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COMPUTERWORLD

PC pricing could spur shakeout

Bad news for smaller players as corporate users return to big vendors

BY CAROL HILDEBRAND
CW STAFF

Third-tier clone makers can kiss the corporate customer goodbye, users and analysts said last week, citing fallout from the recent price blitzkrieg from Compaq Computer Corp. and competing vendors.

"Why would you pick a Most Blessed Happiness box from Taiwan when you can get a Dell for the same price?" said Richard Shaffer, a principal at Technologic Partners in New York. "You'd be foolish."

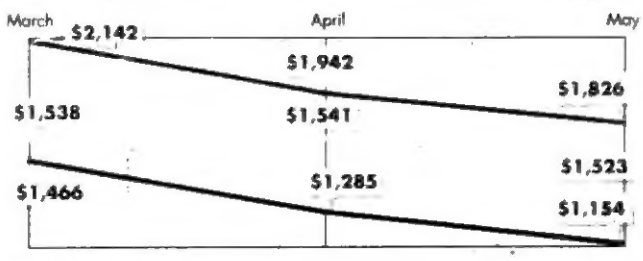
Now that the market leaders have slashed their prices to form a level playing field, corporate customers are being enticed back into the first-tier fold by the promise of long-term vendor viability as well as proven service and support.

"We really faced a dilemma," said Jim Hansel, vice president of investment systems at UBS Asset Management (NY), Inc. "We didn't have the gall to try to justify a price comparison that was 3:1, so we started switching [to

Continued on page 12

Plumbing new depths

Compaq's go-for-broke price-cutting efforts have caused a 14.8% drop in prices during the past three months



Source: Computer Intelligence

Microsoft seeks to prove NT's viability

Operating system delivery schedule still unclear

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — As Microsoft Corp. attempts to tear the "Not There" label off Windows New Technology at this week's Win32 Professional Developers Conference, it will also have to fight doubts that the advanced operating system will ship by year's end.

Microsoft seems to be hedging somewhat on the release schedule. Dwayne Walker, director of Windows NT and networking products, said Microsoft will not be able to determine an absolute ship date until September, which coincides with the broad-based end-user beta test scheduled for that time.

Doubt reigns

Some observers were even more skeptical. "To expect that NT will be debugged and meet user requirements from a commercial environment perspective in 1992 or 1993 is unrealistic," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. She pointed to previous operating system releases that arrived late, including DOS 5.0 and OS/2 2.0, and said she expects third-party developers and Microsoft to encounter more problems than they seem to have anticipated.

Hurwitz also said some early NT developers she has talked to have expressed doubts that NT would ship on schedule.

But not everyone agreed. Other developers, including Frame Technology Corp. and Arbor Software Corp., think the December ship date is feasible.

"Yes, it seems realistic," said Siva Kumar, vice president of the Desktop Products Division at San Jose, Calif.-based Frame

Continued on page 14

TURBOCHARGED!

Borland gazes through Windows at IS

BY JAMES DALY
CW STAFF

Borland International, Inc. will attempt to execute a tricky double play this summer as it tries to take on aggressive competitors in the Microsoft Corp. Windows market while maintaining the loyalty of an increasingly demanding user base.

Nine years after Chief Executive Officer Philippe Kahn started the Scotts Valley, Calif.-based company in a Silicon Valley hideaway, Borland stands at perhaps the most important crossroads of its history. The company is seeking to reach beyond its beginnings as a supplier of microcomputer software into the big leagues of partnering with information systems managers.

But first, Borland must not only break a product development logjam but also take steps to

Continued on page 21

Shifting satisfaction

COMPUTERWORLD BUYERS' SCORECARD

Capacity upgrades and advances in other key areas helped FileNet's image processing product to score higher in user satisfaction than its competitors this year, while Wang's WIIS slipped significantly.

See Buyers' Scorecard, page 59

Product	Score 12/91	Score 7/92
FileNet's WorkFlo	77	79
Wang's WIIS	84	76
IBM's ImagePlus	75	72

Maximum score: 100

IBM caves in to Legent on SystemView pact

BY JOHANNA AMBROSIO
CW STAFF

VIENNA, Va. — After a year of negotiations, Legent Corp. last week joined IBM's SystemView initiative after IBM capitulated by offering a less-costly arrangement. Legent's involvement could entice other software vendors to sign up, resulting in more SystemView products, thus creating an impetus down the road for hesitant customers to implement IBM's systems management architecture.

SystemView, announced in September 1990, is IBM's broad vision of how to manage heterogeneous systems across the enterprise using different vendors' software products from one or several points of control.

Users reacted positively to the Legent/IBM arrangement, but many said they are in no hurry to implement SystemView.

"We prefer [Legent's] products to be SystemView-compliant. We're not doing anything with SystemView at the moment, but it's important that Legent is going in that direction," said Carryl Seaman, chief information officer at HomeFed Bank in San Diego and a Legent customer.

Raymond Wiles, vice president of data center services at TransAmerica Insurance Group in Woodland Hills, Calif., said, "SystemView is . . . something that will come in by osmosis, and

Continued on page 8

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INSIDE

A swarm of dBase IV 1.5 bugs raises the specter of Ashton-Tate. Page 4.

IBM, Microsoft settle royalties spat. Page 4.

Black & Decker CIO Sidney Diamond resigns. Page 6.

Novell's two-headed network management system confuses industry. Page 15.

In Depth — Let's tax TVs to fund U.S. high-tech research. Page 77.

IN THIS ISSUE

NEWS

4 Borland investigates whether dBase IV is jinxed by major bugs.

4 NEC has temporarily stopped shipping its 80M-byte hard drive UltraLite notebooks because of faulty **Quantum** drives.

6 Seven hundred IS employees were cut as part of 4,800 layoffs at **Aetna**.

8 Managers say the **OSF**'s **DME** will be worth the wait — until early 1994.

10 MCI finally offers frame-relay service.

12 Vendors ready advances in notebook technology for fall release.

12 Touch-screen voting and massive databases are among the technologies that will help elect our next president.

14 Borland and **Microsoft** will bury their hatchets to jointly present a Borland compiler for Windows NT.

15 Novell's NetWare Management System's OS/2 and Windows versions can barely communicate with each other.

20 HP is set to unveil a heavily discounted, faster version of its PallBase/SQL relational database.

20 Informix announces four extensions to its Informix-4GL application development language.

Quotable

"Why would you pick a Most Blessed Happiness box from Taiwan when you can get a Dell for the same price? You'd be foolish."

RICHARD SHAFFER
TECHNOLOGIC PARTNERS

On the future of third-tier PC clone makers. See story page 1.

DESKTOP COMPUTING

39 Huntington Bancshares starts small with its 1,500-user migration to OS/2 2.0.

WORKGROUP COMPUTING

49 Novell shoots for the top — the high end — with its plans for NetWare 4.0.

ENTERPRISE NETWORKING

51 Asynchronous Transfer Mode undergoes a fitness test by a user/vendor consortium.

LARGE SYSTEMS

53 From whom should you buy your RDBMS — your systems vendor or an independent supplier?

APPLICATION DEVELOPMENT

63 Interactive Software Engineering readies its new release of Eiffel.

MANAGER'S JOURNAL

81 Imaging is unfamiliar turf for most IS directors.

PRODUCT SPOTLIGHT

67 As X terminals go to more commercial sites, it's more important to understand their sometimes upside-down world.

BUYERS' SCORECARD

59 FileNet's WorkFlo tops competitors in image software ratings.

IN DEPTH

77 Let's tax TVs to boost U.S. high-tech R&D and create low-cost notebooks for all. By David H. Rothman.

DEPARTMENTS

6, 16 News Shorts
24 Advanced Technology
34 Editorial
83 Calendar
84 Computer Careers
92 Marketplace
96 Stocks
97 Computer Industry
98 Inside Lines

The 5th Wave

"IT STARTED OUT AS A KIT, AND WHILE I WAS WAITING FOR PARTS, THEY MERGED WITH A VACUUM CLEANER COMPANY."

EXECUTIVE BRIEFING

■ **Does Microsoft's Windows NT have what it takes?** More than 4,000 developers are in San Francisco this week to find out. Tool vendors are ready to ship products, but questions remain as to whether NT can meet its own December deadline. **Page 1.** IBM and Microsoft's settlement of royalty and patent disputes ensures against a long legal battle, but users differ on whether their buying decisions will be any easier. **Page 4.**

■ **Sidney Diamond exits the VP IS post at Black & Decker** — and the position itself is in question as the tool manufacturer continues to roll IS out into its business units. **Page 6.** Aetna plans to cut 700 IS workers as part of a companywide layoff. The cuts are expected to save $200 million by the end of 1993. It's unclear whether the layoff will affect an initiative to standardize office automation hardware and software across Aetna's 15 business units. **Page 6.**

■ **Corporate buyers are flocking back to name-brand clone makers** as a result of the PC price wars. Analysts expect a shakeout among third-tier players. **Page 1.**

■ **Slap a 10% tax on TVs** and use the money to fund R&D to build notebook computers you can read like a book. That's one author's proposal for aiding the U.S. high-tech industry and creating a computer-savvy labor pool. **Page 77.**

■ **For those tired of vanilla notebooks**, plenty of new flavors are on the way. They include Gateway's Handbook, a sub-3-pound, 6- by 10-in. DOS PC, and Dell's 320SLI, a 3.6-pound notebook sans a floppy drive. **Page 12.**

■ **X terminals are shipping in greater numbers than ever**, with nearly 120,000 units sold in 1991 — up from 12,000 units in 1989 — according to a study by the X Business Group. More are being sold to commercial sites, helping users perform tasks in areas such as CASE, CAD and groupware. **Page 67.**

■ **Novell's network management strategy suffers from incompatibility** between the OS/2 and Windows versions. Novell says it's working on improving links between the products. **Page 15.** The next version of NetWare won't be just an enhanced NetWare 3.X but rather something aimed at a different, higher level of use than the current top-end version. **Page 49.**

■ **Network technology can mask** the complexities of a migration to new systems. Homegrown solutions and standards such as X Window can give end users access to proprietary systems that are being phased out while open platforms are being brought in. **Page 51.**

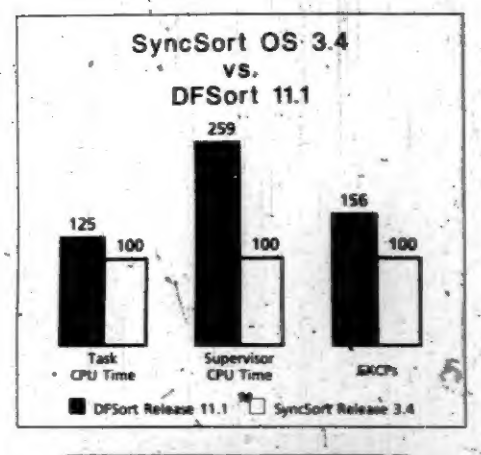
■ **Computer Associates says it will lead users** of dBFast and Nantucket's Clipper environment toward the object-oriented Aspen product. **Page 63.**

■ **If you haven't planned a summer vacation,** you might want to reconsider. IS managers are encouraging employees to take a break, as it has a positive effect on their productivity. **Page 84.**

■ **The question whether to go proprietary or open** when choosing a DBMS brings that good old answer: "It depends." Users are split, saying the flexibility of open systems is nice, but performance is better on a proprietary DBMS. **Page 53.**

■ **On site this week:** Pacific Bell Directory discovers that choosing a computing platform may come down to such simple questions as whether the computer can fit in a sales rep's purse. **Page 39.** OS/2 2.0 migration takes planning, and Huntington Bancshares is going through its plan one step at a time. **Page 39.** Citibank Credit is extending its commitment to Sun workstations, launching plans to move commercial applications such as general ledger onto the Unix platforms. **Page 50.**

IF IT WERE GREASED, IT WOULD BE ALMOST AS FAST AS SYNCSORT.



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Borland exterminating dBase IV 1.5 bugs

BY MARK HALPER
CW STAFF

SCOTTS VALLEY, Calif. — The ghost of Ashton-Tate Corp. was haunting the laboratories last week at Borland International, Inc., where technicians were trying to figure out whether dBase IV 1.5 is hexed with major bugs.

A spate of reports alleging dBase problems have run through electronic bulletin boards and other channels recently, prompting Borland's concern.

The more serious complaints maintain that index files are being corrupted to the extent that users cannot locate records, that dBase is losing text from memo fields and that memo field text is occupying entire disks, producing system hang-ups.

Similar problems led to the demise of Ashton-Tate, the previous purveyor of dBase. Borland acquired Ashton-Tate and the rights to dBase last fall. It released its dBase update, Version 1.5., earlier this year, a move that developers had hoped would exorcise dBase's ills once and for all.

Borland has already begun issuing new dBase disks to developers who, during the last month, have reported what are "minor problems," according to Borland dBase product manager Vince Mendillo.

What proof?

The most severe bug that Borland has had to correct, Mendillo said, has been the inability of some dBase programs to operate the run function in DOS 2.1. The run function allows dBase to execute external commands.

But Mendillo said Borland "has been unable to reproduce" the more serious problems reported by at least three developers.

One of those developers, Susan Perschke, president of Spectrum Data Design in Aurora, Colo., has developed a dBase 1.5 records management program for the state of Colorado. Perschke said corrupt index files have made it virtually impossible to locate records, and her memo field text, which should have occupied about 20K bytes of disk space, swelled to 65M bytes.

"I had no space left to manipulate the data. It took me 3½ weeks to clean it up," Perschke said, noting that in order to safely store the data, she had to remove other programs from her 486-based system and store segments of data on numerous floppy disks.

"When this happened, it was like someone loaded 1.0," Perschke observed, referring to an earlier Ashton-Tate version of dBase. "It was hauntingly familiar."

Borland asked Perschke to send it the application and code more than a week ago, but Mendillo said the company had not yet received it. Perschke said late last week that she had just received permission from the state to send the program and would do so shortly.

Mendillo said he is aware of three reports of "anomalies with memo fields" but that any data that is lost can be recovered using utility files.

Could have been worse

Another developer — not one of the three reports — is Mike Kretzer, a financial systems analyst at Lockheed Missiles & Space Co. in Palo Alto, Calif. He said he lost data from his dBase IV 1.5 memo field recently. Kretzer is getting ready to replace dBase 1.1 with dBase 1.5 on a 40-MHz, 386-based personal computer.

"I lost a couple of small records I had to rewrite," he said. "It wasn't a big deal," he added, "but if it was a larger production file, I would have been quite upset."

Mendillo said Borland has not received enough complaints to consider the memo field problem a consistent, recurring pattern. He claimed that the memo field problems may not relate to dBase per se but could be attributable to hardware configuration or other factors.

Possible roots

Michael Mitsch, a developer at Subaru-Isuzu Automotive, Inc. in Lafayette, Ind., pointed out that the cause could lie in clashing disk caching schemes, in which dBase's internal disk cache program fights with a computer's preexisting disk caching program.

Another developer, Pat Adams, president of DB Unlimited, a consultancy in New York, said the problems could stem from power dips, which are common during the summer.

There was a consensus that Borland must act to resolve what at this point is an enigma.

"If data is being lost, that's critical," said Fletcher Johnson, who is involved with a Bay area dBase user group and is president of Birchwood Systems, Inc., a development house in San Jose, Calif. "Anything else is just an annoyance," he added.

"If Borland gets right on this, they'll be fine," Perschke said. "If they take an ostrich approach, they'll be in trouble."

IBM, Microsoft call truce in battle of code rights

IBM OS/2 to still support Windows but not NT

BY CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — A declaration last week that IBM and Microsoft Corp. have resolved their long-raging software royalty dispute may have temporarily ended the bickering between the two industry giants. And the resulting calm may help users clarify the distinctions between the two companies' 32-bit operating systems.

Prior to the agreement, observers were left guessing as to exactly how far and for how long each firm's rights extended over the other's product. Particularly at issue was how long IBM would have access to Windows source code for use in OS/2, a major selling point of IBM's "integrating platform," OS/2 2.0.

Now, a date of September 1993 has been set for the end of source code rights, with IBM retaining the right to clone Windows application programming interfaces indefinitely.

For those to whom Windows support is vital, the issue had caused some consternation.

"I think it lifts the cloud that was over OS/2 and the potential of OS/2," said Sheldon Laube, national director of information technology at Price Waterhouse. He indicated that one concern over OS/2 had been its continued ability to support Windows applications. Under the new arrangement, such support is guaranteed for at least several years.

Of passing interest only

But while some users were relieved by the news, others said they felt it would have little impact on them.

Dave Arthurs, manager of systems planning at Kotter & Co., said, "I didn't really see how it was going to have any impact on us."

The deal should end the increasingly messy spitting match that began between the two firms when Microsoft announced its intention to veer away from the OS/2 path.

IBM and Microsoft "agreed to disagree on desktop operating systems," according to Microsoft Executive Vice President Steve Ballmer, but they realized they must work together in some areas.

Those areas include the ability of IBM hardware to run Microsoft software, including Windows New Technology (NT).

Perhaps more important is the ability of customers to have some confidence in making purchase decisions, a situation that could have become a nightmare if Microsoft and IBM had locked horns in a lengthy legal battle.

There are no losers

Microsoft also wins. The various royalty fees owed to it by IBM are now made clear, and a $10 million to $20 million payment lets it avoid wading through IBM's sea of patents in court. In addition, IBM will have OEM rights to Windows NT and can sell it on IBM hardware. And Microsoft will still be able to incorporate OS/2 code into NT until September 1993, although it is unclear if this will have a major impact on user interest.

While OS/2 is being touted by IBM as an "integrating" platform for using a variety of operating systems simultaneously, Windows NT is positioned more as a transitional operating system for users looking for a high-powered, secure environment.

The agreement also ends all speculation that any future versions of OS/2 will use all or part of the NT kernel. IBM gave up all rights to use the NT source code except for porting NT to its hardware. "We're not paying for future development of NT," said Lee Reiswig, assistant general manager of programming.

He indicated that the NT kernel was too tailored to Windows to be of use with OS/2. However, he noted, IBM's OEM agreement will still allow it to see NT's source code to determine functionality and performance.

Burying the hatchet

The IBM/Microsoft agreement appears to put an end to the fray that followed Microsoft's break with OS/2 — and so keeps the two out of court.

The following terms will be applied by the new pact:

- **Microsoft will supply IBM with source code for all Windows versions that run on top of DOS, including 32-bit versions, until September 1993. Similarly, IBM will give Microsoft the source code for OS/2 until that time.**
- **Each company will be allowed to use the other's source code in its own products at set royalty rates. A Microsoft spokesman indicated that the royalty rate for each copy of OS/2 2.0 is somewhere between $15 and $30.**
- **IBM will receive source code to Windows NT under an OEM agreement for porting the operating system to IBM hardware.**
- **Microsoft and IBM will exchange technology patent libraries, allowing both to license for both current patents and any others that occur within the next five years. Microsoft agreed to pay between $10 million and $20 million for access to IBM's patents, according to Steve Ballmer, Microsoft's executive vice president of worldwide sales and support.**

CHRISTOPHER LINDQUIST

NEC repairs faulty drives

BY MICHAEL FITZGERALD
CW STAFF

BOXBORO, Mass. — NEC Technologies, Inc. confirmed reports from several users that it is having problems with the 80M-byte hard drive version of its UltraLite notebook products based on Intel Corp.'s 80386SL processor and has stopped shipping them. The problem appears isolated to NEC and some of the 80M-byte hard drives it has shipped.

The company said the problem was in the firmware of the Quantum Corp. drive, which was customized to work with NEC's system management software. A NEC representative said the firm has solved the problem, is in assurance testing and will resume shipping the 80M-byte drives this month. Until then, those customers that do have problems will receive 120M-byte drives at no extra cost.

While it refused to say how many drives were failing, NEC claimed the rate was higher than the normal hard disk malfunction rate but did not elaborate.

Richard Nelson Jr., vice president of agency systems at New York Life Insurance Co., one of NEC's largest customers for portables, said he personally had received three machines with the problem, although the company in general did not have that high a failure rate.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision-making by making access to information easier...much easier.

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

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John Young
President and CEO
Hewlett-Packard Company

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Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.

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NEWS SHORTS

French firm buys IBM's Cadam line

France-based Dassault Systemes, an IBM partner in the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) market, last week formed a new firm that has acquired IBM's entire line of Cadam software products. The new firm, Dassault Systems of America Corp., will pursue a single, unified architecture to support both Cadam products and its own Catia line of CAD/CAM/CAE applications. More than 3,000 IBM mainframe shops use Cadam and Catia products.

EPA ditches remainder of CSC pact

The Environmental Protection Agency last week canceled the last two years of a five-year, $347 million contract with Computer Sciences Corp. (CSC) as part of the agency's overhaul of its procurement practices. The EPA is probing allegations that CSC overbilled for its computer support services but said the contract truncation stemmed from a desire to reduce reliance on a single company.

Oak Ridge Lab buys Intel Paragon

The Oak Ridge National Laboratory in Oak Ridge, Tenn., will buy Intel Corp.'s Paragon XP/S, a supercomputer that runs at 150 billion floating-point operations per second. The laboratory will also serve as a beta-test site for the next generation of hardware and software for Intel's supercomputer line. The two companies also signed a three-year Cooperative Research and Development Agreement under which they will support the U.S. Department of Energy's Technology Commercialization Initiative.

Apple software eases DOS access

Apple Computer, Inc. last week unveiled Macintosh PC Exchange, a $79 software package that allows Macintosh users running System 7.0 and equipped with an Apple SuperDrive floppy disk drive to read, write and format IBM Personal Computer-compatible disks. Files on the PC-compatible disk appear on the Macintosh's screen as standard Macintosh documents and can be imported into Macintosh-based applications. The DOS-formatted disk can be used to transfer Macintosh files to a DOS computer.

Bill limiting RBOC options wins one

The House Judiciary Committee last week passed a bill that would effectively bar the regional Bell operating companies (RBOC) from offering information and long-distance services and from manufacturing equipment. The bill would codify the terms of the AT&T Consent Decree and wipe out a court decision last year that said RBOCs could offer information services.

Short takes

Former **Mellon Bank NA** information systems chief George DiNardo surfaced last week as the new president of Naugatuck, Conn.-based **FBC, Inc.**, the wholly owned IS subsidiary of Orlando, Fla.-based Kirchman Corp. . . . **Corporate Software, Inc.** has appointed former **Microsoft Corp.** Senior Vice President Scott D. Oki to its board of directors. . . . The **Multiuser DOS Federation** has rejected Microsoft's demand that it stop using MDOS as part of its name. The federation is attempting to register MDOS with the U.S. Patent and Trademark Office. . . . **Lotus Development Corp.** joined two major open systems groups last week: **Unix International, Inc.** and the **Open Software Foundation.** . . . A wireless option for **AT&T's** EasyLink customers will be developed by AT&T and wireless network provider **RAM Mobile Data.** The product is slated for delivery next year. . . . **Storage Technology Corp.** and **IBM** have teamed up — despite their rivalry in the tape-library market — to go after a multibillion dollar **NASA** contract, the 15-year Earth Observing System. . . . **Digital Europe** and **Apple Computer Europe, Inc.** have signed a letter of intent to distribute some of each other's products, including Apple Macintoshes and **Digital Equipment Corp.** interconnection products as well as VAX- and reduced instruction set computing-based servers.

More news shorts on page 16

Aetna to slash IS staff by 700

Cutbacks at insurer are expected to save a total of $200 million by 1993

BY KIM S. NASH
CW STAFF

HARTFORD, Conn. — Aetna Life & Casualty Co. might do well to tack on "with less" to the end of its advertising ditty, "A policy to do more."

The fourth-largest insurer in the U.S. last week began pink-slipping the first of 4,800 employees targeted for layoffs between now and 1993 — 700 of whom will be cut from Aetna's 4,900-member information systems department.

Aetna's internal newsletter served as official notification of the layoffs for some employees, although scuttlebutt had permeated the ranks for months [CW, Feb. 3].

The layoffs — expected to save a total of $200 million by the end of 1993 — raised questions about the status of Consistent Office, a plan started in 1990 to get Aetna's arms around its set of disparate office automation tools and set standards for software and hardware.

Several executives in the Aetna Information Technology (AIT) Group refused to comment, including John Loewenberg, AIT's senior vice president who reports to company Chairman Ron Compton.

May be positive

Analysts were optimistic, though, that the layoffs were a good thing. "They know where to cut. Ron Compton did a similar show at Emery [Airborne Express] in the 1980s, turning that company around," said Robert Riegel, assistant vice president at Moody's Investors Service, Inc. in New York.

However, Riegel and other observers noted that certain risks are linked to such a large reduction. Low morale at a firm already hit with layoffs totaling 2,600 employees during the course of 1990 and 1991 might just sink altogether, agreed Greg Schmergel, a consultant specializing in financial services at The Ernst & Young Center for Information Technology and Strategy in Boston.

Technology is a major part of Aetna Health Plans, the firm's group health insurance unit, which has grown during the past few years via the acquisition of several regional health maintenance organizations (HMO). The new HMOs likely left Aetna with duplicate functions in IS, as well as in other departments, that it would be wise to zap, said Ellen Barzilai, an insurance analyst at Alex. Brown & Sons, Inc.

Aetna management seems to have realized this. For example, after absorbing Partners National Health Plans in Irving, Texas, in 1990, Aetna trimmed its work force and consolidated both existing and acquired IS functions [CW, Sept. 30, 1991].

Aetna recently took over Freedom Health Care, Inc., a large HMO based in Wayne, Pa., and Bay Pacific Health Corp. in San Bruno, Calif., but spokesmen would not indicate if IS cuts would happen as a result of these additions.

Too close for comfort

Insiders, who declined to be identified, reported being under management's microscope since January, as executives evaluated who was doing well and who was expendable as a way to "eliminate redundancies" in the department overall.

Although competitors such as The Travelers Corp. and Cigna Corp. have already made drastic staff reductions during the past few years in an effort to cut costs, Aetna is not necessarily late to the party, Riegel said.

He cited the companywide 2,600-person purge announced late in 1990 that coincided with an IS revamp.

In the fall of 1990, the company reorganized AIT to "try to get control of a chaotic department," according to a former IS staff member who asked to remain anonymous.

"The most recent round [of layoffs] is getting so much attention because it's so big," Riegel said.

At a glance
Aetna Life & Casualty

IS budget:
$600M (3% of revenue)

IS staff:
4,900*

Percent of IS budget spent on staff:
41%

Installed processor value:
$70M

*Prior to layoffs

Source: *Computerworld Premier 100* (September 1991)

Diamond deals self out of Black & Decker deck

BY NELL MARGOLIS
CW STAFF

TOWSON, Md. — Sidney Diamond, who helped push Black & Decker Corp. to the forefront of information technology use as its top-ranked information systems executive, may have worked himself out of a job.

Diamond handed in his badge last week. Contacted at home, he described his move as the logical and inevitable outcome of the very strategies he has actively helped implement during the past several years: "Downsizing, outsourcing and decentralizing."

"I guess in a way I've worked myself out of my job," said Diamond, who was vice president of worldwide IS. "It was just a matter of when to say when."

No particular event precipitated his departure, he said. A several-year plan under way at the tool manufacturing firm to roll corporate IS employees out into the business units is reaching its final stages, he noted.

Diamond *'worked myself out of my job'*

With "the last big chunk" recently transferred to the firm's core Power Tools Group, once-central corporate IS is now a significantly reduced stronghold — half of its former size. Once 175 strong in 1988, staffing now stands at 87, according to a source close to the company who requested anonymity.

But signs of an anticipated executive departure were in scant supply at Black & Decker last week. Don Lee, who reported to Diamond as director of technical services and operations, confirmed that he will be taking on the additional title of acting manager of worldwide operations "on an interim basis."

Precisely what duties come with the job, or whether it will gel into a permanent position as senior-most IS executive, remain uncertain, he said. A company spokesman declined all comment on the changing of the guard.

But if IS reporting lines and structure are unresolved, Black & Decker's IS mission is clear: "We will still provide the right tools and resources to enable the businesses to move quickly," Lee said. "And we won't be overly concerned with whose resources we're using — corporate IS' or the business'."

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Great expectations for OSF DME '94 delivery

BY ELISABETH HORWITT
CW STAFF

Network managers seemed largely unfazed by the news last week that commercial implementations of the Open Software Foundation's (OSF) Distributed Management Environment (DME) will not start appearing until early 1994. The consensus seemed to be that the wait will be worth it — if DME lives up to its promise to provide the first viable framework for integrated, enterprisewide network and systems management.

Last week, the OSF announced that it expects to make the full suite of DME protocols available for commercial implementation by the end of next year.

Hewlett-Packard Co., IBM, Digital Equipment Corp. and Tivoli Systems, Inc. are among the vendors that have promised DME implementations after the protocols are ready. This is the first official announcement of a delivery schedule.

For decentralized companies such as DHL Worldwide Express, DME provides the opportunity for different user groups to "choose the best network management solution for them and then provide interoperability," said John McShane, a project manager at DHL Systems, Inc.

Citibank "feels that a lot of DME's functionality will be very useful in the area of heterogeneous systems management," said Harriet Schabes, a vice president at Citicorp Technology Office in New York.

Asked what makes DME stand out from earlier efforts as a network management standard, several users cited its object-oriented architecture, which buffers network management applications from the proprietary nature of the devices and systems they are managing.

The system could send out a command to shut down a multivendor printer installation, and DME's Management Request Broker would have on record exactly what protocols and commands are needed to find and address those printers, even if four different brands were involved, an OSF spokesman said.

"If Cisco or Wellfleet provided a router object in the right form, we could port it" to a DME-compliant management system, and it is immediately manageable via DME-compliant applications, "without training, headaches or customization," said Don Golden, a member of the Network Management Forum's User Advisory Council and a program manager at Shell Oil Co. in Houston.

"The thing to really watch is how fast third parties bring out [network management] applications to run on DME," said Mary Johnston, a principal at Northeast Consulting Resources, Inc., a Boston-based consulting firm.

Users have complained that today's proprietary systems only support a limited number of network management applications, she added. DME potentially solves that problem by letting third parties port their products to any DME-compliant system.

Points of resolution

DME also has the potential of resolving, once and for all, the ongoing "religious wars" about what will be the dominant network mangement standard because it supports both Common Management Information Protocol and Simple Network Management Protocol as well as a remote procedure call-based messaging system, according to Golden.

Users did express some anxiety over whether the OSF would adhere to its current schedule for releasing DME — recalling that earlier OSF standards efforts were delayed.

"The current schedule is practical, but we wouldn't mind seeing it hurry up a bit," Schabes said. "We are concerned that there might be delays. We won't stand still in the meantime. There's a lot you can do to ensure migratability" of pre-DME systems.

What makes DME tick?

Distributed Management Environment is a hodgepodge of technologies and standards that are delivered by six major vendors.

Management User Interface
Sources: Tivoli, HP.
Functions: Motif-based graphical user interface, the ability to call services and information as objects.
Advantages: No need to retrain network managers to work with each new network management system or application.

Application and Management Services
Sources: MIT, HP, Banyan Systems, Inc., IBM, Tivoli.
Functions: Common set of support functions such as printing, licensing, software and event management, event notification, policy implementation and classification of managed elements.
Advantages: Application vendors do not have to reinvent the wheel but can concentrate instead on value-added features.

Application Development Tools
Sources: Tivoli, Groupe Bull.
Functions: Common set of interfaces for network management applications.
Advantages: Network management applications can be ported to any DME-compliant network management system.

Management Protocols
Sources: HP, Tivoli.
Functions: Management applications and systems can exchange information and commands with one another and with managed elements.
Advantages: In addition to object-oriented remote procedure calls, DME systems can interact with non-DME systems that support either Simple Network Management Protocol or Common Management Information Protocol.

ELISABETH HORWITT

IBM caves in to Legent on SystemView

CONTINUED FROM PAGE 1

it will take a long time to evolve."

Until last week, IBM's SystemView partners — called the International Alliance — included Bachman Information Systems, Inc. in Burlington, Mass.; Candle Corp. in Los Angeles; Goal Systems International, Inc. in Columbus, Ohio; Platinum Technology, Inc. in Lombard, Ill.; and Information Retrieval Cos. in Chicago.

To become a full alliance member, a software vendor has to pay an up-front fee and a royalty on every copy of the SystemView product sold either by IBM or the vendor's own sales force (see chart).

A partner is born

The agreement with Legent, however, creates a new classification: development partner. The terms call for Legent to participate in the design and specifications of SystemView, but IBM will not market or sell Legent software. Bill Warner, director of enterprise management for IBM networking systems, said this new category is available to other vendors as well.

Although none of the parties involved would discuss finances, the development partner category was said by one observer to be at least half the cost of the full alliance category — a difference that could mean up to $1 million.

John Burton, Legent's president and chief executive officer, had declined to join the alliance under the original terms, saying that even though Legent supported the concept of SystemView, the cost to become an alliance partner was too high.

In past interviews, Burton had characterized the marketing piece as especially inappropriate for a company of Legent's size. "We are not in need of marketing support," he said.

Eases worries

The relationship, Burton added, "alleviates users' concerns about our ability to implement SystemView in a timely fashion. We never wanted a vision that said IBM was in one camp and Legent was in another, even though we've supported SystemView all along."

About five Legent products already comply with the first level of SystemView integration — a user interface — with some 20 more slated for compliance, Burton added.

Another impetus for Legent to join the SystemView team was its pending acquisition of Goal, already an alliance member. Still, exactly what Legent's SystemView agreement means to Goal is unclear, said Steve Sasser, president of Goal's Systems Software Division.

"We'll have to sit down with Legent and IBM and talk about what makes sense for everyone. I expect this to happen over the next month or two," he said.

No big thrill

Some industry watchers, including Jeff Schulman, an analyst at Gartner Group, Inc. in Stamford, Conn., said the Legent/IBM relationship will not have much of an impact.

"I don't think that others will jump on the bus because, the track record is so bad," he said. "It will help Legent's marketing because they will now have the Good Housekeeping seal, so to speak."

Olivier Thierry, director of marketing and business development at Boole & Babbage, Inc. in Sunnyvale, Calif., said, "You'll see SystemView gain momentum as more companies join; things are going to open up."

Boole & Babbage is negotiating to join the alliance, Thierry added.

Max Watson Jr., chairman of BMC Software, Inc. in Sugar Land, Texas, said he would consider getting aboard the SystemView bus if "we were to get similar terms to Legent." He said BMC has also declined to sign up thus far because of financial reasons.

"It was a simple business decision; we looked at benefit and cost. For us the alliance made zero sense because it was not worth it," Watson said.

Parallel course

IBM's SystemView allies are now grouped in two categories

- **SystemView Development Partner**: Gives companies an early peek at future releases of IBM products. Entitles them to sit on a design council to help draft technical specifications for SystemView. Other benefits include joint press conferences and press releases.

- **International Alliance Member**: All of the above plus an agreement for IBM to help sell the product. Price tag is an up-front fee plus between 10% and 15% of the product's total license revenue.

CW Chart: Tom Monahan

CORRECTIONS

Because of a typographical error, the June 22 issue of *Computerworld* reported that Wang Laboratories, Inc. is charging between $1,000 and $1 million for operating system software licenses on used VS computers. The correct price range is $1,000 to $100,000. Also, the federal district judge who ruled favorably on the pricing policy did so in California and not Massachusetts.

.....

Northrup King Co. was misspelled in the June 15 issue.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

MCI throws hat into frame-relay ring

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — Though bringing up the rear of the frame-relay rollout parade, MCI Communications Corp. last week announced the availability of service on what analysts called the most promising platform to date for migrating users to Asynchronous Transfer Mode (ATM) switching speeds.

Frame relay is a faster packet-switching scheme aimed at efficiently accommodating local-area network interconnection and other applications that generate unpredictable chunks of network traffic.

While MCI has suffered some industry tongue-lashings during the past year for being the last interexchange carrier to introduce a service, "it has missed out more on the frame-relay hoopla" than on business opportunities, said Chris Finn, an associate at TeleChoice, Inc., a telecommunications consultancy in Montclair, N.J.

Users have taken longer than expected to educate themselves about the fledgling technology, he noted. Meanwhile, MCI has built a T3 (45M bit/sec.) backbone network based on a core of Siemens Information Systems, Inc. ATM switches. A version of Wellfleet Communications, Inc. routers that function as feeder switches at the boundary of the network convert incoming frame-relay traffic into industry standard-size cells for transmission across the network via the Siemens backbones [CW, June 29].

A better choice

The equal-size ATM cells have been deemed more appropriate for multimedia applications, which contain delay-sensitive traffic such as voice and video. Eventually, a third inner tier of MCI's network will emerge to collect data from the T3 backbone and transport it at gigabit-range speeds. The MCI platform is similar in concept to that of StrataCom, Inc.'s IPX switches — the platform for several other frame-relay services. However, the IPX cells are nonstandard sizes and top out at T1 speeds.

The higher speed base is important because "right now, customers see ATM as the Holy Grail" of networking, Finn said. "Larger customers who aren't particularly mobile have to look five to seven years down the road" at what technologies they will be using.

The MCI infrastructure is integrated with MCI's automated order entry, service provisioning and billing systems — a benefit to MCI customers cited in a research note drafted early last month by Gartner Group, Inc., a Stamford, Conn.-based consultancy.

MCI is initially offering both fixed-rate and capped usage-sensitive pricing schemes on a contract basis for its frame-relay service.

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Kimberly-Clark IS exec to consult

BY NELL MARGOLIS
CW STAFF

CHICAGO — Two weeks after handing in his chief information officer badge at Dallas-based Kimberly-Clark Corp., John T. Kohler last week turned up as senior practice leader in commercial manufacturing at Technology Solutions Corp. (TSC), a systems integration firm.

"This isn't a new departure for me; it's more like coming back home," Kohler said. A decade ago, Kohler worked at Arthur Young, where he was hired onto the information systems front lines by client Kimberly-Clark. His move to TSC reunites Kohler not only with the consulting business but also with former Arthur Young colleague Albert D. Beedie Jr., who is TSC's chairman and co-chief executive officer.

"Being on the expense side of the [corporate IS] equation was beginning to wear," Kohler said. "It was time to return to the revenue side." He declined to expand on his reasons for leaving Kimberly-Clark [CW, June 29].

The first of Kohler's challenges, Beedie implied in a prepared statement last week, will be shaping the manufacturing practice. He will need to counterbalance blows to TSC's bottom line sustained in its recently closed 1992 fiscal year as a result of shortfalls in its aerospace and defense practices. Notwithstanding that hit, the firm posted a profit of $12.1 million on revenue of $71 million.

WANT QUICK ACCESS TO PRODUCTS?

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Page 91

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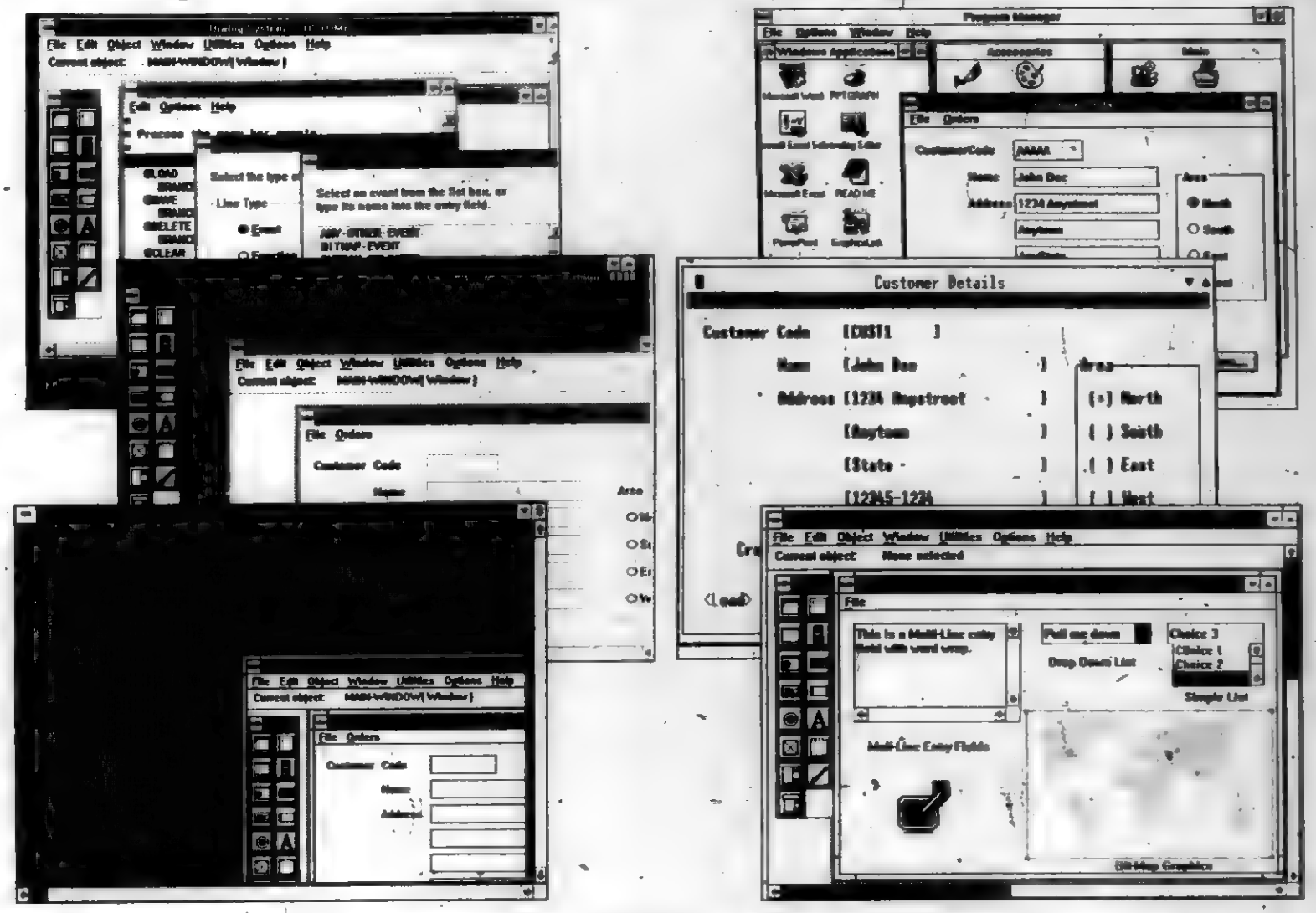

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Plethora of portables on way

BY MICHAEL FITZGERALD
CW STAFF

Vendor research laboratories will heat up this summer with the final preparations for an onslaught of portable technology targeted for fall delivery. Expect dramatic advances in weight and performance, with new features and entire new classes of devices hitting the market.

Some industry executives said they think the slew of new products and product types may create reasons for people to use several computers at a time, while some analysts speculated that some of the products will not survive. Driving the upcoming effort to differentiate portable products is the need for higher margins.

"It's been bloody out there, and vendors are realizing that a vanilla, 'me-too' box doesn't let them make any money," said Dan Ness Jr., an analyst at Computer Intelligence, a market research firm in La Jolla, Calif.

Vendors are moving to add features to their products, changing a market that was filled with Intel Corp. 80386SX-based notebooks that were essentially identical in features.

'Now, analysts point to devices such as the removable hard drives employed by vendors such as Epson America, Inc., the modular architectures touted by Advanced Logic Research, Inc., among others, and the variety of new product designs from companies ranging from Compaq Computer Corp. to Beaver Computer Corp.

In addition, notebooks have embraced non-Intel chips, too. Many companies, such as Wyse Technologies, Inc., use chips from Cyrix Corp. and Advanced Micro Devices, Inc. in addition to Intel chips.

Standard features will continue to get larger, while new technologies such as flash random-access memory cards have already prompted some notebook vendors to banish floppy drives. And notebook makers will remain on crash diets to drive weight down as low as possible.

The shift away from me-too notebooks drew praise from users contacted last week.

"I think the notebook change is positive," said Chad Pearce, network administrator at Miller Mason & Dickenson's Philadelphia office. Pearce said less-expensive color screens in particular would be welcomed by his company, as would notebooks that could provide power-consuming 486DX technology without a loss in battery life.

Still, a more radical shift in portables than just color may be coming, if recently announced products from Dell Computer Corp. and Gateway 2000 Ltd. serve as a preview. Dell recently brought out a 3½-pound, slim 80386SL-based notebook computer, while Gateway released its Handbook, a 2¾-pound, 6 in.-by 10-in. personal computer.

While analysts expect the notebook market to continue to grow, in part because of products like Dell's, the Gateway product and those like it have a less certain future.

"[Dell's product] is great: It shoots the Phoenix ROM-based 8086 CGA subnotebook in the head," said Andrew M. Seybold, editor of the Brookdale, Calif.-based newsletter "The Outlook on Professional Computing."

Still, Seybold said, the lack of a floppy drive on the Dell machine could hurt it in the market, where the companion PC concept pushed by Phoenix Technologies Ltd. may succeed.

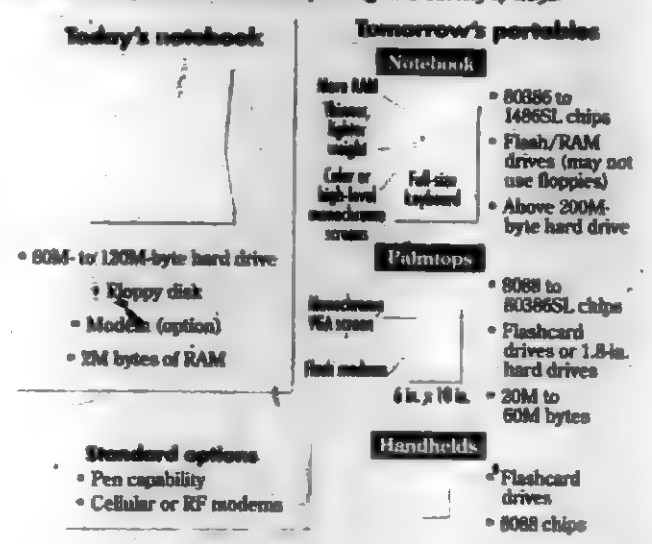
Information systems managers contacted said they liked this new class of PCs for personal use but did not see it making the corporate IS budget.

"In our organization, our laptop users are using Windows and OS/2, so these subnotebooks are kind of a technological step backwards," said Joseph King, assistant vice president of IS at Continental Insurance Co.

Many vendors who plan to enter the market for subnotebooks, or palmtops, said they will position them as consumer electronics devices and not PCs.

A vital transformation

Notebook computers are metamorphosing in a variety of ways:



CW Chart: Janell Genovese

Campaign '92: High-tech politics

BY CAROL HILDEBRAND
and THOMAS HOFFMAN
CW STAFF

For George Washington, the closest thing to technical innovation was a set of poorly fitting wooden dentures that nonetheless made his speech more clear. Today's politicians increasingly rely on a battery of computerized gadgets to keep their campaigns humming.

So far this election season, technology applications have ranged from touch-screen voting to massive database applications to various forms of electronic debating.

At next week's Democratic National Convention, for example, delegates will vote via a touch-screen-based electronic voting system. The convention used a more primitive version back in 1988, but Roger Schneider, director of technology for the convention, said the system has been updated to the point where he has almost eliminated the need for training.

When the delegates gather in Madison Square Garden, they will find 60 touch-screen-equipped point-of-sale terminals from NCR Corp. The terminals are tied to a Unix-based NCR 3B series that runs all of the back-office functions.

The chairmen of the delegations can each send the number of yes and no votes for planks for their parties by touching the screen about three times. However, the systems will not be used to cast the actual votes for the presidential and vice presidential candidates — this will be done using good old lung power.

Schneider said a user could operate the system without any training, although the convention is providing classes. "Our paradigm was to imitate an ATM," he said.

Schneider said the party made a real effort to greatly amplify the use of cutting-edge technology. The convention is running Microsoft Corp.'s Windows 3.1 on top of LAN Manager on top of Unix and is also using Lotus Development Corp.'s Notes groupware.

On the GOP side

The Republican National Convention, which will be held Aug. 17-20 at the Houston Astrodome, will not use electronic voting systems, according to Joseph Fleming, the press secretary for the convention. But it is not abandoning computer support altogether. Fleming said the convention is using 27 different databases supplied by DataPerfect, WordPerfect Corp.'s database offering, to access information on the convention's housing options in Houston, on transportation alternatives and on each of the volunteers working at the convention.

The Republican National Convention is deploying 180 Hewlett-Packard Co. and Compaq Computer Corp. workstations to access database information running over three Novell, Inc. networks. WordPerfect's Office Electronic Mail systems run over the Novell networks. Information is printed out on HP LaserJet III printers.

"It's another way of communicating office-to-office in a high-speed and accurate manner," Fleming said of the convention's computer operations. Despite the information systems infrastructure, he said, the convention does not have any plans to conduct electronic town meetings like the Perot campaign.

Pricing could spur shakeout

CONTINUED FROM PAGE 1

clones]. Fortunately, now we can return [to name brands] because vendors have come back down in price."

With pricing rebuttals to Compaq's new low-end families already logged in from Dell Computer Corp., The Acer Group, Hyundai Electronics America's Information Systems Division, NEC Technologies, Inc., Digital Equipment Corp. and more in the works, industry analysts said, a shakeout among third-tier vendors is inevitable during the next 18 months.

In particular, several analysts have pointed out that some larger companies do not have the cash on hand to sustain a lengthy price war. "Such vendors as AST, Dell, Gateway and ALR are probably OK," said Michael Murphy, editor of the "California Technology Stock Letter." But, he added, "beyond that, it gets tough."

Users probably will not notice the winnowing because most of it will be the small, garage-type organizations, predicted Bill Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

For Wally Nehls, a personal computer coordinator at a Midwestern banking software developer, the wars mean he can stick with Compaq: Pricing considerations had been driving him to consider the lower priced clones. "The biggest thing is to stay with a vendor I trust," Nehls said, adding that both the financial stability of a vendor and its reputation for quality are very important to him.

Mathew Cain, an analyst at Meta Group, Inc. in Westport, Conn., said many of his Fortune 1,000 clients are renewing interest in Compaq as a result of the price cuts. "People who were bouncing Compaq out of their RFPs are now relooking," he said.

For customers, the current climate means that taking a look at smaller companies' long-term viability before making a purchase is a necessity.

"Compaq has decided to press these guys to the mat. If you're buying low-end clones, you better rethink that but fast," Bluestein said.

Jo M. Haraf, director of office technology at Booz, Allen & Hamilton in Bethesda, Md., agreed: "That's why we're not doing business with some of the truly no-name products. We didn't feel that they were going to be around in six months to fulfill their one-year warranty."

However, a protracted price war, while good for customers' pocketbooks, could have a wearing effect in the long term as vendors continue to suffer losses while trying to price-cut their way to bigger market share.

Tom Willmott, an analyst at Aberdeen Group in Boston, said he did not think manufacturing costs, overhead and margins were coming down as fast as vendors' product prices. In a slow-growth hardware market, he doubted whether the reductions would increase unit volume enough. "For the supplier side, it's relatively suicidal," he said.

Nehls agreed: "I don't think a price war will necessarily be good for the industry — it's like the airline price wars," where airlines have been hemorrhaging cash and, in some cases, dropping out of the market.

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Microsoft seeks to promote NT

CONTINUED FROM PAGE 1

TeChnology. He added that the incremental releases of NT that his firm had been receiving were improving in quality, though some features, such as a TrueType font manager, were still missing.

More than 4,000 independent software vendors, analysts, users and journalists will reportedly attend the conference, where Microsoft will try to convince them that the 32-bit Windows NT is indeed the platform for future development.

Toward that end, Microsoft's battery of ammunition will include NT demonstrations and technical discussions, a keynote by Chairman Bill Gates and demonstrations and announcements of third-party development products by more than 40 vendors. Some 25 NT development tools will also be available at the conference, according to Microsoft (see story this page).

Microsoft will tout its 32-bit Windows NT as the platform for future development

Taking it slow

Delaying the product, if necessary, may be a wise move. Microsoft has had a chance to learn from both its Windows 3.0 product and IBM's OS/2 2.0 that rushing to meet a deadline can haunt a company as users clamor for the bug fixes, device drivers and applications necessary to make an operating system usable.

Such thinking is evident in the company's bid to get early versions of the NT developers' kits into as many hands as possible. Every attendee at the conference will be given a compact disc/read-only memory (CD-ROM)-based kit that contains prerelease versions for both Intel Corp. and Mips Computer Systems, Inc. platforms of Windows NT, Win32 Software Development Kit (SDK) tools and a 32-bit version of the Microsoft C/C++ compiler as well as all on-line documentation. After the conference, developers will be able to purchase the SDK for a list price of $399 with paper documentation or $69 as CD-ROM only. The low pricing should help get the kit into the hands of some 20,000 to 30,000 developers that Microsoft hopes to have using NT by this fall.

Such a strategy will no doubt work in Microsoft's favor as it will help make available a large number of 32-bit applications the moment NT ships, which could help sway customers.

"We're anxious for our vendors to explore NT," said Dave Arthurs, manager of systems planning at Kotter & Co. in Chicago. Arthurs said his company is concerned with IBM's ability to sustain OS/2 2.0 and added that Unix was very appealing.

However, he said, if NT meets its hype, it could give him the best of both worlds: the functionality of Unix and the familiar interface and wide variety of applications for Windows.

"What makes me feel comfortable with NT is hearing that developers are going to get copies," he said. "That's the only way that [Microsoft's] really going to be able to fine-tune the operating system."

Newer Technology

While the prerelease version of Windows NT will be aimed primarily at developers of 32-bit Windows applications, the final version — scheduled for release at year's end — should contain much more, including the following:

Available at release:

- Complete DOS, 16-bit Windows, Windows NT, Posix and OS/2 character mode subsystems.
- Transmission Control Protocol/Internet Protocol and a Distributed Computing Environment Remote Procedure Call-compliant support.
- Built-in Microsoft Mail support.
- Ability to use NT as both a client and a server in networked environments as well as redirectors for use with LAN Manager, Novell, Inc.'s NetWare and IBM's LAN Server systems.
- Full multiprocessor support.

Available simultaneously with or shortly after release:

- NT-specific SQL Server with 32-bit and multiprocessor support.
- Systems Network Architecture services and a variety of system and network management products.

CHRISTOPHER LINDQUIST

Borland compiler elicits cease-fire with Microsoft

Industry archrivals to cooperate at conference

BY MARK HALPER
CW STAFF

SCOTTS VALLEY, Calif. — In recent weeks, Borland International, Inc. Chairman Philippe Kahn has let loose with a series of unflattering remarks about Microsoft Corp., likening Microsoft's Pox logo to a dog and claiming he has tried Windows but has not inhaled.

But at least for a moment at this week's Win32 Professional Developers Conference (see story page 1), the two companies will swap olive branches.

Not that either company has been overwhelmed with benevolence toward an archrival. Rather, both are approaching an hour of need.

The occasion will be a 60-minute presentation by Borland of its C++ object-oriented compiler — a product that will go head-to-head with Microsoft's own C++ — for Microsoft's Windows New Technology (NT) and for the Win32s application programming interface.

The demonstration will mark Borland's first public showing of its NT C++. It will apparently also mark the first time that Borland has chosen to demonstrate a product at a Microsoft event.

"We're taking it up several levels," said Gene Wang, vice president and general manager of Borland's Languages Business Unit. "We've never been part of one of their conferences."

Hoping for exposure

The timing is understandable, considering that Microsoft, Digital Equipment Corp. and Symantec Corp. all plan to start offering their own C++ compilers next week. Borland will not ship its product until after NT becomes available and hopes its demonstration next week buys it mind share among other developers.

For Microsoft, having the leading C++ on hand at the NT developer's conference should help build NT momentum.

There is one addendum to the scenario. Borland has not completely let down its barbarian guard: Kahn himself will not be there.

Developer show touts Windows tools

Attendees to see dozens of demos — with many more products promised

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — Tools, tools, tools.

In addition to supplying all of its own development products, Microsoft Corp. claimed that some 100 independent software vendors have promised to release more than 141 tools for 32-bit Windows, including Windows New Technology (NT). To help get the word out, Microsoft will ship a compact disc/read-only memory package containing a variety of text, advertisements and working models of 32-bit third-party tools to all Win32 Professiopal Developers Conference attendees two or three weeks after the conference.

Thirty-six companies reportedly will be demonstrating products at the conference, and about 25 of them should be ready to take orders, at least for beta-test versions of their products. Still other vendors will be announcing tools at later dates. Among the committed vendors are the following:

- **Texas Instruments, Inc.** has pledged to make its Information Engineering Facility computer-aided software engineering tools available on NT.
- **Sybase, Inc.** will be on hand to show off a 32-bit, multiprocessor version of SQL Server for NT running on a four-processor machine.
- Not to be outdone, **Oracle Corp.** will have its Oracle Server up and running on an NT-based system. Oracle was seen running on a multiprocessor NT server as early as this year's Comdex/Spring.
- **Watcom International Corp.**'s Watcom C/386 32-bit C compiler.
- **Symantec Corp.**'s Zortech C++, one of several 32-bit C++ compilers scheduled for the near future.
- **Knowledge Garden, Inc.**'s KPWin for NT.
- **Digital Equipment Corp.**'s DEC C++ for Windows NT.
- **Blue Sky Software Corp.**'s WindowsMaker, BugMan and RoboHelp Windows design and debugging utilities.
- **Congruent Corp.** will demonstrate the GNU programming tools popular on Unix platforms, for NT.
- **Acucobol-85** plans to supply an NT version of its product that already runs on Unix and mainframe environments.
- **Easel Corp.** will unveil its Easel/Win for NT application generation tool.
- **Frame Technology Corp.** will be on hand to demonstrate FrameMaker for NT, the 32-bit Windows version of its popular Unix publishing package.
- **Computer Innovations, Inc.** will have a pair of tools on hand: DEBUG 2000 and EDIT 2000.
- **Caseworks, Inc.**'s WorkBench will be on the show floor for demonstrations.
- **Guild Products, Inc.** will unveil the Guild Prototyper for 32-bit Windows.
- **Mozart Systems Corp.** will have an NT version of its product available for demos.
- **XDB Systems** will show XDB-Server for Windows NT.

MICROSOFT WILL SHIP a CD-ROM package containing a variety of text, advertisements and working models of 32-bit third-party tools to all attendees two or three weeks after the conference.

Novell NMS rollout puzzles industry

Incompatibilities between Windows and OS/2 versions discovered

BY ELISABETH HORWITT
CW STAFF

PROVO, Utah — One point that Novell, Inc. did not make clear at the debut last February of its NetWare Management System (NMS) is that it was announcing not one, but two products, which can barely speak to each other.

Despite the OS/2 version's strong backing from the Novell/IBM alliance, the Microsoft Corp. Windows version appears to be the winner in terms of functionality and user and developer support. "I guess the market is pulling" toward Windows at the moment, Novell spokesman Duane Murray said. Novell recently sent out 600 copies of NMS in a controlled release.

Novell said it will soon provide more interoperability between the Windows version and the IBM OS/2 Presentation Manager version of NMS. However, the current versions might as well be from two different vendors: The products cannot exchange alerts or other management information, they target different types of network installations, and their user interfaces differ.

"It makes a big difference to a network administrator having to look at two different environments," said Craig Burton, chief executive officer of The Burton Group, a Salt Lake City consulting company.

Different goals

Furthermore, the two versions target very different markets. The OS/2 version targets shops where IBM host networks and Novell local-area networks predominate, while the Windows version represents Novell's bid for the enterprise internetworked LAN market. The Windows version supports Simple Network Management Protocol as a way to manage a wide range of network products; the OS/2 version does not.

Murray indicated that Novell and IBM are working to integrate OS/2-based NMS with Distributed Systems Management, the OS/2 implementation of IBM's SystemView that IBM has promised to release later this year.

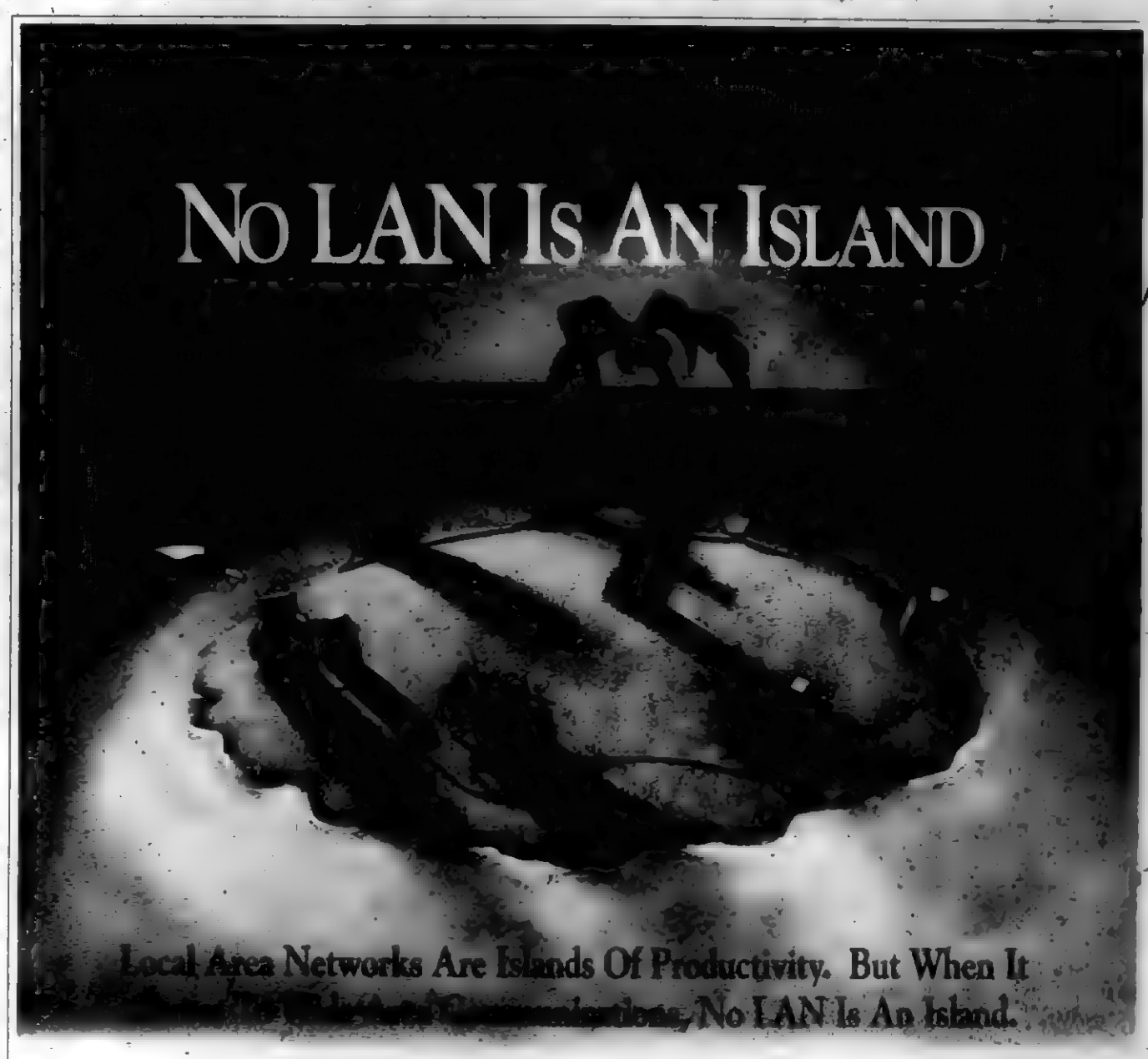
Right now, however, the only advantage that OS/2-based NMS offers over the Windows version is its ability to let users "walk through the NetWare Management Information Base one line at a time" — a capability that few users really need, Murray said.

Novell also confirmed that the two NMSs have incompatible application programming interfaces. This means that third-party vendors committed to supporting NMS on their products will either have to go with just one version or make the integration effort twice.

Of the several dozen vendors that have made that commitment, the "vast majority" have opted to support the Windows version, Murray said.

NMS will remain "pretty basic" until third-party products start bolstering its functionality, Burton said. Novell confirmed that third-party support is crucial to its NMS strategy.

Attesting to the marketing confusion surrounding the two unintegrated versions, Jim Queen, LAN manager at Enron Gas Services Corp. in Houston, said he is using the Windows-based NMS "because I didn't know there was an OS/2 version."



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NEWS SHORTS

HP debuts high-speed net chip

Hewlett-Packard Co. has unveiled what is said to be the first silicon chip set to support high-speed, point-to-point communications at rates of up to 1.5G bit/sec. The HDMP-100 Gigabit-Link Chipset is ideal for network boards that support broadband standards such as High Performance Parallel Interface (Hippi) and Asynchronous Transfer Mode, as well as multimedia, HP said. The chip set's compact design enables it to be incorporated into boards that will cost up to 80% less than current offerings, according to HP. Broadband Communications Products, Inc. said it is planning to release a serial Hippi board, priced under $20,000 and based on the chip set, in the fourth quarter.

IBM, AS/400 VAR spar in court

IBM Credit Corp. testified last week that Legal Eagles Software Systems, Inc., a San Diego-based developer, owes IBM several hundred thousand dollars for Application System/400-related deals made in the late 1980s. Legal Eagles counterclaimed, saying it had overpaid its bills, and pointed to a deposition by a former IBM employee who confirmed the claim. A decision could come as early as Wednesday, said Paul Breen, Legal Eagles' attorney. IBM Credit's lawyer was unavailable for comment.

AST shuffles deck, COO resigns

AST Research, Inc. Co-chairman and Chief Operating Officer Thomas C. K. Yuen resigned last week at the behest of AST's board as part of wide-ranging management overhaul. The directors, acting on the recommendation of a management consulting firm, decided both to replace AST's two-person chairmanship with an outsider and to phase out the COO post, a spokeswoman said. Former AST Co-chairman Safi Qureshey remains with the company as chief executive officer and president. Carmelo Santoro will assume the position of chairman of the board, while Yuen will remain on the board.

Unysis beefs up Unix server line

Unisys Corp. expanded its line of Unix-based, U 6000 midrange servers with the debut of the U 6000 Model 65 servers. They incorporate Intel Corp.'s I486 CPU with a complex instruction set computing-based architecture that was designed for symmetrical multiprocessing. The new models deliver between 42 million and 200 million instructions per second. A single processor system with 16M bytes of main memory costs $24,000; a dual-processor system with 64M bytes of main memory and 425M bytes of disk storage costs $47,500.

IBM ends CFC use at San Jose site

IBM turned off the last chlorofluorocarbon (CFC) cleaner at its San Jose, Calif., disk drive manufacturing facility last week — a site once regarded as one of the worst producers of ozone-damaging CFCs in this country. Five years ago, it reportedly released 1.5 million pounds of CFCs, more than any other plant in the nation. The shutoff came 18 months ahead of schedule, IBM officials said. The San Jose facility will now perform water-based cleaning and high-temperature drying for disk drive parts. According to IBM, it has established a goal of eliminating all CFC emissions in all manufacturing operations by the end of next year.

Short takes

Zenith Data Systems said it dropped out of the Advanced Computing Environment consortium mostly because Intel's next-generation chips are progressing much more rapidly than expected. . . . **Cyrix Corp.** cut retail prices on its FasMath math coprocessors by 60%. The new prices range from $79 to $129. . . . **Microsoft Corp.** and **Oracle Corp.** will join forces to ensure links between their products and will co-develop a driver to the Oracle database. Oracle will also contribute to the Microsoft Open Database Connectivity Specification. . . . **ICL** will resell **3Com Corp.**'s internetworking, wiring hub and terminal servers.

Imaging a role model for IBM

Unit's focus on software and services reflects Big Blue's corporate goals

BY ELLIS BOOKER
CW STAFF

CHICAGO — IBM's document imaging business, among its newest product lines, has unexpectedly evolved as a test bed for new corporate concepts at the company, according to analysts.

"Image is almost a guinea pig in the transformation of IBM," said Scott McCready, a principal at IDC/Avante Technology in Framingham, Mass.

That transformation involves an emphasis on software over hardware and on generalized business consulting and systems integration services. It also includes what even IBM officials acknowledged is an "opportunistic" approach to the technology and the fast-paced market it spawned.

"We were trying to get into a market where we were not . . . and we were trying to get there fast," said S. Craig Grant, manager of cross-platform marketing and management at the IBM Image Solutions Group.

Imaging "fits nicely with a software and services orientation," said Maureen Early, IBM's U.S. manager of image consulting and services. According to Early, the Image Solutions Group is geared to offer full lifecycle consulting, from re-engineering business to implementing systems. She pointedly mentioned that in its consulting capacity, the company would recommend both "IBM and non-IBM components."

Taken together, the market-driven stance of the IBM imaging group may mean dicey choices for users. For instance, IBM to date has steadfastly supported the use of OS/2 workstations for ImagePlus. In this way it toes the corporate party line in support of OS/2. Yet the undeniable popularity of Microsoft Corp.'s Windows environment and its prevalence among other imaging products appears to be forcing a change.

Significantly, IBM showed a prototype of a Windows 3.1 client for ImagePlus/2 at its booth at last month's annual Association for Information and Image Management (AIIM) show in Anaheim, Calif.

Under pressure from a handful of top customers several years ago, IBM entered the imaging market. But it did so in what appeared to be a haphazard and somewhat uncommitted way.

Mark Morin, vice president of the Image Solutions Group, said that when he was appointed in 1986, "I had no one working for me." Morin's organization now has a staff of 550 workers. If IBM's imaging group still seems to be feeling its way in the marketplace, the business is doing nicely.

At a press briefing at AIIM, Morin said revenue from IBM's ImagePlus line was $605 million last year.

That result reflects sales of its mainframe and midrange products, he said, predicting revenue would top $1 billion this year.

Morin said the mainframe and midrange ImagePlus products are each $300 million to $500 million businesses. He added that he saw the same potential in Unix-, local-area network— and client/server-based products — those sold directly by IBM and by its business partners.

In total, IBM claims 700 ImagePlus installations, representing approximately 450 of the Application System/400 products and 250 of the mainframe products. IBM also claims to have sold "dozens" of its Personal System/2 LAN products, which became commercially available at the start of the year.

Still, the need for an integrated product suite is a looming issue. "Customers who wanted to deploy more than one imaging platform have been, up to now, a hypothetical issue," Grant said. He added that because ImagePlus does have some core "concepts," including object orientation, communications (LU6 and Token Ring) and support for Systems Managed Storage, its pieces will work together as customers demand.

Seeking a new image

An IBM survey of user companies at the AIIM show found imaging a critical factor in achieving a competitive advantage

Base: 377 senior managers surveyed on June 23 from financial, data processing, manufacturing, utilities and government organizations

Source: IBM

Prime to split ownership of 50 Series line

BY KIM S. NASH
CW STAFF

NATICK, Mass. — Prime Computer, Inc. plans to hand over responsibility for its 50 Series hardware business — plus an interest-free loan of up to $20 million — to COPM, Inc., a new company headed by Neil McMullan, president of Prime's Computer Systems Business Unit, according to documents filed with the Securities and Exchange Commission (SEC).

The papers, filed late last month with an initial public offering for stock in Prime's ComputerVision software unit, include the following provisions:

- COPM would be given sole rights to database/application development systems Prime Information and PI/Open, which is estimated to be worth $25 million.
- COPM and Prime would share ownership of the 50 Series, including two- and four-way multiprocessing products currently in development, known as the Toons project.
- Prime would retain exclusive rights to service 50 Series users — both the installed base of approximately 9,700 systems and any new business COPM might generate.

If the deal goes through, Prime users such as Whitehall Co. in Norwood, Mass., would have to deal with two separate vendors: COPM for hardware and systems software and Prime for service.

The proposed agreement, subject to board and SEC approval, makes George Bailey, MIS director at Whitehall, a bit uneasy. One reason users have contracted for service directly with Prime rather than going to a third-party provider has been the company's "inside and out" knowledge of the proprietary hardware and software, Bailey said.

"I wonder whether that link will be as strong if they're two separate companies," he said.

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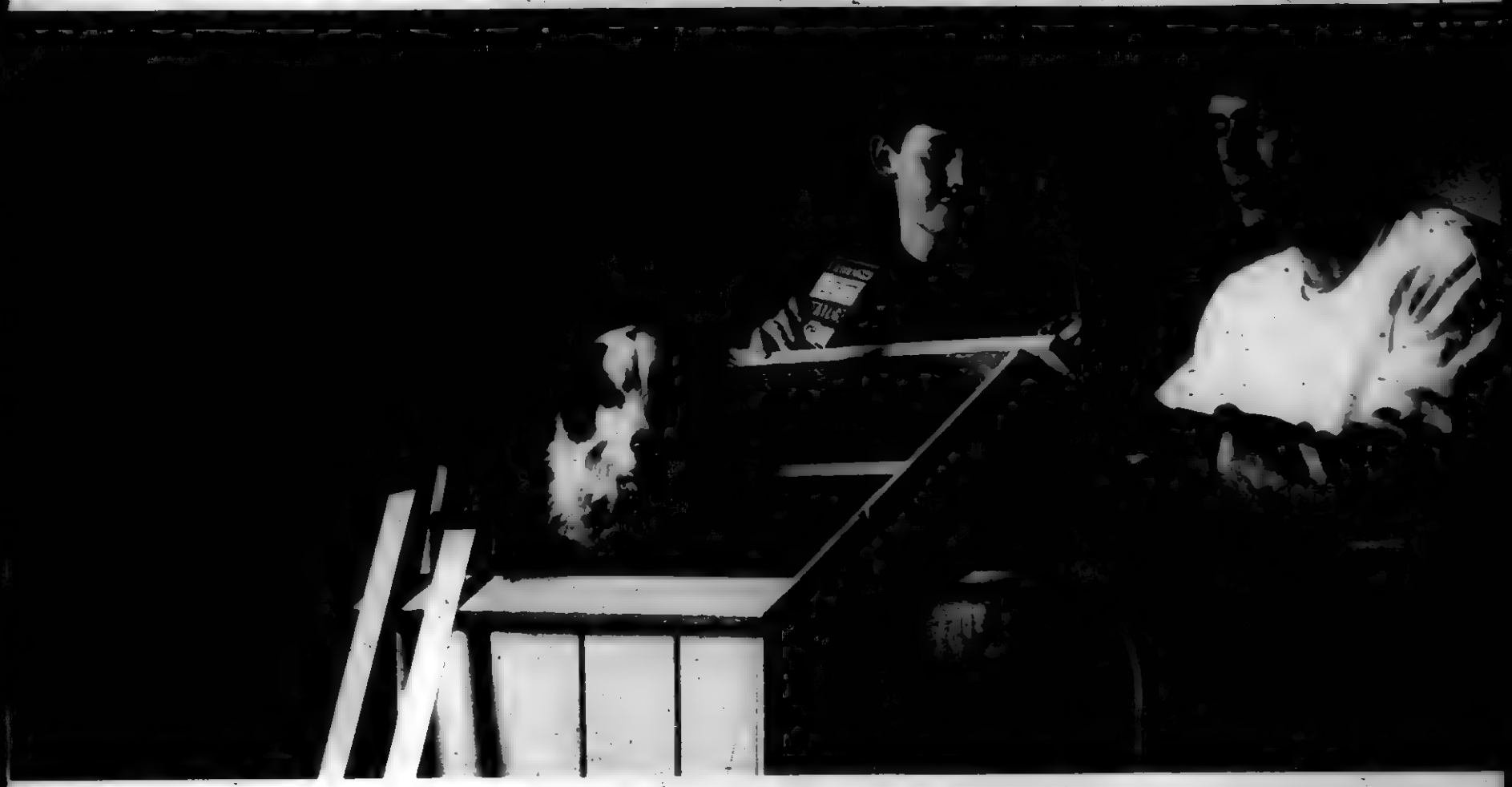

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HEWLETT PACKARD

HP ready to fire next volley in RDBMS battle

BY JEAN S. BOZMAN
and MARK HALPER
CW STAFF

PALO ALTO, Calif. — An aggressive Hewlett-Packard Co. today hopes to answer the challenge posed by Oracle Corp. and other relational database management system vendors when it introduces a steeply discounted, faster upgrade to its AllBase/SQL relational database.

HP's revamp of its 4-year-old product includes many distributed database features that are comparable with those introduced last month in Oracle's Version 7 — and it competes with the latest wave of products from the major independent RDBMS vendors.

New features will include stored procedures, triggers, two-phase commit for on-line updating and row-level locking for data integrity. HP has included several unique features, such as database shadowing for on-line backup, which posts all recent changes in the database to a second copy of AllBase/SQL.

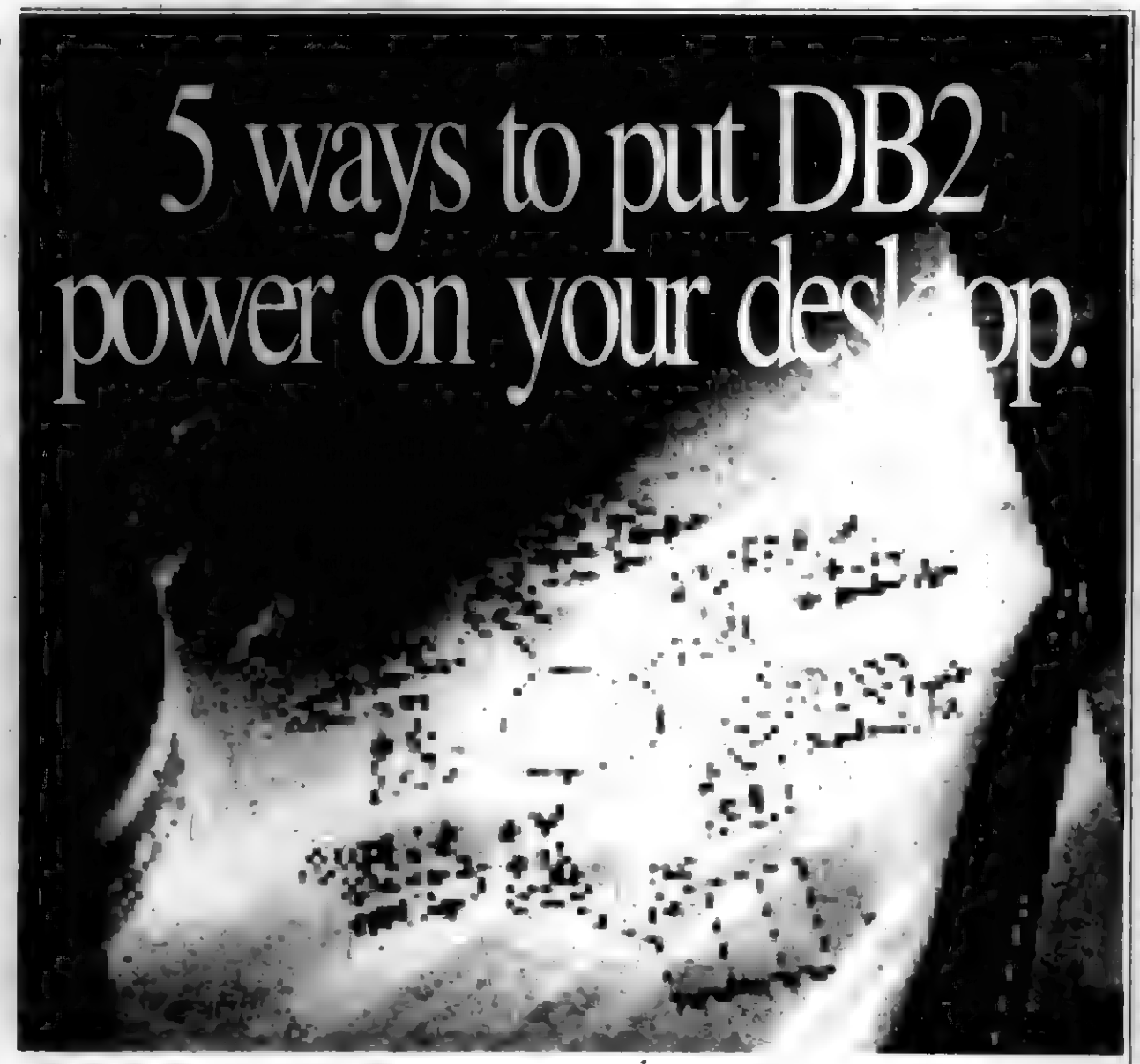
To promote sales, HP is steeply discounting AllBase in comparison with similar products. Prices range from $1,500 to $30,000, depending on system configuration. The database is currently available for HP's proprietary HP 3000 family, and it is slated to ship next month for HP's Unix-based reduced instruction set computing-based workstation and minicomputer lines.

But while HP hopes to lure database customers through its aggressive pricing, its ultimate goal with AllBase is to promote sales of HP minicomputers — both the proprietary 3000 line and the 9000 Unix series — and its Unix workstations, according to John Robertson, research and development section manager at HP.

Therefore, HP will continue to walk a fine line between promoting its own database and encouraging leading database vendors such as Oracle to write for HP platforms, Robertson said. AllBase/SQL has been tuned to provide 30% to 50% better performance than any independent RDBMS running on an HP MPE/IX or HP/UX machine, he added.

The additional speed is achieved by tightly tuning AllBase to HP's operating systems. "It has better performance because it's engineered specifically for the HP hardware," explained Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Santa Clara, Calif.

However, AllBase/SQL is bound to dent the widely installed base of HP's Turbo Image database, even among all-HP shops, industry analysts said. Turbo Image, which is designed for high-speed transaction processing, has historically run faster than AllBase.



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Informix extends 4GL technology

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — Informix Software, Inc. packed a little flexibility into its fourth-generation language (4GL) last week, announcing four extensions to its 6-year-old Informix-4GL application development language, including a graphical user interface (GUI).

Analysts said the extensions came just in time because Informix's character-based 4GL was viewed as an aging technology and a weak point in the $179 million firm's product line.

The following are the new extensions to Informix-4GL:

- Informix-4GL/GX, a 4GL that lets users deploy applications on either character-based or GUI-based screens. Pricing starts at $1,280.
- Informix-4GL for ToolBus, a version of 4GL that can be dropped into Informix's ToolBus "framework" for third-party computer-aided software engineering tools and development tools. The ToolBus technology was obtained under license from Hewlett-Packard Co. The base price is $1,200.
- Informix-4GL/RF, a version of the development language that can be used to program applications for handheld, DOS-based terminals that communicate using radio frequency. Pricing starts at $1,950.
- Informix-TP/Toolkit, a version that readies application code to run under a transaction monitor. The base price is $500.

"Informix filled a big hole in their strategic portfolio," said Neal Hill, a senior software analyst at Forrester Research, Inc. in Cambridge, Mass. "Now they've got all the key building blocks on the tool front."

Some large Informix sites were pleased to see the new software, particularly the new support for graphical workstations and the module that supports on-line transaction processing monitors such as NCR Corp.'s Tuxedo. It will be adapted to support NCR's Top End and Transarc Corp.'s Encina.

Hyatt Corp., for example, based its hotel reservation system on AT&T (now NCR) hardware and the Informix relational database.

All products are currently shipping except for the Informix-4GL/RF, which is scheduled to be available later this month.

Borland gazes through Windows

CONTINUED FROM PAGE 1

catch up with year-old initiatives from rivals Microsoft and Lotus Development Corp. targeting corporate accounts.

On the product side, Kahn has promised he will not be stingy with the whip in taking his $500 million firm into the Windows battle against behemoths Microsoft and Lotus. He has vowed to ship by the end of this summer Window's versions of the Paradox and dBase databases and Quattro Pro spreadsheet as well as a half-dozen more updates and introductions.

"We eat and sleep Windows these days," said Kahn, who clearly sees Windows as the future of Borland. Company insiders said the firm recently turned down a $3 million job from the U.S. Army for a simple port of an application to run on their Unix network. Kahn refused, fearing it would dilute the focus of programmers who were concentrating on Windows work.

Trouble is, users are wondering if the singularly driven Kahn is losing touch with what they want and what they need: a broad range of applications to accommodate their multivendor platforms (see story below).

"I just hope Borland doesn't make us a victim of their ambitions," said Bob Smiley, lead systems analyst at Matson Navigation Co., a shipping firm in San Francisco.

"I wish they'd just expand on their pluses instead of trying to take on everyone in town," said John A. Coyle, a dBase user and chartered life underwriter at Equitable Financial Cos., in Huntsville, Ala.

Wish may come true

Coyle may, in fact, get his wish. After 18 months of praising Windows with every bone in its body, Borland's enthusiasm may be waning. And for good reasons. First, the company has had difficulty meeting self-imposed — and much-ballyhooed — Windows products ship dates.

This has not been an easy thing to digest for a company that prides itself on the quickness to market that its object-oriented application development techniques afford. The lack of Windows products was cited as one of several reasons behind a $26.9 million decline in Borland's bottom line during its fiscal fourth quarter.

Even more ominous, however, is Microsoft's purchase of Fox Software, Inc. and its plans to release a Fox-developed Windows database as early as this month. After grabbing the mental high ground, with constant sneak peaks at its upcoming Paradox for Windows, Kahn is faced with his worst nightmare: Microsoft beating him to market with a Windows database.

Already, officials are downplaying the role the graphical user interface will play within Borland. Spokeswoman Sandra Hawker said Borland is an operating environment agnostic. She also cited data from Infocorp, a San Jose, Calif.-based research house, that nearly 50% of the IS community has no plans to move to Windows — ever.

Kevin Fleming

Kahn's latest gig *is a mission to have Borland employees 'eat and sleep Windows' to fight rivals Microsoft and Lotus and ship late products*

Also troubling on the Windows front are early reports from beta-test users that upcoming Windows packages may be less than ideal. "Borland is focusing a lot of energy on delivering product fast, but not complete," Smiley said.

Beta-test users of Paradox for Windows also indicate that the product is incompatible with its DOS-based predecessor. "You can't port code over," Smiley said. Another beta-test user added, "If you run Paradox for Windows, you have no shot of it running with Paradox for DOS."

Similar painful stories are coming out about alpha copies of Borland's dBase compiler. "It's got some neat stuff, but they did a silly thing and left out the screen painter and report writer," said George F. Goley IV, president of Micro Endeavors, Inc., a consulting and training firm in Drexel Hill, Pa.

A similar faux pas hurt Lotus' sales of 1-2-3. Borland said this slipup will be fixed by the time the product ships late this year.

The incompatibilities are a matter of no small concern to users. "We count on these new upgraded packages to be similar because we've got a lot of time and training invested in using and integrating them," said Roland Murphy, an engineer at the Resources Conservation Co. in Bellevue, Wash.

Borland is seeking to take advantage of that investment in other ways as well. Next month, the company will roll out several sales and marketing initiatives, coupled with account visits from top company executives, in a bid to bolster Borland's visibility with IS managers [CW, June 15].

The company is attempting to rectify the situation with a series of programs that include volume licensing agreements, educational seminars and having executives "adopt an account."

Down to business

"Borland has had a hard time building a direct sales force. They need to do this. As the desktop becomes the fundamental base layer of the corporate computing pyramid, they need to get on the short list of MIS or else they could find themselves frozen out of some very large accounts," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

In addition, Borland does have plans for other platforms. The Unix strategy focuses around Interbase. For example, the features of the Paradox database engine and Interbase have been merged to create an enhanced database engine called Interbase Local Engine.

The Interbase database engine offers users an alternative to the Unix-based database servers and will serve as the common database engine for the Windows versions of dBase and Paradox. Borland said Paradox and dBase will be able to share data when the Windows versions of each ship later this year.

"It sounds great on paper, but I'll hold my judgment until I see something happen," said James Ramsey, a dBase user at the San Francisco police department. Borland also plans to continue DOS upgrades on all applications.

Jack Detrick, director of data processing at Centinela Hospital in Los Angeles, said scrapping dBase completely would be a mistake. "I've got a lot of dBase applications running here at the hospital, and I'm not about to . . . say we're going to convert them all to Paradox," he said. Instead, he said he would be amenable to a merged product using the dBase programming language and the Paradox interface.

Borland officials also said they plan to support IBM's OS/2. The firm recently unveiled Objectvision for OS/2 and plans to support C++ under OS/2. The company is also expected to announce its Windows New Technology strategy later this week.

Yet another thorn in Borland's side is a lengthy copyright suit with Lotus that has yet to be resolved.

By year's end, users should have a slew of new products and some outreach programs to mull over. While Kahn hankers for the scrappy start-up days of old, his user base will be watching very carefully to see if Borland has matured into the kind of reliable, broad-based and IS-minded company they need to grow with.

Users put Borland on notice

According to Borland users, the firm faces a number of challenges in the next year, chief of which are the following:

- Retain the loyalty of former Ashton-Tate Corp. customers, many of whom became nervous when Borland talked about converting them from dBase to Paradox. Borland has since backed off that strategy, but its competitors are looking to capitalize on the confusion.
- Provide easy-to-use front-end tools that allow users to perform personalized database services and access data on larger systems.
- Continue the frontal assault on Microsoft's systems business. There are rumors that Borland and Novell, Inc. are collaborating on a strategic client/server marketing strategy that might allow Borland's Interbase engine to be built into Novell's NetWare.
- Make the tutorials easier to use. "We're getting very complex and leaving a lot of people behind," said John A. Coyle, a dBase user and chartered life underwriter at Equitable Financial. "It's one thing to bring out a new product. It's another to get it used."
- Move on hints that it is working with Apple on a database.

In particular, those rumors have been warmly greeted by users struggling to bridge interoperability gaps inherent in many multiplatform environments. They would like to see Borland take advantage of the graphical Macintosh interface; make it a relational, rather than a flat-file, database; provide connectivity to Paradox for DOS and Paradox for Windows; provide a feature similar to SQL Link, a Paradox Version 3.5 companion product that allows users to access remote SQL data without learning complex SQL programming; and leverage client/server connectivity to Interbase, which offers a relational database management system for multiuser environments.

Helping hands

Borland CEO Philippe Kahn has broadly hinted that he would like to continue partnering with other companies. "We're willing to help our competitors, even if it does mean giving away some technology."

This strategy may include a linkup with Novell, Inc., although that move might only be used to scare off a common enemy: Microsoft.

"There is an old saying that the enemy of my enemy is my friend," said Dataquest, Inc. analyst Paul Cubbage. "Borland [applications] and Novell [networking operating systems] face a very real threat in Microsoft."

There is also talk that Borland may help provide tools for the forthcoming object-oriented operating system from Taligent, Inc., the joint venture between IBM and Apple Computer, Inc.

And next month, Borland will roll out the first of a half-dozen planned partnerships with systems integrators as it strives to raise its profile among IS managers.

JAMES DALY

WHAT, EXACTLY, IS ACCEPTABLE RISK?

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Smart food

■ No, you can't eat this one and it doesn't build strong bodies, but it could build smart computers. One of the experiments scheduled to be carried out on the flight of the space shuttle Columbia, launched June 25, involved a smart protein believed to have potential as computer memory material. Several educational institutions and companies were sponsoring the research into the commercial viability of the light-harvesting protein bacteriorhodopsin in computer memory applications. Researchers hope the material can be used in the future to build optical three-dimensional memory storing 18G bytes of information in a storage device measuring only 5 cubic centimeters.

Real deal

■ Cray Research, Inc. and Modular Computer Systems, Inc. (Modcomp) have signed an agreement under which Fort Lauderdale, Fla.-based Modcomp will license its REAL/IX real-time operating system technology to Cray. The companies plan to collaborate in developing system software to support real-time applications on the Cray Y-MP EL supercomputer. Cray also announced an agreement with Applied Dynamics International, Inc. in Ann Arbor, Mich., under which Cray and Applied Dynamics will develop and jointly market real-time computer simulation products.

Raising Arizona

■ Attempts to simulate the growth of semiconductor crystals are under way at Arizona State University. The school recently installed a Convex Computer Corp. C3400 supercomputer to simulate growth of crystals for silicon and gallium arsenide semiconductors. The computer will attack equations of theoretical physics to predict physical and chemical reactions as new super chips are developed. It will then produce a videotape of super chip growth.

Letting the robot take the plunge

AT&T sonar system scans ocean floor for lost cables and buried treasures

BY ELISABETH HORWITT
CW STAFF

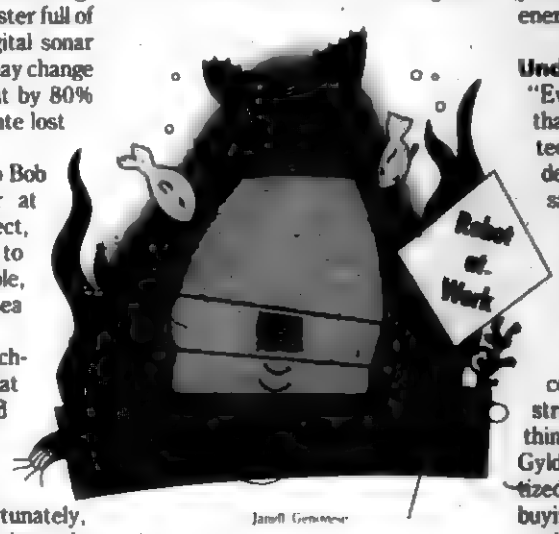
Searching for things on the ocean floor can be a frustrating and time-consuming job, whether the object in question is a lost fiber-optic cable segment, an oil pipeline or a canister full of radioactive waste. But a digital sonar device developed by AT&T may change all that. It is expected to cut by 80% the total time it takes to locate lost and severed cables.

For example, according to Bob Bannon, a senior engineer at AT&T who directed the project, it currently takes AT&T two to four hours to locate a lost cable, depending on weather and sea conditions.

Current cable-finding technology includes devices that sense a cable's magnetic field and analog sonar that bounces analog waves off the ocean floor and analyzes the resulting echoes. Unfortunately, magnetic sensing generally misses the small-diameter fiber-optic cables on which international data comunications often rely. Meanwhile, analog waves tend to be absorbed by the boulders, rocks and gaseous clays on the ocean floor, Bannon said.

Chirping away

In contrast, an AT&T Bell Laboratories-patented technology called digital signal processing sends digital pulse "chirps" that pierce through rock and clay to locate objects far more quickly and accurately, AT&T said. AT&T has incorporated that technology into a prototype system called Enhanced Bottom Sonar System (EBSS). The system rides in a remotely operated vehicle (ROV) that travels underwater sending out digital chirps. The chirps bounce off the sea floor, and the return signal is picked up by the system, which converts it into digital information.



Janell Genovese

"You see various contours [of the sea bottom], and when [EBSS] sees something lying on the surface, it gives you an acoustic signature," Bannon said.

The ROV system sends information to a shipboard AT&T Intel Corp. 1486-based StarServer S workstation, which refers to a library of signatures to determine what type of object has been spotted on the ocean floor.

Although the device was developed to find lost cable segments, the technology might also be used to find "special objects," such as the black box from the Air India plane that went down off the coast of Ireland or even gas pockets or rock strata with oil for the energy industries, Bannon said.

Underwater progress

"Everything we've seen to date shows that this is one of the most promising technologies for locating things underwater to come along in years," said Godik Gyldenege, manager of government and commercial programs at Oceaneering Technologies, which has given AT&T input on the application of digital sonar.

Oceaneering Technologies has concluded that EBSS "has a demonstrated ability to locate continuous things like cable and oil pipelines," Gyldenege said. "Once it is productized, we would be very interested in buying it" as an aid in the company's work for oil and gas companies.

On the other hand, digital sonar has yet to prove its ability to locate isolated objects, such as canisters or rock strata that contain oil, Gyldenege said. "Working underwater is a tricky, difficult process."

AT&T is using EBSS in its own cable recovery services. The company has no time frame for announcing commercial availability, Bannon said.

The next phase of the EBSS project is to miniaturize the system so that it can be installed in smaller ROVs.

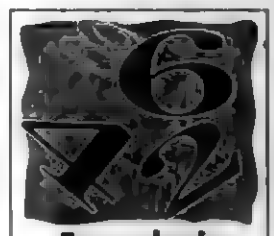
Applications become clearer with fuzzy logic

BY CHRISTOPHER LINDQUIST
CW STAFF

Very little in life is black and white, but computers have a tendency to make us solve problems that way. Now, Knoxville, Tenn.-based FuziWare, Inc. is producing fuzzy logic applications that circumvent some of the restrictiveness of traditional binary solutions.

FuziWare's products, such as FuziQuote and the soon-to-be released FuziCalc, allow users to establish "fuzzy" values for activities such as determining the per-piece price on manufactured goods. Users can input hard data, such as costs of raw materials and tooling, and then add fuzzy values for such things as "How much do we want this job?" and "How busy are we at the moment?" The effect of fuzzy information on the equation is determined by historical data, embedded knowledge from experienced employees and "current insight" into the situation at the moment the quote is made.

The result is an accurate quote made in less time than would normally be required to pass proposals in front of all the required employees and shorter response times to customer requests.



"With our quoting, a lot of the numbers that we would come up with were best guess," said Laney Fowler, vice president of sales and marketing at Foremost Manufacturing Co., a formed metal fabricator in Union, N.J. FuziQuote allows the firm to input ranges instead of crisp numbers and include abstract information.

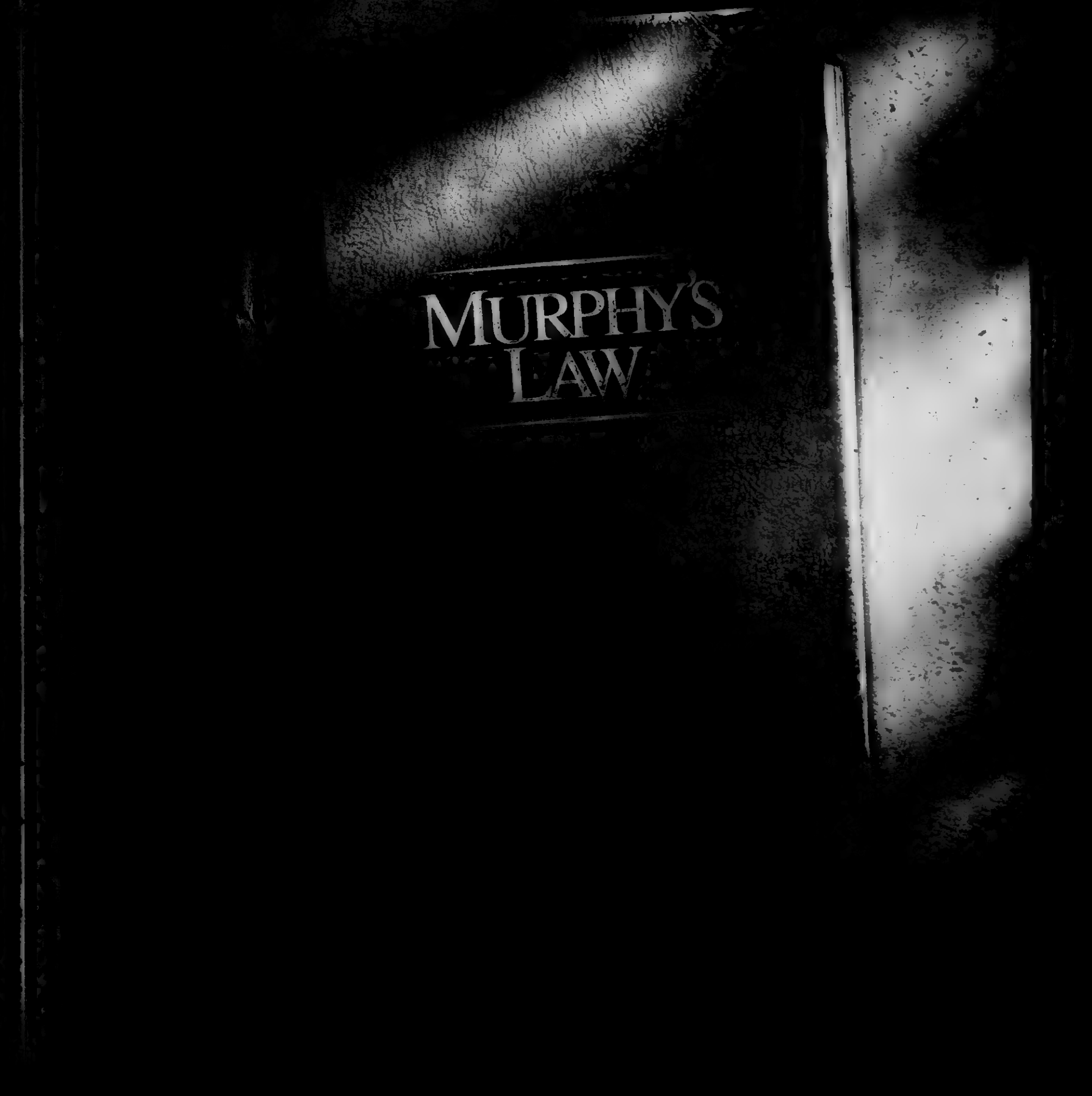
FuziQuote also eliminates the need for the company to gather all its employees with quoting experience each time a bid has to be calculated.

FuziCalc takes the fuzzy logic idea even further into the realm of general use. Users are presented with a common Windows-based spreadsheet interface into which they can add both hard and fuzzy data. Fuzzy numbers are represented by a chart that can be directly manipulated by the user. Users can pick a range of acceptable or probable answers and also establish a "desirability" level from "0" (unacceptable) to "1" (totally acceptable).

For example, an application that might be used to determine possible cities for a new plant might include such factors as city size, number of available airline flights and temperature. By adjusting a graph for each factor, a user might indicate that cities having between 500,000 and 3 million residents, at least 15 flights per day and an average temperature of 50 to 70 degrees Fahrenheit are suitable.

FuziCalc will be available later this summer for a list price of $995.

DELL INTRODUCES A CONCEPT SO REVOLUTIONARY, IT BREAKS EVERY LAW IN THE BOOK.



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For particularly tough situations, we can rewrite parts of the BIOS for you.

We also have strategic relationships with the people who make those new products. For example, if you have a problem with system software from Novell, Banyan, SCO, Microsoft or IBM, we'll use our alliances with these companies to bring everyone together to solve your problem.

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We constantly create compatibility situations that will "break" the system, then find a way to make it work—so you don't have to.

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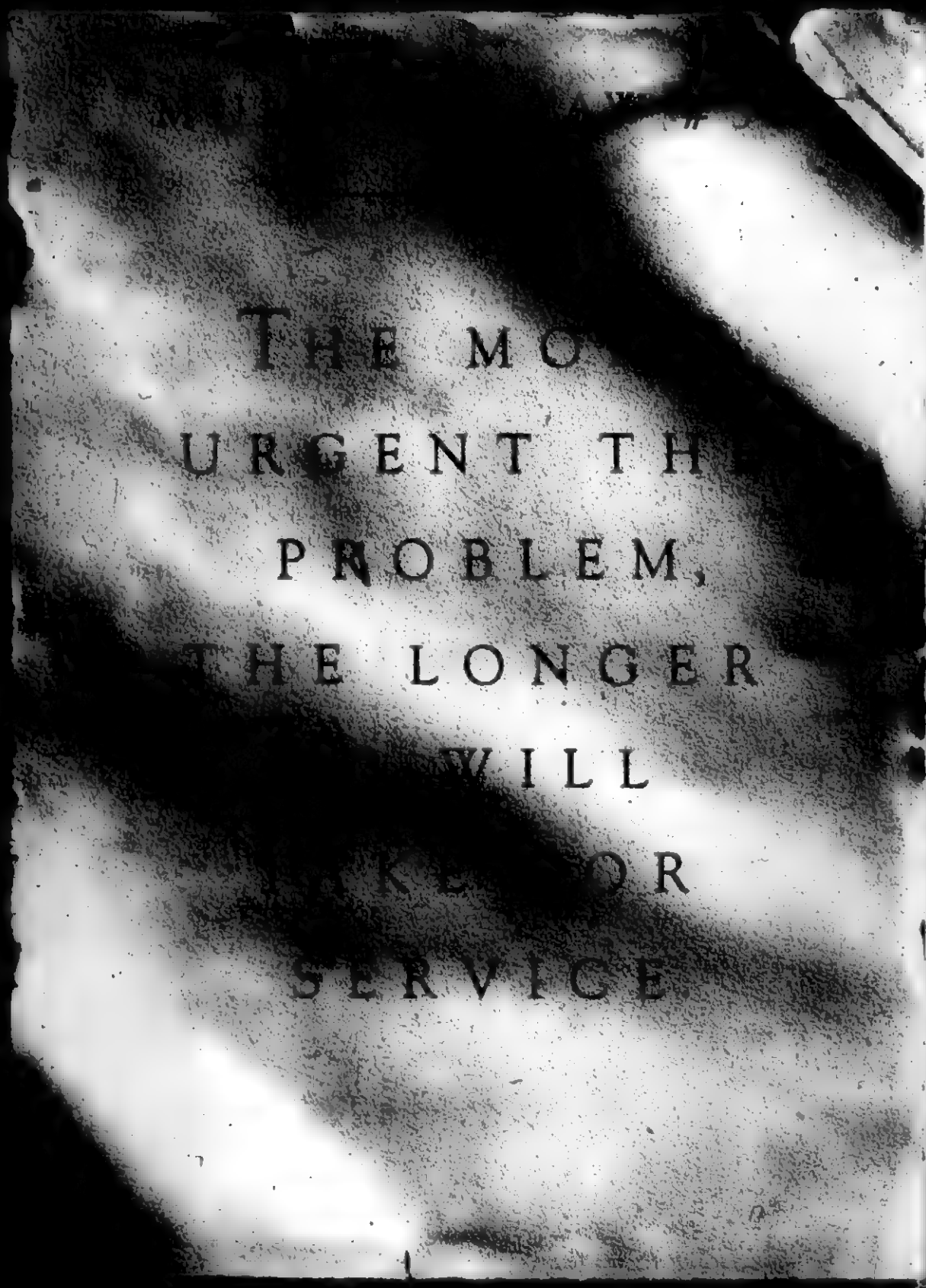
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EDITORIAL

Making up grades

To read the papers lately, you could conclude that what's going on in the market is the great once-in-a-lifetime, sell out to the bare walls, PC price-cutting mother of all high-tech basement sales, buy it now while it's so cheap splurge-a-rama.

To further entice and induce corporate buyers, vendors are all but giving away those memory-hogging graphical operating environments. With the hardware so dang cheap, the world of GUIs so attainable, what is there to keep corporate buyers from doing their part to help this country spend its way out of the recession?

The answer for many big users is the experience with what has been billed as a reasonably painless process: namely, upgrading.

At a recent Microcomputer Managers Association meeting, corporate PC chiefs swapped stories of their "painless" upgrade experiences. They were perhaps best summed up by one manager from a financial services firm, who said, "It's harder than you think, it takes longer, and it costs more than you'll be told."

It cost one of the managers greater than $1,000 per user to upgrade 50 users to the wonderful world of GUIs. These users had pretty modern hardware to start with, so the iron upgrades were under $10,000, while the operating system costs were far less. So where'd the money go? Three-fourths was spent on upgrading applications and in training the users, that's where.

While the manager says he believes the upgrade journey will prove to be worth the pain, he was quick to add that the GUI vendor had "published claims showing tremendous benefits of GUIs, and they haven't been replicated since." In other words, *caveat emptor*.

If the PC vendors would just look at their own research more closely they'd discover that on the corporate buyer's list of purchase influences, price is third or fourth — or lower. Their needs are more elementary and — in some cases, perhaps — contrary to the goals of the vendors.

For example, managers are having a very difficult time distributing software upgrades, especially when end users number in the hundreds or thousands. Tracking the many and varied software license provisions is another expansive headache. What they want here is seamless electronic distribution and simpler, if not more liberal, license language. To date, there has been talk about filling these needs, but not much action.

Many PC vendors, who have historically sold their products through third parties with little direct contact with corporate buyers, privately express frustration with what they perceive to be buyers' recalcitrance within the IS community. What they are really hearing is the voice of experience.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Grand delusions

Chris Goggans ["Hackers aren't the real enemy," Viewpoint, June 8] hardly rates serious attention or acclaim as a threat to the world's computer networks or even as a clever programmer.

First of all, Internet has long been established as an open network for use by the public and academia. For all his delusions of grandeur, Goggans' feat of breaching Internet is the equivalent of sneaking in the back door of someone's house while there is a huge party going on.

My advice to this young man is to spend some time reading the U.S. Constitution to gain an understanding of the meaning of the right to privacy. If this fails to make an impression, perhaps what is needed is for someone to walk into his home, raid the fridge, make a few long-distance phone calls, then borrow his car "to learn how it works in minute detail."

David Park
New York

Big Blue backer calls for reality check

Regarding the commentary by Chris Lindquist, "Bitter taste of real world" [CW, June 8]: It's been my dream to be able to develop applications for the Japanese version of DOS here in the U.S., so when OS/2 2.0 came out with the capability to launch multiple versions of DOS, I decided to call the 800 number to ask if it supported DOS "V," the Japanese version of PC-DOS.

The people at IBM were courteous, polite and willing to help. They took my name and phone number and assigned me a problem ID to which I could refer when making follow-up calls.

They called me the next day to let me know the question was being investigated. Several weeks later they called me to tell me the answer I was looking for: the Japanese version of OS/2 2.0 would support both American and Japanese DOS on an American hardware setup.

I have only good things to say about IBM's support number, except that it's a shame Lindquist omitted the one thing he should have done to get his problem solved. This indicates to me that Lindquist ultimately failed to be a "real user."

Shoji Mizumoto
The Sakura Bank Ltd.
New York

Tax factors may discourage contractors

Regarding "Laid off? Try captaining your own ship" [CW, May 25]: This advice would have been good prior to the passage of Section 1706 of the tax code. It is far outdated now.

The advice given by David Baum would result in no work, because employers are frightened of hiring independent contractors. The IRS could question the independent status of the contractor from more than 20 common law elements of independence, most of which are inappropriate in a mainframe, team-structured environment. The excessive fines fall on the employer and the employee.

We can blame this state of affairs on that "outsider," Ross Perot, who got the legislation passed by his friend Sen. Patrick Moynihan, to his own great profit and to the detriment of all programming entrepreneurs. I urge all readers to lobby their legislators for the repeal of this law.

William S. Pirone
Woodland Hills, Calif.

Rental firm responds: The Hertz truth

"Hertz mulls outsourcing rescue" [CW, June 22] suggests Hertz is a desperate company seeking a cash infusion. Hertz is a financially secure, competitively strong company. As with any well-run company, management is always looking for ways to improve productivity and reduce costs. To that end, Hertz has analyzed its IS costs and is considering outsourcing some, but not all, of its data center.

Also, no study for Hertz has ever concluded that outsourcing would cost more. Moreover, Hertz will not sell software or hardware assets to improve cash flow or for any other reason.

We are No. 1 in our industry, and as our ranking in *Computerworld*'s Premier 100 listing has established, we are also No. 1 in the car rental industry for the effective use of management information systems.

We will certainly do nothing to change that.

Gary D. Orrell
Staff Vice President MIS
The Hertz Corp.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Hurrah for the 'Second Circuit'

PHILIPPE KAHN

If you follow the computer industry, you've probably read at least something about the issue of software copyrightability. Personally, I'm not much for reading legal briefs, but due to a number of companies that believe competitive battles should be fought in the courtroom, I have been forced to read more than my share.

This is a computer book, not a legal journal, so I'll spare you the legal jargon and just get right to the point: Right now, our industry is facing an issue that is absolutely critical to the future health of the U.S. computer industry.

Innovation has been the driving force that has made us a world leader in software. But that advantage is being threatened by companies trying to overextend copyright protection to guard their own interests.

Last week, the Federal Court of Appeals in the prestigious "Second Circuit" published a landmark decision on the standards for copyright protection of computer software. The decision is a huge victory for everyone concerned with the future and health of the U.S. computer industry.

Finally, the courts have made a strong statement to corporations that choose to use the legal system as a competitive stumbling block, rather than competing with technological innovation and straightforward, aggressive marketing.

A matter of balance

In its decision, the Court of Appeals made it clear that the results reached by other courts on this issue were "less than satisfactory." In the case of *Computer Associates* v. *Altai*, the court issued a ruling that specifically recognizes "the necessary balance between creative incentive and industrial competition."

We were very pleased with the court's position that aspects of a computer program that are dictated by considerations of efficiency and factors external to the program itself or taken from the public domain are not protectable.

The ruling reflects the basic tenets of copyright law, and this is a position that Borland has long held.

I believe that the most important aspect of the Altai decision is its clear declaration that "compatibility" is not a dirty word. The court stated that aspects of a program's structure that are "dictated by the nature of other programs with which it was designed to interact" are not protected by copyright legislation.

The court felt it was important to allow the distribution of a "compatibility component" of a computer program because that aspect "saves the user the costs, both in time and money, that would otherwise be expended in purchasing new programs, modifying existing systems to run them and gaining familiarity with their operation."

For those of you who follow Borland and use our products, the court's statement might look familiar, because it contains the essence of several advertisements for our Quattro Pro spreadsheet.

We hope the importance of the Altai decision becomes clear to everyone in the industry and to all of our customers.

Much at stake

If these cases were to be decided the other way, they could seriously damage a large portion of the American computer and software industry — those companies lawfully engaged in the making of compatible products.

The Second Circuit's overriding concern was "the preservation of the balance between competition and protection." "The interest of copyright law," the court said, "is not simply conferring a monopoly on industrious persons, but advancing the public welfare through rewarding artistic creativity . . . ."

Unfortunately, however, the battle does not end with the Altai case. We hope the Second Circuit's decision in Altai becomes a road map that other courts choose to follow, but unless and until the U.S. Supreme Court decides the issue, there is no requirement that they do so.

Kahn is chairman and chief executive officer of Borland International, Inc.

Call off the hostilities: There's a lot of work to do

DAVID VASKEVITCH

Which would you rather have: style or substance?

Our mainframes contain large data-based applications that run fast and offer complete reliability. Yet these applications have hostile front ends that make it almost impossible to find data quickly or integrate it into the spreadsheets and word processors we've all grown to know and love. Desktop PCs offer slick, friendly applications that integrate easily with all those tools. However, PC applications deal only with the data you type in or load from a floppy disk and provide no way to access the information the organization runs on.

Great choice: lots of substance but terrible appearance, or great superficial appearance but no underlying substance.

Database vs. interface

At the heart of this dilemma is the fact that most IS departments are split into two camps, with completely different cultures: mainframers centered around their databases and PC developers focused on the user interface.

As a result, we see proposals for client/server application development where even the suggestion that some data might stay in DB2 or IMS is viewed as religious heresy. And Cobol-based systems organizations actively look for inconsequential projects that can be built on LANs without getting in the way of any real applications.

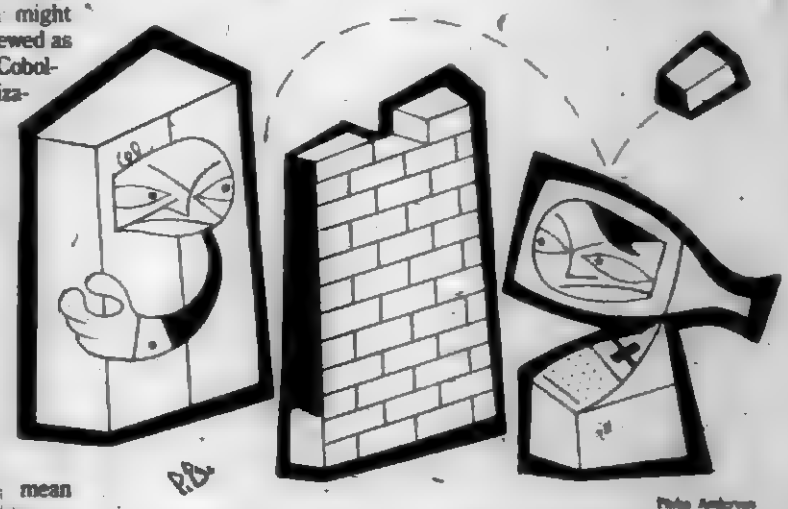
What we have here are two cultures that, at best, just don't understand each other and, at worst, are sometimes at war.

When mainframe professionals talk about databases, they mean DB2, IMS and Rdb — storage and retrieval engines built to support thousands of simultaneous users while safeguarding data through power failures and disk crashes. But for PCers, databases are products such as dBase, Paradox and DataEase — workstation-resident development tools built for single users.

Supporting eight simultaneous users is a significant accomplishment for these lightweight engines, while integrity is generally defined in terms of being able to retreat to the last backup.

The two communities generally are not even talking in the same terms. What a PCer thinks of as a DBMS a mainframer would call a 4GL. When it comes to database design tools, the cultural disconnect gets worse.

Mainframe-trained, data-oriented developers have the tools and understanding to build the big, serious applications that contain the data our organizations run on. What about accessing that data, though?



Philip Anderson

Mainframe developers think in terms of 3270 screens and data entry fields — an environment where the central computer controls the entire interaction. To them, interface design means deciding the order in which the user moves through a relatively fixed set of static forms.

Concepts such as Direct Manipulation and WYSIWYG, which lie at the center of modern GUIs, have no meaning for mainframers. Just as PCers lack the basic concepts and experience to think about database design, mainframe developers lack the fundamental framework to conceptualize, let alone build, truly graphical and friendly interfaces.

So we're left with two fundamentally different cultures, both critical to building the applications of the '90s.

This schism isn't going to be easy to close. The problem runs deeper than concepts, tools and vocabularies. Each group has an almost religious belief in the correctness of its own approach.

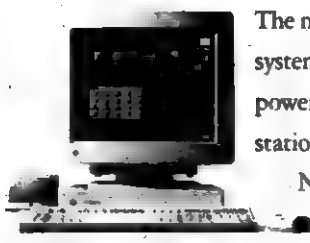
Fortunately, there's a saving grace: Scratch any dedicated computer professional and you'll find a hacker underneath. The challenge is to help each side see the promise and the value in what the other knows.

Vaskevitch is director of strategic services for Microsoft Consulting Services at Microsoft Corp. in Redmond, Wash.

Show me a new workstation with better numbers, and you'll get my attention.

Show me one with better ideas, and you'll get my order.

Introducing SPARCstation 10.



The new SPARCstation™ 10 system is four times more powerful than any workstation we've ever made.

Not only that, we also think you'll find it a hundred times more interesting than any workstation anyone else has ever made.

More interesting, because it runs your applications better than other desktops. Because you can upgrade to future processors about as easily as you can change a light bulb.

And because it doesn't trade off backward compatibility for the sake of forward thinking.

In other words, the Sun™ SPARCstation 10 is not just a new model.

It's an entirely new computer.

The only performance that matters.

With each of the SPARCstation 10 models, ranging from 86 to over 400 MIPS, you'll find we've asked a single question:

What good is a turbo-powered engine if the car's transmission is sluggish? Or if its tires are flat?

Our point is that building faster CPUs makes very little difference if the rest of the computer can't keep up.

So the SPARCstation 10 possesses not only a faster CPU, but also a faster system bus, faster input/output, faster networking, and built-in multiprocessing.

The faster CPU is our remarkable — and reassuring — new SuperSPARC™ chip.

Reassuring, because SuperSPARC is binary compatible with previous generations of SPARC.® It runs the Solaris® operating environment, too, so you can use thousands of existing applications.

And remarkable, because SuperSPARC can handle three instructions at once (most others manage only one or two). Imagine what that does for sheer processing speed.

Now here's where things really start cooking:

We teamed all that horsepower with the extra performance of multiprocessing. One megabyte of SuperCache™ memory. A 320-megabyte-per-second peak memory bandwidth. A 10-megabyte-per-second SCSI disk controller. And a large I/O buffer for faster Ethernet transfers.

Individually, each of these represents a big step forward in computing performance. But together they produce an astonishing leap ahead in application performance.

And to the person whose hands are on the keyboard, that's the only kind that matters.

Growing up vs. growing old.

Though budgets have never been tighter, most workstations are still designed around the wasteful belief that you're willing to replace last year's computer just to work with a newer processor.

The SPARCstation 10 was designed around a different philosophy:

Make the processor replaceable, not the workstation.

To that end, we put the processor on a small SPARC module that plugs into the motherboard. As faster chips become available, you can upgrade by pulling out the old card and plugging in a new one.

The rest of your investment — memory, storage, accelerators, everything — is left intact.

But don't feel you have to wait around for faster chips. You have the freedom to grow a SPARCstation 10 in plenty of ways right now.

You can start by plugging in a second SPARC module. Since this machine was engineered throughout for symmetric multiprocessing, you'll nearly double its processing power.

You can also boost its memory to 512 megabytes. And its disk capacity to 26 gigabytes.

There are ports for both parallel and serial devices; connections for thick, thin, or twisted-pair Ethernet; even ISDN connectors for networking over public telephone lines. All built in. Which leaves its four expansion slots available for other functions.

To sum up, we hope you like the way SPARCstation 10 looks on your desk.

Because it's going to be there quite a while.

The future is not an option.

As innovative as computer companies try to be, they usually can't keep up with what people like you are ready for.

For instance, how long have you been hearing about promising new technologies like multiprocessing? Multimedia? ISDN?

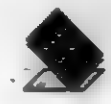
And how many workstations can you name that give you every one of those capabilities, right out of the box?

There's only one.

Multiprocessing Performance

You've already read how the SPARCstation 10's multiprocessing can speed up the applications you run today. But it also means you can add enough horsepower later to run next-generation software built around multithreading and object management.

And then there's ISDN. It brings the worldwide telephone network directly into the Sun SPARCstation 10 — without modems or other gadgets. Which allows applications to make faxing, voicemail, and even video conferencing as natural as printing.



Plug-In SPARC Modules

A 16-bit audio chip and external speaker are also included. So applications can use CD-quality sound for e-mail, spoken tutorials, and multimedia presentations.

And there's enough memory, disk space, and bus bandwidth to meet the enormous demands of animation, simulations, and real-time video.

Binary Compatible

Oh sure, there are plenty of options you can add to this computer.

The future, though, is standard equipment.

Admit it, you're intrigued.

You can't have read this far without feeling at least a twinge of excitement.

Maybe it's for the swift kick-in-the-pants this machine can give to the applications that you're already running today.

Or the enthusiastic way it welcomes whatever new technologies may be around the corner.

Maybe you simply can't help but respect a computer that offers your business a lot more than just MIPS and MFLOPS.

Whatever you think, here's what to do:

Call 1-800-426-5321, ext. 485 for complete information on the SPARCstation 10, or the name of your Sun reseller or sales representative.

It's the first workstation to combine such powerful numbers with such potent ideas.

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If a new PS/2 56 or 57 interests you, running twice as fast on one should, too.

Application	Test*	PS/2 56/57 w/ 4MB RAM w/ Windows 3.1 & MS-DOS 5	Standard configuration PS/2 56/57 w/ 4MB RAM w/ OS/2 2.0	Times Faster
		Time in seconds	Time in seconds	
Microsoft Excel 4.0 for Windows	File Load	73	53.8	7.4
Lotus® 1-2-3® for Windows	Application Load	21.5	134.8	6.3
Ami Pro™ 2.0 for Windows	Print	18.0	110.0	6.1
WordPerfect® 5.1 for Windows	Spellcheck	12.7	26.4	2.1

If you're like most people, you probably use applications for the Microsoft® Windows™ operating system. But if you happen to get the standard configuration PS/2® 56 or 57 with OS/2® 2.0 these days, you might notice that your programs run at substandard speeds.

What's the solution? New Microsoft Windows & MS-DOS® 5 for IBM® PS/2.

We've combined MS-DOS 5 and Windows 3.1 in a single installation specifically designed for the IBM PS/2. Which means you can run most of your applications for Windows twice as fast, and in many cases over five times as fast, as the standard configuration PS/2 56 and 57 allow.

Through 1992, the Windows and MS-DOS 5 package is $149.95.** It's easy to install for yourself. Or ask your IBM reseller to install it for you on the new IBM PS/2 of your choice.

To get the facts on Windows and OS/2, give us a call at (800) 541-1261, Department HG8. We'll be happy to help you get up to speed.

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*Tests measure performance in operations commonly selected by industry publications, including PC Magazine, InfoWorld and PC WORLD, for evaluation of word processing and spreadsheet applications. Actual test files used conform to descriptions contained in PC WORLD evaluations. Tests were performed by an independent third party. Spreadsheet File Load: Time from issuance of File Open command to time user regained control of the application, based on loading a file with 253 months of assets and liabilities. Spreadsheet Application Load: The time it takes to load an application. The test was timed from when the icon was double-clicked to when the user regained control of the application. (Under the OS/2 test, the time was measured based on beginning from an OS/2 desktop.) Word Processor Print: The time it took to print a one-page document containing two text columns and a TIFF image. The test was timed from when the print command was issued until the user regained control of the application. Word Processor Spellcheck: Time required to spellcheck an 11-page document with no spelling errors. Test was timed from when the Spellcheck command was issued until the user regained control of the application. **Suggested retail price. Reseller prices may vary. For more information, call (800) 541-1261, Dept. HG8. Outside the U.S. and Canada, call (206) 936-8661. In Canada, call (800) 563-9048.* © 1992 Microsoft Corporation. All rights reserved. Printed in the USA. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. IBM, OS/2 and PS/2 are registered trademarks of International Business Machines Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Ami Pro is a trademark of Samna Corporation, a wholly-owned subsidiary of Lotus Development Corporation. WordPerfect is a registered trademark of WordPerfect Corporation.

Undercutting Compaq: NEC joins the fray

BY CAROL HILDEBRAND
CW STAFF

Another predator has joined the price-cutting frenzy following Compaq Computer Corp.'s landmark product/price blitz in mid-June.

NEC Technologies, Inc. announced across-the-board price reductions on its entire families of PowerMate desktop, UltraLite notebook and ProSpeed laptop computers.

The company, in another nod to the Compaq announcement, will provide free one-year, on-site service for the desktop machines.

Not premeditated

Michael Everett, marketing manager for desktop systems at NEC, acknowledged that Compaq's actions were the reason for NEC's follow-up. "We were not planning on cutting prices before that Compaq announcement," he said.

Everett echoed analysts' predictions that the collapse of the price umbrella previously held up by Compaq, IBM and Apple Computer, Inc. would drive many smaller competitors out of business.

"If we were a company that didn't have the financial resources of NEC, it would be very difficult out there. The more marginal manufacturers are going to be the ones that lose. They need economies of scale and manufacturing," Everett said.

He also said NEC has now cut its product cycle down to six to eight months, which is another crucial factor.

Beating the competition

NEC prices dipped to an average of 5% to 10% below Compaq's. For example, NEC's PowerMate 486/50l with a 120M-byte hard drive is now $2,749, a $950 price cut. Compaq's similarly configured model is $3,669, Everett said.

In the PowerMate family, prices now range from $1,099 for a 20-MHz 80386-based model with a 60M-byte hard drive to $7,749 for an Extended Industry Standard Architecture-based 50-MHz 1486-based box with a 535M-byte hard drive.

Notebook systems dipped as low as $2,199 for an UltraLite SL/25C, while a 486SX ProSpeed laptop is now priced at $4,799.

Step by step, bank moves 1,500 to OS/2

Huntington Bancshares' implementation plan calls for full conversion to OS/2 2.0 in 18 months

BY ROSEMARY HAMILTON
CW STAFF

COLUMBUS, Ohio — It starts with a group of 10, expands to a group of 500 and will eventually spread out to close to 1,500 users.

That is the easy way to explain Huntington Bancshares, Inc.'s deployment of IBM's OS/2 2.0. But the actual implementation process involves far more time, energy and patience, according to Cary Serif, manager of applied technology at the bank.

To make the shift to 2.0, Huntington put together the following plan: Work with a small group of users to determine migration and training issues.

Once the issues are established, move ahead with 2.0 installations based on priority software projects at the bank.

At the same time, individual users can request upgrades to 2.0, but "the first priority is projects," Serif said.

"With respect to the end users, we are having monthly meetings to show people what 2.0 is all about," Serif added.

"The deployment is driven more by the bigger projects in the bank," Serif added. "If it's considered a critical application, then it gets priority."

500 ahead

Two projects topping the list are a branch automation and executive information system. The branch automation system involves about 500 users. Serif said this group will be upgraded to 2.0 once the tests are completed with the group of 10.

When IBM shipped the final version of 2.0 in March, Huntington put together the small test group to determine what its users would need for support and training.

Testing is still under way, and Serif could not say when it would be wrapped up.

So far, the test group has shown that for end users to receive satisfactory performance for 2.0, each workstation will require about 8M bytes of storage.

Technically, users could get by with 4M to 6M bytes of storage, but "we don't want to put 2.0 up and have people impacted because they don't have enough memory," Serif said.

Also, many desktops at Huntington are 80286-based and will need to be boosted up to 80386-class systems, which Serif said may be done with add-on boards.

> "THE DEPLOYMENT is driven more by the bigger projects in the bank. . . . If it's considered a critical application, then it gets priority."
>
> CARY SERIF
> HUNTINGTON BANCSHARES

With these hardware upgrades rolled in, Serif estimated that the average upgrade will cost about $1,000 per system.

The test group includes a mix of Microsoft Corp. DOS and OS/2 1.3 users so the bank can determine what the different migration and training issues will be.

In addition, among the 10 are users from various pockets of the company so the bank's population is fairly represented.

So far, the group has shown that DOS and 1.3 users will require a good deal of support, in part because 2.0 opens up so many new options for them.

"Because 2.0 is so much more functional that 1.3 or DOS, there's going to be a lot more questions," Serif said.

Subtle persuasion

DOS users may still need a little convincing that 2.0 could help boost their productivity, Serif said.

"The intention with the DOS people is to help really open their eyes," he added.

Huntington's Information Resource Center recently completed a 2.0 training program to be ready to assist end users.

As testing continues with the group of 10, Serif said, the 500 users on the branch banking project are a top concern. "This group has a little more priority, because it's a very important project to the bank."

Finally, Serif said, he expects 1,000 to 1,500 end users will be up and running with 2.0 within the "next 12 to 18 months."

The portable that had to fit in the sales rep's purse

BY MICHAEL FITZGERALD
CW STAFF

SAN FRANCISCO — Sales representatives at Pacific Bell Directory let their fingers do the walking — on a keyboard from Fujitsu Personal Systems, Inc.'s Poqet computer.

Two motives drove the choice of the 1-pound portables: a management mandate to bring technology into the business and a sales representative's desire to have a computer that fit in her purse.

"To me, we could provide more information much easier and in the process could increase our accuracy because everything would be more up to date," said Stuart Graham, then director of operations and sales support.

Updates to sales data, which were done quarterly with a paper system, as well as periodic specials, occur monthly with the computerized systems, Graham said.

The Poqet project became an offshoot of a four-year, $200 million project aimed largely at the internal telemarketing group.

"Upper management said as a company we had to [automate] since we're moving into a technological era," said Bill Bozym, an information systems planning and technology assessment specialist at Pacific Bell Directory, a subsidiary of Pacific Bell.

The search for small systems came from practical reasons. "These sales reps carry around a lot of stuff with them, and one female manager said she wanted to be able to put the computer in her purse," Bozym said. The Poqet machines measure roughly 8½ by 4¼ in.

So Bozym pulled out his microscope. He looked first at Atari Corp.'s Portfolio computer and, after building a prototype on it, got feedback that its 8-line, 40-character display was, in fact, too small. Then he turned to the Poqet, which displays 25 80-character lines.

Continued on page 42

Andy Freeberg

Bill Bozym, *Project leader*

Pacific Bell Directory, *San Francisco*

- **Challenge:** To provide an effective yet extremely lightweight computer to sales representatives who are forced to heft numerous paper-filled binders.
- **Technology:** Fujitsu Personal Systems' Poqets, Borland's Paradox database, a proprietary database.
- **Impact:** Full impact yet to be measured, but six months after rollout, 40% of the reps use the technology heavily and 86% say it improves their ability to make sales.

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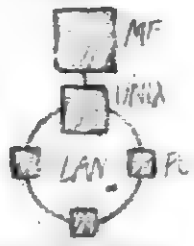

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486, palmtops lead way at PC Expo

Product announcements, Compaq-sparked price cuts highlighted at recent conference

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — All-hours night life, harrowing taxi rides and hot dogs: It was New York, all right. As if to prove it belonged, PC Expo had more products than you could count. Some of them were even new.

There were also a variety of price cuts made, in response to Compaq Computer Corp.'s low-cost offerings (CW, June 22).

The largest vendor to add its name to the list of price butchers was NEC Technologies, Inc. Boxboro, Mass.-based NEC cut prices on all of its products (see story page 39).

Epson America, Inc. added several new models to its product line. It added a variety of Extended Industry Standard Architecture-based desktop and tower systems based on Intel Corp.'s I486 processor and two XT/AT Bus-based boxes, the Equity 486DX2/50 Plus and the Equity 386/33 Plus. Epson also extended its service hours and added on-site service. A company spokesman said Epson was debating how to price the system in the wake of the Compaq price cuts.

NCR Corp. added a multimedia machine. The product, called the System 3331 Multimedia Learning Station, is the first of a planned series of products that merge technology from AT&T and NCR. It uses either the 25-MHz 486SX or the 33-MHz 486DX, is upgradable and has built-in full-motion video, stereo sound and 1,024- by 768-pixel graphics resolution.

NCR said the product will cost $5,300 when available next month. Neil Whittington, assistant vice president of NCR's multimedia products business unit, said automated teller machines in the future would likely have multimedia capabilities.

Chips and Technologies, Inc. landed some U.S. customers for its 80386 offering. Computerland Corp. will use it in its Trion store brand models, as will Happauge Direct, a division of Happauge Computer Works, Inc. in Happauge, N.Y. Chips and Technologies also showed five palmtop-size personal computers in its booth that use its PC/Chip, including the Handbook from Gateway 2000 Ltd., a 6- by 10-in., 3.6-pound PC that will cost $1,295 and a small pen-based system from JFK Associates, Inc.

First on the block

Wyse Technology, Inc. released what it said was the first 5-pound notebook with a 200M-byte hard drive. The Wyse DecisionMate 486SLKC Model 200/4 uses Cyrix Corp.'s 25-MHz CX486SLC processor, has 4M bytes of random-access memory and will cost $2,899 when it begins shipping later this month.

Memorex Telex Corp. rejoined the ranks of PC manufacturers, announcing nine new systems, the least expensive of which is a 25-MHz 386SX with 2M bytes of RAM for $621.

Phoenix Technologies Ltd. and Calera Recognition Systems, Inc. announced that they would build a combined fax/optical character recognition software product for sale to hardware manufacturers. The integrated product, slated for release by the end of the month, will combine PhoenixFax with Sunnyvale, Calif.-based Calera's FaxGrabber. Phoenix Technologies, based in Norwood, Mass., also said it would create a retail line of communications software.

New York-based Hertz Computer Corp. brought out a 50-MHz 486-based box. The Hertz 486/50E has 8M bytes of RAM, 256K bytes of secondary cache and eight expansion slots. It is priced at $2,149.

Overseas demand

Texas Micro, Inc. said it was shipping its fault-tolerant server, the FSTA, and that its first sales were in the Japanese market. Tokyo's city hall, which is piloting five of the new servers to process its emergency calls, plans to purchase 35 more if the pilot goes as planned.

Dauphin Technology, Inc. announced it would focus 90% of its research and development money on pen computing. Alan Yong, Dauphin's president and chief executive officer, said the company plans to announce five new pen-based systems by the end of the year.

Helix Electronic Publishing Corp., a Haverford, Pa., company, demonstrated a prototype of its CityGuide product. Designed to be used on a portable computer, the CityGuide features Zagat's restaurant guides, landmarks and hotels, plus directions and other information, for the 30 largest U.S. cities. It will cost $69.95 per city when available late this month and requires a system with at least 2M bytes of RAM.

Integrated Technology, Inc., a start-up based in South Orange, N.J., displayed its CompuPhone telephone keyboard, which features a telephone built into a computer keyboard. The product is currently under license to Key Tronic Corp., a large maker of keyboards. The CompuPhone comes in either a headset or handset version.

IN BRIEF

Claris boosts MacDraw Pro

■ **Claris Corp. has announced MacDraw Pro Version 1.5. The product is reportedly 25% to 75% faster than the previous version and includes full Signaling Apple Computer, Inc. System 7.0 support, including support for QuickTime, Publish & Subscribe and Apple events. It is available for $399.**

■ **Cambridge, Mass.-based Dataware Technologies, Inc.** has announced the Kanji version of its compact disc/read-only memory (CD-ROM) authoring and retrieval software. With the addition of this version, users can now develop a single CD-ROM data set with "culturally sensitive" user interfaces in such languages as Japanese, English, French, Italian and others. Data can also be placed on the CD-ROMs in a "parallel" manner that allows multiple languages to be accessed on one CD.

■ **Traveling Software, Inc.** released LapLink Pro Corporate 10-Pak, a licensing deal that will allow users to buy 10 copies of LapLink Pro for $799, less than $80 a user. Individual copies of LapLink retail for $169.95.

■ **IBM** announced recently that it is negotiating with a number of personal computer distributors to resell its memory, hard drives, monitors and adapters. The products are aimed at users of IBM and IBM-compatible PCs.

■ **Zenith Data Systems**, a Groupe Bull subsidiary, said it will offer The Santa Cruz Operation's Open Desktop Release 2.0 as an option with its new Z-Station and Z-Server lines.

The portable that fit in a purse

CONTINUED FROM PAGE 39

Pacific Bell piloted the Poqet, including a proprietary database Bozym built using Microsoft Corp.'s C 6.0, in 1991 and rolled out Poqets to half of its outside representatives — approximately 300 — in January.

The database contains pricing data for advertisements and information on co-op deals. Data is entered in a Borland International, Inc. Paradox format, run through an ASCII transfer program and put on random-access memory cards. Information from the proprietary database on the Poqets is then fed into a personal computer in each sales branch that has a card reader.

Data is ultimately transferred into an Oracle Corp. database on corporate Digital Equipment Corp. VAX systems.

Bozym said 40% of the sales reps who have Poqets use them heavily, and 75% use them at least twice a week. Pacific Bell Directory is evaluating their impact now. Graham said an internal survey showed that 91% of the salespeople said they did their jobs better because of the Poqets.

Graham, now general manager of Pacific Bell Directory's San Jose, Calif., sales branch, said he was going to propose the purchase of more Poqets. Pacific Bell will invest cautiously, though, because it plans to continue looking at new uses of technology, including pen-capable systems. Graham and Bozym said pen technology presents possibilities for the company.

"I went to a construction site with one of our reps to talk to a plumber and we had to climb up to the sixth floor of this building. In an environment like that, two-handed computing would be nice," Bozym said.

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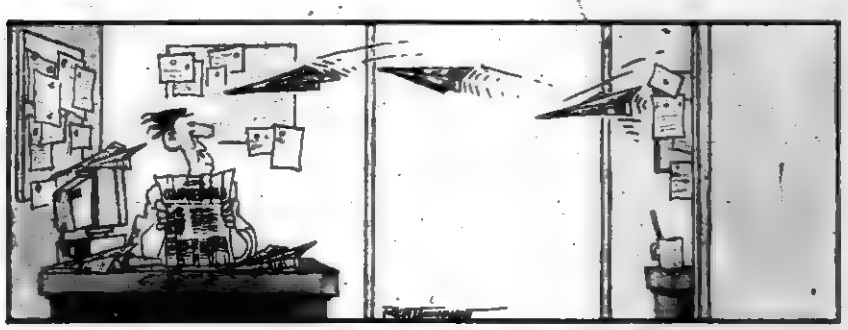

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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
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Caere unveils fax/OCR software

BY CAROL HILDEBRAND
CW STAFF

Caere Corp. is taking optical character recognition (OCR) a step further with the introduction of FaxMaster.

The first example of integrated fax/OCR software aimed at Microsoft Corp.'s Windows, FaxMaster allows users to send and receive both OCR and compressed fax documents.

"Current fax software is a photo, an image — you can't edit it, and you also can't share it" because of the space such an image can take up, noted Larry Miller, Caere's vice president of marketing. "This is the first complete product that sends and receives in computer-readable form."

FaxMaster is based on some of the following features:

• Send and receive. Users can send and receive faxes directly from within a desktop application. The package utilizes direct input technology to allow access between FaxMaster and their applications.

OCR is performed automatically in the background mode for faxes being received.

FaxMaster also enables users to receive both text and image versions of incoming faxes. The software is activated by clicking on the FaxMaster icon within an application.

• OCR. FaxMaster can recognize standard-mode faxes, which are sent at only 200 by 100 dot/in. The technology is built on a neural OCR engine in order to solve the low-resolution fax recognition issue.

• Compress. Proprietary technology from Caere allows users to compress images well beyond industry standards if the user is sending and receiving images. Standard-mode faxes can be compressed by up to 5:1 over CCITT Group III compression, which can significantly reduce storage problems.

Slated for third-quarter availability, FaxMaster is priced at $249. The package requires a personal computer of the 386 class or above with 4M bytes of random-access memory, 8M bytes of available hard drive space and a mouse.

MS-DOS 3.1 or above and Microsoft Windows 3.1 are also necessary.

The software is compatible with Class 1, Class 2, CAS and Sierra SendFax modems.

Windows printing fixes

Part of a series of Windows 3.1 user tips provided by Microsoft Corp. and based on questions commonly asked of Microsoft customer support personnel.

Q What could be causing printing problems that didn't occur in Windows Version 3.0?

A When you set up Windows 3.1, some printer drivers may not get updated correctly. To make sure your printer driver was updated correctly, do the following:

• Remove the printer driver that you are using from your system. Run Control Panel and choose Printers. Select the printer driver and choose the Remove button.

• Use File Manager to change to the WINDOWS/SYSTEM directory. Select the printer driver file name and press the Delete key.

• Reinstall the printer driver by running Control Panel and choosing Printers. Choose the Add button, select your printer and choose the Install button.

Q When I print in landscape mode on a Linotronic printer, the Encapsulated PostScript graphic portions of the document are rotated. Why?

A If you are using the Linotronic or another PostScript printer driver, try adding this line — LandScapeOrient = 270 — to the [ModelName,Port] section of the WINN.INI file. This is the section that says [Linotronic 200/230,LPT1], and not the section that says [PostScript,LPT1].

Q Can I use TrueType fonts with my Hewlett-Packard Co. DeskJet printer?

A The printer drivers supplied by HP do not support TrueType fonts. You can use the DeskJet printer driver that comes with Windows 3.1, but it does not support HP scalable fonts.

Q Is it possible to print in color using my HP DeskJet 500C printer?

A Using the printer driver supplied by HP, you can print in color using this printer. If you want to use TrueType fonts, you can use the printer driver that comes with Windows 3.1; however, you won't be able to print in color.

NEW PRODUCTS

Utilities

Demax Software, Inc. has announced the releases of the System Detective Automated Operations (AO) and Interactive Session modules. Both products assess a range of system elements for more control of the security environment.

They have the ability to monitor remote terminals and lock out users attempting to access systems via batch, network or detached jobs.

System Detective AO has an expanded set of utilities to query its event database. System Detective Interactive Session allows users to interact directly with a suspicious user or process and can be tailored to a company's requirements with a customizable command set.

Pricing for the System Detective AO module starts at $295, and the Interactive Session module starts at $245.

Demax Software
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Peripherals

Nisca, Inc. has started shipping the Niscan Spectra, a 24-bit scanner with software for DOS and Microsoft Corp.'s Windows 3.0 environments.

Images can be incorporated in a variety of business applications including multimedia productions, proposals, newsletters and other documents. Niscan Spectra scans in between 256 or 16 million colors, in 64 or 256 shades of gray and at resolutions from 25 to 400 dot/in. When an image is scanned, it can be edited in either ScanRix and ColoRix VGA or in Picture Publisher, which is software included in the package.

Niscan Spectra for DOS or Windows costs $995.

Nisca
Suite 104
1919 Old Denton Road
Carrollton, Texas 75006
(214) 242-9696

Data Technology Corp. has started shipping the DTC2290 32-bit Integrated Drive Electronics (IDE) to Extended Industry Standard Architecture (EISA) host adapter.

The product is a controller that allows the IDE disk drives to perform at their maximum data rates of up to 8M byte/sec. on the EISA bus.

While under DOS, the DTC2290 typically improves EISA system data throughput by 300% to 400%, according to the company. The DTC2290 can support up to four IDE disk drives, each with an 8G-byte capacity, for a maximum capacity of 32G bytes per card.

EISA configuration file support is provided, and the DTC2290 can support both duplexing and mirroring under Novell, Inc. NetWare with a single card.

The DTC2290 costs $145.

Data Technology
500 Yosemite Drive
Milpitas, Calif. 95035
(408) 942-4000

BusTek Corp. has announced the BT-545S, a Small Computer Systems Interface (SCSI)-2 host adapter that delivers up to 10M byte/sec. synchronous and 7M byte/sec. asynchronous SCSI data transfers.

The adapter is designed for high-speed, I/O-intensive file server and data acquisition environments. Features include an internal edge connector and external 50-pin SCSI-2 connector. Support is provided for hard disk drives with up to 8G bytes of data storage capacity and any combination of up to two 3½-in. or 5¼-in. drives, including support for 2.8M-byte floppy disk drives.

The BT-545S costs $449.

BusTek
4151 Burton Drive
Santa Clara, Calif. 95054
(408) 492-9090

Systems

Panacea, Inc. has announced a line of high-performance AutoCAD software accelerator products for Autodesk, Inc.'s AutoCAD Release 12.

TurboDLD Classic and TurboDLD Deluxe offer four times the increased speed of AutoCAD drivers in Zoom, Pan and Redraw operations. The TurboDLD Classic has "The Big Picture," a movable bird's eye view of the current AutoCAD drawing with the active editing area highlighted. TurboDLD Deluxe comes with real-time panning, a Zoom Preview spyglass, pop-up menus, a drawing viewer and fully reconfigurable digitizer buttons.

The TurboDLD Classic costs $149, and the TurboDLD Deluxe costs $249.

Panacea
Suite 4
Post Office Square
24 Orchard Drive
Londonderry, N.H. 03053
(603) 437-5022

Software application packages

Systat, Inc. has announced Systat for Windows.

According to the company, Microsoft Corp.'s Windows environment makes it easier to learn Systat PC, and the point and click interface speeds tasks, providing quick analyses. Data sets can be analyzed, and a selection of statistical analysis can be accessed and applied to data with QuickStat buttons.

Systat for Windows can be accessed to work in either standard or extended memory modes. This version offers new brushing tools that let users click on data points and examine corresponding cases in the data editor.

Systat for Windows costs $895.

Systat
1800 Sherman Ave.
Evanston, Ill. 60201
(708) 864-5670

Document Techologies, Inc. has created the WDK2000, a Microsoft Corp. Windows developer's kit.

The product was designed to simplify Windows programs for displaying, scanning, processing, printing and storing computer images that have resolution and clarity similar to those printed or written on paper.

The WDK2000 can display images at 200 dot/in. and has imaging functions that are accessed using Dynamic Linked Libraries. More than 40 different high-level functions are offered, including image scan, image print and image storage on local Small Computer Systems Interface or network devices, compression and expansion.

The WDK2000 costs $1,495.

Document Technologies
1300 Charleston Road
Mountain View, Calif.
94043
(415) 964-6100

Data storage

Tandberg Data, Inc. has introduced the Panther 2000, a ¼-in. cartridge tape backup system.

The Panther 2000 features a native storage capacity of 2G bytes, which can be doubled to more than 4G bytes with data compression.

The product is available in internal and external configurations for single-user and local-area network applications and is compatible with a variety of environments, including IBM Personal Computers and compatibles, Sun Microsystems, Inc. SPARCstations and Apple Computer, Inc. Macintoshes.

Panther 2000 prices range from $3,100 to $5,600.

Tandberg Data
Suite 600
2649 Townsgate Road
Westlake Village, Calif.
91361
(805) 495-8384

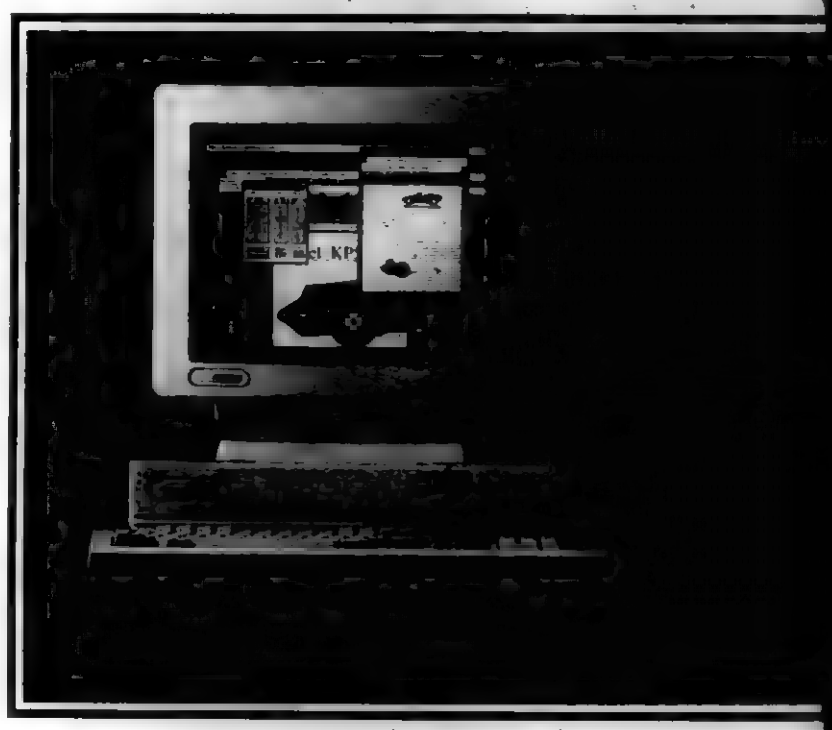
THE COMPAQ DESKPRO/i. SO A LIMITED PRICE LEADS

The company most qualified to advance the state of the desktop computer announces four systems that represent a breakthrough in R&D. At prices that won't ruin your P&L. Reflecting the level of thinking and quality that you've come to expect from Compaq.

At Compaq, there's a fundamental belief held by all of us that when you set an extraordinary goal, extraordinary people will meet it.

Recently, for example, you made it clear to us that you wanted computers with everything from advanced graphics to audio capability to affordable prices. Our response: the COMPAQ DESKPRO/i Family of PCs. Four new systems loaded with features to enhance productivity.

The built-in COMPAQ QVision 1024 Graphics Controller, for example, allows you to scroll, resize windows and pull down menus up to ten times faster than most popular video graphic subsystems. So quickly, as a matter of fact, you may find your computer waiting for you. Instead of the other way around.



Its unique processor upgrade system ensures your PC won't be swept into obsolescence.

Simple chip upgradability and a 64-KB cache

*This service is provided by contracted Service Providers and may not be available in certain geographic locations. Contact the Compaq Customer Support Center for further details. © 1992 Compaq Computer Corporation. All Rights Reserved. Printed in the U.S.A. COMPAQ DESKPRO Registered U.S. Patent and Trademark Office. QVision and CompaqCare are trademarks of Compaq Computer Corporation.

MUCH FOR THE IDEA THAT TO LIMITED THINKING.

memory module option provide quantum leaps in performance. Without similar outlays of cash.

Intel 386/25, 386/33, 486SX/25, 486/33 ♦ *QVision accelerated graphics* ♦ *Chip upgradability* ♦ *Integrated business audio* ♦ *4 MB RAM (expandable to 32 MB)* ♦ *Cache memory standard* ♦ *3 ISA expansion slots* ♦ *3 drive bays* ♦ *84-MB to 510-MB hard drive options* ♦ *Multi-level security features* ♦ *Microsoft MS-DOS 5.0 as published by Compaq*

The integrated audio system provides for an unprecedented, yet not unfamiliar dimension in mainstream business computing: your voice.

The result of a working collaboration between Compaq and Microsoft, it allows you, among other things, to easily paste voice messages into spreadsheets and documents. Either as notes to yourself or as voice-mail across your entire network.

And we've engineered this breadth of technology right onto the PC's system board, preserving the small footprint, large storage capacity and expansion of the COMPAQ DESKPRO/i.

Not to mention your financial integrity.

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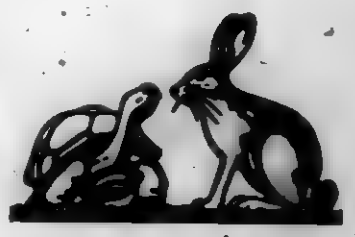

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FROM THE COMPANY T

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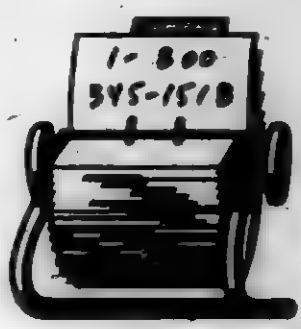

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Transaction cements market dominance of two leading knowledge base system vendors and sets stage for entry into broader application development market

On June 25, 1992, AICorp, Inc. and Aion Corporation, the two leading knowledge base system vendors, signed an agreement to merge operations. The merger establishes a single company with clear market dominance and sets the stage to extend our reach into the larger market for general purpose application development tools.

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Novell envisions stratified market

BY MICHELE DOSTERT
SPECIAL TO CW

Novell, Inc.'s next-generation NetWare 4.0 product, slated to ship by year's end, will be aimed at the high-end, corporatewide network market. The company said it hopes that adding a more robust network operating system product to its current NetWare line will help Novell sell into Fortune 1,000 local-area network sites without loosening its grip on the workgroup and departmental markets.

"NetWare 3.1 was our new, high-end technology when it was introduced, but that was two years ago," said Bob Young, director of marketing at Novell's NetWare Product Division.

"Now, we are positioning NetWare Lite for the 25-user level and our 2.X line at the workgroup, 100-user versions that represent a major push for us to get into the high end of the market," Young said.

Little user interest

Earlier, Novell had planned to call its forthcoming NetWare release NetWare 3.2 and position it as an extension of its 3.X line. However, Novell said it discovered that many 3.1 customers were not interested in the planned enhancements, such as directory and naming services, foreign language support, integrated image processing engine and SFT III fault tolerance.

Also, Novell's experimental alpha release of a 3.11-based 1,000-user version of NetWare reportedly ran into problems with 3.X's 256-user limit dictated by its bindery structure.

"I looked at bringing in the 3.X-based 1,000-user NetWare but decided against it," said Brian Gunnell, assistant vice president of networks at Canseco, Inc., a Carmel, Ind.-based insurance holding company with a 600-node NetWare LAN. "The printing didn't work. We wanted to use it for mail, but it was limited by the 256-user bindery — there were just too many caveats for me."

"We built our 1,000-user version on NetWare 3.X, but we always intended to move it to a directory-based platform. It was our customers who suggested that such a major rearchitecture dictated a next-generation product name; hence, NetWare 4.0," Young said.

Some industry experts said they expect NetWare 4.0 to do well in the Fortune 1,000 market. "I talked to two customers today who are very interested in 1,000-user NetWare 4.0, and both want to use it as glue to help integrate their mainframe and minis with their LANs," said Pete Heles, vice president of LanTech, a high-end integrator in Indianapolis.

"Our customers with large LANs are very excited about the new directory-based NetWare," said Barry Saltzman, head of JWP, Inc.'s systems consulting group in New York. "I think most of them will upgrade because the new directory services will let them manage their distributed LANs in all their branches from one central location, which is crucial for them."

Novell will try to lure large 3.X users to 4.0 by making the upgrade path as painless as possible: A "bindery emulator" in 4.0 will allow seamless integration of 3.X and 4.0 servers into one transparent network.

Slow to switch

But many 3.X users are approaching the upgrade cautiously. "We will look at 4.0 when it comes out; but I'm always leery of .0 releases," Gunnell said. "I'll definitely bring it up in test mode and run some benchmarks on it before I think about putting it into production."

Many users just getting comfortable with NetWare 3.11 said they are not inclined to upgrade anytime soon. "Sure, the improved directory and naming structure would be nice, but it's not enough to get me to move," said Bob Wrage, a network administrator at Deere & Co. in Moline, Ill. "Really, we're still getting our feet wet with 3.11. Now, if 4.0 would let me run my applications in protected mode, that would make me move."

Although Novell has not confirmed it, high-end resellers and applications developers who have seen preliminary demonstrations of 4.0 indicate that it will enable users to run in protected mode.

Barry Gilbert, director of the market research firm InfoCorp in Acton, Mass., said, "NetWare 4.0 won't be released till the end of the year, so we won't know until probably the first quarter of '93 how many users will move to 4.0, and how fast. It's going to be interesting to see how many customers really want 1,000-user NetWare."

Dostert is a Salt Lake City-based freelance writer.

Lion's share

The lower end NetWare 2.0 line dominates the Novell installed base, although Novell sees room for a NetWare version aimed higher than NetWare 3.0

Percent of installed base
Total: 1.3 million servers (year-end 1991)

Source: The Burton Group

PeopleSoft offers electronic support

BY ROSEMARY HAMILTON
CW STAFF

Two users of PeopleSoft, Inc.'s recently released electronic customer support system said it is a big step up from the traditional service methods.

PeopleSoft's PS/Forum is based on Lotus Development Corp.'s Notes workgroup software. The human resources software company purchased 250 copies of Notes from Lotus and is providing them to customers as part of their standard maintenance deal. With Notes, customers can access three databases at PeopleSoft, including one that contains updates and fixes for the software.

"As far as providing access, there's no substitute," said Dick Schell, director of information systems at The Turner Corp. in New York. "There's no waiting for phone calls. We can just contact them any time we want to."

Customers can also access a database that serves as a user forum or bulletin board for PeopleSoft users to exchange information. Another database is for general discussion purposes.

At your service

Schell said PS/Forum allows him to directly correspond to PeopleSoft and, if an issue requires more in-depth discussion, a meeting can be arranged. At the same time, if a product concern is minor, a user can find information in one of the databases and not have to wait for a company response.

"There's more efficient communication," added David Weizer, manager of human resources systems and records at Rolm, a Siemens company. "You can type out a lengthy message [to PeopleSoft support], and it allows them to know in detail what it is you need to know. Then they have time to formulate their response."

PeopleSoft uses Notes internally and has been planning to extend it to its customer base.

Work flow emerges as imaging trend

Importance soars as imaging technology evolves into catalyst for business process re-engineering

BY ELLIS BOOKER
CW STAFF

ANAHEIM, Calif. — Work flow was highlighted as the crucial software component of imaging systems during last month's Association for Image and Information Management (AIIM) conference here.

On the hardware side, meanwhile, there was a plethora of personal computer local-area network-based imaging systems. There was also a gathering of support for Unix-based servers in general — particularly the IBM RISC System/6000.

Why has work flow, which manages the routing of images between individuals, applications and processes, become such an important software category?

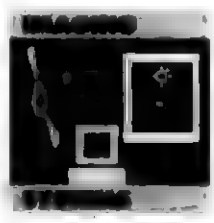
As imaging has evolved from a mundane "storage and retrieval" technology to a leading catalyst for business process re-engineering, work flow has become the apparatus for this broader activity.

On the brink

Indeed, re-engineering was on the minds of many attendees, according to a straw poll conducted by IBM at the show. Among other results, the survey found that 76% of the 377 respondents are implementing or plan to implement a business re-engineering project; approximately 70% said this activity was "likely" to take place within a year.

Virtually all imaging vendors now offer work flow, either of their own design or based on another vendor's core technology.

For instance, Digital Equipment Corp. picked EPIC/workflow from Computron Technologies Corp. in Rutherford, N.J., as a work-flow component for its VAX/VMS DECimage Express product.



The industry trend, apparent at AIIM, is for the work-flow component, like the image system, to run under an icon-driven graphical user interface (GUI). For the majority of vendors, this means Microsoft Corp.'s Windows environment.

In addition, the capabilities of work-flow systems continue to improve. Sigma Systems, Inc., for instance, announced at AIIM a new version of its RouteBuilder graphical work-flow development product that supports parallel routing, time and event queues and the creation of ad hoc work-flow instructions.

Indeed, while work-flow systems are still primarily targeted at information systems departments or systems integrators, the move toward object-oriented graphical interfaces promises to make them easy enough for end users to program.

In its AIIM booth, for instance, IBM demonstrated a prototype object-oriented system that builds host-based work-flow instructions from an OS/2 2.0 workstation.

Giant leap

Show attendees said ease of use and end-user access to imaging could take a quantum step forward when Lotus Development Corp.'s Notes: Document Imaging, a $200 to $400 companion product to Lotus' Notes, hits the streets within the next two months.

Built under a partnership between Lotus and Eastman Kodak Co., Calera Recognition Systems, Inc. and GammaLink, the product could have a profound effect on the imaging industry, according to analysts.

"The total world of imaging is 50,000 to 60,000 seats, so if the image version of Notes gets 10% of, say, a half-million Notes sites, it'll double the size of the industry," said analyst Bruce R. Silver at BIS Strategic Decisions in Norwell, Mass.

"But Notes isn't going to do claims processing at Blue Shield," warned Silver, adding that transaction-intensive, production-oriented imaging products from vendors such as FileNet Corp. would still find a large audience.

Noting the impact that work flow could have on their business operations, several sophisticated users of imaging technology at AIIM indicated a need to "decouple" the work-flow system from the imaging system.

"The work flow we want is one that works independently of the imaging system," said Gamil Sakla, assistant vice president at The First National Bank of Chicago.

No easy task

"Architecturally it's there, it's possible, but it's not simple," Silver observed, adding that this might be one direction for the marketplace in the coming year.

But if work-flow systems do become interoperable, imaging systems from different vendors will be able to work together transparently.

That scenario suggests partnerships between vendors offering high-end, transaction-oriented imaging solutions — the kinds of products designed to automate insurance claims processing — and single-user or workgroup imaging systems that typically support more ad hoc, white-collar applications.

Products issuing from these relationships could span departmental and production-oriented applications.

"The first vendor to provide that," said Jordan M. Libit, vice president of marketing at FileNet, "is likely to have a winner."

IN BRIEF

Xerox joins Intergraph

■ Intergraph Corp. and Xerox Imaging Systems (XIS) recently formed a business alliance to provide Intergraph customers with text recognition software. Under the agreement, Intergraph will integrate XIS' ScanWorx, a document input system for Unix platforms, into its reduced instruction set computing-based workstation line for document image management and publishing systems.

One major customer of the combined Intergraph/XIS product is the U.S. Naval Sea Systems Command, which last year awarded Intergraph a $362 million contract for computer-aided design work.

Citicorp Credit draws ledger into Sun net

BY JOHANNA AMBROSIO
CW STAFF

Citicorp Credit Services' financial reporting group is adding to the suite of commercial applications on its network of Sun Microsystems, Inc. workstations. Most recently, the Citicorp subsidiary chose a general ledger package.

This package joins software from Lotus Development Corp. and Island Graphics Corp., among others, that runs on Citicorp Credit's 50-workstation Sun network. The Long Island City, N.Y.-based company uses SPARC-1 and SPARC-2 workstations, three Sun servers and 20 personal computers, including Compaq Computer Corp. and Dell Computer Corp. machines.

The general ledger system, called RFS/GL from Skylight Systems in Wyncote, Pa., will initially be used to track Citicorp Credit's asset securitization, which involves turning $23 billion worth of credit-card receivables into secured bonds.

"Eventually we will use RFS/GL as a subledger with the corporate Citicorp general ledger system," said John Weisenseel, vice president of treasury operations at Citicorp Credit. The corporate general ledger is a package from McCormack & Dodge, now part of Dun & Bradstreet Software, that runs on an IBM mainframe.

> THE GENERAL ledger system will initially be used to track Citicorp Credit's asset securitization.

Citicorp Credit is also writing other applications, including a cash management system, with which the Skylight software will communicate. The general ledger will be operational by late this month, Weisenseel said, and will support up to four users.

The Skylight software is replacing a PC package called Solomon. "We found the current package to be inflexible," said Tom Adamski, director of card products treasury systems. "RFS/GL had the best grip on multicurrency," an important requirement because Citicorp does business in so many different countries, Adamski said.

Another criterion was that the package had to work with Sybase, Inc.'s relational database under Unix, since that is Citicorp Credit's standard. Not quite three years ago, Citicorp Credit switched over from a proprietary Hewlett-Packard Co. Series 3000 minicomputer to the Sun workstations. "We wanted the price/performance and scalability of the client/server architecture," Adamski said. "And development is much easier on the Suns than it was on either a mainframe or a minicomputer."

NEW PRODUCTS

LAN hardware

Asante Technologies, Inc. has introduced a series of Token Ring adapter cards.

TokenPac cards are designed for personal computers and compatibles based on National Semiconductor Corp.'s Token Ring Protocol Interface Controller. The cards connect PCs based on Extended Industry Standard Architecture and IBM's Micro Channel Architecture to IEEE 802.5 Token Ring networks and provide 4/16M bit/sec. performance.

The TokenPac network interface cards cost $699.

Asante Technologies
404 Tasman Drive
Sunnyvale, Calif. 94089
(408) 752-8388

Workgroup software applications

Applied System Technologies, Inc. has announced the Manager's Window, a Microsoft Corp. Windows-based management module for Dispatch-1 and Fieldwatch, the company's service management systems.

It incorporates three integrated windows that offer functional and graphical capabilities. The Dispatch Board View displays a matrix of call assignments in priority order. The Call/Work Order View opens call boxes and reveals data about the service call, and Map View visually depicts geographic hot spots, work force allocations and current technician statuses.

The Manager's Window costs $7,995.

AST
100 Highpoint Drive
Chalfont, Pa. 18914
(215) 822-8888

Electronic mail

Reach Software Corp. has introduced a second-generation version of Mailman, an open electronic-mail platform.

Mailman 2.0 is a Microsoft Corp. Windows-based open E-mail product that has access to a variety of E-mail servers, databases and applications. New features include an improved user interface for message functions, fast message composing and direct access to local-area network directories. Mailman 2.0 supports Novell, Inc.'s NetWare MHS, Banyan Systems, Inc.'s Vines Mail and Windows 3.1.

Mailman 2.0 for MHS costs $995 for 25 users and $2,295 for unlimited users per mail server. Mailman 2.0 for Vines costs $1,495 for unlimited users per mail server.

Reach Software
872 Hermosa Drive
Sunnyvale, Calif. 94086
(408) 733-8685

DOD funds three-year study on LAN/WAN ATM link coordination

BY ELISABETH HORWITT
CW STAFF

A consortium of vendor, academic and government organizations recently embarked on a three-year test of asynchronous transfer mode (ATM) technology under heavy application loads. A major focus of the Multidimensional Applications and Gigabit Internetwork Consortium is to study how to effectively coordinate links between local- and wide-area ATM devices, consortium members said.

Funded by the U.S. Department of Defense (DOD), the project will run a bandwidth-hungry dynamic terrain visualization application across an ATM-based network. The application will use the ATM network to provide several geographically separate data centers with terrain visualization data collected by the Earth Resources Observation Systems Data Center, a Sioux Falls, S.D.-based unit of the U.S. Geological Survey's National Mapping Division.

The data will end up at the Army's Future Battle Laboratory in Fort Leavenworth, Kan., where military personnel will be able to view terrain on a computer screen as if they were traveling over it by foot, air or car.

Also linked via the ATM network will be the Minnesota Super Computer Center, Inc. in Minneapolis and the University of Kansas in Lawrence, Kan. U.S. Sprint Communications Co. will interconnect the various sites over 2.4G bit/sec. ATM links that are based on the Synchronous Optical Network (Sonet) standard, spokesmen said.

All-purpose project

The project was designed to serve several purposes for the consortium members. Of major potential use to future ATM network users is the work being done by Digital Equipment Corp., Sprint, Northern Telecom, Inc. and the University of Kansas to "explore the feasibility of some options for interfacing the LAN and WAN ATM," said Gary Minden, an associate professor of electrical and computer engineering at the University of Kansas. Among the issues to be explored during the project are the following:

- What protocols the ATM local-area network switch should use to set up circuits over a long-distance ATM network. "The local ATM group is talking about setting up the initial circuits via a Simple Network Management Protocol mechanism, but that probably won't fly on the WAN," Minden said.
- How to manage allocation of long-distance ATM bandwidth among different devices to avoid congestion.
- How serious is the risk that occasional cells, or small packets, will be dropped during transmission, and how this risk can be minimized.

MILITARY PERSONNEL will be able to view terrain on a computer screen as if they were actually traveling over it by foot, air or car.

In general, the vendors will be testing interoperability and performance of ATM links that include both a LAN and WAN network component. The university will be testing a gateway that it is developing between ATM-based LANs and WAN services, he added. An experimental ATM LAN switch from DEC will be using the gateway to gain access to Sprint's ATM-based long-distance connections, Minden said.

DOD expects to test a potentially useful application for the military and also collect some valuable data about high-speed networks that will be useful to government high-speed network projects such as the National Research and Education Network.

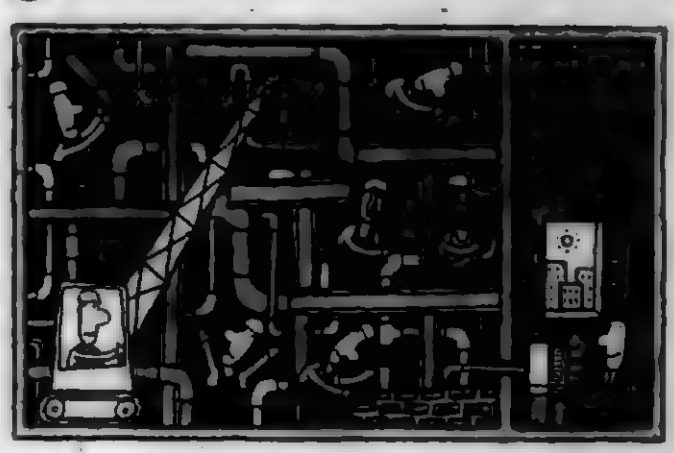
"This is one of several gigabit-per-second, test-bed networks that DARPA is working on," a Sprint spokesman said.

Sprint hopes to gain insight into troubleshooting, management and interoperability issues associated with operating a high-speed network, the spokesman added. Sprint also plans to introduce a service based on broadband Integrated Services Digital Network, which will incorporate both ATM and Sonet, in the mid-1990s, he added.

Hiding migration from users

X is one aid for firms in systems transition

BY JOANIE M. WEXLER
CW STAFF



Many information services professionals migrating their companies from host-centric to distributed computing schemes are facing a juggling act as they maintain large legacy systems while porting corporate applications to smaller, dispersed platforms.

This challenge is generally being met by creating desktop "windows" into the corporate network through either homegrown or industry-standard interfaces such as the X Window System.

Both tacks mask users from the application porting that is going on behind the scenes.

Users, then, transparently access data from wherever it happens to reside at the moment across the network without necessarily knowing where they are getting it from.

Protection preparation

The approach is an example of one migration method advocated by Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. That strategy consists of "surrounding" applications while they are ported to new platforms. While heavy-duty application re-engineering takes place on the back-end computer engines, users continue to see a consistent interface, and the desktop hardware investment is protected, Hurwitz explained.

For example, companies such as Enron Gas Services Corp. in Houston and Citicorp's Global Cash Management Services Group in Tampa, Fla., are building separate front ends for each of the various desktop platforms installed throughout their organizations. This scenario can require multiple communications protocol stacks on each desktop in order to allow the user to tap into the various disparate hosts, explained Jim Queen, local-area network manager at Enron.

"Users get a screenful of data that could easily be a composite from several different platforms" across the network, Queen said. Enron is using Powersoft Corp.'s PowerBuilder, an SQL development tool, to develop a Microsoft Corp. Windows application for accessing far-flung data.

On other desktops, the company is running an OS/2 application with Novell, Inc. NetWare Requester, IBM Systems Network Architecture and Unix-oriented Transmission Control

Continued on page 52

Re-engineering report cards

To help bring their software re-engineering projects in on time and within budget, some organizations have looked to the Software Process Program at the Software Engineering Institute (SEI) at Carnegie Mellon University in Pittsburgh.

The program is a review process that helps organizations evaluate and implement project planning, testing, standards implementation, configuration management and quality assurance procedures in their software development efforts. One commercial site leveraging the program is Citicorp, which began the process last summer. As part of its global effort to slash network and systems redundancies throughout the corporation, Citicorp is turning to open, distributed computing based on the Open Software Foundation's Distributed Computing Environment, explained Richard Lessard, senior vice president of applications development in the Global Cash Management Services division.

For its software development efforts, which include shifting applications from a mainframe-centric to distributed scenario, Citicorp received a "strong 2" from Carnegie Mellon on a 1-to-5 scale, with 5 reflecting the most mature development category, Lessard said.

Bill Curtis, director of the Carnegie Mellon program, explained that 80% of the 59 organizations assessed so far have received a 1 rating, which indicates an organization with "really no defined process that is crisis-driven and has lots of defects." Only 2% to 3% received a 4; no organizations received a 5. Carnegie Mellon is planning to issue a report on its findings with the 59 companies later this year, Curtis said.

"Organizations moving to distributed computing are finding that they don't have a life-cycle process in place, such as version control," noted Paul Scheib, senior managing consultant at Arthur D. Little, Inc. in Burlington, Mass. His firm is one of nine independent consulting firms licensed by Carnegie Mellon to conduct the process evaluations. "A lot of the controls of the mainframe environment just go away when you distribute," he added.

Lessard said the study told Citicorp that in order to advance to a 3 rating, it must either buy or build LAN-based tools that allow the firm to integrate the modeling and estimating efforts of similar, individual projects and build in appropriate chargeback and better "what if" mechanisms.

Users have cited a lack of tools as a major hurdle in moving to distributed computing. However, Lessard noted, "tools are secondary. If you can't manage the development process" from an organizational perspective, "there is no point."

JOANIE M. WEXLER

Router delivery lag concerns users

BY JOANIE M. WEXLER
CW STAFF

Despite user excitement about plans by the two fastest growing multiprotocol router vendors to build industry-standard switches for multimedia applications [CW, June 29], several companies pointed to some housekeeping issues they would like to see their suppliers clear up first.

For example, delivery of Wellfleet Communications, Inc.'s gigabit-backplane Backbone Node bridge/router — with versions originally slated to ship during the first and second quarters of this year — has slipped by about a quarter. While shipment is "imminent," according to Wellfleet President Paul Severino, the lower-end Link Backbone Node, due to ship first, will route only Digital Equipment Corp. DECnet Phase IV and Transmission Control Protocol/Internet Protocol (IP) alongside translation and transparent bridging.

Wellfleet is not violating any promises with the limited support, but routing just the two protocols "doesn't do it for us because [Novell, Inc.'s] IPX is one of our biggest protocols," said Vincent G. Curatolo, vice president of distributed systems services at Wellfleet shop Merrill Lynch & Co. in New York.

Similarly, "We're waiting for the [highest end] Backbone Concentrator Node for its redundancy level here at the data center," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co., a Wellfleet customer in Newark, Del. On the protocol support side, Delmarva is tapping its foot for Wellfleet's promised Banyan Systems, Inc. Vines IP support, Scoggin said.

Wellfleet shop Bear, Stearns & Co. has been "after Wellfleet since the beginning of the year to develop an HSSI," or High-Speed Serial Interface, said Ken Starkey, associate director of communications at the New York-based firm. He said that in the interim, he has installed a few routers from rival Cisco Systems, Inc. to support HSSI for some specific applications.

However, the industry also has issues with Cisco about the life cycle of its C bus-based hardware architecture, which relies on shared memory and CPU power that render it less scalable as networks grow.

"The fault tolerance we need, particularly when we add our IBM SNA traffic to our router network, can't be found anywhere today except at Wellfleet," said Anthony Brown, manager of communications product development at Martin Marietta Information Systems Co. in Orlando, Fla. Martin Marietta is currently preparing to issue a router bid.

The ability to isolate failures to protect network segments is inherent in Wellfleet's forthcoming Backbone Node design, which dedicates CPU power and memory to each set of network interface cards rather than having multiple router elements contend for those resources.

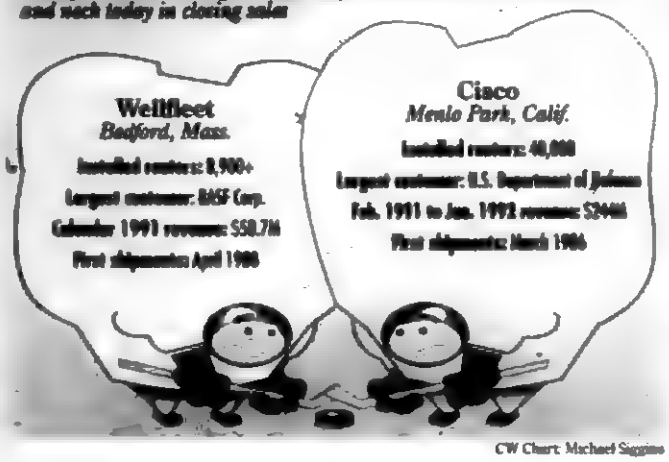
"Redundant CPU and hot swapability [being able to add or remove interface cards without bringing down the network] will be architecturally difficult for Cisco. They'll probably need to build a new box to do it," Brown predicted.

Cisco President John P. Morgridge said his firm "is always looking at changing architectures" but must be careful not to displace its installed base. He acknowledged that it would be "highly unlikely" that a new hardware architecture based on a different bus would be compatible with existing Cisco equipment.

Morgridge said Cisco recognizes the importance to customers of hot swapability, but he declined to say when the firm might provide that capability.

Router rival face-off

Cisco's two-year jump on Wellfleet has rendered its presence significantly more pervasive, although analysts say the two firms are running neck and neck today in closing sales



CW Chart: Michael Siggins

Hot tech

This issue is important to large Cisco shop Young & Rubicam, Inc., based in New York. "I haven't had any trouble with Cisco, but this issue makes me nervous because of our heavy reliance on these nodes," said Howard Maynard, senior vice president and director of MIS.

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy, insisted, "Cisco has got to come out with an interim architecture between what it currently has and its [Asynchronous Transfer Mode] switch, or Wellfleet will gain all the market share at the high end."

Rick Malone, a principal at Vertical Systems Group, a consulting firm in Dedham, Mass., agreed. "In the next generation, Cisco must be concerned with their hardware platform. If you run out of capacity, there's not much that interface software can do," he said.

IN BRIEF

TX3 hub enhanced

■ **Ascom Timeplex** announced that it has enhanced its TX3/SuperHub System to support additional high-speed capabilities. The hub's Multimegabit Data Transport Capability is said to support High-Speed Serial Interface, V.35 and RS-530 connections at rates of 1.54M to 41M bit/sec. The hub can also dynamically set up multiple T1 channels that can be bundled into a single high-speed link. The enhancements are scheduled for October availability at prices of $7,200 to $12,000.

■ **BT Tymnet, Inc.** has signed two major video-conferencing customers. Unilever, a $40 billion international consumer goods company, has decided to standardize on BT's technology and products for inter- and intracompany video communications. Unilever firm Lever Brothers Co. plans to use BT's service and equipment at its headquarters in London; Rotterdam, Netherlands; and in several U.S. locations.

In addition, the Michigan Collegiate Telecommunications Association, a consortium of 50 colleges and universities, has selected BT's video-conferencing systems as the basis for interactive, video-based courses.

Protocol may save IBM's 6611 processor

BY JOANIE M. WEXLER
CW STAFF

Ironically, it may be the open systems movement that saves IBM's neck in the multiprotocol router market.

Analysts point out that the proliferation of the industry-standard Open Shortest Path First (OSPF) routing protocol could reserve some space for IBM's 6611 Network Processor in existing internetworks.

IBM recently announced it will ship the 6611 three months late to ensure effective integration of myriad routing, bridging and management functions rather than shipping a product that might not meet user expectations [CW, June 29].

OSPF is a standard way for routers in Transmission Control Protocol/Internet Protocol networks to communicate routing table information, thus allowing routers from different vendors supporting the protocol to work together in one network. To date, organizations have tended to stick with one router vendor because of interoperability concerns.

With router leaders such as Cisco Systems, Inc. and Wellfleet Communications, Inc. growing at competitively rapid rates and stockpiling market share, the interoperability afforded by OSPF could allow users to wait to install IBM routers in network niches where they deem it strategic, while moving ahead now with their base internetworking strategies.

"If OSPF proves to be a satisfactory mechanism for creating multivendor router networks, IBM will hold its own in the router market," predicted Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy.

Forum formed

To that end, a group of router vendors, including Wellfleet, Proteon, Inc. and 3Com Corp., recently formed the OSPF Interoperability Forum to ensure that their routers mesh smoothly across networks.

"When OSPF kicks in, it will give us some alternatives," said Howard Maynard, senior vice president and director of MIS at worldwide advertising agency Young & Rubicam, Inc., a large Cisco shop based in New York. "But right now, a mixed bag [of routers] would only make my life more complicated."

While most users said they want the security of vendor independence, many may nonetheless elect not to exercise their options unless there are specific segments of their networks that merit a deviation from the corporate standard either by function or cost.

"Ideally, we'd like to standardize on one vendor and simply avoid dealing with the OSPF issues," said the vice president of telecommunications at a global bank who preferred not to be named.

Hiding migration woes

CONTINUED FROM PAGE 51

Protocol/Internet Protocol stacks for accessing different host environments, he said.

Similarly, Richard Lessard, Citicorp Global Cash Management Services senior vice president of applications development, explained that his firm is using a homegrown front-end mask while "we go into the tough back end and build, say, one investment system for everyone."

However, other large companies such as Kash n' Karry Food Stores and The World Bank are achieving the same effect by using X display terminals, which support industry-standard graphical user interfaces, and the networkwide use of the X protocol.

X terminals are graphics-oriented hardware/software devices that allow users to pull up multiple application windows on their screen from disparate networked hosts. Rather than running applications on the desktop that might have to change, they open up desktop windows to the applications instead, explained Dennis W. Read, information engineer at Kash n' Karry.

Use of X terminals also eliminates the need to run multiple protocol stacks on the desktop, observers said.

"In our organization, any technology we use must be scalable so we can incrementally add users with the right granularity," said Larry Austin, senior systems specialist at The World Bank in Washington, D.C. "The beauty of X is that we can scale by just adding another server."

Open or closed? You decide

Users split on picking proprietary or independent relational databases

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

Picking a relational database is a weighty decision. Features, functions, performance and price all go into the selection process. But users still seem divided over whether to buy a database from their systems vendor or one from an independent supplier that runs on many hardware platforms.

Relational database management system software sales are split between proprietary and independent databases, according to surveys conducted by International Data Corp. (IDC) in Framingham, Mass. Independent RDBMS sales in 1991 totaled $1.9 billion in the U.S. Roughly $1.6 billion in U.S. sales that year were by systems vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co., said Tony Picardi, director of software research at IDC.

The trade-offs between choosing "open" or "closed" systems are many, users said. Some said proprietary systems can be tuned better to their HP, DEC or IBM machines, providing better performance. But others said it is more important to have database products and tools that can be moved to other hardware platforms, providing more flexibility in future information systems planning.

Kenny Services, Inc., a New York division of Standard & Poor's Corp., is migrating from DEC VAXs to faster Sequent Computer Corp. Model 750s by moving its Oracle Corp. RDBMS to new hardware. "We didn't feel it was cost-effective to run Oracle on the VAXs anymore," said Ira Kirschner, director of technical services at Kenny Services. "Our incremental growth required us to do box swaps to get more power, and each box swap cost about $200,000."

But longtime DEC and HP computer users, who feel no need to mix and match computer systems, said they benefit by getting database and systems support from the same vendor. And all major RDBMS vendors offer similar features for distributed database applications. "The classic trade-off is between flexibility and power," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "The systems vendor can tune the database to the operating system, and they can devote more of the code in the database to optimizing performance for their platform."

"There are still some performance advantages to using a systems vendor's database," said Richard Kislowski, vice president and chief information officer at PacifiCare Health Systems, Inc., a health maintenance organization in Cypress, Calif. "Five years ago, it made lots of difference compared to the performance of an independent database. Today, the difference is in the 10% to 30% range."

Kislowski, who uses Rdb 4.0 on a DEC VAX 9000 Model 400 as his primary production machine, sees another advantage: synchronization of releases. When PacifiCare upgrades to DEC's VMS 5.5 later this month, it will know that Rdb was changed to take advantage of the new VMS features. "When you're dealing with open software, the database might be ported to an HP platform first, rather than to DEC," he said.

Both DEC and HP give users powerful financial incentives to stay with their proprietary Rdb and AllBase/SQL databases, respectively. A runtime version of Rdb has been provided at no cost for several years — and HP offers its AllBase at a steep discount compared with open systems RDBMS products.

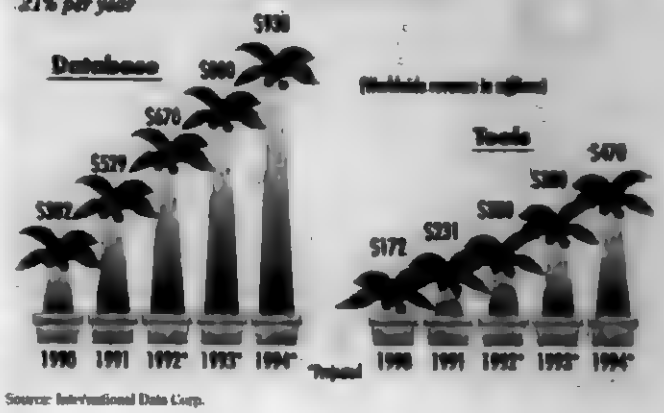
WHEN USERS OF independent RDBMS packages do choose open platforms over proprietary systems, cost savings from cheaper hardware is often cited as the rationale.

Support for a wide range of platforms sometimes strains independent vendors' resources,

Continued on page 57

Open and growing

Growth in the Unix DBMS market is averaging 21% per year



Source: International Data Corp.

DB2 tool aids remote databases

BY THOMAS HOFFMAN
CW STAFF

HOUSTON — Database users know that installing IBM DB2 on all machines that need to access DB2 data can get pretty expensive, with DB2 licenses costing more than $3,000 per month. However, DB2 users may find solace in a new software tool aimed at allowing DB2 applications to exist where DB2 machines do not.

The new product, Shadow for DB2, which was introduced last month by Neon Systems, Inc., eases remote use of DB2 databases while reducing the need to replicate data. Peter Schaeffer, director of technology at Neon, said Shadow for DB2 replicates data running on DB2 machines operating under IBM's MVS/XA or later releases of MVS.

Schaeffer said IBM has a system called Distributed Data Facility (DDF) that allows DB2 systems to communicate with one another. However, DDF requires users to conduct a number of administrative actions to request information from remote locations, according to Schaeffer.

Zero effort

For example, with DDF, DB2 users must change programs in order to access remote data. No such requirements apply to Shadow for DB2, which has pleased at least one early user.

"The administrative effort of Shadow for DB2 vs. DDF is zippo," said Robert Iappini, a senior consulting engineer at Texaco, Inc., which has been testing Shadow for DB2 for six weeks for its Time-Sharing Option applications.

Texaco is testing Shadow for DB2 at two data centers in Tulsa, Okla., and Iappini said he is pleased with the results thus far. He cited resource savings and reduced overhead because Texaco no longer needs to replicate data for each of its DB2 machines. Iappini said his company will eventually install the software tool in Texaco's Bellaire, Texas, data center so all three data centers can be linked.

Schaeffer said his company is developing a mechanism for Sybase, Inc.'s SQL Server applications to access DB2, with plans to begin shipping a product within two months. Schaeffer said a similar product, called Shadow for IMS, would comprise personal computer or workstation-to-mainframe connectivity. He said Shadow for IMS will start shipping by September.

Shadow for DB2 is priced from $9,950 to $55,000, depending on the user's hardware platform, with multiple copy discounts available.

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DEC moves cause rumbles in third-party storage market

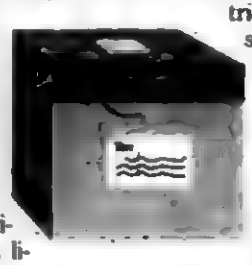
BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp.'s aggressive stance in the third-party DEC storage market is causing some concern among users at VAX sites about whether they will continue to have access to a range of competitive options.

Meanwhile, the recent sale of Costa Mesa, Calif.-based Emulex Corp.'s DEC storage line of products to System Industries, Inc. led users to question whether Emulex's shift in focus may become a wider trend.

DEC's lawsuits over its Standard Disk Interconnect (SDI) and Standard Tape Interconnect (STI) patents, together with a shrinking market, combined to influence Emulex's decision [CW, June 29].

"DEC is making it difficult for companies to survive. Look at Emulex," said Kent Gardner, director of the computational laboratory at Crump Institute for Biological Imaging at the University of California, Los Angeles. "DEC has a certain right of return on its investment. But the third-party market made DEC what it is because people were able to put their [DEC] systems together inexpensively [via third-party products]. DEC doesn't have a right to force them out of business."



Users singled out DEC's lawsuits as particularly worrisome. They favor a licensing strategy like the one DEC is now offering for the company's Digital Storage System Interconnect (DSSI) technology. Industry analysts and some third-party vendors said that policy is not prohibitive in its pricing structures.

According to some analysts, DEC was to some extent driven into offering this licensing program by pressure from large DEC sites with third-party DSSI products and with whom DEC did not desire to jeopardize business.

A number of third-party vendors, including System Industries and Emulex, signed letters of accord with DEC to phase out sales of their SDI/STI products.

Vendors who continue to have lawsuits pending include MicroTechnologies, Inc. (MTI) in Anaheim, Calif., and Lago Systems, Inc. in Los Gatos, Calif.

"DEC is using the patents for marketing purposes and is trying to restrain trade," said Larry Pyle, president of Lago.

DEC officials said, however, they are merely defending the company's rights. "Patents allow innovators the right to exclude others from making, using or selling the patented device," said John Gunther, DEC's legal counsel for mass storage. "In the case of the SDI and STI technology, we are merely asking for those rights guaranteed us by the U.S. Constitution."

On the other hand, users emphasized the importance of third-party alternatives. "It is a bit of a concern — I would hate to have DEC be my only option," Gardner said. "A smaller company can bring newer technology out sooner and at a lower cost."

Tom Stewart, VAX systems manager at Information Handling Services, an information company in Englewood, Colo., recently purchased a FailSafe redundant arrays of inexpensive disks (RAID) box from MTI.

"Until recently, we always purchased from DEC," Stewart said. "We used VAX striping to get performance, but we really needed to look at some other alternatives. DEC is working on RAID technology, but we needed a product that was ready. Obviously, if you can only buy from one vendor, there also are not many choices on what you are going to pay."

IN BRIEF

Navy gets hardware

■ **Cable & Computer Technology, Inc.**, an Anaheim, Calif.-based contractor, last month became the first of three prime contractors in the U.S. Navy's proof of concept development program, dubbed Next Generation Computer Resources (NGCR), to deliver fully compliant Futurebus+ hardware. Other contractors include **Raytheon Corp.**'s Marlboro, Mass.-based Equipment Division, which seeks to complete acceptance testing of its NGCR systems before the end of the summer, Cable & Computer Technology officials said. The third contractor, **Litton Data Systems, Inc.** in Pascagoula, Miss., is still listed as part of NCGR development, but the status of its work is unclear, Cable & Computer Technology officials said.

■ A Virginia secure systems firm called **HFSI** recently said that its general-purpose "trusted" computer system had received a B3-level rating from the **National Security Agency's National Computer Security Center.** The XTS-200 supports client/server applications and enforces security on open systems, according to the company.

Usage-based pricing gets boost

BY THOMAS HOFFMAN
CW STAFF

UNIONDALE, N.Y. — The issue of tiered pricing vs. usage-based pricing for software is drawing attention with the introduction of a software utility designed to help mainframe software vendors track how often their products are used.

Proginet Corp., a developer of connectivity software for IBM host systems, recently announced Software Meter for use with IBM's MVS/ESA operating environment [CW, June 8].

Many users have said they would welcome a change from the current tiered-pricing model to a usage-based model. Some users expressed concern over paying high licensing fees for software that is used only a few times per year or priced based on the size of the CPU of the machine that runs it.

Endless possibilities

Usage-based pricing "has tremendous merit in certain types of products, especially with products in which the size of the CPU does not correlate with the application which is used," said Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla.

Alamo uses an IBM Enterprise System/9000 Model 900 running under MVS/ESA.

"If the industry were to adopt a means of measuring beneficial use [of software], that would be a help to the users and vendors," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh, a large IBM mainframe shop.

One analyst said Software Meter offers tremendous benefits to users and vendors. "This type of third-party arbitration mechanism is important to both parties. It keeps everybody honest," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy.

Dzubeck said he expects software vendors to eventually offer users two pricing structures for software — usage-based and flat-rate pricing — so users can "mix and match" the two pricing structures to work out the best deal for their shops.

Dzubeck said mainframe vendors have been wrestling with developing a usage-based pricing model for the past two years, "but no one's been able to figure out a way to deploy it until now."

Software Meter furnishes vendors with five pieces of information on customer software use: software product name, customer identification number, duration of each session of software use, frequency of use and platform size and type.

MVS/ESA-based software calls Software Meter through an application programming interface and provides usage measurements determined by the vendor. A counter stores the information in nonvolatile memory. Software Meter also incorporates security features that alert the vendor if the meter has been compromised in any way.

Software Meter will be sold to software vendors on an OEM basis beginning this month. Implementation of Software Meter requires customers to have a Network Package Switching Interface and access to a public data network.

Proginet Vice President Joseph Mohen recently said his company was engaged in discussions with at least two mainframe software vendors who would sell Software Meter as OEMs.

Computer Associates International, Inc. said it had limited communications with Proginet that eventually broke off. Sanjay Kumar, senior vice president of planning at CA, said his firm is not interested in buying Software Meter because CA engineers have been working on developing similar products. Kumar would not elaborate on CA's development activities.

Midlevel DASD line debuts for AS/400

BY KIM S. NASH
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc. recently extended its product line further down the Application System/400 ladder with a DASD offering for IBM's midlevel midrange machines.

The $60 million company complemented its high-end 9606 direct-access storage devices (DASD) with the 7100 series, a line for IBM's AS/400 model 9404 minicomputer family.

Relatively few vendors other than IBM offer DASD for these machines.

Rx for savings

Lower price enticed drug store giant Walgreen Co. to buy 80 400M-byte DASD subsystems from IPL Systems, according to Don Churchill, chief information officer at the Deerfield, Ill.-based chain.

Walgreen is in the process of upgrading memory on its entire AS/400 installation, which is estimated to be more than 1,500 boxes.

Because he has found that the DASD systems for 9404 machines available from third parties are similar to those offered by IBM, "we've been buying them from whoever has the best price," Churchill said. The list includes another independent vendor that Churchill declined to identify, as well as IBM.

The 7100 line, which is available immediately, can be configured as single- or dual-disk drive modules for 9404 B, C, D and E processors, with prices ranging from $4.85 to $6.88 per megabyte of storage. The single drives are available as 320M-byte, 400M-byte or 988M-byte drives, and the dual models come in 640M-byte, 800M-byte or 1,976M-byte sizes.

New markets eyed

IPL already sells DASD products for IBM's top-end 9406 and low-end 9402 AS/400 models. But with the new 9404 line, the vendor plans to target the retail and insurance industries specifically.

These users often have AS/400-based point-of-sale setups for which extra DASD would be useful, said David DeMartinis, IPL's product manager.

The latest E series AS/400 processor, introduced in February, sports improved performance and capacity over previous models, which may help grow the market for additional disk storage, DeMartinis added.

Open or closed? You decide

CONTINUED FROM PAGE 53

analysts noted. Oracle, Sybase, Inc., The Ask Cos.' Ingres Products Division and Informix Software, Inc. have rollout schedules that ship versions for hardware platforms in waves. Some platforms get the latest RDBMS months before others, causing frustration in mixed-hardware shops.

When users of independent RDBMS packages do choose open platforms over proprietary systems, cost savings from cheaper hardware is often cited as the rationale. At BP Exploration (Alaska), Inc., an investment of $1.5 million in Unix workstations is expected to save $2.5 million in annual operating costs. BP Alaska is using IBM's RISC System/6000s as Sybase database servers and Apple Computer, Inc. Macintoshes as clients.

IS managers in the open systems world are seeing greater opportunities to buy packaged applications software and write new applications using fourth-generation languages.

Red Devil, Inc. in Union, N.J., is nearly finished replacing its IBM mainframe's homegrown manufacturing and financial systems with packaged Unix applications from IIS Corp. The packages will run on top of an Oracle RDBMS. AT&T Series 7000 Unix machines will be the servers, and personal computers running Lotus Development Corp.'s 1-2-3 will be the clients.

John Coff, Red Devil's director of MIS, said the removal of the firm's IBM 4361 will save thousands of maintenance dollars — and cut the operations staff from 14 to one.

Give both a try

A brand-new venture gets the chance to hand-pick the elements of its IS infrastructure. Encompass, a global joint venture between AMR Corp., the parent of American Airlines, rail company CSX Corp. and PTT Telecom in the Netherlands chose to link open and closed database systems through client/server applications.

The host systems are DEC VAXs, which connect with Intel Corp.-based PCs running OS/2 and IBM's RS/6000 Unix workstations. "We have adopted a message-bus technology that allows our applications to be independent of the database and independent of the network," said Rick Poff, vice president of development and operations at the Cary, N.C., venture.

The VAXs run Sybase's SQL Server database software, as will the RS/6000s; the IBM OS/2 computers run IBM's Database Manager for OS/2. Encompass elected not to run DEC's less-expensive Rdb because of the need to deploy database applications on three types of hardware. "Sybase goes across many platforms," Poff said. "Rdb does not."

Applications development is carried out by 120 programmers using the Uniface Corp. fourth-generation language and Objective C. "One developer in our environment is doing what four to five can do elsewhere," Poff said.

Encompass' systems, based on AMR's Sabre system technology, book reservations for freight shipments and track those shipments along the way. "It's a logistics system that allows trading partners to plan, to execute and to analyse their shipment pipeline," Poff explained.

Among Encompass' customers are Fortune 500 companies, and each of them gets a small Encompass database server in its headquarters.

HP updates MPE/IX operating system

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week introduced an upgraded version of its proprietary minicomputer operating system, serving notice that, at least for now, it is not putting all of its large systems eggs into a Unix basket.

Many of the enhancements that HP is building into MPE/IX Version 4.0 are aimed at making both the operating system and the HP 3000 series on which it runs less susceptible to system crashes and data corruption and therefore more palatable to data center users.

HP also added support for the Unix networking interface Berkeley Sockets Version 4.3, continuing a company trend of facilitating MPE/IX coexistence with Unix environments. That trend included the addition of Posix compliance last fall and includes planned support for the Distributed Computing Environment, the Distributed Management Environment and X/Open Consortium Ltd.'s XTP transaction processing standard.

But HP focused attention last week on the reliability upgrades and denied speculation that the company has any near-term plans to run a Unix kernel on the 3000, a move that would veritably meld the 3000 line with the Unix-based HP 9000 series.

Richard Sevcik, general manager of HP's Commercial Systems Division, said MPE/IX remains better suited for mission-critical applications than does HP/UX, the Unix implementation for the HP 9000. While HP is striving to make MPE/IX more interoperable with Unix and other operating systems, it intends to continue to base it in the near term on the proprietary MPE kernel, he said.

> "THE UTOPIA would be to have one operating system kernel support all environments."
>
> RICHARD SEVCIK
> HEWLETT-PACKARD

But the firm is "looking into various kernel scenarios," Sevcik said. "The utopia would be to have one operating system kernel support all environments. In the long term, that's our dream. In the short term, that's not going to happen."

HP said it plans to start shipping MPE/IX Version 4.0 by the end of this month. The company said reliability and data integrity enhancements include the following:

- Try/Recover routines that improve the 3000's ability to work around an application failure without shutting down.
- Aggregate parallel recovery, which speeds up operating system reboot in the event of a failure from a typical time of one or two hours on earlier versions of the system to about 20 minutes.
- Redundant arrays of inexpensive disks storage.

Connectivity enhancements include support for Token Ring. HP also added PU2.1 capabilities to the MPE/IX's LU6.2 application programming interface feature, which the company said gives the 3000 peer-to-peer communications with Application System/400s and other IBM systems.

HP said other improvements include increases in maximum terminal support from 850 to 2,300, in concurrent processes from 3,119 to 5,460, in maximum file size from 2G to 4G bytes and in disk capacity from 85G to 690G bytes.

NEW PRODUCTS

System software

Integrated Solutions, Inc. has announced Graphical Systems Manager 3.0 for the Digital Equipment Corp. VAX/VMS and Unix markets.

The product is a graphical user interface system for enhancing DEC Command Language and Unix Shell commands and managing systems in a distributed or client/server environment. Major changes in this release include an enhanced display server, expanded functionality for open systems and an increased number of display windows and templates for system management functions.

Prices range from $750 to $19,000.

Integrated Solutions
1020 Eighth Ave.
King of Prussia, Pa. 19406
(215) 337-2282

Ergodic Systems has released MDS32, a menu design system for the Digital Equipment Corp. VAX/VMS.

MDS32 allows users to develop personal computer-quality menu interfaces to VMS-based applications. New capabilities include the ExpressMenu, a design tool that lets users interactively design and edit an MDS32 application on any ANSI term. ExpressMenu uses function keys, drag-and-drop positioning, pop-up dialog boxes and tool bars.

Another new feature is the condition test, which provides a way to implement security within an MDS32 application. A directory navigator and new user-based licensing options have also been included.

Single-user personal-use licenses for MDS32 cost $315.

Ergodic Systems
23666-A Birtcher Drive
El Toro, Calif. 92630
(714) 380-9719

Database management

Micro Decisionware, Inc. has announced Database Gateway for DB2 Release 2.0 and DB2-CICS Access Server Release 1.4.

The components were designed to help users who are integrating DB2 and other mainframe sources in client/server applications. Enhancements to the Database Gateway for DB2 and DB2-CICS include Data Compression, Multiple Host Transaction identifications and Temporary Storage Management, which bypasses CICS temporary storage, providing a way for results to return directly to the client.

The Database Gateway for DB2 costs $4,995. Pricing for the DB2-CICS Access Server ranges from $48,000 to $125,000.

Micro Decisionware
2995 Wilderness Place
Boulder, Colo. 80301
(303) 443-2706

Allen Systems Group, Inc. has announced Sedit.DB, an integrated workbench product for the DB2 environment.

Sedit.DB assists users in performing daily development, testing and DB2 management processes. It works in a Dialog Manager application with an ISPF-compatible editor.

Sedit.DB's features include formatted editing for data entry, a screen design facility that modifies the display and a catalog query facility. Fill-in-the-blanks DB2 object maintenance and DB2 security administration are also included.

The product includes formatted editing for data entry and a screen design facility for modifying the display.

Prices for Sedit.DB range from $18,700 to $27,500.

Allen Systems Group
750 11th St. South
Naples, Fla. 33940
(813) 263-6700

Software application packages

Silico-Magnetic Intelligence Corp. has announced two products: the Better-C Version 3.0 program generator for C/C++ and the Top-Down Designer Version 2.0 computer-aided software engineering design tool for C/C++. Enhancements include C++ code generation for Better-C, and Top-Down Designer has been augmented to support object-oriented design specific to C++. The Better-C Version 3.0 package consists of a tutorial, library source, program generator and files. Top-Down Designer Version 3.0 consists of interactive designer software and a tutorial.

Better-C Version 3.0 costs $195, and Top-Down Designer Version 3.0 costs $399.

Silico-Magnetic Intelligence
24 Jean Lane
Chestnut Ridge, N.Y. 10952
(914) 426-2610

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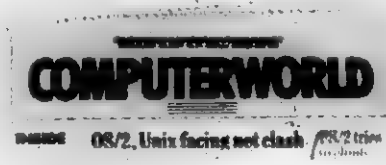

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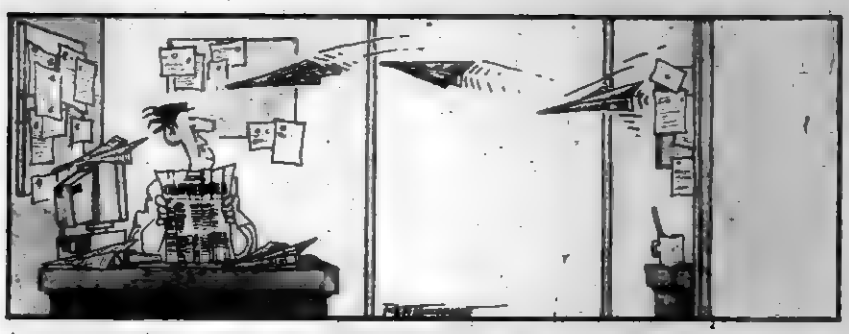

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23. Dir./Mgr. Sys. Development, Sys. Architecture
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60. Sys. Integrators/VARs/Consulting Mgt.

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BUYERS' SCORECARD

FileNet surges ahead in imaging satisfaction

BY DEREK SLATER
CW STAFF

FileNet Corp.'s WorkFlo leapfrogged over Wang Laboratories, Inc.'s Wang Integrated Imaging System (WIIS) to top the Buyers' Scorecard survey on integrated image processing software.

Wang's WIIS won a similar survey last December by a comfortable margin. This year, however, WorkFlo topped most areas of the survey and finished with an overall score of 79, followed by Wang's WIIS at 76 and IBM's ImagePlus at 72. The 79 score represents a two-point climb for WorkFlo over last year's survey, when the FileNet product finished at 77. The overall WIIS score reflects an eight-point drop from last year. IBM's score was three points lower than last year.

Buyers' Scorecard reflects users' satisfaction with their installed technologies. Users assigned ratings on a scale of 1 to 10 in 17 specific categories. The users also rated the importance of each category. (See the methodology on the next page for a description of the scoring process.)

WorkFlo's biggest area of improvement over last year came in capacity to handle work load, rising from a 7.8 rating to an 8.5 rating this year. This change is in large part because of two capacity upgrades of FileNet's Unix Image Server. The latest version, released in May, has twice the capacity of the previous line.

Other jumps for WorkFlo were in compatibility with installed systems (rising from 7.5 last year to 8.1) and overall speed of processing (rising from 7.4 to 7.9).

WorkFlo earned consistently high ratings in the areas users noted as most important. WorkFlo's lowest scores came in optical character recognition (OCR) and forms processing, an area in which none of the products fared particularly well, and in compatibility with other vendors' equipment.

Slightly more than 50% of the FileNet respondents run their imaging applications on Unix servers with Unix-based or personal computer clients. FileNet recently announced enhancements to its desktop software products, and 18% of the FileNet users reported that they intend to run their imaging applications entirely on PC networks within a year.

Wang's scores fell most significantly in satisfaction with the responsiveness of vendor service (from 9.0 last year to 7.9) and quality of technical support (from 8.6 last year to 7.9), although several users expressed their satisfaction with Wang's support in verbatim responses.

Despite some dissatisfaction with the proprietary nature of the company's VS hardware, Wang's respondents by and large said they do not intend to defect during the coming year. Only 13% of the Wang users surveyed indicated that they will move their imaging applications away from the VS to other systems. Similar percentages of WorkFlo and ImagePlus users said they plan to switch hardware platforms.

Meanwhile, Wang continues to expand its support for new systems under the company's Open/image strategy. Recently the Lowell, Mass.-based company announced support for IBM's RISC System/6000 platform, which analysts foresee as a critical imaging platform in coming years [CW, June 22]. Wang's implementation will let users operate a central VS system to run imaging applications while RS/6000 units function as image servers. The RS/6000s will be relabeled as Wang RISC Series Servers.

ImagePlus' 72 score is three points lower than last year's result. However, in the most important categories, buyers rated the product about the same as last year, and ImagePlus jumped notably in the area of ease of use (7.4, compared to 6.8 last year). Declines came in OCR and forms processing (4.7, down from 5.4), text-retreival features (6.4, down from 6.9) and overall cost of purchase and implementation (5.9, down from 6.2).

IBM's software runs on several platforms, but a great majority (76%) of the ImagePlus respondents reported using a mainframe or Application System/400.

Overall, 83% of the users said their imaging systems delivered the increase in productivity that they expected when they purchased them. IBM, Wang and FileNet are the pioneers of image processing, with more than 500 installations each. ●

Integrated imaging software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: FileNet, 37; Wang, 32; IBM, 43

Total possible score 100 Mean score 76

Product	Highest ratings	Lowest ratings
FileNet's WorkFlo SCORE 79	Work-flow management Responsiveness of vendor service Image-capture ability	OCR and forms processing features Compatibility with other vendors' equipment Cost of purchase and implementation
Wang's WIIS SCORE 76	Reliability Capacity to handle work load Ease of use	Compatibility with other vendors' equipment OCR and forms processing features Overall cost of purchase and implementation
IBM's ImagePlus SCORE 72	Capacity to handle work load Responsiveness of vendor service Reliability	OCR and forms processing Overall cost of purchase and implementation Text-retrieval features

RATINGS IN ORDER OF IMPORTANCE

FileNet's WorkFlo sweeps the first six areas with consistent ratings. Users rate reliability and capacity to handle work load as key issues in imaging applications.

(Additional ratings on next page)

User importance rating:

9.3 Reliability

9.0 Capacity to handle work load

8.8 Responsiveness of vendor service

8.8 Image capture capability

8.7 Quality of technical support

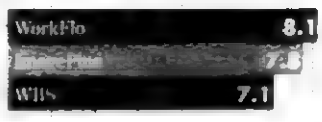
8.7 Ease of use

RATINGS IN ORDER OF IMPORTANCE

(Integrated imaging software, continued from previous page)

WorkFlo maintains high ratings, placing first or second in all remaining categories.

8.5 Compatibility with installed systems

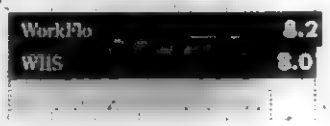


8.4 Overall speed of processing

8.3 Work-flow management features

8.0 Overall cost of purchase and implementation

7.9 Application development tools



7.9 Depth and accessibility of documentation

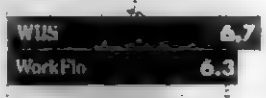
7.7 Amount of customization required

7.5 Ease of installation

7.2 Compatibility with other vendors' equipment

6.3 Text-retrieval features

6.2 OCR and forms processing features



Verbatim

What do you like best/least about this product?
(Based on the most frequently stated answer. Quotes are selected from users' responses.)

[redacted]

Likes

Work-flow controls
"We can develop applications that also measure and manage business activities."

Dislikes

Not flexible
"It lacks flexibility in reporting what it has indexed."

[redacted]

Likes

Ease of use
"It's menu-driven and easy to use."

Dislikes

Not flexible
"We'd prefer a generic application instead of having them come in and customize it for us, which is more expensive."

[redacted]

Likes

Integrates well with existing systems
"We like the way it integrates into all of our systems."

Dislikes

Not flexible
"The front-end work-flow manager is not flexible enough."

Loyalties

Would you buy the product again?
(Reasons based on most frequently stated responses)

[redacted]

Responses: 37

37 — **Likely**
The reason: Good support

Number of respondents

[redacted]

Responses: 31

27 — **Likely**
The reason: Meets our needs

4 — **Unlikely**
The reason: Product is not going to remain strong in the market

Number of respondents

[redacted]

Responses: 42

37 — **Likely**
The reason: Meets our needs

5 — **Unlikely**
The reason: Poor overall design

Number of respondents

Vital statistics

Total number of respondents: 112

What is your position?

IS director	16
IS manager	22
Project manager	35
Technical support	7
End user	9
Other	23

What is your responsibility for imaging systems?

Evaluate or recommend vendors	97
Determine need	87
Set standards for your company	85
Select vendors	82
Establish purchase agreements	59

How many years have you been involved with imaging sysems?

Less than 1 year	8
1 - 2 years	35
3 - 4 years	43
5 or more years	24
Don't know	2

In what industry does your company do the majority of its business?

Government agencies	34
Insurance	23
Financial services	13
Manufacturing	7
Banking	6
Transportation	5
Other	31

METHODOLOGY

Products included in this Buyers' Scorecard are the Top 3 market-share leaders among integrated image processing systems.

User names were provided by nonvendor sources. First Market Research in Austin, Texas, conducted the survey and tabulated the results. The response base was 37 users for FileNet, 32 for Wang and 43 for IBM.

To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100. The ratio of the average weighted score to the average user importance rating is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

RESPONDENT PROFILE

Respondents reported using the following hardware platforms: Wang or other minicomputer, 27; IBM AS/400, 24; Unix server, 19; mainframe, 11; PC network, 6; other, 25.

More than half of the respondents said they view increased productivity as the most important benefit obtained from their image processing software. Improved speed and improved customer service, as well as increased storage space, were also cited as benefits.

Primary applications addressed by these imaging products include insurance, accounting, storage and retrieval, customer service and inventory/order entry.

Respondents said they would like to see the following features added to their products:

- More open systems.
- More functionality.
- Better voice or image annotation support.
- Better documentation.
- Better integration capabilities.
- Higher speed.
- Enhanced scanners.
- More color capabilities.
- Integrated work flow.
- More connectivity.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: Bruce Silver, BIS Strategic Decisions; CW Database Division.

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DATAMATION—SEPTEMBER 1, 1991

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Eiffel to add speed, application builder

BY MELINDA-CAROL BALLOU
CW STAFF

GOLETA, Calif. — Interactive Software Engineering, Inc. (ISE) is scheduled to announce and begin shipping a new release of the company's Eiffel object-oriented software development environment next week. According to company officials, the release significantly shortens compilation times and offers an application builder.

The components of Eiffel 3.0 include EiffelBench, the programming environment that offers an incremental compiler/interpreter; EiffelBuild, an application builder; EiffelVision, a class library for development of graphical applications and user interfaces; EiffelBase, with basic class libraries; EiffelStore, a class library for database interfacing; EiffelCase analysis/design tools; and ArchiText structured document constructor.

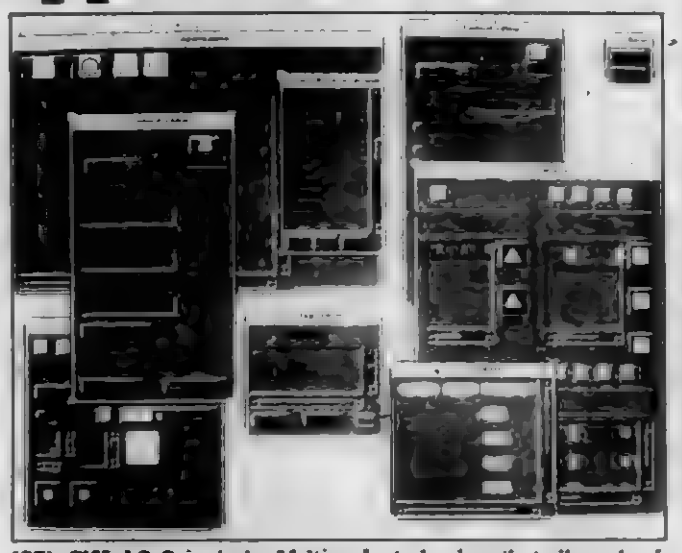
New with Version 3.0 is ISE's Melting Ice technology, which allows developers to execute applications as they are being built rather than having to wait for them to be compiled.

"One of the complaints about Version 2.3 was that it was a compiled environment, and people had to wait for applications to compile before they could test their [new code]," said Philippe Stephan, chief engineer at ISE.

"Now you start with the compiled system — the frozen system — and then during the day, as you make changes, what you change is interpreted. Eiffel also checks a program before executing it," Stephan said.

GUI builder

The new EiffelBuild interactive application generator is a program that lets users design graphical user interfaces and then link them with Eiffel code. The links between the user interface objects and the code "are accomplished via a drag-and-drop mechanism, which lets you link any graphical object to any Eiffel code," Stephan said. The product supports both the Open Software Foundation's Motif and Sun Microsystems, Inc.'s Open Look X Window interface.



ISE's Eiffel 3.0 *includes Melting Ice technology that allows developers to execute applications as they are being built*

Also new with this version are libraries that have been added around reusable components: the EiffelVision library and EiffelStore, which lets users interface with databases, including those from Oracle Corp., Informix Corp. and Versant Object Technology.

Users said they were enthusiastic about the new version of Eiffel.

"The length of compile and link time has always been a problem, not just with Eiffel but with other object-oriented languages as well, such as C++," said Dave Butler, a consultant at Sandia National Laboratory in Albuquerque, N.M. "If 3.0 performs as advertised with the Melting Ice technology, it will be an extremely desirable development environment indeed, and we are eagerly awaiting it."

The new version is slated to ship next week for Unix, VMS and AIX. EiffelBench and EiffelBuild are both priced at $995; EiffelBase and ArchiText are $495 each; EiffelVision is $1,495; EiffelStore and EiffelCase are $1,995 each.

CA's strategy to merge Xbase line begins to gel

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Computer Associates International, Inc.'s plans are coming together for the merging of its Xbase product line with the products of the recently acquired Nantucket Corp.

CA's two-pronged strategy will eventually bring the two product families together under a long-range project initiated by Nantucket.

CA Chairman and Chief Executive Officer Charles B. Wang said the company will offer its Xbase users two paths to reach its ultimate Xbase environment: the object-oriented programming path of CA-Clipper and the graphical user interface path of CA-dBFast with Microsoft Corp. Windows support. Both paths will eventually lead to CA's next-generation Xbase platform, Aspen.

"We see two paths to the Xbase world: object-oriented programming and graphical user interface," Wang said. He added that both paths provide users with immediate benefits while protecting and leveraging users' investments in application development with the eventual migration to Aspen.

Wang added that all of CA's Xbase products, which now run under Windows, will eventually be ported over to IBM's OS/2 2.0, Unix System Laboratories, Inc.'s Unix and the Open Software Foundation's Motif operating systems as well.

Aspen, which was being developed by Nantucket prior to the acquisition, will be equipped with an object-oriented language, a native code compiler, an integrated development environment and the dBFstyle used by Borland International, Inc.'s dBase product line and client/server databases. Aspen will be available under Windows first, followed by versions for OS/2 and other platforms. Compatibility kits for applications in other Xbase environments, including dBase III and IV and Fox Software, Inc.'s FoxPro, will also be available.

Development path

Wang said Aspen will be demonstrated at Comdex/Fall '92 in November and is scheduled to be available for beta testing in the fourth quarter. Wang said CA intends to deliver Aspen to its customers in the first quarter of 1993.

That's good news to independent software vendors and users who have been waiting anxiously for Aspen to hit the scene. Many users breathed a sigh of relief in May when CA announced its intention to acquire Nantucket.

Although users interviewed said they were satisfied with Nantucket's Clipper environment, they said they felt uncertain about the firm's financial status and its ability to meet development and shipping deadlines.

"The state of Nantucket's finances made it difficult for them to continue to develop and upgrade Clipper," said Al Acker, a senior software analyst at Cybernetics, Inc., a Grand Junction, Colo.-based Clipper application software developer.

Initially, a small percentage of Clipper users reacted unfavorably to CA's acquisition of Nantucket, Acker said, because these users had developed relationships with Clipper engineers. Wang said CA has retained almost all of Nantucket's Clipper developers. In fact, Nantucket President Larry Heimendinger is staying on with CA as director of Xbase strategies.

Acker said most Clipper users look favorably on the acquisition. He said he is impressed with CA's strategic direction with Clipper and Aspen because the $1.4 billion Islandia, N.Y.-based software giant has the financial resources to expand the Xbase product set beyond Nantucket's capabilities. If CA "follows through on their statement of direction, I view it as good news," Acker said.

According to Wang, CA-dBFast, which is currently available in Version 1.7C, will be upgraded to Version 2.0 by November for release at DevCon, a Nantucket independent software developers' conference for Clipper in Boston.

Enhancements for CA-dBFast 2.0, now in beta testing, will include an active dictionary/repository, a visual application designer, a visual report designer and improved performance of the database engine.

Cadre backs UnixWare, agrees to port Teamwork

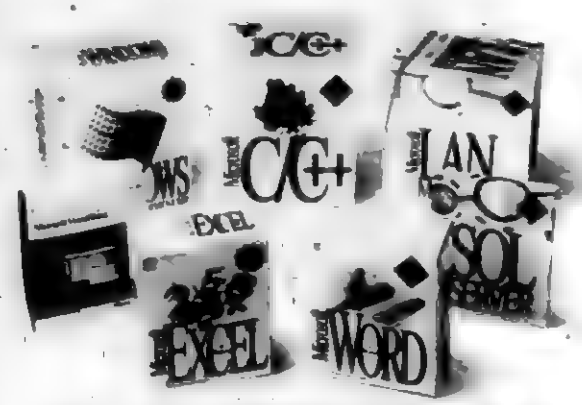
■ **Cadre Technologies, Inc.** endorsed **Univel**'s UnixWare, an operating system for Intel Corp.-based desktops and servers co-developed by **Unix System Laboratories, Inc.** and **Novell, Inc.** Providence, R.I.-based Cadre will begin to port Teamwork, a family of application development tools, to UnixWare when it receives an early copy of the system, which is expected this year. Meanwhile, Westboro, Mass.-based **Hyperdesk Corp.** announced that its Hyperdesk Distributed Object Management System will support UnixWare.

■ **Visible Systems Corp.** added forward and reverse engineering features to Visible Analyst Workbench, a suite of computer-aided software engineering (CASE) tools. The Waltham, Mass.-based company, which specializes in CASE tools for **IBM**'s Application System/400 line, said the product lets users build data models for planning and generating applications in C language, Cobol and IBM's Cross System Product External Code Format.

■ Progressive Application Renovation, a graphical user interface builder from Burlingame, Calif.-based **Mosart Systems Corp.**, is now available from three consulting firms: Marathon Systems, Segue Partners and Information Integration Consulting.

■ **Lufthansa German Airlines** has licensed Canadian Plus, a frequent-flier system from Canadian Airlines. The system is based on a template developed with **Texas Instruments, Inc.**'s Information Engineering Facility CASE workbench.

Everybody talks a in corporate America. some of th



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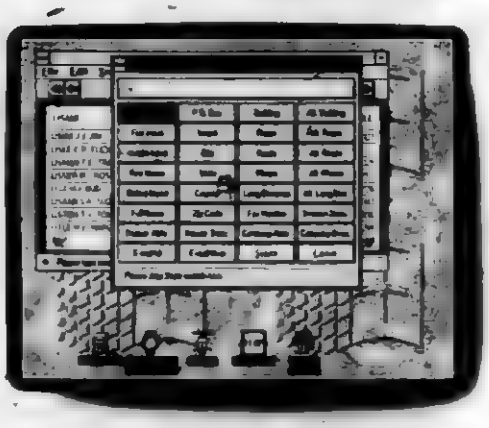
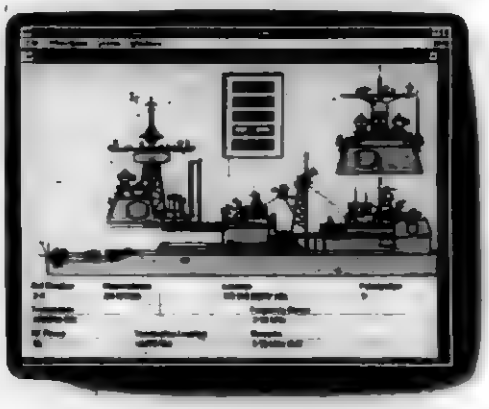


CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

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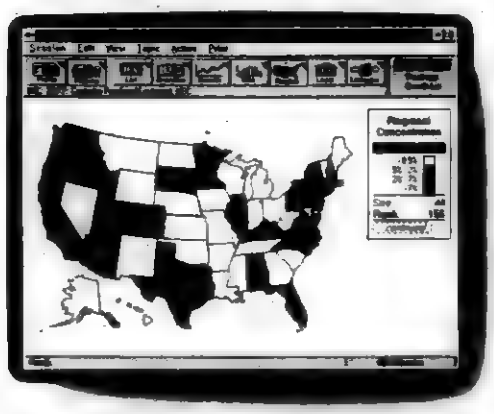
bout the problems We'd like to talk about e solutions.

Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.

Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.

Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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Information Builders targets Windows

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Information Builders, Inc. (IBI) recently introduced performance boosts for its application development environment with the debut of Level5 Object Release 2.5 for Microsoft Corp.'s Windows 3.0 and 3.1.

The software is an object-oriented, knowledge-based application development tool that IBI upgraded from its earlier Release 2.2. IBI has added new data interfaces and performance improvements to the upgrade.

"The new version is a lot better than Release 2.2 because you can move your screens onto the mainframe," said Jerry Kessler, project leader of the application consulting team at Navistar International Corp., an Oak Brook Terrace, Ill.-based manufacturer of truck and diesel engines. Kessler was referring to Release 2.5's ability to access remote mainframe data in addition to its direct data access capabilities with personal computer databases.

Kessler beta-tested Release 2.5 for three months before purchasing the product last month to upgrade Navistar's copy of Release 2.2. He noted other improvements over Release 2.2, including better performance, better object structure and improved compiler messages. Kessler said Navistar is considering using Release 2.5 to convert its Level5 Object Release 1.3 users who require IBM mainframe data access.

According to Sean McCarthy, a marketing manager at IBI, the Windows development tool also enables users to achieve distributed data access with IBI's Enterprise Data Access/SQL 2.0, a client/server software package and a part of IBM's Information Warehouse. Release 2.5 also supports full implementation of SQL and offers a Dynamic Data Exchange interface, which is one of several interfaces included with the new package.

McCarthy said the added features were implemented as a result of user requests. "In Windows, everything is changing so rapidly that vendors are trying to compete with new features all the time," McCarthy said. He added that IBI is currently beta-testing an MVS version, which is slated to ship next month.

In addition to its ability to run in Windows 3.0 and 3.1 environments, McCarthy said Release 2.5 also works in Windows running under IBM's OS/2 2.0 operating system.

Level5 Object Release 2.5 is available now, and it is priced at $995 for the development system.

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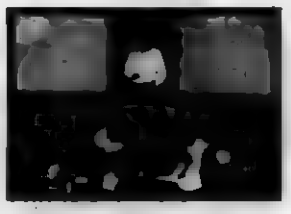

KEYNOTE
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Father of the Personal Computer
"Turning Visions Into Reality"

Plenary Session
"GUIs... And Then What?"
Ed Bott, Editor-in-Chief, *PC/Computing*

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Cadre releases DB Designer 3.1

An updated database re-engineering tool from Providence, R.I.-based Cadre Technologies, Inc. can reportedly convert flat-file databases to a relational model.

According to company officials, the new version of DB Designer can derive business rules and entity relationships from flat-file databases — such as IBM's VSAM and IMS and Computer Associates International, Inc.'s CA-IDMS — and prepare them for use with relational products such as IBM's DB2, Informix Software, Inc.'s Informix, Oracle Corp.'s Oracle and Sybase, Inc.'s SQL Server.

Previously available only for IBM's OS/2, DB Designer Release 3.1 now supports the Sun Microsystems, Inc. SPARCstation line of workstations. Prices for the new version of the tool, which is shipping now, begin at $20,000.

NEW PRODUCT

Application development tools

Dragonfire Software Systems has released Version 1.0 of the PC/Cobol Toolkit, a set of library routines.

The product was designed for users with PC/Cobol compilers based on the Micro Focus Cobol/2 Compiler. Callable routines that verify disk and printer status, perform screen I/O, retrieve directory listings and free disk space and available memory are features included in this release. The PC/Cobol Toolkit costs $50 without the source code, $100 with it.

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The joy of X . . . terminals

The X environment — once mysterious to commercial sites — turns out to be user-friendly as it starts to serve some very everyday needs

BY STEPHEN AUDITORE

Maybe it's the letter "X." Maybe it's their roots in an MIT research project called "Athena." Whatever the reason, for a lot of commercial users, X terminals are shrouded by some mystery.

In reality, there's nothing overly exotic about the work being done by these intelligent, diskless devices. In fact, they're helping users perform some pretty down-home tasks in areas such as computer-aided software engineering, computer-aided design, database query, on-line transaction processing and groupware. They're also shipping in larger numbers than ever before, with nearly 120,000 X terminals sold in 1991, up from 12,000 units shipped in 1989.

On the other hand, an X terminal is not your basic terminal. It was designed explicitly to run the X Window System, a hardware- and network-independent windowing and graphics protocol — now a de facto industry standard — that allows users to view all systems computing elements on a single screen as if they were one large computer.

X terminals running X allow users to simultaneously view many different applications residing on heterogeneous computers across the network also running the X Window System. The X terminal itself does not process the applications; it performs all the tasks necessary to display them in a graphical way on its high-resolution screen.

Backward world

In some ways, entering the X world can be like walking through the looking glass. For one thing, the concept of client and server are reversed. An X terminal — a desktop device — comes bundled with its own proprietary version of what is called X "server" software. The software sends and receives X protocol commands to the machines on the network, called "hosts," that run the applications — known as the "clients." This is because, technically speaking, the networkwide clients are sharing the "server" resource of a high-bit-mapped display.

You don't need an X terminal to deliver X-based applications to the desktop. You could use a workstation or a personal computer running X server software (see story page 69). But generally, workstations are more expensive than X terminals to purchase, maintain and support, while PCs are better used by people who use X sporadically.

X terminals have become an attractive option because they offer the following:

- Can be administered like a simple terminal.
- Offer a lower cost seat.
- Are easier to administer and support.
- Do not need to be upgraded whenever a new generation of workstation becomes available.

All this probably sounds great, but there are some drawbacks — real and perceived — to using X. For one, there is a lack of X-based commercial applications. However, most X applications will likely be mission-critical, proprietary applications, such as billing, planning, customer service and documentation systems. The key applications driving the acceptance of X in the commercial sector will not be third-party, shrink-wrapped applications but database management systems and fourth-generation languages that support X. **Oracle Corp.** and The Ask Cos.' **Ingres Products Division** already offer products that support X-based database application development.

Some people also bemoan the impact of X terminals on the network and the hosts they rely on for processing. However, it's the application that determines the traffic level, not the total number of X terminals on the network. The more windows, or applications, that are opened simultaneously, the more resources are required. Other factors that affect network traffic include the type of window activity and the amount of information sent to a window.

One way that X terminal vendors are working to minimize network traffic is to use local window managers; that is, the processing required to manage the terminal's windows is performed on the terminal rather than somewhere across the network. If the window manager runs on the host, high levels of window activity can increase network traffic.

Keep in mind, however, that the very nature of X — highly user-interactive — creates a sporadic-burst pattern, which should minimize its impact on the network loading.

Selecting an X terminal

Unlike traditional terminals, an X terminal is not a display product. The size, resolution and type of display is certainly important; most nontechnical customers settle on midsize color displays (16 to 17 in.), with 1,024 by 768 or 1,280 by 1,024 pixels, supporting eight-bit planes of color.

But an X terminal is actually a

Continued on page 68

Auditore is president of the X Business Group, Inc., a market research and consulting firm in Fremont, Calif.

INSIDE

Best of Both Worlds
You can have your PCs and X Window System, too. Page 69.

Three Tales of X
From vendor support to wiring to configuration travails. Page 76.

Product Guide
A comprehensive listing of color X terminal models. Page 75.

X marks the vendor

BY JIM ROYNAN

The following market leaders offer a range of X terminals, from lower price monochrome to color models. Each is committed to open systems products, offering workstations and other open systems hardware and peripherals in addition to X terminals.

• Network Computing Devices, Inc.

Overview: Currently dominates the X terminal market, outselling its nearest competitor by a 2-to-1 margin. First to incorporate a reduced instruction set computing (RISC) chip. Sells directly to users; particularly strong in Sun Microsystems environments. Tends to concentrate on the middle — rather than the high — end of the market. Prices range from $1,495 to $5,395.

Weaknesses: Prices are higher than comparable X terminals from competitors. Serial port support limited to ANSI.

• Tektronix, Inc.

Overview: Has established technical dominance in the X terminal market. Historically the first to announce many new technologies, such as a 19-in. X terminal. Recently added a machine with PEX, which allows the X terminal to use client/server implementations of the standards body-approved graphics language PHIGS, or Programmers' Hierarchical Interactive Graphics. Markets its products primarily at the high end. Offers eight X terminals, ranging in price from $2,495 to $6,995.

Weaknesses: Design incorporates a separate processor unit that is cumbersome and requires the attachment of several cables for it to function. Processor unit must sit either alongside the display or on the floor. On/off and power indicators are not conveniently located nor easily visible.

• Visual

Overview: First to bring an X terminal to market and only one here that concentrates almost exclusively on X terminals. Entire TX product line features software-selectable resolutions and timing to ensure compatibility. More than 10 X terminals in its product line, ranging in price from $995 to $6,065.

Weaknesses: The company's sales consist almost exclusively of monochrome units, which have an interlaced display, known for being tiring to the eye over extended periods of use.

• Human Designed Systems.

Overview: Awarded what is believed to be the single largest order of X terminals ever, from the U.S. Army Reserve Component Automation System (RCAS), through Boeing Computer Services, for about 50,000 of its ViewStation FX series. Tends to focus more on integrating X terminals into an environment than on direct sales to end users or distributors. Price ranges from $1,499 to $5,999.

Weaknesses: Only recently became a major X terminal maker with significant sales and revenue. Questions remain as to its ability to keep up with non-RCAS production and distribution in the wake of its recent award.

• Hewlett-Packard Co.

Overview: Has made significant strides in high-end X terminals. RISC-based models are solid and well-engineered and boast top-notch benchmark performance. With the success of its 9000 series workstation and respected X terminal line, HP is making a push into the high-performance graphics market. Prices range from $2,995 to $5,995.

Weaknesses: HP terminals, like those of Network Computing, tend to be slightly higher priced than competitive units.

• Digital Equipment Corp.

Overview: Optimized for DECwindows and VT-320-based applications. Recent announcement of the XVT 2000 line lowers the low end of its offerings from $2,195 to $1,999. The new models feature menu-driven operation, reduced network overhead and simultaneous access to Unix, Ultrix and VMS host applications.

Weaknesses: Heavy reliance on large installed base of Ultrix and VMS users to move toward open systems may preclude the company from marketing its X terminals to non-DEC users.

Roynan is an analyst at Bluestone Consulting, Inc., a consulting firm in Mount Laurel, N.J., that specializes in Unix and open systems.

The joy of X . . . terminals

CONTINUED FROM PAGE 67

software and network product. A successful deployment of X terminals relies on the software and the degree to which the device affects network traffic.

The leading X terminal suppliers recognize this, with **Network Computing Devices, Inc.**, **Hewlett-Packard Co.**, **Digital Equipment Corp.**, **IBM** and **Tektronix, Inc.** all offering very sophisticated X server functionality.

Choosing among the more than 30 vendors offering more than 200 different X terminal models, then, is really a matter of checking out their software, their compatibility with your installation, their support capabilities and the ongoing administration that their terminals require.

Software variables

The current version of the X Window System is X11 Release 5.0. Few X terminal vendors are shipping this release, but X is backward-compatible, meaning that X11 Release 3.0 applications will run with X11 Release 4.0 and Release 5.0 servers.

The software components of many X terminals include the following:

Local clients. These are programs that, in the X world, have traditionally run on the network but now run in the X terminal. The rationale behind local clients is that they can reduce the host and network load by providing services that would otherwise be supplied by host- or network-resident clients.

Common local clients include window managers and terminal emulators. Nearly all X terminal vendors support local clients of various types, with **Applied Digital Data Services, Inc.** (a subsidiary of NCR Corp.), DEC, Network Computing and Tektronix offering local window managers.

When you're shopping for X server software, look for the following:

- **X11 revision:** R4 or R5.
- **Network management:** SNMP.
- **Local client support:** Window managers (Motif), terminal emulations.
- **Font server support.**
- **Network protocols:** TCP/IP, DECnet and LAT (if DEC).
- **Ease of installation:** Tape availability, installation scripts, graphical user interface-based setup, remote configuration capability.

Fonts. Until the latest release of the X Window System, font handling on X terminals was a cumbersome task. Release 5.0 improves on that by providing a font server that runs on the network. The font server processes all font requests, converting them to a common format that X terminals understand.

Network management support. Simple Network Management Protocol (SNMP) has become a de facto standard for X terminals. With SNMP support, users can monitor X terminals using standard network management programs.

While the features of the X11 server are important (see story this page), whether the software is robust is more important. Check with other customers of the supplier to see what their experiences with the X server software have been.

Supporting the load

The X server software can either be loaded from internal read-only memory or downloaded from a network-resident host. Nearly all suppliers support both methods.

There are pros and cons to each. Booting from the network can take its toll if a large number of X terminals boot simultaneously. On the other hand, it's a lot easier to upgrade the X server software when it's network-resident.

If the X terminal is booted from the network, you need to know which hosts are supported and which media are supplied. Independent suppliers Network Computing and Tektronix support nearly all major platforms. The system suppliers tend to specialize in their own platforms, except for HP, which in addition to its own systems supports **Sun Microsystems, Inc.** workstations and IBM RISC System/6000s. Look for all major X

Quick reference comparison

X terminals support X the best, but they are not as good for local applications

	X terminals	PCs with X	Workstations
Cost/Seat	$4,000-$4,500 (17-in. color monitor)	$4,700-$5,800 (16-in. color monitor, 486-33)	$5,400-$6,500 (16-in. color monitor, diskless)
Network requirements	Increase in network traffic	Increase in network traffic	Significant increase in network traffic
Host requirements	• 1M-3M bytes per X terminal • 1-3 MIPS per X terminal* • 10 times memory swap space	• 1M-3M bytes per X terminal • 1-3 MIPS per X terminal* • 10 times memory swap space	8M-16M byte swap memory on host
X performance	Good to excellent	Poor to adequate	Good to excellent
Use profile	• Heavy X • No local applications • Historically technical users • Commercial use a fast-growing segment	• Casual X • Heavy local applications	• Mixed X access • Local workstation applications
Applications	Mission-critical vertical, OLTP, publishing, database access, CASE, office automation	E-mail, database query, mission-critical vertical applications	CAD/CAM, CASE
Advantages	• Lower life cycle costs • Network-upgradable (desktop power increasing by adding capabilities to network)	• Leverage PC investment • Retain access to PC applications • Integrated w/PC environment	• Full workstation compatibility • No application compatibility issues
Issues	• No local processing capabilities • Requires network processing • Most X terminals connected via network • Cultural resistance from workstation users	• Performance of X server • Compatibility with installed PC options • Installation, ease of use • May require PC upgrade • Configuration support • Life cycle cost high	• Expensive to increase desktop capability • Not optimized for X server functionality • Life cycle cost high • Security risk • Administration difficult (backups, support)

*Application-dependent

Source: X Business Group, Inc.

terminal suppliers to offer multihost boot support in the future.

Far from being "dumb" devices, X terminals usually sport a powerful processor, often a reduced instruction-set computing (RISC) CPU. The processor is what runs the X server software, using the memory or program and session storage.

The memory in the X terminal fulfills several needs, including running the X server, storing fonts, storing dynamic information relating to windows, local clients and video memory (usually video random-access memory).

But more memory is not always better. The memory that really matters is the amount not occupied by the X server. For example, Product A may have 5M bytes in a standard configuration, while Product B has 4M bytes. But Product A requires 1.5M bytes for its X server while Product B uses only 500K bytes. Which is better? Know what the memory is used for and how it is allocated.

The amount of local memory required is based on the number of windows open, the fonts in use and the type of information in the window. If you are doing mostly textual applications with less than four windows open, 2M to 4M bytes should be adequate.

Anything else will require at least 4M bytes, and if local clients such as a window manager are added, then more is needed. For a reference point, an official Open Software Foundation Motif window manager requires approximately 500K bytes of memory.

Communications

Communications between the X terminal and the X client are effected via standard network protocols and wires. Most networked X connections use Transmission Control Protocol/Internet Protocol, using the Ethernet protocol, running on a thin, thick or twisted-pair medium.

While most of the benefits of X are derived from being on a network, many organizations still use serial connections, especially where X terminals are replacing conversational terminals. If you don't have a network and aren't going to install one but want to use X, look at products that can connect via a serial link, such as those from **Qume Corp.**, Network Computing and DEC.

It may be necessary to run an X terminal from a remote location or over a serial line. Depending on the transmission speed, supporting remote X often requires an optimized low-bandwidth X protocol. Possible protocols include Point to Point Protocol, XRemote and Serial Line Internet Protocol, or SLIP.

.....

The next generation of X terminals will feature more powerful hardware (RISC processors, expanded memory, more input devices) and will further increase its software capabilities.

Elements of the graphical user environment, such as multiple work spaces and desktop managers, will become resident in the X terminal. The X Window System will eventually become invisible to users.

Further into the future, X terminals will be replaced by terminals that are optimized for a specific user environment and interfaces. There will be Motif terminals, Open Look terminals, DECwindows terminals, Destiny terminals, HP/VUE terminals, Microsoft Corp. Windows New Technology terminals, Solaris terminals . . . and on and on. ●

Casual X: PC X servers give users a bit of both worlds

You *can* have your X and PCs, too, with personal computer-based X server software.

PC X server software allows the PC to function as an X display device while retaining its DOS and **Microsoft Corp.** Windows — or **Commodore Business Machines, Inc.** Amiga, **IBM** OS/2 and **Apple Computer, Inc.** Macintosh — functionality. So far, a good number of companies have opted for this route, with the current installed base (including **Digital Equipment Corp.**'s Pathworks) exceeding 222,000 users, with most running under DOS or Microsoft Windows.

In fact, one of the most important trends in the PC X server market has been the increased demand for Microsoft Windows-based PC X servers. Windows and X integration permits users to view DOS, X and Windows applications simultaneously and allows cutting and pasting of data and information between applications. Windows' PC X servers also allow users to employ Windows' local window manager, which lends the Windows look and feel to X applications while reducing network traffic.

But PC X servers are not for everyone. As vendors of the software have discovered, converting a PC to an X-capable device is not an easy thing; in fact, it can be more difficult than adding an X terminal to the network. For one thing, you may be in for a significant degree of upgrading, including the following:

- More memory.
- A network interface card.
- Network software.
- PC X software.
- Higher resolution displays and graphics adapters.

To achieve a reasonable level of X performance with minimal impact on the local DOS/Windows environment, you would need at least an 80386-based 33-MHz PC (in the Intel Corp. environment), with 8M bytes of random-access memory, a 14-in. color display and at least Video Graphics Array, preferably Super VGA resolution.

The fact is, PC X server software does not turn a PC into an X terminal. The inherent hardware and software limitations of PCs limit their performance and functionality as X display servers. Although PC architecture and memory management have taken some great strides, DOS is still a single-user operating system constrained by 640K bytes of conventional memory, which significantly limits application size and mulitasking capabilities.

As with workstations, networked PCs also require a higher level of attention from the network administrator than X terminals. PCs with X servers do not offer the life cycle cost advantages proffered by X terminals.

X-equipped PCs are best left for casual X application use, such as people who only need occasional access to X applications. For example, the aerospace, petrochemical and manufacturing industries often have X-based database applications — usually archives of technical manuals and documents. Since these applications tend to be for query and display purposes, not data entry and update, it's a good use for PC X servers.

X on PCs will work well for organizations with a large investment in PC hardware and software that want users to have some access to X-based information resources and database applications. This will be especially true in commercial market segments such as telecommunications, banking, insurance, financial services, hotels and the airlines.

STEPHEN AUDITORE

X on the PC

The following are a sampling of PC X software vendors

AGE Logic, Inc.
San Diego
Xoftware for DOS and Windows

Apple Computer, Inc.
Cupertino, Calif.
Mac/X for Macintosh

GFXBase
Milpitas, Calif.
GFXbase for the Amiga

Hummingbird Communications Ltd.
Markham, Ontario
HCL-Exceed for DOS and Windows

Network Computing Devices, Inc.
PC-X Division
Mountain View, Calif.
PC Xview for Windows and DOS

Visionware (Unipress Software, Inc.)
Edison, N.J.
Xvision for Windows

White Pine Software, Inc.
Nashua, N.H.
Exodus for the Macintosh

Source: X Business Group, Inc. CW Chart: Janell Genovese

Performance — Xstones vs. the Rolling Stones

No matter how hard vendors have tried to promote a single-number benchmark for X terminals, one does not exist.

Some suppliers (usually those with the biggest number) have been promoting "Xstones." Xstones is derived from an X server development tool called "X-bench," developed by Siemens/Nixdorf Information Systems, Inc. It shows the performance of the X server software in a computer-aided software engineering (CASE) environment and does not factor in a non-CASE environment, user interaction and network traffic.

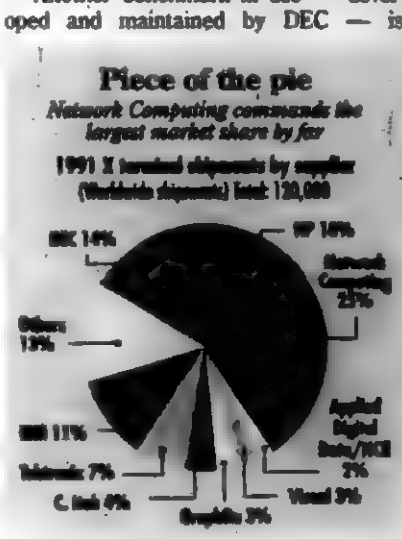
Another benchmark in use — developed and maintained by DEC — is X11perf. This suite of more than 400 tests provides ratings of how well the X server performs various X primitives. Several of these ratings have been grouped into values called "DXUPs." By evaluating the application against the DXUPs, you can garner some idea of how well X terminals will run that application relative to each other.

Hewlett-Packard Co.'s Panacom Division has published several application- and terminal-specific performance test papers that provide more insight into X terminal and system performance than any of the benchmark programs in use.

STEPHEN AUDITORE

Piece of the pie

Network Computing commands the largest market share by far



Source: X Business Group, Inc.

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Remote SpoolPrint 370
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FAX: 419/589-9409
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COMPUTERWORLD

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1992 Computerworld Editorial Calendar (July-December)

Issue Date	Ad Closings Color*	Ad Closings B/W	Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
July 6	June 19	June 26	**Product Spotlight:** X Terminals **Buyers' Scorecard:** Integrated Image Processing Software		Starch Study	
July 13	June 26	July 3	**Executive Report**			Mails: July 15 Space Close: June 5 Mat'l Close: June 8
July 20	July 3	July 10	**Product Spotlight:** New Generation of Word Processing Software **Buyers' Scorecard:** Object-oriented Programming Software	Communication Networks West & Object World July 21-23, San Francisco	Starch Study	
July 27	July 10	July 17	**Executive Report**			
Aug. 3	July 17	July 24	**Product Spotlight:** Inventory Management Software **Buyers' Scorecard:** Full Life-cycle CASE			
Aug. 10	July 24	July 31	**Industry Closeup:** IS in Banking **Executive Report**	Windows OS/2 Aug. 12-14, Boston	Starch Study	Mails: Aug. 12 Space Close: July 3 Mat'l Close: July 6
Aug. 17	July 31	Aug. 7	**Product Spotlight:** Object-oriented PC Development Tools **Buyers' Scorecard:** Large-capacity Mainframes			
Aug. 24	Aug. 7	Aug. 14	**Executive Report**			
Aug. 31	Aug. 14	Aug. 21	**Product Spotlight:** Peripherals for Travel (portable modems, printers, docking stations) **Buyers' Scorecard:** Mainframe RDBMS		Starch Study	
Sept. 7	Aug. 21	Aug. 28	**Special Report:** Annual Salary Survey			
Sept. 14	Aug. 28	Sept. 4	**Special Report:** Annual Job Satisfaction/Job Performance Survey **Special Supplement:** Annual *Premier 100* Magazine		Starch Study	Mails: Sept. 16 Space Close: Aug. 7 Mat'l Close: Aug. 10
Sept. 21	Sept. 4	Sept. 11	**Product Spotlight:** The Latest Frame Relay Products and Services **Buyers' Scorecard:** 486 PCs (33 Mhz)	TCA Sept. 21-26, San Diego		
Sept. 28	Sept. 11	Sept. 18	**Executive Report**			
Oct. 5	Sept. 18	Sept. 25	**Product Spotlight:** EDI Products and Services **Buyers' Scorecard:** Disk Arrays			
Oct. 12	Sept. 25	Oct. 2	**Integration Strategies:** Integrating New Development Tools **Industry Closeup:** IS in Biotechnology	Networld Oct. 13-15, Dallas	Starch Study	Mails: Oct. 14 Space Close: Sept. 4 Mat'l Close: Sept. 7
Oct. 19	Oct. 2	Oct. 9	**Product Spotlight:** Project Management Software **Buyers' Scorecard:** Midrange Systems (10 Mips or Higher)			
Oct. 26	Oct. 9	Oct. 16	**Special Issue:** Annual *Campus Edition* **Executive Report**	Interop '92 Oct. 26-30, San Francisco PC Expo Oct. 27-29, Chicago		
Nov. 2	Oct. 16	Oct. 23	**Product Spotlight:** Work-flow Software **Buyers' Scorecard:** PC Graphical User Interfaces		Starch Study	
Nov. 9	Oct. 23	Oct. 30	**Executive Report**			Mails: Nov. 11 Space Close: Oct. 2 Mat'l Close: Oct. 5
Nov. 16	Oct. 30	Nov. 6	**Product Spotlight:** Best Buys in 486 PCs **Buyers' Scorecard:** Virus Detection Software	Comdex Fall Nov. 16-20, Las Vegas	Starch Study	
Nov. 23	Nov. 6	Nov. 13	**Integration Strategies:** Rise of the Specialist Integrator **Industry Closeup:** IS in Retail			
Nov. 30	Nov. 13	Nov. 20	**Product Spotlight:** Minicomputers **Buyers' Scorecard:** E-Mail Enabled Applications		Starch Study	Mails: Dec. 2 Space Close: Nov. 6 Mat'l Close: Nov. 9
Dec. 7	Nov. 20	Nov. 25	**Executive Report**			
Dec. 14	Nov. 25	Dec. 4	**Product Spotlight:** Windows Utilities **Buyers' Scorecard:** DASD		Starch Study	
Dec. 21	Dec. 4	Dec. 11	**Executive Report**			
Dec. 28 & Jan. 4, 1993	Dec. 11	Dec. 18	**Special Edition:** Annual Forecast Issue			

* Includes ads placed within Executive Report or Product Spotlight sections and premium positions.

Please Note: Executive Report topics will be announced one month prior to ad closing. Your sales representative will provide you with specific information on each topic.

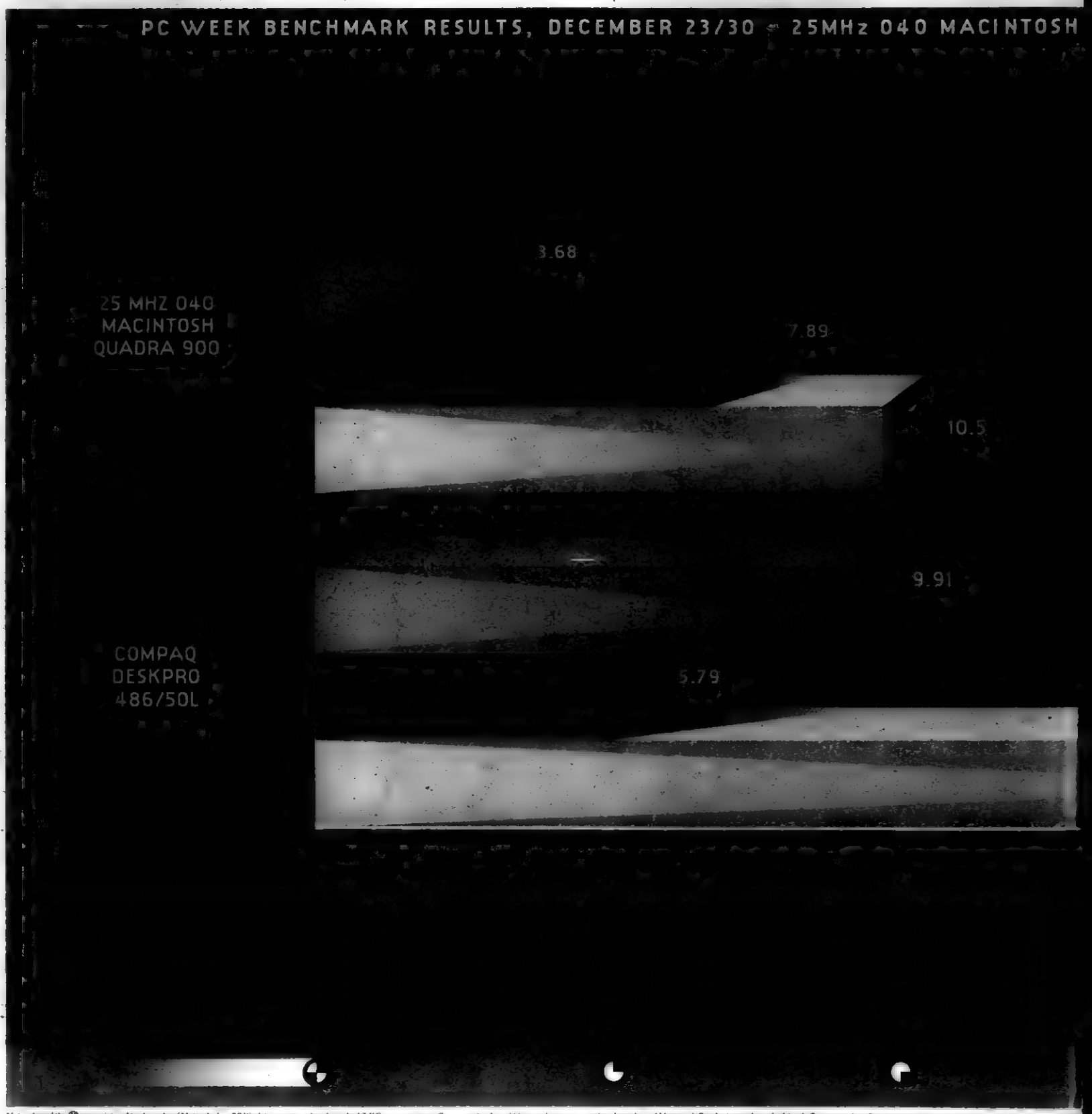
Color X terminals

VENDOR	PRODUCT	SCREEN SIZE (DIAGONAL INCHES)/RESOLUTION	HOST BOOTED FROM	PROCESSOR/GRAPHIC PROCESSOR TYPE	MINIMUM/MAXIMUM RAM SUPPORTED BY X TERMINAL (BYTES)	RAM REQUIRED BY X SERVER	VIDEO MEMORY (BYTES)	FLASH PROM	SYSTEM BOOTED	X11 RELEASE SUPPORTED	REMOTE PROTOCOLS SUPPORTED	FUNCTIONS LOCALLY RUN ON X TERMINAL	LOCAL WINDOW MANAGER	BIT PLANES SUPPORTED	NUMBER/TYPE OF INTERFACES SUPPORTED	PRICE
Applied Digital Data Systems, Inc., a subsidiary of NCR Corp. (407) 333-0330	3414 X-Station Model XL 17CE	17/1,024 x 768	Sun/HP, DEC, IBM, NCR/AT&T	68020/34020	5M/20M	1.3M	1M	No	Download, prom	R4	SLIP, PPP, TCP/IP, DECnet	Font management, window management	Motif, tab window manager	8	1 serial	$3,995 base price
	3414 X-Station Model XL 19CE	15/1,024 x 768	Sun, HP, DEC, IBM, NCR/AT&T	68020/34020	5M/20M	1.3M	1M	No	Download, prom	R4	SLIP, PPP, TCP/IP, DECnet	Font management, window management	Motif, tab window manager	8	1 serial	$2,995 base price
C. Itoh Technology, Inc. (714) 727-4456	X Terminals	17, 19, 21/1,280 x 1,024	Sun, HP, DEC, IBM (any with TCP/IP)	TI 340X, TI 34020/34030	4M/36M	1M	2M	Yes	Download, prom	R5	SLIP, PPP, CSLIP	Font management, window management, color management	Motif, Open Look	8	1 serial, 1 parallel, AUI Ethernet (thin net, 10Base, 10Base-T, 10Base-2)	$3,000 - $5,000
Digital Equipment Corp. (800) 344-4825	VXT 2000 19-in. color	19/1,280 x 1,024	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$5,895
	VXT 2000 17-in. color	17/1,024 x 768	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$4,695
	VXT 2000 15-in. color	15/1,024 x 768	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$3,495
Hewlett-Packard Co. (800) 752-0900	HP 700/RX Model 16Ca	19/1,280 x 1,024	Sun, HP, IBM, SCO	i960/None	4M/16M	2M	2M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$5,995
	HP 700/RX Model 16Cs	16/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/16M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$4,995
	HP 700/RX Model 16Ci	16/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/16M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$3,995
	HP 700/RX Model 14Ci	14/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/16M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$2,995
Human Designed Systems (215) 277-8300	HDS ViewSystem FX	14, 16, 17, 19/1,024 x 768 to 1,280 x 1,024	All hosts; flash prom-based	i960/None	4M/72M	1M	1M, 2M	Yes	Download, prom	R4	SLIP, PPP, CSLIP	Window management	Motif, Open Look	1,8	2 serial, 1 parallel	$2,599 base price
IBM (512) 838-7900	IBM Xstation 120	12 - 23/640 x 480 to 1,280 x 1,024	Sun, DEC, IBM, SCO Unix	TI 34020/34020	2.5M/16.5M	600K	1M - 2M	No	Download, optional 30M-byte hard file	R4	SLIP	Font management	None	8	2 serial, 1 parallel	$2,650 base price, display and software extra
	IBM Xstation 130	12-23/640 x 480 to 1,280 x 1,024	Sun, DEC, IBM, SCO Unix	TI 34010/34010	0.5M/8.5M	300K (R3), 500K (R4)	0.5M-2M	No	Download	R3, R4	None	None	None	8	1 serial, 1 parallel	$1,800 base price, display and software extra
Intergraph Corp. (205) 730-2000	InterX 550	19/1,184 x 884	Sun, Intergraph	TI 34020, 68030/ 34020	6M/24M	6M	2M	No	Download	R4	SLIP	Font management, color management	None	8	1 serial, 1 parallel	$6,900
Japan Computer Corp. (301) 982-0883	Super XR	17, 19/1,280 x 1,024	Sun, HP, DEC, IBM	R3000A/ASIC	4M/32M	2M	1M minimum	No	Download, prom	R4, R5	SLIP	Window management	Motif	8	1 serial, 2 Ethernet	$6,395 (19-in. screen); $5,395 (17-in. screen)
	Super FX	17, 19/1,280 x 1,024	Sun, HP, DEC, IBM	68030/ASIC	4M/32M	2M	1M minimum	No	Download, prom	R4, R5	SLIP	Window management	Motif	32	1 serial, 2 Ethernet	$10,995 (19-in. screen); $9,995 (17-in. screen)
	Super XL	15/1,024 x 768	Sun, HP, DEC, IBM	68020/ASIC	4M/32M	2M	1M minimum	No	Download, prom	R4, R5	SLIP	Window management	Motif	8	1 serial, 2 Ethernet	$3,195
Jupiter Systems (510) 523-6000	MX1000	19/1,280 x 1,024	Sun, HP, DEC, IBM	None	4M/96M	1M	12M	No	Download	R5	None	Font management, color management	None	8	4 serial	$6,500
Link Technologies, Inc. (510) 651-6000	LX 1300	14-21/1,280 x 1024	Sun, HP, DEC, IBM	68030, TI 24020/34020	6M/37M	1.4M	2M	Yes	Download, prom	R4	SLIP	Window management	Motif	8	3 serial, 1 AUI	$2,999
Network Computing Devices, Inc. (415) 694-0650	NCD19c	19/1,280 x 1,024	Sun, HP, DEC, IBM	RISC 88100/ASIC	6M/32M	1.2M	512K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Work Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$6,395
	NCD17cr	17/1,280 x 1,024	Sun, HP, DEC, IBM	RISC 88100/ASIC	6M/40M	1.2M	512K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$5,395
	NCD17c	17/1,024 x 768	Sun, HP, DEC, IBM	68020/2 ASICs	4M/32M	1.2M	128K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$4,500
	NCD14c	14/1,024 x 768	Sun, HP, DEC, IBM	68020/2 ASICs	4M/32M	1.2M	128K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$3,000
Northwest Digital Systems, Inc. (206) 524-0914 (800) 537-1201	NDS X Station- X20 Widest II	15-20/1,024 x 768, 1,152 x 900, 1,280 x 1,024, 1,600 x 1,280	Sun, HP, DEC, IBM, any Unix host	TI 340x/None	2M/16M	750K (R4), 1M (R5)	2M	Yes	Download, prom	R4, R5	SLIP	Font management, color management	None	8	2 serial	Contact vendor
	NDS X Station- X20 Widest	15-20/1,024 x 768, 1,152 x 900, 1,280 x 1,024	Sun, HP, DEC, IBM, any Unix host	TI 34020/None	2M/16M	750K (R4), 1M (R5)	1M	Yes	Download, prom	R4, R5	SLIP	Font management, color management	None	8	2 serial	$2,795 - $4,695, depending on configuration
Samsung Information Systems America, Inc. (201) 229-4000	X Terminal	14, 15, 17, 19/ 1,024 x 768, 1,280 x 1,024	Sun, HP, DEC, IBM	AMD 29000/None	4M/16M	2M	1M, 2M	Yes	Download, prom	R4, R5	SLIP, NFS	Window management	No	8	2 serial	$4,995 (19-in. screen), $3,995 (17-in. screen), $3,495 (15-in. screen), $3,195 (14-in. screen)

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

Add Windows To A 50 MHz 486 PC And What Do You Get?

Oh, About Two-thir



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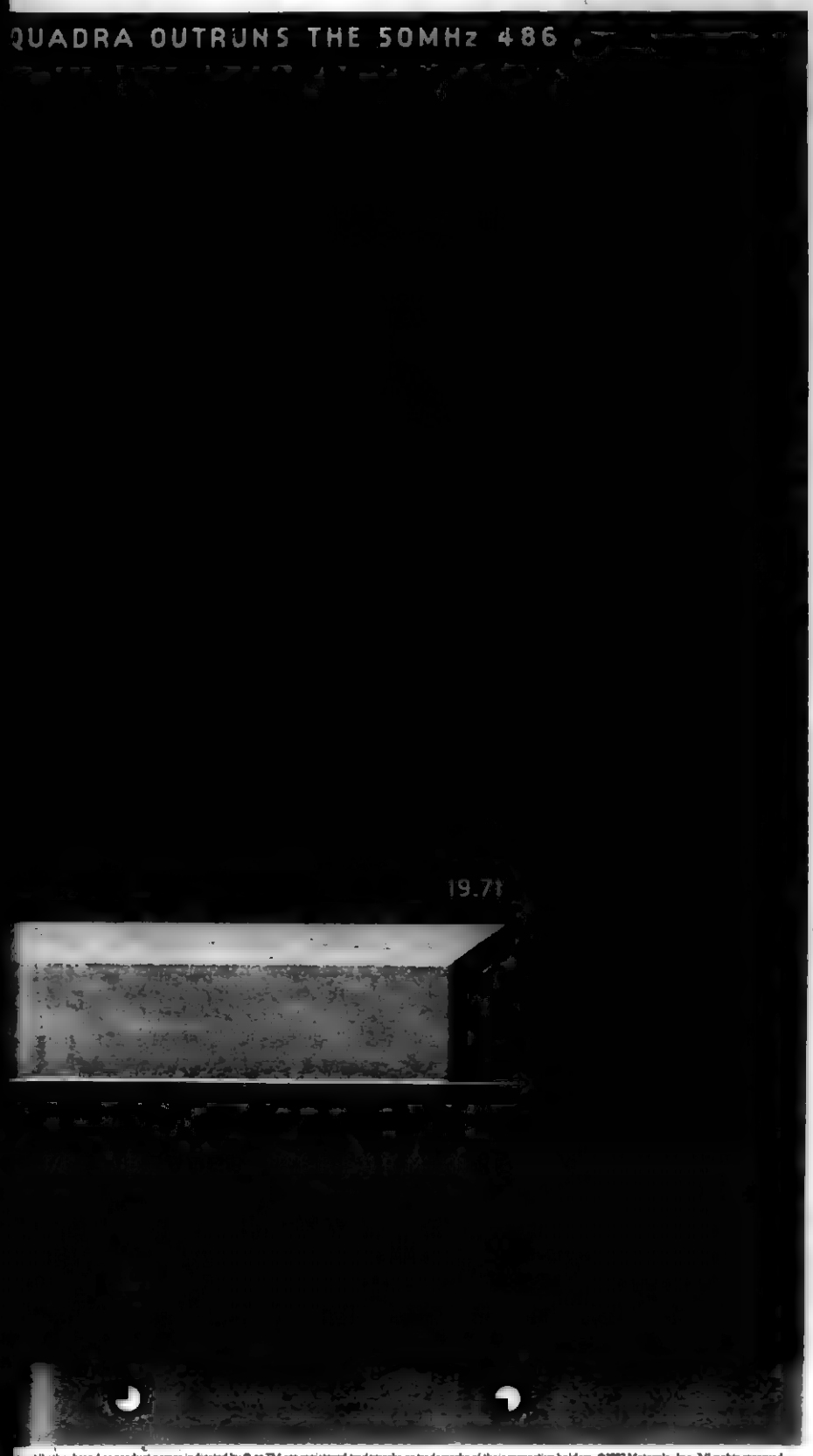

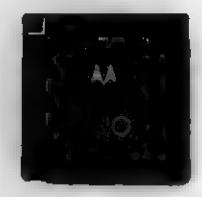

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Faster than what? Faster than a 486* Windows™ PC, according to PC Week. In its benchmarks (at left), an Apple® Macintosh® Quadra™ powered by a 25 MHz Motorola 68040 beat a 50 MHz 486 Windows PC in two tests out of three. And was about 33 percent faster overall.

No surprise, really. Macintosh and its graphical user interface were designed from the start around the 68000's true 32-bit architecture. Naturally, it outperforms a computer powered by an extended 8-bit architecture running a character-based operating system with a tacked-on GUI.

That's especially true when the Macintosh is powered by a 68040. With two on-chip caches and an internal 50 MHz clock, the 68040 outruns everything in its class. And even faster versions are on the way.

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Go Macintosh Quadra. Go 040. Or go slower.

For a free copy of the PC Week test results, call 1-800-845-MOTO.

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	SCREEN SIZE (DIAGONAL INCHES)/RESOLUTION	HOST BOOTED FROM	PROCESSOR/GRAPHIC PROCESSOR TYPE	MINIMUM/MAXIMUM RAM SUPPORTED BY X TERMINAL (BYTES)	RAM REQUIRED BY X SERVER	VIDEO MEMORY (BYTES)	FLASH PROM	SYSTEM BOOTED	X11 RELEASE SUPPORTED	REMOTE PROTOCOLS SUPPORTED	FUNCTIONS LOCALLY RUN ON X TERMINAL	LOCAL WINDOW MANAGER	BIT PLANES SUPPORTED	NUMBER/TYPE OF INTERFACES SUPPORTED	PRICE
Sunflower Corp. (512) 000-0001	Xcel Series Model XL-12	Screen purchased separately/1,280 x 1,024	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1.5M	No	Download	R4	None	Font management	None	8	2 serial, 1 parallel	$1,999
	Xcel Series Model XL-10	Screen purchased separately/1,024 x 768	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1M	No	Download	R4	None	Font management	None	8	2 serial, 1 parallel	$1,549
	Xcel Series Model XL-8	Screen purchased separately/800 x 600	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1M	No	Download	R4	None	Font management	None	8	2 serial, 1 parallel	$1,399
Tandberg Data (011-47) 2-18-6060	TDU 6810F	14/1,024 x 768, 800 x 600	Sun, HP, DEC, IBM, DG	TI 34020/MP	5M/21M	1M	1M	Yes	Download, prom	R4	NP	Window management	Motif	8	2 serial	Contact vendor
	TDU 6820F	17/1,024 x 768	Sun, HP, DEC, IBM, DG	TI 34020/MP	5M/21M	1M	1M	Yes	Download, prom	R4	NP	Window management	Motif	8	2 serial	Contact vendor
Tektronix, Inc. (800) 289-8436	XP600 Series	17, 19/ 1,280 x 1,024, 1,152 x 900	Sun, HP, DEC, IBM, VMS, Unix	R3000/34020	8M/32M	3M	1M, 2M (depending on model)	No	Download, prom	R4	SLIP	Font management, window management	Motif	8	2 serial	$3,395 - $5,895, depending on model
	XP10 Series	15-19/ 1,024 x 768, 1,280 x 1,024, 1,152 x 900	Sun, HP, DEC, IBM, VMS, Unix	TI 34020/Mage	4M/12M	2M	1M	No	Download, prom	R4	Serial Xpress	Font management, window management	Motif	8	2 serial	$990 - $3,795, depending on model
Visual (800) 836-4400	TX800C	19/Up to 1,280 x 1,024	Sun, HP, DEC, IBM	68040/2 custom ASIC	4M/16M	Varies with local clients	2M	Yes	Download, flash	R5	SLIP	Font management, window management, color management	Motif, Open Look, tab window manager	8	2 serial	$3,495 base price
	TX800C	19/Up to 1,280 x 1,024	Sun, HP, DEC, IBM	68030, TI 34020/34020	4M/37M	Varies with local clients	2M	Yes	Download, flash	R4	SLIP	Font management, window management, color management	Motif, Open Look, tab window manager	8	2 serial	$2,995 base price includes software license

Tales from the land of X

Wrong number, wrong address

Even users with impeccable technology credentials can create minor disasters with X Window System terminals. Such was the case at the US West NewVector Group in Bellevue, Wash., where employees use X terminals from Applied Digital Data Systems running over a network to Sequent Computer Systems, Inc. computers. One of their main occupations is monitoring cellular phone switches.

For instance, if the tower light fails, says Bill Holt, manager of production for open systems administration, that information is passed over the wide-area network to the Sequent computer, which displays it on overhead screens. If multiple problems appear to be hitting at once, "the [tech staff] can bring up the window related to the specific city and iconize it off, so it's there if the problem occurs," Holt says.

But one day the system kept crashing. Since X terminals act like nodes on a network, Holt explains, each one has its own address. Users have to correctly input their own terminal's address and the address of the machine they're going to communicate with.

"We had a situation where the user reversed those numbers," Holt says. It was hours before the user reported a correlation between the crash and his attempt to access the system. "Very few X terminals offer protection of the basic setup configuration," Holt says.

The system *is described by US West's Holt as 'a miniature movie theater, and everyone has a full panoramic view'*

Please support me

"Know thy vendor" is a proverb that worked especially well for Henry Camp, president of Medical Systems Development Corp. (MSDC). His company selected X terminals two years ago for Atlanta-based Grady Memorial Hospital to run the Theresa medical software produced by MSDC.

The 400 X terminals were to be installed on an Ethernet LAN and run off DEC VAXs. The hospital decided to switch from dumb terminals because of the complexity of patient information that doctors need to evaluate.

Camp says it was critical to find a vendor committed to helping Grady resolve the technology concerns particular to a hospital. The chosen company was Westboro, Mass.-based Visual, which has fulfilled its share of special requests. When the hospital wanted to have the terminals print directly to local printers in 1989, Visual made it possible for printers to attach to the terminal's serial port and capture host data, instead of requiring separate wiring. And since the hospital also required bar-code readers, Visual adapted its readers to fit in the keyboard connection available on the terminal.

"I think a willingness to accommodate changes is extremely important for X terminal manufacturers compared to ASCII terminals," Camp says.

Getting your wires crossed

For Jim Honerkamp, selecting an X terminal for the brokers at McDonald & Company Securities, Inc. in Cincinnati was a no-brainer: At the time, only Network Computing offered a localized windowing manager, which helped limit the amount of network traffic.

The plan was for the brokers to make trades at their desks using the X terminals, as well as log on to a remote stock quote system. But once the terminals were selected, Honerkamp says, director of computer services at the Gradison Division, the company discovered that its existing wiring scheme wouldn't work.

"We had a four-pair wire, and we were using one side for phones and one side for dumb terminals," Honerkamp says. "That didn't work with X terminals because you couldn't have the phone signal running over the same physical wire."

Fortunately, the company had also decided to install a one-way broadcast system conveying brokerage news through a speaker on each broker's desk. That system was hooked up through the telephone wire.

Then Honerkamp turned the X terminal wiring problem into an opportunity by trying a new technology: connecting the X terminals to the LAN via Motorola, Inc. Altair wireless LAN units.

Currently, ceiling-suspended "control modules" (connected to the LAN with twisted-pair wire) broadcast radio signals to "user modules" that are in turn connected to groups of X terminals with twisted-pair wire. "There's no wire between the user module and control module," Honerkamp says, "so it drastically minimizes the amount of wire that you have to pull."

"We're spread across two floors of a twin-tower building," he continues. "If I had 70 dead runs [of wire] from my computer room, I'd get into big bucks. Instead, we run about 10 and still drive 70 terminals."

All stories by Anita Amirrezvani, a freelance writer in Berkeley, Calif.

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runs out of gas?
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And, of
it with M
Window

*The as yet to be named generati

Series

e

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- O Engineering
- O Scientific Research
- O E-Mail
- O Order-entry
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- O Image Processing
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- O Business Graphics

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O Less than 10 O 10-20 O 20-35 O More

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- O DOS with Windows
- O OS/2
- O MAC
- O UNIX™
- O VMS
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From how many manufacturers?

What kinds of connections does your PC(s) require? (Check all that apply)

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Information access for all

What if TV sets cost a little more, computers almost nothing and everyone could tap into national databases containing anything in print?

BY DAVID H. ROTHMAN

Some high school students in Silver Spring, Md., have been working on an affordable virtual reality system for small business. While a finished system won't go on sale next week at Radio Shack, the students' work has been good enough for a top Army laboratory to hire one of them for the summer. Ten years from now, all three students might be cherished employees at Intel Corp., IBM or another high-tech company.

Gloria Seelman, a research coordinator at Montgomery Blair High School in Silver Spring, sees the ongoing project as an educational success. Students' brains and tenacity have helped. But so has something else. Via Dialog databases, students at the school can dial up many facts missing from the school library.

Without databases, Seelman says, the work done so far might have taken twice as long. As it happens, even the University of Maryland lacked perhaps half of the books helpful to the project, and interlibrary loans would have meant weeks of waiting. The databases, unfortunately, offered citations but not full texts of books.

Imagine how much the Blair students could have accomplished by now in their three-semester course in Independent Research if they could have downloaded whole books, if they had not been limited to the offerings of libraries nearby. Suppose that they could easily hook up with an electronic version of the whole Library of Congress. In fact, suppose that millions of other students, parents — anyone — could retrieve technical tomes, novels, articles — almost anything ever published. Suppose, too, that they could read the material on laptop computers that sold for $50 or, even better, were provided free of charge by the government.

Farfetched? No. For years, computer hackers and librarians have dreamed of being able to read any book on-line. And now technology has come far enough for this to happen in the next two decades, through a plan that I'll propose here. My TeleRead plan would promote literacy, increase general exposure to computer technology and aid our domestic high-tech industry.

Tim Clark

Under TeleRead, millions of Americans could dial up books from home via a giant computer network. The government would encourage Silicon Valley to turn out small, affordable computers with sharp American-made screens that you could read more easily than a book.

No, Washington wouldn't pay laptop makers for research and development. Rather, the government would use revenue from a 10% tax on television sets and other video products to buy laptops for schools and libraries, ensuring enough of a market to justify the R&D in the private sector.

Extrapolating from a Department of Commerce statistic on annual sales to consumers, such a tax might raise $2 billion a year. This tax needn't be burdensome. Let's say a television cost $350 and the owner kept it five years. He would pay a tax of $35, or 10%, when he bought the set; that would break down to just $7 annually, or about the price of a pizza.

A tax would hardly kill off television or double SAT scores, but it would send a message about new priorities for the country.

Some general tax revenue might augment the money from the "Tube Tax" if need be, but not necessarily forever. The TeleRead program could collect subscription fees, determined by family income, from people downloading books and other material from the network.

Spending spree

Just how would TeleRead spend its money at the start? One of the program's goals would be to develop an instant market for trailblazing U.S. companies in areas such as screens and memory chips. With massive procurement contracts, the government could hasten the coming of powerful, toaster-simple laptops selling for a tenth or twentieth of the cost of today's models. Right now such machines seem to be at least two decades off, if you want them to have sharp color screens.

TeleRead contracts would clearly favor computers with screens and other parts designed and manufactured in this country. Domestic companies couldn't avoid all foreign technology, of course. But the TeleRead program would nurture our R&D as much as possible, especially in crucial fields

Continued on page 78

Here's the plan

- Use money from 10% sales tax on TVs to underwrite R&D by U.S. companies on notebook computers you can read like a book.
- Give these computers free to all schools and libraries, and make them available at a very low cost to everyone else.
- Develop national databases of new and existing published material.
- Create a national network to provide easy access to these information stores.

Results: A boost for U.S. high tech; better educational opportunities for all citizens; and a more literate and technically proficient labor pool.

Rothman is author of *The Complete Laptop Computer Guide* (St. Martin's Press, New York) and other books on high tech.

Continued from page 77

such as laptop screens and memory. Simply put, the program would make high tech safer for our often skittish venture capitalists without setting up a massive research bureaucracy or resorting to an onerous tariff, such as the one that the Commerce Department slapped on some LCD screens.

Promotion of U.S. high technology, of course, would be just one of TeleRead's purposes. With money from the Tube Tax, the federal government could give away laptops to many schools and libraries and ultimately to bright students from low-income families.

Our schools need more computers. According to statistics published in the 1992 Computer Industry Almanac, U.S. public schools had one computer for every 20 students last year. What's more, programs for the gifted and talented enjoy a disproportionate share of the machines.

Corporations donate equipment in some districts, but the flow of gifts is too small and too haphazard to do much good nationwide.

Even in affluent areas, many schools are hanging on to Apple Computer, Inc.'s Apple IIs and other antiques and are wishing they could offer their students something better, according to Vicki Hancock, an educational technology expert at the Association for Supervision and Curriculum Development (ASCD) in Alexandria, Va.

Benefits on every level

TeleRead, of course, shouldn't just buy computers. It should also help pay for computer literacy instructors for students, teachers and librarians so the machines wouldn't sit around unused in closets. Everybody would master the basics of on-line searching, the high-tech equivalent of the Dewey decimal system. Teachers would learn how to dial up books and other material in their specialties to enrich their classes.

"This program would benefit average students as well as gifted ones, and it would better prepare Americans for work in an information-dependent society," says Hancock, editor of the "ASCD Curriculum/Technology Quarterly."

"Schools should teach everyone to find and analyze facts from many sources, not just regurgitate from textbooks," she says.

Jeremy Gordon, a just-graduated senior who worked on the Montgomery Blair project, agrees. "When I go to the public library," he says, "I see long lines of students in front of the CD-ROM magazine index. An on-line national database would be incredibly useful."

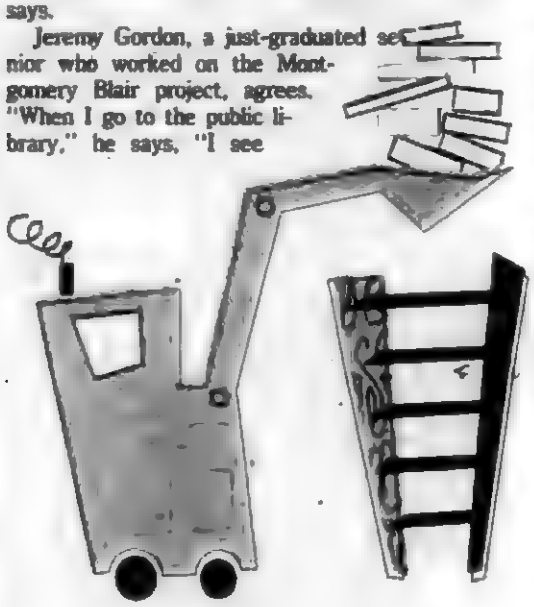
TRnet, part of the TeleRead program, would offer Gordon and his peers an electonic cornucopia. This national network would carry the full texts of all new books and other publications.

Operation phase in

The way this would come about is that the government would begin to require all material longer than 10,000 words to be in digital form in order to be copyrighted. The government would phase in this requirement gradually, perhaps with a voluntary program. Many authors and publishers would rush to take advantage of TRnet, seeing it as a new market; after all, most publishers today are already using computers to set type. As for undigitized material shorter than 10,000 words, scanners could pick up the images.

In all cases, TeleRead would pay fairly. If you wrote a book, for example, your earnings would depend on how often people dialed it up. Of course the network would not need to pay anyone for items already in the public domain — for example, government publications, statistics and old literary classics. So the basic TRnet service might be free or cost very little, even for nonstudents.

Mind you, TRnet would be just one option for readers. People could still buy books, either the old-fashioned kind or the electronic variety, from publishers or authors themselves. That would be one way to cope with the risk of censorship.



Using what we've got

A public network is an essential, however, if we want broad-based, affordable access to a wide selection of books and other material.

Some skeptics might call this plan socialistic, but it isn't — any more than a public library is.

If Andrew Carnegie, that 19th-century capitalist extraordinaire, were alive today, he would probably be funding demonstration projects, just as he helped small-town libraries across the U.S., hoping that ambitious Americans would use the technology of the day to better themselves and their earning potential. •

Yes, there is literature ready to be downloaded

Two decades ago, Michael Hart had a vision. Although most of the people he tried to describe it to thought the idea was crazy, Hart was convinced that someday, hundreds of millions of people would own computers and want to use them to access research books and great works of literature.

Since then, Hart, an adjunct professor at Illinois Benedictine College in Lisle, Ill., and a small army of volunteers across the country have transferred several dozen books, mostly classics such as *Alice in Wonderland* and the Bible, into electronic form for free distribution. His goal these days is 10,000 free on-line texts by the end of the year 2001. *Computerworld* assistant editor Kelly E. Dwyer recently spoke with Hart about this ambitious undertaking, which is called Project Gutenberg.

Q What is it that compelled you to make this project your life's work? What's your driving force?

A Our goal is for some reasonable fraction of the population to be able to get some reasonable fraction of the information that they want, without having to do any more than say, "Hey computer, have you got Aristotle's *Poetica* in here?" and it will say, "Bing! Here it is." If 75% of the people could get 75% of their questions answered, we'd feel a certain amount of success. It would be even better if 90% of the people could get 90% of their questions answered.

Whatever books people look things up in the most, that's what we want to publish. We'll eventually publish phone books, encyclopedias, the dictionary. We've got a thesaurus and an almanac already. If we knew exactly the 10,000 books that people wanted to look stuff up in the most, those are the ones we would do. It's purely utilitarian. People ask me why I do it, and the really big answer is, "Because it's there."

Q Why aren't hard-copy books that are free from libraries enough?

A When you go to the library, the books can be already checked out, they can be in for rebinding, they can be on the wrong shelf, they can have their pages torn out of them. You aren't supposed to write in them, you have to bring them back; if you don't bring them back on time, you have to pay a fine.

For me to get *Alice in Wonderland* off of one of our computers here takes me a local phone call, which costs a nickel; or, if I ride my bike over to the computer, it doesn't cost me anything. And if I get 20 books, it still only costs me a nickel for the phone call. And I can dial up and get *Alice in Wonderland* and never have to take it back.

The reason for electronic text instead of paper is it's cheap, universal — it can be translated into every computer language that's ever going to come up. Any computer you're going to find, you can run one of our books on.

Q Reading off a screen doesn't seem like the most comfortable or natural way to read a book.

A As people get screens that are more and more to their liking, it doesn't bother their eyes so much to read them on the screen. And eventually we'll have screens that look just like paper anyhow.

Q How many texts are currently on-line?

A We've got about 24 to 26 on our machine in particular. We don't have enough space to keep the old ones. Carnegie Mellon University has a collection of our stuff. I don't know, they've probably got 50 things that we did. We've got several different editions of the Bible . . . a couple different editions of *Paradise Lost*, *Aesop's Fables*, things like that.

I'm sure *Alice in Wonderland* is our most popular title. It was our flagship book for a long time. Anybody who wanted to experiment with Gutenberg, we just sent them *Alice in Wonderland*.

Q How many volunteers are now working with you on this project? Who are they?

A We've probably got in the low hundreds. And they're about evenly divided between the volunteers who help us do copyright searches and locate old editions that we can use and the people who actually enter the books themselves.

We've got everything from little old ladies in the middle of Vermont typing away at old Ataris and Apples to people who are full tenured professors. People from all over the world enter all the text. I get boxes in the mail with a book and a disk that say, "Here, I typed in this book; here's the disk."

Q What are your goals? How many books would you like to see on-line? How many copies distributed? How many readers?

A I expect 100 million readers by the end of 2001. The basic home library is going to be 10,000 books. Our goal by the end of the year 2001 is for people to be able to store our entire library of 10,000 books for $100.

I am seriously predicting that it will cost a penny to store the average book on a floppy by the end of the year 2001. Right now it costs a nickel to store something like *Alice in Wonderland* on a 1.44M-byte floppy.

Q How do you currently distribute the texts? Do you foresee using other distribution means down the road?

A We mail disks around to people who can't get on the Internet, bulletin boards post our texts for people that don't have any network connections and others will just call up on the phone and get them. A lot of it's just hand-to-hand. There's a Bitnet connection besides an Internet connection.

Internet is still the easiest way, in my opinion, because you can use FTP. And with FTP, even with a really slow connection — where you're getting 5K bytes per second — that's still only 30 seconds to get *Alice in Wonderland*. You couldn't possibly walk down to the library and get it as fast as you could dial up. •

The TeleReader circa the year 2012

It's the year 2012. TeleReader designs have evolved slowly over the years. Washington did not just ask for bids and then settle on a permanent design. Instead, it has awarded contracts in steps.

The first machines cost a great deal and were far less powerful than the model you own today. But they did encourage the use of TRnet, which the government started as soon as possible to get publishers to digitize their offerings. Here's what the TeleReader looks like and what it can do after 20 years of evolution:

Form

The machine comes with two detachable parts. The first is a keyboard with a built-in trackball. The keyboard is big enough for typing but small enough to carry around comfortably, and it can even fold up.

The second part is a thin, lightweight, detachable screen that contains the CPU and memory chips, which are the true guts of the computer, as well as a tiny loudspeaker.

The screen measures 12 in. — small enough to be compact, but large enough to be read comfortably. You do not see even the slightest flicker. Also, the screen uses vivid color to help hold your attention, and it can offer charts and drawings in detail.

Functions

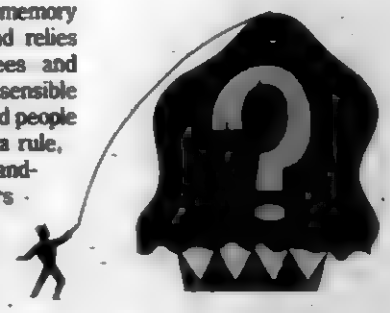
• **Access.** You fetch books and articles via phone wires or cellular radio. Throughput at the start of the TeleRead project was as high as 38.4K bit/sec. and now, after 20 years, can exceed 1M bit/sec. in many cases, Superfast speeds are possible even without fiber-optic wiring in homes, schools and libraries if telephone companies update their switching equipment.

• **Search.** You can use the trackball to work your way through a Macintosh-like menu. Your screen shows that you have millions of choices from books, newspapers, magazines and professional journals. But not to worry. You needn't structure your queries much at all. TRnet uses artificial intelligence to help you zoom in on your exact topic.

• **Knowledge collection and perusal.** You can read directly from the screen, open up another window and take notes or use the built-in speaker to listen to audio material (such as a speech you are reading). You can prop up your TeleReader screen on a table using a built-in stand, place the keyboard on your desk for extended work sessions or detach the screen for comfortable reading.

• **Knowledge retention.** The TeleReader stores at least a gigabyte of data, the equivalent of about 500,000 double-spaced, typewritten pages. You can hold thousands of books, and if you want to exchange data with friends, you can plug in memory cards. Because TeleRead relies on flat subscription fees and reaches a huge market, sensible authors do not really mind people sharing their books. As a rule, writers get paid more handsomely than when readers spent so much money on cardboard, paper and ink.

DAVID H. ROTHMAN



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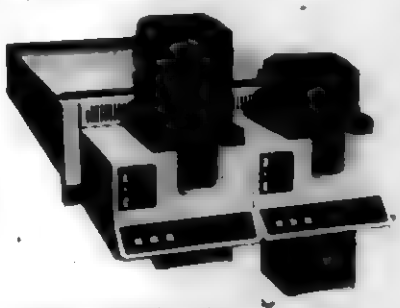

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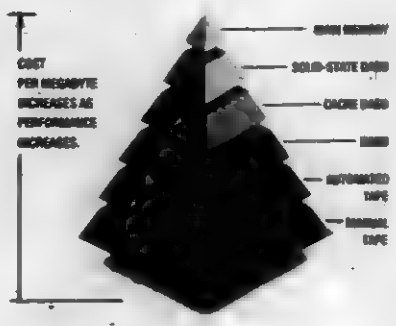

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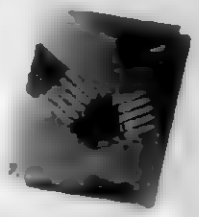

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EXECUTIVE TRACK

Elise J. Ross has been promoted to the post of corporate vice president at **The New York Times.** In her new position, Ross, 48, will be responsible for all information systems and communications for the newspaper company's information and publishing systems, including the development of IS and new technology strategies. Ross formerly served as vice president of systems and technology at the paper.

Campbell Travel is making **Money:** In fact, the Dallas-based corporate travel management firm is making him an IS consultant. **Denny Money**, formerly operations manager at food flavoring manufacturer The Van Tone Co., came aboard at Campbell earlier this year to help supply the firm with a competitive distinction by way of technology-driven, individual tailored customer services.

Cherri Musser is the new manager of the IS strategic business unit at **Texas Instruments, Inc.**'s Enterprise Systems Business. Musser, who joined TI in 1973 as a business applications programmer/analyst and has risen steadily through the IS ranks, takes on the IS stewardship of a unit focused on four areas of application development software: procurement, order processing, customer management and electronic data interchange. She is responsible for internal TI's Corporate Business Systems, comprising marketing, logistics, control and administration.

There's a new hand on DEC at **Computer Methods Corp.** The Livonia, Mich.-based software and consulting firm last week announced that **Ernest Ritterhaus** is its new divisional manager in charge of an operations group focused on consulting with the firm's Digital Equipment Corp.-based clients. A 14-year computer industry veteran, Ritterhaus most recently founded a software firm, Devenir Corp.

Imaging: It's a jungle in there

IS directors blazing trails in imaging are wise to learn from others' mistakes

BY NELL MARGOLIS
CW STAFF

J.D. Kay

Whoever said "What you don't know won't hurt you" never tried to implement a large-scale imaging project.

To the contrary, say information systems directors who have navigated the perils of the huge projects that are emerging as cornerstones of corporate re-engineering efforts at banks, insurance firms and other large companies: The first and perhaps worst mistake IS directors can make is to hare down the imaging trail kidding themselves that they're on familiar territory.

"Imaging as a pure technology has been around for a good while, so people tend to think they know their way around it," says George Hewlett, corporate vice president at New York Life Insurance Co. But they don't, Hewlett and others who have been there say.

Bungalow blues

New York Life recently whittled down to manageable size a plan to put virtually its entire business on an imaging platform; the company is striving toward its ambitious goal one finite business process at a time. "Nobody has died over this," Hewlett says, "but that doesn't mean the IS people in charge aren't taking a lot of antacid tablets."

The U.S. Patent Office so underestimated the technical complexities and time requirements of an early image-based automated patenting process that the schedule was pushed back three years, Assistant IS Commissioner Thomas Giammo said. The cost to the patent office? Time, money "and at least one career," says Wick Keating, vice president at Arlington, Va.-based systems integration firm American Management Systems, Inc., which was called in to consult on the project.

Second thoughts rarely come cheap on imaging turf, where "the average significant project starts out in the $1 million to $2 million range, and the sky is the limit," Keating notes.

But while there is no guaranteed safe route through the deceptively virgin territory, canny IS leaders can hedge their bets by heeding the cautionary tales that are filtering back from early explorers.

For starters, Hewlett says, "There's a need to recognize that the power curve for document imaging is simply not the same as it is for item processing." Not only does the bit count surge, he says, but the parameters change. "The forms aren't the same size. Suddenly, you're dealing with myriad colors, shapes, sizes, paper weights — and with myriad complexities, especially associated with indexing and recognition."

While the power demands are likely to exceed your expectations, the compatibility of the various hardware and software components lashed together into an imaging system are likely to fall short, warns Frederick Bauer, senior systems project administrator at Baltimore Gas & Electric Co. (BG&E). "Be wary of the word 'Open,'" he says. "Every vendor out there professes to have open systems, but when you get down to the nitty-gritty, they don't talk to each other."

Stumbling blocks

As part of a five-year re-engineering plan kicked off about 2½ years ago, BG&E recently committed to image some 200,000 pages of technical, procedural and business textual information critical to the operation of its Calvert Cliffs, Md., nuclear plant. Phase II, which will load drawings into the system, is next.

The Calvert Cliffs project stalled midstream, Bauer says, when emulation software selected partly on the basis of its alleged openness balked at communicating with the plant's extensive Novell, Inc. network. While bridging the communication gap did not add dollars to the utility's contract price, Bauer says, "it held up production for about three months. We knew going in that we'd probably run into some

Continued on page 83

When the going gets tough . . .

In imaging, as in all re-engineering activities, the thorniest problems are cultural rather than technological. As veteran management consultant Michael Hammer says, "The soft issues are the hard issues." And two of the hardest, IS heads agree, are the work-force cuts often triggered by work-process improvements and finger-pointing that can start when the virtually inevitable imaging project snafus set in.

A raft of imaging pioneers offer two rules of thumb: When it comes to staff cuts, act quickly, decisively and with constant communication; when it comes to blame, don't act at all. "If you don't reduce work force, you don't get the efficiencies that the new way of working was planned to attain," management consultant Rex M. Scott notes. "But you've got to be careful to do it in a way that leaves [the layoff survivors] excited and not preoccupied with fear for their jobs."

Scott had to walk that narrow line recently when, as director of operations and chief financial officer at Rocky Mount, N.C.-based Unity Bank & Trust Co., he helped spearhead the $140 million bank's installation of a check processing imaging system. "We told our employees what we were doing early, we told them why, and we told them everything at once," he said. "That helps."

Reticence, even undertaken with the best diplomatic intentions, can go hideously awry, American Management Systems' Wick Keating added: "One company whose name I can't reveal geared up an imaging team and didn't tell them that the goal of the project they were working on was a 40% reduction of their own ranks." The news leaked anyway, Keating said. "You can just imagine how hard everyone was working to make sure the project got implemented," he added.

NELL MARGOLIS

Chase cuts over to Metrotech

New York bank consolidates three IS facilities into single Brooklyn site

BY THOMAS HOFFMAN
CW STAFF

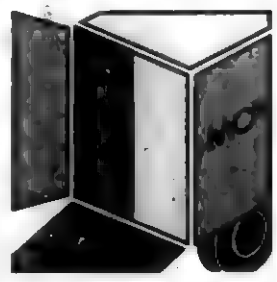
NEW YORK — A data center grows in Brooklyn.

In an effort to save money on prime Manhattan real estate and to consolidate its back-office operations, Chase Manhattan Bank NA is in the midst of a $500 million consolidation project.

The $97 billion bank is currently moving the bulk of its back-office data center operations — such as domestic and international money transfer and check processing — from two sites in Manhattan and one on Long Island to a new facility in Brooklyn. By September, the bank said, the facility will house 7,000 Chase employees.

The new facility is called Metrotech. It's the brainchild of New York City officials who are desperate to keep the remainder of large New York-based businesses from moving their operations out of the city to areas in which real estate is less expensive. The Security Industries Automation Corp. is also in the process of moving into the Metrotech site.

Consolidation is nothing new to Chase, the nation's fifth-largest bank (ranked by assets). Chase's parent company, Chase Manhattan Corp., has consolidated 100 data centers to 58 sites during the past two years, according to a report issued earlier this year by Salomon Brothers, Inc.



The report said the consolidations have saved Chase $29 million annually, with further consolidations, such as Metrotech, expected to double those savings within two years.

Chase executives declined to project cost savings for the consolidation efforts related to Metrotech. However, Anthony Minko, vice president of telecommunications at Chase and the Metrotech telecom site manager, said the firm expects major productivity gains to result from the new networking equipment being installed.

Chase's Metrotech environment will consist of 62 16M-bit IBM Token Ring local-area networks with an Ethernet backbone. At the heart of Metrotech is AT&T's Systemax PDS, a complex yet flexible wiring hub that supports all of Chase's voice and data communications.

Jerry Cafaro, AT&T support manager for the Chase project, said the Systemax PDS installation at Metrotech is AT&T's largest to date. Minko said the AT&T Systemax PDS will provide Chase with a common link among its mainframes throughout the world.

To date, the bank has installed one IBM Enterprise System/9000 Model 900 mainframe and has funding for one more this year and space for three more mainframes in the future. Chase is also installing a Unisys Corp. 2200/900 mainframe to support check processing, several hundred Digital Equipment Corp. VAX minicomputers and several Storage Technology Corp. ACS 4400 automated tape library subsystems.

Over Memorial Day weekend, Chase was scheduled to move its data center from New York Plaza in Manhattan to Metrotech. Uni-Data and Communications, Inc., a Flushing, N.Y., systems integrator, has been contracted to install Chase's hardware in Metrotech during a one-year migration.

According to Daniel G. Hoffman, vice president of sales and marketing at Uni-Data, Chase's equipment at Metrotech will mirror current Chase technology at the bank's offices in Manhattan and at its Lake Success, N.Y., data center.

The command center is expected to be production-ready by September. Additional equipment to support the command center will be installed in August. Minko said the facility is configured to eventually support up to 11,800 workstation users.

Minko noted that Chase considered moving these operations to New Jersey until four years ago but was persuaded by city officials to remain in New York. "Besides, Chase has been in New York for 200 years," he added.

TI launches program for IS personnel

DALLAS — Amid ever-increasing demand for improved information systems support staff, Texas Instruments, Inc. is making a move on the supply side.

TI's Employee Development Center, launched in April, is a pilot program aimed at making sure that IS personnel get all the career training and advising they can soak up — and, importantly, that they get a good deal of it from their department and division managers.

Under a senior adviser program that is a formal part of the pilot, managers turn mentor, advising staff members on topics likely to clear and widen career paths, Development Center head Sue Hensley said.

While actual senior advisory meetings are held in confidence, Hensley said, typical discussions "include progress vs. self-expectation, technical resources available, technical trends, organizational cultures, policy and procedures and training recommendations."

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Imaging: It's a jungle in there

CONTINUED FROM PAGE 81

problems, but we didn't know it would take this long."

In fact, Bauer adds, the utilities are drawing an ironic moral from watching one another's trials and errors in the imaging arena: "Those that have a network already are at a disadvantage."

The First National Bank of Chicago, an early adopter of imaging for both check processing and commercial documents, learned the hard way that processing images puts unique demands on an existing computer infrastructure.

"We first tried to put documentation on the mainframe using an early version of IBM's [ImagePlus] system," says Gamil Sakla, assistant vice president at the bank. "But it clobbered the CICS system," he adds. "You can't mix transaction processing and imaging."

Tough advice though it is, imaging pioneers widely agree that the best guide to implementing a major imaging project may be that which you learn from your own early mistakes. Vicarious experience is a less expensive and harrowing alternative — help yourself to a heaping portion, IS leaders recommend:

- "The criticality of an up-front feasibility study cannot be stressed enough," says Mark Olson, deputy vice president of student financial and information systems at Columbia University in New York, now shepherding the sprawling 15-college university through an effort to put some 70,000 financial forms into an imaging system expected to be up and running by Christmas. Columbia spent eight months on vendor selection alone.

And don't short training and staffing requirements as you draw your blueprint, Olson adds: Many have, and many have paid.

- "Interview some of your vendors' other customers," Bauer says. And kick the tires, early and often. "I would insist on an on-site demo of every piece of equipment you buy," he says. "Make the vendors prove not just that it works, but that it works in your context, to the requirements of your plan."
- Make sure your first attempt is finite and noncritical, Hewlett cautions. No one at your company will thank you for having a learning experience on mission-critical turf or time.

Above all, Hewlett and others say, be mindful at all times of the fact that imaging is not an evolutionary technology so much as it is a revolutionary corporate cultural change. "Don't expect to get rid of paper early in the game," Hewlett says. "That won't happen. It can't. The biggest question we still get asked by people working with our new imaging system is, 'When can we print it?' "

Midwest bureau chief Ellis Booker contributed to this story.

Why ask why?

Don't assume you need a professional systems integration firm to see you through an imaging attempt, says Frederick Bauer, senior systems project administrator at Baltimore Gas & Electric. And don't assume you don't, either.

"This is a highly individual decision," Bauer says. "If you're modeling on another firm's experience, don't ask whether they used an integrator. Ask why." BG&E, for instance, partnered with American Management Systems on the first phase of the Calvert Cliffs project. For Phase II, Bauer says, the firm plans to leverage its Phase I experience and proceed ahead without outside integration aid.

If your own business goals and IS capability in fact lead you to reach for an ally, notes Mark Olson, deputy vice president of student financial and information systems at Columbia University, don't run right to a professional services firm. "See what [your imaging hardware and software vendors] have to offer by way of systems integration services," he says. Vendors are scrambling to establish themselves as ace service providers and might do a lot to add you to their success stories. What's more, Olson says, they made your equipment, so they know where the bones are buried — and where the potential lies.

NELL MARGOLIS

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No rest for the weary? Time off doesn't always equal vacation

BY JILL VITIELLO
SPECIAL TO CW

It's July 6. Have you planned your summer vacation yet? If not, you might want to consider taking off a full week or even two. Really, the boss insists.

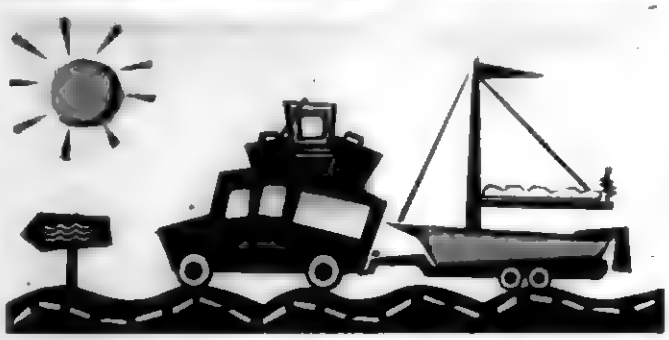
Many forward-thinking information systems managers are starting to see the health and corporate benefits of well-rested, well-balanced employees.

"Time off is an important part of our attitude about a healthy work style," says Nick Barth, president of Armor Systems, Inc. in Maitland, Fla.

This attitude comes as a change for a work culture that for many years prided itself on long hours, bleary eyes and stacked-up vacation time.

"As a general rule, computer people like to work, but overwork is detrimental to your health," says Harold A. Sample, data processing manager at Amerada Hess Corp. in Jackson, Miss. "We've all seen those walking zombies who never take their vacation time."

Some companies permit employees to store up unused vacation time from one year and carry it over to the next, thereby building up allowable days off. However, many IS managers now frown on that practice and encourage time off when time is due. "Our employees work hard and need to take their vacations when due," Barth says.



This change in attitude has a lot to do with the new pressures implicit in the job. IS has always been an intense environment, but today that's more true than ever.

"As a rule, IS jobs are high-stress," says Richard Wonder, president of the New York/New Jersey region of Robert Half International, Inc. in New York. "Add to that the fact that recessionary times put additional pressures on IS professionals, and it's not hard to see why IS employees really need to take several consecutive vacation days."

The trend toward shrinking IS departments, too, has forced many IS professionals to feel they need to take on extra tasks and work even longer hours.

Although just about everyone acknowledges the benefits of vacation time, it's tough to get IS professionals to truly take a break.

In fact, the trend for many IS people today is to skip out for a couple of days, not a whole week.

These people favor shorter, more frequent breaks, saying it gives them time with their families without making them fall behind at the office, Wonder says.

"Some families are so busy they hardly ever see each other unless they pack up their bags and head off together. They look forward to and cherish these times together," says Peter W. Mason, a travel marketing expert affiliated with the Travel and Tourism Research Association.

Others, like Sharon Moses, systems manager at Plochman, Inc. in Chicago, are tacking vacation days onto business trips, thereby saving themselves airfare. Moses recently visited family members in California after a business trip there.

In fact, spending time with family is the No. 1 reason people give for wanting to take time away from the office.

Have PC, will travel

However, many IS workers admit that the work doesn't stop even while they are away from the office. "Actually, IS people can do a lot of our problem-solving work in our heads. Even when we're relaxing, our minds are working," Sample says.

Ironically, the very people who enable others to tote their offices anywhere — IS employees — are the same people who never get a break from the office. In addition, because offices are so portable, the lines of distinction between work and leisure have blurred.

Most who are out of the office for even a few days will check their voice mail and electronic mail. They leave phone numbers where they can be reached in emergencies, and they solve problems or handle users' questions over the telephone or with remote dial-up access from their laptops to the company's computers.

"With my computer, modem and fax, I can literally take my office with me on vacation," says James E. Bell, director of IS at the Colonial Williamsburg Foundation in Williamsburg, Va.

Most everyone agrees that interruptions are inevitable; they simply come with the territory.

Of course, not all IS professionals stay accessible while away from the office. For example, many at Atlantic Electric Co. in Pleasantville, N.J., choose true getaways such as fishing trips, says Michael G. Barnes, director of technical services.

However you opt to do it, taking time away from the routine of daily pressures improves job performance in the long run.

"We all need a break in the action," says Alan Mis, director of IS at American Steamship Co. in Buffalo, N.Y. "After a vacation, people return to work refreshed, with new ideas and increased energy."

Sound good? Then what are you waiting for?

Vitiello is a speech writer and freelance writer based in East Brunswick, N.J.

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INDUSTRY CURRENTS

Mail-order firms deliver great package

BY EMILY LEINFUSS
SPECIAL TO CW

They swim in an Olympic-size pool at lunchtime, play tennis after work and buy clothes at 40% off. No, they're not fashion models; they're the well-treated information systems employees at Lands' End Corp. in Dodgeville, Wis.

Lands' End, which houses a $6 million fitness facility on its grounds, is not the only mail-order catalog company to offer such perks. Mail-order firms — mostly family-run operations — are famous for their training policies, loyalty to their employees and, most recently, investments in technology.

"Mail-order companies are offering some exciting and innovative technical challenges, good work environments and a fair amount of investment in technology because the business relies so heavily on order processing and data collection," says Beverly Lieberman, president of executive search firm Halbrecht/Lieberman Associates in Stamford, Conn.

The name of the game in mail order is quality merchandise at low cost, which makes low margins an absolute necessity. "The only way to do that is by automating every aspect of the business," says Richard Davis, vice president of MIS at Popular Club Plan in Garfield, N.J. "Mail order lives and breathes DP," he says, adding that the industry is starting to realize that "it couldn't survive without it."

That was not always the case. The family-run origins of mail order kept innovative technology to a minimum, and the industry is now playing a game of catch-up with more sophisticated, highly automated industries.

Booming business is also putting the heat on for more efficient ways to keep up with orders.

To that end, many companies — including Spiegel, Inc. in Westmont, Ill. — are moving to client/server architectures with relational databases and distributed platforms.

Just-in-time inventory practices through electronic data interchange are also growing popular, says Nick Iozzo, technical services manager at Spiegel.

Most firms do not use much packaged software, so there are also lots of opportunities to design and write large application systems from soup to nuts.

Inexperience welcome

But what makes mail order stand out from other industries — such as insurance and banking, for example — is that the inexperienced need not shy away from applying.

"To get into [banking], you have to have all the credentials already," Iozzo says. "Mail-order companies allow you to grow. We offer all kinds of training. When you get in on the ground floor, you are allowed to experiment — even to make mistakes."

Iozzo gained invaluable technical savvy putting together a local-area network-based desktop publishing system for Spiegel's catalog production.

Mark Norman, a personal computer analyst at Lillian Vernon Corp. in Mount Vernon, N.Y., had a similar experience.

Norman says he probably would not have been able to learn about the LAN environment were it not for a recent project in which he was given full responsibility for developing and implementing a LAN and a distributed database.

Different backgrounds

In addition to getting good training, people don't necessarily have to have a strong technical background to get into IS in this industry. "Mail-order companies put the emphasis on quality people and are not averse to hiring hybrids — people who have a combination of technical skills and solid business know-how," says Chick Bisberg, president of Two-Party Systems, Inc., a recruitment firm in Livingston, N.J.

Even if you come in with just the technical experience, you're bound to pick up on the business side. The nature of mail order forces IS people to become less specialized and gain a more broad-based understanding of the business.

Frank Buettner, director of computer services at Lands' End, says he had no idea of the "big picture" when he worked in the insurance industry earlier in his career. But at Lands' End, Buettner has been involved with multiple areas of the business, developing inventory, purchasing, forecasting, marketing and decision support systems. "Now I understand the intricacies of each and that every department must work together," he adds.

Buettner says he likes to look at all the departments as a whole and wants to get involved in corporate strategic planning. He feels he can realize this goal because Lands' End likes to hire and promote from within, and he has seen technical people move into general business areas at the firm.

Not all need apply

But there isn't room for everyone who might like to take advantage of the mail-order environment. While the overall industry is healthy — which bodes well for IS disciplines and careers — it does not offer the sheer volume of employment of larger industries such as financial services or insurance, Bisberg says.

Secondly, the opportunities are best for entry- or lower level programmers, designers, and systems analysts.

The trick to a career in mail order is to get in on the ground floor or at the programming or system design level because the general thrust in the industry is to emphasize training and hiring from within.

"We mainly hire entry-level people and train them. Occasionally we go outside and hire for certain experience when we need it," says Jim Holly, manager of systems and programming at Peoria, Ill.-based Foster & Gallagher, Inc., a firm that owns a number of mail-order concerns.

Leinfuss is a free-lance writer based in Sarasota, Fla.

Stamp of approval

None of the hiring managers interviewed say they look for directly related experience when hiring in the mail-order industry. When hiring for jobs such as application programmer and project leader, broad business skills are a plus, and mail-order experience is not usually a requirement, says Richard Davis, president of MIS at Popular Club Plan.

For example, when Davis puts an ad in the paper or uses an agency, he never asks for prior mail-order experience. "I look for whether they have inventory control experience, accounts receivable experience, customer service experience," he says.

Nick Iozzo, technical services manager at Spiegel, says he looks for people with technical skills and a good business sense. "You have to have some business sense to interpret what users want," he says.

EMILY LEINFUSS

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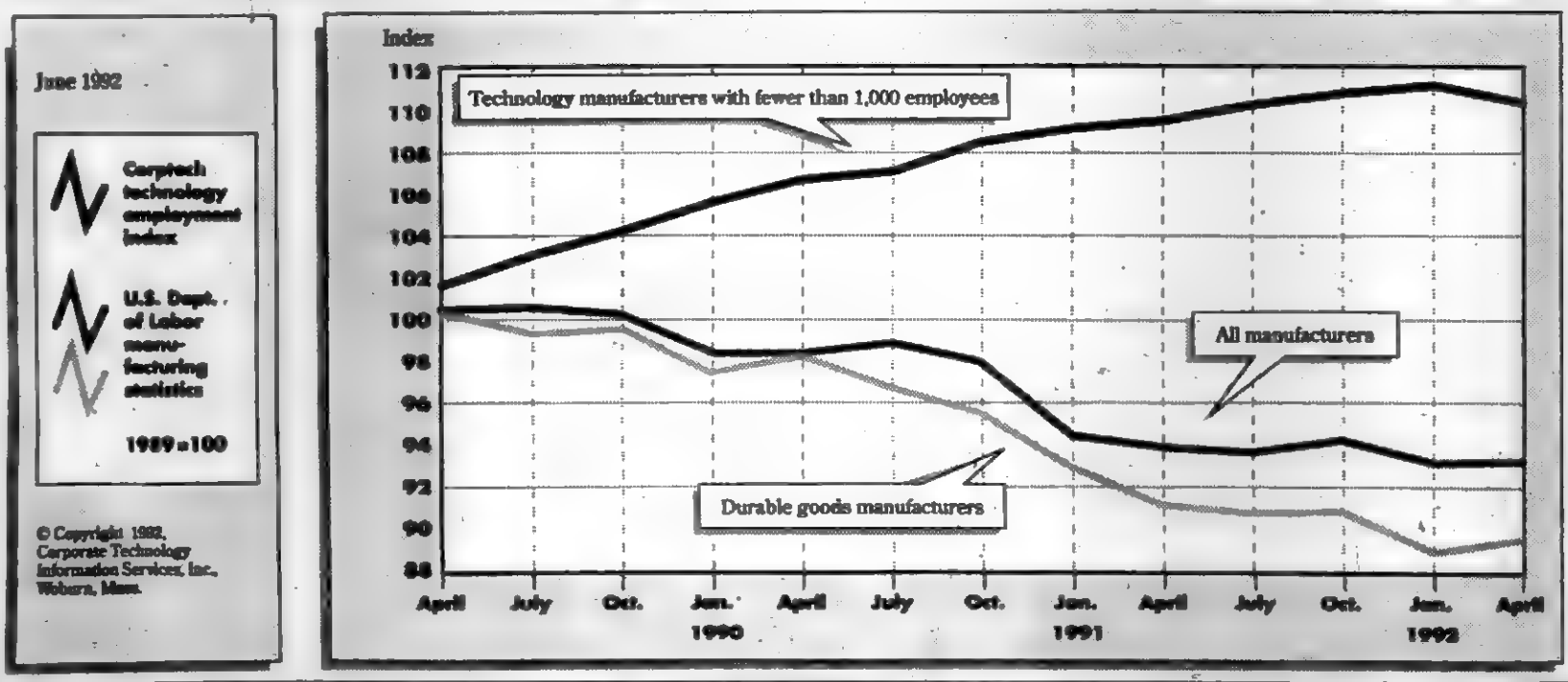
Technology manufacturers may be experiencing a slight downturn in 1992, but they are still way in front of all other manufacturers



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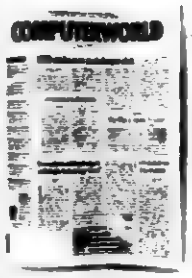

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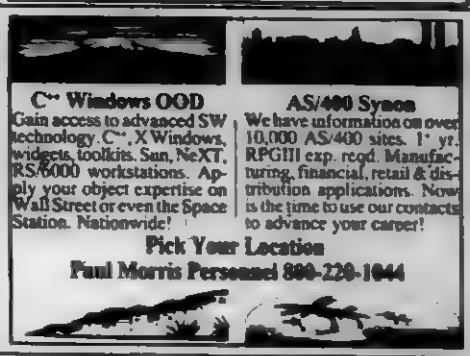

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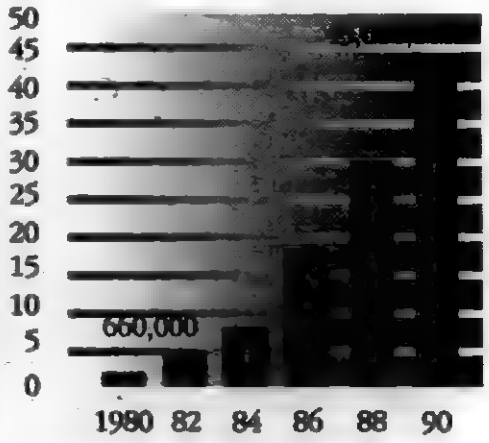
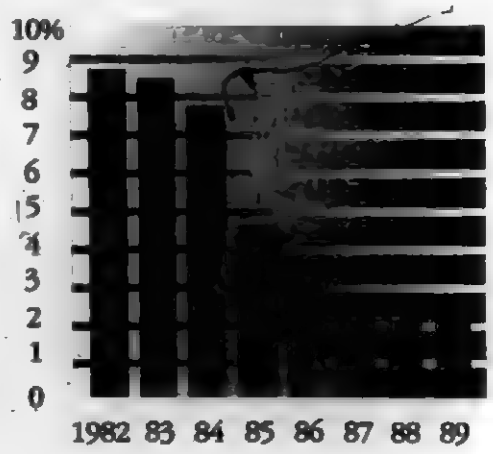


Fewer campus freshman are choosing computer careers**



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IBM (all but PC)	hardware	488,965
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medium-scale computers	67,325
small-scale computers	46,945
personal computers	73,925
technical workstations	30,943
Software Vendor	160,264
for large-scale systems	71,152
for medium-scale systems	81,799
for small-scale systems	72,212
for personal computers	66,366
for technical workstations	26,022
Non-CPU Computer Products Manufacturer	34,311
VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	52,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	35,940
Communications Systems	30,264
Public Utilities	43,687
Transportation	49,151
Wholesale/Retail Trade	82,674
Education	91,073

SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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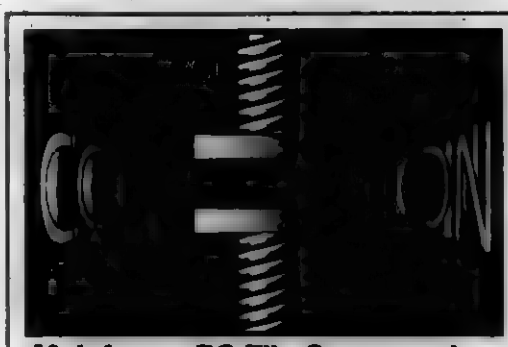

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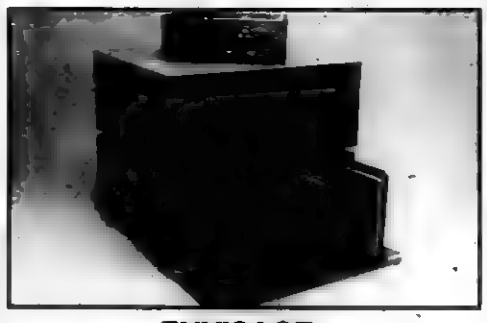

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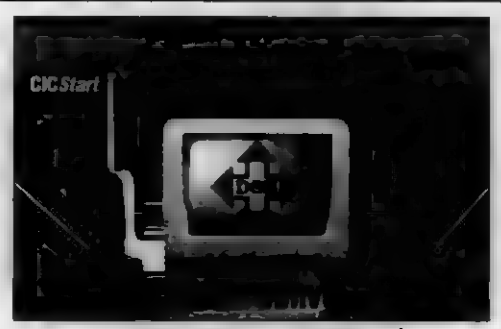

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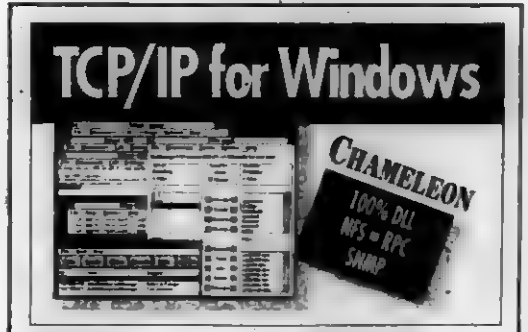

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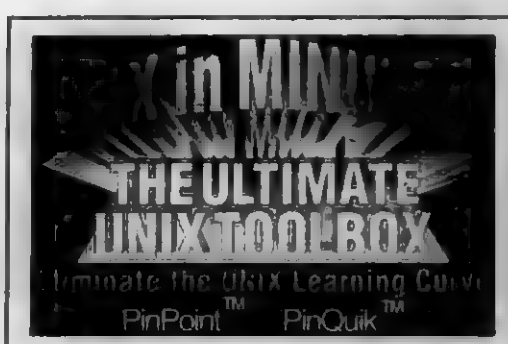

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PC project managers pack punch

BY DANIEL J. LYONS
SPECIAL TO CW

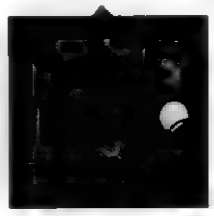
The huge success of Microsoft Corp.'s Windows has sparked new interest in personal computer-based project management packages.

In the past, these PC programs were too cumbersome and complicated for many mainstream users. But thanks to snazzy Windows interfaces, a wider audience is emerging.

In 1991, the market for low-end project management programs priced under $1,500 grew 40%, according to Mary Conti Loffredo, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm. Sales of high-end products, she says, shrank 15%.

The reason: Many traditional high-end features are now showing up on the easier to use, less expensive PC products. For example, most PC project managers priced between $600 and $900 can now handle several thousand activities per project making them as powerful as products costing several thousand dollars.

Computer Associates International, Inc. in Islandia, N.Y., ported CA-SuperProject 2.0 to Windows late last year. The $895 package costs more than rival Microsoft's Project for Windows ($695) and Time Line ($699) from Symantec Corp. in Cupertino, Calif.



But, according to analysts, the CA package is more powerful, offering multilevel security, a variable use-over-time function and tight links to midrange and mainframe-based platforms.

Vendors are also focusing on making products easier to use. Microsoft's Project for Windows 3.0, for example, offers a feature called Planning Wizards, which guide a user interactively through a variety of scenarios. CA-SuperProject 2.0 has a Beginner Mode for simple jobs and an Advanced Planning Mode for more complicated work.

Other advanced features now found in PC packages include flexible reporting, high-quality graphic output, cost-tracking and sophisticated resource management capabilities.

However, despite the trend toward ease of use, consultants say project management packages are still far from simple.

"Everyone's buying scheduling tools even though they have no idea of how to do things," says Gopal Kapur, president of The Center for Project Management, a consulting and software development firm in San Ramon, Calif. "Then they blame the scheduling tool for not doing the job for them."

Kapur and others agree that it's wise to get users classroom training or help from experienced trainers or consultants.

Critics also warn that even though low-end programs theoretically can handle heavy loads, they can be unbearably slow.

What to look for:

- Maximum activities per project.
- Learning curve.
- Network/multiuser support.
- Integration with other applications.
- Chart types available.
- Environments supported.
- Scheduling increments.
- Resource management facilities.
- Cost tracking.
- Reporting and communication features.

Shopping list

Consultants offer the following tips for buyers of project management software:

- **Match software to the job.** In construction projects, for instance, simple resource management facilities will suffice. In contrast, a software development project needs to factor in the skills of individuals, so resource management is a must.
- **Don't forget existing environments.** A company that uses, say, Microsoft's Word and Excel, might do best to choose Project for Windows, which has tight ties to those products. But if a company needs to move data between multiple platforms such as minicomputers and PCs, CA-SuperProject, which runs on DOS, Windows and Digital Equipment Corp. VAXs, may be a better choice.
- **Don't buy too much power.** Consultants warn that using a product like Open Plan 4.0 from Welcom Technology, Inc. in Houston for the average business application is like using a cannon to shoot pigeons. Depending on the platform, this package can cost as much as $180,000.

"If I were a general contractor and had lots of subcontractors and lots of accounting for time, then I could see using a higher end package," says Bob Carlson, senior staff member at MCI Telecommunications in Sacramento, Calif. "But for little ad hoc projects, you don't need them."

Carlson recently acquired Protracs Professional 2.0 ($89.95) from Applied Microsystems, Inc. in Atlanta. "Sure there are things that it can't do," he says. "But I don't know what they are, and I don't care."

Lyons is an Ann Arbor, Mich.-based free-lance writer.

Four can be better than one

With more people doing project management, some firms find it makes sense to use several packages. Sverdrup Corp., an architectural, engineering and construction firm in St. Louis, uses four packages. The reason, says Bill Woloch, a project manager in the firm's Falls Church, Va., office, is simple: Different projects require different tools.

For instance, Sverdrup uses Micro-Frame Program Manager, an $11,000 program from Micro-Frame Technologies, Inc. in Ontario, Calif., to the company's corporate reporting system. For big projects, such as construction of baseball stadiums, Sverdrup uses Primavera Project Planner, a $4,000 package from Primavera Systems, Inc. in Bala Cynwyd, Pa.

For smaller jobs, Sverdrup turns to Symantec's Time Line, which Woloch says is much easier to use, and management uses Symantec's On Target ($399). "Primavera is very powerful, but it's a complicated program, and there's a steep learning curve. So you try to use it only when you have to. It's like the Thompson submachine gun of project management. If you can do the job with a .22, why use the Thompson?"

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The BoCoEx index on used computers

Closing prices report for the week ending June 26, 1992

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PS/2 Model 35SX	$1,325	$1,500	$800
PS/2 Model 55SX	$1,000	$1,300	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$2,300	$3,000	$1,500
PS/2 Model 80	$1,600	$1,800	$1,100
PS/2 Model 95	$4,800	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$550	$650	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$2,000	$2,450	$2,200
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SE	$750	$875	$600
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Andersen Consulting 62
AT&T Business Communications Services 54-55

B I Moyle Associates, Inc. 53
Bachman C3
Broderick Data Systems 69

Cincom Systems 42
CM Ventures 66
Compaq Computer Corp 44-47
Computer Associates 40-41
CW Circulation 68
CW Editorial Calendar 70-71
CW Lotus Notes Awards 80
CW Marketing 49
CW Recruitment 10, 15, 66, 79

Data General 61
Dell Computer 25-33
Digital Equipment Corp 76/77

EDS 82-83

Hewlett-Packard 18-19

Information Builders 13
Informix 17

Micro Focus 11
Microsoft 38, 64-65
Motorola 73-75
Multi-Tech Systems 15

Novell 22-23

Okidata 10
Oracle Corp 5

Software Engineering of America C4
Sun Microsystems 36-37
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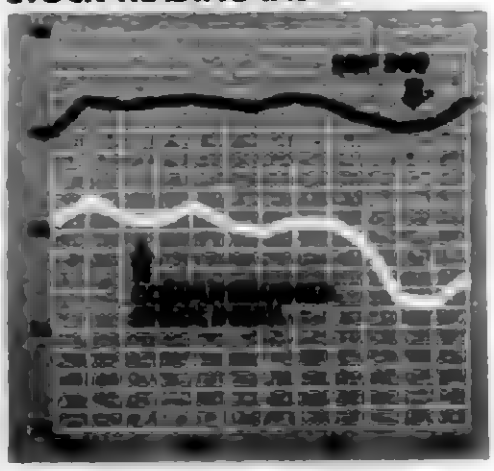

Industry Almanac

NEW COVERAGE

Electronic Data Systems Corp. Shearson Lehman Brothers, Inc. initiated coverage of EDS, which trades as General Motors Corp. Class E stock (GME), with a rating of outperform. The company's non-General Motors business topped $3.7 billion in 1991, and Shearson expects it to grow 20% to 25% this year. The outsourcing market in which EDS competes racked up sales of $106 billion last year and could grow more than 15% annually during the next three years, according to David Readerman, a Shearson analyst. The earnings outlook for the company is strong, as EDS controls some of the largest outsourcing contracts signed to date, he said, predicting that EDS will sign new deals this year worth a total of approximately $6 billion.

Lotus Development Corp. Prudential Securities, Inc. recently tagged Lotus (LOTS) a buy but cautioned that the stock is risky right now. Lotus is the dominant spreadsheet supplier, but it is also entering fast-growing, competitive markets, said Gibbs Moody, a Prudential analyst. However, the company's cross-platform strategy should help protect its spreadsheet flank, he said. Groupware, which contributed $41 million to Lotus' 1991 total sales of $829 million, could represent more than $300 million in revenue for the company by 1994, according to Moody. Lotus will inevitably go up against **Microsoft Corp.** (MSFT) and **Borland International, Inc.** (BORL) in the groupware ring, but Lotus has two years of experience behind it and faces little competition right now, he added.

RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Dell Computer Corp.** (Alex. Brown & Sons, Inc.). Dell's (DELL) current market share-capture strategy and its return-on-sales goal of 5% to 6% cannot be achieved simultaneously. Profit projections for the 1993 and 1994 fiscal years were cut, but sales expectations have increased. Recent products announced by **Compaq Computer Corp.** (CPQ) should motivate Dell to focus more on market share goals instead of its operating model. Dell will likely try to rev up revenue momentum with Gemini, a low-end product line priced 10% to 20% below Compaq's latest offerings. Gemini boxes are expected out soon.

LISA DAVIDSON and KIM S. NASH

Computerworld Weekly Stock Ticker

CLOSING PRICES THURSDAY, JULY 2, 1992

TOP PERCENT GAINERS

Antel Communication Corp	44 44
Information Resources (L)	31 33
Cambex Corp	31 11
Data Switch Corp	30 00
Octel Communications Corp	22 45
Dataram Corp	20 21
Oracle Corp *	18 42
Group I Software	17 74

TOP PERCENT LOSERS

Easel Corp	-59 76
Quarterdeck Office Sys (L)	-53 41
Network General	-50 00
Software Publishing Corp	-30 39
Sequoia Systems Inc (L)	-28 57
Mentor Graphics (L)	-28 57
ALCorp	-21 05
Microcom Inc	-18 75

TOP DOLLAR GAINERS

Matsushita Electronics	6 50
Information Resources (L)	5 88
Progress Software Corp	5 50
Policy Management Sys	4 13
Octel Communications Corp	4 13
Cambex Corp	3 50
Novell Inc *	3 25
Southwestern Bell Corp	3 13

TOP DOLLAR LOSERS

Easel Corp	-12 25
Network General	-9 25
Quarterdeck Office Sys (L)	-5 88
Software Publishing Corp	-3 88
Mentor Graphics (L)	-3 00
Filenet Corp	-2 75
Sequoia Systems Inc (L)	-2 50
Sungard Data Systems (H)	-2 25

Exch	52-Week High	52-Week Low		July 2 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 1.71%**			
OTC	15 00	6 75	3 COM Corp *	10 50	-0 25	-2 33
NYS	65 75	56 25	American Info Techs Corp *	64 00	1 13	1 79
NYS	44 63	32 88	AT&T *	43 88	2 00	4 78
OTC	4 25	1 00	Antel Communication Corp	1 63	0 50	44 44
NYS	50 63	40 25	Bell Atlantic Corp	44 75	0 25	0 56
NYS	53 63	43 38	Bellsouth Corp	49 75	0 88	1 79
NYS	7 63	4 63	Bolt Beranek & Newman	4 63	-0 13	-2 63
NYS	65 88	36 63	Cabletron Systems	48 50	1 50	3 19
OTC	31 00	12 75	Chipcom Corp	47 75	2 88	6 41
OTC	48 50	15 38	Cisco Systems Inc	47 75	1 13	2 42
OTC	35 25	12 75	Compression Labs Inc	13 00	-0 38	-2 80
OTC	3 38	0 88	Data Switch Corp	1 63	0 38	30 00
NYS	29 63	12 38	Digital Comm Assoc *	17 75	-0 25	-1 39
OTC	17 75	8 50	Digital Systems Int'l Inc	8 75	-0 25	-2 78
OTC	7 38	3 63	DSC Communications	4 63	0 00	0 00
OTC	10 88	4 75	Fibronics Int'l Inc	5 00	-0 13	-2 44
OTC	37 50	13 75	Filenet Corp	19 50	-2 75	-12 36
OTC	3 38	1 13	Gandalf Technologies Inc	2 56	-0 06	-2 38
OTC	2 50	0 88	Gateway Communications (L)	1 00	0 13	14 29
NYS	5 50	2 13	General Datacomm Inds	3 63	0 13	3 57
ASE	5 88	0 50	Go Video	2 75	0 00	0 00
NYS	35 00	28 13	GTE Corp *	32 00	0 25	0 79
NYS	70 63	50 00	ITT Corp	64 88	0 75	1 17
OTC	36 13	25 25	MCI Communications Corp	32 25	0 13	0 39
OTC	14 50	6 50	Microcom Inc	6 50	-1 50	-18 75
NYS	18 25	8 63	Network Equipment Tech *	10 63	-0 75	-6 59
OTC	25 50	6 75	Network General	9 25	-9 25	-50 00
OTC	20 00	8 50	Network Systems Corp	10 88	1 00	10 13
OTC	17 88	5 50	Newbridge Networks Corp	16 13	-0 13	-0 77
NYS	49 25	34 13	Northern Telecom Ltd *	37 00	1 50	4 23
OTC	85 00	23 88	Novell Inc *	53 75	3 25	6 44
NYS	82 38	69 13	Wynex Corp *	79 38	2 63	3 42
OTC	37 50	16 50	Octel Communications Corp	22 50	4 13	22 45
OTC	9 88	4 50	Penril Data Comm Networks	4 50	-0 38	-7 69
OTC	53 00	23 00	Picturetel Corp	25 25	-0 38	-1 46
OTC	18 75	10 00	Proteon Inc	11 00	0 25	2 33
NYS	24 00	11 63	Scientific Atlanta Inc	23 38	0 88	3 89
NYS	65 00	51 50	Southwestern Bell Corp	62 88	3 13	5 23
NYS	30 00	20 75	Sprint Corp	21 88	0 38	1 74
OTC	36 25	14 25	Synoptics Communications	30 25	0 75	2 54
NYS	38 88	32 88	U S West Inc	36 88	0 88	2 43
OTC	41 25	21 25	Wellfleet Communications	29 25	1 00	3 54
PC and Workstations			**Up 3.40%**			
OTC	15 25	4 75	Advanced Logic Research (L)	5 25	0 50	10 53
OTC	70 00	41 75	Apple Computer Inc *	46 25	0 75	1 65
OTC	32 25	12 00	AST Research Inc * (L)	13 88	1 00	7 77
NYS	19 25	9 50	Commodore Int'l (L)	10 13	0 63	6 58
NYS	37 50	22 13	Compaq Computer Corp *	24 63	1 00	4 23
OTC	29 00	13 91	Dell Computer Corp	17 75	0 88	5 19
OTC	7 75	3 00	Everex Systems Inc	3 25	-0 13	-3 70
NYS	34 00	21 25	Harris Corp	27 75	0 63	2 30
NYS	85 00	44 63	Hewlett-Packard Co *	66 88	-1 50	-2 19
OTC	16 50	7 38	Mips Computer Systems	8 75	0 13	1 45
NYS	29 75	14 00	Silicon Graphics	17 50	1 13	6 87
OTC	35 88	20 75	Sun Microsystems Inc *	26 13	3 00	12 97
NYS	31 25	23 25	Tandy Corp *	23 25	-1 00	-4 12
NYS	11 13	5 13	Zenith Electronics	7 50	0 25	3 45
OTC	25 50	5 25	Zeos International Ltd	6 25	-0 13	-1 96
Large Systems			**Off 1.61%**			
ASE	20 63	11 63	Amdahl Corp *	17 63	1 00	6 02
NYS	14 00	7 50	Control Data Corp	13 75	0 00	0 00
NYS	16 38	6 88	Convex Computer	6 88	-0 50	-6 78
OTC	19 63	2 88	Cray Computer	3 13	0 00	0 00
NYS	52 25	27 38	Cray Research Inc * (L)	29 00	1 38	4 98
NYS	22 50	7 13	Data General Corp	7 63	-0 13	-1 61
NYS	71 75	33 25	Digital Equipment Corp * (L)	33 63	-0 88	-2 54
NYS	106 38	81 63	IBM *	96 88	-0 38	-0 39
NYS	127 50	93 50	Matsushita Electronics	108 50	6 50	6 31
OTC	19 75	9 50	Pyramid Technology	10 75	-0 50	-4 44
OTC	17 88	7 50	Sequent Computer Sys	15 13	0 25	1 68
OTC	16 38	6 25	Sequoia Systems Inc (L)	6 25	-2 50	-28 57
NYS	54 25	28 75	Stratus Computer Inc *	43 00	1 88	4 56
NYS	15 13	9 50	Tandem Computers Inc *	11 25	-1 00	-8 16
OTC	3 44	1 13	Tandon Corp	1 31	0 06	5 04
NYS	11 76	3 38	Unisys Corp *	8 75	0 00	0 00
ASE	7 50	2 00	Wang Labs Inc (b)*	3 50	-0 13	-3 45
Software			**Off 0.09%**			
OTC	68 50	37 50	Adobe Systems Inc	44 75	2 50	5 92
OTC	13 25	3 50	Ai Corp	3 75	-1 00	-21 05
OTC	45 50	11 50	Aldus Corp	13 00	0 88	7 22
OTC	19 75	10 13	American Software Inc	12 88	0 63	5 10
OTC	20 00	7 50	Ask Computer Systems	11 75	0 75	6 82
OTC	57 25	23 25	Autodesk Inc	37 13	0 63	1 71
OTC	37 75	8 25	Bachman Info Systems	10 50	1 50	16 67
OTC	42 50	26 00	BGS Systems Inc	36 75	0 50	1 38
OTC	79 00	37 25	BMC Software Inc	42 00	2 38	5 99
OTC	20 50	9 00	Boole & Babbage	17 00	-0 13	-0 73
OTC	86 75	37 75	Borland Int'l Inc * (L)	41 00	1 38	3 47
OTC	11 25	4 38	CE Software (L)	4 50	-0 13	-2 70
ASE	14 38	6 50	Cheyenne Software Inc	12 13	0 38	3 19
OTC	20 38	7 25	Cognos Inc	9 13	1 00	12 31
NYS	17 00	7 50	Computer Associates *	12 00	0 88	7 87
OTC	21 50	9 25	Cornerstone Inc	10 25	0 25	2 50
OTC	47 88	8 25	Easel Corp	8 25	-12 25	-59 76
OTC	19 50	9 25	Goal Systems Int'l	16 88	1 13	7 14
OTC	25 50	11 50	Group I Software	18 25	2 75	17 74
OTC	6 63	3 50	Hogan Systems Inc	4 00	0 38	10 34
OTC	36 25	18 50	Information Resources (L)	24 63	5 88	31 33
OTC	38 00	5 50	Informix Corp	29 00	1 75	6 42
OTC	3 63	1 06	Intellicorp Inc	1 38	-0 25	-15 38
OTC	27 75	13 50	Intergraph Corp (H)	13 50	-1 00	-6 90
OTC	15 00	4 88	Interleaf Inc	8 25	-1 63	-16 46
OTC	20 25	8 50	Intersolv Inc	12 25	-0 50	-3 92
OTC	30 00	10 50	Knowledgeware Inc	11 88	0 00	0 00
OTC	45 25	20 25	Legent Corp *	32 50	1 88	6 12
OTC	40 75	17 75	Lotus Development * (L)	18 25	0 50	2 82
OTC	7 38	2 38	Mesa Software	2 88	0 19	6 96
OTC	22 25	7 50	Mentor Graphics (L)	7 50	-3 00	-28 57
OTC	20 50	6 50	Micrografx Inc	14 75	0 25	1 72
OTC	88 84	40 34	Microsoft Corp *	69 88	3 13	4 68
OTC	21 13	7 88	Oracle Corp *	16 88	2 63	18 42
OTC	41 25	12 00	Parametric Technology	36 75	2 25	6 52
OTC	11 00	4 13	Phoenix Technologies	4 13	-0 13	-2 94
OTC	25 25	9 63	Platinum Technology	14 25	0 75	5 56
OTC	48 50	27 50	Progress Software Corp	38 00	5 50	16 92
OTC	26 63	5 13	Quarterdeck Office Sys (L)	5 13	-5 88	-53 41
OTC	29 50	8 75	Rasterops	10 50	0 25	2 44
OTC	17 25	6 13	Ross Systems	6 13	-1 38	-18 33
OTC	26 25	8 88	Software Publishing Corp	8 88	-3 88	-30 39
OTC	8 50	2 00	Software Toolworks Inc	2 38	0 31	15 12
OTC	7 25	1 75	Spinnaker Software	3 13	0 13	4 17
OTC	16 50	6 25	State of the Art	7 75	-0 50	-6 06
NYS	25 25	11 38	Sterling Software Inc	16 00	1 50	10 34
OTC	30 00	13 00	Struct Dynamics Research	14 00	-0 50	-3 45
OTC	31 75	15 00	Sybase Inc	25 75	2 75	11 96
OTC	51 00	21 88	Symantec Corp	37 50	2 38	6 76
NYS	15 50	6 50	Systems Center Inc * (L)	6 50	-0 88	-11 86
OTC	34 25	8 68	System Software Assoc	29 50	1 50	5 36
OTC	23 75	15 00	Walker Interactive Systems (L)	17 25	0 50	2 99
OTC	6 63	2 13	Worcester	2 50	-0 13	-4 76
Semiconductors			**Up 1.50%**			
NYS	21 50	7 75	Advanced Micro Devices	7 75	-1 00	-11 43
NYS	11 13	7 00	Analog Devices Inc	9 75	0 25	2 63
OTC	15 13	6 75	Atmel Corp	8 50	-0 25	-2 86
OTC	14 13	6 38	Chips and Technologies	6 63	-0 63	-8 62
NYS	22 63	8 38	Cypress Semiconductor Corp	8 38	-0 13	-1 47
NYS	9 75	6 25	Dallas Semiconductor	9 13	0 88	10 91
OTC	58 75	38 50	Intel Corp *	55 88	0 63	1 13
NYS	9 88	5 88	LSI Logic Corp (L)	6 75	0 75	12 50
NYS	22 38	11 13	Micron Technology	14 13	-0 13	-0 88
NYS	83 75	54 00	Motorola Inc *	78 63	0 38	0 48
NYS	11 50	3 88	National Semiconductor *	9 50	0 75	8 57
OTC	27 00	12 75	Sierra Semiconductor	13 88	0 13	0 91
NYS	40 50	26 00	Texas Instruments *	36 00	1 50	4 35
OTC	10 50	5 88	VLSI Technology	6 88	-0 25	-3 51
OTC	12 50	3 38	Wafertech	3 38	0 00	0 00
ASE	5 63	2 00	Western Digital Corp	4 75	0 50	11 76
OTC	32 50	17 25	Xilinx (L)	18 25	0 50	2 82
OTC	11 50	4 63	Zilog Inc	7 25	0 00	0 00
Peripherals and Subsystems			**Up 5.27%**			
OTC	2 00	1 00	Aperture Technologies	1 56	0 06	4 20
OTC	10 00	2 75	Archive Corp	7 50	0 38	5 26
OTC	24 50	11 25	Banctec Inc	22 13	-0 38	-1 67
OTC	23 50	6 00	Cambex Corp	14 75	3 50	31 11
ASE	17 50	7 00	Cognitronics Corp	16 25	0 63	4 00
NYS	23 88	12 50	Conner Peripherals *	17 63	0 13	0 71
ASE	19 88	3 34	Dataram Corp	14 13	2 38	20 21
NYS	18 63	4 88	EMC Corp	17 50	1 63	10 24
OTC	9 38	4 75	Emulex Corp	7 13	0 38	5 56
OTC	23 00	14 50	Evans & Sutherland (L)	15 00	0 00	0 00
OTC	40 63	13 38	Exabyte	28 25	0 25	0 89
OTC	27 25	15 75	Intelligent Info Systems	23 38	1 38	6 25
OTC	11 25	4 00	Iomega Corp	5 75	0 25	4 55
OTC	34 75	14 50	IPL Systems Inc	18 88	0 13	0 67
OTC	24 50	11 75	Komag Inc	13 00	0 38	2 97
OTC	14 00	1 63	Maxtor Corp *	10 00	1 13	12 68
OTC	12 63	5 50	Micropolis Corp	8 50	0 50	6 25
NYS	98 75	83 50	3M Co	96 00	0 38	0 39
OTC	8 75	3 50	Printronix Inc	5 00	-0 25	-4 76
NYS	26 75	8 13	QMS Inc	8 25	-0 25	-2 94
OTC	18 00	8 88	Quantum Corp	13 63	0 75	5 83
OTC	12 25	5 13	Radius Inc	11 50	1 00	9 52
NYS	12 88	5 88	Recognition Equipment	8 50	0 25	3 03
OTC	13 13	5 38	Rexon Inc	10 00	1 00	11 11
OTC	17 63	7 25	Seagate Technology *	14 50	0 00	0 00
NYS	78 00	28 63	Storage Technology * (L)	30 63	1 50	5 15
NYS	30 88	16 00	Tektronix Inc	17 75	0 63	3 65
NYS	82 25	52 63	Xerox Corp	89 75	1 88	2 76
Services			**Up 1.71%**			
OTC	18 00	11 66	American Mgmt Systems *	18 00	2 50	16 13
NYS	5 38	2 88	Anacomp Inc	3 63	0 00	0 00
OTC	19 00	12 25	Analysts Int'l	16 50	0 00	0 00
NYS	49 00	30 25	Auto Data Processing *	42 75	0 50	1 18
NYS	24 16	12 50	Comdisco Inc *	15 50	0 88	5 98
OTC	13 50	7 75	Computer Horizons	8 75	-0 25	-2 78
NYS	84 88	52 25	Computer Sciences *	62 38	1 00	1 63
NYS	10 13	7 00	Computer Task Group	8 00	-0 25	-3 03
OTC	19 25	7 75	Corporate Software	9 75	-0 25	-2 50
OTC	30 75	12 75	Egghead Discount Software	17 25	0 88	5 34
NYS	33 06	23 19	General Motors E (EDS) *	28 88	1 25	4 52
OTC	30 38	6 25	Intelligent Electronics (L)	7 50	0 13	1 69
OTC	14 88	2 56	Mentor	9 63	-0 50	-4 94
OTC	15 75	5 75	Microage Inc	10 75	0 50	4 88
OTC	27 50	13 50	Paychex	24 00	2 00	9 09
NYS	73 00	47 25	Policy Management Sys	64 88	4 13	6 79
NYS	43 50	19 63	Reynolds and Reynolds	36 25	-0 88	-2 36
OTC	32 00	21 25	SEI Corp	23 13	0 88	3 93
OTC	24 38	16 88	Shared Medical Systems	19 13	1 13	6 25
OTC	26 25	13 50	Sungard Data Systems (H)	23 25	-2 25	-8 82
NYS	4 88	1 13	Ultimate Corp	1 63	-0 13	-7 14

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Toshiba, IBM align

■ **IBM** and **Toshiba Corp.** last week confirmed that they will take on **Intel Corp.** by jointly developing solid-state storage devices using flash memory chips. Under the agreement, the companies will collaborate on design but will independently assemble and market their own devices.

■ **Oracle Corp.** last week continued restructuring its upper management. Geoffrey Squire, who had been president of Oracle's worldwide distribution sales organization since 1990, was named chief executive officer of Oracle International Operations. Oracle also hired Anthony Craig, a former CEO of Prime Computer, Inc., as senior vice president of its Intercontinental Division, where he reports to Squire. Robert Shaw, a former Booz Allen & Hamilton managing partner, was named senior vice president of Oracle's Consulting Group. He will report to recently named Oracle USA President Ray Lane.

■ Richard Smith, a senior information systems executive at **American Express Travel Related Services Co.**'s technology center in Phoenix, was fired a few days after the **IBM** sales executive who called on his account was terminated. Neither firm would comment on whether the firings were related. An Amex spokesman, however, said Smith's departure followed an investigation into his outside business dealings.

■ **Next, Inc.** last week said it has obtained additional financing in the form of a $55 million credit line from investor **Canon, Inc.** and a $10 million credit line from Chairman Steve Jobs. Funds borrowed on these lines would be converted to equity if and when Next goes public.

Hopes high despite second-quarter woes

BY KIM S. NASH
CW STAFF

Dour second-quarter earnings statements have not shattered Wall Street's hopes for a late 1992 recovery, but they clearly have some industry pundits worried. Several companies last week either warned of worse-than-expected quarterly results or reported outright bad news.

Following Lotus Development Corp.'s disclosure that its second quarter would not meet earlier expectations [CW, June 29], software developers such as Easel Corp. and Software Publishing Corp., networking vendor Network General Corp. and chip maker Advanced Micro Devices, Inc. warned investors of their own fiscal second-quarter woes.

"It's not great, but not hopeless. And it sure beats last quarter," said Randy Brandon, a vice president at Duff & Phelps Investment Research Co. in Chicago, of the latest round of financial results.

Large systems vendors are expected to fare better, compared with the monumental losses recorded late last year. New orders for Enterprise System/9000 mainframes — still the bread and butter of IBM's balance sheet — are expected to boost that company's bottom line despite the industry buzz about user downsizing, according to Curt Rohrman, an analyst at First Boston Corp. "Companies that run high-end mainframes are not scrapping them," Rohrman said.

Meanwhile, IBM's Application System/400 minicomputer line will coast with about 5% sales growth this year and no more until a new product cycle starts. This is expected in mid- to late 1993, he added.

Reorganization efforts have thus far had little impact on either IBM or Digital Equipment Corp., but results are likely to appear later this year.

Analysts generally agreed that things will improve throughout the industry in 1992's latter half. The fourth quarter is likely to shine as users run through the money that remains in their annual IS budgets, they predicted.

Financial results for the quarter just ended, however, will continue to fall short of the lofty expectations set early in 1992, particularly in the personal computer arena.

The culprit? Price wars, according to John Girton, vice president of research at Van Kasper & Co., a brokerage firm in San Francisco.

PC makers can cut prices for only so long before bottom lines are seriously hurt, Girton said. That is what hit Dell Computer Corp. this quarter, and that's what Compaq Computer Corp. is, in part, rebounding from, he explained.

Compaq's first-quarter sales of $45 million, reported in April, were a 60% free-fall from those of a year ago, and the current quarter looks similar. The company said restructuring costs and aggressive price-cutting will dig into profits for this quarter and next quarter.

Steven Eskenazi, an analyst at Alex. Brown & Sons, Inc. in New York, reduced earnings estimates for Dell, citing heavy pressure from Compaq's latest low-priced offerings.

What the market needs to spur sales, Girton said, is "something more exciting than cheaper and faster models. Price wars kill innovation."

Squeezed margins are not a PC hardware-only phenomenon. Software Publishing expects to report a loss or break-even results for its fiscal third quarter, which ended last week. The PC applications maker said a slowing DOS market and scorching competition among Microsoft Corp. Windows-based products eroded profit margins in recent months.

Not so at Microsoft. Users have snapped up Windows 3.1, Excel 4.0 and Word for Windows at a fast clip, leaving Microsoft likely to surpass earnings estimates again this quarter, Brandon said.

Those products — out on time and in good shape — helped the company bag its quarter even before it started, he said. "You don't stop a runaway freight train."

Another high note was Oracle Corp., which closed out fiscal 1992 with sales of $1.2 billion, up 15% from last year. Profits jumped to $61.5 million from a 1991 loss of $12.4 million.

"The fourth quarter was strong and probably more of what we expect of our business in 1993," said Michael Musson, Oracle's director of investor relations. "We're seeing good growth in our Unix and desktop businesses," he added.

However, IBM mainframe license sales coasted at $22 million in the fourth quarter of 1992, even with 1991's last quarter. Quarterly sales of DEC VAX versions of Oracle's relational database — once the mainstay of Oracle sales — fell to $43 million from $49 million in 1991.

Easel, meanwhile, said it would report a loss. It blamed an inadequate sales staff and a blurred product message.

"We have been repositioning the company as a provider of client/server development tools, and it has taken us longer to reach the market with this message than anticipated," said Doug Kahn, president and chief executive officer.

Senior West Coast editor Jean S. Bozman contributed to this report.

Rocky road

Sales at some companies are expected to increase from last year at this time but decrease significantly compared with last quarter — with a few exceptions:

	1992 calendar second-quarter sales	1991 calendar second-quarter sales	Year-to-year increase	1992 calendar first-quarter sales	Quarter-to-quarter change
AMD	$346.3M*	$296.8M	17%	$407.4M	(15)%
Easel	$6.7M to $7.4M**	$6.4M	5% to 16%	$8.2M	(18)% to (28)%
Interactive	$23.9M	$15.7M	53%	$21.6M	11%
Network General	$1.5M**	$1.2M	15%	$1.9M	(21)%
Oracle	$366M	$287M	25%	$296M	24%
Software Publishing	$34M to $36M	$31.9M	7% to 13%	$43.4M	(17)% to (22)%

*Projected **Will report July 9 ***Will report July 20

Banyan plans stock offering of $10 to $12 per share

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — After years of false starts, networking software vendor Banyan Systems, Inc. last week said it has filed a registration with the Securities and Exchange Commission for an initial public offering (IPO) of 2.7 million shares of its common stock with an estimated per-share price of $10 to $12.

Banyan customers have been pushing the company to go public or be acquired in order to gain the resources it needs to enrich its Vines network operating system and grow market share. Industry observers historically have pointed to both timing issues surrounding Banyan management upheavals and market conditions as the barriers that have prevented the IPO from going forward before now.

However, with A. Peter Hamilton named Banyan president just one month ago, and the software IPO investment climate less than optimum, it is not clear that Banyan has found an especially opportune time for the move now.

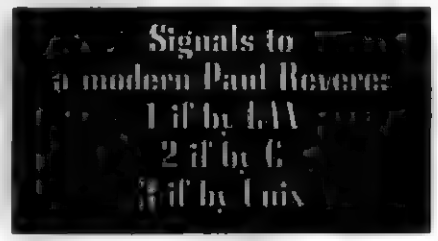
David Wu, an investment analyst at S. G. Warburg & Co. in New York, said he suspects the main reason for Banyan's move in a "crummy environment" is competitor Novell, Inc.'s forthcoming NetWare 4.0 release, which is slated to include global naming services — Banyan's current claim to fame.

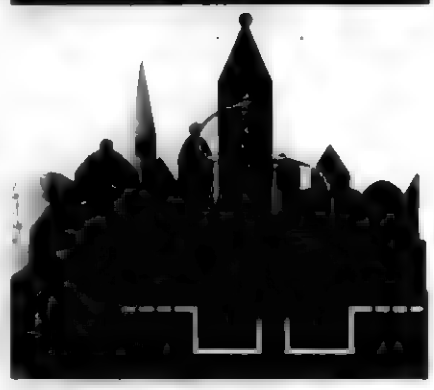
"Going public now would help because more cash on the balance sheet gives customers a better feeling that you're going to be around" in the face of new competition, Wu said.

Tongue twisting

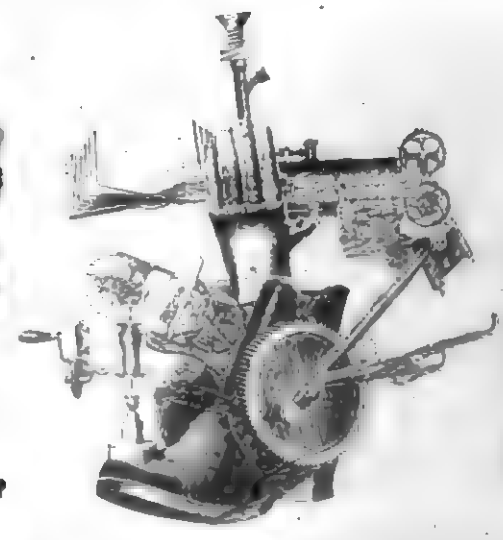
Harry Hacker hacked a hunk of hard-locked hex code.
If Harry Hacker hacked a hunk of hard-locked hex code,
how many hunks of hard-locked hex code did Harry Hacker hack?
(*repeat three times*)

beige toaster *n.*
A Macintosh computer.
digit *n.*
An employee of Digital Equipment Corp.
IBM discount *n.*
A price increase.
troglodyte mode *n.*
Programming with the lights turned off, sunglasses on and the terminal inverted (black on white) because you've been up so many days straight that your eyes hurt. Loud music blaring from a stereo is optional but recommended (see larval stage).





What do you call someone who really understands the difference between NetWare and Vines?
The Wizard of NOS



The next thing in portables

Beta Shoe Co.'s Software Engineering Division today announced Compu-toe, a 6-ounce insert for steel-toed work boots. "It will blow your socks off!" a Beta Shoe spokesman said.

The Compu-toe packs the thrust of a 486 desktop and comes with an advanced OOPS interface that is invoked by simply walking around and kicking objects. Filing cabinets and garbage cans can be accessed intuitively with a single swift kick.

The vendor claims that Compu-toe was designed for difficult situations that do not respond readily to conventional desktop computing. Employee motivation programs, font-rich office newsletters, three-dimensional spreadsheets and federally funded recycling programs are cited as examples.

Basic commands are executed by simple foot movements, leaving the user's hands free for virtually any purpose. Parallel processing is readily achieved with a pair of Compu-toes and a reasonable level of sobriety. Advanced users are said to benefit from tango lessons.

Compu-toe offers 4M bytes of on-sole RAM. Data compression hardware is standard. An optional step-on bar-code reader can read crushed beer cans. There are also plans for the introduction of a track-shoe-ball later this year.

From **Walter Frey**
Senior manager, systems research and development
Alberta Treasury
Edmonton, Alberta

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: Mt. Xinu, Inc., Berkeley, Calif.; The New Hacker's Dictionary (The MIT Press)

WYSIWYG design and illustration: Tom Monahan

INSIDE LINES

Making music

▶ Strange bedfellows will be hosting a bash this week at the Win32 Professional Developers Conference in San Francisco. Archrivals Microsoft and Borland will pool hors d'oeuvre budgets along with a mutual competitor of theirs, database vendor Oracle. For Borland and Microsoft, which compete viciously in several software arenas, the friendliness symbolizes a shared need to promote Borland's C++ compiler and Microsoft's Windows NT operating system (see story page 14). Borland Chairman Philippe Kahn's omnipresent Turbo Jazz band is billed as the entertainment, sans Kahn, who will be in Japan, according to one Borland source. Borland is seeking replacement players from Microsoft.

Sign of the times

▶ Client/server is gaining mind share at the Transaction Processing Council (TPC), a benchmarking group that is widely used by midrange and workstation hardware and software vendors. Beginning July 15, the TPC will require vendors publishing TPC results to designate whether they ran tests in a client/server or a host configuration. This is good news for vendors of proprietary host systems, which have complained that the lack of such a designation has benefited the client/server camp. In a related undertaking, the TPC said it expects to offer client/server-specific benchmarks within the year.

Marketing 101

▶ A source close to IBM said Big Blue can make its Intel-approved SLC clone for about $5 more than an 80386SX costs to produce. Our source wonders why IBM charges $530 more for a Model 57SLC than for a similarly configured 57SX, when lower SLC pricing might give users a reason to buy the machines and boost IBM's market share. An IBM spokesman declined to comment on specific chip pricing other than to say that IBM makes the SLC at a cost-competitive price. He added that the SLC offers more performance than the SX and thus should cost more.

Different strokes

▶ DEC last week quietly cut prices on many of its PCs by as much as 25%, but sources said that was a long-planned action. Reports are that DEC will lop prices still further next week as a rebuttal to the current tag-slashing frenzy touched off by Compaq's blitz. Along the same lines, AST will not be cutting prices, chiefly because the company expects to have totally revamped its line by the end of next month.

Dirty electronic tricks

▶ An interloper posing as a Perot spokesman recently posted an address box on CompuServe, we hear. One correspondent tipped off the campaign after the impostor's answers made him sound a little suspicious. Campaign spokesmen denied a connection, and the on-line address disappeared shortly thereafter.

At your service

▶ Apple Chairman John Sculley noted recently that Kaleida could be used for both Apple and IBM to make a foray into the information services industry. He called the creation of a national information network key to their future: "IBM and Apple do not feel constrained to just be in [information] products. Both companies at this time are looking at getting into information services." Sculley said Apple and IBM could move into information services separately as well.

Only a year after Apple shelled out $26.5 million to settle a suit brought by The Beatles over the name "Apple," the company may be facing another trademark fight. This year's offender: Newton. Those in the industry may remember it as the moniker of an upcoming handheld personal computer device from Apple, but the rest of the world knows it as a fig cookie made by the Nabisco Foods Group. Nabisco spokesman Mark Gutshce said the company has held a trademark on "Newton" for 101 years, adding, "We are very protective of our trademark . . . and we have been known to be very aggressive in protecting our rights." Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

Pioneers moving nets to fast ATM technology

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — The arrival of scalable, lightning-fast switches that could eventually replace corporatewide network infrastructures officially kicked in last week with the introduction of standards-based products from Adaptive Corp.

The Redwood City, Calif., subsidiary of Network Equipment Technologies, Inc. rolled out an Asynchronous Transfer Mode local-area network switch and corresponding workstation adapter cards at customer site Bear, Stearns & Co. The brokerage firm, a division of the U.S. Air Force and Texas Instruments, Inc. have committed to all-out shifts to the gigabit-speed-capable technology, which is touted for its ability to expand limitlessly in direct proportion to ever-rising computer speeds.

A vendor/user forum is building ATM as the eventual glue that will eliminate the boundaries between LAN and wide-area networks to create seamless enterprise networks.

The technology is also hailed for its ability to meld the varying characteristics of voice, video and data traffic and for its secure, point-to-point nature. This capability is not inherent in any of today's shared-bandwidth, data-only LANs, including the still-emerging, 100M bit/sec.

Continued on page 10

NEW PRODUCT IN-SITE

BBC features in a PC package

Evaluators at user firms report IBM's RS/6000 Model 220 is faster and cheaper than many of its workstation competitors, but its PC attributes make it an unconventional choice for many companies.
See New Product In-Site, page 38.

Networking:	4
Performance:	4
Operating system:	4
Support:	3
Value:	4

Ratings are based on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations.

Wiretap snares alleged hackers

FBI says hacking no joke; notes theft of credit reports, database invasions

BY JAMES DALY
and THOMAS HOFFMAN
CW STAFF

NEW YORK — Last week's indictment of some of the most notorious and self-promoting names in the computer hacker community signals a newfound aggressiveness on the part of frustrated federal law enforcement agents.

A two-year investigation snared five defendants, ranging in age from 18 to 22, in the government's first use of court-authorized wiretaps to monitor voice conversations and data transmissions of computer hackers.

The defendants are charged with breaking into computer systems at several regional telephone companies, Fortune 500 firms such as Martin Marietta Corp., universities and credit-reporting agencies such as TRW, Inc., which reportedly had 176 consumer credit reports stolen and sold to private investigators (see story page 14).

Hardest hit was St. Louis-based Southwestern Bell, which had to spend $370,000 to locate corrupted programs and install new security devices, according to the indictment.

Serious repercussions

The charges were the result of a joint investigation by the U.S. Attorney's Office, the Secret Service and the FBI. The 11-count indictment accuses the five defendants of computer fraud, computer tampering, wire fraud, illegal wiretapping and conspiracy.

If convicted, they face up to five years in prison for each count, for a total of 55 years, plus a maximum fine of $250,000 for each count.

Agents expressed concern that the penetration of some of the country's most secure data networks by young men barely out of high school may have started out as a round of one-upmanship to see who could get into the most sophisticated systems as well as harass others.

"This is no game, and we want them to know that," FBI special agent Richard DeFilippo said. "We're not going to sit by

Continued on page 14

STUMPING FOR TECHNOLOGY

Industry weighs candidates' posture on high-tech policy

BY GARY H. ANTHES
CW STAFF

As the Democratic National Convention gets under way today in New York, creators and users of information technology will look closely at the candidates for clues as to who is most likely to meet their business and technology agendas. So far, many have said they are disappointed with the record of President Bush, wary of Arkansas Gov. Bill Clinton and intrigued by fellow techno-businessman Ross Perot.

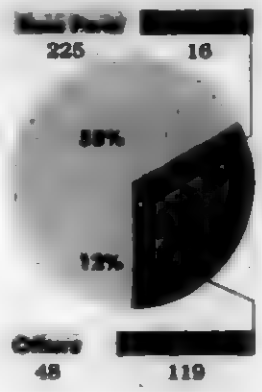
"The watchword [on technology] for Bush is 'reluctance,' and with Perot and Clinton it's 'enthusiasm,' " said Michael Maibach, director of government affairs at Intel Corp. and until recently a Republican candidate for Congress.

Users and other high-tech executives said they want a strong federal technology policy that is driven by industry, not government. They want tax incentives to stimulate investment, more

Continued on page 20

Home boy

More than half of 408 member executives responding to a recent American Electronics Association survey expressed support for Ross Perot



Source: American Electronics Association

Novell's net management falls short

Users term system a resource hog; bemoan clashing NLM, NetWare bias

BY JOANIE M. WEXLER
CW STAFF

Some early users of Novell, Inc.'s fledgling internetwork management system have hit snags that range from gluttonous server resource consumption to a lack of useful applications.

Novell has touted its NetWare Management System as the enterprise network management system for spanning heterogeneous networks. But despite its positioning, NMS so far addresses only NetWare environments, users said, and does so with limited functionality.

Some users said they are concerned enough to strip the product from their servers until several issues are resolved. Novell officials were unavailable to comment on these issues by press time.

One such customer is Enron Gas Services Co., which said it has seen two instances in which a server failed and the system did not alert the management console. "Aside from providing us with a network map, the system is not feeding us any useful information," said Jim Queen, local-area network manager at the Houston-based firm.

Similarly, Tom Bodenhorn, operations manager in the information systems department at Amos Press, Inc., said NMS' mapmaking function currently "only picks up devices running IPX," Novell's communications protocol. The Sidney, Ohio, publisher runs a large network of Apple Computer, Inc. Macintoshes with NetWare for Macintosh NetWare Loadable Module

Continued on page 12

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INSIDE

Executive Report — Why more IS chiefs, including Colonial Williamsburg's Jim Bell, are rethinking PC and LAN support. Page 69.

Compaq caught short of new PCs. Page 4.

Alpha-ready machines are ready to roll at DEC. Page 8.

Developers assess Windows NT's future role. Page 12.

IN THIS ISSUE

NEWS

4 A slew of PC vendors seeks to match **Compaq**'s lower prices and lower end machines.

4 **Intel** sets August date for announcement of its most powerful 486 chip yet: the 33/66-MHz I486DX2.

4 Some users are looking elsewhere for their cut-rate PCs as an order backlog slows shipment of **Compaq** boxes.

6 **IBM Credit Corp.** must repay a developer for AS/400-related bills the client overpaid.

7 **IBM**'s Problem Management Bridge automatically calls in service providers after users pinpoint the source of a network problem.

8 **DEC** to announce Alpha-ready systems that should ship this summer.

12 Win32 developer's conference attendees appear pleased with **Windows NT**.

15 Futurist Charles P. Lecht, a longtime IDG News Service correspondent whose dispatches from Tokyo predicted numerous technology trends, has died of cancer.

16 **Oracle** is expected to target government users with an Oracle 7.0 version that sports midlevel security.

16 **Informix**'s first worldwide user conference was the setting for some unexpected product announcements.

Quotable

"This is no game, and we want them to know that. We're not going to sit by and watch these guys play an electronic version of 'Can you top this?'"

RICHARD DEFILIPPO
FBI

On the FBI's crackdown on computer hackers. See story page 1.

DESKTOP COMPUTING

31 Many issues face firms considering a Windows migration.

36 Technology Analysis: **CA**'s CA-Textor 6.0 and **Symantec**'s JustWrite 2.0.

38 New Product In-Site: Evaluators give **IBM**'s **RS/6000 Model 220** favorable marks, but users are few and far between.

WORKGROUP COMPUTING

43 **An American Airlines** unit brings mainframe bills down 90%.

ENTERPRISE NETWORKING

53 **Aacom Timeplex** reorganizes into three business units.

LARGE SYSTEMS

61 **Boole & Babbage** readies MV Manager for MVS.

APPLICATION DEVELOPMENT

67 HP, Cadre, Cognos launch Unix CASE products.

MANAGER'S JOURNAL

79 CEO View: Rockwell International's Donald M. Beall is a no-nonsense kind of guy.

EXECUTIVE REPORT

69 As downsizing roars on, companies grapple with the best ways to keep LANs and PCs in top shape.

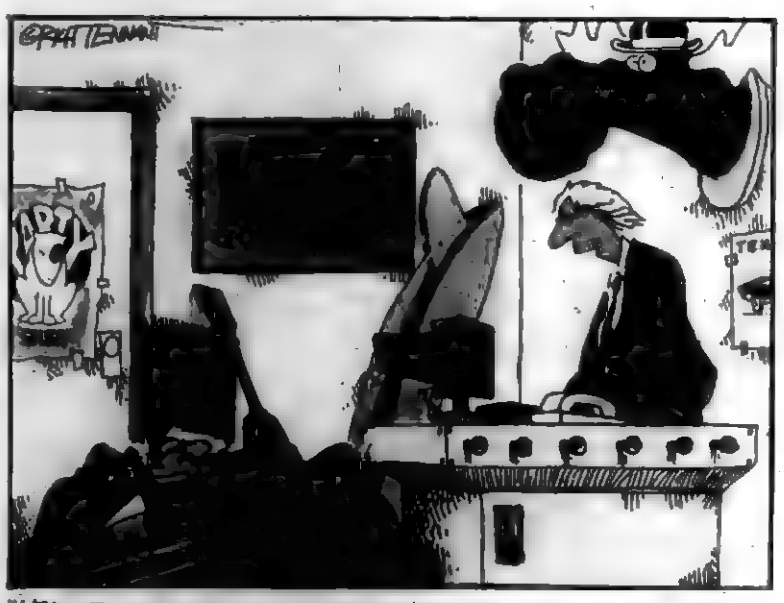
IN DEPTH

75 Lotus CEO Jim Manzi is out for a little respect: A profile. By Glenn Rifkin.

DEPARTMENTS

6, 16 News Shorts
24 Advanced Technology
28 Editorial
80 Intelligence Files
81 Calendar
83 Computer Careers
91 Marketplace
96 Stocks
97 Computer Industry
98 Inside Lines

The 5th Wave



"YEAH, I STARTED THE COMPANY RIGHT AFTER I GRADUATED FROM COLLEGE. HOW'D YOU GUESS?"

EXECUTIVE BRIEFING

■ **Outsourcing may be on the wane as the preferred way of servicing strategic PCs and LANs.** Most companies now mix internal and external service, but a growing number of IS chiefs say they'd prefer to handle more network maintenance, installation, wiring, training and diagnostics in-house. Major factors include cost savings and greater control of strategic downsized systems. **Page 69.**

■ **Some of the most notorious names in the computer hacker community are handed indictments** as federal law enforcement officials continue their crackdown on computer crime. A two-year investigation culminates in the arrest of five defendants ranging in age from 18 to 22, who fall victim to the government's first use of court-authorized wiretaps of hackers' conversations and data transmissions. **Page 1.**

■ **Creators and users of information technology** say the trio of presidential hopefuls is paying insufficient heed to their concerns. Many declare themselves disappointed with the Bush record, wary of Bill Clinton and intrigued by Ross Perot. **Page 1.**

■ **IBM enters the code re-engineering niche** via an AD/Cycle partnership with Viasoft. **Page 8.**

■ **Is Lotus CEO Jim Manzi the Rodney Dangerfield** of the computer industry? He has taken Lotus from $156 million to $1 billion in sales during his nine-year tenure, but critics still zing his management style (arrogant), product moves (delays in 1-2-3 follow-ons) and market judgment (where's Windows?). **Page 75.**

■ **Users may be taking the cautious approach** in moving to Windows with some of their core applications. Managers voice concerns about training people on new interfaces, performance trade-offs and the need to upgrade many PCs. **Page 31.**

■ **Chips on steroids** are due out from Intel, which promises an August debut of its most powerful 486DX yet. Observers downplay Intel's summer fireworks. The real power boost, they say, will come with the P5 processor. **Page 4.**

■ **The network management technology behind the application** isn't what's important to many users. They say they are happy to have CMIP, SNMP and SMP hidden from them as long as the application portion of their network management system works. **Page 53.**

■ **Belt-tightening and staff cutbacks at Hughes Aircraft** will put pressure on the company's Systems Sector group to prove itself as Hughes tries to expand its presence in the systems integration business. **Page 80.**

■ **Novell's recent rollout of NetWare Management System** may have been premature. Early users report limited functionality, server drains and inexplicable network freezes — but they also express confidence that the networking giant will soon resolve the issues. **Page 1.**

■ **On site this week:** Big savings from a downsizing move have already started to show up for a development unit within American Airlines. **Page 43.** The cobbler's child isn't going shoeless at Intel, where the internal IS group is actually serving as a test bed for Intel's belief that a major corporation can run on the company's chips. **Page 46.** Pinching pennies means doing in-house application development at Marsh Village Pantry. A nonprogrammer was able to invest two weeks' work and $1,895 for a development tool and build an application that could have cost $120,000 commercially. **Page 67.** Unilever is moving steadily toward full use of standards-based computing, drawing on the technologies defined by the OSF. **Page 56.**

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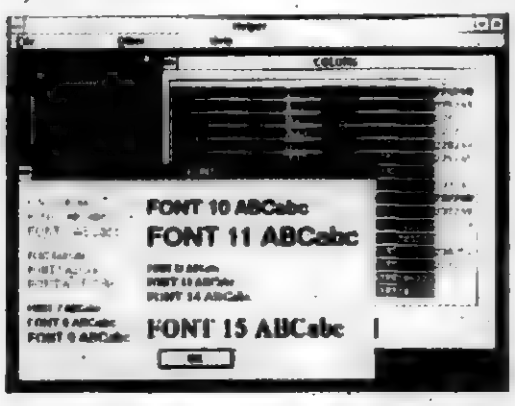

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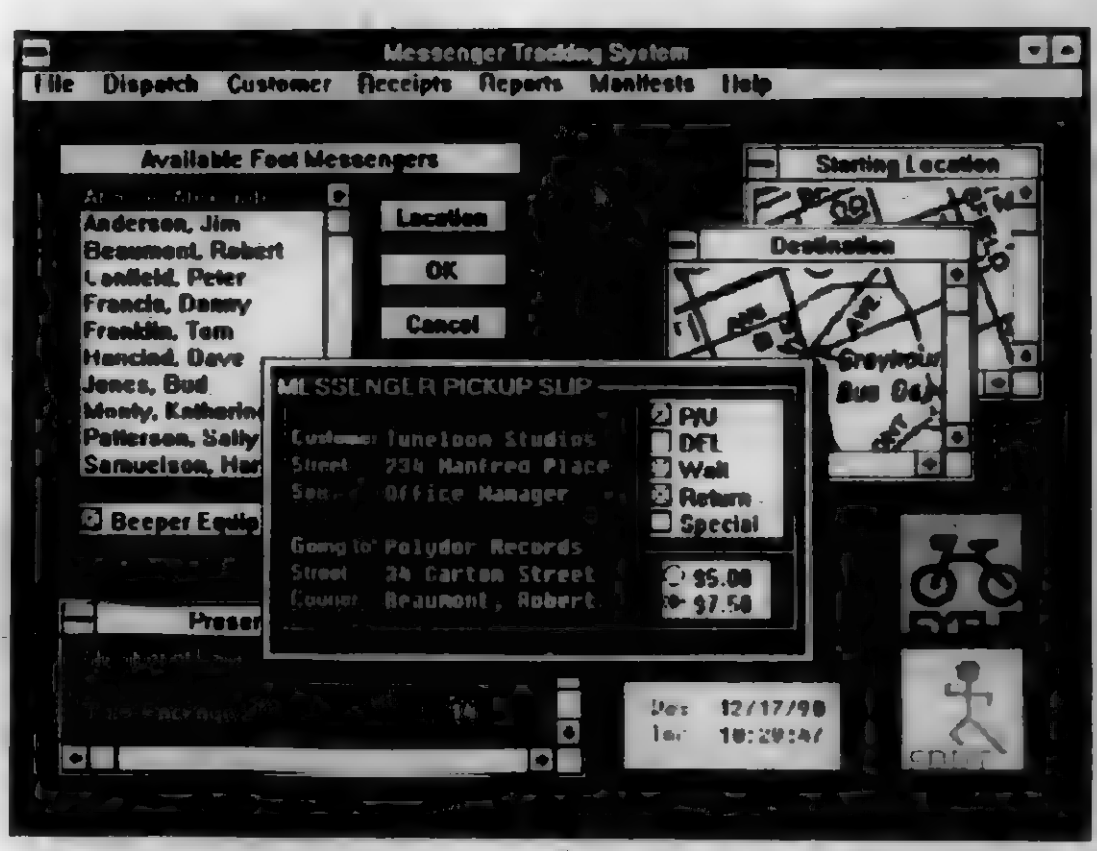

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Price war to hurt PC industry

Analysts warn vendors of regrets to come for this summer's tag-slashing

BY CAROL HILDEBRAND
CW STAFF

Personal computer vendors last week continued to chime into the price-cutting tune set by Compaq Computer Corp. last month. But for some, analysts said, the song will turn out to be a dirge.

"Clearly, by the time this is all over, the industry is going to wish this had been the summer that never happened," said Peter Kastner, an analyst at Aberdeen Group in Boston.

The latest to step up to the price guillotine include NCR Corp., Zenith Data Systems, Digital Equipment Corp., Austin Computer Systems and CompuAdd Corp., with announcements ranging from tag-slashing to new low-end PC families to 486 boxes priced at less than $1,000.

Analysts said the price cuts represented the trickle-down effect: "As the first tier goes, the rest will follow," noted John Dunkle, an analyst at Work-Group Technologies, Inc. in Hampton, N.H. He added that this week's cuts were from second- and third-tier clone makers, as well as major organizations with little to no PC presence.

CW Chart: Stephanie Faucher

One of the biggest firms not yet heard from is IBM. With its Personal System/2 line generally priced at the top end of the market, analysts said, the company needs to respond. "IBM has never been a price leader. It looks like they're being dragged down kicking and screaming," Kastner said. Sources said they expect IBM will announce its price cuts on July 21. While the amount of the reductions is unclear, Models 70 and 80 will probably take a big hit: They are due to be revamped in the fall.

Details of the pricing actions include the following:

- NCR dropped prices 15% to 30% on its servers and workstations and introduced a two-year warranty service on the workstation line. In addition, NCR said it will introduce entry-level PCs in the fourth quarter.
- DEC lopped 35% to 42% off its Desktop Direct line as well as adding an Intel Corp. 50-MHz I486 model. A 16-MHz 386 machine now costs $935, down from $1,449. The PCs include 3M bytes of random-access memory, a 52M-byte hard drive, a mouse, a monochrome monitor and DOS and Microsoft Corp.'s Windows preinstalled.
- Zenith Data dropped its suggested retail prices in favor of "ZDS prices," which are essentially estimated street prices. The company also reduced prices from 4% to 21%. For example, a 25-MHz 386 box is down 11%, to $1,699.
- CompuAdd unveiled the V Series, a new entry-level line of PCs. The seven desktop and tower models include boxes based on both Intel and Cyrix Corp. processors. Pricing ranges from $899 for a 25-MHz 386 model to $2,399 for a 486 50-MHz DX2 machine.
- Price reductions also clocked in from Austin Computer, with cuts estimated at 10% to 25%. The company also introduced several new machines, among them a 25-MHz 486SLC model for $995.

SGI unveils workstations, cuts prices

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. ushered in a speedy new quintuplet of Iris Indigo workstations last week and dropped prices on some models in the current line.

The new Indigo R4000 machines are based on the Mips Technologies, Inc. R4000SC processor, a 50-MHz chip that Silicon Graphics claimed will boost CPU and system power by 300% over the original Indigo R3000A models. Mips Technologies is now a wholly owned subsidiary of Silicon Graphics.

The Indigo R4000s range in price from the $12,485 Indigo Entry to the $32,000 Indigo Elan. The new models are scheduled to ship in September, and for $9,000, customers can upgrade from current R3000-based Indigos to the same graphics level in the R4000 line.

Keep the ball rolling

Silicon Graphics officials said they will continue to sell the Indigo R3000s, priced from $6,400 to $27,000, for price-sensitive users who can get by with lower CPU performance.

Silicon Graphics "has done a nice job of making the Indigos a good, friendly visualization environment at a reasonable price," said David Pensak, corporate adviser for computer technology at Du Pont Co. in Wilmington, Del. Du Pont's research and development department uses Indigos as front-end processors for molecular modeling on a Cray Research, Inc. Y-MP supercomputer.

The Indigo has fueled Silicon Graphics' growing presence in the computer-aided design and manufacturing field during the past year, particularly among resellers, said Tom Greaves, vice president of Daratech, Inc., a market research firm in Cambridge, Mass. Silicon Graphics also cut Indigo R3000 memory prices up to 36% on 8M- and 32M-byte modules, which as of Aug. 1 will be priced at $1,250 and $3,500, respectively.

Intel to unleash DX2, claims strongest chip yet

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Intel Corp. will announce its most powerful microprocessor yet on Aug. 10 when it unveils its 33-MHz/66-MHz I486DX2 chip, according to sources close to the company.

The new DX2 will be followed by announcements of several systems based on it from the likes of IBM, Compaq Computer Corp., Advanced Logic Research, Inc. (ALR) and others, the sources said.

The chip will be Intel's second DX2 processor. The DX2 line uses a clock-doubling technology that increases performance by having the external part of the chip run at twice the speed of the internal part. Intel's OverDrive family of processors, sold through retail channels, also uses clock-doubling technology.

More to come

On Aug. 11, as a follow-on to Intel's announcement, IBM will announce processor upgrade cards based on the 33-MHz/66-MHz DX2 for both its Personal System/2 Model 90 and Model 95 product lines, sources close to IBM said. Versions of these systems with the DX2/66 on the motherboard are expected to come later in the fall, the sources said. Expected list pricing is $3,000 for the Model 90 upgrade, and markedly higher for the Model 95 processor upgrade. IBM does not comment on unannounced products.

Spokesmen at Compaq and ALR refused to confirm any dates, but both said their companies would announce systems based on the 66-MHz DX2 when it is announced by Intel. Both said they expect the chip will be used in desktops and servers.

At least one user is looking forward to the extra power.

"We're looking at [a new project] where we may exceed, or at least stretch, our current environment, so we may have a need for a server based on that 66-MHz processor," said Glenn Sandusky, chief information officer at the benefits consulting firm of Miller Mason & Dickenson in Chicago.

Quantum baby step

Analysts said users may not see much of a performance increase. Moreover, the new chip's pricing is expected to be close to that of the 50-MHz 486DX.

"The 66-MHz DX2 vs. a 50-MHz chip should not be that much faster," said Peter Kastner, a vice president at market research firm Aberdeen Group in Boston. "You'll get the delta between a 50 MHz and a 66 MHz. However, as soon as you go to memory, all bets are off."

Kastner and others said a quantum jump in performance was unlikely until the P5, Intel's next-generation microprocessor, appears later this year.

Intel refused to comment.

Backlog leaves Compaq buyers searching

BY CAROL HILDEBRAND
and MICHAEL FITZGERALD
CW STAFF

HOUSTON — A backlog of orders on Compaq Computer Corp.'s new low-priced computers has the company suffering from an embarrassment of riches as some users look elsewhere to fill short-term needs.

"I was looking for a couple units . . . and was told they were not available until July 17. Then Dell lowered their prices, and I just switched," said Charlie Shepard, microsystems manager at Mirage Resorts, Inc. in Las Vegas. "You need a PC unit, you can't wait for it."

However, Shepard said the backlog would not stop him from buying Compaq machines once they become available.

Jim Hayes, chief information officer at Taylor Medical, Inc. in Beaumont, Texas, said he has several purchase orders ready to go for Contura notebooks. If they are unavailable, "it could make me go to another brand as a stop gap measure," he said. Any major buying commitments are likely to be unaffected.

Compaq spokesman John Sweney last week attributed the bottleneck to greater than anticipated demand for every product the company announced June 15. The company expects to be fully up caught up with demand later this quarter, he said.

Analysts said that while Compaq is likely to lose some sales as a result of the shortfall, most major customers will wait out the price war before making major decisions. "Our large corporate buyers are still waiting to see how low they can go," said Matthew Cain, an analyst at Meta Group, Inc.

Bruce Stephen, an analyst at International Data Corp., said the situation is not unusual. It takes a while for the channel to fill, he said, and while the dearth of available products will cause some users to switch buying plans, "smart customers are going to wait until conditions level out — maybe wait to see what IBM and AST are going to do. . . . There's a lot of opportunity for people to save money."

However, the situation is causing some users to hedge their bets. Douglas Murphy, director of information systems at Comcast Corp. in Miami, said his distributor had warned him of the problem. "As a contingency, I'm asking our distributor to check other lines, AST being our backup," he said.

Check out the Marketplace Pages on Page 91.

WHAT HAVE BILL GATES, SCOTT MCNEALY, JOHN SCULLEY, JOHN YOUNG AND LARRY ELLISON AGREED TO COOPERATE ON?

NEWS SHORTS

IBM to disclose strategic initiative

IBM is expected to disclose a strategic business agreement today. Wall Streeet sources said IBM will reveal an agreement with Toshiba Corp. and Siemens AG to build 256M-bit dynamic random access memories. IBM and Siemens currently are cooperating on 64M-bit memories.

Token Ring patent claims upheld

After two years of reexaminations, the U.S. Patent and Trademark Office has upheld all the claims of a holding company that administers the Token Ring networking technology patent. The move means that long-standing litigation by Token Ring vendor Madge Networks, Inc., which has been fighting Token Ring inventor Olof Soderblom's patent for years while refusing to pay royalties, can resume. Madge won its case against the Soderblom patent in the UK in June 1990. The Soderblom patent currently applies to both Token Ring and Fiber Distributed Data Interface technology.

KnowledgeWare eyes OS/2 tools

KnowledgeWare, Inc. plans to support IBM's new focus on software re-engineering with an OS/2-based module for analyzing and reworking Cobol applications. Application Development Workbench (ADW)/Maintenance Workstation, its first 32-bit OS/2-based product, will include a graphics maintenance facility that shows program logic and lets programmers graphically edit applications. It will interface with KnowledgeWare's existing re-engineering tools under ADW.

Apple, Quorum resolve suit

Quorum Software Systems, Inc. has settled its 3-month-old lawsuit against Apple Computer, Inc. The Menlo Park, Calif.-based software company sued Apple earlier this year after Apple complained that Quorum had violated its copyrights and patents. Quorum countered by asking the court to declare that no rights were violated and that some of Apple's patents were invalid. Terms of the settlement were not disclosed.

DAL server aids Apple/IBM link

Pacer Software, Inc. is expected to unwrap its Data Access Language (DAL) Server today. It enables IBM RISC System/6000 AIX users to run Apple Computer, Inc. Macintosh applications that access large, host-resident databases. The DAL Client is Apple's standard for relational database connectivity. Pricing ranges from $4,000 for 16 users to $12,000 for unlimited access.

ISSC nails retail outsourcing pact

IBM outsourcing subsidiary Integrated Systems Solutions Corp. (ISSC) racked up another retail industry score last week, signing a long-term pact to run hardware and data center operations for Rochelle Park, N.J.-based United Retail Group, Inc. Under the agreement, ISSC will also maintain a store-to-host data network and oversee in-store automation. Its latest client, which operates several nationwide chains of large-size women's apparel, will continue to do its own development.

Short takes

Data General Corp. plans to expand its Unix-based Aviion line of workstations and servers tomorrow with four new products said to expand Avion's compute and data availability functions, a spokesman said. . . . **Intel Corp.** will cut prices today on its entire line of niath coprocessors. A spokeswoman said all Intel math coprocessors — the 80387SX, 387DX and 387SL mobile — will be priced at $99, in response to price cuts from competitors **Cyrix Corp.** and **Integrated Information Technology, Inc.** Previously, Intel's math coprocessors were priced between $149 and $299. . . . **Dataquest, Inc.** has named as president Judith H. Hamilton, a 26-year information technology veteran. She will have overall responsibility for Dataquest's worldwide market research and consulting services.

More news shorts on page 16

Dull named Kimberly-Clark CIO

But some say former vice president inherits a post of diluted authority

BY NELL MARGOLIS
CW STAFF

DALLAS — Kimberly-Clark Corp. last week moved Vice President James Dull, 45, into the chief information officer slot vacated late last month by Dull's longtime mentor, John T. Kohler.

Meanwhile, observers differed on whether a concurrent change in reporting lines signals a lessening of the company's heralded commitment to information systems.

Kohler left amid bold IS rollouts on multiple fronts [CW, June 29]. However, Dull's appointment is no panic grab, according to several highly placed sources, who said the paper products player was able to act quickly because the ideal candidate was suited up and waiting in the wings.

"In fact," noted Kohler, now a partner at Technology Solutions Co., "I hired him in as part of the succession plan." The tight chain of successorship, he said, indicates that the guard is the only thing that is really changing in Kimberly-Clark's ambitious IS plans.

However, a former Kimberly-Clark executive who asked to remain anonymous saw a reporting change instituted last week as ominous: Where Kohler reported directly to Chief Executive Officer Wayne Sanders, Dull will report to Thomas Falk, senior vice president of administration and analysis.

"This is a clear signal that IS is not as important to upper management as it once was," the former executive said. "At a time when other major corporations are promoting IS and bringing it closer to the critical business functions, Kimberly-Clark is backsliding."

Not so, Falk said. "The status of the [IS] organization is in no way affected by the change in reporting relationship," he said. The move, a spokeswoman added, "is simply a reorganization." The firm declined to state the reasons for the reorganization.

A second former Kimberly-Clark executive who asked not to be identified agreed with the company's denial that a demotion of the IS function can be read into the action. He said he viewed the move as the necessary straightening of reporting lines gone askew.

"Kohler reported to [former Kimberly-Clark CEO] Darwin Smith," he noted. "When Sanders succeeded Smith in April, no one saw a reason to rock the boat." However, he said, the boat was rocking already because "Smith, in his inimitable fashion, got more involved in IS than he probably ought to have been." Dull, he added, "has great credibility with Sanders, as he does with everybody in the organization. Falk is a very able guy, and also very highly regarded. This is no demotion."

Dull declined to be interviewed at this time.

If Dull's line of reporting received mixed reviews, the appointment itself did not. "Jim Dull is the best person they could have possibly found for this very important job," said one of the former Kimberly-Clark executives. "He's not a technician in any sense of the word; he's a leader in every sense."

The executive said Dull's abilities to spot and nurture talent, to motivate people and especially to translate technology to nonscientific users auger well for his turn at the firm's CIO bat.

Court orders IBM to refund AS/400-related overcharge

BY KIM S. NASH
CW STAFF

SAN DIEGO — IBM Credit Corp. (ICC) was stung last week by a federal circuit court judge's ruling that ordered IBM's financing arm to repay a local software developer up to $56,000 for Application System/400-related bills that the developer was found to have overpaid three years ago.

Observers said the case touched on an issue faced by many third-party software makers when the AS/400 line was introduced in less-than-perfect shape in 1988. Specifically, early AS/400 models contained, by some estimates, up to 3,000 hardware and software bugs, for which IBM had to issue program temporary fixes (PTF). When the problems interfered with the performance of third-party applications, end users demanded help from their independent vendors.

The vendors, in turn, sent out support staff to smooth over the problems but could only respond as quickly as IBM put out PTFs. Although IBM claimed that relatively few bugs existed, it took the unprecedented step of setting up a special office in Rochester, Minn., to handle customer complaints, according to testimony from Ralph Martino, general manager at ICC. At the time the lawsuit was filed, Martino was a marketing executive.

It remains to be seen whether this case will open the floodgates for other lawsuits to be filed against IBM or ICC.

"There was a lot of trouble with the early models, which caused problems for third parties all over the country," said Dolly Fair, president of Fair Marketing, Inc., a used equipment broker in Deerfield Beach, Fla. "Who knows what will happen now?"

The case began when ICC sued Legal Eagles Software Systems, Inc. in 1989, alleging that the company ducked payment of its bills. Legal Eagles countered that its perturbed customers of early "bug-ridden" AS/400 models withheld payments, which, according to Legal Eagles President Bill Tudor, caused it to slip on obligations to ICC. So separately, in 1989, Tudor sold his company to another software developer and used some of the proceeds to pay off ICC. The judge ruled last week that Legal Eagles ended up overpaying by $44,000 to $56,000, the exact sum to be determined within 30 days.

Meanwhile, Legal Eagles had countersued, alleging that ICC representatives had committed fraud and negotiated contracts in bad faith.

Legal Eagles, which is no longer in business but exists only to see this suit through, also sued ICC for out-of-pocket expenses incurred when Legal Eagles sent its own support personnel to fix hardware and operating system problems "that were essentially IBM's fault," Tudor said.

The judge denied these claims, saying that they did not pertain to the financial collection case at hand and would have to be taken up with IBM proper.

For its part, ICC does not believe this decision will precipitate any further legal action from resellers or developers, according to a spokesman.

"The AS/400 has been out for several years, with a strong reputation," the spokesman said, implying that if other companies had contemplated filing lawsuits stemming from early AS/400 problems, they would have done so already.

ICC has no plans to appeal the ruling, the spokesman said.

IBM software triggers calls to network servicers

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — IBM offered last week to take some of the burden off help desk managers' shoulders via an OS/2-based product that automatically calls in outside service providers to fix problems on the network.

There is a catch, however: Help desk departments or users must first pinpoint the source of the network problem and enter the information on IBM's mainframe-based trouble-ticketing system, Information/Management.

In the past, help desk managers have had to put together the relevant facts about each new problem twice: once as an Info/Management record and a second time over the telephone to the vendor's service center, an IBM spokesman said.

Once IBM Problem Management Bridge (PMB)/MVS is installed, however, help desk managers need only create the initial Info/Management record of a problem, then press a PF key, IBM said. PMB is said to automatically create a trouble ticket that describes the problem and the device or circuit affected and send it to the third-party service company, carrier or network vendor that is responsible.

PMB keeps files of background data such as the company account number, address, product number and configuration and automatically fills this information in, the spokesman said.

IBM's product is a "step in the right direction" toward efficient problem management for companies that have been moving to a more distributed, networked computing environment, said Michael Kennedy, senior consultant at Arthur D. Little, Inc., a Cambridge, Mass.-based consulting firm.

However, Kennedy cautioned, the product will not do much good in companies that are still struggling to coordinate support across telecommunications, local-area networks and data center operations. These firms must organize problem identification resolution across these different domains before they install a product such as PMB, "or else you'll have one problem generating a dozen trouble tickets," Kennedy said.

The product also eliminates the need for help desk managers to field telephone calls from the vendor, providing notification of a repair person's arrival time, a delay or a missing part, IBM said. The vendor support center can use the PMB link to send this information directly to Info/Management rather than playing telephone tag with the help desk.

Sophisticated users can develop IBM NetView applications that automatically collect alerts from a variety of network systems, create Info/Management trouble tickets and send them to the right vendor, eliminating help desk operator intervention, a second IBM spokesman said.

The initial product is scheduled to ship Sept. 25 with a base price of $15,000. A link to IBM's Network Service Support Center costs an additional $10,000.

Bridging the gap

With some 20,000 end users generating approximately 150,000 trouble calls annually — a number that is expected to rise — Pratt & Whitney, an aerospace defense contractor in Hartford, Conn., has been looking for ways to improve the quality and timeliness of problem resolution on its computer networks. But it doesn't want to hire a lot of new help desk operators.

IBM's PMB, which the United Technologies Corp. division has been beta-testing, is potentially one piece of the answer.

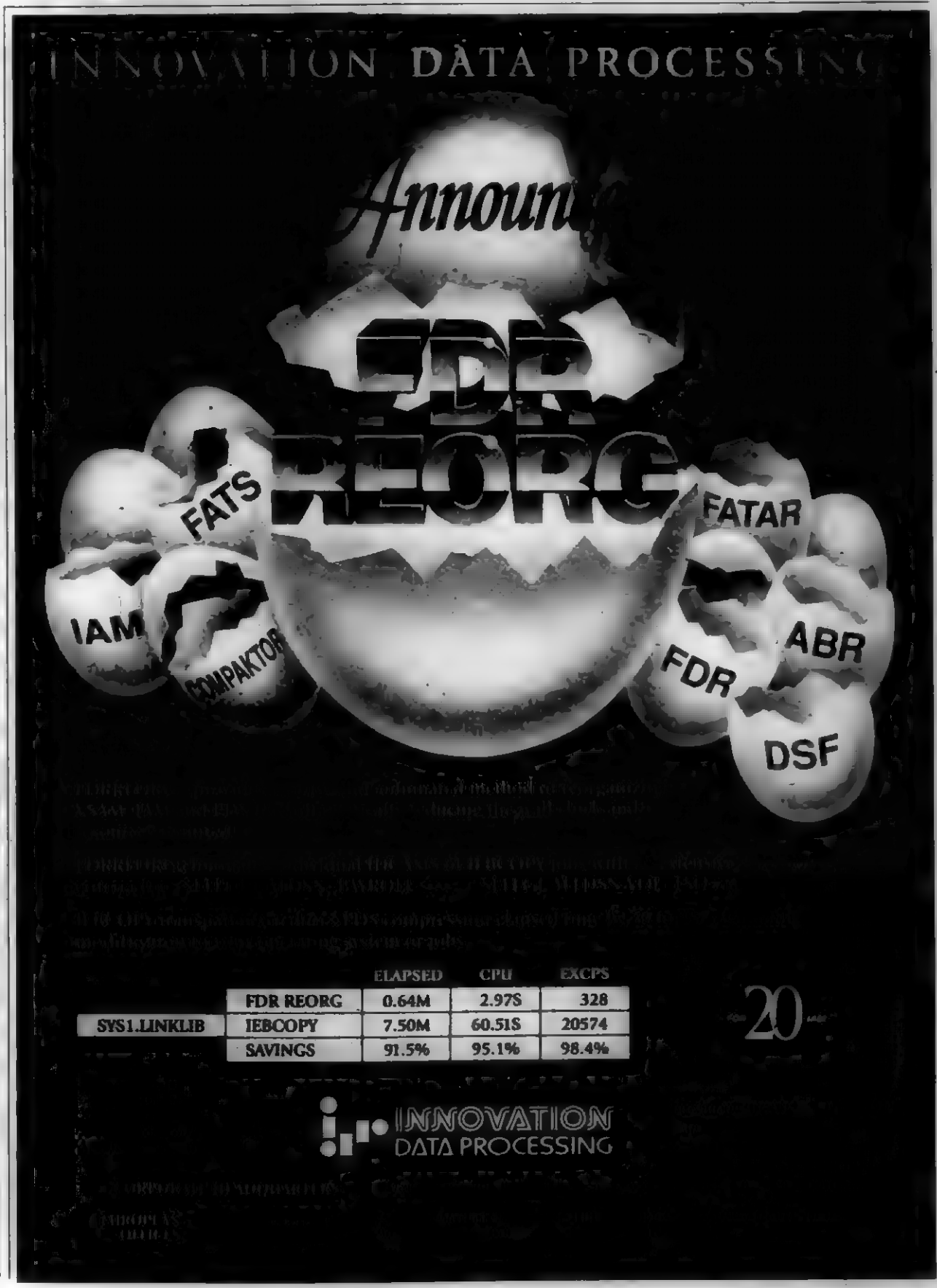
The product promises to save help desk managers time dealing with problems that require outside help from a vendor or third-party support center, said Michael Morin, supervisor of data center operations at Pratt & Whitney. While such problems only make up about 12,000 to 15,000 calls per year, each one requires a help desk operator to spend several minutes on the phone giving the vendor "basic user and configuration information," he added.

With PMB, the operator can convey that information by calling up one field, turning "a multiple-minute transaction into a few seconds," Morin said.

Furthermore, PMB automatically fields vendor callbacks, "acknowledging the problem, saying they'll fix it in two hours or that they're waiting for parts and will be back in two days," Morin said.

Pratt & Whitney is also using PMB in a pilot test of an application that enables end users to generate their own trouble tickets, Morin said. "With PMB, users can dispatch tickets directly to the vendor without involving the help desk at all."

ELISABETH HORWITT



IBM picks Viasoft as AD/Cycle member

BY JOHANNA AMBROSIO
CW STAFF

WHITE PLAINS, N.Y. — IBM last week added Viasoft, Inc., a developer of re-engineering tools, to its International Alliance for AD/Cycle. In doing so, IBM voiced support for the art of re-engineering existing code — a new market niche for IBM.

Also last week, AD/Cycle partner KnowledgeWare, Inc., based in Atlanta, introduced re-engineering tools (see story p. 6). Alliance members Bachman Information Systems, Inc., Intersolv, Inc. and Micro Focus, Inc. already offer re-engineering products, but Phoenix-based Viasoft, with its more mainstream product line, will probably take the lead in helping define AD/Cycle's re-engineering strategy, observers said.

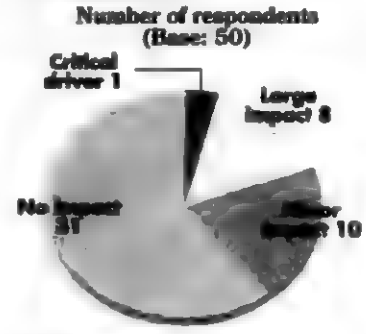
Re-engineering refers to the process of analyzing and cleaning up applications code by eliminating data-name redundancies and performing other housekeeping tasks. The code is thus made ready for the next step — changing it, adding to it or moving it to a different hardware platform. Until the agreement with Viasoft, most of IBM's and its AD/Cycle business partners' offerings focused on developing new applications as opposed to working with existing applications.

"It's recognition that maintenance is a critical part of AD/Cycle," said Mike DeSena, information systems manager at The Travelers Corp. in Hartford, Conn., a Viasoft customer. "Until now, most AD/Cycle tools have been for new development, but that represents only about 20% to 25% of our activity. The rest is maintenance."

Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., said the partnership "acknowledges one basic fact: There are some real nice bottom-line benefits to be had by addressing maintenance." He added, however, that the relationship will not likely help IBM and AD/Cycle win much more market share because IBM's Repository Manager is still not complete.

Unnoticeable

AD/Cycle has had little influence on user's CASE strategy



Source: Forrester Research, Inc.

"When you talk about AD/Cycle, the first thing that comes to mind is Repository. That has left a bad taste in people's mouths, and we've stayed away from it," added Joseph Panasci, an associate at Morgan Guaranty Trust in New York, also a Viasoft customer.

Business terms of the agreement were not disclosed, but IBM will sell five of Viasoft's mainframe-based re-engineering products beginning July 17.

Most industry watchers reacted positively to the IBM/Viasoft relationship, noting that the development and marketing deal would probably have more impact on Viasoft than it would on IBM, which is mostly filling product gaps through the deal.

Sentiments shared

"It will also expose Viasoft to a better financial position, and that will benefit everyone," said Rich Olshefski, vice president of IS at Reliance Insurance Co. in Philadelphia. "I've always felt strongly that Viasoft is one of the premier vendors in the re-engineering field, but now IBM does too."

Some of Viasoft's 1,000 customers said they hoped the relationship would speed up Viasoft's delivery of re-engineering products that run under OS/2. "If they move the workbench to OS/2, that would benefit us," Panasci said.

Viasoft President LeRoy Ellison said the arrangement will "improve our financial outlook dramatically. A lot of customers see us as a smaller player, and this should simplify the sales cycle." For fiscal year 1992, which closed on June 30, revenue for the private company was in the $18 million range, Ellison said, adding that revenue should grow by "at least 50%" for the current fiscal year.

He said that Viasoft will make "no major changes" to its development plans as a result of the deal but said that "we have made commitments to develop OS/2 products as fast as possible. We will probably accelerate what we would have done otherwise." Four OS/2 products will be ready by the end of the year, in contrast to the original plan of having two ready by year's end and two ready by mid-1993, Ellison said.

Viasoft's own version of a central repository allows the tools to share information. That repository will evolve to share information with IBM's Repository Manager, Ellison said.

DEC to announce Alpha-ready boxes

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — In an effort to smooth migration concerns and entice customers into early purchases of its next-generation computers, Digital Equipment Corp. will unveil a family of "Alpha-ready" systems this week. The boxes are slated to ship by the end of September.

However, some users interviewed last week indicated that they are not biting, saying they will wait to see the full-blown Alpha system before making any decisions.

Separately, DEC will also announce two major shifts in the company's software business practices this week: user-based pricing and a decision to no longer bundle runtime Rdb with the Open VMS kernel and base-level systems.

Although Pauline Nist, DEC's group engineering manager for data center systems and servers, maintained that the pricing on the server packages would be favorable and users would not pay a penalty, analysts said they expect the move may negatively affect Rdb sales.

The long-expected unveiling of Alpha-ready systems [CW, June 15] comes one week prior to the release of DEC's financial results for the company's fourth fiscal quarter, which industry analysts said they expect to be dismal.

Included in the announcement will be the VAX 10000 family, which comprises extensions to the current VAX 9000 mainframe series; the VAX 7000 family, which extends the current VAX 6000 line; and Alpha-ready VAX 4000s, a VAXstation 4000 Model 90 and a MicroVAX 3100 Model 90.

The systems will all be based on DEC's next generation of NVAX processors. The 7000 and the 10000 series will offer a pin-compatible version that will allow users to swap in an Alpha board when the boards become available. The lower end systems will require a box swap.

"Given the level of interest that has been generated by Alpha, we wanted to provide Alpha-ready solutions that would give people some degree of control over their business planning as they wait for systems to become available by guaranteeing a fixed upgrade price," Nist said.

Industry analysts were positive in their assessments of the strategy. "It's a bit of good news before the tornado [of the company's financial results] strikes," said Chris Christiansen, research director of multiuser systems at International Data Corp., a market research firm in Framingham, Mass.

Slow to move

Many users, however, will want to wait for the actual Alpha machines before making their choices, he added.

"We have no desire to jump into it at this point — we've got an installed base of traditional VMS machines, and that's what we'll use for the next year or two," said Rick Webster, a senior systems analyst at Caterpillar, Inc., a Peoria, Ill.-based manufacturer.

"We have a group of RS/6000s on the way. It's a price/performance issue, and we'll evaluate Alpha when it arrives," added Bill Anderson, chief information officer at Prudential Securities, Inc. in New York.

But for people who are already convinced of the need to move to Alpha, these systems will be helpful, according to Ted Nieland, a member of the VMS Systems Special Interest Group Executive Committee at the Digital Equipment Computer Users Society.

"There are people who need these machines now and who are trying to plan for the transition," Nieland said. "This gives them options."

All DEC'd out

DEC hopes its new Alpha-ready machines will get users motivated to migrate to its next-generation system. A sampling of the new offerings:

Model	Configuration	Memory	Price*
VAX 4000-600	Uniprocessor	64M bytes	$138,000
VAX 7000-610	Uniprocessor	128M bytes	$256,000
VAX 10000-610	Uniprocessor	256M bytes	$442,000

*Tentative

CW Chart: Stephanie Faucher

DEC cuts back RdbStar; wins users' support

BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp. users appeared mostly unperturbed that the company recently pared a distributed database project, saying the technology potentially duplicated features available with the Rdb engine and would have had minimal short-term impact.

The decision to eliminate RdbStar's database engine, sources said, is part of a corporatewide plan to cut expenses by streamlining software development costs [CW, June 29].

DEC will now focus on building distributed database capabilities that will run in conjunction with the Rdb database engine for applications on multiple relational database management systems and operating systems, DEC sources said. DEC officials said they are still in the process of deciding which portions of the project to retain and what to offer.

Some members of the Digital Equipment Computer Users Society were generally supportive of DEC's decision to focus on Rdb.

Right move

"I've had a little concern that DEC was investing heavily in a duplicate database and that was going to substantially confuse people," said Jeffrey Jalbert, president of JCC Consulting, a Granville, Ohio-based consulting firm, and recent chairman of the user society's VAX to Alpha Transition Group. "Taking a full-featured Rdb and translating that to Unix with the [distributed] capabilities of RdbStar, that's what DEC should have tried to do from the beginning."

Tim Mueller, chairman of the society's Data Management Systems Special Interest Group, said he thought RdbStar was designed to overcome architectural hurdles to distributed data management that are present in the Rdb architecture. But users may not yet require those capabilities, he said.

"Until you look at distributed [features], Rdb is robust," Mueller said. "But most users are still grappling with two-phase commit, and they're still learning about what they can do with available technology. People are saying that they need it in the future, but they're not sure they need it right now."

A Cooperative-Server Database From Oracle

The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision making by making access to information easier...much easier.

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation

"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.

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Pioneers moving nets to fast ATM technology

CONTINUED FROM PAGE 1

Fiber Distributed Data Interface (FDDI) network.

The Air Force, TI and Bear, Stearns all said they intend to leverage Adaptive's ATM products for the voluminous bandwidth they need for multimedia, imaging, computer-aided design and manufacturing and other distributed applications. They said they will bypass FDDI entirely or use FDDI in niche applications.

Because all current LANs rely on multiple users sharing a fixed amount of bandwidth, network performance can degrade as additional users attach. This generally results in network administrators continually segmenting networks to keep local performance high, eventually slowing interLAN performance as traffic must travel through more bridges and routers.

On this issue, John M. McQuillan, president of McQuillan Consulting in Cambridge, Mass., said that "most internetworks today are in crisis because we've outgrown the original design points with bridges, routers and hubs."

Because of this, "we need a radical adjustment to our network infrastructure," said Sam Shuler, communications strategy manager at TI. "It looks as if ATM will get us out of the mode of reactive service delivery and ahead of the power curve."

Jeff Marshall, Bear, Stearns' managing director of communications, said 20% of his users need the 100M bit/sec. to-the-desktop speeds currently afforded by Adaptive's ATM. A year ago, Bear, Stearns was bullish on FDDI, but "we dropped those plans when ATM heated up," said Ken Starkey, associate director of communications.

Networking officials at TI and the Air Force cited goals of immediately moving 10% of their desktop users and 100% of their backbones onto ATM and shifting to 100% ATM desktops by late 1994. The decisions represent a displacement of the organizations' current network infrastructures, the officials said.

Frank Ricotta, director of network services at the Space Systems Division of the Air Force, said he has about 10 FDDIs that he intends to phase out. Because of remote launch testing and distributed number-crunching applications, "our chief information officer was easy to convince" about moving to an ATM infrastructure, he said. "The technology reduces cycle time and saves money."

Embedded base dilemma

However, the full-blown infrastructure swapouts of the three organizations are not likely to reflect the paths that mainstream corporate America will take in getting their networks onto ATM, given their installed LAN bases. Gateways in routers and wiring hubs for feeding LANs such as Ethernet into ATM networks are expected to serve as a common ATM migratory path.

But "our leading-edge customers tell us they know the network course they are on with today's LANs is not sustainable," said Audrey MacLean, Adaptive's chief executive officer.

However, ATM, like any new technology, has a pricing problem, noted Paul Callahan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. Combined per-port switch and adapter card prices total about $9,000 per ATM connection, compared with the more palatable FDDI prices, which have dropped into the $2,000 range with recent announcements by IBM and 3Com Corp.

The scalability is worth the price for users in need, such as the Air Force, Ricotta said. "Today's cost, compared with other LANs like FDDI, is higher for getting the infrastructure in place. But over time it is cheaper" because technologies do not have to be replaced, he said.

Quick switch on way

Adaptive's ATMX kicks off the movement to LAN switching:

Characteristics: Local-area multimedia switch with 1.2G-byte backplane.
- Users plug in cards to add capacity.
- "Virtual network" concept means LANs are configured in software instead of via physical media. If workstation moves, no new address needs to be issued.
- Switched point-to-point connections rather than contention for bandwidth.

Speed: Initially 100M bit/sec. per device.
Media: Fiber; copper to come.
Adapter cards: Initially available for Sun Microsystems, Inc. SPARCstations only.
Management: SNMP manager with X Window System/OSF Motif interface.
Price: $9,000 per connection (includes both switch port and adapter card).
Availability: September 1992.

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Windows NT gains respect at Win32 show

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — It was the techies' day to play as more than 4,500 developers converged on the Moscone Center this week for Microsoft Corp.'s Win32 Professional Developer's Conference. After touring the guts of NT, many attendees declared themselves happy with what they had seen.

After seeing for themselves that Windows New Technology (NT) is real, commercial and some corporate developers said their next step is to determine where and how NT fits into their strategic plans.

Several corporate developers at the conference said they were investigating the actual potential for NT. However, only one, a software architect at the U.S. Department of State, said he had any particular projects in mind for the operating system.

But even if attendees were only browsing, the sheer number of developers present was a positive sign to companies considering the adoption of Windows NT. An attendee from a large insurance company said his company was a big OS/2 shop, but it is looking into Windows NT for some uses. The conference helped confirm for him that Windows NT would be a viable operating system.

"I've been to OS/2 shows, and they've been one-tenth the size of this," he said. "There are not as many developers interested" in OS/2.

Although Microsoft officials reiterated the party line that NT is slated to ship by year's end, there were some rumblings — although not a lot of concern — about the possibility of a slipped ship date. Several developers commented that they would not be surprised if Windows NT is not released until early next year. But they also noted that Microsoft would be well-advised to ship a stable product a couple of months late than to ship a less-than-ready product on time.

Not ready to capitulate

While the high attendance bodes well for the future of third-party applications under Windows NT, just how many products will actually result from this conference remains to be seen. Some developers' questions are still unanswered.

For example, some developers were concerned about the order in which Microsoft is releasing the pieces of its 32-bit development kit. A developer at a large insurance company said he would like to have seen the Win32S subset of the Win32 application programming interface available with the kit now instead of later this fall.

Win32S will allow developers to write a 32-bit Windows application that will run on both Windows NT and Windows 3.1.

The goal of Win32S is to give developers access to the large installed base of Windows 3.1 users while providing an easy upgrade path to Windows NT and other 32-bit versions of Windows to come.

Another developer wanted a device driver development kit available with the prerelease version of the software development kit (SDK) distributed at the show so that less mainstream devices, such as fax cards, could be made to support NT early on. Currently, the Windows NT SDK supplies drivers for several of the more popular video, Small Computer Systems Interface and compact disc/read-only memory devices as well as one tape backup system and a sound card.

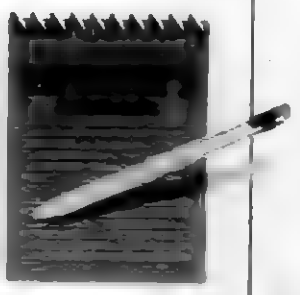
Favorable impression

As for Windows NT, attendee enthusiasm was high. Dozens of machines — both Intel Corp.- and Mips Technologies, Inc.-based — were available for hands-on testing. The test room was generally full of developers looking for a chance to try out a variety of NT features, with many complimenting Microsoft on the stability of the product. Indeed, very few of the machines crashed during the three days of the show.

The demonstration machines allowed users to try out most NT features, including security and system administration. Some machines also ran copies of 32-bit Visual Basic, Excel and Frame Technology Corp.'s FrameMaker as well as Corel Systems Corp.'s 16-bit CorelDraw and Borland International, Inc.'s DOS-based dBase.

Windows NT is still in its infancy, however, and several months of testing is needed before it can be determined how well the operating system will meet its and developers' goals.

Dave Zanini, a systems analyst at the Colorado Department of Transportation in Denver, summed up NT's future in six words: "It'll be great if it works."



The Win32 Professional Developer's Conference last week managed to attract some 4,600 developers, but not all of the action was confined to the technical break-out sessions. Quite a bit was happening in other areas of the conference, including the following:

• Anyone who attended the Windows Futures session was given a chance to take a quick look at Microsoft's Cairo, an object-oriented environment scheduled for release in 1994. Cairo is based on Microsoft's object model, which will be an extension of the Object Linking and Embedding feature currently found in Windows 3.1.

• Microsoft's Paul Maritz received some applause — and some laughs — when he announced that Windows NT will ship with a wide variety of printer drivers, a major fault with earlier versions of OS/2. In his words: "We've sworn we will never again ship an operating system that doesn't print."

• Phar Lap Software, Inc. in Cambridge, Mass., found the best way to gain market share with a product: First create the market, then give away the product. Phar Lap is taking orders for Quickstart, a tool that lets developers create Windows NT applications under DOS. The goal of the product is twofold: to give developers who might not have the hardware necessary for full NT development a chance to get going and to give Phar Lap some answers as to where it should aim its business in the future. Developers must fill out a survey in order to receive the product.

• With all the attendees, you would think the world was flooded with Windows programmers. Such is not the case, however. The message board in the main entrance of the Moscone Center had new job openings posted on a daily basis. To address this shortage, Bill Gates said Microsoft was pursuing getting NT into educational settings. In fact, universities may even gain access to Windows NT source code.

• Attendees at a reception held Sunday night were asked to write down questions to be answered by Bill Gates at his keynote the next morning. One inquirer wondered if the Microsoft head had managed to get his Porsche 959 on the road yet. No, Gates replied, indicating that his busy schedule had forced him to leave the less than road-legal sports car in a free-trade zone in Oakland.

Compiled by staff writer Christopher Lindquist

Novell's net management falls short

CONTINUED FROM PAGE 1

on its servers. However, "you can't see the Macs," which speak AppleTalk protocols, he noted.

Also troublesome, Bodenhorn said, is that the NMS software developer's kit is nowhere to be found, although Amos Press ordered it months ago.

The law firm of Brobeck, Phleger & Harrison in San Francisco, an original NMS beta-test site and user of the controlled release now in circulation at 600 sites, expected a "device-independent" product, according to Mark Greinke, a network engineer. "But the current reality is NMS is a passive monitor of Novell equipment only," he said, and until third parties add their extensions to it, "it is of minimal use."

NMS performs well gathering statistics, Greinke said, "but I want to do dynamic configuration of servers, routers, multiplexers and wiring hubs from one console." Currently, he said, he must hop among four different consoles — each with a different interface — to manage the various devices.

Queen also reported that Enron's NetWare server utilization shot up from about 20% to 80% when it loaded the series of NLMs comprising NMS 1.0. "This has slowed the entire network down with noticeable response time delays," he said.

Not all users reported such extreme server drains. Bodenhorn, for example, said he saw just a 5% to 8% consumption of memory in his servers' available cache buffers, which has not impacted network performance. And Novell has reported network utilization increases of only 2% on average.

However, NetLAN, Inc., a New York Novell dealer with about 10 customers running NMS, has "seen some abnormally high server utilization and freezing," said Marc Trachtenberg, director of technology. "My gut feeling is that the problem is the way the management stuff handles itself in memory." Trachtenberg ventured that NMS could be running in some unprotected memory areas that are supposed to be reserved for the NetWare core operating system.

'Resource hog'

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C.-based consultancy, said NMS "is a resource hog" because it was designed as a LAN-at-a-time manager of internetworks rather than as an enterprise manager.

The LAN-by-LAN nature of NMS is proving to be a bit of an obstacle to insurance firm Capital Holding, Inc.'s goal of distributing multiple management consoles corporatewide. Bob Pruitt, a network engineer at the Louisville, Ky.-based firm, said the network management databases currently cannot be distributed across servers so that a management console on each LAN can access the data.

"If the databases were on the network [rather than stored locally on one centralized management console], a distributed set of consoles could access those files without us having to totally configure each console," he explained.

Another NMS issue concerns occasional NLM-clashing [CW, March 30]. Enron was chagrined to discover — by fluke rather than directly from Novell — that a software patch was necessary to harmonize NMS with its Cheyenne, Inc. Arcserve tape backup NLM.

Trachtenberg said Novell is creating software patches rather than discovering problems with the system. "This is undesirable because if you need a special patch for each NLM and you load another NLM that doesn't like that patch," you can run into more problems, he explained.

In light of the myriad NMS issues — not uncommon with newly released, sophisticated products — most customers are "taking NMS off their servers and waiting," Trachtenberg said.

"I've never bought a bad product from Novell, but I consider this to be a bad product," Queen said. However, he added, he is confident that the vendor's track record indicates it will soon remedy the glitches.

Similarly, Pruitt said, "While currently NMS is not doing a lot for us, we like what we see as a foundation. We hope that 18 months from now the third-party applications will kick in and make it shine."

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Wiretap snares alleged hackers

CONTINUED FROM PAGE 1

and watch these guys play an electronic version of 'Can you top this?' "

According to the indictment, the men allegedly carried on a conversation in early November 1991 in which they sought instructions on how to add and remove delinquency reports "to destroy people's lives ... or make them look like a saint."

Several days later, members allegedly discussed a lengthy list of institutions that operated computers, with one member noting, "We've just got to start hitting these sites left and right." Law enforcement officials interpreted that to mean government offices, private companies and a U.S. Air Force base.

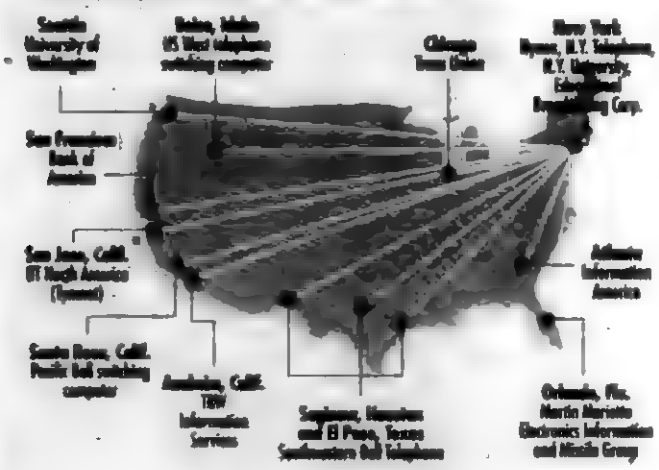
group of hackers called MOD, an acronym used variously to mean Masters of Disaster and Masters of Deception.

The group's earliest known act dates back to Nov. 28, 1989, when authorities said the group wiped out nearly all the information contained in the Learning Link computer operated by the Educational Broadcast Corp., WNET Channel 13 in New York. A message was allegedly left that said: "Happy Thanksgiving you turkeys, from all of us at MOD," signed by Acid Phreak, Phiber Optik and Scorpion.

That does not wash with some observers. "Several times, Phiber Optik has spoken publicly and very genuinely about his

Hacking cross country

The hackers known as 'the Masters of Deception' allegedly gained access to computers from New York to California



The high-profile raid, however, may have little real effect on hacking in the long term. "Ultimately, the only purpose this will probably serve is that hackers will go deeper underground, which is a heck of a lot more frightening," said Ian Murphy, president of IAM/Secure Data Systems, Inc., a security consultancy in Gladwyne, Pa.

The arrests, however, may serve to wake some firms up to their security vulnerabilities. At many companies, the only security system is a poster above the copy machine that shows a dog with a moustache and a Sherlock Holmes hat, said David Stang, chairman of the International Computer Security Association in Washington, D.C.

Name game

Indicted last week were Mark Abene, known as Phiber Optik; Elias Ladopoulous, known as Acid Phreak; Julio Fernandez, known as Outlaw; John Lee, known as Corrupt; and Paul Stira, known as Scorpion.

The indictment charges that they were part of a close-knit

aversion to corrupting data, so it seems unusual that he would destroy data and then identify himself," said Mike Godwin, general counsel at the Electronic Frontier Foundation, a civil liberties lobbying group based in Washington, D.C. "This whole indictment could very well be an attempt to frame some people who the authorities believe glorify hacking."

The hoped-for chilling effects of the indictments could thus be reversed into outrage if the investigation turns out to be bungled. The federal government, after all, has a checkered history of computer raids, observers pointed out.

In early 1989, for example, Secret Service agents arrested Craig Neidorf for allegedly dialing into the computers at Atlanta-based BellSouth Corp. and copying documents on the firm's 911 system. The agency charged Niedorf with illegally publishing a document that BellSouth claimed was worth $79,000. The government's case later collapsed when it was discovered that the information can be ordered from BellSouth for $13. The price of victory for Neidorf: more than $100,000 in legal fees.

Moreover, in March 1990, the Secret Service raided the home of Steve Jackson, who published role-playing computer games in Austin, Texas. The agents seized computers they said contained a "handbook of computer crime." The handbook was, in fact, an electronic game under development.

Jackson was not charged with any crime, but he said the prolonged disruption and seizing of equipment pushed his business close to bankruptcy.

A 'good' case

Government officials seem anxious to sponge away those memories. The FBI has long expressed the desire to prosecute a "good" computer crime case, and perhaps this is it, said Buck Bloombecker, director of the National Center for Computer Crime Data in Santa Cruz, Calif.

Officials think this could be that case. Assistant U.S. Attorney Stephen Fishbein said members of MOD were able to obtain unauthorized passwords and billing codes from switching systems at telecom companies such as Southwestern Bell to make free long-distance telephone calls.

At the FBI, DiFilippo said he expects other indictments could result and other victims could be found in the course of the ongoing investigation. That appears to have begun already. In a related action last month, Morton Rosenfeld and Alfredo de la Fe each pleaded guilty in U.S. District Court in New York to conspiracy to use passwords and other access devices purchased from MOD.

During the past few years, TRW and other credit-reporting agencies have become such frequent hacker victims that "it's no longer considered impressive to be able to get someone's TRW report," Murphy said. "It's too easy."

New probe under way

Law enforcement officials in San Diego are currently investigating computer system breaches into the credit-reporting network of Equifax, Inc. in Atlanta.

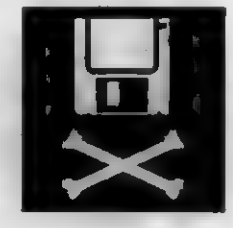
Last week's indictments could also possibly signal greater use of wiretaps in federal computer crime investigations. Already, there is legislation in Congress that, if passed, would allow federal investigators to intercept digital transmissions, said Otto G. Obermaier, U.S. attorney for the Southern District of New York.

Under current statutes, federal investigators can now intercept only analog transmissions, as they did in this case.

Netherlands, Mexico chase after hackers

BY JAMES DALY
CW STAFF

Crackdowns on hackers and software pirates echoed from two corners of the international community last week as the Netherlands passed a tough new hacker law and Mexico instituted raids against Mexican computer dealers suspected of copyright infringement.



In the Netherlands, hackers now face up to six years in jail for illegally entering a secured data system. The law, which is expected to become official next spring, begins with a maximum penalty of six months' imprisonment for hackers who enter a secured computer system but gets progressively more rigorous.

Imprisonment can be as long as four years if data in the system has been changed and six years for hacking a system that serves a common use, such as a hospital database.

Critics contend that the proposal does not differentiate between internal and external computer crime. Cracking the password of a colleague, according to the law, can merit prosecution.

Hackers also said they believe the law will only increase the danger to computer systems because they will no longer give cheap warnings if a system has poor security.

In Mexico City, the Business Software Alliance and the Procuraduria General de la Republica — the Mexican federal attorney's office — raided two companies suspected of illegally reproducing software programs made by Microsoft Corp. and Autodesk, Inc.

Numerous machines and disks were seized at Comyss SA de D.V., Col Narvarte and Carbase de Mexico SA de C.V., Col Romero de Terreros in what was called the first salvo to fight widespread software piracy in Mexico.

The attorney general's office is in the process of evaluating the seized materials to determine if indictments are in order.

Illegally accessed sites boost security

Some victims of hacker infiltration are stepping up security measures at their companies to guard against further intrusion, if not lost revenue.

For example, the security breaches by MOD at Southwestern Bell cost the company $370,000, including the cost of locating programs that were modified or corrupted by the hackers and other expenses accrued toward the installation of new computers and security devices, according to Joseph Elstner, district manager for media relations at Southwestern Bell in St. Louis.

Elstner declined to give examples of new security devices installed by Southwestern Bell for fear of "tipping off" other hackers. However, he said the company has recently installed new security devices that automatically alert the host communications system when an unauthorized entry has been made.

At TRW Information Services in Anaheim, Calif., a spokeswoman said the firm has recently begun using new computer terminals in which passwords are "embedded" within the computer. She said most of the credit system users now have such terminals.

The TRW spokeswoman added that earlier published reports that computer hackers had altered TRW credit reports were erroneous.

"Hackers may enter the system, but by no means can they alter a credit report," she said.

The spokeswoman said she is not aware of any lost revenue as a result of the security breaches, and she said she does not know of any pending civil suits filed by any of the 176 TRW clients whose reports were allegedly stolen and sold by MOD to Morton Rosenfeld.

THOMAS HOFFMAN

Computer industry loses an important visionary

Businessman/author Charles P. Lecht succumbs to cancer

TOKYO — Charles P. Lecht — technologist, futurist, computer industry observer, businessman, writer and relentlessly curious intellect — lost a long battle with cancer July 3.

Even though this fight was a matter of public knowledge, the ending was still a shock. As longtime friend Marvin Minsky observed, "The world of computer science is so young that we still find it strange to recognize mortality."

Furthermore, "Charley" Lecht seemed somehow the antithesis of mortality. He was, Minksy said, a person who "saw opportunities everywhere and engaged in them with inspiring optimism and courage."

Since 1985, Lecht, 59, lived in Tokyo, where he operated Lecht Sciences, Inc., a research and development firm specializing in computer animation and graphics. This was, as Minsky described it, no ordinary enterprise, but "a sort of media laboratory" built around a "great gang of programming hackers and artist/animators."

From his base in Japan, Lecht also served as a correspondent for the IDG News Service, which supplies material to *Computerworld* and its sister publications around the world. This continued an association that began in 1977 with *Computerworld*'s publication of a series of Lecht's essays called "The Waves of Change."

Lecht — Lecht-o-san to many of his friends and colleagues in the U.S., Japan and places in-between — literally grew up in the computer industry.

In 1951, at the age of 18, he took a job as an operator of a hand crank-driven desk calculator for a defense engineering company. Later, he progressed to computer programming at IBM, MIT's Lincoln Laboratories and Mitre Corp. Two degrees in mathematics and a stint in the U.S. Army later, Lecht founded his own software house, called Advanced Computer Techniques Corp., which he ran for 20 years.

Boundless curiosity about technology and the future were lifelong characteristics. In the foreword to the latest of Lecht's six books — *The Information Tsunami: A Futurist Looks Back — Computerworld* founder Patrick J. McGovern recalled their first meeting in 1968.

Having been advised that Lecht possessed an incomparable vision of the future of computer technology, McGovern went to visit him in New York. What McGovern found at that meeting was an electric personality truly wired into the future.

"The person I encountered made an immediate and permanent impression," McGovern recalled. "His office looked like the back lot of a science fiction film, filled with robots, computer parts and all manner of futuristic toys. But the surroundings paled next to Charley himself, a diminutive, cigar-chomping package of intellectual energy, endless vitality and nonstop enthusiasm. Charley doesn't so much greet you as invade your senses."

It was probably that intense, focused interest in everything around him that made Lecht so adept at predicting trends in technology. He was an avid listener and a terrific assimilator.

This trait served Lecht well most of his life. Certainly it helped to make him, as McGovern put it, "one of the computer industry's most important visionaries." It allowed him to blend into a notoriously insular society and become that rare exception — a U.S. businessman who was able to connect and thrive in Japan.

On one occasion, however, this usually useful ability to meld worked just a little too well.

As longtime friend Webb Castor recalled, Lecht's intense concentration and unique mannerisms almost got both of them thrown into jail as spies by the Shah of Iran's secret police, the SAVAK. Charley did not speak Farsi, the language of Iran, Castor said, but something about the way he stroked his beard and hummed in a mantra-like way as he listened to them seemed to have convinced the Iranians that he not only understood them but was probably a spy.

Lecht *literally grew up in the industry*

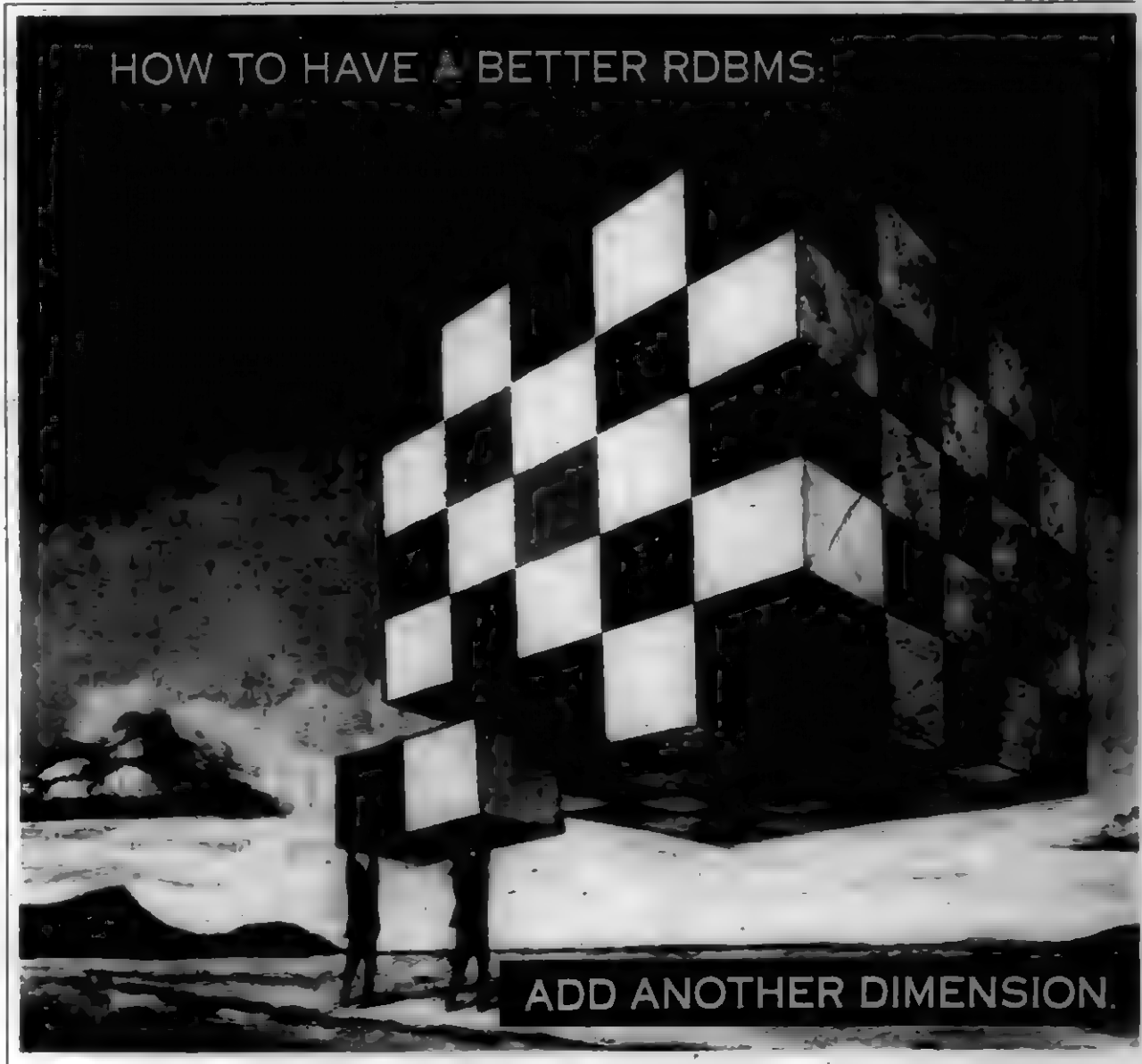
Castor and Lecht eventually got out of that hot situation and the country. Castor stayed a little longer, but recalled that his friend warned him not to linger too long because the Shah's reign would not last for more than four years.

That was 1975. The revolution came in 1979. It always paid to listen to Charley Lecht.

Lecht leaves his wife Suzanne and two sons, Eric and Jonathan.

Suzanne Lecht will continue to operate Lecht Sciences with Jaime Chee and Michael Levy, the creators of the company's latest product, a second-generation multimedia version of the Realtime Animation System.

JOANNE KELLEHER



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NEWS SHORTS

NCR offers management software

NCR Corp. last week unveiled a new generation of network management software. StarSentry Systems Manager 3.5 was designed to offer increased protection against network management failures and single-site control of networks that comprise multivendor computers. A lower cost option, Systems Manager/100, provides many of the same features and functionality for networks of up to 100 nodes. Based on Unix System V, Release 4, Systems Manager 3.5 supports Simple Network Management Protocol and costs $15,000. Systems Manager/100 costs $5,500.

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Mail interface groups budge an inch

The X.400 Application Program Interface Association (XAPIA) last week said it would consider Microsoft Corp.'s recent recommendation to define a more generic messaging application programming interface than one dedicated to X.400 standards. XAPIA Chairman Ed Owens said the initial idea is to provide a basic mechanism for sending a message across multiple disparate messaging APIs. The XAPIA will query users on their needs at upcoming Electronic Mail Association meetings.

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Group addresses child, elderly care

Twelve blue chip firms are working together to improve the quality of child and elderly care nationwide. Participants include initiator IBM, AT&T, American Express Co., Xerox Corp., Exxon Corp., Eastman Kodak Co., The Travelers Corp., Johnson & Johnson, Amoco Corp., the Allstate unit of Sears, Roebuck and Co., Motorola, Inc. and NationsBank Corp. The plan involves "a more coordinated approach, working at the community level to improve and expand existing programs and create new ones," AT&T said. The companies would not yet detail funding levels or name the targeted communities.

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Vive la telecom!

Northern Telecom, Inc. bought an initial 20% stake in Matra Communication, a division of French holding company Matra Group. The two firms will launch 50:50 joint ventures in radio communications and public network switching equipment. Northern Telecom will also merge its French private branch exchange marketing, sales and service groups into Matra Communication.

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TCP/IP embroiled in standards tiff

A barrage of electronic protest memos last week greeted the Internet Advisory Board's recommended course for correcting the currently limited address space of Transmission Control Protocol/Internet Protocol (TCP/IP). In a memo, the board reiterated its stance that the community should adopt a new architecture based on the Open Systems Interconnect (OSI) Connectionless Network Protocol. Members objected, saying that other proposals now on the floor deserved consideration and that migrating to OSI-based addressing would require major revamps of all TCP/IP networks.

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Short takes

Executive information systems maker **Pilot Software, Inc.** is set to merge with **TechGnosis International, Inc.**, a Boca Raton, Fla.-based firm that makes a data access tool for SQL databases. . . . John M. McLoone, 49, has left his position as vice president of information technologies in the Grace Specialty business at **W. R. Grace & Co.** in Boca Raton, Fla. He has joined Handy & Harman, a New York-based precious metals fabricator and refiner, as vice president of financial services. . . . Paul Low, who retired last month as **IBM's** top semiconductor executive, was named an advisory partner at the venture capital group of Weiss, Peck & Greer International Fund, a New York-based investment company. The 35-year IBM veteran will act as a consultant for the development of the company's computer operations and evaluate new technology investments. . . . **Unisys Corp.** was awarded a $3 million contract from the **Algerian Bank of Agriculture and Rural Development** to install a Unix-based network supporting more than 300 Unisys U6000/15s and U6000/35s.

Oracle plans secure database

Could appeal to federal users who want multilevel security in one place

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — In a bid to boost its appeal to federal government users, Oracle Corp. is expected to announce a secure version of its Oracle 7 relational database, called Trusted Oracle 7, tomorrow, Oracle sources said.

Trusted Oracle will provide multilevel security in a single, integrated database, analysts said. Individual users will be able to view data stored in the database rows and columns based on their personal security clearance. This will allow federal agencies to move away from a long-held practice of holding data in many physically isolated databases.

"Oracle needs to have Trusted Oracle to get the federal business," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif.

Linda Vetter, vice president of Oracle's Secure Systems Group, said Trusted Oracle would be marketed to federal agencies and to companies that wish to protect sensitive data. "Government agencies need it for classified information," Vetter said, "but the point is that the software is designed to keep sensitive data separate from other data. That could include company-proprietary information or accounting information."

Michael Abbey, a database analyst at the Auditor General's Office in Ottawa who chairs Oracle's Affinity program for top users and Oracle executives, said there will be commercial applications for the secure product, along with law enforcement and tax uses.

It is unclear when beta testing, which began last month, will end. But Vetter said Trusted Oracle will be shipped to customers within 90 days of Oracle 7's expected release this fall.

The four major access-control labels used by the U.S. government are classified, confidential, secret and top secret.

Even Trusted Oracle and its B1-level database competitors may not be used to handle the highest levels of classified data, some experts said. "B1 is the lowest level at which you have mandatory access control labels for secret and top secret data," said Stephen Crocker, vice president at Trusted Information Systems, Inc. in Glenwood, Md.

Crocker said federal agencies would welcome the ability to gather data from isolated databases into a B1-level integrated database and also intermix data of varying security labels in unified databases.

Oracle did not provide pricing, but users expect to pay a premium for the secure version.

Trusted Oracle has been under evaluation by the National Computer Security Center (NCSC) for the B1-level security rating for a year. The Oracle 7 database has also been submitted to the NCSC for a C2 rating.

The U.S. government maintains security guidelines, labeled by number and letter combinations, in a so-called "orange book." C ratings are lower than B ratings, and higher numbers indicate higher levels of security.

Shielded data

Database vendors are scurrying to secure their products

Vendor	Product name	Date of shipment	Security rating sought
Sybase	Secure SQL Server	1989	B1
DEC	SERdb V4.1	1992	B1
Informix Software	OnLine/Secure 4.1	1992	B1*
Oracle	Trusted Oracle 7	1993	B1*

*Trusted Oracle and Informix OnLine/Secure are currently being evaluated by the National Computer Security Center (NCSC) for a B1 rating. None of the relational databases above have received an official NCSC rating yet.

Source: Vendor information

CW Chart: Janell Genovese

Informix emphasizes tools at user show

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — Users of Informix Software, Inc. products, most of whom acquired Informix databases through a value-added reseller, came to the firm's first worldwide user conference last week to shop for software tools.

"I'm looking for CASE tools and application software packages," said Yona Bik, a computer manager at Diesenhaus, an Israeli travel agency in Tel Aviv, echoing a response heard from a number of the 1,000 Informix users in attendance. Bik was also shopping for multimedia tools for personal computer-based video travelogues. "I'm interested in everything, especially in tools. We're networking our PC boxes together," he said.

Informix demonstrated its latest set of Informix fourth-generation language (4GL) extensions, announced earlier this month. But it also showed off an eclectic set of unannounced tools in the conference exhibit hall, including the following:

- **HyperScript**, a development language for graphical applications formerly bundled with the Informix Wingz graphical spreadsheet. Targeted at end-user query applications such as executive information systems, it will be announced with Wingz 2.0 this fall, Informix said.
- **Storm**, an icon-based query environment that requires the aid of IS programmers. IS personnel prepare special "views" of the database, which users customize with a point-and-click editing system. End-user queries will be glued together from these icon-based menus. The first versions of Storm, to be announced this fall, will support OSF/Motif and Microsoft Corp.'s Windows.
- **Informix 4GL++**, a version of the Informix 4GL tool kit with object-oriented extensions, slated to debut next year. Informix Chairman Roger Sippl told industry analysts that object-oriented tools will be the vehicle of choice for adding object-oriented features to relational databases. Informix 4GL++ will run against Informix and other relational databases as an "open" tool.

Informix Chief Executive Officer Phil White said the $179 million company has every intention of optimizing its tool sets for open systems applications and no intention of building its own computer-aided software engineering (CASE) tools. Informix decided last year to market a licensed version of Hewlett-Packard Co.'s SoftBench as a framework for third-party CASE tools. The plan is to use Informix's capital sparingly as it competes with several firms of equal size — and with $1.1 billion Oracle Corp.

"We're trying to focus on the user's ability to deploy new applications," White said. "We're focusing on our core technology of engines and tools and banking on lots of technology from other companies."

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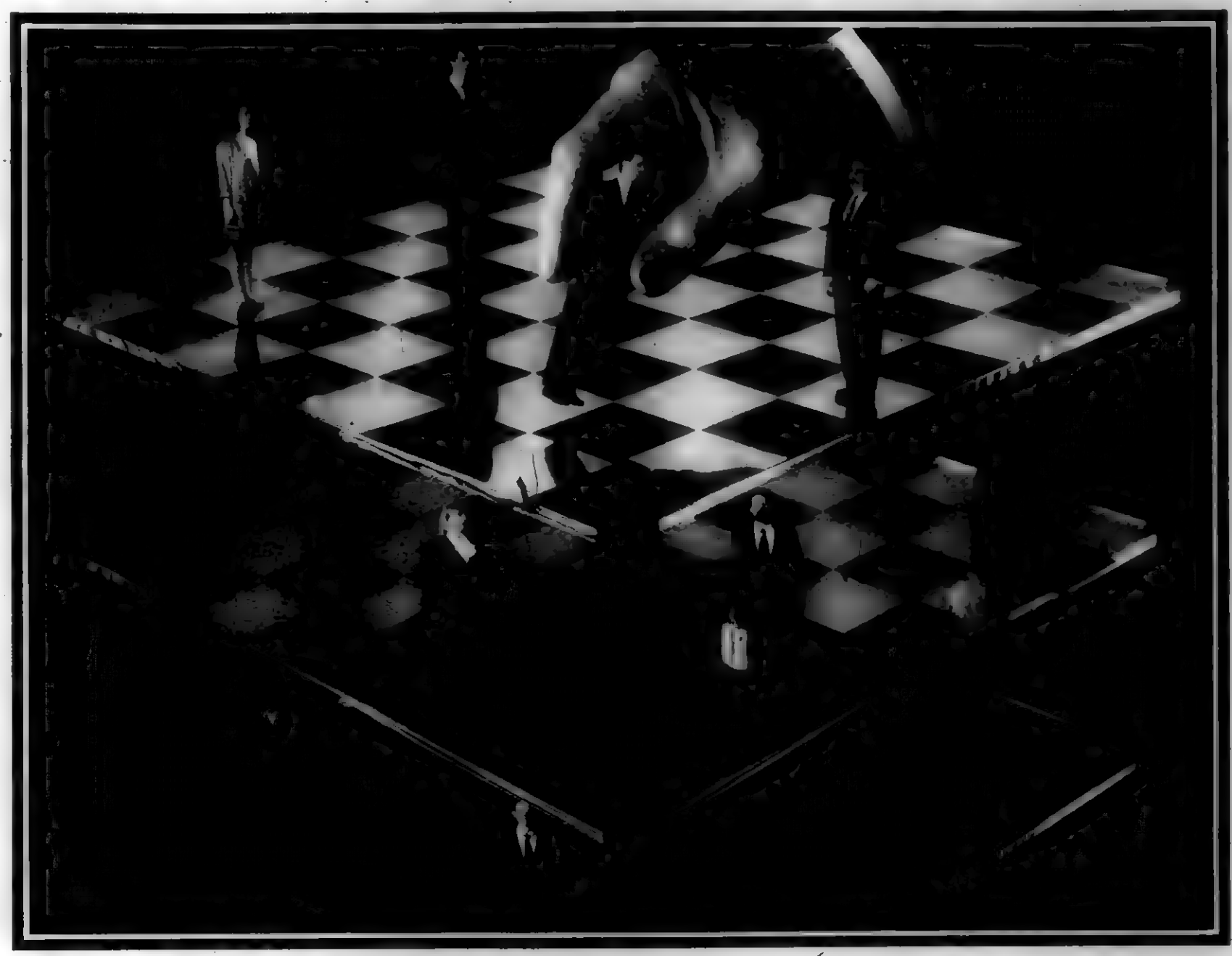

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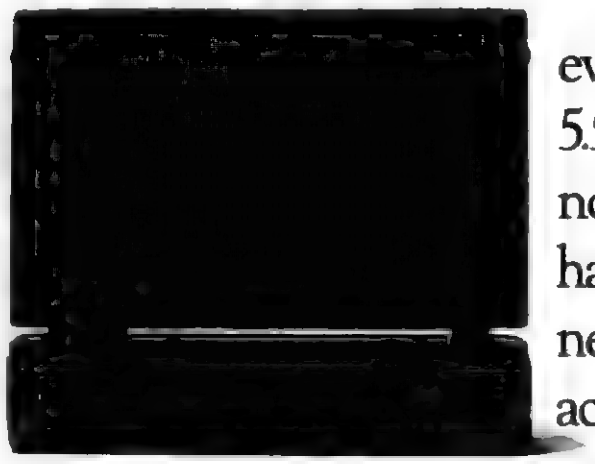

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(Although our spec sheets do make excellent reading.)

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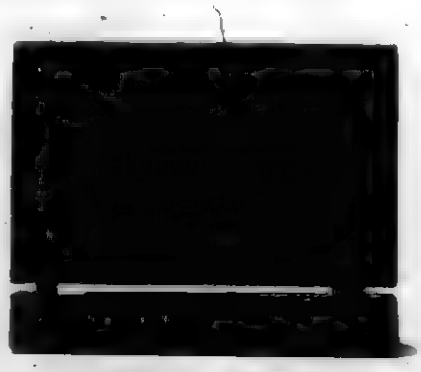

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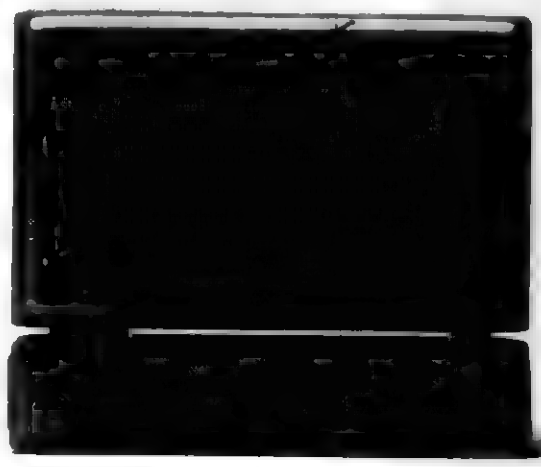

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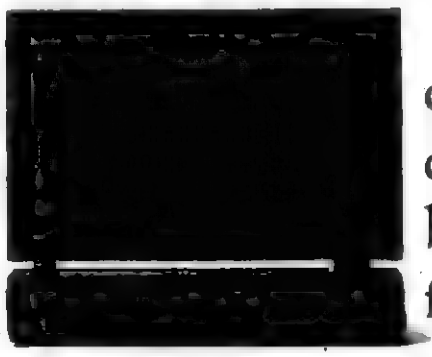

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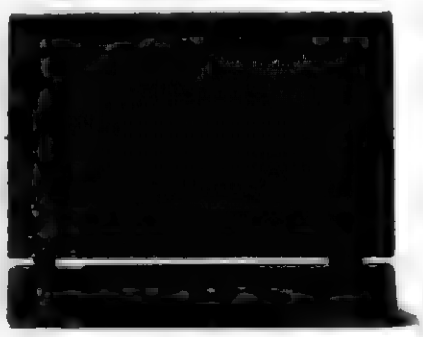

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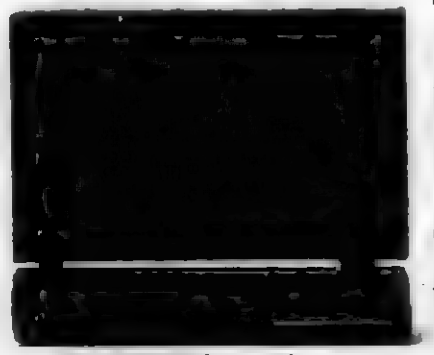

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Tech policy weighed

CONTINUED FROM PAGE 1

aggressive trade policies, stronger intellectual property right protections and a freer flow of technology from government laboratories into the commercial world.

Those calling for a stronger government/industry partnership simultaneously warned of a heavy government hand.

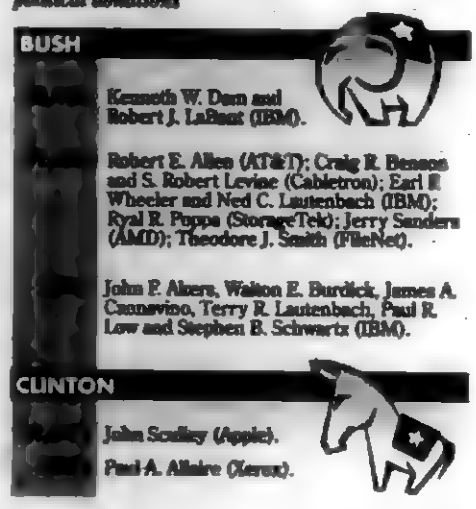
"As a technology industry, we have problems with both parties," Maibach said. "The Democrats want the government to play an active role, but the danger is they will want to drive the policies. The Republican Party understands that business does not want more regulation, but it needs to realize that in the age of information and technology and a global trading system, we have to have government as an ally."

Yet company executives said the candidates are not paying attention to key industry concerns. "None of the candidates is focusing on our national technological competitiveness," said Merrill W. Buckley, president of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). "We need a coherent, national technological policy, a national plan, strong trade and tax policy."

Others, such as Jerry Schneider, founder and director of the Association of PC User Groups, would like "a cabinet-level science/technology adviser with a lot of clout and some mechanism for getting more ear play for industry and user problems."

Technology seeding

High-profile, high-tech executives have made political donations



Compiled by Mitch Betts CW Chart: Stephanie Faucher

Enthusiasm needed

Regardless of the specific agenda, users and vendors expressed a common desire, which Maibach summed up: "What we want from the next president is some enthusiasm and the will to win the technology battle — not benign neglect."

Fear of such neglect may be tied to a lack of understanding about just where the White House stands on issues of technological competitiveness.

Those taking part in a recent public debate on U.S. technology policy, co-sponsored by *Computerworld* and Computer Associates International, Inc., started from a common assumption that the country has none. But days later, Robert M. White, undersecretary for technology at the U.S. Department of Commerce, said rumors of a nonexistent national policy were greatly exaggerated. As proof, he offered a reporter two volumes: "U.S. Technology Policy" from the White House Science Office and "Strategic View" from the Technology Administration of the Commerce Department.

It is true that Bush has consistently argued for free market solutions to the country's economic problems and has rejected calls from Democrats and industry executives for broad federal programs to support specific industries. However, despite the rhetoric, the administration has taken a number of steps to push the government closer into a partnership with business: providing funds to industry consortia such as Sematech; supporting the High Performance Computing and Communications initiative originally crafted by Congress (which includes a proposal for a national data highway); and turning in double-digit budget increases for the science and technology agencies.

White: *U.S. has high-tech policy*

"We have this unusual situation that President Bush is actually doing more than he's promising, which is an incredible thing for a politician," Lewis M. Branscomb, a professor at Harvard University's John F. Kennedy School of Government and former chief scientist at IBM, said at the debate. "It's kind of a stealth policy."

But the administration's creep toward technological activism comes without a grand plan to pull it all together, a number of observers said. "It's false to say that you can win at football without a team strategy, if you just deal with individual steps on the playing field," said Craig Fields, chairman of The Microelectronics and Computer Technology Corp., an Austin, Texas-based electronics and computer science research consortium.

Apparently ready for a change — but not to Clinton — are members of the American Electronics Association (AEA). More than half of those responding to a recent poll said they would vote for Perot in November. Just 29% said they would give Bush the nod, and a scant 4% support Clinton.

AEA President J. Richard Iverson acknowledged he was surprised by the strong Perot showing, saying it may indicate that AEA members — mostly smaller companies — are blaming Presidents Bush and Reagan for the banking fiasco that has left credit scarce for high-tech start-ups. He also credited Perot's 30-year background in computer services and systems integration.

Perot is also the only presidential candidate ever to ask the Association for Computing Machinery for its views. Perot has also queried Fields on his views on competitiveness.

Weak response

But the candidates' overall record in soliciting industry views is mixed. In April, the IEEE sent a list of 10 questions to the candidates, probing their views on matters pertaining to a number of issues including technology. Only Clinton has responded, although the Bush campaign said it will.

Responding to Clinton's call for a civilian technology agency patterned after the billion dollar-per-year Defense Advanced Research Projects Agency, White said, "We have it now. The Advanced Technology Program [ATP] meets those needs." The 2-year-old ATP gives grants to firms and consortia for research and development in new technologies with broad applications. Funded now at $47 million, the White House has requested $68 million for 1993.

The next president will need to do at least three things to satisfy the high-tech community: take steps to improve the economy, embrace fiscal policies that encourage long-term investments in technology and create an environment in which Uncle Sam is seen as an ally, not an obstacle, in the increasingly tough battle for global preeminence.

Posturing for the high-tech vote

Bush

Technology: Significantly boosted federal funding for research and development and supported some modest government/industry partnerships. Rejects a broad industrial policy.
Taxes: Wants a permanent R&D tax credit, possibly with an expanded definition of R&D; favors a broad capital gains tax cut.
Trade: Endorses free-trade agreement with Mexico; vows to further relax computer export barriers; has won promises from Japan to buy more U.S. chips and computers; rejects "protectionism."

Clinton

Technology: Would create a civilian R&D government agency, develop "smart" highway technology, build a national fiber-optic data network by 2015, offset reduced defense R&D with increased civilian R&D and start a support agency for defense firms hit by budget cuts.
Taxes: Favors a permanent tax credit for R&D and a 50% cut in capital gains tax on long-term investments in new businesses.
Trade: Would toughen penalties for unfair practices. Supports president's proposed free-trade agreement with Mexico.

Perot

Technology: Philosophically closer to Clinton than to Bush, Perot favors stronger government/business/labor partnerships and significantly increased federal funding for education, training and R&D; wants government to help develop specific plans to ensure viability of key industries.
Taxes: Favors a permanent R&D development tax credit and a capital gains tax cut for small start-up companies.
Trade: Favors tough trade policies; criticizes Bush's proposed free-trade pact with Mexico.

Read our lips

The high-tech community had the following tips for the candidates:

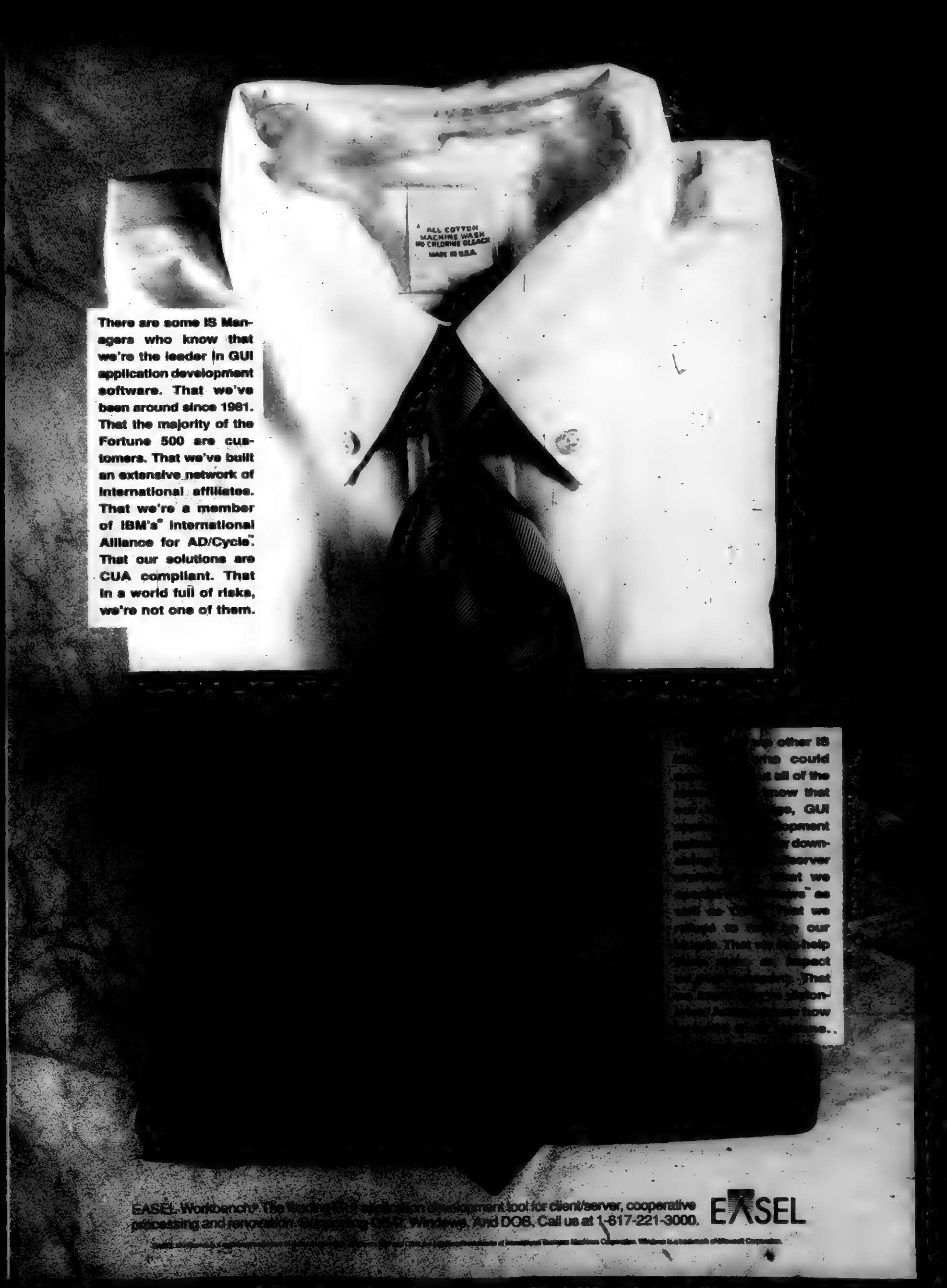
Michael Maibach, *director of government affairs at Intel Corp. and until recently a candidate for Congress:*
• "We need intellectual property protections, a good trading system, open markets, good tax and fiscal policy. Government must be a partner with industry because the ingredients of competitiveness are so policy-driven."

Riley Rapke, *director of government affairs at Oracle Corp.:*
• "I'd like to see a greater awareness of the uses of technology for solving social problems such as health care."

Mitch Kapor, *founder of Lotus Development Corp., chairman of On Technology, Inc. and president of the Electronic Frontier Foundation:*
• On the campaign: "None of our issues are of the kind of absolute, first-rank, national urgency that they need to elbow their way into the presidential campaign."
• On a president: "I'd like to see him take an active interest in privacy and [communications] infrastructure issues."

Craig Fields, *chairman and chief executive officer of The Microelectronics and Computer Technology Corp.:*
• "The fixation should not be on what are the ideas because there are so many good ones around. It should be on implementation. We can debate endlessly and fail."

Roger Sippl, *chairman of Informix Software, Inc.:*
• "Who should come up with technological policy? Not Congress, not politicians. They are just going to screw it up. They're going to get lobbied by somebody, and they're going to get pork-barreled." Sippl said the private sector should define and shape technological policy.



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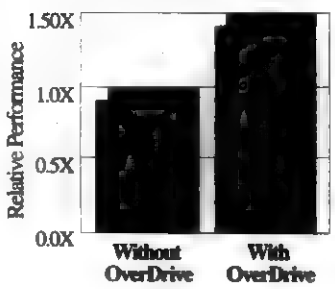

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ADVANCED TECHNOLOGY

TECH TALK

Electronic meeting

■ If you want to talk about futuristic technologies, you might as well use state-of-the-art technology to run the meeting. The Institute of Electrical and Electronics Engineers, Inc. (IEEE) plans to run a videoconference to explore the use of virtual reality and other computer technologies as educational tools. New York-based IEEE says the Sept. 30 broadcast is intended to provide a glimpse of tomorrow's workplace. Presenters will be from organizations such as the U.S. Department of Defense, the University of California at Berkeley, Intel Corp. and the University of Central Florida's Visual Systems Laboratory. Key topics include computer aids for product design, computer aids for manufacturing control and virtual reality for planning, training and education.

In the running

■ Organizers of the 1992 Gordon Bell Prize competition have selected finalists for the award honoring significant achievements in the application of parallel processing for practical scientific and engineering problems. The winners, to be named during the High-Performance Computing and Communications Conference Nov. 16-20 in Minneapolis, will come from the following: A team from the Jet Propulsion Laboratories in Pasadena, Calif., and Intel Corp. for work on electromagnetic scattering calculations; a team from the Swiss Federal Institute of Technology for a multisignal processor system with intelligent communications; a team from Argonne National Laboratory for work on large, sparse systems of linear equations in massively parallel applications; a team from Purdue University and Emory University for superconcurrent simulation of polymer chains on heterogeneous networks; and a team from Los Alamos National Laboratory and the California Institute of Technology for "Astrophysical N-Body Simulations at 5.4 GFLOPS."

Setting stage for future work force

Electronic teaching tools today may force corporations to change their ways tomorrow

BY CHRISTOPHER LINDQUIST
CW STAFF

What did you do in school today?

For most of us, the answer would have been something along the lines of drawing some pictures or reading a book or, if we were lucky, maybe taking a field trip. In the not so distant future, however, the answers might also include taking a tour of the human nervous system or talking about dinosaurs with an archeologist at a dig site thousands of miles away. Such are the prospects that today's technology could bring to the classroom of tomorrow.

They are prospects that information systems managers and other business executives may have to consider as they prepare tomorrow's corporation for the entry of today's student.

Students are going to be exposed to training techniques beyond being lectured to, reading books and occasionally seeing a film. Students may use networked and stand-alone multimedia workstations in conjunction with bar-coded textbooks that interactively call up additional audio, video and text information with the flick of a light pen.

They may become used to going on "electronic field trips" with thousands of other students through the use of satellite television and broadband networks. They may even someday use virtual reality to walk through a human body to examine an immune system. And when they enter the work force, they will expect similar training from their employers.

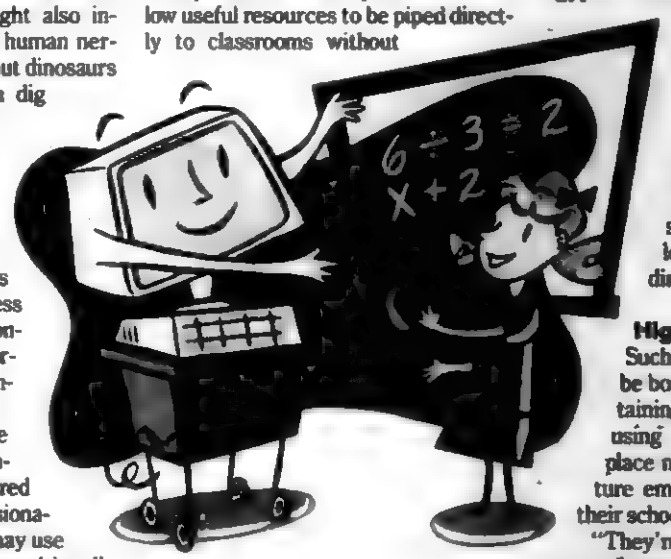
Radical learning changes

"The technology will really change how we look at the learning process and the education process," said Frank B. Withrow, team leader for the Technology Applications Group in the U.S. Department of Education's Educational Research and Improvement Division. Gone will be the "master teachers," and in their places will be "coaches" who will sit beside students.

"The classroom of the future will have a handful of networked PCs and a teacher's multimedia computer linked into the school network," said Nelson Heller, publisher of the "Heller Report on Educational Technology and Telecommunications Markets" in Highland Park, Ill. Such a setup would allow the teacher to use the system both for lecture support and for self-paced learning sessions.

Other noncomputer technologies will also have a dramatic impact on schools. Many of today's schools are being built to accommodate broadband fiber-optic or coaxial networks that will be used to connect both computers and audio/visual systems within the school and to outside information resources.

Media centers will be set up with all the necessary audio and visual equipment — videocassette recorders, film projectors, stereo systems, cable and satellite television — and classrooms will each contain large-screen monitors and speakers. Such a system would allow useful resources to be piped directly to classrooms without large amounts of equipment being transported and would also let classes interact with one another.



John & Wendy

A program along those lines has already been tried, Withrow said. Students in Fairfax County, Va., were connected to students in East and West Germany during the dismantling of the Berlin Wall. Such "distance learning" techniques are expensive, but part of the cost can be borne by other schools that are able to watch the proceedings on satellite TV.

Beyond even these electronic excursions are the exciting possibilities of virtual reality. While TV transmissions are limited to the tangible physical world, virtual reality knows no boundaries but the imagination — and cost. Such systems are generally expensive now, but companies such as computer-aided design and engineering software vendor Autodesk, Inc. are beginning to produce systems that will become more affordable in the near future. With cost out of the way, the possibilities would become nearly limitless. "Visit the Egyptian tombs — then you could explore the human anatomy," Heller said.

He also cited Videodiscovery, a firm in Seattle that produces videodiscs for use in education, including one that can be used with a special pair of glasses that lets students view a three-dimensional human skull.

High expectations

Such systems will obviously be both educational and entertaining. And students taught using them will most likely place new demands on their future employers to keep up with their schools.

"They're going to expect computers. I suppose they're going to expect a continuing effort both to supply them with the tools they need and to keep them up to date," Heller said.

One thing they may not expect, however, is classrooms. As national electronic communications networks improve and the telephone companies are given more freedom to provide services, students of any age may soon be able to simply dial a phone number and receive multimedia lessons on nearly any subject, Withrow said.

"Down the road maybe a decade from now, learning experiences can as easily go into the home, the school or the workplace just by dialing up," Withrow said. "It's going to enhance our concept of lifelong education."

Fast track 101

A variety of companies are providing advanced technology for use in schools. Among them are the following:

• Apple Computer, Inc., in conjunction with EdMark Corp., has created the Apple Early Learning Connections program that combines EdMark's TouchWindow touch-sensitive conversion kit for Macintosh monitors with a compact disc/read-only memory drive, a scanner, a Macintosh LCII and a printer to teach language skills to young students.

• Jostens Learning Corp., based in San Diego, produces a line of network-based educational tools called the Interactive Media System. The hardware- and software-based products include The Card, a combination audio, video, digital video interactive and network card that provides a personal computer with the functionality necessary to view multimedia educational applications. The company also produces a server for use in the networks that provides 1.2G bytes of disk storage for video, audio and text files.

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EDITORIAL

Open season

Technology Investment Strategies' report on open systems, released last week, is a stinging rebuke of the "open" strategies put forth by major vendors.

The Framingham, Mass.-based consultancy outlines in detail a market reality where confusion has become a competitive weapon for the vendor community. The victim of the confusion, the report states, is the customer, whose interests are anything but a top priority to suppliers bent on disguising what look like proprietary solutions as products imbued and endowed with the spirit of openness.

States the report, "Each vendor's use of the term 'open systems' will express the vendor's best interest, usually in terms of some technology. . . . The viability of any [open systems] analysis that centers on a vendor's best interest will, like the tides, come and go as a vendor's products gain and then lose interest and use within the user community." In other words, openness is in the eye of the beholder. And that's a finding that is tough to argue against.

Caught up in the maelstrom and confusion is the poor user, who, the report contends, is in danger of being misled. The user needs a road map to avoid following any number of different open systems strategies to proprietary dead ends. What assumptions can customers make in this environment?

For starters, all vendors serve their own best interests. As the report shows, Microsoft's open systems strategy rests on its own operating systems. The heart of DEC's open systems strategy is a VAX/VMS server platform. Oracle's open systems strategy is predicated on its own DBMS and tools. And so on.

In fact, almost every vendor's view of openness is laced with its own proprietary view of the world. Does this fit your definition of openness?

Another good assumption to make is that open systems is a dynamic concept, not some static be-all and end-all goal. Openness is a word most synonymous with "choice," not with "Unix," and in today's world, choice for the users most often means preserving the information technology investments already made.

Finally, the report advises that users envision yellow caution flags when a vendor talks about open systems not with a business focus but with a technology focus. This is perhaps the greatest underlying weakness of, and greatest challenge for, many PC software companies that traditionally sold their products through third parties but now must influence IS buyers directly. Many of these companies are struggling to address computing as part of the business imperative, and in that struggle, they often default to pushing technology in search of solutions.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

How we can really help the FBI spy on us

"FBI seeks right to tap all net services" [CW, June 8] says that "FBI officials complained that many businesses today are incapable of providing such intercepts, so legislation is required to force changes. . . ."

I suppose this would mean not only that a local computer club with a one-line bulletin board service would have to get a second line so the FBI could intercept club member communications but also that the club members would not be allowed to exchange any communications that could be interpreted as encrypted: zipped and arc'd files, machine code programs, data tables, etc. In distributed processing environments, I suppose the requirements would be greater.

This would mean that in the two- to three-PC network I have in my office at home, I would have to make arrangements for the FBI to observe the transmissions between my PCs in both the MS-DOS and the Unix environments. I guess I can't even transmit programs between my machines because they could contain encrypted data.

I have a modest proposal.

Let us develop a lattice grid over the entire country. Every 10 ft in every direction we place a microphone. This microphone grid can then report everything that is going on to the FBI. Special computers that monitor digitized speech can be used to track the speech patterns of only those people whom the FBI wants to follow (criminals and opponents of the proposed bill, for example, but I don't have to worry because this letter doesn't oppose the bill).

Then we can rest assured, when we go to sleep at night, that the FBI is there to be sensitive to the dreams of a nation at rest.

William R. Patterson
Stratford, N.J.

A pill that it would be wise to swallow

Regarding "Under the gun: Pentagon wields IS strategic weapon" [CW, June 8]: Corporate America tends to regard the branches of government as separate entities that share little besides tax revenue. However, Paul Strassmann's goal is a centrally managed system, with information and information processing provided to networked users as a utility.

However, this is a pie-in-the-sky view; with "bureaucratic inertia" and "interservice rivalries," the "largest information technology reform ever taken" will take a large dose of discipline combined with commitment and a generous helping of hard work.

And that recipe seems hard for the corporate sector to swallow. One source in the article said he "wishes he could be there without getting there." It's like losing weight. Sure, we'd all like to be thin, but who wants to eat right? Who wants to exercise? Most of us would rather skip meals, take diet pills or drink shakes to lose weight.

We all face the same problems the Pentagon has; however, it is "under the gun" and is creating a detailed plan of attack. Can corporate information systems management really afford to do any less?

Dianne Sherman
Palm Harbor, Fla.

Money talks

The frustrating experience of Alan Radding [CW, "The mail-order CPU upgrade from hell," June 15] is not a new experience.

It appears that Radding got what he paid for. He opted to solve his needs with a solution of hardware, but, by his own description of his problems, he lacked the expertise to perform all the needed services and obviously required the technical services of a reseller familiar with the hardware and means to upgrade the system.

In addition, the mail-order firm's underlying support organization was obviously nonexistent, and for a good reason — it costs money to provide this, money Radding was unwilling to spend. If you want a functioning automobile, purchase it from dealer that can provide the support, not a shop that will assemble one for you with a collection of components.

Thomas J. Decker
Pompano Beach, Fla.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Melting frozen productivity

MARK G. BARMANN

In executive suites across the country, probing questions are being asked about the enduring value of millions of dollars invested in vast portfolios of computer applications. Exactly what do we have to show for all that investment?

All too often, the answer is, "Not very much that's usable."

The image that keeps coming to my mind is that of a frozen rope. Over time, business work flows have been captured in code and preserved there, past their useful life. Now splices, handcrafted with numbing complexity, link parts of processes in odd and unyielding shapes that are solidly resistant to all but superficial change.

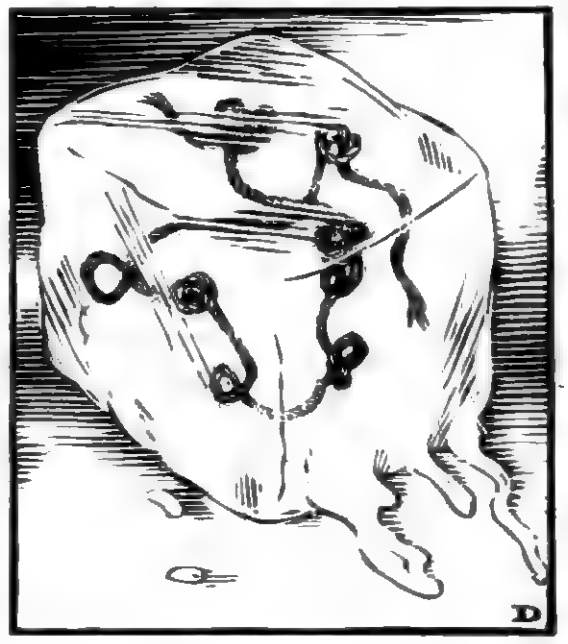
This is why efforts to rearrange work flows are so often thwarted. Unbraiding this solidly frozen coil will take immense work and expense.

Stuck in old patterns

What we've done wrong in the past isn't the only thing standing in the way of our achieving real productivity. We're still making mistakes, repeating those old patterns. Corner-cutting in the design and construction of systems is rampant under mandates for rapid implementation. Indiscriminate selections of packaged software introduce persistent anomalies. Primitive development tools thwart higher level approaches to design and construction. Performance constraints imposed by traditional processors severely limit the range of possible solutions.

And, far from the least of the problems is the fact that work processes within our IS organizations are often frozen into ancient shapes themselves.

I know all of this firsthand. I've been through it in spades. But, I also know that things needn't be this way any longer.



Bob Dahm

New approaches can make a difference. Model-based analysis frees designers from the constraints of the past and exposes the needless intricacies and redundancies so rife in today's systems. Emphasis on reusable components can bring order to application development. Distributed processing can help with the even more challenging goal of distribution of allied data.

We must use network-based computing toward those ends. We must seize on open systems that now exist and work to guide vendors toward more complete realizations of the open promise. We must use processors with speed, size and cost characteristics as diverse as the tasks they support.

Finally, we must recognize that what lies ahead is as much a cultural revolution as a technological one. We must encourage unconventional thought and cultivate dissidence. We must be favorably disposed to discovery and tolerant of setback, dealing constructively with the organizational dysfunction that almost inevitably comes with change.

As John Maynard Keynes once said, the real difficulty in changing the course of any enterprise lies not in developing new ideas but in escaping from old ones. But if we are going to find satisfactory answers to those questions from the executive suite, we have to escape the noose we have fashioned for ourselves from that frozen rope.

Barmann is executive vice president and CIO at Charles Schwab & Co. in San Francisco.

The dangers of selective information sharing

RANDALL C. KENNEDY

Nondisclosure agreements (NDA), once sacred pacts of secrecy between vendors and their "special" customers, have come under fire recently from many angles.

Why all the furor? Because NDAs, like most other "agreements of trust," are subject to abuse once they are exposed to the predatory world of a free-market economy.

NDAs are very "in" these days. Every vendor has somebody, somewhere, testing that hot new release or that much-anticipated update under vows of silence. Not only vendors but consultants, end users, even whole IS shops have jumped on the beta-testing bandwagon. And, as NDAs and their accompanying beta-testing programs have increased in popularity, so have the opportunities for abuse.

A good example of this can be seen in the way that more and more companies are using NDAs as political tools in an attempt to gain an advantage over their competition. The recent Microsoft/DR DOS debacle seems to fit this pattern almost to a "T." Digital Research needed access to the Windows 3.1 beta code to ensure that its product would be compatible, yet Microsoft steadfastly denied access to the code.

When questioned about this subject, Brad Silverberg, vice president of Personal Systems at Microsoft, commented that "Digital Research chose to make a living cloning Microsoft products, like MS-DOS," and this justified its omission from the beta-test program. At the same time, however, networking products competitor Novell was allowed to participate.

AS NONDISCLOSURE agreements and their accompanying beta-testing programs have increased in popularity, so have the opportunities for abuse.

The industry perception of why Microsoft chose to accept Novell yet reject Digital Research was that Microsoft could not risk producing a Novell-incompatible version of Windows but had nothing to gain from accommodating Digital Research.

Regardless of the motives involved, it is easy to see how this kind of "political favoritism" can have serious ramifications for customers. As vendors bicker over access to critical code, we pay the price in the form of incompatible software and delayed ship dates.

Beta snooping

Another way in which the NDA concept is being abused is through what is commonly referred to as "beta snooping." It seems that when it comes to a competitor's beta products, many vendors have thrown the common laws of good business ethics right out the window.

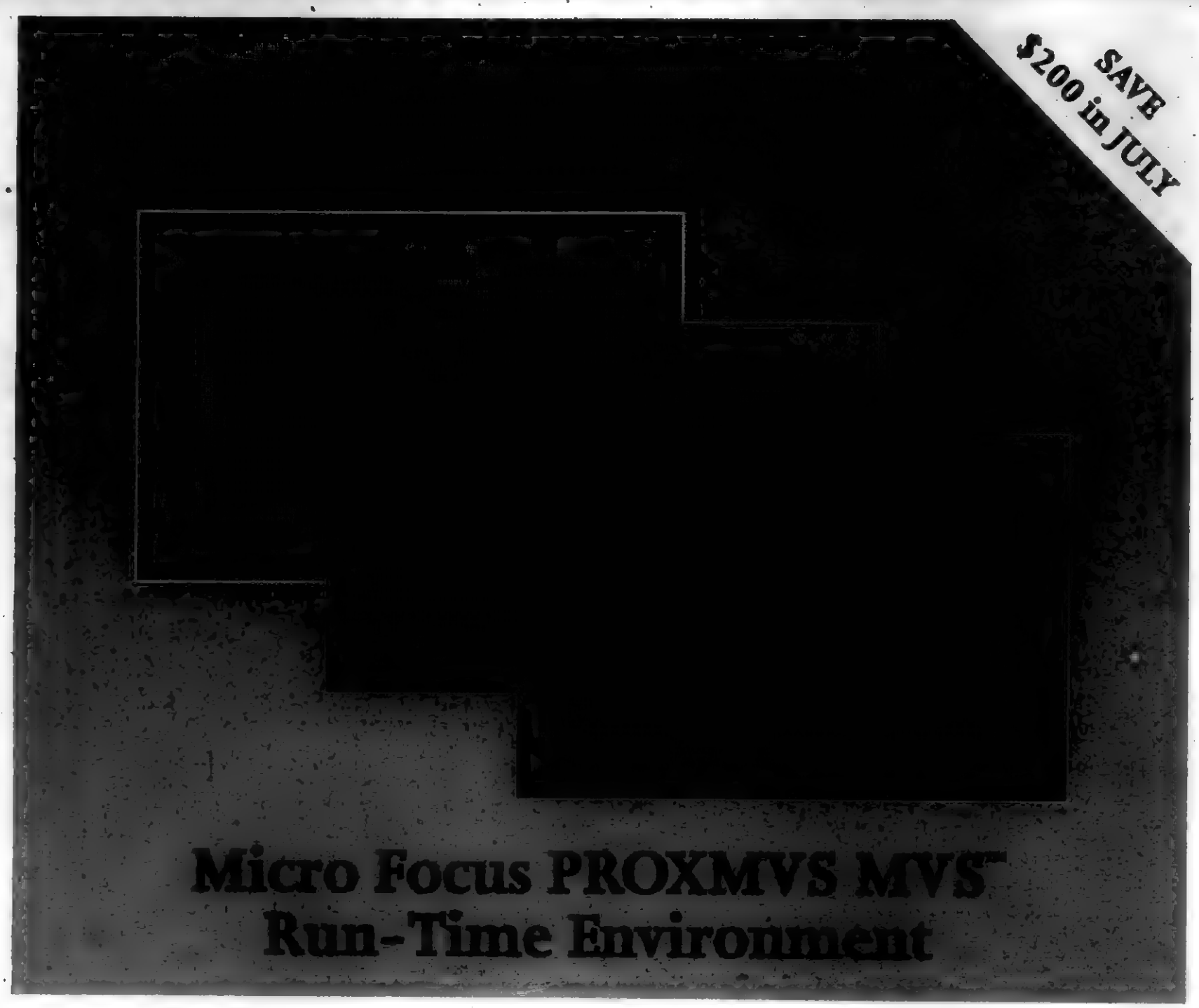
I was shocked recently when, during the course of a discussion about a newly released Windows communications product, a representative from a small independent software vendor (ISV) announced that he had been "playing" with this product since its early beta-test stages.

Because this person's firm was a direct competitor to the vendor whose product we were discussing, I was intrigued. When I pressed him for details, he admitted that he had accepted an offer from one of the competitor's beta-test sites to examine the prerelease software.

The ISV rep's actions were in total violation of every moral and ethical guideline of business behavior, yet he showed no signs of remorse. Sadly, this is rapidly becoming the norm. Furthermore, while it is easy to concentrate on the ISV's wrongdoing, we must also remember that it was the beta-test site that initiated the exchange and that it did so in direct violation of a legal, binding agreement. As a result, it both violated a trust and opened itself up to litigation.

So what are we to make of this "NDA dilemma"? Basically, that there's much more at stake here than a chance to play with the latest and greatest in bug-ridden prerelease software or to be quoted in a trade rag as an adventurer of the "bleeding edge" variety. These agreements can be fraught with ethical and legal pitfalls, and if IS is going to participate in such programs, it must do so in a politically savvy and morally responsible way.

Kennedy is a contributing editor to *Wagner Journal* and a technical associate at large. You can reach him via CompuServe at 76437,1041.



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IN BRIEF

Poqet change

■ **Poqet Computer Corp.**, which manufactures sub-2-pound portable and pen computers, has changed its name to Fujitsu Personal Systems, Inc. to reflect its owner, Fujitsu of Japan. The renamed company will remain based in Santa Clara, Calif. It also announced that it will resell HyperPad for Pen Computers from Brightbill-Roberts & Co. HyperPad, a development tool, will sell for $595.

■ **Chevron Corp.'s** Information Technology Co., which handles internal information systems for the multinational petroleum company, said it would make Courier V.32bis modems from U.S. Robotics, Inc. its internal standard.

■ **Hayes Microcomputer Products, Inc.** recently introduced new products and cut prices. Hayes' new Optima 96 + Fax96 and Optima 24 + Fax96 fax/data modems were introduced for $419 and $169, respectively. They will ship in the third quarter. Hayes also announced that it has reduced prices on its Optima family of data-only modems by up to 20%.

Windows word processing a tricky move

Windows users embrace environment but are wary of migrating critical applications

BY CAROL HILDEBRAND
CW STAFF

Microsoft Corp.'s Windows operating system is selling with gusto, but when it comes to migrating critical applications such as word processing, users are exhibiting considerably more caution.

With word processors being the most widely used category of software, upgrading an installed base can be tricky. And moving to Windows can be exponentially more so, as users have to grapple with an entirely new interface as well as with performance issues.

Of five user sites surveyed about their current involvement in both the DOS and the graphical user interface world, a number of issues were flagged as factors to take into consideration when planning either a wholesale migration or an attempt to exist in a hybrid world.

> MANY USERS need help unlearning muscle habits ingrained from years of DOS use.

The first issue users brought up was platform shortcomings. With Intel Corp. 80386 machines necessary, at minimum, most sites do not have the hardware capabilities for a wholesale migration. So users are trickling over as hardware gets upgraded and as business needs dictate.

Read Gilgen, director of learning support services at the University of Wisconsin at Madison, said its gradual migration was mandated by hardware constraints. "It's hardware-related more than anything else," he said. "In our academic environment, we don't have the budget and authority for a wholesale migration."

Peter Dalton, a partner at Dallas-based law firm Jackson & Walker, said that the company's hybrid environment is a partial result of hardware. Lawyers generally have the higher powered boxes while support staff remains on DOS, he said. If they gave Windows to everybody, he said, "We'd have to upgrade hardware, get better monitors, buy mice; so for the foreseeable future, we'll be a hybrid environment."

With users in both the DOS and Windows camps, smooth file compatibility between the two also crops up. "We have to have it," said Linda Deinberg, a network manager at Fujasawa Pharmaceutical in Deerfield, Ill., who added that the firm's decision to remain with WordPerfect Corp.'s namesake product was in part predicated on this.

Compatibility is also helpful in the learning process. Users tend to keep copies of both DOS and Windows word processors as they are learning. Gilgen said that he used the two on about a 50-to-50 ratio for his first six months of learning. When speed was of the essence, he would switch back to DOS to really crunch out the documents.

Speed, in fact, was an issue mentioned by nearly all of the users. Graphical word processors are generally slower than their DOS counterparts, and heavy users may be resistant to change. Jeanne Hale, a systems analyst evaluating products at Chevron Information Technology Co. in San Ramon, Calif., said that when it comes to the company's real heads-down word processors, migration will be slow. "For some of them, it's hard to take their hands off the keyboard and move to the mouse," she said.

Chevron, like most of the others, is moving its users to Windows as they get hardware-capable — and also if there is a business need. "If all they've purchased a PC for is Lotus and WordPerfect, they may not get Windows because it's not based on a business need," Hale said.

With the new environment also comes training challenges. Many users need help unlearning muscle habits ingrained from years of DOS use. For example, several users cited WordPerfect's offering of two different keyboards for its Windows product. Users can start on a DOS-compliant keyboard, and as they get more Windows-savvy, move to an IBM Common User Access board.

Key difference

Deinberg pointed out that the F1 key has different meanings in DOS and Windows. "I guess the biggest problem when people move is the switching of F3 and F1. Now, F1 is absolutely Help, not Cancel," she said. Deinberg said that her company was planning a series of one-hour training sessions designed to make users more comfortable moving around in Windows-based word processors.

Along with hard-to-change muscle habits come hard-to-change users. Gilgen said that he is expecting to encounter resistance from old dogs disinclined to learn new tricks but is taking a messiah approach to the challenge. "We'll get a few early adopters to start showing people how it works and the benefits of it," he said.

What to watch for

Users cite the following issues when moving word processing to Windows:

Hardware: Lack of horsepower is forcing gradual moves.

Speed: Graphical word processors are generally slower than their DOS cousins.

Compatibility: Many companies are running a hybrid environment, so file compatibility is vital.

Training: A graphical environment means breaking a lot of old habits for new graphical tricks.

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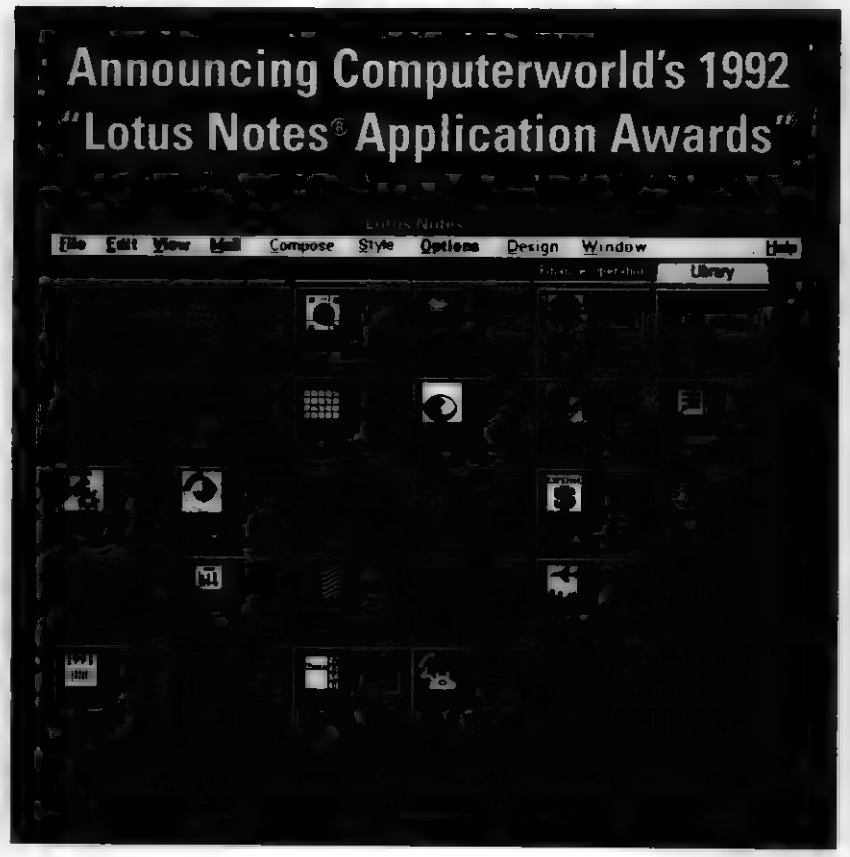

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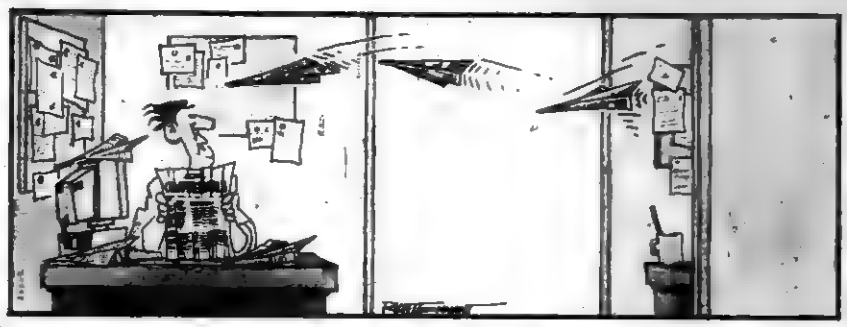

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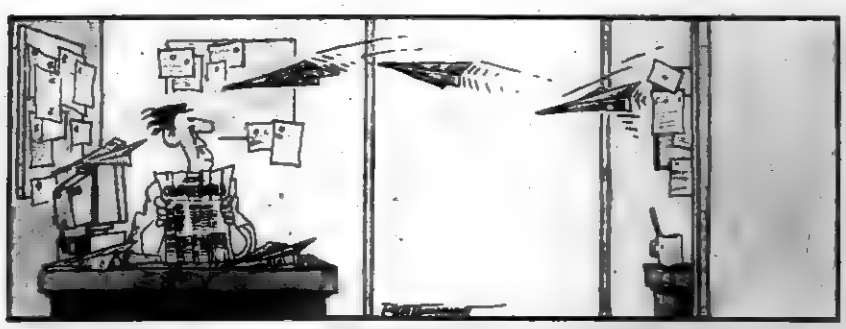

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31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
80. Other Titled Personnel

3. **IS INVOLVEMENT** (Circle all that apply)
Please indicate your involvement in IS/MIS/DP.
A. Manage/Supervise IS/MIS/DP Staff
B. Recommend/Specify IS Equipment
C. Purchase IS Equipment
D. End-user of IS Equipment
E. No Involvement

E4228-8

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Marion, Ohio 43306-4144

Health services firm takes first step toward imaging system reform

BY ELLIS BOOKER
CW STAFF

GARLAND, Texas — Step one: Change the process. Step two: Change the system.

Intent on making its transition to electronic document imaging as uneventful as possible, Outreach Health Services first revamped its paper-based procedures and computer applications.

Outreach, which provides in-home nursing care in north and central Texas, did this well in advance of selecting its personal computer and local-area network-based imaging system.

"We built an application, including paper forms, that can work with virtually any imaging platform," project manager Lee Church said.

This approach to imaging would be applauded by many analysts, systems integrators and an increasing number of imaging vendors. All have begun to stress that the true benefits of imaging are only obtained when core business procedures — the majority of which continue to rely on the handling of paper documents — are re-engineered.

Indeed, when examined closely, Outreach's imaging solution is only the front end of a larger system designed to streamline, speed up and improve the quality of the nursing care it gives to patients and its back-office activities, such as the detailed claim forms it must file for Medicare reimbursement.

This larger redesign was necessary, Church explained, because of the pressures on health care providers today.

"There's an exploding demand for home health care but a very short supply of skilled registered nurses," he said. Two additional pressures, Church said, are new federal requirements for claims paperwork and "the overall demand to lower the cost of delivering services."

"Basically, we took the nursing processing and broke it down into discrete observations," Church explained. Each observation in turn was given a set of data points.

The result was a paper form for the 600 to 800 full-time-equivalent nurses employed by Outreach. The new forms for the field nurses are composed largely of fill-in-the-blank boxes.

Incoming forms will be fed into an awaiting, homegrown transaction system. Like the imaging system, this component — which is built in assembly, C and the FoxPro database system from Fox Software, Inc. — will be PC-based. A hardware vendor is expected to be chosen within weeks, according to Church.

One immediate benefit from this approach will be a companion application that will take the incoming data and reformat it for a Medicare claim.

"We taught the computer to regurgitate [the data] in standard medical language," Church said, adding that this will mean a faster turnaround of those claims.

A second, future component of the system, described as a long-term repository for computerized patient records, will use a Unix server under a relational database engine.

> "WE BUILT AN application that can work with virtually any imaging platform."
>
> LEE CHURCH
> OUTREACH HEALTH SERVICES

"We expect to reduce the paperwork burden on our nurses from 2½ hours a day to around 15 minutes a day," Church said, adding that this time savings amounts to a cost savings of $8 to $10 per home visit.

A side benefit of an image-based application, according to Church, will be intrinsic to the write-once read-many (WORM) optical disc drives that will store the substance of Outreach's nursing reports.

"Because we provide medical services," Church explained, "we need a good, clear-cut and unassailable audit trail." A WORM drive will provide exactly that, he said.

Outreach plans to deploy its homegrown system, already being beta-tested in its Amarillo, Texas, office, to another 21 sites over the next 10 months, according to Church.

Outreach also plans to equip a small portion of this staff with pen-based portable computers and digital cameras. Those cameras will help add a digitized picture of the patient or a patient's injury to the permanent electronic record.

Eventually, Church said, Outreach hopes to offer its image processing technology to other nursing companies through third parties.

Hospital's Mac system gives voice to bedridden children

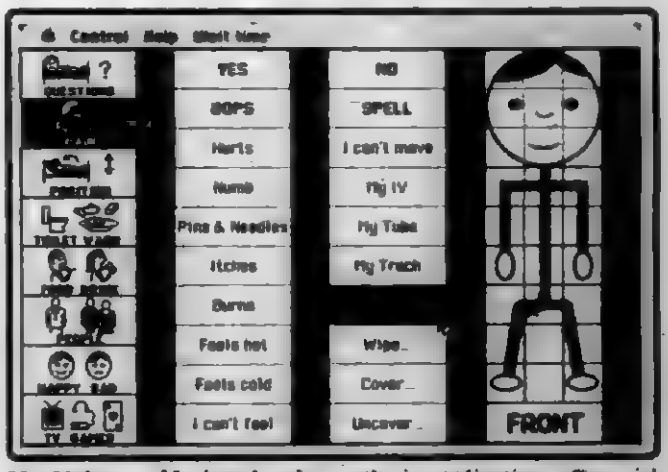
BY JAMES DALY
CW STAFF

TORONTO — If there is anything worse than being bedridden in a hospital, it is being bedridden in a hospital and not being able to tell your doctor what hurts.

But that is the dilemma facing dozens of patients annually in the Pediatric Intensive Care Unit (PICU) of The Hospital for Sick Children, a 480-bed downtown facility that caters to ailing members of the younger set. In extreme cases, children cannot talk because they have tubes placed down their throats to facilitate breathing.

A handful of sharp doctors, however, have used the power of the Apple Computer, Inc. Macintosh and the MacInTalk voice synthesis system to get around that problem.

The result is an entertaining solution to the frustration of being unable to talk: My Voice, an application that allows the Macintosh to speak for the patient.



My Voice, a Macintosh voice synthesis application, offers sick kids the chance to communicate in an entertaining way

Practical and fun

The hospital staff first considered using flash cards to help young patients communicate, but physicians wanted something more appealing. Dr. Geoff Barker, director of critical care, suggested the use of the computer — an idea that was roundly applauded.

"I think the fact that the system talks to them not only helps them communicate but eases the pain a bit," said Dr. Gordon Tait, who helped develop the system.

The computer-generated voice synthesis application goes a long way toward easing the fears of computerphobes. It also eliminates the need for the person receiving the message to awkwardly stretch over the patient and view the computer screen.

With My Voice, the Macintosh is suspended over the patient from a special mounting stand placed at the foot of the bed. This allows the computer to be conveniently positioned and does not interfere with access to the patient from the side of the bed, Tait said.

Because children as young as 7 years old would be using the system, it had to be simple to operate. One advantage of My Voice is that it can be controlled with a minimal amount of physical effort on the patient's part. With only one finger, patients can manipulate a trackball and select messages via an on-screen pointer.

For patients who have difficulty clicking the trackball button — such as those with heavily bandaged hands — My Voice can be operated in a timed mode in which a message is selected by positioning the pointer over a message for a specified time interval of between one and six seconds.

Quadriplegics can operate My Voice by using a setup that allows them to control the position of the pointer with head movements. "We wanted My Voice to be available for everyone," Tait said.

My Voice provides eight screens of 30 messages each. The topics for each screen include categories such as Questions, Pain, Position, Toilet & Wash, Food & Drink, People, Happy & Sad and TV & Games.

Several screens also include a stick figure so that the patient can refer to parts of the body. Tait said that sentences can be composed by selecting a verb and following it with a body part (Please scratch . . . my foot) or selecting a body part and following it with an adjective (My hand . . . is itchy).

Imaginative minds

My Voice also allows patients to compose their own messages, using an alphabet screen that serves as a crude word processor to spell out and store up to eight different messages.

"Even with 600 or 700 message combinations available, we still can't think of everything an 8-year-old might want to say," Tait said.

The Hospital for Sick Children is sold on the Macintosh in other areas of the department as well, according to Tait.

Dr. John Edmonds, one of the four staff physicians in the PICU, developed a Macintosh-based system to provide physicians in training with quick exposure to the problems that postoperative cardiac patients encounter.

Answer to an OLE problem

WINDOWS POINTERS

Part of a series of Windows 3.1 user tips provided by Microsoft Corp. and based on questions commonly asked of Microsoft customer support personnel.

Q Since upgrading from Windows 3.0 to Version 3.1, I can no longer use the Object Linking and Embedding (OLE) features in Excel or Word for Windows. Why?

A If you upgrade from Windows 3.0 to Windows 3.1 and you had installed in Windows 3.0 an application that supports OLE, Windows 3.1 may not recognize the OLE database. You need to update the database, which is a file named REG.DAT. To update the REG.DAT file, do the following:

1) From the File menu in Program Manager, choose the Run command.

2) In the Command Line box, type "ragedit." The Registration Information Editor appears.

3) From the File menu, choose the Merge Registration File.

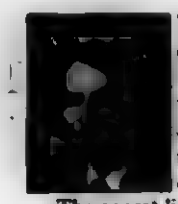
4) Select the registration file that corresponds to the OLE application you are using. For example, if you are using Microsoft Publisher, choose MSPUB.REG.

5) Choose the OK button.

WINDOWS VIEW

Jesse Berst

License to save



What if you could buy less Windows software and still do a better job of serving end users?

The secret lies in a technology called "licensing servers." These programs sit on a network server and monitor how many copies of an application are in use. If you exceed your agreement, the licensing server can optionally restrict access. In other words, it can refuse access to the 51st user if you only have a license for 50.

With all the noise in the world of Windows, it was easy to overlook the early summer announcement by Microsoft and others of a licensing server API for Windows (LSAPI). Even though LSAPI hasn't gotten a lot of attention, I think it holds the key to saving corporations millions of dollars by slashing the time they spend on license administration while helping them make better buying decisions.

Stand to benefit

When the first versions of the LSAPI arrive at the end of the year, corporate and commercial developers will have a standard set of calls for hooking into licensing servers. This standardization is likely to stimulate the sales and use of licensing servers — and I think users will be the big beneficiaries.

For instance, one of the nation's largest drug companies recently installed licensing servers for its research lab using beta-test copies of Funk Software's AppMeter. The drug firm's concern over compliance had led it to buy a license for every person who might use a package. Although it stood to save big bucks by switching to concurrent licensing, management wouldn't agree to the changeover until a plan was in place to enforce the licenses.

So the firm installed AppMeter. At first, the company executive did not enforce the licenses but simply let AppMeter run for six weeks. At that point, they had a reading of the true level of demand for each application. From there, they were able to purchase the appropriate number of licenses and switch to enforcement mode.

License enforcement and administration is a burdensome headache that can be greatly streamlined with one of these products. Yet that may be the least important benefit. Licensing servers monitor use and send the information to a log file, which can be the key to smarter purchase decisions.

Suppose you discover you are only using 50% of the licenses at the "high-water mark." You might be able to save money by shifting some of the licenses to a different server.

In a similar fashion, the log report might show a low usage percentage except for the last three days of the month, when you exceed your allowed maximum. Rather than buy extra licenses for those three days, you might solve the problem by shifting employee deadlines.

Or consider this scenario, which is common in a Windows environment: Some of your users load a handful of Windows programs at the beginning of the day and then leave them idle as icons at the bottom of the desktop, just in case they need them. A report from the licensing server can reveal which individuals are hogging copies they aren't using.

More for less

In other words, the information available from a licensing server may persuade you to buy less software rather than more. Even when you discover a valid need for additional licenses, you will have detailed reports to take to management.

You don't need the Windows LSAPI to implement a licensing server. However, some of the current approaches have problems detecting what applications are out there, when they are launched and when they shut down again. LSAPI addresses these basic needs. First, it provides a standard way to embed the name of the application, the publisher, the version number and so on. Second, it provides a standard mechanism for "announcing" when an application is starting or stopping.

There's been lots of talk lately about electronic software distribution. Although it's important to find fast, convenient ways to buy and distribute software, it's equally important to decide whether to buy it in the first place. And that's one of the most compelling advantages of licensing servers.

The Windows environment will not be the only one with licensing servers, but the LSAPI standardization effort means it will likely be widely adopted on Windows and more reliable than before. Of all the dozens of Windows announcements made in 1992, the one that saves corporations the most money in the long run may be the one that encouraged universal support for licensing servers.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Computer vendors volunteer services to help Rebuild LA

After the riots, nonprofit organization forms to catalog offers of help

BY JEAN S. BOZMAN
CW STAFF

LOS ANGELES — Using hardware, software and services donated by industry vendors, a fledgling nonprofit organization called Rebuild LA is using a desktop database to catalog thousands of offers to help reconstruct the riot-torn portions of this city.

A pilot system was built on a Borland International, Inc. Paradox database at Arthur Andersen & Co.'s Los Angeles offices in May. The database and the 50-plus personal computers donated by IBM and other vendors that access it were installed in June at Rebuild LA's downtown headquarters, from which the group is spearheading the volunteer reconstruction efforts.

Currently, there are approximately 8,000 cataloged offers of assistance in the database, said Brian Kadison, who headed the Andersen team.

Offers of assistance range from a $50 million grant from Southern California Edison Co. to smaller offers of employment, food and construction services.

"This is a community-driven effort," Kadison said. "It's a way to use private-sector resources more effectively and to cut through government bureaucracy" to get things done.

Bill Brown, an IBM executive who formerly managed the firm's service operations in San Diego, has been assigned full-time to help the Rebuild LA effort. He is finding job-training centers for displaced workers and loans for burnt-out businesses.

Other computer firms that gave assistance to the project include Microsoft Corp., Lotus Development Corp., AST Research, Inc., Epson America, Inc., Northern Telecom, Inc., Novell, Inc. and Xerox Corp.

Kadison said volunteers helped with data entry. In time, Rebuild LA should have 70 staff members, he said, and in June it had about half that number. Rebuild LA's director is Peter Ueberroth, a Southern California businessman.

> "THIS IS A community-driven effort. It's a way to use private-sector resources more effectively and to cut through government bureaucracy" to get things done.
>
> BRIAN KADISON
> ARTHUR ANDERSEN

NEW PRODUCTS

Software application packages

RG Software Systems, Inc. has started shipping Vi-Spy Professional Edition Version 9.0.

Vi-Spy Professional Edition has a windowing and menu interface, dynamic menuing system and Polymorphic Viruses detection/prevention. It has an on-line document reader and a Help file that is accessible from the DOS menu or windows interface.

Vi-Spy Professional Edition Version 9.0 costs $149.95.

RG Software Systems
Suite 630
6900 E. Camelback Road
Scottsdale, Ariz. 85251
(602) 423-8000

Syscorp International, Inc. has introduced MicroStep V1.6 and MicroStep QS.

The products are full-function software development environments that allow users to make complete stand-alone or multi-user client/server applications without having to manually create code. An active data dictionary manages the consistency of objects both across and within applications, and users can jump between processing modules with a hot-jump feature.

A computer-aided software engineering function specifies and maintains complex logic expressions.

MicroStep QS costs $895; MicroStep V1.6 costs $1,895.

Syscorp International
Suite 300
Echelon IV
9430 Research Blvd.
Austin, Texas 78759
(512) 338-5800

Faxes

Eclipse Systems, Inc. has released Eclipse Fax for the Microsoft Corp. Windows environment.

The product adds file management features, desktop publishing capabilities, scanner support, simplified operation and increased speed to fax software.

Without using a desktop publishing program, users can create businesslike documents with personal signatures, company logos, graphics and Windows fonts.

Eclipse Fax offers such features as fax modification, what-you-see-is-what-you-get thumbnail view editing, tool bars and dialog boxes.

Eclipse Fax costs $119.

Eclipse Systems
Suite 1121
33 W. Monroe St.
Chicago, Ill. 60603
(312) 541-0260

Peripherals

Morse Technology, Inc. has released Morse KP8050.

The product is an Extended Industry Standard Architecture integrated drive electronics (IDE) caching controller. The KP8050 features defect mapping, bus mastering, disk mirroring and duplexing. Microsoft Corp.'s Windows, Novell, Inc.'s NetWare and The Santa Cruz Operation and Interactive Unix drives are included. Up to 8G bytes of data on four IDE drives and up to 16G bytes per system with two controllers can be supported.

The KP8050 costs $719 or $380 when purchased in volume.

Morse Technology
Unit 1, 17531 Railroad St.
City of Industry, Calif.
91748
(818) 854-8681

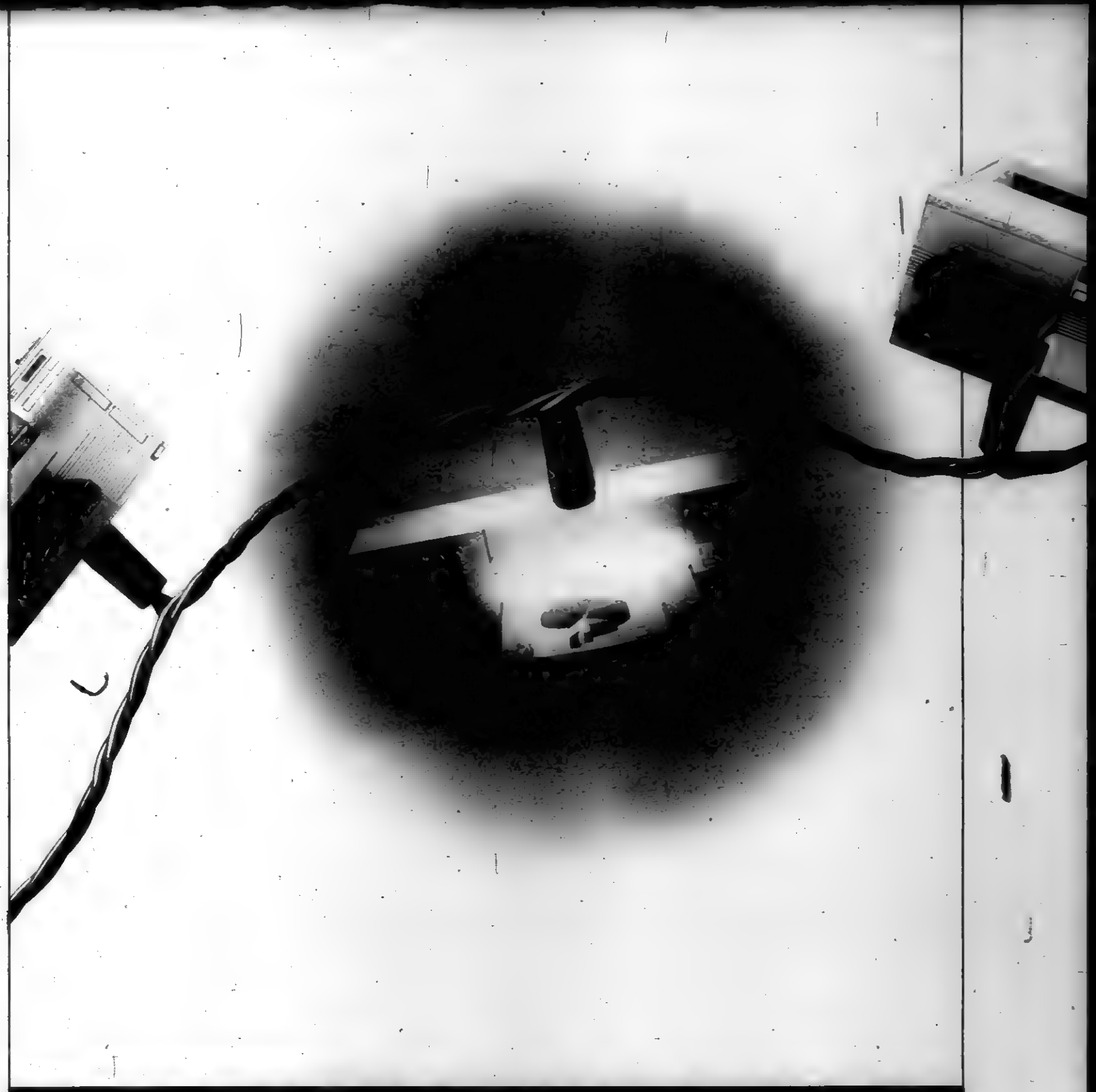
Macintosh products

Asante Technologies, Inc. has started shipping Person To Person, a network communications application that lets Apple Computer, Inc. Macintosh users exchange voice messages and text files without servers.

Users can attach reminders to other users' calendars with a message attachment feature and can send files by dragging them into a desktop outbox. Person To Person has an electric Post-it Note Window that can leave messages directly on the computer screen.

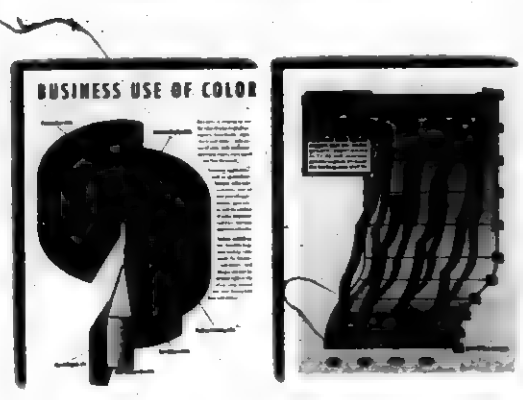
A two-user twin pack costs $149, a 10-user pack $399, and a zone user pack is $699.

Asante Technologies
404 Tasman Drive
Sunnyvale, Calif. 94089
(408) 752-8388



HP's PaintJet XL300. Now, brilliance doesn't require genius to install.

At last. A 300 dpi color printer that's as easy to add to your system as a LaserJet.



Vivid color has never been so simple. The new PaintJet XL300 inkjet printer gives you laser-quality color graphics, text, and the compatibility of HP LaserJet printers. All for the remarkably low price of just $3,495.*

The PaintJet XL300 has LaserJet compatibility built right in. The same typefaces. The same page formatting. It also has PC/Macintosh auto-switching, so users in a mixed environment can share. And, just like a LaserJet, the PaintJet XL300 becomes network-ready with optional HP JetDirect interface cards.

Get laser-quality printing on a choice of media that includes plain paper and transparencies. Or add Adobe® PostScript® for access to even more graphics applications.

See how easily the PaintJet XL300 can bring color to your system. Call **1-800-752-0900, Ext. 3158** for a free print sample and the name of the authorized HP dealer nearest you.†

HEWLETT PACKARD

© 1992 Hewlett-Packard Company *Suggested U.S. list price. Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries. †In Canada call 1-800-387-3867, Ext. 3158. PS12295

CA-Textor 6.0: Powerful but unpolished

Technology Analysis — A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

Computer Associates International, Inc.'s CA-Textor jumps to the Microsoft Corp. Windows platform with Version 6.0. Reviewers said CA-Textor is an unusual mid-range word processor that needs further refining but offers some powerful features.

Performance: CA-Textor's speed is comparable with that of high-end Windows word processors, according to *PC Magazine*. However, the program requires only 3.5M bytes of disk space when fully installed.

Ease of use: Handling graphics and working with the Styles features can be awkward, reviewers said.

Editing: High-end features that are missing include frames, a macro language and support for endnotes and footnotes. CA-Textor does provide cut-and-paste capabilities along with a library feature that lets users store related documents in folders.

Output: *PC Week* reported some problems with fonts when running CA-Textor 6.0 on a system with a large number of installed Adobe Systems, Inc. Type Manager fonts.

Overall value: Version 6.0 costs $225. Reviewers said it is a promising package with many strengths.

Computer Associates' CA-Textor 6.0

Reviewer	Performance	Ease of use	Editing	Output	Documentation	Value
Infoworld 5/25/92	Slow to reformat	Effortless import and export	The basics; superior mail-merge	Print preview with zoom	NC	Competent
PC Week 4/27/92	NC	Difficult working with graphics	Some innovative features	Some font problems	NC	Good for text-intensive documents
PC Magazine 6/16/92	Resembles pre-software programs	Clumsy but powerful table editor	Three editing modes	NC	NC	Worth getting to know
Windows Magazine 4/92	Very fast	Easiest tool bar	Only a few conversion formats	NC	Excellent on-line manual	Very good
PC Computing 6/92	NC	User-definable dictionaries	Feature-packed table editor	NC	NC	Ideal for international businesses
PC User 4/8/92	Features speed editing	Crude interface	Full-featured	NC	NC	High quality
Newsbytes 5/22/92	Easy to unlearn	NC	No macros	NC	Very good	Low price
Users						
Mark Hansen, Bostek	■■	■■	■■	■▪	■▪	Impressive for low end
Mark Miller, PC Solutions	■■	■■	■■	■■	■	Excellent value

Key: ■■ Very good ■▪ Good ■ Fair ▪ Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

CA reported revenue of $470 million for the quarter ended in March 1992, up from $360 million for the comparable quarter in 1991. Profit for the quarter was $58 million, up from $39 million last year.

CA responds

Marc Sokol, product strategy director:

Ease of use: We tried to keep the interface as simple as possible. For introductory users, it's wonderful, but more advanced users may find it awkward. We may add an expert mode in the future.

Output: We're addressing the fonts issue.

Value: We're offering an introductory price of $99 for Textor through August.

JustWrite 2.0: Stronger, lower cost

Symantec's JustWrite 2.0

Reviewer	Performance	Ease of use	Editing	Output	Documentation	Value
PC Computing 6/92	NC	Friendly	Surprising depth	Easily prints merged documents	NC	Fine alternative to high end
PC Week 4/27/92	NC	Improved formatting control	File format support problems	NC	NC	Better for complex formatting
Windows Magazine 4/92	Fast	Easy	Formatting is simple	NC	NC	NC
PC User 4/8/92	NC	Impressive looking	Quite powerful	NC	NC	Should consider cutting price
Newsbytes 4/17/92	NC	New quick paste feature	Integrated table editor	NC	NC	Enhanced data sharing capabilities
Users						
Robert Sturgeon, RMS Computers	■	■	■▪	■	■▪	Slow
Greg Haskett, Mitsubishi Electronics of America, Inc.	■▪	■■	■■	■■	■■	Best template feature
Julie McCabe, independent user	NC	■▪	■▪	■■	NC	Sometimes complicated
Analysts						
Dana Noble, The Noble Group	■	■	■	■▪	■	Does not meet expectations

Key: ■■ Very good ■▪ Good ■ Fair ▪ Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Symantec reported profits of $7.7 million on revenue of $62 million for the quarter ended in March 1992. Profits for the same quarter in 1991 were $5.7 million on revenue of $41.5 million. Analyst Peter Rogers at Robertson, Stephens & Co. rated the firm's short-term performance and long-term stability as very good.

Symantec responds

Patrick Vermont, product manager:

Performance: What we may add in the long-term [strategy] is a dialog box-based macro recorder, as opposed to having users write macro code.

Editing: We've updated our filter for Word for Windows 2.0 documents, and we will have the new filter available on CompuServe and on our bulletin board.

Symantec Corp.'s JustWrite 2.0 provides a range of powerful features at about half the price of high-end competitors. The upgraded Windows word processor now offers improved control over document formatting and a more easily customized tool bar.

Performance: JustWrite has no macro language, but users may still be able to save time by using the document libraries and style templates, reviewers said.

Ease of use: The tool bar, which allows users to perform common functions with a single mouse click, now handles up to four rows of icons.

Editing: Standard features include a spell checker, thesaurus, grammar checker and endnote and footnote capabilities. A new floating frame feature enables users to juggle the placement of sections of text, graphics or Windows Object Linking and Embedding objects. *PC Week* noted some glitches in the product's support for other word processing file formats, including moderately complex Microsoft Word for Windows files.

Output: The new version offers improved mail-merge capabilities, reviewers said.

Overall value: At $249, JustWrite is an enticing value, according to reviewers. Its frames features make JustWrite suitable for handling complicated formatting requirements.

A co… discovery: 3.1 is less than 2.0.

You don't have to be a whiz at math to figure this one out. When it comes to running Windows™ applications, OS/2 2.0* gives you more than DOS 5.0 plus Windows 3.1. But that's only part of the equation.

OS/2 2.0 can get more out of DOS applications than Windows. Windows can't run OS/2 applications at all. And when it comes to running multiple applications, OS/2 2.0 is so much better, you can throw comparisons out the window.

You see, OS/2 2.0 isn't just a DOS extension. It's a true operating system. Windows isn't. That's why OS/2 2.0 can run multiple DOS, Windows and OS/2 applications at the same time, in separate windows on the same screen. And OS/2 Crash Protection™ can help shield running applications from each other, providing protection should one fail.

Of course, you could still go and spend $149.95 for a special DOS and Windows package. But when you consider that for as low as $49 you could get the capabilities of DOS and Windows, plus all the added benefits of OS/2—including Adobe Type Manager™—it just doesn't add up.

For an IBM authorized dealer near you, or to order OS/2 2.0 from IBM—at special introductory prices of $49 for Windows users and $99 from any DOS through July 31*—call 1 800 3-IBM-OS2.**

	OS/2: Win-OS/2 Full Screen	DOS 5.0 & Win 3.1 Full Screen
WordPerfect® (spellcheck)†	38.5 sec	43.6 sec
AmiPro™ 2.0 (print)††	95.1 sec	104.6 sec
Preemptive multi-tasking of Win apps	YES	NO
Crash protection	YES	NO

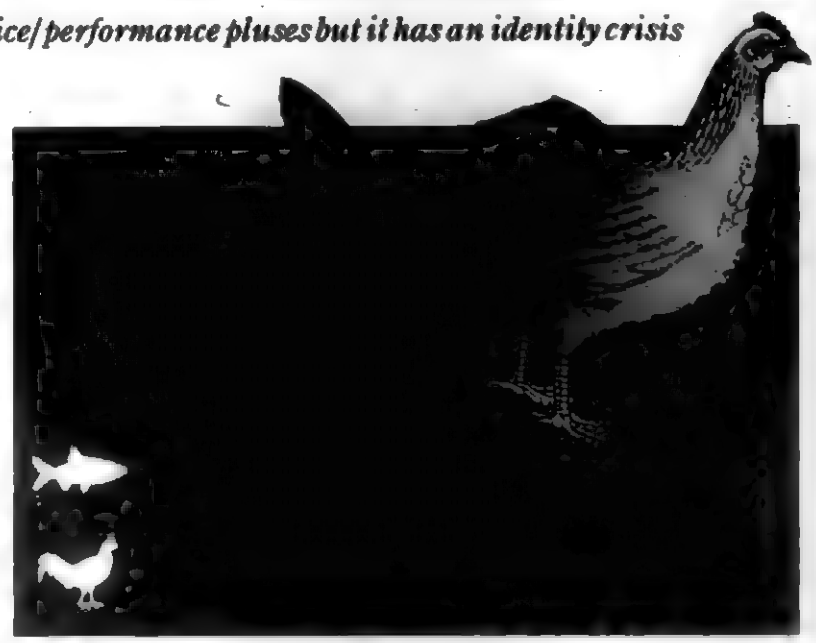
IBM

*Upgrade from Windows, $49; upgrade from any DOS, $99; $139 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 7/31/92. Shipping and handling not included. **In Canada, call 1 800 465-7999. †Tests conducted by NSTL. System under test is a PS/2 57SX w/4MB RAM and an 8513 VGA display. Under Windows 3.1, applications were loaded and/or executed from the Windows 3.1 Program Manager. Under OS/2, applications were also loaded and/or executed from the Win-OS/2 Full Screen Program Manager. Both Windows 3.1 and Win-OS/2 use a disk cache of 64KB. ††Word processor spellcheck: The time required to spellcheck a document with no spelling errors. Open the Word Perfect for Windows 5.1 document entitled "macro.doc". Select TOOLS from the menu bar, then select SPELLER. Select OPTIONS from the SPELLER menu bar, and deselect all of the options. Click OK. Test was timed from the click until the user regained control of the application. "Macro.doc" contains 21 pages and is 47,455 bytes. ††Word Processor Print: The time it took to print a word processing document. Open the AmiPro 2.0 document entitled "printest.sam." Select FILE from the menu bar, then select PRINT. Select FROM page 1 to 1 and click OK. The test was timed from the click until the first page completed printing on the printer. Windows 3.1 used the IBM LaserPrinter 4029 PS17 PostScript printer driver shipped with the Windows 3.1 software package, and Win-OS/2 used the IBM 4029 v21 (17 [illegible]) PostScript printer driver shipped with the OS/2 2.0 Operating System using LPT1.OS2. NSTL makes no warranties, express or implied, as to results to be obtained by any person or entity from use of the services or the results thereof, or any information or data included therein. NSTL makes no express or implied warranties of merchantability or fitness for a particular purpose or use with respect to the services and/or results thereof, or any information or data included therein. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1992 IBM Corp.

NEW PRODUCT IN-SITE

Low-cost RISC with a PC look

IBM's RS/6000 Model 220 offers many price/performance pluses but it has an identity crisis



- An amalgamation of personal computer and workstation technologies, the IBM RISC System/6000 Model 220 is having a difficult time finding a niche in many companies.
- With a fully configured price tag of less than $10,000, the Model 220 is competitively priced with other workstations having lower price/performance ratios.
- While users are finding that most RS/6000 applications port easily to the Model 220 running AIX 3.2.1, they are experiencing minor problems with its outdated implementation of X Window.
- IBM seems to be having difficulty generating awareness of the Model 220 among its customers. In a survey of more than 50 shops using other versions of the RS/6000, only a handful owned or knew about the Model 220.

Is there a market for low-end workstations with strong price/performance and PC attributes? IBM aims to find out with its latest RS/6000 workstation, the Model 220.

Users are apparently not snapping up the system because of its nontraditional mixture of attributes. But those who have evaluated it find it compares favorably with competitive systems, particularly Sun Microsystems, Inc.'s SPARCstation lines.

Four users from *Computerworld*'s Product Evaluation Council (see company list below) teamed up with analysts David Brown at Technology Investment Strategies Corp. and Phil Magne at ARS/Workstation Laboratories to evaluate the Model 220.

NETWORKING

The evaluators found that the Model 220 was simply a matter of "plug and play," integrating easily into their varied network environments.

Educational institution: "The 220s just sit on our Ethernet, which is connected to a couple of backbones with thousands of nodes. It just connected right up."

Utility: "We use one of the 220s as an SNA gateway on Ethernet, and it was plug and play."

Support for networking through AIX, the Model 220's operating system, is very good, with a wide variety of protocols supported, according to Magne.

The only drawback, according to the utility company evaluator, is a limited number of slots. The 220 comes with only two, which is fine for end-user implementation, but as a gateway there is a limited number of networks that can be supported.

PERFORMANCE

Benchmark tests from Workstation Labs and the users show that the 220 performs as fast as or faster than Sun SPARCstations and Digital Equipment Corp. DECstations but not as fast as the latest Hewlett-Packard Co. HP 9000 models.

The educational institution, running a wide variety of engineering, research and academic applications, found the 220 "much faster" than the Sun SPARCstation 2, IPX and IPC lines.

"The most dramatic comparison was with the Sun's floating point performance. The 220 was much higher based on the SPECmarks," the evaluator said.

His results did not include a comparison against the newest SPARCstations released after the SPARC 2.

The utility found the times to process data communications applications nearly identical to the SPARC 2, while the manufacturer found the 220 "far superior" to a DEC VAXstation running Adra Systems, Inc.'s Cadra drawing package.

Magne reported that the 220's disk performance is enhanced by AIX's file-mapping capability, which gives it an edge over competitors.

The education institution evaluator was less impressed with disk speed than processor speed. One of his systems uses a 400M-byte internal disk and an 1G-byte external disk. However, disk access speed was slowed by the use of standard SCSI disks.

"The total disk space is more limited. But we can hang a gigabyte of disk off of each system, and that's plenty for the next year or two," he said.

The utility ported applications from an HP 9000 Model 700 to the RS/6000 to evaluate video and graphics performance. The 220 provided 500K operations per second compared to 1,500K for the HP machine, which meets the evaluators' expectations.

The users also tested network speed by running file transfer between systems and comparing the results to the other workstations installed on the network. The results were about the same for the 220 as other IBM and Sun workstations.

OPERATING SYSTEM

Users familiar with AIX found it easy to use on the Model 220, although they encountered problems when using different versions of AIX and other software.

For example, the education evaluator found that his XServer software would

COMPANY 1 PROFILE

RATINGS	
Networking	4
Performance	3
Operating system	3
Support	4
Ease of use	4
Software availability	4
Value	4
Overall	3.7

INDUSTRY: UTILITY

•Number of RS/6000 Model 220s:	3
•Memory capacity per system:	320M bytes
•Other RS/6000s:	Yes
•System compared to:	Sun SPARC II
•Other workstations:	1,000 plus PCs, etc.
•Networked:	Yes
•Network type:	TCP/IP

•**Applications:** Development of real-time X.25 TCP/IP communications system using C and IBM's Softbench.

COMPANY 2 PROFILE

RATINGS	
Networking	NC
Performance	5
Operating system	4
Support	2
Ease of use	3
Software availability	5
Value	NC
Overall	3.8

INDUSTRY: MANUFACTURING

•Number of RS/6000 Model 220s:	1
•Memory capacity per system:	NC
•Other RS/6000s:	No
•System compared to:	DEC VAXstation
•Other workstations:	NC
•Networked:	No
•Network type:	None

•**Applications:** Adra System's Cadra engineering drawing and graphics program.

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crash at the drop of a hat. IBM eventually addressed the problem, which may be related to a graphics adapter, by sending the user a new version of AIX. The institution had been using Version 3.2 and will now use Version 3.2.1.

The utility evaluator found that AIX 3.2.1 does not provide direct support for MIT's latest graphics subsystem, X11R5. Using the previous version required additional work for the information systems department to adjust applications to meet users' needs.

Other users who were less familiar with AIX discovered it offered a wide variety of options and a good interface. But they also reported that there was a learning curve required to become acclimated.

Manufacturer: "There were more Help prompts available. I didn't like the fact that AIX was sensitive to upper and lowercase; that led to some problems: Overall, AIX was slightly better."

SUPPORT

The evaluators reported slower service and support responsiveness than they were accustomed to, or they found it difficult to reach the appropriate IBM expert, particularly for AIX issues.

"They've been a little slower than I would have liked in responding to the XServer crashing problem," the education evaluator said.

The manufacturer evaluator had problems with keyboard mapping, which would change after he specified the parameters. "Compared to what I get from DEC, the support was worse. It took IBM the longest time to solve the mapping problem." The problem was apparently related to an upcoming version of AIX and the application being used.

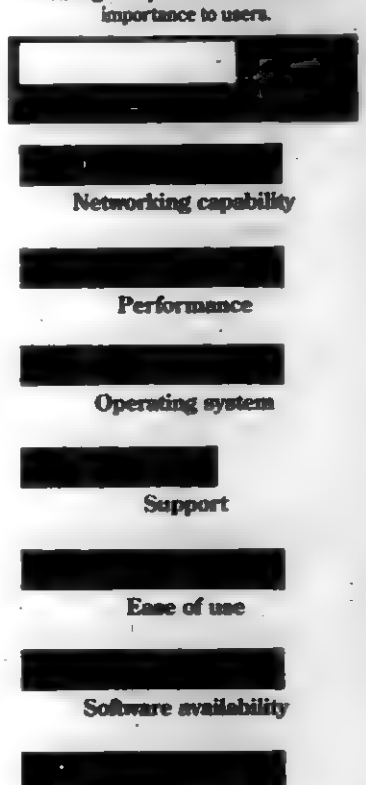
EASE OF USE

The evaluators reported better documentation for AIX 3.2, and they found the Model 220 easy to use after learning the operating system requirements.

Faster performance made it easier to use than other systems, according to the manufacturer.

IBM RS/6000 Model 220

Ratings are based on user expectations on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



SOFTWARE AVAILABILITY

Generally, the users were satisfied with the availability of software. They were able to find the engineering and development applications they needed or were able to port their own.

However, compared with the PC environment, there are fewer AIX applications for end users. This limitation is a key factor in determining how and where the RS/6000 Model 220 can be used. Despite its PC price, faster performance and architecture, the AIX platform limits its viability as a generic end-user system when compared with OS/2- and DOS-based PCs.

VALUE

The evaluators found the Model 220 a good value for their environments. They paid less than or about the same as the cost for comparable systems and achieved superior performance.

"We compared it to Sun systems and desktop PCs. Where you have users who need more power than you get with DOS on a PC, the 220 is a good solution. The price was about equal to Sun; our experience with AIX caused us to choose the 220," the utility user said.

Another aspect of the value is the ability to use standard PC peripherals, such as tape drives and disk drives.

"We've expanded several boxes using inexpensive PC peripherals. IBM components are outrageous in terms of price, and we were able to get drives advertised in PC trade publications for $3 per megabyte," the utility user said.

Compiled by Michael Sullivan-Trainor and Garry Ray, CW staff.

IBM RESPONDS

Here is IBM's response to the issues raised in this evaluation:

Positioning: The 220 is the entry model in the IBM RS/6000 line and offers a low-price, full-feature RISC workstation for customers who want an open systems solution. The Micro Channel Architecture (MCA) is used in all RS/6000 models; Small Computer Systems Interface (SCSI) connections are also supported by all models. An integrated SCSI controller is provided in the 220 as well as the desktop 340 and 350 and the rack-mounted 970.

IBM chose to use the MCA for the RS/6000 because of its excellent technology and growth capability and for the compatibility it provides in terms of being able to share adapters with MCA-based Personal System/2s.

We do not see any positioning issues for our customers even though the price points for PCs and workstations may overlap in some cases. The decision of whether to buy a PC or a workstation is determined by many factors. With the 220, we are meeting the needs of that class of customer who wants a powerful but lower priced RISC-based system.

Operating system: The 220 was not intended to run with levels of AIX/6000 before 3.2.1. There is XServer code in 3.2.1 that is for the 220.

IBM supports the X11 standard and intends to introduce X11R5 support as well as any future X11 releases on an aggressive schedule. We currently have X11R5 running on the RS/6000 as a technology demonstration.

Support: The only difference between support for the 220 and support for the rest of the RS/6000 family is that setup of the 220 has been simplified so customers can do it themselves. IBM provides the same high level of support for the 220 that our customers have come to expect.

Performance face-off

RS/6000 Model 220 with 16M bytes of main memory

	SPECmarks	Price	Price/performance
RS/6000 Model 220	20.5	$10,275*	$501/SPECmark
DECstation 5000/25	14.4	$17,060	$1,184/SPECmark
Sun SPARCstation IPX	18.4	$17,795	$967/SPECmark
HP 9000/710	48	$20,645	$430/SPECmark

Source: Workstation Laboratories *Price based on 16M bytes of memory including hardware and operating system costs

INDUSTRY: EDUCATION

RATINGS	
Networking	4
Performance	3
Operating system	4
Support	4
Ease of use	4
Software availability	4
Value	4
Overall	3.8

- **Number of RS/6000 Model 220s:** 12
- **Memory capacity per system:** 400M bytes
- **Other RS/6000s:** Yes
- **System compared to:** Sun SPARC II, IPX
- **Other workstations:** 500 multiuser
- **Networked:** Yes
- **Network type:** Ethernet
- **Applications:** General Unix/X Windows workstation load in an academic research and instructional environment.

INDUSTRY: TRANSPORTATION

RATINGS	
Networking	NC
Performance	3
Operating system	3
Support	3
Ease of use	3
Software availability	3
Value	3
Overall	3

- **Number of RS/6000 Model 220s:** 1
- **Memory capacity per system:** NC
- **Other RS/6000s:** Yes
- **System compared to:** Sun
- **Other workstations:** NC
- **Networked:** No
- **Network type:** None
- **Applications:** General transportation applications.

METHODOLOGY: Product ratings and written information are based on the evaluations of four user organizations and product analysts who have extensive knowledge of the product. Each user has a version of the product installed at its site running production work loads. The material was gathered through written surveys and teleconferencing. The users are members of the Computerworld Product Evaluation Council. Ratings are based on user expectations on a scale of 1 to 5, where 5 is above expectations and 1 is below expectations. Ratings are presented in order of importance to users.
NC: No comment

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Sales Management	*Sales Presentations*
Industry Newswire	*Policy Handbook*
Customer Service Tracking	*Electronic Mail*
Forms Routing	*Financial Profiles*
Quality Management	*Telemarketing*
Contract Library	*Technical Support*
Correspondence Tracking	*Job Postings*
User Group Discussions	*Credit and Collections*

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by Gary Lancaster

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New network cuts mainframe bills 90%

American Airlines development unit reaps savings with distributed $4.5 million Unix-based system

BY MARYFRAN JOHNSON
CW STAFF

DALLAS — The annual bill for mainframe computing services used to run up past the $5 million mark at American Airlines Decision Technologies, the software development and consulting subsidiary of AMR Corp.

This year, the tab will drop below $430,000 — a 90% decline in the space of three years.

The catalyst for this dramatic change is a downsizing project that led Decision Technologies to create an open systems network, built with $4.5 million worth of multivendor Unix-based hardware and software.

The rise and fall

Now entering the final segment of a project begun 18 months ago, information systems executives say the productivity of their 350 analysts has risen as dependency on corporate IBM mainframes in Tulsa, Okla., has declined.

"What we really get is fast turnaround for our analysts," said John DiNovo, manager of internal systems at Decision Technologies. For complex "what if" analyses, they can now run several jobs against data stored locally rather than remotely.

The company provides consulting services and develops decision support systems for American Airlines as well as for outside companies such as Lufthansa German Airlines, Ryder Truck Rental, Inc. and Royal Caribbean Cruise Lines.

"It turns out that the technologies we've developed for our business problems are readily exportable," DiNovo said. "In our case, we want to decide how many people to put in the planes. Ryder Truck may want to schedule their fleet, and a cruise line wants to figure out how many seats to sell."

The decision to develop its own network crystalized in 1989-90, just a year after AMR fashioned the subsidiary out of its former operations research department. Decision Technologies originally paid an annual charge back to AMR for use of both the corporate mainframes and the "InterAAct" network of IBM Personal System/2s.

"Once we decided to go after external business, it became apparent we would need a platform to support that effort," said Bruce Light, a senior consultant at Decision Technologies. "Not all companies have mainframes, and we wanted to be able to offer turnkey solutions."

ON SITE

Bruce Light (left) and John DiNovo.

American Airlines Decision Technologies
(subsidiary of AMR Corp.)
Dallas, Texas

- **Challenge:** Downsizing from mainframe computing to an open systems network.
- **Technology:** $4.5 million client/server network of 150 Unix-based workstations and X Window System terminals, several compute servers and two data servers for optical and magnetic storage.
- **Result:** Improved user productivity with local file access and processing, faster performance of CPU-intensive applications and significant reduction in fees for corporate mainframe use.

Mandate: 1-year payback

A simple but rather demanding criterion governed the rollout of the client/server environment: expenditures for each phase had to be recovered through savings realized during the subsequent 12 months. Without demonstrable savings, there would be no purchases approved for the next phase, Light said.

"The bottom line was that we paid for the network investment within one year," Light said.

Already noted as improvements are faster performance of CPU-intensive applications, ease of use with X Window System-based user interfaces and greater flexibility in the Unix environment. While historical data collection is still the province of the mainframe, processing of the data is now under local control.

"It is so much more productive to run our jobs locally," Light said.

Decision Technologies' open systems network includes two data servers from Epoch Systems, Inc. and Auspex, Inc., several compute servers and 150 high-end engineering workstations and X terminals.

The majority of the workstations are from the former Mips Computer Systems, Inc. — now owned by Silicon Graphics, Inc. — but the mix also includes systems from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Silicon Graphics. Another 150 PCs are used on the administrative side of the company, with connectivity provided by Transmission Control Protocol/Internet Protocol over an Ethernet backbone.

Storage intensive

The network had to accommodate not only the applications running locally but also the management and storage of up to 60G bytes of data once stored and managed by mainframes.

The first data models ported to the Unix systems were the capacity planning and crew allocations — both so large they spawned an immediate need for greater data management and storage capacity.

"I don't think we anticipated the magnitude of the data management problem," DiNovo said. "With traditional means for storage — magnetic disks — we would have had to fill rooms of it." That need led to the purchase of the data servers: the Epoch system for storage and access to historical data and the Auspex multiprocessor system for high-speed access to active files, DiNovo explained.

One drawback to this new environment is the relative paucity of system and network management tools — a complaint widely echoed by other companies downsizing from mainframes to Unix-based networks. "Every vendor doing something a little different causes us a headache," Light said. "We've even thought of writing stuff ourselves to go and do administrative things in this environment."

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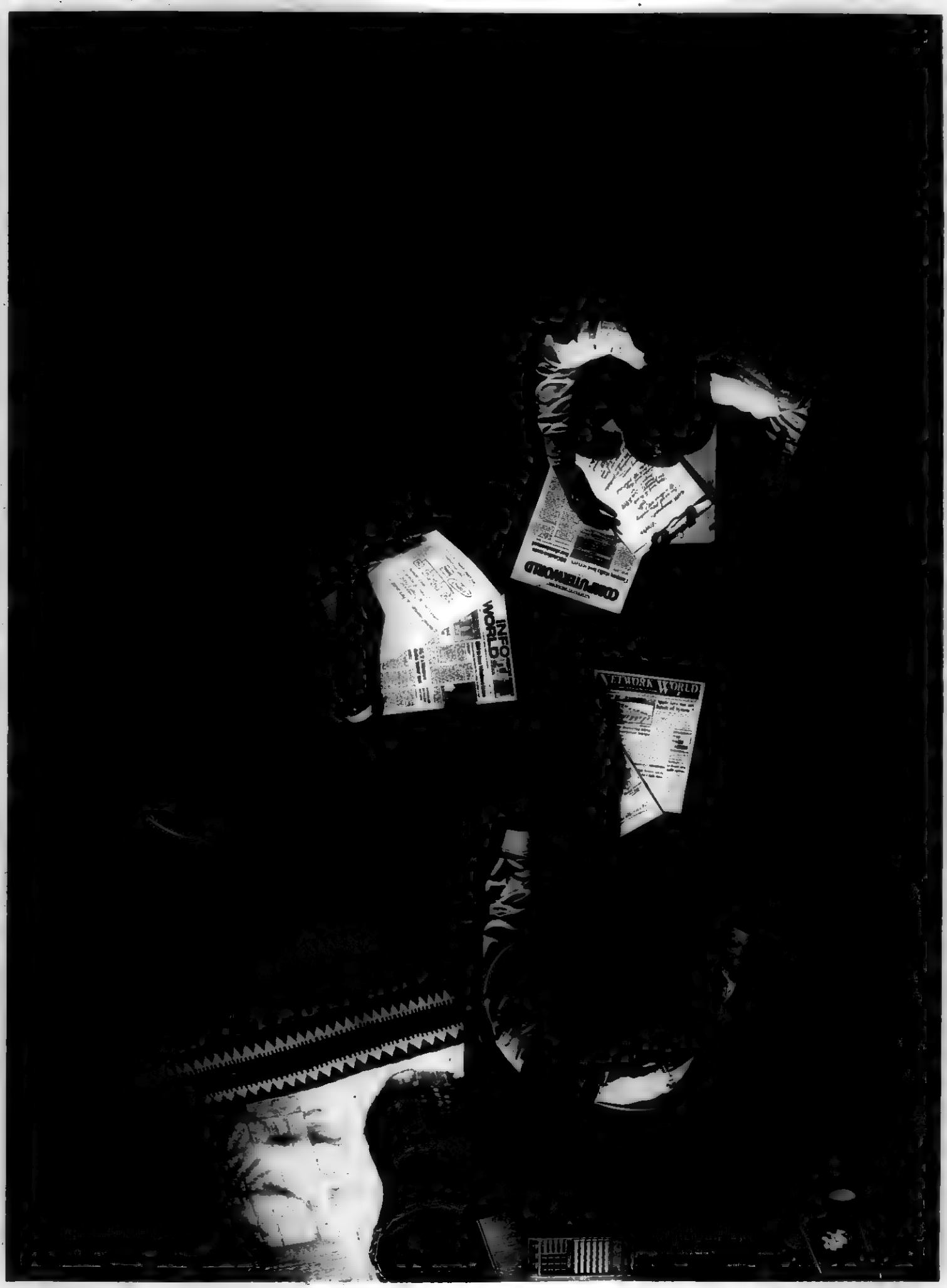

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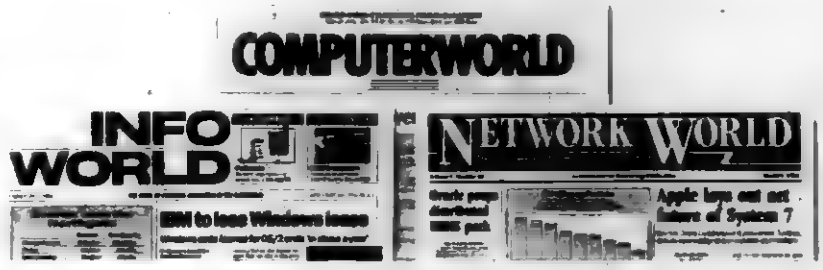

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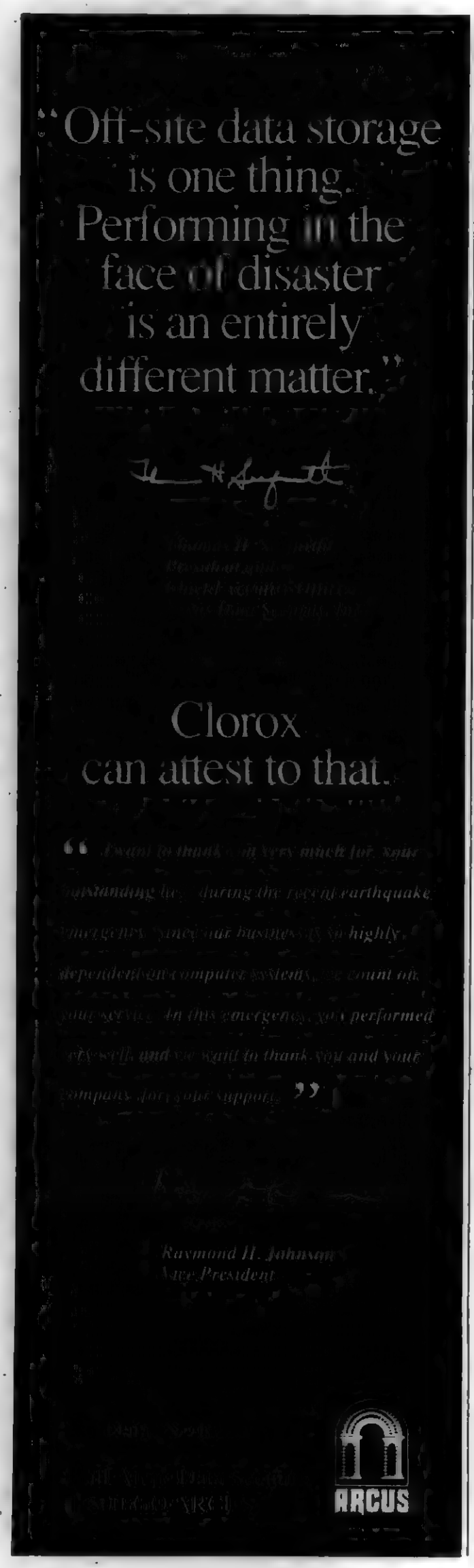


Intel looks inward to future

Chip company's IS group begins to implement its vision — on itself

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Intel Corp.'s Corporate Information Services (CIS) group knows firsthand what it would feel like to be a lab rat that helped experiment on itself. The CIS group is the guinea pig for Intel's vision of the future, in charge of implementing the plan and enduring the experiment.

"They're playing leading implementor of some of the most advanced technology. It's very painful — most companies would not want to do this [as fast as we are]. You need an MIS department with courage and very thick skin," said Ron Whittier, vice president of Intel's Architecture and Software Technology Group, which drives architectural design at Intel. Whittier oversees the CIS department.

The initial phase of the plan is under way to achieve Intel's vision of the future: Computer-Supported Collaboration (CSC). This vision, not surprisingly, will involve a computing environment based entirely on Intel microprocessors. Intel has started with a move to create one, or possibly two, seamless internal electronic-mail systems by using Soft-Switch, Inc.'s Soft-Switch Central to integrate its seven to 12 systems.

Whittier said the year of effort to create this seamless network has been "painful" at times.

"We're struggling through it — this is not an easy transition for an IS department," he said.

Neal Franking, director of the CIS group at Intel, agreed that the challenges were big and that all parties want to be further along than they are. Integrating different groups has been particularly difficult.

"We historically have been very focused in optimizing individual things. We now have to get the pieces to play together, and moving up that optimization curve is hard," Franking said. "It's a big shift, or really two megashifts: One is the shift to more distributed technologies, the other is dealing with development methodologies that work within a cross-functional design."

ON SITE

Ron Whittier

Intel Corp.
Santa Clara, Calif.

- **Challenge:** To build a foundation for future systems, such as data-rich messaging applications.
- **Strategy:** Replace IBM mainframes and DEC VAXs with Intel-based workstations and servers.
- **Goals:** Increased productivity, reduced travel expense and proof that an entire corporation can run on Intel chips.

However, "We think we're over the mental hump of changing the paradigm," he added.

Since the CIS group was brought under Whittier's command in May 1991, it has also influenced the way Intel builds its microprocessors.

While changes in specific chip design have not occurred, Whittier noted that Intel has, for instance, shifted an architectural focus from building security features into its chips to improving data movement.

"You start to understand that it's not security so much as moving rich data types around, so video acceleration might become more important than security," Whittier said. "In that sense, you get a sense of what should be important in the next generation of products coming out and start to feed into the architecture and software design of the product."

Flight of fancy

The ultimate goal for Intel goes beyond just the improved personal productivity and lower costs that Franking cited.

"We want to put the airlines out of business, because the cost of business travel is killing us," Whittier said half-seriously about doing business just-in-time by flying everywhere. "If [people] had very capable data or videoconferencing capability, they wouldn't have to do that."

This would require as-yet uncreated power-eating, full-motion video multimedia applications that would ideally create more demand for Intel chips.

"We want people to burn more and more MIPS and buy lots and lots of [Intel] chips, so our fundamental business model is set up in getting consumers to consume MIPS," Whittier explained.

Still, Intel has a way to go before it can handle more processing power itself. Whittier estimated it would take two years of a "tough" transition to data-rich applications — for example, messaging-sensitive spreadsheets or word processors that allow more than one person to work on a document at a time.

Nonetheless, Intel can show results. Franking, who reports to Whittier, said Intel has moved out two of its four IBM 3090 600Js, replacing them with client/server networks. Intel's predominant network is Banyan Systems, Inc.'s Vines.

Intel is also working to replace its approximately 100 Digital Equipment Corp. VAXs with Intel-based workstations running Unix. Intel also has a group of IBM RISC System/6000s that it is trying to supplant with Intel-based machines. The company's current vendor of choice is NCR Corp.

Franking said he expects Intel will be a pioneer user of its own next-generation P5-based systems but will focus volume purchases on upgradable 1486-based personal computers for some time to come. The 25,000-person firm has 22,000 PCs, 95% of them 80386 or better.

IN BRIEF

PCs check in at Hilton

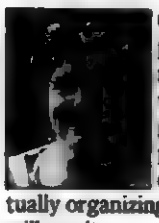
■ **Hilton Reservation Service** recently launched the use of networked IBM personal computers as the key workstations in its U.S. reservation center. The Intel Corp. 80386-based desktop machines replace dumb IBM 3270-type terminals and will provide graphics capabilities for the Beverly Hills, Calif.-based hotel reservation system.

■ **The Banco Popolare di Bergamo**, one of the oldest and largest private banks in Italy, has signed a $1 million deal with Applix, Inc. to standardize 240 bank branches on Asterx Unix office software. Under the contract, Banco Popolare will replace its character-based office automation software with Asterx, running on the bank's Sun Microsystems, Inc. SPARCstations and linked to an Oracle Corp. relational database management system. The entire hardware and software installation is valued at more than $18 million, bank officials said. Asterx is a suite of applications and tools used to create compound documents containing text, spreadsheets and graphics.

COMMENTARY

Emma Zevik

Grasping groupware



Choosing a core product isn't the major hurdle when launching a groupware project. The challenge is actually organizing the group that will use it.

It is imperative to consider the benefits and the challenges groups face in approaching a groupware product. Clearly, the strongest need is for design and customization, which should be tailored to a group's needs.

Design and development can include customizing menus and commands in the user interface as well as tailoring conferences for specific purposes. Consider running at least two pilot applications with either one or a few business problems that can be solved by an on-line group. For groups approaching networking for the first time, design is a crucial consideration because design is what attracts and retains member participation.

For example, organizers of Artswire Net — a project of the New York Foundation for the Arts that links arts organizations to solve artists' business and artistic needs — spent several months developing custom menus prior to implementation. Language, ease of use and syntax of the menu interface were carefully considered by the group and MetaSystems Design Group, Inc. (MDG) in Arlington, Va., which carries Artswire Net on The MetaNetwork (TMN).

Iris, a TMN network connecting teachers and classrooms, has been up and running since 1989. For an ongoing workgroup that has been operating for a number of years, continuing development and assessment are equally important to improving and revitalizing the on-line group.

Planning is key

Launching a successful groupware effort requires careful planning for both systems and human resources. The selection of the team of people that will implement the groupware is crucial. Try to assemble a mix of disciplines so the team will be balanced. The implementation plan should define business objectives and balance the technology and the scope of the project for its members.

Running a group of six members on-line is different from facilitating a group of 150 people. Planning objectives need to include training for individual users as well as for the moderators of the workgroup. APHIS, the U.S. Department of Agriculture's Animal, Plant, Health Inspection Service network, began as a supplement to a senior officers' training course and has grown to run seven different applications on its network.

Yes, the technical IS considerations such as hardware and software are important, but beyond the technical aspects of the groupware product is the human factor. This is just as important as, if not more important than, the technical factor. No matter what the group — lawyers, artists, teachers, accountants, managers — the key to successful implementation of groupware is the participation of people.

Groupware works best with people who are team players. If participants are already comfortable working together, then the implementation of a groupware product is going to be more natural. Artswire spent two years developing the human component of its network before it began to work with MDG to design its on-line system. Too many groups neglect this important piece of the process.

Think of an architectural design firm that works with companies to design their physical spaces. The most successful implementations of groupware projects are those that work toward the design of their electronic spaces.

With all the recent hoopla about workgroup computing, unrealistic expectations are sure to help bring about failure. In this industry where "groupware" is still a nebulous term, clarity and definition are vital assets. Appropriate design and development combined with careful planning can help ensure active participation by members in any workgroup environment.

Zevik is a computer trainer in Lexington, Mass.

IN BRIEF

Novell adds fresh versions of NetWare for Macintosh

■ **Novell, Inc.** recently expanded its Apple Computer, Inc. Macintosh connectivity options with the announcement of 5-, 20- and 100-user versions of its NetWare for Macintosh Version 3.11.

The new editions include support for the Simple Network Management Protocol, print accounting, printer logs, printer keeper and hold queues and the option to cancel print job notification.

Suggested retail prices are $495 for five users, $895 for 20 users and $1,995 for 100 users. In March, Novell announced a 200-user version priced at $2,995.

■ **IBM** has unveiled software that integrates configuration management and defect tracking for software development on **Hewlett-Packard Co.** and **Sun Microsystems, Inc.** workstations as well as IBM RISC System/6000s.

The new products, which are available for HP and Sun client machines next month at $695 per seat, are based on IBM's AIX Configuration Management Version Control Client/6000 tools.

To use the software, users must install it on a workstation connected to an RS/6000 server. The software tools give customers access to configuration management, version control, integrated problem tracking and design change control features, according to the company.

■ **Digital Equipment Corp.** recently added two new systems to its DECstation/DECsystem line of Unix workstations and servers and reduced prices by as much as 40% for its Turbochannel graphics options and the prepackaged systems that use them.

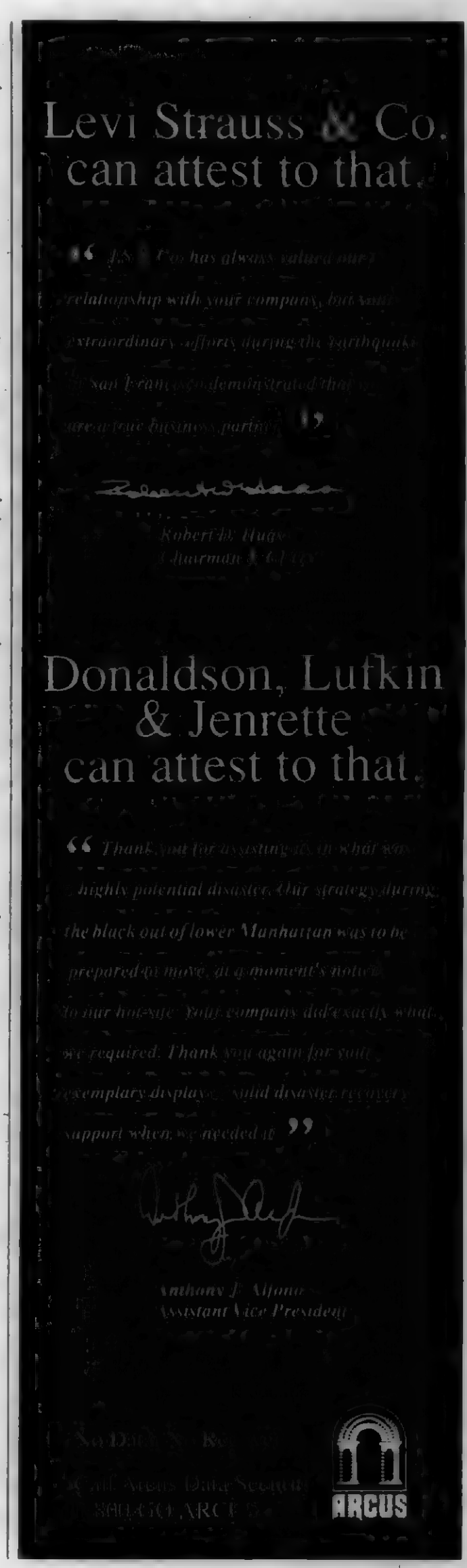
The new hardware includes the Personal DECstation 5000 Model 33, a 25-SPECmark workstation running at a clock speed of 33 MHz that is priced at $6,995 for a diskless version.

Also introduced was the DECsystem 5000 Model 133 server, a new midrange member of the series that is priced from $7,925 for a diskless version.

■ **Sun Microsystems Computer Corp.**, the hardware subsidiary of Sun Microsystems, reported that it is gaining ground in the process control market, where the company expects to earn $100 million in annual revenue by 1995.

Sun recently announced a new Scalable Processor Architecture (SPARC)-based system from The Foxboro Co. The system reportedly produces integrated industrial process management and control systems.

With the addition of Foxboro, three of the top distributed control system vendors in the U.S., including Westinghouse Electric Corp., now use SPARC systems as their primary platforms.



NEW PRODUCTS

Unix

Arnet Corp. has introduced ArnetFax, a fax package for Unix systems.

ArnetFax allows users to transmit to or receive from any Group 3 fax machine worldwide. Word processing or other applications using ASCII, Tag Image File Format or International Standards Organization character text files transmit output directly.

Up to eight fax channels can be accessed from a Unix-based personal computer via a multiline capability. ArnetFax costs $995 for a single-line board with Unix software or $1,295 for a dual-line board with Unix software. A single board without software costs $695; a dual-line board without software costs $995.

Arnet
618 Grassmere Park Drive, #6
Nashville, Tenn. 37211
(615) 834-8000

Workstations

Danford Corp. has introduced the EEB-4700 Extended Industry Standard Architecture (EISA) Expansion Box.

The product is an intelligent EISA bus expansion for Hewlett-Packard Co.'s 9000 Series 700 workstations. The EEB-4700 expands the single EISA slot in the HP Models 720 and 730 systems into seven full-featured EISA slots.

The EEB-4700 adds more EISA slots for interfacing I/O boards, enhancing the expansion ability of the Series 700 workstation, the company reported.

The EEB-4700 costs $3,750.

Danford
350 W. Fifth St.
San Pedro, Calif. 90731
(213) 514-9334

Bristol Technology, Inc. has announced Wind/U, software technology that enables Microsoft Corp. Windows applications to run as native Unix/Motif applications.

Windows applications can be executed on the native Unix environment when the existing Windows application is recompiled in the Unix environment and linked to the Wind/U Library.

The Wind/U tool kit provides the Windows applications ported to Unix with the same functionality between Windows and Unix versions. It is priced at $50,000.

Bristol Technology
898 Ethan Allen Highway
Ridgefield, Conn. 06877
(203) 438-6969

Electronic mail

InterCon Systems Corp. has announced Dispatcher/X.400 for MacX.400, an electronic-mail software gateway that allows Apple Computer, Inc. Macintosh users to exchange E-mail with workstations on X.400 systems.

The product is for high-performance local- and wide-area network connections and is for users with large internetwork systems with high-volume E-mail traffic. With Apple Server, Macintosh users can exchange electronic messages between their QuickMail E-mail system and any X.400 compatible system.

The product costs $1,995.

InterCon Systems
950 Herndon Pkwy.
Herndon, Va. 22070
(703) 709-9890

Micro-to-micro

Andataco has started shipping Liken 1.2, an Apple Computer, Inc. Macintosh environment emulator.

Liken 1.2 improves the sharing between Sun Microsystems, Inc. and Macintosh environments with cut-and-paste functionality and more user-customizable setup features. Applications that operate on a Macintosh Classic can run without modification in an X Window System and on Sun and compatible Scalable Processor Architecture workstations.

Single-user licenses cost $695.

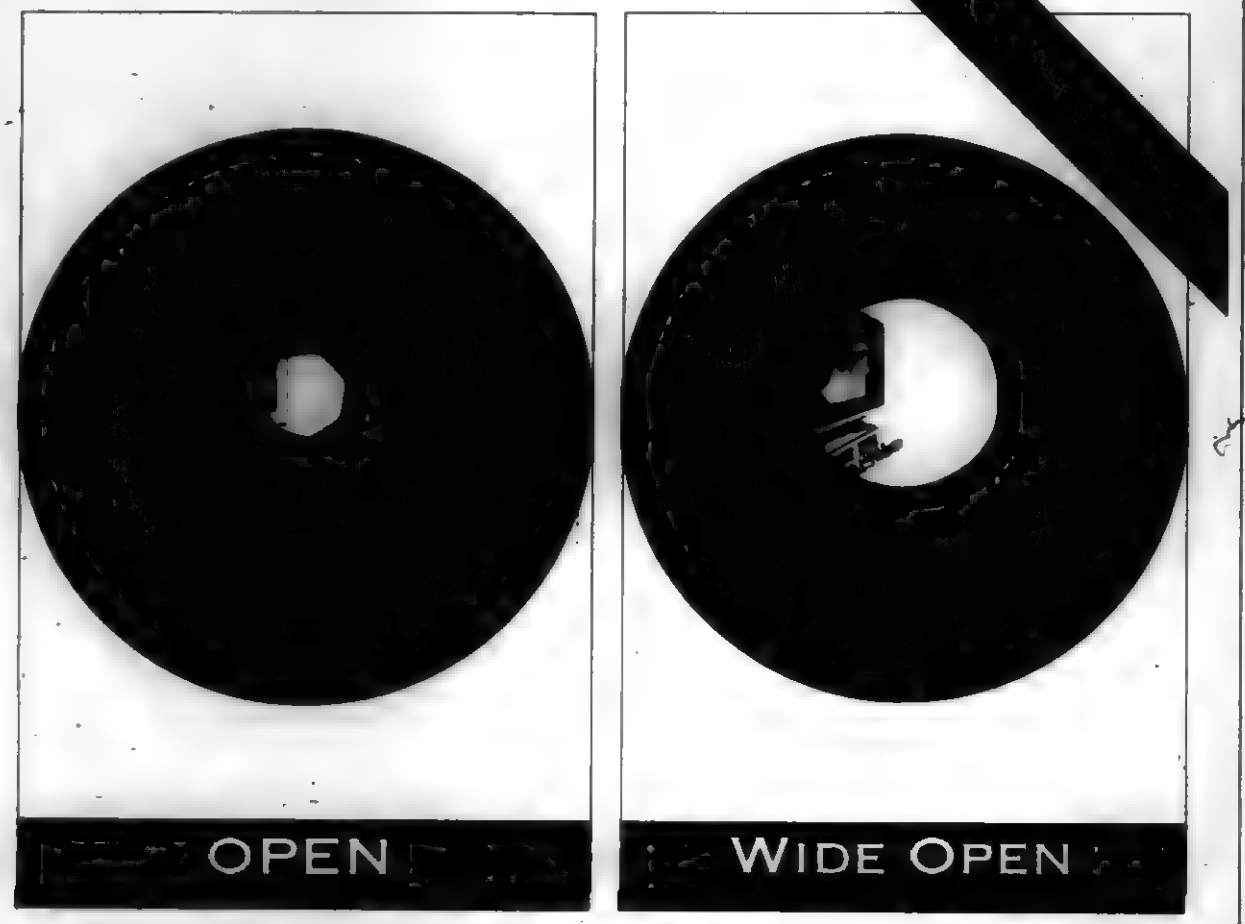
Andataco
9550 Waples St.
San Diego, Calif. 92121
(619) 453-9191

Sitka Corp., a subsidiary of Sun Microsystems, Inc., has announced NetPrint Sun.

The product ($495) is a set of network printing services that provide Sun workstations, Apple Computer, Inc. Macintosh computers and IBM and compatible personal computer users with a way to share printing resources.

NetPrint Sun gives Macintosh and PC users on any Ethernet or LocalTalk network access to the Sun printing services and gives Sun workstations the abilty to print on any Macintosh or PC PostScript printer on the network.

Sitka
950 Marina Villiage Pkwy.
Alameda, Calif. 94501
(510) 769-9669



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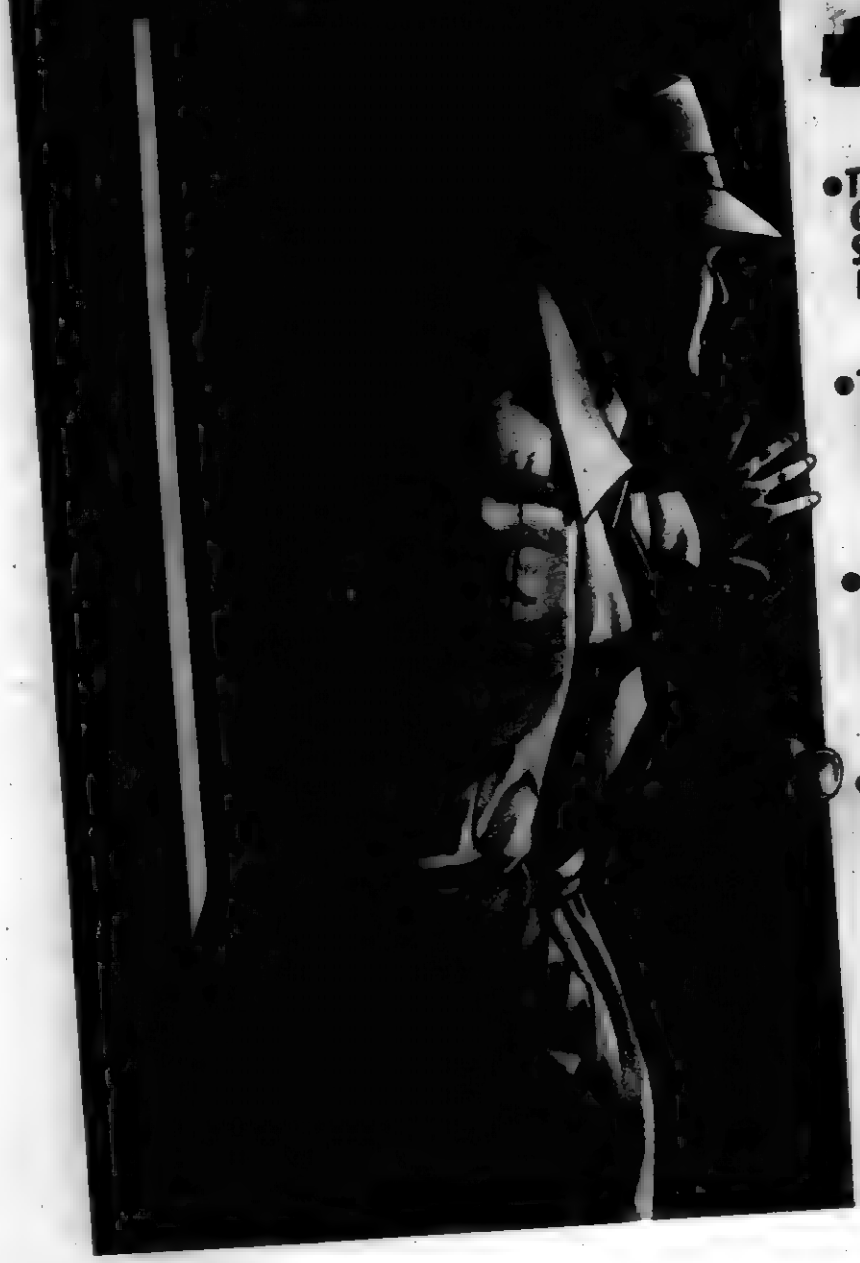

INSIDE:

- THE MYSTERY OF THE GLASS HOUSE.
  Some said the jig was up.
  But they were wrong.
- THE TANGLED WEB OF NETWORKING.
  Where one false move could mean curtains.
- THE SCRAMBLED STANDARDS CAPER.
  Too many suspects.
  Too few answers.
- THE CASE OF THE NEBULOUS CLIENT-SERVER.
  Did the butler do it?
  Or the host?

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No end in sight for 'religious wars'

Recent arrival of new network management standards further complicates user, vendor choices

BY ELISABETH HORWITT
CW STAFF

"What we users are concerned about is not CMIP or SNMP or SMP — but applications such as performance, bandwidth and configuration management. If SNMP is the best way to manage one class of devices and CMIP another, I want vendors to take care of that problem and hide it from me."

This plea was made recently by Ron Scott, section head of telecommunications operations at Ontario Hydro, on behalf of the Users Advisory Council of the Network Management Forum. He spoke for many information systems and network managers who are sick of what another user described as the "religious wars" among the proponents of different network management standards.

Unfortunately, those wars show no signs of abating. In fact, the recent appearance of new network management standards may make it even more difficult for users and vendors to choose a clear winner.

A few years back, choices for multivendor network management were simpler — or some would say, almost nonexistent. The vast bulk of network management systems were proprietary, and the only standard in sight was the then-embryonic Open Systems Interconnect (OSI), Common Management Information Protocol/Services (CMIP/CMIS).

Today, network management vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co. have shown a willingness to support network management standards. The question is, which ones?

The two current leading candidates for a dominant industry standard are CMIP/CMIS and the Simple Network Management Protocol (SNMP). Developed by the Internet Engineering Task Force (IETF) several years ago as a quick and dirty solution to managing Transmission Control Protocol/Internet Protocol networks, SNMP has won broad support among local-area network bridge, router and hub vendors. However, industry consensus has it that SNMP is too limited to become the enterprise network management protocol, particularly because it lacks the ability to integrate multivendor network management systems.

CMIP is said to offer all of the functionality that SNMP lacks. However, vendors have held off from implementing the protocol, as defined by the Network Management Forum, because they claim that user demand for such products is lacking. Users point out that they cannot base their network management systems around CMIP if it remains commercially nonexistent.

Recent studies conducted by several research firms confirm that large corporations will be making massive network management purchases during the next few years. However, they disagree as to which protocols will dominate that market.

Of 32 companies recently surveyed by Infonetics Research, Inc., 28 said they were standardizing on SNMP, and only two said they were standardizing on CMIP.

Furthermore, the emergence of Simple Management Protocol (SMP), which is said to remedy SNMP's failings, is likely to nail the lid on CMIP's coffin, according to Michael Howard, president of the San Jose, Calif., research firm. Jointly developed by four major SNMP software companies, SMP has yet to be formally adopted by the IETF as the next generation of SNMP. However, the protocol is expected to draw broad vendor support [CW, June 29].

According to a study released by Insight Research Corp. last month, sales of CMIP-based systems totaled $10 million last year and are projected to reach $20 million this year. In contrast, annual expenditures on SNMP-based systems were $150 million last year and are projected to hit $350 million this year, according to the Livingston, N.J.-based research firm.

However, annual CMIP sales will jump to $1.4 billion in 1996, overtaking SNMP sales, which will only hit $1 billion, Insight predicted. A major drive behind CMIP's long-term success will be the carriers, which are in the process of developing network management systems based on the OSI standard, the study said.

Northeast Consulting Resources, Inc. agreed with Insight's assessment — up to a point. "Carriers are more likely to be CMIP-oriented [because] they have to be CCITT-oriented," said Mary Johnston, a principal at the Boston-based firm. "That in turn will drive the multiplexer and possibly the PBX vendors to support CMIP. The question is whether it will get the internetworking community, now set on SNMP, to change its mind in the next few years."

Meanwhile, users are eyeing the Open Software Foundation's Distributed Management Environment (DME). DME's joint support of CMIP and SNMP offers a potential resolution of the standards wars.

Catch-up time

While IBM's network management products will show gains, the higher growth rates will be in the open systems sector

Network management expenditures (millions)

	1991	1992	1993	1994	1995	1996
SNA/NetView	$810	$1,040	$1,300	$1,550	$1,830	$2,050
[illegible]	$150	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
OSI CMIP/CMIS	$10	$20	$70	$350	$865	$1,400
Others*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$130
Total	$1,600	$2,100	$2,700	$3,300	$4,000	$4,600

*Including [illegible]

Source: The Insight Research Corp.

Defense firms eye commercial security

Hughes STX, ICL join forces to provide enterprisewide net protection

BY JAMES DALY
CW STAFF

With the Cold War rapidly thawing, large companies with extensive experience in defense-oriented technology are scrambling to apply those skills to the private sector.

One of the bigger projects under way teams security veterans Hughes STX, a subsidiary of Hughes Aircraft Co. that specializes in large-scale custom integration projects, and British computer giant ICL. The companies recently announced plans to jointly market systems similar to those they developed for U.S. and British defense agencies. Officials at the companies said they hope the new venture nets $100 million in annual sales within four years.

The two will take a crack at one of the most bothersome problems facing the information systems manager at large sites: providing network security that will encompass all of the disparate pieces of an open enterprisewide network.

> "LARGE NETWORKS have become playgrounds for hackers and industrial spies."
>
> MORGAN DEATH
> HUGHES STX

"Large networks have become playgrounds for hackers and industrial spies," said Morgan Death, Hughes STX's vice president and general manager.

The sheer size of the networks makes them almost impossible to manage, Death said.

Security experts said heterogeneous networks are especially vulnerable whenever a large number of remote dial-up users are involved.

"Remember that if you as an authorized user can log in from anywhere on a large network, so can anyone else, whether you want them to or not," said David Stang, chairman of the International Computer Security Association in Washington, D.C.

Both Hughes and ICL have previously designed and built huge computer and communications networks for defense and government use. Hughes, an aerospace concern with about $4 billion in annual sales, is an experienced systems integrator that has performed $1 billion in security services in the last five years

Continued on page 55

Ascom Timeplex realigns

BY JOANIE M. WEXLER
CW STAFF

WOODCLIFF LAKE, N.J. — The first major influence of new Ascom Timeplex President William Y. O'Connor was felt this month in the form of a corporate reorganization aimed at allowing the company to respond more quickly to customers.

O'Connor was named president of the networking company in March by Switzerland-based Ascom, which purchased Timeplex, Inc. from Unisys Corp. last September. O'Connor succeeds Unisys veteran Dewaine Osman as Timeplex president.

The vendor has formed three business units that will each focus more sharply on the areas of transport, internetworking and core technologies such as cell relay and network management architectures.

Previously, the firm had corporate directors of engineering, marketing, sales and other functional areas, company spokesman Tony Squeglia explained.

To each its own

Now, each of the three business units will have its own functional head who will report to O'Connor in a matrix style of management.

Prior to the reorganization, directors "couldn't help but become a bottleneck" because they were responsible for a function for the whole company, Squeglia said. One analyst pointed out that acting more quickly — a similar goal that IBM set nearly a year ago with its corporate restructuring — is critical in light of the shifting nature of the corporate sell.

"Today's client/server computing paradigm is requiring vendors to "sell out to business units as well as up to financial executives," noted Jeremy Frank, vice president of European telecommunications strategies at Gartner Group, Inc., a Stamford, Conn.-based consultancy.

Splitting into focused groups "can allow companies to form very, lean, aggressive business units that can compete in their niche by making decisions when they need to make them," Frank said.

Squeglia said that Ascom Timeplex is also forming vertical marketing groups of people with expertise in specific industries.

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   ☐ Multipart forms ☐ Text ☐ Graphics ☐ Other

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Defense eyes security

CONTINUED FROM PAGE 53

for the U.S. Department of Defense (DOD) and related agencies.

At issue is more than security, Death said. Systems are being underused, information is not easily disseminated or made available to everyone who needs it, and tracking enterprise activity is an elusive dream. "These are the same problems that the government and defense community had for years," he said. "Networks are so large or so diverse that users have a difficult time navigating through their own computers."

HUGHES STX will take the lead in managing the venture, but it will be structured to draw on talents throughout the ranks of both corporations.

The pair initially expects to offer two plans to secure large networks — typically 5,000 or more nodes. They include the following:

- First up will be ICL's Access Manager, which allows users to log on and be presented with a single menu of all the system resources to which they are allowed.

Typically, many large corporate networks tying hundreds of dissimilar computers together force the user to laboriously navigate through an elaborate network by memorizing dozens of passwords.

- For sites involved in government work that requires Posix and Government Open Systems Interconnect Profile standards compliance, the pair will offer the Corporate Headquarters Office Technology System (CHOTS), which was developed by ICL for the UK's Ministry of Defence. CHOTS is a secure office automation system that can accommodate 30,000 users in dozens of locations, according to ICL spokesman Andrew Roberts. It adheres to the B1 level of security described in the DOD's Orange Book guidelines.

CHOTS provides a long list of functionality, including stringent methods to determine the identity and authenticity of the user, encryption techniques, a means of restricting network resources and a comprehensive record of all activities performed on the network. Users are also assigned one of 32 classifications, such as Secret, Confidential or Classified, and are only permitted to use the network within the boundaries of their classification.

Users should expect to pay between $500 and $1,000 per workstation for either Access Manager- or CHOTS-provided security, Death said, but "we're working to get that number down." He added that both Access Manager and CHOTS can be integrated into existing systems. "Users won't have to rip out everything they already have."

Hughes STX will take the lead in managing the venture, but it will be structured to draw on talents throughout the ranks of both corporations.

Although the pairing marks another in a series of moves by Hughes to deploy its defense-related skills in the commercial sector, it is not alone in the endeavor. Several other companies have announced products offering the B1 level of security, including Informix Corp., which in February announced the B1-level OnLine/Secure 4.1, a relational database management system for secure Unix platforms.

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International conglomerate eyes OSF

Unilever's 500 firms undergo migration, seeking gain in software portability and productivity

BY LEONARD A. HINDUS
SPECIAL TO CW

Unilever PLC is in the process of migrating its 500-plus operating companies to Open Software Foundation (OSF) protocols, with the goal of providing software portability across its worldwide operations.

Unilever expects savings on the order of hundreds of millions of dollars a year from being able to port applications and share data across its companies' information systems, said Nick White, head of telecommunications at Unilever.

Unilever, based in London and Rotterdam, the Netherlands, made the decision to standardize its information technology worldwide on the OSF client/server model in 1990. The company completed definition of the standards in 1991. Unilever expects to complete the migration to the OSF corporatewide by 1996.

The biggest expected payoff from the new architecture is the ability to share data among all of its 20,000 managers within two years, said Regis Garbo, director of data communications and IS at Lever Brothers USA, a Unilever company. "Our companies used to operate in isolation; now they're learning to work as teams." Without standards, "it was hard enough to access data within a company, let alone share data between companies," Garbo said.

"We want to be able to take software from one company and transfer it to any other company and have it up and running within five working days," explained Chief Information Officer Michael Johnson.

In addition, the corporation expects to reduce the development of typical software applications from two years to three months.

The OSF standards will also let several operating companies share the cost of software systems that none of them could afford to develop alone. "We can no longer afford to reinvent the wheel in each of our 500 operating companies," Johnson stated.

A $40 billion international conglomerate, Unilever includes companies such as Lever Brothers, Thomas J. Lipton, Inc., Ragu, Calvin Klein, Inc. and Faberge.

Garbo reported that Lever Brothers has already cut software development time with the use of development tools and the client/server model by a "factor of 10."

Unilever plans to implement the OSF Application Environment Specification standards suite, which includes the OSF/1 operating system, the Motif interface, the OSF's Distributed Computing Environment and SQL.

Unilever has had to sell the concept of a corporatewide information technology to its operating companies, which are accustomed to enjoying a high degree of autonomy in their IS buying decisions. Steering committees have been formed in which technical managers from the various companies can provide input into the development of the corporation's information and telecommunications architectures.

Unilever also plans to implement a corporatewide videoconferencing network based on BT equipment and services. The network will quickly pay for itself through reduced travel expenses and is also expected to foster "more frequent and more productive communications between the managers of different operating companies," White said.

Unilever selected BT, after evaluating several competing systems, as the company that demonstrated the greatest degree of interoperability via the CCITT H.261 video coding/decoding standard.

Videoconferencing will be installed in more than 100 Unilever locations within the next three years. "The real proliferation will come with the development of desktop video/data communications workstations," White predicted. "We ensured that our directory is capable of registering up to 100,000 video workstations."

Unilever has negotiated agreements with three computer vendors: Digital Equipment Corp., Hewlett-Packard Co. and IBM. The operating companies are free to buy from any of these vendors. Unilever selected databases from Oracle Corp. and Sybase, Inc.; however, managers can select any database that has the same SQL access commands as Sybase and Oracle.

In the same way, Unilever has global agreements for WordPerfect Corp.'s word processing software and Lotus Development Corp.'s 1-2-3 spreadsheets. U.S. Sprint Communications Co. was selected for global electronic mail, U.S. voice and data communications and European data communications.

Hindus is principal at Fibbledale Communications, Inc., a Hudson, Mass., marketing and communications firm.

ON SITE

Unilever

Unilever PLC
London and Rotterdam, the Netherlands

- **Challenge:** To provide software portability across worldwide operations of 500-plus operating companies.
- **Strategy:** To standardize on OSF protocols.
- **Goal:** To save hundreds of millions of dollars per year by sharing data and common applications.

Nothing personal

As part of the decision to standardize on open systems, Unilever will not buy any more personal computers after 1993.

"We're not going to throw away investment in PCs," said Nick White, head of telecommunications at Unilever. "We'll simply stop buying any more."

In the place of PCs, Unilever will buy Unix-based workstations from the three approved vendors, IBM, DEC and HP. White stressed that this decision is based on Unilever's desire to establish total interoperability among the systems used by each of the more than 500 operating companies.

White also said Unilever wants to get floppy disks off the system. "You don't need floppies in an open client/server environment. Floppies represent a security risk and the major source of viruses." He said that if users want to move data from one point to another, they can draw it from the network via the client/server architecture.

NEW PRODUCTS

Gateways, bridges, routers

Micom Communications Corp. has introduced NetRunner, a remote Ethernet bridge that integrates voice, fax and data traffic with local-area network traffic over low-speed leased lines.

NetRunner uses Micom's rapid relay technology, which is a combination of fast-packet multiplexing, advanced voice, data and local-area compression and fax demodulation. NetRunner supports all LAN protocols and traffic, including Transmission Control Protocol/Internet Protocol, Apple Computer, Inc.'s AppleTalk, Digital Equipment Corp.'s DECnet and Novell, Inc.'s IPX, according to the company.

NetRunner prices start at $3,500.

Micom Communications
4100 Los Angeles Ave.
Simi Valley, Calif. 93063
(805) 583-8600

Netronix, Inc. has announced the latest version of its TokenMaster 2000 local Token Ring bridge.

TokenMaster can achieve speeds of 15.4M bit/sec. by incorporating a series of modifications known as the Token-Ring Interface Accelerator. The accelerator was designed for speed enhancement and improves the performance of the IBM Token Ring mini-module within the Netronix Token Ring bridge.

The product benefits users running applications utilizing frames of 500 bytes or larger, according to the company.

TokenMaster 2000 costs $4,690.

Netronix
1372 N. McDowell Blvd.
Petaluma, Calif. 94954
(707) 769-3300

Datability, Inc. has introduced Mux/Routers, a local-area network internetworking solution.

Using a standard switched telephone network, Mux/Routers transparently connects terminal users and computers in one location with systems in remote locations.

Mux/Routers supports dedicated circuits and access-on-demand connections via standard dial-up modems and Channel Service Unit/Data Service Units. It also has the capacity to attach remote sensing and data gathering equipment and to route it to a central location for processing, according to the company.

Mux/Routers costs $2,999.

Datability
1 Palmer Terrace
Carlstadt, N.J. 07072
(201) 438-2400

Customer premises equipment

Racal-Datacom, Inc. has announced an inverse multiplexer based on its Racal Communications Processor (RCP).

The RCP-BMM (Bandwidth Management Module) is a solution used for high-bandwidth applications such as videoconferencing, local-area network internetworking and disaster backup of high-speed trunks.

The RCP-BMM has applications that include bulk data transfer and computer-aided design and manufacturing. The unit can automatically demand more bandwidth from the network provider on an as-needed basis. The RCP-BMM supports from two to eight input ports and multiple network connections, according to the company.

Pricing for the RCP-BMM starts at $10,000.

Racal-Datacom
1601 N. Harrison Pkwy.
Sunrise, Fla. 33323
(305) 846-1601

X Window Systems

Visual has introduced the TX800C, a color open network terminal.

According to the company, the TX800C is the most upgradable and interoperable configuration of any X terminal-style device available. An industry-standard S-bus expansion slot gives the TX800C the ability to download and run a variety of other terminal services. The TX800C has features including a small footprint, fanless operation and simple single in-line memory module expansion, according to the company.

The TX800C costs $3,495.

Visual
120 Flanders Road
Westboro, Mass. 01581
(508) 836-4400

Integrated Computer Solutions, Inc. has announced Ada-Motif, an Ada solution for the X Window System user.

Development of X Windows applications can be done entirely in Ada. Users can create graphical user interfaces and custom widgets. Ada-Motif supports intermixed Ada and C routines, simplifying the use of the product with existing systems.

Ada-Motif costs $2,995.

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IBM Business Partner

COMMENTARY

Jean S. Bozman

Examining RDBMS angst

Oracle's June introduction of the Oracle 7.0 relational database solved one set of problems for users: It put the names of Oracle 7.0's new features on paper, and it confirmed the 20% price premium placed on the relational database's three options for programming, distributed database and parallel processing.

But problems remain in the planning area. How should users view the relational database market, now that the largest independent player, $1.1 billion Oracle, has put its cards on the table? Should users believe the analysts' predictions that RDBMSs are quickly becoming commodity products? Will consulting and programming tools be the only things that add value to database engines when users switch to open systems?

Well, the world hasn't changed overnight. Users should note that Oracle 7.0 will not be shipped until the fall and that most Oracle users will probably acquire it next year — or later. By that time, comparable products will be available from all major RDBMS vendors. Even so, competing vendors will continue to insist that the Oracle product has functional gaps and that their own products are still superior, in some ways, to Oracle 7.0.

Under fire

Users are already getting such messages from Oracle's three primary competitors: Sybase, Ask's Ingres Products Division and Informix Software. Turning somewhat defensive, each prepared a formal response to Oracle 7.0: Ingres wrote a white paper comparing its features with Oracle's. Informix released a folder of fact sheets labeled "What [Oracle] won't be telling you on June 15." And Sybase executives, who prepared their own competitive-analysis brochures, are still shaking their heads over Oracle's veiled references to an outclassed "early client/server" database product during the Oracle 7.0 announcement in New York. Oracle executives have since confirmed that the reference was to Sybase's 4-year-old

Continued on page 64

Boole to outline distributed plan

BY JOHANNA AMBROSIO
CW STAFF

Boole & Babbage, Inc. will lay the groundwork for its distributed systems management products later this week with a new release of its underlying base technology.

The first product to incorporate the new technology will be available on Wednesday, said Olivier Thierry, director of marketing and business development at Boole. The product, MV Manager for MVS, helps users monitor performance of an entire application instead of having to track each individual subsystem, such as JES3 or CICS, on different terminals.

With MV Manager, users can see an unlimited number of subsystems on one screen. Users can also see the work loads of multiple mainframes on the same screen. Pricing for MV Manager, part of Boole's MainView family, starts at $19,700.

At the heart of both the new technology and the product is the underlying principle that users should be able to have "a single point of command, like the cockpit of a jet, that monitors the entire enterprise," Thierry said.

That direction is important to Stone Container Corp. in Chicago, a large Boole customer, said Rich Antonini, manager of computer resources. He said his company will install MV Manager for MVS later this summer. "I've seen it demonstrated, and it looks like a very good product," he said.

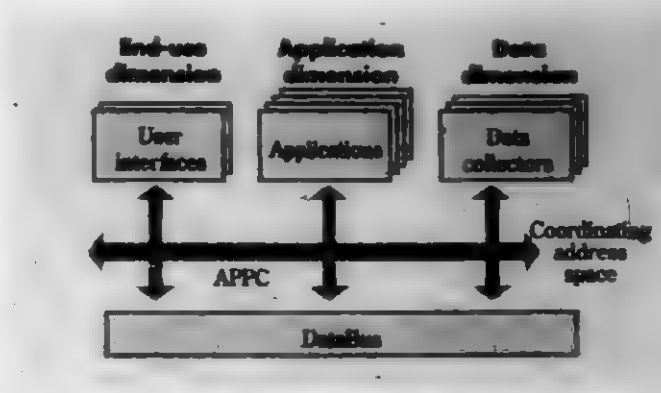
Bill Chewning, assistant director of information systems operations at the National Geographic Society in Gaithersburg, Md., and a Boole customer, said the new product sounds attractive, but it is too late for his shop. "We just brought in a competitive product that will be in production within a couple of weeks," Chewning said.

Jeff Schulman, an analyst at Gartner Group, Inc. in Stamford, Conn., said, "Boole's architecture walks a nice line between the proprietary and open worlds. The key for them will be to get the products out the door and to sell."

The new technology, called Boole & Babbage Intercommunication Facility Release 3.10 (BBI-3), essentially separates the graphical user interface, the applications logic of the program and the data into different components. That way, any one of the three can be changed without affecting the other two.

In the future, Boole said, BBI will support IBM's OS/2 with Presentation Manager. The firm also plans to let BBI combine information from multiple systems and products in one window, as opposed to many.

Although MV Manager will be the first product to implement BBI, other products are slated to follow this summer, including new versions of CMS Monitor and Net/Avail.



Boole & Babbage's technology base for its distributed systems management products separates the user interface, applications logic and data into different components

GeoVision to announce Vision 2.0 GIS

Release based on relational architecture runs with commercial RDBMSs

BY MELINDA-CAROL BALLOU
CW STAFF

DENVER — GeoVision Systems, Inc. this week will announce Vision 2.0 Enterprise Geographic Information System (GIS), which offers a relational architecture that allows the product to run in conjunction with commercial relational database management systems.

This new capability allows users to pull mainstream corporate data into the spatial context offered by GIS technology, company officials said.

Users can, for instance, integrate financial, personnel and facility data with spatial information such as maps, drawings, photographs and diagrams from the GIS application.

Previously, requests for spatial data would go to an executive information systems (EIS) proprietary database, and requests for tabular data or attributes would go to the RDBMS. Both sets of data would then be pulled into the GIS application for analysis.

GeoVision engineers rewrote the database access layer for this version of the product to route all data requests directly to the RDBMS, providing direct access to spatial indexing, coordinate strings and graphic attributes. This offers faster access to the data as well as complete RDBMS and GIS functionality — including data integrity, recovery and security features. The new version also supports the Open Software Foundation's Motif graphical user interface.

Vision GIS supports RDBMSs from Oracle Corp. and The Ask Cos.' Ingres Products Division in this first release, with others to follow, officials said.

An industry analyst said GeoVision's support of RDBMS capabilities offers significant advantages.

"Other GIS vendors have interfaces to RDBMSs, but you lose performance when you use those," said Gisela Wilson, manager of computer-aided design and engineering programs at International Data Corp., a market research firm based in Framingham, Mass. Vision 2.0 "can use the database management capabilities that the RDBMS vendors have developed, which is terrific. You can overlay commercial information with geographic information, which opens up an entirely different area of applications" to users.

Users were also enthusiastic about the new capabilities of the product. Government agencies, such as those in Orange County, Fla., are using Vision GIS to integrate data across different departments.

GIS joining

"GIS offers tight coupling with Oracle, and we've been able to build on its capabilities," said Pierce Eichelberger, GIS project coordinator at the Orange County Data Center in Orlando, Fla. "We have GIS users doing joins from node to node across VMS and Ultrix, and it's so easy they tend to forget where they're doing their processing." In addition to the VMS and Ultrix nodes, Eichelberger said, the center has about 150 Apple Computer, Inc. Macintoshes and three dozen personal computers in its GIS network.

"Geography provides a natural framework for viewing and integrating a range of data. Now users can navigate from one database to another via a series of foreign key joins," he added.

Vision 2.0 is scheduled to begin shipping by the end of this month. Pricing ranges from $2,000 to $20,000.

The product runs on Unix workstations and servers from Digital Equipment Corp., IBM and Sun Microsystems, Inc. and also on VMS.

Integrator pitches system to newspapers

BY MARK HALPER
CW STAFF

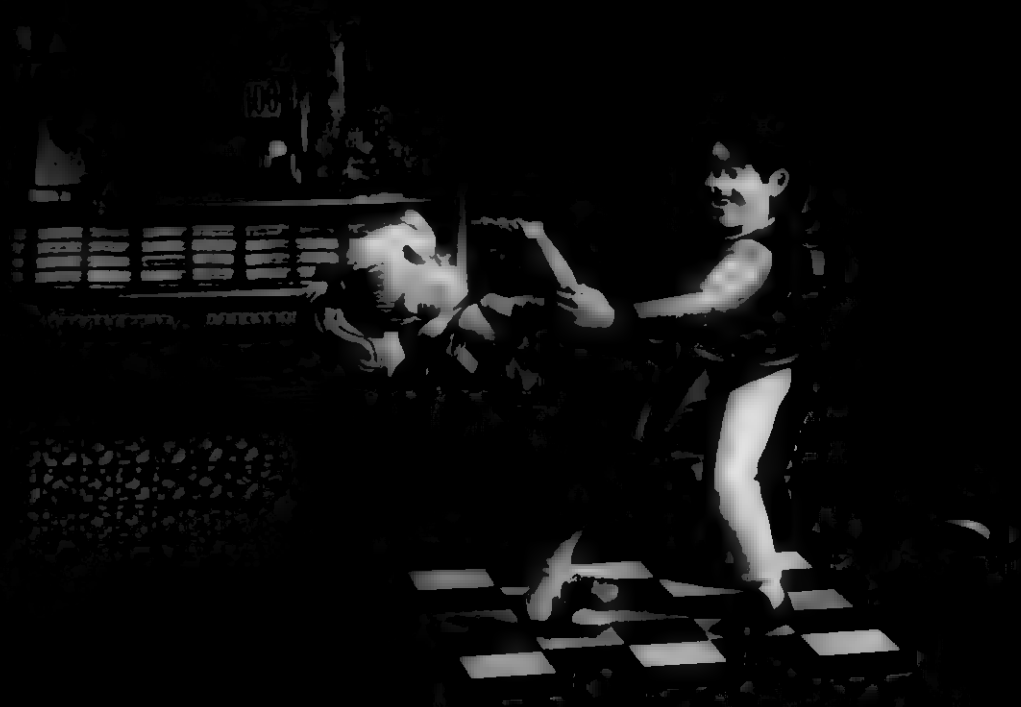
SACRAMENTO, Calif. — Small could be beautiful for newspaper computer system specialist System Integrators, Inc. (SII), which is parlaying Tandem Computers, Inc.'s recent release of a low-end, fault-tolerant system into sales for small to midsize clients.

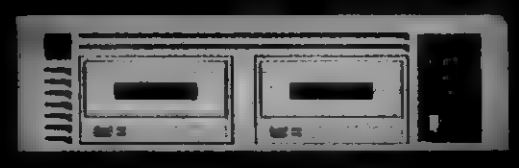
Sacramento-based SII is aiming its new System 55/XR at papers with circulations of 20,000 to 80,000. The 55/XR is a distributed system built around Cupertino, Calif.-based Tandem's 8-month-old CLX/R series, a less costly and less powerful reduced insruction set computing-based version of Tandem's proprietary complex instruction set computing-based CLX line.

The CLX/R uses Mips Technologies, Inc.'s R3000 processor and runs Tandem's proprietary fault-tolerant Guardian operating system.

Earlier this month, SII signed a deal with the *Santa Maria Times* in Santa Maria, Calif., to install a distributed system

Continued on page 63





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"Before IPL, back-ups were a real problem for us. Using standard tapes, it would take a full nine hours to do a complete system save. We'd have to open our facility on a Sunday, and with a day of tedious work in front of us, the process was very stressful."

Instead of hiring additional staff to solve the problem, Dan turned to IPL's 8mm solutions. "Thanks to IPL's 6765 tape drive, Duracell's back-up is now a totally unattended process using 8mm technology. We even took the extra step of testing the drive at our IBM disaster recovery site in Sydney. It performed impeccably."

Which means fewer headaches for Dan, and more time to concentrate on other areas of the business. "Working with a storage leader like IPL was refreshing. The quality information and attention we received helped us make a comfortable decision, and local service made installation simple. We're grateful to have such a top performer on our side."

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Tool set aids software firms

BY MELINDA-CAROL BALLOU
CW STAFF

EMERYVILLE, Calif. — Scopus Technology, Inc. recently unveiled ProTeam, a family of products said to automate and integrate engineering, quality assurance, technical support and sales operations for software companies and for software-centered organizations.

The ProTeam modules include SupportTeam for call tracking and customer support; QualityTeam for bug tracking and quality control; and ViewTeam for graphical analysis of information. The data for all of the modules is located on Sybase, Inc.'s SQL Server relational database management system, and a runtime copy of the database is included with the product.

"Our product is client/server-oriented — a substantial part of the application runs on the server, which also provides services to the client," Scopus President David Schwab said.

These applications include a notification service that builds business rules to drive certain events, such as who gets notified if a bug has been sitting unassigned for too long; a full search-and-retrieval system; and a service that reports the average time required to resolve a bug.

ProTeam applications can be customized for specific site requirements without the need for programming, according to company officials.

"We provide a standard off-the-shelf application that is highly configurable by the MIS user via graphical manipulation of the entire application, letting them rename fields, add buttons and do what they want without having to touch the code," Schwab said.

End users agreed. "The configurability of the system has been very important for us — they offer a standard product, and you can easily make changes," said Ken Erikson, information systems project leader at Viewlogic Systems, Inc., a software manufacturer of electric design automation tools based in Marlboro, Mass. "We're looking for ways to present the data graphically and to track the integrity of the information that we have. ProTeam lets us do that."

> "WE'RE LOOKING for ways to present the data graphically and to track the integrity of the information that we have. ProTeam lets us do that."
>
> KEN ERIKSON
> VIEWLOGIC SYSTEMS

Other users cited the advantages of ProTeam for effective customer support.

"Customer support is nothing more than a hub of information that needs to be disseminated throughout the company. If a problem escalates, for instance, I want automatic notification so that I can make sure that the technical or sales rep is aware of it," said Cecil Lawson, manager of customer services at Rational, an object-oriented tools company in Santa Clara, Calif.

"I've used this as a management tool to tell me what users are calling about. I can log on very easily and intuitively get that information. And it also allows upper management to see what's going on by offering easy access to information for the heterogeneous groups within our organization."

ProTeam is available now, and a typical configuration, which supports four servers for technical support people and 20 client engineers, is priced at approximately $45,000. ProTeam clients can run on any system that supports X Window System, and the server portion will run on any system that supports SQL Server, including Digital Equipment Corp. VAXs and DECstations, IBM RISC System/6000s, Sun Microsystems, Inc. SPARCstations and Hewlett-Packard Co. HP 9000s.

File transfer tasks eased with Outbound package

BY CHRISTOPHER LINDQUIST
CW STAFF

File transfer and communications packages normally depend on the node system to initiate the transfer. Such a situation requires the personal computer user to be savvy in both connecting to and retrieving the necessary data, which require time and training and can incur support costs as well.

In an effort to reduce these expenditures, particularly in cases of nightly transfers of data, San Francisco-based Firesign Computer Co. has produced Outbound, a host-based alternative.

"The philosophy here is that we want the control and the error reporting to be on the mainframe end," he said.

Toward that end, the package allows systems analysts or managers to determine what data to transfer to the [illegible] nodes and when, according to the company.

Outbound runs under DOS, Microsoft Corp.'s Windows or OS/2 and allows a VM- or MVS-based IBM 370 or 390 host system to undertake a file transfer without any interaction by the PC user. All transactions are controlled from the mainframe and run in the background on the PC.

Outbound consists of about 200K bytes of host code and a small terminate-and-stay resident program for DOS systems. OS/2 and Windows versions run as background programs.

Host pricing varies depending on installation but is usually around $15,000, according to the company. PC copies are $150 for DOS and Windows versions and $300 for OS/2.

An optional service contract is also available.

IBM, Hitachi ink printer deal

IDG NEWS SERVICE

TOKYO — Hitachi Ltd. and IBM have agreed to co-develop a computer printer, according to a Japanese press report.

The reported agreement covers development of print mechanisms and printer controllers used in large-scale printers for office systems and mainframes, as well as software for the printer.

The two companies already cooperate in several fields. Hitachi, for example, sells IBM-compatible mainframes.

The printer to be co-developed will reportedly be manufactured by Pennant Systems, a Connecticut-based company that makes IBM printers, and by Hitachi Koki Co., which currently manufactures Hitachi's printers.

IBM set up separate companies for external memory devices and printers in December 1991 as part of its streamlining effort that put more control in the hands of smaller operations to boost competition.

The two firms will start making the printer as early as 1993, according to the report. IBM will reportedly sell the printer, which could cost as much as $640,000, worldwide.

SII parlays Tandem with System 55/XR

CONTINUED FROM PAGE 61

based on the 55/XR.

The *Santa Maria Times*, which has a daily circulation of 22,000, was the third paper to purchase a CLX/R system from SII. Last month, two jointly run suburban dailies in Pittsburg, Calif., the *Valley News Dispatch* and *North Hills News Record*, began installations.

SII, which claims to be Tandem's largest reseller, hopes that the low-end system will generate additional business with newspapers that otherwise could not afford more powerful fault-tolerant Tandem equipment.

Sensible strategy

Santa Maria Times publisher John Shields said the strategy makes sense.

"The 55 was downsizing from the larger papers to where it is more affordable for the smaller ones," Shields said. "If SII were restricted to the large papers, they would have a limited market."

Tandem's prices for the CLX/R start at approximately $25,000, compared with $125,000 for the CLX series.

SII's largest customer is currently the *Los Angeles Times*, which runs 1,500 personal computers connected to about 20 midsize Tandem computers.

"We've been out of their cost range," the spokesman said, referring to the smaller size newspaper.

"There are upwards of 200 papers out there" that might now consider a system based on Tandem's new machine, the spokesman added.

SII is not, however, expecting meteoric results.

"The recession still has its stranglehold around the newspaper business," the spokesman said.

For privately held SII, that stranglehold choked revenue in the fiscal year ended Sept. 30, 1991, to $67 million — down from $72 million the previous year.

SII expects to complete the *Santa Maria Times* installation by the end of this month, according to company officials.

The paper will put a few users on the system July 20, according to Shields. It plans to bring the entire paper on-line after Labor Day weekend, when the company will run its editorial and advertising operations on the system, he said.

SII is tying the Tandem box — which can support up to 96 workstations — to 26 Intel Corp. 80386-based PCs.

Safe choice

The *Santa Maria Times* evaluated other fault-tolerant systems, but it chose the Tandem model because it judged it to be the most fail-safe, according to Shields.

The project entails loading the 26 Intel PCs with cards that emulate SII's Coyote terminals, which prior to client/server computing were the front-end boxes that SII typically installed, Shields said.

SII is loading its own software for both editorial and advertising staffs and is also installing an Apple Computer, Inc. Macintosh pagination system.

The *Santa Maria Times* has been using SII's System 22, a 10-year-old machine.

IN BRIEF

Ingres joins with ESL

■ **The Ask Coe.' Ingres Products Division** moved a step closer to object-oriented database systems recently by agreeing to incorporate spatial data management technology from ESL, Inc. in Sunnyvale, Calif. The joint development agreement will extend the Ingres 6.4 database's Object Management module by the end of 1993, said Marilyn Bohl, senior vice president of engineering at Ingres. ESL, a defense contractor, has working prototypes of this object management capability for multidimensional data types, according to ESL President Art Money. Possible applications include geographic information systems, cartography, weather prediction and computer-aided design and manufacturing, according to Ingres officials.

■ **Epoch Systems, Inc.** will supply **Tandem Computers, Inc.** with data network management software technology to support Tandem's image storage management products. The new local-area network-attached Tandem Image Storage Server can store and manage nearly 20 million images or about 1 terabyte of data, the company said. Pricing ranges from $103,000 to $334,000.

Bozman

CONTINUED FROM PAGE 61

client/server technology.

All of this angst in the vendor community puts users in an unusually strong position for next year. Those who adopt open systems should be in a position to pick and choose their database of choice for new projects. For that reason, pricing should be competitive, particularly on Unix platforms. Users should also be able to mix and match third-party development tools from Uniface, Unify, Progress, JYACC and others for client/server development on multiple platforms.

However, users should pay attention to the number of strings attached to each database vendor's system. For example, Oracle users will need to buy SQLnet 2.0 to make distributed database applications work, and the next generation of Oracle development tools is not yet ready for announcement.

Many Sybase users are developing applications for the current Sybase 4.2 and 4.8 products, but some are still not happy with the packaged Sybase APT tools. And, Informix users who want a multithreaded server must wait for Informix 6.0's 1993 arrival.

You would think there was a great gnashing of teeth about these product schedules. That's what the highly competitive vendors would have you believe. Yet, a number of users have said they are quite content to start planning for Oracle 7.0, or its counterparts, as long as they know about database features and where to get application development tools.

Finding the right ingredients

The challenge that looms on next year's horizon is how to best assemble, how to best mix and match, the "open" database tools with the most appropriate database. Some confident Oracle users say they know exactly what they want and are glad the day of plug-and-play systems has come. They plan to install their own Oracle 7.0 systems within months.

Other users — mindful of the complexity of distributed database systems — say they will turn to consultants or RDBMS vendors for help with systems integration.

That is exactly what Oracle is counting on. Oracle has roughly five times the revenue of its largest competitors and more than a thousand staff consultants. It plans to use its throw-weight to boost the size of its installed base and to bring a new generation of customers into the fold.

Bozman is *Computerworld*'s West Coast senior editor.

Third parties target VAX 6000

BY MELINDA-CAROL BALLOU
CW STAFF

HOPKINTON, Mass. — Third-party memory and storage providers are targeting Digital Equipment Corp.'s VAX 6000 line with a series of products and price cuts.

Clearpoint Research Corp., based here, introduced the DCME-V60 memory board for VAX 6000 Model 500 and 600 computers and the DCME-V61, a memory upgrade solution for DEC's VAX 6000 Model 200, 300 and 400 minicomputers.

Separately, Dataram Corp. in Princeton, N.J., announced a 20% price reduction of the company's DR600 expansion memory board for DEC's VAX 6000 Model 200, 300 and 400 minicomputers.

Clearpoint officials said their release of the DCME-V60 offers the first third-party memory product targeting DEC's 6000 Model 500 and 600 computers.

"We had to reverse the XMI bus, and that took a lot of work because the protocol and the interface logic reside in the XMI chips," said Mitch Wolf, product manager of DEC memory at Clearpoint. "We had to reverse-engineer not only the bus but also how the different boards talk to one another."

Wolf said he expects that DEC will not pursue litigation against Clearpoint for this new product, adding that because the companies resolved their pending suit over the BI bus litigation, they have a more amicable relationship. Earlier this year, neither party was found guilty of anything as a result of the BI bus litigation filed against Clearpoint by DEC.

"DEC is looking at the product," Wolf said. "Neither of us are companies that have tons of cash lying around, and both of our goals are to work and make money and not to spend money funding lawyers. We spent a lot of time on the legal side as well as the engineering side [in developing DCME-V60] and feel that we have a clean design. Our goal here is to actually get a license, and we're meeting with [DEC] on an ongoing basis."

Both the DCME-V60 and the DCME-V61 are shipping this month. Pricing for the DCME-V60 ranges from $22,860 for 32M bytes to $71,445 for 128M bytes. Pricing for the DCME-V61 ranges from $16,100 for 32M bytes to $57,870 for 128M bytes.

Dataram's DR600 now ranges in price from $15,000 for a 32M-byte board to $55,000 for a 128M-byte board.

NEW PRODUCTS

Database management

Compuware Corp. has released TransRelate Workbench for DB2 2.1.

This release offers new utility management capabilities, expanded catalog analysis, reporting features, enhanced migration facilities and support for DB2 Release 2.3. Users can analyze DB2 catalogs and create and modify DB2 objects without writing SQL.

DB2 utility management and DB2 security administration capabilities are provided in the Workbench, and the product automatically generates procedures that handle referential integrity, authorizations, utilities, data and plans, according to the company.

Pricing for TransRelate Workbench for DB2 Release 2.1 starts at $49,000.

Compuware
31440 Northwestern Highway
Farmington Hills, Mich. 48333
(313) 737-7300

Information Retrieval Cos. has released Automated Systems Information Management (ASIM) Version 4.3.

The product provides components for enterprisewide systems management including asset, problem, request, change, configuration and human resource administration.

ASIM's dynamic structure provides reporting capabilities through a knowledge base of rules and data definitions that it builds and shares between each systems area.

A Configuration and Voice Management feature provides connectivity data to be defined within a component record, which eliminates the need to create individual connection records, according to the company.

Prices for the ASIM product line range from $5,000 to $135,000.

Information Retrieval
Suite 610
312 W. Randolph
Chicago, Ill. 60606
(312) 726-7587

Utilities

Macro 4, Inc. has announced Tubes VTAM Version 2.3, an installed session manager.

Users can operate in a window environment and cut information from one window and paste it to another. Version 2.3 of Tubes VTAM offers an Advanced Function Option that includes windows, cut/paste, demo/view and network minimizer functions.

New features include support of double-byte character languages, translation tables that support special character languages, refinements in the Tubes Panel and Scripting Language and performance enhancements.

Tubes VTAM Version 2.3 has lease rates of $505 to $1,025 per month depending on mainframe classification.

Macro 4
35 Waterview Blvd.
Parsippany, N.J. 07054
(201) 402-8000

Data storage

Micro Technology, Inc. has announced StingRay, a Call Indicator (CI)-attached server that supports Small Computer Systems Interface (SCSI) open architecture. StingRay seamlessly emulates Digital Equipment Corp.'s Hierachical Storage Controller. The product is the first open systems-based, non-DEC solution for CI-attached storage.

SCSI peripherals can be moved anywhere across the DEC architecture, which allows peripheral storage, backup device and archive system investments to be preserved indefinitely.

Prices begin at $35,000 for 21-port capability.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

Software application packages

E3 Associates Ltd. has introduced E3Trim, a purchasing and inventory management system for IBM Application System/400 computers.

E3Trim performs economic analysis and has a base system with functions such as demand forecasting, lead-time forecasting, service level and safety stock analysis and order-cycle analysis. According to the company, E3Trim was designed with additional options including forward buying, diverter, or alternate source buying, order planning, booking and purchase order management. E3Trim and the AS/400 can be interfaced to most other accounting or business information systems and computer models.

E3Trim prices start at $24,000.

E3 Associates
Suite 600
1800 Parkway Place
Marietta, Ga. 30067
(404) 424-0100

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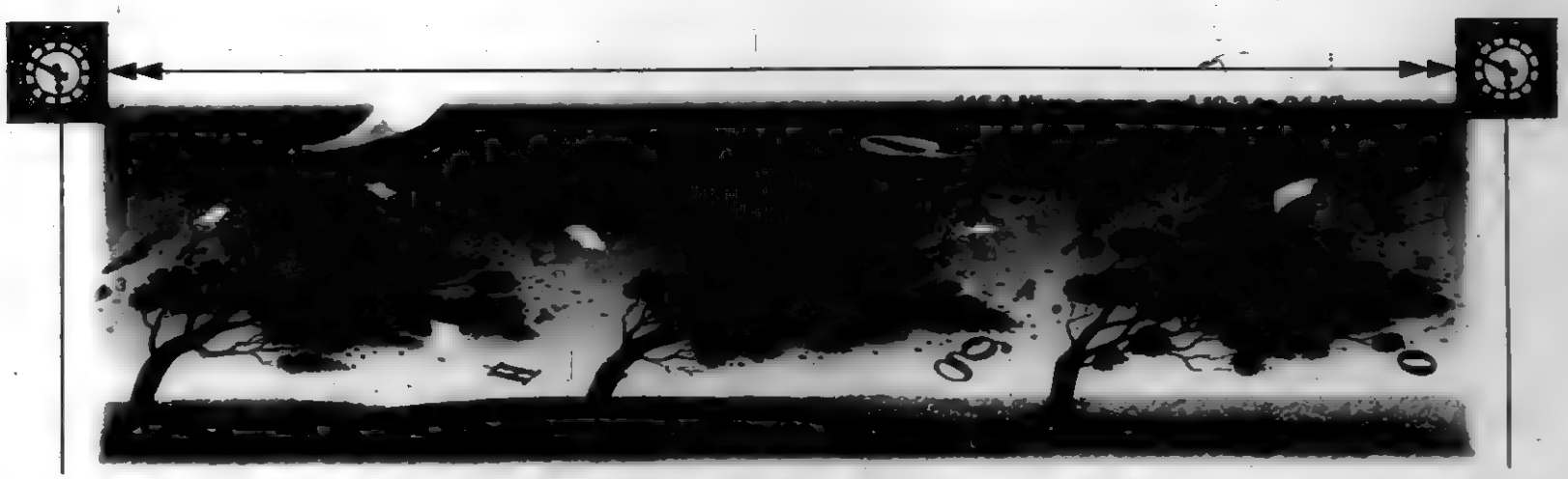

If you're interested in V.fast, take your time reading this.

Motorola Codex introduces the first V.fast dial modem.

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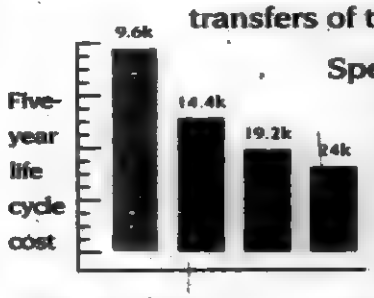

It pays to think fast. The faster the throughput, the faster the payback on your modem investment.

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Fax# 508-261-1204

THIS IS WHAT A MASSACRE LOOKS LIKE IN THE WORLD OF APPLICATION DEVELOPMENT.

DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	HIRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.8	7.1	8.1	7.6
Price/Performance	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	9.0	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	9.8	8.4	8.9	9.1	8.8	9.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.8	7.2	6.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.8	6.4	6.9	7.0
Frequency of Releases	8.8	7.5	6.7	7.2	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.9

Compiled from the 1991 Datapro Reports on Relational/Computer System Online Software, available for each product listed. Ratings from 1990. The results are those of ranked scores of the products as compiled by Datapro.

VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	SYBASE SQL	HIRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	6.05	6.10	5.89
Memory requirement	7.37	6.16	4.25	6.18	5.22
Ease of programming	9.03	7.09	6.09	6.20	5.98
Ability to manipulate data	9.19	7.41	7.44	6.81	5.87
Sorting capabilities	9.02	7.44	7.69	6.65	5.78
Provision for software security	8.86	6.93	7.28	5.07	5.78
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.81	7.05	6.15	6.10	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	9.09	7.66	7.66	6.61	6.11
Satisfaction with product profitability	8.36	7.04	6.22	5.58	5.13
Overall quality of product	8.94	7.37	6.69	6.32	5.44
Product Features Average	8.84	7.10	6.61	6.14	5.60
SUPPORT FEATURES					
Provision for customer support	7.74	5.98	5.76	5.77	5.50
Charges for training time	5.88	4.48	4.58	5.64	4.56
Provision for technical support	7.83	5.76	5.72	5.87	5.22
Provision for marketing support	6.89	5.82	6.09	6.13	3.80
Documentation & product information	8.74	6.73	6.58	6.45	5.56
Frequency of updates & revisions	8.39	5.88	6.34	5.57	6.00
Support Features Average	7.73	5.78	5.84	5.90	4.94
Overall Average	8.34	6.66	6.56	6.08	5.36

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PROGRESS
SOFTWARE

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PROGRESS applications are fully portable across the broadest spectrum of hardware platforms, operating systems, network protocols and user interfaces. So many, in fact, that we had to list them here in small type: AIX,™ CTOS, HP/UX,™ NOVELL NLM, OSF/1,® OS/2,® OS/400,™ UNIX,® ULTRIX,™ VMS,™ XENIX,® MICROSOFT® WINDOWS,™ X WINDOWS,™ DECnet,™ LAN MANAGER,™ NetBIOS,™ NOVELL® SPX/IPX, TCP/IP and SNA APPC LU 6.2. Also, PROGRESS lets you process information in other databases, including AS/400, C-ISAM,™ CT-ISAM,™ ORACLE, Rdb, and RMS.

CPMADV0713

Unix CASE market: Three more's a crowd

HP, Cadre and Cognos try to get a piece of the growing action with new product announcements

BY KIM S. NASH
CW STAFF

The Unix CASE market just got more crowded.

Hewlett-Packard Co. and Cadre Technologies, Inc. recently announced new software tools to run in and help build programs for Unix environments.

Separately, Cognos, Inc. elbowed its way into the crowd with an entirely revamped product line designed to cater to Unix development.

Boom time

Analysts last week warned of an impending brouhaha in the Unix computer-aided software engineering (CASE) arena as more vendors leap in to grab a share of the growing action.

Worldwide sales of Unix-based application development products topped $1.39 billion in 1991, up from about $1 billion for 1990, according to Dataquest, Inc. Sales projections for 1992 were unavailable.

However, although some CASE makers have gotten into the commercial Unix act, most of that revenue was brought in by vendors in the technical sector, according to Andrew Topper, an analyst at Foresight Systems, Inc., a consulting firm in Okemos, Mich.

Until mainstream CASE players such as Texas Instruments, Inc. and KnowledgeWare, Inc. deliver Unix products — not just product plans — commercial users will be wary of Unix CASE, Topper said.

Meanwhile, HP and other vendors are doing their part to further the cause. HP, a relative old-timer in the Unix development tools market, last week expanded SoftBench, its development framework, with two products designed to help users better manage CASE projects.

ChangeVision is a Unix-based software change request management tool designed to help programmers automate, track and measure modifications to programs. SynerVision is a set of process management templates that can be filled with business and information systems data and project goals to help organize large CASE jobs.

The products, which run on Unix machines from HP and Sun Microsystems, Inc., are priced at $5,950 for the set. Bought individually, SynerVision costs $3,950, and ChangeVision costs $2,950.

Alan Arnette, marketing manager at HP's Software Engineering Systems Division, said SoftBench sales ballooned 60% during the first half of 1992 compared with 1991's first half. He declined to enumerate exact figures, however, saying that the company does not break out revenue for separate business units.

Still, about 40% of SoftBench sales have been to the commercial sector, with the majority going to the scientific community, Arnette acknowledged.

Separately, Ottawa, Ontario-based Cognos, which has catered primarily to the MVS operating system for most of its 23-year history, plans to break free of proprietary reins with tools for six Unix platforms, including HP's HP/UX.

Most of the company's PowerHouse 7.0 family is due out next month. The line will also run on Unix flavors from Data General Corp., IBM, Digital Equipment Corp., Sun and The Santa Cruz Operation.

Existing PowerHouse-built applications will not be obsolete, according to Cognos. Users can recompile programs constructed with previous versions of PowerHouse to run in a Unix environment "with little effort and without losing any functionality or data," said Ron Zamboini, senior vice president of research and development at Cognos.

For its part, Beaverton, Ore.-based Cadre introduced Ensemble, a six-component suite that includes products for constructing, documenting and testing C programs. Reverse-engineering tools are also in the works, the company said.

Prices for the modules, which are scheduled to ship next month, range from $3,000 to $6,000. The suite will initially run on Sun's SPARC FCS, with AIX, HP/UX and Ultrix to follow, Cadre said.

Report card

Cognos' PowerHouse 7.0	August
HP's SoftBench family	Some out, more due in December
Interactive Development Environments' Software through Pictera	Already out
KnowledgeWare's ADW	Late 1992
Texas Instruments' IEF	Late 1992

CW Chart: Janell Genovese

Do-it-yourself credo governs IS at convenience store chain

BY GARRY RAY
CW STAFF

Take a ride through the Hoosier state of Indiana and you're likely to spot dozens of convenience store/gas station combinations that have sprouted in cornfields and cow pastures during the last decade.

Well past the chewing gum and newspaper stage, these stores now offer everything from chicken dinners to oil changes and fertilizer in order to woo and keep customers in an industry where profit margins look healthy at a bare 1% or 2% of sales.

Slim margins are nothing new to Marsh Village Pantry, a 173-store chain that is owned and operated by Marsh Supermarkets, Inc., a 60-year-old, billion-dollar firm that runs 83 grocery stores from its Indianapolis headquarters. Not surprisingly, the frugal Marsh is squeezing every last drop of profit from its Marsh Village convenience stores through a compelling mix of intelligent cost controls, insightful planning and a bevy of do-it-yourself information systems.

"Cost is the issue all of the time," said John Laboda, vice president of IS at Marsh.

Marsh Village Pantry
Indianapolis

- **Challenge:** To deliver a DSD invoice-entry application to more than 175 Marsh Village Pantry convenience stores, providing store managers with timely profitability measures and corporate offices with accounts payable information.
- **Technology:** Syscorp International's Microstep, a visual application development system; Xcellent's Remoteware Communications Management System; store-based 286 PCs.
- **Impact:** Two-week turnaround on DSD application; store managers have more useful supplier information; corporate offices reduced invoice-entry tasks and gained better cost controls.

A do-it-yourself credo is the core operating and cost-containment philosophy of John Wingate, the company's director of management information and communication systems. Speaking of his approach to IS planning and development, Wingate said, "We want to do it our way, so we can do it when we want to and change it when we want to change." At Marsh Village, turnkey systems vendors need not apply.

In keeping with that philosophy, Wingate has invested in a number of technologies that give the company inexpensive and flexible control over internal and store-based IS. Its pay telephones can be programmed and maintained from headquarters; cash registers interact with local, 286-based systems; an intricate data collection system automatically retrieves store accounting records and adds them to a consolidated accounts payable system.

Wingate's most recent creation is an invoice recording system that gives store managers an immediate sense of profitability mixes on incoming store deliveries.

Created using MicroStep, a visual programming tool from Austin, Texas-based Syscorp International, Inc., the Direct Store Delivery (DSD) invoicing system was designed to offload centralized data entry tasks, which previously required the efforts of 15 headquarters staffers, to local store managers.

Beneficial side effects

Even though managers are now picking up the job of entering 30 to 40 invoices per week into the system, Wingate said, they get a correspooding benefit. As they enter invoices into the store-based systems running the DSD application, "they get retail pricing and gross profit," he said. "It has eliminated a lot of work. Most of them like it."

Previously, managers calculated these figures manually and had little ability to play "what if" with vendor deliveries.

Marsh's headquarters also gets the immediate benefit of timely accounts payable information. Using the Atlanta-based Xcellenet, Inc.'s RemoteWare Communications Management System, DSD invoicing files are automatically collected on a twice-weekly basis from each of the stores and integrated into the company's central accounting system.

Once done, the Marsh accounting department compares invoices against a centralized master file of vendor prices. Variances between the master pricing file and invoices are immediately flagged for review.

In keeping with his philosophy that "I always buy with the idea that I want to do the development," Wingate purchased MicroStep after looking at a number of convenience store packages that cost in excess of $120,000. The $1,895 MicroStep allowed Wingate, who is not a professional programmer, to create a similar application in two weeks, he said.

At last report, Wingate was working on another MicroStep application that will allow the Marsh Village marketing department to create convenience store menu items by tapping into the centralized pricing database and working on a cost basis for all ingredients.

Satisfied that his low-cost, do-it-yourself approach is reaping rewards, Wingate said, "Everybody who has expertise on staff can do what we have done, and they can do it themselves."

Oracle, Cadre Technologies form strategic relationship

BY JEAN S. BOZMAN
CW STAFF

Some users of Oracle Corp.'s relational database management system see their IBM mainframes' IMS files as a large island of data stranded in a hierarchical, nonrelational database.

Until last month, users had no Oracle computer-aided software engineering (CASE) tools to reverse-engineer data from nonrelational sources such as IMS and have sometimes left 20-year-old IMS systems running in parallel with newer Oracle-based systems.

"It's been a bit of a problem," noted Ian Fisher, vice president of Oracle's worldwide CASE marketing. "We could retrofit definitions of data held in Oracle databases, but many Oracle applications were built without CASE."

To provide reverse-engineering tools to such users, Oracle recently announced a strategic relationship with Cadre Technologies, Inc. in Beaverton, Ore.

By December, Cadre will ship a version of its DB Designer CASE tool that can build models of IMS data inside Oracle's CASE Dictionary. The Oracle data dictionary/repository can be linked to other Oracle CASE tools to generate new applications.

Based on automated analysis, DB Designer 3.1 creates CASE entity relationship diagrams to recycle IMS data.

"It determines what the relationships are between the IMS data records," said Andy Mahon, a senior analyst at New Science Associates, Inc. in Randolph, Mass. "You use [the contents of] the existing IMS database to aid the process of designing Oracle database systems and applications."

One longtime Oracle user said the reverse-engineering approach could speed the conversion of aging IMS data.

"Some people have converted data from IMS to Oracle, but it tends to be a fairly large undertaking," said Dale Lowery, president of Oracle User Resource, a Washington, D.C.-based consortium of Oracle user groups.

Some conversion methods have forced thousands of rows of IMS data into oversized Oracle data tables, then sliced large chunks of that data into smaller tables, Lowery said.

Cadre's bottom-up design approach compares with Bachman Information Systems, Inc.'s IBM-compatible CASE tools for IMS, analysts said.

Varied access

DB Designer can access other flat-file sources, such as IBM's VSAM, Digital Equipment Corp.'s RMS and Computer Associates International, Inc.'s IDMS.

Prices for Unix workstation versions of DB Designer Release 3.1 start at $20,000.

Cadre and Oracle will jointly develop more Oracle links to hierarchical databases. But future DB Designer releases will also target Unix database products that compete with the Oracle RDBMS, Cadre said.

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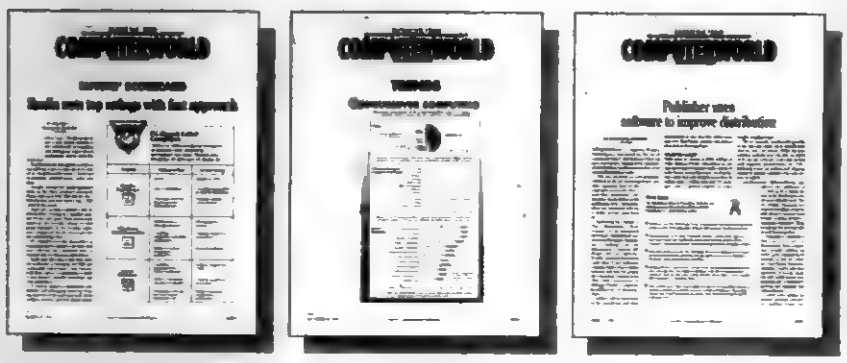

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Information resource manager now shipping

PALM HARBOR, Fla. — M. Bryce & Associates has begun shipping the Pride Information Factory, an information resource manager that works in concert with IBM's AD/Cycle and a variety of computer-aided software engineering tools and methodologies.

According to company officials, the Information Factory includes a project management system that maintains project guidelines, calendars and schedules.

It also includes three information engineering modules comprising enterprise engineering, systems engineering and database engineering.

Specifications and designs from all modules are stored and maintained in a proprietary information resource manager.

The product, which runs on IBM's OS/2 2.0, costs $15,000 for an initial license fee.

Individual copies of the software are priced at $25,000 to $5,000 per copy, depending on quantity, according to the company.

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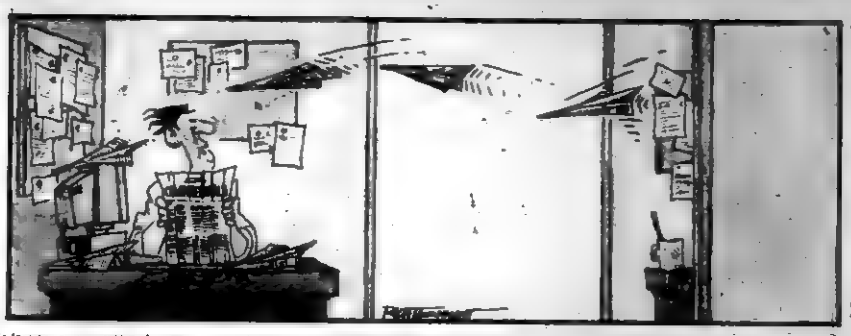

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In, out or both?

As downsizing roars on, companies grapple with the best ways of keeping LANs and PCs in tip-top shape. Surprise: Outsourcing may be waning.

Katherine Lambert

Colonial Williamsburg's Bell: *Hopes to save $40K this year on IS budget by bringing increasingly important PC LAN support in-house*

BY DANIEL LYONS

Visitors who come to Colonial Williamsburg to enjoy the historic architecture, the period costumes and the world's largest folk art collection will never notice the change.

But the information systems department that services the restored section of this historic Virginia city is trying a new approach to keeping its personal computers and local-area networks humming smoothly.

Until last year, The Colonial Williamsburg Foundation relied on outside vendors to maintain its 450 PCs and five LANs. Outsourcing freed staffers to concentrate on running the IBM Application System/400 minicomputers that support the museums, hotels, restaurants and shops in the 160-acre historic district.

But then Jim Bell, the foundation's director of IS, decided to switch from outsourcing PC and LAN services back to in-house support.

A big reason, according to Bell, was that internal IS support was cheaper than hiring an outsider. Bell, who says the benefits of outsourcing are exaggerated, expects to trim $40,000 from his PC LAN budget this year by handling maintenance in-house.

But he says there's another, more important motive: "The networks are going to be with us for a while, so we want to be able to rely on ourselves," he explains. "It's the heartbeat of the company. You have to have some control."

Lyons is an Ann Arbor, Mich.-based free-lance writer.

What? Voluntarily take over the headache-filled business of servicing the organization's spiderweb of LANs and desktop computers? Is he crazy? If so, Bell will have more company than you'd think.

According to consultants, more and more IS chiefs are willingly assuming PC and LAN upkeep chores and reducing reliance on service vendors, outsourcers and other third-party providers.

A recent survey by Dataquest/Ledgeway, a Framingham, Mass.-based market research firm, showed that nearly three-quarters of the IS chiefs polled would like to greatly increase the number of networking tasks done in-house, especially maintenance, installation, wiring, training and diagnostics (see chart page 70). Anecdotal evidence also supports this finding.

What's underlying this surprising trend? According to IS managers and consultants, it is the belief that PCs and LANs are not high-tech weeds but rather vital corporate backbones that deserve the best care available.

As a result, many IS heads are willing to endure pains — including retraining staff, fighting turf battles with departmental LAN gurus and deciding whether to outsource part, all or none of the PC and LAN maintenance — to protect the family desktop jewels.

"Sure, the average Joe can go out and buy a network and plug it in, and it goes," Bell says. "But it's much more strategic than that. There are security issues, for example. That's where IS folks can bring the level of expertise to the implementation, and that's why it needs to be in-house."

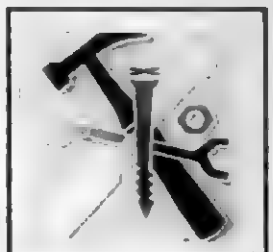
Still struggling

Despite the growing desire to self-maintain, consultants say many large organizations are still thrashing about for the best way to service the growing tangle of networked desktop devices.

Companies "really haven't converged on a right or even a good answer," says Janet Hyland, director of network strategy research at Forrester Research, Inc., a Cambridge, Mass., market research firm. "You see everything from departmental users struggling to do the maintenance themselves right up to having the corporate IS function chartered to do that."

Unfortunately, IS departments that tackle the job may find themselves caught between two

Continued on page 70



Maintenance

KEY POINTS

▶More IS departments are taking on PC and LAN maintenance in hopes of gaining greater control of downsized systems.

▶Most IS chiefs polled by Dataquest/Ledgeway say they would prefer to handle more network maintenance, installation, wiring, training and diagnostics in-house.

▶A recent antitrust ruling favoring third-party service providers is the latest wave to hit the maintenance market. See story page 71.

▶IS managers considering buying third-party services are advised to use multiple vendors, look beyond low bidders and drive a hard bargain. See story page 72.

▶User stories: Subaru, Home Mutual Life, Black & Decker, Land O' Lakes, Colonial Williamsburg, William B. Reilly, Texas Department of Information Resources, American Overseas Book. Stories begin this page.

QUOTABLE:

"The whole maintenance industry is in a state of transition and revolution."

Donald Blumberg
D.F. Blumberg

Firms struggle to keep LANs and PCs in shape

CONTINUED FROM PAGE 69

conflicting pressures, according to Jeffrey Kaplan, a director at Dataquest/Ledgeway. On one hand, Kaplan says, firms are decentralizing processing power companywide. This would suggest that departments take care of their own LANs and PCs, he says.

Yet many firms are also aggressively trying to unite small LANs and PCs into enterprisewide webs, which calls for more central control and IS involvement, Kaplan notes.

As a result, many IS chiefs are employing a mix of outsourcing and do-it-yourself maintenance for PCs and LANs, with a growing preference for the latter. Dataquest/Ledgeway predicts that spending on outside maintenance and in-house personnel will both rise this year, to 15.2% and 28.9% of the total IS budget, respectively.

"We see a split," Kaplan says. "Despite the fact that outsourcing is getting a lot of attention — and there is more interest in it than ever — there remains a silent majority who are more interested in retaining control."

Tricky times ahead

But consultants and IS managers warn that new or even experienced do-it-yourselfers may be in for some unexpectedly tricky times.

For starters, they note that PCs and LANs are often harder to maintain than mainframes and minicomputers. Fewer systems management tools are available, devices tend to be widely scattered and standards are still evolving.

Then there are the end users, some of whom take a very active interest in their LANs. "It's difficult to keep things on an even keel when the users are mucking around," Forrester Research's Hyland says.

The cost advantages of self-maintaining vs. outsourcing LAN support are also less than clear. Few of the IS heads interviewed could or would provide hard numbers for money saved by handling their own LAN upkeep chores.

Outsourcing vendors are quick to point out the difficulties in comparing in-house service costs vs. farming out LAN maintenance. Internal programs, they say, are rife with hidden costs.

"It's not just the cost of hardware or the cost of putting two or three people on site to manage the networks," says Juan Cardona, program manager for LAN and workstation services at Bell Atlantic Business Systems Services, an outsourcing vendor.

He says the true cost includes such things as keeping up with upgrades for every product on the PC network, restocking inventories and educating IS staff.

"Just the cost of retraining is huge," Cardona says, citing a study by Meta Group, Inc. that fixes the cost of providing PC and LAN support at $750 to $1,000 per user per year.

Benefits — and costs

Still, The Colonial Williamsburg Foundation's Bell and others are sold on handling PC and LAN upkeep in-house. Besides the cost savings, Bell says he believes he's getting better service than he did from the local computer store chain (which he declines to name) that previously handled the chores.

"When someone on staff goes out to fix a printer, generally they do preventive maintenance, too, so the equipment tends to stay healthier longer," he says.

Of course, taking over the work also has its costs in dollars and staff time. For example, rather than hiring outside PC experts, Bell is simply retraining and redeploying the foundation's IS staff members.

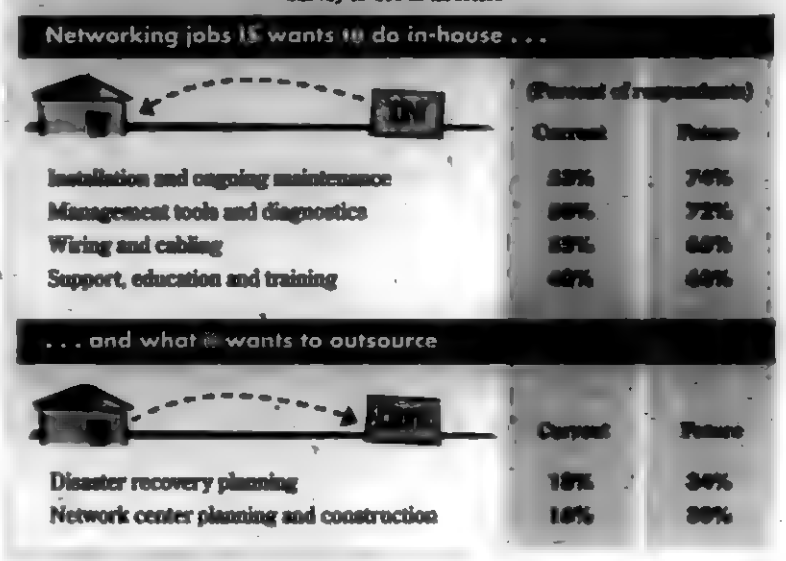
For instance, a former information center staff member now oversees PC and LAN maintenance, and former programmers are being trained as Certified NetWare Engineers who will eventually work as LAN administrators.

In fact, Bell is so confident in the approach that the team will oversee the company's next big project: linking the

Networking ins and outs

IS chiefs want to handle more networking tasks internally while farming out disaster and construction work to vendors, outsourcers or third-party providers

Survey of 350 IS directors



Source: Dataquest/Ledgeway

Insurer comes full circle

Howard Brenner, executive vice president at Home Mutual Life Insurance Co., has been around the in-house vs. outsourcing LAN maintenance block a couple of times and is back where he started.

The Baltimore company downsized several years ago, replacing a 1970s-era Honeywell Bull, Inc. 2060 mainframe with 66 PCs connected on a handful of Artisoft, Inc. LANtastic LANs.

After relying on outside maintenance from the technical support department of a local PC supplier and a few computer vendors, then hiring an internal PC expert, Brenner is moving back to outsourcing.

He now says money can be saved by contracting an outside vendor while also pushing more of the load for service and support onto users.

Brenner has narrowed the search to two companies. But rather than simply buying time and materials contracts or paying a fixed price, he plans to buy 250 hours or so of support time at $55 to $90 per hour.

Even more important than saving money, he says, is competence and freedom from having to assemble hardware. Brenner says he hopes to free three IS staffers from the chore so they can be available to provide more user direction and support.

To choose the winner, the company has hired two finalists to do small jobs, such as upgrading a server. The best performer will get the pact, Brenner says.

"It's wonderful having a support person on staff, but the problem is that people tend to lean on that individual to solve problems that they could solve themselves," Brenner says. "Now everyone is going to have to do a little more before they call somebody."

DANIEL LYONS

Subaru of America driven to outsource support

Not everyone is clamoring to dump outsourcing for the less-than-fun task of maintaining downsized systems.

Earlier this year, Subaru of America, Inc. in Cherry Hill, N.J., outsourced nearly all of its computer operations, including personal computer and local-area network support, to Unisys Corp. in a seven-year deal worth $45 million.

Unisys took responsibility for running Subaru's two Unisys mainframes, two Wang Laboratories, Inc. minicomputers and Digital Equipment Corp. workstations, as well as training, running the help desk and maintaining approximately 600 PCs at headquarters and regional offices and 2,000 workstations in 650 U.S. dealerships, according to John Piccone, Subaru's director of business information systems.

Piccone says the deal has freed Subaru's 70 IS staffers from mundane chores such as hardware maintenance and data center operation and has allowed them to focus instead on strategic business concerns and application development.

Steve Hill

Subaru's Piccone: *Unloading nonstrategic tasks*

At the same time, the company, a subsidiary of Fuji Heavy Industries Ltd., has been able to reduce its total IS budget by more than 15%, Piccone says. Some 28 of the department's staffers now work for Unisys at Subaru's Pennsauken, N.J.-based data center.

It's obvious but crucial when forming an outsourcing deal, Piccone says, that both sides establish which tasks they will handle. His advice: Define acceptable service levels, and develop a barometer for monitoring them.

"You should spend as much time as possible beforehand specifying policies and procedures," he advises.

DANIEL LYONS

LANs onto a backbone with the AS/400s.

Richard Lusky, director of IS at William B. Reilly & Co., a coffee and food manufacturer and distributor in New Orleans, is also sold on the idea of handling PC and LAN maintenance in-house.

His department took over the upkeep of LANs after the departments that controlled them had trouble with two outsourcing vendors. One did a good job, but the other was lousy, according to Lusky, who declines to name either.

The user department "tried outsourcing and doing it on their own," he says. "When they were faced with difficulties getting good maintenance on a timely basis, they looked to us."

Lusky also looked for outside help and hired a PC LAN expert to bring the existing Novell, Inc. NetWare LANs up to snuff and develop a prototype LAN based on IBM's LAN Server. Besides helping IS test the new technology, the project will also give IS staffers needed hands-on experience with LANs.

"They're learning on the job," Lusky says. He says he hopes staffers will eventually become conversant with PC technology and see the LAN as an extension of the company's IBM 4381 mainframe.

Mixed approaches

Of course, some companies are discovering that self-maintenance of downsized systems is more trouble than it's worth and are turning back to outside providers (see stories page 70).

To hedge their bets, many companies, such as Black & Decker Corp. in Towson, Md., are opting in the meantime for a mix of in-house and outsourced LAN service.

For assembly and burn-in of new equipment, training of end users and a software help line, for example, Black & Decker turns to an outside provider.

For breakdowns, the company's in-house IS staff handles about 70% to 80% of maintenance calls, says Sid Diamond, former vice president of worldwide information services. "The remaining ones, the extensive problems, we funnel to the outside organization" — a local Computerland Corp. affiliate, Diamond says.

Many of Black & Decker's 6,000 PCs worldwide are linked to IBM, Amdahl Corp. and Hitachi Data Systems Corp. mainframes, as well as IBM AS/400s, Digital Equipment Corp. VAXs and Novell NetWare networks, which are maintained through vendor service contracts.

But Diamond says it makes more sense to outsource the PC work. "In terms of time and costs and people issues, it's more efficient for us to do it that way," he explains.

Similarly, Land O' Lakes, Inc. in Arden Hills, Minn., uses a mix of outsourced and in-house expertise.

In the past, the dairy products maker had handled most of its PC and LAN support internally, says Mark Wilberts, vice president of IS.

Now it outsources PC hardware maintenance and is considering doing the same with training. But all other PC and LAN service is strictly internal.

Farming out hardware upkeep makes sense, according to Wilberts, because Land O' Lakes, as well as its PC support, is decentralized, with more than 200 locations around the country. The company uses a mix of IBM mainframe (3084Q), midrange (AS/400) and Novell NetWare LAN technologies, and each of the primary business units has its own development and support staff.

"We're not opposed to using outsourcing for other services," Wilberts acknowledges, "but we have not found a cost-effective solution that can meet our needs."

Selective service

Even those companies that are adamantly self-reliant don't rule out the use of outsiders.

At Colonial Williamsburg, Bell still brings in consultants on occasion, especially for network design. "We don't know all the answers," he says, "and of course we always want fresh input."

It's also clear, Bell adds, that different parts of the business are better suited to outsourcing than others. "When you're talking about more dynamic things, ways that help you make money, then you need internal expertise. You have to have more access." ●

Experts say big shakeups creating 'a user's market'

BY DENISE WORHACH

The service industry's fun has just begun. And that's good news for information systems managers buying maintenance, according to industry insiders.

A major antitrust ruling by the U.S. Supreme Court last month fueled an ongoing struggle between independent maintenance firms and big-name computer manufacturers such as IBM, Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp. [CW, June 15].

With the ruling, the nation's top court challenged the widespread practice of computer makers bundling spare parts for service contracts. Some independent service providers had argued that bundling effectively blocked them from getting spare parts.

"The whole maintenance industry is in a state of transition and revolution," says services market analyst Donald Blumberg at D. F. Blumberg and Associates, Inc. in Fort Washington, Pa. "Right now, it's a user's market."

The court's decision is expected to unleash numerous lawsuits, which could ultimately benefit third-party firms eager to grab a bigger slice of the lucrative maintenance business.

Pays to be flexible

In a sector already shaken up by new services, tailor-made programs, more flexible contracts and a rise in self-maintenance by companies, computer manufacturers and independent providers alike are bending over backwards to find or keep business.

"Vendors are becoming flexible in order to succeed," says analyst Marnie Phillips, manager of the service trends program at Dataquest/Ledgeway, a Framingham, Mass., research firm.

In many cases, IS managers can virtually write their own maintenance deals, Phillips says. Little is sacred.

IBM, for example, recently separated service pricing from product price at the Texas Department of Information Resources. Debra Williams, director of planning, says the departure from traditional practice allows her agency to compare prices from different vendors.

Buyers can now also choose among options ranging from a postwarranty repair to full site management. Two- and four-hour critical repair is also becoming more popular.

Behind the shakeups is the desire of makers and independents to grab a bigger piece of the lucrative service and parts business, which Dataquest/Ledgeway pegged at more than $103.1 billion worldwide last year.

Heavily eyed are areas such as network integration (growing at a compound annual rate of 22% and expected to reach $13.7 billion in 1996), network support, software support, data communications, telecommunications and personal computer service.

DEC, IBM, Unisys and other big makers account for about 84% of all service revenue. The rest goes to third-party maintainers, dealers and resellers.

IBM continues to rule the field, earning $12.4 billion in service revenue for 1990, according to Dataquest/Ledgeway. DEC follows, earning $4.8 billion (see chart). More recent figures are unavailable.

James Seitz, assistant general manager of maintenance at IBM, says at least part of this success comes from the firm's ongoing plan to service non-IBM equipment.

To keep competitive, many large vendors are focusing on high-growth markets. Unisys, for instance, is targeting desktop users, says Bob Wilson, director of marketing. The Blue Bell, Pa., firm has also been promoting its prompt response capabilities as well as a pioneering exchange program that lets users swap faulty units with refurbished equipment.

Bell Atlantic Corp., the largest third-party manufacturer, is focusing on networking, says Juan Cardona, program manager of local-area network workstation services.

Bell Atlantic is among the firms betting that information systems managers will continue to blend in-house and outsourced services. "We try to complement in-house services," Cardona says.

Pressures from giants have prompted smaller vendors to devise some creative solutions. For instance, Dell Computer Corp. arranges its service agreements through BancTec Service Corp. in Dallas. Compaq Computer Corp. contracts with Bell Atlantic to provide service for its products.

Troubled third parties

Despite the new arrangements, some third parties are feeling the pinch. For example, San Antonio-based Intelogic Trace, Inc. is $25 million in debt.

Blumberg says some weaker independents are ripe for takeover by larger competitors. He notes the recent purchase of TRW, Inc.'s $110 million service arm by Computerland. Combined revenues exceed $400 million.

Although the recent Supreme Court ruling is expected to give a big boost to independent providers, no one seems too certain what the next big service trend will be.

For now, analysts say, IS managers should take advantage of a competitive service marketplace.

"If you can't get what you want, ask," Phillips says. "If you still can't get what you want, go elsewhere." ●

Worhach is an Austin, Texas-based free-lance writer specializing in business and technology issues.

How they stack up

Computer and communications vendors account for nearly 90% of the maintenance service market

1990 worldwide service revenue (in millions)

1. IBM	$12,400
2. DEC	$4,797
3. Xerox	$4,100
4. Unisys	$3,961
5. HP	$3,600
6. NCR	$2,610
7. Siemens/Nixdorf	$1,820
8. Groupe Bull	$1,484
9. AT&T	$1,020
10. Olivetti	$1,370

Total market: $40.2 B

Source: Dataquest/Ledgeway

Get yourself a good deal

The following is a 12-step program, culled from expert advice, to help you find your best maintenance solution.

- Define and develop a comprehensive list of service requirements.
- Determine and rank the urgency of each application and the risk of exposure.
- Advertise your service needs.
- Open the bidding process to as many competitors as possible.
- Consolidate your service contracts when possible.
- Steer away from proprietary maintenance on proprietary equipment.
- Carefully compare costs, conversions and capabilities.
- Negotiate with current or prospective providers, but avoid lowballers.
- Consider maintaining your own low-end equipment that has a low failure rate.
- Look at total life cycle costs when purchasing new or old equipment.
- Give a preference to those vendors dedicated to your industry.
- Review your maintenance decision as often as is warranted.

DENISE WORHACH

Getting quick fix on best way to buy maintenance

Debra Williams
Texas Department of Information Resources

▸ Don't put all your eggs in one basket.

Debra Williams faces a challenge as big as Texas — literally.

The Lone Star State boasts $1 billion worth of telecommunications and data processing hardware in 225 agencies, with sites in cities from El Paso to Houston.

As director of planning for the Texas Department of Information Resources, Williams is looking for ways to end waste, gain economies of scale and ensure system security.

With annual personal computer maintenance contracts running $500 on a $1,000 system, according to Williams, cost-cutting opportunities are abundant.

In hopes of getting the best deal, the agency is opening maintenance contracts to several competitors. The tactic was used successfully for systems acquisition, according to Williams, who's betting it will work with service, too.

Williams is dead set against relying on a single source to maintain critical applications. Having several vendors under contract, she says, helps ease administration, saves money and guarantees reliability.

The latter is especially important, according to Williams, for institutions such as state medical centers, law enforcement, criminal justice and any application that affects public health and safety.

Like many of her peers, Williams says she will probably use a combination of internal and several external servicers.

.....

Janet Hyland
Forrester Research, Inc.

▸ First gain user trust.

"Plenty of departmental folks brought in LANs because MIS wasn't responsive to them in the first place," Hyland says.

"There's a real feeling that MIS has their head in the sand and has never been responsive," she adds. "So why should I hand this responsibility to them?"

But as long as IS is willing and able to do the work, departments generally will turn the task over to them, Hyland says.

"Usually, departments want responsibility for LAN management until the first time they have a big server crash, and then they want the corporation to fix it," she says.

.....

Hale Gaffney
American Overseas Book Co.

▸ Don't shop price.

When his IBM 3600 disk crashed last month, Hale Gaffney considered himself lucky it happened at 5 p.m. on a Friday.

"We were able to get ourselves up and running by Monday morning," says Gaffney, president of American Overseas Book in Norwood, N.J.

Gaffney credits the company's maintenance provider, Intelogic Trace, Inc. in San Antonio, with the speedy re-creation of lost files used by the 25-terminal midrange system.

Interestingly, when the $11 million bookseller put out its maintenance contract three years ago, Intelogic was not the low bidder.

However, at that time, Gaffney had judged that the Texas company would be better prepared than the other unnamed bidders to handle a sudden disaster. He says his decision has proved undeniably correct.

"Put price last on your list of considerations," he advises. "If you're up, you can do business. The minute you're down, you're out."

.....

Marnie Phillips
Dataquest/Ledgeway

▸ Be tough.

Phillips' research firm recently polled maintenance vendors about profit margins. The industry average was close to 40%.

The clear message, according to Phillips, is simply this: "There's room to negotiate."

.....

Donald Blumberg
D.F. Blumberg & Associates, Inc.

▸ Know what you want and say so clearly.

According to Blumberg, information systems departments need to follow the basics by first defining and articulating service needs, including voice and communications equipment.

Next, he says, "Publicize those needs." Any bids forthcoming can be used as leverage against a current or prospective provider, whether in-house or outsourced, Blumberg explains.

Then, according to Blumberg, it's time for IS to tell each vendor, "Sharpen your pencil and let's talk." Once a decision is made, he advises re-examining the situation every three to six months.

DENISE WORHACH

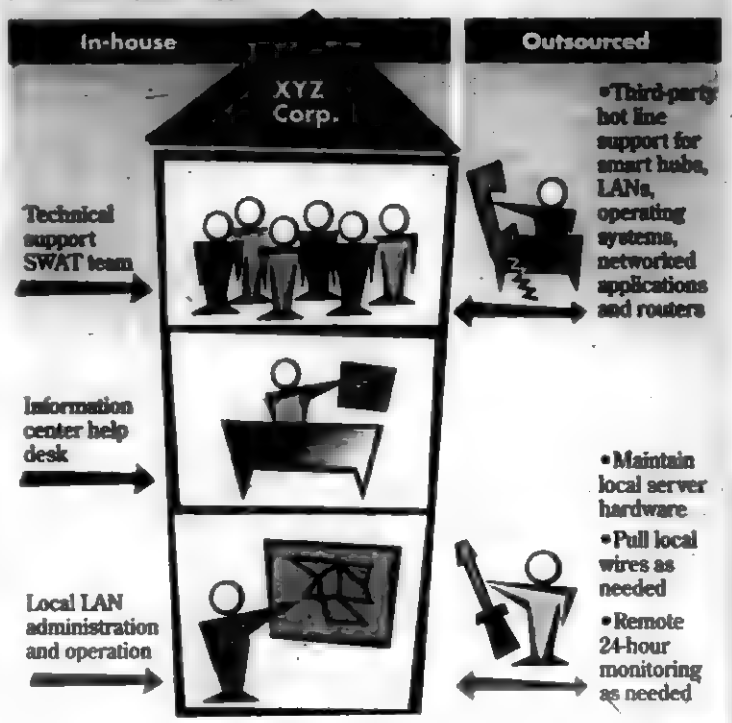
Will Van Overbeek

Williams: *dead set against having the Texas Department of Information Resources rely on a single source to maintain critical applications*

Try this three-step model for successful LAN support

How to split up LAN upkeep

Fortune 1,000 firms are advised to use a mix of internal and external help for the most effective support of LANs:



Source: Forrester Research, Inc.

Many companies are opting for a mix of internal and outsourced support for their local-area networks. However, a large number of information systems managers may not be certain which tasks to keep in-house and which to farm out.

Forrester Research, Inc. has designed a three-tier "LAN Support Model" for Fortune 1,000 companies. The model goes as follows, from the bottom up:

- **Level 1: Local LAN administration and operation.** This LAN support can be handled by nontechnical personnel who have been trained in the network operating system.
- **Level 2: Information center help desk.** Staff members here should learn enough LAN technology to be able to answer simple questions because end-user naivete is a leading LAN problem.

Help desk staff members should also be able to tell which problems need to be investigated further.

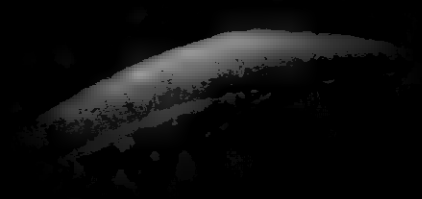
- **Level 3: Technical support SWAT team.** MIS should retrain some personnel and deploy them into LAN and internetworking.

These people should receive vendor training, such as that offered by Novell, Inc.'s Certified NetWare Engineer program.

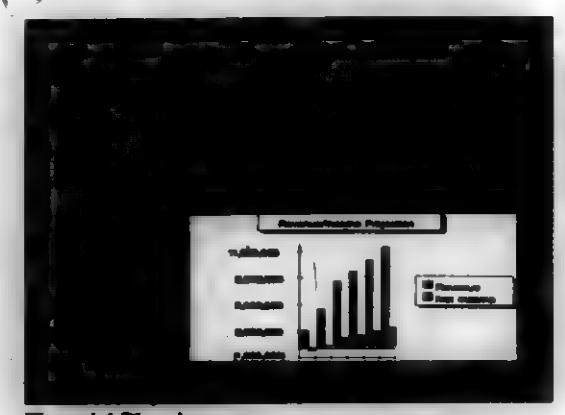
These personnel should also learn to use remote diagnosis and management tools to keep tabs on faraway LANs.

DENISE WORHACH

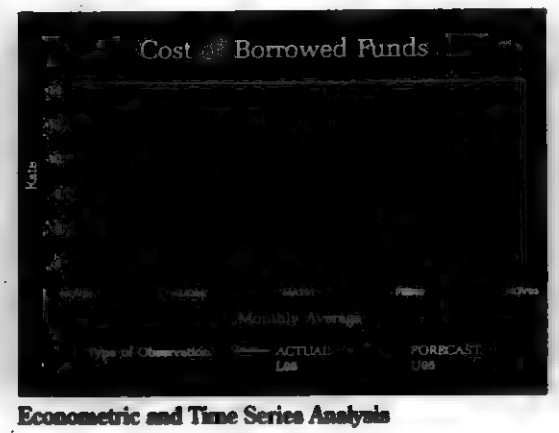
Where are you headed with your applications development?



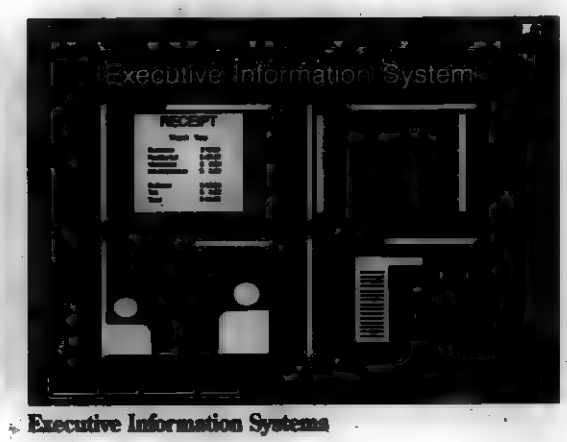
BACHMAN



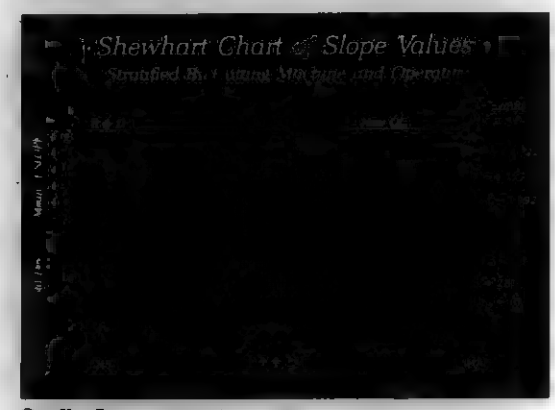
Financial Planning



Econometric and Time Series Analysis



Executive Information Systems



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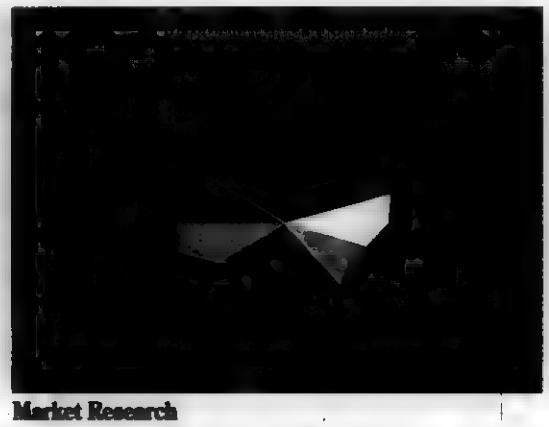

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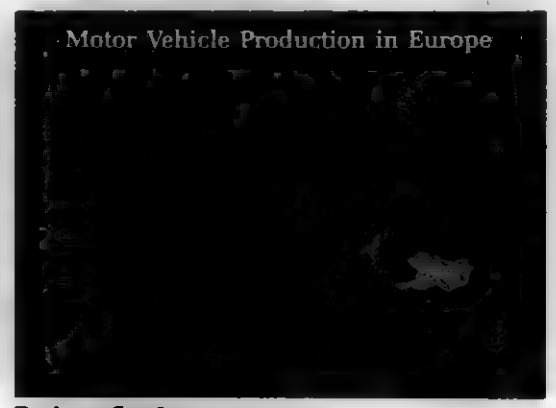
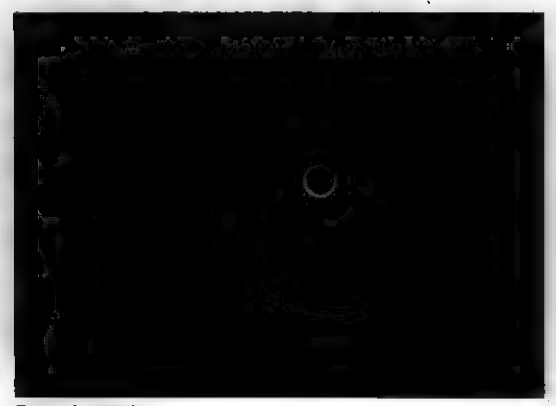
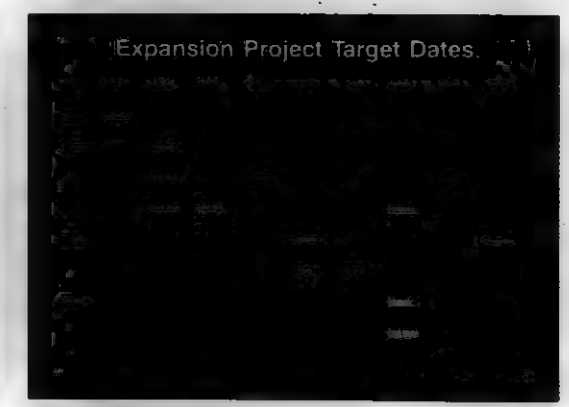


Business Graphs

Visualization



Data Analysis



Project Management

Profile: Jim Manzi

Out for a little respect, Lotus' chief may need Notes' success to silence critics attacking his management style and the company's one-product reputation

John Owen

BY GLENN RIFKIN

For a man who claims to have once required "two weeks on lithium" in order to give a speech, Jim Manzi has finally found comfort under the spotlight. As evidenced by his cross-dressing, crowd-pleasing Aretha Franklin strut (replete with shoulder-length wig and gold-sequined miniskirt) at Lotus Development Corp.'s 10th birthday party celebration in June, Manzi has overcome his stage fright.

But was it mere coincidence that he chose Aretha's signature rhythm and blues classic *Respect* to lip sync for the 15,000 amazed partygoers at the Boston Garden that night?

For Manzi, respect from within the personal computer software industry has been in short supply during much of his nine-year tenure at Lotus, first as the company's president and then as its chairman and chief executive officer. Despite having overseen Lotus' growth from $156 million to $1 billion in revenue during that time, Manzi, 40, has spent more time fending off critics and sparring with the likes of Microsoft Corp.'s Bill Gates and Borland International, Inc.'s Philippe Kahn than he has accepting accolades. He may, in fact, be the most beleaguered success story in the computer industry.

Controversy has been Manzi's constant companion. Delays in 1-2-3 software follow-ons as well as development snafus and missed market opportunities related to the spreadsheet's Windows version have deflected attention from Lotus' growth.

His steely intelligence and biting sense of humor (some call him arrogant) have done little to endear him to analysts and reporters who cover Lotus.

"He has a weird sense of humor that a lot of people don't get," says Esther Dyson, editor of "Release 1.0," an industry newsletter. "For a while, he didn't understand how seriously people took this stuff."

And he had the hubris to assume that a nontechnical former journalist and McKinsey & Co. consultant could compete on the hallowed PC playing fields against such genius technologists as Gates and Kahn. In an industry in which the ability to write code or speak fluent C++ determines membership in the club, Manzi is perceived as an outsider, someone who can't truly "talk the talk" or "walk the walk."

So there will be great irony if Manzi's Notes strategy, on which he is clearly betting the future of Lotus, pays off — as some analysts believe it will (see story page 76). Besides filling Lotus' coffers, success with Notes may finally elevate Manzi in the cynical eyes of the industry.

The early road

Son of a Yonkers, N.Y., dentist, Manzi was a Colgate University classics major who took a circuitous route to Lotus. He helped William F. Buckley write a book on the United Nations in 1974 and worked as a journalist at Gannett Co. for three years before entering graduate school at Tufts University near Boston.

Soured on the invasive nature of journalism after being asked to interview the parents of a suicide victim, he applied to McKinsey in 1979 to try his hand at consulting.

Roger Kline, his boss at McKinsey, remembers that Manzi was not cut from the stereotypical McKinsey cloth. "He was not the tall, establishment-looking type we generally hired," Kline says. "He was a wily, intense, street-smart guy who smoked. Plus, he didn't have a business school background."

Continued on page 76

Manzi was selected by *Fortune* magazine in 1989 as one of the toughest bosses in America. "That's the most appalling thing that's happened to me since I've been at Lotus — to be selected next to some guy who was quoted as saying, 'I really know how to chew ass, and I like it.' It's repulsive."

Rifkin is a free-lance writer based in Sudbury, Mass.

Continued from page 75

Despite being atypical, Manzi flourished at McKinsey because of his analytical prowess and was well on his way to becoming a partner.

Then in 1982, McKinsey sent Manzi to the newborn Lotus to help Mitch Kapor make sense of the intricacies of starting and running a business. Manzi, only 31, was hooked by the excitement of the start-up and joined Lotus in 1983, just as the company began shipping its groundbreaking product. The company sold $53 million worth of 1-2-3 the first year. "Back then, we were hanging on to a meteor," Manzi says. He became president of Lotus in 1984.

Lead with iron fist

During his time at Lotus, Manzi has garnered a reputation as an impatient boss who brooks no fools and will intimidate employees with a baleful stare or cutting remark. However, those close to Manzi are pained by characterizations that paint him as arrogant and aloof.

Janet Axelrod, a former Lotus vice president who joined the company as its second employee, has remained close to Manzi despite politically opposite points of view. A confirmed liberal, she counts the conservative Manzi among her closest friends.

"Jim's public reputation is so far from what he is that it's a joke," Axelrod says. "He's a thoughtful, caring person. He is obsessively private, and he's just unwilling to prostrate himself to the press." But the criticism, she says, has hurt.

"If he was truly the bastard he's painted as being, he wouldn't give a damn," she says. "But this doesn't roll off his back."

Axelrod points out that despite their political differences, Manzi has "absolutely protected" all the philanthropy programs she put in place, such as an on-site day-care center and the donation of 1% of pretax profits for charitable contributions every year.

Manzi, who calls "obscene" his own sizable total compensation — which rose to an eye-popping $25 million in 1987 — personally donates huge sums of money to charitable and social institutions but is reluctant to discuss his private affairs. He recently donated $50,000 to a South Boston center for new mothers and $250,000 to Colgate (where he is a trustee) to endow a scholarship for children in Boston.

Those close to Manzi say his hard-edged reputation was born when he took on the role of "bad cop" for Kapor.

Manzi says Kapor was "genetically incapable of saying no to people, so I took on that role. I had to deliver a lot of bad news to people."

Kapor, who left Lotus in 1986, says he didn't hire Manzi to be the bad guy, but "in retrospect, that was certainly one of the reasons. I had trouble making tough business decisions, especially if I perceived they were hurtful to individuals. Jim was able to take a more businesslike view of the whole situation.

"There was some good cop/bad cop synergy, though I felt Jim really got the worst of the deal," Kapor adds. "People undercredited him and overcredited me. On the other hand, he never shared the kind of passion for the technology that I have. That made it difficult sometimes."

Despite his six years away from Lotus, Kapor's legend still pervades the halls of Lotus. Kapor's renowned Hawaiian shirts and easygoing humor made him a sharp contrast to the intense Manzi. Says one longtime employee: "Mitch was like a big teddy bear; you'd follow him anywhere. Jim is not a huggable kind of guy."

Former employees such as Heidi Sinclair, who served as vice president of corporate communications for three years and is now at archrival Borland, acknowledge that Manzi is very intelligent and a decent person. But, Sinclair says, he has one fatal flaw: "He's a very poor manager of people. He doesn't create an environment where people are empowered to do what they need to do."

Ed Belove, former vice president of corporate research and development, adds that Manzi was particularly uncomfortable with developers. "He's not a product person," Belove says. "It doesn't matter if you are technical or not. What matters is that senior managers should be really excited about the products and what they do. Jim is not someone who turns on a PC and uses the products; it's not fun for him."

Jeffrey Tarter, publisher of "Softletter" newsletter in Watertown, Mass., is a strong Manzi supporter who says he believes Lotus' Notes is positioned to become the next 1-2-3. "I'm a fan of his, but I also see he has encouraged some of the tight timetables and a vision of where they need to go. For that, you need a very strong technical visionary. Jim has not provided that vision."

In the past three years, pressure has been building on Manzi and Lotus as Microsoft and Borland mounted a broadside attack on Lotus' once sacrosanct spreadsheet market. Even amid the euphoria of Lotus' birthday celebration, Manzi is shadowed by a rapid decline in spreadsheet market share — from 82% in revenue in 1989 to 55% in 1991, according to Goldman, Sachs & Co.

With Microsoft's Excel 4.0 receiving marquee reviews and Borland readying its Quattro Pro for Windows to ship in August, analysts worry that more and more customers will be wooed away from Lotus. "The No. 1 vendor seems to be playing perpetual catch-up in its own market," says Richard Sherlund, an analyst at Goldman, Sachs.

Manzi dismisses the criticism, claiming Lotus has a 65% market share in spreadsheet revenue, including 90% of the DOS market and 100% of the OS/2 and Unix markets. He acknowledges, however, that there is a "head-on" battle in the Windows arena.

That head-on battle has already left some scars on the company, which announced recently that this quarter's revenue would likely be $10 million less than what Wall Street had been expecting, partly because of slow growth in the Windows spreadsheet market [CW, June 29]. The week the announcement came out, Lotus shares dropped $7.50 to $17.75 per share.

Manzi insists that Lotus' future is not solely dependent on 1-2-3, adding that Notes sales are encouraging. "I have a very deep-seated belief that what we have been building for the last three or four years is dead on for the next three to five years," he says.

Lotus' Notes: The Manzi mission

Manzi is banking on his workgroup software to pick up where 1-2-3 left off

Talk to Jim Manzi and you can expect to hear about Notes early in the conversation. He speaks about Lotus' workgroup platform and communications software product with a rare passion — perhaps because he is betting the company's future on it.

Using Notes as the foundation, Lotus is selling a suite of products, including its cash cow 1-2-3 spreadsheet, along with electronic mail, word processing and graphics software.

Manzi says he believes so fervently in this strategy that he will brook no internal obstacles to its success. Those who don't get on board, like former Senior Vice Presidents Frank King and Stephen Crummey, are left behind. Lotus has already invested nearly $100 million in Notes.

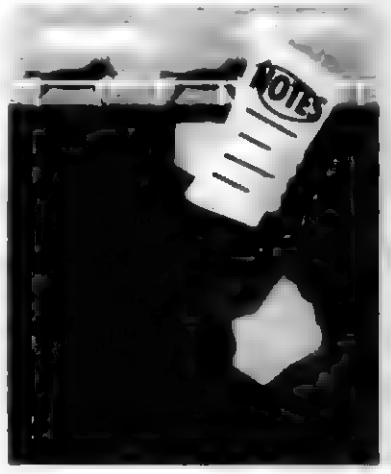
"This is the first time Jim has had new product fever," says David Readerman, an analyst at Shearson Lehman Brothers, Inc. "He is crusading for Notes like Philippe and Gates have always done for their products."

Making the Notes strategy pay off won't be easy for Lotus and will require a sea change within the corporate culture. Old distribution channels must be discarded in favor of a new model, which Lotus must invent for itself. The selling cycle for Notes is long and arduous because the product, which retails for $495, can't be sold individually as 1-2-3 is. Unless an entire company or, at minimum, division or business unit embraces Notes, the software is useless.

But Notes is clearly picking up momentum and starting to draw rave notices. IBM recently adopted Notes and CC:Mail as its local-area network products of choice. Neither Microsoft nor Borland are said to have anything close, and even Manzi's toughest critics express admiration for Notes. But the jury is still out on its success; Notes currently makes up only 4% of Lotus' revenue.

What would make the success of Notes especially sweet for Manzi is that the strategy is clearly his, and a win may be just the thing to pull him out from under the imposing shadow of Mitch Kapor, Lotus' founder and co-creator of 1-2-3, who left in 1986.

Critics such as industry watcher Stewart Alsop contend that Manzi has ridden the broad back of Lotus 1-2-3, a product with such unprecedented momentum and stamina that it was impossible to derail.



Manzi, the critics point out, couldn't screw up the insatiable appetite for 1-2-3, even as Lotus mishandled several follow-on introductions of the software. Some say Manzi's lack of technical skills hampers his ability to find synergy and harmony with his internal development teams.

"Jim has been a victim of the development organization," says one analyst who requested anonymity. "The R&D guys will [b— s—] you and squander millions if you don't set out for them tight timetables and a vision of where they need to go. For that, you need a very strong technical visionary. Jim has not provided that vision."

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How Chairman Jim sees it:

- the collapse of the proposed Lotus/Novell merger: "I haven't looked back on it. I was upset it broke up at the time. But we didn't change our strategy because of it."
- Mitch Kapor's departure from Lotus: "I underestimated the impact of his leaving, not so much from a line-management perspective but the gaping hole that existed in development and the impact of the founder leaving the company. I wasn't smart enough to understand that."
- personal feuds with Bill Gates and Philippe Kahn: "The industry is, in an awful way, personality-driven. I find that infantile and immature at best. I never wanted to be a party to that, nor do I relish the entertainment biz."
- his relationship with Lotus employees: "You ask anybody here: The easiest person to see in the company is me."
- recent layoffs, the first in the company's history: "Downsizing was the hardest thing I had to do in nine years here. That's a management failure."

worst tendencies at Lotus," Tarter says. "People get very risk-averse, nervous about their jobs, overstudy things, shoot down ideas that weren't invented there. Ironically, Jim is both a visionary and a person who doesn't encourage visionary behavior in his own company."

Tarter says Manzi is known to be particularly tough on his executives. "The inner circle is expected to perform at incredibly high levels," he says. "You don't win your way into that circle and rest on your laurels. If you fail, you're out."

Robert Weiler, senior vice president of sales and marketing, says Manzi is extremely demanding of his executives but is also very loyal. He describes how painful it was this past December when Manzi had to dismiss Frank King, the former IBM executive who had turned around Lotus' sagging development team just three years earlier.

"Jim got physically ill," Weiler says. "He wasn't sleeping, and it was really hard for him. He just believed the changes had to be made."

> "PEOPLE UNDERCREDITED [Manzi] and overcredited me."
>
> MITCH KAPOR
> LOTUS FOUNDER

Frank Ingari, who left Lotus in 1990 after disagreements with King and was persuaded by Manzi to return as vice president of marketing this year, says his boss' tough reputation is not without foundation.

"Nine days out of 10, Jim is supportive, funny and charming, but that 10th time, if he is in a bad mood or hot on an issue, he can be very intimidating," Ingari says. "He can turn his intelligence on you."

Ingari says that under those circumstances, Manzi "loves for you to push back. The wrong way to survive is to be intimidated on that 10th day."

Manzi acknowledges that he is "a fairly demanding guy. I'm straightforward. I attempt to be fairly clear about what I'm looking for and what constitutes goodness."

He says he never raises his voice and acknowledges that people can interpret things he says differently from what he intends. "I have to guard against that," he says. Manzi also says that he underestimated both the technical and emotional impact of Kapor's departure from Lotus.

But Manzi seems to pay little heed to his critics. In January, when Stewart Alsop, an industry watcher, published an open letter in a newsletter calling on Manzi to step down for the good of Lotus, Manzi simply did not respond.

"I got more supporting letters and notes and E-mail after that came out than at any time in my being here," Manzi says. "Stewart is an ardent and passionate defender of single users of PCs. My concern has always been and will be computing within an organizational context, which is where the real promise is."

Manzi says that he has, since the letter, run into Alsop.

"He asked me what I thought of his letter," Manzi recounts. "My primary thought was that I'm always impressed by how many people in the world think it's their job to give me advice." ●

How Chairman Jim sees it:

Q Mitch Kapor's desire to replace 1-2-3 with Symphony: "When Symphony was being developed, Mitchell thought it was the replacement product for 1-2-3. So we disagreed about that. It was hard to imagine while we were selling tens of millions of dollars of 1-2-3 that you'd want to derail that phenomenon. Fortunately we didn't. That was about $1.5 billion ago in terms of revenue."

Q his lucrative compensation as Lotus chairman: "It's obscene. The level is obscene and embarrassing. But it's on paper. It's stock. It's widely known that I haven't sold any stock other than to pay taxes. I get s-t from the guy who does my taxes for not diversifying enough because 99% of my net worth is in the company. He thinks I'm nuts."

Q discovering that Lotus was quietly doing business in South Africa despite the company's official policy against such dealings: "We found out that the person running our international operations had approved doing business in South Africa. He winked and said it was OK even though it violated everything this company has stood for in business. We questioned him about it, and he changed his story, so we fired him on the spot. We had no knowledge of what was happening and certainly didn't endorse it."

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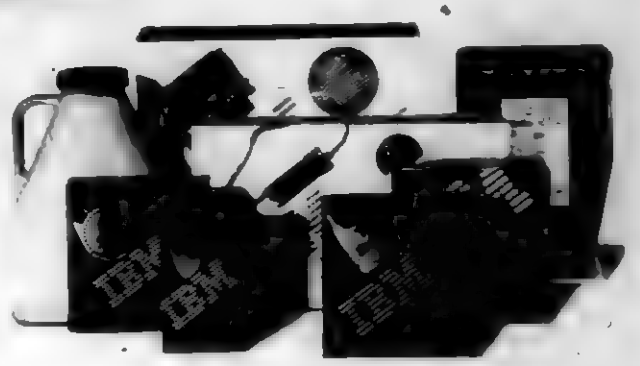

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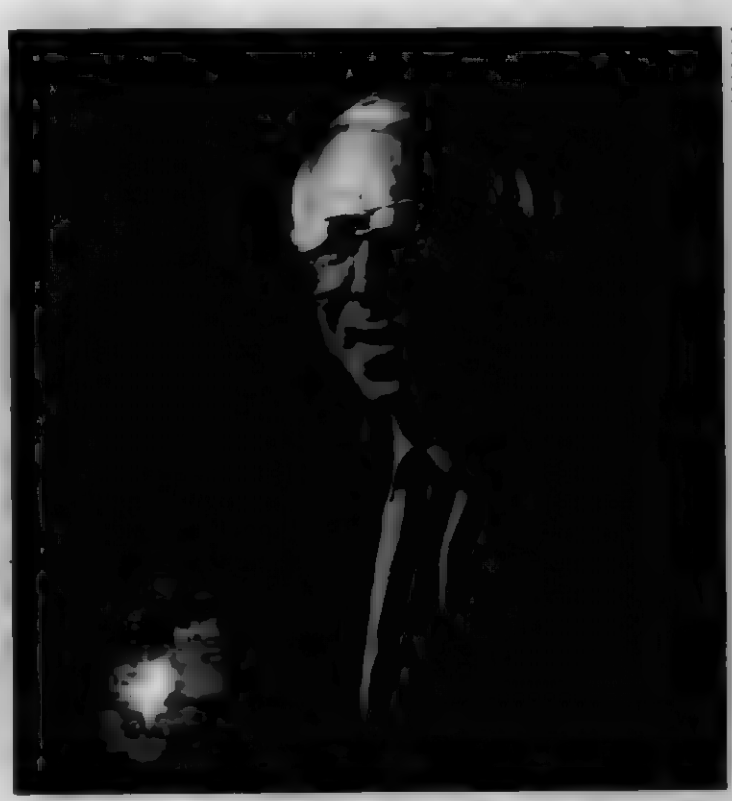
THE CEO VIEW

Rocketing to top with back-to-basics approach

Rockwell CEO endorses customer focus, employee communication and getting workers closely involved

Donald M. Beall hates to waste time. That shows in his clipped speech, his get-down-to-basics corporate and civic creed and his rocket rise at Rockwell International Corp. The small-town son of a small businessman kicked off his career at the aerospace giant by turning around the firm's foundering electronics business. He went on to turn around a recently acquired radio company. He changed the entire company from a vulnerable government contractor into a healthily diversified commercial manufacturer — a multinational player whose 83,400 employees do business at some 443 plants in 48 states and 26



The CEO: *Donald M. Beall, 53; bachelor's degree (metallurgical engineering), San Jose State College, 1960; master's degree cum laude, University of Pittsburgh, 1961.*

The career: *Chairman and CEO of Rockwell International Corp., 1988-present. President and chief operating officer, 1979-88. Corporate executive vice president, 1977-79. Director since 1978. Joined Rockwell in 1968 as executive director of finance. Became executive vice president of Electronics Group a year later. Following firm's initial investment in Collins Radio Co., was named executive vice president, then president, of that unit, 1971-1976. Named president of electronics operations in 1976. Prior to joining Rockwell, was associated with Ford Motor Co., 1961-68.*

Accomplishments: *Spearheaded and presided over Rockwell's transition from a defense contractor to a highly diversified, highly profitable $12 billion vendor of products from space shuttles to truck axles to printing presses.*

foreign countries. At the age of 49, he became the youngest chief executive officer in the company's history.

Early this month, Beall spoke with *Computerworld* Senior Editor Nell Margolis on information technology as an enabler of corporate expansion and customer service — and the CEO's role in driving it.

■

ROCKWELL IS HEAVILY involved in the use of advanced data processing — not only in running the administrative functions, which is something every company does, but in every aspect of what we do. So many of our products are so software-intensive these days that having the most advanced technology available and familiar to us is pretty much a given.

That's true when we're talking about 10 new gun-stops with massive, Ada-programmed on-board controllers that we're providing to the U.S. Navy. You'd expect it to be. But it's also true in the case of the door-latches that our Allen-Bradley [industrial automation] business is manufacturing in Birmingham, England, where we've launched a new, highly computerized assembly line.

Also at Allen-Bradley, we've got a system called Passport that serves as an example of [IS] directly at the service of customers. This is an inquiry system whereby customers located anywhere in the world can check in electronically at any time and find out whether we've got a part, where it is, how much it costs and how they can get it without having to talk to a single person. Many plants have similar tie-ins.

And take our plant in Gifhorn, Germany. That's in Northeast Germany, not far from Wolfsburg — which is the world headquarters of Volkswagen, one of our customers. Because this is a highly automated plant, with just-in-time inventory and electronic communications going back and forth between our plant and the VW headquarters all the time, it only takes us 134 minutes after getting an order to complete and ship an entire roof set for a specific Volkswagen vehicle — and we make more than 3,000 a day.

■

My own personal opinion is that there aren't any limits [inherent in] the technology itself; the problems come in the way it's been used. Most companies — and I'm not talking just about Rockwell, I'm talking about companies in general — have spent the last decade getting overstaffed, overbureaucratized and noncompetitive. And this goes for their [deployment] of technology as well as everything else: Most are using technology but managing it in a lousy way.

■

There's no magic formula. It's just a matter of getting back to basics: focusing on customers, communicating with employees, making sure employees are involved heavily in the process. Communicate very effectively. Take every opportunity to challenge the status quo. Really, I'm just talking about fundamentals. This isn't an original thought — but it's a fact.

In our kind of business, the various company divisions have to work very closely, because tight coordination is a big part of the product. Recently, we put a system on-line by which all our businesses share supplier information. And this is also an example of how information systems can be used to involve employees in the process: The idea for the [supplier information coordination] was developed jointly by procurement [staffers] and [IS] staffers working together.

■

Because of the nature of the businesses we're in — automotives, avionics, graphics — we've been exposed early to very aggressive international competition, and we've benefited from it. We had to adopt what some people call progressive management approaches, not because we're so smart, but because anything less and we wouldn't have met the competition.

Total Quality Management, or whatever buzzword they're using these days? That's been absorbed into daily life at Rockwell, and for one reason — because there was no other choice. Go into our plant in Laurinburg, N.C., where we're producing transmissions: Every person is cross-trained on every single job. There's minimal supervision. There's gain-sharing. But that's a far cry from how we operated some time ago; we were hurried into it by the pressure of competing with companies and countries that took it for granted.

Look — essentially, every facsimile machine in the world is made in Japan. Each of them has a Rockwell motor. It took a lot of our skills in digital signal processing to be able to make that statement — but it also took our ability to have products delivered with the timeliness, and demonstrating the quality, that our Japanese partners won't do without. Winning in that important market is one hell of a powerful motivator.

I see my role as that of a cheerleader and a catalyst. To the extent that the company sees that I think certain

Continued on page 81

INSIDE

- Hughes Aircraft plans to cut 9,000 workers worldwide during the next 18 months. Page 80.
- Calendar. Page 81.

EXECUTIVE TRACK

Hubert P. Clarke, vice president and director of the information systems division at Ridgefield Park, N.J.-based **UJB Financial Service Corp.**, has been promoted to senior vice president and director of the firm's technical services division.

In his new position, Clarke, who joined UJB in 1968 as a computer operator and has risen steadily through the IS ranks, is responsible for the development and maintenance of voice and data communications, capacity planning, equipment acquisition and leasing, as well as all technical services.

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The board of directors of Washington, D.C.-based **Greater Southeast Healthcare System** recently appointed **Kenneth F. Johnson** vice president of planning and IS.

Prior to joining Greater Southeast, Johnson — a 30-year veteran of both the accounting and health care industries — owned and operated Strategic Healthcare System, Inc.

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Fort Wayne, Ind.-based **Lincoln Financial Corp.** recently promoted its director of operations and data processing, **Larry A. Shoff**. A recent arrival at Lincoln Financial, Shoff — who was formerly employed at NCOT Systems Corp., an IS consulting firm in Sylvania, Ohio — now wears the title of first vice president.

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The Federal Reserve Bank of New York has a new assistant vice president. **Gerald Hayden**, a 30-year New York Fed veteran who had been manager of the general computer operations department since 1987, was recently promoted to the higher rank and assigned to the IS area with responsibility for the contingency operations, quality assurance and general computer operations departments.

Upcoming cuts turn up heat under Hughes

BY NELL MARGOLIS
CW STAFF

LOS ANGELES — Early this year, when Michael Armstrong walked out of a senior executive's office at IBM to become chief executive officer of Hughes Aircraft Corp., the executive long seen as IBM Chairman John Akers' likely successor said he did not want to wait until mid-decade to find out what it was like to run a company.

He is finding out some of the harder parts up front — and facing them in true Blue fashion. Late last month, Armstrong took a leaf straight from Akers' book and cut back his firm's work force to position for a hopeful spring forward in a troubled market once the economy rebounds.

Hughes' plan to cut 9,000 jobs worldwide — approximately 15% of its current work force — and carry out "a major facilities consolidation" over the next 18 months aims at streamlining the company for action during a persistently slow economy and in the face of potentially "severe program cutbacks" in its largest market: federal defense.

However, the move also ratchets up the pressure on Hughes' fledgling Systems Sector to prove itself the growth catalyst and market differentiator that it was conceived to be.

The Systems Sector made its debut in April. It combines seven Hughes operations into a part business unit that includes the company's full information systems complement: Reston, Va.-based Hughes Information Technology Co., Lanham, Md.-based Hughes SCX and the former IS division of the Space and Communications Group.

Under the stewardship of former Radar Systems Group head John Weaver, now Systems Sector president, the IS forces have been lashed together with Hughes' Weapon Systems, Command and Control and Advanced Traffic Management Systems Groups to give the struggling defense contractor a shot in the marketing arm: the ability to act as a designer, developer and systems integrator on huge, mission-critical projects, both military and commercial.

In the latter category the sector is currently leveraging its expertise in integrating mammoth defense projects to develop a software guidance system tailored to run airports.

A company spokesman said last week that he doubted the impending layoffs and consolidation will take a heavy toll in the Systems Sector.

> **THE MOVE RATCHETS up the pressure on Hughes' fledgling Systems Sector to prove itself the growth catalyst and market differentiator that it was conceived to be.**

"You have to think that, in most cases, it will be defense areas that will be hit the hardest," he speculated. "That's where the weakness is."

The Systems Sector, on the other hand, "is considered one of the most promising growth areas," he said. The spokesman noted that Weaver's appointment to the sector's top spot came with an appointment to Hughes' office of the chairman.

In fact, the spokesman's speculation gained support from the company's official statement that "most of the layoffs will be in Southern California, which houses more than two-thirds of the company's current 60,000 work force." Thus the IS contingent's East Coast address could confer a modicum of safety.

However, the spokesman added, no final decisions as to locale have been made. What has been decided is that the estimated 9,000 employees to be laid off will receive a special supplemental benefits package, which will also be extended retroactively to the 3,000 or so Hughes employees who have been laid off this year.

The costs of the coming downsizing, prominently including the special benefits, triggered a $749.4 million after-tax charge against Hughes' second-quarter 1992 earnings.

Items of interest from publications, speeches, surveys and research projects

.....

A training 'quickie'

■ One chief executive officer's critical test for a successful information system: "It should take no longer than three hours of training for users to become proficient — not five or six days in a classroom," said Roger Schipke, chairman, president and CEO of Ryland Group, Inc. in Columbia, Md.

Source: Remarks at the Lattanze Center's CEO/CIO Roundtable in Baltimore, June 10, 1992.

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Store 'n' save

■ With the price of machinery to write data onto compact disc/read-only memory (CD-ROM) dropping to under $6,000, many more corporations are able to cost-justify the investment. Eastman Kodak Co., for example, began shipping inventory data on CD-ROM instead of downloading it over phone lines and turned a $100,000 investment into a $1 million yearly savings. And Ford Motor Co. replaced the vast paper catalogs it was sending to dealers with CDs and saved on printing and mailing costs.

Source: "CD-ROM: The Next PC Revolution," by Mark Alpert, Fortune, June 29, 1992.

.....

Low man on the totem pole

■ In a recent Ernst & Young survey showing the base salaries of managers as a percentage of the CEO's salary, the top execs in IS came out at the bottom of the heap. The survey showed that while chief operating officers at companies with annual sales of less than $50 million bring in 73% of the CEO's base salary and top marketing and sales executives take home 58% of the CEO's earnings, top systems and data processing managers earn only 39% of the CEO's pay.

Source: "Benchmark — Top Execs' Paychecks," Inc., July 1992.

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The data disease

■ Demand for data increases to meet data processing capacity, according to author Ross K. Baker. This phenomenon has brought on a new social ill that he terms "dataholism" — the result of researchers obsessed with finding and publishing meaningless statistics giving us more information than we could possibly use.

For example, taxis are now equipped with dashboard computers that spit out reams of information on pick-up and drop-off times, odometer readings, elapsed time between pick-up and drop-off, the fare, the tax, the tip — right down to the license plate on the cab. Baker was convinced that dataholism was rampant when he checked into a hotel room and found it took a computer to operate the shower.

Source: "Dataholics Anonymous," by Ross K. Baker, American Demographics, July 1992.

.....

The food-to-cow linkup

■ Scientists at Pennsylvania State University have developed a computer program designed to link livestock owners with waste food — products such as pizza, pretzels, chocolate and canned veggies no longer fresh enough to be in stores. The computer program calculates the lowest cost ration plan for the animals and displays a map that shows where particular foods are and how much it would cost to transport the items.

Source: "Sending Leftover Pizzas Down to the Farm," Business Week, June 22, 1992.

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Let's face it, MIT

■ If MIT's Media Lab has anything to do with it, it won't be long before computers can "recognize" people, an ability that may have application in security devices. MIT researchers are exploring machines that can recall images on command. "You'd be able to say, 'Are there any pictures of George Bush in here?' and the computer would look through and pull up all the pictures," said Alex Pentland at MIT. "At the moment, there's no way to have the computer look into a picture and see what it contains. We want to build a picture processor that's just like a word processor."

Source: "Face Space," Discover, August 1992.

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Efficient or effective?

■ What's the difference between efficiency and effectiveness? According to Dr. James C. Wetherbe, director of the Management Information Systems Research Center at the University of Minnesota's Carlson School of Management, "efficiency has to do with your resources and how well they are used. Computers are generally regarded as tools of efficiency. Effectiveness is how well you can satisfy your customers, and often people don't realize the impact information technology can have on this part of the business equation."

Wetherbe sees efficiency as a by-product of effectiveness. "If you use information systems for effectiveness, you become efficient in the process because of the economy of technology. In that sense, you can have your cake and eat it, too."

Source: "If You're Not Fixing It, You May Go Broke," Beyond Computing, May/June 1992.

.....

Compiled by Kelly E. Dwyer, assistant editor, features, with contributions from Mitch Betts, national correspondent, and Paul Gillin, executive editor.

CALENDAR

JULY 19-25

Comnet. San Francisco, July 20-23 — Contact: Matt Maudino, World Expo Corp., Framingham, Mass. (800) 225-4698.

Object World '92. San Francisco, July 20-23 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (800) 225-4698.

APICS '92. Chicago, July 22-23 — Contact: APICS Meeting Registration, Falls Church, Va. (703) 237-8344.

Memory Expo '92. Santa Clara, Calif., July 21-23 — Contact: Memory Expo '92, Englewood, Colo. (303) 220-0600.

QuarkXPress Users Conference (QUI). New York, July 22-23 — Contact: QUI, Salem, N.H. (603) 898-2822.

JULY 26-AUG. 1

Siggraph. Chicago, July 26-31 — Contact: Siggraph Information Hotline, Chicago, Ill. (312) 321-6830.

The Managing Enterprise Networks Conference. Boston, July 27-29 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Gigabit Networks. Washington, D.C., July 28-29 — Contact: Wilma Hurwitz, Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

PC/Canada. Toronto, July 28-30 — Contact: The Interface Group, Needham, Mass. (617) 449-8938.

Color Connections 4. Boston, July 30-Aug. 1 — Contact: Graphic Communications Association, Alexandria, Va. (703) 519-8162.

AUG. 2-8

International Gupta Developers Conference. San Francisco, Aug. 2-5 — Contact: Gupta Travel Headquarters, San Francisco, Calif. (415) 445-8813.

GroupWare '92 Conference & Exposition. San Jose, Calif., Aug. 3-5 — Contact: The Conference Group, Scottsdale, Calif. (602) 661-1260.

Tools USA '92 (Technology of Object-Oriented Languages and Systems). Santa Barbara, Calif., Aug. 3-6 — Contact: Burghardt Tenderich, Tools Conferences, Santa Barbara, Calif. (805) 685-1006.

Fed Micro '92. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Face CD-ROM and Multimedia Conference & Exposition. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Professional Engineers Examination Conference. Indianapolis, Aug. 5-8 — Contact: Institute of Industrial Engineers, Norcross, Ga. (404) 449-0460.

AUG. 9-15

Apple Enterprise Computing Conference. Boston, Aug. 12-14 — Contact: Emilio Robles, Apple Computer, Inc., Cupertino, Calif. (408) 862-5671.

AUG. 16-22

Sigcomm '92. Baltimore, Aug. 17-20 — Contact: SRI International, Menlo Park, Calif. (415) 326-6200.

Windows & OS/2 Conference. Boston, Aug. 19-21 — Contact: CM Ventures, Inc., Emeryville, Calif. (510) 601-5000.

AUG. 23-29

Interex Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew, Interex, Sunnyvale, Calif. (408) 738-4048.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Parr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Columbus, Ohio, Aug. 25 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cohesion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, BIS Strategic Decisions, Norwell, Mass. (617) 878-6650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Handip, DMA Computerfest, Dayton, Ohio (513) 263-3378.

AUG. 30-SEPT. 5

Primavera Systems, Inc.'s Ninth Annual User Conference. Philadelphia, Aug. 30-Sept. 2 — Contact: Primavera Systems, Inc., Bala Cynwyd, Pa. (215) 660-5830.

Surface Mount International Conference. San Jose, Calif., Aug. 30-Sept. 3 — Contact: SMTA, Edina, Minn. (612) 920-7682.

International Training Conference & Exposition. Anaheim, Calif., Aug. 31-Sept. 2 — Contact: Russell F. McKennon, Trade Associates, Inc., Rockville, Md. (301) 468-3210.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 3-Oct. 2 — Contact: Computer Intelligence, Farmington, Conn. (203) 676-2200.

SEPT. 6-12

Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 20-26

Image World. New York, Sept. 21-25 — Contact: Benita Rosmanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

SEPT. 27-OCT. 3

Seneca Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association Annual Conference (SPA). Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Beall: Rocketing to the top

CONTINUED FROM PAGE 79

goals and means of attaining them are important, then they will become important to the company.

■

Will business and economic changes over the next few years dictate the need for a new kind of CIO? I think that's true today. The IS leader has to feel that he's part of the top management team. That means he has to be a part of that team, which in turn means understanding the business of every business division. As far as having that kind of cross-fertilization at Rockwell — again, it isn't perfect here, but it's a lot better than it used to be.

Again, there isn't a silver bullet on how to improve — you keep the goal in mind and put one foot in front of the other. One good idea we've come up with is our management task force, a group that includes representatives from key staff positions from all businesses. Their mission is to feel very free to challenge everything we're doing.

The simple fact of their existence sends a powerful message to the rest of the company. You don't set up a group to challenge the company if you aren't open to hearing and acting on the suggestions they make.

■

Would we consider outsourcing IS? We frequently do. We're continually looking at every aspect of the company on a make vs. buy basis, reviewing options and alternatives; the process never really stops. And that includes telecommunications, I guess, as well as IS. But so far, the case for outsourcing IS hasn't been made. Frankly, we've got a very effective set of services, and we haven't been shown any reason to believe it would be to our benefit to send any of them out.

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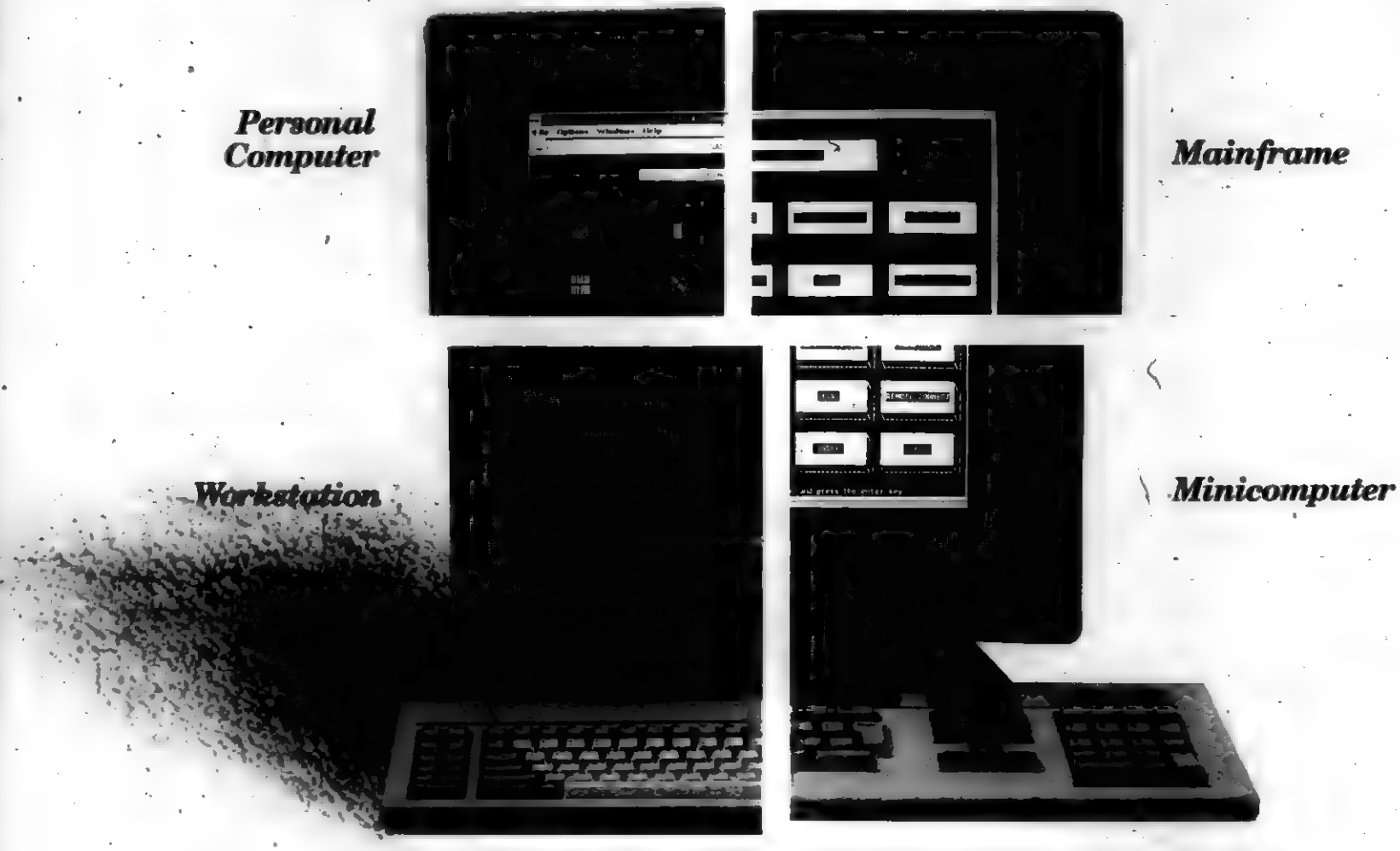

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IS personnel seek best of both worlds

On and off the job, a growing number of computer professionals pursue entrepreneurial dreams

BY SALLY CUSACK
SPECIAL TO CW

You've always dreamed of being your own boss but don't want to lose the paycheck from your 9-to-5 job. Take heart — you can still fulfill your dreams by dabbling in outside work after hours or heading up a special "intrapreneurial" project at your current company.

Intrapreneurship takes many forms, from composing training documents to streamlining routine tasks. The most exciting examples are often found in new software development.

Consider John Sall, cofounder and senior vice president at SAS Institute, Inc., a large, privately held software company based in Cary, N.C. Sall wanted to develop a statistical software program for the Apple Computer, Inc. Macintosh after seeing several new software products at a trade show.

Realizing that his company's flagship product, the SAS System, would be inappropriate for the Macintosh environment, Sall set about developing his own company, called JMP, and statistical visualization software for the Apple system. The new product, also called JMP, grossed $1 million in its first year of release.

As a result, in addition to his position at SAS, Sall also works full time as the product developer at JMP, whose staff now includes

four full-time developers.

An environment that promotes free thinking and risk taking, like that at SAS, must exist for intrapreneurial innovation to take place, however.

Double duty

Industry observers say this type of double life may be on the upswing among information systems personnel at larger U.S. companies.

For instance, of the 1,000 members of the San Francisco-based Software Entrepreneurs' Forum (SEF), more than 50% of the group's members are professional programmers and technical people, says an SEF spokeswoman. She says that the SEF is no longer a "group of programmers with a dream"; instead, members are more actively pursuing entrepreneurial goals.

Most members are seeking to expand their entrepreneurial ambitions in the world of software and related services. The organization now includes individual developers from established companies, as well as people currently employed in marketing, advertising, public relations and other communications fields.

A recent survey of IS managers by research firm Francorp, Inc., an Olympia Fields, Ill.-based business research firm, found that of 88 respondents, nearly two-thirds say they have looked seriously into business ownership.

IS professionals with specializations in personal computers, networking skills and communications are actively getting into entrepreneurial and intrapreneurial ventures, according to Chuck Muller, a partner at Andersen, Jones & Muller, a Southfield, Mich.-based firm specializing in the recruitment of IS professionals. Muller says this is because it's easier for them to transfer their skills to small business and home business.

He adds, however, that he has not found this to be true among people with the typical IBM mainframe skills. Instead, he says he's noticed them to be more committed to their jobs.

In the Francorp survey, office technology consulting was named as the top supplemental career by nearly two-thirds of the managers polled. The survey also indicates that the entrepreneurial desire extends beyond the simple need to produce one's own software package.

Taking on clients outside the office can help both employees and larger employers, says Louise Rielly Sacco, director of the Consultants and Entrepreneurs special interest group of the Boston Computer Society. She estimates that 500 to 600 members of the 3,000-member group are corporate employees.

For example, a person assigned to a specific project might find his skills eroding after two or three years. "Consulting on the side allows people to learn new products and technology," Rielly Sacco says.

Finally, she adds, experimenting with an after-hours business is a good way to test the waters before plunging ahead with a self-run business.

For the fun of it

Sheer love of technology, not just the extra income, is behind many entrepreneurial ventures. Take Tom Casey, for example.

After putting in a 9- to 12-hour day as a senior application project specialist at New York Life Insurance Co., Casey usually goes out to provide at-home training to PC users.

Casey emphasizes that he has no intention of leaving his job at the insurance company. In fact, he says his after-hours consulting business dovetails nicely with his daytime position because it brings to him the hands-on programming he sees less and less of during the day because of increasing management responsibilities.

"I'm involved more on management projects than programming," Casey explains, "and this really keeps my skills fine-tuned.

"But let's face it," he adds. "The real reason is that I just love working with the stuff."

Cusack is a free-lance writer based in Marston Mills, Mass.

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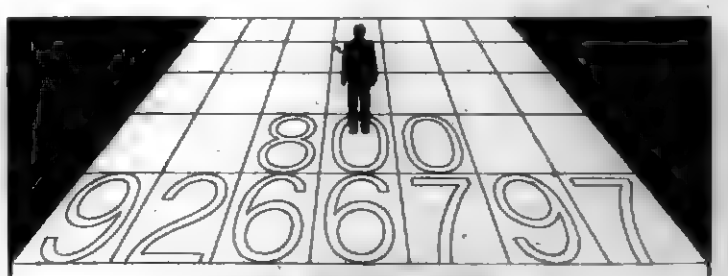

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The successful candidate will have a vision for innovative uses of information technology in higher education, a record of progressively responsible management experience in the field of information technology, broad technical knowledge, and the ability to foster cooperative relationships within a diverse academic community. Outstanding communication and interpersonal skills are essential. Candidates must have a minimum of ten years' experience in providing leadership and managing computing resources and services, preferably in an educational and research environment having both central and decentralized resources. A Ph.D. is desired and at least a master's degree is required. Emphasis will be given to the quantity and quality of a candidate's experience and leadership record.

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Search Committee review of credentials will begin on August 15, 1992, but credentials will be accepted for consideration until the position is filled. Applications and nominations, along with four references, should be sent to:

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SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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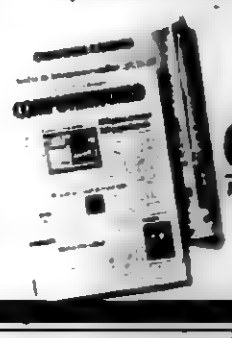

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Solid skills boost marketability

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chuck Muller, a partner at Andersen, Jones & Muller, a Southfield, Mich.-based firm specializing in the recruitment of IS professionals.

Q My current position has been part programming, part systems management and part operations. Is programming experience any more or less important than systems management experience? I have an opportunity to move into an applications programming position elsewhere. Should I take it or continue to gain systems management experience here?

A You should assess where you would like your career to go in the next five years. Typically, the technical support and applications programming career paths are distinct and require different types of experience.

If you decide to pursue systems management in a VAX/VMS environment, it would be best to remain at your present position and solidify your experience. Programming skills may be useful but are usually not required for a systems manager position. Two years of experience should be enough to compete for a new position.

Q I am looking to broaden my skill set from my current database (IDMS) to a relational model (Oracle, DB2, Ingres). I would also like some exposure to other areas such as computer-aided software engineering, local-area networks and client/server. Any advice or industries to look at?

A Obtaining a position in an IDMS shop that has committed to moving toward the relational model is the most likely way for you to get relational database exposure and maintain your salary and title. The strongest industries right now for this are health care, manufacturing and temporary services. In making a transition from one software or hardware environment to another, it is critical to assess how the technical environment of a potential employer will affect your future marketability.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I was recently interviewed for a job as a programmer analyst and was asked what my salary requirements were. How can I answer this question in the future without harming my chances at getting the job?

A If you are asked about your current or previous salary, you should be honest. Be sure to note your total compensation package, including base salary, bonuses, overtime and vacation. You should also mention if you are expecting a raise or promotion within the next three months. Do not state an exact figure, but stress an interest in an career opportunity and that you would consider a "reasonable offer."

Q I worked my way up the ranks to a data administrator for a Fortune 500 company in 1983. I then joined the corporate software engineering training group. After that job, I ran a business providing training in structured analysis, real-time extensions and managing projects. I have consulted on projects during the analysis phase, and now I want to apply my skills and experience working on projects through to completion. Any suggestions on how to attract the attention of a company?

A First, target your resume to highlight skills that are applicable to a particular type of job rather than using a chronological resume. This will allow you to define the job "target." For career opportunities, start networking with your clients from the last five years. They will know your work and your knowledge base. Use them as sources of potential leads into other opportunities.

☞ We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

How to succeed in working with the technophobic

Patience and persistence are important. Use a pilot program to show people how new technology will help them do their job better or more easily — then the reluctance goes away.

Kenneth A. Krallman, MIS manager
Carlton Technologies, Inc., Orchard Park, N.Y.

Give executives practical demonstrations that solve immediate problems. For example, if they want specific information but don't know how to access it, bring a laptop into their offices and show them how to get that information. Or install golf games to help reluctant users gain confidence.

William S. Murray, director of IS
Tribune Broadcasting Co., Chicago

We work with our people one-on-one to make sure we all keep pace with technology. People who hang on to old technology mistakenly think that their jobs are secure if they're the only ones who know how to do a particular task. In reality, they must accept new technology or risk having their jobs abolished.

Robert Hegedus, MIS director
Universal-Rundle Corp., New Castle, Pa.

Help people understand how a new system will be beneficial to them as individuals. If you show them how their own work will be made easier, they will go along with the program.

Jim Grainer, senior vice president, corporate operations
First Commerce Corp., New Orleans

Don't permit people to dwell on the past and offer what was done before as a solution or as justification for why new technology won't work.

Bob Beckstad, director of data processing
Time Customer Service, Inc., Tampa, Fla.

Compiled by Jill Vitiello, a free-lance writer based in East Brunswick, N.J.

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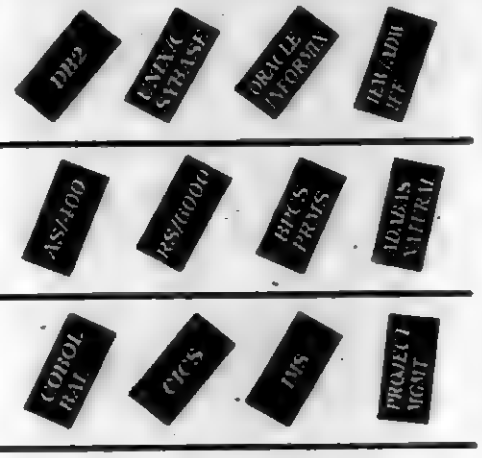

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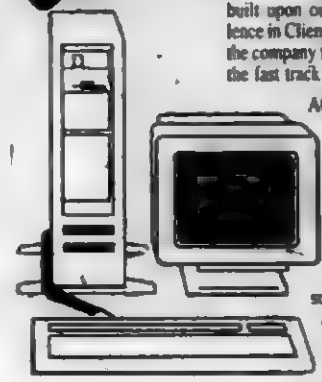

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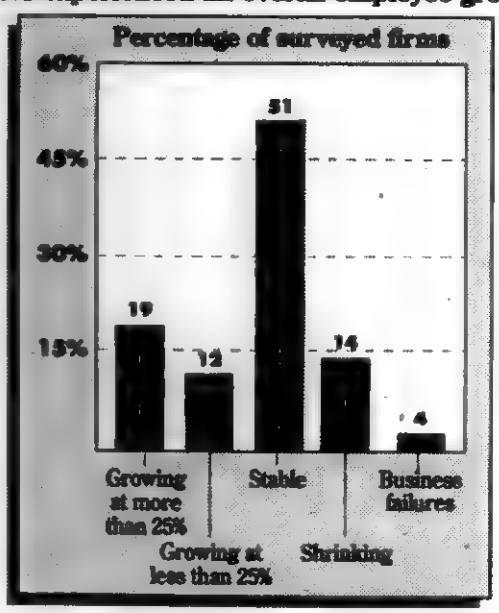

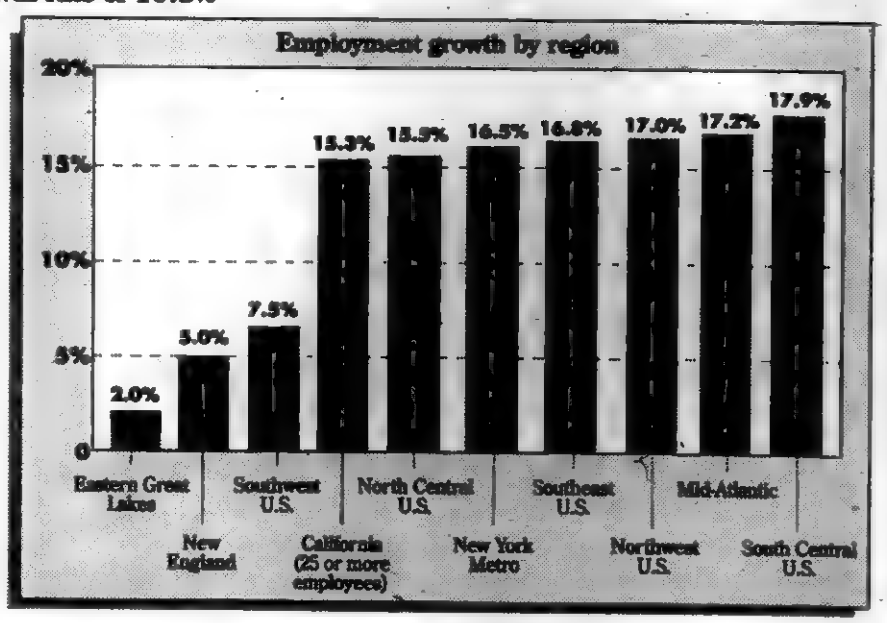

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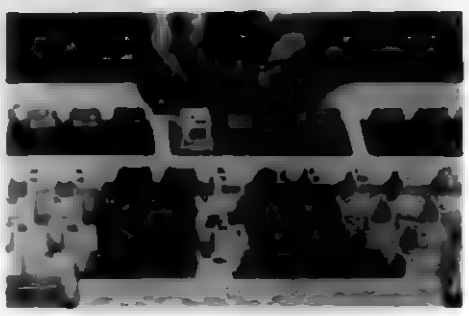

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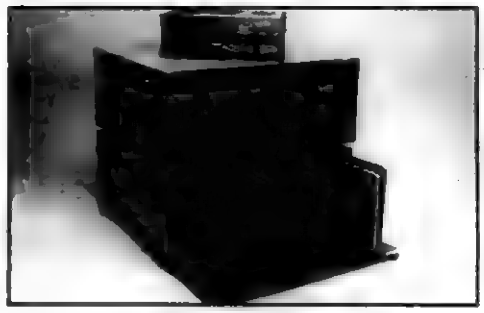

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Want trade show bargains? Know where and when to look

BY ALICE BREDIN
SPECIAL TO CW

You step into a huge enclosed area. Lights are blinking, music is blaring and people are everywhere. Is this really the kind of place where you are likely to stumble across a great deal?

Veteran trade show attendees say yes. If you know where to look and how to sidestep the bogus discounts, rigged demos and hot air, these events are full of bargains.

The real deals at trade shows can be found on the last day of the event, especially later on in the day.

Hidden bargains

Vendors that don't want to haul products back to headquarters are eager to sell — discounts can reach 50%. But don't look for these bargains to be advertised. No one is going to post a "50% off" sign. But if you approach vendors, you might be able to get a deal.

"Fatigue sets in on the last day, and vendors want to get rid of products," says Pam Bybell, manager of user group support at the Boston Computer Society. So don't be afraid to haggle.

If you're not going to be around on the show's last day, a bargain you can get anytime is a special unit evaluation. A vendor may sell a $1,000 item at a 40% discount, but only if they think you'll buy more later on at full price.

If freebies are what you want, look carefully because vendors don't usually announce that they have things to give away. Instead, these items — usually software, add-in cards or other small peripherals — are tucked under the table. Getting them is a hit-or-miss proposition, however. The best approach to obtain freebies is to strike up conversations with vendors whose products interest you. You may end up walking away with something.

Don't be fooled into accepting crippled copies lacking the functionality of the full-blown product, though. Instead, trade show veterans suggest, try to get full-copy versions that are marked "not for resale."

But no matter how low a price you get, you don't have a bargain if you wind up with something that is less or different than what was advertised.

To avoid being taken in by a slick demonstration, you should always ask if the product that is running is the same as the product that will be shipped. If not, ask what the differences are.

"It's not typical, but some vendors might remove all the functions in a database update to make a product appear to run faster than it actually does," one trade show veteran says.

Hardware watch

The CPU running software at a trade show should also be questioned. You could be in for a shock if you see a product demonstrated on an Intel Corp. 1486-based machine and you run it on an 80386-based system in your office. CPUs at shows are often under a table, so you must ask. The same goes for the hard disk.

Lastly, keep in mind that even though products look easy to use at a trade show, they may not be: Remember that vendors practice using the products every day.

"Don't get dazzled by the ease of a product in a demo," Bybell warns. "Keep your feet on the ground, and remember that all products have a learning curve."

Bredin is a free-lance writer based in New York.

Shop safely

One can never be too careful at a trade show. Despite your best efforts, falling prey to an unscrupulous vendor is easy. To come away unscathed, trade show veterans advise that attendees watch for the following traps and consider the safer alternatives.

➤**Trap: Overbuying.** "When you get to the show floor, it's crazy, noisy and loud — it's exciting," says Pam Bybell, manager of user group support at the Boston Computer Society. "A lot of people buy things and realize later they really don't need the 10 extra features they just paid for."
Safe solution: Identify what you need in the way of features before you start wandering the aisles. If you've already drawn up your shopping list, you won't be as apt to succumb to impulse.

➤**Trap: Buying sizzle.** "Vendors at shows will advertise software at 20% off the list price, but software is almost never sold at list price," explains Louise Sacco, a consultant at The Enterprise Group, a Needham, Mass.-based consortium of consultants.
Safe solution: Check prices at local dealers, discount stores and mail-order firms before buying. This may save you from being duped by a bogus discount.

➤**Trap: False starters.** Keep in mind that some products displayed at trade shows never hit the market, says Morris Herman, chairman of the Santa Barbara, Calif., Apple Computer, Inc. Macintosh user group. Herman, who works as a computer equipment adviser to Raytheon Co., recalls getting a beta-test copy of a very promising spreadsheet, but the product never came out. "You want to make sure you aren't recommending a product that won't appear," he warns.
Safe solution: To make sure the product can be counted on, check whether the company has the muscle and money behind it to deliver the product to market.

➤**Trap: Fly-by-night vendors.** "Some people get their hands on a bunch of no-name computers and sell them at a show, and they've never sold computers before or since," Sacco warns.
Safe solution: Ask how long the company has been in business. "You can also run out into the lobby and see if they are listed in the local yellow pages," Sacco suggests.

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The BoCoEx index on used computers

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	Closing price	Ask	Bid
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PS/2 Model 35SX	$1,325	$1,500	$800
PS/2 Model 55SX	$1,000	$1,300	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$2,100	$3,000	$1,500
PS/2 Model 80	$1,500	$1,800	$1,100
PS/2 Model 95	$4,800	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$550	$650	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$2,000	$2,450	$2,200
Apple Macintosh Classic	$800	$900	$700
SE	$750	$875	$600
IIX	$2,700	$3,250	$2,000
IICI	$3,100	$3,600	$2,460
IIFX	$4,100	$4,900	$3,700

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ADVERTISERS INDEX

AICorp	78
Arcus Data Security	46, 47
AT&T Business Communications Services	26-27
Bachmas	73
BMC Software	60
Borland International	C4
Chipcom	C3
Command Technology	31
Compaq Computer Corp	57-59
Computer Associates	3
CW Editorial Reprints	68
CW Lotus Notes Awards	32
CW Marketing	43
CW Recruitment	4, 48, 55, 68
Data General	49
Dun & Bradstreet	81
Dynasoft	64
Easel	21
Embarc/Motorola	52
Everex	54
Genicom	55
Hayes Microcomputer	42
Hewlett-Packard	35
IBM	37
IDG	44-45
Information Builders	17
Informix	13
Innovation Data Processing	7
Intel	22-23
Intergraph	48
IPL Systems	62
Legent Corp	50-51
Lexmark	77
Lotus Development Corp	40-41
Micro Focus	30
Motorola Codex	65
Oracle Corp	5, 9
Progress Software	66
Roes Systems	10
SAS Institute	74, 82
Software Engineering of America	11
Toshiba	18-19
VMark Software	15

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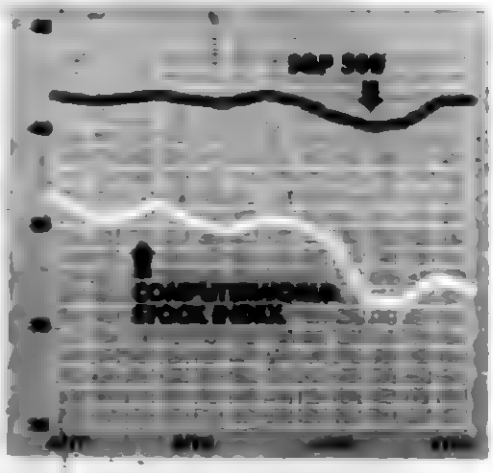
STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGE

DOWNGRADED FROM BUY TO HOLD: **Comshare, Inc.** (The Chicago Corp.). Comshare's (CSRE) decision to shift from a mainframe- to a local-area network-based product strategy — combined with a lack of software for **Microsoft Corp.**'s Windows — will drag down fiscal fourth-quarter earnings. Mainframe licenses of Commander EIS, the company's flagship product, could slip nearly 30% this year.

The company is counting on an OS/2 edition of Commander EIS, expected this summer, and a new version for Windows, due out in October, to pull up earnings next year.

ANALYSIS IN BRIEF

"Chip Makers' Seasonal Outlook"
Michael Gumport
Shearson Lehman Brothers, Inc.
June 15

Semiconductor stocks tend to rally late in the year and plunge in July. Five major chip makers' stocks — **Advanced Micro Devices, Inc.** (AMD), **Intel Corp.** (INTC), **National Semiconductor Corp.** (NSM), **Texas Instruments, Inc.** (TXN) and **Motorola, Inc.** (MOT) — have dropped an average of nearly 40% for the past 11 consecutive summers.

Meanwhile, The Semiconductor Industry Association said that U.S. chip demand will pick up about 12%, but not until late 1992. That surge could translate into a 30% rise in share prices through early 1993. In other words, chip stock prices look grim in the near term but promising for later this year.

LISA DAVIDSON and KIM S. NASH

Shearson says . . .

Current investment ratings from Shearson Lehman Brothers

AMD	Avoid
Intel	Neutral
Motorola	Buy
National Semiconductor	Neutral
TI	Buy

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JULY 10, 1992

TOP PERCENT GAINERS

Ross Systems (L)	32.65
Fibronix Int'l Inc	25.00
Mentor Graphics (L)	23.33
Conner Peripherals*	15.60
Printronix Inc	15.00
Micropolis Corp	11.76
Sierra Semiconductor	11.71
Xilinx	11.64

TOP PERCENT LOSERS

Microcom Inc (L)	-40.38
Micrografx Inc	-32.20
Meca Software (L)	-26.09
Planet Corp (L)	-25.00
Gateway Communications (L)	-25.00
Symantec Corp.	-20.67
AI Corp (L)	-20.00
American Mgmt Systems* (H)	-15.97

TOP DOLLAR GAINERS

Digital Equipment Corp.*	3.88
Belisouth Corp.	3.00
Conner Peripherals*	2.75
American Info Techs Corp.*	2.50
Policy Management Sys	2.25
Xilinx	2.13
Banctec Inc	2.13
Ross Systems (L)	2.00

TOP DOLLAR LOSERS

Symantec Corp	-7.75
Planet Corp (L)	-4.88
Matsushita Electronics	-4.88
Parametric Technology	-4.75
Micrografx Inc	-4.75
Chipcom Corp.	-3.00
American Mgmt Systems* (H)	-2.88
Microcom Inc (L)	-2.63

Exch	52-Week High	52-Week Low		July 10 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Off 1.77%**
OTC	15.00	6.75	3COM Corp.*	10.00	-0.50	-4.76
NYS	66.50	56.25	American Info Techs Corp.*	66.50	2.50	3.91
NYS	44.63	32.88	AT&T*	43.75	-0.13	-0.28
OTC	4.25	1.00	Ariel Communication Corp	1.50	-0.13	-7.69
NYS	50.63	40.25	Bell Atlantic Corp	46.63	1.88	4.19
NYS	52.75	43.38	Bellsouth Corp	52.75	3.00	6.03
NYS	7.63	4.25	Bolt Beranek & Newman (L)	4.25	-0.38	-8.11
NYS	65.88	36.63	Cabletron Systems	48.75	0.25	0.52
OTC	31.00	14.50	Chipcom Corp	22.50	-3.00	-11.76
OTC	49.25	17.38	Cisco Systems Inc (H)	46.75	-1.00	-2.09
OTC	35.25	12.75	Compression Labs Inc	13.63	0.63	4.81
OTC	3.38	0.88	Data Switch Corp	1.50	-0.13	-7.69
NYS	23.63	12.38	Digital Comm Assoc.*	18.50	0.75	4.23
OTC	17.75	8.50	Digital Systems Int'l Inc	8.50	-0.25	-2.86
OTC	7.38	3.63	DSC Communications	4.75	0.13	2.70
OTC	10.88	4.75	Fibronix Int'l Inc	6.25	1.25	25.00
OTC	37.50	10.50	Fibronix Int'l Inc	14.63	-4.88	-25.00
OTC	5.38	1.13	Gandalf Technologies Inc	2.38	-0.19	-7.34
OTC	2.50	0.69	Gateway Communications (L)	0.75	-0.25	-25.00
NYS	5.50	2.13	General Datacomm Inds	3.63	0.00	0.00
ASE	5.88	0.50	Go Video	3.00	0.25	9.09
NYS	35.00	28.13	GTE Corp.*	32.88	0.88	2.73
NYS	70.63	50.00	ITT Corp	66.13	1.25	1.93
OTC	38.13	25.25	MCI Communications Corp.	31.13	-1.13	-3.49
OTC	14.50	3.88	Microcom Inc (L)	3.88	-2.63	-40.38
NYS	18.25	9.13	Network Equipment Tech.*	9.75	-0.88	-8.24
OTC	25.50	6.75	Network General	9.63	0.38	4.05
OTC	20.00	8.50	Network Systems Corp	10.13	-0.75	-6.90
OTC	17.88	5.50	Newbridge Networks Corp	16.38	0.25	1.55
NYS	49.25	34.13	Northern Telecom Ltd.*	38.13	1.13	3.04
OTC	65.00	26.00	Novell Inc.*	53.75	0.00	0.00
NYS	82.38	69.13	Nynex Corp.*	81.00	1.63	2.05
OTC	37.50	16.50	Octel Communications Corp	22.75	0.25	1.11
OTC	9.88	4.50	Penril Data Comm. Ntwks.	4.50	0.00	0.00
OTC	53.00	21.50	Picturetel Corp. (L)	23.00	-2.25	-8.91
OTC	18.75	10.00	Proteon Inc	11.00	0.00	0.00
NYS	24.88	11.63	Scientific Atlanta Inc	24.88	1.50	6.42
NYS	66.00	51.50	Southwestern Bell Corp	63.50	0.63	0.99
NYS	29.75	20.75	Sprint Corp	21.75	-0.13	-0.57
OTC	13.75	3.63	Standard Microsystems Corp	11.38	0.00	0.00
OTC	33.00	14.25	Synoptics Communications	31.63	1.38	4.55
NYS	38.88	32.88	US West Inc	38.88	2.00	5.42
OTC	41.25	21.25	Wellfleet Communications	29.50	0.25	0.85
PCs and Workstations						**Off 0.31%**
OTC	15.25	4.75	Advanced Logic Research	4.75	-0.50	-9.52
OTC	70.00	42.25	Apple Computer Inc.*	45.75	-0.50	-1.08
OTC	32.25	12.00	AST Research Inc.*	14.00	0.13	0.90
NYS	19.25	9.38	Commodore Int'l	9.38	-0.75	-7.41
NYS	37.50	22.13	Compaq Computer Corp.*	26.13	1.50	6.09
OTC	29.00	13.91	Dell Computer Corp	17.50	-0.25	-1.41
OTC	7.75	3.00	Everex Systems Inc	3.38	0.13	3.85
NYS	34.00	21.25	Harris Corp	27.25	-0.50	-1.80
NYS	85.00	44.63	Hewlett-Packard Co.*	67.25	0.38	0.56
NYS	29.75	14.13	Silicon Graphics	18.38	0.88	5.00
OTC	35.88	20.75	Sun Microsystems Inc.*	26.88	0.75	2.87
NYS	31.25	22.38	Tandy Corp.* (L)	23.63	0.38	1.61
NYS	11.13	5.13	Zenith Electronics	7.50	0.00	0.00
OTC	25.50	5.25	Zeos International Ltd	6.00	-0.25	-4.00
Large Systems						**Off 0.65%**
ASE	20.63	11.88	Amdahl Corp.*	17.00	-0.63	-3.55
NYS	14.00	7.50	Control Data Corp	13.75	0.00	0.00
NYS	16.38	6.38	Convex Computer (L)	6.38	-0.50	-7.27
OTC	19.63	2.88	Cray Computer	3.13	0.00	0.00
NYS	52.25	27.38	Cray Research Inc.*	28.75	-0.25	-0.86
NYS	22.50	7.13	Data General Corp	7.63	0.00	0.00
NYS	71.75	33.25	Digital Equipment Corp.*	37.50	3.88	11.52
NYS	105.38	81.63	IBM*	97.75	0.88	0.90
NYS	126.00	93.50	Matsushita Electronics	104.63	-4.88	-4.45
OTC	19.75	9.50	Pyramid Technology	10.50	-0.25	-2.33
OTC	17.88	7.50	Sequent Computer Sys	14.88	-0.25	-1.65
OTC	18.38	5.50	Sequoia Systems Inc (L)	6.13	-0.13	-2.00
NYS	54.25	29.75	Stratus Computer Inc.*	42.63	-0.38	-0.87
NYS	15.13	9.50	Tandem Computers Inc.*	11.50	0.25	2.22
NYS	11.75	3.38	Unisys Corp.*	8.88	0.13	1.43
ASE	7.50	2.00	Wang Labs Inc (b)*	3.38	-0.13	-3.57
Software						**Off 1.34%**
OTC	68.50	37.50	Adobe Systems Inc	44.00	-0.75	-1.68
OTC	13.25	3.00	AI Corp (L)	3.00	-0.75	-20.00
OTC	45.50	11.50	Aldus Corp	13.25	0.25	1.92
OTC	19.75	10.13	American Software Inc	12.75	-0.13	-0.97
OTC	20.00	7.50	Ask Computer Systems	10.38	-1.38	-11.70
OTC	57.25	23.25	Autodesk Inc	38.50	1.38	3.70
OTC	37.75	8.25	Bachman/Info. Systems	11.25	0.75	7.14
OTC	42.50	29.00	BGS Systems Inc	35.50	-1.25	-3.40
OTC	79.00	37.25	BMC Software Inc	42.75	0.75	1.79
OTC	20.50	9.00	Boole & Babbage	17.25	0.25	1.47
OTC	86.75	37.75	Borland Int'l Inc.*	38.88	-2.13	-5.18
OTC	11.25	3.88	CE Software (L)	4.00	-0.50	-11.11
ASE	14.38	6.50	Cheyenne Software Inc	10.63	-1.50	-12.37
OTC	20.38	7.25	Cognos Inc	8.25	-0.88	-9.59
NYS	17.00	7.50	Computer Associates*	12.50	0.50	4.17

Exch	52-Week High	52-Week Low		July 10 Close	Wk Net Change	Wk Pct Change
OTC	21.50	9.25	Comshare Inc	10.00	-0.25	-2.44
OTC	47.88	8.50	Essel Corp (L)	8.00	-0.25	-3.03
OTC	19.50	9.25	Goal Systems Int'l	17.38	0.50	2.96
OTC	23.50	11.50	Group I Software	20.00	1.75	9.59
OTC	6.63	3.50	Hogan Systems Inc	4.00	0.00	0.00
OTC	36.25	18.50	Information Resources	24.38	-0.25	-1.02
OTC	35.00	5.50	Informix Corp	29.25	-0.75	-2.56
OTC	27.75	12.50	Intergraph Corp. (L)	13.75	0.25	1.85
OTC	15.00	4.88	Interleaf Inc	8.75	0.50	6.06
OTC	20.25	8.50	Intersolv Inc	12.75	0.50	4.08
OTC	30.00	10.50	Knowledgeware Inc	13.00	1.13	9.47
OTC	45.25	20.25	Lagare Corp.*	33.38	0.88	2.69
OTC	40.75	16.75	Lotus Development* (L)	17.25	-1.00	-5.48
OTC	7.38	2.13	Meca Software (L)	2.13	-0.75	-26.09
OTC	22.25	6.50	Mentor Graphics (L)	9.25	1.75	23.33
OTC	20.50	6.50	Micrografx Inc	10.00	-4.75	-32.20
OTC	88.84	43.34	Microsoft Corp.*	89.50	-0.38	-0.54
OTC	21.13	9.38	Oracle Corp.*	17.88	1.00	5.93
OTC	41.25	13.00	Parametric Technology	32.00	-4.75	-12.93
OTC	11.00	3.75	Phoenix Technologies (L)	3.88	-0.25	-6.06
OTC	25.25	10.50	Platinum Technology	13.50	-0.75	-5.26
OTC	46.50	27.50	Progress Software Corp	35.75	-2.25	-5.92
OTC	26.63	4.00	Quarterdeck Office Sys. (L)	5.00	-0.13	-2.44
OTC	32.75	9.50	Rainbow Technologies Inc	14.50	1.25	9.43
OTC	29.50	8.75	Rasterops	10.88	0.38	3.57
OTC	17.25	5.38	Ross Systems (L)	8.13	2.00	32.65
OTC	26.25	8.25	Software Publishing Corp. (L)	9.00	0.13	1.41
OTC	8.50	2.00	Software Toolworks Inc	2.25	-0.13	-5.26
OTC	7.25	1.75	Spectrum Software	3.13	0.00	0.00
OTC	16.50	6.25	State of the Art	7.88	0.13	1.61
NYS	25.25	11.63	Sterling Software Inc	16.50	0.50	3.13
OTC	30.00	13.00	Struct Dynamics Research	15.50	1.50	10.71
OTC	31.75	15.00	Sybase Inc	24.00	-1.75	-6.80
OTC	51.00	22.50	Symantec Corp	29.75	-7.75	-20.67
NYS	15.50	6.38	Systems Center Inc.* (L)	6.38	-0.13	-1.92
OTC	34.25	8.66	System Software Assoc.	27.50	-2.00	-6.78
OTC	23.75	15.00	Walker Interactive Systems	17.00	-0.25	-1.45
OTC	6.63	2.13	Wordstar	2.63	0.13	5.00
Semiconductors						**Up 1.65%**
NYS	21.50	7.38	Advanced Micro Devices (L)	8.25	0.50	6.45
NYS	11.13	7.00	Analog Devices Inc	9.63	-0.13	-1.28
OTC	15.13	6.75	Atmel Corp	9.38	0.88	10.29
OTC	14.13	6.00	Chips and Technologies (L)	6.00	-0.63	-9.43
NYS	22.63	7.88	Cypress Semiconductor Corp (L)	7.88	-0.50	-5.97
NYS	10.00	6.25	Dallas Semiconductor	10.00	0.88	9.59
OTC	68.75	38.50	Intel Corp.*	56.50	0.63	1.12
NYS	9.88	5.88	LSI Logic Corp.	6.50	-0.25	-3.70
NYS	22.38	11.13	Micron Technology	13.88	-0.25	-1.77
NYS	83.75	54.00	Motorola Inc.*	78.00	1.38	1.79
NYS	11.50	3.88	National Semiconductor*	9.13	-0.38	-3.95
OTC	27.00	12.75	Sierra Semiconductor	15.50	1.63	11.71
NYS	40.50	26.00	Texas Instruments*	37.75	1.75	4.86
OTC	10.50	5.88	VLSI Technology	7.25	0.38	5.45
OTC	12.50	3.13	Weitek (L)	3.25	-0.13	-3.70
ASE	5.63	2.00	Western Digital Corp.	4.75	0.00	0.00
OTC	32.50	17.25	Xilinx	20.38	2.13	11.64
OTC	11.50	4.63	Zilog Inc	7.00	-0.25	-3.45
Peripherals and Subsystems						**Up 1.30%**
OTC	10.00	2.75	Archive Corp.	6.75	-0.75	-10.00
OTC	24.50	11.25	Banctec Inc	24.25	2.13	9.60
OTC	23.50	7.00	Cambex Corp.	14.00	-0.75	-5.08
ASE	17.50	7.00	Cognitronics Corp.	16.13	-0.13	-0.77
NYS	23.88	12.50	Conner Peripherals*	20.38	2.75	15.60
ASE	19.66	3.34	Dataram Corp.	12.76	-1.38	-9.73
NYS	18.63	4.88	EMC Corp	18.25	0.75	4.29
OTC	9.38	4.75	Emulex Corp	6.88	-0.25	-3.51
OTC	23.00	14.50	Evans & Sutherland	16.00	1.00	6.67
OTC	40.63	16.00	Exabyte	29.38	1.13	3.99
OTC	27.25	15.75	Intelligent Info. Systems	24.25	0.88	3.74
OTC	11.25	4.50	Iomega Corp	5.50	-0.25	-4.35
OTC	34.75	14.50	IPL Systems Inc.	19.00	0.13	0.66
OTC	24.50	11.75	Komag Inc	12.25	-0.75	-5.77
OTC	14.00	1.63	Maxtor Corp.*	10.75	0.75	7.50
OTC	12.63	5.50	Micropolis Corp.	9.50	1.00	11.76
NYS	98.75	83.50	3M Co	96.88	0.88	0.91
OTC	8.75	3.50	Printronix Inc.	5.75	0.75	15.00
NYS	26.75	7.25	QMS Inc. (L)	7.38	-0.88	-10.61
OTC	18.00	8.88	Quantum Corp.	14.50	0.88	6.42
OTC	12.25	5.13	Radius Inc	11.78	0.25	2.17
NYS	12.88	5.88	Recognition Equipment	8.00	-0.50	-5.88
OTC	13.13	5.38	Reason Inc	9.63	-0.38	-3.75
OTC	17.63	7.25	Seagate Technology*	14.63	0.13	0.88
NYS	78.00	28.63	Storage Technology*	31.00	0.38	1.22
NYS	30.88	16.00	Tektronix Inc.	18.13	0.38	2.11
NYS	82.25	52.63	Xerox Corp.	71.25	1.50	2.15
Services						**Off 0.24%**
OTC	18.00	11.86	American Mgmt. Systems* (H)	15.13	-2.88	-15.97
NYS	5.38	2.88	Anacomp Inc	3.50	-0.13	-3.45
OTC	19.00	12.25	Analysts Int'l	17.13	0.63	3.79
NYS	49.00	30.25	Auto Data Processing*	41.25	-1.50	-3.51
NYS	24.16	12.50	Comdisco Inc.*	17.13	1.63	10.48
OTC	13.50	7.75	Computer Horizons	8.25	-0.50	-5.71
NYS	84.88	52.25	Computer Sciences*	62.50	0.13	0.20
NYS	10.13	7.00	Computer Task Group	7.25	-0.75	-9.38
OTC	40.50	15.00	CompUSA Inc.	26.25	0.00	0.00
OTC	19.25	7.75	Corporate Software	10.00	0.25	2.56
OTC	30.75	12.75	Egghead Discount Software	17.25	0.00	0.00
NYS	33.06	23.19	General Motors E (EDS)*	27.38	-1.50	-5.19
OTC	30.38	6.25	Intelligent Electronics	8.00	0.50	6.67
OTC	14.88	2.63	Mentor	9.75	0.13	1.30
OTC	15.75	6.50	Microage Inc	10.00	-0.75	-6.98
OTC	27.50	13.50	Paychex	24.00	0.00	0.00
NYS	73.00	47.25	Policy Management Sys	67.13	2.25	3.47
NYS	43.50	19.63	Reynolds and Reynolds	38.00	1.75	4.83
OTC	32.00	21.25	SEI Corp	23.25	0.13	0.54
OTC	24.38	16.88	Shared Medical Systems	19.38	0.25	1.31
OTC	26.25	13.50	Sungard Data Systems	23.75	0.50	2.15
NYS	4.88	1.13	Ultimate Corp.	1.75	0.13	7.69

Note: Mips was acquired by Silicon Graphics and was removed from our list accordingly

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

FileNet profits decline

■ **FileNet Corp.** last week said it expected second-quarter earnings to plunge almost 66% — to $600,000 — from the comparable period last year. Revenue for the quarter ended July 5 is expected to come in at $34.5 million, 20% above the like period last year. The document image processing vendor said economic concerns continue to hamper revenue growth, contributing to project delays for about 15% of the company's prospects.

■ Richard Giordanella, president of **Ross Systems, Inc.**, resigned last week after five years on the job. His duties at the Redwood City, Calif., financial applications developer will be handled by Larry Smart, who was named president of North American operations, and Guy Davidson, who heads European operations.

Short takes

■ **SHL Systemhouse, Inc.** and South Korea's **Samsung Group** are forming a strategic alliance that will give the Ottawa, Ontario-based systems integrator access to the Korean market as well as discounted hardware. SHL will provide Samsung with client/server expertise. . . . **Appsoft, Inc.** last week said it has acquired rights to PowerStep, a spreadsheet for Next, Inc. computers from **Borland International, Inc.** . . . **Bachman Information Systems, Inc.** said it is comfortable with Wall Street's earnings estimates, which range between 8 cents and 16 cents a share for its fourth quarter ended June 30. . . . **Kean, Inc.** announced that it posted second-quarter profits of $1.6 million, up slightly from the year-earlier period, on revenue of $24.7 million.

Everex, Northgate nix merger

Direct-mail PC house instead sells 51% stake to investment group

BY CAROL HILDEBRAND
CW STAFF

FREMONT, Calif., and EDEN PRAIRIE, Minn. — Everex Systems, Inc. and Northgate Computer Corp. last week called off their proposed merger, leaving Everex without a partner in the fast-growing direct-mail personal computer business.

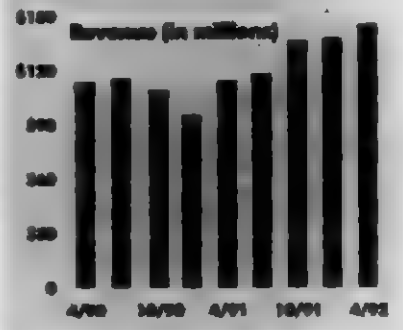
Northgate instead sold a controlling interest in the PC company to Marjac Investments, Inc. in Herndon, Va. Northgate President Gary Held said Marjac was leading a group of investors who will get a 51% stake in the company. Marjac will reportedly also infuse Northgate with $3 million in operating capital.

Northgate and Everex, which signed a letter of intent May 19 for a stock-swap deal valued at about $4.3 million, said last week that both structural and financial constraints kept them from reaching an agreement.

Recent changes in the PC market brought on by Compaq Computer Corp.'s aggressive new products and pricing also played a role, noted Michael J. Whalen, Everex's director of marketing services. He denied that the meltdown of the deal had anything to do with the nosedive that Everex stock took after the announcement.

On the mend

Everex is growing again after slipping in 1990



Source: Prolytix Corp.

"Market conditions are nothing like they were when we decided to pursue the merger," Whalen said.

While Everex still lacks a mail-order distribution strategy, Whalen said, it is going to take a wait-and-see attitude while the market goes through its period of turmoil. Recent company price cuts should make its resellers more competitive, he added.

Don Collier, president of Prolytix Corp. in Santa Barbara, Calif., noted that Everex, which is currently recovering from a rocky financial period, was not in the best shape for a buyout anyway. Cash reserves of about $11 million did not put Everex in a strong buying stance, he said, even with the recent addition of a $72 million line of credit.

Integrator awash in uncollected receivables

BY MARK HALPER
CW STAFF

CHICAGO — Uncertainty regarding defense spending combined with allegedly loose business practices have taken a toll on systems integrator Technology Solutions Co. (TSC), which is scrambling to collect $8.5 million from Northrop Corp. while writing off $3.6 million in uncollected receivables from other customers.

Analysts last week questioned TSC's assertion that verbal commitments are normal modus operandi in the integration business. "It's not for the quality firms, at least not when you're talking about millions of dollars," observed Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn. "It was a little loosey-goosey."

TSC's difficulties triggered a lawsuit from shareholders, who accused the company of mismanaging its business by agreeing to do work based on verbal rather than written commitments.

The suit followed a 50% decline one week earlier in TSC's stock from approximately 14½ to 7½ after TSC disclosed its financial difficulties.

TSC last week said it will lay off between 75 and 100 employees, about 15% to 20% of its work force, from the aerospace and defense portion of its manufacturing sector.

In its report for the year and quarter ending May 31, TSC claimed that Northrop had failed to deliver $8.5 million that TSC had logged in its fourth quarter books as revenue.

TSC SAID IT will lay off between 75 and 100 employees from the aerospace and defense portion of its manufacturing sector.

The money, according to TSC, reflected Northrop's financial obligation under a verbal agreement entered in March for a systems integration. A TSC spokesman said the integrator hopes to recover those funds by building charges into future work TSC will do for Northrop, which has been a steady customer of TSC's.

But the spokesman conceded that TSC may not be able to collect the full amount and said, "There's no assurance at all that we'll land a contract with them."

Late discovery

TSC discovered Northrop's $8.5 million shortcoming once the project was two-thirds complete and "we were slipping into the phase where we needed something in writing," the spokesman said. TSC is holding seven of its project managers accountable for $5.3 million in uncollected funds, he said.

Northrop has drastically altered its business practices since President Bush began pushing Congress to phase out Northrop's B2 bomber from the U.S. military arsenal, the TSC spokesman claimed.

TSC's $3.6 million in write-offs includes a $2.3 million charge against smaller aerospace and defense contractors with which TSC also had verbal commitments, the TSC spokesman said.

TSC's year-end net income was $12.1 million, up from $8.5 million the previous year, on revenue of $71 million, up from $52.4 million, according to the company. Revenue for the fourth quarter was $23 million, up from $16 million, and net income rose to $5.5 million from $4.1 million.

Legent, Goal plan to slash 200 positions

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp. last week disclosed that its merger with Goal Systems International, Inc. will result in a 10% reduction in the work force of the combined company. The cuts will be made across the board but will be deepest in administration and finance, Legent said.

About 200 positions will be eliminated, but fewer people will lose their jobs because some will be moved to other, temporarily vacant positions, a Legent spokeswoman said. The cuts and other cost-saving measures are expected to save the merged company $20 million annually.

THE CUTS AND other cost-saving measures are expected to save the merged company $20 million annually.

Goal, based in Columbus, Ohio, employs 800 people and sells software to support computer operations management, performance management and computer-based training.

Legent, based here, has 1,300 employees and has products in information systems business management, data center operations management, system resource management, network management and software management. The merger of the firms is scheduled to be completed Aug. 3.

Up and down

Separately, Legent said it will report for the quarter ended June 30 net income of $11.4 million on sales of more than $70 million, some 35% higher than the comparable quarter last year.

However, Legent said it will adopt new accounting guidelines for software revenue recognition. When restated to reflect that change, the company will report a 9% drop in earnings and a 3% fall in revenue.

John F. Burton, Legent's chief executive officer, said the merger with Goal is progressing smoothly, with product plans and organizational structure being mapped out.

TRENDS

IS budget control

Users tighten their belts and become more independent as organizations curb IS costs

Here's to the future

In the past three years, IS departments cut costs by reducing staff. If faced with future budgetary pressures, improving productivity will be higher on the agenda.

Past

Top priority

Reduced head count	64%
Reduced budget	60%
Cost spin-off to user organizations	21%

Last resort

Combine data centers	2%
Process improvement	2%
Re-engineering	1%

Future

Top priority

Increase automation/ productivity	73%
Reduce head count	52%
Reduce capital expenditures	48%

Last resort

Outsource	35%
Reorganize	33%
Convert to profit center	12%

Numbers have been rounded. Multiple responses allowed; list includes the first three and last three responses in each category

Doing more with less

Users become more self-sufficient when confronted with IS services cutbacks

Develop own capabilities	51%
Eliminate use	41%
Contract with vendors	22%
No service cutbacks	13%
Slow down development	6%
Improve prioritization	5%
Improve productivity	3%
Other	2%

In the black

Of those respondents who have cut costs during the last three years, **87%** view their cost-cutting programs as successful.

Base: 251 CIOs/senior information managers

Source: Gateway Information Services, Inc., New York

NEXT WEEK

Jon Holman left a consulting job to take over as director of technology at the big California law firm of Brobeck, Phleger & Harrison. He consolidated its server investments by installing superservers from NetFrame Systems, a decision that so far has left him — and the law firm — with no complaints. Read about it in Workgroup Computing.

Andy Freeberg

Offloading application development from mainframes to PCs promises productivity jumps of 30% to 40% and lower development costs. But it may not be right for everyone. Read In Depth to help you figure out whether such a move is appropriate for your shop and how to minimize hardware and software costs if you decide to take the plunge.

INSIDE LINES

Over the horizon

▶ Sources close to IBM say its PC group is pointing toward a September announcement of huge proportions. On the list is a revamp for most of the PS/2 line, including Models 50 through 80, a number of new PS/1s, the new PS/Direct line (to be sold through the mail-order channel) and two new notebooks, one an active-matrix color version with IBM's home-grown 386SLC inside it. A similar notebook with the 486SLC2 is slated for release next year.

An in-betweenie

▶ Compaq is planning to slip a couple of high-end notebooks between last month's low-end announcement and the server announcements scheduled for late summer. Both notebooks will feature a 33-MHz 486DX chip and 120M-byte hard drive to start. One will be monochrome; the other will use an active-matrix color screen. Look for them late next month.

No chip 'til its time

▶ Sources close to Intel say the giant chip maker has pushed back the announcement date for its still-unnamed 486 follow-on, the P5. Earlier this year, Intel had said it would announce the chip in late summer, but now it will wait until November, according to well-placed sources. One source cracked that Intel is still trying to figure out a name for the chip — hence, the delay. The announcement delay does not mean that the chip is behind schedule, though: Major vendors have the P5 and are building systems around it, and insiders at vendor firms say they fully expect to show P5-based products at Comdex/Fall '92.

Getting small

▶ AT&T and pen-based operating system maker Go will announce plans today to collaborate on wireless RISC-based portable computers that can send and receive messages, make phone calls, file hand-drawn messages, transmit photos or look up phone numbers. The technology should debut within six months in AT&T-labeled devices the size of a steno pad, to be priced at several thousand dollars, according to AT&T officials.

No bug spray necessary

▶ Microsoft is reportedly working on a project that would allow applications written to the Win32 API set to run on Apple's Macintosh. The program will run on Apple's System 7.0 and allow users to recompile Win32 applications to get an instant Macintosh program. Ironically, the project is code-named Alar, which is the name of an apple pesticide.

Defensive driving

▶ The National Safety Council is on the go — and so might be its IS department. Concurrent with an office move, the Chicago-based organization "will probably" outsource its entire computer operations, according to a source inside the council. However, no final decisions have been made, and it is unclear which outsourcers have bid for the job. Operations currently revolve around a Data General proprietary MV 40000 minicomputer, which the council will retain for "about six months, no more than a year" after changing locales in the middle of this month, the source added.

Thrift doesn't appear to be the watchword at money-losing DG. The company has spent a nice chunk of change beautifying its Westwood, Mass., executive suite with new furniture and window treatments, according to a minicomputer analyst. "Guess they wanted the big guys to look all spiffed up when potential customers came to town," the analyst noted. No doubt at least some would-be DG buyers might be more impressed with a non-red balance sheet instead. Maybe the big iron guys should take a tip from those high-flying box makers over at Dell. The Austin, Texas-based company has cleaned out executive suites and installed standard-issue desks and phones. The executives took a 5% pay cut for the year as well. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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COMPUTERWORLD

MIDCOURSE CORRECTION

OSF struggles to right listing ship

BY MARYFRAN JOHNSON
CW STAFF

First of a two-part series on the Open Software Foundation.

CAMBRIDGE, Mass. — The beginning of the end of the so-called "Unix wars" can be traced back to a breezy spring evening last year, when the presidents of the Open Software Foundation and Unix System Laboratories, Inc. met and made peace at Buoniconti's Italian restaurant.

The OSF's Tory *(l.) and USL's Pieper pledge their support publicly*

The results of that diplomatic dinner, held between USL's Roel Pieper and the OSF's David Tory, are emerging now with USL's recent public support for key OSF software technologies in system and network management.

Users are especially relieved to hear both companies now declaring that their Unix variants — Unix System V, Release 4 and OSF/1 — will be interoperable next year via common interfaces and specifications.

"Users care about being able to buy products that interoperate and heterogeneous platforms that work well together," said Warren Hoffman, a principal consultant at Du Pont Co. in Wilmington, Del. Hoffman is also a member of the OSF's end-user committee.

"If we don't want to be bogged down with

Continued on page 20

Olsen resigns on eve of big losses, layoffs

Successor must navigate Alpha migration

BY MELINDA-CAROL BALLOU and KIM S. NASH
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp.'s long overdue restructuring gained momentum last week with the surprise announcement of founder Kenneth Olsen's imminent retirement.

Underscoring the need for big changes at the beleaguered minicomputer maker is the expected confirmation this week of large losses that are expected to be followed by massive layoffs.

Analysts said DEC's painful restructuring could impact users in two key areas: Some unprofitable product lines are expected to be phased out, and DEC will finally tighten its marketing focus.

While earlier estimates for DEC's fiscal fourth-quarter operating loss hovered at about $250 million, analysts last week revised their projections to about $150 million following statements by DEC executives regarding a last-minute uptick in orders. DEC is expected to take a restructuring charge of approximately $1 billion to cover costs associated with laying off more than 10,000 employees, or about 10% of its work force, analysts said.

User: *Olsen will leave 'verybig hole'*

Olsen's handpicked successor is Robert Palmer, current vice president of manufacturing and logistics, who has overseen the production of Alpha, DEC's next-generation RISC chip. Palmer's mandate will be to en-

Continued on page 16

IBM downsizes AD/Cycle focus

BY JOHANNA AMBROSIO
CW STAFF

SAN JOSE, Calif. — Within the next 30 days, IBM is expected to disclose a major shift in focus for its AD/Cycle computer-aided software engineering initiative that will once and for all extend the framework beyond the mainframe to Unix and OS/2-based local-area networks, users and other sources said last week.

IBM executives were not available for comment, but a spokesman did confirm that IBM is "actively looking at extensions to AD/Cycle" to address the "need for workgroup development support."

Some observers lauded the pending announcement as IBM's response to customers wanting to develop software on OS/2 and AIX workstations. But others viewed it as IBM's acknowledgment of defeat with the much-troubled, mainframe-centric Repository Manager/MVS.

"That's a hard swerve away from the original concept. The idea was to have a central storage place and directory to better develop and reuse code for the entire enterprise. If you map that onto a LAN, it's not the same concept," said Howard Fosdick, an independent consultant and former president of the

Continued on page 15

Code recycling

Users rate Smalltalk compilers above C++ products for creating reusable code

See Buyers' Scorecard, page 43

Product	Reusability of code
Digitalk's Smalltalk/V	8.5
ParcPlace Systems' Objectworks/Smalltalk	8.3
Microsoft's C/C++	7.9
Borland's C++	7.3

Ratings indicate user satisfaction
Maximum score: 10

Users shun big iron for networked PCs

Micros could save Knight-Ridder $1.7 million

BY JOANIE M. WEXLER
CW STAFF

LEAWOOD, Kan. — After running its services on Tandem Computers, Inc. systems for a dozen years, worldwide information services firm Knight-Ridder Financial, Inc. is seriously considering a migration off the fault-tolerant machines onto high-end personal computers.

Vice President of Systems and Development Richard Boulderstone had actually scheduled the gutsy platform shift to begin late this month — until Tandem experts arrived last week to salvage the account by fine-tuning the system's performance. Their success has caused Knight-Ridder to reevaluate its plans, though the PC shift is still likely, he said.

Boulderstone had cited higher, more consistent throughput speeds as one impetus behind his plans. An expected savings of $1.7 million in processing power

Continued on page 14

Bendix Notes push tied to quality initiative

BY CAROL HILDEBRAND
CW STAFF

SOUTH BEND, Ind. — Bendix Automotive Systems Group last week kicked off a multimillion-dollar, multiyear downsizing process that could eventually move the company's entire automotive sector off an IBM Systems Network Architecture/Profs environment and onto a multiple-LAN platform that would be anchored by a 5,000-node license for Lotus Development Corp.'s Notes and CC:Mail.

Dennis Everett, group direc-

Continued on page 14

INSIDE

HP CEO John Young to retire Oct. 31; Lew Platt, HP's minicomputer and workstation chief, tapped as successor. Page 6.

The love/hate relationship between Apple and Microsoft gets mushy. Page 4.

Are hackers turning on one another? Page 6.

Oracle to unveil revamped applications line. Page 10.

Product Spotlight — The new word processors are decidedly *not* 'everything in a box.' Page 77.

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IN THIS ISSUE

NEWS

4 Interoperability is the cornerstone of some **Apple/Microsoft** announcements.

4 Number crunchers, take note: Advanced financial applications are on the way.

6 **HP** names minicomputer and workstation chief Lew Platt CEO.

6 No kin o' mine: Some hackers celebrate the recent arrests of MOD members.

8 The **Internet Engineering Task Force** plans to fix some limitations of SNMP and TCP/IP.

8 There are no dog days of summer for notebook vendors: Witness these new products.

10 Oracle Applications Release 9.0 products, to be introduced today, eliminate earlier flaws, **Oracle** says.

12 **Sequoia Systems** unveils an entry-level fault-tolerant system.

12 **DG** precedes its expected quarterly loss with the release of several Aviion-related products.

14 The San Francisco Bay Area's conductorless trains will soon be run by fault-tolerant Unix systems.

24 Wireless networks receive a boost from an **FCC** plan to allocate radio spectrum for their use.

Quotable

"If Alpha fails, DEC is dead."

RIKKI KIRZNER
DATAQUEST

On its growing product line. See story page 16.

DESKTOP COMPUTING

35 **Dell** pushes PC service and support.

WORKGROUP COMPUTING

45 Having to support multiple LAN operating systems may be worth the headaches.

ENTERPRISE NETWORKING

51 'Resource discovery tools' help users roam through the Internet.

LARGE SYSTEMS

59 **Sterling Software** looks to a portable application development language for its client/server push.

APPLICATION DEVELOPMENT

69 The computer system at an Ohio retirement agency is stepping aside to make way for a new generation.

MANAGER'S JOURNAL

87 Support remains a critical issue at most companies — almost 40% of which have no structured policy for PC support.

PRODUCT SPOTLIGHT

77 Word processors: from simple, fast and efficient to pumped-up and slowed-down.

BUYERS' SCORECARD

43 **ParcPlace Systems'** Objectworks/Smalltalk earns the top rating from OOP language users — but the competition is not far behind.

IN DEPTH

83 How you can move mainframe development onto PCs without shelling out a lot of dough. By Mark A. Butterline.

DEPARTMENTS

6, 16 News Shorts
30 Advanced Technology
32 Editorial
89 Calendar
92 Computer Careers
99 Marketplace
104 Stocks
105 Computer Industry
106 Inside Lines

The 5th Wave

"I JUST DON'T THINK THIS NEW SALES KID IS GONNA WORK OUT."

EXECUTIVE BRIEFING

■ **Surprise retirements announced last week** by longtime DEC President Ken Olsen and HP President John Young portend significant changes for this pair of major system vendors. DEC is beset by financial woes as it struggles through yet another reorganization, while the much stronger HP is striving to make inroads in corporate data center accounts. **Pages 1, 6.**

■ **With the Unix wars now over, the OSF is entering a critical new stage** in its four-year existence. Its six major sponsors are pondering changes this summer in how the $55 million nonprofit foundation goes about its business. End users, meanwhile, are anxious to see delivery of some long-promised systems and network management software for distributed computing. **Page 1.**

■ **IBM prepares to extend AD/Cycle and Repository Manager to workstations,** while the eventual fate of the mainframe product line remains unclear. **Page 1.**

■ **Microsoft and Apple** shelve their differences and outline plans for future joint technologies. **Page 4.**

■ **Knight-Ridder is considering bumping some of its service processing** off fault-tolerant Tandem systems to run on orders-of-magnitude cheaper PCs. **Page 1.**

■ **Stratus Computer and Sequoia Systems,** neighboring fault-tolerant system vendors, both roll out new hardware. **Page 12.**

■ **Offloading mainframe development to PCs** can increase developer productivity 30% to 40%, but is it right for everybody? **Page 83.**

■ **The latest Windows word processors are loaded with features,** but some people are finding they need both a Windows version for fancy layout tricks and a DOS version to pump out documents quickly. **Page 77.**

■ **A proprietary operating system wins out** at General Mills, which scraps a Unix project in favor of HP's MPE/IX. **Page 59.**

■ **The success of automated teller machines** has sparked interest in self-service technology by insurers and hotels. **Page 88.**

■ **PC support problems grow** as user applications become more complex. IS departments are scrambling to fill gaps. **Page 87.**

■ **Dell differentiates between its low-priced and deluxe PCs** by bundling service options ranging from compatibility guarantees to telephone support. **Page 35.**

■ **Who needs Windows?** A New York social service organization finds low-cost DOS environment serves its needs just fine. **Page 35.**

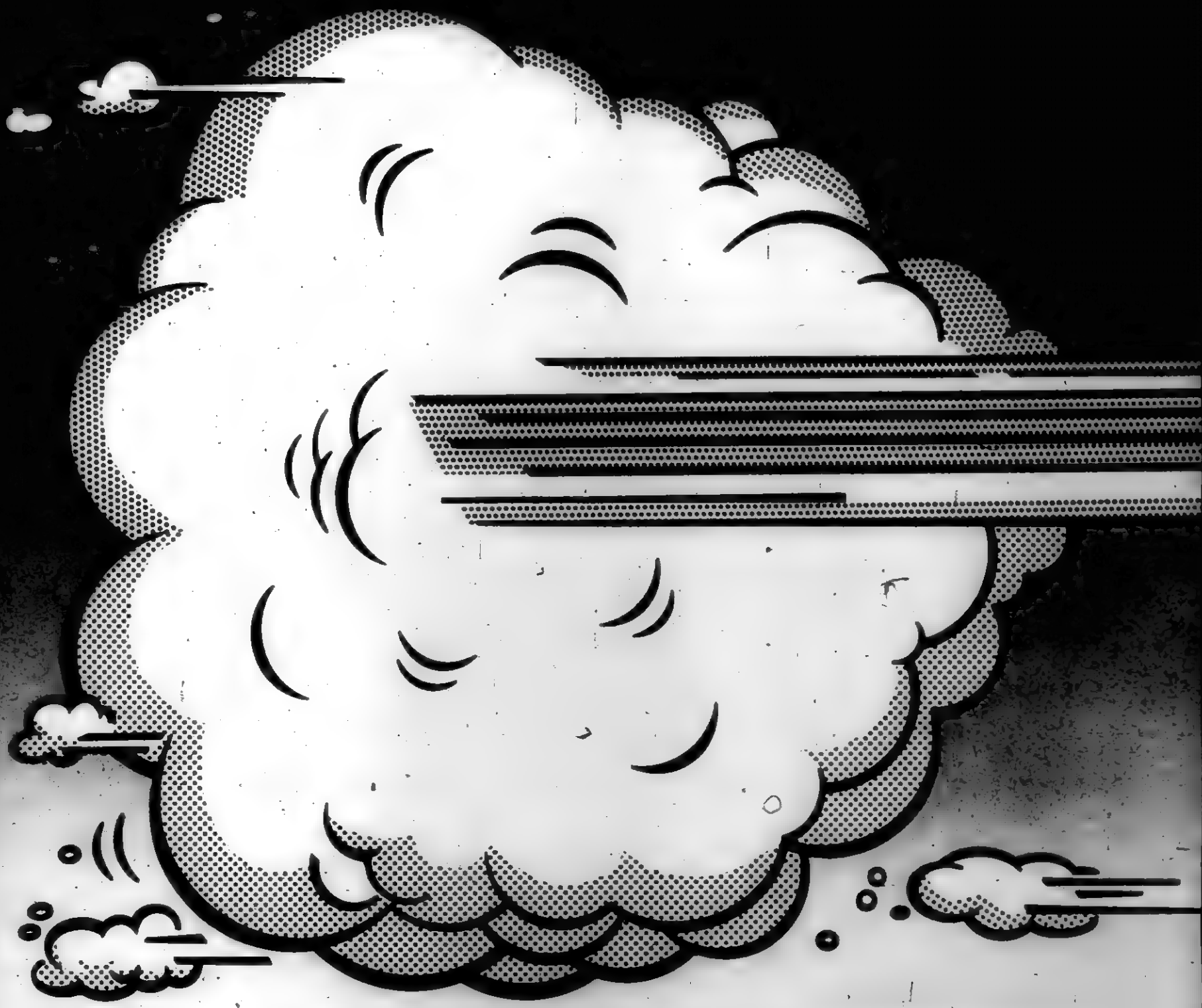
■ **Coffee and your morning computer?** It may happen, as newspapers begin to dabble in on-line delivery. **Page 30.**

■ **A little LAN diversity isn't bad,** a report notes. Emerging distributed computing standards should overcome operating system incompatibilities. **Page 45.**

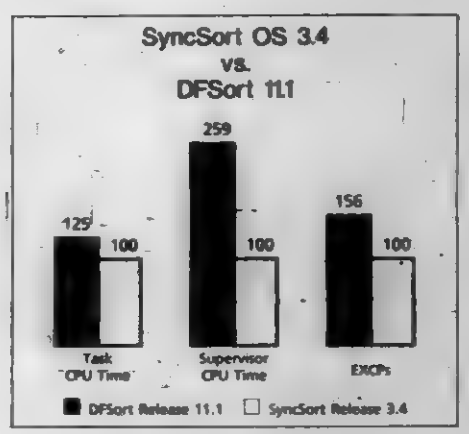
■ **A European CASE standard is winning U.S. backers** for its ability to integrate diverse proprietary tools. **Page 69.**

■ **Sterling Software gets client/server** religion. It's betting on the Zim application development system to break out of its mainframe mold. **Page 59.**

■ **On site this week:** Superservers bring order to a chaotic computing setup at a San Francisco-based law firm. **Page 45.** A Canadian credit union breathes easier as remote channel extenders cut backup times to nanoseconds. **Page 51.** A giant CASE project brings wrenching organizational change to an Ohio state agency, but IS staffers say it was worth the trouble. **Page 69.**



HERE'S WHERE WE LEAVE THE COMPETITION.



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Apple, Microsoft announce joint tech plans

Support, integration agreements highlight competitive cease-fire; product upgrades announced

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — The love/hate relationship between Microsoft Corp. and Apple Computer, Inc. continued unabated last week as the courtroom foes and desktop rivals shelved their differences long enough to outline future joint technologies plans.

In addition, Microsoft announced updates to its project management, mail and integrated application packages for Apple's Macintosh and revealed plans to develop software for the next-generation Macintosh computer, the PowerPC.

The pair's joint technology initiatives covered a number of different areas to enhance productivity for mutual customers. They will begin to arrive in the first half of 1993, according to both companies, and will include the following features:

- Apple will support Microsoft's Open Database Connectivity (ODBC) application programming interface (API) as a standard facility of the Macintosh Data Access Manager, thus allowing ODBC-compliant applications access to server databases through one set of API calls. ODBC is a call-level interface specification developed by the SQL Access Group, a consortium of more than 40 vendors.
- Both companies said they would work to integrate the functionality of ODBC and Apple's Data Access Language (DAL). Apple announced plans to build an ODBC/DAL client that will translate ODBC calls and information into DAL functions and provide ODBC applications access to DAL servers. It also intends to develop an ODBC/DAL client for Windows.
- Microsoft will support Apple's Open Collaboration Environment, which integrates a messaging function into the next major update of Microsoft's Word and Excel.
- Microsoft gave a sneak peek at a new FoxBase for the Macintosh that it hopes to deliver by year's end.

In the politics

Will the agreements have any significant effect on the day-to-day work lives of users? "I'm all for anything that will help interoperability, and this may do that in some small way, but I think the most important thing about this agreement is the politics," said Rick Marolt, information systems manager at Great Central Insurance Co. in Peoria, Ill.

The application updates mark a periodic refresh for Microsoft's Macintosh line. Works Version 3.0 is a major upgrade of the integrated productivity application that offers a word processor, database, spreadsheet, drawing and communications capabilities in one package. It is expected to be available in the third quarter for $249.

Project Version 3.0 is designed to organize, schedule, chart and summarize all aspects of a project and can be easily customized. It is scheduled to be available by early next month and sport a retail price of $695.

Microsoft also announced Version 3.1 of Mail for AppleTalk, which adds remote access and wide-area connectivity. It is slated to ship next month for $395.

Apple Chairman John Sculley said that while the two firms have sparred in other areas, Microsoft has always supported "the mother ship Macintosh" and that common business sense dictates that the two cooperate. Microsoft Chairman Bill Gates agreed: "You can't approach this business in an emotional way. In many ways we're Apple's best supporter."

The Apple/Microsoft relationship — which fluctuates widely between bitter competitive battles and supportive announcements — certainly ranks as one of the most chameleon-like relationships in the computer industry, observers said.

Although the firms have worked closely together for more than a decade, Apple is currently involved in a bitter 4-year-old copyright suit against Microsoft and Hewlett-Packard Co., which it has charged with illegally copying graphical elements of the Macintosh screen appearance into their Windows and NewWave interfaces, respectively.

Lotus results show Windows app struggles

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — In reporting revenue of $220 million for its second quarter last week, the official word from Lotus Development Corp. was that while the results "reflect significant progress," the company "currently faces challenges in spreadsheet market growth, pricing and worldwide economic trends."

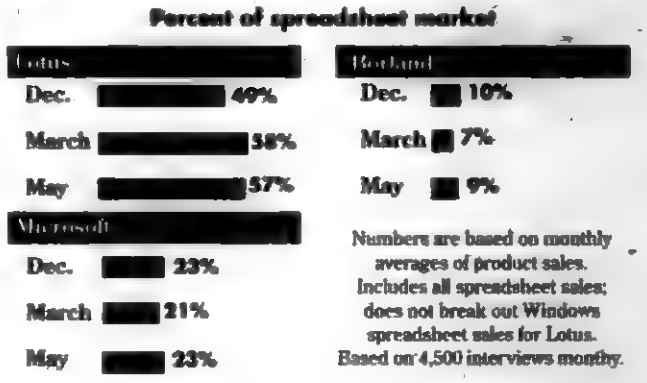
Translation: There is still a heck of a struggle between Lotus and Microsoft Corp. to win over users to their Windows applications, according to several industry observers.

Lotus reported net income of $14.9 million for the quarter ending in June, up from $9.2 million last year. The results are in line with Lotus' announcement last month that revenue would be about $10 million less than expected.

Lotus and Microsoft have downplayed recent rumors that their Windows applications suites are selling at bargain-basement prices. Even so, users and analysts said they are aware of price cuts on these packages, which include a spreadsheet, a word processing and graphics application and a single mail module. This amounts to more than $1,500 worth of software — but Microsoft lists Office at $750, and Lotus prices Smartsuite at $795.

Holding on

Although Lotus has had trouble penetrating the Windows spreadsheet segment, its overall market share has grown in 1992



Source: Computer Intelligence

"Over the last several months, we've seen indications of very low prices for suites," said Jude Gartland, a senior vice president at Shearson Lehman Brothers, Inc. in New York.

Tim McCollum, a Wall Street analyst and senior vice president at Dean Witter Reynolds, said his company recently made some Microsoft Office purchases. While he did not know the exact price, he said he believed the final cost was less than $300 a suite.

Officials at both companies said the real issue is not so much the price war but a more basic shift in users' buying patterns. Many users are looking to suites to provide a set of applications from a single source, they said. The price is hard to beat, and support is simplified.

For the vendors, it means less revenue per application in the short term. But it also indicates a single customer uses four of their applications, which could mean a greater revenue stream per customer over time.

Advanced financial tools home in on spreadsheets

BY ROSEMARY HAMILTON
CW STAFF

A new wave in personal computer financial tools is rolling in, bringing with it a promise of relief to users who are tired of the hassles that come with managing complex spreadsheets.

"The spreadsheet has been king, and there haven't been a whole lot of changes," said Karl Dahlin, a senior systems analyst at Raynet Corp., a supplier of fiber-optic systems. "We'd developed them to a level of complexity where maintenance became impossible."

Lotus Development Corp. and Objective Software, a Palo Alto, Calif., start-up, each plan to ship advanced financial analysis tools soon.

Frank Ingari, a Lotus vice president, said Improv for Microsoft Corp.'s Windows will ship to beta-test customers "within a couple months" and is on target for a debut late this year. Objective will officially launch Spreadbase for the Apple Computer, Inc. Macintosh next week and plans to preview a Windows version at Comdex/Fall '92.

"It's about time somebody did this," said Jeffrey van Skyhawk, manager of information technology assessment at Bose Corp. in Framingham, Mass., who beta-tested Spreadbase.

Computer Associates International, Inc. has been selling CA-Compete, a Windows-based tool that integrates spreadsheet and database technology, since early last year. And officials from Microsoft and Borland International, Inc. said they are also tackling this issue but will do so by improving their current spreadsheets rather than by delivering new products.

For example, Borland's Quattro Pro for Windows, which still does not have an official ship date, will include a "core database engine," said Lee Phillips, director of product management at the company.

"We don't see that technology like Improv is the solution for a broad class of [spreadsheet] problems," Phillips said. "Borland's whole take on this thing is to look at whole issues that are [about] data organization and data retrieval. They are probably better addressed with database technology, not spreadsheet technology."

Microsoft said it, too, will add to its spreadsheet, although it did not spell out what functions will be rolled into Excel.

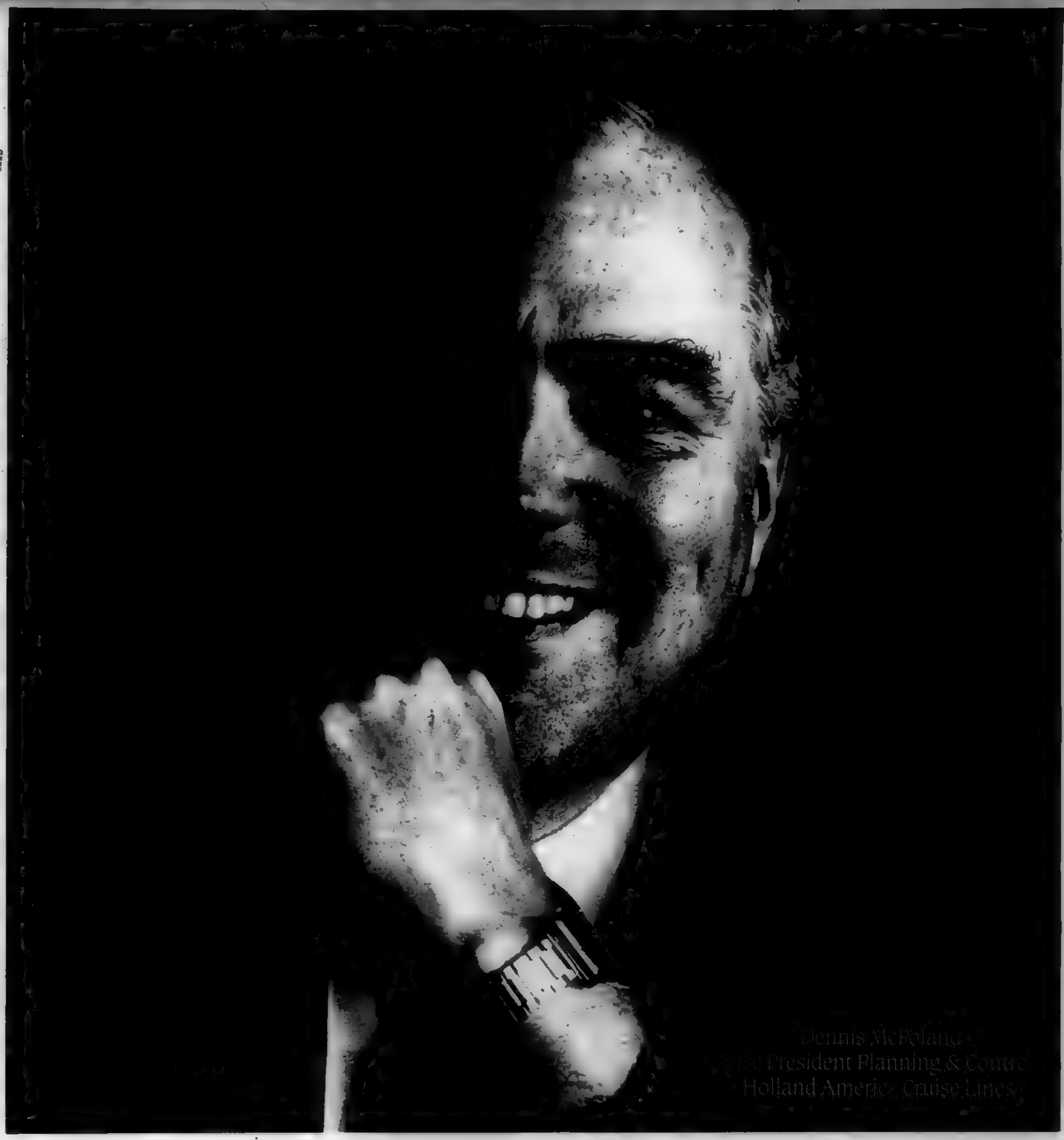
"Every company uses spreadsheets, and probably no company is totally satisfied with how they do it," said Lewis Levin, general manager at the Excel business unit. "Maybe too much of their work still has to be done by hand, and they wish their spreadsheet would do more of that. We intend to make that much easier."

However, at least one information systems executive was impressed with Improv, which Ingari described as more spreadsheet than database technology. "I've looked at Improv, and it has a couple strengths," said Jude Gartland, a senior vice president at Shearson Lehman Brothers, Inc. in New York.

Currently, there are many products available to improve a user's ability to work with financial data on the desktop, from executive information systems to data access tools that help load spreadsheets with data from outside sources.

But these latest efforts are an attempt to bump spreadsheets up to a new level.

"We are talking about business analysts who have horribly complicated spreadsheets or are using decision support tools that required a lot of MIS involvement and so that limited them," said Bernd Harzog, an analyst at Gartner Group, Inc. in Stamford, Conn.



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NEWS SHORTS

Perot back in the computing saddle

Ross Perot will return to Perot Systems Corp. after ending his unofficial bid for the presidency, a spokesman said. Perot will not displace Morton Meyerson, who left Dell Computer Corp. in May to become chairman and chief executive officer so that Perot could organize his campaign [CW, June 1]. "We expect [he'll do] strategic work, helping us to design major deals . . . [and] develop our company," said DeSoto Jordan, a founder of Perot Systems.

IBM's quarterly revenue jumps 10%

Continued cost-cutting and a jump of more than 40% in service revenue contributed to a 10% jump in IBM's fiscal second-quarter sales. IBM reported $1.2 billion in second-quarter profits on revenue of $16.2 billion. This time last year the company posted a profit of $126 million on sales of $14.7 billion. Chairman John Akers said that software growth is also helping IBM make "steady progress in reshaping" itself.

Apple's quarterly results shine

Sales of Apple Computer, Inc.'s popular PowerBook portable made a sizable dent in the firm's coffers as the Cupertino, Calif.-based company reported healthy third-quarter earnings last week. Revenue for the third fiscal quarter, which ended June 26, was $1.74 billion, a 13.8% increase over the $1.529 billion reported in the third quarter of the previous year. Net income was $132 million, compared to a net loss of $53 million in the same period last year that reflected a onetime $224 million restructuring charge.

IBM to boost PVS systems

IBM this week will extend the performance of its Power Visualization System (PVS) with a boost in processing power, memory and functionality, according to sources close to IBM. The top-of-the-line PVS Model 4 Server will include 32 Intel Corp. I860XP processors in parallel and scales up to 2.5G bytes of system memory.

Unisys network processor to debut

Next week, Unisys Corp. is expected to introduce Communications Access Processing, a network processor designed to promote interoperability between multivendor computer platforms and IBM's Systems Network Architecture (SNA) mainframe environment. It will handle front-end processors, remote concentrators, terminal concentrators, bridges and routers. It provides IBM 3270 terminal access to applications running under Unix and routes information from local-area networks over an SNA wide-area network.

Bull executive found murdered

The dismembered body of murder victim Thomas Mulcahy, director of international account sales at Billerica, Mass.-based Bull HN Information Systems, Inc., was discovered in New Jersey last week by a state-employed maintenance crew. Neither police nor Mulcahy's family have stated possible explanations for the mysterious death of the 22-year Bull veteran.

Short takes

Emulex Corp. will not sell its Digital Equipment Corp. storage line to **System Industries, Inc.** after "exhaustive examination" of a buyout proposal announced last month. . . . **Intel**'s supercomputer division and **Advanced Visual Systems, Inc.** (AVS) will make AVS' visualization software available on Intel supercomputers, the companies said last week. . . . **Dataquest, Inc.** is projecting that Japanese semiconductor makers will reduce capital spending on plant and equipment by 29% in fiscal 1992. . . . **Cypress Semiconductor Corp.** said it has beaten **Texas Instruments, Inc.** in a patent infringement case that resulted in a TI patent being invalidated. TI sued Cypress over circuitry used in Cypress' programmable logic devices. . . . **WordStar International, Inc.** said it will acquire **Zsoft Corp.**, a maker of graphics and image editing software.

More news shorts on page 16

Platt to replace Young as HP CEO

The move could boost vendor's penetration of the corporate data center

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co., which is waging an all-out effort to raise its profile as a vendor for the corporate data center, last week named its minicomputer and workstation chief, Lew Platt, as its next chief executive officer.

Platt will take over Nov. 1 for John Young, who is retiring after 14 years. During Young's reign, HP was transformed from a company known mainly for test equipment and calculators to one that now vies with IBM and Digital Equipment Corp. for information systems mind share.

Chief Operating Officer Dean Morton, who has shared duties with Young since 1990, when the company created a chief executive office, is also retiring. Young and Morton, both 60, described their pending early retirements as voluntary.

By naming Platt, 51, the HP board ended months of speculation over whether Platt or 55-year-old Richard Hackborn, HP's printer, peripherals and personal computer chief, would succeed Young. Together, Platt's computer systems organization and Hackborn's computer products organization account for the bulk of the firm's growth.

Young *brought HP to the big league to compete with DEC and IBM*

For Hackborn, growth has come largely through increasing sales of HP's highly successful laser and inkjet printers. Platt's success has come through overseeing HP's move into Unix in both its workstation and its minicomputer business.

Users and analysts noted last week that a change was in order as the company steps up its effort to replace IBM iron in corporate data centers with both its Unix and proprietary MPE/IX minicomputers.

Young "was able to run with it for a distance. But now, with the move to Unix and other pressures they're feeling, there needs to be someone with a different outlook and someone more focused on systems," said Roger Lindquist, manager of information services at Dryers Grand Ice Cream, Inc. in Oakland, Calif.

One of Platt's largest challenges will be to enhance the firm's professional services and systems integration capabilities, Young said.

Platt agreed: "We have the hardware. Now we have to demonstrate we can help users migrate platforms and that we can do the consulting."

Frustrated hackers may have helped feds in MOD sting

BY JAMES DALY
CW STAFF

NEW YORK — Are hackers beginning to police themselves? The five men recently charged with cracking into scores of complex computer systems during the last two years may have been fingered by other hackers who had grown weary of the group's penchant for destruction and vindictiveness, members of the hacker community said.

The arrest of the defendants, whom federal law enforcement officials claimed were members of a confederation variously called the "Masters of Deception" and the "Masters of Disaster" (MOD), was cause for celebration in some quarters where the group is known as a spiteful fringe element.

"Some of these guys were a big pain," said one source who requested anonymity for fear that unindicted MOD members would plot revenge. "They used their skills to harass others, which is not what hacking is all about. MOD came with a 'you will respect us' attitude, and no one liked it."

Said another: "In the past few months, there has been a lot of muttering on the [bulletin] boards about these guys."

In one episode, MOD members reportedly arranged for the modem of a computer at the University of Louisville in Kentucky to continually dial the home number of a hacker bulletin board member who refused to grant them greater access privileges. A similar threat was heard in Maryland.

In the indictment, the defendants are accused of carrying on a conversation in early November 1991 in which they sought instructions on how to add and remove credit delinquency reports "to destroy people's lives . . . or make them look like a saint." Unlike many other hacker organizations, the members of MOD agreed to share important computer information only among themselves and not with other hackers.

Officials mum

Who exactly helped the FBI, Secret Service and U.S. Attorney General's Office prepare a case against the group is still anyone's guess. Assistant U.S. Attorney Stephen Fishbein is not saying. He confirmed that the investigation into the MOD began in 1990, but he would not elaborate on how or why it was launched or who participated. FBI and Secret Service officials were equally mute.

Some observers said that if the charges are true, the men were not true "hackers" at all.

"Hacking is something done in the spirit of creative playfulness, and people who break into computer security systems aren't hackers — they're criminals," said Richard Stahlman, president of the Cambridge, Mass.-based Free Software Foundation, a public charity that develops free software. The foundation had several files on one computer deleted by a hacker who some claimed belonged to the MOD.

The MOD hackers are charged with breaking into computer systems at several regional telephone companies, Fortune 500 firms including Martin Marietta Corp., universities and credit-reporting concerns such as TRW, Inc., which reportedly had 176 consumer credit reports stolen and sold to private investigators. The 11-count indictment accuses the defendants of computer fraud, computer tampering, wire fraud, illegal wiretapping and conspiracy.

But some hackers said the charges are like trying to killing ants with a sledgehammer. "These guys may have acted idiotically, but this was a stupid way to get back at them," said Emmanuel Goldstein, editor of *2600*, a quarterly magazine for the hacker community based in Middle Island, N.Y.

Longtime hackers said the MOD wanted to move into the vacuum left when the Legion of Doom began to disintegrate in late 1989 and early 1990 after a series of arrests in Atlanta and Texas. Federal law enforcement officials have described the Legion of Doom as a group of about 15 computer enthusiasts whose members rerouted calls, stole and altered data and disrupted telephone services.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

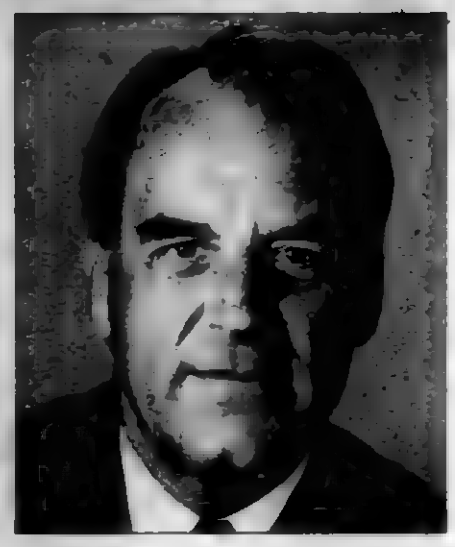
Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation



"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

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Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.

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Sun upgrade offer targets Apollo users

BY MARYFRAN JOHNSON
CW STAFF

Let the upgrade games begin.

Sun Microsystems, Inc. began pitching a hardware trade-in campaign to Hewlett-Packard Co.'s Apollo workstation users last week. Sun, based in Mountain View, Calif., is offering discounts from $3,300 to $6,800 off its SPARCstation IPX and SPARCstation 2 machines to users ready to jettison their Apollo boxes.

Sun is snapping at the shiny lure of the more than 100,000 Apollo machines installed worldwide. Purchased by HP in 1989, Apollo Computer, Inc.'s proprietary Domain operating system recently entered what users are calling "hospice care" — meaning that no more major releases are coming, but HP support is promised until the year 2000.

This means war

Sun claimed that its program, which runs through Dec. 31, offers 50% higher trade-in values than HP's. Palo Alto, Calif.-based HP said it would "stay on top of the price war," claiming to have already spent millions on programs to migrate the Apollo base. HP recently launched a "dealmaker program" for Apollo users that discounts fully configured HP Series 700 workstations by 40%.

Bigger hurdles than pricing stand in Sun's way, however. Many Domain users dislike Unix in general and Sun specifically.

"Sun and Apollo were arch-enemies," said Doug Eltoft, chairman of the Interworks HP/Apollo workstation user group and director of the Iowa Computer-Aided Engineering Network at the University of Iowa. "It's a religious thing. Computer people aren't necessarily rational."

Eltoft manages a network with 200 Apollo/Domain workstations and another 100 Unix-based HP/Apollo 9000 Series 700 workstations. "Domain was an operating system designed around networking, while Unix was patched together to understand networking afterwards," he said. "Anybody on Domain who is hoping to get functionality back is waiting for the Open Software Foundation's DCE."

The integrated set of system management software in the Distributed Computing Environment (DCE) includes Apollo's Network Computing System distributed file structure, Eltoft noted. HP plans to layer DCE software in the HP/UX 9.0 Unix operating system set for release later this year.

Another deciding factor for some users may be that SPARCstations cannot be plugged into Apollo Token Ring networks, HP officials said. They can offer Apollo users an add-in networking card to plug Series 700 workstations into those networks. HP also produces a Domain-lookalike user interface on the Series 700 that Sun does not.

Notebook market heats up as 486s hit the beach

BY MICHAEL FITZGERALD
CW STAFF

The fabled summer slump does not apply to the notebook market. Four vendors released new products last week, including some that use Intel Corp.'s I486 or compatible processors.

The Intel 486 products came from Advanced Logic Research, Inc., while Grid Systems Corp. released a notebook based on Cyrix Corp.'s 386/486SX hybrid, the CX486SLC.

Zeos International Ltd. released a 386SL-based notebook with an innovative screen design, and Librex Computer Systems, Inc. released a notebook that uses Advanced Micro Devices, Inc.'s AM386SXL.

Most market research firms have said they do not expect the 486 to become the dominant notebook processor in the foreseeable future, and few vendors offer it. However, in the wake of significant price cuts from Intel on its 486DX and 486SX processors, some said they are rethinking their 486 sales projections.

"The 486 will look stronger this year than we initially thought because of the opportunity that some vendors are taking to bring price points down to competitive levels with the 386," said Richard Zwetchkenbaum, senior personal computer analyst at International Data Corp. in Framingham, Mass.

For example, executives at Toshiba America Information Systems, Inc. said recently that they expect their 486 notebooks to supplant their 386 products as standard by year's end, in light of declines in chip pricing. At the same time, sources said Toshiba plans to release a $1,495 386SX notebook in September.

While 486 power is not likely to interest all users, several said they were looking at 486 notebooks.

"We would like more 486 notebooks for our work," James Slattery, supervisor of the systems group at Dow Jones, Inc., said at a recent trade show.

"We would like to switch to the 486," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. Nelson said his company might wait for 486 notebooks with 200M- or 240M-byte hard drives, which he said he expects in the next few months, before approving them for purchase.

He does not expect to pay a significant premium for a 486 notebook. "Incremental prices are getting closer and closer all the time," he said.

Slattery said Dow Jones will wait to see if prices will fall further.

The new notebooks continue this trend. The Grid 1755/486SLC costs $2,795, which is what many 386SX notebooks listed for at the beginning of this year. ALR's Intel 486SX and DX-based Ranger MC models offer a passive-matrix color screen with 60M-, 80M- or 120M-byte hard drives and have a lower base price than 386SL-based active-matrix color notebooks from other vendors. The Zeos and Librex 386-based notebooks each start at less than $1,900.

Zeos may have scored a first, by building a screen that can tilt or swivel to a variety of angles. The Zeos Freestyle/SL is also the first notebook the company has designed and built in-house.

While the 386SX and derivatives appear to have a solid future, analysts said lower prices on 486-based machines were the death knell for the 286 chip.

"The price differential is not that great now, and I don't see much of a future for the 286," said William Lempesis, president of Lempesis Research in Pleasanton, Calif.

Moving on up

A variety of vendors last week expanded their notebook product lines, some adding 486-based products

	Weight	Chip	Price	Available	Screen
[illegible] 1755/ 486SLC	6¼ pounds	Cyrix 486SLC	$2,795 (w/ [illegible]-byte drive)	Now	8½ in. VGA [illegible]
ALR [illegible]	7½ pounds	Intel 25-MHz 486SX 25-MHz 486DX	SX: $4,495 (w/ 60M-byte drive) DX: $5,495 (w/ 120M-byte drive)	Late [illegible]	8½ - in. VGA passive-matrix color
Zeos Freestyle SL	8.8 pounds	Intel 25-MHz 386SL	$3,895 (w/ [illegible]-byte drive)	Now/ [illegible]	Preview 9½ in. VGA [illegible]
Librex VS386SXL	6.2 pounds	AMD 25-MHz 386SXL	$1,799 (w/ [illegible]-byte drive)	Now	8½ in. VGA [illegible]

CW Chart: Stephanie Faucher

Internet group seeks SNMP, TCP/IP fixes

BY ELISABETH HORWITT
CW STAFF

CAMBRIDGE, Mass. — Some 700 members of the Internet Engineering Task Force (IETF) reached an informal consensus last week on how to quickly fix some serious limitations in Simple Network Management Protocol (SNMP) and Transmission Control Protocol/Internet Protocol (TCP/IP).

At stake is the two protocols' continuing status as successful de facto standards that can meet users' increasingly complex needs into the next century.

SNMP, which has remained virtually static for the past four years, is missing key functions such as the ability to interconnect different network management systems and collect network management data in bulk. TCP/IP, meanwhile, suffers from a limited address space that may cause Internet to run out of new addresses to assign within three years.

IETF members got their first look at Simple Management Protocol (SMP), which four prominent SNMP software developers are proposing as SNMP's successor (CW, June 29). The protocol is said to remedy the SNMP problems described above and also support other transport protocols besides TCP/IP.

"It was clear there was a consensus" around SMP, said Chuck Davin, the IETF's area director of network management. A warm reception, coupled with the absence of rivals, makes it almost certain that SMP will become the new SNMP, Davin said. A stable draft of SMP should become available between November and March.

Things have been a little more stormy in the TCP/IP arena.

Internet, a TCP/IP-based international network for the research, government and academic communities, is doubling in size every year — which means that TCP/IP's 32-bit addressing scheme is likely to run out of addresses sometime within the next five years, according to IETF estimates.

Two weeks prior to the meeting, the Internet Advisory Board proposed that the community forego further debate on various TCP/IP addressing proposals and get right down to "aggressive development and deployment" of an architecture based on the OSI Connectionless Network Protocol (CW, July 13).

The board's proposal generated a storm of protests that users needed more time to choose the right scheme.

OSI-based routing for TCP/IP could actually make life easier for federal agencies, which are mandated by the government to support OSI on their networks, said Steve Wolff, director of networking at the National Science Foundation. "We urge the community to find some resolution of the addressing problem as rapidly as possible."

Bowing to user pressure, The Internet Advisory Board effectively reversed its position at the start of last week's meeting. Its new recommendation was for the community to go on evaluating various addressing scheme submissions with the hope of making a choice by the next IETF meeting in November.

High standards

TCP/IP is still the most dominant non-IBM networking standard

"What network protocols are being used on your company's network?"
(Multiple responses allowed)

Percent of sites
Total: 400
(60 from government sector)

IBM SDLC	61%
TCP/IP	52%
Async	46%
Novell IPX	38%
DECnet	35%
IBM LU6.2	34%
Bisync	31%
OSI	13%
Other	18%

Source: Business Research Group, Inc

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Ask bypasses Ingres to build Unix-based program suite

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — The Ask Cos.' 1990 purchase of Ingres Corp. was supposed to marry Ingres' open systems database with Ask's financial and manufacturing software. The marriage took place, but the internal development process bogged down, sources said, leaving the happy couple with no offspring — yet.

But Ask needed software if it was to meet its promise to offer a line of Unix applications this year. So last week, the company unveiled a Unix-based applications suite called Manman/X developed without Ingres' aid or technology.

The suite was quietly purchased last summer from Baan International B.V. in the Netherlands for an undisclosed sum, sources said. Baan's Unix applications were not written for the Ingres database, however, and must be ported to Ingres, Ask confirmed.

"We bought the source code, and we can do with it what we like," said Peter West, Ask's vice president of marketing. Manman/X will ship in September, he said, although prices for the Manman/X applications have not yet been disclosed.

Manman/X will not be confined to Ingres. "It's reasonable for a customer to say, 'I want to run on Ingres, on [DEC's] Rdb or on Oracle,' " West said. "For an application vendor, it's advisable to run on more than one database.

"If you can go to market with a product that has some kind of track record, you can turn it into revenue much faster," West said, noting that Baan's product has been out for two or three years.

Industry analysts said $400 million Ask had to act now because Oracle Corp. and Dun & Bradstreet Software already field Unix applications with relational databases. Ask's 12-year-old Manman product runs on proprietary computers from Digital Equipment Corp. and Hewlett-Packard Co. "They could not wait," said Peter Kastner, a software analyst at the Aberdeen Group in Boston who lauded the move.

Advance, the product suite Ask is developing with Ingres that was viewed as a weapon against rival application vendors, was due to ship this year. For now, it remains on the drawing board, Ingres said.

Complex problems

Performance problems cropped up during a beta-test program earlier this year. "What we learned from the beta sites was that there were performance problems that were not related to Ingres or to relational database technology in general," West said. Advance "is incredibly complex code."

When Advance is ready, it will be able to exchange data with Manman/X, West said. He said the products would be complementary. "We have more options than before," he said. "We will be able to evolve our product line with Manman/X, rather than replacing it with Advance."

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Oracle to unveil new applications

REDWOOD CITY, Calif. — After a year inside a skunkworks development laboratory, Oracle Corp.'s revamped application software packages will be introduced today in San Francisco. The Oracle Applications Release 9.0 products have been rewritten to eliminate quality flaws associated with earlier releases, said George Koch, senior vice president at Oracle's application division.

To prevent the kind of bugs associated with the first release of Oracle Financials two years ago, Oracle involved 40 user companies in its development process. Extensive beta testing at two dozen sites worldwide began in January and ended in May. The products shipped quietly last month.

Industry analysts who viewed some of the 23 application packages last week said users will be able to adjust the amount of work done by personal computer clients and database servers.

Options will allow users to turn on-screen features on and off as needed. Database report forms can be stored on servers, which saves PC memory and reduces network traffic.

Applications Release 9.0 will be provided as a free upgrade to the 800 companies that own earlier versions.

JEAN S. BOZMAN

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Page 98

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Stratus pads OLTP family with scalable systems

BY MELINDA-CAROL BALLOU
CW STAFF

MARLBORO, Mass. — Stratus Computer, Inc. extended its series of Intel Corp. 1860XR reduced instruction set computing (RISC)-based on-line transaction processor (OLTP), fault-tolerant computers last week with scalable systems that span the performance gamut.

The next generation of XA/R systems includes single-, dual- and quad-processor systems (see chart), which offer more than double the performance of the company's complex instruction set computing (CISC)-based XA2000 series computers for a comparable price, Stratus officials said. The 1860-based systems must sustain the company's user base until Stratus ships Hewlett-Packard Co.'s Precision Architecture-RISC-based systems sometime during 1994 or 1995, analysts noted.

High-end Models 300 through 330 are scalable from uniprocessor fault-tolerant systems to multiprocessor systems via a new twin-processor technology, Stratus officials said. Models 310, 320 and 330 offer two, four or six CPUs, respectively.

"The major technical innovation for us was the addition of multiprocessing for the RISC line," said Barbara Babcock, vice president of corporate marketing at Stratus. Applications are source code-compatible across the firm's product line, she said, which can run either the company's proprietary VOS operating system or FTX, Stratus' implementation of Unix System V, Release 4 from Unix System Laboratories, Inc.

The midrange systems — Models 25, 35 and 45 — will replace the company's previous XA/R Model 20, which began shipping last year, officials said.

Industry analysts were positive in their assessments of the systems, which target customers ranging from telecommunications and health care to the financial industries. "I think this line will carry [Stratus] until the second half of 1994," said Carolyn Osgood, a senior analyst at International Data Corp., a market research firm in Framingham, Mass.

Only 3% of Stratus' more than 5,000 installed systems have moved to the two XA/R RISC-based products that were available last year. This means that practically all of Stratus' user base is still running applications on the XA2000 series and may soon require the price/performance upgrades and scalability of the new line of XA/R. Many may not want to wait several years for platforms based on HP's PA-RISC architecture, according to industry analysts.

Tom Donaghey, manager of distribution systems at the Gillette North Atlantic Group in North Andover, Mass., a division of The Gillette Co., had an original CISC-based Stratus XA400 machine, which he upgraded to the entry-level XA/R Model 5 late last month.

"We were at first looking to expand to the XA2000 line, and then we decided to hold out until they came out with this line of RISC technology," he said.

"Response is a lot better, and the products offer increased capacity and compute power so we can expand applications," Donaghey noted.

Shiny and new
Stratus' new processor line is based on Intel's 1860XR processor. A sampling:

One logical CPU*	VOS 11.1, FTX 2.1	March 1992	32M-byte memory, I/O subsystem, 66M-byte disk, operating system	$124,000 with FTX, $145,000 with VOS
Two logical CPUs*	VOS 11.5, FTX 2.2	Fourth-quarter 1992	64M-byte memory, I/O subsystem, operating system	$394,000 with FTX, $450,000 with VOS
Four logical CPUs*	VOS 11.5, FTX 2.2	Third-quarter 1992	128M-byte memory, I/O subsystem, operating system	$828,000 with FTX, $905,000 with VOS
Six logical CPUs*	VOS 11.6, FTX 2.2	Fourth-quarter 1992	128M-byte memory, I/O subsystem, operating system	$1,039,000 with FTX, $1,130,000 with VOS

* A logical CPU comprises two logic-checking microprocessors on a printed circuit board, and all microprocessors are duplicated on a matching CPU board.

Source: Stratus Computer, Inc

CW Chart: Stephanie Faucher

Sequoia adds entry-level model to fault-tolerant line

BY MELINDA-CAROL BALLOU
CW STAFF

MARLBORO, Mass. — Sequoia Systems, Inc. last week unveiled an entry-level addition to the company's Motorola Corp. 68040-based line of fault-tolerant systems.

Dubbed the Sequoia Series 40, the system can incorporate up to four Motorola processors and complements the company's high-end Series 400. The four microprocessors can run concurrently at 25 MHz with 256K bytes of nonwrite-through cache. This contrasts with the Series 400, which can offer up to 32 processors.

The Series 40 also offers from 16M to 192M bytes of system memory, two to four I/O processors and VME-compatible buses, up to 88G bytes of physical disk storage, dual digital audio tape backup subsystems and battery backup.

At a starting price of $159,000, company officials said, the Series 40 offers "leading price/performance for Unix-based fault-tolerant computers."

Sequoia officials added that they have enhanced the performance of the Series 400 system by adding a turboprocessor element, which will upgrade the product from 25 to 33 MHz. They have also increased cache size from 1M to 4M bytes.

In addition, Hewlett-Packard Co., a partner and reseller for Sequoia, has introduced a version of the System 40 called the HP Model 1012.

Separately, Sequoia officials announced that their products will now support relational database management systems from Unidata, Inc. as well as those from Oracle Corp., Informix Software Corp. and Ask Computer Systems, Inc.'s Ingres Products Division.

DG extends Aviion systems with RAID

BY KIM S. NASH
CW STAFF

WESTBORO, Mass. — Data General Corp. last week unveiled several Aviion-related products, including a redundant arrays of inexpensive disks (RAID) storage system for the Unix-based boxes. The move preceded this week's expected announcement of a fiscal third-quarter loss, DG's second consecutive period in the red after five quarters of profitability.

The new Motorola, Inc. 88100-based servers — which range from 39 to 235 million instructions per second (MIPS) — put the company in a "very competitive" position against commercial Unix stalwarts IBM and Hewlett-Packard Co., according to John Gantz, chief analyst at Dataquest/Ledgeway Group in Framingham, Mass.

Gantz said DG's symmetric multiprocessing features are attractive. The company said it booked more than 10 first-day orders for the new products from firms including Source Data, Inc., GE Retail Systems and Choice Courier Systems, Inc.

However, it is too soon to tell what kind of impact the products will have on DG's bottom line over the long term, observers agreed. Wall Street's consensus was that, like last quarter, the firm will post a loss resulting from a revenue shortfall and restructuring costs from a 1,000-worker layoff that was announced last quarter.

Although three new servers were introduced, HADA II, DG's high-availability disk array, was clearly the star of the show. Chairman Ron Skates ballyhooed the product, saying no other Unix vendor offers a high-availability storage subsystem, which is required by financial institutions and other users that need 24 hour-a-day data access.

RAID technology provides users with access to data when part of the subsystem fails. The "near fault-tolerant" design gives users a choice of RAID levels, including 0, 1, 3 and 5, according to DG.

"The HADA product was pretty impressive," Gantz said; it leaves DG "well-fortified for the commercial environment."

HADA II is packaged with five 500M-byte or five 1G-byte 3½-in. disk drives and can provide up to 20G bytes of data storage. Pricing for the product, slated to ship next month, starts at $35,000.

Also announced for delivery by year's end was an upgraded DG/UX operating system and two servers that expand the MIPS rating of the Aviion line. DG/UX 5.4.2 offers 60% better Transmission Control Protocol/Internet Protocol performance and improved security features, the company said. It costs $550.

Onward, upward
The AV 8000-8 doubles the performance of DG's previous high-end Aviion model, the AV 8000

	AV 4605	AV 6280-20	AV 8000-8*
Processor	Single	8	8
MIPS	39	235	235
Memory (min/max)	32/128	128/768	128/768
Disk storage support	1.9G bytes to 38G bytes	320G bytes	320G bytes
Base price	$19,995	$200,000	$270,000
Availability	Now	Year-end	Year-end

*Packaged with disk array

CORRECTIONS

A story in the July 13 issue incorrectly said Intel Corp.'s DX2 clock-doubling technology doubles the external speed of the processor.

In fact, the processor runs twice as fast internally as externally.

.....

Because of a transcription error, an interview with Rockwell International Corp. Chairman Donald R. Beall in the July 13 issue referred to "gun-stops" that Rockwell supplied to the U.S. Navy; the firm, in fact, supplied gunships.

Similarly, Rockwell's automotive business, not its Allen-Bradley industrial automation business, manufactures door latches; the firm makes modems, not motors, for fax machines; and Mr. Beall's middle initial is R., not M.

.....

Because of an error in information provided to *Computerworld*, Aetna Life & Casualty Co. Chairman Ron Compton was mistakenly identified as a former executive at Emory Airborne Express in the July 6 issue. In fact, Compton has worked at the Hartford, Conn., insurer for 35 years.

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BART moves to Unix to ease maintenance

BY JEAN S. BOZMAN
CW STAFF

OAKLAND, Calif. — After 20 years of running its automated trains using an array of proprietary minicomputers, the Bay Area Rapid Transit (BART) system revealed last week that it is moving to open systems in a bid to build an easier system to maintain. And by the time fault-tolerant Unix systems are aboard the conductorless trains in 1995, BART hopes to have relational database management systems tracking their spacing and speed.

Some $30 million has been budgeted for new computers to cover a five-year, $300 million extension of the BART train system beyond its current 34 stations. The project is expected to break ground soon.

BART said it will build its next-generation control system with 50 Tandem Computers, Inc. Integrity Unix systems and Informix Software, Inc.'s relational database engine. The computers, which will be linked by a Transmission Control Protocol/Internet Protocol and Synchronous Optical Network, will be phased in over the five-year period. BART had withheld news of its purchasing decisions until the rejection of a protest by Hewlett-Packard Co. freed it to do so.

David Warwick, the director of BART's project to overhaul its computers, said last week that the new computers will be 10 times as powerful as the aging Data General Corp. MV 10000 systems they replace. "We're taking a quantum leap in terms of hardware," said Warwick, group manager of systems engineering at BART's engineering and construction department.

The Unix software will be easier to enhance and maintain than the current mix of DG MV 10000 machines: Digital Equipment Corp. PDP-8s, which manage displays of train destinations, and Modcomp Co. computers, which gather fare-collection data from automated ticket machines.

BART's current T1 network samples 15,000 data points 400 times per second to find power and rail problems.

The decision to move to open systems comes three years after the BART board fired Logica Data Architects, Inc., a systems integrator that ran up a $20 million bill developing a train control system that stretched BART's computers to capacity [CW, Nov. 27, 1989]. A 1989 independent audit of the Logica project found $2.67 million in cost overruns. In all, BART spent $40 million over 10 years, half of which was for Logica's train-control software.

However, the train-control software Logica developed is coming along for the ride. Twenty BART programmers will adapt it to Unix, starting in January.

BART is already using the Logica software on its DG computers. "It will take 18 to 24 months to" port the software, said Warwick, who was hired two years ago to overhaul the control systems.

BART plans to purchase a Unix software application to gather fare-collection data from its automated ticket machines and build a display system to show train destinations on top of the Informix RDBMS.

Bendix Notes push tied to quality initiative

CONTINUED FROM PAGE 1

tor of information systems and services at BAS, said that although he will eventually realize some cost savings, his main goal is to meet a total quality initiative that focuses on improved teamwork, increased communications and reduced response time.

Notes should answer the first two requirements, Everett said, which will then contribute to cutting response time.

Notes allows people in different time zones to work from the same repository of images, graphics, voice, documents and spreadsheets, he pointed out.

Along with the electronic mail and workgroup software, the company will be moving its business applications, such as spreadsheets and word processing, over to the local-area network. Everett said he is 99% certain Lotus will be tapped for the full suite of Microsoft Corp. Windows-based applications, including 1-2-3 for Windows, Ami Pro and Freelance.

Everett is in charge of about 1,000 personal computers, both in North America and in Europe. A $1.5 billion brake component segment of Allied Signal, Inc.'s $4 billion automotive sector, his group has just completed a six-month "real-world" pilot program involving 22 users who tested the applications software. A second pilot for Notes and the image and document management software is still in progress.

Everett said he plans to add 150 more users to the rollout by year's end, with another 250 slated for next year. He envisions about 10 LANs with approximately 100 users each for his bailiwick. Chances are good that the rest of the sector will then follow his lead, Everett added, bringing the total users involved to about 5,000.

One-stop shop

Everett said a deciding factor in moving from the SNA-based Professional Office System (Profs) environment running on an IBM 3090 to an Ethernet LAN running Novell, Inc.'s NetWare was that the company wanted a single vendor for all of its applications.

Everett said the only possible stumbling block to signing with Lotus would be if Lotus' European training and support facilities could not fulfill his needs. The company included audio features in the pilot for voice commentary and is talking about working with Picturetel Corp. to bring videoconferencing down to the desktop, he said.

The ability to add voice annotations to Notes documents would help, Everett said, but he envisions the Picturetel connection as aiding on-site training.

E. Allen Hershey, a partner at Ernst & Young in Ann Arbor, Mich., gave the thumbs-up to getting rid of Profs. "Anyone depending on SNA-type networks to provide communication at this time ought to be looking at doing this kind of a plan," he said, citing the slowness of the network as a big factor.

Everett said the mainframe environment will run in tandem with the LANs during the migration period. Allied Signal has been telescoping its data centers as part of a consolidation effort. The three sectors of the company are being moved into one data center in Tempe, Ariz.

Although the move is mainly geared to speed communications and reduce response time to customers, Everett said, "over time, we'll migrate the mainframe applications that make sense to the LAN."

For networking needs, Everett is using NetWare 3.1.1 running over Ethernet. He plans to implement unattended backups that will monitor the LAN and back up an unattended PC or server.

By moving onto a LAN, Everett said, he will also be able to remove the layer of midrange machines, such as IBM 9370s, now at most of the company's sites. Four midrange machines will be removed from U.S. sites during the next year, he said. There are no plans to turn over any staff, but he said he is retraining them in LAN-oriented programming.

PCs could save Knight-Ridder $1.7M

CONTINUED FROM PAGE 1

upgrades next year alone remains a factor likely to ultimately persuade him to continue with his plans.

Knight-Ridder Financial — a division of $2.2 billion Knight-Ridder, Inc.'s $330 million Business Services Group — is contemplating a $300,000 investment in redundant 486, 50-MHz, DOS-based PCs on a centralized local-area network to replace the Tandem processors that currently handle about 150 price-processing transactions per second. Boulderstone said he expects that number to swell to about 1,000 in two years.

It would cost $2 million to upgrade CPU capacity on the Tandem to accommodate business growth, Boulderstone said.

He said he is willing to live with a degree of downtime risk associated with networked PCs because "fault tolerance is a bit of a myth." Boulderstone explained that "there are many pieces in a system, and not all of them are fault-tolerant."

For example, the firm runs some services it inherited via a merger of the corporation's commodity and financial divisions last summer on Unix-based Hewlett-Packard Co. 9000 minicomputers; PCs serve as communications controllers and customer interfaces.

In addition, "we've had instances where the backup hardware was working fine but the software failed, or we had an electrical disturbance. You're always [vulnerable to] your UPS system and communications circuits," Boulderstone said.

Analysts said they consider a shift from Tandem to PCs sound from a hardware reliability and performance perspective. However, they deemed it risky with respect to some thorny software challenges facing the company.

Currently, sophisticated software for synchronizing traffic rerouting and backup is not available for PC LANs, meaning users must take on that nontrivial task in-house.

"Unlike software from Tandem or big software development companies with many users, [Knight-Ridder] will be testing the software's reliability itself," Dave Hill, a senior consultant at The Yankee Group in Boston, pointed out. "But if the company is saving a lot of money, it may be worth the risk" of some corresponding downtime.

To date, "there has not been a migration to fault tolerance in the PC world" either by users or vendors, said David Wu, a computer analyst at S. G. Warburg & Co. in New York.

Boulderstone acknowledged that "PCs are very reliable as long as you . . . write the software well." He said he is confident he has the programming expertise to meet that challenge.

Currently, Knight-Ridder's Tandems accept data feeds from the New York Stock Exchange, the Chicago Board of Trade and many other financial and commodity information-generating sources. The networked PCs would take over the job of receiving the data, converting it into a common format and transferring it to a communications controller that merges it and sends it to customers.

While PCs would take over the Knight-Ridder division's pricing service — which broadcasts real-time commodities prices to farmers, brokers, grain elevator operators and others — the Tandems would continue to handle the business' entire commodity news broadcasting service for the short term.

Knight-Ridder Financial has invested $4 million in its four Tandem Cyclone and four VLX processors. The firm's pricing service uses about 50% of the Tandem cycles now.

The PCs would free up the Tandems to serve the company's growing news service without costly processing power upgrades.

"We're convinced we can drive a very large number of prices through PCs, as long as we don't do a lot of disk I/O," Boulderstone said.

AD/Cycle focus downsized

CONTINUED FROM PAGE 1

Repository AD/Cycle user group in Chicago.

Repository Manager/MVS — a key piece of mainframe software that was originally intended as the means by which customers could keep track of development projects throughout the enterprise — has been dogged by political infighting and technical problems since its announcement in September 1989. As a result, it never won widespread user favor and is installed at just a handful of user shops.

Technical issues involved performance and an underlying model that some said was inadequate from the beginning. Political woes sprung from trying to work with various AD/Cycle development partners — a case of too many cooks spoiling the broth.

"They tried to accommodate everybody and probably made it more complex than they had to," said Dick Stromberg, a consultant at Du Pont Co. in Wilmington, Del., and a Repository Manager customer, although his shop is not actively using it.

Muddy waters

As a result, Repository Manager's direction has been muddled. IBM managers went from promising OS/2 support in March 1989 to saying in October 1990 that no OS/2 support would be forthcoming. In January, an IBM marketing manager said the Application System/400 platform would be the next to have a version of Repository Manager, but that plan seems to have been superseded by the OS/2 LAN and AIX versions.

In fact, some sources, including one at IBM, have said that the company will functionally stabilize, as in halt new development, of the mainframe repository — a charge that an IBM spokesman denied. However, the company had also initially denied it was killing the LAN version of OfficeVision but later acknowledged its termination [CW, June 8].

"They'll chill Repository Manager/MVS but not kill it," said Michael West, an analyst at Gartner Group, Inc. in Stamford, Conn. Instead, observers said, IBM will shift mainframe resources over to the LAN and Unix versions.

"Overall, we're fairly pleased" with the coming OS/2 and AIX wares, said Eric Jones, manager of data services at the Arizona Department of Transportation in Phoenix and one of the few active Repository Manager users. "We'll now have some other options for software development."

He said he was also happy with the original Repository Manager, which his shop has used to develop its tools.

However, others were not so sure that the new direction would be a hit. "There are other LAN and Unix repositories available on the market and no particular reason to get into an IBM solution," Fosdick said.

Among these is Minneapolis-based InfoSpan Corp.'s InfoSpan, a repository product that runs on OS/2 and Unix. IBM salesmen have pitched this product to some customers, and the firm is said to be among the new players in the workstation group of AD/Cycle vendors.

IBM has been briefing AD/Cycle customers about the pending announcements, which will include new development and marketing partners. Still unclear, however, is how IBM will reconcile what has until now been two separate software development environments: one for the AIX world and another for mainframe customers. IBM resells Hewlett-Packard Co.'s Workbench, along with other third-party packages, on the RISC System/6000 platform.

Ira Morrow, a vice president at Shearson Lehman Brothers, Inc. in New York, said he applauds the new direction, which he is due to be formally briefed on in about a week. "More power to them: If it's not working, make it work," he said. If IBM's announcement yields a "practical and pragmatic" approach to software development, Morrow said, he would evaluate it.

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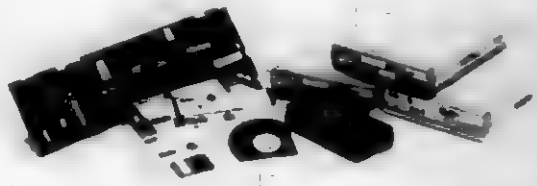

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NEWS SHORTS

Kurtzig steps down as Ask CEO

Sandra L. Kurtzig, founder, chairman and chief executive officer of The Ask Cos., will relinquish her CEO post Sept. 1. Pier Carlo Falotti, who last week resigned as president and CEO of Digital Equipment Corp.'s European operations (see story page 1) and is a 23-year DEC veteran, was named her successor. Kurtzig will remain chairman, while Falotti will join the board of directors. Almost 50% of Ask's more than $400 million in sales come from abroad.

USL sues Berkeley Software

Unix System Laboratories, Inc. (USL), a Summit, N.J.-based subsidiary of AT&T, has sued Berkeley Software Design, Inc. for trademark infringement, false advertising and unfair competition. The action, filed in U.S. District Court in New Jersey, seeks injunctive relief and unspecified punitive damages. Berkeley Software Design, which distributes a version of Berkeley Software Design Unix system software, has filed for dismissal.

Du Pont to step up halon phaseout

Du Pont Co., the largest producer of halon, a fire-extinguishing gas widely used in computer rooms, said it will stop production of the chemical by the end of 1993 — one year earlier than planned. In February, President Bush ordered a halt to the production of halons and chlorofluorocarbons by the end of 1995. Du Pont also unveiled what it said is the first commercially available halon alternative, FE-13, which reportedly has "zero ozone-depletion potential" and costs about the same as halon. Halon equipment cannot be used with FE-13 unless it is modified.

Storage Tek's income drops

Storage Technology Corp. reported lower net income and earnings per share for the second quarter ended June 26 vs. the same period a year ago. Net income was $6.6 million, compared with $18.8 million last year. Chairman Ryal Poppa attributed the "disappointing financial performance" mostly to higher expenses and slower buying decisions.

IBM hosts send software to Macs

Tangram Systems Corp. said it has enhanced its AM:PM offering to provide automatic software distribution from an IBM MVS host to the Apple Computer, Inc. Macintosh. The Macintosh communicates with the IBM host via Apple's SNA-PS over Token Ring or Synchronous Data Link Control. AM:PM also supports distribution to DOS, OS/2 and Novell, Inc. NetWare environments.

MCI names executives

MCI Communications Corp. has shuffled its executive staff and consolidated four regional sales divisions into two national units. Jonathan C. Crane, former president of MCI's Eastern Division, was named president of MCI National Accounts. Timothy F. Price, previously senior vice president of sales and marketing for MCI consumer and commercial markets, was named president of MCI Business Services.

Short takes

Borland International, Inc. instituted a new policy that offers health insurance benefits to gay or heterosexual unmarried domestic partners of its employees; for example, those who live together and share fiduciary responsibilities. . . . **NCube Corp.** introduced the 2E series of massively parallel computers, an entry-level family that delivers up to 1,280 million instructions per second at a price of less than $2,500 per transaction per second. . . . **TRW, Inc.** spun off a company to commercialize its Fast Data Finder, a speedy text-scanning and routing device that the company had developed for military and intelligence agencies. TRW holds a minority interest in the Pasadena, Calif.-based spin-off, **Paracel, Inc.**

VMS opened for Alpha initiative

X/Open XPG3 branding is key to winning more government contracts

BY MELINDA-CAROL BALLOU
CW STAFF

BOSTON — Digital Equipment Corp. last week unveiled its "Alpha-ready" systems, which, as expected, run an open systems implementation of VMS. These products are intended to smooth the transition to DEC's next-generation reduced instruction set computing architecture, as well as provide an incentive to purchase revamped VAXs, DEC officials said.

Crucial to a successful revival for the company will be DEC's ability to effectively market Alpha products outside the vendor's current user base. "If Alpha fails, DEC is dead," said Rikki Kirzner, a senior analyst at Dataquest, Inc., a market research firm in San Jose, Calif. "And while the technology is very competitive, DEC is going to have to convince more than its own user base to go with the Alpha processors."

Included in the product line are the following: the VAXstation 4000 Model 90 workstation, with prices starting at $11,995; the MicroVAX 3100 Model 90 and VAX 4000 Model 100 servers, with prices starting at $41,694; the VAX 4000 Models 400 and 600 servers, with prices starting at $88,467 and $148,411, respectively; the VAX 7000 series of servers, with prices starting at $253,472; and the VAX 10000 series, with prices starting at just over $1 million. All products will ship by September, except for the 10000, which ships in October.

Delivery deluge

In addition to the hardware platforms, DEC said, it will also ship turnkey Advantage Server Solutions in 16 different configurations, Accessworks capabilities and new disk and tape storage solutions.

DEC also announced fault-tolerant Alpha-ready servers and enhanced Fiber Distributed Data Interface clustering for disaster recovery, for which pricing and shipping details will be given at a later date. The new clustering allows data centers to be separated by hundreds of miles via the use of T3/E3 services.

Of even greater potential significance for DEC was the announcement of the X/Open XPG3 branding for Open VMS and Posix compliance, which can free users from proprietary isolation while giving DEC the ability to compete for government contracts.

"DEC went through a Stephen King-class nightmare of tests to get XPG3 branding for Open VMS. There is no historical precedent for any but a Unix operating system passing them. This breaks the correlation between Unix and the term 'open systems,' " said George Shaffner, chief operating officer at the X/Open Consortium Ltd.

Many industry analysts reacted positively to the XPG3 branding, though some were skeptical about its impact.

"While XPG3 is important, it does not go far enough in terms of making applications transparent across platforms," Kirzner said. "You can't run Unix files on VMS with a simple recompile, for instance; you still have to rewrite them. But it does prevent the erosion of the VMS installed base by giving VMS users a path toward open solutions — this means that there'll be some work involved, but they won't be locked in."

Olsen resigns on eve of big loss, layoffs

CONTINUED FROM PAGE 1

sure the successful introduction and adoption of Alpha-based systems by current DEC users and prospects.

Users contacted last week were surprised by Olsen's plans to depart at such a decisive juncture for the company. Olsen was reportedly pressured by the board to retire, although a company spokesman said the decision to leave was ultimately his own. As recently as two months ago, Olsen said he was not planning to retire soon.

All of the users spoke warmly of Olsen and his contributions to the industry. "When a great entrepreneur leaves a company that's never been led by anyone else, it's significant. We'll have to see how the company moves on," said Al Chaby, information systems director at Envirosafe Management Services, Inc. in Valley Forge, Pa.

Others were clearly shaken by the news of Olsen's retirement. "This is frightening," said Ray Sasso, chief information officer at Simplot Co. With $20 million and 15 years invested in DEC equipment, the Boise, Idaho-based food processing firm has a lot riding on DEC's moves.

While generally maintaining an interest in DEC's upcoming Alpha products, some users said they nonetheless will wait to see what shakes out as the new chief executive officer takes the reins.

Simplot, for example, had planned to be one of the "first kids on the block" with Alpha technology, but the top-level shakeup will force the company to reconsider that investment, according to Sasso. "I'll certainly have to sleep on it now," he said. "There's a very big hole now, and I don't know if it can be filled."

Industry analysts were more positive about the potential impact of Olsen's departure. "DEC needs new leadership and vision — someone who is not carrying around the shackles of the past and who can see where DEC has to go with a little more objectivity," said Rikki Kirzner, a senior analyst at Dataquest, Inc., a market research firm in San Jose, Calif.

Palmer's track record shows he is willing to wield the ax, according to analysts. As head of DEC's semiconductor and then manufacturing operations, Palmer closed down some 10 facilities and laid off thousands of workers.

"He's decisive and gets things done, which is what the company needs," said Bill Sines, vice president of Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

Palmer's appointment is effective Oct. 1, pending board approval. Olsen, however, will remain on the board of directors until November 1993.

Neither Olsen nor Palmer were available for comment last week.

Customers should see the impact of the ongoing reorganization immediately. DEC is redoubling its efforts in vertical markets and is focusing on getting sales and marketing personnel out to user sites as often as possible, according to officials last week.

Direct sales, however, are expected to be deemphasized in favor of less costly marketing via OEM and value-added reseller channels as the company turns to more turnkey solutions, according to internal DEC sources.

As a prelude to the layoffs — expected to begin in significant numbers next month — DEC business groups will receive budgets this week for the upcoming fiscal year. They will have to provide final expense and head count projections to the corporate office by July 31, according to internal sources at DEC.

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OSF struggles to right its listing ship

CONTINUED FROM PAGE 1

details, we have to agree that the generic direction of USL and OSF are alike," Pieper noted. "I think OSF is looking for the best strategic and business position they can play."

That search is taking the OSF through a rather awkward stage in its development as the vendor-supported group shifts its focus from products based solely on Unix to cross-platform software technologies, or "middleware."

The key issues that Tory and his board are hashing out this summer include the following:

- How to move the $55 million nonprofit foundation toward self-sufficiency by the end of next year (see story below).
- How to manage the accelerating amount of engineering work done by outside companies.
- How to redistribute the OSF's internal resources to speed up development of the system and network management software that users are demanding: the Distributed Computing Environment (DCE) and Distributed Management Environment (DME).
- How to improve the quality of OSF source code and eliminate bug fixes duplicated by vendors.

"OSF is trying to track where the needs of the industry are," said Ted Hanss, chairman of the OSF's end-user steering committee and head of the Center for Information Technology Integration at the University of Michigan. "They started off with an operating system platform [OSF/1], then moved to DCE and are now evolving to distributed management with DME."

DCE is an integrated set of seven products — including a distributed file system and security, directory and naming services — that enable distributed computing across a mixed network of Unix and proprietary systems. DME is a complementary set of technologies for enterprisewide network and systems management.

Dealing with delays

Delays of 12 to 18 months have plagued both OSF/1 and DCE, prompting this latest round of soul-searching by OSF's management and six sponsors: IBM, Digital Equipment Corp., Hewlett-Packard Co., Groupe Bull, Hitachi Ltd. and Siemens/Nixdorf Informationssysteme AG.

Although it has been shipping to vendors since 1990, OSF/1 still has scant market presence, which analysts blamed largely on initial quality problems with OSF/1 source code and slow-motion adoption of the kernel by IBM, DEC and HP. DCE products will not appear until later this year or early 1993, and DME products will not show up in end-user shops until 1994, analysts estimated.

In four years, the OSF has had mixed success with its products but is acclaimed for engendering cooperation among the industry's fiercest competitors.

Still, only one of its five major technologies can be declared a success at this point: the Motif graphical user interface, which the OSF claims as a de facto standard with more than 500,000 installed seats.

The market competitor, Sun Microsystems, Inc.'s Open Look graphical user interface, has roughly 550,000 installations. IBM, HP and other major systems vendors have standardized on Motif as their user interface and are shipping it with their Unix workstations.

The foundation has reached a point now where buggy code and overdue deliveries are no longer acceptable to its sponsors or end-user members.

"Originally, [the sponsors] said, 'Give us the technology and don't worry about the quality. We'll deal with that because that's part of our productization,'" Tory said. Then, as the economy worsened and the recession took its toll among the sponsors, the thinking changed.

"We do want OSF to do more productizing," said Jim Bell, director of integrated information management at HP. That means improving code quality, accelerating delivery schedules and doing more testing in-house rather than duplicating such efforts at each vendor company.

"An extra month spent at OSF can cut two months off the time [the source-level product] sits inside companies like HP," Bell said.

"We were a little naive in what we thought would happen," said Mike Saranga, president of the OSF's board of directors and IBM's assistant general manager of systems, structures and management. "Our crystal ball was too foggy in 1988."

Saranga said that while the sponsors' vision for the OSF in the open systems market has not changed, the road has taken a few unexpected turns. "We will nail it down and get OSF on a steady course" in board meetings this month and next, he added.

Batting 1-for-3

Despite the three largest sponsors' stout declarations of support two years ago for a single, standard Unix operating system across their platforms, DEC is the only one to wholeheartedly adopt the OSF/1 kernel. IBM and HP, worried about disrupting their customer bases, are proceeding more cautiously by adopting pieces of the kernel and moving toward compliance with the OSF's Application Environment Specification (AES).

"The AES is really the most critical endorsement we need from the vendors," Hanss said. The AES is a set of specifications that correspond to the OSF/1 reference implementation. USL is pledging support for this set of specs next year, and OSF/1 in turn will support USL's Unix System V specifications. The result should be easily portable applications between System V, Release 4 and OSF/1.

Most users, however, are far more interested in delivery of the integrated system and network management tools in DCE and DME than in the OSF/1 kernel.

"When you get people's appetites whetted, you have to give them something to eat," said Sheri Anderson, senior vice president of production and system services at Charles Schwab & Co. in San Francisco.

"OSF did an excellent job with Motif and a real good job on DCE, but they haven't delivered much of what the market needs," Hoffman agreed. "Their timelines may have been overly ambitious. Things turned out to be more complex than they thought."

(Next week: The OSF's impact on open systems.)

Searching for self-sufficiency

Money — and how to make more of it — is the single biggest problem facing the OSF.

With 300 employees and annual spending levels reaching $55 million last year, the OSF is casting about for ways to reach self-sufficiency by 1994.

The nonprofit foundation is currently beholden to its major sponsors for more than half of its budget — $30 million in 1992, then $22.5 million in 1993. The remaining funds come from government grants, contract research and licensing fees.

According to OSF President David Tory, annual spending levels of $55 million to $60 million could sustain the company's mission over the next several years. However, reaching the point of self-sufficiency, he added, "takes a lot longer than everyone thought."

Delays in product deliveries and a cooler market reception than anticipated have undermined the plan for self-sufficiency, analysts noted.

Revenue breakout by technology
(in thousands)

1990		1991	
Motif	$4,149	Motif	$8,733
OSF/1	$1,056	OSF/1	$5,508
DCE	$53	DCE	$570
		DME	$22

Tory is especially optimistic about the DCE system management software, which the OSF projects will help boost licensing revenue to $50 million by 1994.

Although revenue from the OSF technologies — Motif, OSF/1, DCE and the DME — is beginning to ramp up (see chart), the roughly $15 million in licensing fees cannot sustain the organization.

All told, sponsor funding has contributed more than $180 million to the OSF since its founding.

The original nine sponsors — each pledging $4.5 million annually for the first three years — shrank to six with the mergers of HP/Apollo Computer, Inc. and Siemens/Nixdorf Informationssysteme, and the withdrawal of Philips NV.

The six current sponsors, who signed on for another, two-year funding stint at $5 million each, are IBM, DEC, HP, Groupe Bull, Siemens/Nixdorf and Hitachi.

The 340 member companies together contributed about $6 million in dues to the OSF in 1991, with 60% to 70% of them paying the full $25,000 annual fee while the universities and nonprofit companies pay $5,000 or less.

Grants and contracts with the OSF Research Institute, plus other services, accounted for $7 million to $8 million last year.

MARYFRAN JOHNSON

OSF's technology lineup

Motif
Graphical user interface

Available since July 1989 and installed on more than 500,000 systems now. Source license with full distribution: $15,000 (increased this year from $2,000).

OSF/1
Unix operating system

Shipping to vendors since 1990. Approximately 30 site licenses. Full distribution license: $85,000 (increased this year from $50,000). Additional CPU licenses: $3,000 each.

DCE
Distributed Computing Environment

Integrated set of seven system software management products. Available to end users in late '92/early '93. Source license with full distribution: $150,000. Limited distribution: $15,000.

DME
Distributed Management Environment

Integrated set of technologies and standards for enterprisewide network and systems management. Available to end users in 1994. "Snapshot" code available now for $1,000.

ANDF
Architecture Neutral Distribution Format

Compiler technology to produce a single version of shrink-wrapped software for multiple platforms. Tied to DCE and DME. First product slated for 1993 from Unix System Laboratories. Pricing not available.

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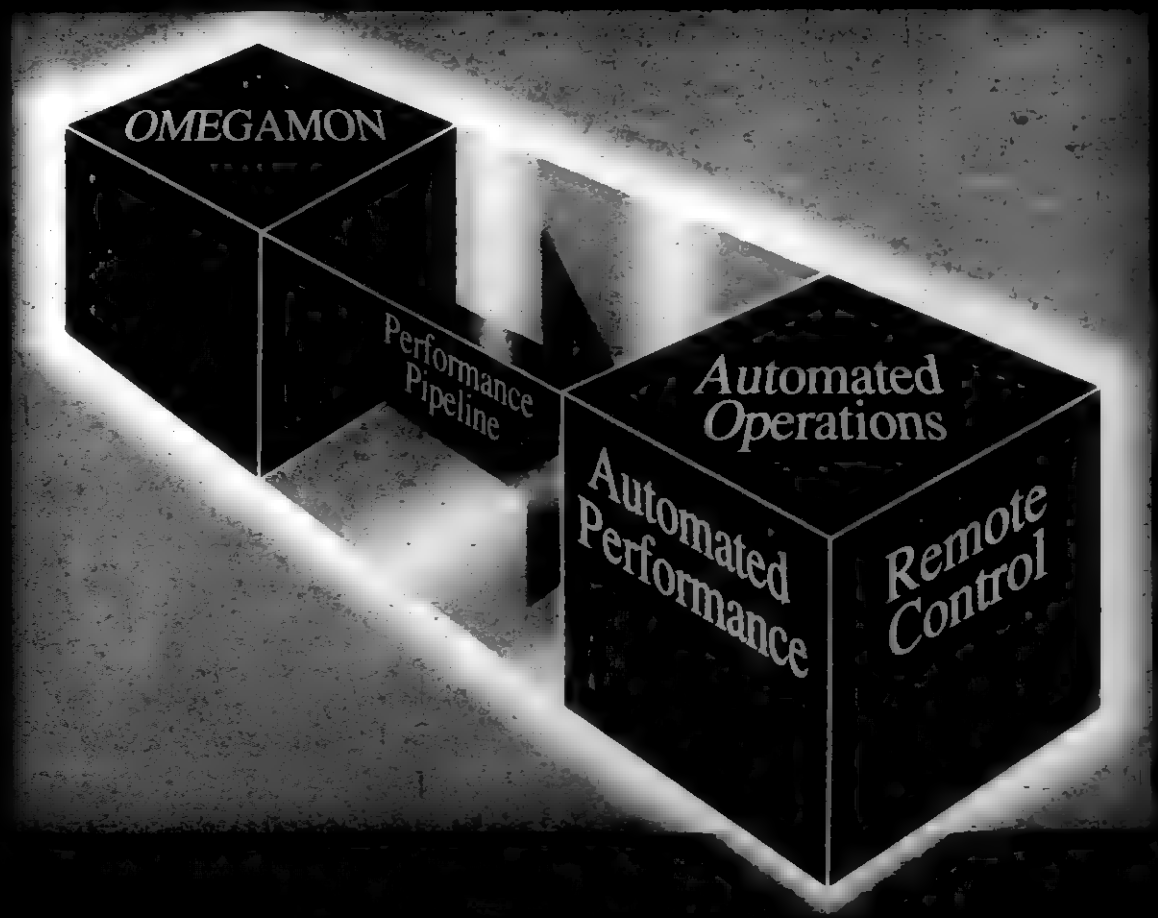

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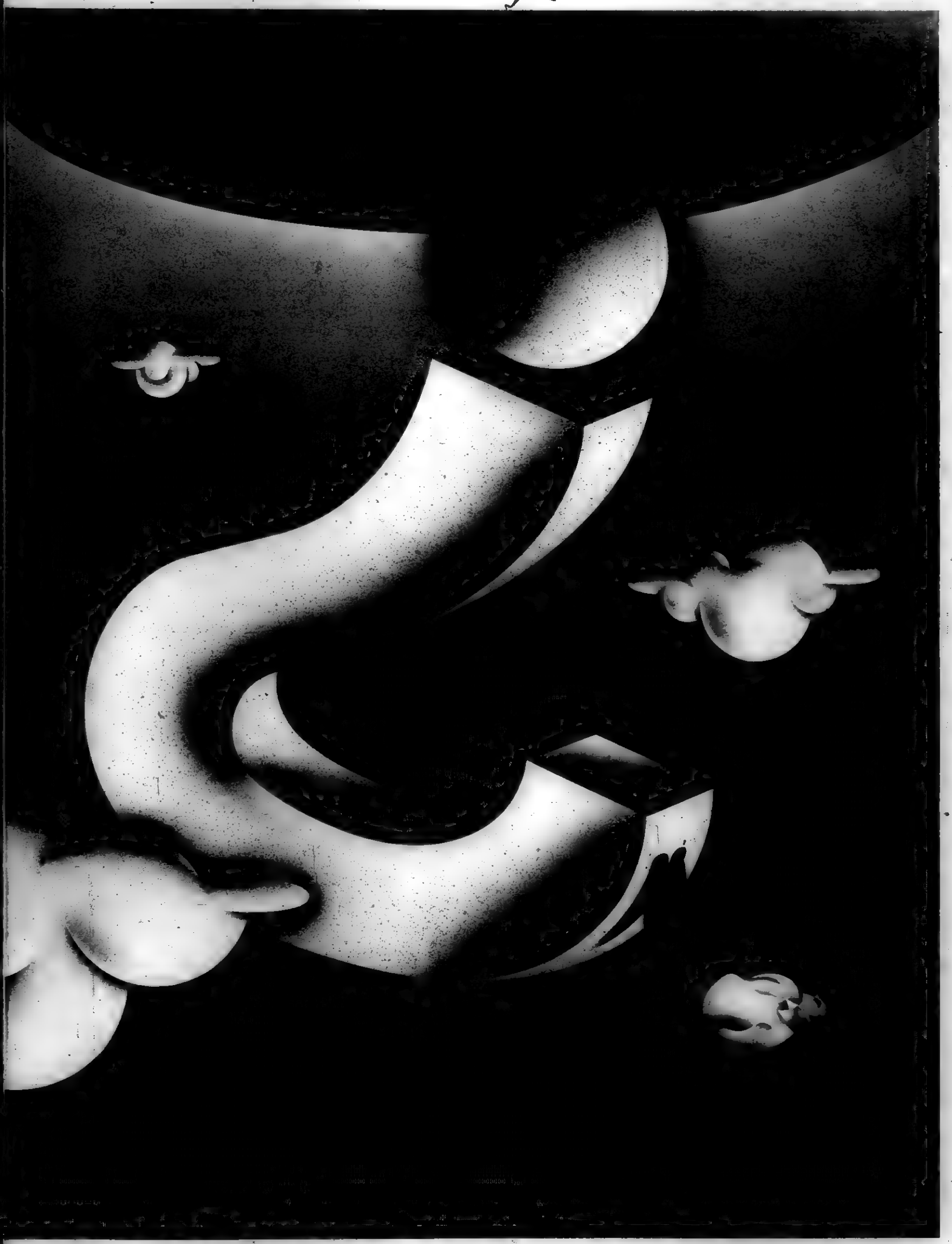

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FCC to open airwaves to radio-based wireless LANs

BY GARY H. ANTHES
CW STAFF

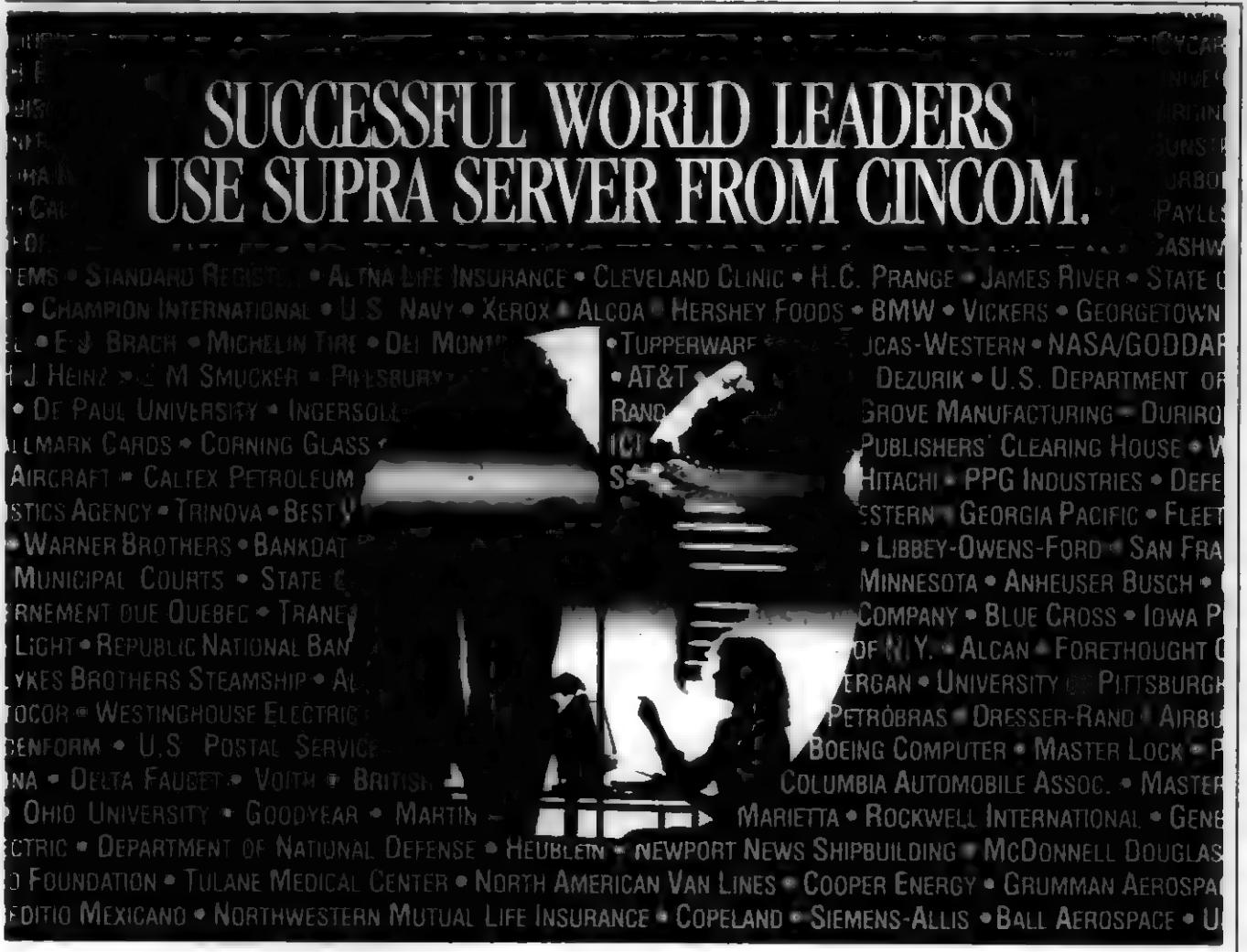
WASHINGTON, D.C. — The Federal Communications Commission had good news last week for a coalition of computer and communications companies when it revealed a plan to allocate 20 MHz of radio spectrum for use in wireless networks. The plan is tentative pending receipt of public comment and is likely to become final in the first half of 1993.

The slice of spectrum, which under the proposal could be used without a license, is intended for user-configured wireless local-area networks and cordless private branch exchange systems.

"It's a good result for the computer folks," said Henry Goldberg, an attorney representing Apple Computer, Inc., which led the industry in a petition for 40 MHz of radio frequency. Goldberg said the Wireless Information Networks Forum will continue to seek a greater allocation from the commission. "But this is solid," he added.

In addition to Apple, the forum includes AT&T, Digital Equipment Corp., Grid Systems Corp., Hewlett-Packard Co., IBM, NCR Corp., IBM's Rolm Systems, Sun Microsystems Computer Corp., Tandem Computers, Inc. and Ungermann-Bass, Inc.

An Apple spokeswoman said the firm wanted to add radio-based personal computer data services capabilities to its Newton family of "personal digital assistants" announced in May and due for delivery early next year.



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Mac gains FDDI links

BY JOANIE M. WEXLER
CW STAFF

Users of Apple Computer Inc.'s Macintosh II and high-end Quadra computers will finally be able to leverage the 100M bit/sec. speeds of Fiber Distributed Data Interface (FDDI) local-area networks next month.

An announcement last week by Cabletron Systems, Inc. and a preannouncement made to *Computerworld* by Codenoll Technology, Inc. render the two vendors the kickoff suppliers of FDDI interfaces for Apple's multimedia-oriented computers. Quadras and enhanced Macintosh IIs tend to run bandwidth-intensive applications that require FDDI's high speeds, analysts noted.

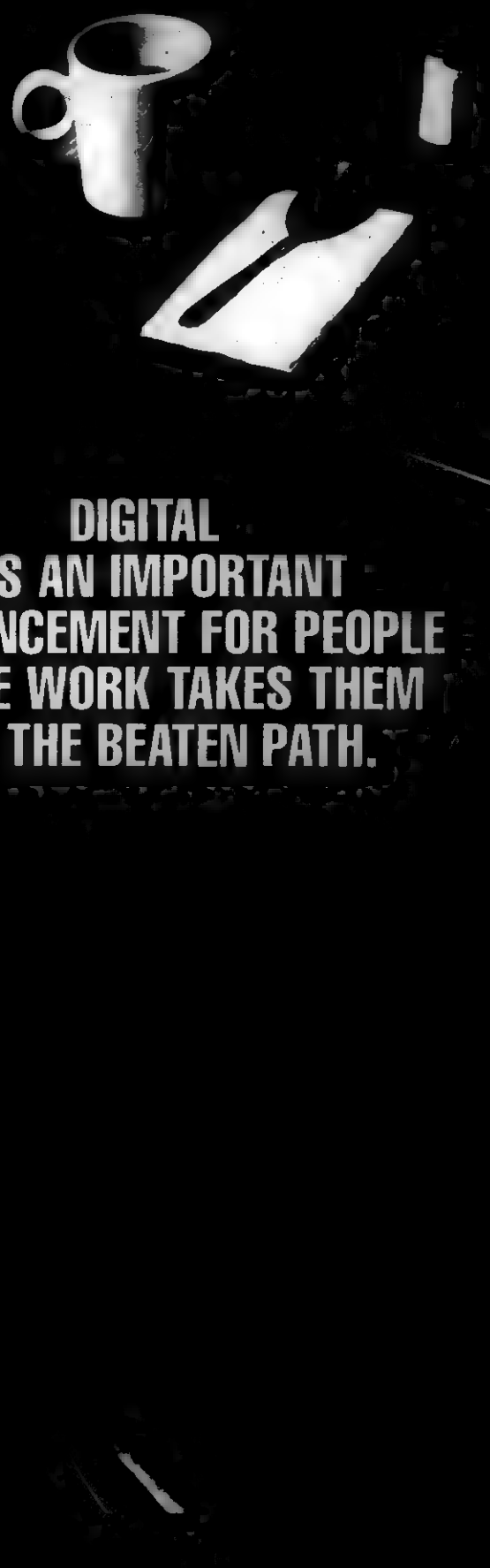
Jim Hamstra, a consultant at Stanatek in Shorewood, Minn., cited prepress color separations in publishing houses and video as common Quadra and Macintosh II applications with the bandwidth requiring FDDI.

Shipping soon

Cabletron said it will ship a $2,995 single-attached, fiber-based card in 90 days. Because FDDI LANs were designed with two counter-rotating rings for redundancy, each LAN node must contain a connection to each ring. Either the network adapter must contain two connections or a single-attached workstation must link to the second ring through a concentrator.

The cost of a Cabletron FDDI attachment would thus be $2,995 plus the cost of one port in an FDDI concentrator (about the same price) from another vendor, rendering the entire connection about $6,000.

Meanwhile, Codenoll said it will ship at the end of next month a $3,995 single-attached fiber card, a $4,995 dual-attached fiber card and a $3,495 card that links the NuBus computers to shielded twisted-pair wiring. However, the shielded twisted-pair cards will not comply with the specifications currently under construction for a combination unshielded twisted-pair/shielded twisted-pair standard, according to Brian Ramsey, director of marketing.



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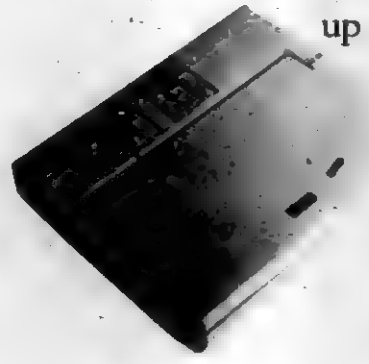

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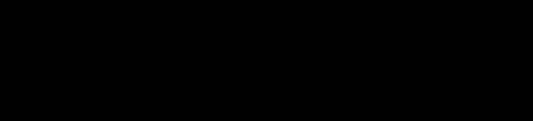

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Mouse:	Three-button Mouse
Software:	MS-DOS 5.0 and MS-Windows™ 3.1

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Microprocessor:	Intel 1386 running at 16MHz
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Storage:	122MB IDE Hard Disk 3.5" 1.44MB Floppy
Resolution Mode:	1024 x 768 SVGA Adapter with 512K Video RAM
Display:	14" VGA Color Monitor
Keyboard:	101-key Keyboard
Mouse:	Three-button Mouse
Software:	MS-DOS 5.0 and MS-Windows 3.1

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DECpc 420sx

Microprocessor:	Intel 486sx running at 20MHz
Memory:	4MB Memory (exp. to 32MB)
Storage:	122MB IDE Hard Disk 3.5" 1.44MB Floppy
Resolution Mode:	1024 x 768 SVGA Adapter with 512KB Video RAM, upgrades to 1MB for 256 color support
Display:	14" Multi-sync VGA Color Monitor
Keyboard:	101-key Keyboard
Mouse:	Three-button Mouse
Software:	MS-DOS 5.0 and MS-Windows 3.1

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I am interested in a:
386 486 Other Not Sure

How many applications will your PC(s) run in a typical workday?

How many PCs do you anticipate purchasing over the next 12 months?

Are you interested in leasing? Yes No
Immediately 1 - 3 months
3 - 6 months 6 - 12 months

What best describes the type of work the system will be used for? (Check all that apply)

- O Word Processing
- O Database (filing records)
- O Retail Store Management
- O Education
- O Engineering
- O Scientific Research
- O E-Mail
- O Order-entry
- O Financial Calculations
- O Desktop Publishing
- O Design (CAD/CAM)
- O Industrial Process Control
- O Software Development
- O Other industry-specific applications (please specify)

Which of these graphics-oriented applications best describes your needs? (Check all that apply)

- O Desktop Publishing
- O Realtime Modeling
- O AutoCad
- O CAD/CAM
- O Image Processing
- O Business Graphics
- O Animation

How many people work in your group, department or small business?

O Less than 10 O 10-20 O 20-35 O More

Is your desktop operating system:

- O DOS
- O DOS with Windows
- O OS/2
- O MAC
- O UNIX™
- O VMS
- O Other

LAN Communication

How many PCs do you have installed?

From how many manufacturers?

What kinds of connections does your PC(s) require? (Check all that apply)

- O Links with other PCs in the immediate surroundings
- O Connection to the local area network (LAN) throughout a building
- O A line to a host system in a remote location

What kind of media (cable) is used in your LANs today?

What is the networking software now being used in your company?

What kind of host system will your PC communicate with?

O Digital O IBM O Other

What kind of service do you need?

- O On-Site Hardware Support
- O Telephone Support
- O FAX Hotline
- O Software Support
- O Training

How many of your users take portables on the road?

Do you currently have a service contract(s) for your PCs?

O Yes O No

How many?

Does your service provider offer Multivendor Support?

O Yes O No

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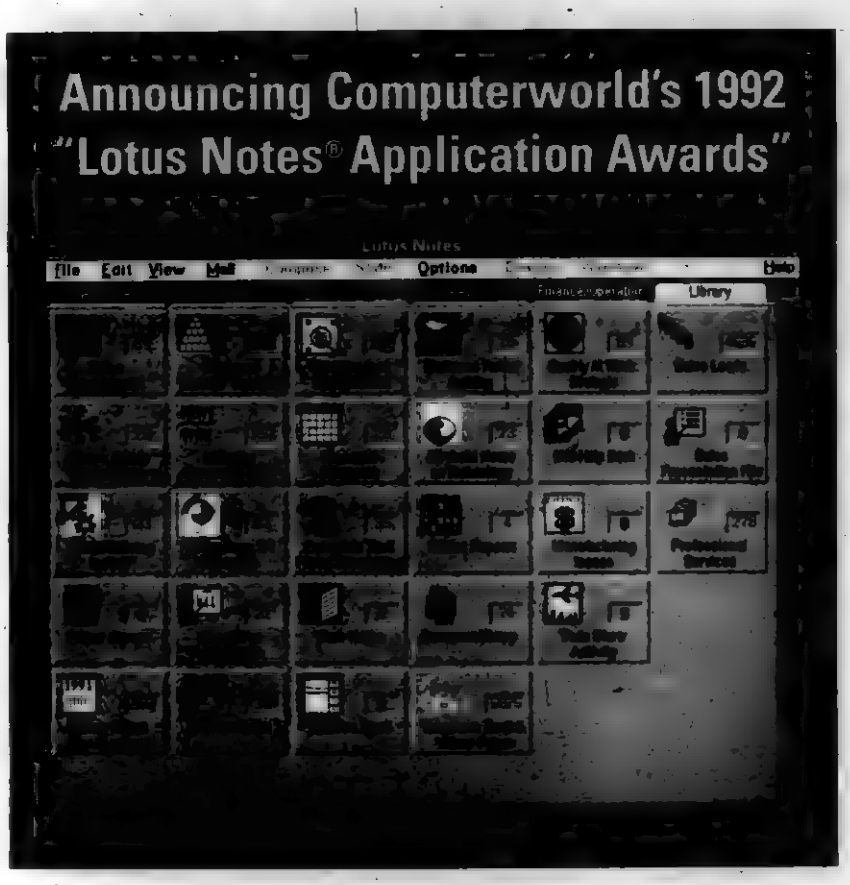
Take Note

Announcing Computerworld's 1992 "Lotus Notes® Application Awards"



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All entries should be Notes applications currently in use (not a prototype). Entries may be based on applications developed by an end-user organization, a systems integrator, VAR or Lotus Notes Alliance Partner.

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Deadline for entry is Midnight (EST), July 29, 1992.

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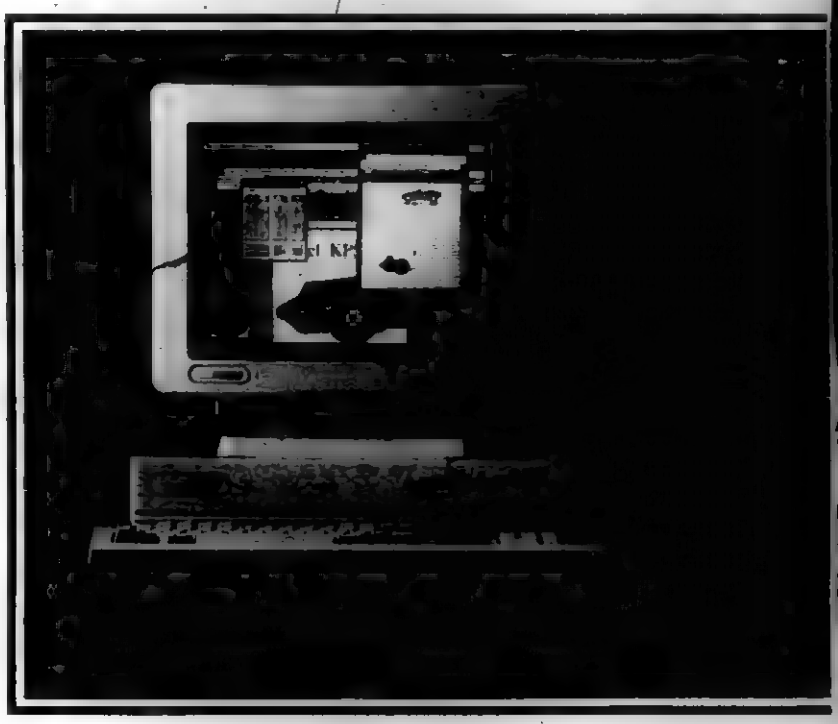

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The integrated audio system provides for an unprecedented, yet not unfamiliar dimension in mainstream business computing: your voice.

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And we've engineered this breadth of technology right onto the PC's system board, preserving the small footprint, large storage capacity and expansion of the COMPAQ DESKPRO/i.

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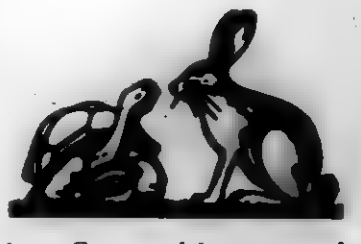
We bet you'll be as excited about the COMPAQ DESKPRO/i as we are.



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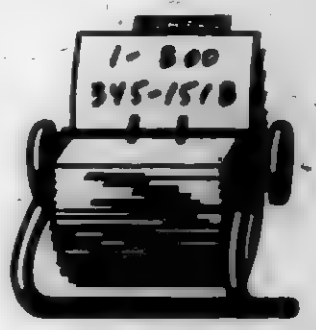
Intel 386SX/25 ♦ *2 MB RAM* ♦ *3 ISA slots* ♦ *3 drive bays* ♦ *84- or 120-MB hard drive*
Intel 486/33 ♦ *4 MB RAM* ♦ *3 ISA slots* ♦ *3 drive bays* ♦ *84- or 120-MB hard drive*
All models include high-resolution 1024 x 768 video and pre-installed Microsoft MS-DOS 5.0 as published by Compaq

All in all, the COMPAQ ProLinea 3/25s PC sizes up quite nicely. At a mere 12.6" x 14.9" x 3.5", it's one of the smallest footprints in the industry.



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ADVANCED TECHNOLOGY

TECH TALK

When the chips are up

■ A new transistor technology developed by IBM may someday become the basis of a new generation of high-speed computers. BiCMOS technology integrates common bipolar transistors with power-saving CMOS field-effect transistors, providing high performance with lower power consumption. The combination should allow developers to implement transistors with the best features of each, according to IBM.

It's virtually a reality

■ Virtual reality will come closer to real life this September, when the Institute of Electrical and Electronics Engineers, Inc. (IEEE) holds a videoconference on the subject. On Sept. 30, the session, titled "Emerging Technologies: Will Your Company Be Ready?", will give engineers and students a chance to discuss computer aids for product design and manufacturing control and virtual reality for planning, training and education. Registration for corporations starts at $100 per person. Registration information is available from IEEE in Piscataway, N.J.

Up, up and away — sort of

■ The second annual International Aerial Robotics Competition got off the ground despite the fact that several of the contestants did not. Entries were received from eight colleges (twice as many as last year), but only four were able to fly under computer control. And none of the contestants were able to perform the assigned tasks: finding, retrieving and carrying metal disks across a 3-ft barrier. This year's $5,000 first-place winner was a "flying gyroscope" built by the Georgia Institute of Technology team and based on, of all things, a hula hoop. Second and third place went to helicopter-like robots from the Southern College of Technology and a second Georgia Tech team, respectively.

Extra! Extra! Newspapers paperless!

Sophisticated features beef up portable electronic newspapers to rival printed word

BY ELLIS BOOKER
CW STAFF

From its inception, the idea of reading a newspaper on a computer screen has been greeted by most daily newspaper publishers as, well, unnatural.

After all, a news*paper* continues to be an essential part of the morning routine for tens of millions of readers.

But things are changing. More powerful technologies on the desktop, such as graphical user interfaces and intelligent search algorithms, make it easier to navigate through an electronic document. And on-line service providers are getting better at packaging information for local readers.

Media companies are concerned that eventually their share of the local market will come under assault. But others are taking the electronic delivery bull by the horns.

At your service

Enter Chicago Online, a joint venture between information network provider America Online, Inc. and Chicago's Tribune Co., the media giant that owns, among other properties, the *Chicago Tribune*. The service was announced in mid-May.

"I think you have to be careful taking a published vehicle and extrapolating it into an electronic [product]," said Gene Quinn, general manager at Chicago Online. According to Quinn, while other media companies have tried proprietary local on-line services, Chicago Online is the first partnership between a local news-gathering entity and a national on-line service.

The result that Quinn said he and his colleagues hope for is a $7.95 per month interactive information and entertainment service emphasizing local stories and information, including classified advertising.

But why would a reader choose this electronic "paper" over the traditional form?

Jean Thomassie

"In the short term, it's the ability to interact with the owners of the ink and paper and others who share your opinions," Quinn said. The longer term value, he said, will hinge on what he called "transaction services," which might include an electronic advertisement from which the reader could place an order or stock quotes from which a reader could access a company profile.

In addition, the electronic format suggests "individual databases, tailored to demography and psychographic segments," Quinn said.

Still, analysts are cautious, agreeing with Quinn that questions of how this future product ought to be packaged are of supreme importance.

Yet the potential benefits to the publisher's bottom line are inescapable. Take the mundane issue of the price of newsprint, which George Sacerdote, a vice president at Arthur D. Little, Inc. in New York, said is a publisher's largest expense after salaries.

Although noting that a modern daily newspaper is "basically an electronic product with a paper skin," an even bigger question mark is how advertisers, who pay the lion's share of a newspaper's bills, will be incorporated into this format.

"Fundamentally, a newspaper is an advertising medium. . . . Advertisers pay the bills. The question is, how do you preserve this business model in an electronic paper?"

So far, at least, the higher subscription-costs of electronic news media have made this a moot question. But according to Sacerdote and others, in order to drive the cost of the electronic paper down to appeal to that vast "middle market," advertisers will have to be wooed to the medium.

"It's much too soon to tell how advertisers are reacting to these services," Quinn said. "There just hasn't been enough experience."

Competition to come

While both the business model and the look-and-feel of electronic papers sort themselves out, a new wrinkle has been added by two emerging technologies: portable computers and wireless networks.

Portable devices — laptops, pen-based computers and a new generation of palm-size machines such as Apple Computer, Inc.'s Newton — suggest a delivery vehicle for an electronic paper that can be carried on a commuter train on the way to work, its stories updated regularly via wireless radio networks.

Roger Fidler, director of new media technology at the Knight-Ridder, Inc. newspaper chain, is one of those betting that portability will be a key ingredient of what he has called the "mediamorphosis" of publishing.

But Quinn said he thinks there will be a preponderance of "alternative" delivery vehicles for news and information in coming years. "You have to think of the information independent of the medium," he said.

On-line, but not on the move

What would cause a typical reader to prefer electronic, on-line news — delivered via a desktop or portable computer — to that conventional and extremely familiar medium, the daily newspaper?

"The electronic product can filter information. You get what you want with less volume to wade through," said Chris Elwell, an analyst at Simba Information, Inc. in Wilton, Conn. For instance, the sports enthusiast can check baseball scores without having to flip through pages in the business section.

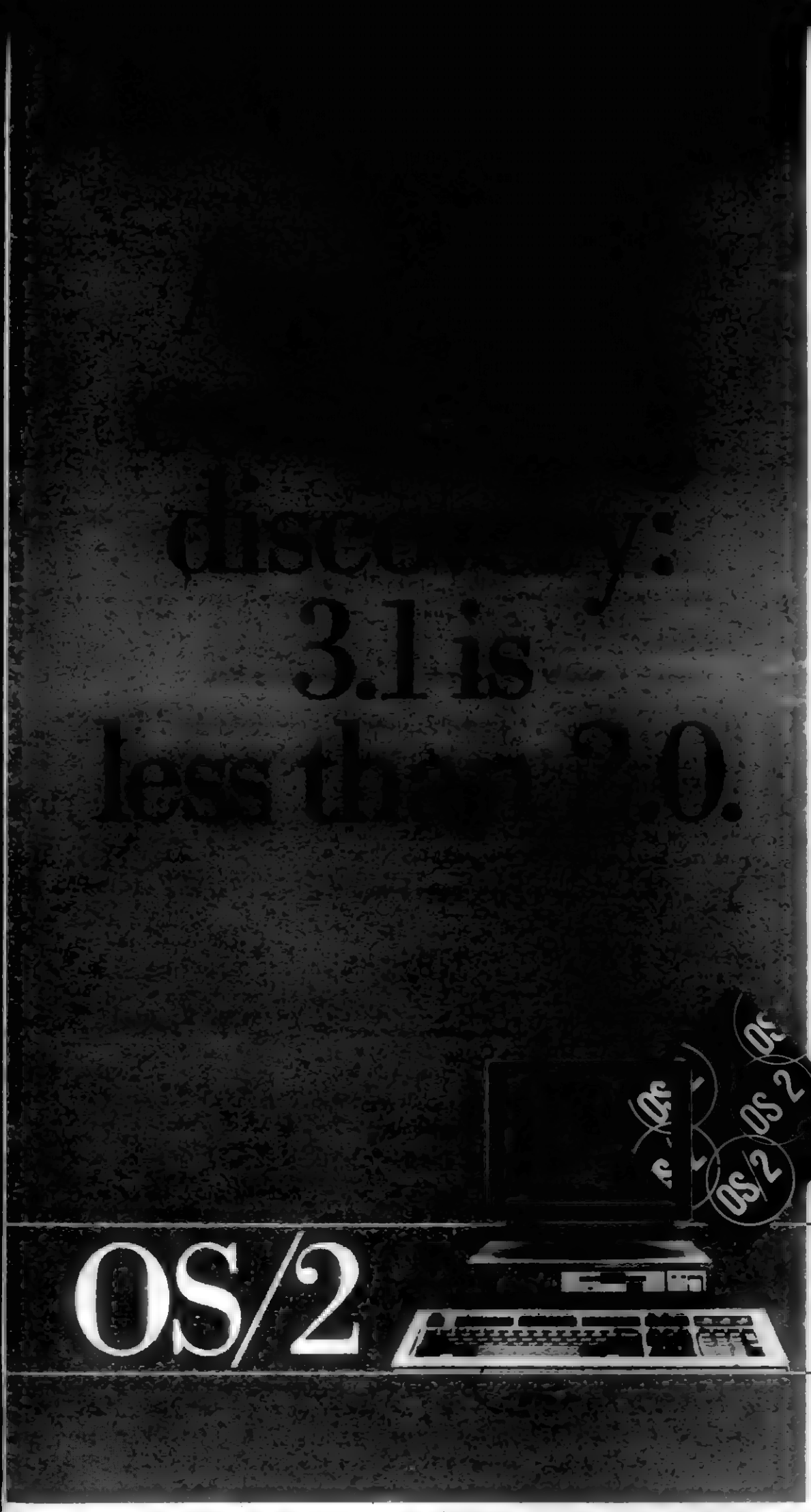
Yet only a fraction of people logging on to on-line information networks use the medium for this purpose, Elwell said: "My guess is something like 15% or less are checking news."

In its most recent study, "Online Services 1992 Review, Trends & Forecast," Simba estimated that the total number of subscribers to "end-user oriented" on-line services was just 2.7 million as of the end of last December — about the same circulation of *The Wall Street Journal* alone.

This relatively tiny universe of users has made it, to date, unattractive to advertisers, who largely foot the bill for paper-based magazines and newspapers.

"It'll be a long time until we get to an advertiser-supported payment structure, and we may never get there," Elwell said.

ELLIS BOOKER



You don't have to be a whiz at math to figure this one out. When it comes to running Windows™ applications, OS/2 2.0* gives you more than DOS 5.0 plus Windows 3.1. But that's only part of the equation.

OS/2 2.0 can get more out of DOS applications than Windows. Windows can't run OS/2 applications at all. And when it comes to running multiple applications, OS/2 2.0 is so much better, you can throw comparisons out the window.

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WordPerfect® (spellcheck)†	38.5 sec	43.6 sec
AmiPro™ 2.0 (print)††	95.1 sec	104.6 sec
Preemptive multi-tasking of Win apps	YES	NO
Crash protection	YES	NO

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*Upgrade from Windows, $49; upgrade from any DOS, $99; $139 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 7/31/92. Shipping and handling not included. **In Canada, call 1 800 465-7999. †Tests conducted by NSTL. System under test is a PS/2 57SX w/4MB RAM and an 8513 VGA display. Under Windows 3.1 applications were loaded and/or executed from the Windows 3.1 Program Manager. Under OS/2 applications were also loaded and/or executed from the Win-OS/2 Full Screen Program Manager. Both Windows 3.1 and Win-OS/2 use a disk cache of 64KB. †Word processor spellcheck. The time required to spellcheck a document with no spelling errors. Open the Word Perfect for Windows 5.1 document entitled "macro.doc." Select TOOLS from the menu bar, then select SPELLER. Select OPTIONS from the SPELLER menu bar, and deselect all of the options. Click OK. Test was timed from the click until the user regained control of the application. "Macro.doc" contains 21 pages and is 47,455 bytes. ††Word Processor Print. The time it took to print a word processing document. Open the AmiPro 2.0 document entitled "printest.sam." Select FILE from the menu bar, then select PRINT. Select FROM page 1 to 1 and click OK. The test was timed from the click until the first page completed printing on the printer. Windows 3.1 used the IBM LaserPrinter 4029 PS17 PostScript printer driver shipped with the Windows 3.1 software package, and Win OS/2 used the IBM 4029 v21 (17 font) PostScript printer driver shipped with the OS/2 2.0 Operating System using LPT1.OS2. NSTL makes no warranties, express or implied, as to results to be obtained by any person or entity from use of the services or the results thereof, or any information or data included therein. NSTL makes no express or implied warranties of merchantability or fitness for a particular purpose or use with respect to the services and/or results thereof, or any information or data included therein. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1992 IBM Corp.

EDITORIAL

Out like a lamb

So much for grand plans.

As we report this week, IBM has shifted its efforts on Repository Manager/MVS, the keystone of its AD/Cycle software development strategy, to developing versions for smaller platforms. If Repository Manager/MVS dies, it will take with it perhaps the last potent argument IBM had for users to build new applications on mainframes.

IBM's resource shift, coming barely two years after the skeletal Repository Manager/MVS code shipped, says a lot about the changes going on at IBM and the newfound muscle of corporate IS customers. Repository Manager had the benefit of all the marketing push IBM could put behind it: controlled prereleases to analysts and the press, an impressive rollout and the backing of a brace of IBM Business Partners.

But it has flopped in the market because it is fundamentally the wrong answer to user questions about how to deal with mounting application backlogs. Repository Manager's first release was a resource-hogging, host-based, grand plan solution to a problem that demanded fast and flexible tools. That's the old IBM at work.

Users quickly said, "No thanks." If they needed to, they would buy Texas Instruments' or CGI Systems' repositories instead. That's the new customer-driven market at work.

So IBM has now reined in the product and decided to concentrate its time and money on smaller platforms where users say they want to coordinate their CASE activities. That's the new, more responsive IBM at work.

To those who have followed IBM's mainframe software strategy for a while, the speed with which these events have transpired is breathtaking. In the past, IBM was willing to push badly built software products for years if it thought users would eventually buy them. DB2, for example, was a dog in its early releases but benefited from three years of aggressive price-cutting while IBM developers fixed problems. In contrast, lately IBM has been quick to pull the string or find outside help on products it once considered strategic. OfficeVision/LAN, for example, was yanked after only two years. Customers are dictating the rules, and even IBM has to play by them.

Where does Repository Manager go from here? Its original goal of unifying competing CASE standards is commendable, but IBM's choice of platforms wasn't. If IBM can deliver useful repositories on Unix, LANs and AS/400s and continue to build third-party support, then it will address specific IS needs to offload mainframe development. But leave the grand plans at home.

Paul Gillin, Executive Editor

LETTERS TO THE EDITOR

It's academic

I see little evidence that IS organizations consider it "good corporate policy" to get future leaders from the academic world, as Francis Walnut puts it ["Lofty ideas don't build systems," CW, June 15]. Instead, I see the same sort of anti-intellectual bias that he shows in his article.

The least tractable problems arise from a lack of good specification and design work, leading to an extended test phase, unreliable systems and a maintenance headache. Large projects are far more complex than anything the most talented individual can handle in a reasonable time period.

Ironically, it's the academic world where you are most likely to find the good "end-to-end" programmer. It's the commercial world where programming has little esteem and is seen as an entry-level position.

Andrew Raybould
Jersey City, N.J.

Image Innovation seeks to clear record

This is regarding "4GL development tool targets images" [CW, June 1], your coverage of Image Innovation's breakthrough in developing the Image Application WorkBench.

A couple of errors in this article may give a wrong impression of this product. First, you quoted Mary Hamway, a senior analyst at New Sciences, as saying that "Users don't need TRW or Andersen Consulting. . . . They can develop an application themselves." She told me her quote was taken out of context. Also, I was quoted as saying, "Our product is aimed at users, not developers." This is not true.

The Image Application WorkBench was designed for use by any developer of image applications. In the past, this type of development has been done by systems integrators like TRW and Andersen because the applications development process has required extensive, complex 4GL coding requiring the specialized knowledge typically found with systems integrators. The development cycle has also been long, costly and risky.

We believe the Image Application WorkBench is a major breakthrough that has the potential to reduce development costs and schedules by 60%. Also, it is a much easier tool to use and will improve communication between developers and users, thereby reducing development risks.

Naren Bakshi
President
Image Innovation
Orinda, Calif.

Flat wrong

Your headline "Copyright grip on source code weakened" [CW, June 29] was exactly wrong. Protection for source code is unchanged. It would have been more accurate to say "CA loses attempt to claim copyright protection for something that isn't in the source code." Or something like that.

Joshua Stern
Los Angeles

What about all the other wiretapping?

FBI Director William S. Sessions suggests the FBI's wiretap proposal isn't radical [CW, May 25]. I have investigated the FBI and other agencies' use of surveillance and interception techniques. According to the Administrative Office of the U.S. Courts and the Attorney General's Office, the number of interception orders approved by courts in this country is about 2,000 per year.

Sessions maintains that wiretapping is an investigative technique of the last resort. An analysis of the size of the industry that supports only 2,000 court-approved interceptions per year shows that limiting interceptions to legal actions would bankrupt the industry in short order.

The industry is obviously providing equipment for other uses. Why has Sessions not directed the FBI to investigate that? The manufacture of this equipment is closely regulated by law.

It would seem that the FBI's attempt to direct telephone technological innovation is an effort, though unintentional, to allow business as usual — e.g., interception of communications by numerous unauthorized individuals with unknown credentials and similarly unknown agendas.

Glen L. Roberts
Publisher, Full Disclosure
Libertyville, Ill.

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We need policy follow-through

SEN. JEFF BINGAMAN

I believe the U.S. needs to adopt a conscious and aggressive technology policy.

Since the end of World War II the federal government has pursued a de facto technology policy that rests on two legs: support for basic science and "mission-oriented" technology development (largely cutting-edge defense technology). That breakthrough-oriented policy has worked well for many years, but it is no longer adequate because it ignores commercial follow-through.

Unless we adapt our traditional policy, we will continue to see foreign firms succeed at commercializing technologies invented in the U.S.

Changing world

Three fundamental changes have rendered our traditional, de facto technology policy obsolete. These changes suggest the direction in which an explicit technology policy must go.

The most important change has been the emergence of foreign firms that can refine breakthrough technologies developed elsewhere. Now, the greatest competitive advantage lies not with those who make the original discovery, but with those who perfect its manufacture.

A second change has been a decline in defense "spin-offs." Although military and space R&D spawned technologies such as computers, semiconductors and jet-propelled aircraft, defense R&D has been less effective at fostering commercial technology development in recent years.

Moreover, experts agree that the much larger and more dynamic commercial marketplace will increasingly drive both military and civilian technologies.

The third major change is that foreign rivals, having out-manufactured us using our own breakthrough technologies, are now increasingly developing their own. And, their investments in commercial technology now exceed ours.

Of the leading industrial countries, the U.S. alone fails to provide direct governmental support for commercial technology development.

The solution to our competitive problems, in my view, is not to divert resources from science and thereby risk losing our longstanding advantage. Instead, we must acknowledge the fundamental changes of the last 45 years and adapt our approach accordingly.

First, we should provide direct support for commercial technology development. That support should be cost-shared with industry, and it should focus on technology that is too risky for industry to undertake alone.

Second, we should give more attention to the diffusion and application of technology.

I'm calling for a national commitment of resources to state and local programs that provide manufacturing extension services to small and medium-size firms. We currently spend less than $100 million a year on manufacturing extension, compared with $1.3 billion on agricultural extension.

I'm also recommending federal support for activities by geographically clustered companies that enhance their ability to commercialize and apply technology.

The strength of regional technology clusters is fast becoming the key to international competitiveness. To borrow a phrase, to win globally, we must think locally.

All in one

Finally, we should integrate our civilian and military technology bases into a single national technology base. Here, one specific recommendation is to broaden the mission of the Pentagon's Defense Advanced Research Projects Agency to explicitly include support for technologies with both defense and commercial applications.

I believe strongly in markets: Industry can best judge market demand and bring commercial products to fruition.

The question for me is how to make the best use of the strengths of both government and industry.

The answer, in my view, is to seek ways to couple a larger fraction of the massive federal R&D enterprise to industrial efforts.

This does not imply government's "picking winners and losers." It does imply government's "making winners" out of technologies picked by industry.

Bingaman (D-N.M.) chairs the Senate Defense Industry and Technology Subcommittee.

Ignored, misunderstood, OS/2 deserves better

AXEL TILLMAN

No one seems willing to give IBM a fair chance these days. OS/2 is a great product, and I'm tired of reading page after page about new Windows 3.1 features and very little about OS/2 2.0.

I am not saying this because my firm has developed an OS/2 product. Our corporate strategy does not rely on OS/2, but I as a user and our guys from development hope OS/2 succeeds because it is the better platform.

Some writers claim the race will go to the company with the better marketing. I have to disagree. Everyone I've spoken to who has given OS/2 an objective tryout has been excited about it. But editorial impacts readers 10 times more than advertising, and no one is going to want to try OS/2 if publications consistently ignore or denigrate it.

It is hardly surprising, for example, that an operating environment would require less disk and memory space than a full-fledged operating system, but that distinction is seldom made by writers or reviewers. When Windows NT, which may really be an operating system, does appear, however, you can be sure that it will require more memory and more disk space than OS/2.

Right now, what I care about is fulfilling my technical requirements in a desktop environment. Beginning the day I installed OS/2 on my 25-MHz 386, I was extremely pleased at the speed with which I was able to accomplish goals I hadn't been able to reach after a year of painful experimentation with Windows.

Each task is a mouse click away. The number of system crashes is down to zero, from an average of five per day with Windows 3.0. I also don't have to boot my systems 10 times a day to access my network because OS/2 doesn't lock up the way Windows did when I tried to access network resources.

I'll admit that my particular hardware setup probably caused some of these problems. But the fact is that OS/2 2.0 solved them all, and I am now able to run multiple DOS, Windows and OS/2 applications combined with DOS-based network access simultaneously and still have my PC reacting to me.

Love at first look

I fell in love with OS/2's new graphical interface, the "Desktop." Once you get used to the handling, it's hard to imagine that there was ever another way of doing things. And it is important to understand that I am the sort of person who always said I liked to type at the prompt and know what I was doing. I never expected to warm to a graphical interface, and Windows really didn't convince me.

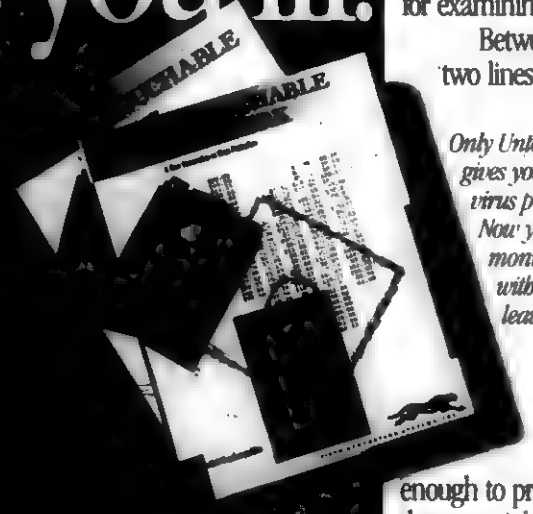
Just recently, I saw some lab-test results comparing OS/2 2.0 to Windows 3.1 and, although the testers tried to compare apples with oranges, OS/2 showed very good performance. Windows 3.1 didn't do all that much better on the application test than OS/2 simulating Windows did, and I suspect that if they had tried comparing performance on 1-2-3, using the OS/2 product from Lotus, the results would have been reversed.

The testers also didn't try four simultaneous DOS benchmarks under Windows vs. OS/2, which would have shown the real strength. This is like testing a Porsche against a Ford Fiesta at 55 mph.

OS/2 2.0 isn't the best that OS/2 can be. It should be considered a migration pass to purer OS/2 environments. In the meantime, however, the important thing is that it is real and delivers dependable performance.

Tillman is vice president of marketing at Triosystems, Inc. in Nashua, N.H.

Paying again and again for virus protection is enough to make you ill.



Frankly, paying anything at all is pretty nauseating.

But that's nothing compared to the feeling you get in your stomach when a drive full of data goes down the drain.

So you pay.

Then you pay again. For upgrades. Or quarterly "updates."

But even that doesn't buy you much peace of mind. Because each new day brings an average of six new viruses into the world.

Which means all anti-virus programs are inherently obsolete.

Except one.

Introducing Untouchable.™ The only software in the world that gives you 100% protection.

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Like other anti-virus software, Untouchable is equipped with a TSR monitor for patroling your system memory, plus a scanner/remover for examining the files on your disk.

Between them, these first two lines of defense can recognize and obliterate over 1000 of the little buggers—enough to protect you from 95% of the potential carnage.

Only Untouchable Network gives you centralized virus protection. Now you can install, monitor and control without having to leave your seat.

If you find that statistic reassuring, then you probably like the odds in Russian Roulette.

If you don't, you'll want to know that Untouchable is equipped with a unique *third* line of defense, which has been mathematically proven to be, well, untouchable.

Instead of looking for viruses, this third line of defense looks for *changes in your executable and system files.*

If the change is but a single byte, Untouchable will spot it and, using our patent-pending recovery technique, reconstruct the file to its original state.

The process is known as Generic Differential Detection, and certain other programs claim to perform it, too.

But only Untouchable calculates file signatures using not one, but two proprietary algorithms that can't be reverse-engineered.

Only Untouchable guarantees 100% safe recovery of infected files. (Unlike other programs that proudly generate corrupted files, Untouchable knows when the jig is up and doesn't attempt recovery.)

Only Untouchable can provide centralized network virus protection. In fact, Untouchable Network has enough virus alerts and reporting mechanisms to settle the stomach of even the most nervous Netware® administrator.

And only Untouchable is backed by our vaunted 24-hour toll-free technical support and a one-year money-back guarantee.

If you're worried about viruses—and you should be—don't reach for the Maalox.® Reach for the phone. Dial 1-800-926-4289. Ext. 55.

You'll feel better right away.

FIFTH GENERATION SYSTEMS, INC

SAVE $50 Visit your dealer between now and August 31, 1992, and get Untouchable DOS for just $49 (sugg. list, $99).

MS-DOS is just fine for this support agency

BY ROSEMARY HAMILTON
CW STAFF

The information systems department at the Catholic Guardian Society of Brooklyn & Queens is not what you would call leading edge. But it is proving that it does not have to be to get the job done.

The society relies on a collection of Microsoft Corp. DOS-based applications and has no immediate plans to upgrade to a Windows environment, said Stan Capela, MIS director.

The Catholic Guardian, which will officially change its name to Heartshare Human Services of New York in September, was founded in 1914 to provide support services to orphans. Now funded with a mix of city, state and private support, it offers services including foster care, adoption and family crisis management as well as a set of educational and treatment programs for the developmentally disabled.

Capela oversees 10 staff members who generate reports, manage casework software and handle agencywide research. The Catholic Guardian's financial operation is handled by a separate group that uses an IBM Application System/400. Of the organization's $42 million operating budget, less than 1% goes to IS, according to Capela.

Capela's group uses Borland International, Inc.'s Quattro Pro to generate reports, Borland's dBase to maintain records and a few applications written by an independent firm. In addition, the group will be moving to a Novell, Inc. local-area network to support its 15 personal computers.

It is also evaluating Lotus Development Corp.'s Agenda, a DOS-based personal information management tool, to help case managers.

Recently, Capela's group has been polishing up a case management program written by Defrain Systems, Inc. in New York to support its family crisis prevention program. Defrain wrote the software in Clipper, a programming language for dBase that was developed by Nantucket Corp., which was recently acquired by Computer Associates International, Inc.

Defrain wrote Evolve, a similar case management system for Catholic Guardian's foster care program, three years ago. It provides a tracking mechanism for children's records, produces reports and handles the payroll for foster parents.

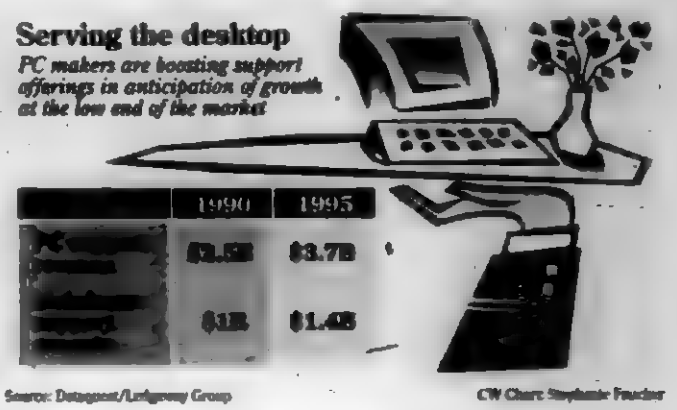
Both of these service programs were once managed by paper alone. Four years ago, Capela began using dBase to maintain data on foster children. While this was an improvement, the staff still needed an easier mechanism to produce reports and track information, Capela said.

Gets the job done

With Evolve, "the bottom line is I have increased report writing by 25% to 30% a year," he said. The system holds records on nearly 4,000 children with 1,050 active files today.

The organization's IS effort began four years ago when a two-person quality assurance team was set up.

"We started off with three computers and now we are up to 15," Capela said. "We are talking about a department with very little background in computers."



Source: Dataquest/Link Group — CW Chart: Stephanie Faucher

Dell makes support desktop difference

BY CAROL HILDEBRAND
CW STAFF

Tucked in with Dell Computer Corp.'s recent price cuts and entry-level personal computer introduction was a service and support initiative that analysts said signals another push for the corporate desktop.

The Austin, Texas-based company differentiated its lines — the low-end Dimension line and the traditional Dell line — by adding expanded service and support into the higher priced lines.

"There is a set of customers looking for basic hardware value and a set looking for total IS value equation. We split our hardware families along those lines," said Michael O'Dell, vice president of product development at Dell.

Analysts said the move continues Chairman Michael Dell's efforts to move his company away from a clone image and compete with the big boys — companies such as Compaq Computer Corp., IBM and AST Research, Inc.

"It's really the only path that Dell can take at this point," said Scott Stein, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "Without getting creative with distribution, the only way to differentiate today is through a 'peace of mind' guarantee."

However, Stein noted that Dell will have a tough time keeping up with its competitors now that they have slashed the bottoms out of their prices. "Their support effort has to be good, particularly in light of a resurgent Compaq," he noted.

For the difference in price between a Dell and a Dimension — about $250 for a 33-MHz Intel Corp. 80386-based PC — users can get the following new services if they decide to buy:

- **Guaranteed compatibility.** If a Dell system has a compatibility problem within three years of purchase, a customer is entitled to Dell's help in solving the problem. Failure to fix the glitch will result in a refund.

Will Van Overbeek

Dell is moving *his firm away from a clone image in part through enhanced service*

- **Guaranteed response.** Dell is promising to provide technical support within five minutes of calling the company's support line (operated from 6 a.m. to midnight). Those not willing to wait the five minutes will get a call back within the hour. If not, Dell will pay the user $25.
- **Guaranteed service.** Holders of Dell service contracts now have access to next-business-day replacement of desktops and notebooks.

Dimension users get 24-hour technical help via fax, access to the company's toll-free automated technical support, a year's worth of help from an expert help hotline and a 30-day money-back guarantee.

Compaq bets on one-stop printer shopping

BY CAROL HILDEBRAND
CW STAFF

Compaq Computer Corp.'s new peripherals division may be a Johnny-come-lately to the printer market, but analysts are predicting that one thing it won't be is an also-ran.

The company's distribution system and reputation for quality should help garner the division a piece of the printer market, which is currently dominated by Hewlett-Packard Co. on the desktop laser printer side, analysts said, pointing out that the company will probably follow the one-stop shopping method successfully employed by Apple Computer, Inc.

Although no specific products have yet been announced, Compaq said it will first target the network printing market.

One-stop shopping

"The key to the whole thing is, 'Can people buy a printer where they shop for PCs?' " said Mark Boer, a senior market analyst at BIS Strategic Decisions in Norwell, Mass. "It's unrealistic to think that everybody is going to stop buying other brands and start buying Compaq, but I think they will do very well."

Joel Wecksell, an analyst at Gartner Group, Inc., agreed, pointing out that Compaq's dealer system, which he estimated numbers about 4,000, is one of the strongest in the U.S.

> "IT'S UNREALISTIC TO think that everybody is going to stop buying other brands and start buying Compaq, but I think they will do very well."
>
> MARK BOER
> BIS STRATEGIC DECISIONS

As the company tries to entice users with the promise of one-stop shopping, it can also expand beyond its personal computer hardware base, a market of ever-eroding profit margins and ruthless competition. Boer observed that while a PC is more of a onetime purchase, printers generate steady income through the sales of supplies, such as toner.

First in line

Compaq's first effort will reportedly be a 17 page/min. network-ready printer, which jibes with the firm's strong reputation for networkable products. Said one Compaq user who has seen the printer: "It burns up the HP — if it comes in near it in cost, they'd make a dent" in the market.

The one problem the user found was that the printer did not have a duplex option; that is, it could not print on both sides of the paper, an optional feature on the HP product.

However, Boer said that in the range that BIS designates as networkable printers — those that print between 12 and 19 page/min. — only about 8% of buyers want duplex printing. "While it's really neat from a paper-saving standpoint, not many printers can handle it," he said.

Senior writer Michael Fitzgerald contributed to this story.

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Z series.

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is built in.

The *Z* series of desktop and notebook PCs and servers is a whole new way of thinking. It views PCs as a long-term investment, and has the vision to protect it. It's called Thinking Ahead.

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How to deal with two Novell problems

WINDOWS POINTERS

Part of a series of Windows 3.1 user tips provided by Microsoft Corp. and based on questions commonly asked of Microsoft customer support personnel.

Q Why doesn't my Novell, Inc. NWPOPUP.EXE messaging utility initialize properly? When I exit Windows I get all my messages.

A If you are running Windows in 386 enhanced mode and a version of Novell NetWare's NWPOPUP.EXE with a file date earlier than March 10, 1992 is in your Windows directory, or if NWPOPUP.EXE is located in a directory prior to the Windows directory entry in the PATH= statement, then NWPOPUP.EXE will get loaded and will not initialize properly under Windows 3.1. It may also be necessary to try placing the following line in the [386Enh] section of your SYSTEM.INI file: **TimerCriticalSection=10000**

This increases the amount of time before the critical section is timed out.

Q I am the system administrator for a Novell network. Most of my workstations run with no problem, but two of my workstations run only in standard mode and not in 386 enhanced mode. If I do not log on to the network, then I can run in 386 enhanced mode.

A There are four possible causes for the problem: 1) incorrect network software drivers, 2) IRQ conflict, 3) random-access memory address conflict or 4) base address conflict.

1) Read the NETWORKS.WRI file for the steps necessary to upgrade your current versions of IPX and NETX. If needed, contact your network card manufacturer if you need new low-level drivers.

2) Most machines do not support two devices using the same IRQ at the same time. This means that if you are using your network card on IRQ3 or IRQ4, then you will have to either disable COM2 or COM1, which use the same respective TRQ, or reconfigure the network card for a free IRQ. On most machines, IRQ5 and IRQ2 are free, meaning no other hardware device is attempting to use them.

3) Many network cards use a RAM address in the Upper Memory area between 640K and 1,024K bytes. If your card is using this range, then exclude use of this range with EMM386.EXE or an EMMEXCLUDE statement in the SYSTEM.INI file's [386Enh] section. Some cards will not function properly at D000 and need to be reconfigured for D800.

4) Many hardware devices have base memory addresses (e.g., COM ports). There may be a conflict with an existing device. Try reconfiguring the network card for an address of 300h or greater.

User group offers .INI editing relief

BY CHRISTOPHER LINDQUIST
CW STAFF

The Windows Users Group Network (Wugnet), based in Media, Pa., recently unveiled a Windows configuration management tool designed to eliminate the need to manually edit a variety of .INI configuration files — and to drum up some membership in the group.

Windows System Engineer provides point-and-click access to the wide variety of parameters — including some not documented in Microsoft Corp.'s literature — involved in fine-tuning Windows to a particular environment. Among the available parameters are those dealing with memory, keyboard interface, networks, communications and disk operations.

Users click on check boxes and spin buttons to select features and settings, allowing a try-as-you-go approach to configuring Windows. System Engineer also keeps a log of all changes and allows users to keep multiple configurations and revert back to previous settings for any reason and at any time.

"System Engineer works well as a tool to explore and tweak performance settings, etc., of the Windows environment," said David Howell, information systems manager at PED Manufacturing. He used System Engineer to quickly edit his SYSTEM.INI and WIN.INI configuration files.

However, "it probably goes a bit further than most folks need," Howell added. "Still, for power users, it's a handy tool."

System Engineer also includes detailed technical help concerning both its own operation and the operation of many technical aspects of Windows configuration.

"Balloon help" is also available on any parameter. Clicking on a parameter with the right mouse button calls up an information box about its configuration options.

System Engineer is available with a Wugnet membership. Full membership fees start at $99 per year for individuals and $495 for corporations.

Announcing the development of a spatial database system for those who know what one is.

Ingres, a leading relational database company, and ESL, a leading developer of advanced imagery systems and GIS applications, are pleased to announce that spatial database management capabilities are being added to the Ingres Intelligent Database. Spatial database management capabilities, including new data types, operators, and access methods, will be embedded in the Object Management Extension of the database. This development is expected to open up a $25 billion market in GIS alone. For more information, call 1-800-4-INGRES.

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Handheld device market taking shape

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Vendors hope that small packages can yield good things. At least two impending chip moves may lend shape to the market for handheld devices.

AT&T's Microelectronics Division and Go Corp. used Mobile92, a recent Technologic Partners conference on mobile devices, to announce AT&T's reduced instruction set computing (RISC) chip, called Hobbit, which runs a RISC-specific version of Go's PenPoint operating system (see story bottom right).

Analysts said Hobbit will lead to cheaper, faster handheld devices that will be used like cellular phones.

"I think they're looking at personal communications devices more than anything else," said William Lempesis, president of Lempesis Research in Pleasanton, Calif.

Let's make a deal

In addition, Intel Corp. recently announced a deal with VLSI Technology, Inc. that will give handheld or subnotebook computer builders the opportunity to have custom processors.

Intel spent $50 million to buy less than 20% of VLSI, a chip set maker based in San Jose, Calif. The two companies expect to build integrated 80386 processors targeted at the palmtop and subnotebook markets, focusing on semicustom versions to meet specific vendor requests.

The deal gives VLSI a license to the core of Intel's 3.3V 80386SL power management microprocessor. Intel, meanwhile, will serve as the chip foundry for VLSI's designs.

Intel said it has no plans to create semicustom versions of other processors.

While many observers have said handheld devices will likely be consumer-oriented, Michael Aymar, vice president of the entry-level products group at Intel, said the company thinks products based on its chips — the first version of which will appear in mid-1993 — will be used by businesses before they reach the consumer channel.

Why the move?

Analysts said Intel's move was prompted by a desire to appear responsive to customers in the face of Cyrix Corp.'s recent agreement to license its Intel-mimicking processors to Texas Instruments, Inc. They also pointed to competition for the handheld market from the new Hobbit chip and companies such as Chips and Technologies, Inc.

At least one analyst said the Intel initiative will badly damage the effort by Phoenix Technologies Ltd. and Lotus Development Corp. to create "companion" personal computers based on Chips and Technologies' chips [CW, May 4].

"This puts people like [Phoenix/Lotus] reference design out of business," said Andrew M. Seybold, editor of "The Outlook on Professional Computing," a newsletter published in Brookdale, Calif. "If I'm a vendor and I can specify a design and get Intel and VLSI to build it for me and it's in a chip that I own, then I can maybe get my prices up."

Hopes for Hobbit

A potential market of 1 billion units drew AT&T into the market for handheld communicators.

"We know it's going to be a very big market, perhaps a billion users by the end of the decade," said Rakesh Sood, marketing director at AT&T's Personal Communications Systems Division. Besides the new division, AT&T last week announced Hobbit, a RISC processor; and its plan to use a version of Go's PenPoint operating system optimized for RISC chips.

Sood and S. Jerrold Kaplan, Foster City, Calif.-based Go's founder and chairman, said the two companies had worked on this project for more than a year. Sood said there will be a reference design set consisting of the new PenPoint and the Hobbit chip in November.

Kaplan said he expects products in the $500 to $1,500 price range based on the reference set to hit the market early next year.

The dual announcement will benefit both companies, according to analysts.

"Hobbit is worthless without an operating system, and Go gets to show it's committed to scalable systems when there is a question of whether Microsoft's Windows for Pen Computing is truly scalable," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. in Santa Clara, Calif.

MICHAEL FITZGERALD

Announcing the development of a spatial database system for those who don't.

Imagine a big shoe box in which you can store about, oh, two trillion pieces of information.

That is a spatial database.

Into it go bits of information like the entire population of the earth by height, weight, and age. Or the moon, mapped square inch by square inch. Or every cell in the human body. Little things like that.

But unlike the shoebox you have now, where you keep your old receipts, and can't find anything, the spatial database lets you retrieve all the information put into it. In any combination you want. In any form you want. At any time you want.

All two trillion bits of it.

And the retrieval we're talking about is not like the retrieval from any ordinary database.

A spatial database allows you to retrieve and arrange data on "multidimensions." Which means that the bits of data you put into the database can all be related to one another. No matter how deep the layers of data get. No matter how long ago you put the data into the database.

All you do is simply tell the spatial database to compare this with that with this with that with this with that.

What's more, a spatial database allows you to create and store three-dimensional shapes, like the shape of a mountain you've just mapped.

All of which, while interesting, may beg the question: So what?

To answer, consider another large number associated with the spatial database: Twenty-five billion dollars.

That is the conservative estimate for what will happen to just one piece of the total market for the spatial database. That $25 billion piece is called Geographic Information Systems. Or GIS, for short.

The people who make up the GIS market do such things as map and collect geographic reference points for further analysis. Mapping Venus is a GIS job. So is mapping Los Angeles. And so is mapping weather systems.

And what can be done with all those "geographic reference points"?

You can unclog city traffic, for one thing. Or find the quickest routes for emergency vehicles. Or monitor trends in high-crime areas. Or select the best sites for retail bank branches.

The list is endless.

And so are the markets for spatial databases. GIS. Finance. Engineering. Any business that uses large amounts of data and needs to arrange, relate, and access them quickly and simply.

All you need are the right applications. And, of course, the spatial database that can handle all those "reference points."

Why Ingres and ESL?

Ingres is the only company that makes relational databases designed right from the start to accommodate a spatial database. And Ingres is the only company with the experience to make a spatial database practical for real-world companies, not just research laboratories.

ESL, on the other hand, specializes in creating effective applications for the GIS market.

Soon, this unique team will bring their efforts to market.

Which should give you a head start on asking questions about spatial databases and how they can help your company.

Now that you know what one is.

For more information, call 1-800-4-INGRES.

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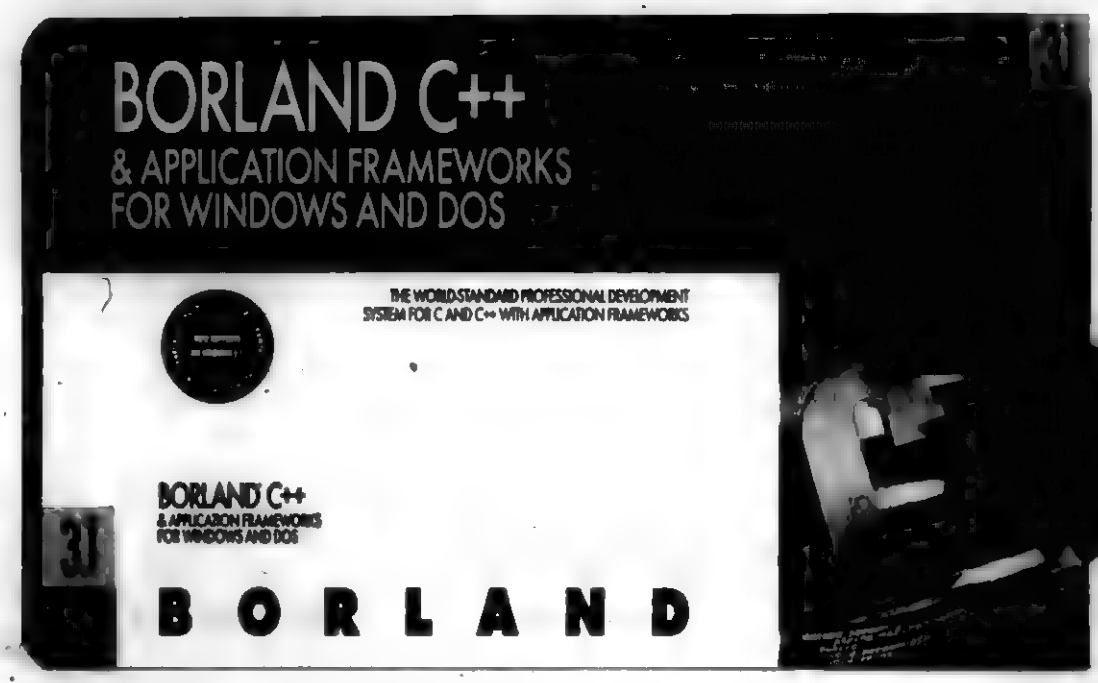
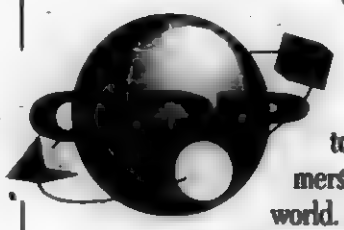
B O R L

The Leader in Object-



Professional C programmers are choosing object-oriented C++ because they know it increases productivity. And the C++ they're choosing is from Borland. With more than 650,000 copies of C++ shipped, Borland sets the standard. Since 1983, Borland has consistently provided professional software development tools to programmers around the world. Today, Borland is the acknowledged leader in Object-Oriented Programming (OOP). OOP gives you amazing code reusability, extensibility and easier maintenance because applications are built on a basis of tested, reliable code.



Supports MS-Windows 3.1

New! Full support for MS-Windows 3.0 and 3.1

Borland® C++ fully supports MS-Windows 3.1 as well as MS-Windows 3.0, and supplies example programs to help you master all the advanced features of MS-Windows 3.1, such as Object Linking and Embedding (OLE), multimedia and TrueType fonts. Of course, full support for Dynamic Link Libraries (DLL), Multiple Document Interface (MDI) and Dynamic Data Exchange (DDE) is also included.

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Borland C++ is the choice of professional C *and* C++ programmers for Windows *and* DOS application development. The third-generation C++ compiler fully supports the AT&T CFRONT 3.0 standard C++, including templates! And the powerful C compiler fully implements the ANSI C standard. With both compilers included you can program in C today and move to C++ when you're ready.

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A host of powerful features in one package!

Borland C++ comes with an array of powerful yet easy-to-use features demanded by today's professional programmers.

New! The optimizing **Windows-hosted IDE** provides a superior software development environment. Now you create, edit, compile with optimization, and run Windows applications all from within Windows. All resulting in remarkable productivity. Only Borland C++ gives you the graphical **ObjectBrowser.™** So you get a visual display of the relationships between objects, and can easily navigate through the classes, functions or variables in your code.

New! Color-coded syntax highlighting makes your code more readable and helps you spot errors.

The **EasyWin™ Library** converts standard DOS applications to Windows just by recompiling. The **SpeedBar™** makes Windows development astonishingly intuitive and fast, employing recognizable icons to represent your frequently used menu items.

Resource Workshop allows you to visually create your Windows user interface without programming.

New! UAE tracer helps trace Windows errors.

Quality tools that other compilers can't match

Borland C++ also comes complete with all the tools that the serious professional developer needs. Borland's award-winning

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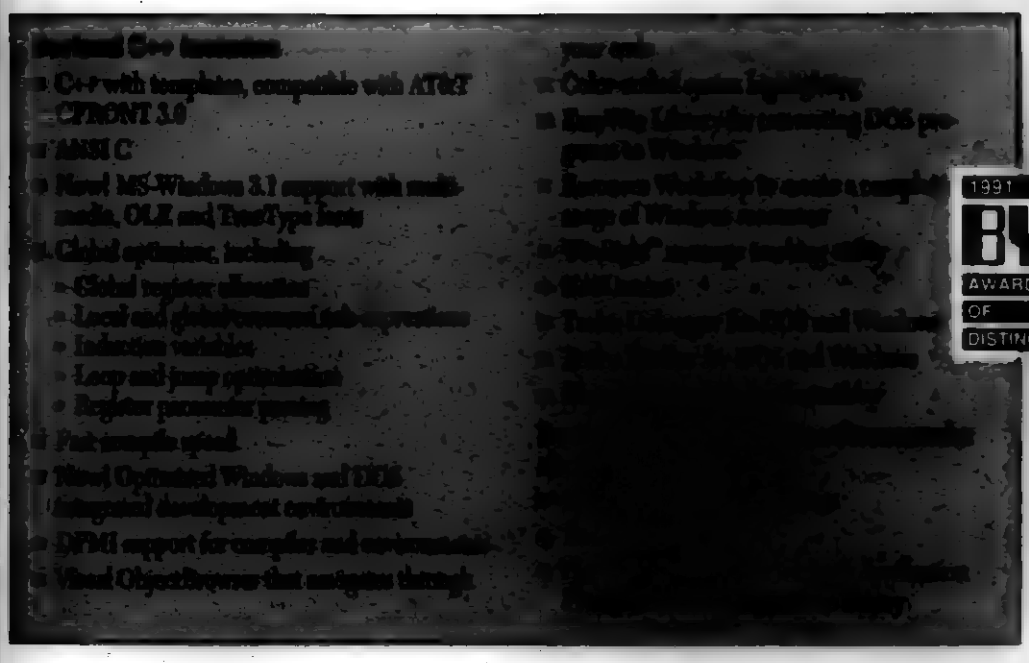

1991 BYTE AWARD OF DISTINCTION

PC WEEK LABS TOP PRODUCTS OF 1991

"Borland C++ is clearly the superior Windows development system; it is without doubt the most comprehensive language package we have ever seen."
—*InfoWorld, February 3, 1992*

Free CASE tool worth $495

The Protogen CASE tool speeds development by letting you visually design Windows user interfaces and generate code.

When you buy Borland C++ now ($495 suggested retail price) or Borland C++ & Application Frameworks ($749 suggested retail price), you get a Protogen code generator *free*!

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Turbo Debugger® gives you intelligent, interactive debugging on a single monitor. The **Turbo Profiler™** helps you spot bottlenecks in your code to streamline your application's performance. With the object-oriented **Turbo Assembler®** you can integrate your assembly language code into your applications quickly and easily.

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The **ObjectWindows™** application framework streamlines Windows development. It automates initialization and gives your applications more functionality with less code. ObjectWindows also features Borland Custom Controls that make your applications look great.

Also included is **Turbo Vision,™** the application framework for DOS that gives you capabilities similar to ObjectWindows for character-based programs. Both come with full source code.

The critics' choice

"Borland C++ looks set to become the *de facto* development environment for Windows programmers."
—*Program Now*, December 1991

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Scotts Valley, CA 95067-0001

B O R L A N D

NEW PRODUCTS

Software applications packages

ZSoft Corp. has announced PC Paintbrush 5+, a color and gray-scale image editor.

PC Paintbrush 5+ creates, scans and edits images used in desktop publishing and presentation applications. This upgrade includes new filters and a stitching feature that allows separately scanned sections of an image to be pasted together. Segments of an image can appear farther away or closer than other segments with a Perspective feature, and a Magic Wand tool can automatically select areas of similar colors.

PC Paintbrush 5+ provides special text effects, including size and style control, gradient options, shadowing, kerning and leading.

PC Paintbrush 5+ costs $149.

ZSoft
Suite 100
450 Franklin Road
Marietta, Ga. 30067
(404) 428-0008

Theos Software Corp. has introduced the Theo+Grafx Multi VGA Adapter Kit.

The product allows multiple Video Graphics Array monitors to be attached to one 386/486 host personal computer. Users can run standard DOS graphical programs such as Microsoft Corp.'s Windows and Aldus Corp.'s PageMaker in multiuser mode on remote bit-mapped monitors.

Working in conjunction with the Theos multiuser DOS environment, Theo+DOS, users can produce DOS-based workgroup systems for about half the price of local-area networks, the company reported.

The VGA adapter kit costs $1,895.

Theos Software
Suite 360
1777 Botelho Drive
Walnut Creek, Calif. 94595
(510) 935-1118

Iges Data Analysis, Inc. has announced IgesView Version 3.0.

IgesView displays computer-aided design and manufacturing (CAD/CAM) data without requiring access to a CAD system. Users can manipulate, mark up, integrate and validate CAD/CAM engineering and design data and convert CAD graphics to a number of electronic publishing systems. New to this version are entity selection and engineering mark-up/red-lining capabilities.

Other features include a window to modify and summarize the visibility and color of each Iges entity and quick access to the manipulation features of IgesView via the main window.

Prices start at $1,995 for a single floating license.

Iges Data Analysis
2001 N. Janice Ave.
Melrose Park, Ill. 60160
(708) 449-3430

Fax

Optus Software has released FacSys Version 3.3, a fax solution for Novell, Inc. NetWare local-area networks.

FacSys supports multiple fax servers for users with multiple file servers and high fax volume. To avoid bottlenecks, FacSys will automatically allocate fax jobs to the fax server with the lightest active load. A new Microsoft Corp. Windows printer driver pops up automatically when fax transmission is selected.

Other features in this release include a QuickSend feature that allows users to send just the cover page using the built-in word processor, simplified transmission of multiple files and support for Class II devices.

FacSys costs $995 per file server.

Optus Software
100 Davidson Ave.
Somerset, N.J. 08873
(908) 271-9568

Peripherals

Wintek Corp. has released Power I/O Module interface cards.

The interface cards were designed to be used with the Wintek controller chassis and personal computer, IBM PC AT and Extended Industry Standard Architecture (EISA) computer systems. A printed circuit card plugs into the appropriate-style expansion slot and lets users cable directly to industry-standard digital I/O racks. The racks can be used for either data acquisition or control applications and typically provide 8, 16 or 24 channels of digital I/O capability.

The Power I/O Module for PC/AT/EISA computers costs $159, and the Power I/O module for the Wintek controller chassis costs $125.

Wintek
1801 South St.
Lafayette, Ind. 47904
(317) 448-1903

Patton Electronics Co. has introduced Patton Model 2015.

Patton Model 2015 is a passive interface converter that allows an asynchronous RS-449 device to communicate with a synchronous V 3.5 device. It is protocol-independent and can support communication distances of 4,000 ft.

Patton Model 2015 comes in two versions that cost $119 each.

Patton Electronics
7958 Cessna Ave.
Gaithersburg, Md. 20879
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BUYERS' SCORECARD

C++, Smalltalk vie for object-oriented favor

BY DEREK SLATER
CW STAFF

Applications developers seeking to catch the wave and move to object-oriented programming (OOP) face an expanding number of options.

C++ is one of the most popular choices. Detractors say C++ is not a pure object-oriented language but rather a set of object-oriented extensions pasted over conventional C language; however, proponents argue that this fact makes C++ easier for C programmers to learn than other OOP languages.

Smalltalk and Lisp are pure OOP languages offered by many vendors. The OOP product gamut also includes a number of proprietary development environments such as The Whitewater Group's Actor (recently purchased by Symantec Corp.); Object/1 from Micro Data Base Systems, Inc.; and Energize Programming System from Lucid, Inc.

In a poll of C++ and Smalltalk users, ParcPlace Systems, Inc.'s Objectworks/Smalltalk compiler and development environment distinguished itself with the top overall score of 79. Its competitors finished close behind: Microsoft Corp.'s C/C++ scored 77, Digitalk, Inc.'s Smalltalk/V earned a 76, and Borland International, Inc.'s C++ scored 75.

The results demonstrated some of the relative strengths of these two approaches to OOP. In general, users gave the two Smalltalk products higher satisfaction ratings in areas such as support for inheritance and ease of maintaining applications. The C++ environments scored noticeably higher in speed of applications.

Buyers' Scorecard measures users' satisfaction with their installed technologies. See the methodology on the following page for a detailed description of the scoring process.

The two Smalltalk alternatives offer a range of functionality and price. Both products were upgraded recently.

ParcPlace announced Objectworks/Smalltalk Release 4.1 on June 2. The Objectworks/Smalltalk environment is priced at $3,500 per user — by far the most expensive product in the survey. It outscored the competition by a notable margin in portability of applications (8.9, compared to Microsoft C/C++'s second-place 8.0). Objectworks also scored highest in quality of vendor support.

Objectworks runs on several platforms, including personal computers, Apple Computer, Inc. Macintoshes and a variety of Unix workstations. A number of new add-on tools and utilities are available, such as the Objectworks/Smalltalk C Programming utility.

Digitalk's Smalltalk/V for Windows was also upgraded in early June. It now includes an icon bar for common functions, support for Windows' Multiple Document Interface and new tools for monitoring the status of development tasks. Digitalk's product topped ParcPlace's in areas including reusability of code for other applications. Smalltalk/V is also less expensive than Objectworks, carrying a $499.95 price tag for Version 2.0. In addition to Windows, Smalltalk/V supports OS/2, DOS and the Macintosh platform.

Microsoft's C/C++ compiler is relatively new, with the product's object-oriented C++ extensions added to its C language compiler in Release 7.0 ($499). Users rated it above Borland's C++ compiler in several areas, including quality of support and documentation.

Borland's C++ has been available for several years and holds the lion's share of the OOP compiler market. The newly released Version 3.1 is priced at $495. Its highest score came in the area of compiler performance.

More than 70% of the users surveyed indicated that using OOP has increased their productivity. ●

Object-oriented programming software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: ParcPlace, 18; Digitalk, 32; Microsoft, 23; Borland, 37.

Total possible score **100** Mean score **77**

Product	Highest ratings	Lowest ratings
ParcPlace's Objectworks/ Smalltalk SCORE 79	Portability of applications Support for inheritance Reusability of code	Training time required Speed of applications Ease of maintaining applications
Microsoft's C/C++ SCORE 77	Documentation Availability of class libraries Quality of vendor support	Training time required Compiler performance Browser support
Digitalk's Smalltalk/V SCORE 76	Reusability of code Debugging features Support for inheritance	Training time required Documentation Speed of applications
Borland's C++ SCORE 75	Speed of applications Integration of tools and functions Debugging features	Training time required Browser support Portability of applications

RATINGS IN ORDER OF IMPORTANCE

Each of the six most important categories is topped by a Smalltalk product.
Users indicated that ease of maintaining applications is the most important evaluation area.

User importance rating:

(Detailed ratings on next page)

8.6 Ease of maintaining applications

8.4 Debugging features

8.3 Integration of tools and functions within environment

8.3 Reusability of code for other applications

8.2 Quality of vendor support

7.9 Responsiveness of vendor service

RATINGS IN ORDER OF IMPORTANCE

(Object-oriented programming software, continued from previous page)

Microsoft's and Borland's packages top the areas of documention and speed of applications. ParcPlace Systems' product earns a noteworthy score in portability of applications.

7.9 Documentation

7.9 Support for inheritance

7.7 Speed of applications

7.6 Compiler performance

7.6 Browser support

7.5 Availability of class libraries

7.3 Portability of applications

7.1 Training time required

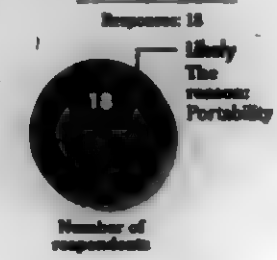
7.1 Support for runtime and compile time delegation

Loyalties

Would you buy the product again?
(Reasons are based on the most frequently stated responses.)

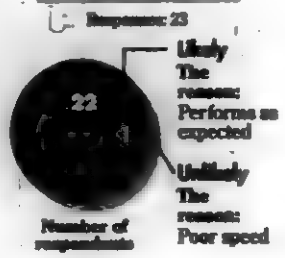
ParcPlace

Response: 18



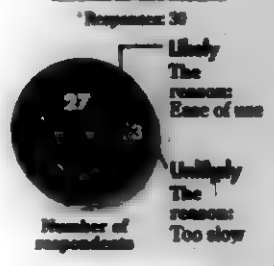
Microsoft

Response: 23



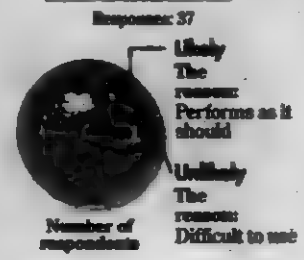
Digitalk

Response: 30



Borland

Response: 37



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers. Quotes are selected from users' responses.)

ParcPlace

Likes

Portability

"We can switch our applications to a new platform very easily."

Dislikes

Compatibility

"Smalltalk is its own little world."

Microsoft

Likes

Ease of use

"It's fairly easy for C programmers to learn the extensions."

Dislikes

Speed

"It's too slow."

Digitalk

Likes

Ease of use

"It can put together a quick and easy application."

Dislikes

Speed

"We'd like to see them improve the speed of the programs."

Borland

Likes

Integration of environment and tools

"It's a very mature product in terms of integration of all the functions."

Dislikes

Compatibility

"The lack of network compatibility is a problem."

Vital statistics

Total number of respondents: 110

What is your position?

IS director	6
IS manager	6
Project manager	7
Applications development manager	8
Programmer/Other	83

How long have you been involved with OOP?

Less than one year	8
1-2 years	37
3-4 years	28
Five or more years	35
Don't know	2

What is your responsibility for OOP software?

Evaluate or recommend vendors	102
Determine need	101
Select vendors	96
Set standards for organization	95

Roughly what percentage of your object-oriented code has been reusable?

0-25%	32
26-50%	36
51-80%	24
More than 80%	8
Don't know	10

METHODOLOGY

The C++ compilers selected for this Buyers' Scorecard are from the programming language market share leaders. The Smalltalk packages are the leading products in that segment of the languages market.

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 37 users for Borland International, Inc.'s C++, 23 for Microsoft Corp.'s C/C++, 18 for ParcPlace Systems, Inc.'s Objectworks/Smalltalk and 32 for Digitalk, Inc.'s Smalltalk/V.

Users assigned 1-to-10 ratings based on their satisfaction with their object-oriented programming software packages in 15 specific categories. The users also rated the importance of each category.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: Byron Hale, Effective Information; *Computerworld* Database Division.

Don't put your eggs in one LAN basket, research study advises

BY MICHELE DOSTERT
CW STAFF

When corporate information systems departments try to integrate department local-area networks into their enterprisewide computing environment, they often find themselves supporting multiple LAN operating systems.

That is not necessarily bad, according to a recent report by Technology Investment Strategies Corp. (TISC), a Framingham, Mass.-based market research firm. Contrary to the belief that single operating system strategies make life simpler, the report said, a certain amount of chaos leaves corporate options open wider.

Too soon to call

"Tactically, forcing these departments to change to a technology that may not work as well for them is going to be unpopular," said Mark Leary, director of communications and network research at TISC and the author of the report. "Strategically, the LAN industry and the NOSs are changing so rapidly that it's too early to lock in to any one technology."

According to Leary, future operating system compliance with network standards such as the Open Software Foundation's Distributed Computing Environment will enable users to mix and match without sacrificing interoperability among different systems. That should minimize the risk buyers currently face of locking themselves into proprietary technology that may not meet their future needs.

"In two to three years, the dust should settle in the desktop operating system wars, and it will be clearer how network services should be integrated into the desktop," Leary said. "To bet the farm on one NOS now would be premature."

IS managers should concentrate on learning how to manage distributed LANs from a centralized location and building trust in their ability to support LANs in user departments, Leary added.

Craig Goldman, chief information officer at The Chase Manhattan Bank NA, agreed that it is still too early to pick standards. "For now, in terms of our future platform, we are not making any decisions," Goldman said. "I think that anyone who doesn't need to choose absolutely right now would be well-advised to sit tight and not make any mistakes."

The TISC report recommended Novell, Inc.'s NetWare as the best network operating system available for firms committed to a single-system strategy. Large companies, however, should feel comfortable with the least-risk route — the multiple operating system strategy.

Unifying the law of the LAN

Bay Area firm begins to integrate offices

BY MICHAEL FITZGERALD
CW STAFF

SAN FRANCISCO — The San Francisco Bay is merely steps away from Jon Holman's office, but he has not had much time to sit on the dock and whistle since joining the law firm of Brobeck, Phleger & Harrison three years ago.

The former Andersen Consulting consultant has been busy unifying a loosely connected jumble of local-area networks in the firm's five offices.

"Administratively, it was a real nightmare," Holman said. "We probably had seven different versions of NetWare floating around."

No place like home

The San Francisco office alone had 13 or 14 file servers in place, each handling 40 to 50 users. However, because the firm had installed technology on an ad hoc basis, the system in the home office was different from those in the firm's other California offices in Los Angeles, Palo Alto, San Diego and Newport Beach — as well as different from the firm's back-office systems.

Los Angeles, for example, used a Digital Equipment Corp. VAX for its computing needs.

"Our goal was to make it so that somebody could go to any office in the firm and have the same environment — the same phone system, the same on-screen menus, etc.," said Holman, who is director of technology at the $150 million firm.

When Brobeck, Phleger made the decision to create a "one-firm firm," as Holman called the network unity scheme, the Los Angeles office began the migration, moving from the VAX to a NetFrame Systems, Inc. NetFrame 400 superserver 18 months ago.

Continued on page 47

Jon Holman

Brobeck, Phleger & Harrison
San Francisco

- **Challenge:** To build a unified IS environment to save administrative costs.
- **Strategy:** Consolidate 25 file servers into six superservers from NetFrame Systems. Focus on CASE-based application design.
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Unifying the law of the LAN

CONTINUED FROM PAGE 45

Holman said the decision to buy a NetFrame was not made lightly. "We had looked very closely at [Compaq Computer Corp.'s] SystemPro," he said. "We basically concluded the SystemPro was a souped-up PC, and the NetFrame was aimed at a different market."

He also cited upgrade costs for Novell, Inc.'s NetWare as a factor in the decision to move from multiple servers to the NetFrames. "When we priced all that out, the savings that we realized from only having to buy three to four copies vs. 13 to 15, we actually were able to almost pay for the cost of the NetFrames," Holman said.

Declines in licensing costs for packages such as Lotus Development Corp.'s CC:Mail, as well as reduced administrative burdens, contributed to the decision.

No rest for the weary

And then there was the superservers' reliability. "Our LAN environment is mission-critical to us — we are close to a 24-hour shop," Holman said.

Brobeck, Phleger now runs its back-office operations on an IBM Application System/400 and its front-office applications on NetWare 3.11 running on NetFrame 100- and 400-class machines. The firm also has a NetFrame 450 for use as a test machine. The two systems are connected directly via Ethernet with routers from Cisco Systems, Inc.

More than 1,100 Brobeck, Phleger employees use the systems, including more than 80% of the firm's attorneys.

The changeover went fairly smoothly, with the only limitations being those imposed by the NetWare 3.11 software. "It only supports 250 connections, and at that level we're not approaching capacity on these machines," he said.

Though his initial goal has been accomplished, Holman still has plenty to do. Brobeck, Phleger has aimed to replace at least half of its 80286-based PCs with systems of 386SX- or higher class products. It is also weighing a decision whether to move to Microsoft Corp.'s Windows environment while keeping a close eye on declining prices of optical disc technology. It already uses some 20G bytes of storage to handle its records.

Brobeck, Phleger is in the midst of building new financial systems, including a new client accounting system, using Lansa, a computer-aided software engineering tool from Australia's Aspect Computing Pty. Ltd.

Ram Mobile Data forms E-mail unit

BY ELLIS BOOKER
CW STAFF

NEW YORK — Taking to heart forecasts that electronic messaging will be the "killer app" behind the growth of wide-area wireless networking, Ram Mobile Data last week formed a new business unit.

The Wireless Messaging Business Unit will offer wireless connectivity services, starting with a suite of tools designed to enable those who write applications or provide electronic-mail services to add Ram wireless connectivity to their products and services, said company Vice President Martin Levetin, who will serve as general manager of the new business unit.

Plan in the works

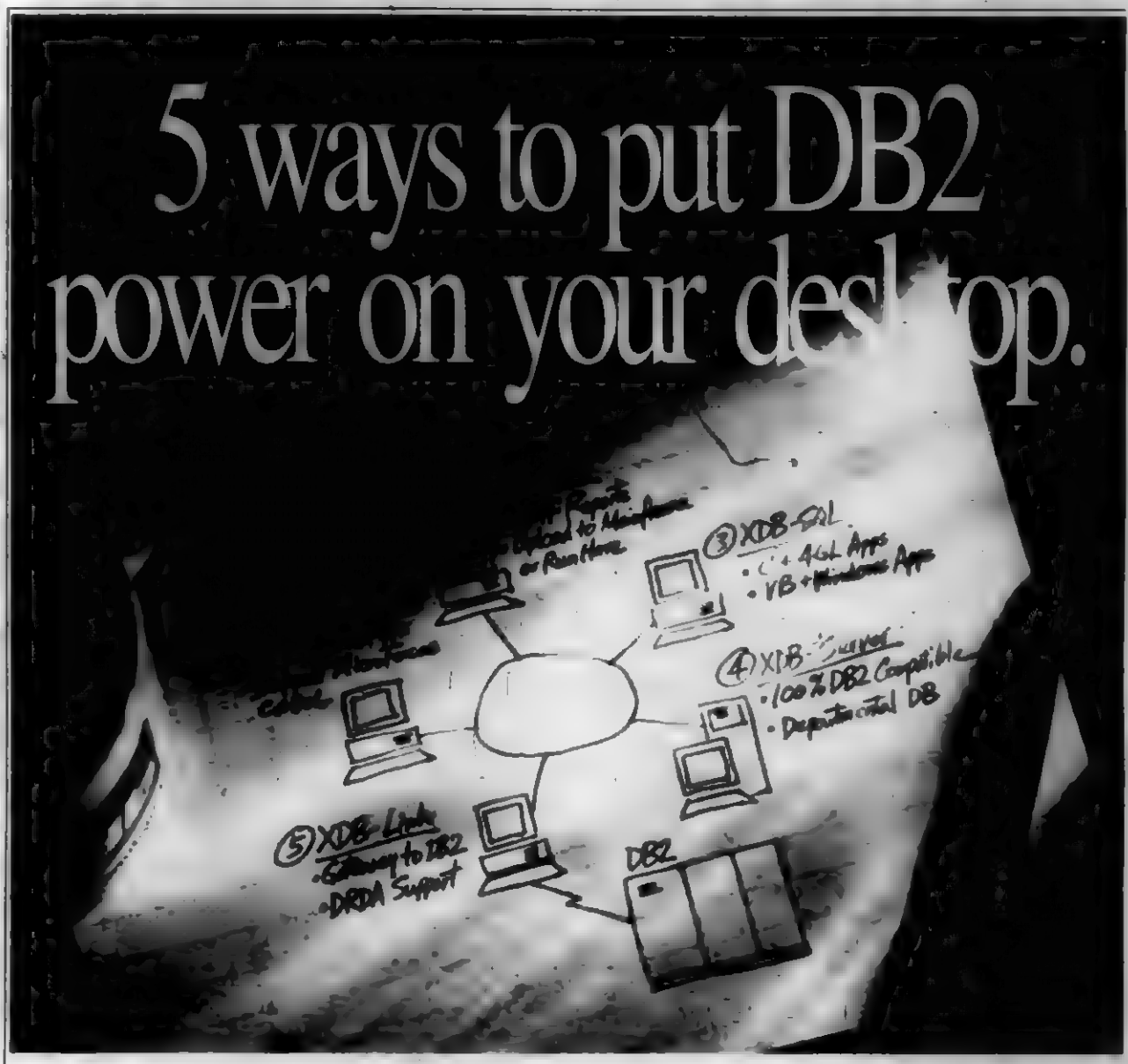
Just three weeks ago, in fact, Ram Mobile Data and AT&T EasyLink announced plans to develop a wireless option sometime next year for users of the AT&T E-mail service.

The emphasis on E-mail and wireless E-mail is warranted, according to Ram Mobile Data, given industry growth projections.

The Electronic-Mail Association is predicting that the number of E-mail users will triple to 27 million during the next three years.

"There's a tremendous tumult in the market right now, with a lot of opportunity," said Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J. "Everyone realizes that most of the communication services that are carried on the wires today could be provided over these [wireless] networks."

New York-based Ram Mobile Data is a business venture between Ram Broadcasting Corp. and BellSouth Corp.



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Swiss stock consortium banks on Sun

Group to use SPARC platform for software development as it automates trading system

BY GARY H. ANTHES
CW STAFF

A consortium of Swiss stock exchanges has chosen Sun Microsystems, Inc. to supply the development platforms for an electronic exchange for the 21st century.

The consortium, Association Tripartite Bourses (ATB), will replace manual trading systems at exchanges based in Geneva, Zurich and Basel, Switzerland, with an automated trading system accessible by member banks, brokerages and other financial entities. ATB will work with the Swiss Options and Financial Futures Exchanges — a private company spun off from ATB — on the project. Completion by the end of 1994 is the goal, at a cost of $55 million.

While hardware for the production system has not been chosen, Bernard Fuchs, a spokesman for ATB, said Sun SPARCstations and SPARCservers were chosen for software development in part because of their adherence to open system standards. The resulting applications must be portable and must be able to interface with whatever systems are in place at member institutions, he said.

Fuchs said Sun was also chosen for its new Solaris 2.0 operating environment, which includes Unix System V, Release 4, plus features for multithreading, symmetric multiprocessing, network security and real-time processing.

The three exchanges, which now operate independently, will be merged and replaced by the single, electronic exchange, Fuchs said.

In addition, the new system will encompass both equities and futures trading — previously separate — according to Serge Dugas, financial services marketing manager at Sun Microsystems Computer Corp., the hardware subsidiary of Sun that has provided networked workstations and servers to exchanges in the U.S., Japan and Europe.

Fuchs said the trading system will initially be used by some 65 Swiss banks and may later be made available to other financial institutions. The applications, to be written in the C language, will provide decentralized trade-order entry and market data display as well as centralized order administration and execution. Data provided to members will be updated in real time as trading occurs.

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DU160	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	All Rates
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA128	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA/DL	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD, Soft Upgrade
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
DS6	DSU/CSU	56 Kbps	DDS	Low Cost 56K Sync.
DDSMR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDSMR2	DSU/CSU	56 Kbps	DDS	DDS with Sec. Channel
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IN BRIEF

Preferred tool eases upgrades to NetWare

■ For users seeking automated tools to ease Novell, Inc. NetWare operating system upgrades, **Preferred Systems, Inc.** in Trumbull, Conn., last week announced PSI:Origen 2.0. The software, aimed at filling gaps created when people are not available to make upgrades, reportedly reads information from file servers into Origen's database management system; makes enterprise changes to users, groups, directory structures and other local-area network parameters; and creates and distributes new user passwords. The software costs $495 for the first server and $295 for subsequent servers.

■ Arcnet LAN pioneer **Datapoint Corp.** in San Antonio recently introduced an enhanced version of its multimedia/videoconferencing workstation that includes full-duplex audio capabilities, a high-resolution monitor and internal camera, speaker and microphone. Users' workstations can double as nodes on the vendor's Minx videoconferencing network, which affords intrabuilding videoconferencing in a LAN-like manner by allowing stations to share resources, such as a coder/decoder for hooking into long-distance videoconferences, according to the company. The workstation also reportedly extends the allowable distances between desktops and video servers.

■ Smart hub maker **NetWorth, Inc.** recently put a price tag on its NetWare Application Engine (NAE), a module allowing users to bundle Novell NetWare server functions into their intelligent wiring hubs. The Irving, Texas-based vendor is charging $4,995 for the module running NetWare Runtime — a single-user version of NetWare Version 3.11 minus file, print and directory services. Modules without Runtime cost $3,995.

The NAE, slated to ship next month, contains a 486DX processor with a 120M-byte hard drive and 4M bytes of random-access memory. It includes two serial and one parallel port, as well as two Ethernet links.

NEW PRODUCTS

LAN hardware

Proxim, Inc. has announced RangeLAN/LT, a local-area network adapter card for Compaq Computer Corp.'s Compaq LTE Lite and LTE 386S/20 series of notebook computers.

Users integrate RangeLAN/LT into the fax/modem slot of their Compaq LTE portables. Because the RangeLAN/LT adapter card uses spread spectrum radio, it does not require Federal Communications Commission licensing.

Compaq LTE users with RangeLAN/LT can communicate with any desktop or server that has Proxim's RangeLAN/ISA full-size adapter card, enabling existing LANs to extend into the portable networking and communications environments.

RangeLAN/LT costs $595 per unit.

Proxim
295 N. Bernardo Ave.
Mountain View, Calif.
94043
(415) 960-1630

CBIS, Inc. has announced MachLink LANBoard, a 16-bit XT/AT bus-compatible local-area network card.

MachLink LANBoard can transmit data and applications over the LAN at 50M bit/sec. All data and applications, including the image-intensive applications of computer-aided design, tape backup and multimedia, have increased transmission speeds.

According to the company, this data transmission rate represents a 200%+ increase over 8-bit Ethernet and Token Ring LAN cards. MachLink runs over standard copper, unshielded twisted-pair or twisted-pair cabling.

MachLink LANBoard costs $349 per card.

CBIS
Suite 170, Building 100
5875 Peachtree Industrial Blvd.
Norcross, Ga. 30092
(404) 446-1332

Allied Telesis, Inc. has announced the AT-3612T, a departmental Ethernet concentrator.

The AT-3612T has 12 10Base-T ports, and up to eight AT-3612Ts can be plugged into a single chassis to build a departmental concentrator with 96 ports.

A high level of redundancy is provided by the AT-3612T. Any AT-3612T can behave as a Simple Network Management Protocol-managed concentrator, backup or slave unit in the concentrator, and if one unit malfunctions, it can be hot-swapped and replaced without causing network downtime.

The AT-3612T costs $1,795.

Allied Telesis
575 E. Middlefield Road
Mountain View, Calif.
94043
(415) 964-2771

Interphase Corp. has added a FiberHub 1600 Fiber Distributed Data Interface (FDDI) network concentrator to its line of FDDI solutions.

The product is a stand-alone device providing connectivity for 8 to 16 stations. The FiberHub 1600 can be configured in a variety of ways for ease of implementation and ease of FDDI network expansion. It also has modules that are hot-swappable for maintenance. Users can customize network configurations to suit topology or application needs.

Prices begin at $13,995 for an eight-port configuration.

Interphase
13800 Senlac
Dallas, Texas 75234
(214) 919-9000

Unix

Demax Software has introduced SecureMax/UX 2.0, a software solution that allows users to assess and monitor the security of a multivendor Unix network from a single interface.

The SecureMax/UX 2.0 can manage or audit hundreds of distributed Sun Microsystems, Inc. SunOS, Digital Equipment Corp. Ultrix and Hewlett-Packard Co. HP/UX platforms from a central workstation. Detailed investigations of critical node security are supported. The SecureMax/UX 2.0 can repair problems by automatically creating corrective shell scripts. According to the company, ease of use is a key feature in this release.

Single CPU copies cost $495.

Demax Software
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Modems

Prometheus Products, Inc. has introduced the Ultima Home Office for the Apple Computer, Inc. Macintosh.

The product is a communications center offering voice mail, data modem and desktop fax capabilities. Operating under System 6.0, it is also System 7.0-savvy and compatible with practically all other modems, connecting automatically at the other modems' highest speed, ranging from 300 bit/sec. to 14.4K bit/sec.

Included is an integrated software application called Maxfax that gives users complete control of fax and voice-mail functions, including a single list of voice and fax messages that have been sent or received.

Ultima Home Office for the Macintosh costs $649.

Prometheus Products
9524 SW Tualatin
Sherwood Road
Tualatin, Ore. 97062
(503) 692-9600

Cleo Communications has introduced AllSync, a product that provides the capabilities of all major modem types on one board via a single telephone line.

AllSync eliminates the need for external boxes and extra telephone lines, and because multiple modems can be placed on a single board, users do not have to buy new modems whenever their needs change, the company said. The product includes AT Command set functions such as auto-dial, auto-answer and auto-disconnect.

AllSync prices start at $1,095.

Cleo Communications
3796 Plaza Drive
Ann Arbor, Mich. 48108
(313) 662-2002

Workgroup software applications

Altsys Corp. has announced Virtuoso for Solaris.

Virtuoso is an advanced design and production program for the Solaris operating system on Scalable Processor Architecture and Sun Microsystems, Inc.-compatible workstations.

The product was designed for users who want illustration and text-handling capabilities in one program. Virtuoso has basic drawing and transformation tools, unlimited design layers, extensive fill and line control and Adobe Systems, Inc.'s PostScript support.

Virtuoso costs $695.

Altsys
269 W. Renner Road
Richardson, Texas 75080
(214) 680-2060

Electronic mail

Notework Corp. has started shipping A-Gate, a local-area network electronic-mail gateway to the AT&T Mail system.

The gateway will allow users of the vendor's E-mail package for Novell, Inc. LANs — also called Notework — and other LAN-based E-mail products to exchange messages with the AT&T Mail service.

Available in three versions, two of A-Gate's versions connect Notework or CC:Mail to AT&T Mail without Novell's NetWare Message Handling System (MHS). The third version connects Notework, WordPerfect Corp.'s WordPerfect or any other MHS-compliant LAN E-mail package to AT&T Mail by using MHS.

Prices start at $399.

Notework
320 Washington St.
Brookline, Mass. 02146
(617) 734-4317

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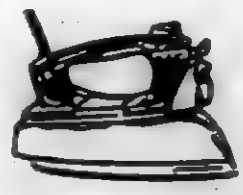
A



I doubt it. The Big Iron is where it's at. I've got too much tied up in mainframes to waste time on small platforms.

B

I'm still waffling. I won't commit until smaller platforms are proven in the business environment.

C

Hey, I'm a big fan. I'm already doing it. MIPS are cheap.

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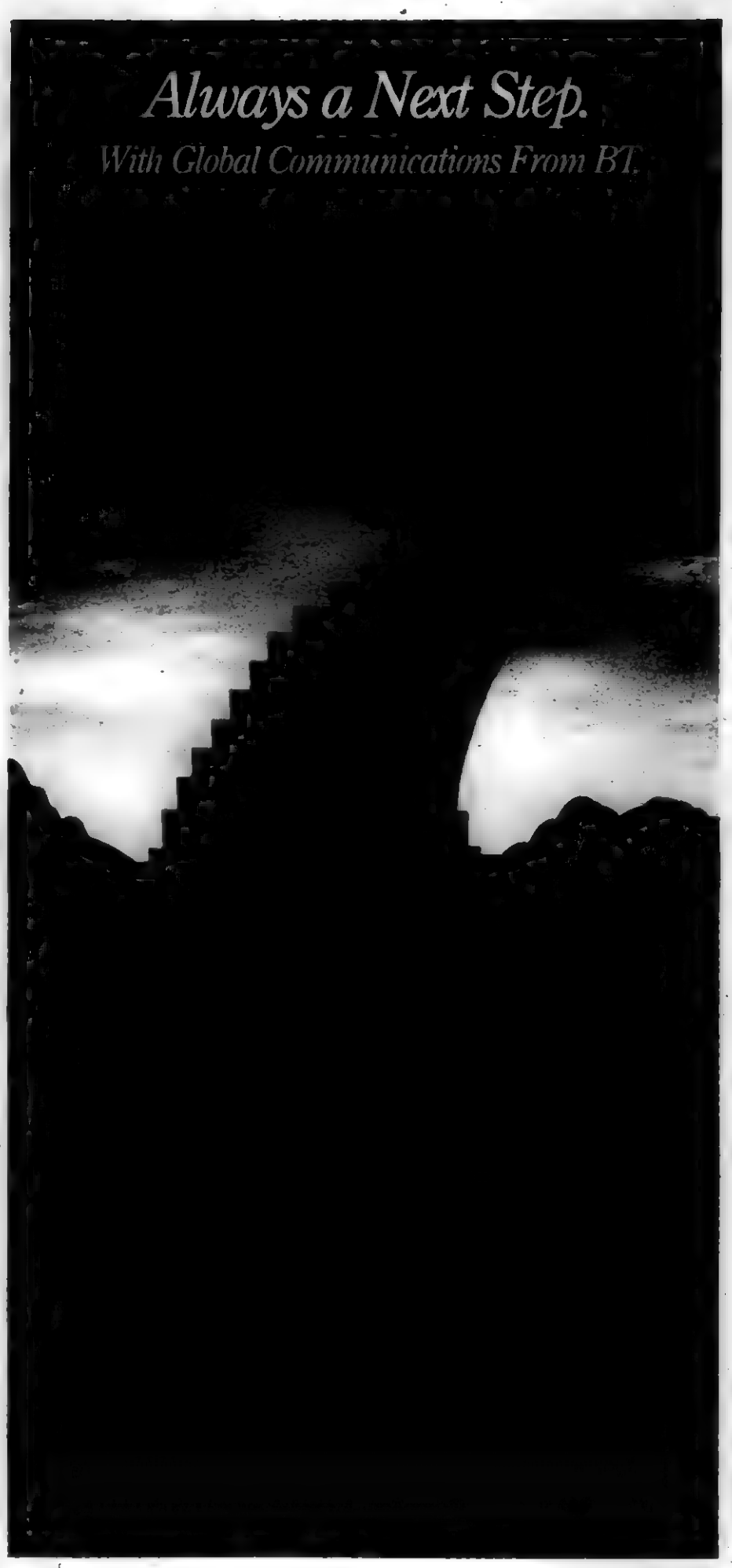

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Canadian bank finds needed link

Network Systems' remote channel extension units help connect IMS, DB2 databases to backup gear

BY ELISABETH HORWITT
CW STAFF

MONTREAL — Last September, La Confederation de Caisses Populaires et d'Economie des Jardins du Quebec became a test bed for Network Systems, Inc.'s recently announced remote channel extension products.

At stake for the Canadian credit union was the possibility of filling a 30-minute gap in its data center backup system, which handles transactions coming in from a network of more than 10,000 terminals and 1,450 automated teller machines, according to Gary Gutsche, chief technical adviser at the company.

Late last year, Network Systems introduced its 7200 series of host controllers and 7250 series of device controllers, which are said to be the first high-speed channel connections to link mainframes and rotational direct-access storage devices (DASD) over virtually unlimited distances. Until then, channel extenders only supported local links between mainframes and rotational DASDs.

Prior to the introductions, Caisses Populaires, whose primary and backup data centers are 15 km apart, could not have mainframe transactions written directly to backup disks located many miles away. Like many companies, the $44 billion credit union maintains geographically separate data centers to safeguard against a single disaster hitting both.

Much at stake

Caisses Populaires had been using a "roll-your-own" application to scan each disk for updates, load a batch into a file and send it to the backup site at regular intervals via Systems Center, Inc.'s Network Datamover, Gutsche said. The whole process takes 30 minutes, which means that a data center or network failure could cost the company as much as 30 minutes' worth of transactions, Gutsche said.

Because the credit union's computers handle 200 transactions per second at peak times, this would mean the loss of more than 300,000 transactions totaling millions of dollars, he added.

Further delays were common because the 56K bit/sec. links between the primary and backup data centers were shared by a variety of applications.

"At one time, we found that nothing had arrived at the secondary site for an hour and a half," Gutsche said. "This was not acceptable."

Last fall, a test bed was set up to link an IBM Enterprise System/9000 Model 820 mainframe at Caisses Populaires' primary data center, with a bank of HDS-7390 DASDs and a bank of HDS-7490 tape cassette drives at the backup site. The link comprised Network Systems' remote channel extension units and a 45M bit/sec. fiber-based link from Bell Canada.

The configuration was used to log both IMS and DB2 database transactions to the backup devices. During tests, the link handled 58 I/Os per second, with a constant response time of 15 msec, the credit union discovered. This exceeded the company's expectations by about 30%, Gutsche said.

ON SITE

La Confederation de Caisses Populaires et d'Economie des Jardins du Quebec
Montreal

Gary Gutsche

- **Challenge:** More timely entering of banking customers' transactions on backup data center 15 km from primary center.
- **Technology:** Network Systems, Inc.'s channel extension for rotational DASD, which allows direct writing of updates to backup disks over 45M bit/sec. T3 link.
- **Impact:** Lag between transaction update on primary and backup systems cut from 30 minutes or more to 17 msec.

"We think this is because our dedicated fiber link requires less time for error recovery" than the former shared links, he explained.

The tape configuration is still in test mode while the credit union works out how to ensure that tape backups are allocated channel addresses on an as-needed basis, Gutsche said. "Otherwise, we're in full production mode."

Network Systems' devices cost Caisses Populaires approximately $195,000.

Did its homework

The credit union considered using IBM's Remote Recovery Data Facility as an alternative solution. However, the software did not support DB2 at the time. In addition, the company has a policy of minimizing maintenance and overhead costs by adding as little mainframe software as possible, Gutsche said.

Caisses Populaires also considered using IBM's Escon, a fiber-based channel networking system that will soon support links over distances of up to 50 km, Gutsche said. The drawback of Escon was that it required the credit union to set up and maintain its own dedicated, fiber-based connections between the two data centers, he added.

"You have to negotiate with the city, rent conduits under the sidewalks and hire an accredited contractor," he said. In contrast, Network Systems' devices run over T3 services supplied and maintained by Bell Canada at considerably less cost, Gutsche said. He declined to say what the carrier is charging for the link.

Computer Network Technology Corp. announced a similar remote channel extension in April, but the product has yet to ship.

Tools help Internet users discover on-line treasures

BY GARY H. ANTHES
CW STAFF

Users looking for information on the Internet can now get a little help from their friends: Archie, Prospero, WAIS, Gopher and Knowbots.

As the Internet explodes — nearly doubling in size annually — a number of methods are emerging to enable its approximately 4 million users to tap into an estimated 1T byte of publicly available information, including a wide variety of documents, scientific data, software, sounds and images.

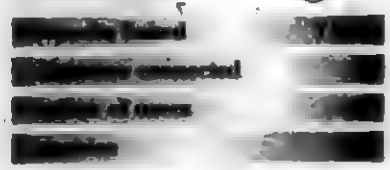
The techniques, which lie at the intersection of library and computer science, are geared to making information available to nontechnical users attempting to navigate the Internet, a vast web of multiprotocol networks supporting international collaboration in the fields of research and education.

"There are all kinds of information servers getting set up now. The problem is, how do you find out what's out there and get a copy of it?" said Michael Schwartz, assistant

Continued on page 52

Casting a wide net

Growth of the Internet is spurring the need for tools that make finding information easier



Source: The Internet Society CW Chart: Stephanie Faucher

A trio of navigation aids

Here are the most popular tools for exploring the Internet:

• GOPHER

Gopher offers users transparent access to more than 100 servers worldwide, according to "Connexions," published by Interop Co. Nontechnical users can browse through an information hierarchy called Gopherspace, clicking on items of interest at successive levels of detail. They can also submit words to Gopher for full-text searches at one or more sites.

The user's software is loaded with the address of a "root" Gopher server, which sends an initial list of menu items to the user. The items may include text files, directories, search engines and references to other Gopher servers, which are linked and accessed transparently.

• ARCHIE

Archie maintains an inventory of anonymous File Transfer Protocol sites where users can retrieve things such as public domain software and technical reports from machines on which they do not have accounts.

Archie polls each of 1,100 archive sites monthly and updates a directory of 2.1 million retrievable files containing 120G bytes of data. It is estimated that some 50,000 keyword searches are processed daily through 13 Archie servers worldwide.

• WAIS

Developed by Thinking Machines Corp., Apple Computer, Inc., Dow Jones & Co. and KPMG Peat Marwick, WAIS exists in both public domain and commercial versions.

Natural language WAIS queries go to a server holding a master directory at Thinking Machines, which acts like a 411 telephone service, returning to the user the identities of the server likely to meet the user's needs.

The user then goes directly to that server for full-text word searches and retrieval of text, pictures, spreadsheets, graphics, sound or video. WAIS can rate the relevancy of documents in terms of their similarity to other user-specified documents.

According to Thinking Machines, there are more than 260 Internet WAIS servers and 15,000 WAIS users in 28 countries.

GARY H. ANTHES

Application monitors telecom systems for fraud

BY JAMES DALY
CW STAFF

ATLANTA — The recent arrest of several prominent New York-based computer hackers is the latest example of how vulnerable even the most secure telephone networks can be.

The five defendants are accused of breaking into computer systems nationwide during the past two years and at some sites call-forwarding local numbers to long-distance numbers in order to obtain long-distance services for the price of a local call. Hardest hit was Southwestern Bell, the St. Louis-based Baby Bell, which incurred losses of about $370,000.

A new product, however, may help ease some of the hacker-generated anxiety. Complementary Solutions, Inc.'s Telemate FraudFighter automatically learns normal telecommunications activity levels and then monitors specific trunk groups, extensions, calling regions and Direct Inward System Access codes for fraud. If it detects deviant patterns, it warns users, according to company spokeswoman Jamie Pritchard.

FraudFighter typically requires the firm's Telemate call-accounting package but will work with other call-accounting applications provided the user has a Y-cable to split the signal, Pritchard said.

Users said the key to fighting telecommunications fraud is recognizing abnormal patterns quickly. Several months ago Telemate user Sherry Roggeman, communications coordinator at the Empire Southwest Co. heavy equipment dealership in Phoenix, noticed an unusual amount of telecom activity with Puerto Rico, a place where Empire Southwest does not normally do much business. To her dismay, she discovered that someone had gained unauthorized access to the company's private branch exchange through its 800 number and was charging long-distance calls to the company.

By the time she clamped down and tightened access restrictions, Empire Southwest had been hit for $15,000 in calls. "It's frightening," Roggeman said. "Telecom fraud is a big business, and it's scary to think that someone is spending all this time trying to crack my system."

To detect that kind of 800-number scam, FraudFighter tracks the number of incoming and outgoing calls, their length and day of the week for the trunks being monitored, Pritchard said.

When FraudFighter detects unusual activity, it warns the user with a message on the computer screen, message on the printer, audible alert and/or dial-out to a beeper or other device.

FraudFighter sells for $2,000, which includes one year of support.

Tools help many Internet users

CONTINUED FROM PAGE 51

professor of computer science at the University of Colorado and a pioneer in an emerging field called "resource discovery."

The dozen or so tools for Internet resource discovery use a variety of techniques, from the narrowly focused Netfind, which can locate electronic-mail addresses, to the commercially available Wide Area Information Server, which can search the globe for multimedia information including news, weather forecasts, government software packages and Library of Congress catalogs (see story page 51).

Mark McCahill, manager of microcomputer systems at the University of Minnesota, said he used two of the tools — Gopher and Archie — to find and retrieve public domain software for use in a campuswide E-mail project.

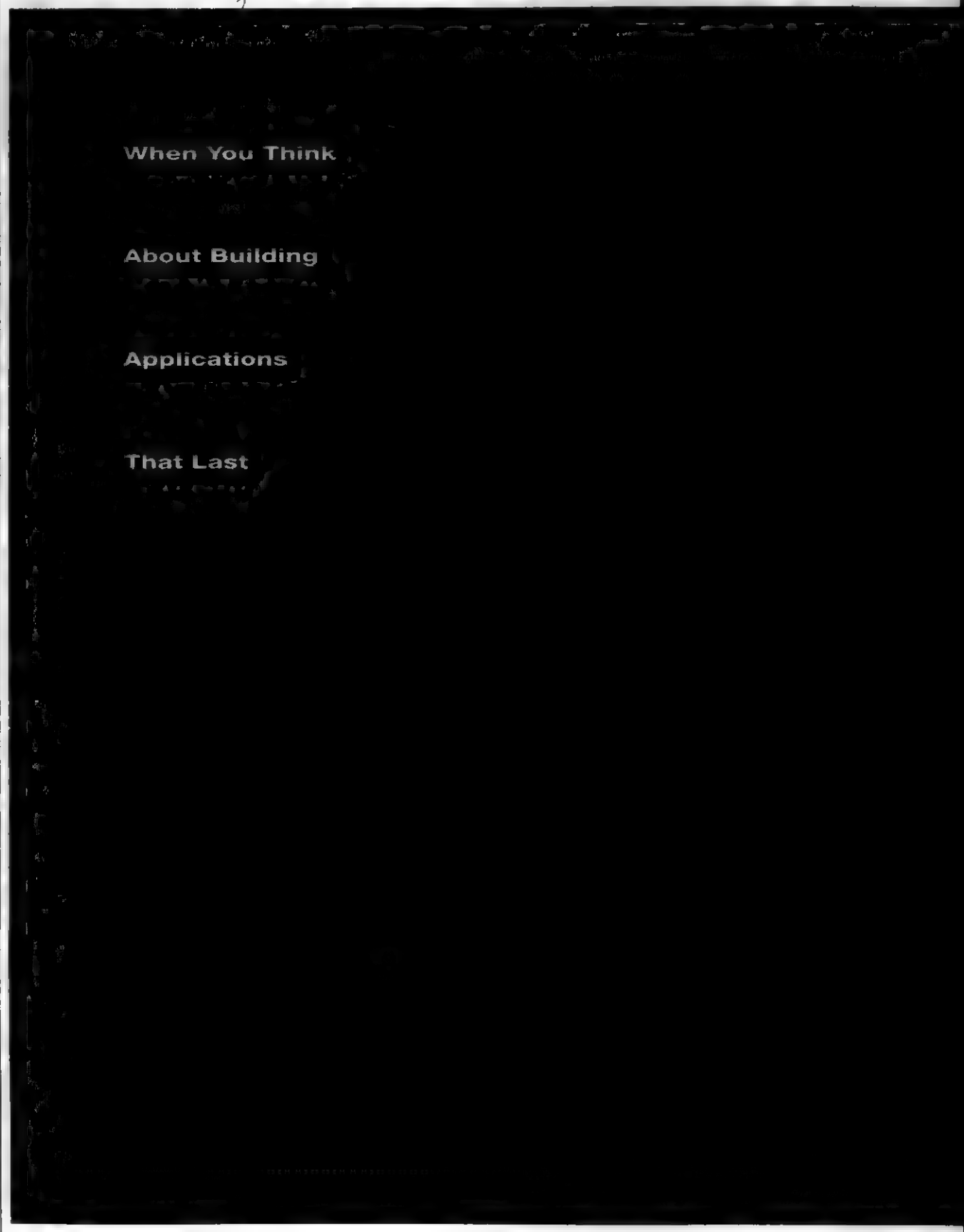
"Archie is a wonderful service because people like me are always saying, 'Gee, I know there's some little bit of software somewhere on the Internet, but I don't have a clue where,' " McCahill said.

The resource discovery tools are an idea whose time has come, Schwartz said: "A few years ago, the network didn't have enough bandwidth or enough connectivity to really make the world of information networking possible. Now it does. In the next few years, we'll see an explosion in information availability."

But Schwartz added that the evolution of the Internet will raise some tricky questions. For example, as the Internet becomes commercialized, methods of accounting and billing for use will have to be devised, and liability issues will surface. "If I maintain a directory, can someone sue me if it's wrong?" he asked.

But the future of the Internet also holds some good news for users. The resource discovery techniques, each developed to solve a particular problem, are gradually becoming stitched together through software gateways. For example, from Gopher a user can invoke a number of the other services, letting each do what it does best while the gateways do the appropriate protocol translations. The user needs to know only the Gopher syntax.

According to Schwartz, users are given a simpler, more unified view of the increasingly complex Internet, which he called "a huge example of a working anarchy."



Study's bandwidth projections belie some user expectations

BY JOANIE M. WEXLER
CW STAFF

MANCHESTER, Mass. — Expectations of a coming bandwidth usage explosion have been tempered by a recent Technology Management International, Inc. study of networking trends in more than 250 large commercial firms.

Bandwidth usage growth in corporate networks — local- and wide-area networks combined — should remain fairly steady at a 30% compounded annual growth rate for an indefinite period of time, said Ralph R. Hubbard, president of the consulting firm. Growth rate will largely be fueled, he added, by the emerging applications that many consider the biggest network usage drivers: multimedia, imaging and client/server computing.

However, "we see a much more modest increase in bandwidth than the quantum leaps anticipated by some," Hubbard said. A main reason is that the bulk of the companies in transition are "big IBM shops that will be in transition for a long time," he explained (see chart).

Changing the mix

Migration to client/server will proceed steadily as users move from terminal-to-host architectures in stages

Source: Technology Management International, Inc.

CW Chart: Stephanie Pincher

Industry opinions on the bandwidth issue vary widely, though. For example, Gartner Group, Inc. predicted that widespread client/server applications could result in a 100-fold increase in bandwidth requirements industrywide within three to five years. Some analysts also pointed out that once bigger data highways are in place, users generally have no trouble filling them up.

Commonwealth Edison Co. in Chicago expects to "break even" in bandwidth use with its shift to client/server computing, said Kurt Muehlbauer, supervising analyst at the electric utility.

Some users see their bandwidth needs multiplying from sheer data volume alone, not necessarily from newfangled, bandwidth-hungry applications.

David Eisenlohr, vice president of telecommunications at the Pacific Stock Exchange in San Francisco, estimated that his firm's data traffic will double every two years indefinitely. "This is simply to stay competitive with the information flow of our competitors," he said, "not because the exchange is distributing its computing architecture or initiating big-bandwidth applications."

"I'm in the camp that the industry worldwide is way underestimating its bandwidth needs," said Howard Maynard, senior vice president and director of IS at Young & Rubicam, Inc., a global advertising agency based in New York.

"I see tremendous growth of and demand for bandwidth both within and between buildings," he said. In addition to videoconferencing, Maynard noted, one application certain to boost the bandwidth load at his firm is Lotus Development Corp.'s Notes groupware package.

Duplicating databases

The agency is conducting an experiment with the package that involves "replicating databases across sites, and this summer those databases will include images," Maynard said.

"Conceivably, we need 10M bit/sec. to the desktop now," he said, adding that he is interested in "personal Ethernet" technologies from the likes of Synernetics, Inc., 3Com Corp., Alantec Corp. and others to pump more life into his Ethernet investments.

The tacks taken by these vendors dedicate 10M bit/sec. of bandwidth to each desktop — rather than having multiple desktops share 10M bit/sec. — and switch the traffic over a high-speed (usually 100M bit/sec.) backplane residing in a bridgelike device.

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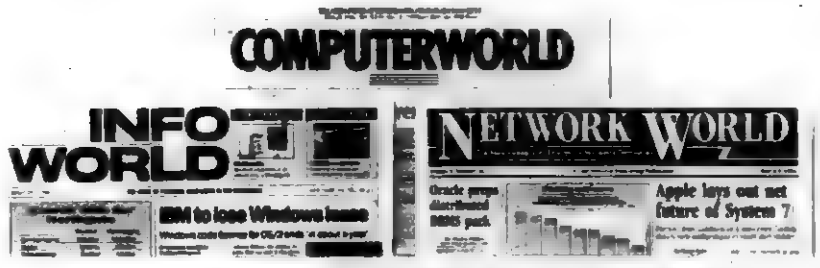

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NEW PRODUCTS

Gateways, bridges, routers

Raycom Systems, Inc. has started shipping Model 200 Local Fiber Distributed Data Interface-Token Ring Bridge.

The bridge can be used in any environment with IBM or IBM-compatible source routing Token Ring nodes. With the Model 200, users can connect a local Token Ring network to another Token Ring network up to 10 km away. Reliability features include independent processors on each interface, which guarantee proper handling of traffic bursts, plus redundant power supplies and self-diagnostic software for high system availability and quick fault-tolerant diagnosis.

The Model 200 Local FDDI-Token Bridge costs $9,995.

Raycom Systems
#C-8
16525 Sherman Way
Van Nuys, Calif. 91406
(818) 909-4186

Coefficient Systems Corp. has introduced MGate/E, a Novell, Inc. NetWare-specific gateway.

MGate/E is designed for users with one or more NetWare subnetworks that are already tied to an Ethernet local-area network backbone by NetWare-compatible bridge/routers. Token Ring, Arcnet or Ethernet subnetworks can be used, and the bridge/router connection can be a LAN or wide-area network link.

Installation of the MGate/E gateway on the Ethernet LAN gives every personal computer on all of the subnetworks access to every Digital Equipment Corp. VAX on the Ethernet.

MGate/E costs $1,995 for five users, $4,995 for 20 users and $11,950 for 60 users.

Coefficient Systems
2039 Palmer Ave.
Larchmont, N.Y. 10538
(914) 834-0446

Madge Networks, Inc. has introduced Smart Ringbridge, a stand-alone, IBM-compatible local Token Ring bridge.

The Smart Ringbridge allows users to forward network traffic at up to 12,500 frame/sec. and transfer data at 16M bit/sec. network bandwidth between two Token Rings. Support for Novell, Inc. NetWare environments is provided, allowing users to forward nonsource router NetWare IPX traffic using standard IPX routing protocols.

Network management software enables users to manage bridges remotely from a personal computer workstation connected to the Token Ring network.

Smart Ringbridge costs $6,995.

Madge Networks
42 Airport Pkwy.
San Jose, Calif. 95110
(408) 441-1300

Network management

SynOptics Communications, Inc. has announced the Lattis EZ-View, a management system for Ethernet local-area networks.

Lattis EZ-View allows the SynOptics intelligent hubs to do basic network management functions such as port partitioning and performance monitoring. The system offers an expanded view capability, which allows all intelligent hubs being managed on the network to be listed in a window called the concentrator list box.

Lattis EZ-View costs $695 per license.

SynOptics Communications
4401 Great America Pkwy.
Santa Clara, Calif. 95052
(408) 988-2400

Micro-to-host

Network Software Associates, Inc. has released DynaComm/Elite Version 3.3, an upgrade of its 3270 emulation software for personal computers running Microsoft Corp.'s Windows.

DynaComm/Elite 3.3 supports Windows 3.1 and TrueType. It features improved performance and an asynchronous link driver, which allows a PC to connect to a host system via the PC's commport and standard asynchronous phone or X.25 lines.

The product costs $495. Upgrades from previous versions are free.

Network Software Associates
39 Argonaut St.
Laguna Hills, Calif. 92656
(714) 768-4013

Customer premises equipment

Telemax Corp. has introduced the Dawn 2020 All-Rates Digital Data Service (DDS) Unit.

Users with both V.35 and RS-232 have access to DDS-type digital four-wire telephone lines at all standard subrate DDS line speeds of 2.4K, 4.8K, 9.6K, 19.2K, 56K and 64K bit/sec.

Dawn 2020 supports both synchronous and asynchronous data and has diagnostic and self-tests. The product has a secondary channel for operation at 56K bit/sec. over a DDS II line, access to multipoint DDS service and can be configured with a DIP switch located on the bottom of the unit.

Dawn 2020 costs $595.

Telemax
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It shows in the 1992 *Users' Choice* survey conducted by *Data Communications* in which AT&T Tridom was voted the *Best Overall VSAT Vendor* with the *Best Technology.*

And it shows by what industry analysts are saying. A recent *Yankee Group* report lauded AT&T Tridom's shared hub service capability, technical superiority, and facility for combining VSAT technology with terrestrial data services.

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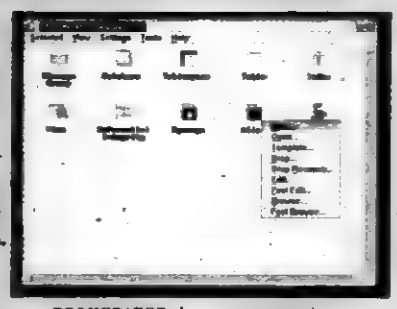
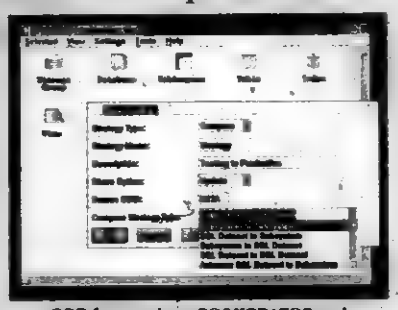


RC/MIGRATOR shares a common icon-based interface with RC/UPDATE and future OS/2 versions of our products.

Our initial OS/2 offerings are really giving DBAs a very fresh new look on things.

RC/MIGRATOR and RC/UPDATE are already the best-selling tools for DB2 object and data management. Our new OS/2 versions promise to add to their fame among DBAs in data centers everywhere.



OS/2 front-ends on RC/MIGRATOR and RC/UPDATE let DBAs concentrate on DB2 object tasks instead of products.

RC/MIGRATOR and RC/UPDATE are the first of many OS/2 products from PLATINUM. As an IBM® SystemView™ vendor, we're working on OS/2 versions of the other products in our complete suite of tools and utilities for DB2. Which simply means that no matter which interface the CRT screens in your data center present, you'll continue to maximize DB2 performance in the future with us.

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Cheerio to Unix, cereal giant says

BY MARK HALPER
CW STAFF

MINNEAPOLIS — General Mills, Inc.'s distribution group has a true computer confession: It tried Unix, but it did not inhale.

The $7.2 billion cereal giant's open systems flirtation lasted all of a few months in early 1991, after the company installed a Hewlett-Packard Co. 9000 minicomputer running HP's Unix implementation, HP/UX, at its West Chicago, Ill., plant.

It did not take long for General Mills, based here, to return to its HP MPE senses, a recovery enabled in part by what the company discovered was the ease of portability between HP/UX and the proprietary MPE/IX operating system.

"There's a lot of panacea thought today that says you have to have Unix," said Mike Meinz, principal technical consultant in General Mills' IS group. "You don't have to have Unix."

The company's Unix project was a pilot for what would have been a series of HP/UX installations running warehouse management software at nine General Mills distribution centers and eight plants around the country.

But the Unix euphoria, if it ever set in at all, never spread beyond West Chicago. Within months, General Mills had pulled the plug on the 9000 and ported the warehousing software over to the MPE/IX operating system running on a score of proprietary HP 3000 minicomputers. MPE/IX is the latest release of HP's proprietary operating system. It is compliant with the government's Posix open systems standard.

The move was logical because General Mills was already well-outfitted with HP 3000s. It had 21 of them spread among its data center in Minneapolis and its plants and was about to begin the

General Mills' Meinz: *'You don't have to have Unix'*

process of migrating them from HP's older versions to new models built on HP's Precision Architecture microprocessor.

This raises the question of why General Mills turned on to Unix and the 9000 in the first place.

> **THE DIVISION CHOSE Unix because its preferred warehousing software was available only for Unix platforms.**

According to Meinz, the autonomous distribution division chose Unix because its preferred warehousing software — an application provided by a small third-party vendor — was available only for Unix platforms.

Good warehouse management software can provide a strategic advantage in the packaged-food industry, where factors such as shelf life and inventory control affect a company's fortunes. The distribution division wanted nothing less than what it considered the best software and was willing to change platforms to get it, Meinz noted.

Managers in the distribution operations farmed out maintenance of the program to the vendor but came to the sobering realization that, given General Mills' existing HP 3000 orientation, a 3000 implementation might be more prudent — especially because, as Meinz noted, the folks in distribution "weren't happy with the [vendor's] bills."

The distribution group turned to the IS group to see what could be done internally. IS' answer was to port the warehousing software to MPE/IX.

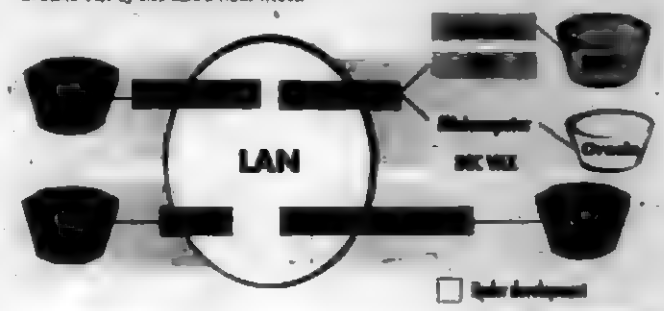
In one-third the time

What followed became a testimonial to MPE's portability. Meinz said he had anticipated the porting project would take six months, but it took only two. And much of that time was spent developing enhancements to the existing program rather than actually porting to it. General Mills had purchased the source code when it bought the software.

According to Meinz, the port was a cinch because the software vendor's program is based on Oracle Corp.'s database server software. As such, it uses many of the same building blocks in Oracle's MPE port, like the C programming language and the SQL Forms development environment.

Meinz said the SQL Forms portion required no recompiling, and the C language portion required only a simple recompile process.

Not the mainframe
With the Zim client/server deployment scheme, Sterling Software breaks out of the IBM host mold



CW Chart: Stephanie Faucher

Sterling Software steps up client/server strategy

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

WOODLAND HILLS, Calif. — During the 1980s, Sterling Software, Inc. grew by acquiring software companies with products aimed at the IBM mainframe. The Sterling portfolio of packages and data-extraction tools grew, but nearly all of the new products played within the four walls of IBM's Systems Application Architecture.

One notable exception was Zanthe Corp., a Canadian firm with personal computer-based technology that held the promise of client/server computing.

This year, Sterling launched a client/server strategy, counting on the portability of Zanthe's Zim, a portable application development language with a built-in relational database. In April, Sterling said that Zim, running on OS/2- and DOS-based PCs, would soon be linked with a number of relational databases.

Versions of Zim for IBM's OS/2 Database Manager, Microsoft Corp.'s SQL Server and Oracle Corp. databases are slated to ship this quarter.

This fall, $220 million Sterling will accelerate its move into client/server computing by shipping packages that will allow Zim to access several Unix databases.

Sterling also plans to announce a homegrown product, code-named Odyssey, that links IBM PCs with legacy applications on IBM mainframes. Another product, code-named Galil by its Israeli inventors, was designed to manage storage of local-area network data by 1993.

One Zim user was pleased that Sterling has thrown some muscle behind the product. The Four Seasons Hotels Ltd., a 23-hotel chain based in Toronto, used Zim to create strategic systems for customer billing, guest registration and hotel administration on Unix-based Hewlett-Packard Co. HP 9000s with PC clients.

Prior to Sterling's 1989 acquisition, "there was a chance of Zanthe folding its tent and going away," said Geoffrey McDowell, manager of technology and research at the hotel. "Now, we know that won't happen."

Continued on page 62

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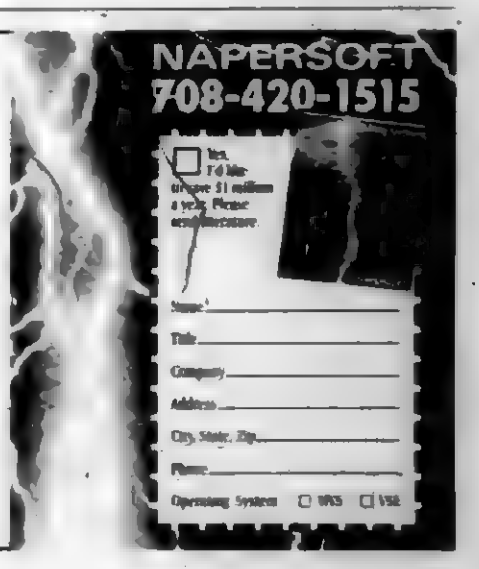


Information Builders' upgrade improves VAX/VMS integration

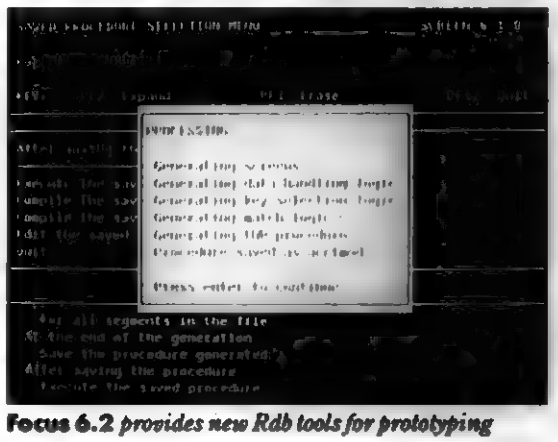
BY MELINDA-CAROL BALLOU
CW STAFF

NEW YORK — Information Builders, Inc. has expanded support for native Digital Equipment Corp. VAX files and added a window-driven front end to a new release of Focus for VMS.

Focus Version 6.2 offers better options for managing concurrent user access to Rdb tables and includes new query optimization and trace facilities.

It also reportedly exploits new Rdb data access features that limit record locking through greater use of read-only mode.

One user was particularly pleased with the performance and access improvements resulting from the new concurrency options. The new version eliminates "many of the locking problems which had previously occurred when accessing Rdb, allowing more users to have concurrent access to the database," said Bob Romoser, a systems analyst at the Public Utilities Commission of Ohio, based in Columbus, a beta-test site for the new release.



Focus 6.2 *provides new Rdb tools for prototyping*

Focus 6.2 also provides new Rdb tools for prototyping, including Rdb File Talk, a window-driven utility that makes it easier to define new Rdb tables, the company said. Rdb Modify Talk automatically generates transaction processing systems with default data entry screens and function keys.

"Some of our people used Rdb Modify Talk and found that it allowed them to easily generate prototypes for simple Rdb applications," Romoser said.

Information Builders officials said they are also working with DEC to integrate Focus with DEC's RdbExpert tuning tool.

In addition, new features for the All-In-1 interface make it easier for developers to tightly integrate Focus applications with All-In-1, Information Builders officials said.

New tools for generating RMS applications and creating RMS files are also available with Focus 6.2, as are new ways of managing the RMS lock manager, they added.

Focus Release 6.2 for VMS is shipping now and is priced from $3,200 to $195,000.

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Integris deals with Pyramid

BY KIM S. NASH
CW STAFF

BILLERICA, Mass. — Integris, the systems integration unit of Bull HN Information Systems, Inc., and Pyramid Technology Corp. have signed a deal that fits snugly into the "you scrub my back, I'll scrub yours" category.

Integris, based here, plans to resell Pyramid's MIServer line of Unix servers. In turn, the San Jose, Calif.-based hardware maker will sell Integris' consulting and integration services to its customers.

The reseller deal is the first effort by Integris to expand its direct sales channel, according to Steve Gardner, Integris' president.

"Pyramid is important to us because of their high-end strength in open systems," added Stan Wysocki, an Integris vice president.

The Bull subsidiary's mandate is to convert IBM mainframe users to Unix environments. The group operates independently of Bull, with separate profit and loss statements. According to Gardner, revenue for 1991 totaled $14 million — about $6 million short of Gardner's original projections when Integris was launched eight months ago [CW, Nov. 18, 1991].

Key to Integris' downsizing push is UniKix, a software tool that regenerates Cobol/VSAM CICS applications for Unix platforms. UniKix currently supports 10 versions of Unix, including those from Data General Corp., Bull, IBM, Sun Microsystems, Inc., Sequent Computer Systems, Inc. and Solbourne Computer, Inc.

Extra marketing muscle cannot hurt 11-year-old Pyramid, which is expected to report a loss this week for the third quarter, according to Bear, Stearns & Co., a brokerage firm in New York.

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Attention: Marketing

COMMENTARY

Sam Albert

IBM: Global co-opetitor

Someone has called IBM's recent spate of third-party alliances "*kereitsu* run amok" — a reference to the Japanese scheme of interlocking suppliers.

IBM has indeed become the classic American kereitsu: a horizontally and vertically integrated industrial organization with a financial affiliate — IBM Credit Corp. — as a wholly owned subsidiary.

The most recent example is last week's announcement that IBM will develop 256M-bit chips jointly with Toshiba and Siemens AG. The project is simply too massive for any of the three partners to undertake alone.

This is all a form of "co-opetition," a cross between cooperation and competition. Because the technology has become so wide-ranging that no company, not even IBM, can do everything itself,

IBM HAS PLENTY of world-class production capacity available and is more than willing to make it available to other companies.

even fierce competitors find themselves working together in various niches of the industry.

If you understand the different kinds of arrangements IBM is entering into, you can better sort them out. The strategy has four foundational goals, and any new alliance formed by IBM or an IBM business unit must meet at least one of them:

- To accelerate the development of new technologies.
- To broaden the reach and capacity of IBM's worldwide distribution capabilities.
- To reduce the costs of bringing new products to market.
- To grow IBM's revenue streams faster.

On this foundation, IBM is building a new operational structure based on an assortment of relationships:

- **Business partnerships** — IBM has literally thousands of these, and their primary importance is to enhance IBM's distribution. These include IBM-authorized agents, dealers and remarketers. Business partners add value by providing their customers with software and ancillary equipment as well as computer hardware.
- **Joint ventures** — These typically result in the creation of a new company by IBM and its partners. Taligent and Kaleida are the most prominent fruits of the IBM and Apple relationship. IBM has also formed Display Technologies with Toshiba to manufacture color flat-panel displays and has joint-venture arrangements with Motorola, Diebold, Coopers & Lybrand and U.S. Trust.
- **Equity partnerships** — Since late 1988, IBM has become a kind of venture capital company, financing smaller, mostly cash-poor companies with promising technologies of interest to IBM. The company has formed more than 50 equity partnerships in the U.S. and another 200 or so worldwide.

So far this year, IBM has announced equity agreements with Red Shark Technologies, a developer of multimedia enabling tools; Sapiens International, developer of AD/Cycle enhancement and enabling tools; and Parallan for that firm's network server.

- **Technology sharing/development agreements** — IBM has entered into a number of these agreements, such as those with Auspex Systems for the development of high-performance file services for the Unix environment; with Go for a pen-based computer operating system; and with former nemesis Hitachi for the next generation of printer engines.

Technology agreements will become more common in the future as the cost of research and development skyrockets and the margins in the computer industry shrink.

- **Licensing agreements** — These give IBM access to hardware, software or services. For example, IBM has licensed Novell's portable network software for use on the RS/6000 and has licensed two applications from Lotus to provide immediate help to its still somewhat anemic OfficeVision and OS/2 software offerings.
- **OEM agreements** — IBM has plenty of world-class production capacity available and is more than willing to make it available to other companies. Some notable OEM agreements currently in place: with Wang for PS/2 and RS/6000 models; with Videocart for custom-built portable computers mounted on grocery shopping carts; and with American Airlines for PS/2 models that will carry the Sabre system logo (which will be remarketed in the travel industry).

How is IBM's alliance strategy working out? It's too early to issue a meaningful report card. But IBM badly needs an honor roll performance.

Albert is president of Sam Albert Associates in Scarsdale, N.Y.

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Sterling steps up client/server strategy

CONTINUED FROM PAGE 59

If the client/server strategy is successful, Sterling's application development tools will tap into IBM mainframes as easily as Unix relational databases. Sterling is ready to forge alliances, as it did with Tandem Computers, Inc. last year, to make the plan work.

Sterling is also adapting its year-old Corporate Applications Management Initiative — a framework to manage the applications development life cycle — to embrace Unix data sources and heterogeneous computer networks, said Marshall Warwaruk, vice president of business development at Sterling's systems software group.

Industry analysts said Sterling will have a hard time competing with the marketing might of $1.3 billion Computer Associates International, Inc., another formerly IBM-centric firm with acquired packages that is currently moving to client/server products.

Integration a key

To gain new business, Sterling will have to integrate its tools better than CA does, according to analysts.

Users will be the ones to determine whether the new products offer cooperative processing between clients and servers or whether the mainframe does most of the work.

"Sterling will have to prove that they are doing client/server according to the intent of the law, rather than the letter of the law," said Aaron Zornes, a software analyst at Meta Group, Inc. in Westport, Conn.

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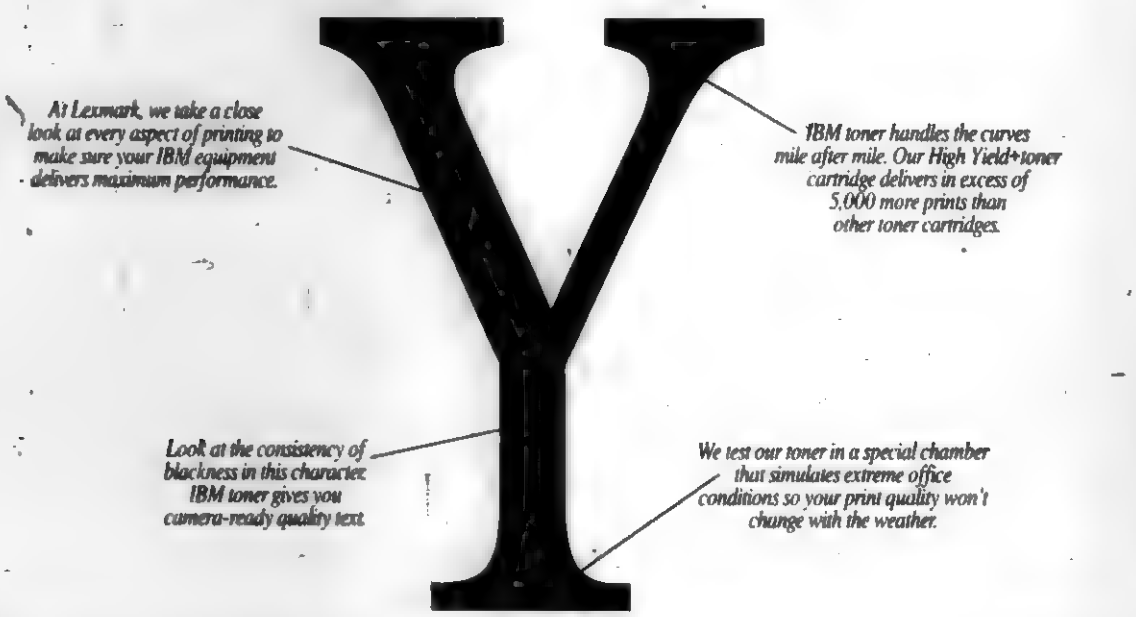

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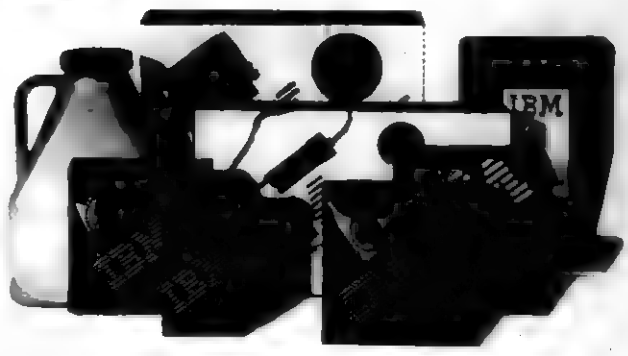

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IN BRIEF

Sybase adds HP platforms

■ **Sybase, Inc.** said it has added **Hewlett-Packard Co.**'s Precision Architecture HP 9000 Series 800 minicomputers and HP 9000 Apollo Series 700 workstations as development platforms.

■ **Unisys Government Systems, Inc.**, a wholly owned subsidiary of Unisys Corp., won a 10-year, $338 million contract from the General Services Administration (GSA) to develop the GSA Systems program. Unisys will provide several low-end and high-end Unisys A series mainframes, Intel Corp.-based desktop systems, Grid Systems Corp. 286-based notebook computers and other peripherals and software. It will also provide network integration as well as build and manage GSA's data center.

■ **Cable & Computer Technology, Inc.**, an Anaheim, Calif.-based contractor, last month became the first of three prime contractors in the U.S. Navy's proof of concept development program, dubbed Next Generation Computer Resources (NGCR), to deliver fully compliant Futurebus+ hardware. Other contractors include **Raytheon Corp.**'s Marlboro, Mass.-based Equipment Division, which seeks to complete acceptance testing of its NGCR systems before the end of the summer, according to Cable & Computer Technology officials. The status of the third contractor, **Litton Data Systems, Inc.** in Pascagoula, Miss., is unclear, Cable & Computer Technology officials said.

■ A Virginia secure-systems firm, **HFSI**, said its general-purpose "trusted" computer system has received a B3-level rating from the **National Security Agency's National Computer Security Center**. The XTS-200 supports client/server applications, enforcing security on open systems.

■ The 650-branch **Slovakian Savings Bank** has placed an order for $55 million worth of computer infrastructure gear from **NCR Corp.** The project, which has at its heart two NCR System 3600 multiprocessor Unix-based computers, will provide massively parallel computing, client/server technology, object-oriented programming and satellite communications.

■ Minneapolis-based **Lawson Associates, Inc.** will expand functions to its Retail Management System software by packaging it with a personal computer-based point-of-sale application from **Comshare, Inc.** in Ann Arbor, Mich.

Print Strategy? *What* Print Strategy?

If you're questioning your print strategy or lack thereof, look to Digital. We can help you **minimize cost** and **maximize productivity.**

Incorporating a print strategy within your office environment — that is, organizing printers and the way people access them — can save you money, make printer management easier, and increase overall office productivity.

Without a *good* strategy, you're not only continually reacting to requests for private printers, but you're also spending a small fortune.

Consider an office with 100 desktop computer or workstation users, each with a private printer. The cost of printing will average approximately $150,000 per year, including supplies, maintenance, and amortization.

And what about capacity? With an average throughput of six pages per minute, 100 printers can deliver one-quarter of a million pages per day during normal working hours. However, 100 users typically print fewer than 10,000 pages total — that's an excess capacity of 2,000 percent.

Even if they share personal printers, your office staff still has limited capabilities, low throughput, and logistical problems. Some printers handle the PostScript protocol; others handle HP-PCL. None can print large jobs fast or handle a variety of media simultaneously.

DECprint Services: Our Strategy at Work

Digital's print strategy for your office environment is twofold. First, we move your printers onto the network to give people easy access to a variety of printers. Second, we provide you with DECprint services — the printers, software, and service that work in combination to satisfy all your business requirements. The result? You need fewer printers and you save money — *as much as $75,000, or half the annual cost of 100 private printers.*

The Right Print Strategy Makes Implementation Easy

Your plan of action should be simple: Offer a variety of printers that is customized for your office environment, and place these printers closest to those who use them most often.

For example, place one of Digital's low-cost DECLaser printers in every aisle or so of a department. Then, place a PrintServer printer in a central location for servicing special requirements, such as printing large jobs or printing on large-size paper. A Colormate printer can be located beside the PrintServer to meet color printing needs.

Being able to select from a range of Digital printers — handling sheet sizes up to B (11 × 17 inches) or A3 (297 × 420 mm) at speeds from 4 to 40 pages per minute — lets you meet all your business printing needs. A sampling of Digital printers includes:

- **DECLaser 2250**
  An 8-ppm printer with two input trays — one to handle plain paper, the other to handle letterhead stock or transparencies.
- **PrintServer**
  Appropriate for fast printing of large print jobs, one or two of these printers can meet the print requirements of 50 to 100 users.
- **Colormate PostScript**
  Offering color printing for transparencies as well as paper.

As for your existing hardware, Digital's print strategy accommodates many printers, allowing you to move the printers you already have onto the network. Although these printers may not offer some advanced print features, they can very often be shared.

Supporting Software Completes the Picture

Digital's print software and PostScript printers can handle many print protocols — and the output looks the same across print-family members. Protocols include:

- PostScript
- ASCII
- HP-PCL
- Apple LaserWriter operators
- TEKTRONIX 4010/4014.

What's more, VMS users are informed when their jobs start, when they're completed, or when a job cannot complete because the printer is out of paper.

Along with a variety of printing hardware and software, DECprint services also provide:

- A flexible font-licensing program that can relieve you of the "which printer is licensed to use which font" dilemma
- The capability for system administrators to manage any number of printers from their desks
- Direct user access to printers in remote cities via your office network and Digital's Distributed Queuing Service (DQS)
- The ability for PC and Macintosh users to share the same printers and have full network access to mail and file services, via a PATHWORKS server.

Our Print Strategy Will Keep You Smiling

Your print strategy should decrease printing expenses and increase office productivity. Digital's print services combine printing hardware and software to provide you with this kind of total printing solution.

For more information on Digital's print services, call 800-DIGITAL (800-344-4825), ext. 59J.

PRINT STRATEGY

Digital's print strategy takes the printer out of the private office and puts it on the shared network. So now, an office of 100 people utilizes 8 personal, 12 shared, and 2 departmental printers. As a result, your cost in terms of dollars and paper is significantly reduced to:

- **$75,000 per year, and**
- **60,000 pages per day (total capacity).**

Our print strategy means a decrease in office printers and an increase in office savings.

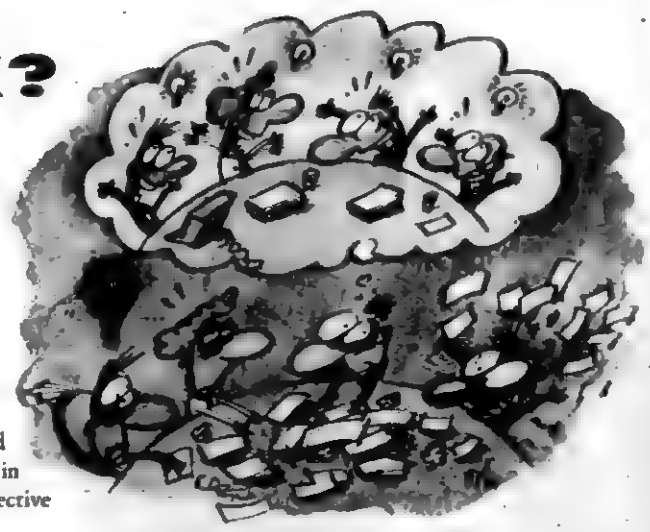
NO PRINT STRATEGY

If each person in your office has their own private printer, you're using up a lot of extra resources — including money. For example, look at an office of 100 people and 100 desktop laser printers. This one-to-one print strategy can cost you up to:

- **$150,000 per year, and**
- **384,000 pages per day (total capacity).**

Not a situation your office can live with — for very long.

Wouldn't You Rather Be In MEETINGS THAT WORK?



We all know about meetings that DON'T work:

When you don't have the information you need right there when you need it. Or a key contributor is unable to travel across town or around the world to attend. So you don't reach any conclusions or make any decisions and end up scheduling another meeting. Then you wait days for the first meeting's minutes so you can prepare for the second one.

Productivity? It's out the window.

There is a better way:
MEETINGS-THAT-WORK.
The innovative, distributive group work conferencing solution from Digital.

Real Work in Real Time, Regardless of Location

The dynamics of a meeting vary with its purpose. One meeting may be between two individuals in a collaborative work session. Or it could be an individual conducting group training. Or several groups together in a distributed conference.

In any of these meeting scenarios, Meetings-That-Work can link people via a range of technology-based configurations:

- Desktop teleconferencing
- Networked conference rooms
- Plug-and-play mobile meetings
- Multimedia conferencing.

And Meetings-That-Work can bring the participants the information needed to get the work done in a variety of ways:

- Voice and text
- Voice, text, and graphics
- Voice, text, graphics, and video.

Realtime Results Too

Meetings-That-Work enables meeting participants to:

- Access critical information online, on the spot
- Create agendas and minutes online, then distribute them in a timely manner
- Clarify and track action items online
- Create and edit documents and spreadsheets online in real time
- Project key documents to accommodate larger group meetings.

In this way, meetings can be managed more effectively — enabling participants to focus on the business at hand, getting group "buy in" as the meeting progresses. The entire decision-making process is sped up and improved, which in turn leads to more effective results.

In addition, Meetings-That-Work can help to decrease travel costs and reduce employee "wear and tear." A team effort no longer means that everyone has to sit in the same room together.

And productivity? Now it soars.

Digital Experience Strengthens the Agenda

Meetings-That-Work combines Digital and third-party distributed user application products.

The solutions package is available in standard and customized configurations. Solutions are designed to fit any of today's multivendor computing environments.

From initial evaluation to solution design and implementation, our team of experienced Meetings-That-Work consultants provides business and technical support and training as needed.

Here's Your Next Action Item:
For more information on how Meetings-That-Work can work for your organization, contact the Meetings-That-Work consulting team at 800-742-1755.

The ESE50 Solid State Disk MEETS THE NEED for I/O *SPEED*

From financial trading and telecommunications to retail, pharmaceutical, and scientific environments, the ability to achieve consistently fast access to data has become a necessary business requirement.

To that end, Digital offers you the ESE50 Solid State Disk — technology that can access data 100 times faster than a traditional magnetic disk. This high-performance disk not only adds significant speed to your system's applications, but also maximizes your system's capabilities.

Easy to use. Easy to implement. And easily a price/performance leader.

Plug-and-Play Feature Makes ESE50 Easy to Use

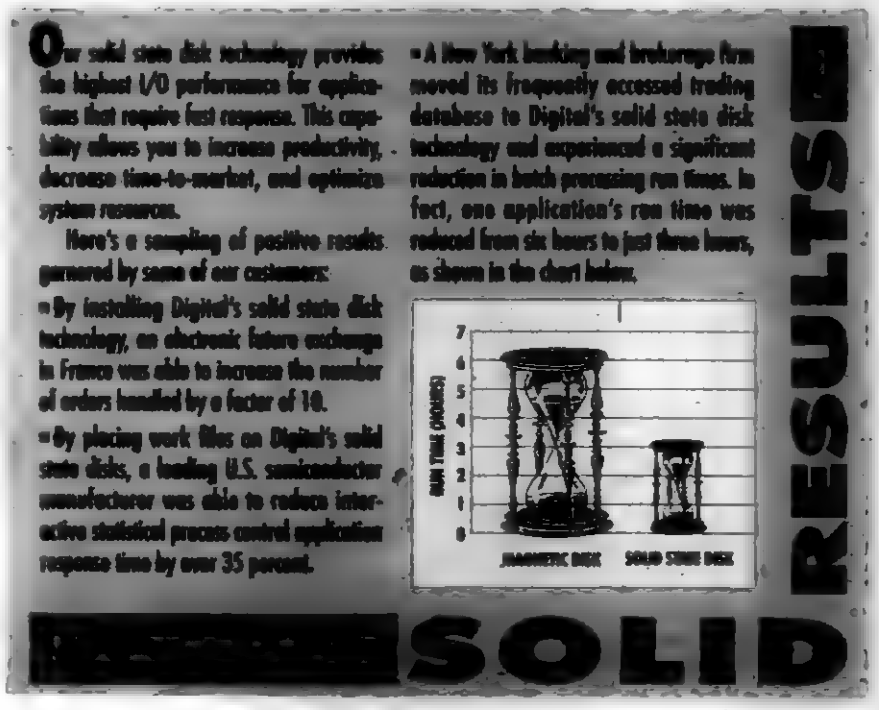
With the ESE50 Solid State Disk, you get the results you need without investing a lot of time learning new technology. Just like a magnetic disk, the ESE50 plug-and-play capability means it can be added to Digital VAX and VAXcluster systems without application or operating system modifications. In short, you get a significant increase in application performance without expending time and money on application rewrites.

What's more, this new-generation solid state disk is an 8-inch, half-rack RA92-size product installable in SA900 storage array cabinets. These features let you:

- Integrate the ESE50 with magnetic disk and tape devices
- Conserve floorspace, power, and air conditioning
- Optimize HSC controllers by providing the ability to support up to 1 GB of solid state disk storage through one port.

Most important, the ESE50 Solid State Disk leads in price/performance, making it affordable for many new applications. For example, the 600 MB ESE50 is priced at $275 per megabyte — more than a 58 percent savings per megabyte over Digital's previous-generation solid state disk technology.

For more information on the ESE50 Solid State Disk, call 800-DEC-INFO (800-332-4636), ext. SSD, and request an ESE50 product information sheet.



PARTNER SHIPS

Pioneer and Digital: A Decade of *Quality*

DECWORLD '92 marked the 10-year anniversary of Digital's relationship with Pioneer, a distributor of computer products, software, and services. Pioneer is one of Digital's largest full-line distributors, with 40 sales offices and 180 Digital-trained sales and support representatives around the country. Value-added capabilities that have helped Pioneer attract a large customer base include:

- Customized systems including hardware, software, and services
- Integration of VMS, ULTRIX, Digital layered, and third-party software products
- Solutions based on relationships with software suppliers, including expertise in imaging, technical publications, and database products
- Experience in applications solutions including distribution, manufacturing, and financial services.

Two Views: Partner and End User

Patrick O'Connor, Pioneer's Senior Corporate Marketing Manager, begins a discussion on added value by pointing out a feature of Pioneer that is unique among Digital distributors. "We not only resell Digital products, but we also use them to run Pioneer's daily business," he says. "We are a state-of-the-art Digital end user. Pioneer currently has ten large VAX systems comprising two VAXclusters. These VAXclusters support 900 Pioneer employees."

The added value to customers is clear, according to Bob Bailey, Pioneer's Director of Marketing. "We can bring customers in, have them meet with our MIS people, and discuss with them some of the same opportunities that we've experienced as a Digital end user.

"In fact, we did that a few weeks ago with a large financial institution," Bailey continues. "Since we've done a lot of work in the area of redundant communications and networking, they came to us for assistance in getting started in that effort. Our own experience allowed our MIS people to work with them in outlining a strategy best suited for their business."

Pioneer's Offerings Are Proof of Its "Pursuit of Excellence"

A copy of Pioneer's mission and quality statements hangs in each of the company's facilities, according to Bob Bailey. The statements paint a portrait of excellence, integrity, and, above all, meeting and exceeding customer expectations.

Pioneer's quality statement emphasizes commitment, fairness, integrity, and quality.

But these words aren't confined to paper. They're put into action through extensive programs and services.

These ideals become reality as Bailey and O'Connor discuss the many offerings Pioneer provides in order to enhance customer satisfaction. Offerings include:

- **Pioneer Evaluation Center**
  Providing over one million dollars' worth of evaluation equipment. The equipment, fully loaded and fully functional, is delivered by a systems engineer who serves as a guide for the end user in understanding the system.
- **Digital Dedicated Systems Engineers**
  Offering on-site systems consulting, network design, and capacity planning.
- **Pioneer Porting Centers**
  Seven centers across the country that enable customers to port their application software to Digital platforms.
- **Proposal/Configuration Center**
  The center provides cost-of-ownership studies, extensive proposals, configurations, and product literature.
- **PC by Pioneer**
  A new service launched in conjunction with Digital's DESKTOP DIRECT organization. Customers simply dial 800-247-2800 to order and receive a fully configured personal computer, or other PC products.
- **Software Applications**
  Providing software applications to meet customers' requirements. Pioneer's knowledge of and agreements with leading software providers bring robust solutions to the end user.
- **Technical Application Centers**
  Three centers located across the U.S. that are designed for custom integration of application software.
- **National Accounts Program**
  Multi-location account coverage and technical support in conjunction with corporate agreements.
- **A Technical/Executive Seminar Series**
  Offering approximately 70 seminars nationwide encompassing 15 different topics, such as PATHWORKS Networking, UNIX for Management, and a series on product updates.
- **Extensive Value-Added Reseller Program**
  Providing quality VARs with extensive support services in many areas, including lead generation, a co-op program, advertising, and financial services.

Attention to Service Now and in the Future

Strengthening and enhancing its customer offerings are Pioneer priorities, according to O'Connor. It's the kind of service that doesn't end after the sale. "At Pioneer, customers are assigned their own personal service representative who is dedicated to their business and dedicated to complete customer satisfaction," Bailey explains.

This focus on service has also resulted in the creation of a portfolio of services — a program in partnership with Digital that provides Network Integration services, including network consulting, network implementation, network management, and desktop services for customers.

Even with an already extensive list of offerings, Pioneer has embarked on "FutureStart" — a total quality management program to improve every area of Pioneer business. The future vision of Pioneer extends the portfolio of services to include Digital's Alpha technology. "One of Pioneer's top priorities is ensuring that our customers' investments are protected," said Bailey, "and we share that concern with Digital."

For more information on Pioneer offerings, call Pioneer at 800-227-1693.

Digital Consulting Services Are Rated "R"

As many businesses struggle to remain competitive in an increasingly global market, the term "reengineering" has become the hottest industry buzzword. And rightly so, as the reengineering of broken or obsolete business processes is indeed a growing concern among many companies today.

That's where specific Digital offerings can help, according to Pat Zilvitis, Business Manager for Digital Consulting Services. These services can take your business full circle — from an initial evaluation report to implementation of a completely new business strategy.

Here, Zilvitis talks about the full spectrum of Digital Consulting Services, and how our complete solution helps you not only reengineer, but also rethink, retool, and ultimately, reenergize your business.

Defining Digital's Consulting Business

Digital Consulting Services have undergone marked changes in the last year and a half, according to Zilvitis. These changes include expansion into three vital business segments: Enterprise Engineering, Information Systems Management, and Enabling Technology.

"**Enterprise Engineering** provides a framework to assist you in analyzing and implementing the right processes to satisfy your business strategy. Our own history as an engineering, manufacturing, and logistics company, including the fact that we have incorporated engineering disciplines in the design of our hardware, software, and networking capabilities, gives us expertise that benefits the client," Zilvitis explains.

"**Information Systems (IS) Management** takes a look at the role of information technology within a company — in terms of its ability to effectively support a company's business strategy.

"**Enabling Technology** can be described as the foundation of Enterprise Engineering and IS Management," he continues. "Enabling Technology encompasses hardware and software technology, networking technology, and multivendor connectivity and interoperability."

The ability to help clients redesign their business processes and deal with the human side of change gives Digital a differential advantage.

The major benefit offered by these three business segments is in satisfying the total solution needs of clients, according to Zilvitis. "And it's done on a one-stop shopping basis," he adds. "We offer services that range from consulting to outsourcing, with all the steps in between tailored to the client's needs."

People Plus Technology: A Total Solution

There are some companies that buy technology without first investigating if the vision of top management is in sync with the rest of the company. "We understand that with new technology comes a host of challenges," Zilvitis says. "Our ability to help clients redesign their business processes and deal with the human side of change gives us a differential advantage. It's what makes the Digital Consulting Services solution so complete."

Real Challenges Real Results

Our consulting offerings carry with them a history of successful partnering and alliances. The following examples each convey a customer challenge, the Digital Consulting Services solution, and, most important, the positive results that followed.

Volkswagen: Worldwide Automobile Manufacturer

With international competition getting tougher all the time, Volkswagen is working on an aggressive plan to dramatically reduce the product development time of all its vehicles by 1995. Achieving better time-to-market means more cross-functional integration — a change that impacts every single Volkswagen employee.

To that end, Digital Consulting Services offered to help analyze business processes and interlinked process chains. This extensive analysis plus improvement methods provided by Digital consultants assisted Volkswagen in shortening, optimizing, and redesigning its process chains. As a result, Volkswagen has seen significant improvement in time-to-market.

Fleet Precious Metals: A Subsidiary of Fleet National Bank

Fleet Precious Metals faced two challenges. First, the organization needed to move a critical application to a new technology without disrupting operations or losing any customer data. Second, Fleet saw a need to tie together bank applications running on systems from a multitude of vendors.

Using Digital-developed Enterprise Engineering and business analysis methodologies, Digital consultants worked with Fleet managers in defining Fleet's business processes and identifying areas that needed strengthening. Digital consultants were able not only to design a new system to include new business functionalities identified by Fleet managers, but also to enhance the customized software Fleet was already using.

As a result of the Fleet/Digital partnership, a turnkey system with enhanced functionality and improved efficiencies now fully supports Fleet's data processing requirements.

Yamaha: Global Musical Instrument Company

Yamaha, the largest musical instrument company in the world, needed to prepare to make significant investments in a high-quality large scale integration design system and a corresponding fast time-to-market production process to continue to increase its market share. The company turned to Digital for help with strategic planning in terms of their semiconductor design and engineering business.

Digital consultants provided Yamaha with extensive analysis on current design and manufacturing processes. From this information, a plan was produced that outlined actions required to optimize the semiconductor operations now and that served as a guide for future investment decisions.

This plan was successful in providing Yamaha with ways to improve information flow throughout the organization — positively impacting time-to-market, productivity, and quality.

For more information on Digital Consulting Services, call 800-DEC-INFO (800-332-4636), ext. 445, and request a Digital Consulting Services brochure.

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NEW PRODUCTS

Data storage

Metrum Information Storage has started shipping the RSS-600B and RSS-48B data storage libraries.

The libraries are integrated with the company's new RSP-2150 digital tape drive. The combination of a high-capacity drive and tape media with robotics technology has increased the storage capacity of the RSS-600B to 8.7T bytes and the RSS-48B to 696G bytes.

Pricing for the RSS-600B robot starts at $265,000 and at $75,000 for the RSS-48B. The RSP-2150 drive costs $32,900.

Metrum Information Storage
4800 E. Dry Creek Road
Littleton, Colo. 80122
(303) 773-4700

Database management

Platinum Technology, Inc. has released Platinum RC/Update and Platinum RC/Migrator for IBM's OS/2.

Platinum RC/Migrator is a tool designed for DB2 migrations, alterations and subsystem/DDL file comparisons. Platinum RC/Update is a DB2 object-management tool that provides the needed functionality to manage and maintain DB2 objects and data and to support the application development area.

Mainframe versions of Platinum RC/Migrator and Platinum RC/Update range from $17,250 to $87,297, depending on CPU size.

Platinum Technology
555 WatersEdge Drive
Lombard, Ill. 60148
(708) 620-5000

CDB Software, Inc. has announced CDB/Fast Copy and CDB/Rexx software packages.

According to the company, CDB/Fast Copy completes the backup process 10 times faster than its competition.

CDB/Fast Copy can make up to eight image copies in one pass of table space because less clock time is used with a minimum amount of central processing time and data integrity. CDB/Rexx is a full-function programming interface between DB2 and Rexx. Users receive interfaces between Rexx and DB2 Commands and DB2 Trace Records.

Pricing for CDB/Fast Copy starts at $12,500, and CDB/Rexx starts at $10,500.

CDB Software
Suite 120
6464 Savoy Drive
Houston, Texas 77036
(713) 780-2382

Tone Software Corp. has announced the Data Base Control Center (DCC).

The DCC is a control package designed to manage DB2. It consists of three components: DCC-Assist, DCC-Compact and DCC-SQL. The components work together to create a DB2 system management environment. DCC-Assist is a workbench tool that features object creation and modification, catalog queries, authorization control and a utility generation tool.

According to the company, DCC-Compact provides average compression rates of 50% to 80%, and it minimizes the access path length. DCC-SQL avoids using compile, linkedit and bind steps during the preprocess, and it can edit and test dialogs while still in the ISPF/PDF, which results in immediate feedback.

Prices range from $20,000 to $85,000.

Tone Software
1735 S. Brookhurst
Anaheim, Calif. 92804
(714) 991-9460

System Industries, Inc. has introduced the Raider's Edge disk subsystem.

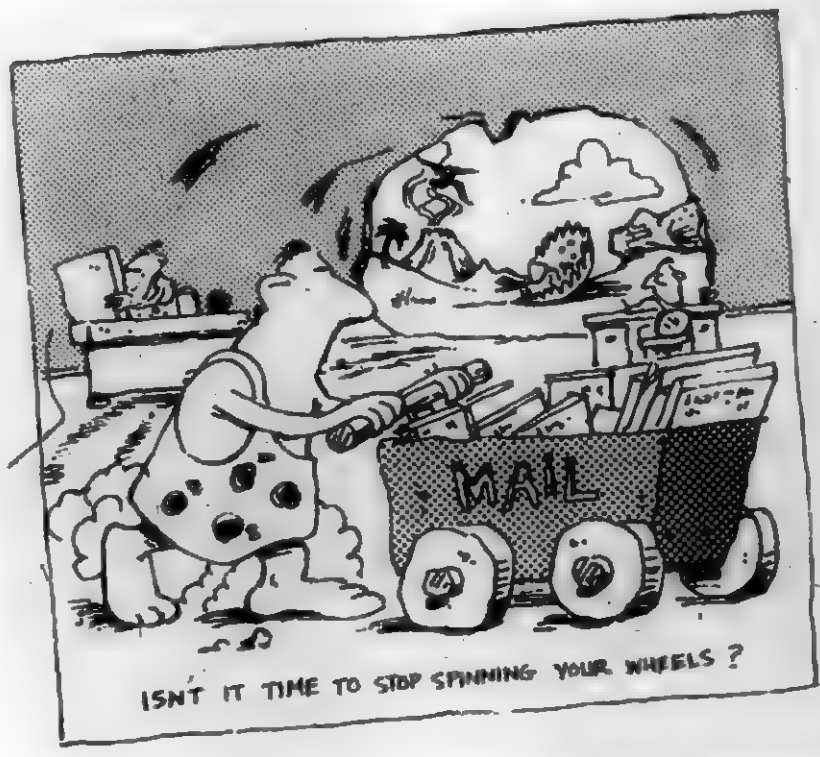
The product is a redundant arrays of inexpensive disks technology subsystem for the Digital Equipment Corp. VAX environment. Raider's Edge is designed to solve I/O performance and data availability problems. According to the company, a key feature is ease of integration into VAX systems.

High-data availability is accomplished by a data-checking algorithm and parity scheme. Application processing can continue without any interruption if a single drive fails because the failed drive is hot-swapped, and the new drive is automatically brought up to full operation.

Raider's Edge is available with capacities of 1.8G or 3.3G bytes, and users can add capacity when needed. It comes with the company's monitor sofware, which constantly monitors the conditions of the Raider's Edge internal drive and allows operators to access the subsystem's configuration and diagnostic menus.

Pricing for the Raider's Edge subsystem starts at $36,000.

System Industries
1855 Barber Lane
Milipitas, Calif. 95123
(408) 432-1212



By now, your office workflow problems should be a thing *of* the past, not *from* the past.

Since the dawn of civilization, people have been passing information on everything from stone tablets to scroll parchments. Fortunately, we've come a long way from the days of routing stone tablets. But even modern paper carries with it many of the same intrinsic processing problems as stones.

Today there is a solution...it's called the FileNet® WorkFlo® Business System. With WorkFlo, digitized document images replace paper and your personal computer becomes an extension of your desktop, integrating mainframe data, PC applications, and images into the work process.

WorkFlo automatically links, prioritizes, and manages the storage, retrieval, processing, display, communication, printing, and routing of all the information required to process your work.

Put FileNet to work for you. Our installed base of more than 500 systems in production applications in 18 industries underscores why imaging is one of the most strategic technologies of the '90s. Call Ray Brown at (714) 966-3900 or write FileNet Corporation, 3565 Harbor Boulevard, Costa Mesa, CA 92626 for a free 16-page brochure on "Integrating Your Information Resources."

FileNet
The Imaging & WorkFlo Company

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508 879-4700
with your computer/modem

REACH OUT AND ACCESS EVERYTHING

EDA/SQL FROM INFORMATION BUILDERS: The Industry Standard Client/Server Solution That Lets Any Tool Access Any Data, Non-Relational or Relational, From Any Desktop.

INACCESSIBLE DATA IS USELESS

You've spent a lot of years and a ton of money building up the databanks you need to call on regularly to help run your business.

But, can you access your data fast when you need it?

Even worse, if it's on an incompatible platform, can you access it at all?

Chances are the answer is no.

HOW BIG BUSINESS LOOKS AFTER BUSINESS

Happily there's another answer to the problem. It's called Enterprise Data Access (EDA/SQL) from Information Builders. The people who specialize in distributed information systems.

EDA/SQL extends the reach of desktop solutions. It enables virtually any application or end-user tool that supports SQL to transparently reach any data in non-relational database files from any workstation.

REACH OUT AND RETRIEVE

With so many SQL tools integrated with many of the proprietary databases, you need a standard method of access with the power and flexibility to extend their range across distributed, multivendor systems environments.

EDA/SQL lets you do it — and with both relational and legacy data systems, so your investment in all of your existing data is future proof.

Nothing else delivers this universal, flexible, access capability in the day to day management of all your company's data.

So when you need to reach data, regularly, quickly, and regardless of platform, there's only one company to call.

Information Builders, the distributed information systems specialist.

For more information on EDA/SQL and how it can solve all your data access problems or to attend a FREE Seminar...

Call 800-969-INFO

In Canada call 1-416-364-2760

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Information Builders, Inc.

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European standard grabs fancy of key U.S. players

BY GARRY RAY
CW STAFF

An emerging European standard for computer-aided software engineering (CASE) could play a prominent role in the U.S. by 1994, according to participants at CASE '92, an industry convention held earlier this month in Montreal.

Attendees also said the standard could provide an alternative to other CASE environments such as IBM's AD/Cycle.

The standard, the European Computer Manufacturer's Association Portable Common Tools Environment (ECMA PCTE), offers a nonproprietary framework for integrating CASE tools and data from a variety of vendors.

ECMA PCTE IS a CASE environment standard that is designed to integrate and control compliant application development tools.

"What people are looking at is having a bunch of tools, which they can integrate, and at moving data from project to project," said Michael Kearns, a senior staff analyst at New Technology, Inc., a Huntsville, Ala.-based contractor for NASA. "Proprietary standards" — such as IBM's AD/Cycle — "aren't easy for tool vendors to live with," he said.

ECMA PCTE is a CASE environment standard that was designed to integrate and control compliant application development tools and that defines how data integration and sharing could be achieved among those tools. For example, analysis and design tools, project managers, version control programs and data repositories could all be integrated within a PCTE environment.

Fast mover

"PCTE is one of the big moves gaining acceptance in the United States," said Jacky Estublier, a researcher at the National Center of Scientific Research in Grenoble, France. "I was surprised that acceptance was so strong" at the conference, he added.

CASE suppliers are embracing PCTE as a means of providing underlying tools and services that they currently must build on their own, such as data management and data distribution services.

Nicholas Wybolt, director of engineering at Providence, R.I.-based Cadre Technologies, Inc., said maintaining services such as windowing and data management across multiple platforms "had diluted our efforts" in improving the company's Teamwork CASE tools. Cadre announced in December that it will make Teamwork compliant with PCTE by 1994.

Another sign of the standard's growing momentum in the U.S. was a formal endorsement by Digital Equipment Corp. DEC, which had previously supported portions of the PCTE standard in its Cohesion CASE environment, announced that it will begin working with Austin, Texas-based International Software Systems, Inc. to design an "architectural definition and implementation plan" for ECMA PCTE, a company spokesman said.

That threw into question the company's commitment to a competing scheme called A Tool Integration Standard (ATIS). ATIS is the core integration component of DEC's Cohesion CASE environment.

A marketing victory

According to K. C. King, manager of technology transition at the Boeing Stars Project in Arlington, Va., "There's no doubt that PCTE has won the marketing battle." Boeing and DEC have been development partners in the Stars project. A DEC spokesman characterized ECMA PCTE as "complementary" to its existing ATIS implementation.

IBM was also expressing support for the European standard with its private demonstration at CASE '92 of a prototype CASE framework based on ECMA PCTE. "IBM has the first [ECMA PCTE] prototype in the world," Estublier said.

IBM has consistently stated that its PCTE efforts will be targeted toward technical CASE environments, such as its AIX SDE Workbench/6000, which runs on RISC System/6000 workstations. At the conference, IBM representatives characterized questions about the impact of PCTE on AD/Cycle as "political issues" that they declined to discuss.

Make way for CASE generation

State agency in Ohio replaces 20-year-old benefits system using Pacbase

BY KIM S. NASH
CW STAFF

COLUMBUS, Ohio — It won't get a gold watch or a nice plaque, but the 20-year-old benefits system at the State Teachers' Retirement System (STRS) of Ohio is being retired. Replacing it is an agile set of applications built with integrated computer-aided software engineering (CASE) tools.

But the birth of the CASE-made system, dubbed Legacy, was a pricey, sometimes painful four-year ordeal.

The $13.5 million project "caused a total transformation of our IT center," said Robert Bowers, deputy executive director for administration at STRS.

Reduces paper chase

Those involved agreed that the new system lets benefits counselors spend about 30% to 40% more time advising clients during a typical meeting, rather than running down missing paperwork. Linda Sampson, a member services counselor who advises teachers on how to set up retirement funds, said she can do tasks with Legacy that she could not do with the old system.

For example, "what-if" analysis is now possible. Previously, "I could see a teacher's account only in current form," Sampson explained. "Now I can work out different scenarios on-line, literally in minutes." Clients can quickly make decisions about their golden years by studying previews of changes to factors such as amount of annual contribution or type of service.

ON SITE

Linda Sampson

State Teachers' Retirement System of Ohio
Columbus, Ohio

- **Challenge:** To revamp entire 1,000-program teachers' benefits system with an eye toward scrapping existing Bull mainframe within two years for an open platform.
- **Technology:** CGI Systems' Pacbase integrated CASE tool set.
- **Result:** Easily modified and ported system that the state of Ohio plans to sell to other sources.

The transition was anything but quick, however. In 1988, Ohio's teachers' retirement group realized that its monolithic benefits application — running on two 8000 series mainframes from Bull HN Information Systems, Inc. — badly needed an overhaul. The system, which will run until December when Legacy moves from pilot stage into production, lacks documentation. Plus, the four benefits areas that it tracks are not integrated.

That means, as Bowers put it, "maintenance can be a nightmare, and never mind doing enhancements."

The right ingredients

The lure of easier caretaking and built-in hooks to make modifications easier drew STRS to CASE. The Bull boxes, which Bowers said he will ditch within two years, actually simplified the decision of which CASE products to buy. CGI Systems, Inc.'s Pacbase was the only integrated workbench at the time that supported Bull's proprietary operating system, according to Bowers.

"What clinched it was that Pacbase also gives us the ability to migrate the applications to other platforms later on," he added.

The $150,000 to $300,000 product can generate code for IBM MVS and OS/400, Bull, Unisys Corp., Digital Equipment Corp. and Hewlett-Packard Co. environments and various versions of Unix, among other operating systems.

"Whatever we eventually decide on, we're covered," Bowers said.

However, it was after that initial buying decision that the trouble started. The state hired a Big Six accounting firm to analyze

Continued on page 72

Xpediter 6.0 debuts from Compuware

BY JOHANNA AMBROSIO
CW STAFF

A new release of a debugging tool from Compuware Corp. allows mainframe programmers to debug both on-line and batch applications, a capability that previously required two separate software packages.

Compuware said that at least 50 of the 650 users of Xpediter 6.0 have bought it to replace another vendor's product.

Two of those are Centerior Energy Corp. in Cleveland and The Acacia Group, an insurance concern in Washington, D.C. In both cases, the users jettisoned Intertest from Computer Associates International, Inc.

Centerior had been using both Intertest and an earlier version of Xpediter, according to Daniel Rose, a systems analyst at the electric services company. But the newest release of CICS, Version 3.2, could accommodate only one symbolic debugger. Xpediter was selected because it tested out to be "friendlier" than Intertest and more intuitive to a programmer, he said.

Production possibilities

Centerior plans to have Xpediter 6.0 in production by early next month, Rose added.

Acacia has been using Version 6.0 since March and had also been using Intertest, systems specialist Matthew Roswurm said.

"We were getting ready to do a CPU upgrade, and we didn't want to pay the upgrade fee for Intertest," Roswurm said. Because Xpediter 6.0 can now handle very large files, he said, Acacia made the switch over to using Xpediter exclusively.

Roswurm said he likes the "cleaned up" interface over the old Xpediter version and that the new version is "much more on-line-oriented." Acacia is using Xpediter to convert to a new insurance application package, he said.

Xpediter 6.0, which runs under MVS and VSE, also added support for DB2 and expanded its support for third-party applications. It is available now, and pricing ranges from $25,000 to $49,000.

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The success of Texas Instruments I-CASE product is proven—in the field.

There is an integrated CASE product that works. It works now...and it works well.

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Productivity gains in initial development are hard to measure, but reports of 2-to-1 improvements are fairly common—and some go as high as 5-to-1.

Quality improvements are dramatic. Users are getting more of what they need to run their businesses. Systems get up and running easier and faster.

As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

Now, develop on PC and generate for DEC/VMS, UNIX. TANDEM, WINDOWS available soon.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/VMS and some UNIX platforms. TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

Developers give IEF highest rating in COMPUTERWORLD.

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The new IEF Starter Kit will give you everything you need to start building systems with I-CASE on your OS/2 PC.

Along with the tutorial, the kit includes our standard OS/2 PC analysis, design and construction toolsets as well as testing and code generation in C. (A COBOL compiler is optional and priced separately.) There's also 90 days of "hot-line" support.

The kit is priced at $10,000 (limit one per customer company). That's about one-half the regular cost of the toolsets.

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Government purchasers, please reference GSA #GS00K92AGS5530

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Head of Operations, Systems/Computing
Rolls-Royce Aerospace

"With previous methods, we would have had to compromise on an 'okay' 10-screen Lease Accounting system. With the IEF, our users got everything they wanted—an outstanding 40-screen system—in the same time. They are requesting the IEF for all future systems."
Tom Jeffery
Sr. VP, Information Systems
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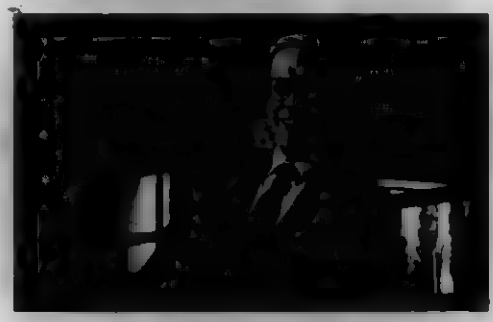
Venkat (Vinnie) Tiruvilvamala
Director, CPC/CPPC Information Systems
SONY Corporation



"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."
Bill Palm
President, Canadian Technology Services
Canadian Airlines

"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."
James R. Engle
Director, Systems and Programming
Rhône-Poulenc Rorer

"Your new IEF tutorial was a way to quickly become familiar with the IEF and see how the IEF will allow quality systems to be built very quickly. I feel I now know how to build systems using the techniques described."
Roger Strand
Application Development Consultant
First Federal Lincoln

"The IEF tutorial is very well done. I feel comfortable with this software and I have acquired the skills to build simple systems. The tutorial is a very fast and effective means of evaluating the capabilities of the IEF."
Margaret Kubaitis
Research Programmer, IS&S
University of Illinois

"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."
K. E. Peacock
Data Administrator
City of Saskatoon, Saskatchewan

Make way for CASE generation

CONTINUED FROM PAGE 69

existing business procedures and design a new system. After several months, the IS group decided the relationship "wasn't profitable for us" and dismissed the firm, which Bowers declined to name. Nor would he specify the problems that prompted the break, except to say results were slow in coming and sometimes looked like they would not appear at all.

So Ohio looked to its 60 users for help. A committee, headed by Sampson, was formed to advise IS on what the system should look like and how it should work.

Her greatest challenge, she said, was not translating techno-speak into user terms, but keeping users interested in the project. "Four years is a long time to work on something without seeing it," she observed.

The committee used joint application development-style methods to get IS and end users working together. The give-and-take gave users a sense of ownership in the project, Sampson said.

After three years of drawing blueprints, STRS was ready last year to begin building programs. But complete Pacbase training would have taken too long and prevented several in-house programmers from doing their regular work, Bowers said. So the state sought out a small, local consulting firm for help: Claremont Consulting in Oakbrook, Ill., which specializes in Pacbase and Texas Instruments, Inc.'s Information Engineering Facility.

Claremont sent in 35 programmers and analysts to work with STRS' user committee and 15 IS personnel. CGI also provided a few consultants. A year later, Legacy is nearing completion and parts of it are already in limited use at STRS. The state of Ohio plans to officially install the first piece, Member Benefits, in December, with a Pensions module to follow.

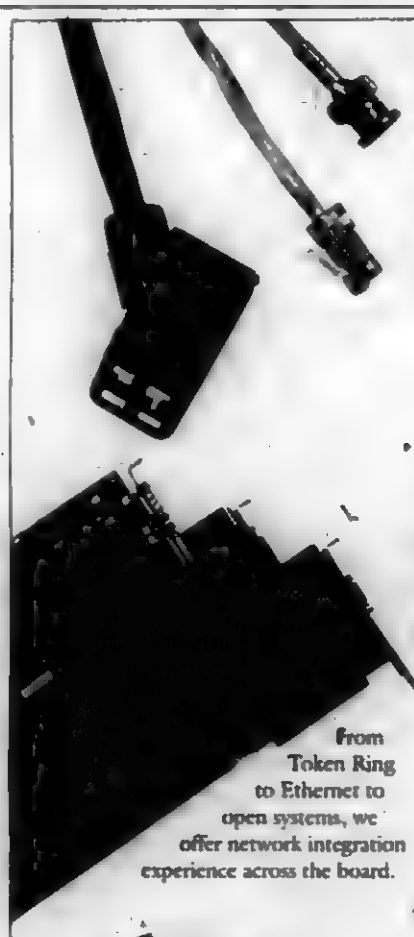
CASE "is the way to go," Bowers said, "but you pay a price for it in training and re-orienting your programming staff." However, the experience has improved the way IS operates, he added.

Retirement money

A price of $13.5 million might seem like a lot to spend on a software development project. However, the new 1,000-application system encompasses nearly every task STRS handles, according to Robert Bowers, deputy executive director for administration. "It's not just a core application. It's the total of what we do," Bowers said.

That cost includes software and hardware, including CGI's Pacbase and a turnkey relational database from Teradata Corp. But the biggest expense was people, Bowers estimated that staff salaries, outside consulting and in-house training made up more than half of the $13.5 million.

The state plans to recoup some of the money spent by peddling Legacy to other state and municipal retirement funds. STRS and Claremont Consulting formed a new company for that purpose: Claremont Retirement Technologies, Inc. in Oakbrook, Ill.



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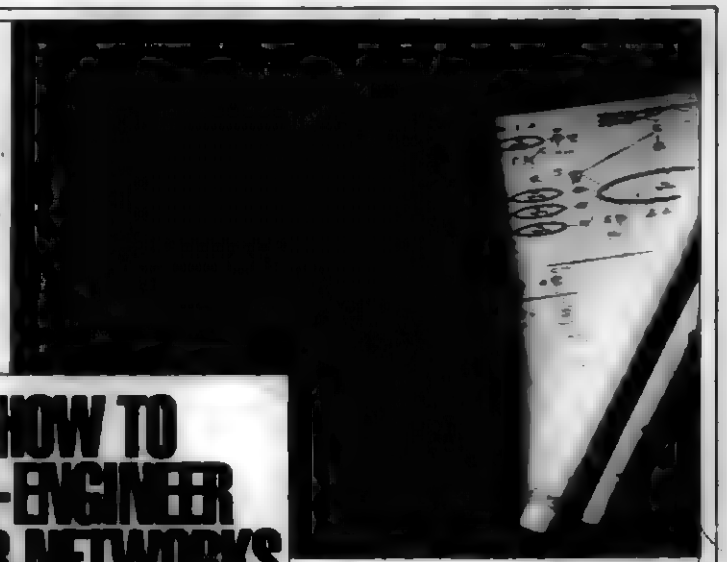

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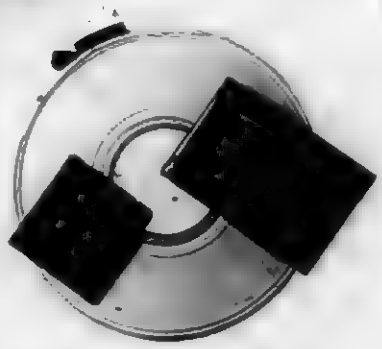

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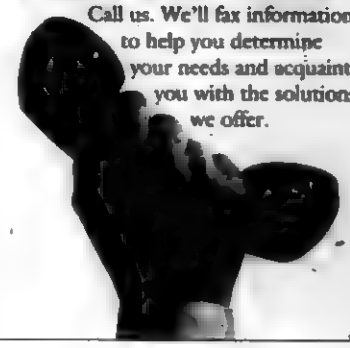

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IN BRIEF

IBM, Easel eye Asia

■ **IBM** signed a marketing agreement with **Easel Corp.** to sell its development products in Asia. Easel/2 2.0 will be available in a double-byte character set to let developers in Japan, Korea and Taiwan build applications that incorporate their native language.

■ **Objectivity, Inc.** in Santa Clara, Calif., recently announced an integrated graphical environment designed to assist in the development of object-oriented databases and applications based on **Digital Equipment Corp.**'s DEC Fuse application development environment.

Called Objectivity/DB, the software is an object-oriented database management system that is primarily designed for use in technical and engineering applications. The software incorporates standard C++ and is also available on **Sun Microsystems, Inc.**, **Hewlett-Packard Co.** and **IBM** RISC System/6000 platforms.

■ **Softool Corp.** in Goleta, Calif., and Beaverton, Ore.-based **Cadre Technologies, Inc.** have joined forces to integrate Softool's change and configuration management program, CCC/Manager, with Cadre's Teamwork, a group of software development tools.

■ France's **Sapiens International Corp.**, whose U.S. office is in Cary, N.C., will supply $2 million worth of application development tools to **Manpower France**, a unit of employment agency Manpower, Inc.

NEW PRODUCTS

Application development tools

Beck Computer Systems has announced RMSEDT Version 3.1 for use on the Digital Equipment Corp. VAX/VMS.

RMSEDT is a VMS software tool that lets users interactively inspect, modify and report on Recovery Management Support (RMS) files. Regardless of file organization, record layout or record length, users can access any RMS file.

Enhancements include performance improvement of up to 300% when executing indirect command files and compatibility with Cobol and dBase IV, the company said.

RMSEDT Version 3.1 also supports a new data type called HEX string that allows users to inspect and input data in hexadecimal format, the company reported.

RMSEDT license pricing ranges from $950 to $7,950.

Beck Computer Systems
5372 Long Beach Blvd.
Long Beach, Calif. 90805
(310) 428-2894

Cortex Corp. has introduced Version 5.0 of CorVision, a repository-based application generator.

By producing commercial applications in the ANSI C source code, this version supports a range of computer platforms. Users can build client/server applications using MS-DOS or Microsoft Corp.'s Windows-based personal computers as clients with a number of Unix servers, according to the company.

Version 5.0 applications are implemented using industry standards including IEEE Posix, Transmission Control Protocol/Internet Protocol and SQL.

A typical entry-level configuration of CorVision costs $35,000.

Cortex
100 Fifth Ave.
Waltham, Mass. 02154
(617) 622-1900

Dragonfire Software Systems has released Version 1.0 of the PC/Cobol Toolkit, a set of library routines.

The product is designed for users with PC/Cobol compilers based on the Micro Focus Cobol/2 Compiler. Features such as callable routines that verify disk and printer status, perform screen I/O, retrieve directory listings and shell out to DOS are included.

The tool kit also provides a number of copybook files for use in the programmer's code.

The PC/Cobol Toolkit costs $50 without the source code. The source code with tool kit costs $100.

Dragonfire Software Systems
14407 Cypress Falls
Cypress, Texas 77429
(713) 870-7966

Software Artistry, Inc. has released Version 3.2 of Application Software Expert, a cross-platform, rapid application development and expert systems tool.

The product is composed of a fourth-generation language, a block structured procedural language, an expert systems inference engine and user interface objects.

Multiple database management system access capabilities have also been added to this release.

Version 3.2 offers user interface objects, including pull-down menus, calendars, spreadsheets and tabular database browsers.

Application Software Expert Version 3.2 is priced from $3,000.

Software Artistry
Suite 1100
3500 Depauw Blvd.
Indianapolis, Ind. 46268
(317) 876-3042

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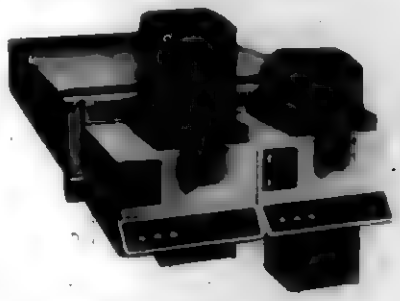

to the IBM AS/400 user. These choices include 18-track cartridge, 8-mm cartridge and reel-to-reel tape subsystems that make back-up both easy and cost-effective. Our new 9336-compatible DASD subsystems offer levels of performance and reliability never before available to the AS/400 user.

Each features optional hot-spare technology for data protection and cache technology for high performance.

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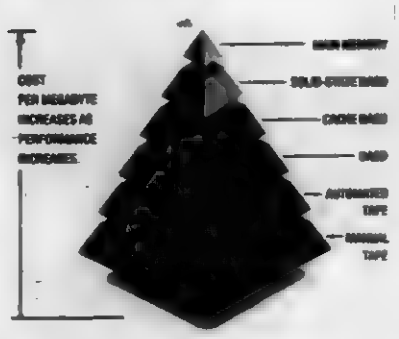
We've just released the Alpine 9600 Storage Manager™, a fault-tolerant, disk-array subsystem that is the first AS/400

storage device to provide continuous operation through redundant components and RAID 5 (Redundant Array of Independent Disk) architecture.

Alpine sets a new standard in data availability and protection. Key components are hot-pluggable and may be replaced without disrupting operations.

Planning for Growth

With more choices available and more coming, you will want to build a sound storage procedure for today and

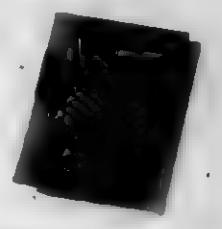


have a growth plan for the future. To aid you in that process, XL/Datacomp provides you with a strategy with which to realize the benefits of Data Storage Management (DSM).

DSM shows you how to store data on the type of device that provides the best level of performance and protection. The result is a multi-level storage environment, a mixture of high-speed alternatives for

high-speed needs and cost-effective devices to handle less time-critical tasks. As we make new alternatives such as solid-state DASD and automated tape library systems available, you can incorporate them into the DSM strategy to take the best advantage of each type of device.

To find out more about the new XL/Datacomp line of storage devices, or the ways you can put DSM to work to improve the access and cost-effectiveness of your data storage, call for the FREE booklet "Guide To Effective Data Storage Management."



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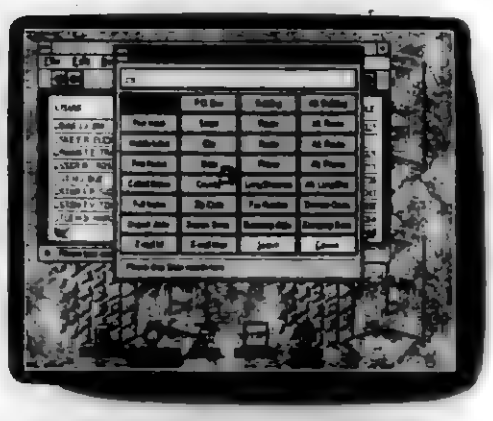
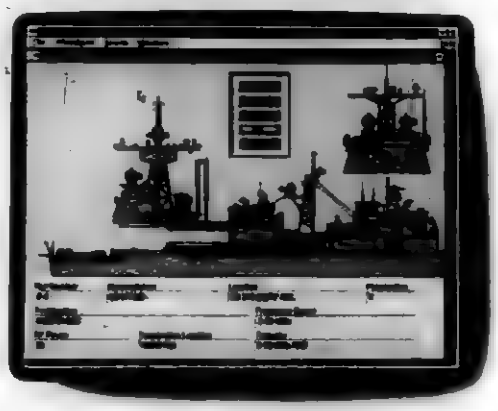


CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

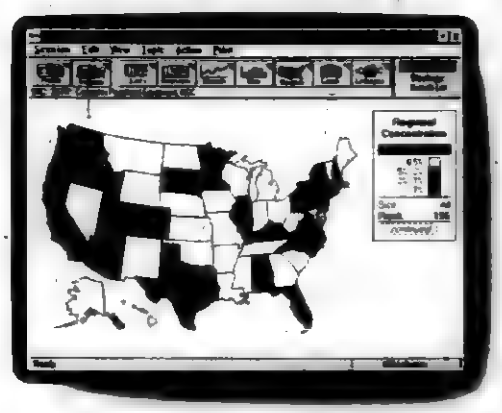
Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

© 1992 Microsoft Corporation. All rights reserved. The Windows World Open competition was sponsored by ComputerWorld, Windows Watcher, Windows World and Microsoft. Winners were selected by five independent Windows experts. Choice of development tool was not a criterion for entrance in the contest. Microsoft is a registered trademark of Microsoft, Inc. Bridge Tool Kit is a trademark of Softbridge Microsystems Corporation. Q+E is a trademark of Pioneer Software Systems Incorporated. Superbase is a registered trademark of Precision Incorporated.

bout the problems We'd like to talk about e solutions.

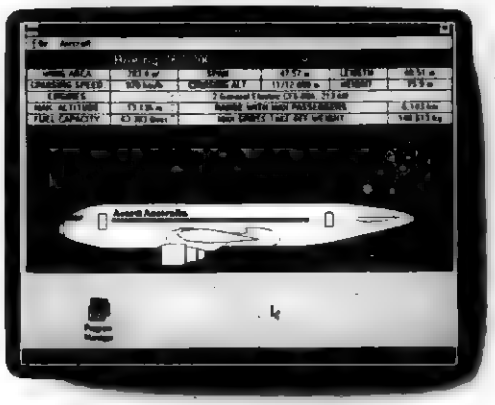
Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.



Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.

Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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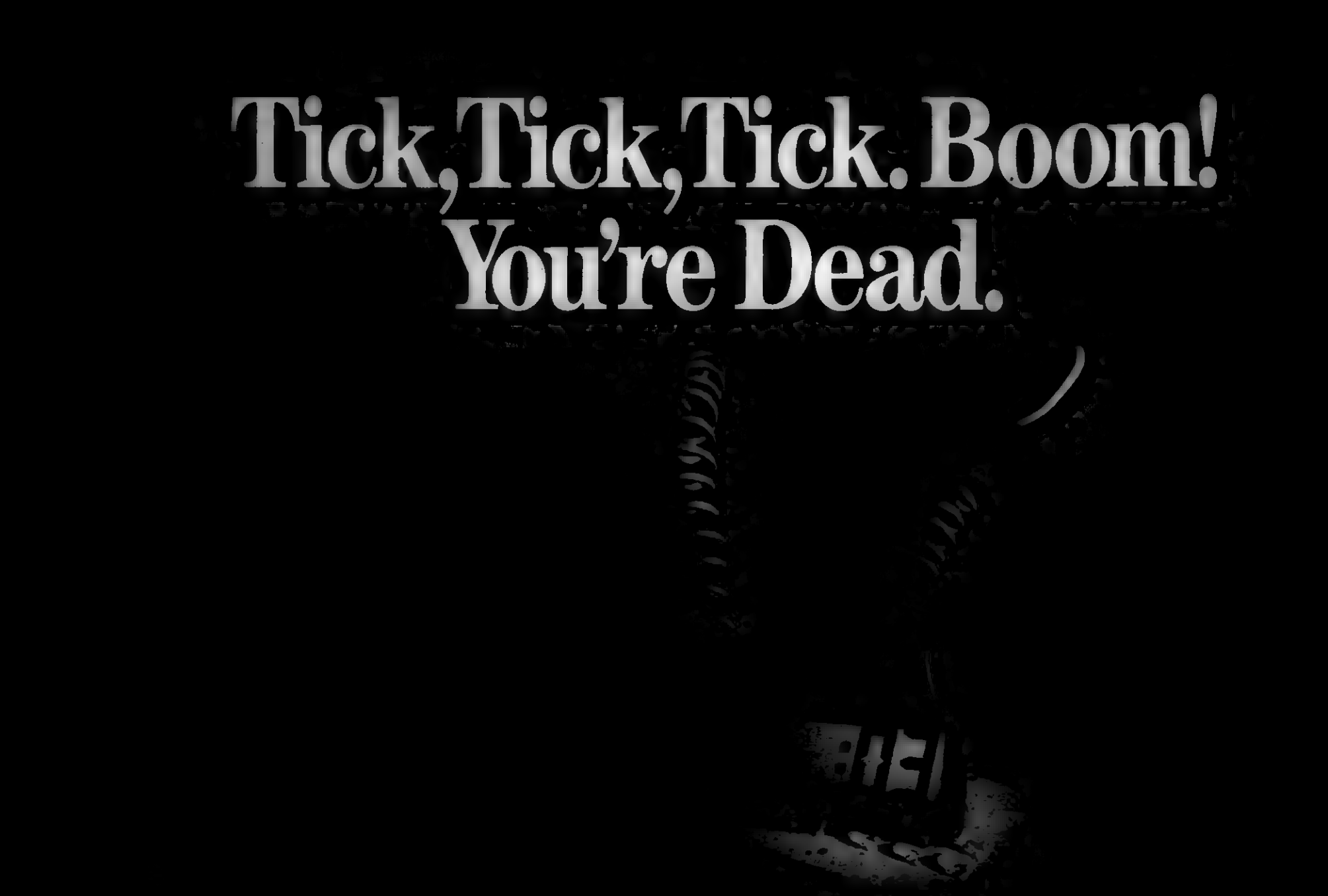

A time bomb may be lurking inside your modem. A fatal flaw that can paralyze the data you're transmitting, causing untold chaos to the flow of accurate data you need.

You see, some modem manufacturers decided to turn their backs on proven modem technology, and on you. They haven't told you about the dangers because the only solution for this crisis is to replace their modems. Fortunately, Hayes® can give you the knowledge to locate the bomb and prevent the purchase of another one.

HOW TO UNCOVER THE BOMB. We've developed a FREE test kit that's extremely easy to run on your PC or Mac. The kit spells out the dangers completely and accurately tracks down their fatally flawed component. To order your FREE kit, just call 800-846-8388, FAX your request to 404-729-6650, or download the test files from the Hayes BBS.

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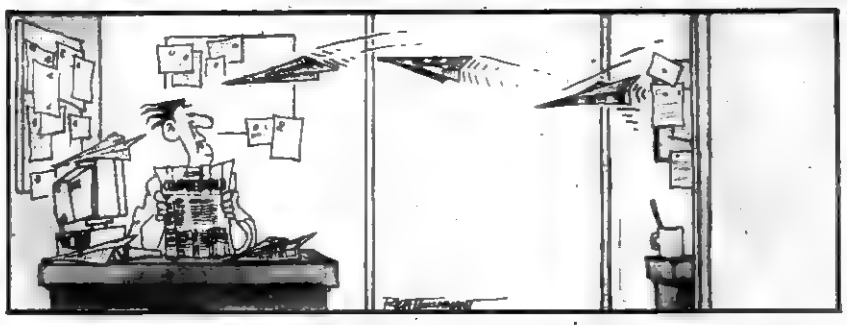

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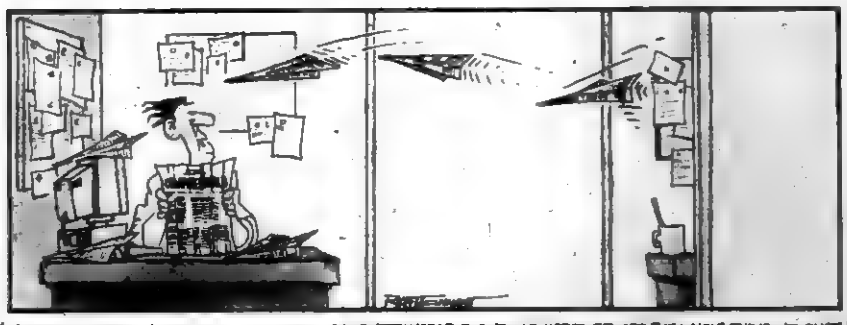

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The new word processors: More than you may ever need

Loads of accessories and functions don't always translate into a great deal

BY ALAN RADDING

How are the new word processors like political candidates? Both claim to do almost everything; both are attempting to trounce their competitors at every turn; and it's very possible to get too much of both of them.

If you have seen any of the latest word processors, you get the idea: They include a little bit of many specialties, such as desktop publishing, presentation graphics and spreadsheets. DOS word processors now sport a graphical look and feel, and even Unix is gaining a more personal computer-like image.

And the features keep on rolling. One vendor may pull ahead with a new gadget but never fear — the others will be close behind. This is especially true in the Windows world, where **Lotus Development Corp.**, **Microsoft Corp.** and **WordPerfect Corp.** are in a constant game of leapfrog.

Lotus recently jumped ahead as top frog with its latest release of Ami Pro 3.0. It now provides drawing capabilities within the program, multiple rows of "one-click icons" and more file formats, style sheets and on-screen fonts. Before that, Microsoft Word had been regarded as offering the most functions and being the most intuitive, says Bill Kesselring, an industry analyst at Dataquest, Inc. in San Jose, Calif. With all the action at WordPerfect, there's little chance of any status quo taking hold.

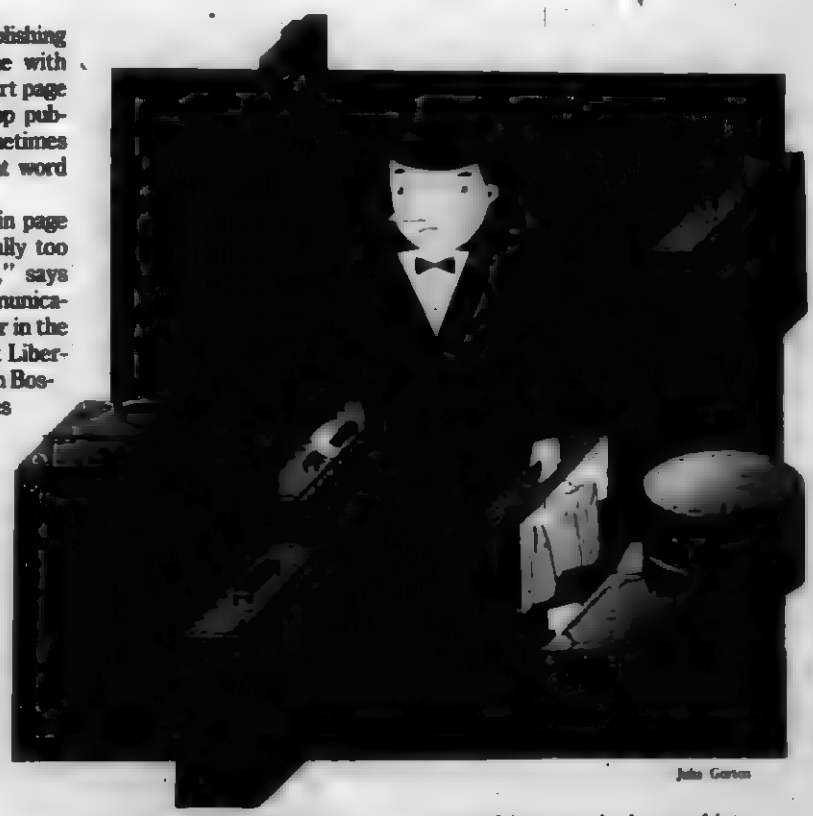
No guarantees

Some of these features are impressive, but across the board, the newest generation of word processors doesn't entirely replace the packages from which they borrow their features and functionality. These whiz-bang features also don't guarantee increased productivity.

The most touted features — what-you-see-is-what-you-get (WYSIWYG), desktop publishing and graphics — all come with their frustrations (see chart page 78). For instance, desktop publishing features can sometimes get in the way of efficient word processing.

"I can write and edit in page layout mode, but it is really too distracting and too slow," says Ralph Valente, a communications specialist/copywriter in the advertising department at Liberty Mutual Insurance Co. in Boston. Valente writes sales brochures on an **Apple Computer, Inc.** Macintosh running Word for the Macintosh but turns the disk over to the art staff for layout with **Aldus Corp.**'s PageMaker.

Still, there are features to get excited about, such as one-click icons, macro recorders and extensive file importing (see chart page 78).



John Gerson

Larger issues

So you can watch the race and place your bet, or you can take a more long-term approach: Choose the package according to concerns larger than mere features and functionality.

For one thing, so much depends on which other packages — spreadsheets, electronic mail or databases — the word processor can interoperate with. This is especially true in the Windows world, where Microsoft, Lotus and WordPerfect are all trying to come out with closely coupled product portfolios.

These product lines — actually suites of Microsoft Windows-based applications — promise tightly integrated features such as Object Linking and Embedding (OLE) and Dynamic Data Exchange (DDE), consistent operation and look-and-feel from program to program and greater assurance of Windows compatibility (no unrecoverable errors) among the applications.

Of the "Big Three," Microsoft Word is regarded as taking the best advantage of Windows. However, Lotus is catching up fast with its own suite of Windows-based products, including 1-2-3 and Freelance.

The degree of DDE and OLE support plays an important role here. With DDE, data from a spreadsheet can be inserted into a word processor. At a later date, if the data changes in the spreadsheet, it will be updated when the word processing document is opened.

OLE takes DDE a step further. Here spreadsheet data can be inserted into the word processing document. If the user clicks on the spreadsheet data, it opens the spreadsheet program, giving full spreadsheet capability within the word processor.

However, some consider OLE overrated. For instance, it is still difficult to implement. Even in Word, OLE is far from intuitive and can produce some spotty results.

Just when you think you may want a Windows word processor, think again: These packages can easily overburden your PC. In OS/2 and Unix as well, all the new functionality takes its toll on CPU, memory and storage. The programs are large, running from 5M to more than 10M bytes. On an Intel Corp. 80386 33-MHz machine with 8M bytes of memory and 200M bytes of storage, the Windows products

Continued on page 78

Radding is a free-lance writer based in Newton, Mass.

INSIDE

In Search Of a 10
Two users and their hunt for the ideal word processor. Page 78.

Bargain Or Bust?
No-frills versions get letters out without distractions. Page 79.

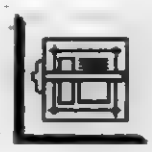
Take Your Pick
DOS, Unix, Windows, Mac and OS/2 packages. Pages 80-81.

Features and more features

Graphics and productivity features are the areas of concentration for the newest packages

WYSIWYG page preview: All the latest products let you view the page before printing to check placement of titles, graphics and other elements. However, even the best WYSIWYG is not perfect, and there can be discrepancies between what you see on the screen and the actual output.

WYSIWYG editing: The newest Windows word processors allow you to edit in WYSIWYG mode. However, editing is slow and can be difficult, especially when reading narrow, lowercase letters such as "i" or "l."



Layout: Layout capabilities vary, from the basic (combining text and graphics in a frame) to the sophisticated (wrapping text around odd-shaped graphics). None yet have the precise control and productivity features of full-powered desktop publishing systems.

Import, move, size, rotate and crop graphics: Most high-end packages allow you to import graphics from other packages and position and resize them in the document.

Drawing capabilities: A few products either have a drawing capability or incorporate an existing drawing package. Ami Pro offers drawing capability within the document. None yet matches the best stand-alone drawing programs.

Drag and drop: Windows-based products allow you to define and move text with the mouse rather than requiring you to go back to the "edit" menu and click on the cut-and-paste options.

One-click-function icons (also known as "smart icons" and "button bars"): This feature allows you to just click on a single icon to perform a function rather than going to the menu and making several clicks of the mouse. Some packages allow you to customize icons or move them anywhere on the screen.

File importing/conversion: Windows products, in particular, offer extensive support for multiple data formats. Be warned that file conversion can slow down performance, and not everything converts well.

Macro recorders: These allow you to automatically reduce a series of keystrokes or mouse clicks to a single command. You can also turn the macro into a customized button. For complex, interactive tasks, however, you will still have to program the macro using a command language.

Automatic envelopes: Most word processors now provide a choice of envelope formats that can be called up with a keystroke or two. Ami Pro's most recent release, 3.0, goes one step further by automatically taking the inside address from the letter and placing it in an envelope format.

Style sheets: All word processors allow you to customize style sheets, rather than having to create formats and layouts from scratch. The latest Ami Pro version and Word for Windows come with dozens of ready-made style sheets.

In search of the perfect word processor

For choosy users, it always seems as though the ultimate word processor is awaiting them in a new release.

Smarts. Ease of use. And a dual license that allows him to run a copy on his portable. That's what Kevin Grantham, director of marketing at Westronic Systems Corp. in Richardson, Texas, can't seem to find in a word processor. He has tried **WordStar International**'s WordStar, **Microsoft**'s Word 4.0, Mass 11 (a VAX product that also runs on the PC) and **Lotus**' Manuscript.

What he says he wants is a word processor "that knows how documents are put together." Manuscript had smarts, he says. Unfortunately, it had a difficult interface.

Mass 11 was very powerful, but the license was a problem, and it "was impossible to learn," Grantham says. He was "blown away" by the style sheets in Word, but he didn't like the fact that he had to exit the program to get graphics. Ami Pro let him draw right in the program, but it wasn't intuitive. Now that Ami Pro Release 3.0 promises to do things such as automatically place the inside address on the envelope, Grantham says he may be able to stop searching.

If you can't find what you want in one package, why not use two? That's what Bohdan Zachary, a TV producer/director at North South Films in San Francisco, is doing. He switches between Word for Windows and Word for DOS, depending on his needs.

Zachary never wanted to abandon his original word processor, WordStar. But as WordStar failed to keep pace, Zachary was forced to shop around. Now that WordStar has announced Version 7.0 for DOS, Zachary's hopes have been raised. "I keep reading good things about WordStar 7.0." If they're true, he can return to the package he knows and likes best.

ALAN RADDING

The new word processors

CONTINUED FROM PAGE 77

ran noticeably slower than the latest DOS counterparts. From loading the program to cutting and pasting to the spell checker, performance lagged.

If, as the analysts say, typical users only use about 10% of the features, they may be carrying a lot of extra overhead from which they will rarely benefit.

That's why a lot of people may turn to the now-graphical DOS packages, such as the latest DOS products from **WordStar International, Inc.**, WordPerfect and Microsoft. All now feature mouse support and pull-down menus. All have desktop publishing, editing, formatting, font and graphics features that come very close to the Windows products while at the same time delivering faster performance.

Lacking a few functions

Where they fall short is in Windows-specific features; they do not support DDE and OLE, for instance. They also still cut and paste rather than drag and drop text; they don't let you edit text in WYSIWYG mode; they don't have one-click icons; and they don't support more than two windows on the screen at a time.

Some WordStar users prefer Release 7.0 over the Windows version because it retains more of the original WordStar features while adding almost everything in the Windows version. "WordStar 7.0 gives you almost all the features, but they didn't screw anything up to do it," says Robert Bloom, chief at the U.S. Army International Material Evaluation Division in Aberdeen Proving Ground, Md.

The bottom line is that Windows may be the most obvious and sexy option, but it is not the only one, as there is increasing activity on other platforms (see charts pages 80 and 81).

As in other areas of life, new is not always as wonderful as it appears. That goes for word processing as well: Despite graphical interfaces, the systems are not intuitive. Yes, it's a lot easier to click on a paragraph and change its format or drag some copy from here to there. But no amount of pull-down menus, mouse control, on-screen Help, style sheets, built-in macros, one-click icons, drag-and-drop and other ease-of-use features will enable you to absorb all the new features, from math capabilities to fonts. One leading word processor has seven sets of button bars — it's easy to lose track of which one you're using.

Some ease-of-use features are also proving to be performance bottlenecks. Take the mouse, for example. Some of the best features in these word processing programs are mouse-dependent, which can slow a fast typist. Of the Big Three, Ami Pro suffers the most without the mouse.

The thing to keep in mind is that you don't want to overload. Most people would like to be surrounded by their favorite belongings on vacation, but do you really want to lug them around the airport?

Whichever way you go, you almost can't go wrong. Unlike a political election in which the best candidate increasingly appears to be "none of the above," when it comes to choosing a word processor, any of the above will do the job well. •

Take a walk on the 'lite' side

BY LYNN HABER

Sometimes, you can just get too much of a good thing. For these times, there is a "lite" choice. About a half-dozen popular word processing vendors offer no-bells-and-whistles versions of their software, sometimes referred to as executive word processors. At this point, according to one vendor, the low-end variety accounts for about 10% of all word processors sold.

WHAT YOU GET: Basic editing tools, text manipulation, basic formatting capabilities such as margin setting, small tables and graphics placement, a rudimentary spell checker and a grammar checker.

A limited number now have improved performance and formatting capability as well as better design efficiency, including mouse support and Microsoft Corp. Windows capabilities.

If you stay away from the Windows versions, you'll require less memory and disk space than with fully functioned word processors, with a minimum of 640K bytes of random-access memory and 1M to 5M bytes of disk space.

You'll also be able to go from loading the package to printing a document in a half-hour, vendors estimate.

WHAT YOU DON'T GET: You won't get graphics with pizzazz, advanced editing tools or very much memory. Lite products usually have limited file compatibility as well. You also give up large charts, the ability to overlay text on a graphic, font support, full-blown grammar and spell checkers and tabling capabilities. You can get a dictionary of about 200,000 words but not a thesaurus. Desktop publishing features are limited.

Another drawback is that "lite" may force an organization to support more than one word processor.

PRICE RANGE: $49.95 to $249.

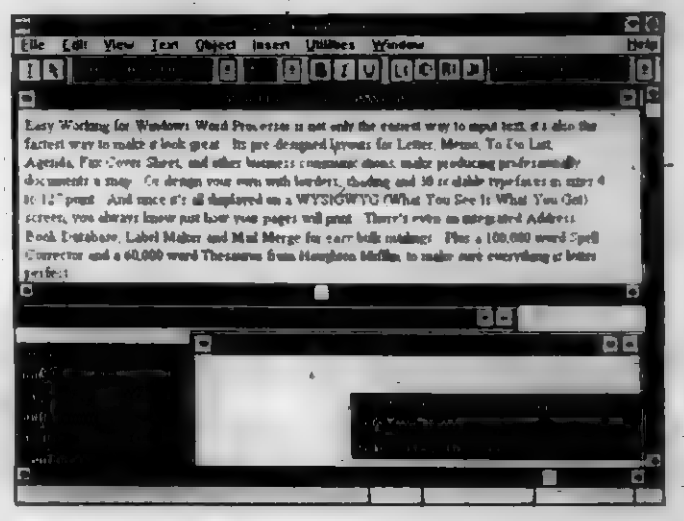
COMMON USE: People use lite packages when they need to get out simple, short documents or notes quickly. Others use lite versions of a higher end package on their portables because they require less memory. Some firms, such as Trustmark Bank in Jackson, Miss., are making the best of both the high-end and the low-end worlds.

USER COMMENT: Leigh Johnson, an information analyst at Trustmark, says the bank has standardized on WordPerfect and LetterPerfect, a high-end and low-end solution, respectively, from **WordPerfect Corp.** More than 50 branch offices use the low-cost LetterPerfect for creating simple one-page documents, while anything outside the branch offices is done with WordPerfect.

WHO MAKES IT:
- **Broderbund Software, Inc.**
(415) 382-4400
Bank Street Writer Plus ($59.95)
- **Lotus Development Corp.**
(617) 577-8500
Lotus Write 2.0 for Windows ($199)
- **Microsoft Corp.**
(206) 882-8080
Windows Write (included in Windows 3.0) ($149.95)
- **Software Publishing Corp.**
(408) 986-8000
Professional Write 2.22 for DOS, Professional Write Plus for Windows ($249)
- **Spinnaker Software Corp.**
(617) 494-1200
Easyworking for Windows and Eight-In-One for DOS or Windows ($49.95 and $59.95)
- **Symantec Corp.**
(408) 253-9600
JustWrite 2.0 ($249)
- **WordPerfect Corp.**
(801) 225-5000
LetterPerfect 1.0 ($149)

Haber is a free-lance writer based in Boston.

'Lite' word processing packages such as Spinnaker's Easyworking for Windows offer features such as basic editing tools and formatting capabilities. However, they don't give you extensive graphics or desktop publishing capabilities.



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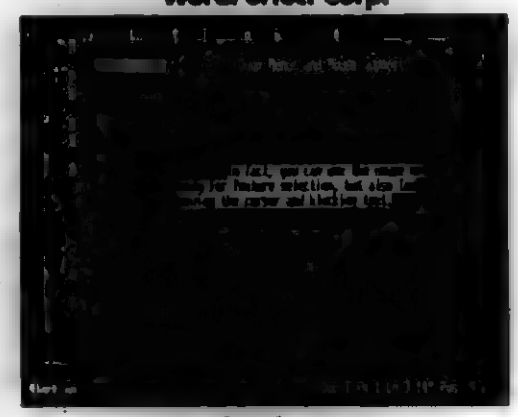
A look at the new generation

DOS

Just because it's DOS doesn't mean it isn't graphical. DOS word processors now feature pull-down menus and mouse support. The most functional ones also offer layout and graphics, multiple fonts, WYSIWYG page preview and multiple window support. However, they do not support DDE, OLE or smart icons, and they still cut and paste rather than drag and drop text.

WordPerfect Corp.



WordPerfect 5.1
(800) 451-5151

RAM (full installation): 2.5M bytes.

Editing: Find-and-replace, macro recorders, style sheets, thesaurus, foreign language dictionary, undelete (last three deletions).

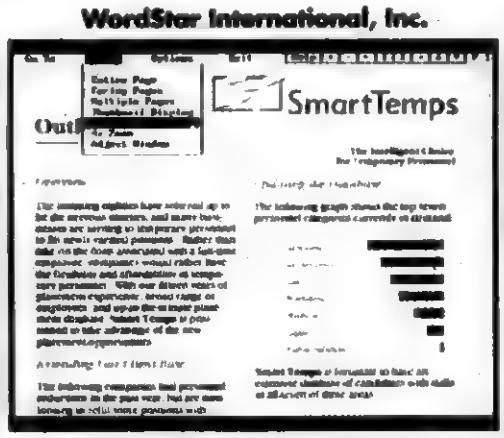
Layout: WYSIWYG page preview, 24 columns supported, automatic frame captions, automatic page numbering, landscape and portrait pages, kerning. Does not have: WYSIWYG page layout, movable rulers, frame layering.

Graphics: Moves, sizes, crops and flows text around graphics; creates frames for text and graphics; lines, boxes and borders; scaling and cropping. Does not have a charting module.

File conversions: WordPerfect, ASCII, all leading word processors.

Price: $495 single user.

WordStar International, Inc.



WordStar Release 7.0
(415) 382-8000

RAM (full installation): 7M bytes.

Editing: Find-and-replace, macro recorder, style sheets, thesaurus, foreign language dictionary, Undo functions, various paragraph styles, GOTO.

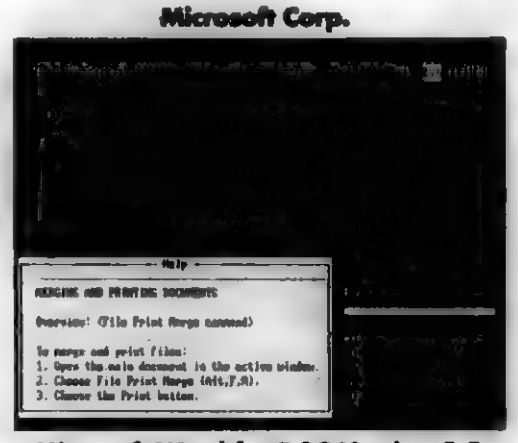
Layout: WYSIWYG page preview, eight columns supported. Does not have: WYSIWYG page layout, movable rulers, automatic frame captions, frame layering.

Graphics: Lines, boxes and borders; line and fill styles. Does not: move, size or crop graphics; flow text around graphics; provide frames for text and graphics; have charting module; do scaling and cropping.

File conversions: WordPerfect, Macintosh, ASCII.

Price: $495 single user.

Microsoft Corp.



Microsoft Word for DOS Version 5.5
(206) 882-8080

RAM (full installation): 3M bytes.

Editing: Thesaurus. Does not have: find-and-replace, grammar checker, foreign language dictionary, Undo.

Layout: WYSIWYG page layout and page preview, 22 columns supported. Does not have: movable rulers, automatic frame captions, automatic page numbering, frame layering, landscape and portrait pages.

Graphics: Moves, sizes, crops and flows text around graphics; lines, boxes and borders. Does not have: frames for text and graphics, charting module, line and fill styles, scaling and cropping.

File conversions: WordPerfect, Macintosh, ASCII.

Price: $450.

Other menu-based, graphical DOS contenders include: WYSIWYG Corp.'s The Universal Word (310) 215-9645; Quicksoft, Inc.'s PC-Write Advanced Level 4.0 (206) 282-0452; Xyquest, Inc.'s Signature for DOS (508) 671-0888; BrownBag Software's Mindreader (408) 559-4545; Dilworth Software's QS Version 3.0 (408) 624-6500; Trajectory Software, Inc.'s LEX Elite (201) 447-5200; Microsystems Engineering Corp.'s Wiziword 2.0 (708) 882-0111; Digital Equipment Corp.'s DECwrite (603) 884-3765.

UNIX

BBN Software Products
(617) 873-5000
BBN Slate
Price: $995 per user

Clarity Software
(415) 691-0320
Rapport
Price: $895 per user

Dilworth Software
(408) 624-6500
QS Version 3.0
Price: $795 starting price

Island Graphics
(415) 491-1000
IslandWrite, Draw and Paint
Price: $995

Digital Equipment Corp.
(800) 344-4825
DECwrite
Price: $1,200

Microsystems Engineering
(708) 882-0111
Wiziword 2.0
Price: $995

Trajectory Software, Inc.
(201) 447-5200
LEX Elite
Price: $495 starting price

WordPerfect Corp.
(800) 451-5151
WordPerfect 5.1 for X Window
Price: $495 per user

Unix word processing, which was traditionally kludgey and clumsy, has gotten sleeker, with offerings from **Island Graphics**, **WordPerfect** and others.

Island Graphics is the leading dedicated Unix vendor to bring personal computer-like advanced word processing to the Unix environment. Its package features WYSIWYG editing and WYSIWYG page layout, page preview, style sheets and extensive graphics capabilities, such as the ability to move, size and crop graphics, as well as various line and fill styles from which to choose.

A problem with Island Graphics' three-way integration is resource consumption — a full installation requires 40M bytes. "All three products are great, but they need a lot of memory," reports Glen Key, technical consultant at US West Communications, Inc. in Denver.

Key runs the Island Graphics products on a Sun Microsystems, Inc. SPARCstation with 28M bytes of memory, and it's a tight squeeze, he claims.

The product also does not support automatic macro recorders, cannot drag and drop text, has no charting modules and does not support E-mail standards.

BBN Software's and Clarity's packages are multimedia in style, combining text, graphics, image and sound. Other Unix packages were originally DOS-based and then ported to Unix.

WINDOWS

Windows is where much of the attention is focused. Only in this environment will you see features such as DDE and OLE support, one-click-function icons and drag and drop.

Microsoft's Word for Windows. Of the "Big Three," Word is widely regarded as taking the best advantage of Windows. It offers the largest number of features and also includes Microsoft's Draw. The program is extremely intuitive to use and will even translate WordPerfect commands into Word commands. $495, (206) 882-8080.

WordPerfect's WordPerfect for Windows. This is WordPerfect's first effort at Windows. It lacks built-in drawing and Object Linking and Embedding (OLE), but it handles imported graphics and supports more local-area network protocols than Word for Windows and Ami Pro. It also provides a very powerful file manager. WordPerfect for Windows preserves WordPerfect's "reveal codes" capability. $495, (800) 451-5151.

Lotus Development's Ami Pro 3.0. This most recent release provides built-in graphics and improved performance and now handles the largest number of file formats. The program also has some built-in intelligence, such as where to find the address of the recipient of a letter. However, it accomplishes this by doing annoying things, such as imposing its own file-naming system on the user. Lotus is catching up fast to Word's Windows support. $495, (404) 391-0011.

WordStar International's WordStar. WordStar is making a run at the Big Three by providing familiar features and commands for its user base. However, devotees will have to deal with much that is new. It supports OLE and Dynamic Data Exchange, what-you-see-is-what-you-get, built-in drawing and a fax modem format that preserves the document's layout and style. $119, (415) 382-8000.

Computer Associates' CA-Textor. CA is jumping into the ring with a midprice offering that doesn't attempt to provide all the features of the leading word processors. It boasts the standard features as well as a multilanguage (English/French) capability and also provides a library system that lets the user collect related documents in a single file folder. $225, (561) 342-6000.

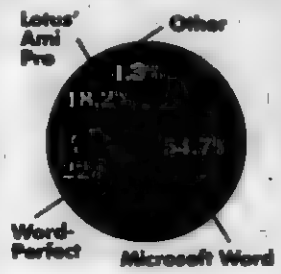
Digital Equipment's DECwrite. DEC combines advanced Windows word processing features with DECwrite's traditional strengths, such as integration with its Compound Document Architecture, which allows users to combine text, graphics, images and other data types in a single document. It also comes as part of its Team Links, which provides a groupware-like document management system that allows multiple authors and editors to work on a document. $695, (800) 344-4825.

Also marketing: Spinnaker Software, Inc.'s PFS:Window Works, (617) 494-1200; DeScribe, Inc.'s DeScribe Word Processor, (916) 646-1111; Symantec Corp.'s JustWrite Version 2.0, (408) 253-9600.

For a full matrix chart of Windows word processors, see January 13, 1992, issue of Product Spotlight.

The Big Three

Windows word processing is dominated by three contenders
(Based on 1991 market share figures)



Source: Dataquest, Inc.

MACINTOSH

Microsoft Word dominates the Macintosh market, which includes four other major contenders

Claris Corp.
MacWrite II
(408) 727-8227
Price: $129

DeltaPoint, Inc.
Taste 1.02C
(408) 648-4000
Price: $149

Microsoft Corp.
Microsoft Word
(206) 882-8080
Price: $495

T/Maker Corp.
WriteNow 3.0
(415) 962-0195
Price: $249

WordPerfect Corp.
WordPerfect for the Mac
(801) 451-5151
Price: $495

There has never been a question of graphical user interface in the Macintosh world, of course. This makes all of these products heavily mouse-dependent. And here more than on any other platform, Windows products can significantly slow performance. Ted Page, senior copywriter at Polaroid Corp. in Cambridge, Mass., uses **Microsoft**'s Word for the Macintosh. "It had abominable performance on my old Mac SE," he says. On his new Macintosh IISI, Word runs a lot better.

Claris' MacWrite II is a mid-range product and lacks some of the most advanced functions, says Corporate Software, Inc., a major software distributor.

T/Maker Co.'s WriteNow is said to be something of a "sleeper," offering excellent performance and an interesting mix of high-end features, according to Jeffrey Tarter, publisher of the "Softletter" newsletter in Watertown, Mass.

Still, Microsoft Word is the one to beat. "You get WYSIWYG, and it is very easy to use. It has become the [unofficial] standard here," Page says.

OS/2

DeScribe is the only company so far to have built a word processor for OS/2 from the ground up

DeScribe, Inc.
DeScribe Word Processor
(916) 646-1111

Price: $495 server, $350 single user, $139 competitive upgrade.

Editing: WYSIWYG editing, macro recorders, thesaurus, spell checker and optional foreign language dictionary. Does not have drag-and-drop capability or smart icons, footnotes, tables and math functions.

Layout: Page preview, style sheets, automatic page numbering and movable rulers.

Graphics: Imports/Exports many text and graphics files, including ASCII, .DIF, .WKS. Does not include a charting module, clip art library.

OS/2 is attracting word processing vendors but at a much slower pace than Windows and DOS. Without fanfare, **Microsoft** released Word for OS/2 last month to bring the product in line with OS/2 2.0. And **WordPerfect** has a version that the company says is comparable to its 5.1 release. Few others have released OS/2 versions of their originally DOS or Windows products.

One reason why word processing for OS/2 has not been a big market is because it allows users to run DOS and Windows-based programs. "There really isn't much need for OS/2 word processors," says Jeffrey Tarter at the "Softletter" newsletter in Watertown, Mass. Dave Clancy, director of research and development at Logica North America in Waltham, Mass., adds, "We try not to do word processing on OS/2. We use it at the server level."

PET PEEVES

Each individual Windows file is larger than its DOS counterpart. A simple document containing only text, returns and tabs took up 5,046 bytes in WordPerfect 5.1 for DOS but required 11,131 bytes in Ami Pro 3.0.

The dialog box on Ami Pro 3.0's spell checker jumps around the screen to avoid covering the text in question. That means you have to keep moving the mouse to keep up with it.

With WordPerfect for Windows, it's nice that you can choose either the WordPerfect or the Windows keyboard. But if you choose the former, you sacrifice consistency across Windows programs. If you choose the latter, WordPerfect users will have to learn new function keys.

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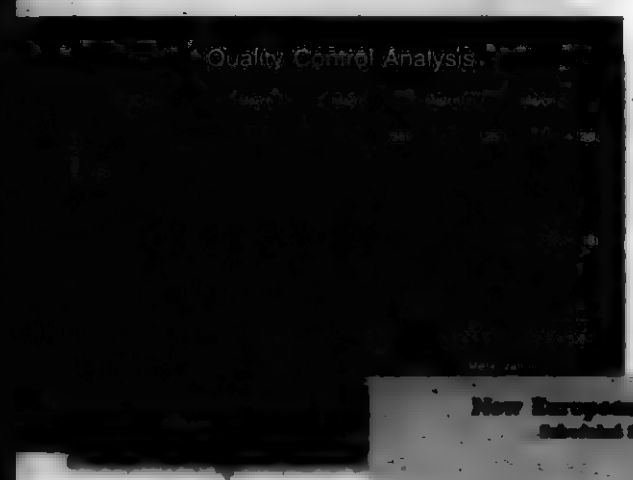

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Get thee to a PC!

Offloading application development from a mainframe to a PC promises cost and productivity benefits. But is it right for you?

BY MARK A. BUTTERLINE

Moving application development activities from the mainframe to the personal computer workstation will be the single most important technology change that most commercial information systems shops will have to address in the 1990s. They cannot overlook the power of the PC-based development tools (e.g., compilers, debuggers, database management system tools, teleprocessing monitor tools, CASE tools), which will greatly exceed the power of their traditional mainframe counterparts.

Nor can they overlook the economics of PC-based mainframe application development. Currently, productivity increases of 30% to 40% are achievable with an outlay of $10,000 to $20,000 per developer.

These productivity improvements and tantalizing costs, together with quality improvements, are the reasons most IS shops make the move to offloaded development environments.

These are desirable goals indeed. But before your IS shop plunges into offloading mainframe development, it must determine whether offloading is right for it. That means analyzing developer needs, assessing the impact of offloaded development on current IS roles and exploring which part of the development cycle fits best into the offloaded development environment.

Analyzing developer needs begins with examining the mainframe tools you have and how developers use them. This exercise is important because offloading mainframe development is mostly a question of mainframe emulation on smaller computers. You'll need to collect information on a wide range of tools: compilers, teleprocessing monitors, DBMSs, code generators, debuggers, utilities, statistical packages, etc.

You'll also need to find out how these mainframe tools are being used. In some situations in which a team is using a mainframe compiler that is fully supported on a PC workstation (such as IBM OS/VS Cobol), it may be using a DBMS that is not (such as IBM Model 204). If the number of modules that contain calls to the unsupported DBMS is small, use of an offloaded development environment may still be possible.

> Skimping on the right components can make an offloaded development environment affordable. See page 84.

Next, you must find out more about your developers, typically through a survey, to determine whether to move to an offloaded development environment and who should become users in that environment.

The survey should extract the following seven points of information from developers:

1) Tool-use levels. By asking developers to rate their current level of use of specific operating systems, languages, DBMSs, teleprocessing monitors, mainframe utilities/tools, Unix utilities/tools and DOS utilities/tools, you can discern which areas will need the most attention when it comes time to select PC workstation counterparts. In addition to helping select workstation tools, these ratings, when performed both before and after deployment, are a gauge of the environment's effectiveness.

2) Function of potential users. The reason to identify the potential users' job titles (e.g., programmer, analyst, system tester) is that some functions are better suited to offloading than others.

The functions of programmer and analyst have the most to gain from offloaded development. Programmers are usually the main beneficiaries. Large chunks of programmer functions — coding, editing, syntax checking/compiling, unit testing and some string and system testing — can be moved to an offloaded development environment. Use of lower computer-aided software engineering (CASE) tools (e.g., code generators) in conjunction with upper CASE tools (those used from data or function analysis) can be very effective here.

For their part, analysts are likely to benefit from an offloaded environment because almost all upper CASE tools are PC-based and thus are natural candidates for inclusion in an offloaded development environment.

System testers can also gain some benefits from the offloaded development environment. Most of these benefits have to do with being able to use a more secure and robust set of tools, mainly PC versions of mainframe DBMS and teleprocessing monitors, than would normally be available on the mainframe. These robust tools enable users to do more rigorous or damaging tests than would be practical in a multiuser situation.

Continued on page 84

Butterline is a senior specialist at AT&T. This article is based on his book, ***From Mainframes to Workstations: Offloading Application Development***, published by QED Publishing Group in Wellesley, Mass. (Copyright 1992, QED Publishing Group.)

Philip Anderson

Continued from page 83

These environments also give the individual the tools necessary to set up test databases without the assistance of other personnel, which can improve the productivity of the experienced tester.

3) Type of systems being developed. It is important to know whether users will be working on permanent systems that will be enhanced or maintained or whether they will be working on "throwaway" or ad-hoc systems. The information will have a direct bearing on the cost-effectiveness of the offloaded development environment.

Groups developing permanent systems will usually find more benefit than those developing throwaway ones because throwaway or ad-hoc report development typically involves more code reuse, less testing and fewer compilations.

4) Development life cycle position. Whether a potential developer's project is in the development, enhancement or maintenance part of the development life cycle will affect his selection as an offloaded development environment user. More on this later.

5) Expected work levels. Finding out what percentage of a developer's time over the next year will be spent on new development, continuing development or repair maintenance will establish whether he is a candidate for an offloaded environment. Developers that anticipate low work levels, such as only repair maintenance work, probably aren't appropriate. Users on projects that need large-scale enhancement on a regular basis are among the best candidates.

6) Critical system components. If converting the developer(s) of an existing system, it is important to identify which system components or modules must be fully functional in the offloaded development environment. You'd want to know, for example, that all critical modules could reproduce the same results with a PC workstation's debugger tool as on the mainframe. This data will be needed by the people who will select the workstation tools for the offloaded environment.

7) Interlanguage call (and other crazy interfaces) identification. The idea is to catch all insurmountable obstacles to the effective use of an offloaded development environment before you commit resources.

Development cycle issues

In terms of analyzing the survey, you'll want to determine whether your shop is one that is developing new applications or making significant enhancements to existing applications. Such shops have the most evident justification for offloading development because straight new

Continued on page 86

Which costs to skimp on and how to do it

Focus cuts on PCs, never on servers

With the prices for CPU microprocessors and memory chips for the most part on the decline, it follows that PC workstation and server prices will also decrease.

Minimizing costs in the hardware area has therefore become a question of knowing where you can skimp on components and where you can't.

Skimping on the right components can make an offloaded development environment affordable to organizations that are short on money. Skimping on the wrong components can be detrimental to the success of the project.

Where to skimp

▶**PC workstations.** In most situations, it is not necessary to deploy the latest in PC workstation technology. For example, if you plan to use only character-based DOS tools in the forseeable future, then getting by with a 386SX with a color monitor and a 100M-byte drive may be acceptable.

However, if you plan to pursue the latest and greatest tools in the marketplace, a more powerful configuration may be required.

The important thing to note is that when a new CPU microprocessor is released, it usually takes a couple years for the software that can fully exploit the new microprocessor to be introduced.

By then, of course, a new generation of microprocessors may be available, and your PC will have been subjected to a lot of wear and tear and may not have much life left in it.

As a rule, get a PC workstation that you think can handle tools you will be acquiring during the next two to three years.

▶**Local-area networks.** When deciding which LAN to get, there are not only technical considerations but also cost considerations. Many LAN software packages run on multiple LAN hardware platforms, and the cost for these LAN hardware systems varies. Shop around.

A second cost consideration is the medium used to connect the LAN together. For example, IBM's Token Ring uses shielded twisted-pair. If your building is already wired with unshielded twisted-pair, then installing a product using shielded twisted-pair would be much more costly because of the expense of rewiring.

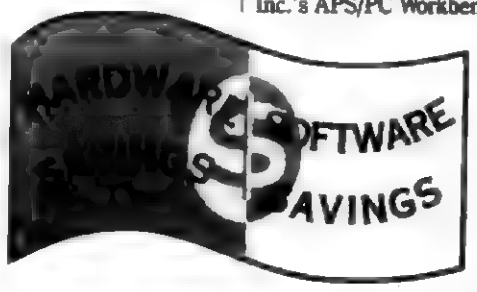
Depending on the age of your building, environmental costs associated with cutting holes in asbestos-filled walls may also come into play.

▶**Computer links.** When considering how to connect servers to other servers or servers to mainframes, consider the amount of traffic that is likely to go over the line. If speed is not essential and traffic is expected to be low, consider dial-up communications links rather than direct links.

▶**Two- vs. three-tier architecture.** If your operation is small (five to eight users) and is not expected to grow, then a two-tier setup (PC workstations in place of 3270 terminals) may be viable.

Of course, skimping on certain components can result in an underpowered, problem-ridden environment.

Where NOT to skimp



▶**Server.** Never, never, never skimp on server power (i.e., CPU microprocessor, dynamic random-access memory chips and hard disk).

Servers are always located at a critical choke point in the offloaded development environment. Having an underpowered server will slow down all users and make the transition to offloaded development more difficult.

In addition, initial savings will be quickly consumed by expensive server upgrades.

If you need an item to skimp on with the server, try the monitor. Fancy IBM Video Graphics Array graphics are almost never needed on a server. Character-based terminals will usually do nicely.

▶**2½- vs. three-tier architecture.** There is no technical reason to choose a 2½-tier environment (PC workstation connected directly to the mainframe and a LAN) over a three-tier environment. There is no financial reason, either.

Both environments require LANs and servers, but the three-tier consolidates comunications links at a single server, while in the 2½-tier, each PC has its own link. This makes the three-tier environment cheaper.

Look into discounts, VARs, stockpiling

A major cost associated with setting up an offloaded development environment is software for both the server (local-area network software) and the PC workstation. When determining where to minimize costs in the software area, it's best to concentrate on the PC workstation side because server software prices are generally not high when you consider the number of users. For instance, an unlimited server license for certain LAN packages can be less than $3,500.

PC workstation software, on the other hand, can be very expensive. For example, Micro Focus, Inc.'s Cobol Workbench lists for $3,000, and Intersolv, Inc.'s APS/PC Workbench lists for more than $9,000 for some configurations.

Minimizing costs for workstation software is a matter of wisely choosing where you get your software, negotiating your terms of purchase according to what's best for you and deciding whether to get a maintenance contract.

Many different types of vendors sell PC software. Determining where to procure your software is the consideration that will directly affect your costs:

▶**Discount houses.** Discount houses charge very low prices for software packages that sell in fairly large quantities. However, discount houses normally don't carry expensive packages or those requiring a lot of tuning or training.

▶**Value-added resellers (VAR).** VARs will usually carry a limited selection of complex software packages that they specialize in. In addition to having software packages usually available for immediate delivery, VARs can offer training and assistance with installation.

Prices for software from VARs can sometimes be higher than from other sources.

▶**Software houses.** Software houses that produce complex/expensive packages will usually reserve availability for just themselves or certain VARs. If you are looking for many copies of a tool, the software house should be able to provide the best discount possible.

After identifying the appropriate vendors for the software tools you plan to purchase, questions regarding the terms of purchase come into play. Some of the terms that directly affect software costs include the following:

▶**Discounts.** This is a tricky area in that there are not a lot of set rules. A discount can range anywhere from 0% to 80% of list price. It depends on how hungry the vendor is, how much competition there is and what the published discount schedule is.

It can also be influenced by what commitments the customer is willing to make and the list price of the products. Products with prices in the $2,000-plus per copy range can be discounted significantly because there is room to maneuver. Products in the several hundred dollars range usually can't be discounted as much.

Contacts among friends and colleagues who have purchased tools can help you get an idea of how much of a discount to ask for.

▶**Stockpiling.** One way to get discounts is to buy a large number of copies of a package up front and store them until they are needed. However, this isn't always a savvy practice because new versions of software are always coming out, making previous versions obsolete. A good rule to follow is to buy only what you can make good use of in the short term (two to three months).

▶**Cumulative contracts.** If a vendor is reluctant to give a significant discount without the purchase of a large number of packages, then try to get it to agree to a cumulative contract. That is a contract that gives bigger and bigger discounts for each additional copy of software purchased.

Another consideration that will directly affect software costs is whether to buy maintenance contracts — which include technical support and new releases — for major software packages or to buy the new releases as needed.

Usually users are better off when they buy whatever upgrades they need. You should purchase new releases only if there is some new feature in it that you need. As far as technical support goes, it is rare to find a PC tool vendor that will refuse technical support because the user hasn't purchased a maintenance contract.

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Continued from page 84

development usually involves long periods of coding, testing and repeated compilations. Moving to PCs will provide big gains in developer productivity, program quality and mainframe use charges.

Projects in the maintenance phase are trickier to figure out. Whether a project in the maintenance part of the development cycle should consider moving to an offloaded development environment depends mostly on how much it resembles a new development project.

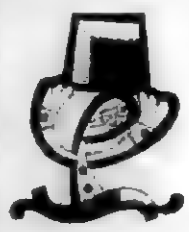
Projects that involve only small-scale changes or enhancements or just repair maintenance will usually not be able to cost-justify the conversion to an offloaded environment. The reason? Changing just a few lines of code in a module cannot support the time or trouble of downloading it to a PC workstation, making and testing the change and then uploading it.

Maintenance projects that handle a large quantity of changes and enhancements on a regular basis should see nearly the same benefits of productivity, quality and cost savings that a new development project sees.

Mainframe practices that pay

Many standard development practices that developers should be following in their mainframe environments really pay off when users are considering a move to an offloaded development environment. These are the most important practices:

▸**Isolation of I/O.** Having calls to DBMSs and teleprocessing monitors isolated from the system logic not only gives development groups extra flexibility in the selection of system software but also simplifies the conversion of programs from mainframe to offloaded development environments.



Keeping calls to DBMSs and teleprocessing monitors relegated to a small number of I/O modules decreases the number of potential trouble spots.

▸**Use of mainstream tools.** Use of obscure languages, DBMSs and teleprocessing monitors not only makes it difficult for management to find and retain knowledgeable staff but also ignores the reality that software vendors usually don't pay attention to these areas. It is a lot easier to find PC-based Cobol tools than PC-based PL/1 tools.

▸**Discouraging the use of interlanguage calls.** Interlanguage calls (e.g., a Cobol program calling a subroutine written in PL/1) are never simple to implement, even in the world of IBM mainframes. This is why they are strongly discouraged in most IS shops.

Offloaded development environments are no exception to this. Trying to get a program written in one language and supported by one vendor's package to call a program written in another language and supported by a different vendor's package is usually extremely difficult if not impossible in the PC workstation environment.

▸**Use of common modules.** In addition to improving developer productivity, extensive use of common modules will greatly assist the transition from mainframe to offloaded development.

This occurs for two reasons. First, it is easier to identify the key modules of the existing mainframe system. This is important when checking for compatibility problems between mainframe- and workstation-based tools. Second, use of common modules means there will be fewer modules to keep track of and move around.

The payoff

Productivity benefits for new development and certain maintenance projects offloaded to PCs are attributable to subsecond response time, powerful tools and a high degree of interactivity on the smaller platform.

Subsecond response time can have a large impact on productivity because the user's concentration is not interrupted as often as that of someone hitting the carriage return on a terminal and waiting three, five or 10 seconds for it to respond. Subsecond response doesn't give the user time to start thinking about what he's having for lunch while he's waiting for his entry to be processed.

IBM and other companies have studied this aspect of subsecond response time. In these studies, programmers used dumb terminals that were channel-attached to MVS mainframes. This meant that the users had subsecond response for trivial commands, such as ISPF edit commands, but not for compiles. The developers reported that the time they spent designing, coding and unit testing was reduced 37% to 50%. This had a significant impact on project delivery times as well as on employee morale.

Productivity improvements in offloading development to PCs is also attributable to the use of more powerful tools. For example, in Cobol debugging and unit testing, full-screen display is generally regarded as superior to single-line display, with a 50% productivity improvement possible.

A final productivity consideration is the degree of interactivity. In most mainframe environments, when a command is entered, an entire screen of data is sent between the computer and the terminal. This is not the case with PCs, which leads to a great increase in human/computer interactivity. In addition, peripherals such as mice can also speed up activities.

As with productivity, the quality of applications developed in the subsecond response time environment of single-user PC workstations is significant. This is because of the effects of workstation vs. mainframe testing tools.

Most applications developed for large businesses involve the use of DBMSs and sometimes teleprocessing monitors. Doing significant unit, string and system testing usually involves working against a single-test database. (Single-test databases are used because it is usually not a trivial matter to set up a test database, which usually involves going to a database administrator.)

When testing, the programmers or testers find themselves wanting to test a module or system thoroughly but not at the risk of crashing or damaging the test database or teleprocessing monitor region. This could interfere with someone else's work and/or take a long time to fix or restore from a backup. Thus, testing is difficult, time-consuming and not as complete as it could be.

In a workstation environment, developers can create their own test databases or teleprocessing monitor test regions without assistance from others. They can also test more thoroughly because damaged databases are easily replaced. PC-based testing can also involve the execution of code that is difficult or impossible to test in the mainframe environment. Overall system quality goes up.

Mercenary considerations

In terms of costs and cost savings, an offloaded development environment can range from $2,500 to $20,000 or more per user. Typical costs will be in the range of $12,000 to $18,000.

These costs are offset by two major savings. The first and most important is productivity. Successful offloaded development environments should encounter productivity improvements of at least 30% (i.e., if a project had $100,000 in labor costs before deployment on an offloaded development environment, it should have labor charges of only $70,000 after converting over). In large companies this would mean a per-person productivity increase worth $30,000 per year (i.e., 2,000 billable hours per year x $50 per hour x 30% savings). This, of course, assumes that there is extra work waiting to be performed by the developer.

The other major cost saving is reduced mainframe charges. In many large companies, IBM MVS TSO charges exceed $1,000 per month per developer for those actively doing new development work.

These charges are usually attributable to CPU- or I/O-intensive activities such as compiling and testing. Coding and editing functions are usually inexpensive. In successful offloaded development environments, a large number of compilations and tests are carried out on PC workstations. In new development environments, where programs are repeatedly compiled and then dynamically tested many times, this can account for 80% to 90% of developer TSO charges. Obviously, for environments in which mainframe-based production runs are also performed by the developer (e.g., ad-hoc reporting) the percentage would be less.

Thus, the high-level numbers for an offloaded development environment are as follows:

▸Costs:

$15,000 per developer (including hardware, software, support).

$3,000 per developer per year (ongoing support).

▸Benefits:

$30,000 per developer per year (productivity improvement).

$10,000 per developer per year (reduced mainframe charges).

The benefits of offloading application development to PCs can be very exciting, but be careful to keep your expectations realistic. It is important to realize that even if offloading is right for your company, it will still take at least six months to a year to complete the move. Dedication to achieving a highly productive environment in the long term is necessary. If you cannot sustain such an effort, you should likely avoid conversion altogether. ●

Effect on 'Joe average' shop

The impact of offloaded development on the culture and organizational structure of an IS shop can be very significant. IS managers should be aware of the possible implications and plan accordingly. Some of the major impacts can include the following:

1 ***Threat to hierarchical management structure.*** With the availability of networked PC workstations, E-mail and groupware, the gathering of teams of developers to accomplish specific tasks is usually easier than in the mainframe-only environment. When technical boundaries are less of a problem to the assembling of development teams, organizational boundaries become more obvious.

2 ***Management has more on its plate.*** Most managers of mainframe-based IS shops are not used to dealing with large-scale hardware issues or network management. In the old environment, these things were usually handled by the same people who operated and maintained the mainframes. Therefore, management's reaction to the possible introduction of offloaded development may underestimate the effort and complexity involved.

3 ***Conflicts between liberal and conservative proponents of new technology.*** In an offloaded development environment, the development groups have to decide which new technology to embrace. IS management must play devil's advocate.

If a majority of a development team wants to pursue the introduction of new hardware and software aggressively, management should ask for a closer examination of the viability of the proposed new tools. If the majority is overly conservative, then management needs to provide extra encouragement to pursue new technology.

4 ***Restructuring of support and administration functions.*** With the deployment of offloaded development technology, more administrative and support functions will need to be moved to the application development groups themselves.

5 ***Changes in chargeback for internal support.*** In many large companies, there is an IS department that operates and maintains mainframes and networks and provides a central organization for technical support and standards. In most cases, the funding for all this is included in the mainframe use rates.

However, with more computing being done on PC workstations, servers and LANs, the traditional funding method starts to dry up. IS management needs to address this question.

PC users agree: Support takes center stage

Downsizing trend in IS departments may be preventing companies from maximizing their systems' potential

BY MICHAEL FITZGERALD
CW STAFF

From supers to micros, computers have one essential thing in common: They get used.

Users, particularly personal computer users in a distributed computing environment, also have one thing in common: They need help, whether in learning how to use their systems, venturing deeper into an application's complexity or dealing with emergencies.

Yet these kinds of issues may not make the list of priorities at newly lean-and-mean information systems organizations. According to a recent market research study, 39% of all companies with PC users have no structured policy for handling support — and this includes 23% of firms with more than 10,000 employees (see story below left).

That is a deficit few firms can afford.

"You need a wide range of skills to do technical support effectively — you need a NetWare engineer, someone who knows hardware technology, someone who knows 1-2-3, etc., and you can't afford it on a local [office] basis," says Sheldon Laube, national director of information and technology at New York-based Price Waterhouse.

Beating the bushes

At a time when industry figures from entrepreneur Michael Dell to consultant Michael Hammer say computers are not being used as well as they could be, users such as Laube say their companies can't become more efficient and sophisticated computer users until and unless they get better support. IS organizations, meanwhile, are beating the bushes for ways to provide it: vendors, third-party companies — including resellers — help desks, internal consultants and various combinations thereof are getting called on to handle support.

"Auburn is a small town, so there aren't a number of service providers here," says Bliss Bailey, a network services specialist at the Division of University Computing Services (DUCS) at Auburn University in Auburn, Ala.

The university has compensated for this through its own size and also by selective decentralization: Several departments, such as the School of Engineering, have their own autonomous IS departments.

The university's DUCS is also taking some unconventional routes to improve support: building its own PCs to ensure the quality of its hardware, for example, and grading support levels.

We "don't support students so much, but we do have administrative staff, professors and [other] faculty members, and they have really different sets of needs," Bailey says.

Basically, DUCS effectively "ends up doing a lot of compromising," according to Bailey.

To make support "as generic as possible," Auburn University has made it clear wherever possible that it will support only certain applications. Bailey says this approach works fairly well for the administrative staff, but faculty members frequently go beyond what DUCS can support.

"They may need to use applications so specialized that we are at risk of not understanding what they're working with — like astrophysics," Bailey says. "They want to use packages we have no experience with. It's very difficult to support them in that context."

Like many state institutions, the university faces budget crunches. It may stop making its own PCs to try to take advantage of cost savings offered through state buying contracts, Bailey says, and it has generally sacrificed on hardware spending in favor of maintaining staff and training levels. It also limits support to the hours of 8 a.m. to 5 p.m.

Outsourcing support

Philadelphia-based Comcast Corp. has found support relief through outsourcing. The company, which has its main data center in Miami, has seen significant savings in support costs since it outsourced part of its support group, according to Douglas Murphy, Comcast's IS director.

"We had three full-time people at our Philadelphia headquarters responsible for doing maintenance and problem triage, along with providing some sort of purchasing guidelines," Murphy says.

"It became very complex to support locations outside of corporate."

Comcast, a cable and networking firm, has approximately 70 cable offices nationwide. Each houses disparate hardware and software. It wanted to boost its technological expertise, coordinate purchasing to cut down on no-name clones and build a national support organization. As the company looked at ways to effectively support itself within these limits, "we realized that . . . we would have to build a staff significantly larger than we have now just to handle

Continued on page 89

Mission impossible

All too many large commercial companies do not believe they can effectively support their PCs, according to a recent study by BIS Strategic Decisions in Norwell, Mass., and Weingarten Publications, Inc.

The two market research firms polled approximately 500 commercial firms across a wide spectrum of sizes. Some 51% of the respondents reported that they cannot meet all their end users' support needs.

The survey also showed that 52% of all user organizations have switched vendors over support issues.

On average, respondents estimated it costs $415 annually to support a PC and another $319 to support each end user. For small companies — those with fewer than 99 employees — these costs rise to $1,062 for each PC and $889 for each user, while companies with more than 10,000 employees spend $295 for each PC and $252 for each user.

The report yielded some unexpected quirks. For instance, IBM was rated as providing the worst PC hardware support, but it also dominated the ratings for best support provider. Similarly, Compaq Computer Corp. finished second in both categories.

Microsoft Corp. and Lotus Development Corp. also hit both extremes. They copped the top two spots, respectively, as worst providers of software support — and also placed second and third as best.

MICHAEL FITZGERALD

Outsourcing auditions

When Comcast decided to look into outsourcing its support operation, it called in IBM, Computers for the Professional Ltd. — one of its resellers with experience in building help desks — and Forte Systems, Inc., a small Westchester, Pa.-based vendor that had helped Comcast in a disaster-recovery situation, says Douglas Murphy, IS director.

Although it had originally considered Forte only from a disaster-driven sense of allegiance, Comcast decided to go with the small company, which came in with a bid that was both worthy and priceworthy.

Under the agreement the two companies forged, a Forte support staffer works on site at Comcast's Philadelphia headquarters. This person coordinates parts inventory and handles support for all offices within a 100-mile radius. Forte also runs a help desk for Comcast's users; Comcast keeps a two-person help desk in Miami to handle anything beyond the Philadelphia area.

The program is only in its second quarter. However, Murphy says, it has effectively handled its first challenge, the Michelangelo virus — two cases were diagnosed and stopped before any data was lost — and is ahead of its budget projection. Comcast expects to save $140,000 from its $370,000 annual support outlay. As Murphy sees it, "We've multiplied our service level by 600% and reduced expenses by 33%."

MICHAEL FITZGERALD

Self-service a growing trend for customers

Self-help terminals benefit consumers, firms

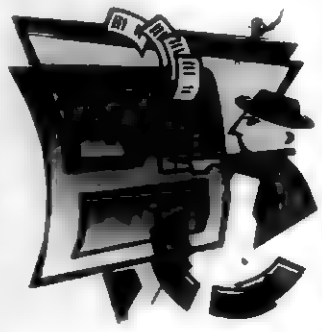
BY MITCH BETTS
CW STAFF

Taking some labor-saving advice from Tom Sawyer, U.S. and European banks, hotels and retailers are experimenting with self-service computer terminals in hopes of getting customers to handle routine transactions themselves.

"For consumers, it's part of the do-it-yourself craze. For the companies, it's like Tom Sawyer getting someone else to paint his fence," said Jerry Kanter, director of the Center for Information Management Studies at Babson College in Wellesley, Mass. Customers are willing to use the self-service terminals if they perceive some benefit, such as faster service, he said.

The classic example of a self-service terminal is the automated teller machine (ATM). When the first ATMs were introduced in 1971, critics said consumers would find them too impersonal, noted Terrell Ward Bynum, director of the Research Center on Computing and Society at Southern Connecticut State University in New Haven.

Instead, people found ATMs so convenient they switched accounts to latch onto a bank with an ATM network [CW, Jan. 20]. For example, researchers said Citibank's ATM network helped it increase market share in New York City from 4% in 1977 to 13% in 1988.



Now, banks are experimenting with self-service terminals that can cash checks, reorder checks, print statements and even sell insurance policies, according to Mentis Corp., a market research firm in Salisbury, Md. The terminals can extend the bank's hours and locations without an increase in staff and branch overhead costs.

Rather than rushing into big investments in self-service technology, however, most banks are still experimenting with small pilot programs, said Mentis associate Mary Donadoni. In order to cost-justify larger investments, banks want to know whether the terminals can produce a significant revenue stream, such as by cross-selling other banking and insurance products, she said.

Similarly, several hotel chains are now pilot testing automated check-in terminals to cut down on lines at the front desk, said Dan Daniele, a hospitality industry consultant at Ernst & Young in Chicago. The systems are great for frequent business travelers interested in speed and efficiency, but Daniele said the machines will never gain widespread use or totally displace the front desk staff.

Some big hotel chains reportedly have vowed never to use the technology on grounds that it eliminates the "warm, personal greeting."

EXECUTIVE TRACK

Richard H. Gilman, former deputy director of systems and technology at **The New York Times**, has been promoted to the position of vice president. He succeeds Elise J. Ross, who was recently named corporate vice president in charge of information systems and technology at the newspaper publishing firm. Gilman, 41, will be responsible for operating, maintaining and developing all of the newspaper's business and news computer systems as well as for developing the paper's information technology strategy.

Gilman came to the newspaper in 1983.

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Palo Alto, Calif.-based **Collagen Corp.** recently appointed its IS group manager, **David Foster**, vice president of finance and chief financial officer. An eight-year veteran of the biomedical devices manufacturer, Foster, 34, will report to Collagen President and Chief Executive Officer Howard Palefsky.

.....

Maurice Collin has been named general director of **General Motors Corp.**'s recently created Market Data Center. Collin, 57, has been with GM for 32 years. At his new post, he will now direct the collection, preparation and reporting of worldwide corporate marketing data as well as creation and maintenance of worldwide automotive market information systems.

.....

Former Fleet Bank NA data processing and consumer lending executive **Bryan Bowerman** recently became executive vice president and lending and operations division head at **Society for Savings Bancorp, Inc.** Bowerman, a 25-year banking industry veteran, will manage IS, bank operations and lending services for the Hartford, Conn.-based bank.

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Support takes center stage

CONTINUED FROM PAGE 87

support across the country," Murphy says.

Instead, Comcast opted to rely on the nationwide support force someone else has already built: in this particular case, Westchester, Pa.-based Forte Systems, Inc. (see story page 87).

At Price Waterhouse, Laube has made better support a cornerstone of his company's new technology strategy [CW, Jan. 13].

Supplying support

Price Waterhouse has roughly 110 offices to support and this year began putting in place a regional support structure of 20 offices, with staffs ranging in size from five to 25.

"We see two components to support," Laube says. "One is keeping things running. The other is helping people use the technology more effectively. If [both] are handled by the same people, there are always too many fires to put out to help people figure out new ways to use the computers, and that's where the real energy should be spent."

According to Laube, Price Waterhouse does not expect to save money with its support structure, despite the consolidation.

"It'll probably cost us more, but we think it'll give us much better utilization of our technology investment," he says. "We have $100 million invested in this technology, and we want the most effective return we can get."

DPMA presents awards to Hennessey, Manning

BY ELLIS BOOKER
CW STAFF

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) has announced that Audrey Kathleen Hennessey is the winner of its Distinguished Information Sciences Award.

Hennessey is an associate professor of management information systems and also the director of the Institute for Studies in Organizational Automation at Texas Tech University in Lubbock.

Past award winners include Ross Perot, Mitchell Kapor and the late Rear Admiral Grace Murray Hopper.

The DPMA also announced the selection of David L. Manning as the recipient of its Information Processing Public Service Award.

Manning is in his second term as commissioner of the Department of Finance and Administration for the state of Tennessee. In addition, he is head of the state's Information System Council.

Manning and Hennessey will accept their awards at the 1992 Info/Tech Management Conference and Exposition, slated to be held in Nashville in October.

CALENDAR

AUG. 2-8

International Gupta Developers Conference. San Francisco, Aug. 2-5 — Contact: Gupta Travel Headquarters, San Francisco, Calif. (415) 445-8813.

GroupWare '92 Conference & Exposition. San Jose, Calif., Aug. 3-5 — Contact: The Conference Group, Scottsdale, Calif. (602) 661-1260.

Fed Micro '92. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Fed CD-ROM and Multimedia Conference & Exposition. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Professional Engineers Examination Conference. Indianapolis, Aug. 5-8 — Contact: Institute of Industrial Engineers, Norcross, Ga. (404) 449-0460.

AUG. 9-15

The 24th National Association of State Information Resource Executives Annual Conference. St. Paul, Minn., Aug. 10-12 — Contact: Mary Alice Sosby, National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1965.

Apple Enterprise Computing Conference. Boston, Aug. 12-14 — Contact: Emilio Robles, Apple Computer, Inc., Cupertino, Calif. (408) 862-5671.

AUG. 16-22

Sigcomm '92. Baltimore, Aug. 17-20 — Contact: SRI International, Menlo Park, Calif. (415) 326-6200.

Windows & OS/2 Conference. Boston, Aug. 19-21 — Contact: CM Ventures, Inc., Emeryville, Calif. (510) 601-5000.

AUG. 23-29

Interex Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew, Interex, Sunnyvale, Calif. (408) 738-4848.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Farr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Columbus, Ohio, Aug. 25 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cohesion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, BIS Strategic Decisions, Norwell, Mass. (617) 878-6650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Hanslip, DMA Computerfest, Dayton, Ohio (513) 263-3378.

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For almost 10 years, Devon Consulting has been staffing large data-processing shops in the Philadelphia area with temporary high-tech programming professionals. As President Joel Adams explains, the firm essentially provides programmers, technical writers, and DP specialists like systems programmers, software engineers, and database administrators to companies on a contractual basis as needed. Looking at the specialized computer skills required by their ever-expanding client base, he knows their recruitment message must reach the most qualified audience available. So, like fellow NACCB members who report favorable results, he, too, advertises in *Computerworld*.

"Our clients - banks, insurance firms, pharmaceutical and chemical companies, and software developers - typically require seasoned professionals with unique, hard-to-find skill sets. However, professionals with a minimum of three years' experience in specific technical areas are often few and far between. To fully satisfy our clients' objectives, I need to target an audience with very technical expertise. With its highly qualified readership, *Computerworld* is crucial in helping us make that match.

"As we began to expand outside the immediate area into New Jersey and Delaware, our need to reach a wider technical base grew as well. Unlike our advertisements in Sunday editions of local metropolitan newspapers, our recruitment advertising in *Computerworld* draws qualified candidates not only from New Jersey and New York but also from all around the world. It's by far our single most-effective vehicle for reaching our target audience. Clearly, our recruitment advertisements in *Computerworld* cost less than in other newspapers and produce higher quality responses. In the past two weeks, for example, nearly 20% of the resumes we received came from *Computerworld* alone.

"In our business, recruitment results like these are key. In 1990 we placed about 135 new starts in addition to the employees we already had in place. This year we expect that number to total 165 or possibly higher. To ensure that Devon Consulting continues placing the right professionals in the right jobs, we fully intend to run an ongoing recruitment advertising schedule in *Computerworld*. When it comes to advertising, we believe that consistency is just as important as the size, message, and vehicle.

"Overall, our *Computerworld* recruitment advertising fulfills a threefold purpose. First and foremost, it's invaluable in recruiting all the top technical talent we need. It also helps us gain share of mind among a highly qualified base of readers. Finally, we know our clients read *Computerworld* and view its advertisers as significant players in the industry. When they read our advertisement, then, they see Devon Consulting as an advertiser in the industry's trade journal. That kind of presence only enhances our company image."

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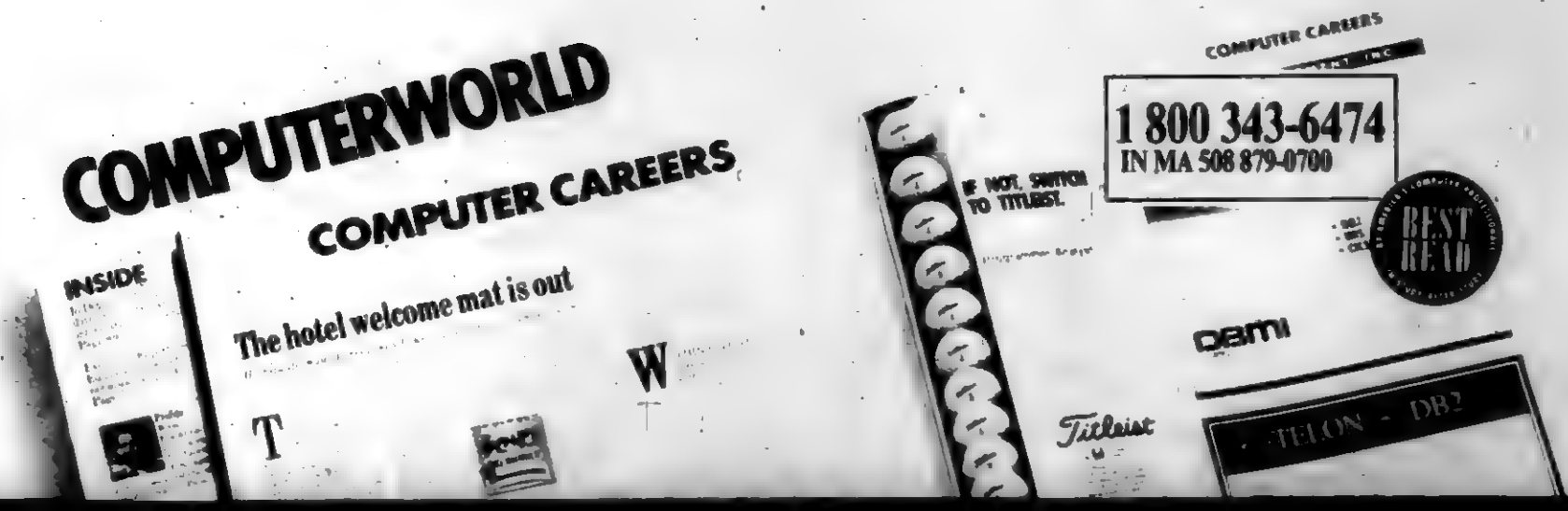


Smart answers to tough questions

You're sitting across from an interviewer who is the key to getting the job you want in a desirable company. You think you're doing fine, but then he asks you a question that you don't quite know how to answer. You stumble for what you hope is an intelligent response, but the incident throws you off stride. You see your chances for getting the job falter as you go through the rest of the interview in a fog.

Don't let this happen to you. To help you parry the tough interview question, we asked recruiters to give us some common queries and those responses that will keep you in the running or knock you out of the race.

Question: Tell me about yourself.

Incorrect: Well, I was born and raised in Moose River, Maine, and became interested in computers at a very young age. I started a computer club in junior high, and when I was in high school, I was president . . .

Correct: As you can see from my resume, I graduated from college with honors. I secured my first job with XYZ Corp., where I . . . After leaving XYZ, I started my own company.

Rule of thumb: Rehearse a short presentation that describes your accomplishments in chronological order, focusing only on things that will be of interest to the interviewer. Know when to stop — think in 30-second sound bites. A long-winded response will make you appear unorganized.

Question: What was the biggest data processing disaster you caused, and what did you do to resolve it?

Incorrect: I was responsible for implementing changes to an existing production system. Somewhere along the line, someone forgot to do some of the required steps — it wasn't me — and the system blew up. It wasn't my fault, though, so I let someone else solve the problem.

Correct: I was responsible for implementing changes to an existing production system. The problem was, I hurried through the procedure, cutting out a few steps, and went ahead and implemented the changes anyway.

It blew up and caused all kinds of problems in the user community. To fix the problem, I ended up going back and correcting it so the users wouldn't be upset.

Rule of thumb: You want to show that you can handle responsibility when things go wrong and that you learned from your mistakes.

Question: Describe your most significant information systems accomplishment.

Incorrect: I managed 95 people developing our new payroll system.

Correct: I was responsible for the development and implementation of our new payroll system, which was delivered three months ahead of schedule with full functionality. This saved the company more than $350,000 during the first six months of operation.

Rule of thumb: You want to answer with specific accomplishments. The correct response offers information on how your actions and responsibilities positively affected the bottom line.

Question: What are your long-term career goals?

Incorrect: I want to work in a stable company where I can gain new skills and make a contribution.

Correct: My goal is to become a senior IS manager responsible for ongoing application areas. I intend to get there by seeking out intermediate positions that strengthen my knowledge of the business, technical skills, project leadership and supervisory skills.

Rule of thumb: Not only have you identified a long-term goal that is available in the interviewer's company, but you've also identified the intermediate goals that are required to attain the long-term goal.

Question: What salary are you looking for?

Incorrect: I'd like to earn $50,000 a year.

Correct: The reason I'm here interviewing with you is that I'm looking for the best career opportunity. Based on my knowledge of the company and the opportunity so far, I'm very interested in pursuing both. To answer your specific question about what I am looking for in the way of salary, that's your call to make.

Once I get to know the firm and the firm gets to know me, and you feel I can handle this job, my hopes are that you'll make me the best offer you can.

Rule of thumb: By quoting a specific figure, you could be shortchanging yourself. If the job only went up to $45,000, you've knocked yourself out of the ballpark.

By making salary the interviewer's call, you'll put the situation in the interviewer's hands, where it belongs. Without actually saying it, you've said, "I didn't come in here with a price tag on my head. I'm a long-term company person interested in growth and technical challenge."

You've also said, "I trust your judgment to make me a fair and equitable offer." It'll be a win-win situation because you won't be making an unreasonable demand, and you won't be putting yourself out of the salary range before you can take a crack at the job.

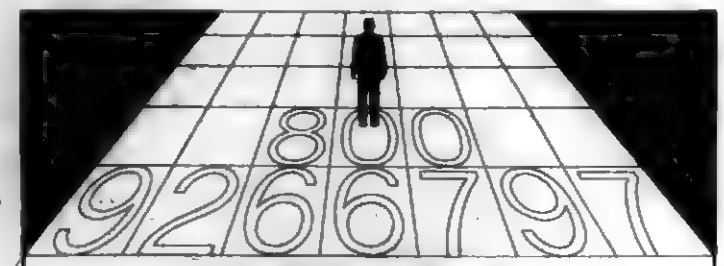
Question: Have you used XYZ tool?

Incorrect: No, I haven't used that tool.

Correct: No, I haven't used that specific tool, but I understand it's quite similar to tool ABC, which I've been using for three years. As a matter of fact, I taught myself to use tool ABC at my current job.

Rule of thumb: Your response is truthful and also brings a positive attitude to your answer. You are displaying a can-do, self-starting attitude. You've also indicated your ability to overcome past training gaps.

These interviewing tips were provided by Jim Parker, a senior recruiter at Technical Connections, Inc. in Los Angeles; Chuck Muller, a partner at Andersen, Jones & Muller in Southfield, Mich.; Chick Bieberg, president of Two-Party Systems, Inc. in Livingston, N.J.; and Max Steiner, marketing director at Corico Recruiters and Contract Solutions, Inc. in Salem, N.H. Compiled by Kelly E. Dwyer, assistant editor, features.



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Arrghh! My blasted computer's down

BY KATHLEEN GOW
SPECIAL TO CW

Remember the time your car conked out on the way to that important meeting with your software vendor? One phone call and your road service technician had you on your way in no time.

Help desk operators have a little of the road service troubleshooter in them. They get called in to assist business users in dire need of help, whether it's a file sent to a wrong printer, a garbled document or a whole local-area network going down in the middle of the day.

Help desk operators' lives can get exciting, especially when the 20 users of that crashed LAN are ringing the phone off the hook.

"A help desk analyst has to be able to calm the person down on the other end of the line," says Dean Wortham, store systems hotline manager at Dallas-based JC Penney Co. He oversees the retailer's three help desk groups. "They can't be easily perturbed."

Keeping it cool

At JC Penney's help desk, not being perturbed means being able to handle anxious, frustrated or even verbally abusive store managers who are having cash register hardware problems 10 minutes before opening.

A customer service orientation is important to have, managers say, although it needs to be backed by technical proficiency and the ability to learn quickly. Formal education is not always a prerequisite to a job on a help desk.

Darren Lindstrom, a help desk operator at Brookstone Co. in Peterborough, N.H., does not have a college degree, but he personifies "someone who is proficient and can find his own way," according to Karen Hamm, network administrator. That ability, as well as the ability to think on his feet, has helped Lindstrom handle queries in the wake of the company's recent downsizing from mainframes to IBM Application System/400s.

Lindstrom's duties vary widely: Problems can be as simple as someone's phone not working or as complex as somebody's database program no longer accessing his files.

On a quiet day, when the calls aren't constant, Lindstrom's responsibilities include keeping personal computer inventory up to date and installing new software.

Because "there's no such thing as a typical help desk," the technical skills needed to work on a desk vary from situation to situation, says Mark Nemtzow, director of research at the Help Desk Institute (HDI) in Colorado Springs.

Two may be better

For example, at Reader's Digest Association, Inc. in Pleasantville, N.Y., there are two help desks — one for PC users and one for mainframe users — called "field engineering services."

The PC help desk gets 1,500 calls a month from about 2,000 users. Of those 2,000 users, 1,200 also get support from the mainframe help desk.

"They really are two different disciplines," says Paul Foley, manager of the PC help desk. "The PC people need to have a base knowledge of DOS and standard software packages."

Reader's Digest's mainframe help desk staff have come from operations backgrounds, bringing with them a familiarity with VMS, IBM's mainframe operating system, and VTAM, communications software for Systems Network Architecture environments, according to Robert Croft, supervisor of the mainframe help desk and one of three help desk personnel who handle about 100 calls a day.

What both help desks share is the need for employees who can deal with people in a pleasant way under stressful conditions.

Help desk staff members cite variety and continuous learning as pluses. "You can learn a lot of different applications and keep pretty much up to date with new releases," says Joseph E. Stingley, technical analyst at the Host/User Support Group, one of the three help desk staff members who make up JC Penney's store systems hotline. Such broad knowledge can't look bad on a resume, Stingley adds.

Stable income

As for job security, Wortham says, "the help desk business is booming because so many systems are being rolled out and every software and hardware system needs support."

Nemtzow agrees: "The more you have end users doing their own computing, the more of a need there will be for a help desk." He adds that HDI's research shows that help desk professionals move into one of six areas: programming, network management, operations, end-user computing, a noninformation systems department or another company.

A growth path on the help desk itself depends on its size. On the PC help desk at Reader's Digest, for instance, there are five title and salary levels, ranging from the entry-level associate field engineering coordinator (at an annual salary of $25,000 to $27,000) to senior field engineering analysts with some supervisory responsibilities (from the high $30s to the mid $50s).

Stress is the job's primary drawback. "Every once in a while you get a pat on the back, but they are few and far between," says Terry Gillespie, operations manager in charge of the help desk at Dr Pepper/Seven-Up Cos. in Dallas.

Gow is a free-lance writer based in Medford, Mass.

Double-edged sword

One of the biggest changes coming down the road for help desk analysts is the growing use of automation software. By far the biggest change in the role of help desk analysts at JC Penney has been the addition of the Apriori knowledge-based system from Answer Computer, Inc., says Dean Wortham, JC Penny's store systems hotline manager. "It used to be all manuals and memory," he adds. "Now it's 'pick-and-click' — we're able to see the solutions and click on one of them."

Before, JC Penney looked for support representatives with specialized knowledge. Today, because the software has allowed the firm to consolidate eight help desk teams down to three and replace seven telephone operators with an automated call processing system, the qualities the company emphasizes are commitment to customer service and good communications skills.

The automated system has meant less stress for help desk personnel because the system serves as a knowledge base and historical record. In the past, each of the eight help-desk teams would specialize in one specific area of support. Now support representatives on the three remaining teams must have technical knowledge in many areas instead of just one.

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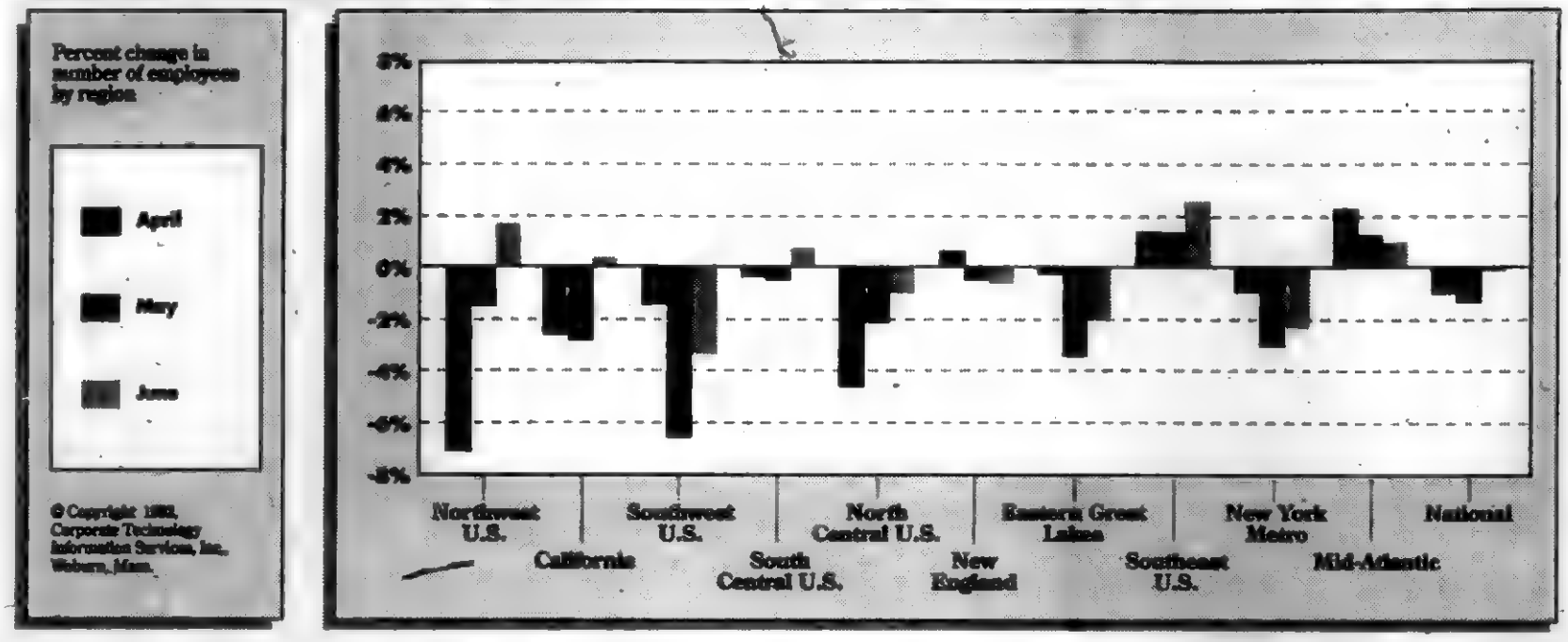
Computerworld/Corptech Career Index

The majority of the nation's employment growth figures during the past three months fell below the 0% line. May was the worst month, with a 1.3% overall decline in employment. June was the best month, with a 0.1% decline.



Reynolds Electrical & Engineering Co., Inc. is the largest prime contractor for the U.S. Department of Energy's Nevada Operations Office (DOE/NV). Your area of professional expertise in the following specialties are available in our Information Systems Department.

SENIOR SYSTEMS ANALYST/PROGRAMMER—VAX TECHNICAL SYSTEMS

Work Location: Las Vegas, Nevada

The position requires a bachelor's degree in MIS, Computer Science, related fields or equivalent experience. The individual being sought for this position will be assigned to work in the Technical Support Section of a data center. Candidates must have at least 3 years' experience in consulting with data center users, including computer system operations personnel and senior level Systems Analyst/Programmers who design and develop business and technical applications in a VAX/VMS computer environment. Applicable experience should include in-depth knowledge of the VMS operating system, layered product set, third party devices, and an understanding of VAX cluster configuration and control. Additional experience with Local Area Networks (NOVELL, DEC Pathworks) is a definite plus.

SENIOR SYSTEMS ANALYST/PROGRAMMER—APPLICATION DEVELOPMENT

Work Location: Las Vegas and Mercury, Nevada

These positions require a bachelor's degree in MIS, Computer Science, related fields or equivalent experience. Must have three or more years' experience with Digital Equipment Corporation (DEC) VAX/VMS, application development using FORTRAN or COBOL, and relational database technology. Should have good communication skills and a solid foundation in structured analysis/design and programming techniques. Knowledge of SmartStar 4GL'S and PC application development (FOXPRO, dBASE IV, LOTUS) is desirable.

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REECo

Statistical Programmer Analyst, 40hrs/wk., 9:00am-12:00pm, and, 1:00pm-6:00pm. $27,500/year. Statistical analysis, consultation and programming (using SAS on VAX/VMS and NeXT/UNIX) on clinical/experimental electrophysiological data. The statistical methods used are: Testing of Hypothesis, Linear and NON-Linear Regression, ANOVA, ANCOVA, Nonparametrics, Factor Analysis, Categorical Data Analysis, Design of Experiment, and Survival Curves. Design, implement, and maintain clinical/experimental data base (ORACLE database). Design and implement software systems for clinical data analysis and acquisition (mainly using C programming language). Consultation on program and database development and design of research projects for physicians, Ph.Ds, and staff. M.S. in Statistics as well as 1 year experience as a Statistical Programmer Analyst or Graduate Assistant required. Previous experience must include scientific programming using C and FORTRAN. Additional 6 months as a statistics or mathematics Teaching Assistant/Lab Consultant. Graduate experience must include one course each in Numerical Analysis; Statistical Theory and Real Analyses. Must have proof of legal authority to work permanently in the U.S. Send two copies of your resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street-3 South, Chicago, IL 60605, Attention: Mary Miller, Reference #V-IL 5191-M. NO CALLS. An Employer Paid Ad.

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SOFTWARE ENGINEER required. Design, development, coding, testing & implementation of systems software & database software using NATURAL, ADABAS, ADABAS DBMS & NATURAL 2 in MVS, UNIX & real-time environments. Systems Programming using PL/1, SQL, COBOL & Assembly as well as VSAM & PREDICT. Development of real-time systems using CMS, JCL & ACP/TPF coding (Airline Control Programming). Applicants required to have a Master's Degree or its equivalent in Computers or Engineering with at least one year experience in the job offered. Job site in Atlanta, Georgia for next 8 to 12 months; however, applicant must be willing to relocate as employer's needs dictate. Applicants must have proof of legal authority to work in the U.S. Annual salary will be $40,000 per year for a 40-hour work week. Interested applicants send resumes or apply in person to the Georgia Department of Labor, 2611 Lakewood Ave. SW, Atlanta, GA 30315, or to the nearest Georgia Job Service Center. Job Order No.: GA5557728. Employer paid ad.

System Engineer

Resp. for computer systems analyses in designing automatic material handling systems to control mechanical operation for the corrugated industry. Conduct research on development of a simulation system. Design software for control algorithms and computer communication. Must be familiar with Analog and Digital Control Systems, Digital Computer Logic, Digital Computer Design, Simulation Technique & 'C' programming. Knowledge of Multi Channel Serial Communication & Computer Interface is req. Min. M.S.E.E. req. Salary: $34,000.00/yr. Job Site & Interv.: Indianapolis, IN. Send resume with social security number to Job I.D. #3366313, Indiana State Employment & Training Services, 10 North Senate Avenue, Room 103, Indianapolis, Indiana 46204, Attention: Fay Skeels.

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Trinity College/Seminary seeks a qualified system administrator for 55 user HP-9000/847 system (HP-UX) and 1100 user voice/data switch utilizing AT&T System 75 (61) and OCTEL Aspen. Full-time, reports to Director of Information Services, 2-5 yrs of UNIX system admin exp. required. Prior telecommunications experience desired. BS required. Computer Science preferred.

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VLSI Engineer: Implementation of integrated circuits for several international standards in the area of electronic imaging and coded representations of picture and audio information; implement the Joint Photographic Experts Group (JPEG) standard for still pictures, with direct involvement in the Motion Pictures Experts Group (MPEG) standards decoder chip implementation for full motion video, and decoder designs, utilizing high frequency signal processing VLSI circuits; set-up and operation of a state-of-the-art design facility, involving integration of hardware from several vendors, including acquisition, storage, processing and display of signals required for VLSI design. Applicants should possess Bachelor of Science degree in Electrical Engineering. Must have taken at least (1) graduate-level electrical engineering course in each of the following subjects: 1) Switching Circuits; 2) Digital Computer Architecture; and four (4) courses in VLSI design. Graduate-level research work must include: development of a Serial Communication Interface chip and 8-bit Parity Checker/Generator using VTI's VLSI CAD tools. 40 hrs./wk., 9:00 a.m.-5:00 p.m.; $33,000.00/year. Must have proof of legal authority to work permanently in the U.S. Send resumes to Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois, 60605. Attention: JACK SCHAFFER Reference # V-IL 4546-J. 2 Copies of Your Resume Required. NO CALLS. AN EMPLOYER PAID AD.

PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with AS/400, AS/400 Internals (Control Language), RPG/400, 4GL, Structured Programming Techniques and Structured Analysis and Design Techniques. Must have Bachelor's Degree in Computer Science or Engineering or Math/Statistics. Experience required is 2 years in job offered or 2 years as a Programmer or Systems Analyst or Software Engineer. Additionally, two years experience must involve the use of AS/400, AS/400 Internals (Control Language), RPG/400, 4GL, Structured Programming Techniques and Structured Analysis and Design Techniques. M-F; 40 hrs/week, 8:00-5:00, salary $38,300/year. Houston, Texas location. Must have proof of legal authority to work in the U.S. Apply in person or send resume to the Texas Employment Commission, J.O. #6687457, TEC Building, Austin, TX 78778. Ad paid by an Equal Employment Opportunity Employer.

SOFTWARE DEVELOPMENT ENGINEER required. Research, design & develop computer software systems. Responsible for development, support, & service of new software products from inception to implementation. Utilize technical knowledge of Computer Assisted Software Engineering (CASE), Fourth Generation Technology (4GT) & Software Implementation Life Cycle. Utilize knowledge of Unisys A-Series, B1000, MS-DOS architectures, operations & applications software; utilize Structured Software Implementation Life Cycle Methodology & Fourth Generation Language Business Analysis. Provide consultation & expertise on Fourth Generation Languages (4GL) (4GT) & CASE development tools. Applicants required to have a Bachelor's Degree in Math, Computers, or Engineering with 5 yrs. exp. in the job offered, or 5 yrs. exp. in design & development of Applications Software. The 5 yrs. exp. must include 2 yrs. structured software implementation life cycle methodologies & 4GL business analysis, 2 yrs 4GL design, development & implementation, 2 yrs. Unisys A-Series & B1000 architectures & operating systems, & 2 yrs. MS-DOS operating systems, environmental & applications software. Salary $53,000/yr for a 40-hour work week. Must have proof of legal authority to work in the U.S. Interested applicants please send two resumes to Illinois Department of Employment Security, 401 S. State Street - 3 South, Chicago, IL 60605. Attn: Jean Woodson. Reference # V-L5408W. No calls. An employer paid ad.

Systems Engineer - To do research into formal methods for specifying the data-capture function for real-time call-detail acquisition in AT&T switching systems. To do prototype software and hardware supporting the development and execution of such formal specifications. Develop and analyze statistical models of the data-capture process in the prototype and production systems, including design of critical performance tests and analyses of test data for validation of the models developed. Requires a PhD in Computer Science, Physics or Operations Research, with experience in quantitative modeling of stochastic dynamic systems and software development in a Unix-based environment. Applicant must also have two years experience in the job offered or two years as a Research Assistant in Theoretical Physics at a college/university. 40 hours per week, (work schedule: 8:00am to 5:00pm). Salary is $58,000 per year. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attn: J. Aschenbrenner. Reference: V-L5442A. No Calls. An Employer Paid Ad. EOE.

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[redacted] BSCS or BSEE is required with a minimum of 5 years experience with C, operating systems, real-time embedded controls, and knowledge of one of the following: NetWare, LAN Manager or Banyan Vines. Responsible for modifying network interface software for Crown based printers.

[redacted] BSCS or BSEE is required with a minimum of 5 years experience with C, operating systems, real-time embedded controls, and knowledge of one of the following: TCP/IP, DECnet, or EtherTalk. Responsible for modifying network interface software for Crown based printers.

[redacted] BSCS or BSEE required with at least 5 plus years of experience in System Management/System Architecture in an IBM environment. Experience with heterogeneous networks and IPDS is a plus. Knowledge of communications protocols, C, Assembler, IBM mainframe, or mid-range systems is required. Responsibilities will include developing and supporting the IBM communications protocol controller code, which may include portation of existing code to new platforms.

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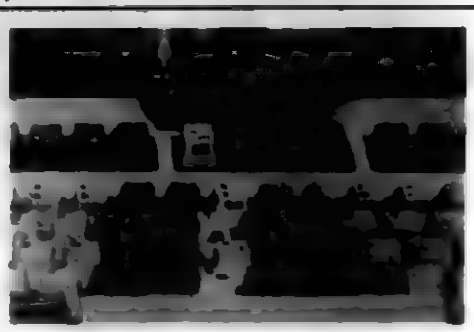

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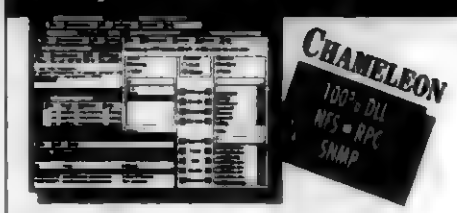

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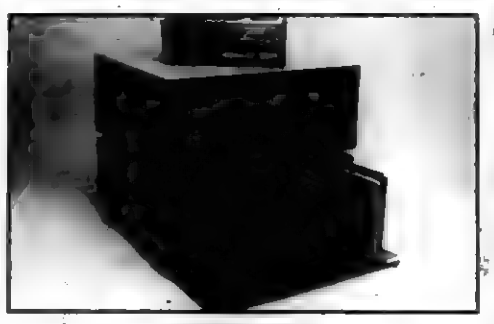

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Don't rush into an escrow

Despite common beliefs, source-code escrows are not always required

BY JOEL B. GILMAN
SPECIAL TO CW

Vendors don't like to talk about it. You probably don't want to pay for it. But what if your vendor goes out of business or files for Chapter 11?

Won't you be sorry that you didn't purchase a source-code escrow, which guarantees you a copy of the original source code? Without it, how will you be able to maintain, upgrade and otherwise alter your software?

You may be nodding your head, "Yes," and getting ready to open your wallet. But before you do, you should realize that you may not have to.

Most corporate policies and legal textbooks on computer law insist that a company obtain a source-code escrow on every software purchase.

If they did, companies would be spending thousands of dollars each year on escrow fees alone. Vendors wouldn't be very happy either because the extra paperwork would make it a hassle to close a deal.

The fact is, despite warnings to the contrary, most people don't need a software escrow. So, before you go through the trouble and expense of setting one up, see if you can answer yes to all of the following statements:

The software is customized exclusively for your company or is so specialized that only a handful of executable copies will be sold.

There is very little to be gained by having access to the source code for mass-marketed software. Yet, a surprising number of buyers' attorneys will try to negotiate an escrow — as a matter of company policy — for mass-marketed software.

The vendor has been in business for less than 10 years, and you have never heard of it before.

No company is invulnerable, but you need to weigh the cost of obtaining an escrow against the probability that the vendor will be around in the future.

A related consideration is how long you expect to use the system.

Typically, business systems are replaced every 5 to 10 years. If you feel confident that the vendor will be around that long, a source-code escrow does very little except cost money.

The vendor does not make the source code available to you as part of the transaction.

If the vendor is willing to license the source code to you, why bother with an escrow? Many companies are willing to release source code — for a hefty fee — but having the source code is better than having it in escrow.

Your company is heavily dependent on the software.

Even if the first three factors are met, you still don't need access to source code if the system in question is only used for minor functions.

If you do decide to purchase an escrow, be prepared for how much it will cost. Escrow holders assume full liability for the proper storage and release of the source code. Therefore, it doesn't come cheap.

You can expect to spend $500 to $2,000 in setup costs (including administration fees) and another $1,000 to $1,500 per year in maintenance and storage.

Some escrow companies may also include one free product update a year. After that, it will cost you.

Gilman is a Seattle-based attorney who practices computer law.

If you decide to buy . . .

Thousands of organizations claim to offer software escrows. Finding one that works for your company is a daunting challenge. A true escrow requires a third party (bank, attorney or other) to administer and take responsibility for maintaining and upgrading the escrow.

The following pointers may help you sort through the options:

- There are many "vault" companies that say they provide escrows when in fact all they offer is a safe-deposit box for everything from floppy disks to Grandpa's cuff links. Go with a company that understands what you're doing and what source code is.
- Don't bother with a bank escrow department — they think in terms of real-estate transactions and won't know what you're talking about.
- Your legal staff should review the escrow holder's contract. Most escrow companies have a separate contract that needs to be approved by both the system vendor and system user and that spells out the details of how and when the source code can be used.
- Make sure the contract spells out when you want the source code released. At a minimum, it should include the vendor's voluntary or involuntary bankruptcy and cessation of business or customer support for the system.
- The agreement with the vendor should state that if the vendor goes under, the bankruptcy trustee is authorized to release source code to the user.

By law, the trustee in bankruptcy has power over a company's assets, including intangibles such as copyrights and computer source code. Without clear authorization, a court may stop an escrow holder from releasing source code — at least until the final discharge order, which can take years.

- Be sure there is a provision in the vendor's and the escrow holder's agreement that ensures updates to the source code are deposited with the escrow holder as soon as they are implemented.

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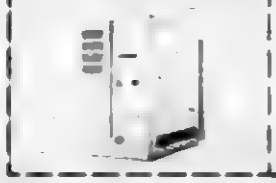

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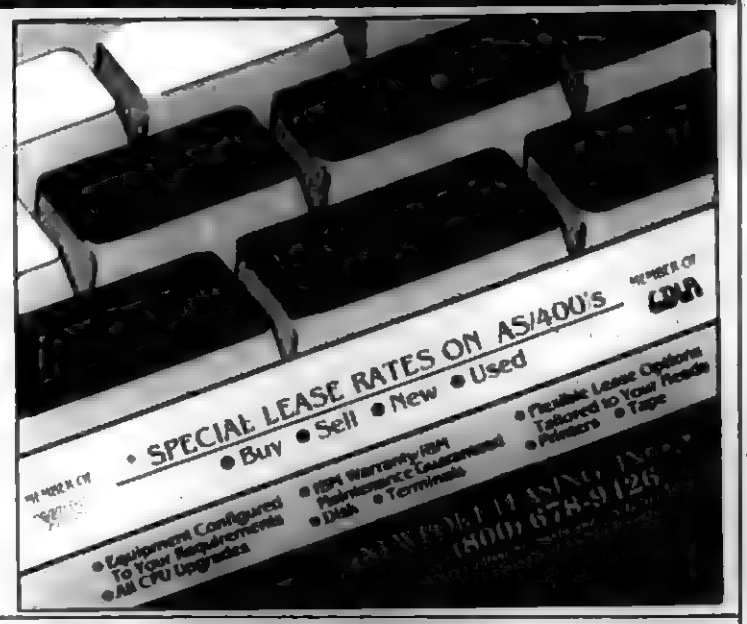

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The BoCoEx index on used computers

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PS/2 Model 35SX	$1,325	$1,500	$800
PS/2 Model 55SX	$1,000	$1,300	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$2,100	$3,000	$1,500
PS/2 Model 80	$1,500	$1,800	$1,100
PS/2 Model 95	$4,400	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$500	$600	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$2,000	$2,450	$2,200
Apple Macintosh Classic	$800	$900	$700
SE	$725	$775	$500
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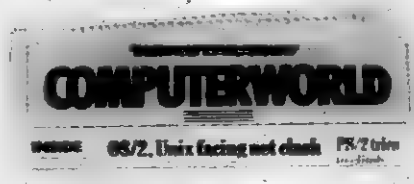

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ADVERTISERS INDEX

Ask Computer	38-39
AT&T Business Communications Services	17-19
AT&T Tridom	57
Borland International	40-41
British Telecom North America	50
CANAC Telecom	73
Candle Corp	21
CIE America	61
Cincom Systems	24
Compaq Computer Corp	26-29
Computer Associates	5
CW Lotus Notes Awards	25
CW Marketing	45
CW Recruitment	10, 47, 67, 73
Data General	85
Digital Equipment Corp	24/25, 63-66
Dun & Bradstreet	49
Dysan International	42
EDS	88-89
Fifth Generation	34
Filenet	67
Harris Adacom	72
Hayes Microcomputer	76
IBM	31
IDG	54-55
Information Builders	68
Informix	C4
Lawson Associates	56
Lexmark	62
Lotus Development Corp	46
Micro Focus	11
Microsoft	74-75
Multi-Tech Systems	15
Napersoft	59
Novell	22-23
Oracle Corp	7
Platinum Technology	58
SAS Institute	13, 82
Software 2000	10
Sterling Software	60
Sybase, Inc	9
Syncsort	3
Texas Instruments	70-71
Unify Corp	52-53
Universal Data Systems	48
U.S. Sprint	C3
Wellfleet Communications	90
XDB Systems	47
XL/Datacomp	79
Zenith Data Systems	36-37

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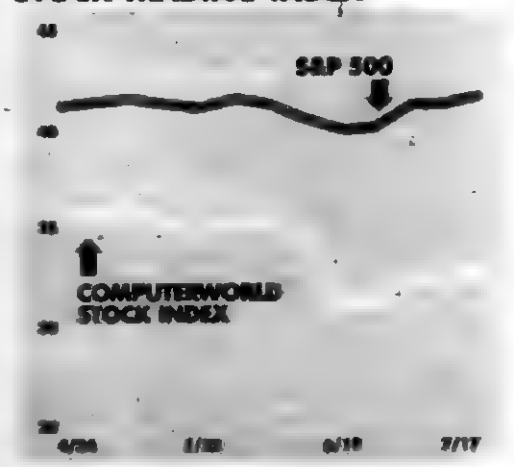

Industry Almanac

RECOMMENDATION CHANGE

UPGRADED FROM UNDERPERFORM TO HOLD: **Digital Equipment Corp.** (Smith Barney, Harris Upham & Co.). DEC (DEC) stock has managed to survive a tough period of sinking revenue growth. The firm's installed base and technical know-how could help bring about a financial turnaround, but Alpha technology is the real ticket to recovery.

The company will probably report an operating loss for its fiscal fourth quarter, but the deficit could be less imposing than expected. DEC shares have been upgraded at this point because the expected loss, combined with a pending restructuring charge and adjustments resulting from a change in accounting practices, could cut into DEC's valuation, lowering it to about $44 per share. The current rating is about $58.

DOWNGRADED FROM STRONG BUY TO BUY: **Micrografx, Inc.** (Alex. Brown & Sons, Inc.). Micrografx (MGXI) recently said its revenue will parallel Wall Street expectations for the company's first-fiscal quarter of 1993. However, profits will fall short of predictions, partly because of greater than expected spending on marketing and research and development. Also, an IBM contract that would have brought in additional revenue never surfaced.

INITIAL PUBLIC OFFERINGS

Electronic Information Systems, Inc. filed papers with the Securities and Exchange Commission to offer 1.7 million shares of common stock priced at $5 per share. The Stamford, Conn.-based company offers call-processing systems targeted at users engaged in tasks such as direct marketing, bill collecting and fund raising. Profits topped $1.3 million last year on sales of $20.5 million.

Vitesse Semiconductor Corp., based in Camarillo, Calif., plans to sell 3.2 million shares, priced at $9 per share. Vitesse designs and markets digital gallium arsenide integrated circuits, which are chips used in high-performance computers and communications products. **Convex Computer Corp.** is a large Vitesse customer, accounting for more than 20% of Vitesse's $23.7 million in revenue for 1991. The company posted a $3.2 million loss for last year.

LISA DAVIDSON and KIM S. NASH

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JULY 17, 1992

TOP PERCENT GAINERS

Software Toolworks Inc	50.00
Platinum Technology	27.78
Gateway Communications	25.07
Ask Computer Systems	19.28
Rainbow Technologies Inc	17.24
Network Equipment Tech *	16.67
Digital Equipment Corp *	15.67
Proteon Inc (L)	13.64

TOP PERCENT LOSERS

Sierra Semiconductor	-25.81
Picturetel Corp (L)	-22.28
Wellfleet (L)	-19.23
Compression Labs Inc (L)	-17.43
Compuware Inc	-15.00
Corporate Software	-15.00
Printronix Inc	-13.04
Chips and Technologies (L)	-12.50

TOP DOLLAR GAINERS

Digital Equipment Corp *	5.88
Motorola Inc *	5.00
BMC Software Inc	4.00
Symantec Corp	3.75
Platinum Technology	3.75
Wellfleet Communications	2.88
Reynolds and Reynolds	2.75
Cabletron Systems	2.75

TOP DOLLAR LOSERS

Picturetel Corp (L)	-5.13
Sierra Semiconductor	-4.00
Banctec Inc	-2.88
IBM *	-2.88
Computer Sciences *	-2.63
Compression Labs Inc (L)	-2.38
Group I Software	-2.00
Borland Int'l Inc * (L)	-1.88

Exch	52-Week			July 17 Close	Wk Net Change	Wk Pct Change
	High	Low				
Communications and Network Services			**Up 2.19%**			
OTC	15.00	6.75	3 COM Corp *	10.00	0.00	0.00
NYS	67.38	56.25	American Info Techs Corp *(H)	67.38	0.88	1.32
NYS	44.63	32.88	AT&T *	44.50	0.75	1.71
OTC	4.25	1.00	Antel Communication Corp	1.38	-0.13	-8.33
NYS	50.63	40.25	Bell Atlantic Corp	47.38	0.75	1.61
NYS	53.00	43.38	Bellsouth Corp (H)	52.63	-0.13	-0.24
NYS	7.38	4.13	Bolt, Beranek & Newman (L)	4.63	0.38	8.82
NYS	65.88	36.63	Cabletron Systems	51.50	2.75	5.64
OTC	31.00	14.50	Chipcom Corp	21.75	-0.75	-3.33
OTC	49.25	17.63	Cisco Systems Inc	49.25	2.50	5.35
OTC	35.25	11.25	Compression Labs Inc (L)	11.25	-2.38	-17.43
OTC	3.38	0.88	Data Switch Corp	1.56	0.06	4.20
NYS	23.63	12.38	Digital Comm. Assoc *	19.13	0.63	3.38
OTC	17.50	8.50	Digital Systems Int'l Inc	8.75	0.25	2.94
OTC	7.00	3.63	DSC Communications	5.38	0.63	13.16
OTC	10.88	4.75	Fibronix Int'l Inc	5.50	-0.75	-12.00
OTC	37.50	10.50	Filenet Corp	16.25	1.63	11.11
OTC	3.38	1.13	Gandalf Technologies Inc	2.63	0.25	10.53
OTC	2.44	0.69	Gateway Communications	0.94	0.19	25.07
NYS	5.50	2.13	General Datacomm Inds	3.75	0.13	3.45
ASE	5.88	0.50	Go Video	3.00	0.00	0.00
NYS	35.00	28.13	GTE Corp *	33.00	0.13	0.38
NYS	70.63	50.00	ITT Corp	64.75	-1.38	-2.08
OTC	36.13	25.25	MCI Communications Corp	33.00	1.88	6.02
OTC	14.50	2.25	Microcom Inc (L)	4.00	0.13	3.23
NYS	18.25	9.25	Network Equipment Tech *	11.38	1.63	16.67
OTC	25.50	6.75	Network General	9.50	-0.13	-1.30
OTC	20.00	8.50	Network Systems Corp	9.88	-0.25	-2.47
OTC	17.88	5.50	Newbridge Networks Corp	16.00	-0.38	-2.29
NYS	49.25	34.13	Northern Telecom Ltd *	38.88	0.75	1.97
OTC	65.00	26.63	Novell Inc *	54.00	0.25	0.47
NYS	82.38	69.13	Nynex Corp *	81.00	0.00	0.00
OTC	37.50	18.50	Octel Communications Corp	22.25	-0.50	-2.20
OTC	9.88	4.50	Penril Data Comm. Ntwks	4.75	0.25	5.56
OTC	53.00	17.88	Picturetel Corp (L)	17.88	-5.13	-22.28
NYS	18.75	9.75	Proteon Inc (L)	12.50	1.50	13.64
NYS	25.50	11.63	Scientific Atlanta Inc (H)	24.88	0.00	0.00
NYS	66.00	51.50	Southwestern Bell Corp	66.00	2.50	3.94
NYS	27.63	20.75	Sprint Corp	22.25	0.50	2.30
OTC	13.75	4.00	Standard Microsystems Corp	12.13	0.75	6.59
OTC	33.50	14.25	Synoptics Communications (H)	31.88	0.25	0.79
NYS	39.00	32.88	US West Inc (H)	38.38	-0.50	-1.29
OTC	41.25	21.25	Wellfleet Communications	32.38	2.88	9.75
PC and Workstations			**Off 0.27%**			
OTC	15.25	4.75	Advanced Logic Research	5.00	0.25	5.26
OTC	70.00	42.75	Apple Computer Inc *	45.00	-0.75	-1.64
OTC	32.25	12.00	AST Research Inc *	13.25	-0.75	-5.36
NYS	19.25	9.13	Commodore Int'l (L)	9.50	0.13	1.33
NYS	37.50	22.13	Compaq Computer Corp *	25.00	-1.13	-4.31
OTC	29.00	13.91	Dell Computer Corp	18.00	0.50	2.86
OTC	7.75	3.00	Everex Systems Inc	3.13	-0.25	-7.41
NYS	34.00	21.25	Harris Corp	27.88	0.63	2.29
NYS	85.00	44.63	Hewlett-Packard Co *	69.00	1.75	2.60
NYS	29.75	14.13	Silicon Graphics	19.00	0.63	3.40
OTC	35.88	20.75	Sun Microsystems Inc *	27.50	0.63	2.33
NYS	31.25	22.88	Tandy Corp *	23.00	-0.63	-2.65
NYS	11.13	5.13	Zenith Electronics	7.63	0.13	1.67
OTC	25.50	5.25	Zeos International Ltd	5.75	-0.25	-4.17
Large Systems			**Off 0.09%**			
ASE	20.63	11.63	Amdahl Corp *	17.88	0.88	5.15
NYS	14.00	7.50	Control Data Corp	13.75	0.00	0.00
NYS	16.38	6.00	Convex Computer (L)	6.25	-0.13	-1.96
OTC	19.63	2.75	Cray Computer	2.75	-0.38	-12.00
NYS	52.25	27.38	Cray Research Inc *	29.00	0.25	0.87
NYS	22.50	7.13	Data General Corp	8.50	0.88	11.48
NYS	71.75	33.25	Digital Equipment Corp *	43.38	5.88	15.67
NYS	106.38	81.63	IBM *	94.88	-2.88	-2.94
NYS	125.00	93.50	Matsushita Electronics	103.88	-0.75	-0.72
OTC	19.75	9.50	Pyramid Technology	10.75	0.25	2.38
OTC	17.88	7.50	Sequent Computer Sys	14.38	-0.50	-3.36
OTC	18.38	5.50	Sequoia Systems Inc	5.75	-0.38	-6.12
NYS	54.25	32.38	Stratus Computer Inc *	41.00	-1.63	-3.81
NYS	15.13	9.50	Tandem Computers Inc *	10.25	-1.25	-10.87
NYS	11.75	3.38	Unisys Corp *	9.63	0.75	8.45
ASE	7.50	2.00	Wang Labs Inc (b) *	3.25	-0.13	-3.70
Software			**Up 2.65%**			
OTC	68.50	37.50	Adobe Systems Inc	43.25	-0.75	-1.70
OTC	13.25	2.50	Al Corp (L)	3.00	0.00	0.00
OTC	45.00	11.50	Aldus Corp	14.00	0.75	5.66
OTC	19.75	10.13	American Software Inc	13.13	0.38	2.94
OTC	20.00	7.50	Ask Computer Systems	12.38	2.00	19.28
OTC	57.25	23.25	Autodesk Inc	38.00	-0.50	-1.30
OTC	37.75	8.25	Bachman Info. Systems	11.38	0.13	1.11
OTC	42.50	29.00	BGS Systems Inc	36.00	0.50	1.41
OTC	79.00	37.25	BMC Software Inc	46.75	4.00	9.36
OTC	20.50	9.00	Boole & Babbage	17.50	0.25	1.45
OTC	88.75	38.50	Borland Int'l Inc * (L)	37.00	-1.88	-4.82
OTC	11.25	3.63	CE Software (L)	4.13	0.13	3.13
ASE	14.38	6.50	Cheyenne Software Inc	11.25	0.63	5.88
OTC	20.38	7.25	Cognos Inc	8.38	0.13	1.52

Exch	52-Week			July 17 Close	Wk Net Change	Wk Pct Change
	High	Low				
NYS	17.00	7.50	Computer Associates *	12.00	-0.50	-4.00
OTC	21.50	8.50	Compuware Inc	8.50	-1.50	-15.00
OTC	47.88	6.50	Easel Corp	7.75	-0.25	-3.13
OTC	19.50	9.25	Goal Systems Int'l	18.25	0.88	5.04
OTC	25.50	11.50	Group I Software	18.00	-2.00	-10.00
OTC	6.63	3.50	Hogan Systems Inc	4.38	0.38	9.38
OTC	36.25	18.50	Information Resources	24.00	-0.38	-1.54
OTC	38.00	5.50	Informix Corp	30.50	2.25	7.96
OTC	22.75	12.50	Intergraph Corp	14.25	0.50	3.64
OTC	15.00	4.88	Interleaf Inc	9.75	1.00	11.43
OTC	20.25	8.50	Intersolv Inc	11.88	-0.88	-6.86
OTC	30.00	10.50	Knowledgeware Inc	12.75	-0.25	-1.92
OTC	45.25	20.25	Legent Corp *	35.38	2.00	5.99
OTC	40.75	15.50	Lotus Development * (L)	17.88	0.63	3.62
OTC	7.38	2.06	Meca Software (L)	2.25	0.13	5.88
OTC	22.25	6.50	Mentor Graphics	8.88	-0.38	-4.05
OTC	20.50	6.50	Micrografx Inc	9.75	-0.25	-2.50
OTC	89.84	43.34	Microsoft Corp *	70.25	0.75	1.08
OTC	21.13	8.63	Oracle Corp *	16.75	0.88	4.80
OTC	41.25	13.00	Parametric Technology	34.50	2.50	7.81
OTC	11.00	3.50	Phoenix Technologies (L)	4.00	0.13	3.23
OTC	25.25	10.63	Platinum Technology	17.25	3.75	27.78
OTC	46.50	27.50	Progress Software Corp.	36.25	0.50	1.40
OTC	26.63	4.00	Quarterdeck Office Sys.	4.75	-0.25	-5.00
OTC	32.75	10.25	Rainbow Technologies Inc	17.00	2.50	17.24
OTC	29.50	8.75	Rasterops	11.25	0.38	3.45
OTC	17.25	5.38	Ross Systems	7.50	-0.63	-7.69
OTC	26.25	8.13	Software Publishing Corp (L)	8.25	-0.75	-8.33
OTC	8.50	2.00	Software Toolworks Inc.	3.38	1.13	50.00
OTC	7.25	1.75	Spinnaker Software	3.00	-0.13	-4.00
OTC	16.50	6.25	State of the Art	7.13	-0.75	-9.52
NYS	25.25	11.63	Sterling Software Inc	16.88	0.38	2.27
OTC	30.00	13.00	Struct. Dynamics Research	18.00	0.50	3.23
OTC	31.75	15.00	Sybase Inc	26.50	2.50	10.42
OTC	51.00	22.50	Symantec Corp	33.50	3.75	12.61
NYS	15.50	5.75	Systems Center Inc * (L)	5.75	-0.63	-9.80
OTC	34.25	8.88	System Software Assoc.	28.75	-0.75	-2.73
OTC	23.75	14.50	Walker Interactive Systems (L)	16.00	-1.00	-5.88
OTC	6.63	2.13	Wordstar	2.63	0.00	0.00
Semiconductors			**Off 3.91%**			
NYS	21.50	7.38	Advanced Micro Devices	8.63	0.38	4.55
NYS	11.13	7.00	Analog Devices Inc	9.88	0.25	2.60
OTC	14.88	6.75	Atmel Corp	9.38	0.00	0.00
OTC	14.13	5.25	Chips and Technologies (L)	5.25	-0.75	-12.50
NYS	22.63	7.38	Cypress Semiconductor Corp (L)	8.00	0.13	1.59
NYS	10.13	6.25	Dallas Semiconductor (H)	9.38	-0.63	-8.25
OTC	68.75	38.50	Intel Corp *	56.88	-0.50	-0.88
NYS	9.88	5.75	LSI Logic Corp	5.75	-0.75	-11.54
NYS	22.38	11.13	Micron Technology	14.00	0.13	0.90
NYS	83.75	54.88	Motorola Inc *	83.00	5.00	6.41
NYS	11.50	3.88	National Semiconductor *	9.25	0.13	1.37
OTC	27.00	11.50	Sierra Semiconductor	11.50	-4.00	-25.81
NYS	40.50	26.00	Texas Instruments *	39.63	1.88	4.97
OTC	10.50	5.88	VLSI Technology	6.63	-0.63	-8.62
OTC	9.75	2.50	Wafertech (L)	2.63	-0.63	-19.23
ASE	5.63	2.00	Western Digital Corp	4.63	-0.13	-2.63
OTC	32.50	17.25	Xilinx	21.13	0.75	3.68
OTC	11.50	4.63	Zilog Inc	6.38	-0.63	-8.93
Peripherals and Subsystems			**Off 0.87%**			
OTC	10.00	2.75	Archive Corp	7.38	0.63	9.26
OTC	24.50	11.25	Banctec Inc	21.38	-2.88	-11.86
OTC	23.50	7.00	Cambex Corp	14.00	0.00	0.00
ASE	17.63	7.00	Cognitronics Corp	17.63	1.50	9.30
NYS	23.88	12.50	Conner Peripherals *	19.13	-1.25	-6.13
ASE	19.66	3.38	Dataram Corp	12.63	-0.13	-0.98
NYS	18.75	4.88	EMC Corp (H)	17.13	-1.13	-6.16
OTC	9.38	4.75	Emulex Corp	5.88	0.00	0.00
OTC	23.00	14.50	Evans & Sutherland	14.88	-1.13	-7.03
OTC	40.63	16.00	Exabyte	27.75	-1.63	-5.59
OTC	27.25	15.75	Intelligent Info. Systems	25.00	1.75	7.22
OTC	11.25	4.50	Iomega Corp	5.75	0.25	4.55
OTC	34.75	14.50	IPL Systems Inc	19.38	0.38	1.97
OTC	24.50	10.75	Komag Inc (L)	12.63	0.38	3.06
OTC	14.00	2.25	Maxtor Corp *	11.00	0.25	2.33
OTC	12.63	5.75	Micropolis Corp	9.25	-0.25	-2.63
NYS	98.88	83.50	3M Co	98.88	2.00	2.06
OTC	7.75	3.50	Printronix Inc	5.00	-0.75	-13.04
NYS	26.75	7.00	QMS Inc (L)	7.50	0.13	1.69
OTC	18.00	8.88	Quantum Corp	14.13	-0.38	-2.59
OTC	12.63	5.13	Radius Inc (H)	10.63	-1.13	-9.57
NYS	12.88	5.88	Recognition Equipment	8.13	0.13	1.56
OTC	13.13	5.38	Rexon Inc	9.63	0.00	0.00
OTC	17.63	7.25	Seagate Technology *	14.50	-0.13	-0.85
NYS	78.00	28.13	Storage Technology *	30.88	-0.13	-0.40
NYS	30.88	16.00	Tektronix Inc.	18.13	0.00	0.00
NYS	82.25	52.63	Xerox Corp	71.38	0.13	0.18
Services			**Off 0.48%**			
OTC	18.00	11.88	American Mgmt. Systems *	15.75	0.63	4.13
NYS	5.38	2.88	Answerp Inc	3.13	-0.38	-10.71
OTC	19.00	12.25	Analysts Int'l	17.00	-0.13	-0.73
NYS	48.00	30.25	Auto Data Processing *	42.00	0.75	1.82
NYS	24.18	12.50	Comdisco Inc *	18.00	-1.13	-5.88
OTC	13.50	7.75	Computer Horizons	8.75	0.50	6.06
NYS	84.88	52.25	Computer Sciences *	59.88	-2.63	-4.20
NYS	10.13	7.00	Computer Task Group	8.00	0.75	10.34
OTC	40.50	15.00	CompUSA Inc	26.25	0.00	0.00
OTC	19.25	8.50	Corporate Software	8.50	-1.50	-15.00
OTC	30.75	12.75	Eggnead Discount Software	17.00	-0.25	-1.45
NYS	33.00	23.19	General Motors E (EDS) *	27.13	-0.25	-0.91
OTC	30.38	6.25	Intelligent Electronics	7.75	-0.25	-3.13
OTC	14.88	2.75	Mensel	9.63	-0.13	-1.28
OTC	15.75	6.50	Microage Inc	9.50	-0.50	-5.00
OTC	27.50	13.84	Paychex	23.75	-0.25	-1.04
NYS	73.00	47.25	Policy Management Sys.	69.25	2.13	3.17
NYS	43.50	19.63	Reynolds and Reynolds	40.75	2.75	7.24
OTC	32.00	21.25	SEI Corp	23.25	0.00	0.00
OTC	24.38	16.88	Shared Medical Systems	18.25	-1.13	-5.81
OTC	26.25	13.50	Sungard Data Systems	25.00	1.25	5.26
NYS	4.88	1.13	Ultimate Corp	1.88	0.13	7.14

KEY: (H) = New annual high reached in period (L) = New annual low registered in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Unisys Q2 earnings up

■ Continuing its rebound, **Unisys Corp.** last week reported second-quarter earnings of $105.4 million compared with a $1.3 billion loss in the comparable period last year. Revenue for the quarter, however, declined slightly to $2.09 billion from $2.20 billion. The company attributed its showing to progress made in cutting annual expenses by $800 million.

■ **AT&T** posted second-quarter net profits of $961 million, up 3% from the year-earlier period. Revenue was $9.85 billion, up 2% from the same quarter last year. AT&T Computer subsidiary **NCR Corp.**, which includes recently acquired Teradata Corp., recorded earnings of $98 million on revenue of $1.75 billion.

■ Stung by increased competition from 80386 chip clones, **Intel Corp.** posted second-quarter earnings of $213 million, down 7% from the record level totaled in the comparable period last year. Revenue for the quarter was $1.25 billion, up 5% from the same period last year, the company said.

■ Second-quarter earnings at **Motorola, Inc.** in Schaumburg, Ill., rose 17% to $146 million on revenue of 3.14 billion, an increase of 12% from the like period last year.

■ Ottawa-based systems integrator **SHL Systemhouse, Inc.** reported a third-quarter net loss of $145,000, compared with a $4 million profit in the year-earlier period. Revenue for the period was $548.2 million, up 2% from the third quarter last year.

■ Workstation vendor **Intergraph Corp.** said second-quarter net earnings dropped 86% to $2.9 million on revenue of $289 million — which was also off 4% from the year-earlier period.

Triple threat to hit DRAM market

Expense of building denser memories drives IBM, Siemens AG and Toshiba into partnership

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — IBM, Siemens AG and Toshiba Corp. joined forces last week to build 256M-bit dynamic random-access memories. All three companies said the move was prompted by the expense of developing and building DRAMs. Many analysts interpreted the step as a natural progression toward a truly international economy.

A DRAM is a semiconductor that stores information in a wide variety of devices, ranging from computers to appliances. A 256M-bit DRAM could hold 25,000 pages of typed, double-spaced text. The largest DRAM on the market today holds 16M-bits of data.

Earlier this year, IBM and Siemens cooperated to build the first such semiconductor to hit the market, but other companies such as Hitachi Ltd. and Texas Instruments, Inc. also make them.

Michael Attardo, IBM's general manager of technology products, said all three companies would contribute money for capital investment and development to boost IBM's Advanced Semiconductor Technology Center in East Fishkill, N.Y., to production of quarter-micron-level chips, which is expected to cost as much as $1 billion.

The project would leverage IBM's research and development strength, Siemens' semiconductor process engineering skills and Toshiba's abilities in manufacturing design.

Grand slam

Attardo said he fully expected the threesome to reach the market first with 256M-bit products near the end of the decade. This, he said, was crucial to making profits from chip sales: "If you're six months behind, you could lose billions of dollars."

NEC Corp. has stated it is developing 256M-bit technology, and Attardo said he expects TI — with or without sometime partner Hitachi — to stay in the market.

Attardo also said he expects Intel Corp., inventor of the DRAM, to re-enter the market, although an Intel spokeswoman said this was unlikely. Korean manufacturer Samsung is another likely player.

Strange bedfellows

Advanced Micro Devices, Inc.'s (AMD) W. J. Sanders III, chairman and chief executive officer, appears to have a short memory. The longtime Japan-basher last week led his company into an agreement with Fujitsu Ltd. to make solid-state memories.

Under the deal, AMD and Fujitsu will contribute $350 million each to build a half-micron wafer fabrication facility in Japan. This plant, scheduled to open in 1994, will make erasable programmable read-only memories (EPROM) and flash memories. Sunnyvale, Calif.-based AMD is the world's leading producer of EPROMs and is second to Intel in flash memory production.

The AMD/Fujitsu accord comes in the wake of similar flash memory agreements between Intel and Sharp Corp. and between IBM and Toshiba. Fujitsu assembles Intel's flash memory devices, but an Intel spokeswoman said this arrangement is unlikely to be affected by the new agreement.

MICHAEL FITZGERALD

Systems Center plans layoffs to combat losses

BY ELISABETH HORWITT
CW STAFF

RESTON, Va. — Systems Center, Inc. is now paying for two years of aggressive expansion with a projected second-quarter loss and pending layoffs.

While Systems Center does not yet have firm second-quarter financial figures, numbers will definitely be on the red side of the ledger despite an overall revenue gain, said Richard Moore, vice president of corporate communications. The company earned $326,000 in the comparable period last year on revenue of $29.1 million. "We're not experiencing the growth rates we expected worldwide," he said.

As a result, the company will enact a program to reduce its 1,000-member staff by an undisclosed amount. It initially will seek work-force reductions through a voluntary resignation program featuring an enhanced severance package offered to employees in the U.S. and Australia. Layoffs will follow in an amount to be determined by second-quarter results and by how many employees opt for the voluntary resignation program.

The expected disappointment in the second quarter is partly the result of worldwide economic troubles, Moore said. Also, "there may still be some redundancy and overhead associated with our acquisitions over the last couple of years," he said.

Indeed, "it has been a real strain for Systems Center" to get up to speed with a bevy of acquired product lines that appeal to very different customer bases and have disparate sales and support needs, according to Mary Johnston, a principal at Northeast Consulting Resources, Inc., a Boston-based consulting firm.

Best known for its Network Datamover host bulk file transfer product, Systems Center bit off a large chunk in 1990 when it acquired Australia-based Software Developments International, purveyor of Net Master network management software.

During that same year, Systems Center also acquired a small Texas firm that sold software for managing distributed IBM Application System/400s and another firm that sold administration and backup software for Unix networks.

Despite its current woes, however, Systems Center is making the right step by moving beyond the shrinking mainframe-oriented market to the growing distributed computing arena, Johnston said.

Court ditches bankruptcy shield for pirate

BY JAMES DALY
CW STAFF

PROVO, Utah — A federal judge recently slammed shut an escape hatch often used by software pirates when she declared that one pirate could not avoid paying financial damages by declaring bankruptcy.

U.S. Bankruptcy Judge Lynne Riddle made the ruling as part of a suit brought by Novell, Inc. against computer reseller MedPerfect Systems, Inc. and owner Ronald G. Frank. The defendants reportedly sold office automation and record-keeping systems, including pirated copies of Novell's NetWare, to dentists in Southern California.

In March 1991, Frank and the now-defunct MedPerfect were issued a preliminary injunction ordering them to stop the alleged unauthorized duplication. They filed bankruptcy soon thereafter in a bid to avoid paying damages, a move long used by software pirates.

"In the past, it has become almost routine for software pirates to escape liability by declaring bankruptcy after being sued," said David Bradford, senior vice president at Novell.

Novell was not ready to give up the chase, however, and discovered that the Federal Bankruptcy Code does not allow debtors to skip out on obligations incurred by "willful and malicious" actions. Until now, those legal points had been slippery to make in software piracy cases.

"The hurdle has always been trying to prove that the software copying was malicious," said Cara Burns, a counsel for Novell and lawyer at the Los Angeles law firm of Arter, Hadden, Lawler, Felix & Hall.

Because the defendants admitted making unauthorized copies of Novell software, they fulfilled the "willful" condition. The "malice" requirement was met because the defendants knew they were injuring Novell by selling pirated software, Burns added.

Novell has not said how much it seeks in restitution.

wysiwyg

The algorithm method

South Shore Machine Tools in Lynbrook, N.Y., has just released Sex Machine, a utility that converts ASCII records containing uppercase name and address information to mixed case output. Sex Machine identifies the gender (sex) of each name in the file using an algorithm.

Quips & quotes

"Technology is the key to the America's Cup race. You can't win with a slow boat, and the only way to get a fast boat is to use the best technology available [with] the best computers and software."
Bill Koch, America³ skipper

Did you know?

Apple once asked owners of the Apple III computer to drop the machine from the height of 1 ft onto a flat surface. Why? To ensure that the integrated circuits inside the computer were securely in their sockets.

What's your idea of a vacation?

Bonaire
Dudley Cooke,
president of Executive Insight Group and retired Sun Oil IS exec

Scuba diving and sailing at Kenna Kai resort in Key Largo, Fla.
Joe Hovis,
director of information systems, WCTV (Tallahassee, Fla.)

HARDEE HAR HAR

A software salesman died. Because the salesman's life had both positive and negative aspects to it, St. Peter decided to leave the decision of what to do with his soul up to the dead man. St. Peter leads the guy to two doors. Behind Door No. 1, it's party time — rock and roll, funny hats, everyone having a ball. Behind Door No. 2, things are pretty quiet — serene, pastoral setting, white robes, hymnal reading. The software salesman says to St. Peter, "Gee, I'm a rock 'n roll kind of guy, I'll opt for Door No. 1." So he goes in, St. Peter backs out, door shuts, bolts, devil appears. The software salesman says, "What happened to rock 'n roll?" Devil says, "You liked our demo, eh?"

Do you know any good (clean) computer-related jokes? Then call Jodie Naze or Lory Dix at (800) 343-6474.

Special thanks to the Computer Museum, Boston

OLD COMPUTERS NEVER DIE

UnUsuaL SysTEMS
"WHAT MAKES US UNUSUAL? WE CARE. WE REALLY CARE"

An organization called Unusual Systems is seeking to preserve an icon of the computer era — control panels and consoles from mainframes and minicomputers built during the 1950s, '60s and '70s. Its current mission is to collect as many panels and consoles as possible and then exhibit them. There are 35 pieces in the current collection. Among the items Kevin Stumpf, proprietor, is interested in are Burroughs B5000s, CDC Omegas, DEC PDP-8s, GE 635s, Honeywell 115s, IBM 1401s and Texas Instruments minis. *For more information call Kevin Stumpf at (519) 741-9047.*

INSIDE LINES

What else would he say?

▶ Though relations are warming (see story page 4), Microsoft Chairman Bill Gates doesn't appear ready to cozy up to Apple and support the Pink operating system under development at Taligent, the IBM/Apple joint venture. "We're not clear as to what [the new operating system] will contain," so Microsoft has no plans to support it, he said. Gates was equally noncommittal on the Apple/IBM joint venture Kaleida, which will create multimedia products. "We don't really understand what it is they are doing," he said. "When [CEO] Nat [Goldhaber] gets his plan together, we've invited him to come on up and explain it to us."

Necessary evils

▶ Despite their renewed cooperation, Microsoft is still battling Apple in the courtroom. But Apple sure has a strong financial attraction to keep Microsoft as a partner. Microsoft pulled in $265 million in fiscal 1992 in Macintosh-related applications business, according to Gates. If Macintosh applications were a separate software company, it would be one of the 10 largest in the world, he claimed.

Blood transfusion needed — and fast

▶ While DEC struggles to reorganize, some users contend that the Maynard, Mass., company should examine its sales staff more closely. "They don't know our products. They don't know our needs. All they know is that the end of the month is coming, and they gotta make their quotas," said one longtime user who is fast becoming fed up with DEC's field staff.

Objects galore

▶ This week's ObjectWorld show will be the forum for the unveiling of a product that few analysts have had their eyes on. According to one source, Intellicorp, an erstwhile KnowledgeWare partner, is set to unveil ProKappa-PC 2.0, an object-oriented application development framework designed to bring the desktop into mainframe software development. Intellicorp has spent the past few months working with James Martin — who owns more than 10% of KnowledgeWare — to pave object-oriented paths into IBM mainframe development. Expect a fall delivery of the products, an Intellicorp insider says.

Trading places

▶ Gary McFelia, senior vice president at Chase Manhattan who is responsible for the bank's worldwide desktop support, is moving on to a new charter. In his new role, McFelia will be responsible for Chase's New York trading operations. According to sources close to the company, McFelia will oversee a $75 million project to develop a new trading platform for Chase. The project will enable Chase to link 500 of its New York traders using fiber-optic connections and Sun workstations at 1 Chase Plaza in New York.

Shooting low

▶ Toshiba is preparing its first entry into the low-cost notebook market, sources said. Toshiba general manager Michael Winkler promised earlier this year that the company would deliver a sub-$1,500 notebook by the end of summer. Sources close to the company said it was on schedule to release a $1,495 386SX-based notebook with 1M byte of RAM in September. The sources said Toshiba will also release two high-end totables — AC-powered machines equipped with both Intel 50-MHz DX and 25/50- and 33/66-MHz DX2 chips.

Ex-McCormack & Dodge personnel — some of whom were ousted from their jobs after M&D merged with Management Science America in 1990 to form D&B Software — planned a reunion last week. It wasn't a plot to recapture lost jobs but a breezy nighttime cruise around Boston Harbor. More than 100 former M&D colleagues agreed to attend the event, which was designed to "bring some fun, special people back together," said a marketing rep who helped organize the jaunt. The melding of M&D and MSA "was no merger — it was a wholly unpleasant takeover process that started at the top and worked down through the ranks," according to another ex-M&Der. Phone, fax or CompuServe News Editor Alan Alper with news (or cruise) tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

P5 delay doesn't vex users

Intel reschedules rollout to avoid DX2 overlap, ensure high chip yields

BY CAROL HILDEBRAND
CW STAFF

SANTA CLARA, Calif. — A combination of manufacturing logistics and a determination not to let history repeat itself has forced Intel Corp. to push back the formal announcement of its next-generation microprocessor, moving it into the first quarter of 1993. Users interviewed last week said the delay would have no significant impact on their product plans.

"I don't even know if there's going to be that much demand," said Enrique Crespo Jr., corporate manager of user computing services at Torrington Co. in Torrington, Conn. "Most companies are still trying to migrate to the 486."

The so-called P5, which was expected to debut in time for Comdex/Fall '92 in November, has already appeared in early silicon versions. Intel decided to delay the chip's introduction in part to make sure it could quickly reach production targets, according to P5 product manager Ron Curry.

Intel wanted to avoid repeating its experience with the 1486, which, once introduced, took a year to produce in volume, an Intel spokeswoman said. "When we announce, we want to be sure we can ramp quickly," she explained.

The P5's sedate rollout schedule has the added advantage of stretching the life cycle of Intel's 80386 and 486DX2 chips, sales of which could be cannibalized by a P5 announcement, analysts said. Moreover, rushing into production now would also have the P5 and the DX2 warring for manufacturing lines and "wafer starts," or the

Continued on page 10

Dilemma: Divide DEC to conquer?

BY KIM S. NASH
CW STAFF

MAYNARD, Mass. — Sweeping cost-control measures designed to save Digital Equipment Corp. $1 billion during the next 12 months will likely mean fewer new products, less support personnel and a new way for DEC to do business with its users.

What will be spared, as if there was ever any doubt, is DEC's new Alpha line, company officials said last week while explaining a $188 million fourth-quarter loss and a $1.5 billion restructuring charge.

Among the first issues facing Robert Palmer, who will assume DEC's helm in October, is whether to answer analysts' calls to divide DEC into product-specific units, a la IBM's December reorganization. Such a move could mean that users who have dealt with DEC as a single entity for products from workstations on up will have a few different offices to make friends with in the future.

Company officials indicated last week that spinning off operations into discrete units is indeed in the cards. They offered

Continued on page 14

Bang for the buck

DEC needs to raise employee productivity if it is to regain profitability

Revenue per employee

DG	$146,000
DEC	$122,000
IBM	$188,000
Microsoft	$268,000
Stratus	$180,000
Unisys	$144,000
Wang	$155,000

Based on figures reported for most recent fiscal year.

Source: Company reports

IBM ponders PC spin-off

BY CAROL HILDEBRAND
and CHRISTOPHER LINDQUIST
CW STAFF

WHITE PLAINS, N.Y. — IBM executives are close to reaching a decision on whether to break out the Personal Systems Division as a separate subsidiary by mid-September, sources said late last week.

It is unclear, however, whether OS/2 development will be part of the new division. That decision hinges on whether the subsidiary can absorb OS/2's enormous development costs and still remain profitable.

A source close to IBM con-

Continued on page 10

Windows leads Delta to mixed platforms

Reservation system may need more than OS/2

BY ROSEMARY HAMILTON
CW STAFF

ATLANTA — Delta Air Lines last week revealed that it is shifting from a primarily IBM OS/2 desktop strategy to one that calls for a mix of operating environments, including Microsoft Corp.'s Windows.

The company is close to selecting Windows to replace OS/2 as the environment for its critical, next-generation reservation system, said Ron Eubanks, director of communications and information services support. A final decision has not been made, but "as we tested [OS/2] against Windows, we determined Windows is the better product to use" for this project, he said.

The new reservation system, perhaps the most critical airline operation, is mainframe-based and will be tailored to include intelligent front-end workstations for reservation agents. It will initially be used by 900 agents.

Eubanks said he expects the project to take 12 months. He would not reveal the development cost.

In December 1991, the airline had selected OS/2 for this job as well as for another key project. At that time, the company planned to buy thousands of OS/2 licenses. While Delta does not intend to pull the plug on OS/2 completely, it has decided not to rely on the IBM software as exclusively, Eubanks said.

The company's reservation system programmers want to move forward with the Microsoft software because it is "functionally and speedwise" superior to OS/2, he said.

"The programming folks say, 'Hands down, Windows is the best for this particular environment,' " Eubanks added.

He said this change reflects a new approach at Delta to avoid locking into a particular platform. The goal now is to evaluate software for development proj-

Continued on page 15

MIDCOURSE CORRECTION

Political mine field could sabotage OSF future plans

BY MARYFRAN JOHNSON
CW STAFF

Second of a two-part series on the Open Software Foundation.

CAMBRIDGE, Mass. — Admirers call it the United Nations of the computer industry. Critics call it the Tower of Babel.

Yet whenever the Open Software Foundation makes a move, it has the potential to affect the cutthroat competition among the six major systems vendors that sponsor its work. It can also send ripples through the individual agendas of its 340 member companies.

"It is a political mine field," said Mike Saranga, president of the OSF's board of directors and IBM's assistant general manager of systems, structures and management. "We are very aggressive competitors. It's not like we are kissing cousins and we just got together for a big shindig."

The reasons that brought the OSF together no longer matter much to users — if, indeed, they ever did.

"There's been quite a bit of confusion over the past few years, and I think that's led to reluctance in embracing open systems," said Mike Prince, information systems director at Burlington Coat Factory in Lebanon, N.H.

On the other hand, Prince said he believes the coalition of pow-

Continued on page 50

INSIDE

Flexible licensing terms sell Price Waterhouse on software suite. Page 4.

Coalition will build insurance claims network to cut soaring health care costs. Page 6.

Better late than never: IBM slashes PC price tags by up to 30%. Page 10.

Objects collide with relational databases. Page 12.

Executive Report — Group(ware) therapy. Page 71.

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IN THIS ISSUE

NEWS

4 Price Waterhouse signs up for 25,000 licenses of four **Borland** products.

5 Frito-Lay's IS chief heads to **Perot Systems.**

6 Citing spiraling administrative costs, health care leaders urge the adoption of an EDI standard for medical insurance claims by 1996.

6 In the same vein, a health care consortium is piloting a network that it hopes will cut administrative costs by up to 50%.

10 IBM responds to **Compaq's** pricing but acknowledges that price breaks may not be enough.

12 Several vendors announce interfaces between object-oriented and relational databases, putting the two on a possible collision course.

14 Ken Olsen's legacy; Robert Palmer's challenge.

16 Motorola's new pager service combines satellite transmission and a pocket-size receiver to deliver E-mail to portable computers.

20 Proteon unveils a bridge/router in the $5,000 to $8,000 price range.

21 The Defense Department opens a Center for Software Reuse Operations.

21 Prime Computer will discontinue its hardware line immediately.

Quotable

"Forget about the VAX. Don't put any more money into that product line. Get on with open systems, PCs and Unix workstations."

EDSON DE CASTRO
DATA GENERAL

On what he would do in Robert Palmer's shoes at DEC.
See story page 14.

DESKTOP COMPUTING

45 Applications suites are changing the way companies do business.

48 Technology Analysis: Harvard Draw 1.0 and Windows Draw 3.0.

WORKGROUP COMPUTING

49 IBM teams up with **Chipcom** on superhubs.

ENTERPRISE NETWORKING

55 Managers are investing more heavily in network support.

LARGE SYSTEMS

63 Virginia power plant puts safety documents on-line for its 12,600 employees.

APPLICATION DEVELOPMENT

67 Many developers are waiting for the operating systems wars to shake out before pledging to OS/2 or Windows NT.

MANAGER'S JOURNAL

81 The **Treasury Department** is cashing in on an $850 million deal to revamp its communications systems.

EXECUTIVE REPORT

71 It takes a lot more than unwrapping the package to make groupware work: Tips on how to stay sane.

IN DEPTH

75 Usability labs test to make sure applications developed in-house make sense from a user perspective. By Alice LaPlante.

DEPARTMENTS

6, 16 News Shorts
25 Advanced Technology
28 Editorial
82 Book Reviews
83 Computer Careers
91 Marketplace
96 Stocks
97 Computer Industry
98 Inside Lines

The 5th Wave

"HOW SHOULD I KNOW WHY THEY TOOK IT OFF THE LIST? MAYBE THERE JUST WEREN'T ENOUGH MEMBERS TO SUPPORT AN 'AIREDALES FOR ELVIS' BULLETIN BOARD."

EXECUTIVE BRIEFING

■ **Delta Air Lines might put OS/2 on the next plane out of town and instead go with Windows for a major development project — at least for the time being.** The switch comes as Delta begins a revamp of its reservation system. The move still may not augur a corporatewide Windows strategy, however, as the airline struggles to sort out the issues. **Page 1.**

■ **People and organizational concerns, not technology, pose the biggest obstacles to successful groupware implementations.** Although workgroups often require expanded networking capabilities, early adopters and consultants say that getting different individuals and departments to cooperate remains a far bigger challenge. **Page 71.**

■ **After spending tens of millions of dollars** to develop a customer service application, IDS Financial found out what it had created was technically sound but hard to use. Today, IDS and other companies are relying on usability labs to ensure that software works the way users do. **Page 75.**

■ **An unconventional licensing agreement** between Borland and Price Waterhouse gives the accountancy unlimited use of selected applications. **Page 4.**

■ **With the end of the Unix wars,** some people wonder if the OSF has a future. Sponsors say it does, if only because it gets the biggest vendors pulling in the same direction. OSF is now turning its attention to distributed computing technologies. **Pages 1, 50 and 51.**

■ **A health care industry coalition** and a subsidiary of pharmaceuticals giant McKesson Corp. join forces to pit information technology against escalating administration costs. **Page 6.**

■ **IBM has cut price tags on its personal computer family** by up to 30%, but analysts remain convinced that Big Blue needs to reassess its marketing and distribution strategies. **Page 10.**

■ **Charles Feld, the IS chief who helped Frito-Lay** figure out "where every bag of potato chips is," joins Perot Systems to run a new unit. **Page 5.**

■ **Object-oriented and relational databases** may draw closer as vendors bring out links between them. **Page 12.**

■ **Rod Canion, Compaq Computer's founder, resurfaces** with the formation of a business integration consultancy. **Page 5.**

■ **DEC users suggest Robert Palmer,** the company's new chief, pay more attention to marketing and communicating with customers. **Page 14.**

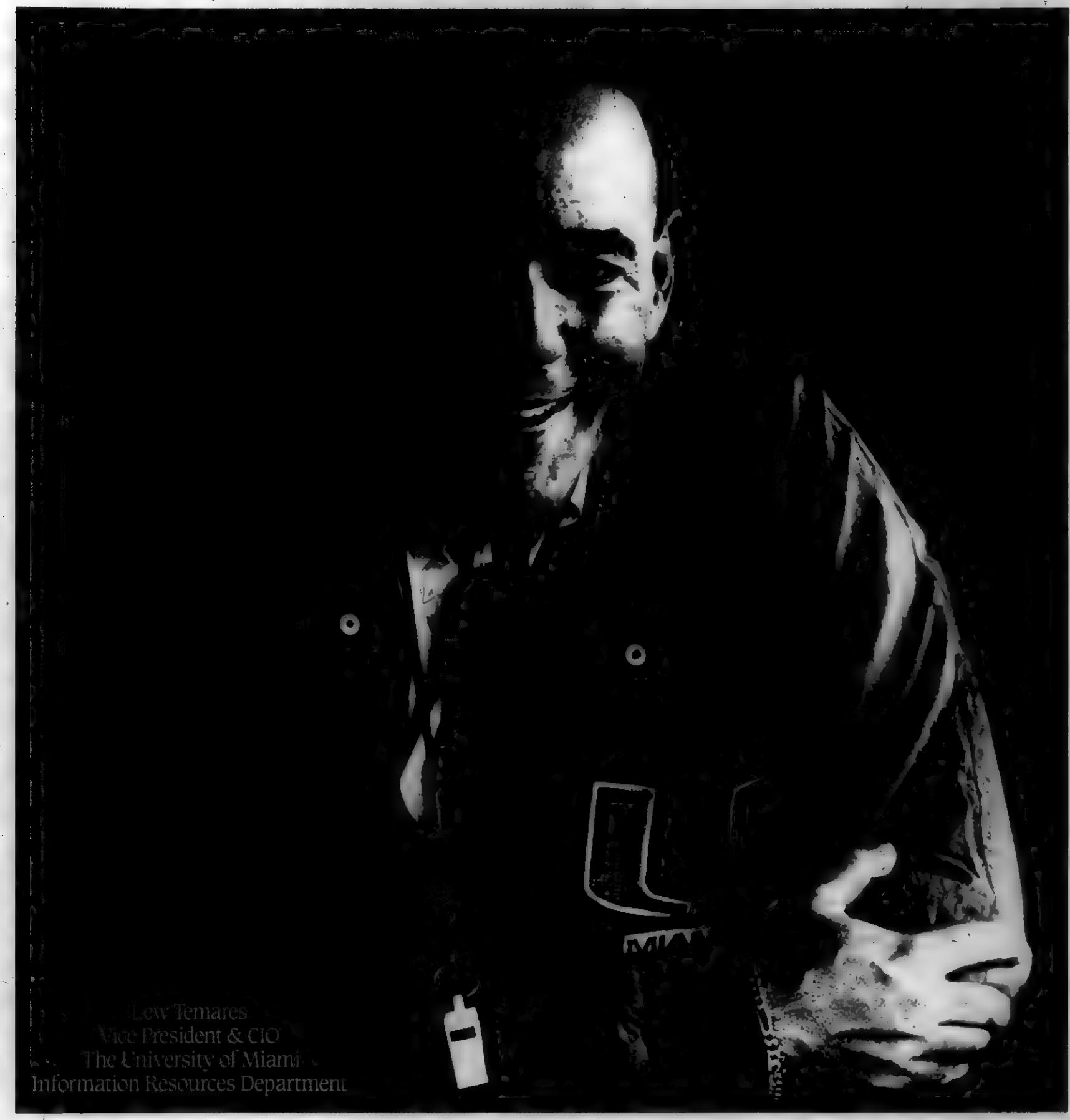
■ **The Department of Defense opens its Center for Software Reuse Operations.** The center provides access to 2.2 million lines of Cobol and Ada code in 1,531 reusable software modules. **Page 21.**

■ **Biometric security devices** and catching on as prices fall, offering computer managers a vast improvement over password protection. **Page 25.**

■ **Network support costs have grown** 20% a year since 1987 and show no signs of slowing as distributed computing makes things messier. **Page 55.**

■ **Windows NT mania isn't transferring** to corporate software development groups just yet. Some users say they'll wait till the operating systems wars are settled. **Page 67.**

■ **On site this week:** Notebook computers help New York Life agents close the deal in the customer's living room. **Page 45.** A Virginia utility gets creative in holding down imaging costs, using fax machines instead of computers to deliver documents. **Page 63.** Maintenance and license fees drive a club operator's move from Unisys mainframes to Sun Microsystems servers. **Page 64.**



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Borland offers twist on licensing fees

BY CHRISTOPHER LINDQUIST and ROSEMARY HAMILTON
CW STAFF

In a move likely to intensify the already cutthroat competition among personal computer developers vying for corporate business, Borland International, Inc. last week announced a package deal that gives Price Waterhouse some 25,000 licenses for each of four Borland products.

The pact features a licensing agreement based on hardware equipment and unlimited use of selected applications. Price Waterhouse will pay a set fee — which one analyst estimated at around $50 per package — to run Borland software on all computers at the company as well as an undisclosed license fee for each additional computer the company buys in the future, according to Sheldon Laube, national director of international technology at Price Waterhouse.

The company will then have the right to install any or all of the four packages — ObjectVision, dBase, Quattro Pro and Paradox — on its machines.

Neither Price Waterhouse nor Borland would comment on the fee schedule.

In addition, Price Waterhouse signed a multiyear maintenance agreement that gives it access to all future upgrades.

The contract no doubt stings Lotus Development Corp., which has a long history with Price Waterhouse and a fierce rivalry with Borland. In addition to being a showcase account for Lotus' Notes — one of the first — Price Waterhouse is a 1-2-3 customer.

The deal effectively eliminates the headache of keeping track not only of the number of computers the financial services firm has but also the number of Borland licenses in use, who has them and where. Now, a single number will suffice.

"We needed a whole new way of doing licensing," Laube said.

At issue was the necessity of some users to use a package on an infrequent basis. Under the old system, the user would have to buy a licensed copy of the product and install it on his computer to remain legal. Now, the same user can simply copy the product from another user. Until the Borland arrangement, "there was no reasonable way of doing that," Laube said.

"Borland has shown an aggressive willingness to throw out the old rules on licensing from the beginning of the company," Laube added.

Borland's history has been strewn with innovative approaches to software licensing and marketing, including the No-Nonsense License Statement, which says Borland software should be treated like a book with no more than one user at a time per license, and the competitive upgrade strategy now used by most large PC vendors.

"Borland loves to upset the status quo and challenge the system," said Stuart Woodring, director of software strategies research at Forrester Research, Inc. in Cambridge, Mass.

Several analysts indicated that such deals have been struck with large buyers on many occasions in the past, but what differs in this case is that Borland is a much smaller company than previous vendors, and it is making a point of publicizing the sale — something other companies have been careful to avoid in order to prevent a price war.

"Nobody wants the real large-volume, funky price deals to come to light, but they're out there," Woodring added. However, Borland seems willing to open the shades.

"Large-scale guerrilla warfare" is how Jim Geisman, president of Marketshare, Inc. in Wayland, Mass., described the move. However, he said, it remains to be seen how many similar purchases the deal will provoke. "This does put a mark on the wall, but how many people will reach up and touch it?"

Deciding factor

Q. What affects your company's software purchasing decision most?

Percent of respondents; base: 121

Source: CW Database Division — CW Chart: Michael Saggese

Shakin' things up

Borland has reorganized into four business units to "reflect the realities of the marketplace," which include the company's inability to get its Windows products out the door, according to a spokeswoman.

Borland's four business units are Paradox and the Paradox Engine, Applications (including Quattro Pro), Languages and Development Tools (dBase and ObjectVision, among others) and InterBase and Workgroup.

Previously, Borland was divided into three groups: InterBase, Applications and Languages. The reshuffling, which was disclosed days after Borland reported a significant second-quarter earnings decline (see story page 97), creates smaller, more focused groups aimed at specific markets, according to a Borland spokeswoman.

"This [reorganization] may well be a near-term response to get the suckers out the door," said Neal Hill, a senior analyst at Forrester Research. "This puts things back in the hands of people who know them the best — [Rob] Dickerson with Paradox and [Steve] Kahn with Quattro Pro."

A tighter focus may be just what Borland needs at the moment as it begins to get late Microsoft Corp. Windows products moving and starts developing workgroup applications around its Interbase Engine in an attempt to present a unified strategy for corporate software buyers. However, while the reorganization may help stabilize the company, it also indicates that some problems did exist. "This is going to call into question the degree to which this is a stable $500 million company," Hill said. "They're casting about trying to find the right formula."

CHRISTOPHER LINDQUIST and MARK HALPER

Microsoft, UB form client/server duo

BY JOANIE M. WEXLER
CW STAFF

REDMOND, Wash. — Ungermann-Bass, Inc.'s (UB) anointment last week as a Microsoft Corp. strategic integrator could give Microsoft customers an in-the-know expert to help them forge ahead with client/server computing.

UB has long been a LAN Manager and SQL Server reseller; its newly elevated status interlocks Microsoft operating systems, client/server technology and training and support with UB's large-scale network integration expertise.

The deal is also aimed at fueling UB's enigmatic server-in-a-hub concept — a scheme that both Microsoft and Novell, Inc. have committed to support — for integrated, centralized server management. The agreement assures customers already considering bundling Microsoft operating systems into their hubs that the UB platform will also support future Microsoft technology.

The strategy has drawn supporters and skeptics alike. Some lauded the merits of blending computing and communications management under one umbrella; others were uneasy with servers residing in an inaccessible, locked wiring closet that is tended by cabling personnel.

Even UB hub customer Microsoft is "on the fence" about whether it will be beneficial in its network, said Dave Leinweber, Microsoft's senior manager of corporate networking.

However, the fortified Microsoft/UB relationship should give Microsoft customers somewhere to turn for help with constructing and administering heterogeneous, distributed networking infrastructures that will carry Microsoft's LAN Manager, SQL Server, Windows New Technology (NT) and LAN Manager for Windows NT network applications.

Users shifting to widely distributed enterprises are facing dilemmas with decentralized administration and support, which will "have to be addressed in any changes we make to our network," said Michael Purcell, staff software engineer at LAN Manager shop Baxter Healthcare Corp., based in Deerfield, Ill.

The Baxter network currently consists largely of stand-alone local-area networks, which the firm is looking to interconnect.

Fixing the glitches

In blending the network application and transport worlds, "a number of issues can come up," UB President Ralph Ungermann explained. For example, he said, an organization running many different kinds of printers might need help in getting LAN Manager applications to interoperate with all of them.

Microsoft's internal network has itself benefited from some UB integration services. For example, Microsoft runs a UB-designed version of the XNS communications protocol that has been specifically optimized for use with the network operating system, Leinweber said.

Microsoft also has integrator alliances with Digital Equipment Corp. and other firms, although the software giant "doesn't have this type of relationship with any other hub vendor," said Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass. Moreover, hubs are becoming cornerstone devices on which many corporate networks are being founded.

Other hub companies, such as market leader Cabletron Systems, Inc., are taking on integrator roles, although most are serving more as a single sales source for network equipment than as an integrator of applications and networks. However, hub maker Networth, Inc., which is half-owned by UB, has a close-knit relationship with Novell that is akin to the Microsoft/UB alliance and thus provides UB inroads into the two largest LAN installed bases.

On the table

Companies implementing client/server computing via LAN Manager are the primary beneficiaries of the Microsoft/Ungermann-Bass alliance, which includes the following characteristics:

- Current and future Microsoft operating systems, client/server technology and training and support to partner with UB's large-scale network integration expertise and support.
- UB to distribute future LAN Manager and Windows NT products.
- UB to support current and future Microsoft technology in its wiring hubs and under its management system.
- UB to participate in Microsoft technology planning.

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Frito's Feld joins Perot Systems

Former IS chief will run business unit to help companies use information

BY MARK HALPER
CW STAFF

HERNDON, Va. — The information systems chief who helped Frito-Lay, Inc. figure out "where every bag of potato chips is" joined Perot Systems Corp. last week to run a new unit charged with helping businesses exploit information.

Charles Feld, who is credited with transforming Frito-Lay's IS group into a strategic operation that uses sophisticated databases to track product and detect regional consumer patterns, was named vice president. He will report to Perot President Pat Horner.

Feld, who served as vice president of management information at Frito-Lay, left the Dallas-based snack food maker earlier this year to form his own consulting group, the Feld Group, which Perot has absorbed. Financial terms were not disclosed.

Perot Chairman Mort Meyerson said Feld will help form a new group within the company that will aid businesses in implementing the types of changes that Feld brought to Frito-Lay.

Perot's Feld *put in charge of 'urban renewal'*

Lessons learned

Under Feld's tutelage, Frito-Lay implemented relational database management systems that enabled it to keep a tight control on inventory and to map out regional business plans, altering promotions and brand names to suit different market preferences.

"You can take your computing power and use it for marketing and distribution, which is what Charlie did at Frito," Meyerson said.

Feld last week described his mission as "urban renewal," noting that corporations need to move away from mainframe computing toward more distributed client/server technology.

"They have to start knocking buildings down and putting new ones up," Feld said.

Canion forms consultancy

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Joseph R. "Rod" Canion, former Compaq Computer Corp. co-founder and chief executive officer, resurfaced last week with the formation of a business integration consultancy.

Speaking at a press briefing, Canion said Insource Management Group will help businesses regain their competitive edge, or what he calls "business fitness." He said its mission is to help clients rethink and redesign how they operate by integrating their business strategy and processes with information systems.

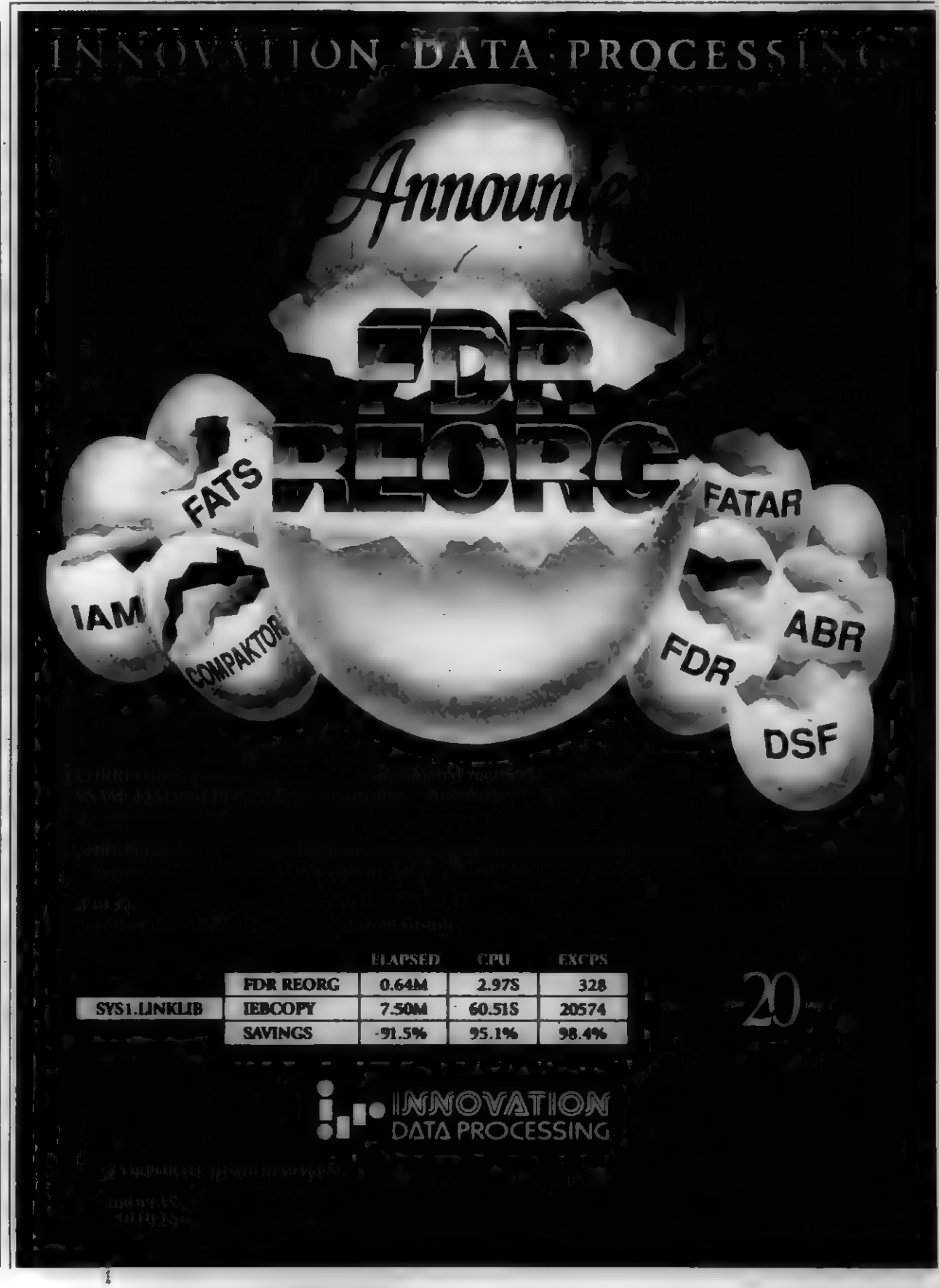
Funded by a $1 million investment — split by Canion and Compaq co-founder James Harris — the company will compete with outsourcing giants such as Electronic Data Systems Corp. and Andersen Consulting.

According to Canion, Insource Management hopes to build long-term client relationships that involve the following three phases:

- First, a team of client and Insource Management staff evaluates the business processes to ensure that they tie in to the company's overall vision.
- Second, the new processes are implemented using appropriate technology.
- Third, the client is trained to manage the new environment and keep abreast of change.

As chairman, Canion carries with him the experience of guiding Compaq through its tumultuous growth years and of being ousted from that same company when he failed to react quickly enough to a rapidly changing market.

President and CEO of Insource Management is Ronald L. Fischer, an EDS executive who was most recently general manager of Perot Systems Corp., a systems integration company headed by Ross Perot. Harris is the final member of the new company's board. The firm has about 10 employees.



NEWS SHORTS

Job stress, keyboard woes linked

A federal study of 533 telephone operators at US West confirmed a link between job stress and the epidemic of hand, wrist, arm and neck injuries from intensive keyboard work. The National Institute for Occupational Safety and Health said 22% of the workers had medically verified injuries. The injuries cropped up mostly among those who feared losing their jobs, faced increased work loads, lacked job diversity and authority and were subjected to electronic performance monitoring.

D&B to shutter Amaps help center

Dun & Bradstreet Software plans to close a service and support facility in Eagan, Minn., used by companies running Amaps, a mainframe-based manufacturing application. Service functions performed by the 70-member staff will be transferred to an Atlanta office by December, a spokesman said. Approximately 10 workers will be offered positions in Atlanta or at D&B Software's Framingham, Mass., office. The others will be offered severance, he added. The move will save the firm an undisclosed amount of money, but it is part of an effort to de-emphasize resources spent on building host-based software in favor of client/server applications, he said.

Object DBMS heart of repository

Versant Object Technology Corp. in Menlo Park, Calif., said last week that its Versant object database management system was the product being used by IBM as the foundation for its AD/Cycle Repository for personal computers running OS/2 and RISC System/6000 workstations running AIX [CW, July 20]. Previously, only MVS systems with IBM's DB2 relational database hosted the Repository Manager. Earlier this year, IBM and Versant had agreed to use the Versant database for IBM's AIX computer-aided software engineering framework offering, said David Gilmour, executive vice president of marketing at Versant.

Unisys wins Ferro outsourcing pact

Unisys Corp. announced last week that it has won a $13 million outsourcing contract with Ferro AB of Sweden, a group of companies that supply professional and consumer hardware goods. Under the five-year deal, Unisys will buy back and operate Unisys computers at the customer site in Alingsas, Sweden. Unisys also will repurchase three of its 2200/400 mainframe computers from Ferro and hire Ferro's information systems staff during a 60-day transition period, which began this month. Ferro will retain its in-house software development staff. Ferro estimated the outsourcing pact will save between $3.3 million and $4.9 million over five years.

EDS extends pact with Enron

Electronic Data Systems Corp. last week signed a three-year outsourcing contract extension with Enron Corp. and also took a 3% stake in the company. The new agreement prolongs the original 1989 contract through 2001 and adds roughly $180 million to the value. Analysts have estimated the size of the original 10-year deal at about $750 million. EDS spent $149.5 million for 3.5 million shares in the $13.5 billion Houston-based natural gas and oil company.

Short takes

Recapitalization discussions among **Encore Computer Corp.**, **Gould, Inc.**, and Gould's Japanese parent, **Nippon Mining Co.**, aimed at an equity infusion for Encore continued last week. . . . IBM Senior Vice President David McKinney, a 36-year veteran, will retire from the firm as of Friday. . . . Greg Carroll, executive director at Washington, D.C.-based **The Computer Leasing & Remarketing Association** (CDLA), will officially step up to the CDLA presidency as of this Saturday. He succeeds Kenneth A. Bouldin. . . . Frank King, former **Lotus Development Corp.** executive, has surfaced as a member of the board of directors at **Excalibur Technologies Corp.**, a maker of document imaging systems.

More news shorts on page 16

Team fights rising medical costs

Will build on-line system that could cut administrative expenses by 50%

BY NELL MARGOLIS
CW STAFF

A health care industry coalition and an information technology subsidiary of $10.3 billion pharmaceuticals giant McKesson Corp. last week joined forces to pit information technology against escalating health care administration costs.

The Health Care Information Network (HCIN), expected to debut by mid-1993 after a several-month pilot program, weds the National Electronic Information Corp.'s (NEIC) vast insurance claims network to prescription drug management software developed by McKesson subsidiary PCS, Inc. The partnership creates a real-time, on-line system for routing a broad slate of managed health care transactions nationwide.

The network will "virtually eliminate paperwork and phone calls" between health care providers, customers and product vendors, claimed Kenneth J. O'Donnell, chief executive officer at NEIC, a Secaucus, N.J.-based managed care professional consortium.

NEIC's 330-vendor member network serves 100,000-plus provider subscribers to account for the health insurance coverage of 85 million people in the U.S.

Health care administrative costs have spiraled to an estimated $80 billion a year, said Joseph T. Brophy, president of The Travelers Insurance Co. in Hartford, Conn., an NEIC member and longtime activist in the health care technology arena. HCIN could reduce that figure by as much as 50%, he added.

HCIN "is a truly significant step" in the battle to control health care costs, said Brophy, who is also co-chairman of the industry's Workgroup for Electronic Data Interchange (WEDI), which last week called for nationwide adoption of the ANSI X12 electronic data interchange standard for insurance claims and billing by 1996 (see story below).

Software to the rescue

"For 10 years, NEIC has been in the business of moving claims" across its public utility network, said Gerald Marrinan, vice president of group health at NEIC member Metropolitan Life Insurance Co. "Now, with the PCS software, it will also be able to move other managed care information — for instance, eligibility requirements, authorizations and referrals."

Brophy said not to discount HCIN's importance on the basis of its restriction to administrative rather than clinical issues.

"Just eliminating postage could reduce health care costs by $4 billion to $10 billion a year," he said. "Electronic [claims] submission could save $20 billion, $30 billion, $40 billion a year, easily."

"Hassle-free," instantaneous transmission of vital claims, patient eligibility, treatment authorization and referral information, O'Donnell said, will wipe out costly and sometimes dangerous delays and omissions.

The network bears no guarantee that the dramatic cost savings will be passed along to patients, several executives involved with the HCIN inititiative said. However, they said, such trickling down is expected.

Phoenix-based prescription drug payment manager PCS won the hotly contested bid to be NEIC's technology partner on the HCIN project, beating out Electronic Data Systems Corp. and IBM subsidiary Integrated Systems Solutions Corp. largely on the strength of technology and timing, O'Donnell said.

"EDS is a very large and powerful company [with a] great deal of health care expertise," he said. "So is IBM. But PCS had an on-line, real-time network [tailored to] the pharmacy marketplace, up and running. There was simply less to develop."

Some 52,000 U.S. pharmacies (approximately 94% of the market) are linked across PCS' Recap network, a 24-hour, seven-day system with extensive emergency backup and storage, McKesson and NEIC said.

Health care leaders boost campaign for EDI

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Leaders of the health care industry last week launched an aggressive campaign to cut $4 billion to $10 billion in paperwork and administrative costs by using electronic data interchange (EDI) and uniform data elements.

Travelers' Brophy: *One standard will replace 400 computer formats*

The sweeping recommendations, made by an industry task force and supported by the federal government, call for nationwide adoption of the ANSI X12 EDI standard for insurance claims and billing by 1996.

"We're going to have one standard to replace more than 400 different computer formats," said Joseph T. Brophy, president of The Travelers Insurance Co. in Hartford, Conn., and co-chairman of the industry's Workgroup for Electronic Data Interchange.

The task force report urges the big players in the industry — such as Medicare, major private insurers and employer plans, hospitals and large clinics — to use EDI by the fourth quarter of 1994, while smaller firms and doctors' offices are given until 1996.

Analysts said the challenge is to get the nation's 6,000 hospitals and 600,000 physicians on board and to figure out who will pay for the transition from proprietary systems to X12 systems.

John Glaser, vice president of information systems at Brigham and Women's Hospital in Boston, praised the initiative, especially the insurance industry's effort to settle on a uniform set of data elements.

"It's a real pain for us to keep track of a couple dozen health insurance formats," he said.

Full compliance

Glaser said hospitals can migrate to X12 as fast as third-party vendors upgrade their software packages. But, he said it may take a legislative fiat to get 100% compliance throughout the health care industry.

Those hospitals that already use EDI have reduced the turnaround time for submitting claims and receiving payments from an average of 80 days to just two or three days, according to researchers at Input, Inc. in Mountain View, Calif.

The EDI intiative has widespread support in the health care industry, including the national Blue Cross/Blue Shield Association, the American Hospital Association and the American Medical Association.

WHAT HAVE BILL GATES, SCOTT MCNEALY, JOHN SCULLEY, JOHN YOUNG AND LARRY ELLISON AGREED TO COOPERATE ON?

Regional banks form ATM network

Electronic Payment Services, Inc. will link 1,400 banks with 13,000 ATMs in 16 states

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Four of the biggest U.S. regional banking companies last week signed a definitive agreement to form one of the largest electronic payment and automated teller machine (ATM) networks in the country.

The cooperative venture — which will link the ATMs and point-of-sale (POS) networks of CoreStates Financial Corp., PNC Financial Corp., Banc One Corp. and Society Corp. — is expected to help the member banks reduce their operating costs significantly through the joint sharing of technology. No estimates are available yet on the anticipated savings, although the cooperative is expected to have annual revenue exceeding $200 million with approximately 600 employees.

The venture, Electronic Payment Services, Inc. (EPS), will be finalized in November, pending approval by the Federal Reserve Board. The banks are planning to link their networks together "some time in 1993," a spokesman for Society said.

EPS will initially represent 1,400 financial institutions with 13,000 ATMs in 16 states, although most of the ATMs are located in Pennsylvania and the Ohio Valley. The company, which will be based in Delaware, will be the largest processor of ATM transactions in the U.S., processing an estimated 1 billion transactions per year.

That includes roughly 20% of the national switch volume, or 730 million "switch" transactions, which occur when customers use ATMs other than the ones owned by the bank that issued their ATM card. There are roughly 90,000 ATMs across the U.S., which process about 6.6 billion transactions annually. In addition, EPS is expected to process more than 650 million electronic POS transactions annually through 150,000 POS terminals used by retailers nationwide.

Banking on an idea

Diogo Teixeira, a partner at Ernst & Young in Boston, said the deal is significant in the banking industry because this is the first venture involving four major regional banking companies.

EPS solves major strategic problems for its founders, particularly CoreStates, Teixeira said. CoreStates was the sole owner of the Money Access Service, Inc. (MAS) network, which, although profitable, had trouble expanding because other banks were reluctant to join a network of only one bank.

However, the integration of these wholly owned ATM networks should enable CoreStates and its partners to dramatically reduce their operating costs, Teixeira said, especially because switching software no longer has to be duplicated.

Strong POS growth will also aid EPS' future, Teixeira said. Retailers have recently begun using POS terminals that accept plastic ATM cards at checkout counters for debit payments in addition to cash, credit cards and checks.

Although the use of ATM cards to automatically deduct purchases from a consumer's bank account is more common in the Western states than on the East Coast, Teixeira said, its adoption by retailers in the East is expected to grow. In fact, the New York Cash Exchange (NYCE) Network has grown to 8,800 POS terminals from only 1,400 last year, said Joan Savarese, vice president of marketing at the NYCE Network.

NYCE Network was formed a few years ago by The Chase Manhattan Bank NA and Chemical Banking Corp., but that venture included nine owners and dozens of smaller partners who are part-owners, Teixeira said. NYCE annually processes 840 million transactions over 10,000 ATMs.

Regional contributions

Savarese said the EPS alliance will not directly impact NYCE because NYCE primarily consists of banks and ATMs in New York and New England.

Philadelphia-based CoreStates will be the leading investor, contributing its MAS ATM network and its wholly owned subsidiary, Buypass Corp., an Atlanta-based processor of electronic POS transactions. Banc One, based in Columbus, Ohio, will contribute its Jubilee ATM network and its POS business. Pittsburgh-based PNC will add its Trinet ATM network, its Owl ATM network and its POS business while Cleveland-based Society will integrate its Green Machine Network Corp. and its POS business.

PNC, CoreStates and Banc One will each own a 31% stake in EPS, while Society will own 7%. CoreStates will receive a cash payment of $78 million from PNC and Banc One, $245 million in preferred stock and dividends tied to the earnings of the new company. With those payments, CoreStates expects to turn a $23 million profit while increasing capital by $100 million.

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IBM (finally) cuts PC prices

Lower tags a start, but Big Blue needs to reassess marketing, distribution

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — IBM finally joined the throng of personal computer vendors responding to Compaq Computer Corp.'s inflammatory pricing flag, but analysts cautioned that the industry giant will also have to provide new product lines and explore different distribution approaches to retain market share.

"I don't think price is enough," said Sam Albert, president of Sam Albert Associates in Scarsdale, N.Y. "It's a very vital statistic, but there are other critical success factors like distribution, marketing and support."

Peter Reilly, director of Personal Systems marketing at IBM's National Distribution Division, acknowledged that the firm has a ways to go. While saying that the 25% to 30% price cuts, coupled with the company's 486SLC2 upgrade offer of $259, bring the firm up to par with Compaq, he noted, "We can't cover three product lines with one. We clearly have some holes in our product lines."

Pros and cons

Some users applauded the pricing moves. Joe King, assistant vice president of client support services at Continental Insurance Co. in Neptune, N.J., said that between the discounts he gets from his dealer and the ones he gets from IBM, the price cuts put the IBM boxes in a very competitive price range.

His firm is standardized on the Personal System/2 Models 56 and 57, "and with the combination of those two discounts, the 56 and 57 boxes are very competitive with Compaq offerings," he said.

King also lauded the 8M bytes of random-access memory now standard on those PCs. "We were expecting a low-cost upgrade, and they made it free; it's very good news," he said.

However, the price cuts came too late for other users. Enrique Crespo Jr., manager of user computing services at Torrington Co. in Torrington, Conn., explained, "By the time IBM brought prices down to our level, we had a whole population of other machines. We don't want to start out with new hardware." He cited investments in maintenance, training and spare parts as factors.

IBM has other plans, but Reilly did not comment on the reported September launch of an entry-level product line. "We need to have a brand of products that are more industry-standard," he said, agreeing that the XT/AT bus would be an industry standard. "Clearly, there is work yet to be done."

He also acknowledged that the company has a long row to hoe in broadening its distribution lines. Although he swore allegiance to the dealer channel, he said the company would expand. "Our stated strategy is to get into enough distribution channels to satisfy all segments, and we're not there yet," he said.

Reilly said the company was about to ship its first mail-order catalog, and IBM customers would eventually be able to order PCs via an 800 number. The company is currently piloting such a number with OS/2. However, he denied reports that the non-IBM brand name Ambira PC series — currently available in Europe, Canada and the UK — would be available in the U.S.

A little off the top

IBM aggressively cut the prices of its PS/2 line up to 30%. Some examples are:

Model	Old Price	New Price	Configuration
56 SLC-039	$4,050	$3,025	20-MHz 386SLC; 8M bytes RAM; 2.88M-byte disk drive; 160M-byte hard drive
57 SLC-039	$4,465	$3,340	20-MHz 386SLC; 8M bytes RAM; 2.88M-byte disk drive; 160M-byte hard drive
95 SX-0HF	$11,295	$8,915	25-MHz 486SX; 8M bytes RAM; 1.44M-byte disk drive; 400M-byte hard drive
N51 SLC-026	$3,145	$2,265	16-MHz 386SLC; 2M bytes RAM; 1.44M-byte disk drive; 80M-byte hard drive

Playing leapfrog

As IBM slashed prices across its PC line, Advanced Logic Research, Inc. (ALR) lopped 22% to 33% off its line of Intel Corp. 1486-based Ranger notebooks, which hit the shelves a scant six months ago.

"We want to make a stance in the high-end notebook business," said David Kirkey, ALR's vice president of marketing. "We think we entered the market with what prices are going to be six months down the road."

ALR typically offers one of the lowest prices on 486 products and is betting its notebook strategy on the 486 platform.

The price of a monochrome 25-MHz 486 system with a 80M-byte hard drive was cut 32%, to $2,495. A similarly configured color notebook was reduced 22%, to $3,495. Kirkey said a 486DX/25 notebook, priced at $2,995, was 27% less than a comparable Toshiba America Information Systems, Inc. T4400 DX configuration, which is priced at $4,098.

CAROL HILDEBRAND

P5 chip delay does not vex Intel users

CONTINUED FROM PAGE 1

basic chip building blocks, the spokeswoman explained.

"I think the market is doing very well with 486DX2, so there's not a pressing need for a new chip," said Michael Slater, editor of "The Microprocessor Report," a Sebastopol, Calif.-based newsletter. "Having accomplished the strategy of convincing the industry that they will have something that will compete with high-end [RISC] chips, they can take a leisurely pace and make sure that they have it all right."

While most personal computer vendors would not comment on the delay, few seemed perturbed. Intel's spokeswoman confirmed that numerous vendors would demonstrate their P5 wares at Comdex.

Another advantage to waiting is continued debugging. Dean McCarron, director of technology at Scottsdale, Ariz.-based In-Stat, Inc., added that with such a complex chip, it is difficult to get the early test runs to yield an acceptable ratio of good chips. "With a bigger processor, there's more room for mistakes," he explained.

Users and analysts both said it would be worth waiting a couple of months to avoid a debacle like the 486/50-MHz debut, where several vendors shipped PCs before discovering bugs in the chip.

"We'd be happier to see them go through all their quality-control measures first than have it a couple of months earlier," said Bill Lodge, a project leader at Turner Corp. in New York. Lodge, whose company moved off mainframes to a networked PC environment, got caught in the crunch caused by the 50-MHz 486 chip, which had some heat dissipation problems.

Others, only now moving onto the 486 line, were not especially put out by a several-month delay on a high-end chip.

"I don't think it will have any major impact on us," said Glenn Sandusky, chief information officer at Miller Mason & Dickenson in Chicago. "We don't have any overwhelming need for the 586 right now." He said it might be something to look into in the future as he gets larger clients.

Jeff Newman, assistant vice president at Barclays Bank PLC in New York, said that although he couldn't wait to see a P5-based PC, he plans to wait till the chip goes down in price before buying. The delay "doesn't affect me either way because the PCs will be too high-priced at the beginning," he said. "I now would have to think a dozen times before I spent more than $4,000 on machines."

The P5, which Intel estimated will initially run at about 100 million instructions per second, is the company's first superscalar processor, which essentially means that the chip will be able to perform multiple tasks simultaneously. It has 3.5 million transistors — more than double that of the 486. The chip will run on a reduced instruction set computing (RISC)-based core — an answer to charges that Intel processors could not keep up with high-end RISC chips.

The company revved up the P5 product cycle to quell speculation that RISC chips would outperform the Intel competition, and most analysts said this delay will not affect the mind share Intel has garnered from the move.

"Intel has a $30 million a year market. None of the RISC guys is even close to that," McCarron said. "Intel clearly has reason to be concerned. However, considering [its] current position, they are dominating the market."

Still, competitors such as Cyrix, Inc. and Advanced Micro Devices, Inc. might net some short-term gains from the delay, analysts said.

IBM ponders PC spin-off

CONTINUED FROM PAGE 1

firmed that dicussions are under way but said a final decision has not yet been reached.

Operating as a separate subsidiary would rid the division of corporate overhead and enable it to more effectively control marketing, sales and distribution — activities that are currently tied in with mainstream IBM. The subsidiary would most likely be managed by James Cannavino, general manager of IBM's Personal Systems Division.

> **"THEY'LL BE building their own bureaucracy. They have to watch their cost structure so things don't get out of hand."**
>
> FRANK DZUBECK
> COMMUNICATIONS
> NETWORK ARCHITECTS

Frank Dzubeck, a consultant at Communications Network Architects, Inc. in Washington, D.C., said the move would give Cannavino and others much more leeway in their ability to do things such as moving manufacturing, but negatives do exist. "They'll be building their own bureaucracy. They have to watch their cost structure so things don't get out of hand," Dzubeck said.

"I think they are finally going to compete against the clones, but they've got to shut off all of their overhead," said Steven Fisher, president of Canaan Analytics, Inc. and a 27-year IBM veteran.

Although details of the discussions remain unclear, most observers said they picture the personal computer subsidiary evolving into several operating units within the division: One would sell high-end systems through dealers, and another — a low-end group — would move products through commodity channels such as mail order and superstores.

Gaining sales control brings up the issue of having multiple IBM salesmen banging on the information systems door, but sources said that a great deal of product will be wholesaled back to IBM Sales and Marketing for sales through that channel.

Disclosure of the spin-off is expected as early as mid-September, which could coincide with or slightly precede the launch of IBM's new low-end PC family, slated for a Sept. 22 unveiling, sources said.

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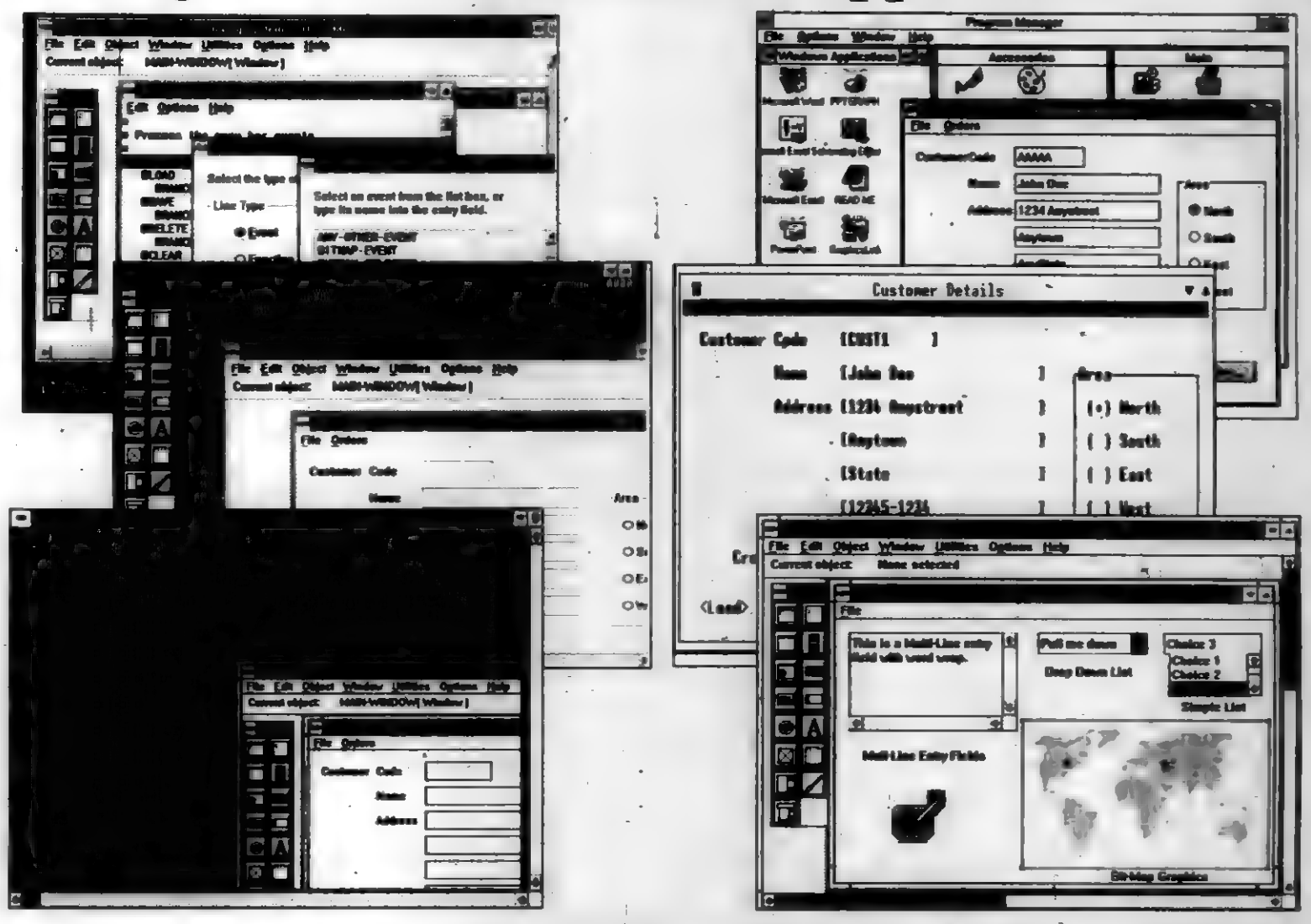

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First links between object, relational databases forged

Vendors announce partnerships, tools to bridge architectural gaps

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Object databases are on a collision course with relational databases.

Users and vendors at last week's Object World show said the two technologies are destined to meet in the mid-1990s, even though object-oriented databases hold different types of data than relational databases, and the two are architecturally isolated because there have been no interfaces between them. That is about to change, however, as several firms announced links between object-oriented databases and relational systems last week:

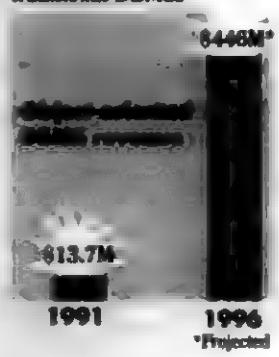
• **Hewlett-Packard Co.** in Palo Alto, Calif., said its OpenODB object database, which shipped in December, will be linked to the Informix OnLine relational database from **Informix Software, Inc.** in Menlo Park, Calif.

Under a cross-licensing deal, OpenODB objects will be stored inside the relational database and accessed through HP's Object SQL interface. Informix will also adapt its 4GL++ tool, which has object-oriented extensions, so it can write applications for OpenODB. The OpenODB product already works with HP's AllBase/SQL relational database.

• **Digital Equipment Corp.** announced its own object-oriented database, called DEC Object/DB Version 1.0. The product, which is slated to ship in September, is based on an object-oriented database made by **Objectivity, Inc.** in Menlo Park, Calif. DEC will sell and support Object/DB and provide software tools to create applications that will link the object database to Rdb.

Object of desire

Object-oriented DBMS vendors can expect substantial growth if they can provide the capabilities of traditional DBMSs



Source: International Data Corp.

• **Object Design, Inc.** in Burlington, Mass., and **Progress Software Corp.** in Bedford, Mass., signed a joint development and marketing agreement under which Object Design's ObjectStore object-oriented database management system will be linked to the Progress 4GL fourth-generation language, which is used to write relational database applications. Products are scheduled to undergo beta tests in the fourth quarter and ship in the first quarter of 1993.

• **Servio Corp.** started shipping Release 3.0 of its GemStone object database, which contains links to Sybase, Inc.'s SQL Server relational database system. Servio's GeODE development tools are used to construct object-oriented applications.

Industry analysts said such partnerships are inevitable, given the small size of most object-oriented database vendors and the requirement to link object-oriented products to the existing information systems infrastructure. This leaves object database firms with very few choices, said Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Stamford, Conn.

"They are either going to form an alliance with the RDBMS vendors, be bought out by them or go out of business," Feinberg said.

Newcomers to object-oriented systems are drawn to their strongest selling points: reusability of objects, reduced development time and the freedom to associate any two objects without complex indexing schemes. But object databases have existed in a vacuum, set apart by unique data-access methods and special software tools.

If the gap between object databases and relational databases were bridged with similar data-access methods, IS developers could draw on a rich set of data from both database structures for complex applications.

"We see the benefits of using object-oriented technology to build new applications, since our Cobol systems are very old," said Mike Blask, an IS administrator at the Maricopa County Health Services Agency in Phoenix.

But there is a need to share data with departments that have relational databases, Blask said: "We probably would not be able to go to object-oriented technology if those links to older systems didn't exist."

But some users questioned whether the links between object databases and relational databases are really needed, even if they will soon be available. They said the stuff of which object-oriented databases are made — everything from geometric data to multimedia images to engineering drawings — cannot be jammed into the up-and-down, left-and-right rows and columns of relational databases.

"It's like chalk and cheese, to quote an English phrase," said Cecil Bloch, a senior analyst at the Research Libraries Group, Inc. in Mountain View, Calif., which builds library systems with object-oriented software. "Object databases and relational databases are inherently different. The only reason there has to be continuity is that the relational database companies don't want to rebuild everything."

Although partnerships between object-oriented firms and relational database firms are new, they are likely to multiply in coming years. Oracle Corp. is reportedly looking for partners to add object-oriented features to its Oracle 7 database release. The Ask Co.'s Ingres Products Division recently announced a partnership with ESL, Inc. in Sunnyvale, Calif., to store ESL's class library of multidimensional objects inside the Ingres relational database. And industry analysts predicted that HP will soon license OpenODB to other RDBMS vendors.

PARTNERSHIPS ARE inevitable, given the small size of most object-oriented databases vendors and the requirement to link object-oriented products to the existing IS infrastructure.

Oracle updates application packages

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — As expected, Oracle Corp. updated its 4-year-old line of application software packages last week, adding client/server support and graphical user interfaces. The move followed a yearlong rewrite of the applications, which have had quality problems since 1988.

"The customers used to be unhappy because they felt they were being used for quality-assurance testing," said George Koch, senior vice president at Oracle's application division.

Oracle Applications Release 9 is a suite of 23 financial and manufacturing applications and four programming utilities built with the Oracle Applications Object Library, a replacement for the aging Application Foundation tool kit. Programs are now documented in Oracle's CASEDictionary so users can customize the packages. They will be available next year on 30 platforms at prices ranging from $26,000 to $166,000.

Icon format

A companion product, the Oracle Business Manager, is a personal computer-based "client" that can access all the new applications and present them to end users in an icon-based format.

Previously, Oracle applications were designed for display on character-mode terminals. Users can now store many report formats on the database server, allowing Oracle to support user sites where PCs are used as clients.

Oracle applications users said they were pleased with the enhancements, but several had not been briefed yet. Greg Larson, manager of business systems at Nerco, Inc. in Portland, Ore., said his energy firm plans to use an automatic posting feature for the General Ledger package, which posts updates from the accounts payable package.

Coca-Cola Bottling Co. in New York and Greenwich, Conn., plans to make use of the Oracle Payables package's "invoice import" feature for electronic data interchange applications, said Ronald Drew, manager of systems development.

Industry analysts said Oracle will be able to grow its $49 million applications business but will face tough competition from traditional applications vendors.

"D&B is the biggest player in the Fortune 1,000 applications business, and Oracle's applications business is one-tenth that size," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Three lessons in objectivity

The leading lights of the personal computer industry traded barbs at last week's Object World over who would incorporate object-oriented features first.

Jim Allchin, Microsoft Corp.'s vice president of advanced systems, joined Borland International, Inc. Chief Executive Officer Philippe Kahn and Next, Inc. CEO Steve Jobs in a three-hour show-and-tell demonstration of object features found in the trio's current and future products.

Microsoft was criticized by Kahn and Jobs for failing to jam enough object-oriented features into the current release of Windows 3.1, never mind the first release of Windows New Technology (NT). Allchin countered that Microsoft's Object Linking and Embedding (OLE) protocol is being enhanced, while the Microsoft Object Manager for handling system resources is hidden in the kernel of NT.

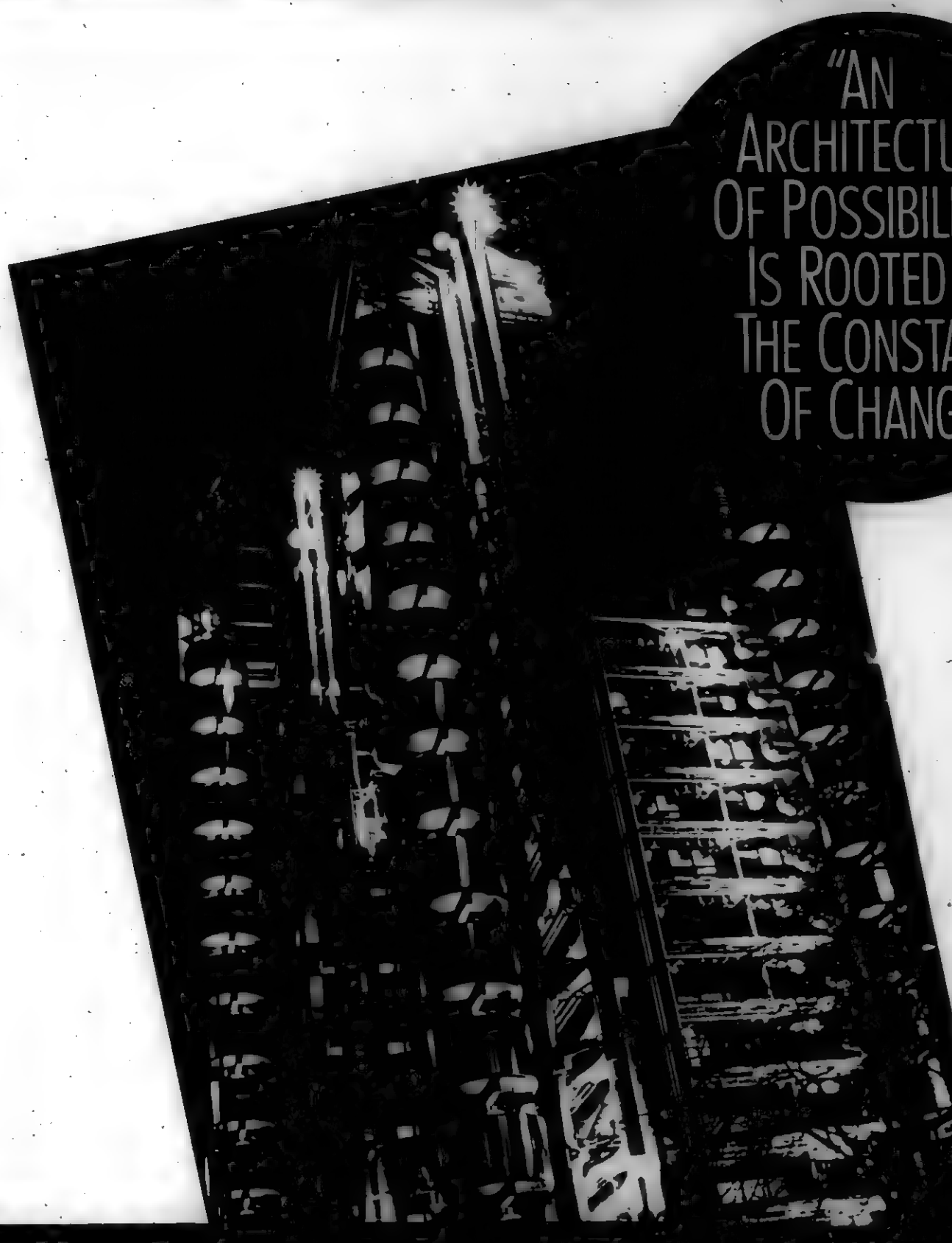
Allchin also claimed Microsoft's object solution would be more cost-effective than Next's. "Steve showed all the things I showed," he said, "but I showed it on PCs."

Kahn had another view of Microsoft's strategy to migrate its installed base to objects. "Today, the only thing object-oriented about OLE is its name," he charged. And, intoning his mantra for object technology, Kahn added: "It has no inheritance, encapsulation or polymorphism." He showed a police report program, built by two San Jose, Calif., police officers with Borland's C++-based ObjectVision. He said his product "surfaced" the object features, allowing users to link spreadsheets and graphs.

Jobs wound up the session by announcing that NextStep 3.0 will ship next month and demonstrating icon-heavy object-oriented applications on a Next computer screen. "We're going to be 60 days late, and I apologize for that," Jobs said, "but at least we have some software to ship."

NextStep 3.0, which runs on Next machines and Intel Corp. I486-based PCs, conforms to the Object Management Group specifications for object-oriented technology, he said.

JEAN S. BOZMAN



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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Olsen's shadow looms large at DEC

BY MELINDA-CAROL BALLOU and KIM S. NASH
CW STAFF

MAYNARD, Mass. — The impending exit of Digital Equipment Corp.'s founder, Ken Olsen, left longtime users and DEC watchers pensive last week, reflecting on what once was and how Olsen made it that way.

"It's a hell of a legacy: a $14 billion company started from a shoebox, one of the world's foremost operating systems, a staff of talented people and a product set that is pretty good, with the Alpha chip set at the pinnacle," said Jeffrey Jalbert, an executive committee member of the Digital Equipment Computer Users Society.

Observers across the board similarly lauded Olsen for his contributions both to his company and to the industry, which many said would have been vastly different without him.

"When you think about it, if it weren't for Ken Olsen, we'd all be using punch cards still," said Bill Bluestein, a senior analyst at Forrester Research, Inc., a research firm in Cambridge, Mass.

With three other engineers and $70,000 in venture capital, Olsen created DEC in 1957, pulling the firm atop the billion dollar mark 20 years later. As sales crested to $7.6 billion in 1986, *Fortune* called him "arguably the most successful entrepreneur in the history of American business."

But at least 126,000 other people — DEC's head count at its peak this year — helped Olsen achieve those honors and, in a way, helped him decide to leave.

Those who know Olsen said he retired after being pressured to make changes that, while necessary, left a bad taste in his mouth: enormous layoffs.

Olsen had consistently objected to wielding the ax and was largely responsible for a generous early retirement plan this spring, observers said.

Just one day before he announced his resignation [CW, July 20], a troubled Olsen told *Computerworld*, "We've always had to adjust our size, but to say that you're going to lay off 5,000 people [for example] — I hate this way of doing it. I want to take care of people, tell them one-on-one and help them find a job."

Slow to move

Olsen's reluctance also extended to certain emerging technologies such as personal computers, unshielded twisted-pair cabling and Unix. DEC eventually came around on all counts.

In the case of Unix, Olsen ultimately OK'd the creation of an open version of VMS, DEC's 15-year-old flagship proprietary operating system. He also launched Alpha, a new generation of reduced instruction set computing technology.

Ironically, Alpha machines — widely regarded as DEC's redeemer from financial hell — are due for delivery shortly after Olsen hangs up his chief executive officer's hat at year's end.

When Alpha ships, "DEC may well be a technical leader once again, which has a lot to do with [Olsen's] insight and leadership," said Al Chaby, MIS director at Envirosafe Management Services, Inc. in Valley Forge, Pa. "It's a pity that the financial performance of DEC has been weak because they are in for a resurgence" with Alpha.

Dilemma: Should DEC divide in order to conquer?

CONTINUED FROM PAGE 1

no definitive plans, but Jack Smith, senior vice president of operations, said the focus is on certain manufacturing and general administration functions.

If DEC is to survive, Palmer must also change the company's reputation for being slow to react to market demands, said Susan McGary, an analyst at The Yankee Group in Boston.

DEC's traditional monolithic structure kept VMS products "nice and coherent top to bottom, but the company was less able to react quickly to changes in the market that way," said Bill Sines, an analyst at Framingham, Mass.-based Technology Investment Strategies Corp.

Still unclear — but expected to be made public within a few weeks — is just how many DEC employees will lose their jobs. Smith said he had "no doomsday numbers" to share regarding the severity of layoffs expected, but he denied that head-count reductions would reach 20,000, a number widely bandied about by analysts.

The company bulldozed its ranks during the past year by 23,000, down to 113,800. That 18% reduction produced about half of the $1 billion annualized spending cut achieved in fiscal 1992, Smith said.

Smith was equally short on specifics about which product lines will be gutted following staffing and funding cutbacks. "We've taken most of the fat out of the system. We'll get the rest out through business process reengineering," he said.

Observers were divided on whether DEC should abandon its second stab at the personal computer business.

However, Smith said the company will push on, despite the meager margins hurting PC veterans such as Compaq Computer Corp. and IBM.

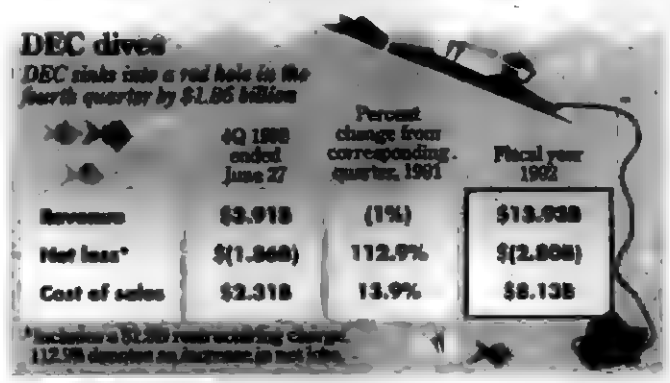
If workers associated with Alpha are safe, so are those in DEC's systems integration group, judging by Smith's remarks. To buffer its hardware strategy, DEC will push hard to promote itself as a service provider, he said. "This is not a 'fix-it' business. Our focus is network management and systems integration," Smith said.

To DEC's credit, service revenue grew 11%, from $5.6 billion last year to $6.2 billion for 1992. "In an inflationary year, that's a good sign," noted John Jones, an analyst at Salomon Brothers, Inc. in San Francisco.

And while Alpha remains DEC's great hope, some users said they are just not yet interested in the systems, which are slated to arrive in early 1993.

"I haven't been real impressed with what I've seen so far — and that's only been on paper anyway," said Jeri Mahoney, a systems specialist at Bridgestone/Firestone Scientific Computing in Akron, Ohio.

Mid-Atlantic correspondent Thomas Hoffman contributed to this report.



Source: Digital Equipment Corp.

The customers speak

None of the users interviewed last week envied the challenge awaiting DEC's new CEO, Robert Palmer, but they had plenty of advice for him — particularly on customer and competitor relationships. Time will tell whether the customer is always right.

Richard Marx, *director of information services at Commonwealth Electric Co. in Wareham, Mass.:*
• "DEC marketing is an oxymoron. If Palmer has a better marketing focus than Olsen did, he has a better shot at turning things around for the company."

Bobby Graves, *systems manager at Champion International, a paper mill in Courtland, Ala.:*
• "I'd get friendlier with other companies. They're going to have to make friends with other vendors, especially IBM, if they want to survive. Many businesses run both DEC and IBM equipment, and they want to get that stuff talking to each other."

Ray Sasso, *chief information officer at food processing company Simplot Co. in Boise, Idaho:*
• "They really need to polish up sales and marketing." More often than not, Sasso added, the person selling him a product does not understand how it fits in with the rest of his estimated $20 million worth of DEC equipment.

"Do something to elevate the stature of the marketing function within the company," he advised Palmer. "The only people who feel loved at DEC are engineers."

Walk a mile

Computerworld asked industry veterans, some of whom have been through the corporate wringer themselves, what they would do in Robert Palmer's shoes.

Gordon Bell. *Now a consultant, Bell oversaw development of DEC's PDP and VAX minicomputer lines and worked at DEC for 17 years.*
• "I'd work like hell to get the company focused on lines of businesses. It was incredibly stupid to announce [Alpha] before they had it available."

Edson de Castro. *After spending eight years in DEC's engineering department, de Castro left to co-found Data General Corp. He is a director at a handful of technology firms.*
• "Forget about the VAX. Don't put any more money into that product line. Tell it like it is on Wall Street. Get on with open systems, PCs and Unix workstations."

John Cunningham. *Currently serving as director at several computer companies, Cunningham was formerly a top gun at DEC's rival, Wang Laboratories, Inc.*
• "Take out three out of every 10 employees from all departments. You just don't need 112,000 people anywhere — I don't care who you are. Find a way into the PC business. They missed in 1982, but that doesn't mean they can't do it now."

Frank Dodge. *Chief executive officer of The Dodge Group, a Framingham, Mass.-based client/server software developer, and co-founder of McCormack & Dodge, now part of Dun & Bradstreet Software.*
• "So many people in that company are overly committed to the VAX that some of them can't let go. Those that can't let go should be sent away — R&D, marketing, sales, everyone. I'd keep people around only to support the VAX line and enhance it."

Key OS/2 ports slow to arrive

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — In the four months since IBM's release of OS/2 2.0, few major personal computer software vendors have shipped compatible products.

IBM now boasts that 160 companies are shipping OS/2 2.0 applications, including Novell, Inc. and Oracle Corp. But most of the top PC applications providers remain in the verbal commitment phase.

Users contacted last week, however, said they are still so preoccupied with testing and rolling out OS/2 2.0 that they are not yet worried about applications availability. "Most of the majors have 32-bit programs in beta or close to that," said Bob Hecht, vice president of investment systems at Prudential Investment Corp. "You can use most of your DOS and Windows apps under 2.0. But on the other hand, you want [32-bit applications] as an option."

However, Jeff Newman, an assistant vice president at Barclays Bank PLC in New York, said he is still waiting for Microsoft Corp.'s decision on LAN Manager for OS/2, and without that support, his OS/2 2.0 installation will be delayed.

Ruth Warren, a Microsoft senior product manager for LAN Manager, said the company is shipping a client version of LAN Manager with 2.0 support to beta-test sites and forecasts a September ship date. However, the company will not yet commit to a server version of LAN Manager with OS/2 2.0 support because it has concerns about 2.0's "stability."

Other top PC software companies, such as WordPerfect Corp., said they will support OS/2 2.0 but would not say when products would be available.

John Soyring, IBM's Personal Systems director of software development programs, said he is pleased with the progress and pointed out that several top software companies delivered Microsoft Windows 3.0-compatible products more than a year after 3.0's debut.

Borland International, Inc. is shipping ObjectVision for OS/2, but its applications group could provide no specific product plans for 2.0 support. Lotus Development Corp. is committed to releasing its suite of products with OS/2 2.0 support and said its 1-2-3 spreadsheet and Freelance Graphics for 2.0 will ship by year's end.

Also, Microsoft is still holding firm with its strategy not to further enhance OS/2 versions of Excel and Word unless it sees a "sufficient" demand for IBM's 32-bit operating system.

Check out the Marketplace Pages on Page 91.

Windows leads Delta to mixed platforms

CONTINUED FROM PAGE 1

ects on a case-by-case basis and select the one with the best cost and functionality. Eubanks also acknowledged that a mixed environment brings a new set of problems: making it all work together.

According to Eubanks, development is under way to bridge the OS/2 and Windows environments, but he would not provide details.

"To get context on this, all you have to do is look at the [financial] news," said Brad Power, a principal at CSC Index, Inc. and director of the company's re-engineering research and advisory service. "They, like all airlines, are in trouble financially. If they are looking at technology decisions, then they will look for the lowest cost solution."

Last week, Delta reported a fiscal year 1992 year-end loss of $506.3 million on revenue of $10.8 billion. For the fourth quarter, ended June 30, it reported a loss of $180 million on revenue of $2.8 billion.

Power said the move to a mixed-platform strategy also reflects the corporate culture at Delta, which is known as a more practical operation and less pioneering than some of its competitors.

Delta "has very good operators — the best people — and they make very practical decisions," Power said. "They don't make technically aggressive or risky ones."

Delta will continue to use OS/2 for an airport traffic-management system, according to Eubanks. He said the company will evaluate OS/2 for future projects and has no intention of pulling the plug on it overall.

"We want to do what's best for users, whether it's OS/2, Windows or dumb terminals," Eubanks added.

An IBM spokesman said, "To our knowledge, our relationship with Delta has not changed."

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NEWS SHORTS

BSA to protect software copyrights

Six leading software publishers have given the Business Software Alliance (BSA) authority to enforce their copyrights in North America. Aldus Corp., Autodesk, Inc., Lotus Development Corp., Microsoft Corp. and WordPerfect Corp. asked Washington, D.C.-based BSA to begin a domestic antipiracy program similar to the initiatives it has in 30 countries worldwide. A Lotus spokesman indicated that the vendor would pursue all of its litigation through the BSA rather than the Software Publishers Association (SPA), though Lotus will remain an SPA member. The BSA quickly obtained a temporary restraining order against McAllen, Texas-based CompuMart, which is suspected of loading illegally copied software onto computers it was selling in Mexico. The group also established a software piracy hot line at (800) 688-2721.

Repeal of Section 1706 debated

The campaign to repeal Section 1706 of the Tax Reform Act of 1976 picked up a little steam last week at a hearing held by the House Ways and Means Committee. Testifying for repeal of the provision, which makes it harder for brokered computer programmers to be classified as independent contractors, were Reps. Doug Barnard Jr. (D-Ga.), Tom Lantos (D-Calif.) and Major R. Owens (D-N.Y.). The Information Technology Association of America said it continues to support Section 1706.

SMDS to hit California

Pacific Bell last week filed a Switched Multimegabit Data Service (SMDS) tariff with the California Public Utilities Commission in hopes of making the service available at T1 speeds in the Los Angeles, San Francisco, San Diego and Sacramento service areas come September. Proposed SMDS charges include a $375 installation fee plus $600 per month for unlimited use and distance within the service area. Customers still need a dedicated T1 line to their local central office, however.

Air traffic control system demo'd

MCI Communications Corp. demonstrated a prototype of its Leased Interfacility National Air Space Communications System (LINCS), a national data and voice network to support air traffic control. Being developed for the Federal Aviation Administration in a 10-year, $1 billion project, LINCS is based on dual circuits and redundant components and is to have a reliability of 99.999%. It is scheduled for installation in the Northwest in the second quarter of next year.

Kit teaches computer ethics

The not-for-profit Research Center on Computing and Society at Southern Connecticut State University and Educational Media Resources, Inc. have assembled a starter kit for teachers who wish to introduce the social and ethical implications of computing into computer science or computer engineering classes. The kit includes three videotapes and two monographs.

Short takes

Bell Atlantic Corp. appointed Arthur A. Bushkin as its first president of information services at **Bell Atlantic Network Services, Inc.** . . . The **National Urban League**'s Job Opportunity Showcase, a recruiting center for matching minority applicants with jobs open at 200 companies nationwide, is being powered by **Digital Equipment Corp.** gear connecting the league's 114 offices with its headquarters in New York. DEC gave the league a $1.5 million grant four years ago. . . . **Borland International, Inc.** has announced an $800,000 order by **Magnavox** for its InterBase relational database engine. It will be used in Magnavox's **Advanced Field Artillery Tactical Data Systems** contract. . . . **Verbatim Corp.** has said it will offer a lifetime warranty on all of its 3½- and 5¼-in. rewritable optical media. . . . **Emerald Systems Corp., Everex Tape Products** and **Mountain Network Solutions, Inc.** will refer customers to **Computer Conversions, Inc.** for data recovery from damaged backup tapes.

Motorola E-mail service bows

BY ELLIS BOOKER
CW STAFF

BOYNTON BEACH, Fla. — Motorola, Inc. last week began offering its next-generation pager service for sending electronic mail and other data to portable computer users.

Embarc, short for Electronic Mail Broadcast to A Roaming Computer, is a noninteractive, one-way service that combines satellite transmission and Motorola's own pocket-size NewsStream receiver to deliver wireless E-mail to laptop, notebook and palmtop computers.

According to Brad Davis, director of strategic marketing for Embarc, Motorola envisions a marketplace represented by the "intersection of electronic-mail and portable computer users." That universe currently consists of approximately 6.5 million to 7 million users, according to Davis, who expects to have 50,000 Embarc users within a year.

At least one early Embarc beta-test user said he would be hard-pressed to give up the service, which has enabled him to receive important IBM Professional Office System messages while traveling.

"I'm kinda hooked on it," said J. Joe Marsh, manager of communications technology at Shell Oil Co. in Houston. Since January, Marsh and 26 staff members have been testing the service with a variety of laptop, palmtop and pen-based portable computers.

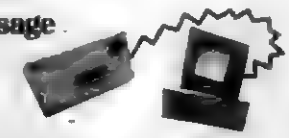
Motorola said last week that it expects its Embarc service to cover the Top 200 U.S. markets by year's end, with plans to expand to 300 markets by 1994 and worldwide coverage during the next five years.

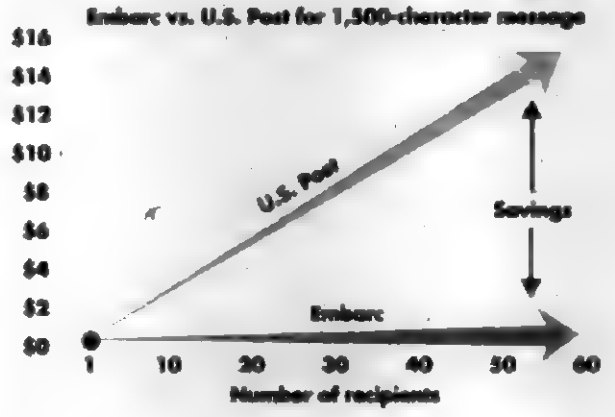
The cost of Embarc includes a onetime $395 charge for the NewsStream pager, "AA" battery, interconnect cable, belt holster and Embarc/DOS user software. The service also carries a basic fee of $15 per month, which includes the delivery of news and weather updates from *USA Today*.

Message senders are charged 13 cents per message, as well as a "wireless stamp" delivery charge ranging from 5 to 50 cents per 100 characters. The fastest speed at which a message can be forwarded to a mobile unit is 15 minutes; the slowest and least expensive rate is for overnight delivery.

The medium is the message

Embarc's price remains flat as the number of people receiving information increases





Source: Motorola, Inc.

Export barriers on encryption eased

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Bush administration recently relaxed controls on the export of some software with encryption capabilities, a move vendors said should lead to better security features in mass-market packages.

Companies that were inhibited in putting security features into their products for fear they could not be exported — or because they could not afford to go through the laborious export approval process — said last week they will accelerate plans to add features for encrypting spreadsheets, files and messages.

"Our customers are asking for security, but to date we have not had a lot of security features," said Nathan Myhrvold, vice president of advanced technology and business development at Microsoft Corp. "We are now able to provide it, domestically and internationally."

No details

Myhrvold would not say when and where encryption features would appear in the Microsoft product line but pointed out, "We've said that the Windows NT operating system will have security features, and we've announced that we will license the RSA encryption technology" from RSA Data Security, Inc. in Redwood City, Calif.

John Winterhalter, manager of information systems at 3M Co.'s Commercial Office Supply Division, said the lack of encryption in most mass-market software is increasingly a problem as companies expand overseas, increase connectivity and move from private to public networks.

"It's critical that we have encryption capabilities. 3M is a global company, and we're running our business on E-mail today. If we and our global partners can't be secure in our communications, we have a big problem," he said.

In a letter to Congress, National Security Adviser Brent Scowcroft said the White House and the Software Publishers Association had developed procedures by which software containing RSA's encryption algorithms with limited encryption key lengths would be effectively freed from export controls.

However, Scowcroft said other encryption methods, such as the federal government's Data Encryption Standard (DES) algorithm, widely used in the banking industry, will continue to be strictly controlled.

Top secret

While industry has gravitated toward RSA's techniques as a standard — with most major software firms having licensed them — the 15-year-old DES algorithm, which uses a 56-bit key length, provides more security than the algorithms approved for export, which use 40-bit keys.

However, unlike the DES algorithm, RSA's algorithms — called RC2 and RC4 — use a variable key length that can be changed by recompiling software. Myhrvold said he prefers RSA's algorithms because they are much more efficient than DES. He said Microsoft would boost security on products for export by increasing key lengths as allowed by the government.

But Lee Mercer, corporate export manager at Digital Equipment Corp., said the failure to free DES products for export was disappointing and inexplicable because DES is already available from foreign competitors.

DEC offers products based on DES and has licensed RSA technology but does not offer products based on it.

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(Until you have a more effective means of business communication up and running, the telephone will have to do.)

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Proteon adds low-end router for uninitiated, remote users

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — The plight of the minimally staffed remote field office seeking admittance to the corporate network improved a notch last week with a low-end internetworking announcement from Proteon, Inc.

The shot in the arm arrived in the form of an inexpensive multiprotocol bridge/router that comes largely preconfigured per instructions users check off on an L. L. Bean-like order form.

Proteon's $4,995 to $7,995 DNX 300M addresses companies' economic inability to stock many small, far-flung sites with expertise for supporting complex networking equipment.

The router's ease of use "is amazing — anyone can configure the thing," said Mike Gourley, network administrator at Physicians Mutual Insurance Co. in Omaha.

Gourley said he was initiated into the router world with the Proteon product and installed it in under 10 minutes. "I've heard horror stories from people who have spent three hours configuring other routers and still don't get it quite right," he said.

Comparing the two

Since Physicians Mutual is a Novell, Inc. shop, Gourley also evaluated Novell's multiprotocol router software. While cost-effective, he said, it was cumbersome and offered a lower throughput.

Matthew Heath, section head of the data communications group at Gulf Stream Aerospace Corp. in Savannah, Ga., also evaluated the Proteon product against the Novell low-end router software he had been previously using. In terms of economics, he countered that "by the time I buy a dedicated PC [for performance], outfit it with LAN cards and buy a keyboard and monitor, the price [of the Novell router] is comparable to Proteon's."

In addition, the Proteon router has "more functionality, more protocol support and higher throughput," he added.

Cable connections of all types, flash memory for remote software loading and reconfiguration, telltale front- and back-panel LEDs and a yes/no step-through configuration menu target remote-site personnel who are minimally interested in the intricacies of networking. The Proteon DNX 300M is due to ship this week.

Users will beg for more

While analysts agreed that the Proteon rollout is in sync with user needs, users will soon be looking to integrate more function into remote-site devices such as smart wiring hubs for further economies of scale, noted Dave Passmore, a vice president at Stamford, Conn.-based Gartner Group, Inc.

For example, Wellfleet Communications, Inc. routers already allow users to connect a private branch exchange into its router and multiplex voice and data over the same T1 line instead of paying for separate links, he said.

Similarly, Micom Communications Corp. announced in May a device it calls NetRunner, a $3,500-and-up bridge-like product that packs Ethernet local-area networking, IBM Systems Network Architecture and voice and fax transmission on one 56K bit/sec. leased line [CW, May 11].

NCR picks image partner

BY ELLIS BOOKER
CW STAFF

DAYTON, Ohio — NCR Corp. last week picked a marketing partner for a check imaging system aimed at the nation's 7,200-plus community banks.

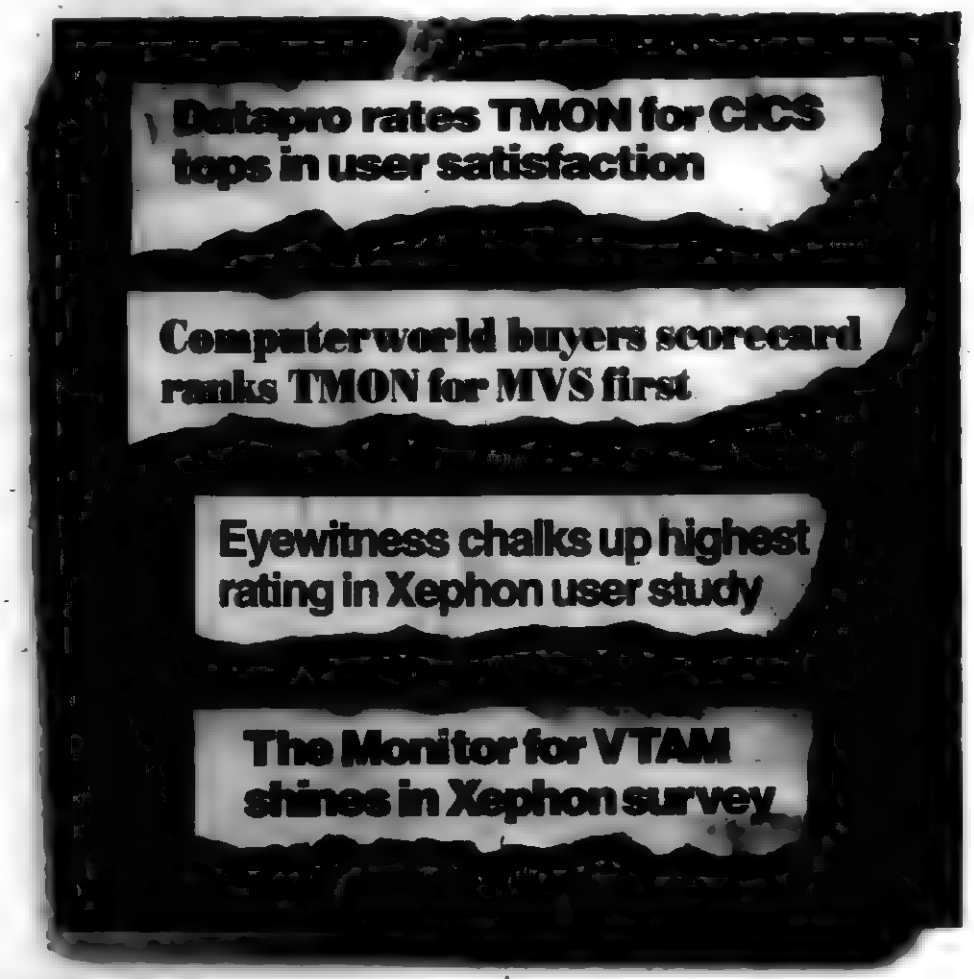
Under terms of the agreement, NCR's System 3000 — a scalable, microprocessor-based Unix line — and its check-sorting signature-recognition hardware systems will be coupled with image statement software from Document Solutions, Inc. in Birmingham, Ala.

Formed last year, Document Solutions specializes in imaging software for banks with assets of $50 million to $500 million.

The NCR/Document Solutions effort will involve approximately 200 NCR salesmen from more than 50 offices who will work with Document Solutions' sales and technical staff, according to the companies.

Last October, NCR and Wachovia Corp., a Winston-Salem, N.C.-based bank holding company, announced a strategic partnership to test NCR's Scalable Image Item Processing System (SIIPS). SIIPS, which also uses the NCR System 3000 hardware platform, is scheduled for release in 1993.

A scalable solution, SIIPS will initially be targeted at large financial customers with assets of more than $1 billion, NCR said.



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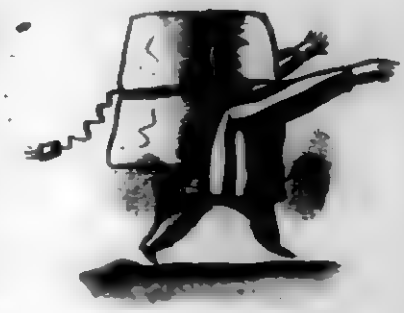
Pentagon opens software reuse center

Reuse could help the federal government save $15 billion in annual software expenditures



Robert Neubecker

BY GARY H. ANTHES
CW STAFF

FALLS CHURCH, Va. — The U.S. Department of Defense (DOD) laid a cornerstone in its huge Corporate Information Management (CIM) program last week when it opened its Center for Software Reuse Operations.

The center provides access to the Pentagon's new Defense Software Repository, which contains 2.2 million lines of Cobol and Ada code in 1,531 reusable software modules.

The software, mostly for financial and logistics applications at present, is available to users throughout the department and to DOD contractors via an automated catalog and retrieval system. "We're open for business. The software is available," said William Galler, deputy program manager for software reuse at the Defense Information Systems Agency.

The repository was stocked initially with software taken from the U.S. Army's Reusable Ada Products for Information Systems Development system, which last week won a "golden nugget" award for excellence from CIM director Paul A. Strassmann.

"We'll get 50% of our needs from reusable components," said Strassmann, the Pentagon's director of defense information. "This will help get the bugs out and help with maintenance."

CIM is a set of initiatives that includes software reuse, computer-aided software engineering, elimination of redundant systems and a cut in the number of DOD data processing centers (CW, June 8).

Strassmann said he expects software reuse to bring about half of the $30 billion target reduction in annual software expenditures resulting from CIM.

Prime eliminates hardware group

BY KIM S. NASH
CW STAFF

NATICK, Mass. — Prime Computer, Inc. will shut down its entire hardware business immediately, halting previous plans to sell the division to a group of company managers led by Neil McMullen, the president of Prime's hardware group.

The company filed documents with the Securities and Exchange Commission (SEC) last week, stating that McMullen's group, ComputerVision — Prime's software unit — and unnamed third parties were "unable to reach final agreement."

As a result, all hardware manufacturing operations will be discontinued. Prime's proposal to take ComputerVision public remains in effect.

The move leaves Prime minicomputer customers at a crossroads. One path would let the approximately 9,700 Prime minicomputer sites press on, receiving support from the PrimeService group that was recently folded into ComputerVision (CW, June 8).

The other road leads Prime users away from the vendor. The SEC papers outline an undefined "short-term" plan to "aid existing customers for an orderly transition to alternate hardware."

Where to now?

Some users will forego that favor. For example, Stan Zelepsky, manager of information resources at the energy division of Zurn Industries, Inc. in Erie, Pa., said he has been preparing for the Prime shutdown for two years now.

"Even the staunchest Prime supporters have seen the writing on the wall," Zelepsky said. A faithful Prime customer for a dozen years, his division is midway through migrating engineering applications from a Prime 2950 minicomputer to a network of Sun Microsystems, Inc. workstations.

On the business side, the company plans to keep a Prime 9955 for another year and a half, "but now that we've been able to touch and feel Unix, it does seem to be the way to go," Zelepsky said.

Hamamatsu Corp. in Bridgewater, N.J., is in the uncomfortable position of having just spent $100,000 on a 5350 model. Eric Atanda, who is responsible for systems and telecommunications at the scientific tools maker, said Prime gave no indication that it was closing down.

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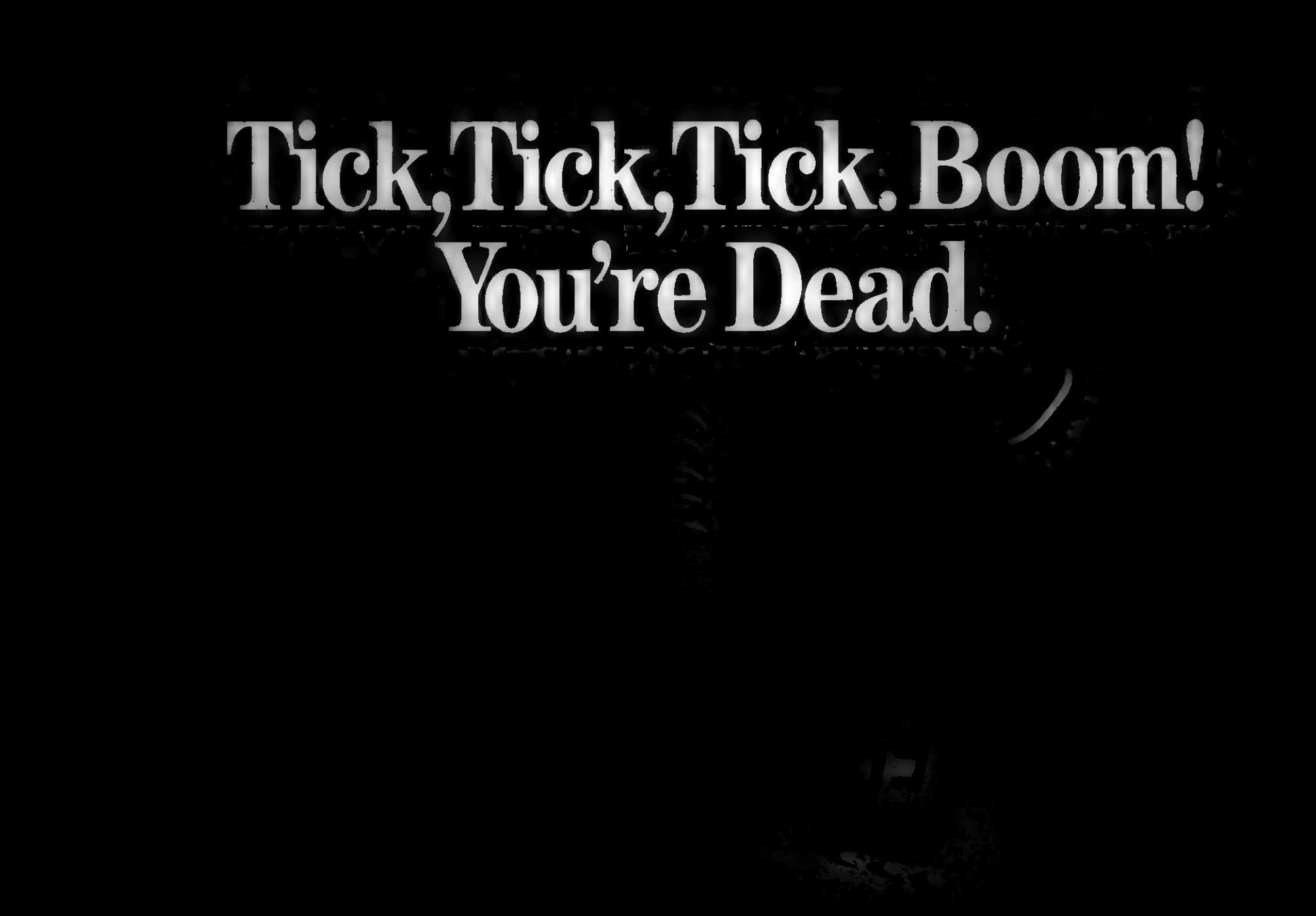

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ADVANCED TECHNOLOGY

Fingerprinting a computer security code

Biometric devices secure computers beyond a reasonable doubt using personal characteristics no one can steal

BY JAMES DALY
CW STAFF

They can steal your access card, and computer passwords are easily cracked. But nobody can steal your retina. Or your fingerprint. Or your voice pattern.

After serving as high-security watchdogs at government installations for the past 20 years, biometric security devices — which identify people through unique body characteristics — are finally gaining supporters in many commercial installations. The reasons are many, including the fact that some individual biometric security devices now cost less than $2,000, down from almost $9,000 in 1985.

More importantly, however, is that many in the security field believe there is no more foolproof way to identify individuals than through biological characteristics — retinal blood vessel patterns, hand geometry and fingerprints — and their behavioral idiosyncrasies, such as signature, vocal intonation and keystroke dynamics. Biometric identifiers, unlike memory-based secrets, cannot be transferred by threat or gift.

"These things are hard to fool, no doubt about that," said Dale Bader, supervisor of operations support at Alascom, a long-distance telecom service in Anchorage, Alaska, that uses a retinal scanner from EyeDentify, Inc.

Security experts say the current method of accessing computers through a password is inadequate in terms of security and administrative costs. Computer crackers and dissatisfied employees breaking into computers pose a serious security threat, particularly as more computers are linked via file-sharing networks.

Meanwhile, biological characteristics such as retinal blood vessels are unique — not even identical twins have the same patterns. And James Bond movies notwithstanding, even a corneal transplant will not fool a retinal scanner.

Janell Genovese

Gaining attention

Today's most popular biometric security devices include fingerprint readers, retinal scanners and devices that recognize handprints and signatures (see story below).

Using a biometric security device is a two-stage process: During enrollment, a computer-generated template is created that the machine will use to match the pattern of the person seeking access. During log-on, the user's pattern is scanned and compared with the template created during enrollment. In many cases, the user will also enter a personal identification code, and both need to match for access.

The systems are not without their glitches, however. Although the systems are much better than in their hit-and-miss early days, problems can still occur. Dolores Tilton, who manages the law offices at the Bank of Boston, uses a fingerprint scanning device that works "most of the time." She adds that when users' hands are cold, they sometimes get rejected. Other people's fingerprints will never get a correct reading, Tilton said.

Bader noted that Alascom's retinal scanning system occasionally will not recognize a pattern if the user is not situated correctly. "If a person is a little crooked, they'll be denied access," she said. But, she added, "that's the user being sloppy, not the machine."

Accuracy is key

All of this points to the fact that biometric identifiers have to be practical. "A reject rate of even 1% is too high," said David Stang, chairman of the International Computer Security Association in Washington, D.C. "If you have five users a day out of 500 whining, it's going to get irritating fast."

Many biometric security devices can be intimidating to users the first few times. Fingerprint scanners, for instance, may be associated with criminal bookings. And some users fear retinal scanners because they do not like the idea of exposing their eyes to the infrared light these devices direct through the pupil to the back of the eye to read retinal patterns.

But people should get used to biometric devices because they are expected to become more pervasive in everyday life. New York's Kennedy Airport, for example, will soon begin testing a system developed by Recognition Systems that uses infrared hand scans to cut delays caused by passport checks. A traveler inserts his passport's computer-readable page into a machine while placing his other hand into a scanner that reads such characteristics as the distance between finger joints. The two-second process can tell whether the passport belongs to the person holding it.

While most biometric devices today secure physical access to computer areas, experts said that will change as users become accustomed to secure computers. Already, one contractor for the Department of Defense has a database that requires users to pass muster on an EyeDentify retinal scanner before they gain access. But high cost prohibits most such use at commercial establishments.

Security experts like Stang expect biometric devices to get even more sophisticated. Stang has envisioned what he calls a "biometric access control product" in which a user sits down at his terminal and the machine lets him in. His chair, coupled to his machine, weighs him and records the information. Today's weight is compared with the weight at his last session. The more sophisticated models would also measure the pressure of a user's back against its back to get a sense of the person's degree of slouch.

That is a prospect security personnel are anxious to embrace. Biometric security devices "are so wonderful because they are so easy," Bader said. "One day we'll wonder how we ever felt secure without them."

Personal security

The following is a list of some of the commercially available biometric security devices:

•Fingerprint readers. These identify people by the shape and number of "minutia," points where fingerprint ridges fork or end. Leading manufacturers include Fingermatrix, Inc. in North White Plains, N.Y., Identix, Inc. in Sunnyvale, Calif., and Identity Systems International, Inc. in Edmonton, Alberta.

•Retinal scanners. A typical scanner sends a beam of low-intensity, near-infrared light through the pupil, illuminating the retina. Since blood vessels absorb more light than the surrounding tissue, the scanner can measure intensity variations at points on the retina. These values are digitized and matched against the "eyeprints" stored in the database. The leading vendor is EyeDentify in Portland, Ore.

•Hand geometry. A reader uses light to construct a three-dimensional image of a person's hand, examining such characteristics as finger length, width and hand thickness. Popular systems are made by San Jose, Calif.-based Recognition Systems and Palmetrics in Portland, Ore.

•Voice verification. A technology that constructs a mathematical model of a speaker's vocal tract, which is used to identify a voice pattern. Manufacturers include Alpha Microsystems in Santa Ana, Calif., and Voice Check, Inc. in Boulder, Colo.

•Signature recognition. A pattern recognition technology that learns both what a signature looks like and how it is executed. Signatures are also analyzed through pen pressure, character shape and pen acceleration. With each acceptable signature, the individual's file is updated to allow for natural drifting in the user's signature over time. Makers of such systems include Menlo Park, Calif.-based Communication Intelligence Corp. and Autosig Systems, Inc. in Irving, Texas.

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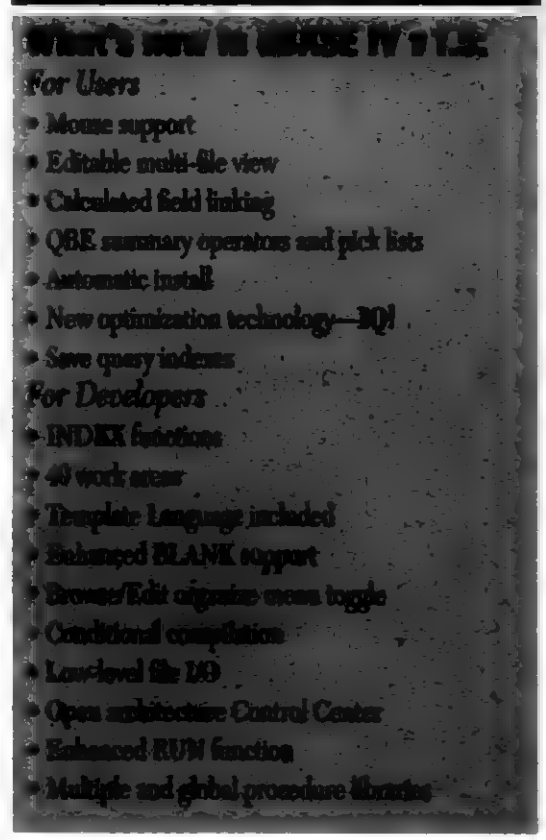

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EDITORIAL

No time to lose

DEC			
	Revenue	Employees	Revenue per employee
1986	$7.6B	94,700	$80,148
1991	$13.9B	121,000	$114,967
Hewlett-Packard			
1986	$7.1B	82,000	$86,609
1991	$14.5B	89,700	$161,572

Which of the above companies is in trouble?

By now, everybody knows the answer to that question, and the departure of Ken Olsen from DEC is only the first step in the long journey that company must make back to profitability.

I'll miss Olsen. He is part curmudgeon, part teddy bear, a brilliant engineer, a technical visionary and one of the few genuine characters in the industry. But I would have missed DEC a lot more if it had stayed on its current course.

Compare DEC to Hewlett-Packard, whose chairman, John Young, retired the same day as Olsen. Both companies cut their teeth selling computers to engineers. Both put down roots in proprietary systems and risked being swamped by the move to openness.

The difference is that HP saw it coming. In 1986 and 1987, it clamped down on hiring and put forth a radical strategy to convert its products to a RISC/Unix architecture. It committed to maintaining a competitive PC product line and began to build a desktop peripherals business that today is the envy of the industry. Above all, HP decentralized and pushed profit-and-loss responsibility down to the divisions.

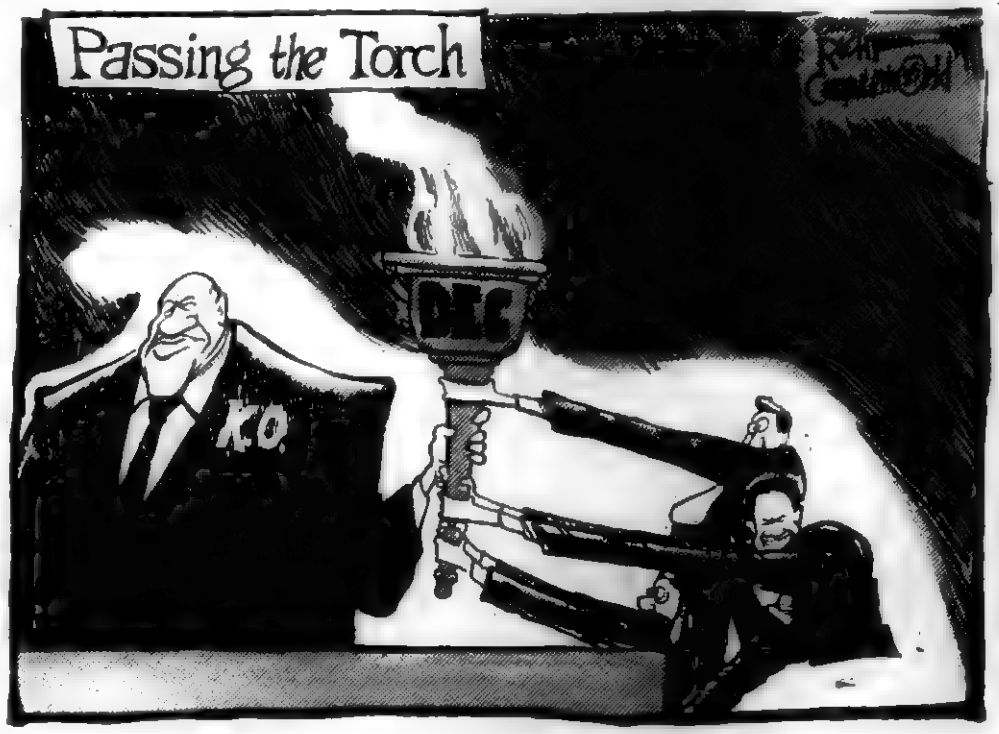
DEC has been late or unwilling to adopt any of those strategies and, as a result, finds itself in a terrible mess. The mandate for DEC's president-elect, Robert Palmer, is to make changes fast. Palmer also should adopt a 100-days strategy that by year's end makes a dramatic statement about where this company is going.

DEC needs to lose at least 20,000 employees to bring its cost structure back within striking distance of the rest of the industry. Palmer also should consider decentralizing the organization to a much greater degree.

DEC must commit every resource it has to moving its customers to the Alpha line with a minimum of cost and pain. Most importantly, DEC must ship Alpha on time — or early. And the product's gotta be good.

DEC's customers really want the company to succeed, and you can't buy loyalty like that. But dire problems call for drastic solutions. Now's the time for action.

Paul Gillin, *Executive editor*



LETTERS TO THE EDITOR

Hot tub photo in poor taste

I see your publication treats women in computing flippantly. No wonder there are so few in this field.

In the June 29 issue's pictures of men, men work. In the pictures of women, they are pretty but obviously not good for working. Women work, too.

I would have hoped your publication would indicate that through its choice of images. I hope you use better images in the future.

Gerald W. Edgar
Renton, Wash.

.....

Regarding "L.A. support system up in smoke" [CW, Executive Report, June 29]: Every photograph of an IS professional in this issue either depicts that person in a business setting or is a formal head shot — except for one: Peggy Stoker, IS chief and head of the trauma and EMS system for Los Angeles County. She is shown in her hot tub.

I was very surprised and discouraged that *Computerworld*, a publication reporting on an industry that generally treats women with respect, should be so insensitive as to the message they were sending.

Dorothy Klauber
Oradell, N.J.

Software development in the Stone Age

To accept Francis Walnut's notion ["Lofty ideas don't build systems," CW, June 15] that software development can be more efficiently addressed by someone who works with a computer in his basement reflects the antiquated practices that have put the state of software development where it is today: in the Technology Stone Age.

Most of the software development done by organizations today requires many participants from the end-user community, management and IS groups.

Second, Walnut's contention that software engineering implies that once the specifications are complete, the creative process is finished is not grounded in reality. Engineering techniques provide a desperately needed dose of discipline to the area of "requirement specification." Historically, this has been ignored by the systems development community. What have resulted are systems that require a great deal of creativity by implementation staffs to make them functional for the end user.

Third, while there is little to argue with about the importance of software systems implementation, far more errors occur because of incorrect software specifications.

The techniques and tools being put into use today, most notably Information Engineering and I-CASE tools, are squarely focused on providing real solutions to real business problems. Better system implementation will not occur until we understand all aspects of software development and adopt the tools and techniques that enable efficient software implementations.

Raymond M. Thompson
Livonia, Mich.

Intellectual property proposal ridiculous

Regarding "The dangers of selective information sharing" [CW, Viewpoint, July 13]: A free market economy is not predatory; it is consensual. You may choose to compete, or you may choose not to.

For Randall Kennedy to say that Microsoft must share its hard-won code with any and all comers that simply appear at its doorstep whining about "need" is not only preposterous but also disgusting.

Nondisclosure agreements allow Microsoft to protect its intellectual property with the force of law. Intellectual property, whether it belongs to a corporation or to an individual, deserves — and demands — the same amount of protection as any other property — perhaps more so than other forms of property.

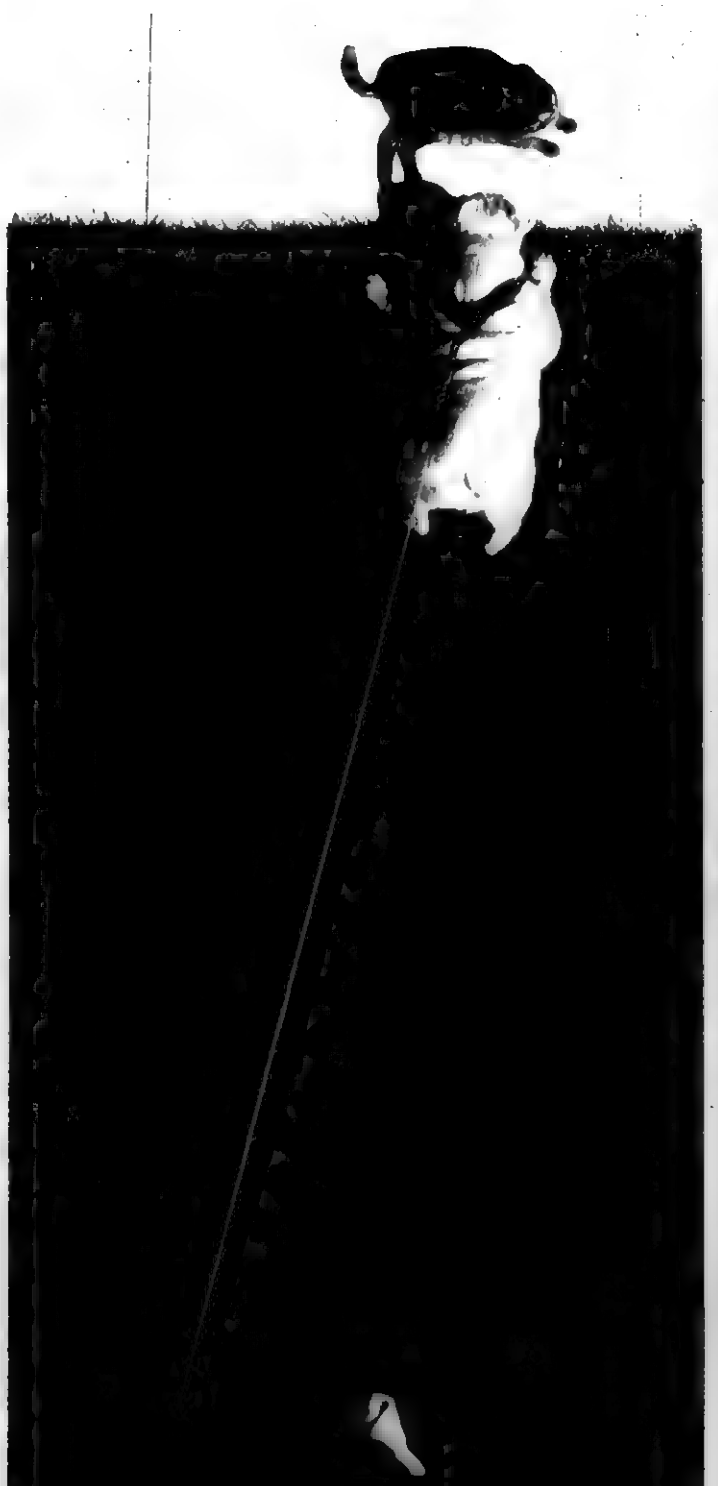
Intellectual property rights promote the greater good. Knowing that the product of your mind will be protected from sponges and moochers will free you to continue to develop newer and better applications, rather than staying with what has already been done.

Kevin Slattery
Mariposa, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

White Paper

NETWORK PRINTERS



Until now, network printers have had the same fifteen-foot restriction.

With HP network-ready LaserJets, you can put your printers where your users are.

Now you can forget about tethering your printers to some faraway server. Because network-ready LaserJet printers can be placed anywhere along your network. Just plug them in as you would PCs and you're ready to roll.

Since you're putting printers by your users, it's as if you're giving them their very own personal printer. Which means they won't have to travel as far for output. Because they're closer to the printer, they can handle some of the routine maintenance tasks, such as paper loading, themselves. Best of all, you won't have to contend with extra boxes, wires or power cables.

HP LaserJet III *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,* Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3073 for the HP Connectivity Solutions Guide.

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Introduction

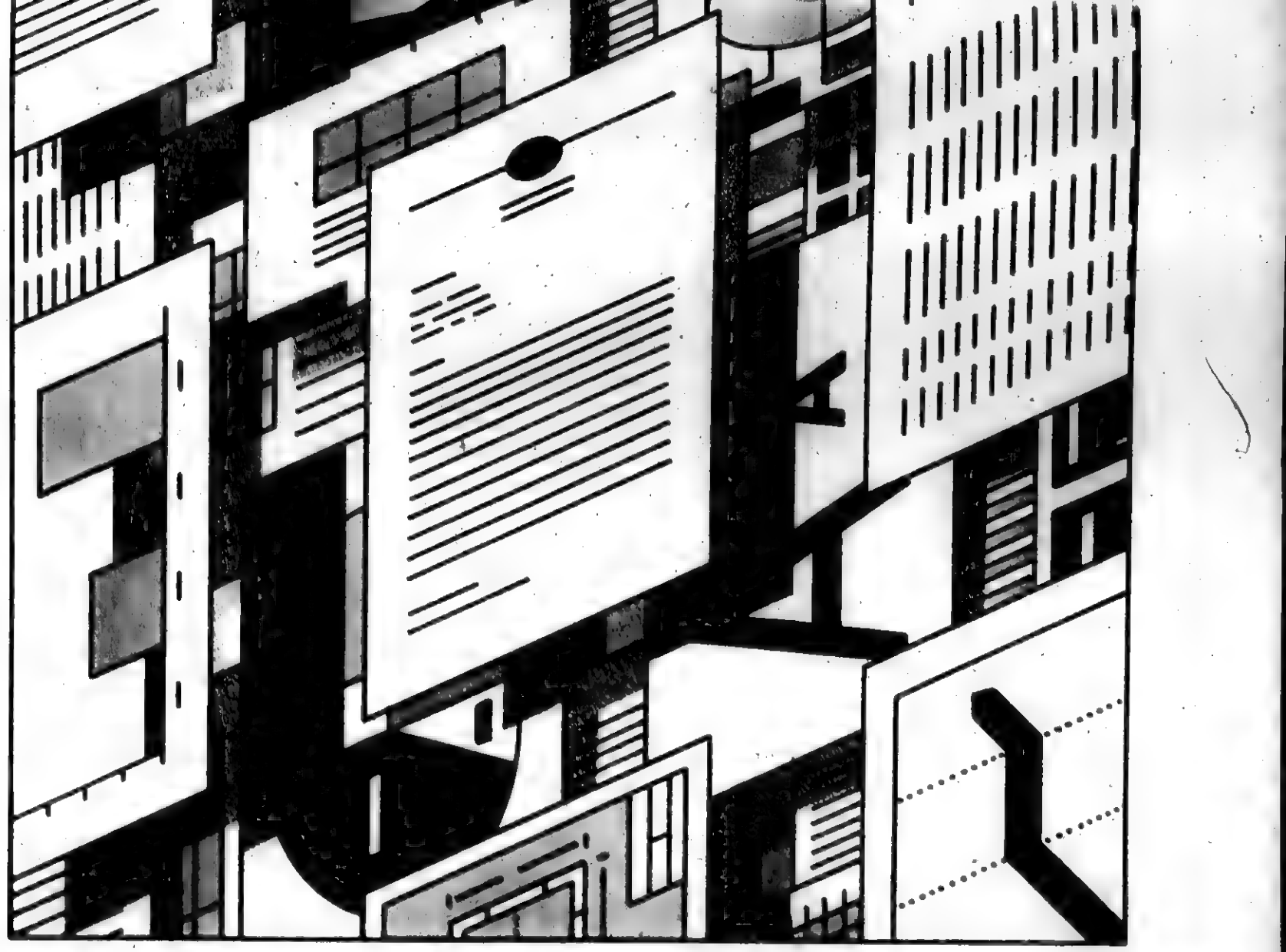
Local area networks have certainly made their impact felt in the computer world. Although some criticize them for their utilitarian applications — they are largely used to link PCs with local printers and storage devices — the fact remains that localizing printer and memory capabilities has vastly changed the nature of computing.

Liberated from the tyranny of centralized, mainframe environments, users have become more productive within departmental workgroups. This local processing trend is strong and growing; IDC research indicates that, by 1996, users believe that 69% of PCs will be attached to LANs. As is frequently the case with technology trends, there is a downside to the great LAN proliferation: integrating printers is a complex challenge for LAN administrators. Despite the printer's importance to users, they are not a top priority for network operating system suppliers. As a result, printer and third-party vendors who make accessories or enhancement products have inherited the challenge of network administration.

Currently, printer interface and software technologies are years away from offering the ability to transmit any print job and have the system intelligently and transparently print it at the closest available printer. Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will continue for the next three to five years. Until it is resolved, network configurations will fail to maximize printer capabilities.

There are, however, interim solutions that ease the burden of printer administration. Although these fixes will not do the job over long periods of time, the day will come when print management software, which is currently in its nascent stages, will seamlessly accommodate different data streams on LANs.

This White Paper was written independently of the *Computerworld* editorial department
by Angele Boyd, Director of Printer Research,
at International Data Corporation.
For more information on the content of this White Paper, or for information on
International Data Corporation, please call 508-872-8200.
For more information on the White Paper Program, please call 508-879-0700.



NETWORK PRINTERS

THE RAPID PROLIFERATION OF LOCAL AREA NETWORKS (LANS) AND PRINTERS IS BRINGING THESE TWO PROMINENT TECHNOLOGIES TO A CONFLUENCE THAT WILL INCREASE THEIR UTILITY AND PROVIDE THE COST-EFFECTIVENESS REQUIRED TO JUSTIFY THE GROWING LEGIONS OF DESKTOP COMPUTERS. ■ ALTHOUGH PRINTERS OBVIOUSLY REPRESENT A FAR MORE MATURE TECHNOLOGY THAN DO LANS, LASER PRINTERS ARE EXPERIENCING SIGNIFICANT GROWTH, IN PART BECAUSE THESE PRINTERS ARE FINDING THEIR WAY INTO MORE AND MORE CORPORATE NETWORKS. THIS CONTRIBUTES TO LAN GROWTH, WHICH IS STIMULATED BY THE ABSORPTION AND PURCHASE OF NEW AND MIXED-PLATFORM NODES, SERVERS AND PERIPHERALS SUCH AS PRINTERS. ■ DESKTOP COMPUTERS ARE BEING CONNECTED AT A HIGH RATE AS CORPORATIONS STRIVE TO LEVERAGE THE HUGE CAPITAL INVESTMENTS THEY MADE IN THESE SYSTEMS DURING THE PAST DECADE. ■ IN A FOURTH-QUARTER 1991 IDC SURVEY,

of 1,600 U.S. users across vertical markets (excluding government and education), respondents report 44% of their PCs are connected to LANs. Respondents expect this LAN penetration rate to accelerate, predicting 60% of their PCs will be attached to LANs by year-end 1992. IDC's total market data indicates a similar but slightly tempered trend when portable PCs are included. During 1989, 26% of installed PCs were linked to LANs. That number escalated to 34% in 1990 and 42% in 1991. By 1996, IDC predicts that 69% of PCs will be on LANs.

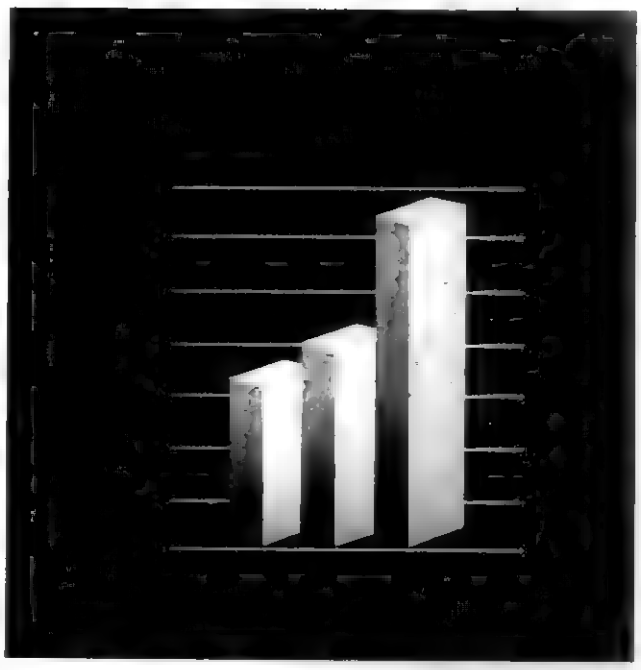
Additional IDC research indicates that, on the printer side, 30% to 40% of laser printers outputting 11 pages per minute (ppm) or fewer sold to business users are linked to LANs compared with 65% to 70% of 12-19 ppm models. Twenty-five to 35% of line printers and 30% to 35% of high-speed serial dot matrix printers are destined for LANs.

Intuitively, it seems LAN installations will be motivated by the need to share applications. And in fact, sharing peripherals such as printers is a leading reason for installing networks. A December 1991 *Infoworld* subscriber study finds that printer sharing and storage device sharing are the most cited reasons for installing LANs. These two reasons are cited by 84% and 74% of respondents, respectively.

The nature of the LAN hierarchy is changing. Increasingly, LANs are comprised of different platforms such as workstations, PCs, Macs, minis and mainframes. And a large percentage of LANs are bridged to another LAN, wide area network (WAN), minicomputer or mainframe. In such cases, printers are accessed across the platform.

PRINTING PROBLEMS PLAGUE LAN ADMINISTRATORS

Integrating printers is a complex problem for LAN administrators. Although printers are important to users, they remain a lower priority for Network Operating System (NOS) suppliers, who continue to focus on data access, communication and security. As a result, printer and third-party vendors who make accessories or enhancement products are left to solve the network administrators' problems.



"Common problems experienced by end users include excessive waiting times, inaccessible or inconvieniently located printers, and problematic network print management features."

Once a printer is shared by at least two users, every printer feature should be remotely and dynamically accessible by each user. In an ideal world, the printer/NOS should be able to transmit any print job, regardless of font, data stream or required forms, and have the system intelligently and transparently print it at the closest available, appropriate printer. Notification of job status would then be communicated back to the user.

At this point, printer, interface and software technologies are years away from this ideal. This is less attributable to technical limitations than it is to the lack of cooperative development between printer and software suppliers. There are, however, solutions available today that will make printing and print administration more user-friendly to users and network administrators alike.

Currently, the NOS limits user knowledge and control of the print function except in rare instances where there is some degree of two-way communication between printer and network users. More typically, when a print job is transmitted across a network, there is limited control over which printer will be utilized, and no guarantee that the job will be printed in the form requested. At best, the typical NOS notification regarding a specific job informs the user if the printer is busy, shut off or out of paper. "Busy" can mean anything from being truly occupied to some type of printer malfunction.

The NOS may also permit the user to determine and change the job's print queue status within the constraints determined by the LAN administrator. However, the user is usually limited in printer choice, since the LAN administrator has generally predefined print queues for specific applications, print format parameters and particular individuals' access.

Further, the user's ability to determine font type, page orientation (portrait or landscape), or graphics content may not be respected for a number of reasons. For instance, the printer's random access memory may be inadequate to accommodate the requested fonts and graphics. Or, the desired fonts may be unavailable at the printer. In these instances, at a minimum, the user should

be informed that there is a problem, and be given options for dealing with it.

Where possible, the problem should be solved transparently for the user. This could happen in the case of best-fit font substitution. However, due to the wide variety of printers and network environments, the kinds of solutions mentioned here may not be available.

Common problems experienced by end users include excessive waiting times, inaccessible or inconveniently located printers, and problematic network print management features. Most important network print management features involve communication to users concerning breakdowns, job completion, low consumables and intelligent routing and font downloading.

Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will persist for the next three to five years. Limitations in printer designs, along with those in application and NOS software printer support, have resulted in network configurations that fail to maximize printer capabilities.

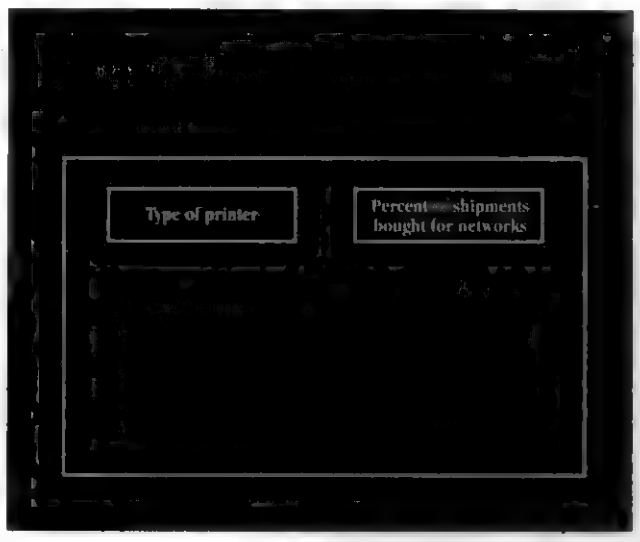
PLANNING TO MEET THE CHALLENGES

With careful planning, network printing problems can be avoided by addressing five areas. They are: capacity; homogeneity versus heterogeneity; printer location needs; software applications; and graphics/images and font usage.

Capacity

Capacity refers to the number of users, the number and size of jobs, and the type and size of media users require. It is important to consider current and future capacity needs.

In assessing capacity the goal is to be able to select the right number of printers, as well as the correct printing speeds and features. It is important to know whether users tend to print many short (up to 10 pages-per-document) jobs, a few long jobs, a mix of short and



long jobs, or small jobs with high-volume bursts at the end of transaction periods.

IDC studies show that the most common speed of network-based printers regardless of network capacity is 8 ppm. This is true despite the fact that such speed is only appropriate for small workgroups of three-to-four users. Although there is an increasing availability of low-cost sub-8 ppm personal, single-user printers, the trend for the LAN printer market is away from such devices.

Largely as a result of cost-conscious management, standalone desktop computers are being networked, and the hidden costs of ownership (consumables, maintenance) of personal page printers are viewed skeptically. The clear trend is toward higher performance page printers that are suitable for sharing by five-to-twenty users.

"It is wise to examine printer use patterns. Sometimes, printers are used as convenience copiers."

Fortunately, a new class of laser printers, the most common printing technology shared on networks, is available. At 15-20 ppm, these printers run at twice the rated speed of earlier 8-11 ppm models, and are designed to be shared by five-to-ten users, but may accommodate up to twenty.

These printers often list for under $5,000, and typically range from $2,400 to $16,000. Their monthly duty cycles — the maximum pages per month recommended by the manufacturer — range from 25,000 to about 50,000, which makes them appropriate for small to midsize workgroups. They are available from a number of vendors including Data-products, DEC, Fujitsu, Genicom, Hewlett Packard, Image Systems, QMS, Texas Instruments and Toshiba.

When choosing printers, paper handling is important to consider. The larger the number of users sharing the printer, or the longer the print jobs, the greater the need for a printer with large capacity input and output. This situation also calls for output handlers with a job offset capability and or mailboxes/sorters.

Low-to-mid volume output is considered to be 300-600 pages per person per month, while high volume is 1,000-1,500 pages per person per month. Eight ppm printers often only have one 200-250 sheet input bin, a slightly smaller output bin and no job offset capability. In contrast, the new breed of workgroup printers often has two 500-sheet input bins, job offset and or optional (additional cost) mailbox sorters.

It is also wise to examine printer use patterns. Sometimes printers are used as convenience copiers. This practice increases print capacity needs, although it may be appropriate under some conditions. A cost-benefit analysis can determine when such conditions exist and whether it makes sense to select personal, rather than shared, printers for networked users. Generally speaking, the lower the laser printer speed, the greater the cost to produce a page. More on this can be found in the article appearing in the April 20, 1992 issue of *Computerworld* entitled "Six Steps to Calculate Cost of Ownership."

Thus, giving everyone on the net-

work his own four-to-six ppm personal laser printer is less cost-effective than sharing workgroup printers on the network. There are times when personal printers are appropriate, i.e., when the user is high-ranking, someone who requires stringent security or someone whose job requirements warrant a dedicated printer.

Consideration should also be given to network users who need to print on 11x17 inch (ledger) paper, on two sides of a page (duplexing), and envelopes. Ledger paper is sometimes used for large spreadsheets, or for printing pamphlets and newsletters. Not all workgroup printers support 11x17 inch paper. It tends to be either a standard feature or not available at all.

Duplexing is popular in paper-intensive industries. Duplexed output costs less to mail, file, archive and otherwise store. When available, it is usually an option on low-to-mid speed (20 ppm and less) printers. It is usually either standard or not available at all on higher speed printers.

Envelope printing is generally available on personal and workgroup printers. Capacity varies, running up to 75 envelopes, and should be evaluated before before making a commitment.

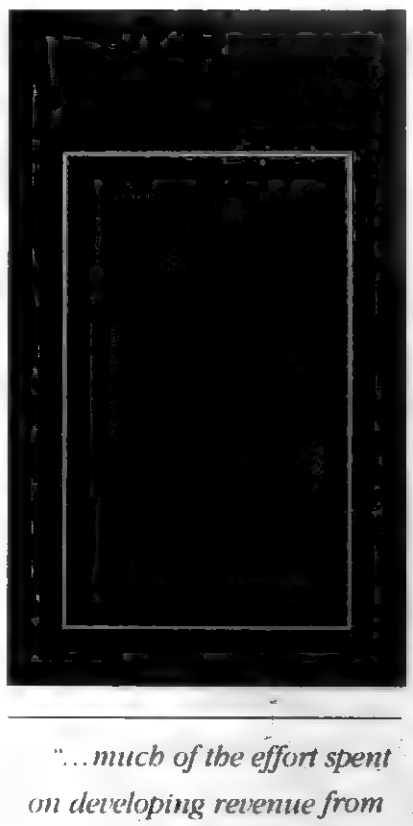
Homogeneity Versus Heterogeneity

Planning for a heterogeneous network with PCs, workstations and minicomputers that have shared printer capabilities requires understanding the physical interface, protocol, and page description language (PDL) requirements for the mixed platforms.

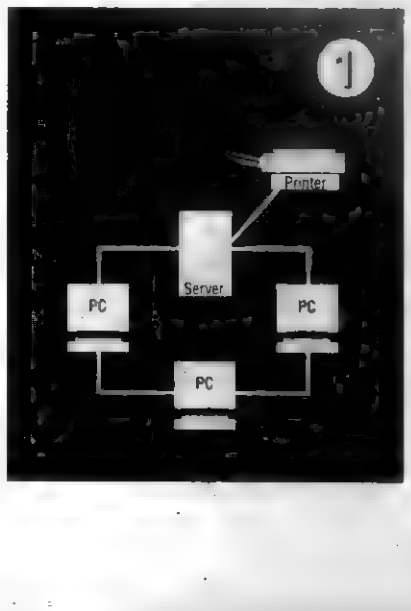
The NOS is simply a conduit for the mixed formats and does nothing to translate them into a specific printer standard. Even when the NOS provides print services to support mixed platforms, the user must still find a printer that can handle them and their PDLs.

It is still common to use a parallel interface to attach a laser printer to a PC server. However, this is changing in favor of direct network interfaces to LANs such as Ethernet and Token Ring. The Macintosh uses either its own version of a serial interface or a Localtalk interface.

Direct connection to the network is preferable, so take note of what topology (Ethernet or Token Ring) the network employs. When choosing a network printer, be sure the printer's physical interface matches network requirements.



"...much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on network operating system software."



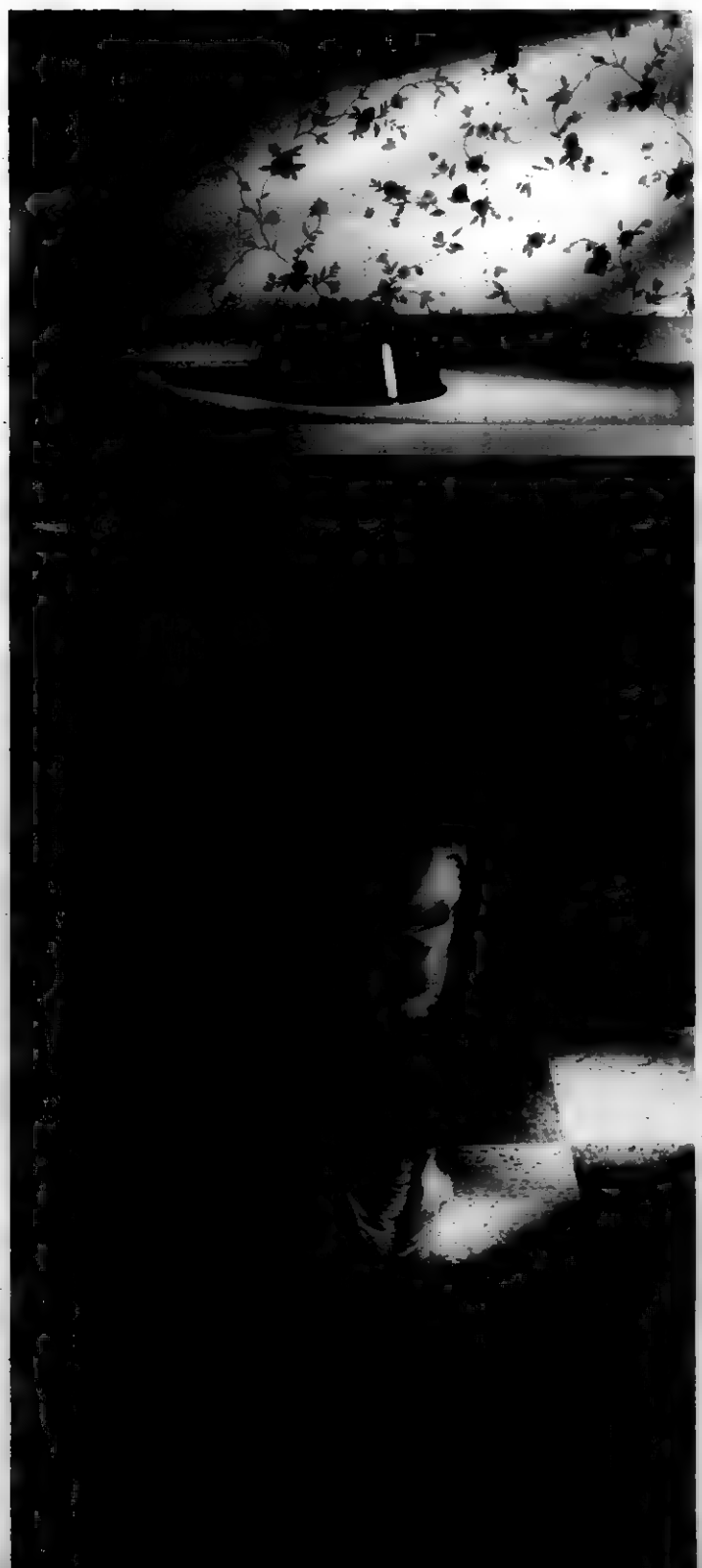
In some instances, simultaneous operation of more than one printer port is desirable, and some printers support this. For example, the parallel and Ethernet ports can be operated together. However, it is important to determine if both ports can switch between PDLs, or whether they are fixed to support the same PDL. HP's PCL and PostScript are the two most common PDLs. In addition, TCP/IP and Appletalk are two protocols that may also require support.

Novell's Netware 3.11 (the 386 extension to the Netware name has been dropped), which was announced at Networld in February 1991, is an example of vendor support for mixed LANs. Netware 3.11 enables client devices based on DOS, Windows, Macs, OS/2 or Unix to share file and print services on a Netware LAN. Mac support was available on Netware 286 but not the 386 version, and Unix support was not provided at all. TCP/IP support is also integrated in 3.11.

Digital Equipment Corp.'s support for Unix, Ultrix and VMS in DECnet and TCP/IP environments, in addition to its support for PCs and Macs through Pathworks, are other examples of vendor support for complex LANs. Sitka's TOPS software offers more than just PostScript printer sharing across Sun workstations, PCs and Macs; it is a complete network operating system that lets each of the three platforms share files in their native mode.

Printer Location Constraints and Network Connectivity Options

A key issue in planning for network printing is deciding where the printers should be located. In the past, technological limitations required that printers be attached to servers. This still presents logistical problems. For example, if the server must be secured after normal working hours, user access is constrained. If a user's system is concurrently acting as both a server and user node, that user will be inconvenienced every time someone comes into his office to print a job.



Until now, waiting for network printing has required the same amount of patience.

HP network-ready LaserJet printers help your users get their output faster.

With an HP network-ready LaserJet printer, your users won't go begging for fast output. Network-ready LaserJets avoid parallel bottlenecks and print up to fifteen times faster than ordinary machines. Since your file server is relieved of some print-server functions, your printing network flexibility increases almost immediately. You'll enjoy faster transaction times. Greater security. And increased speed across your entire system.

HP LaserJet IVi *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,* Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3074 for the HP Connectivity Solutions Guide.

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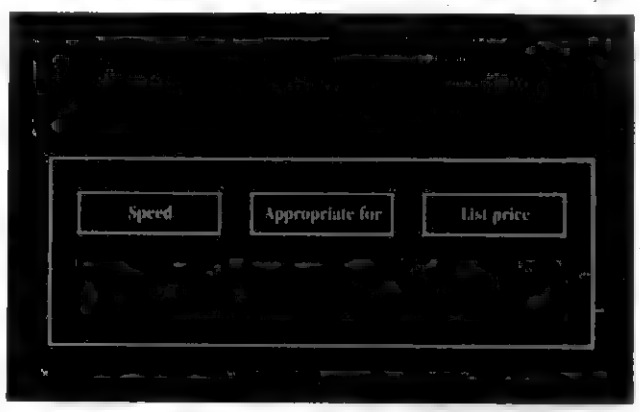
There are four major network printer connectivity options to consider:

- server-attached
- shared via user node with spooling done remotely
- shared via user node with spooling done at user node
- direct to network with network adapter.



Server-attached

Presently, the most common attachment for LAN printers involves having one or more printers attached to a server responsible for file management, printer support and other services. The server may be a computer or a dedicated hardware box. At present, the principle NOS vendors can support a range of server-printer ratios from five-to-eight or five-to-sixteen through either serial, parallel or remote attachments.

This configuration is a legacy of the earlier days of NOS, when server connections were the only type of printer support that network operating system software provided. The NOS vendors, at that time, were much smaller companies, unable to fund a wide variety of system options. They also realized that offering other attachment options would only have stimulated third-party vendor competition.

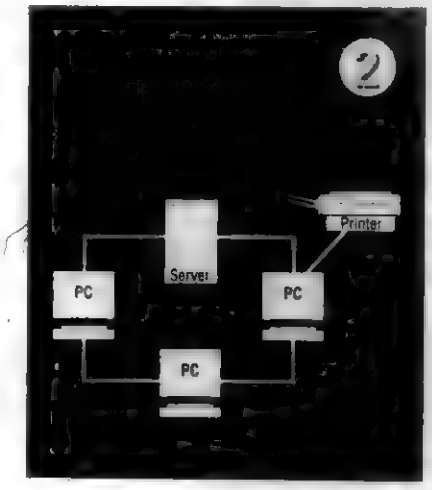
Over the past three years, much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on NOS software. As an example of this phenomenon, consider Novell's withdrawal from the server market and DEC's Source Kits, which provide the necessary host software to drive DEC's Printserver printers from non-DEC Unix servers. With this new emphasis, the capability to support alternative printer attachments not tied to specific server hardware offers a competitive advantage for NOS vendors.

Tied to this has been the printer and printer accessory vendors' desire to make sure printers can be attached anywhere on networks. This has been such a major issue that several vendors, including Intel, Lexmark and Castelle, have developed very small network adapters that are transparent to the NOS and allow the printer to be physically attached anywhere on LAN cabling. The printer's serial or parallel interface is plugged into the network adapter, which, in turn, attaches to Ethernet or Token Ring network cabling.

Shared via User Node with Spooling Done Remotely

The second-most common LAN printer configuration is comprised of a workstation, usually a user's node, whose printer can be accessed by several other users on the network. The workstation does no spooling, and as a result, only one person can print at a time. Multitasking environments such as Unix and Windows prevent user interruption during print jobs.

However, in other environments, when a printing job is being processed, the node's ability to concurrently process other software is appreciably slowed. For this reason, the number of users with access to this printer is limited, usually to no more than three to five people.



A variation of this set-up is to have spooling done on a remote server. This allows print jobs to be simultaneously sent to the printer. In this variation, one or two printers are attached to the workstation. Novell, the most popular NOS supplier, now provides support for remote printing from the server, except under Entry Level Netware (ELS). ELS does not support remote printing because it supports only four to eight users.

Shared via User Node with Spooling Done at User Node (Concurrent Server)

This third LAN printer setup employs a concurrent server — a workstation used as a server providing print spooling and file service as well as end-user capacity. This configuration is not common because it suffers from the same problem as the shared node's printer mentioned above: the node's ability to concurrently process other software needs is appreciably slowed. This configuration can also present a data security risk. If an application crashes, the server function of the workstation is similarly affected.

Direct to Network with Network Adapter

This is the least common configuration, but one that is increasingly being used because of its advantages. It consists of a printer with a built-in Ethernet or Token Ring interface connected directly to the LAN. By separating the file server function from the printing (spooling) function, data security is better addressed. Also, direct-connect printers benefit from enhanced transmission speeds on Ethernet and/or Token Ring. This provides a significant benefit for large Postscript, high-resolution, color- and graphics-image-intensive files being sent to a printer or a typesetter/imagesetter.

Traffic on the network and the interface to the printer are bottlenecks when it comes to speed of printing. When multiple print jobs are sent simultaneously across the network to the server, there is

a delay while each job gets into and out of the server's print queue. More time is lost if the printer is attached to the server via a parallel interface instead of Ethernet or Token Ring. The contrast in communication speed is vast — Ethernet's maximum speed is 10M bit/sec and Token Ring's is four or 16M bit sec while a parallel interface allows only 10K bytes/sec.

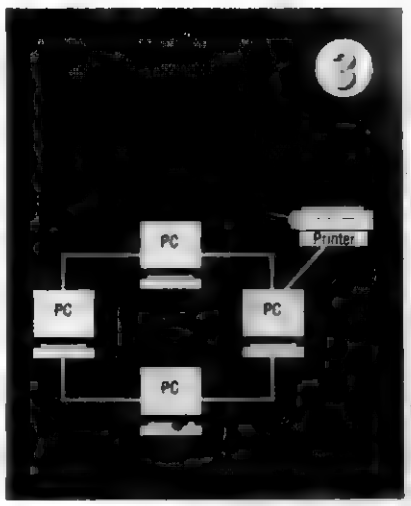
Since there is a direct relationship between an interface's performance and its price, high-speed Ethernet and Token Ring interfaces which list between $700-$900 are commonly used for higher cost printers. Accordingly, higher speed printers (15 ppm+), color devices, and high-resolution devices (600 dpi+) are appropriate candidates for those two cabling schemes.

A number of printer vendors have begun to offer Ethernet and Token Ring interfaces as options on their workgroup printers. These include HP, Toshiba, QMS, Apple and DEC. In addition, third-party vendors such as Intel and Castelle offer external network adapter cards for printers. These allow the connection of two-to-four printers per card.

Software Applications

Knowing the applications and their versions is critically important. One of the most frequent problems encountered by users is their job not printing at all, or printing incorrectly. This frequently happens because the user unknowingly sends the job from an application configured to move output in a specific printer emulation format, to a printer whose current set-up does not match the incoming format. Network printers must be able to print and switch between the emulations supported by applications.

The ability of a printer on a network to seamlessly handle multiple data streams has high utility to both users and network administrators. This is particularly valuable in mixed networks where there is a need to support multiple data streams. Postscript, PCL, DEC ANSI, IPDS, Epson, and line printer have the leading page description language/ emulation market shares. Currently, because of the inability of most laser printers to automatically switch emulations, a PostScript printer is often set up to accept only PostScript while a separate printer may be designated for PCL output.

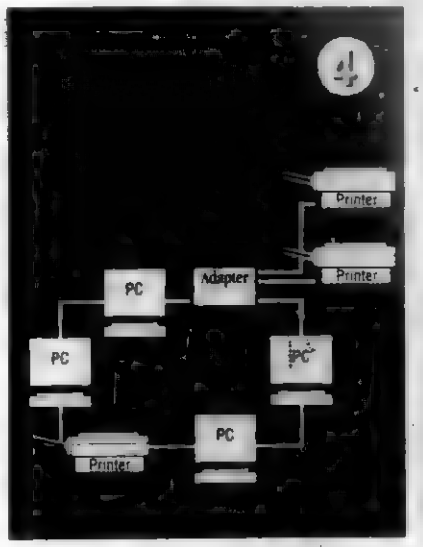


This limitation is changing as several non-impact printer suppliers including HP, QMS, DEC, Tektronix and Talaris offer printers that sense the incoming data stream and print them accordingly. Adobe, which developed Postscript, has just announced support for emulation switching.

Graphics/Images and Fonts

As graphics make output more sophisticated in terms of images and fonts, the amount of data being transferred across the network increases. This has implications for the amount of required printer memory and network bandwidth required to transfer the job to the printer.

With fonts there is also the issue of



WYSIWYG, the ability to see on the screen exactly what will be printed. To support the growing sophistication of user output, it is important to choose network printers that have memory expansion capabilities, WYSIWYG fonts, support for high bandwidth interfaces, and CCITT-based image compression capabilities.

Most workgroup/network printers have generous memory expansion capabilities. While many offer a number of fonts on the printer, not all are WYSIWYG fonts. PostScript and PCL support image compression, the ability for a printer to decompress data is also expected to become important.

NEXT GENERATION NETWORK PRINTING

Several printer and NOS characteristics build a case for print management software on the network. There is a need to transparently manage and distribute printing resources such as fonts, printer data streams and paper handling capabilities to users across the network. Print management software, currently in its nascent stages, will seamlessly handle different data streams by either locating an appropriate network printer that can handle the necessary data stream or translating it into a bitmapped code that is sent to a printer conveniently located near the requesting end user. Print server software from Insight Development Corporation offers a number of these capabilities.

It makes sense for print management software to assume much of this responsibility for groups of lower cost, lower performance printers. This way, it is not necessary to justify the incremental cost of the added intelligence and two-way communication interfaces needed to allow remote and transparent user access. Given that many LANs today are still relatively small — averaging twelve nodes — less expensive printers will continue to proliferate, making a compelling case for intelligent print management software.

In addition to reducing costs, printers running intelligent print management software can charge back to departments based on individual departmental usage.

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HEWLETT PACKARD

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Programming no longer enough

BOB FRANKSTON

There are too many programmers, just as there are too many lawyers. Both professions feel they are major contributors to productivity and the economy. Clients and users accept both of them because they do jobs that they don't know how to do or don't want to do themselves.

I'm not a lawyer, so I can't speak for lawyers. But I am a programmer. The term "programming" is pretty broad, even within the domain of computer software.

I'm using the term for the act of laying out the hoops that the computer must jump through and working at it until it executes the jumps perfectly, or at least frequently.

Ultimately, however, the point is not the fancy hoops but the task that the end user (who's that?) is trying to accomplish. The goal is to go from the user's specification to a program. In fact, what is the difference between the spec and the program? Why shouldn't the process be automatic?

If the process were automatic, the user would write a specification and the computer would execute it: no programmers to argue with. This would avoid the frustration of the user who understands the task but must deal with a programmer who insists that the part number must also double as a sector number (in octal) on disk.

It hobbles the user to have to rely on this other person to accomplish every mundane task.

Jeff Mahon

Having to call a programmer in to get any work done is just as bad as having to call a lawyer for every business detail. It is a symptom of something gone awry, rather than a solution.

There's a good parallel for what I'm suggesting in the evolution of telephone service. At one point, professional operators always handled the complete process of placing a call — from specifications to making the connections. Eventually, however, the volume of calls grew so much that, short of turning the entire population into operators, there was no way to deal with it. So dials were placed on the telephones and people were told to place the calls themselves.

Of course, it takes expertise to properly operate the phone network or construct applications. There is always the danger of accidentally dialing an 011 and reaching Australia instead of Boston or of calling a 900 number.

But for the most part, people would rather risk an occasional foray to Australia than be encumbered by the services of intermediaries.

A user armed with a spreadsheet might confuse precision with accuracy; a user armed with desktop publishing software might discover new degrees of font abuse. But eventually, most of them will learn how to do what they need to do.

Some users go beyond basic use of the tools; they lash pieces together and pipe data and commands around. This can get exceedingly complex and ugly. Rather than being offended by the amazingly baroque systems that come from these tools, however, we should be impressed by the effort and inventiveness.

We should also pay attention to the message of these constructions: Users can be inventive and apply tools (even beyond their design point) in order to accomplish their tasks.

The end, not the means

As users learn how to do their own programming, we must become more attentive to what the programming accomplishes and not just focus on the process.

We, too, can use our skills to accomplish a task, rather than writing a program. Rather than "programmer," our business cards might read salesman, architect, journalist, product designer or hydraulic engineer.

Have I taken my own advice? Of course not. I'm still a programmer. But one day I promise to learn a trade.

Frankston has been programming for 30 years and may be too old to change. VisiCalc is his best known program. You can gripe about his opinions by sending mail to CW1@frankston.com.

Benchmarks aren't all they would have us believe

MURRAY STEIN

Did you buy your last car because of its horsepower rating? Does a pro football scout automatically sign anyone who can run a 4.3 40? Has the world's fastest human ever won the decathalon?

If you answered no to any of the above, chances are you already understand what many computer marketers don't: Computer users want balanced performance, not just MIPS, MFLOPS or even SPECmarks.

I'm not even going to open the can of worms regarding the relative validity of various benchmarks. A few years ago, people started saying MIPS weren't a fair gauge of CPU speed, so MIPS were replaced by SPECmarks. Now the SPECmarks rating is taking flak because it isn't perfect either.

But who's kidding whom? When it comes to performance evaluation, absolute objectivity isn't possible — and it's not necessary. People who use computers in their work know that overall system performance in their application is what's relevant, not a single performance number.

Making the cut

What's becoming clearer and clearer to computer buyers is that a benchmark is only useful as a ballpark estimate. It can tell you within an order of magnitude how fast a system is compared with other systems running the same test, and that can help you shorten your prospective vendor list.

How does a system's I/O performance stack up? Processing speed won't get you far if the I/O is terrible.

And is the system optimized for your application? A computer that has a rocket of a CPU can still be as slow as a swamp turtle when it comes to actual transaction speed because the hardware, the operating system or the network hasn't been tuned to the application.

The questions can go on until the mind boggles. And the frustrating fact is that every benchmark number — MIPS, SPECmarks, megabytes per second, greps, nperf, you name it — tells you precious little about the one thing you really want to know: how the system handles your particular application.

There isn't even a consistent correlation between types of applications and performance benchmarks.

Trial and error

No, there's no way around it: The only way to get a clear sense of how a system will perform in running your application is to load your application or its nearest facsimile on the system in question and try it out. Or look for systems vendors that design and tune their computers to run applications rather than benchmarks.

Unfortunately, such an orientation is rare today. Page through any technology-oriented magazine and you'll see the ads and the claims — faster than a speeding bullet, more SPECmarks than a locomotive, able to crunch large data sets in a single clock cycle.

Some would no doubt say this focus on numbers is an attempt to exploit the ignorant, the way a stereo salesman touts watts per channel to the rich novice. I don't go that far.

I simply say that benchmarks are a distraction as well as a means of avoiding the difficult fact that computers, like people or even like cars, are complex machines.

COMPUTER USERS know that overall system performance in their application is what's relevant, not a single performance number.

In fact, maybe there's something in that comparison. Perhaps computer vendors, like automakers, should be required by law to warn consumers that "actual performance may vary."

Stein is a computer technology consultant at PointSource Communications in Prescott, Ariz., and a frustrated equipment purchaser.

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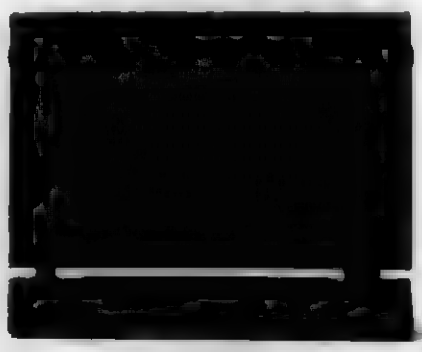
T6400DX

(Although our spec sheets do make excellent reading.)



T2200SX

For example, we thought you might like to know that in the sometimes here-today, gone-tomorrow world of personal computer companies, Toshiba is the market leader in portables—part of a $33 billion company with an R&D budget larger than most companies' annual revenues.

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T3300SL/120MB

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T6400SXC

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T4400SXC

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T3300SL/80MB

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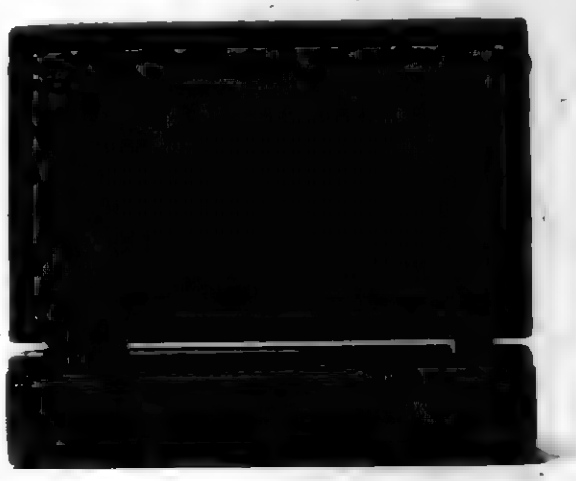
T6400SX



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DATAMATION—SEPTEMBER 1, 1991

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Notebook computers are tools of the trade at New York Life

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — It has been just three years since New York Life Insurance Co. racked up its first computer-driven policy sale. But what a three years it has been.

From those modest beginnings, New York Life's notebook computer-based sales automation effort has grown to include 8,000 of the firm's 9,000 agents. The volume of computer sales has jumped from less than 1% in 1989 to more than 30% today.

That totals more than 13,000 policies during the last month alone, according to Richard E. Nelson Jr., vice president of agency systems.

The foundation of the automated sales effort is a combination customized and off-the-shelf package called NYLexpress, or New York Life Expert Resource Sales and Service, which the company began developing four years ago.

NYLexpress puts a variety of sales tools at the agents' fingertips for use in calculating premiums, estimating benefits and calculating options. The biggest benefit of the software is that it allows agents to close the deal earlier in the sales cycle without getting stuck in the "I'll get back to you on that" cycle.

> IN 1993, New York Life expects that more than 50% of its policies will be sold and processed electronically.

The current NYLexpress barely resembles the initial release of 1989. Based on Microsoft Corp.'s Windows 2.0, that release's two applications consumed 20M bytes of hard disk space.

Today, five insurance applications are installed on the notebooks, spanning the entire selling cycle. They occupy almost 60M bytes of hard disk space. Some 4,000 New York Life agents use luggable portables — largely Prospeeds from NEC Technologies, Inc. — but are shifting to notebooks as storage capacities approach that of the luggables.

New York Life has both homegrown and third-party applications and has spent much of its effort tying them together. The system now automatically updates relevant information, such as customer records, across software modules through the use of a central database.

In-house work is done using Nantucket Corp.'s Clipper and dBase from Borland International, Inc.

New York Life chose a crude version of Windows in 1988 because information systems management thought it would grow with the applications, Nelson said. He opted for a steady "one-piece-at-a-time" development approach.

The agents have driven much

Continued on page 47

Insurance on the go

N.Y. Life has steadily increased its applications portfolio since it introduced portables to its agents in 1989

	June 1989	June 1992
Base laptop unit	Zenith Data's Turbosport	NEC's Ultralite 25 SL/25C
Chip	386	386 SL
MHz	16	25
RAM	640K bytes	4M bytes
Hard drive	40M bytes	120M bytes
DOS version	3.0	5.0
Windows version	2.0	3.0
Sales products covered by software	2	9
Software size	25M bytes	65M bytes
Number of offices using	2	171
Applications processed (per month)	30	13,563

CW Chart: [illegible]

Suite success puts new pressure on software vendors

But corporate customers love the price tag

BY ROSEMARY HAMILTON
CW STAFF

There is a lot more to application suites than their pretty packages.

Suite sales, which are now the source of fierce competition between Lotus Development Corp. and Microsoft Corp., are fundamentally changing the way some customers buy software and vendors make money.

"I think suites are great for us," said Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York. "The price [of an application] vs. the perceived benefit is often too much for people to try it. If the price is cheap, users can really understand the value."

What a bargain

For customers, suites require a far broader commitment to a single vendor than many have made before, but they also give them a bargain-basement price that is hard to beat.

Microsoft and Lotus are now offering four-application suites at a list price that is half the software's total value in pieces. Some customers recently contacted said locking in with a particular vendor is less of an issue these days because the competing product lines have increasingly added similar features. More importantly, it reduces support hassles by reducing the number of contacts.

Jude Gartland, a senior vice president at Shearson Lehman Brothers, Inc. in New York, said selecting a suite is a "matter of which horse you are going to bet on," but it is less likely that you will make a bad choice. His company has purchased suites from Microsoft and Lotus.

"I think you can just about flip a coin on this now. Whichever spreadsheet you think is the best now, it could be just the opposite a year from now," Gartland said.

For software suppliers, however, suites are not so sweet — at least for the near future as they drive down the per-application revenue.

With suites, the market share game is no longer about piling up unit sales alone. Instead, the idea is to bring in customers who commit to not one but several applications and will hopefully provide a bigger per-customer revenue stream over several years.

This idea is appealing enough to have spurred intense competition between the two personal computer software giants. Microsoft launched the market nearly three years ago with the first release of Office and pushed ahead with no real competition until April of this year, when Lotus introduced Smartsuite.

Robert Weiler, a senior vice president at Lotus, said Microsoft essentially called the shots on Smartsuite's pricing. With Office established in the market at $750, Lotus came in at $795, even though Weiler said the applications could have easily sold for $895 as a packaged deal.

Meanwhile, Borland International, Inc. and WordPerfect Corp. are reportedly engaged in discussions to bundle their applications in a suite.

Observers said suites are currently selling for as little as a few hundred dollars. Corporate Software, Inc., a reseller based in Canton, Mass., said it offers an upgrade deal to customers of any Lotus application to Lotus Smartsuite for $319.

"It will be tough for [vendors] to sustain margins that they've gotten used to," said Tim McCollum, an analyst at Dean Witter Reynolds. "They have to learn to live in a different model of business, just like the hardware companies."

As an example, Corporate Software released second-quarter financial results earlier this month that showed an impressive 37% increase in revenue to $71.6 million but a 13% drop in profits to $1 million. The company attributed the lower profits to "a decline in gross margin resulting from lower average unit prices, particularly in the [Microsoft] Windows area."

"We offer [technical] services to our customers, so we make up some money that way," said Ed McGuiggan, corporate accounts product manager. "Also, there's an opportunity in that the customer is purchasing three applications, and we are very much involved in the upgrade business."

Lengthy relationship

Lotus Vice President Frank Ingari said suites represent a "change in the nature of our business and a more mature market.

"We look at 'customers in terms of having a long-term relationship with them, and I expect to get some money from them each year as opposed to trying to get the total value the first time you sell a box and then forget about it," Ingari added.

"As long as you are selecting from a group of vendors who are strong and are going to be here for the long term, I don't see a terrible disadvantage to suites," Goldman said.

Yet not all customers are convinced. Jeff Newman, an assistant vice president at Barclays Bank PLC in New York, said the suite prices are impressive, but "I haven't spoken to anyone here who needs all of that software at once. People are still mixing and matching."

Cheaper in volume

Software suites are selling well, but low prices are pressuring vendor margins

Lotus		Microsoft	
1-2-3 for Windows	$595	Excel	$495
[illegible]	[illegible]	[illegible]	[illegible]
Freelance Graphics for Windows	$495	Powerpoint	$495
[illegible]	[illegible]	[illegible]	[illegible]
Total	$1,569	Total	$1,554
[illegible]	$795	Office	$750

*estimate from 10-node package

WINDOWS VIEW

Jesse Berst

SOS to the rescue

Call it Windows' dirty little secret.

The Microsoft operating environment makes life easier for end users. But it makes life a lot harder for your technical support staff. Windows users typically work with multiple programs, making problems more complex to diagnose. Windows also pushes computer resources to the limit. Troublesome configurations or system bottlenecks quickly show up.

"It is tough to make all these programs live together when you start using Windows with DOS with memory managers and so on," explains Martin Fox, a technical officer at Chemical Bank.

Fortunately, a new CD-ROM product called Support On Site (SOS) lightens some of the work load. Fox, who supports 800 workstations and several LANs with a staff of five, tested SOS prior to its official release in April and continues to use it.

"This information is gold when it comes to configuring and troubleshooting," he says.

Produced by Ziff-Davis' Computer Library Group, SOS provides a single source for information on products from many different vendors. I've had a chance to look it over, and I think it deserves consideration by corporate help desks.

The quality of a reference tool depends on the quality of the data. Ziff went right to the source for the information on SOS. It contacted leading manufacturers (including Microsoft) and obtained documentation, technical notes, bug fixes and other support information. To that it added the text of technical newsletters and books. Then it indexed it and put it all on a CD-ROM together with a search-and-retrieve engine.

Cutting costs

Much of the information on SOS is also available from the CompuServe on-line service. If you need only occasional help, that's the cheapest way to go. But CompuServe charges by the minute. If your technicians spend much time there, the monthly fees quickly add up to hundreds or even thousands of dollars. Even if you throw in $750 for the cost of a CD-ROM drive, you can still get started with SOS for less than $2,000. At that price, it should easily pay for itself if it saves your support staff 40 hours during the first year.

When I set out to write this column, I intended to compare and contrast two separate products. Unfortunately, one of the two companies has apparently gone under. M'aidex, maker of a similar CD-ROM product called HelpDisq, is no longer answering its phones (at least when I tried). HelpDisq was distinguished by its exclusive focus on Windows products and by its native Windows interface.

By contrast, SOS still labors under a clunky DOS interface. Although Fox says he likes it, I don't. I think it is cumbersome and old-fashioned. Fortunately, Ziff is working on Windows and Macintosh interfaces for shipment late this year.

SOS is a bit pricey at $1,295 for the single-user version and $4,995 for a five-person concurrent license. Remember, though, that the price includes 12 monthly updates. For instance, after Windows 3.1 was introduced in April, the May SOS update already had several hundred tech notes about 3.1.

In addition, Ziff is signing up new manufacturers as fast as it can, so each monthly disk usually adds some new products. SOS already supports several dozen DOS and Windows programs. OS/2 support will appear soon, and the company hopes to have Macintosh support by the fall.

Judging by the experience of Fox, you may save that much time in the first month or two. "When it's time to solve a problem," he says, "we make the CD-ROM our first line of defense."

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Sales automation key target for Snap

BY CAROL HILDEBRAND
CW STAFF

With Version 5.0 of Snap sales automation software, the Snap Software Group of Sales Technologies, Inc. hopes to tap into what it sees as a market poised for takeoff.

The company, which is owned by The Dun & Bradstreet Corp., is aiming its namesake product at automating, organizing and integrating sales and marketing and service information.

Divided into six sections, the package allows a firm's sales and marketing teams to track clients and contacts. The sections start with General Information, which has phone numbers, addresses and other account information. The Contacts section lists every contact at a particular company whom sales and marketing have talked to. The Activity section lists the entire history of a particular account.

The Comments module allows free-form textual comments to be entered about an account, and the Products section catalogs sales and leads by company. A Ticklers component stores a package of follow-up items.

Jim Leavey, the company's chief executive officer, said that a recent Harris poll of Fortune 1,000 chief executive officers and chief information officers named sales force automation as its No. 1 project over the next five years.

> "IT'S VERY HARD to evangelize a new market when there's not a lot of name recognition there."
>
> CLARE GILLAN
> IDC

Clare Gillan, an analyst at International Data Corp. (IDC), said the sales force automation software market is still trying to take off, partly because of the lack of a prominent leading vendor. "It's very hard to evangelize a new market when there's not a lot of name recognition there," she said. IDC estimates the 1991 market for sales force automation software at $100 million.

Gillan also said that technology in the arena tends to lag behind the cutting edge in terms of user interface. Snap has addressed that with a spruced-up look that features pull-down menus and pop-up messages.

Michelle Scott, corporate MIS manager at Raxco in Rockville, Md., pinpointed the interface as the package's biggest plus. A feature called Snapshot lets a user bring up a summary of what is in each of the six sections. "Before, you had to physically go into the section to find out what was in there," she said. "It was like having tunnel vision."

Users can also choose contact and account views, which automatically filter information by whether it has a contact name attached to it. "If you enter something about a product, it will force you to select a contact within the system," Scott said.

Snap Version 5.0 is available now, in either single-user, volume purchase or network licensed version. Pricing is $1,500 per single license, with volume discounts available.

Fast graphics bus sparks excitement, risk of confusion

Local bus has board makers rushing to market

BY MICHAEL FITZGERALD
CW STAFF

The hubbub in the personal computer graphics world these days is echoing from an emerging technology called the local bus that promises big performance boosts for graphics-intensive applications.

"I think it's going to totally revolutionize how graphics work and are used in the workplace and the home," said Jake Richter, chief technologist at Panacea, Inc., a maker of software acceleration tools based in Londonderry, N.H. "It's probably the most important thing that's happened to PC graphics."

"For graphics, it's an absolute must-do," agreed Jon Peddie, president of Jon Peddie Associates, which publishes the "PC Graphics Report" in Oakland, Calif.

In basic terms, the local bus is a shortcut to main memory. In PC systems today, graphics and other subsystems perform slowly because the peripherals and add-in cards that drive these data-intensive applications are connected only indirectly to system memory. This is a particular problem for machines that use the snail-like AT bus for input and output.

A local bus lets peripherals bypass the I/O bus and go directly to main memory, greatly speeding up data movement. Most practical estimates said as much as 133M bytes of data per second can be transferred in a system with a local-bus design. However, Richter said, the AT bus will give perhaps 2M byte/sec.

Complex concept

But even the technology's supporters concede that the local-bus concept does not easily lend itself to explanation.

"It's very complicated," said J. David Schuler, technical marketing manager for the architecture development laboratory at Intel Corp. in Beaverton, Ore. Intel recently announced its local-bus effort, Peripheral Component Interconnect (PCI).

Several local-bus implementations are available or in progress at laboratories: the new PCI from Intel; the VL bus from the Video Electronics Standards Association (VESA); and several products from small companies such as Opti, Inc.

Under PCI, the motherboard gains a local bus that lets peripherals run faster, but it does not run add-in boards and hence is not expandable, according to analysts. It was designed to work on numerous architectures beyond Intel's, though the silicon is not due out until sometime early next year.

Supporting Intel's initiative are IBM, Compaq Computer Corp., NCR Corp. and Digital Equipment Corp., among others.

The Intel-specific VL bus is already in some systems, largely ones from no-name cloners, and analysts said that numerous systems with the VL bus will appear at Comdex/Fall '92.

> A LOCAL BUS lets peripherals bypass the I/O bus and go directly to main memory, greatly speeding up data movement.

Perhaps the major difference between the two is that VESA's VL bus will support add-in cards. Intel will leave the decision to support add-in cards up to the individual systems makers.

The whole issue of the local bus gets confusing in part because the buses do not necessarily conflict. Some companies support both VL and PCI. Opti, which has its own local bus, also supports the VL bus.

Individual vendors have their fingers in different pies, too. For instance, Northgate Computer Systems, Inc. will release a line of systems, the VPX line, in the middle of next month that will offer local-bus architecture using a discrete chip set, a la the Chips and Technologies, Inc. Wingine approach.

Some observers, such as Peddie, said they think that only one of these various flavors of local buses will survive (Peddie is betting on the VL bus). Others said room exists for more than one implementation.

"I think PCI will be the choice for expensive, higher-end systems, such as multimedia systems, while the VL bus will be the consumer-level local-bus solution," Richter said.

One thing everyone agrees on: The local bus will drive application speeds way up.

Notebooks at New York Life

CONTINUED FROM PAGE 45

of the expansion in software, Nelson said.

"This is an end-user-driven project. We can point at almost every step to where an agent suggested something," he said. Agents have helped keep it alive, too.

"We put versions out we should have been shot for," Nelson said. "We've had lots of failures; we've made some horrible mistakes, but we've survived them because the agents have stuck with us."

Primary problems have been with database integration and speed, he added.

Honesty is best policy

Agents stuck by NYLexpress, in part because New York Life was honest about problems, according to Nelson.

It did not hurt that the project also had a high-level champion: Executive Vice President Lee Gammill.

Gammill "has been our biggest supporter and our fiercest critic, too," Nelson said. "We couldn't have built this without inside and outside help. And you've got to say thank you to people."

New York Life has had to listen to its agents: They pay $1,500 for the software in addition to the hardware they buy at a discount from the company.

Vice President Nelson: *New York Life listens to agents' feedback*

The arrangement is structured in such a way that if the value was not there, the project would fail, Nelson said.

In 1993, New York Life expects that more than 50% of its policies will be sold and processed electronically, according to Nelson. Meanwhile, other efforts in IS have yielded clear benefits.

Nelson, who came to IS from the pension department at New York Life, said the company has been able to reduce the number of field offices from 500 to 175, primarily through IS efficiencies. All the offices have access to New York Life's General Office and Agent Linkage System, he said.

Make my day

While the product has become much more seamless and is getting used much more — last month, New York Life had its first 1,200 day, when more than 1,200 applications came in electronically — plenty of agents still do not use all the software available to them, according to Nelson.

Nelson approaches that issue with characteristic enthusiasm.

"There are lots of things we can do to expand the use," he said. "A lot more we could do to sell it."

COMMENTARY

Chris Lindquist

A race worth watching

The operating system race hasn't begun in earnest yet, but Microsoft gunned the engine on Windows NT a couple of weeks ago at the Win32 Professional Developers Conference and gave notice that it will be ready for the chase.

If for no other reason than sheer size, the Win32 Professional Developers Conference was impressive. Like it or not, Microsoft should be commended for being able to lure more than 4,000 developers to San Francisco for a look at an operating system that won't ship commercially for another five to eight months. And most of them seemed to be doing just that — looking.

Microsoft certainly did plenty to aid their investigations, including supplying dozens of hands-on workstations and technical workshops as well as handing out free copies of the development kit of prerelease NT to everyone who showed up. Granted, the DOS and 16-bit Windows support in the prerelease are not up to par, but this was a show dedicated to NT as a 32-bit operating system, not a DOS emulator.

Microsoft needs to prove that NT can work. And it seems strongly committed to making NT work. Microsoft can afford this because it has a long-term goal: If Windows NT can become the de facto operating system of the future, Microsoft's other applications can ride the wave to the tune of billions of dollars.

If you own the operating system, you have an advantage in applications — period. It doesn't matter if the only contact your programmers have is when they eat lunch together; that's still more insight than competitors get. Whether you or I or, more importantly, the Federal Trade Commission thinks that situation is anticompetitive or simply good business is irrelevant at the moment. It's making Microsoft money.

Counting losses

IBM can't say the same. There are plenty of indications that IBM isn't making much — if any — money on OS/2 2.0. IBM admits that a good number of OS/2s — and some 90% of those sold through its 800 number — are going out the door for $49 as competitive upgrades to Windows. People I've talked to at other software firms say IBM can't begin to cover its development and production costs at that kind of price.

IBM also can't use the argument that selling OS/2 2.0 sets it up for future software sales. For now, at least, IBM doesn't sell much PC software.

So why is IBM pushing so hard? It could be several things: pride; the sheer momentum of a huge development effort; a long-term goal of dominating the operating system market; a desire to control the operating system on every piece of its hardware, thereby making connectivity and integration of pure IBM hardware easier. Whatever it is, you can bet it isn't small-time.

Meanwhile, Microsoft has no high-end operating system. It has DOS and an advanced DOS shell called Windows 3.1. I don't care what Microsoft says — it isn't an operating system.

Windows NT 3.1 is an operating system. You boot to NT. Any DOS prompt you see under NT is an emulated one. Windows NT 3.1 is *not* Version 3.1 of NT, however. This is marketspeak at its purest.

Microsoft is fond of saying that NT is the result of months of work and that much was learned from OS/2 development. So what? It is fundamentally different than anything Microsoft has put on the market before. Sure, the interface looks the same, but putting the same dashboard on a Ford Escort and a Porche 959 does not change the fact that the guts are not of the same world. Calling it Version 3.1 won't make NT any less of a first generation.

For the next few months, IBM will try to get OS/2 2.0 into as many hands as possible, and Microsoft will do its best to keep people in line for NT. And having two companies the likes of IBM and Microsoft beating each other up to gather customers can only be good for users.

Lindquist is a Computerworld staff writer.

NEW PRODUCTS

Peripherals

BusTek Corp. has introduced the BT-545S, a fast Small Computer Systems Interface (SCSI)-2 host adapter.

The product gives up to 10M byte/sec. synchronous and 7M byte/sec. asynchronous SCSI data transfers. The BT-545S was designed for high-speed, I/O-intensive file server and data aquisition environments and for systems running multitasking operating systems such as Unix, Xenix, Novell, Inc.'s NetWare and OS/2. An on-board ROM BIOS from Phoenix Software Associates Ltd. offers single-tasking DOS operations and built-in Format utilities.

BT-545S is 100% IBM XT/AT bus-compatible and can interconnect between IBM Personal Computer/AT bus and SCSI peripheral devices.

The BT-545S costs $449.

BusTek
4151 Burton Drive
Santa Clara, Calif. 95054
(408) 492-9090

Maxoptix Corp. has introduced the Tahiti IIM, a multifunction optical disc drive.

Tahiti IIM has a read/write cache buffer to increase data transfer rates of on-line storage applications. Available buffer sizes include 256K, 1M and 4M bytes. With the 4M-byte cache, data transfer rates have been measured up to 2.5M byte/sec., almost doubling the performance of standard 256K-byte buffer configurations in certain applications. Sustained data transfer rates of more than 1M byte/sec. can be supported, and the drive has an "in-form-factor" Small Computer Systems Interface-2 interface to ease system integration.

Tahiti IIM costs $4,045.

Maxoptix
2520 Junction Ave.
San Jose, Calif. 95134
(408) 954-9700

Mountain Network Solutions, Inc. has introduced FileSafe TD-250, an internal tape backup system for IBM Classic (AT) Bus and compatible computer systems.

Storing up to 250M bytes of data on a single cartridge, the product uses the QIC-80 format with advanced error recovery and correction techniques. According to the company, the TD-250 can back up 80M bytes of data in approximately 20 minutes and can also connect to the computer through the floppy disk. FileSafe is included with the tape drive, featuring automatic installation, menu or command line operation and on-line, context-sensitive Help screens.

FileSafe TD-250 costs $399.

Mountain Network Solutions
240 E. Hacienda Ave.
Campbell, Calif. 95008
(408) 379-4300

Systems

Future Systems Solutions, Inc. has developed the SpeedCache Plus 4.0.

SpeedCache Plus 4.0 is cache software for compact disc/read-only memory drives and was designed to add speed to both DOS and Microsoft Corp.'s Windows environments. SpeedCache Plus 4.0 boosts the DOS performance by more than 4,000% and Windows by 1,000%, according to the company. This release offers write-back caching, which allows a personal computer to multitask during disk writing, and also features complete DOS device-level compatibility.

SpeedCache Plus 4.0 costs $129.95.

Future Systems Solutions
0420 South 500 East
Bluffton, Ind. 46714
(219) 447-8204

Software application packages

Agfa, the imaging division of Miles, Inc., has started shipping Desktop Styles, a collection of 39 TrueType fonts for Microsoft Corp.'s Windows 3.1 personal computer users.

Agfa TrueType fonts are for use in memos, business letters, proposals, presentations and reports and were designed to improve the quality of electronic and printed communications. This collection consists of TrueType versions of eight fonts resident in the Hewlett-Packard Co. LaserJet III series of printers, for use in the Windows 3.1 environment.

Desktop Styles costs $79.

Agfa
100 Challenger Road
Ridgefield Park, N.J. 07660
(201) 440-2500

Above Software, Inc. has introduced Golden Retriever, an information navigator for Microsoft Corp.'s Windows operating environment.

Users can create, store, track and fetch spreadsheets, letters, memos, proposals and a variety of other applications. Spreadsheets, documents and other data files are organized and stored by subject, project, author and address, the same way that a paper document would be filed. File names can be created, and Golden Retriever has a system of pointers that list a file in several folders, under the same or different name, without duplicating the original document.

Golden Retriever costs $99.

Above Software
2698 White Road #200
Irvine, Calif. 92714
(714) 851-2283

Harvard Draw for Windows: Robust, good price

Technology Analysis — a roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

Harvard Draw for Windows 1.0 is a strong illustration package for business users, reviewers said. The product, from Harvard Graphics creator Software Publishing Corp., omits a few design tools found in its high-end competitors, but it costs less.

Ease of use: Reviewers noted a few minor quirks in the interface, such as the need to select a tool to resize a highlighted object. Overall, though, they said Harvard Draw is straightforward.

Drawing/editing capabilities: Harvard Draw provides a relatively complete tool set, including text wraps, Bezier curves, rotation tools and a good polygon tool. Each illustration can have 99 layers. Missing are some three-dimensional image extrusion tools and Pantone color support.

Speed: Reviewers found Harvard Draw to be exceptionally fast, both in drawing functions and in importing other graphics file formats.

Overall value: Harvard Draw is a very good value at $595. It costs $100 less than high-end competitors while still offering a fairly robust set of tools and features, combined with outstanding speed.

Software Publishing's Harvard Draw for Windows 1.0

Reviewer	Ease of use	Drawing/editing tools	Speed	Documentation	Service and support	Overall value
Infoworld 2/10/92	Very good	Numerous conveniences	Excellent	Very readable	Very good	Very good
PC Magazine 1/28/92	Straightforward	Some nifty special effects	Very fast tracing	NC	NC	More affordable
PC Week 11/11/91	Awkward for certain tasks	Lacks some text-handling features	Speedy	NC	NC	High-caliber set of features
Byte 4/92	Snappy interface	99 layers	Speedy	NC	NC	Professional
Computer Shopper 5/92	Intuitive	Has script language	NC	Extensive but index is abysmal	Competent and pleasant	Solid but short of greatness
PC User 11/20/91	Easy text editing	Tepid graphics manipulation	Fast	NC	NC	Heavy price tag
Users						
Mark Allen, Xenon Projection Services, Inc.	■■	■■	■	■	NC	Output to slides difficult
Bill Brandler, U.S. Department of Transportation	■■	■■	■■	■■	■■	Works well with Harvard Graphics
Analyst						
Katherine Shelly Pfeiffer, New Media Research	■■	■■	■■	■■	■■	Very friendly

Key: ■■ Very good ■■ Good ■ Fair ● Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Software Publishing reported revenue of $43.4 million and profits of $4.1 million for the quarter ended March 31. The same quarter in 1991 yielded revenue of $30.5 million and no profit. Michael Kwatinetz at research firm Sanford C. Bernstein rated the company's short-term performance as fair and long-term stability as good.

Software Publishing responds

Steve Lane, assistant product planning manager:

Ease of use: We haven't gotten a lot of objections on the resizing tool from end users. However, we will probably change it to make it more consistent with Harvard Graphics.

Value: Harvard Draw is competing with the high-end products. We wanted to go out in our first release with an aggressive price.

Windows Draw: Fine for most users

Micrografx's Windows Draw 3.0

Reviewer	Ease of use	Drawing/editing tools	Speed	Documentation	Service and support	Overall value
Infoworld 12/23/91	Very good	Satisfying low-end features	Very good	Very good	Very good	Good alternative
PC Magazine 12/31/91	Revamped interface	Comprehensive filters	NC	NC	NC	Bargain price
PC Week 11/11/91	One of the easiest	Somewhat limited	NC	NC	NC	Affordable
Byte 4/92	Intuitive	Ingenious rotation tool	NC	Excellent	NC	Superb value
PC Sources 2/92	Unintimidating	Lacks multiple layers	NC	Comprehensive	First-class	Reasonable price
Computer Shopper 4/92	Uncluttered	High-end features	No draft mode	Good	NC	Sophisticated
Users						
Greg Friedmann, Southern California Edison Co.	■■	■■	■	■■	■■	Very good for occasional user
Randy Dagger, Tandem Computers, Inc.	■■	■■	■	■	■■	Network installation is an ordeal
Analyst						
Katherine Shelly Pfeiffer, New Media Research	■■	■	■■	■	■■	A great program

Key: ■■ Very good ■■ Good ■ Fair ● Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Micrografx reported sales of $47.3 million and profits of $5.1 million for the quarter ended March 31. Revenue and profits rose 60% and 24%, respectively, from the same quarter last year. John Maxwell III at Soundview Financial Group rated the company's short-term performance as fair and long-term stability as good.

Micrografx responds

Paul Grayson, chairman and chief executive officer:

Speed: There is only one editing mode, which is in full color with all fonts and so forth. We find having a wireframe editing mode is just confusing to the user, and the speed difference is very minute.

Documentation: Everything is combined into one very tutorial-oriented manual.

Business users who need sharp illustrations but do not require professional design tools will welcome Micrografx, Inc.'s Windows Draw 3.0, reviewers said.

Ease of use: The product offers a simpler, more intuitive interface than Micrografx's high-end Designer graphics package, reviewers said.

Drawing/editing capabilities: Windows Draw includes freehand tools, editing functions such as rotation and text wrapping, and an extensive collection of editable clip art. It lacks support for printing cyan, magenta, yellow and black color separations and has no auto-trace tool.

Speed: The program lacks a wireframe drawing mode, which slows some operations. Overall, reviewers said Windows Draw is comparable to other graphics packages in speed.

Documentation: There is no quick reference manual, but reviewers said the strong on-line Help compensates for this. Tutorials are included in the user manual.

Service and support: Free phone support is available 24 hours a day during the week. Micrografx also offers bulletin board and CompuServe support.

Overall value: Priced at $149.95, Windows Draw is an excellent value, reviewers said. Graphics professionals will want to look for more powerful alternatives.

IN BRIEF

Goal revises training tool

■ **Goal Systems International, Inc.** in Columbus, Ohio, released improved versions of its automated training tool for microcomputer and local-area network platforms. Both Phoenix/Micro and Phoenix/LAN Versions 7.3 include improved graphics and better reporting capabilities, the company said.

■ **Best Power Technology, Inc.** in Necedah, Wis., is working on two uninterruptible power supply products that support Simple Network Management Protocol. The products are based on its CheckUPS II power monitoring and unattended shutdown software for Novell, Inc.'s NetWare Management System.

■ **Volkswagen AG, Intergraph Corp. and Control Data Systems, Inc.** signed a joint marketing and technology deal for developing engineering systems for the automotive, aerospace and discrete manufacturing markets. The engineering systems will use a consistent product data model that will be accessed by design, engineering and manufacturing groups.

IBM, Chipcom form superhub partnership

The two companies will pool resources to develop, market and build multiprotocol hub products

BY JOANIE M. WEXLER
CW STAFF

RALEIGH, N.C. — IBM's little-known efforts to migrate its Token Ring customers to multimedia applications got a shot in the arm from the firm's eleventh-hour partnership with smart hub vendor Chipcom Corp. last week.

The two firms roughly outlined an intent to combine worldwide marketing and manufacturing efforts in the "superhub" market, although no product specifics will be announced until year's end, the vendors said.

The term "superhub" refers to smart hub products that allow network administrators to dedicate a full local-area network's bandwidth to each user and switch traffic across a high-speed backplane. The nailed-up bandwidth afforded by switching alleviates the delay-sensitive problems of running multimedia applications over shared-bandwidth LANs.

Superhubs are transitory products to multimedia-oriented Asynchronous Transfer Mode (ATM) networking.

IBM said its relationship with Chipcom forms the foundation of its strategy for entering the ripe multiprotocol hub market — a key product area the industry has been hounding IBM to enter.

"It is because they are so late entering this market that they need to buy into the technology," said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

Until last week, IBM's multimedia migration path consisted of testing and demonstrating desktop videoconferencing applications — such as training videos — running in a client/server scenario within a 16M bit/sec. Token Ring LAN. However, this setup will likely be of limited use, as users could simply run down the hall to meet face-to-face or congregate in a room for a common training session, analysts noted.

Of more likely appeal is a desktop-to-desktop, inter-LAN Token Ring videoconferencing application that the vendor has been testing in "tens of U.S. customer sites" during the past year, said Mike Murphy, the senior planner in IBM's network systems area responsible for the vendor's multimedia strategy. However, the application, dubbed "IBM Person-to-Person," is not yet an announced product and may not be released, Murphy said.

The goal with the Token Ring multimedia efforts — which are happening alongside the firm's development of stand-alone ATM cell switches — is to tide over IBM's large installed Token Ring customer base while higher-speed ATM network infrastructures evolve. IBM said it just passed the 5 million mark in sales of Token Ring adapter cards.

However, an analyst familiar with IBM's strategy said that while the Token Ring architecture outshines those of other shared-bandwidth LANs for carrying voice and video, the industry is more keen on the dedicated LAN approach.

"The IBM Token Ring multimedia efforts are a Band-Aid solution," said Dave Passmore, a vice president in the local-area communications group at Gartner Group, Inc. in Stamford, Conn. "Since ATM switching via the LAN-per-user scenario is not far away, I would recommend they focus their efforts there."

IBM and Chipcom did not specify whether their joint development would include hub-based ATM products, although Chipcom has long advocated the technology. Chipcom and Bytex Corp. are among the hub vendors best positioned for the transition to ATM. Their auto-configuration software allows users to segment networks logically, and they are set up to implement the LAN-per-user form of networking (see story page 55).

Murphy acknowledged that IBM has per-port auto-configuration development in the works, but he did not comment as to whether it is Chipcom or IBM technology.

A closer look

With its Token Ring-oriented multimedia equipment, IBM has been able to send up to 10 simultaneous 1.2M bit/sec. sessions between client and server within the same 16M bit/sec. Token Ring, said Mike Murphy, the IBM senior planner heading up the company's multimedia efforts.

The same circuitry found on a stand-alone coder/decoder sits on an IBM video card in a Personal System/2, he explained. A camera hooks into a $1,995 IBM Action Media II video card, which includes playback capabilities. A card version allowing users to receive video costs $890, IBM said.

Compression algorithms turn voice and video into digitized data for transport over the LAN. The more predictable token-passing access method of Token Ring networks renders the topology more suitable for such applications, according to Dave Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn.

Passmore also pointed out that the Token Ring standard includes a little-used feature that allows applications to make priority reservations for certain network traffic — a useful feature for implementing delay-sensitive voice and video.

JOANIE M. WEXLER

$46 730 769 360

By the end of this week Computerworld readers will have spent over $46.7 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of I

Source: IDG Research Services, Fall 1991

Political minefield could sabotage OSF

CONTINUED FROM PAGE 1

erful companies behind the OSF has spurred his own primary vendor and vocal OSF critic — Sun Microsystems, Inc. — into more rapid innovation and product enhancements to counter the OSF's plans.

Yet will the OSF be around for the long term?

Its three largest sponsors — IBM, Digital Equipment Corp. and Hewlett-Packard Co. — are adamant that it will.

They said their commitment to the foundation's future is solid, and their patience with OSF's struggle to reach self-sufficiency will last.

Stella Johnson

President David Tory *skippers OSF into a turbulent open systems sea*

Open space

"If OSF were to go away, I think there would be a significant void" in the open systems market, Saranga said.

"Without OSF there, I would fear fallback to proprietary solutions from the various vendors," said Ted Hanss, chairman of the OSF's end-user steering committee.

Even users who are unimpressed so far by the OSF's product rollout — the Motif graphical user interface and the OSF/1 Unix operating system — acknowledged some of the organization's accomplishments. They include the following:

- Providing a competitive alternative to Unix System Laboratories, Inc. (USL) and Microsoft Corp. for source-level technology.
- Establishing the request for technology process, a collaborative research and development model previously untried in this industry. It enables competing companies to submit products as candidates for inclusion in OSF technologies.
- Encouraging the penetration of Unix into commercial environments.
- Complementing the standards process and spurring further innovation in the Unix market.

"It is not the job of standards to advance technology, but someone does need to get the technologies out there," said Steven Jenkins, a software architecture engineer at Jet Propulsion Laboratories in Pasadena, Calif. "I believe OSF has bitten off some of the really hard problems in distributed computing. It's not coming as fast as anyone would like it, but it's beating the alternatives."

"OSF has done a good job in getting people in this industry to stop killing each other and work in forums," said Chris Stone, president of Object Management Group, Inc. in Framingham, Mass., which counts dozens of OSF members among its 270 member firms. "They've proved they have some staying power."

The anticipated onslaught next year from Microsoft's Windows New Technology (NT) advanced operating system is helping to encourage a more unified front among Unix and open systems vendors these days.

The warming relationship between the OSF and USL — one-time rivals — bears witness to this worry.

"Everybody is just scared spitless of the notion that NT is going to own all the desktops in the world," said Tony Carrato, a member of the OSF's end-user committee and a principal at Mile-High Information Services, Inc., a consultancy in Denver. "If you really look at NT, it does look an awful lot like Unix."

Search for independents

Users and analysts agreed that a crucial component of the OSF's future viability is its relationship with independent software vendors, who so far have shown only a passing interest in the OSF's activities.

"We would really like to have a coalition of [independent software vendors] similar to the coalition of users at OSF," Hanss said.

Continued on page 51

Kernel, compiler on deck at institute

The OSF Research Institute, with dual headquarters in Cambridge, Mass., and Grenoble, France, also has dual rising stars in its high-tech heavens.

The primary one is the OSF/1 Micro-Kernel, the next generation of the OSF/1 operating system.

The secondary star is a futuristic compiler technology that will enable a single version of a shrink-wrapped software application to run on several different hardware platforms — offering users the ultimate in software portability.

This advanced compiler technology, called ANDF for Architecture Neutral Distribution Format, has been something of a political hotcake at the OSF, however.

"System vendors are still very protective of their software catalogs, and the larger ones are reluctant to level the playing field," said Paul McGuckin, an analyst at Dataquest, Inc.

Two months ago at the foundation's member meeting in Munich, Germany, user members were dismayed to learn that ANDF development was being moved to the back burner at the OSF's European headquarters, largely because of U.S. system vendor indifference. No one at OSF had consulted members of the end-user steering committee about the change in plans.

OSF's Goldstein

"They overlooked a valuable channel with us, but they're really bright people. They won't do it again," said Tony Carrato, a member of the end-user committee.

Fortunately for ANDF, USL stepped in with an undisclosed amount of financial support that reinvigorated the flagging development program. Through joint work with OSF and the UK's Defence Research Agency, USL intends to bring out a commercial ANDF product in 1993.

"My goal is that people can invent hardware that does new and wonderful things without the boat anchor of a vast amount of software" to port, said Ira Goldstein, vice president of research and advanced development at OSF.

Of far greater interest to the OSF sponsor companies is the OSF/1 Micro-Kernel. Based on Carnegie Mellon University's Mach 3.0 kernel, the microkernel is a highly secure, scalable version of OSF/1 that is particularly well-suited to massively parallel or clustered high-performance systems. It makes its commercial debut later this year inside the Intel Corp. Paragon supercomputer.

As a stripped-down version of the kernel — with networking, file systems and virtual memory management removed — the microkernel can also run "multiple personalities" or other operating systems such as OS/2 or MS-DOS in the user space above the kernel.

MARYFRAN JOHNSON

Ready for launching

PASADENA, Calif. — At the Jet Propulsion Laboratories (JPL), everything promised by the OSF's DCE is already working on its 300-node ground data system network.

So why is JPL waiting so anxiously for the OSF's suite of system management tools?

"DCE will actually solve a lot of problems for JPL," said Steven Jenkins, a software architecture engineer at JPL, the part of NASA that does robotic exploration of the solar system. "We invented much of what's in DCE back in the bad old days when you did this stuff yourself, but our solutions aren't necessarily as portable, general or powerful as we'd like them to be."

Built to span multiple platforms running Unix and proprietary operating systems, DCE is a set of services, tools and utilities that enable distributed computing.

"When you look at the problems DCE was set up to solve — remote procedure calls, timing, security, multithreading — those are the big problems we ran into with our network," Jenkins noted.

While there is nothing technically brilliant or ground-breaking about DCE, it does mark the first time an integrated set of these services has been widely accepted as an industry standard — before any product is even available.

Later this year, the DCE technologies will start showing up as layered components in new operating system releases from IBM, DEC, Hewlett-Packard and other vendors.

"Our plans are rather extensive in this area," said Mike Saranga, president of OSF's board of directors and assistant general manager of systems, structures and management at IBM. "DCE will appear in AIX [IBM's Unix variant] this year and in OS/2 and MVS after that."

Yet even more critical than DCE to end users and the OSF sponsors is the follow-on set of system and network management software called the DME.

Although IBM is doing the final integration of DCE, the OSF decided to keep DME work in-house. Foundation officials said they have changed the integration process to avoid some of the snafus with DCE, which is running at least one year late.

"With DCE, there was too much inspection and coordination going on too far downstream in the technology merge process, which slowed down the assimilation of all the different contributions," said Ted Hanss, chairman of the OSF's end-user steering committee. "With DME, they're not trying to do a mass integration but a step-by-step integration, so it's not everything coming together at one point, with all that additional complexity."

MARYFRAN JOHNSON

Mike Prince
IS Director
Burlington Coat Factory

"Confusion over the past few years . . . led to reluctance in embracing open systems."

Sheri Anderson
Senior Vice President of Production and System Services
Charles Schwab

The OSF is "becoming more realistic but not less visionary."

Tony Carrato
Principal
Mile-High Information Services

"Everybody is just scared spitless of the notion that [Microsoft's Windows] NT is going to own all the desktops in the world."

Continued from page 50

Paul McGuckin, an analyst at Dataquest, Inc., said widespread industry acceptance of the OSF's Distributed Computing Environment (DCE) and Distributed Management Environment (DME) as de facto standards — before anyone is even using the products — is perhaps the most astonishing feat in the organization's brief life span (see story page 50).

Finding a niche

"I think OSF has found its place as a supplier of much-needed middleware," McGuckin said. "That is where their success will be."

For users, the true test for any new software technology is application deployment and support. At DHL Systems, Inc. in San Mateo, Calif., distributed computing needs are handled today with Sun's Open Network Computing (ONC) products.

"I'm using ONC not only because it's the only choice I have today but because Informix and the third parties are supporting that interface," said John Scharber, manager of hardware and software systems at DHL Systems. "Just having product out there won't be enough; OSF will need it supported by all my vendors."

Users and analysts alike said the OSF's greatest strengths are in its continued work as a technology integrator. They see the foundation as acceptably neutral ground to determine which products have the potential to become de facto standards in mainstream commercial accounts.

If the OSF did not exist, many users said, something like it would still be necessary to develop the consensus among competing vendors needed to achieve open, distributed computing.

"I think they've realized that if they don't hang together, it's pretty clear what else will happen," Carrato said.

As the OSF matures, it is facing the common problems of any software supplier, but with some additional burdens. Once products are out the door, customers want maintenance, support and assurance that the technology will keep advancing. At a for-profit company, that scenario calls for growth in the product development groups.

"If OSF were to go away, I think there would be a significant void."

Mike Savage
President of the OSF's board of directors and IBM's assistant general manager of systems, structure and management

Yet the static size of the OSF — and the uncertainties of its future funding — means that the organization must shift people from the more stabilized technologies, such as Motif and OSF/1, to emerging ones such as DCE and DME.

After the release of OSF/1.1 a few weeks ago, for example, managers began assigning engineers to other projects.

Changing positions

"If we have a fixed set of resources and we're changing from one technology emphasis to another, those resources change, too," OSF President David Tory said.

Such changes require the OSF to rely increasingly on the resources of its sponsors, who are now being asked to provide more help in the way of engineering, testing and quality assurance.

"I think OSF is learning a lot about delivering products and working with customers," said Sheri Anderson, senior vice president of production and system services at Charles Schwab & Co. in San Francisco. "They're becoming more realistic but not less visionary."

"The time has arrived to deliver on the promises," added Warren Hoffman, a principal consultant at Du Pont Co. in Wilmington, Del. "We don't want it to drag into 1995."

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NEW PRODUCTS

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Raxco has released Bart, a backup and recovery software package for Unix networks.

Bart is a high-speed backup technology designed for heterogeneous networks that have a demand for interoperability. According to the company, Bart has full network support, reliable file recovery and fast backup capability. Bart can back up any disk on any machine on a Transmission Control Protocol/Internet Protocol network, whether the device is local or remote.

It can also generate on-disk indexes that are used to locate files, eliminating the need to process the entire tape, the company said.

Licensing fees range from $399 to $49,995 depending on configuration.

Raxco
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2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Modems

PSI Integration, Inc. has announced the PowerModem 96/96 and the PowerModem 10/42, two internal high-speed fax/data modems designed for the Apple Computer, Inc. Macintosh PowerBook line of computers.

Both products include V.42bis, which enables users to increase throughput of data transmission. With V.42bis, the PowerModem 96/96 can transmit data at speeds of up to 38.4K bit/sec. The PowerModem 10/42 can transmit data at speeds of up to 9.6K bit/sec.

PowerModem 96/96 costs $699, and PowerModem 10/42 costs $399.

PSI Integration
Suite 200
851 E. Hamilton Ave.
Campbell, Calif. 95008
(408) 559-8544

Workgroup software applications

Erdas, Inc. has announced Erdas Imagine GIS (geographic information system) and imaging processing software for Digital Equipment Corp.'s DECstation 5000 Model 100 and 200 series workstations.

The product is a fully integrated, application-driven GIS package that allows users to combine, enhance and manipulate data layers to be used in the X/Motif environment. Imagine offers an image viewer, spatial and statistical modeling, a graphical point-and-click user interface and advanced image processing. A Map Composer is included, and users have the ability to view images at any scale.

Prices start at $10,000.

Erdas
Suite 300
2801 Buford Highway
Atlanta, Ga. 30329
(404) 248-9000

Electronic mail

NBS Systems, Inc. has introduced Enterprise E-Mail Systems, a line of integrated mainframe-based and local-area network-based electronic-mail systems.

The Total Office Support System (TOSS) series of client/server-architected E-mail systems consists of TOSS/Lan, TOSS/Ws, TOSS/PC and TOSS/Host. TOSS/Lan is a system server that provides E-mail among individuals in any size workgroup. TOSS/Ws provides a Microsoft Corp. Windows interface for users accessing either TOSS/Lan or TOSS/Host servers and runs under native MS/DOS, Windows, Unix and OS/2. TOSS/PC provides a Windows-type interface for personal computer off-line operation.

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What's more, Notes is an extremely flexible environment that makes the development and deployment of all kinds of custom applications a relatively quick and easy process. Some typical applications include lead tracking, product planning, brainstorming, account management, reference libraries, call reporting, quality management and more. There are small and large companies, in fact, that have bought Notes to solve a specific problem, only to discover that it answered other needs as well.

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COMMENTARY

Elisabeth Horwitt

Internet users unite

While Democrats went through the motions of choosing a presidential candidate in New York earlier this month, classic democratic consensus-seeking was taking place at the Internet Engineering Task Force (IETF) meeting as some 700 vendors, developers and users argued and schmoozed their way to agreement on proposed enhancements of TCP/IP, SNMP and related protocols.

Internet users tend to be technically-savvy types from the engineering, vendor, academic and government communities. They tend to have ponytails and wear jeans and work shirts, not business suits.

Executives from DEC and other big companies, along with the engineering user types, put off their company manners, put on their work shirts, rolled up their sleeves and got some important business done at this meeting.

Active participants

The amount accomplished was particularly impressive given the number of people involved. The IETF standards-setting process is open to the whole Internet community, which numbers hundreds of thousands if not millions.

Unlike more sedate standards bodies, such as the ISO, you do not have to pay exorbitant membership fees or attend meetings all over the globe in order to have a hand in the standards process.

As one member pointed out to me, IETF keeps its meetings open to all, has no membership fees and charges a bare minimum — $130 — for a five-day conference.

Furthermore, anyone who has an Internet mailbox — or a gateway to the Internet E-mail system — is welcome to put in their 2 cents worth about a proposed new standard or enhancement.

You'd think this huge, loosely knit community would never get anything done, particularly since the governing bodies, such as the Internet Advisory Board, can only recommend courses of

Continued on page 58

Distributed computing drives support costs

Managers cite network complexity as reason

BY JOANIE M. WEXLER
CW STAFF

FRAMINGHAM, Mass. — The proliferation of distributed computing environments and client/server applications is making organizations increasingly dependent on enterprise networks. Managers are now investing more heavily in internal and external network support, according to a recent study by Dataquest/Ledgeway Group, a research firm based here.

The driver behind the growing network support investments (see chart) is the confounding array of communications challenges that are springing up. These range from evaluating new internetworking technologies needed to create enterprise networks to tracking, managing and leveraging far-flung corporate data.

"There are too many products, vendors and technologies" for firms to juggle single-handedly, said Jeff Kaplan, a director at the firm, which surveyed information services and networking managers in 500 large organizations for its annual network support revenue forecast.

Dataquest/Ledgeway calculated that the worldwide network support market reached $16 billion at the end of last year and predicted a near-20% compound annual growth rate for the next five years.

Kaplan estimated that one-third of these budgets could be attributed to management issues associated with distributed computing.

"Companies are fortifying their support capabilities at all levels," but in particular, they are "trying to offload the routine work so that they can focus on higher level planning and design issues, which are more strategic," he said.

Looking outside

Such is the case at Brown and Caldwell Consulting in Pleasant Hill, Calif. "We go outside heavily for maintenance and reliability services," said Jim Smith, manager of information services at the environmental consulting firm. "We try to do our own visionary planning because we're closest to the business. An outsider would have a tremendous learning curve."

Smith, who contracted early in the year with value-added reseller The Asset Group in Houston for ongoing network maintenance, estimated that his budget for outside support will indefinitely constitute at least 10% of the cost of his installed network equipment base.

The main reasons, Smith said, are "the complexity of the networking environment today" and the nationally dispersed nature of his company, which precludes keeping up-to-date networking personnel on the corporate payroll everywhere they are needed.

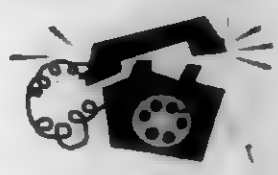
The magnitude of these and other issues is also the rationale behind the many vendor alliances that have cropped up during the last couple of years, according to Kaplan.

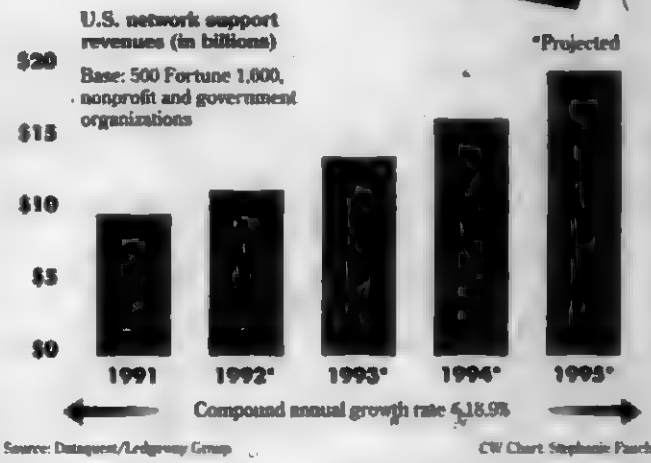
"Ironically, the smaller [vendor] companies that really understand technology, such as the router companies, don't have the field staffs in place" to solely provide their customers with the end-to-end support they need, Kaplan said. Conversely, vendors with the more sweeping support staffs "don't understand the technology," he added.

Users, then, must pool their own resources with vendor and other support sources to handle the job, he said.

Call in the experts

The data management challenges of enterprise networks are driving users to heavier support investments





Source: Dataquest/Ledgeway Group — CW Chart: Stephanie Faucher

Slow migration to ATM expected

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Even those hailing Asynchronous Transfer Mode (ATM) as the Holy Grail of networks acknowledge that large-scale migration to the technology will be hampered by users' existing investments in Ethernets, Token Rings and other local-area networks.

ATM took its initial product form earlier this month with the rollout of a local-area switch from Adaptive Corp. [CW, July 13].

Existing LANs will continue to serve many corporate networking needs far into the future, users and analysts contend, rendering initial ATM installations more prominent as a backbone technology that is more scalable than the emerging, 100M bit/sec. Fiber Distributed Data Interface LAN.

ATM is a gigabit-speed-capable technology that will expand proportionally as computer speeds rise, freeing network managers from continually segmenting and otherwise fiddling with networks as they become bottlenecks. ATM is under construction as industry-standard glue that will eventually eliminate the boundaries between LANs and wide-area networks.

Meanwhile, some users said traditional shared-medium LANs can be tweaked to deliver some capabilities afforded by ATM. This includes software-based network configuration already inherent in smart wiring hubs from Bytex Corp. and Chipcom Corp. These auto-configuration capabilities allow administrators to cut and paste network nodes among workgroups without having to physically rewire.

ATM technology takes these hub functions a step further by building temporary, point-to-point, secure network connections during a transfer at full network speeds — a feature expected from hub maker Ungermann-Bass, Inc. at year's end. In addition, in ATM mode, physically moved nodes automatically pop up on their virtual workgroup with no new addressing or management required.

Keeping the faith

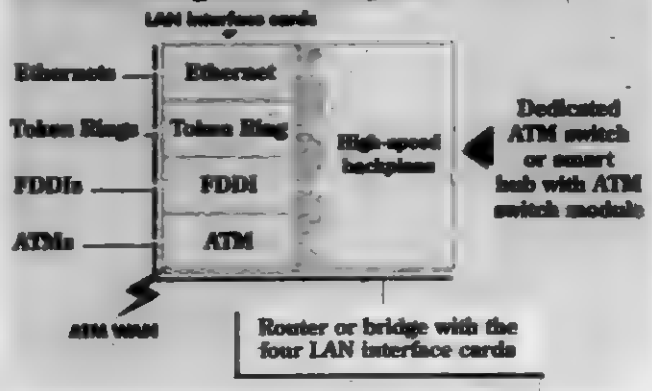
While timing-sensitive multimedia is often cited as the driver behind ATM, some users trust their existing LANs to support those applications.

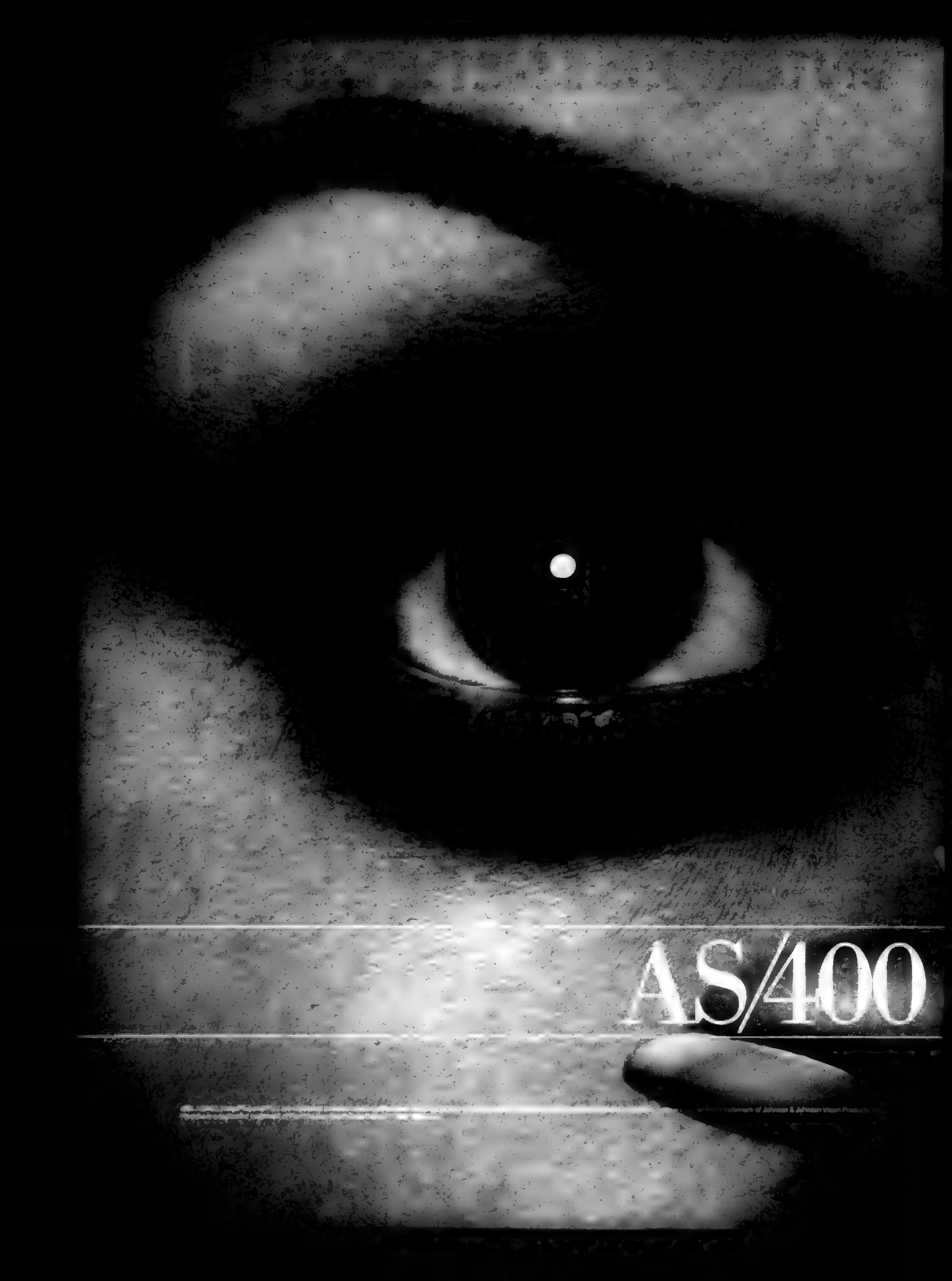
"Multimedia running between a PC and local server works just fine over Token Ring," said Mark Roy, network operations consultant at John Hancock Mutual Life Insurance Co. in Boston. "It's when you run multimedia across the internetwork — where you're aggregating traffic in bridges and routers — that you need the high bandwidth and isochronous char-

Continued on page 58

Local hero

Migration to ATM network infrastructures will be complex as users blend ATM technology with their existing LANs

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Of course, you don't have to be a contact lens maker to see things so clearly. All kinds of companies are looking to advanced AS/400 applications. Companies like Porsche Cars North America Inc. are also using CallPath/400 to improve customer service. And companies like Purity Wholesale Grocers, Inc. and Omak Wood Products are using our advanced applications to fax invoices and information directly from their AS/400s, so they can serve their customers better and reduce costs.

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IBM

TCP/IP suits them fine

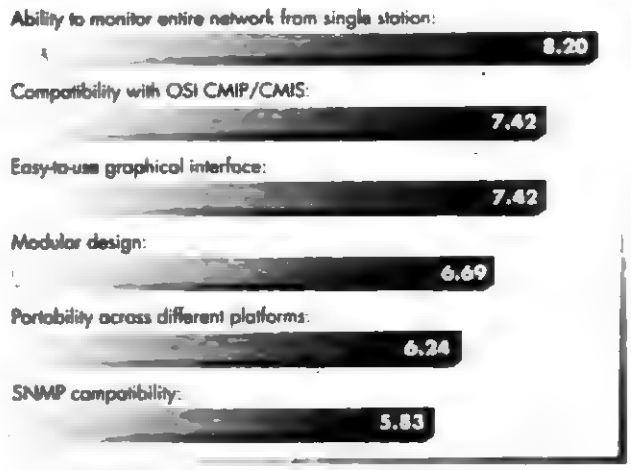
The participants at last week's IETF conference had one common purpose: to ensure that TCP/IP and SNMP continue to be effective means of keeping their international, multivendor systems interoperating.

The possibility of using OSI protocols instead did not even seem to enter members' heads. TCP/IP suits them just fine.

"There is no evidence of a mass migration to OSI in the Internet community," said David Crocker, principal at Sunnyvale, Calif., consulting firm The Branch Office. "People only make changes when there is a big benefit."

Keep it simple

Users rate central monitoring and OSI compatibility as their top network management priorities



Average ratings on a 1-to-10 scale where 10 is a top priority; 400 sites surveyed.

Source: Business Research Group, Inc. CW Chart: Stephanie Faucher

This tendency among users to cleave to TCP/IP, which analysts began noticing a couple of years ago, shows no signs of going away, according to a report that Business Research Group plans to release this week.

A survey of 400 corporate sites found that OSI now constitutes less than 2% of users' overall traffic and is expected to reach just under 4% in two years, the Newton, Mass., research firm said. In contrast, TCP/IP traffic makes up 15% of total traffic today and is expected to make up almost 23% in two years.

And despite the Government OSI Program that mandates OSI for government agencies and contractors, the 60 government sites surveyed by Business Research Group reported a very similar breakdown of TCP/IP and OSI use, said Kevin O'Neill, the firm's vice president of research.

But users placed a much higher priority on OSI Common Management Information Protocol (CMIP) than on SNMP for future integrated network management systems, the study found.

SNMP installations currently abound, while CMIP installations — and products — are scarce, according to several recent studies. But many users still look to CMIP for the future, O'Neill said.

ELISABETH HORWITT

Horwitt

CONTINUED FROM PAGE 55

action, which the community can turn down. Indeed, the community did just that with a recent board recommendation to accept its chosen scheme for a new TCP/IP addressing scheme, without the usual months-long debate of possible alternatives.

And yet IETF members continue to bring out working, commercially successful network and network management standards on a regular basis, while "formal" standards bodies such as the ISO are still bogged down in vendor politics and debate over technical niceties.

Attending one IETF "birds of a feather" session is enough to show why.

At this particular session, four developers were presenting SMP, a potential successor to SNMP. Advance press on SMP, coupled with some nasty rumors that the developers would bypass the formal IETF approval process, meant that some people came to the meeting with chips on their shoulders.

However, the informal consensus of those attending the meeting was that the IETF should start working on refining and finalizing SMP as soon as it is practical to do so.

A major reason why the presentation went so well is that the developers are major SNMP developers with a long list of credits and a lot of power in the IETF community.

In addition, the developers wisely emphasized that they would not push their proposal as a standard until the community has had a chance to go over it thoroughly and make recommendations for changes and additions. This is in accordance with the IETF philosophy of standards-making, which is to "let a thousand flowers [or proposals] bloom" and then turn them over to the Internet community and the market to determine what survives.

Putting it aside

What really makes the IETF an effective body, though, is members' willingness to bury hatchets and put aside egos and organizational politics in order to get things done.

"A lot of former SMP opponents spoke for the protocol" once they had seen the presentation, IETF board member Chuck Davin says. "People may not be 100% in love with SMP, but when the chips are down, they are very committed to ensuring interoperability" across different network management systems.

When the chips are down, these standards setters are more concerned with getting the best standards they can in a timely fashion.

Perhaps that is because the majority of them are users — not vendors or standards body officials.

Horwitt is a Computerworld senior editor, networking.

Slow migration to ATM expected

CONTINUED FROM PAGE 55

acteristics of ATM."

Isochronous capabilities — inherent today only in cell-switching technology such as ATM — guarantee that the equal-length traffic packets arrive at their destination in a steady, deterministic fashion. The characteristic is important for voice and video traffic, which would otherwise be erratic and incomprehensible.

IBM supported Roy's assertion, saying it has tested videoconferencing applications over its 16M bit/sec. Token Ring network in a client/server scenario. The technology "runs fine until traffic reaches about the 90% network utilization range," said Mike Murphy, an IBM senior planner responsible for the firm's multimedia strategy.

Video Token Ring

In addition, cooperative efforts between Bytex and "the Top 2 videoconferencing vendors" — presumably Picturetel Corp. and Compression Laboratories, Inc. — are under way to outfit installed Token Rings with video mechanisms, according to William S. Starner, Bytex corporate vice president of product marketing.

He said Bytex intends to bring its auto-configuration capability to the table to allow users to be cut and pasted on and off a physical Token Ring dedicated to video.

Roy said that it was "with an eye toward ATM" that Hancock invested in the Bytex LAN hub and Wellfleet Communications, Inc. routers. The Bytex hub's software configuration capabilities "allow us to manage our workstation infrastructure" in a manner that is a forerunner to ATM, he said, and the Wellfleet router has the backplane capacity needed to aggregate the hefty volumes of internetwork traffic that will be driven by multimedia.

Hubs and routers will be ATM migration catalysts as they gain interfaces allowing ATM to coexist with other LANs (see story below).

Vendors smooth path to ATM

Internetworking vendors are moving into position to help migrate their customers' hodgepodge of installed networks to a smooth ATM infrastructure.

Retix, for example, has already introduced an ATM interface for its just-released RouterXchange 7000 multiprotocol router. Router market leaders Cisco Systems, Inc. and Wellfleet said such interfaces are imminent and have plans to also introduce full-blown ATM switches in the future [CW, June 29].

On the hub vendor side, Ungermann-Bass, Inc. has said it will deliver ATM switching within its Access/One hub by early next year.

Chipcom Corp. said its short-term goals are to outfit its On-line Concentrator hub with an ATM interface "to add ATM LAN support and bring ATM-like function to existing Ethernets and other LANs. A natural progression to an ATM switching module" will likely follow, said Dave Fowler, Chipcom's vice president of marketing. He indicated Chipcom might be targeting mid-1993 for an ATM backbone interface.

Hub leader Cabletron Systems, Inc. is remaining mum about specific plans, but Bill Clark, product manager of advanced technology, said, "Cabletron has a specific ATM direction," which could be an interface, switching module or full switch. He declined to comment on whether the 631M bit/sec. backplane in Cabletron's Multi Media Access Center will have enough life left in it to support ATM.

Bytex runs a 3G-bit backplane; Adaptive's backplane, which sports a card plug-in architecture that closely resembles that of the gigabit-backplane in the Wellfleet router, has 1.2G bit/sec. of network capacity.

JOANIE M. WEXLER

IN BRIEF

Maintaining net uptime

■ Forest products supplier **Weyerhaeuser Co.** and **AT&T** said they signed an agreement outlining a formal process for determining whether AT&T, Weyerhaeuser's primary telecommunications carrier, is maintaining service quality expectations. Both firms will provide executive, operations and sales teams to discuss what is needed to maintain network uptime.

■ **Vitalink Communications Corp.** in Fremont, Calif., announced that it has signed a reseller agreement with **Digital Equipment Corp.** that will allow DEC to immediately start to resell Vitalink's 5000 series of TransLAN, TransRing and TransPath bridge and bridge-router products and network management products.

■ **Fibronics International, Inc.** has announced a 50% reduction in the price of its Fiber Distributed Data Interface bridges and routers.

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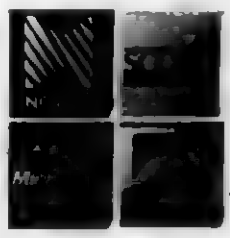

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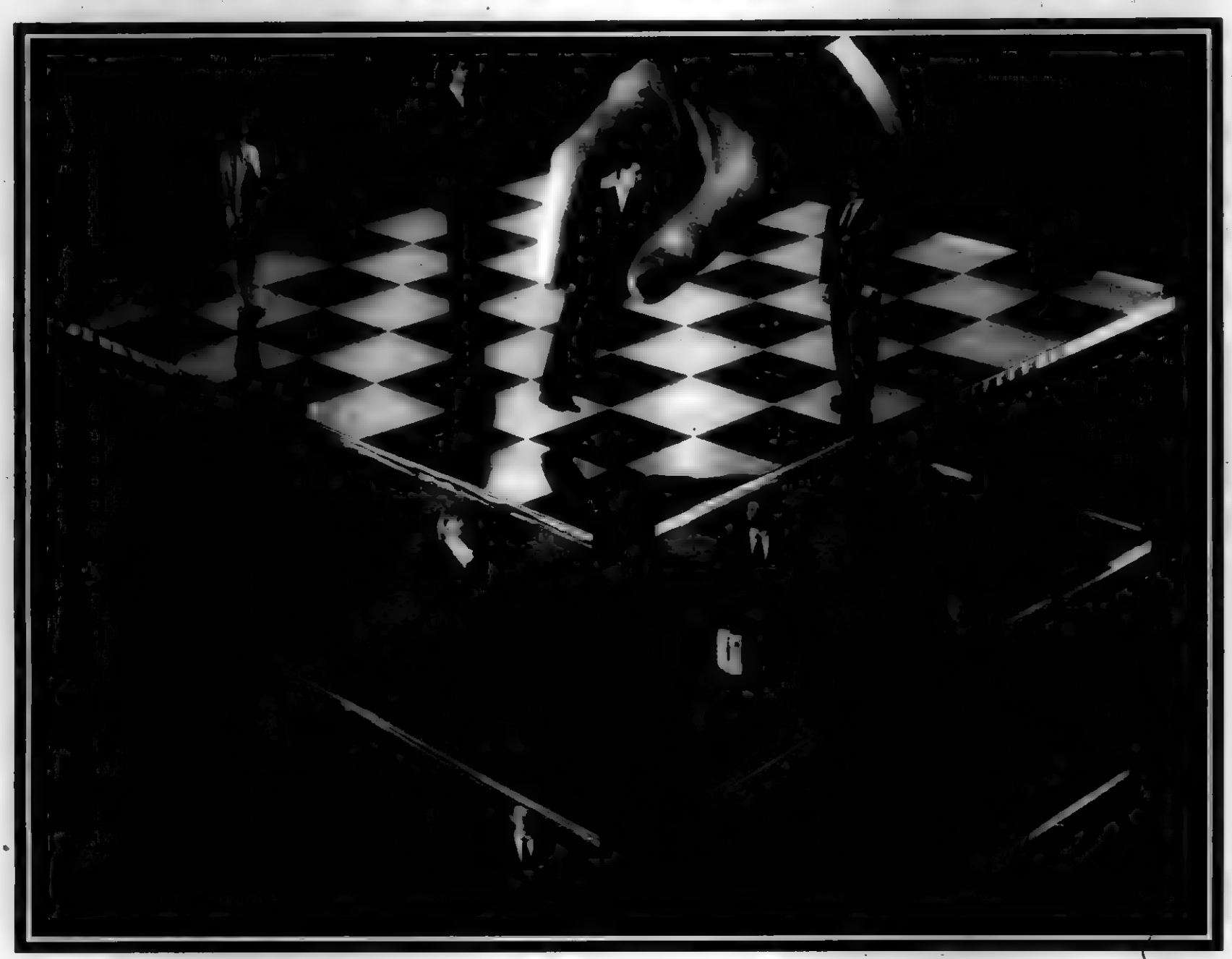

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DG product releases reaffirm Unix direction

BY KIM S. NASH
CW STAFF

WESTBORO, Mass. — Data General Corp.'s recent introduction of a passel of new products — including high-end and mid-range Unix servers — clearly reaffirms that the company's wagon is hitched to Unix.

DG/UX 5.4.2, an upgraded operating system that supports symmetric multiprocessing and HADA II, one of the industry's first high-availability disk arrays geared to Unix environments, temporarily sets DG apart from other Unix players. However, DG and its rivals are apt to hit rocky terrain as Unix boxes become less differentiated and more commodity-like, according to analysts and users.

> "WE MET WITH executives from DG and HP and they . . . recognized that Unix machines are pretty much a commodity already."
>
> DENNIS KOTECKI
> SAINT MARY MEDICAL

For example, the main reason Saint Mary Medical Center opted for DG instead of Hewlett-Packard Co. was the Aviion's superior price/performance, said Dennis Kotecki, director of information systems.

The Long Beach, Calif., medical facility, which previously had not used equipment from either vendor and is making its first foray into Unix, compared an AV 6280 top-end server with a comparably priced HP 9000 Model 887. The AV 6280 rang up 40% better performance, Kotecki said.

"We met with executives from DG and HP, and they . . . recognized that Unix machines are pretty much a commodity already," Kotecki said.

The RAID advantage

An advantage DG currently enjoys, however, is HADA II, a storage subsystem that uses redundant arrays of inexpensive disks (RAID) technology. HADA II was built on technology used in HADA I, a similar subsystem for the company's proprietary MV Eclipse minicomputer line. But HADA II offers more storage capacity — up to 20G bytes. Also, support for various RAID levels is available, including Levels 0, 1, 3 and 5, according to DG.

At an unveiling two weeks ago, DG executives touted the product, with a base price of $35,000, as "unbeatable."

Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif., disagreed. He explained that although HADA II "is a big thing for now," the advantage will be short-lived. Other vendors will no doubt produce similar wares sooner rather than later, he said.

Fax solves imaging dilemma

Virginia Power avoids costly workstation upgrades via coupling plan

BY ELLIS BOOKER
CW STAFF

RICHMOND, Va. — Like many companies that are evaluating electronic document imaging, Virginia Electric & Power Co. faced a dilemma: how to avoid an expensive upgrade of its communications network and computer terminal infrastructure, yet still provide access to document images for casual users.

Unlike most other companies, however, Virginia Power was under a federal mandate to make enterprisewide access to information a reality.

Under the 1987 Occupational Safety and Health Administration Hazard Standard Notification rule, utilities such as Virginia Power have to provide safety and hazard documents — so-called Material Safety Data (MSD) sheets — to any employee who requests them.

Since 1987, Virginia Power has complied with the rule with a manual, paper-based system. But with 12,600 employees and several thousand of the 1- to 12-page sheets to administer, the paper shuffle had become a major administrative undertaking.

ON SITE

VIRGINIA POWER

Virginia Power
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- **Challenge:** To provide access to thousands of health and safety documents to a work force of 12,600 people without incurring massive workstation costs.
- **Technology:** Electronic document imaging.
- **How it works:** Users select documents from an IBM DB2 index on the corporate mainframe, which triggers a fax gateway on the LAN-based imaging system to send the document to one of 260 waiting fax machines.

The push for imaging began two years ago, when the company decided to centralize the management of the safety documents, according to Susan Peterson, client services project manager at Virginia Power's information systems group.

The idea of keying the documents into a central database was rejected, according to Peterson, for fear of the errors this process would inevitably introduce.

"When these documents come to us, we consider them to be in final form, and our intent is not to change them in content or meaning," she said.

Another nonimaging option — electronic data interchange, direct from the vendors — was ruled out because few of Virginia Power's many suppliers have that capability. "It seemed to us the lowest common denominator is paper," Peterson said.

Virginia Power picked an imaging system from ViewStar Corp. in Emeryville, Calif. But a question remained of how to provide imaging access to all employees, many of whom were connected to the utility's 3090-class mainframe.

Solution found

The answer was to couple the ViewStar system with the mainframe.

According to Bob Borowicz, a consultant at Broughton Systems, Inc. based here, the application works in the following manner:

An operator at the ViewStar workstation is simultaneously connected to the mainframe via a 3270 window. Using the Dynamic Data Exchange feature of Microsoft Corp.'s Windows — the workstation interface for ViewStar — the operator assigns each image an index number from the mainframe-based IBM DB2 database.

Later, casual users needing an MSD sheet merely log on to the mainframe, consult the index of "imaged" documents and request one. The local-area network system, alerted to this event, sends the requested docu-

Continued on page 64

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AI seeks new programming role

Futuristic technology allows programmers to bind tool kits together

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — Artificial intelligence, which has long been associated with robots, rules-based reasoning and expert systems, may have found a new niche as the "glue" that holds together a programmer's tool kit.

AI proponents at the recent American Association for Artificial Intelligence (AAAI) conference said many business problems cannot be solved with procedural code alone. You start with a business problem, break it apart into its components and then choose the best technology to process each component, said Bernadette Minton, a case-based reasoning expert at Aion Corp. in Palo Alto, Calif, which recently agreed to merge with AICorp.

Pure case-based reasoning can be strengthened by generalised rules from knowledge-based management systems, Minton said. Case-based reasoning uses stored examples of previous problems and their resolutions to deduce solutions for new problems. Knowledge-based systems contain lists of "rules" from experts in a given subject area. For example, a petroleum engineer who retires from a company can store his knowledge about drilling for oil wells so that other employees can benefit from his experience when he is gone.

Future computer systems will manipulate mixed data types and will require a broader and more flexible tool set. AI can provide a series of reasoning routines that will hold the tools together. "A lot of these AI techniques complement each other well," said Marc Goodman, an AI researcher at Brandeis University in Waltham, Mass.

AI programs can help users to filter and analyze large volumes of data collected by browsing on an enterprisewide network that would otherwise inundate them. A factory-floor AI application can highlight machine outages using multimedia graphics to pinpoint failure "events" passed along from a real-time monitoring system. Expert systems can handle the processing of unstructured data types such as images, multimedia and text.

Brainchild to boom

"There's a lot more to come," said AAAI President Pat Hayes, a scientist at the Beckman Institute at the University of Illinois at Urbana-Champaign. "AI is a collection of ideas about how to manipulate information."

As computing hardware becomes more powerful, it will become practical to apply CPU-intensive AI software to everyday problems, Hayes predicted. Until now, there was a mismatch between AI processing requirements and hardware costs. "A lot of AI techniques have not ever been put into commercial products," he said.

But a lot of integration work must be done to make AI tools — many of which have had limited commercial appeal — part of general-purpose programmer tool sets. Some AI firms have already moved to reposition their products — including Intellicorp in Mountain View, Calif., which is now marketing its Pro-Kappa product line as a set of object-oriented tools.

"Somebody has to come up with an integrated environment where you have bits and pieces of logic mixed," said Natasha Krol, a program director at Meta Group, Inc. in Stamford, Conn.

Several vendors said they are already working on integrated software kits, including AICorp. and IBM. "We have built a set of editors that make it much easier for an end user to maintain a knowledge base," said Jim Gagnard, chief executive officer at AICorp. "Our technology is centered around inference engines, but we have to rebuild it as a tool set." AICorp. plans to mix AI, object-oriented tools and database connectivity tools in a suite of developers' products that will be ready within 18 months, Gagnard added.

Intelligent life

The AI market is dominated by expert systems companies

Source: The Relayer Group/AI Trends

CW Chart: Stephanie Faucher

Focus on function

Practical uses of AI were in the spotlight as the AAAI held its fourth Innovative Applications of Artificial Intelligence conference in San Jose, Calif.

Among the systems showcased were one that helps plan Nynex Corp.'s telephone network and one that speeds the handling of user calls to Compaq Computer Corp.'s support hot line.

Compaq's Support Management Automated Reasoning Technology (SMART) system uses case-based reasoning to help customer support technicians save time, said Timothy Acorn, manager of technical support at Compaq's Houston headquarters.

SMART, installed one year ago, is based on a Sybase, Inc. SQL Server database and a Compaq SystemPro 486 with 24M bytes of memory and 1.6G bytes of disk storage. The AI technology for SMART came from Inference Corp. in El Segundo, Calif.

Another system, Spotlight, scans supermarket checkout data for trends in buying patterns. It uses knowledge-based reasoning to analyze gigabytes of data gathered by A. C. Nielsen Co. in Northbrook, Ill. A search that used to require two to four weeks can now be handled in less than 30 minutes with Spotlight, system designers said.

Many of the 19 systems discussed here brought significant savings to their owners. Nynex's Arachne expert system identified $10 million in capital expenditures that could be saved in Nynex's Massachusetts region. Arachne aids designers of the telecommunications firm's network infrastructure.

JEAN S. BOZMAN

Unix spells end of line for club's aging minis

BY ELLIS BOOKER
CW STAFF

STREAMWOOD, Ill. — Last year, Awana Clubs International added up the annual maintenance costs and relicense fee for the system software on its two Unisys Corp. mainframes and began exploring Unix alternatives.

As a result, this 42-year-old organization, which operates Christian children's clubs in cooperation with more than 6,000 churches worldwide, will be looking for a buyer for its mid-range Unisys A12 and A6 hosts next month.

The move to Sun Microsystems, Inc.'s four-processor 630 "came down to a cost issue," said Tim Rathjen, the project manager of Awana's information systems department.

Sun's line beat out several other Unix server vendors, including Unisys's own U 6000 series. In fact, Unisys — which wants very much to capture

these sorts of open systems migrations among its mainframe customers — appears to have lost the Awana bid in part because of the turmoil in its mainframe business.

"Support from them hasn't been great for the mainframe product," Rathjen said.

Rather than port its long-used financial and distribution software to Unix, Awana chose to replace it. The old software, known as the Burroughs Distribution Package (BDP), had been written under a version of Unisys' Link fourth-generation language that is no longer supported.

"To upgrade, it looked like we'd end up doing a major rewrite anyway," Rathjen said.

> THE MOVE TO Sun Microsystems, Inc.'s four-processor 630 "came down to a cost issue."
>
> TIM RATHJEN
> AWANA

Awana is replacing the BDP program with SSI Financials and Distribution from Aurora, Ill.-based Software Solutions, Inc. (SSI), which converts the 6G bytes of data from Awana's old hierarchical file structure to an ASCII format for use by the underlying Informix Corp. relational database, Jim Solomon, vice president at SSI, explained.

Awana plans to do all future application development in Informix on a Sun SPARCstation II workstation networked to the multiprocessor Sun 630.

Still, the shift to Unix hasn't meant a wholesale change in all of Awana's systems. For instance, about 30 of 75 users are still using proprietary Unisys BTOS workstations, which have their own server and office automation platform.

"Right now we're using a terminal emulator to get [the BTOS users] through to the Sun 630," Rathjen said. Eventually, however, the organization plans to replace these and run all application from the Sun server.

Apart from avoiding future mainframe fees and costs, Awana has witnessed some up-front savings since starting the move to Unix.

Imaging dilemma

CONTINUED FROM PAGE 63

ment to a personal computer-based fax server, which spits out the image to 1 of 260 fax machines at 60 company locations throughout the state. Users can also instruct the system to send a document to a location outside the company, such as a hospital.

"There are about 7,000 MSD sheets to scan, and two interns are doing this job at about 150 documents per day," Borowicz said. In the future, he said, the scanning step may be avoided by having the suppliers fax their MSD sheets directly into the ViewStar fax server.

Although its current use of imaging is specialized and its investment of about $200,000 is modest, Peterson said she is thinking about the changes a broader use of imaging will require in high-speed networking, storage systems and work-flow application development.

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Database management

Data Summary, Inc. has introduced Version 3.0 of the Intelligent Data Conversion System (IDCS) for the IBM Application System/400.

The product helps users move data from IBM System/36s, personal computers, mainframes, Digital Equipment Corp. VAXstations and other non-IBM systems to AS/400 applications. IDCS 3.0 includes a table translation that allows codes in the input data to be translated into the codes that the new system requires. It also includes a join-record feature that connects records from different data files to create a single output record.

IDCS 3.0 costs $995 for AS/400 Model 9402 and $1,800 for other manuals.

Data Summary
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(708) 795-0606

Information Builders, Inc. has announced SmartMode for Focus, an intelligent query analyzer/governor designed to control Focus requests. Focus is a fourth-generation language for application development and end-user computing.

SmartMode for Focus monitors traffic and acquires knowledge about data access patterns. A knowledge base is constructed to extrapolate costs of future requests. SmartMode's Collector Training System captures statistics and reports how requests are processed against heterogeneous data sources.

Prices range from $24,000 to $39,600.

Information Builders
1250 Broadway
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(212) 736-4433

Systems Center, Inc. has announced NDM-MVS/SQL, a software package that provides an SQL link to IBM DB2 databases.

NDM-MVS/SQL was designed to simplify data transfer for distributed, host-connected applications. According to the company, NDM-MVS/SQL provides users with a tool for transferring data, while ensuring data integrity, availability, reliability and security. Data can be selected from a DB2 database and transferred to a flat file on a variety of operating systems, or it can be transferred to another DB2 database. Any NDM-supported operating system can transfer and insert a flat file into a DB2 database.

Prices range from $5,500 to $21,850.

Systems Center
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Software application packages

Avalon Software, Inc. has a new version of its CIIM client/server manufacturing software for Oracle Corp.'s relational database management system.

CIIM 8.5 is a line of fully integrated manufacturing, distribution and financial software applications.

Enhancements in this release include increased ease of use via support for Oracle SQL Forms 3.0, more financial functionality and support for corporate entities. Multicurrency support, greater flexibility in the systems financial modules and more layers of user and system security have also been added.

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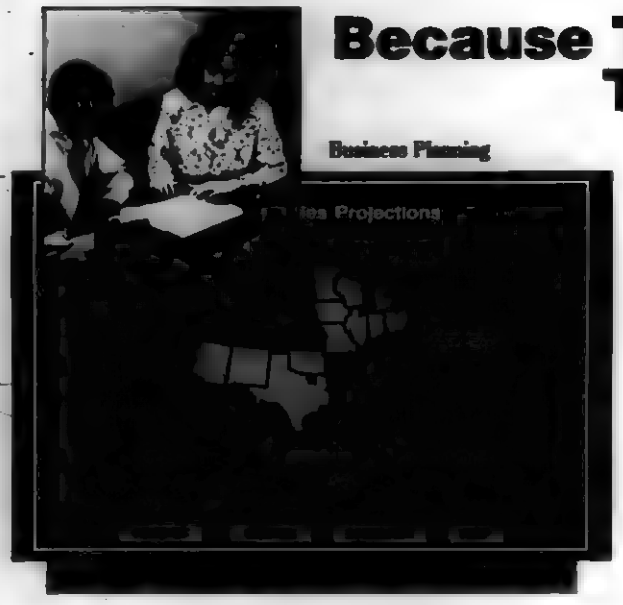

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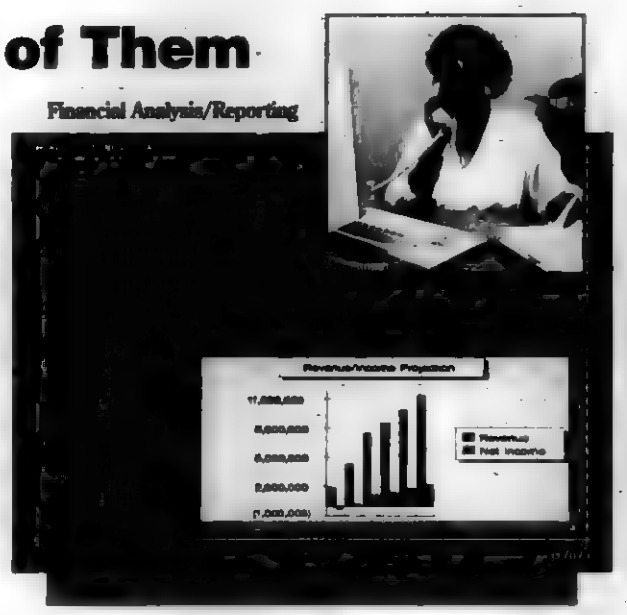

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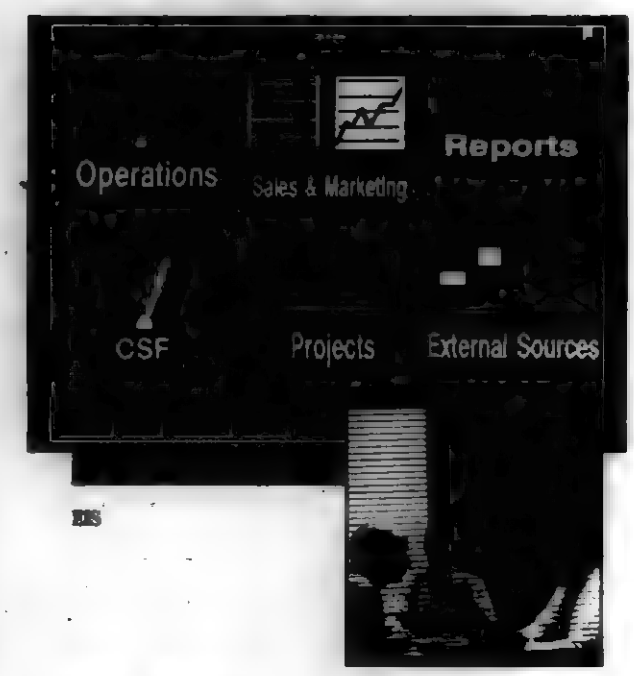

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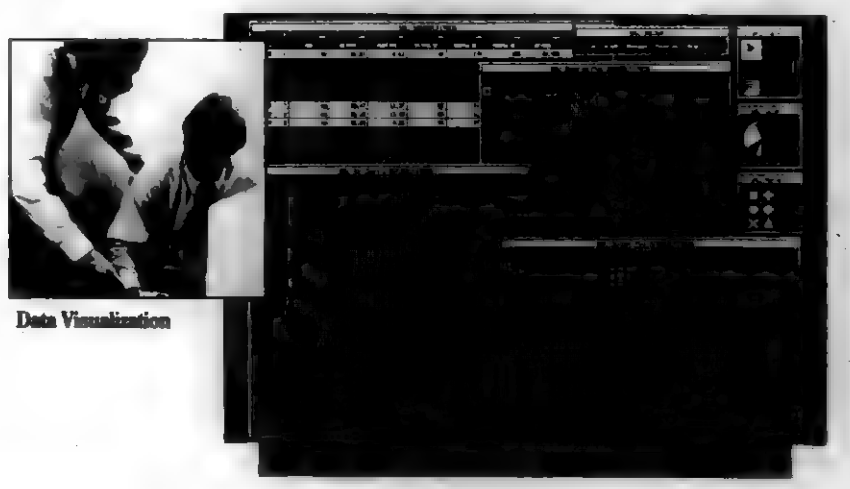

COMMENTARY

Judith S. Hurwitz

Process, then programs

It is a time of soul-searching in the applications development arena. Suddenly, the world seems to have discovered that applications are far from perfect. Some pundits are even asserting that we have not made any gains at all in the last two decades.

In part, the pundits are correct. Systems built over the past 20 years are flawed. Some of these flaws are technological and some are failures of communications. Both problems can be fixed.

But before we discuss how to change, let's look at the source of business frustration with today's applications. Many observers wonder why we are not able to design applications processes in the same way that we design manufacturing processes. After all, a process is a process, right?

Ain't necessarily so

Not necessarily. In factory automation, it is relatively easy to define all of the possible activities involved in the manufacturing process. Details may change over time, but the fundamentals do not.

Not so in applications development.

When we develop systems, we are in fact trying to mimic a vast array of corporate rules and knowledge. Take the developer trying to create an insurance policy system. The system has to reflect business issues, planning and policies — none of which are easy to capture in software.

Fly in the ointment

What is the problem? Computers are wonderful at repetitive tasks — they always have been. But when it comes to handling more subtle knowledge, they are less adept.

So, what's the solution? Should we simply declare the past 20 or 30 years of commercial systems development a failure and move on? Probably not.

Many of these earlier systems really did accomplish the tasks for which they were intended. They allowed large businesses to process millions of

Continued on page 68

IBM repository shift suits users, for now

BY JOHANNA AMBROSIO
CW STAFF

IBM's decision to de-emphasize its mainframe Repository Manager/MVS in favor of a local-area network version suits some users just fine for right now. But large shops expect they will eventually need the power of a mainframe as well.

That was the response to IBM's plan to shift resources away from its mainframe repository and toward providing application development tools and a repository on the workstation and LAN. IBM has been briefing users and analysts about this scenario, which the company is expected to announce within the next two months (CW, July 20).

"We've been using a LAN repository to start capturing data, but I wonder if it will be robust enough," said Brad Ellis, principal manager of data management at McDonnell Douglas Corp. in Hazelwood, Mo. The company has been using ProKit Workbench from McDonnell Douglas Systems Integration Co. in Maryland Heights, Mo., to implement a manufacturing resource planning application, "and we've been pushing it pretty hard," he said.

"It will be a while before we're ready for a mainframe repository, but I think eventually large users will need a combination of the two," Ellis added.

Server search

Ira Morrow, a vice president at Shearson Lehman Brothers, Inc. in New York, said that once a truly distributed database is available, users will be able to keep repository data on various machines and then do a server search to find whatever they need. Still, he agreed, "there may be some shops that need or want a centralized repository, and there should be a choice."

Shearson has been using mainframe-based data dictionaries from Manager Software Products, Inc., BrownStone Solutions, Inc. and Reltech Products, Inc. as "interim" solutions.

Morrow said his key criteria for a repository — regardless of hardware platform — are that tools work with it, that it allow for different developers to work on the same project at the same time and share information; and that it provide the ability to keep track of different versions of a project.

All these features were supposed to be part of IBM's mainframe-based Repository Manager, although a full-fledged product was never delivered.

"There's a crying need in the user community for the concepts of Repository Manager as presented in the original vision," said Ed Acly, an analyst at Technology Investment Strategies Corp. "It will be a while before those capabilities come out on the LAN."

Another problem with IBM's plan, he said, is that the LAN and mainframe repositories will use two different models — object-oriented on the former and entity-relationship on the latter. "Although object-oriented tools are clearly needed and wanted, they're not necessarily substitutable for entity-relationship modeling. That's the dilemma IBM is facing," Acly said.

The uncertainty surrounding IBM's mainframe-based Repository Manager is one reason that Du Pont Co. "is sitting back and not doing anything with it" even though it has the repository in-house, said Dick Stromberg, a consultant at the Wilmington, Del., company.

"A lot of the effort here has moved toward implementing applications packages to get the level of integration we're looking for," Stromberg said.

For example, Du Pont has installed a family of manufacturing and accounting applications from SAP America, Inc. in Lester, Pa., that share data. Still, he said, "I would think that large users need an enterprisewide repository."

Corporate developers hedge on NT

BY GARRY RAY
CW STAFF

While Microsoft Corp.'s promotion of Windows New Technology (NT) has reached a fever pitch, corporate application development managers and other observers remained mixed about their plans to develop for the future operating system.

Microsoft, at its first Win32 Professional Developers Conference held earlier this month in San Francisco, announced that nearly 150 application development tools from nearly 100 vendors already are or soon will be available for the operating system. IBM's OS/2 2.0, which shipped in March, will be supported by nearly 140 third-party development tools at year's end, according to IBM.

However, corporate developers are still waiting for the operating system wars to shake out. A recent survey by the CW Database Division found that information systems managers expect Windows NT to be a key strategic component in many environments but that it would be implemented on only 6% of all personal computers during the next two years.

"Tools are not that important to me," said Theresa Doyle, a vice president for computer and information systems at New York financial firm Dean Witter Reynolds.

The steady stream of support for Windows NT "means that developers are committed," she noted, though her company's equity research department does not develop many in-house applications. Still, Doyle added, "we'll look at NT as soon as it's available."

Faithful to OS/2

Despite the Windows NT buildup, other corporate IS managers remain firmly committed to IBM's OS/2 operating system, largely because of strategic plans that were in place prior to the breakup of IBM and Microsoft about two years ago. And they seem unwilling to wait for Windows NT announcements and promises to come to fruition.

Of the industry's support for Windows NT tools, Cary Serif, manager of applied technology at Columbus, Ohio-based Huntington Bank, said, "That's nice, but we're more confident with something that exists today." Huntington Bank, he said, made a strategic commitment to OS/2 applications and development tools in 1988. "I'm very uncomfortable with having to build applications based on [Microsoft's] strategy of the week."

A similar position was echoed by the vice president of end-user support at a large Northeastern bank who did not want to be identified. "We're very much an IBM-oriented DP organization, so [the availability of Windows NT development tools] hasn't really changed our position at all."

Windows NT supporters have been attracted to the operating system not so much for its broad array of development tools but for tools that address their specific concerns.

Windows NT is "absolutely critical to us," said Sherm Weinberg, manager of strategic planning and data administration at CF Industries, Inc., a farm cooperative manufacturer in Long Grove, Ill. As planner of the company's database strategy, Weinberg said he found the OS/2 Database Manager inadequate for CF Industries'

Continued on page 68

Choose one or both

The majority of today's development tools support both Windows NT and OS/2

Development tools: Which platforms they support

C compilers		
Borland C++	✓	✓
Microsoft C++	✓	
Symantec/Zortech C++	✓	✓
Cobol compilers		
Micro Focus Cobol	✓	✓
Programming tools		
Mansfield Software Group Kedit	✓	✓
Microquill Performance Tracer	✓	
Intersolv PVCS Version Manager	✓	✓
Microedge Slickedit	✓	✓
SQL servers & tools		
Gupta SQL Windows	✓	
Sybase SQL Server	✓	✓
XDB Systems XDB Server	✓	✓
Microsoft SQL Server	✓	✓
Oracle Server	✓	✓
CASE/GUI tools		
Popkin Software System Architect	✓	
Andersen Consulting Foundation	✓	✓
Caseworks Workbench	✓	✓
Neuron Data Open Interface	✓	✓
XVT Software XVT	✓	✓
Client/server tools		
Mozart Systems Mozart	✓	✓
Easel's Easel Workbench	✓	✓

Hurwitz

CONTINUED FROM PAGE 67

invoices, claims and statements. They allowed them to track customers. However, developers of these systems didn't anticipate change.

The demand for faster, more responsive systems comes at a time when users are learning more about the power and capabilities of computers. They expect new technology to be more accessible and easier to use.

Application developers have a responsibility both to provide realistic expectations and to make sure that users can gain the most benefit from today's imperfect systems. This requires highly developed communications skills and a willingness to begin slowly dismantling systems that must be changed and rapidly introducing new technologies that encourage experimentation.

THE REAL CHALLENGE is based on human communications and relationship building — a trait often found lacking in IS management circles.

It means that it is time for IS management to take on two challenges. First, IS management has to begin to carry on two-way conversations with senior line management, not just middle management. Those conversations must be aimed at capturing and codifying business rules and procedures, no matter how subtle. Even better, line managers can become partners in helping IS to develop better applications that the business really needs.

Second, IS management has a responsibility to its business to ensure that these systems are designed to withstand the test of time. "Things will change" should be its clarion call.

In both cases, the challenge has nothing to do with tools or technology because neither will solve the underlying problem of today's application development. Rather, the real challenge is based on human communications and relationship building — a trait often found lacking in IS management circles.

To succeed, IS management will have to take on a new attitude predicated on relationships and pointed at change.

Hurwitz is president of Hurwitz Consulting Group, a Newton, Mass., consultancy specializing in applications development trends and technology, and publisher of "Tool Watch: Enabling Open Applications Development."

Silicon Graphics adds to CASEVision family

BY KIM S. NASH
CW STAFF

MOUNTAIN VIEW, Calif. — This summer has been busy for Silicon Graphics, Inc. Two weeks after rolling out new Unix workstations in its Iris Indigo line, the $550 million company introduced CASE tools last week, expanding its 1-year-old CASEVision line.

The computer-aided software engineering (CASE) products are graphical tools aimed at building applications in both commercial and technical Unix shops.

The CASEVision family supports ToolTalk, an object-oriented framework from Sun Microsystems, Inc. that lets different vendors' tools talk to one another and exchange information. ToolTalk battles Hewlett-Packard Co.'s SoftBench framework.

Sprucing up image

Known primarily for hardware based on reduced instruction set computing (RISC) technology, Silicon Graphics is trying to step up its software presence, according to a spokesman. The new wares are part of an overall push to promote the company's Visual Magic Division, which was formed last year when management rolled its software groups together. Currently, "a lot of people don't even realize we have a software division," the spokesman said.

That is true of many traditionally systems-only vendors that are elbowing into the software sector to bolster sagging revenue as hardware becomes increasingly margin-thin, according to Susan McGary, an analyst at The Yankee Group in Boston. "Yet the hope for systems vendors," she said, "is really software and services."

New products under the CASEVision banner include the following:

- CASEVision/ClearCASE, a version control tracker developed by Atria Software, Inc. The Natick, Mass.-based company signed reseller agreements in May that let both Silicon Graphics and HP market ClearCASE. The $3,000 product was designed to support parallel development — i.e., programmers working in a Unix local-area network environment.
- CASEVision/Tracker, a bug monitor priced at $1,600. Tracker traces bugs in programs that developers are working on and shows where the bugs originated and how they affect other parts of the application.

Tracker and ClearCASE are also available as a package for $3,750.

- Iris Indigo DevStation, a RISC-based personal computer with 16M bytes of random-access memory and a 432M-byte disk drive for a base price of $11,995. The machine, which is slated to be available in September, comes configured with libraries and tools that include a C compiler and OSF/Motif utilities.

A service called CASEVision Consulting is also available to help users integrate CASE into their shops and train programmers, among other tasks.

Corporate developers hedge on NT

CONTINUED FROM PAGE 67

needs. "When we looked at [Microsoft's] SQL Server vs. IBM's Database Manager, SQL Server was head-over-heels better," he said. Microsoft was demonstrating a Windows NT version of SQL Server at the recent developer's conference.

Weinberg also said the array of development tools for SQL Server and for Windows NT will ultimately be more complete than for OS/2. "The tools are not complete yet, but we see the market going to Microsoft," he said.

Some observers said they expect Windows NT will initially take a large chunk of its market from Unix installations.

Peter Schleider, an investment analyst at Minneapolis financial firm Wessels, Arnold & Henderson, predicted that "of the application development group that's Unix-based today, almost 75% will be going to NT in the next year."

Slow to go

According to Schleider, corporate OS/2 developers are less apt to move to Windows NT in such a short time frame. Windows NT "will initially be used [to develop] technical applications," which is the traditional focus of Unix development efforts, Schleider said.

Agreeing with that assessment was Eddie Currie, president of Port Washington, N.Y.-based Imagesoft, Inc., a seller of C++ development tools. The interest in Windows NT "doesn't speak well for Unix in general," he said.

Currie also noted a single important reason why vendors will port their tools to Windows NT: the marketing strength of Microsoft.

According to Currie, "Microsoft will continue to dictate the way things go and to have success with NT and other things they do."

Imagesoft, he said, has begun porting all of its 50 development tools to Windows NT.

Noblenet utility eases Unix woes

BY GARRY RAY
CW STAFF

Unix shops will be released from the terrors of remote procedure call (RPC) coding with a new utility announced by Noblenet, Inc. in Natick, Mass., last week.

RPC is an Open Network Computing specification that enables client/server computing by allowing applications residing on one network node to access procedures that reside on other nodes.

For example, an RPC client application could call and use computationally intensive procedures residing on an RPC-enabled, high-speed supercomputer.

Noblenet's tool, EZ-RPC, is a C programming code generator that replaces and enhances the functionality of the Unix System V, Release 4 utility called RPCgen, which is currently included with most versions of the operating system.

According to Noblenet officials, developers first describe the subroutines to be distributed across a network using conventional C language notation. EZ-RPC then generates the additional C language code needed to create the requisite RPC transport and distribution mechanisms.

The C language source code, which Noblenet officials said is platform-independent, can be examined and altered if necessary.

The tool kit, which is available immediately, is priced at $10,000 per installation with three seats.

NEW PRODUCTS

Computer-aided software engineering

Telesoft has introduced the ASIS Toolkit, a technology that enables users to integrate their tools to the Ada library system.

Ada Semantic Interface Specification (ASIS) was designed to develop Ada-knowledgeable, portable computer-aided software engineering (CASE) tools to boost user productivity.

Reverse-engineering tools, semantic editors, automatic test generators and configuration management systems are some applications included in the CASE software.

Prices for a single ASIS Toolkit range from $13,500 to $36,000, depending on the hardware configuration.

Telesoft
5959 Cornerstone Court W.
San Diego, Calif. 92121
(619) 457-2700

Application development tools

Liant Software Corp. has released C++/Views 2.0 class library.

Users can develop portable applications for Microsoft Corp. Windows, OS/2 Presentation Manager and Unix/Motif. C++/Views 2.0 consists of a third-generation, object-oriented development framework combined with more than 100 ready-to-use classes and programmer productivity tools.

A re-engineered Notifier class provides users with control of resource-based dialogs and support for multiple document interface; a C++/Browse source-code development tool automates programming tasks.

C++/Views for Microsoft Windows costs $495, $995 for OS/2 Presentation Manager and $1,495 for Unix/Motif.

Liant Software
959 Concord St.
Framingham, Mass. 01701
(508) 872-8700

Software Maintenance & Development Systems, Inc. has introduced the ADC/AdaScan.

ADC/AdaScan is an option to Aide-De-Camp, an object-oriented software configuration management system.

The product was designed to help the Ada user find which source files belong to a specific program and also tell what major program structures these files contain and what order files should be compiled in to make an executable program. ADC/AdaScan allows users to identify the types of Ada program units a compilation order represents.

The ADC/AdaScan costs $2,195 for all platforms.

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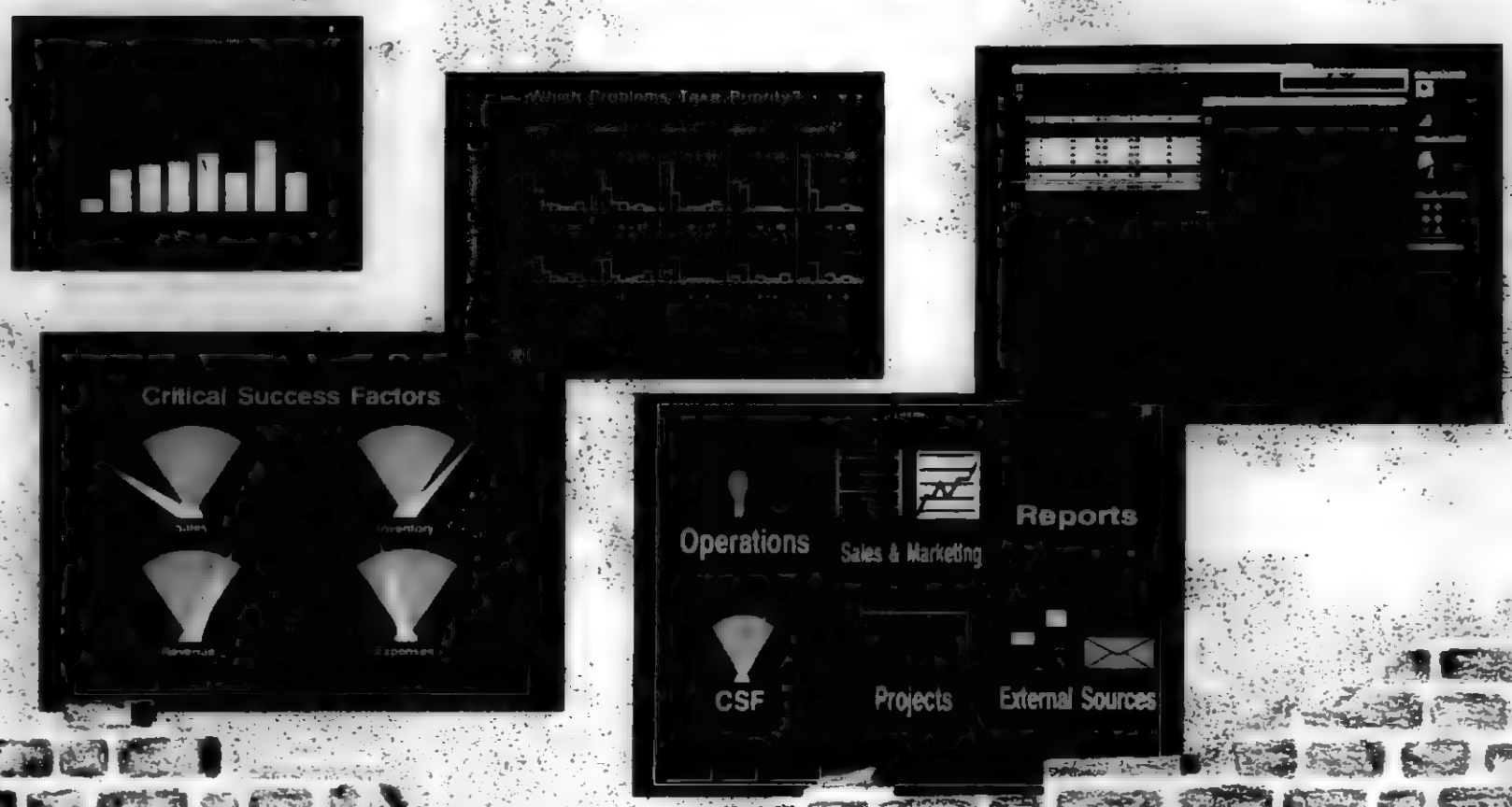
	OS/2: Win-OS/2 Full Screen	DOS 5.0 & Win 3.1 Full Screen
WordPerfect® (spellcheck)†	38.5 sec	43.6 sec
AmiPro™ 2.0 (print)††	95.1 sec	104.6 sec
Preemptive multi-tasking of Win apps	YES	NO
Crash protection	YES	NO

IBM

*Upgrade from Windows, $49; upgrade from any DOS, $99; $139 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 7/31/92. Shipping and handling not included. **In Canada, call 1 800 465-7999. Tests conducted by NSTL. System under test is a PS/2 57SX w/4MB RAM and an 8513 VGA display. Under Windows 3.1, applications were loaded and/or executed from the Windows 3.1 Program Manager. Under OS/2, applications were also loaded and/or executed from the Win-OS/2 Full Screen Program Manager. Both Windows 3.1 and Win-OS/2 use a disk cache of 64KB. †Word processor spellcheck. The time required to spellcheck a document with no spelling errors. Open the Word Perfect for Windows 5.1 document entitled "macro.doc". Select TOOLS from the menu bar, then select SPELLER. Select OPTIONS from the SPELLER menu bar, and deselect all of the options. Click OK. Test was timed from the click until the user regained control of the application. "Macro.doc" contains 21 pages and is 47,455 bytes. ††Word Processor Print. The time it took to print a word processing document. Open the AmiPro 2.0 document entitled "printest.sam". Select FILE from the menu bar, then select PRINT. Select FROM page 1 to 1 and click OK. The test was timed from the click until the first page completed printing on the printer. Windows 3.1 used the IBM LaserPrinter 4029 PS17 PostScript printer driver shipped with the Windows 3.1 software package, and Win-OS/2 used the IBM 4029 v2.1 (17 font) PostScript printer driver shipped with the OS/2 2.0 Operating System using LPT1.OS2. NSTL makes no warranties, express or implied, as to results to be obtained by any person or entity from use of the services or the results thereof, or any information or data included therein. NSTL makes no express or implied warranties of merchantability or fitness for a particular purpose or use with respect to the services and/or results thereof, or any information or data included therein. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1992 IBM Corp.



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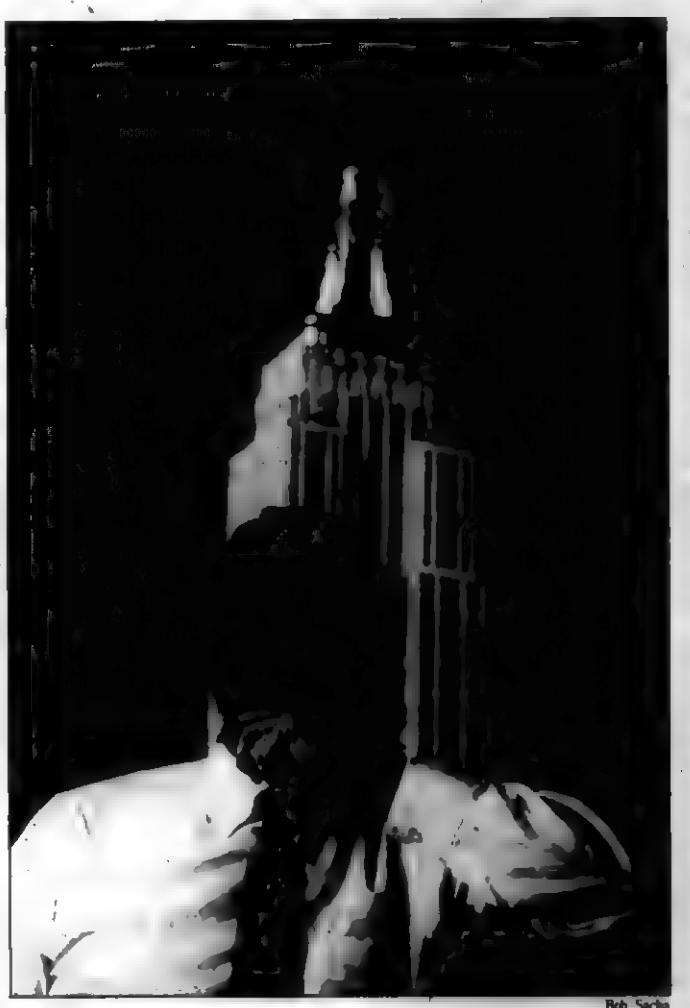
Group(ware) therapy

It takes more than unwrapping the package to create a happy workgroup. People problems loom large. Here's a realistic look at how to stay sane.



Bob Sacha

***'It's not** a technical challenge,' Young & Rubicam's Maynard says. 'It's a cultural and organizational challenge'*

BY ALICE LAPLANTE

Corporate hierarchies flatten overnight. Worker productivity triples. Quality skyrockets. Employees work together in peace and harmony as geographic and organizational barriers collapse.

In your dreams.

There's seemingly no end to the utopian scenarios surrounding workgroup computing, the industry's current software darling. Despite the huge potential, experts and early pioneers say that making workgroups work is a tall order for any information systems department or company.

"The implications go way beyond IS," says Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc. The advertising agency has been experimenting with Lotus Development Corp.'s Notes for almost a year in its New York, San Francisco and London offices. "It's not a technical challenge," Maynard says. "It's a cultural and organizational challenge."

Much of that challenge stems from the many-horned nature of the beast.

"Every day we feel like we've had something new to address," says David Payne, a systems analyst who helped start a Lotus Notes pilot at The Provident Life & Accident Insurance Co. in Chattanooga, Tenn. "Who's going to provide the tool? How do we handle chargebacks? Who controls the database?" (See Payne's firsthand account, page 74.)

Though definitions differ, "workgroup computing" usually refers to everything involved when a group of people use computers to collaborate toward a common goal. Success involves many complex organizational factors that go far beyond choosing the best software to buy.

In fact, even the seemingly simple decision of which product to pick is daunting: Groupware is a broad category that covers everything from sophisticated electronic-mail packages to entire office automation suites. Group authoring, calendaring and scheduling, conferencing, information sharing, project tracking and work-flow management are also popular groupware applications.

Despite this fuzziness, businesses are buying in. After a slow start several years ago, sales of groupware are growing rapidly. According to Work-Group Technologies, Inc. in Hampton, N.H., the worldwide groupware sales are expected to reach $2 billion by the end of 1993, quadrupling 1989 sales.

The market is young, ill-defined and highly fragmented. No vendor holds more than an 18% share, says International Data Corp., a research firm in Framingham, Mass. Sales are dominated by Lotus, which says Notes will be installed on 400,000 personal computers by the end of this year.

More vendors are jumping in every month, however. Major announcements are expected from Borland International, Inc. and Microsoft Corp. within six months (see page 74).

Keep feet on the ground

Though the payoffs of workgroup computing sound attractive, consultants and IS managers stress that too many are plunging ahead with unreal expectations — and false ideas of success.

As in nearly everything, linking technology and business goals, they say, is key.

"Workgroup technologies are only successful if you understand how they will improve your business process," says George Goldsmith, president of The Human Interface Group, Inc., a Wethers-

Continued on page 72

LaPlante is a free-lance writer based in Palo Alto, Calif.

Workgroups

KEY POINTS

▶Groupware pioneers say clear business goals, a handpicked group, reviews of existing processes, good training and measurable goals are the keys to workgroup success. See page 73.

▶A good demo and soup-to-nuts support are needed to launch a groupware pilot. Firsthand account begins on page 74.

▶User stories: Young & Rubicam, Inc. The Provident Life & Accident Insurance Co., Chase Manhattan Bank NA, Dow Chemical Co., Metropolitan Life Insurance Co., Liberty Mutual Insurance Co.

▶Industry watcher David Marshak says major software vendors such as Lotus, Borland and Microsoft are expected to continue their domination of the highly scattered market. See page 74.

▶FAST FACT: The annual cost to install and maintain a LAN-based E-mail box: About $319 on a 1,000-user site, according to Ferris Networks.

QUOTABLE:

"The implications go way beyond IS."

Howard Maynard
Young & Rubicam

Group(ware) therapy

CONTINUED FROM PAGE 71

field, Conn.-based consulting firm specializing in practice improvement and workgroup computing.

Goldsmith and other experienced hands are quick to debunk the following popular assumptions about workgroup computing:

• MYTH: The more information users have access to, the better.

IS managers and consultants agree that too much emphasis is placed on sharing information and not enough on actually completing group work.

"That's perhaps the first 25% of what workgroup computing can do for you," Goldsmith says. "But I don't know of many organizations — unless it's market research or perhaps R&D groups — that are paid for merely sharing information. Most organizations are paid for getting things done, finishing projects on time and on budget and for delighting customers who want to come back for more."

Early implementors simply threw buckets of data at users and hoped greater productivity would follow, notes Bruce D. Sanders, an executive consultant and consulting psychologist who is president of Workgroup Associates in Vacaville, Calif.

"In fact," he says, "the reverse was true. It became easy for the trivial to flood out the significant."

Ironically, a prime example is the Notes User Group, says Michael Mandelbaum, vice president of systems development at the North American Section of Chase Manhattan Bank NA, a workgroup pioneer that now has 1,500 Notes users. The user organization runs a Notes-based database application for 200 corporations worldwide.

The original idea was classic groupware. The premise, Mandelbaum explains, was to give early Notes users a forum to share experiences and solutions.

But things got out of hand, Mandelbaum says. "It used to be that you would see 10 new items posted a day, and it was fairly easy to keep up with what was going on. Now there are 50 or 60 new items, and if you miss two or three days of logging on and reading the database, you become lost."

Learning from the experience, after its initial pilot, Chase appointed expert editors to help keep users from getting bogged down in useless data. Editors hunt out and delete insignificant, inaccurate or misleading entries.

"We found that having a Notes administrator was critical," Mandelbaum says.

• MYTH: An improved or simplified group process will yield a tangible business advantage.

Another common and big mistake experts warn against is believing that an improved group process will automatically help the business — or worse, that it's a worthy end in itself.

At Metropolitan Life Insurance Co., some 150 users in the investment department use Notes. In addition, a group-scheduling application, which runs on the IBM Professional Office System (Profs) E-mail system, helps arrange meetings and conferences among team members scattered in New York, Chicago and Atlanta.

According to David Daniels, manager of executive information at the investment department, meetings or videoconferences that once took hours to arrange now take 30 seconds.

But easier isn't always better, he says. "Now people are saying it's so easy to schedule meetings that people are finding it too easy to schedule unnecessary meetings. That wasn't exactly the point of the system."

Goldsmith recounts the tale of a large multinational insurance client that was having a tough time managing a critical project.

After a series of missed deadlines, the team instituted a practice of filing biweekly progress reports. These reports were filed electronically into a database that was reviewed by management and updated every two weeks.

"Unfortunately, people were making their status reports in the form of diary entries, merely listing their activities," Goldsmith recalls. No attempt was made to compare entries with project goals.

"No one had any idea whether the project was on track or not," he says. His solution was to design a Notes application that required biweekly status reports to be matched to specific project goals as soon as a task was completed.

• MYTH: On-line meetings can replace traditional meetings.

Groupware veterans say another mistake is assuming that a new way of communicating is better simply because it's new. Instead, they say it's important to know when traditional ways are still best.

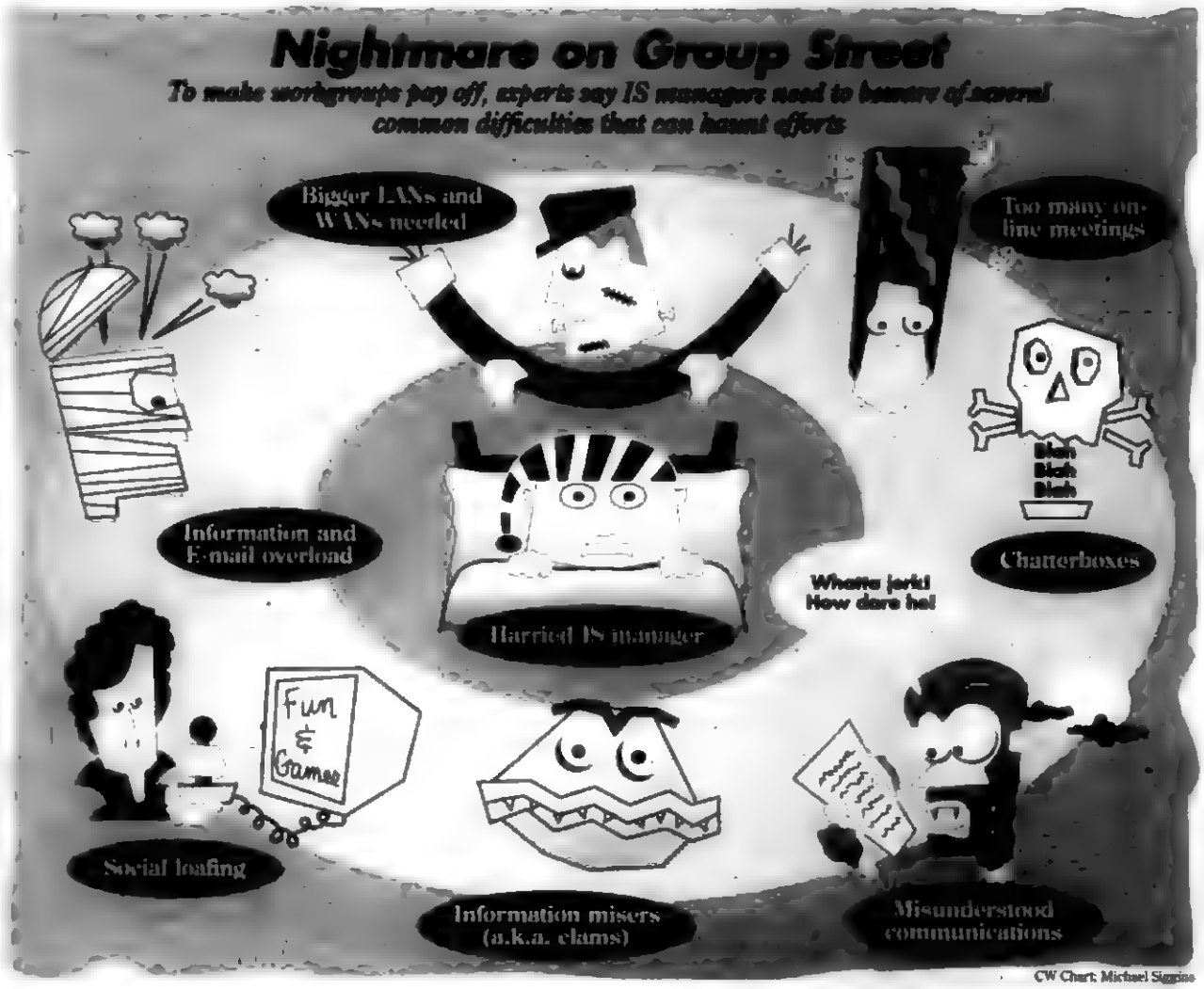
"We've found that the types of meetings that can effectively take place electronically are limited," says Neil Drake, a process specialist at Dow Chemical Co. in Midland, Mich. Dow uses several groupware packages for on-line meetings and collaboration.

The company has discovered that it's impossible to hold successful electronic meetings on certain topics, Drake says.

"We do a lot of planning and technical work, so in most of our meetings, body language is only a minor part of most of the communication that goes on," he explains. For those types of meetings, the electronic format is fine.

However, when negotiations or emotions are important — such as when discussions of corporate philosophy or departmental politics or organizational changes are taking place — electronic sessions don't work as well as traditional, face-to-face meetings, he says.

"Bored or annoyed expressions, crossed legs, sitting-back-in-the-chair motions and other body language clues become extremely important to correctly interpreting what is going on," Drake says.



CW Chart: Michael Siggins

TECHNICAL BACKGROUNDER

What is groupware, anyway?

Groupware — software designed to facilitate workgroup computing — is a fuzzy term that covers a broad range of products that fall into a number of different categories:

• **Information sharing** products are designed to help workgroup members trade data through sophisticated messaging and database functions. Products such as Notes from Lotus Development Corp., Topic from Verity, Inc. and Cooperation from NCR Corp. fall into this category.

• **Electronic meeting** or conference applications — such as Aspects from Group Technologies, Inc., Instant Update from On Technology, Inc. and VisionQuest from Collaborative Technology Corp. — allow two or more users to engage in simultaneous electronic communication via desktop PCs. Many "meetingware" vendors tout their products' ability to provide instant documentation, which lets attendees walk away with hard copies of everything discussed.

• **Scheduling products** — such as Network Scheduler II from Powercore and Action Plus from Action Plus Software — make it easier to arrange meetings or coordinate conferences among a group of people.

• **Networked office automation software suites** such as WordPerfect Office from WordPerfect Corp. and NewWave Office from Hewlett-Packard Co. let individuals perform a variety of applications in sync with one another.

• **E-mail packages** with layers of extra functionality, project management and task management features built-in — such as Higgins from Enable Software, Inc. — are also categorized as groupware.

For this reason, many organizations experimenting with electronic meetings are finding that supplementary means of interaction are important.

For example, if an electronic meeting is going on in one room, participants can interject verbal comments simply by calling them out. At Dow, electronic conferees in different locations will often also use a conference call.

(On the bright side, some conflicts that would arise in face-to-face meetings can disappear in electronic forums.)

• MYTH: More group participation automatically improves quality and productivity.

In fact, experts warn that groupware can actually *harm* productivity. Sanders points to several classic research studies of group efforts that identified a phenomenon called "social loafing."

In one study, for example, individuals playing a game of tug-of-war tended to pull less forcefully as teammates were added. "Part of that can be attributed to the difficulty of coordinating your efforts with others," Sanders says. "But another part clearly comes from individual people feeling that their efforts will not be fully recognized."

To avoid this, Sanders advises designing systems in which everyone's responsibility is clear. "Even in the most democratic workgroup, there has to be clear accountability, responsibility and authority," he says.

On a larger scale, Sanders says he fears that companies with severe communication or management problems will see workgroup computing as a way to solve problems that in reality go much deeper than a software package.

"Groupware is not a panacea for solving organizational problems such as poor communication or information overload," he warns.

• MYTH. People are eager to give and receive new information.

Remember that kid at school who wouldn't share his crayons? Well now he's working next to you, and he hasn't changed. Experts warn that "information misers" — individuals who won't share information even when it would benefit the organization — can be a big fly in the groupware ointment.

A sales representative, for instance, might hesitate to share leads in a common database for fear of losing a personal advantage. The problem is especially bad in corporations that encourage competitiveness among colleagues.

"There's always the issue of deciding what information people want to share and what information they want to keep private," Mandelbaum says.

Chase tries to promote good information citizenship, he says. The bank's international project finance department shares data between the U.S. and the UK about possible client contracts — a virtual impossiblity in the past.

"Two groups in different geographic and time zones now have full access to everything that is going on in either site," Mandelbaum says.

Even where the corporate climate is favorable, he says, local problems can doom groupware projects. Mandelbaum says Notes projects have failed at Chase because of interpersonal or cultural roadblocks. "We've hit places where we've got a good idea and a good project, but the culture just isn't right for it yet."

• MYTH: Installing groupware technology is a snap.

Even though "soft" issues are the biggest groupware concerns, that doesn't mean technical concerns do not exist.

For starters, few organizations have all the necessary network infrastructure in place to make workgroups work.

Functional workgroups can spread beyond the confines of a particular department or geographic site, so companies must first install enough local- and wide-area networks to handle each member.

And because most groupware packages are based on some form of messaging system, installing them on top of the existing enterprisewide E-mail system and other communications packages can make life hellish for both IS and end users.

That was the case at Boston-based Liberty Mutual Insurance Co., project manager Scott Joy says. "One guy in our department needs to check Microsoft Mail, VAX Notes, CompuServe, MCI Mail," Joy says. "The list goes on and on."

Although gateways exist, the simple act of coordinating directories and user identifications is a huge chore. "People are getting bombarded with E-mail boxes," he says.

• MYTH: IS can lead the charge alone.

Consultants worry that eager technology professionals are racing untrained into tricky areas that have vexed senior business consultants, behavioral psychologists and organizational change experts for years.

Met Life's Daniels is concerned that IS professionals lack the needed skills to be on front lines of company change.

"There's the old saying that people went into computers in order to get away from people," Daniels jokes. "Now they are finding themselves at the very center of enabling technologies in the corporate culture. It's ironic."

It's no surprise that smarter companies are increasingly turning end users loose on groupware.

Unlike many other pioneers, Maynard says, Young & Rubicam invited business units to create applications. Today, advertising teams in New York and San Francisco devise prototype Notes applications for client accounting, personnel and more. The applications are then taken to IS to develop for worldwide use.

"The potential impact to our company is enormous," Maynard says. "Too enormous to be solely an IS responsibility." •

***▶The Groupware '92 Conference & Exhibition** runs Aug. 2-5 at the San Jose, Calif., Convention Center. Co-sponsored by SRI International and Lotus, the event features tracks on management, products, technology and user experiences plus a day of technical tutorials.*

Industry notables such as Jim Manzi, Esther Dyson, Ray Noreda, Thomas Malone and Philippe Kahn will host sessions. Exhibitors include several dozen groupware products vendors. For more information, call (800) 925-4906.

ADVICE

Here's a little help to make your group click

Experts and early workgroup computing implementors offer tips on what makes workgroup computing successful:

• Define a specific business objective. Reject vague desires such as "enhanced communication" or "more team participation" in favor of concrete goals. Examples: higher sales among cross-functional product lines, reduced costs and turnaround time for creating customer presentations or more closings on client deals, says George Goldsmith, president of The Human Interface Group, Inc.

• Select the workgroup carefully. Too often, workgroups are created because they already exist (an accounting department, for example), along with a technical infrastructure. Be open-minded enough to create workgroups that transcend existing boundaries or notions, experts advise.

"Groups can be permanent or temporary," says Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "It's a much more fluid concept than a lot of people realise."

• Appoint workgroup "editors." To help prevent its 1,500-user groupware from getting bogged down in too much data, Chase Manhattan Bank NA appointed special editors to pare down extraneous or incorrect entries. "We found that having a Notes administrator was critical," says Michael Mandelbaum, vice president of systems development.

• Examine existing group processes. Experts say the biggest gains in workgroup computing generally come from improved, re-engineered business functions — not from speeding up existing methods. To this end, it's critical to involve end users, information systems professionals, organizational change experts and business managers at this stage.

It's also wise to look for possible trouble. "By spotting problems in current systems, you can anticipate the ones you'll encounter with workgroup computing," says Bruce D. Sanders, an executive consultant at Workgroup Associates.

• Don't forget training. Companies also need to design and deliver a carefully thought-out program that focuses on much more than mere eye/hand coordination and which key to press. Of special importance is educating users on "electronic etiquette," such as typing (grin) before a lighthearted remark.

• Make groupware an orientation tool. Some corporations, such as Dow Chemical Co. and Trellis Network Services in Princeton, N.J., use workgroup packages to quickly orient new hires. "We've built a historical database of department activities over the last five years," explains Neil Drake, a process specialist at Dow. New employees can access a database to read productivity reports, job status entries and programs. Supporters say the tactic helps bring new workers up to speed quickly without diverting other employees from their jobs.

• Know when to go off-line. Wally Baker, assistant vice president of corporate planning at Metropolitan Life Insurance Co., says it's important to know when to switch from electronic discussion to in-person talks. "If you're not careful, you can bite off more than you can chew," he says. "We've learned how much time to devote to input and how much time to devote to discussing the output."

• Establish success measures — and check often. Quantitative benchmarks for measuring workgroup success are key. This means establishing a baseline standard and having a clear "before" snapshot prior to workgroup formation. During the project, measure often. Ask users and others involved to submit qualitative evaluations of the application's success.

ALICE LAPLANTE

Bob Sacha

Select workgroup *'editors' to keep information voids manageable, Chase Manhattan's Mandelbaum advises*

Two views: Groupware in the firm and marketplace

FIRST PERSON

An IS missionary discovers that potential users need show AND tell

BY DAVID PAYNE

Though I'd read about Lotus' Notes over the past couple of years, I didn't fully understand what it was or the significance of groupware until I saw a demonstration at Comdex/Fall '91.

Soon after, we made plans to explore the product. In December 1991, we did our initial installation, which consisted of one Notes server, an IBM Personal System/2 Model 95 and three end users on our team.

My group, part of the information resources department, has built the corporate LAN environment at The Provident Life & Accident Insurance Co. in Chattanooga, Tenn. I joined in January 1989.

From the beginning, our focus has been on the workgroup. We've sought to push beyond "personal productivity tools" and the use of LANs for simple file and printer sharing that characterized the 1980s. To that end, we handle cabling, hardware and software requirements and LAN administration issues to support workgroups. The environment includes everything from a word-processing cluster for a department, an actuarial or underwriting unit, the entire department or a team of managers from different departments.

We have numerous departmental LANs attached to a Token Ring backbone, with more than 800 OS/2-based IBM PS/2 workstations — and the number is still growing.

So with all this preparation, why did installing groupware come as such a surprise? And how did I end up with so much work ahead of me?

Simple idea, tough sell

Right away, we knew that Notes was very different from any personal computer program we had ever seen. "This is the product that will take us that next step — nay, leap — forward toward workgroup productivity," we said. "Let's start telling everyone the good news."

Easier said than done.

When we asked, "Have you heard of Lotus' Notes?" people in our own department unanimously replied, "Yes, I've read about it. It's an E-mail package, right?"

This broad misconception became our first challenge: How do you best convey the concept and uses of Notes (or groupware in general) as a new genre?

At first, we used a typical introductory chart presentation. But we soon discovered that this took too long to get to the point.

Then a realization hit us: Showing any one of many examples of Notes' numerous applications would be more effective. So we began making presentations to individuals or small groups with a demonstration on a laptop loaded with Notes.

Once people understood the basic concept behind groupware, it was time to continue training.

Our first Notes-specific education was to sponsor an in-house introductory application development course taught by Lotus. Prior to this, the participants' only exposure to Notes (if any) had been a 15-min. overview and demonstration. Even so, each one quickly grasped the concepts and the development process.

After the class ended, however, enthusiasm waned. We had expected a clamor for immediate installation and access to this wonderful new tool, but there was none. What happened?

> "THIS IS THE product that will take us that next step — nay, leap — forward toward workgroup productivity," we said. "Let's start telling everyone the good news."

Simply put, our Notes production environment wasn't ready. The reason was that much of what is typically thought of as the LAN environment is hidden from the groupware user.

For example, Notes has no disk drive letters to worry about, no cryptic file names to interpret. For system administrators, it's easy to get caught up in its simplicity.

Nonetheless, the same business-critical LAN management issues are behind what the user sees, including user and group ID administration, system availability, data backup and data security.

And the applications still require some development. While Notes is easy to install on the server, we must still address maintenance issues.

Above all, end users and application developers still need training. Though Notes makes it easy to "load and go," successful implementation for us means a production-level environment that can be used as a base for any application.

Where to go from here?

It's difficult to maintain continued interest in a system that's "just there" — especially without available educational resources. So we remain a small installation (40 or so users) as we build our production system and add applications.

We're currently working with an in-house team on setting up more education. Training is one of the more difficult pieces to coordinate because people are so busy.

We are still excited about groupware tools that will produce productive change to our work flow. With its application development environment, E-mail and expansion options such as the fax gateway and connectivity to other E-mail systems, Notes is a natural fit.

Because of this wonderful new tool, my work has increased enormously. The tremendous payback, however, is worth it. Besides, I can use this tool myself. It's the first product since Lotus 1-2-3 that's really made that big jump for me.

Payne is a systems analyst at The Provident Life & Accident Insurance Co.

INSIDE EDGE

Industry watcher says he expects bigvendors to dominate the scene

BY DAVID S. MARSHAK

Software vendors of every shape and size are seizing groupware as a new way to hook users. Yet successful groupware applications of the '90s will not come out of someone's garage.

High development and delivery costs mean that only major groupware players such as Lotus Development Corp., Microsoft Corp. and Borland International, Inc. are likely to dominate for the foreseeable future.

The following is a fast rundown on the strategies and directions of the major vendors:

LOTUS

Lotus has taken a huge lead in market share and mind share. In fact, Lotus Notes has become almost synonymous with "groupware."

Announced in December 1989, Notes boasts an estimated 400,000 users. Another 2 million Lotus CC:Mail users represent a ready market.

Lotus intends to use Notes to anchor a whole new set of workgroup offerings known as "Noteware." These will include work flow, imaging and document management as well as information and software distribution applications.

Hundreds of other companies are also reselling Notes or adding value to Notes applications, including Sandpoint Corp. in Cambridge, Mass., and Quality Decision Management, Inc. in North Andover, Mass.

MICROSOFT

Microsoft is building a framework for workgroup applications. Windows Open Services Architecture will give any Windows application access to services such as electronic mail and directories.

A Messaging Application Programming Interface (MAPI) will also be offered for the Macintosh, DOS and OS/2. MAPI is being pitched as a cross-platform interface to messaging services.

Microsoft will build its own workgroup applications on MAPI and is encouraging other developers to follow suit.

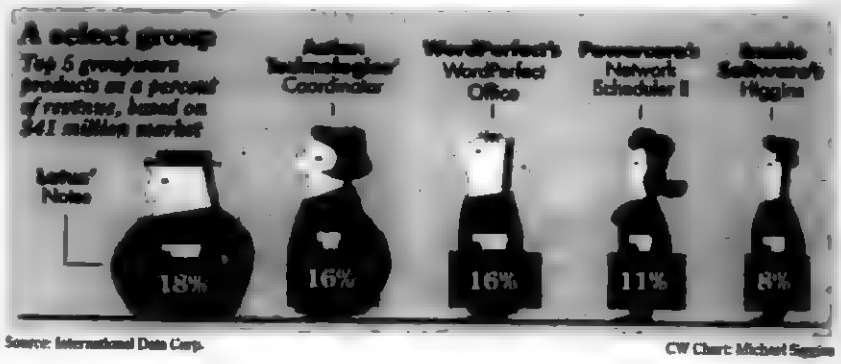
BORLAND

Borland has been coy about its groupware intentions. Despite a February announcement of directions, its plans remain a vague, moving target.

In contrast to Lotus' Notes, Borland is taking a "clientcentric" approach. The plan is to provide communications and workgroup support as an extension to current desktop personal productivity tools.

Borland is well-positioned to use its database technology, particularly InterBase, to build a transaction-based groupware environment. The Borland Object Component Architecture, if successful, should enable existing applications from any vendor to work with this environment.

The suspense may soon be over, however. Next week, Borland is expected to announce new products at the Groupware '92 show. Shipments might not begin until next year, though.



Source: International Data Corp. CW Chart: Michael Siggins

Other big guns

Digital Equipment Corp. and Hewlett-Packard Co. will focus on work flow, while FileNet Corp. in Costa Mesa, Calif., and Plexus Software, Inc. in Sunnyvale, Calif., will concentrate on imaging. Small companies to keep an eye on include Keyfile Corp. in Nashua, N.H., and Reach Software Corp. in Sunnyvale.

IBM's strategy is less clear. It is supporting Lotus' Notes and has an agreement with Action Technologies, Inc. in Alameda, Calif. Still unclear is whether IBM will support Lotus' implementation of Action's product or offer its own work-flow product.

The other area to watch is the E-mail application programming interface (API) wars. Microsoft, Lotus, Apple and others are vying to create the accepted platform for building workgroup applications.

Until a single mail-enabling API is available, developers will be forced to choose camps. The outcome of these battles will go a long way in determining the future of the groupware landscape.

Marshak is a vice president and senior consultant at Patricia Seybold Group in Boston.

Put to the test

Usability labs can help you see if an application is going to fly with users or if you've created a dud — before you sink wads of money into development

BY ALICE LAPLANTE

In the early 1980s, IDS Financial Services, Inc. rolled out a new mainframe-based CICS application it had developed in-house. The program was designed to help the company's customer service representatives more efficiently serve clients who called to update their files or request portfolio information.

The problem was, the application stunk.

Oh, the code *worked*. All its bugs and glitches had been ironed out through standard procedures, and there were no system crashes or significant performance problems. But the system — developed at a cost of tens of millions of dollars, according to Alan Bignall, vice president of financial planning — was virtually unusable. For instance, users who merely wanted to change or verify a customer address, which was a common phone request from IDS customers, were required, among other things, to go through a convoluted series of steps. These steps took users an average of 10 minutes — and sometimes as long as 45 minutes — to complete.

"This was a major engineering project for IS, and it affected hundreds, if not a thousand or more, employees every day," Bignall says.

The reason the system failed miserably was plain: Absolutely no attempt was made to discover whether the software worked the way IDS employees did.

Unfortunately, this is not an atypical scenario for most corporate information systems departments. But some leading-edge IS shops are railing against unusable software and are setting up, funding and managing what are known as usability laboratories. These labs can not only help user productivity but also save money by ensuring that software comes out right the first time and by minimizing the use of support resources.

The idea for usability labs made its way into Fortune-class IS groups from the personal computer software vendor community, which uses these facilities to ensure that commercial products are easy to set up, learn and use. In a nutshell, such a lab conducts usability tests in which typical users are observed performing typical tasks using a given hardware or software product. Any difficulties the users have learning or using the product are measured, noted and sent back to developers for correction.

Usability testing is a separate process from merely testing for bugs; test subjects aren't trying to crash the system. In fact, the assumption is that the application works from a technical point of view. Rather, usability tests are conducted to see whether the system makes sense from the user's perspective.

Tim Lee

That perspective has been brought in at IDS, where a $130,000 usability lab put in place in 1989 is ensuring that the company will never again repeat its "nightmare system" fiasco, says Kay Chalupnik, manager of the usability lab at IDS, a Minneapolis-based subsidiary of American Express Co.

Spend 'n' save

Despite the expenses involved in building such facilities — costs can range from $60,000 to $200,000 for the more sophisticated labs — the savings resulting from usability testing can be substantial. Studies have indicated that each dollar spent early in usability design can save $100 later, says James M. Evans, an IS analyst at Prudential Services Co. who just completed building a usability lab for Prudential Insurance Co. in Roseland, N.J.

Savings on the development side include those stemming from "doing something right the first time," says Jeff Schueler, president of Usability Sciences Corp., an Irving, Texas-based consulting firm. Schueler says an average usability test run in his firm's lab will result in 70 to 100 recommendations of how the software can be improved from a usability standpoint. His firm tests software usability in six areas: installation, training, documentation, on-line Help, interface design and error recovery.

The payback for catching errors can be significant, Schueler says. For companies that don't do usability testing, "there are the additional training and support costs that a poorly designed system will incur: Users will take longer to learn the software and make more phone calls to the help desk after training is complete," he says. Furthermore, there is the lost productivity when users spend valuable time struggling to use the system to perform their day-to-day tasks.

Then there is the ultimate system nightmare: having to go back to the drawing board because an application has been completely rejected as unusable.

Studies are currently under way to quantify the savings involved in usability testing. American Airlines, which opened its 3,000-sq-ft usability lab in 1989, has found that catching a usability problem early in the design process can reduce the cost of fixing it by 60% to 90%, according to

Continued on page 76

Laplante is a free-lance writer based in Palo Alto, Calif.

F.Y.I.

American Airlines' Janice James says that Bob Crandall, CEO of the airline, came to visit the company's usability lab and was so impressed, he suggested that James start a user group. She founded the Usability Lab User Group in 1991. Today it has 250 members.

Here are the pertinent facts:

- First official conference in August at WordPerfect Corp. in Provo, Utah.
- Quarterly newsletter.
- Directory that permits members to contact one another directly.
- For more information, contact James at (817) 963-2785.

Continued from page 75

Janice James, manager of American Airlines' usability lab in Dallas.

The most basic usability lab setup involves two rooms connected by a one-way mirror. The testing room contains the computer equipment on which the target applications will run, a video camera that will capture the subject's reactions to the system and some sort of two-way audio system so that lab staffers in the observation room can communicate with subjects in the test room. Observers may include lab directors with human factor or psychology backgrounds working with cross-functional teams including developers, programmer/analysts, users, support personnel and business managers.

Most labs have two or even three video cameras so that a user can be videotaped from a number of different angles. Summary videotapes can be created using video-editing facilities to combine highlights of various tests.

Logging software that records keystrokes and measures lulls in keyboard activity is helpful although not absolutely necessary. American Airlines opened its lab using just a notepad and a stopwatch.

The kinds of problems usability testing uncovers can include cumbersome or counterintuitive ways to perform basic functions, such as the lengthy series of screens and menus IDS' software had for users to change a customer's address.

Another common problem is obscure and jargony words or phrases used to describe a menu selection. Documentation can be unintelligible or poorly indexed, and keystrokes for basic functions can be inconsistent from one part of the application to another. For example, pressing F1 might bring up on-line Help in one module of an application but close a session in another — a usability no-no. On a more superficial level, the colors on the screen could be distasteful or jarring.

"Several years ago, people were overjoyed simply if a system worked," says Jackie Schrier, a senior research scientist at the Bedford, Mass.-based American Institutes for Research, which performs usability consulting. "Now, IS departments are working at a higher level and want to ensure they are maximizing user effectiveness."

Test early and often

While usability labs minimize the chances of unfriendly software, experts caution against the notion that a usability lab is where finished software is sent just prior to release. They also warn against equating a high-tech facility with results.

"The lab is just a tool; what's more important is the process through which the tool is used," says Dave Rinehart, a partner at consulting firm Usability Systems, Inc. in Atlanta. "People think that building a sophisticated room that contains the appropriate video and sound equipment means they have a usability lab. But if they don't have a sound methodology, it won't do any good."

For example, improperly designed tests could mean that an IS organization is simply validating what it already believes about user interfaces instead of investigating what is really happening in the user community, Rinehart says.

"Usability testing should begin as early as possible in the development process," American Airlines' James says. That way, developers can fix problems as they happen rather than having to redesign the entire application.

Tom D'Onofrio, a senior staff programming analyst at IDS, first used the company's laboratory while designing a new set of integrated, PC-based financial planning tools. Although some preliminary prototypes of the system had been built by the programming team, the usability tests took place fairly early in the design process, he says.

"As a result of what we learned, we went back and did a series of restructuring designs to the system, says D'Onofrio, who feels that "balanced" use of the lab — falling somewhere between a free-for-all brainstorming session and simply asking users for feedback on specific screens — is the most helpful approach.

James says she tries to bring new software products into her American Airlines lab at least four times during a development cycle:

- In the design phase, after a user's needs analysis has been done but before coding has commenced.
- After the application has been prototyped.
- During alpha testing.
- When it's time for a beta release.

"Early design walk-throughs allow users to look at screen designs in order to check the work-flow logic and make sure that menu terminology makes sense," James says. "You can get quite a bit of valuable feedback before any actual coding has begun."

Prudential Services' Evans agrees. "Bringing an application into the lab at the end of the development cycle is usually too late," he says. He adds that although testing at the end of the cycle is better than not testing at all, usability experts should be involved from the moment a new application idea is conceived.

According to Evans, a great deal of up-front work must be done before an application is brought into the lab. Even before programmers get involved, analysts should sit down with end users and break down the things users do (e.g., filing an insurance claim) into a series of tasks.

They should then design successive screens that take into account issues such as the order of the tasks, color combinations and the objects or choices that will be displayed to the user at any given time.

"Once you have a fairly robust prototype that shows how screens will appear and in what sequence, you are ready to bring users into the lab for the first time," Evans says. At this point, actual coding of behind-the-scenes processing or functionality hasn't yet begun; analysts are still determining key work-flow issues. Only after those issues are determined does programming of application functionality begin.

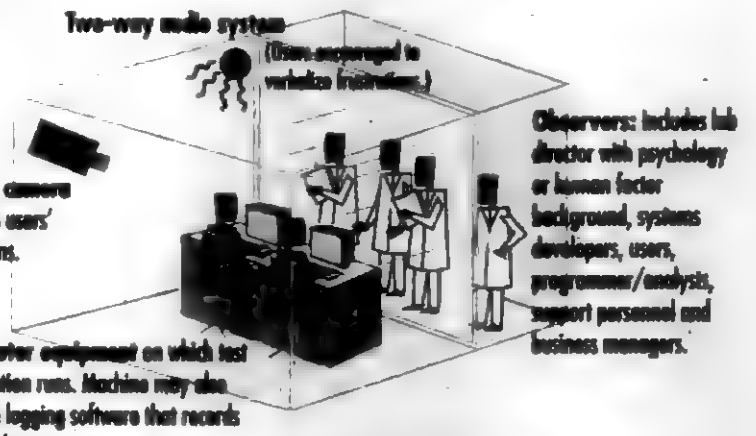
Simulating the real world

Usability experts say the tests run in a lab should mirror the real working world. For example, if a new insurance claims processing system is being tested, users

Continued on page 80

Dissecting the lab

Usability labs can cost from $60,000 to $200,000. Here's what a basic one contains:



Every move you make, they'll be watching you

What do usability experts watch for when conducting a test? Everything.

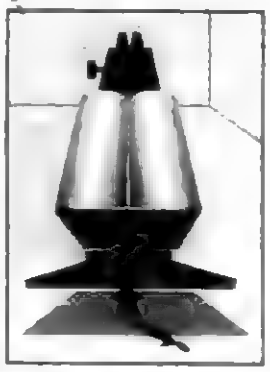
They note all the following evidence during the two to three hours users spend in the lab: verbal comments, facial expressions, the time it takes to complete a specific task, the errors made and the number of times the user has to refer to documentation.

Don Ballman, manager of the usability lab at Mead Data Central, looks for the number and frequency of errors and for excessive "dwell time" — when users are uncertain how to proceed. But a certain number of errors and a certain amount of hesitation is normal, experts say.

"It's important to look for changes to errors made over time," explains Ballman, who says you have to assume users will make some mistakes on an unfamiliar system. "But if they keep making mistakes . . . you've got a problem."

Verbalization is instructive, as is after-the-fact analysis. Ballman will often divide a test into two parts: The user will spend the first hour at the keyboard going through the tests; during the second hour, the subject will review the videotape of his progress.

"Things might click in retrospect, or a subject will understand why he or she didn't get something the first time around," Ballman says. These after-the-fact qualitative comments are extremely valuable, not only for figuring out what is wrong with the system but also for realizing what is right and getting ideas for fixing the problems.



"We look for things such as the number of times a particular error occurred and how many users had that problem," American Airlines' James says. A telephone hookup to a simulated "help desk," actually someone in the observation room who understands the product being tested, can also be useful. This support interaction can give an indication of how often the person will be forced to ask for help when using the system and can point out trouble areas.

Usability Systems' Rinehart says it can also be instructive to take away documentation and let users struggle through a piece of software on their own. "By letting users struggle and seeing if they can figure it out on their own, we can sometimes decide whether we need an additional prompt or a special section in the documentation," Rinehart says.

Choosing Joe Typical User

Experts caution that selecting *whom* to bring into the lab to perform the tests is an important consideration.

"The common way in the past was to say, 'Let's have Joe use the system — he's been working on it for five years and knows it inside and out,' " Prudential Services' Evans says. "But that inside knowledge is precisely why Joe shouldn't be a test subject: He isn't the average user."

It is critical to figure out who the typical user will be and to get an adequate sampling, Evans says. For example, the actual user population might be a combination of computer novices and experienced users.

Evans recommends a bare minimum of four test cases; the best results come from having 8 to 10 users. "After 10 people, you tend to get diminishing returns," he says. "You'll still catch problems, but 95% of your usability issues will have been flagged already."

Ballman says there are two important considerations to take into account before bringing a user into the lab: the user's existing business knowledge and computer skills and the environment in which the software will be used.

This second point is key because while difficult to do in a lab, simulating the workplace is essential, Ballman says.

"The phone goes off, the secretary comes in, a meeting is called, and work gets interrupted all the time in the real world," Ballman says. "A significant part of usability is how well a piece of software can be used in this type of environment. For example, if you've been interrupted, how easy is it to figure out where you were and what you were doing?"

Evans says it's important to put participants at ease before testing begins. "You need to emphasize that you are testing the software, not them," he says. "They need to know you are consulting with them because they are the experts and you value their opinion."

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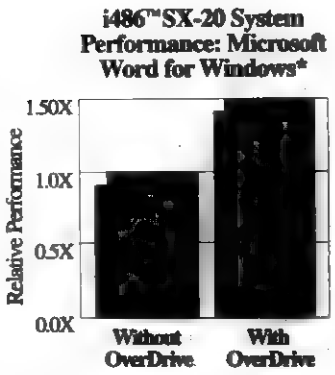

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intel.

Continued from page 76

should attempt to go through every stage of filing a claim, just as they would if they were sitting at their desks. In certain cases, they are asked to bring along actual claims paperwork from their desks.

Often, usability staff members will be aware in advance that certain aspects of the application are questionable; they will then design tests specifically to confirm or deny their suspicions.

"For example, in one application, we suspected that the phrasing used in the menus was too jargony," James says.

The phrase "Flight Monitor" was the title assigned to one pull-down menu that allowed users to check whether a given flight was on schedule. "When our users stumbled over that particular phrase, we knew our suspicions were correct," she says. The phrase was subsequently changed to "Arrival and Departure Times."

At Mead Data Central, the maker of Nexis and Lexis on-line database products, setting quantifiable usability goals is just as important as making sure the simulation is based on the way users really work. For each product tested, developers, users, support personnel and anyone else involved in a particular project are asked to contribute to a "usability certification," such as reducing training time by 50% or reducing help desk calls by 30%, says Don Ballman, manager of the usability lab at Mead Data.

"This way, we have specific objectives in mind throughout the development process," Ballman says.

Mead Data's lab has been in operation since 1989 and tests all internally developed software.

Ballman says more organizations are including usability experts in the development process because they finally perceive that understanding what the user wants is more essential than bolting on additional bells and whistles at the end of the cycle. James estimates that there are currently about 300 labs in operation.

"People are realizing that usability is much more than just a pretty face," Ballman says. "In the past, it was assumed that because people can learn, it's easier for them to adapt to a system than for the system to adapt to them. At the usability lab, we have the opposite premise." ●

Developer angst

One of the most critical aspects to the success of a usability lab is that IS developers "buy into" the process. After all, it doesn't do any good to discover problems in a piece of software if the programmers refuse to acknowledge the validity of the findings.

"There is a natural resistance to someone not familiar with the process," says American Airlines' James, who adds that most developers are usually under a tight deadline and can resent any interference with getting a product out the door. Once they are brought into the lab and can observe users struggling, she says, that resistance usually melts.

"As a generative device for getting ideas from users, it works well," IDS analyst Tom D'Onofrio says.

The IDS usability lab recently ran a series of usability tests on prototype pen-based systems, which are expected to enhance the productivity of IDS representatives, who are often at customer offices, homes or even outdoors when they take down critical data.

IDS brought in IBM — its chosen pen-based vendor — and internal developers to see how users reacted to screen color, readability and other issues involved in pen input.

"Once vendors and developers see actual users struggling, they become true believers," IDS' Chalupnik says.

"We encourage the developers to come in and observe the tests as much as possible," says Prudential Services' Evans, who notes that the Prudential lab was soundproofed for this very reason. "Developers are possessive of their efforts and tend to get a little verbal if they see someone having a problem."

D'Onofrio agrees. "You really want to jump in and explain," he says.

But because the success of a usability lab depends on its providing developers with an objective and balanced "reality check," independence is critical.

If the lab is too closely aligned with IS, there can be subtle but disastrous biases built into the testing process, especially when the systems staff is under pressure to deliver projects on time and on budget.

Having a lab that strikes a balance between the user community and IS is therefore essential, Chalupnik says, adding that she must constantly remind developers reviewing the results of a particular usability test where their responsibilities lie.

"My job, in effect, is to keep asking, 'Well, what did your user say?' when a developer balks at a conclusion," Chalupnik says. "If necessary, I'll replay the videotape until they get the point."

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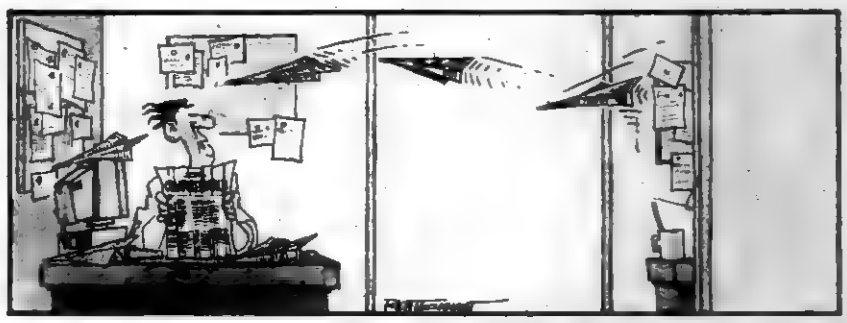

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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MANAGER'S JOURNAL

IN BRIEF

Having it both ways

■ It's a data center. It's a trading floor. It's a data center *and* a trading floor — and the first of its kind, according to executives at the **Boston Stock Exchange.** The planned autumn move of the exchange's downtown Boston data and communications center to a new suburban facility is aimed at garnering greater space at a lesser cost, one executive said — and more: The 10,000 sq-ft space is being designed to serve as an emergency backup trading floor.

■ **Ernest Waller** was recently ensconced at **Florida Bank** as the Jacksonville, Fla.-based federal savings bank's assistant vice president and manager of information systems. Before taking this position, Waller served as assistant vice president of telecommunications at Florida National Bank, also based in Jacksonville.

■ This Thursday is the scheduled opening day for **Metropolitan Life Insurance Co.**'s new computer center in Rensselaer, N.Y. The 212,000 sq-ft facility, which takes over from the company's current New York-based data center and will house systems and software development laboratories as well, will start out with 100 to 125 employees and staff up to some 225 over the next year. It also brings two particular strengths to Met Life's IS: dedicated disaster recovery capability to support the firm's three other data centers in Pennsylvania, Kansas and South Carolina, and proximity to a wealth of colleges and universities apt to provide a broad pool of technical talent.

■ **The Federal National Mortgage Association,** better known as **Fannie Mae,** elected **Barbara B. Lang** to the post of vice president of its corporate IS division. Lang, a 27-year IBM veteran, will manage the day-to-day administrative and control functions of the 600-person department and create systems aimed at placing the latest technologies at Fannie Mae's service.

Treasury Department's wild ride

IS personnel wrestle with massive 10-year, $850 million network procurement plan

BY GARY H. ANTHES
CW STAFF

The U.S. Department of the Treasury is facing a management challenge about as daunting as one could imagine: a 10-year, $850 million project to recast its communications systems, committing to a vendor partnership that will endure long after the technology originally chosen has become obsolete.

And, just to make the exercise a little more interesting, those managing the huge deal have 42 different constituencies to satisfy: executive management, systems management and users at each of 14 Treasury bureaus, including the Internal Revenue Service (IRS), the U.S. Customs Service, the U.S. Mint and the Secret Service.

"I worry about it a lot," says Steven W. Broadbent, the Treasury Department's deputy assistant secretary for information systems. "I worry about the complexity of Treasury and the missions we're responsible for. We have everything from law enforcement to financing the public debt and a heck of a lot in between, and we're trying to meet those mission needs with a single network program."

Nevertheless, outside observers say the agency has taken extraordinary pains to minimize the project's inherent risks and has put together a procurement plan that could become a model for other large systems projects in the government.

The Treasury Department, which will spend $2.2 billion on IS this year, is now soliciting bids for the design, implementation and operation of a departmentwide communications system, which will act as a utility to provide voice and data services to the bureaus.

The system will be augmented by the agency's existing Federal Telecommunications System 2000 (FTS-2000) arrangement with Sprint Corp. (see story page 82).

Steven Tuck

Called the Treasury Communications System (TCS), it will succeed the Consolidated Data Network now managed by Computer Sciences Corp.

"They are one of the few — maybe 10 — government agencies or commercial enterprises to have taken a step back and looked at all the elements of technology — networking, applications, databases and so forth — and set up a strategic plan for all of them," says Francis Dramis, chairman and chief executive officer of Fairfax, Va.-based Network Management, Inc.

The TCS procurement moves away from the practice of issuing hundreds of pages of detailed hardware and software specifications, many of which are obsolete by the time the vendor delivers the goods.

Instead, the TCS request for proposals (RFP) lays out functional requirements and asks vendors to come up with solutions.

"It's an extremely open-ended, flexible structure," says Warren H. Suss, president of Warren H. Suss Associates, a federal market consultancy that is based in Jenkintown, Pa. "This is where the government has been trying to get to in its acquisition process. This is in some ways a model procurement."

While that approach has much merit, it also puts a significant burden on the procuring agency, says Larry Seidel, vice president and head of civilian government programs at American Management Systems, Inc. in Arlington, Va.

Evaluating a range of alternatives and gauging their price/quality tradeoffs, Seidel said, is "much more difficult than just going down a checklist and saying, 'Does it meet the spec?' "

Continued on page 82

WANTED: Systems provider

The Treasury Department's briefcase-busting RFP — the table of contents alone runs 28 pages — contains provisions likely to make bidders on the $850 million information systems overhaul sit up and take notice.

And Treasury hopes those terms will keep the winner — most likely a systems integrator teamed with a telecommunications carrier and a gaggle of subcontractors — on the tip of its technological toes for all 10 years of the resulting contract.

The RFP contains a "technology refreshment" clause, directing the contractor to propose "enhancements" aimed at lowering costs, improving service, adding functionality and boosting reliability of the network. The government reserves the right to demand demonstrations of the enhancements and to reject them for any reason.

In return, the contract for the Treasury Communications System will contain an incentive program that rebates to the contractor fees based on cost savings and other improvements made.

Each year, Treasury will put funds in a kitty expected to be between 1% and 3% of the estimated annual contract price. Payout of the pool depends on contractor performance in three basic areas:

- **Contractor responsiveness:** customer satisfaction, user support, maintenance effectiveness and 13 other subcategories.
- **Network performance:** network delay, availability and mean time to restore.
- **Cost management:** based on an index that compares contractor prices with comparable commercial services.

"In the traditional government contract, the only way the contractor can make money is to sell us something — a new service, a new box," says Steven W. Broadbent, deputy assistant secretary for IS. "Here, if the contractor works smarter, we will give them a bonus on an annual basis."

GARY H. ANTHES

Data centers get the halon out of there

But managers trying to replace the fire retardant are discovering the alternatives aren't so hot

BY GARY H. ANTHES
CW STAFF

Halon's days may be numbered, but users are far from united in their search for a replacement for the computer room fire-fighting chemical.

"Some companies are saying, 'I'll just wait until the manufacturer comes and sells me an alternative,' but that may not happen," said Thomas Cortina, executive director of the Halon Alternatives Research Corp. "None of the candidate agents right now is a definite winner."

Du Pont Co., the largest producer of halon, recently said it will stop production of the controversial gas by the end of 1993 — one year earlier than it had previously promised. The firm simultaneously announced the availability of FE-13, a halon alternative [CW, July 20].

But the new halon-like alternatives are far from perfect. According to fire protection experts, drawbacks include high price, toxicity, poor performance and risk of environmental damage, not to mention unperfected delivery systems.

Stan Slonski, product manager for fire suppression systems at Kidde-Fenwal, Inc. in Ashland, Mass., said halon systems converted to FE-13 use could retain their fire-detection components — typically about half of the system's overall cost.

However, Slonski added, the conversion would require completely new storage tanks and delivery components — parts that cost about three times as much as the halon equivalent.

A halon system with automatic sprinklers for backup will remain in place at the Washington, D.C.-based Smithsonian Institution's main data center, fire protection engineer Robert Wilson said.

Any new systems, Wilson added, will use sprinklers only until a good halon alternative is found.

Two choices

In fact, Cortina said, most users are showing one of two responses to the federal moratorium on the production of halons and chlorofluorocarbons, which deplete the Earth's protective ozone layer: either doing nothing or falling back on tried-and-true means of protection such as automatic sprinklers and carbon-dioxide systems.

According to Paul Harris, sales vice president at Chicago-based Ascoa Fire Systems, companies including The Boeing Co., Ford Motor Co., General Motors Corp. and Chrysler Corp. are actively phasing out their halon systems in favor of water sprinklers and/or carbon dioxide systems.

Harris said the companies are worried about accidental discharges and the possibility that the government could levy a stiff user tax on halon. A current sales tax on halon of 25 cents per pound will jump to $26.50 on Jan. 1, 1994.

ACCORDING TO fire protection experts, drawbacks to halon alternatives include high price, toxicity, poor performance and risk of environmental damage.

Treasury Department's wild procurement ride

CONTINUED FROM PAGE 81

In addition to giving vendors more freedom to craft their own approaches, the RFP makes funds available each year to reward superior vendor performance (see story page 81).

"We'll be constantly challenging the integrator to do business more efficiently and effectively," says James J. Flynik, director of Treasury's Office of Telecommunications Management.

If the vendor "can demonstrate ways to save the government money on a cost-per-packet or cost-per-user or some other basis, we'll return some of those savings," he says.

Not all of the agency's challenges are associated with selection and management of a vendor. Most of Treasury's 163,000 employees are likely to be touched by TCS in some way, and managers and users in the various bureaus have vastly different requirements.

Andrew P. Snow, a vice president at Network Management, which helped Treasury prepare its RFP, says TCS will have to satisfy three groups at each bureau.

"Top executives look for effectiveness in meeting the agency's mission," he notes. "Systems managers look for efficiency. And users are selfish; they just want to get the job done."

Forging a consensus among these three groups is no simple task, Snow says.

"Like all common user networks, it's very important to win the hearts and souls of users. But no one wants to be the sacrificial lamb for the greater good; no one wants to relinquish control," he explains.

Not all aboard

Nevertheless, Snow reports success so far, in part because Treasury management held hundreds of interviews with users and their managers during the three years spent developing the requirements that led to the RFP.

"People are pretty much on board," Broadbent agrees, "but I'll admit we don't have total consensus."

Broadbent says his staff told the bureaus that they could avoid the headaches of managing their own networks by signing on to TCS as a utility.

In addition, Broadbent says he enticed the bureaus — especially the smaller ones — with the promise of better prices and more services than they could effectively buy on their own.

Broadbent *corrals IS for Treasury Department*

Shackled

Despite all the effort that has gone into defining requirements, building a consensus and structuring a deal calculated to lead the vendor down the right path, Broadbent says he still feels handicapped by federal procurement regulations that say bid evaluation criteria must be objective and precise.

"For me, developing relationships is what defines the success of the program, not looking at who brings the best networking architecture to the table, because by the time we get to Year 5, whatever was bid will probably not be in place anymore," Broadbent says. "What I'd do differently if I didn't have all these procurement regulations is put a lot [of emphasis] on how comfortable I feel based on the future relationship."

Broadbent adds, "Are we trying to do too much? I'm convinced we're on the right path, but until we get there, we won't know."

Treasury Communications System (TCS) at a glance

In the next decade, the U.S. Treasury Department plans a massive network overhaul

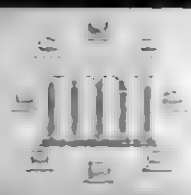
What and when...

Now

- 50,000 users at 3,700 worldwide locations.
- Network traffic 5.7G bytes a day.

By year 2000

- 400,000 users.
- Network traffic 700G bytes a day.



...and how

The Treasury Department environment

- Proliferation of bureau-based LANs.
- Move to client/server computing.
- Huge growth in file transfer applications, driven by new bar systems.
- Explosion in laptop computers to serve 10,000 users who will require dial access to TCS.
- Growth in imaging applications for law enforcement.

The TCS internetwork will consist of three logical pieces:

- A private subnetwork dedicated to the Treasury's use.
- An FTS2000 services subnetwork.
- A commercial services subnetwork offering third-party services.

Source: U.S. Department of the Treasury — CW Chart: Michael Siggins

BOOK REVIEWS

Flexibility: The future of business

The Virtual Corporation
By William Davidow and Michael Malone
HarperCollins Publishers, $23.00

Imagine a huge business enterprise where there are no middle managers; workers' job descriptions are intentionally vague and their daily activities are subject to constant change; and each day's products are individually customized in response to the orders placed the day before.

That is a rough picture of the "virtual corporation" as set forth in this well-written, emphatically argued book. The authors describe virtual products as those produced and customized more-or-less instantaneously in response to specific customer demands. They also describe the radical restructuring necessary for most American businesses to produce virtual products. The authors assert that such change will dictate the success of U.S. firms in the very near future.

Not surprisingly, the enabling force behind all of this change is the dramatic rise of information processing power. *The Virtual Corporation* cites just-in-time inventory control, electronic data interchange and other technologies as contributors to the advent of the new, flexible structure of future businesses.

The book challenges information systems managers to think of their role in business re-engineering as a never-ending process.

Turn Signals are the Facial Expressions of Automobiles
By Donald Norman
Addison-Wesley Publishing Co., $21.95

If you think about information systems all day long, why go home and read a book about IS? Give yourself a break and flip through *Turn Signals*.

The book is a sharp, humorous critique of the follies of design that surround us in everyday life. (Do you accidentally turn on the stereo instead of the VCR or television because you have three remote control units scattered in the living room?) The relevance to IS is this: Applications and systems designers will find that *Turn Signals* challenges their empathy for the needs of end users.

Turn Signals is a loose collection of the author's thoughts on a variety of topics. IS managers who want a useful book without all the network protocol acronyms should take a look.

Reviews by Derek Slater

Attitudes still a barrier for the disabled

Job seekers with disabilities hope legislation will make a difference, but they aren't betting on it

BY ALICE LAPLANTE
SPECIAL TO CW

Blindness did not prevent programmer Dan TeVelde from seeing that he was being discriminated against in his last job search because of his disability. At one place he applied, he heard through the grapevine that he didn't get the position because of his guide dog.

At another corporation, one of two key programming tests TeVelde had to take wasn't available in a Braille format.

TeVelde later found work at McDonald's Corp. in Oak Brook, Ill., as a Cobol and job control language programmer in financial systems development, but it took him many frustrating months. "I should have been more firm, but instead I just went on to the next interview," says TeVelde, who has been employed at McDonald's for more than two years.

Help on the way

At least in theory, a job search shouldn't present that kind of frustration anymore for TeVelde or any other physically challenged individuals thanks to the Americans with Disabilities Act (ADA), which went into effect yesterday for companies with 25 or more employees.

Whether that will be true in practice remains to be seen.

The ADA prohibits employers from discriminating against qualified disabled persons in hiring, and it mandates that they make "reasonable accommodations" that enable such persons to perform essential job functions.

Having a law on the books and actually enforcing it can be two different things, however, and not everyone is sure that you can get rid of job discrimination that easily.

"Don't get me wrong: I think the ADA has helped, but it lacks the teeth it needs to be actively enforced throughout the private sector," says Tom Janus, information systems director at McDonald's, which has been hiring disabled technical workers for the last six years.

Doug Haynes is slightly more hopeful. Haynes, who is visually impaired and works as a help desk operator at Informix Software, Inc. in Menlo Park, Calif., says that although disabled IS workers still need to aggressively seek out employment opportunities, the new law should help.

Haynes knows the value of a legal persuader. It took him 15 months to find an IS position after completing his programming certification at a local technical institute, and even then he probably wouldn't have succeeded if he hadn't steeped himself in state and federal regulations.

"I did extensive research and went to job interviews armed with each and every law regarding the employment of disabled persons," Haynes recalls. Indeed, he credits his being hired at Informix in part to the fact that he pointed out tax laws that give tax credits to organizations that hire disabled persons.

Be prepared

Charlotte Corbett, an adaptive computing technologies specialist at the University of Massachusetts at Boston, recommends that disabled persons seeking IS careers go to interviews armed with precise facts on the enabling technologies they will require.

"Most adaptive measures cost under $100 to implement," Corbett says, but many employers don't realize that and are concerned about the costs of voice synthesizers, screen magnifiers or alternative input devices and other adaptive devices.

"Disabled workers should go into the interview saying, 'Here are my skills, here's the technology I need to do my job, here's the cost, and here's where you can buy it,' " says Carl Brown, director of the High Tech Training Unit of the California Community Colleges, a statewide network of centers where disabled students and staff receive training on adaptive technologies that will aid them in both academic and professional careers.

Haynes found this to be critical in his own job search. "I have $6,000 worth of my own equipment sitting on my desk," Haynes says. A voice synthesizer reads aloud the text that appears on his screen; he also has a special closed-circuit television system that magnifies the display.

Although not expecting overnight change, many are optimistic about the ADA's long-term effects. "Without question, the ADA will open doors," says David Clark, an undergraduate student in cognitive science at the University of California at Berkeley who has cerebral palsy and has worked summer internships as a programmer at Pacific Bell in San Francisco.

"The fact that organizations will be legally mandated to provide assistance to disabled persons will really make a difference," Clark says.

LaPlante is a free-lance writer based in Palo Alto, Calif.

What the law lacks

The ADA does not provide any affirmative action guidelines, nor does it specify any punitive measures against companies that don't comply. Moreover, the law doesn't say how companies are to make — or fund — these accommodations. As such, experts say, the ADA is unlikely to force immediate changes in the hiring of disabled persons in IS shops, for the following reasons:

- Fears about the cost of accommodation technologies and the productivity of disabled workers remain high among many employers.
- Only a minority of IS organizations have actively prepared for accommodating disabled employees. Instead, most say they are taking a wait-and-see attitude.
- The burden of proof will fall on the disabled individual — not the corporate entity — to enforce and test the scope of the new law.

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Honing business skills can't hurt

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Max Messmer, chairman and chief executive officer of Menlo Park, Calif.-based Robert Half International, Inc., which places information systems professionals in the U.S. and abroad.

Q I keep hearing that IS professionals need to develop their business skills to improve their career prospects. Yet as a programmer with more business experience than many of my colleagues, I have never encountered a prospective employer who cared about anything but my technical credentials.

Why is this?

A You may be encountering this reaction because employers typically look for different skills as you move up the career ladder. As a programmer or programmer/analyst, your depth and breadth of technical knowledge are overwhelmingly the determining factors in your marketability.

On the other hand, if you advance to be a systems analyst, project leader or manager, your employer will most likely put a higher value on your overall industry knowledge as well as your specific business management and interpersonal skills.

Q I have three years' experience as a VM/CMS REXX programmer. I have some personal computer experience. In addition, I had Cobol in school and I had a class in C at work, but I haven't had a chance to use it.

Am I pigeonholed in my current position?

A Your knowledge of Cobol and mainframes is important. But the IS world is moving quickly toward newer technologies, such as cooperative processing, open systems, object-oriented coding and graphical user interfaces.

You should continue to learn OS/2 and C at work and concentrate on these newer technologies to stay current with IS trends.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q Can you tell me the best way to go about finding schools that teach fourth-generation language/SQL programming?

I have a bachelor's degree in mathematics and computer science, but it was completed in the early 1970s, and at that time, I did a lot of Fortran programming.

A As part of its computer science curriculum, almost every university offers courses in databases, languages and software construction. These fundamentals are the basis for 4GL/SQL programming.

Your Fortran programming experience is very different from the structured coding, or "English-like," relational nature of 4GL/SQL, but the process of learning a language is similar and you should have very little trouble.

Q As a computer engineering student, I'd like to study Unix. I've tried several companies, but none produces a Unix in a student's price range. With Unix becoming so dominant in this field, I don't want to be left playing with DOS. What can I do?

A There are several ways to access Unix at minimal or no cost. One way is to approach a professor at your school and offer to help on a Unix-based project.

You could also try volunteering at a local nonprofit association that has a Unix system. The group will appreciate your computer experience, and you'll get the chance you need to learn the system.

You can also look into computer clubs, public computer networks or electronic bulletin boards that list ways for an individual to learn new systems at low cost.

We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

What's the best way to make sure you understand user requirements?

➤I go out on the road with users to see how they evaluate psychiatric units in hospitals. We have also started classes twice a month for junior analysts that focus on giving users what they want: being better listeners and communicators.

Deborah Swank, systems analyst
Ohio Department of Mental Health, Columbus, Ohio

➤We have a written request procedure where users write out what they want done. It's the only way we can keep track. These written requests allow for as much detail as the user knows. Then we make sure the user is requesting the right thing and that it's in line with our guidelines.

Joe Woodhouse, systems analyst
John Deere Foundry, Waterloo, Iowa

➤You have to put yourself in the user's place. I go to their location and get them to brief me initially. You need to understand the process from the beginning to the end, so I pretend I'm a new employee and have them walk me through the process.

Ricardo Marrero, systems analyst
Engineering Dept., St. Petersburg, Fla.

➤We have varying levels of user proficiency, so you have to get a feel for what level they're at when you're describing what you plan on using. What's comfortable for one person from an input standpoint may not be comfortable for another.

Mark Vogt, financial systems analyst
National Processing Co., Louisville, Ky.

➤Sometimes I will draw a map for the user that shows the stages of development and how long each stage will take. I think it's very effective. Sometimes they agree, and when they don't, they draw their own diagram.

Henry Grey, systems analyst and technical support
Nynex Information Resources
Systems Technology Department, New York

Compiled by Kathleen A. Gow, a free-lance writer based in Medford, Mass.

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"Every year, Hughes recruits somewhere between 250 and 300 new graduates. The mainstream of our hiring centers around students with engineering backgrounds. Generally about 75% of our student recruits are in the electrical, mechanical, and computer engineering fields. Another 20% or so have scientific backgrounds, primarily in computer science and physics. The balance of our recruiting, then, is for MBA graduates with strong orientation in MIS or CIS. With one advertisement in *Computerworld's Campus Edition*, we get unique reach to all three of our student audiences.

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"In addition to delivering advertising results, the issue's Annual Student Survey serves as an important research tool. Upon receiving data on how students typically view Hughes Aircraft, we felt we needed to strengthen our image in this area. For continued success in recruiting top technical talent, we find feedback like this invaluable.

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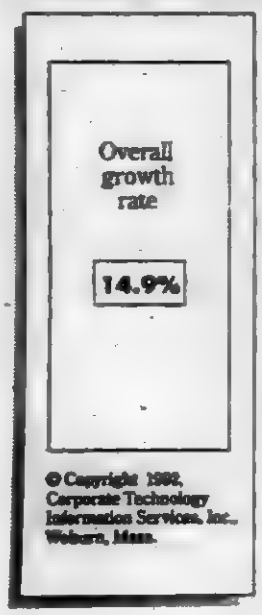

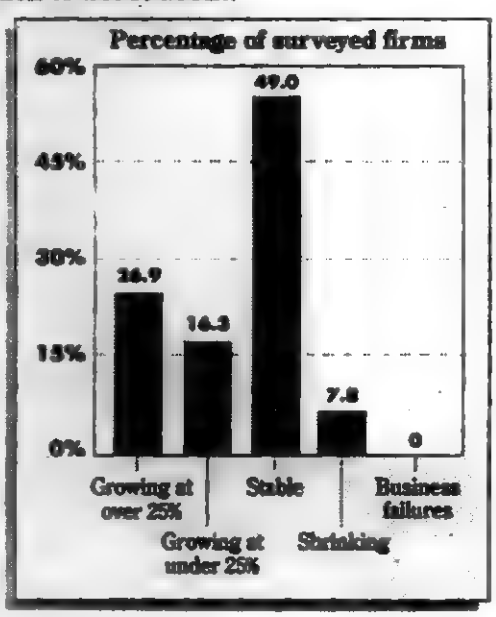

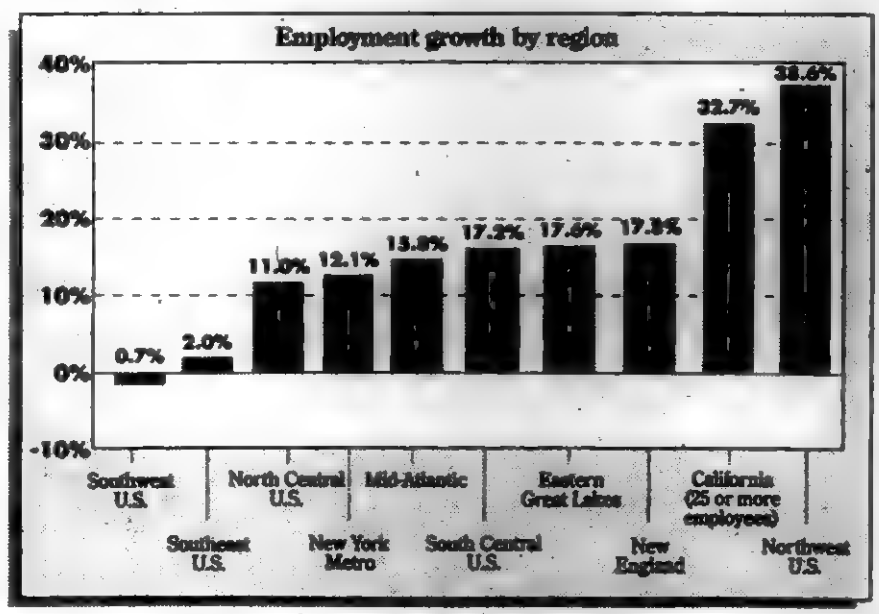

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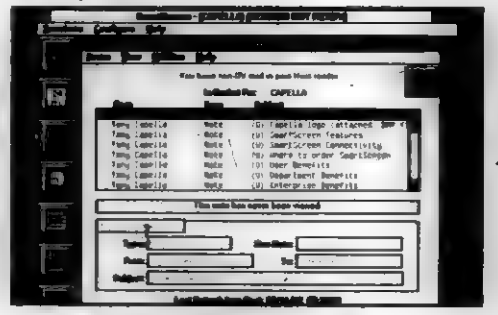

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Haggling for fun and profit

BY DANIEL LYONS
SPECIAL TO CW

Even though he's buying computers with his employer's money, Carl Schwimmer negotiates as if he were paying for the equipment himself. "It's part of my nature to be a haggler," says Schwimmer, director of administrative services at the College of Business Administration at Northern Arizona University in Flagstaff.

"The worst thing a vendor can do is say no. I don't make it embarrassing, but I expect some kind of discount. If they don't come down, I walk away," he says.

Schwimmer is among those who believe it is almost always possible to get a better price on personal computers than what is advertised. Even discount shops will sweeten the deal if they're approached correctly, veteran hagglers say.

Nonbargainers

Oddly enough, most people don't haggle at all, says Ed Samp, purchasing manager at JEM Computers, Inc., a mail-order reseller in Boston. Others agree. Dianne Ford, president of Focal Corp., a value-added reseller in Van Nuys, Calif., notes that 75% of the firm's customers accept the first proposal.

A buyer might not get a deal every time, "but it's a mistake not to ask," Samp says.

The idea is to know what you want, approach the vendor as a potential partner and keep the tone light. But make the seller know you mean business without being arrogant.

"Playing hardball would have the opposite effect; it just turns them off," says Jim Ramsey, information systems manager at ATR Wire & Cable Co. in Danville, Ky.

Ramsey has persuaded mail-order resellers to cut prices on low-end PCs by buying in quantity. "If they're selling PCs at $1,500, we'll offer to buy three for $4,200, and usually they go with it," he says.

Working with the dealer gets much better results, Ford says. "If they say they like my product, my solution, but they've got a budget problem — OK, then I can deal with that," Ford says.

For the truly driven, the price cut can be substantial.

Delmar Epton, executive vice president of the operations group at First Alabama Bancshares in Montgomery, Ala., recently used an updated version of the auction process to realize considerable savings on a used IBM 3090 Model 600J mainframe.

Epton's first plan was to hold an open conference call with all interested vendors. However, resellers didn't want to be on the line together, so they replied by fax.

In less than six hours, Epton reviewed three rounds of bids, each time announcing the lowest price and asking vendors to beat it. "By 2:30 in the afternoon we were done, and we'd saved $300,000 off the first-round best price," Epton says.

Epton advises potential buyers not to allow vendors to dicker with configuration at all. "We told them we did not want them to muddy the water. We issued the specs and told them to bid on that," he says.

More bells and whistles

Hard-core negotiators acknowledge it is not always possible to get a cheaper price, but buyers can often get extra add-ins.

Schwimmer's most recent coup was persuading a Phoenix-based reseller (from which he'd bought 10 PCs) to loan him spare machines in case one of the 10 boxes failed.

"They know that if things work out, in six or seven months I'll buy those two spare PCs," Schwimmer says.

In fact, a vendor will be more likely to offer a deal if it thinks that will bring in more business later, resellers say.

However, no matter how good you are, the type of equipment you need will affect the discount. Savings from a PC deal amount to lunch money compared to costs cut from a mainframe deal.

Mike Baker, computer center manager at Avondale Mills, Inc. in Sylacauga, Ala., recently persuaded IBM to throw in $100,000 worth of free services with his purchase of an $800,000 Enterprise System/9000 mainframe.

"With a company like IBM, they have a set discount rate, and you don't have a lot of leeway," Baker says. "But we got some free contract programming, and they also paid for the wiring of a UPS system."

Once a reseller feels it is dealing with a serious buyer, there are deals to be had, Ford says. But the watchword is flexibility.

For instance, you might want to consider little-known brands over name brands.

"Very often there is a substitute component that works just as well," says Robert Orbach, president of Orbach, Inc., a consulting firm in New York, and former director of business development at 47th Street Computer, a New York-based PC reseller.

Orbach also recommends that buyers forget list price. "The worst thing you can do is negotiate from list. You might get 40% off, but prices are changing so fast it might not mean much," he says. Your best bet is to negotiate from the street price.

One final tip from all those involved is to think of haggling as something enjoyable, not unpleasant.

"It's one of the fun things about my job," Schwimmer says. "And the resellers don't mind it a bit. The ones who deal with me a lot expect it."

Lyons is an Ann Arbor, Mich.-based free-lance writer.

Tips for the true haggler

- Start bargaining from street price, not list price.
- Get prices from a variety of dealers and create competition among them.
- Focus on variables: monitor, keyboard, BIOS type, processor speed and hard disk size.
- Consider little-known brands over top-name brands.
- Make a habit of haggling.

CW Chart: Stephanie Faucher

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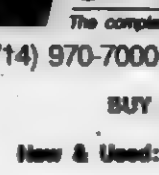

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PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$2,000	$2,500	$1,500
PS/2 Model 80	$1,500	$1,800	$1,100
PS/2 Model 95	$4,400	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$500	$600	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$2,000	$2,450	$2,200
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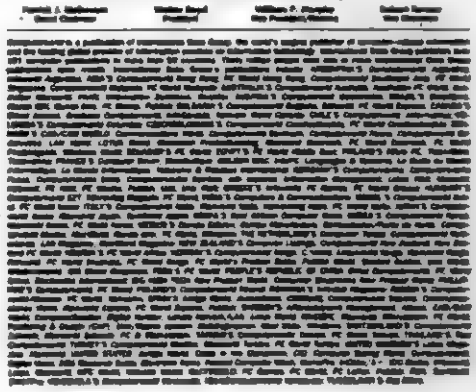

ADVERTISERS INDEX

Andersen Consulting	44
AT&T Network Cable Systems	77
Borland International	26-27
Bull Worldwide Information Systems	C4
Compaq Computer Corp	59-61
Computer Associates	3, 8, 54
CW Marketing	49
CW Recruitment	4, 15, 51, 65
Fischer International	63
Genicom	65
Hayes Microcomputer	24
Hewlett-Packard	30, 37, 40
IBM	22-23, 56-57, 69
Information Builders	62
Informix	C3
Innovation Data Processing	5
Intel	78-79
IPL Systems	17
Landmark Systems	20
Lotus Development Corp	52-53
Micro Focus	11
Oracle Corp	7, 9
Santa Cruz Operation	21
SAS Institute	66, 70
Sterling Software	15
Sybase, Inc.	13
Toshiba America	42-43
WHITE PAPER	29-40
WordPerfect	18-19
Workstation Group	51
Xerox	80

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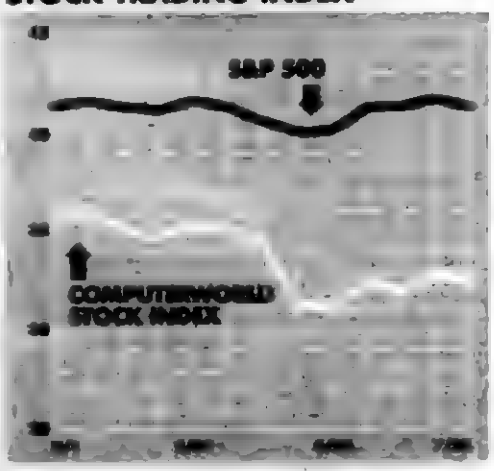
STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Commodore International Ltd.** (Alex. Brown & Sons, Inc.). Weak demand in Europe for consumer products continues to hamper Commodore (CBU), but a distribution deal with **Merisel, Inc.** (MSEL) should bring in an estimated $20 million during the next year.

DOWNGRADED FROM BUY TO HOLD: **Conner Peripherals, Inc.** (Bear, Stearns & Co.). Pricing in the disk-drive market is becoming cutthroat. With a price war going on in the personal computer industry, margins are falling across the board. The next six months look particularly harsh.

The longer term looks more promising. Conner (CNR) intends to enter the tape drive industry and is repositioning itself as a storage solutions company. Plans include building a backup tape drive using magnetic recording technology from **3M Co.** (MMM). Conner will also ship five disk drives this quarter for machines ranging from subnotebooks to workstations. Also in the works are drives preloaded with applications and operating system software.

LISA DAVIDSON

Storage dimensions

Brokerage firms measure up selected storage stocks

Conner Peripherals, Inc.	Hold	Buy
Maxtor Corp.	Buy	Neutral
Micropolis Corp.	Avoid	Outperform
Quantum Corp.	Hold	Outperform
Seagate Technology, Inc.	Hold	Neutral
Storage Technology Corp.	Not rated	Outperform

TOP PERCENT GAINERS

Intelligent Electronics	32.26
Gateway Communications	29.06
3 COM Corp.*	23.75
Phoenix Technologies	21.08
Cypress Semiconductor Corp.	20.31
Informix Corp.	19.67
Octel Communications Corp.	19.10
Maxtor Corp.*	18.18

TOP PERCENT LOSERS

Symantec Corp.	-39.93
IPL Systems Inc.	-32.90
Cognitronics Corp. (H)	-32.82
Compression Labs Inc. (L)	-28.89
Amdahl Corp.*	-20.98
Cambex Corp.	-20.54
Cray Computer (L)	-18.18
Cray Research Inc.*	-16.81

TOP DOLLAR GAINERS

Informix Corp.	6.00
Storage Technology*	5.25
Compaq Computer Corp.*	4.50
Octel Communications Corp.	4.25
Borland Int'l Inc.*	2.63
Dell Computer Corp.	2.50
Hewlett-Packard Co.*	2.50
Cisco Systems Inc. (H)	2.50

TOP DOLLAR LOSERS

Symantec Corp.	-13.38
Matsushita Electronics	-8.88
Adobe Systems Inc.	-7.00
IPL Systems Inc.	-6.38
Cognitronics Corp. (H)	-5.75
Cray Research Inc.*	-4.88
Amdahl Corp.*	-3.75
Northern Telecom Ltd.* (L)	-3.63

Exch	52-Week High	52-Week Low		July 24 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 0.76%**			
OTC	15.00	6.75	3 COM Corp.*	12.38	2.38	23.75
NYS	68.00	58.25	American Info Techs Corp.* (H)	67.75	0.38	0.56
NYS	44.88	32.88	AT&T* (H)	43.00	-1.50	-3.37
OTC	4.25	1.00	Ariel Communication Corp.	1.38	0.00	0.00
NYS	50.63	40.25	Bell Atlantic Corp.	46.75	-0.63	-1.32
NYS	53.25	43.38	Bellsouth Corp. (H)	50.63	-2.00	-3.80
NYS	7.25	4.13	Bolt, Beranek & Newman	4.50	-0.13	-2.70
NYS	65.88	36.63	Cabletron Systems	52.50	1.00	1.94
OTC	31.00	14.75	Chipcom Corp.	22.00	0.25	1.15
OTC	51.75	18.25	Cisco Systems Inc. (H)	51.75	2.50	5.08
OTC	36.25	6.00	Compression Labs Inc. (L)	8.00	-3.25	-28.89
OTC	3.38	0.88	Data Switch Corp.	1.75	0.19	11.96
NYS	23.63	12.38	Digital Comm. Assoc.*	18.75	-0.38	-1.96
OTC	17.50	8.25	Digital Systems Int'l Inc. (L)	8.63	-0.13	-1.43
OTC	7.00	3.63	DSC Communications	6.13	0.75	13.95
OTC	10.88	4.75	Fibronix Int'l Inc.	5.50	0.00	0.00
OTC	37.50	10.50	Fiserv Corp.	15.50	-0.75	-4.62
OTC	3.38	1.13	Gandalf Technologies Inc.	2.56	-0.06	-2.38
OTC	2.31	0.69	Gateway Communications	1.22	0.28	29.96
NYS	5.50	2.13	General Datacomm Inds.	3.88	0.13	3.33
ASE	5.88	0.50	Go Video	2.75	-0.25	-8.33
NYS	35.00	28.13	GTE Corp.*	34.13	1.13	3.41
NYS	70.63	58.00	ITT Corp.	65.00	0.25	0.39
OTC	36.13	25.25	MCI Communications Corp.	32.38	-0.63	-1.89
OTC	14.50	2.25	Microcom Inc.	3.63	-0.38	-9.38
NYS	18.25	9.50	Network Equipment Tech.*	10.25	-1.13	-9.89
OTC	25.50	6.75	Network General	9.50	0.00	0.00
OTC	20.00	8.50	Network Systems Corp.	10.75	0.88	8.86
OTC	17.88	5.50	Newbridge Networks Corp.	15.75	-0.25	-1.56
NYS	49.25	33.75	Northern Telecom Ltd.* (L)	35.25	-3.63	-9.32
OTC	85.00	27.13	Novell Inc.*	54.00	0.00	0.00
NYS	82.38	69.13	Nynex Corp.*	80.38	-0.63	-0.77
OTC	37.50	16.50	Octel Communications Corp.	26.50	4.25	19.10
OTC	9.88	4.25	Plenet Data Comm. Newks. (L)	4.25	-0.50	-10.53
OTC	53.00	17.00	Picturetel Corp. (L)	18.75	0.88	4.90
OTC	18.75	9.75	Proteon Inc.	13.50	1.00	8.00
NYS	25.50	11.63	Scientific Atlanta Inc.	24.63	-0.25	-1.01
NYS	66.25	51.50	Southwestern Bell Corp. (H)	64.63	-1.38	-2.09
NYS	27.63	20.75	Sprint Corp.	22.13	-0.13	-0.56
OTC	13.75	4.00	Standard Microsystems Corp.	11.50	-0.63	-5.15
OTC	33.50	14.25	Synoptics Communications	33.00	1.13	3.53
NYS	39.00	32.88	US West Inc.	39.00	0.63	1.63
OTC	41.25	21.25	Wellfleet Communications	33.13	0.75	2.32
PC and Workstations			**Up 2.31%**			
OTC	15.25	4.50	Advanced Logic Research (L)	5.25	0.25	5.00
OTC	70.00	42.75	Apple Computer Inc.*	45.88	0.88	1.94
OTC	32.25	12.00	AST Research Inc.*	13.13	-0.13	-0.94
NYS	19.25	9.00	Commodore Int'l (L)	9.63	0.13	1.32
NYS	37.50	22.13	Compaq Computer Corp.*	29.50	4.50	18.00
OTC	29.00	13.91	Dell Computer Corp.	20.50	2.50	13.89
OTC	7.75	3.00	Everex Systems Inc.	3.13	0.00	0.00
NYS	34.00	21.25	Harris Corp.	27.38	-0.50	-1.79
NYS	85.00	44.63	Hewlett-Packard Co.*	71.50	2.50	3.62
NYS	29.75	14.13	Silicon Graphics	18.25	-0.75	-3.95
OTC	36.88	20.75	Sun Microsystems Inc.*	28.00	0.50	1.82
NYS	31.25	22.50	Tandy Corp.* (L)	24.25	1.25	5.43
NYS	11.13	5.13	Zenith Electronics	7.88	0.25	3.28
OTC	25.50	4.88	Zeos International Ltd.	4.88	-0.88	-15.22
Large Systems			**Off 3.93%**			
ASE	20.63	11.63	Amdahl Corp.*	14.13	-3.75	-20.98
NYS	16.00	7.50	Cambex Corp.	15.50	1.00	6.90
NYS	16.38	5.88	Convex Computer (L)	5.88	-0.38	-6.00
OTC	19.63	2.25	Cray Computer (L)	2.25	-0.50	-18.18
NYS	52.25	24.13	Cray Research Inc.*	24.13	-4.88	-16.81
NYS	22.50	7.13	Data General Corp.	8.88	0.38	4.41
NYS	70.38	33.25	Digital Equipment Corp.*	40.38	-3.00	-6.92
NYS	106.38	81.63	IBM*	92.50	-2.38	-2.50
NYS	125.00	93.50	Matsushita Electronics	95.00	-8.88	-8.54
OTC	19.75	9.50	Pyramid Technology	10.25	-0.50	-4.65
OTC	17.88	7.50	Sequent Computer Sys.	15.00	0.63	4.35
OTC	18.38*	5.00	Sequoia Systems Inc. (L)	6.38	0.63	10.87
NYS	54.25	34.00	Stratus Computer Inc.*	41.75	0.75	1.83
NYS	15.13	9.50	Tandem Computers Inc.*	10.88	0.63	6.10
NYS	11.75	3.63	Unisys Corp.*	9.88	0.25	2.60
ASE	7.50	2.00	Wang Labs Inc. (b)*	2.75	-0.50	-15.38
Software			**Up 1.33%**			
OTC	68.50	36.25	Adobe Systems Inc.	36.25	-7.00	-16.18
OTC	13.25	2.50	Ai Corp.	3.00	0.00	0.00
OTC	45.00	11.50	Altos Corp.	14.50	0.50	3.57
OTC	19.75	10.13	American Software Inc.	13.88	0.75	5.71
OTC	20.00	7.50	Ask Computer Systems	13.00	0.63	5.05
OTC	57.25	23.25	Autodesk Inc.	39.13	1.13	2.96
OTC	37.75	8.25	Bachman Info. Systems	11.25	-0.13	-1.10
OTC	42.50	29.00	BGS Systems Inc.	35.88	-0.13	-0.35
OTC	79.00	37.25	BMC Software Inc.	48.75	2.00	4.28
OTC	20.50	9.00	Boole & Babbage	17.75	0.25	1.43
OTC	88.75	36.50	Borland Int'l Inc.*	38.83	2.63	7.09
OTC	11.25	3.63	CE Software	4.50	0.38	9.09
ASE	14.38	6.50	Cheyenne Software Inc.	10.50	-0.75	-6.67
OTC	29.38	7.25	Cognos Inc.	8.88	0.50	5.97
NYS	17.00	7.50	Computer Associates*	13.75	1.75	14.58
OTC	21.50	8.50	Comshare Inc. (L)	8.75	0.25	2.94
OTC	47.88	6.50	Easel Corp.	7.50	-0.25	-3.23
OTC	19.50	9.25	Goal Systems Int'l	16.38	0.13	0.68
OTC	25.50	11.50	Group I Software	19.00	1.00	5.56
OTC	6.63	3.50	Hogan Systems Inc.	4.63	0.25	5.71
OTC	36.25	18.50	Information Resources	25.00	1.00	4.17
OTC	38.50	5.50	Informix Corp.	36.50	6.00	19.67
OTC	22.75	12.50	Intergraph Corp.	14.25	0.00	0.00
OTC	15.00	5.13	Interleaf Inc.	10.00	0.25	2.56
OTC	20.25	8.50	Intersolv Inc.	13.50	1.63	13.88
OTC	30.00	10.50	Knowledgeware Inc.	12.75	0.00	0.00
OTC	45.25	20.25	Legent Corp.*	35.38	0.00	0.00
OTC	40.75	15.50	Lotus Development*	19.75	0.88	4.90
OTC	7.38	2.06	Meca Software	2.25	0.00	0.00
OTC	22.25	6.50	Mentor Graphics	6.75	-0.13	-1.41
OTC	20.50	6.50	Micrografx Inc.	9.13	-0.63	-6.41
OTC	88.84	45.84	Microsoft Corp.*	72.75	2.50	3.56
OTC	21.13	8.88	Oracle Corp.*	18.88	0.13	0.67
OTC	41.25	13.00	Parametric Technology	33.75	-0.75	-2.17
OTC	11.00	3.50	Phoenix Technologies	4.88	0.88	21.88
OTC	25.25	10.63	Platinum Technology	17.25	0.00	0.00
OTC	46.50	27.50	Progress Software Corp.	38.00	1.75	4.83
OTC	26.63	4.00	Quarterdeck Office Sys.	4.88	0.13	2.63
OTC	32.75	10.25	Rainbow Technologies Inc.	17.75	0.75	4.41
OTC	29.50	9.75	Rasterops	11.50	0.25	2.22
OTC	17.25	5.38	Ross Systems	8.00	0.50	6.67
OTC	26.25	7.50	Software Publishing Corp. (L)	8.25	0.00	0.00
OTC	8.50	2.00	Software Toolworks Inc.	3.13	-0.25	-7.41
OTC	7.25	1.75	Spinnaker Software	2.75	-0.25	-8.33
OTC	18.50	6.25	State of the Art	7.25	0.13	1.75
NYS	25.25	11.63	Sterling Software Inc.	16.13	-0.75	-4.44
OTC	30.00	13.00	Struct. Dynamics Research	16.50	0.50	3.13
OTC	31.75	15.00	Sybase Inc.	28.25	1.75	6.60
OTC	51.00	20.13	Symantec Corp.	20.13	-13.38	-39.93
NYS	15.50	6.63	Systemd Center Inc.* (L)	5.63	-0.13	-2.17
OTC	34.25	9.88	System Software Assoc.	27.25	0.50	1.87
OTC	23.75	14.50	Walker Interactive Systems	15.25	-0.75	-4.69
OTC	6.63	2.13	Wordstar	2.50	-0.13	-4.76
Semiconductors			**Up 1.87%**			
NYS	21.50	7.38	Advanced Micro Devices	8.50	-0.13	-1.45
NYS	11.13	7.00	Analog Devices Inc.	9.38	-0.50	-5.06
OTC	14.13	6.75	Atmel Corp.	8.88	-0.50	-5.33
OTC	14.13	4.75	Chips and Technologies (L)	4.75	-0.50	-9.52
NYS	22.63	7.38	Cypress Semiconductor Corp.	9.63	1.63	20.31
NYS	10.13	6.25	Dallas Semiconductor	9.63	0.25	2.67
OTC	69.75	38.50	Intel Corp.*	56.25	2.25	4.02
NYS	9.88	5.50	LSI Logic Corp. (L)	5.50	-0.25	-4.35
NYS	22.38	11.13	Micron Technology	15.00	1.00	7.14
NYS	83.75	54.00	Motorola Inc.*	83.63	0.63	0.75
NYS	11.50	3.88	National Semiconductor*	9.75	0.50	5.41
OTC	27.00	11.00	Sierra Semiconductor (L)	11.13	-0.38	-3.26
NYS	40.50	28.00	Texas Instruments*	40.50	0.88	2.21
OTC	10.50	5.88	VLSI Technology	6.13	-0.50	-7.55
OTC	9.75	2.13	Wafertech (L)	3.00	0.38	14.29
ASE	5.63	2.00	Western Digital Corp.	4.88	0.25	5.41
OTC	32.50	17.25	Xilinx	20.75	-0.38	-1.78
OTC	11.50	4.63	Zilog Inc.	7.00	0.63	9.80
Peripherals and Subsystems			**Off 0.89%**			
OTC	10.00	2.75	Archive Corp.	7.88	0.50	6.78
OTC	24.50	11.25	Banctec Inc.	21.75	0.38	1.75
OTC	23.50	7.00	Cambex Corp.	11.13	-2.88	-20.54
ASE	18.38	7.00	Cognitronics Corp. (H)	11.88	-5.75	-32.82
NYS	23.88	12.50	Conner Peripherals*	20.38	1.25	6.54
ASE	19.88	3.41	Dataram Corp.	13.13	0.50	3.96
NYS	19.25	5.88	EMC Corp. (H)	16.13	-1.00	-6.84
OTC	9.38	4.75	Emulex Corp.	6.88	0.00	0.00
OTC	23.00	14.25	Evans & Sutherland (L)	14.75	-0.13	-0.84
OTC	40.63	18.00	Exabyte	29.75	2.00	7.23
OTC	27.25	15.75	Intelligent Info. Systems	25.00	-1.00	-3.85
OTC	11.25	4.63	Iomega Corp.	5.50	-0.25	-4.35
OTC	34.75	13.00	IPL Systems Inc.	13.00	-6.38	-32.90
OTC	24.50	10.75	Komag Inc.	13.50	0.88	6.93
OTC	14.00	2.63	Maxtor Corp.*	13.00	2.00	18.18
OTC	12.63	5.75	Micropolis Corp.	9.75	0.50	5.41
NYS	99.75	83.50	3M Co. (H)	98.38	-0.50	-0.51
OTC	7.75	3.50	Printronix Inc.	5.25	0.25	5.00
NYS	26.75	7.00	QMS Inc.	7.75	0.25	3.33
OTC	18.00	8.88	Quantum Corp.	13.75	-0.38	-2.65
OTC	12.75	5.13	Radius Inc. (H)	10.63	0.00	0.00
NYS	12.88	5.88	Recognition Equipment	7.75	-0.38	-4.62
OTC	13.13	5.38	Rexon Inc.	9.25	-0.38	-3.90
OTC	17.63	7.25	Seagate Technology*	15.13	0.63	4.31
NYS	78.00	28.13	Storage Technology*	36.13	5.25	17.00
NYS	30.88	16.00	Tektronix Inc.	18.25	0.13	0.69
NYS	82.26	52.63	Xerox Corp.	72.50	1.13	1.58
Services			**Up 1.50%**			
OTC	18.00	11.88	American Mgmt. Systems*	16.75	1.00	6.35
NYS	5.38	2.88	Anacomp Inc.	3.38	0.25	8.00
OTC	19.00	12.25	Analysts Int'l	16.75	-0.25	-1.47
NYS	49.00	30.25	Auto Data Processing*	42.63	0.63	1.49
NYS	24.16	12.50	Comdisco Inc.*	15.50	-0.50	-3.13
OTC	13.50	7.75	Computer Horizons	8.75	0.00	0.00
NYS	84.88	52.25	Computer Sciences*	59.25	-0.63	-1.04
NYS	10.13	7.00	Computer Task Group	8.13	0.13	1.56
OTC	40.50	15.00	CompUSA Inc.	24.50	-1.75	-6.67
OTC	19.25	7.50	Corporate Software (L)	7.50	-1.00	-11.76
OTC	30.75	12.75	Egghead Discount Software	17.50	0.50	2.94
NYS	33.06	23.19	General Motors E (EDS)*	25.88	-1.25	-4.61
OTC	30.38	6.25	Intelligent Electronics	10.25	2.50	32.26
OTC	14.88	2.75	Marisel	9.88	0.25	2.60
OTC	15.75	7.00	Micrografx Inc.	9.00	-0.50	-5.26
OTC	27.50	13.84	Paychex	24.50	0.75	3.16
NYS	73.00	47.25	Policy Management Sys.	66.00	-3.25	-4.69
NYS	43.50	19.63	Reynolds and Reynolds	42.00	1.25	3.07
OTC	32.00	21.25	SEI Corp.	23.00	-0.25	-1.08
OTC	24.38	16.88	Shared Medical Systems	19.75	1.50	8.22
OTC	28.25	13.50	Sungard Data Systems	25.75	0.75	3.00
NYS	4.88	1.13	Ultimate Corp.	1.88	0.00	0.00

Note: Control Data Corp. changed its name to Ceridian Corp.

KEY: (H) — New annual high reached in period (L) — New annual low reached in week.

* Companies tracked in Computerworld Stock Index

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IN BRIEF

DG suffers $11.7M loss

■ As expected, **Data General Corp.** reported a fiscal third-quarter loss of $11.7 million on a 14% drop in sales. There was a silver lining: Sales of Unix systems surpassed those of DG's proprietary lines for the first time — but not enough to overcome the Westboro, Mass., firm's second consecutive unprofitable quarter.

■ Belt-tightening measures at **Tandem Computers, Inc.** contributed to a 50% increase in fiscal third-quarter profits to $17.4 million. Revenue at the Cupertino, Calif., firm climbed 5% to $503.2 million from the comparable quarter last year.

■ Citing domestic growth in sales to domestic telecommunications, retail, gaming and travel customers, **Stratus Computer, Inc.** posted a second-quarter profit of $13.5 million, up 28% from the year-earlier period. Revenue climbed 10% to $117.4 million, the Marlboro, Mass., company said.

■ Blaming the "difficult global climate," **Cray Research, Inc.** reported that its second-quarter earnings declined 94% to $1.2 million. Revenue dropped 6% to $184.9 million for the period, the Eagan, Minn., firm said.

■ **IBM Credit Corp.** reported preliminary second-quarter earnings of $52.7 million, up 26% from the comparable period last year. The Stamford, Conn., company said it originated financing for $4.2 billion worth of equipment, software and services during the first half of the year.

■ Fiscal third-quarter profits at **Comdisco, Inc.** declined 36% to $12 million. Revenue for the Rosemont, Ill., lessor increased 9% to $561 million, compared to the year-earlier period.

Q2 view: Early bird does catch worm

Software vendors that gambled on risky markets early cash in; latecomers lose out — for now

BY CHRISTOPHER LINDQUIST
CW STAFF

Second-quarter financials released by software developers last week were dominated by the "haves," much to the chagrin of the "have-nots."

Vendors that have established themselves in what were once considered risky markets, such as Microsoft Corp.'s Windows and relational databases, hit pay dirt, while those that only recently jumped in often found themselves floundering.

The situation could change during the next year, however. Analysts indicated that the Windows software market will become more competitive as more vendors enter it. And mainframe software vendors, several of which showed significant revenue gains, may be riding a temporary wave of upgrades as customers purchase larger, more powerful machines with an eye toward consolidating data centers — and software licenses.

And so it goes

The spate of quarterly financial reports issued last week broke down as follows:

• **PC software:** The bottom line is still strong for several personal computer software vendors, especially those with a strong Windows presence such as the king of the Windows hill — Microsoft itself. The Redmond, Wash.-based company tempered strong net income gains of 52%, with a note of caution concerning future earnings, however, indicating that it is simply getting too large to produce 50% yearly increases.

Analyst David Thomas at Prudential Securities, Inc. said increases of 33% to 35% would probably be more realistic for next year.

Pricing pressure in the Windows market will increase as Borland International, Inc. finally releases its Windows products later this year and companies such as Lotus Development Corp. and WordPerfect Corp. push upgraded — and more competitive — versions of their Windows products out the door.

For now, however, Borland is the one that is suffering, as evidenced by a 16.3% revenue decrease compared with the same quarter last year, attributed in part to its inability to produce Windows products. Another possible cause is its tendency to flood the channel with products that are not selling.

Second-quarter earnings 1992

	Revenue April to June 1992	Percent change from 1991	Profit April to June 1992	Percent change from 1991
BMC Software	$50.5M	30%	$13.2M	45%
Borland	$114.8M	(16.3%)	$1.7M	(85.5%)
CA	$367.5M	28%	$19.3M	45%
Excel	$7.0M	9%	$(585,000)	(150%)
Informix	$60.3M	51%	$9.1M	568%
Interleaf	$26.5M	26%	$1.5M	1,543%
Legent	$69.9M	35%	$11.3M	47%
Microsoft	$815.4M	55%	$210.1M	52%
Software Publishing	$35.1M	10%	$679M	5%
Sybase	$57.8M	59%	$4.4M	317%
Symantec	$60.2M	39%	$6.4M	66%

CW Chart: Michael Siggins

"The one thing that seems to be happening is that they've been stuffing the channel like Ashton-Tate used to do, and that's a real dangerous thing," said Jeff Tarter, editor of the "Softletter" newsletter. He added, "You're making product and not getting paid for it."

And Lotus' numbers — a net income increase of $5.7 million — were not tremendous, though the firm's announcement a month ago of a less-than-optimal quarter drew some of the sting from the results.

• **Mainframe software:** Computer Associates International, Inc., Legent Corp., BMC Software, Inc. and Platinum Technology, Inc. all showed strong quarters despite the continued shrinkage of the overall mainframe hardware market. Indeed, CA's 28% increase established a new high-water mark for the company.

"CA still continues to be the mainframe software company users love to hate," said Peter Burris, director of commercial systems research at International Data Corp. in Framingham, Mass., "but they still realize they have trouble living without [CA]."

Legent also posted a record quarter, with overall revenue increases of 35%. Its international operations posted "dramatic" new sales growth.

The seeming contradiction between shrinking numbers of mainframes and increased software sales is explained by several factors, including the increased acceptance of IBM's DB2 relational database; the subsequent demand for DB2-related software; and an increase in processing power per system as customers upgrade to more powerful mainframes, according to Thomas.

"The more speed you have in a system, the more management it needs, and that is totally a software issue," he said.

Restructuring pays off: Compaq profits up 15%

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Severe cost-control measures and an avalanche of new product sales propelled Compaq Computer Corp. further along in its turnaround, as the personal computer giant posted second-quarter profits of $29 million, an increase of 15% over the same period last year.

The company last week reported sales of $827 million for the quarter ended June 30 — up 15% from the comparable period last year.

Rebounding from a year-long restructuring process, the company has been working to save its market share from lower priced clone makers while cutting its operating costs.

President and Chief Executive Officer Eckhard Pfeiffer attributed the resurgence to the company's mid-June price cut and product blitzkrieg, as well as the company's continued effort to cut expenses by reducing overhead and manufacturing costs.

Pfeiffer also pinpointed the increased distribution levels — which will see Compaq products in more than 1,000 superstores and mass market outlets by year's end — as a factor.

Although Pfeiffer would not disclose unit numbers, he claimed Compaq shipped "tens of thousands of the new products before the quarter closed."

Back orders build up

In fact, the company had such a strong demand that the products are currently backlogged, necessitating triple shifts at Compaq's manufacturing plants here and in Singapore and double shifts at its Scotland site.

Pfeiffer said that although some machines should be out of backlog by the end of next month and others by September, everything from the June 15 announcement is on back order.

Analysts said that while the good news from Compaq is undoubtedly a plus, it is unclear whether the company will remain in the black.

"I don't think it indicates a PC recovery," said Joe McGlone, a principal at McGlone & Co. in Westport, Conn. "The predictability of earnings is still in question because of the glut of PC vendors."

Analysts did agree that the new products have provided a much-needed boost for the ailing vendor.

"It's like Apple all over again — when Apple cut prices and rolled the Classic out, business boomed," said Bill Bluestein, an analyst at Forrester Research, Inc.

He added that Compaq's increased distribution channels and new pressure on component suppliers to provide discounts also played a role in the resurgence.

TRENDS

Application Development

The newer development methods have not displaced older technology at mainframe sites, which still struggle with poor documentation and maintenance.

Tool mix

3GLs are used more than any other tool for application development.

Percentage of sites using tool (some sites using more than one tool)

Maintenance snafus

Inaccurate or missing documentation is the most troublesome problem when maintaining applications. Missing source code is the least serious, but it is more common.

Percentage of sites encountering the following problems

	Serious	Regular	Occasional
Missing source code	1%	5%	60%
Inconsistent data	4%	18%	53%
Resistant object code	3%	9%	31%
Unstructured code	7%	26%	69%
Poor documentation	11%	36%	49%

Base: 953
Multiple responses allowed; numbers have been rounded.

Life cycle costs

Maintenance accounts for 32% of the total lifetime cost of applications development. During the past year, this cost has risen while others have dropped slightly.

Percentage of costs

	1992	1991
Maintenance	32%	25%
Programming	26%	27%
Application design	16%	19%
Testing/integration	14%	15%
Requirements analysis	12%	14%

Source: Xephon WPWS, Orlando, Fla.

Did you know?

Few sites (less than 2.5%) invest in re-engineering tools to make old applications more maintainable. This is surprising, given the level of expenditure on maintenance.

NEXT WEEK

Shape up and ship out: ▶ **Robert D. Kunisch**, PHH's chairman, president and CEO, is spearheading the use of information technology to bridge the gap between the relocation and real estate sides of his $4 billion Hunt Valley, Md., firm — and also to hone both businesses into nimble multinational competitors. See Manager's Journal.

Robert Smith Jr.

Software development is alive and well in the former Soviet Union, as In Depth reveals. The opportunities for U.S. companies are great. They can swap expertise in sales and marketing — areas in which Soviet developers are inexperienced — for access to inexpensive software engineering manpower skilled in PCs and object-oriented design.

INSIDE LINES

In the mail

▶ Mail 3.0 is apparently on its way, although about a month late. Sources close to Microsoft confirmed that the company will go on a press tour to unveil the product sometime this week, with the official announcement probably occurring at GroupWare '92 next week. And Windows for Workgroups is apparently shaping up nicely, a source says. The peer-to-peer version of Windows reportedly includes an enhanced File Manager with toolbar access to features, dual redirectors for Windows to Windows, and Windows to Novell NetWare, the yet-to-be-released Schedule Plus group scheduling package and a subset of the Mail 3.0 user interface.

Losing its leaves

▶ Confirming long-circulating rumors, Banyan is talking to analysts and reporters this week about its plans to unbundle some of its networking services from its core Vines network operating system. The Westboro, Mass.-based vendor is expected to make utilities such as its highly acclaimed StreetTalk naming and directory service available for other LAN operating systems such as Novell's NetWare and Microsoft's LAN Manager.

Sabre rattling

▶ Asked last week what he considers to be his company's top competitor, Oracle Corporate Vice President Terry Garnett blurted out, "DEC," without any hesitation. "We're facing an illegal competitor there. They give product [Rdb] away with the hardware, and that's how they've gained market share." Garnett said DEC is exhibiting the kind of bundling fervor last seen with IBM in the 1960s, adding that the Federal Trade Commission should investigate DEC. Will Oracle file papers to instigate such an investigation? "We're viewing that as an option," Garnett said.

Unconfirmed

▶ AMR Corp.'s Confirm automated reservation system remained stuck in a holding pattern last week as the Dallas-based airline holding company waited for three key investors to fish or cut bait. Budget Rent A Car, Marriott and Hilton Hotels have until Friday to commit to Confirm or deal themselves out; as of late last week, they appeared to be taking their time.

No veiled threat

▶ Bellcore has threatened legal action against *2600 Magazine*, a hacker publication in Middle Island, N.Y., that it claims published proprietary Bellcore internal information. Editor Emmanuel Goldstein won't say how he got the documents, which detail ways to remotely listen in on phone conversations, but he claims the publication is within its First Amendment rights to publish them.

Petri dish

▶ A disturbing new package that has popped up on virus bulletin boards is called the "Virus Creation Laboratory" (VCL) which includes a development environment written in Borland C++, well-written documentation and eight sample viruses. The VCL makes virus writing a matter of picking options from pull-down menus. Infection type, encryption, etc., can be selected, as well as a range of nasty effects. Experts say any beginning DOS user can create working viruses with this package. Although it isn't the first attempt at such a package, it appears to be the most user-friendly.

Pundits are still puzzling over what to call billionaire industrialist Ross Perot's withdrawal from his undeclared presidential candidacy — but at least one spokesman at EDS' Dallas headquarters knows exactly what to call it: Sweet Freedom. "I'm having the best work week I've had since the Perot campaign started," he exulted last week. "There have been whole days when just about all I've done is answer phone calls about Ross." The spotlight's glare may have given a particular headache to EDS, which has gone to great lengths to distance itself from its colorful but controversial Perotian origins. Phone, fax or CompuServe Assistant News Editor Patricia Keefe with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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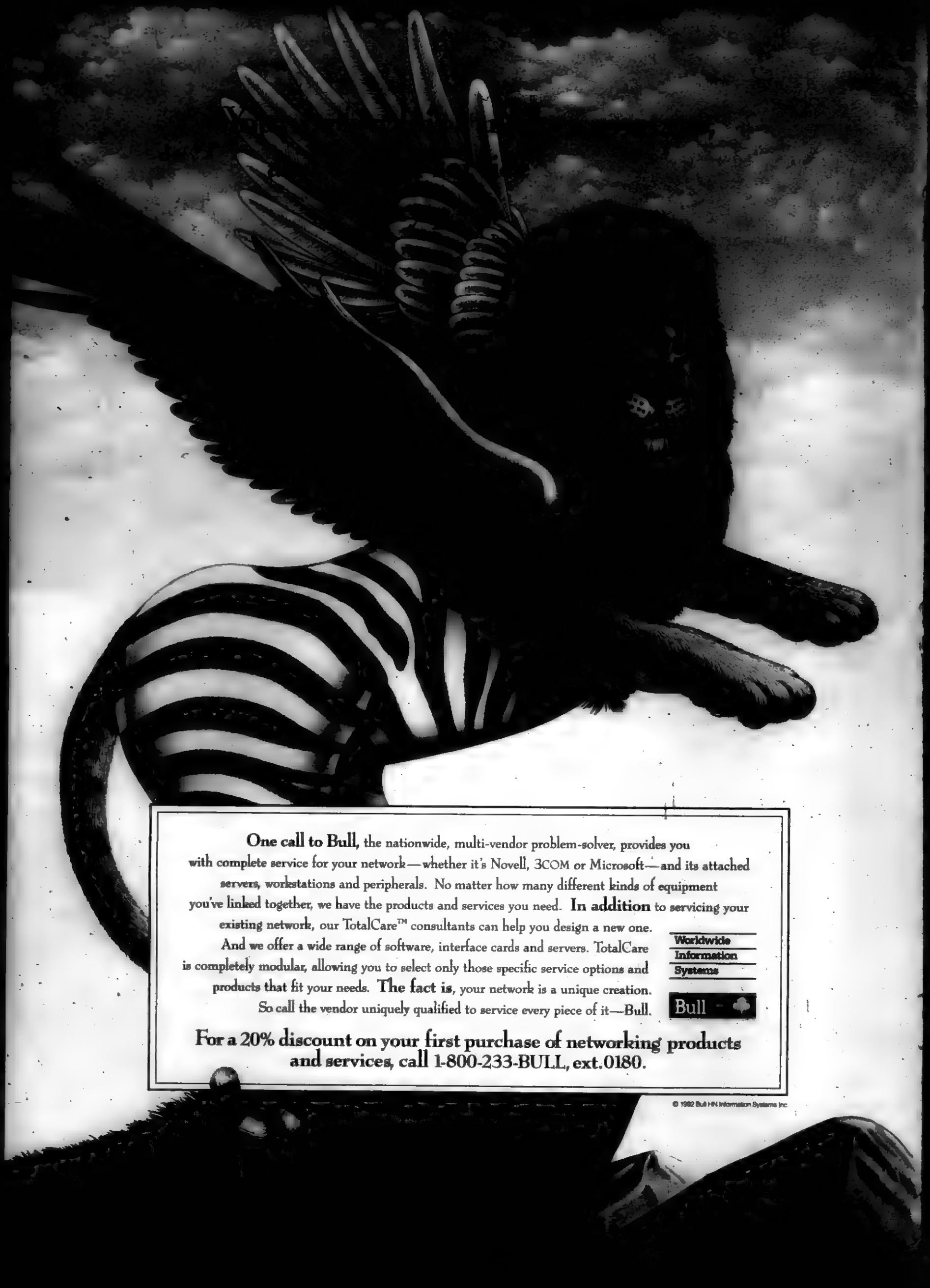

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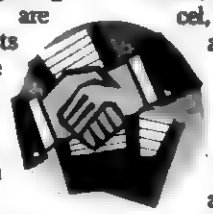
COMPUTERWORLD

Users cash in on Windows battle

Vendors offer bargains, services in effort to close corporate megadeals

BY ROSEMARY HAMILTON
and CHRISTOPHER LINDQUIST
CW STAFF

Corporate users migrating to Windows desktops are reaping big benefits from the fierce battle currently being waged among software companies scrambling to win their business.



While users said they still select products based on quality and end-user requirements, companies are increasingly willing to throw in many extras — including less restrictive licensing policies, maintenance agreements and cut-rate prices — to gain share in the Microsoft Corp. Windows market.

In other words, the megadeal announced between Price Waterhouse and Borland International, Inc. late last month is just the tip of the iceberg [CW, July 27]. Andersen Consulting, for example, is finalizing a deal with Microsoft to provide application software for its 65,000 users worldwide, according to Rick Stuckey, partner in charge of Andersen's Knowledge Exchange Program.

Stuckey said the agreement is now going through its last legal hurdles, and it will designate Excel, Word and PowerPoint as standards for users within its consulting business and accounting group (see story page 6).

Andersen is not alone. Other corporate users said they either have recently closed large deals with the major personal computer software companies for Windows applications or are considering this route.

"Since Price Waterhouse struck its deal, we've had vendors come to us," said Jude Gartland, a senior vice president at Lehman Brothers. He said it would be "difficult" for his company to standardize on select applications, but he expects the "Price Waterhouse deal to be replicated and offered by Borland and others to companies with large" user populations.

Jeff Tarter, editor of "Softletter," an industry newsletter

Continued on page 6

EDS pulling plug on some CA software

Moves to replace products in 18 data centers

BY MARK HALPER
CW STAFF

DALLAS — Electronic Data Systems Corp. has begun dumping mainframe software from Computer Associates International, Inc. in favor of other brands as tensions between the two industry giants escalate.

The EDS action, which is under way at its 18 data centers, mirrors a reported move by Litton Computer Services in San Jose, Calif., to divest itself of CA software.

"We're looking to find products and vendors that we can rely on," an EDS spokesman said. "In some cases, because of disagreements we have with CA, we can't rely on them."

CA has moved aggressively of late to crack down on software use and license transferral in a world roiled by information systems consolidation and downsizing.

CA and EDS are suing each other in federal court. EDS filed a lawsuit on Jan. 9, alleging that CA refused to provide service and support and had raised license fees for spurious reasons. CA countered with a suit of its own later that month, alleging that EDS had combined and moved licenses among different processors to support several customers simultaneously — a violation of the license pact.

One step at a time

An EDS spokesman said his company is in various stages of replacing CA software used to process thousands of clients worldwide.

"We're trying to look at alternatives to the top dozen or so products of theirs," the spokesman said, adding that the outgo-

Continued on page 10

IS Rx: HYPE OR HOPE?

Taming the health care cost monster

BY NELL MARGOLIS
and ELLIS BOOKER
CW STAFF

Health care costs in the U.S. careened out of control long ago and kept on going: Currently pegged by some analysts at $1 billion a day, they are racing toward an estimated $1.6 trillion a year by 2000. Meanwhile, the frenzied search for a cure to the cancerous bill has landed doctors on the information systems doorstep.

A slew of experts, backed up by some promising pilot studies, said information technology can help put the brakes on escalating health care costs. But, they caution, it will not be easy, and it will not happen overnight.

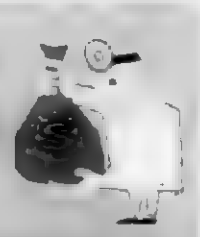
Approximately $163 billion — roughly 20% of the country's projected 1992 annual $817 billion outlay on health care — is spent on administration, most of which is squandered, according to a recent study in *Consumer Reports*.

Information technology in general and telecommunications in particular seem to be apt

Continued on page 14

Healthy bill

Processing the nation's estimated 5 million health care claims a day can cost as much as $7.5 million



1991	1992
$1.45	$1.50*

Price per claim

The goal is to get the processing price down to $1.20 per claim. This could be done by standardizing on a single HCFA 1500 claim form, available in 50 versions today.

*highest it has ever been

Source: International Data Corp. CW Chart: Michael Siggins

Rising barometers

Overall user satisfaction with leading I-CASE tools is up from last year

See Buyers' Scorecard, page 81

Product	Score 1991	1992
Texas Instruments' IEF	74	76
CGI Systems' PacBase	71	76
Arthur Andersen's Foundation	65	68
KnowledgeWare's IEW/ADW	63	66
Average score	69	72

Maximum score: 100

No rush to toss aside proprietary minis

So far, troubled firms retain loyal customers, but most eyeing open options

BY MELINDA-CAROL BALLOU
and KIM S. NASH
CW STAFF

While executives from Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc. labor to restructure — and, in some cases, save their financially troubled companies — many of their customers are quietly planning a move from proprietary minicomputers toward an open future.

That is the consensus from more than two dozen users of proprietary minicomputers from the three vendors interviewed last week. While some users plan to stick by their systems for a while, many are shifting to client/server systems built around Unix workstations or local-area networks, none of which bodes well for the mini-making trio.

DEC and DG, however, have some breathing room. A significant number of DEC and DG installed users said they are staying with the proprietary systems at least for the short term because of the companies' infusion of resources and energy into VAX and MV product lines. Long term, these same users may ultimately plan to move to more open environments.

Of the three, Wang appears to be on the shakiest ground, and DEC users are the most loyal.

DEC's Open VMS, its Alpha migration path and user invest-

Continued on page 12

INSIDE

Some IS directors, such as Evan Wride at Nissan Motor Corp. USA, worry about IBM's cutbacks. Page 8.

The Confirm reservation alliance seems to be calling it quits. Page 20.

In Depth — Need programmers adept at C, C++ or assembler language? Try looking in the former USSR. Page 89.

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IN THIS ISSUE

NEWS

4 **Banyan** opens up network services to **NetWare** users.

6 **Andersen Consulting** is ready to finalize a deal that would provide **Microsoft** applications to 65,000 users.

8 Some users are worried about what the thinning of **IBM**'s ranks will mean for them.

10 Can the mainframe be a giant server? **IBM** thinks it can and is planning a product strategy around the idea.

12 **DEC** CEO-designate Robert Palmer grapples with the unpleasant issue of layoffs.

14 The U.S. could save billions on health care if doctors went on-line, according to **Arthur D. Little.**

16 **Northgate** makes plans to replace its Slimline PCs with a new product family this month.

20 AFter 3½ years and $125 million; a travel consortium gives up on its goal of creating **Confirm**, an integrated travel reservation system.

24 Presidential hopeful **Bill Clinton** holds an electronic town meeting at **Tandem Computers**, where he promises policies that would strengthen the U.S. high-tech industry.

Quotable

"We are very anxious to get away from the issue of counting copies of programs."

RICK STUCKEY
ANDERSEN CONSULTING

On a pending megadeal with Microsoft to supply software for 65,000 users. See story page 6.

DESKTOP COMPUTING

35 IQ Software's **Intelligent Query** joins the growing ranks of report-writing tools for desktop computers.

WORKGROUP COMPUTING

55 **OS/2** and **Windows** face off to win support from Novell NetWare users.

ENTERPRISE NETWORKING

63 Users on the go fight for their right to full client/server access.

LARGE SYSTEMS

71 Paperless offices are trying to demonstrate their worth to uninitiated businesses.

APPLICATION DEVELOPMENT

77 Non-AD/Cycle fans try **Amdahl**'s Huron.

MANAGER'S JOURNAL

93 **PHH** Chief Robert D. Kunisch shares thoughts on his fight to re-engineer the business.

PRODUCT SPOTLIGHT

83 Has an expired lease surprised you? Then it's time to start thinking 'asset management software.'

BUYERS' SCORECARD

81 **CGI**'s PacBase and **TI**'s IEF top I-CASE user satisfaction.

IN DEPTH

89 Looking for cheap programming? Try the former USSR. By John S. Morrison.

DEPARTMENTS

6, 16 News Shorts
30 Advanced Technology
32 Editorial
96 Calendar
95 Book Review
97 Computer Careers
105 Marketplace
108 Stocks
109 Computer Industry
110 Inside Lines

The 5th Wave

"THIS SECURITY PROGRAM WILL RESPOND TO THREE THINGS: AN INCORRECT ACCESS CODE, AN INAPPROPRIATE FILE REQUEST OR SOMETIMES A CRAZY HUNCH THAT MAYBE YOU'RE JUST ANOTHER SLIME BALL WITH MISAPPROPRIATION OF SECURED DATA ON HIS MIND."

EXECUTIVE BRIEFING

■ **Information technology could strip $30 billion a year** from U.S. health care costs. A spate of promising pilot projects shows the potential benefits. But don't expect the road to these vaunted savings to be easy, short or inexpensive. **Page 1.**

■ **The former Soviet Union may be the next bastion of software engineering talent,** with manpower 40% cheaper than in the U.S. What's needed, according to Lev Weinberg, Boris Yeltsin's enterprise adviser, are U.S. and other foreign partners who can share their sales and support expertise in return for access to coders skilled in C, C++ and assembler. **Page 89.**

■ **PC software vendors are wheeling and dealing** with large customers. While it may be too early to call this a price war, flexible terms and bargains are there for buyers willing to bargain. Andersen Consulting is signing a massive license to buy Microsoft products for 65,000 users. **Page 1.**

■ **EDS is divesting itself of Computer Associates' software** in the wake of a CA lawsuit over alleged EDS licensing violations. **Page 1.**

■ **Minimakers' troubles have users looking at their options,** with LANs and Unix systems ranking high on the list. But some will stay loyal if the vendor commits to the products. **Page 1.**

■ **Novell sets a September ship date** for its multiprotocol WAN router, though observers say the vendor's diluted offering could be a misdirected effort. **Page 4.** The choice between Windows and OS/2 as a client operating system under Novell's NetWare becomes more difficult with the improvements made to OS/2 in Release 2.0. **Page 55.**

■ **It's not uncommon for data centers to lose track** of purchased equipment. That's why about one quarter of the data centers in Fortune 500 companies have started using inventory management software to cut operations costs but the systems range in the tens of thousands of dollars. **Page 83.**

■ **Users have mixed reactions to IBM's aggressive cost-cutting plans.** Some are concerned that support and service could suffer, but others say IBM will be leaner and meaner. **Page 8.**

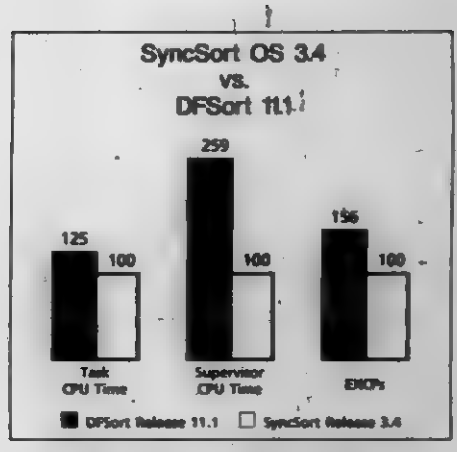
■ **The challenges presented by a mobile work force** have only begun to surface. Now that sales representatives and other workers are taking portables to heart, IS has to deal with giving them new types of access, such as full client/server capabilities. **Page 63.**

■ **Users can cut costs and improve service** by providing on-line access to reports that have traditionally been printed in and distributed by the data processing center. But there are roadblocks to be overcome. **Page 71.**

■ **Is early retirement the right choice for you?** Experts suggest you first weigh the current cost of living, outstanding obligations and the holes that inflation could make in a nest egg before making a decision. **Page 97.**

■ **On site this week:** "Never again," says the FAA after the 1991 AT&T network crash shut down New York airports. A backup communications system is now in place to keep air traffic control centers going in the event of another outage. **Page 63.** St. Agnes Medical Center relies on networked PCs to not only save costs but also make the whole operation run more efficiently by smoothing interdepartmental communication. **Page 58.** New York Hospital finds cash benefits in moving its data center offsite, a move made possible by a high-speed networking architecture. **Page 66.** A merger leaves PacifiCare Health Systems with some tough choices about when to use its own software and when to meld in the applications inherited from the acquired company. **Page 71.** Its program-related systems may be leading edge, but ABC Radio wants to do more with back-office or business-related computing. **Page 74.**

HERE'S WHERE WE LEAVE THE COMPETITION.



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Banyan to port net services to NetWare

BY MICHELE DOSTERT
CW STAFF

WESTBORO, Mass. — Banyan Systems, Inc. is seeking to expand its customer base by offering key services such as StreetTalk on platforms other than its proprietary Vines network operating system, starting with NetWare from archrival Novell, Inc.

Vines will also be ported to open Unix platforms, beginning with delivery of a version for The Santa Cruz Operation's (SCO) Unix next month.

Although the "foundation network services" to be offered on NetWare include security, management, messaging and the StreetTalk directory, which should have the most appeal to NetWare users, Banyan's announcement was a statement of direction only. The firm gave no specifics on the functionality, pricing or release dates for its new NetWare products, although it promised that the products would ship by year's end.

Hence, wary users, burned in the past by "statements of direction" sans delivery dates, are taking a wait-and-see attitude toward Banyan's new openness.

Also unclear is how helpful this unbundling will be to Banyan. Analysts differed over whether it will help win over NetWare users now eyeing promised directory services in the as-yet-unshipped NetWare 4.0. NetWare-only users have been pleading for a distributed directory service for years.

Word on the street

Banyan's StreetTalk directory services, a true enterprisewide, distributed name service, has long been the envy of many NetWare users. So Banyan is betting that NetWare users tired of waiting will investigate StreetTalk as an alternative, though some users may prefer to wait.

"I have 1,700 users. We already spend most of our time integrating our applications" and NetWare Loadable Modules, said Donald Sternfeld, director of information systems at law firm Morgan, Lewis & Bockius. "Adding Banyan services would mean adding complexity where I'm trying to simplify."

"What Banyan has inadvertently done is provided a migration path for its users to move to Novell. Lots of Banyan users would feel safer with Novell, but they may not want to leave StreetTalk. Now they can have the best of both worlds," said Glenn Marianko, a reseller at Glasgal Communications in Northvale, N.J.

The details that Banyan did provide also raised issues.

For example, Banyan indicated that the new products will be positioned as utilities for NetWare, rather than as a Vines/NetWare application interoperability product. This means customers in mixed environments wishing to share applications must still go through third-party gateways.

In addition, Banyan recently promised to enhance its messaging service to support industry-wide messaging application programming interfaces such as Vendor Independent Messaging, Microsoft Corp.'s Mail API and Novell's Message Handling Service. But the company has released no timetables for adding this support.

While Banyan sweats the details, users are looking for them. "It would be nice if we could use the same set of management and naming utilities on all our servers," said Dave DeVries, a senior LAN analyst at First Bank Systems, Inc. in Minneapolis, which has five NetWare servers in a mostly Banyan environment. There is some suspicion that Banyan's new product expansion strategy is linked to its upcoming public offering. Banyan has filed an initial public offering (IPO) registration statement with the Securities and Exchange Commission, although no date has been set for the actual offering. One banking source involved in the IPO said, "We weren't going to take them public with just an 8% market share for Vines; they had to leverage their strengths into additional products."

There are two possible target markets for Banyan services on NetWare: the small number of mixed Vines/NetWare environments, where analysts said they should do well, and the huge NetWare-only installed base, which will be a much harder nut for Banyan to crack.

Banyan's Vines for SCO is the first of what Banyan said will eventually be a family of Vines on as many as 14 different Unix platforms. The company is looking at moving Vines to reduced instruction set computing-based as well as Intel Corp.-based Unix platforms.

Novell to ship router next month

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — Novell, Inc. last week attached a September ship date to its wide-area-oriented routing software. The imminent rollout reflects attempts to better position Novell as an enterprise networking provider, though observers said the firm could be misdirecting some of its energies in a market already brimming with established suppliers.

Given that Novell must first catch up to router leaders in functionality and performance areas before it will be taken seriously, "it would make sense for Novell to resell more heavy-duty products from other vendors than to waste time with a half-solution," said Richard Malone, principal at Vertical Systems, Inc., a consultancy in Dedham, Mass.

Novell's $995 MultiProtocol Router v2.0, when running with its $1,295 WAN Links v2.0 software, extends Novell capabilities to route Transmission Control Protocol/Internet Protocol (TCP/IP) and Apple Computer, Inc. AppleTalk to wide-area networks. It also adds Open Systems Interconnect protocol support to both single-site internetworks and WANs.

Previously, Novell routed only IPX over wide-area links but handled IPX, TCP/IP and AppleTalk between local-area networks within a site.

Novell's low-end routing software for personal computer platforms still lacks support for many protocols, bridging functions and many of the wide-area interfaces supported by other router makers, though it is in development. Novell, however, is up front about not expecting to be the foundation of customers' router infrastructures.

Rather, its routing efforts target sites looking to leverage their Novell NetWare expertise and PC server platforms and respond to customer demand to "simplify and enable IPX over larger networks in conjunction with other players," said Navindra Jain, vice president and general manager of Novell's Internetworking Products Division.

However, "If someone mixes and matches [different vendors'] routers in a very large network, they are guaranteed a complication in administration," said a senior LAN specialist at a large insurance pension management company and Novell shop who preferred not to be identified.

Other Novell shops, including Gulf Stream Aerospace Corp. in Savannah, Ga., and Physicians Mutual Insurance Co. in Omaha, discarded the Novell routing option for Proteon, Inc.'s recently announced low-end DNX 300M for performance reasons [CW, July 27].

Jain acknowledged that the trade-off posed by Novell's basing its routing on industry-standard hardware, which affords economies of scale and hardware recyclability, is performance vs. proprietary platforms.

Customer profiles

Low-end products from various internetworking vendors serve different customers

Novell MultiProtocol Router v2.0	Proteon DNX 300M	Cisco/Wellfleet IRS/Feeder Node
Very small remote Novell sites wishing to leverage NetWare expertise. Limited performance requirements.	Small branch sites lacking network-savvy staff and needing full protocol support of router backbone. Limited performance requirements.	Small branch sites needing full protocol support of router backbone, high performance.

CW Chart: Janell Genovese

Industry cutting down on ATM roadblocks

BY JOANIE M. WEXLER
CW STAFF

Recent vendor pairings on Asynchronous Transfer Mode (ATM) technology show promise that the industry has learned from past mistakes to minimize technology-stalling red tape and political infighting within standards committees, analysts said.

Although they still have their prestandards development work to protect, vendors are becoming more pragmatic, observers agreed, and are picking up on the necessity of forming early-on interoperability and technology-exchange partnerships. The most recent is last week's announcement that chip maker National Semiconductor Corp. will license Adaptive Corp.'s ATM interface technology as the basis for chips that will figure in National's multimedia strategy.

The week before, Wellfleet Communications, Inc. and vendor Digital Link Corp. said they had agreed on a specification for how routers should hand off data frames to wide-area network gear.

"I have yet to see interoperable products above Layer 1 [physical connections] without these kinds of arrangements," said Richard Malone, a principal at Vertical Systems, Inc., a Dedham, Mass.-based consulting firm. "You're always going to have implementation differences" to resolve; otherwise, vendors would be left with no value to add, he said.

Adaptive, Wellfleet and Digital Link are all members of the ATM Forum, a vendor group following in the footsteps of the successful Frame Relay Forum for accelerating the implementation of high-speed networks. The group is making pioneering efforts to proliferate ATM — pegged as the favorite technology for handling the delay-sensitive, high-bandwidth demands of multimedia applications.

"Eventually, all camps will come down to one interface," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy. Vendors "are learning that if the other guy has something better, they better take it," he added.

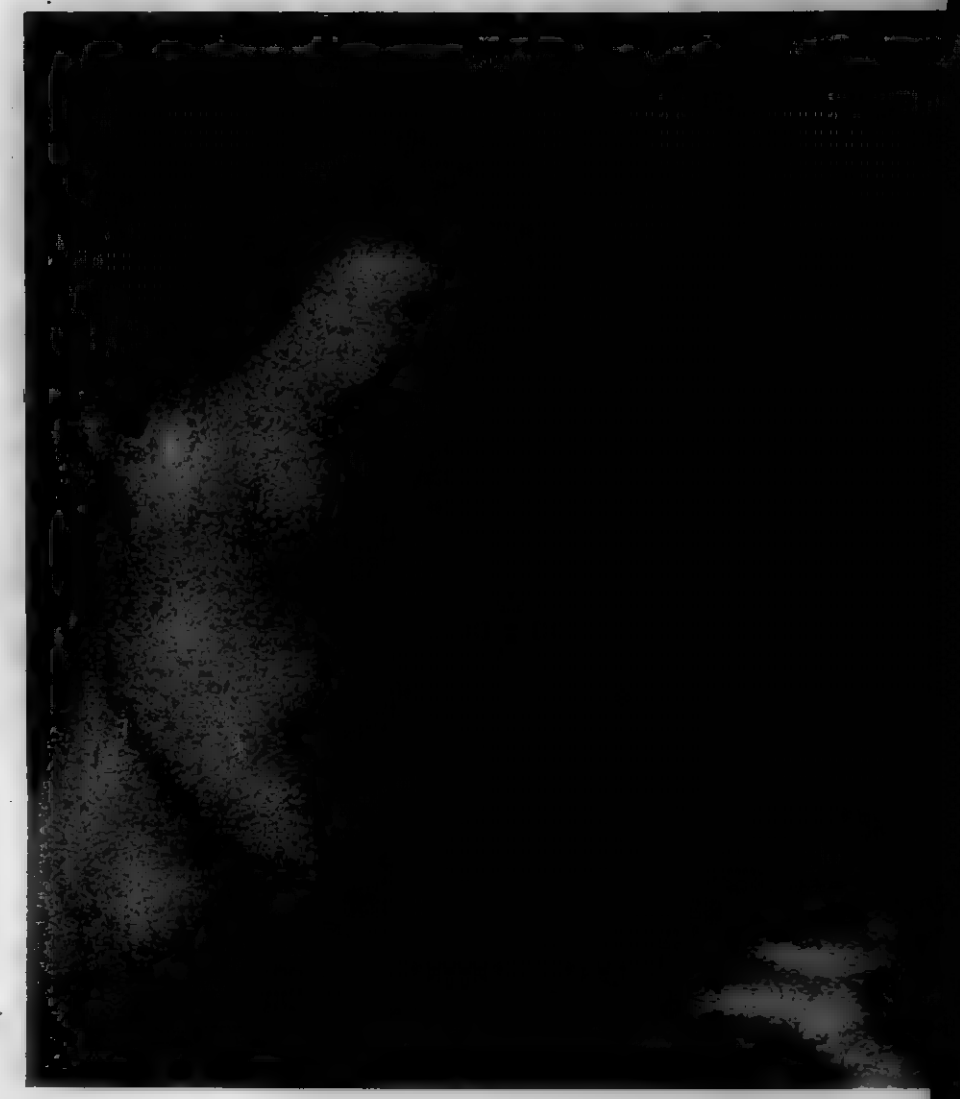
Live and learn

One learning experience was a two-tiered holdup with Fiber Distributed Data Interface (FDDI) that could relegate it to a niche technology usurped by ATM. A year-long impasse over whether to create a standard to support FDDI's 100M bit/sec. speeds at lower costs over both unshielded and shielded twisted-pair or over shielded wiring only, followed by a split opinion on signal encoding methods, finally broke when the camps merged last month.

Prior to that, the original FDDI standard dragged on because of political differences about how much embedded management the FDDI chip sets should contain.

"Before the forums came along, the political arguments happened in formal standards committees that are more structured," noted Steve Taylor, president of Distributed Networking Associates, a consulting firm in Greensboro, N.C. "That made it much slower to get issues resolved."

She's transferring data from Paris and L.A., processing it in New York, then sending reports back to the field. And she's not dreaming.



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NEWS SHORTS

CSX commits to OS/2

CSX Corp. will standardize on IBM's OS/2 as its desktop operating system for what may eventually be as many as 20,000 users, according to George Sekely, president of CSX Technology, the transportation company's information services subsidiary. About 6,000 CSX users are currently using IBM Personal Computers, most of which are running MS-DOS. The remaining users will be upgraded from dumb terminals. Sekely said OS/2 was selected because it has "a more defined future" than MS-DOS.

Groupware '92 seeks definitions

Groupware '92, the first commercial workgroup computing conference, begins in San Jose, Calif., this week with the goal of providing a better definition of just what workgroup technology really is. The top PC software companies will be on hand to further establish themselves as groupware players, although no product announcements are planned. However, Lotus Development Corp. is scheduled to debate rival Borland International, Inc. on workgroup approaches.

Compaq to mount SystemPro push

Compaq Computer Corp. will try to preempt IBM's expected September PC announcements by making sweeping changes to its SystemPro line the week of Sept. 14, sources said. A Compaq executive said in June that the server division would make an announcement in the fall that will rival the giant desktop rollout last December. Enhancements are expected to include a dual-bus structure and price cuts that will bring the SystemPro/LT line to the $5,000 level.

IBM outlines new OS/2 promotions

With its original OS/2 2.0 pricing promotion ending last Friday, IBM has introduced a replacement program that still offers cut-rate deals off OS/2's $195 list price, although not as low as the first campaign. Previously, users could get price breaks only if they ordered directly from IBM. Now, users of Microsoft Corp.'s Windows can license OS/2 for $79, up from $49. DOS users can upgrade for $99, which is the same as in the first promotion. New users can license 2.0 for $149, up from $139. The promotion runs through the end of October.

DOS/Windows upgrades bundled

Microsoft will begin shipping a single-install version of its DOS 5.0 upgrade and Windows 3.1 for use on any computer currently running DOS. The $199.95 integrated package allows users to simultaneously upgrade DOS while installing or upgrading Windows using a single installation program.

Microsoft mouse suit escalates

Los Angeles-based Z-Nix Co. has filed a variety of claims, including an antitrust claim, against Microsoft in the latest legal battle over the firm's right to ship Windows with its line of mice. Z-Nix and Microsoft have been in a constant back-and-forth struggle since 1990, when Microsoft reportedly raised Z-Nix's royalty rate. The current suit seeks to invalidate Microsoft's copyright for Windows on the allegation that Microsoft used it illegally in restraint of trade.

Short takes

Microsoft announced the Microsoft Developer Network for developers writing programs for Windows and Windows New Technology. . . . **Borland** unveiled Version 3.1 of Brief, a popular programmer's editor for MS-DOS and OS/2. The list price is $249.95, but a special price of $99.95 will be available for a limited time. . . . **Stac Electronics**, a data compression software and hardware manufacturer in Carlsbad, Calif., has been hit with a class action suit alleging that it misled investors about its financial condition. . . . Object-oriented programming has reached **Cray Research, Inc.** supercomputers in the form of the Cray C++ Compiling Systems Version 1.0.

More news shorts on page 16

Microsoft wins license pact

Andersen and Microsoft forge multiyear, multiuser licensing deal

BY ROSEMARY HAMILTON
CW STAFF

CHICAGO — Andersen Consulting is about to make the recent ground-breaking personal computer software deal between Price Waterhouse and Borland International, Inc. look like [illegible] stuff.

Andersen will soon finalize a several-year agreement with Microsoft Corp. that will provide licenses for at least three of its applications to as many as 65,000 users, according to Rick Stuckey, partner in charge of the Knowledge Exchange Program at Andersen.

In comparison, the Price Waterhouse deal covers four Borland products for 25,000 licenses each.

Stuckey said Andersen began working with Microsoft last year when it first selected Windows as a graphical user interface. At that time, there was little competition on the Windows application front, so Andersen forged ahead with Microsoft products.

One way: Our way

The deal establishes Microsoft's Excel, Word and PowerPoint as corporate standards for both Andersen and its accounting counterpart, Arthur Andersen & Co.

"We think it's the right thing to do, and we are very anxious to get away from the issue of counting copies of programs," Stuckey said.

The exact provisions of the contract are not yet finalized. Still to be hammered out are the legal criteria that will ensure that the deal accounts for "the evolution of the products," Stuckey said.

"We are still trying to set up the formula to get new features and so forth," he added.

He likened the spirit of the Microsoft pact to a similar large deal Andersen struck earlier this year with Lotus Development Corp. for its Notes workgroup platform.

Notes was licensed for 20,000 users, with the potential for thousands more, and "we never ever dealt with how many copies" of Notes the company would actually use, Stuckey said.

He said Andersen has closed a number of similar deals, adding that "we have others dragging on in negotiations."

Customers cash in on fierce Windows battle

CONTINUED FROM PAGE 1

published in Watertown, Mass., said he believes Microsoft set off this latest competition. "As soon as WordPerfect and Lotus got their Windows versions in the market, Microsoft saw its market share eroding," Tarter said. "Microsoft freaked out and cut prices and cut deals. Now the others are retaliating."

Indeed, vendors may have to do this to win sales as users become more aware of the deals.

"A couple more Price Waterhouses choosing Quattro Pro or 1-2-3 will send a very strong message to the vendors," said Joe King, vice president of information systems at Continental Life Insurance Co. "We're all out there looking every time we have to make a decision."

Software vendors contacted last week said they are increasing licensing options.

For example, Computer Associates International, Inc. confirmed that it will get into the application suite business. Sanjay Kumar, a senior vice president, said CA will announce Simply Business, a $550 suite with five software programs, including Accpac Simply Accounting, CA-Compete, CA-Textor and CA-Cricket Presents.

Stuckey said a key piece of the pending Microsoft agreement is that it "ignores numbers of copies" and allows users less-restricted access to software. The idea is to provide standard applications that are "available to everyone, regardless of how often they use it," he said.

Some users said such flexible licensing policies are badly needed and overdue.

"We could save head count by making it a much easier process to manage," said Cary Serif, manager of applied technology at Huntington Bancshares, Inc. in Columbus, Ohio.

The wheeling and dealing means the software firms will take some financial hits, but observers said the firms are willing to do so in exchange for longer term revenue streams as customers upgrade their products en masse.

"There's a transition [under way] now where they will have to get by with lower margins to be in a better position in the future," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

The bargain rates are most obvious in the recent suite competition between Microsoft and Lotus Development Corp., which both offer a bundled set of four applications. At least one analyst said his firm purchases suites for about $300, which translates to about $75 per application.

Ironically, several users said that while licensing options and cheap prices are obviously important, the No. 1 factor when selecting a software vendor is still quality.

Unum Corp., an insurance firm in Portland, Maine, and a long-time 1-2-3 user, recently selected the Microsoft Office suite because of its superior features and integration, said John Roberts, vice president of corporate research and planning. Yet he took bids from a number of companies, and while he would not reveal exact price quotes, he said he was "shocked by the [low] prices."

A license to save

Users have a variety of licensing needs that ideally would be, or are being, met by software vendors

Cary Serif, *manager of applied technology at Huntington Bancshares:*

"This ploy, for lack of a better word, is a way to perpetuate their products, and it makes a lot of sense. They are making it as cheap as possible, and I think it's great."

Jack Garland, *senior vice president at Lehman Brothers:*

"It is getting more and more complex for the administrator to live by the letter and spirit of the existing licenses. It looks like Borland is recognizing that and taking a step in the right direction."

[illegible], *vice president of information processing and treasurer at Federal Kemper [illegible] Co.:*

"We have quite a bit of networked software, and a lot of our software is covered under a network agreement. The cost of network licensing is usually less than buying, say, five shrink-wrapped copies."

CW Chart: Stephanie Faucher

WHAT HAVE BILL GATES, SCOTT MCNEALY, JOHN SCULLEY, JOHN YOUNG AND LARRY ELLISON AGREED TO COOPERATE ON?

Customers see IBM cutbacks as mixed bag

Users expect recent cuts will rejuvenate Big Blue but worry that service and support may suffer

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM users are reacting to last week's news that 18,000 employees will leave between now and the end of the year with some worries but also with high hopes of seeing a more responsive organization.

Most concerns centered around possible service and support reductions, as well as the chance that customers will have to begin paying for some services they have traditionally received for free, which will possibly impact their bottom lines.

"It used to be that IBM could bring people in and, for an account our size, a lot of that came free," said Al Smith, deputy director at Teale Data Center in Sacramento, Calif., the state's largest data center. "They're not going to have the ability to do that any longer."

Jay Stevens, a senior vice president at Dean Witter in New York, said users may soon have no choice but to pay for once-free services. "It cannot go both ways — the old way of doing business in a new competitive environment," he said.

Another hot button was the possibility of lost access to experienced account representatives, should they be among those opting for early retirement.

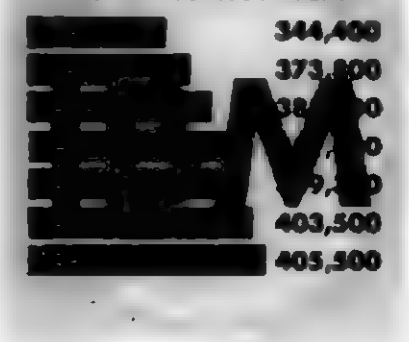
"The problem is that there is no guarantee that the people left at IBM are the very best IBM has," said Sheri Anderson, a senior vice president at Charles Schwab & Co. in San Francisco. "It's humane to let employees choose, but it's not necessarily best for the company."

One information systems specialist at a state agency, who said two of his account reps are leaving, agreed. "You come to depend on these people; you know what they can do for you, and you don't see them anymore," he said. Instead, "you get some new kids, full of piss and vinegar, but they don't know anything."

On good terms

A considerable number of IBM employees have taken advantage of its voluntary incentive programs

IBM's year-end worldwide head count



Source: IBM CW Chart: Janell Genovese

Not to worry

But not everyone is worried. Some customers said the staffing reductions — attributed to IBM's latest crack at a voluntary retirement program — might work to re-energize the firm.

"The people here in the central New Jersey office seem confused but invigorated," said Paul Maszczak, director of data processing operations at C. R. Bard, Inc. in Murray Hill, N.J. "This brings a new awareness of the competitive marketplace."

Frank Metz, IBM's chief financial officer, said at an analyst's meeting in New York last week that the company will save $900 million annually because of the reduction, which will total 32,000 people by year's end. Of that total, some 14,000 have already left, with the remaining 18,000 to do so by Dec. 31.

By then, Metz said, IBM's total employee count will be close to 300,000, compared with 344,400 at the end of 1991 and peak employment in 1986 of 403,500.

Schwab's Anderson *expresses concern that those departing may include top talent*

Some users said they have noticed changes at IBM, citing its attempts to reorganize into smaller business units and the loss of 14,000 people so far this year.

Overall, users' reactions to the IBM reductions seemed tied mostly to the status of their account teams. Evan Wride, director of IS at Nissan Motor Corp. USA in Gardena, Calif., said, "The old-timers who are leaving knew who to go to. They had the contacts within IBM."

Wride, whose account representative is among those taking the early-out plan, suggested that "IBM find a way to make it easier for the account reps to bring together the experts they need."

Many users have noticed little change. "The only real impact we've seen is that sales and systems engineering comes out of Philadelphia instead of Wilmington," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

Jim Oleksiw, telecommunications director at The Travelers Corp. in Hartford, Conn., said, "I haven't seen the service change dramatically over the past year." Still, he said he is "concerned. For guys like me in operations, with that need to get day-to-day problems fixed, there just may not be as many management people to talk to."

Senior editor Elisabeth Horwitt, senior West Coast editor Jean S. Bozman and Mid-Atlantic correspondent Thomas Hoffman contributed to this story.

IBM execs to recommend PC spin-off

BY MICHAEL FITZGERALD
and ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — After nearly a year of consideration, top members of IBM's Entry Systems Division (ESD) will recommend to IBM corporate that it cut loose the personal computer and workstation division into a wholly owned subsidiary, according to sources close to the company.

Of course, the top brass at IBM may decide that PCs are too important to the company's future to spin them off. Then again, Frank Metz, IBM's chief financial officer, told Wall Street analysts last week that "our biggest gross profit problem is in the PS [line of business]."

But if the plan is approved, the new subsidiary will likely have a different name, a la Lexmark International, Inc., which was the IBM printer group. It will also encompass the RISC System/6000 and Personal System/2 product lines, as well as OS/2 and the OS/2 LAN Server product, sources said. James Cannavino, general manager of IBM's ESD, is expected to head the unit.

An IBM spokeswoman declined to comment on specifics of any restructuring but said that "there have been ongoing efforts since December to sharpen the competitiveness of IBM's PC business, and you will continue to see us change."

While many analysts said a less-fettered PC group would gain competitive force, users contacted were not as positive. Some were concerned that IBM might derail some of its long-term strategies, particularly those based on OS/2.

Users concerned

"I would care if they split off the PC group. One of the reasons we went with OS/2 was because it's part of Systems Application Architecture," said Keith Sievers, treasurer and vice president of information processing at Federal Kemper Insurance Co. He expressed concern that an independent subsidiary might not work as effectively to integrate products such as DB2 and OS/2.

"I would hate to see them break it up, so we are back to the problem we had five years ago, where we get our platform products from a lot of different vendors," Sievers said.

But some observers said a separate subsidiary would be free of the IBM bureaucracy and would be able to develop and ship products more quickly.

"Well, they couldn't move more slowly" than they do now, said Jeff Newman, assistant vice president of IS at Barclays Bank PLC in New York. "I think they need the ESD back the way it was in the early '80s."

Another plus under a reorganization, analysts said, is that it will further free the ESD from worries about competing with other IBM units.

"There's no question that IBM has been a politically run organization, with the total information goal — mainframe, mini, etc. — being the focus," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. "Because of this, the PC division has been torn in multiple directions almost from Day 1. A new structure gives them a chance to be really competitive with the rest of the market as it continues being much more PC-oriented."

Still, IBM will have to resolve how it will sell both hardware and software into traditional IBM shops and how it will provide service effectively.

Analysts speculated that IBM will prepare to spin off the PC group, and perhaps some other divisions, toward the end of next year.

Mid-Atlantic correspondent Thomas Hoffman contributed to this story.

On the Blue horizon

IBM's big fall product salvo, expected Sept. 22, will include at least two high-end notebooks and a new line of low-end products, according to sources who have been briefed by the company.

IBM is also expected to revamp its Personal System/2 line from top to bottom.

The notebooks will be based on IBM's own SLC chip. One will use the 386SLC and feature an active-matrix color screen. The other will use the 486SLC2, which features an internal clock speed that doubles the external clock speed. This product will weigh 6½ pounds and will feature broad upgradability, sources said.

"This is the first notebook IBM has done that actually might be a step ahead of the market," commented one user source who has seen the product. Pricing has not been finalized, but the user expressed concern that IBM would price the product 25% to 30% above the rest of the market — a level he called too high.

The Value line of personal computers, which may be manufactured by a company other than IBM, will feature three model families positioned as low-end offerings.

Sources said the configurations included a model based on IBM's 386SLC, equipped with 2M bytes of random-access memory and either an 80M- or 170M-byte hard drive. A mid-level model will feature Intel Corp.'s 25-MHz I486SX chip, 4M bytes of RAM and the same hard drive configurations as the Value 386SLC. The most powerful version will use Intel's 33-MHz 486DX, with 4M bytes of RAM and a 170M-byte hard drive.

IBM will sell these through an 800 number and will build to order, aiming to deliver to the user within 48 hours, according to sources.

IBM is also expected to replace the PS/2 Models 70, 80 and L40SX with all new models. An IBM spokesman refused to comment on specific details but said IBM feels it is not addressing certain markets through its PS/2 or PS/1 lines.

MICHAEL FITZGERALD

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EDS pulling CA software plug

CONTINUED FROM PAGE 1

ing CA products include scheduling, security, tape management and sorting programs. EDS has more than 1,200 CA licenses, the spokesman said.

A CA spokesman said the vendor was not aware of the moves by either outsourcing company. "If this report is true, we believe that clients of EDS and Litton should be far more concerned than we are because they will be forced to use an inferior security system," CA said in a prepared statement. The company cited the product's portability and central administration features as advantages. CA holds a 53% share of the mainframe security software market, according to Sentry Market Research.

While the moves could potentially save EDS money by avoiding CA fees, EDS would be unlikely to pass on those savings to users, Merrill Lynch & Co. analyst Stephen McClellan noted. EDS signs fixed price contracts with customers, he said. "The idea is for EDS to sign them and to cut costs where possible."

A source close to EDS said the outsourcer is replacing CA's ACF2 security software with IBM's RACF. EDS is also reviewing the possibility of replacing CA software at client locations where EDS operates on-site, the EDS spokesman said.

In a parallel move, Litton, which counts financial services firm Quotron Systems, Inc. in Los Angeles and clothing retailer Brooks Brothers in New York among its outsourcing clients, is also aggressively moving away from using CA software, according to Rita Terdiman, a Santa Clara, Calif.-based consultant at Gartner Group, Inc.

Litton officials did not return telephone calls, but Terdiman said that Litton officials told her it is switching its data center security software from ACF2 to IBM's RACF, replacing CA scheduling software with IBM programs and codeveloping a tape management system with IBM to replace CA's.

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IBM to revamp host strategy

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM will unveil an architecture and related products later this year that will help it position the mainframe as a giant server, an IBM executive said last week.

"We're trying to evolve our whole strategy," said Bill Wilson, assistant general manager of IBM's Enterprise Systems line of business. "We want to provide the industrial strength of large systems to client/server environments. We recognize that the large system will be another node on the network." IBM's plan, he added, is to "make the mainframe an integral and viable part" of a corporate computing environment.

In this scenario, the mainframe could be used to back up files from workstations or to run applications that reside jointly on a personal computer and on the mainframe.

Wilson said the fall announcement will include the following:

- The formal unveiling of an architecture that has been used internally at IBM for some time to develop client/server products. The architecture, probably modeled along the lines of the AD/Cycle and SystemView initiatives, will detail specifications that third-party vendors can use to plug their workstation-based products into the System/390 mainframe.
- Software from IBM and third parties that will allow applications logic to be split between the mainframe and the workstation. IBM's architecture will support MS-DOS, OS/2 and Unix on the client side, Wilson said. "They are all potential clients, no matter whose workstations they are," he added.

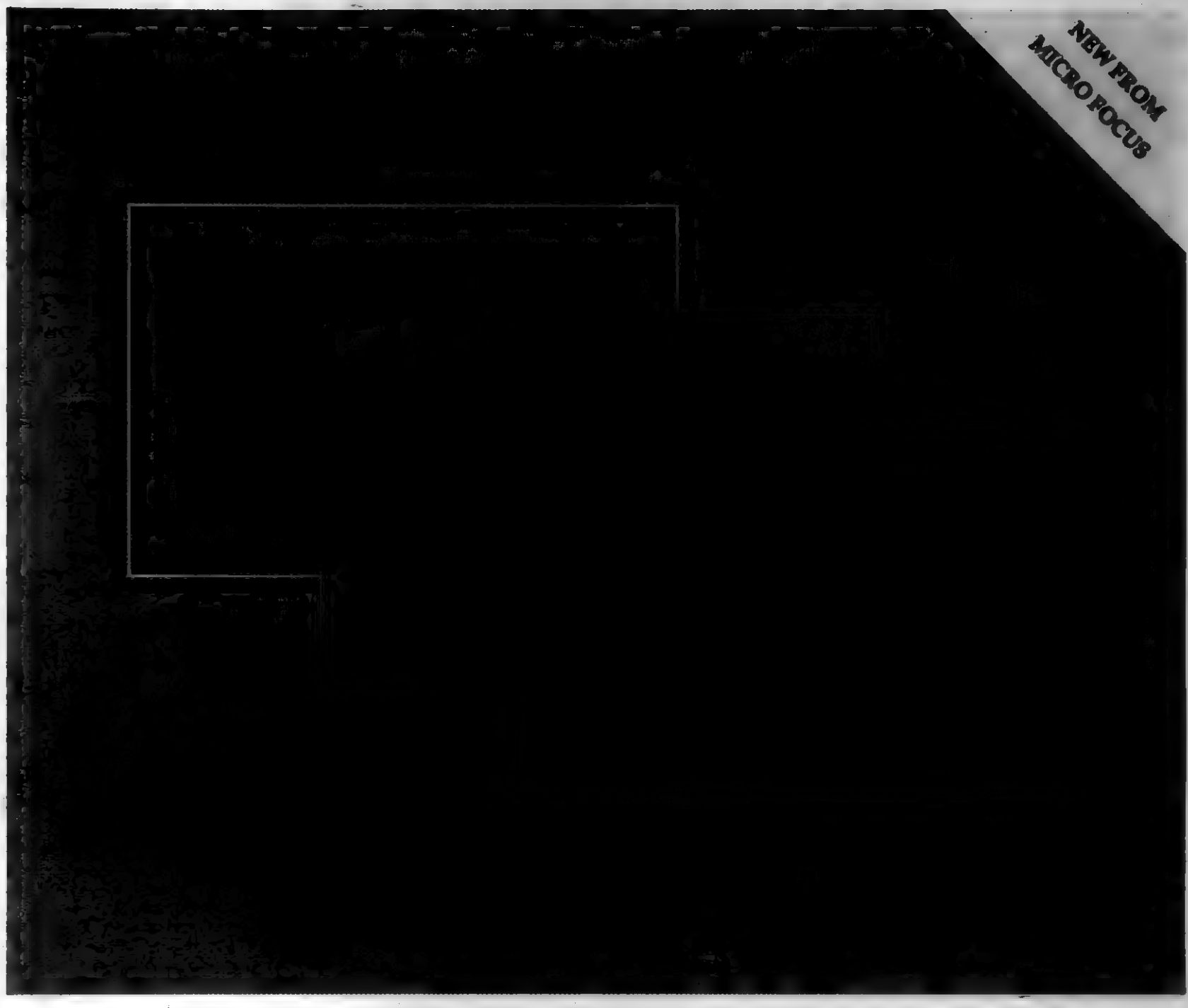
The eventual goal, Wilson said, is to provide intelligent code that can automatically decide the most appropriate place to run, whether on the workstation or the mainframe.

For their part, customers and analysts said this vision of the future fits with the role they see for the mainframe.

"It isn't going to go away, but I believe the mainframe as we have known it in a traditional sense will serve as a repository for data" instead of the primary place where applications reside, said William Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y.

Analysts were similarly upbeat about IBM's plans. "It's a valid role," said William Malik, an analyst at Gartner Group, Inc. in Stamford, Conn. He added that IBM has already signaled that Transmission Control Protocol/Internet Protocol will likely be the primary communications protocol used in this environment and that IBM's Advanced Program-to-Program Communications will play a key role.

About two years ago, Wilson said, IBM started a development group within Enterprise Systems to work on products that use the mainframe as a server to workstation clients. Within the last year, this group has introduced six products, including one called Workstation LAN File Services that allows a mainframe to back up files from local-area networks.



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DEC starts revamp, delays cuts

BY MELINDA-CAROL BALLOU
CW STAFF

In his first official communique with Digital Equipment Corp. employees last week, DEC's chief executive officer-designate, Robert Palmer, stressed the need to restructure the company but also said he will not begin by immediately eliminating "thousands and thousands of jobs in our company."

As a result, the time frame for finalizing head counts has been pushed back from this week until the end of the month, internal DEC sources said. The delay was attributed both to managerial changes and to the need to offer DEC the opportunity to try to find places for those who would otherwise be laid off.

Industry analysts estimated that DEC must cut approximately 15,000 employees in order to return to profitability. While Palmer grapples with layoff decisions, DEC's restructuring is already well under way, according to internal sources.

Groups merging

The separate product marketing and product management groups under DEC's Software Products Group, for example, are being merged into one unit to be dubbed the Expertise Center, the sources said.

"In the past, we put energy into component product marketing, and this restructuring effort seeks to raise marketing up a notch to collections of linked products to offer a clearer understanding to our sales force and to users," David Stone, vice president of the group, told *Computerworld*.

At least 100 employees could lose their jobs as a result, sources said, but Stone would make no estimates at this time because DEC is still deciding which technologies will be retained.

DEC's Palmer *wants to minimize talent loss*

This type of streamlining will be applied across the company, other internal sources said.

A DEC spokesman said the Expertise Center will enable DEC to place greater emphasis on coordinating its marketing.

Separately, one DEC vice president told *Computerworld* last month that DEC will also change manufacturing and the kind of attention that is put on customers.

"We want to be more responsive to customers and to collapse the time it takes to get products and services to them," said DEC's Frank McCabe, vice president of global information systems. He said that instead of merely meeting explicit demands, DEC plans to observe users at work and then determine a matrix of their requirements.

Palmer said in his internal comments that as the company redesigns its supply chain, many activities will be discovered that do not add "sufficient value" to the company.

In the meantime, many employees are panicking, one source said. Despite that and Palmer's relative newness, many DEC employees approve of a different, clearer and more accessible management style, according to the sources.

Analysts also reacted favorably to Palmer's speech. "He was unambiguous about the fact that there are too many people in the company, but he also said that they aren't going to react and whack their hands off," said Peter Kastner, a vice president at the Aberdeen Group, a market research firm in Boston.

"It was well-crafted and indicated that Palmer was in charge. It had a strong ending where he said he had zero tolerance for managers who make excuses, and he wants people to go out there and get the job done and not wait for management to tell them what to do," Kastner said.

Prime user base prepared for shutdown

BY KIM S. NASH
CW STAFF

The next two years will be busy for users of Prime Computer, Inc. equipment. Recent confirmation that the company will start shutting down its hardware operations immediately has spurred a number of users to target 1994 as the end of the line for the bulk of their Prime installations.

Few of those users interviewed last week, however, expressed alarm over their own futures, given what they view as an inevitable end to Prime's troubled business.

"We've been making plans for a while now to switch to another platform, so there's no cause for alarm," said Stan Zelepsky, manager of information resources at one of five Prime-dominated divisions of Zurn Industries, Inc. in Erie, Pa.

Poor communication

That sentiment pervades the Prime user base, according to Ray George, president of the Pittsburgh Prime Users Group. He said his group and other regional groups began formulating alternatives when "a lot of suspicious things happened" at a national user group meeting in June. That was when news hit that Prime's ComputerVision software unit would be spun off, leaving the fate of the hardware side unknown.

"I thought that Prime managers would address these hot issues while they had us all assembled, but they didn't. They packed up and left the meeting the next day," George said.

Prime officials said they were unable to respond to user queries at that time because documents had not officially been filed with the Securities and Exchange Commission. Still, officials did little to clue attendees in on what to expect.

That kind of poor communication, coupled with Prime's equally weak financial condition, cued users to start the trek to a mix of predominantly Unix hardware, including systems from Hewlett-Packard Co. and IBM.

As migration goes on, users said they will make do with what they have. ComputerVision, whose initial public offering is still planned, is counting on that because it will depend on PrimeService for a good portion of its revenue.

Users generally said they are happy with PrimeService but questioned its long-term viability now that hardware manufacturing will cease and service needs will drop proportionally.

Plus, third-party providers have stepped up efforts to undercut PrimeService prices, said George Bailey, IS director at Whitehall Co. in Norwood, Mass. Bailey, who is migrating applications off a Prime Model 9955 to Unix machines, said area service providers claimed they could save the liquor distributor $20,000 to $30,000 per year.

The processing power of a just-purchased Model 5340 will carry Bridgewater, N.J.-based Hamamatsu Corp. for another five years, systems and telecommunications manager Eric Atanda said. "But what if we need more memory or disk drives?" Atanda wondered.

Companies in the same boat most now buy equipment from independent resellers, such as 1st Solutions, Inc. in Phoenix.

No rush to toss aside proprietary minis

CONTINUED FROM PAGE 1

ment in existing applications may pay off. Eight out of 12 DEC users contacted plan to retain some or all of their VAX configuration in the near term.

Gordy Hunt, systems operations manager at Crane Plastics Co. in Columbus, Ohio, said he expects Alpha to carry him through the next few years, although he needs to start seeing the actual machines and pricing. "We're happy with our VAXs, in comparison with other vendors, which let you stay with the same software and swap out boxes over lunch."

Some recent VAX buyers said they are looking for nonproprietary systems and performance requirements beyond what they currently have. "We don't want to be tied to any particular vendor's product, but if the VAX is cost-competitive in an open environment, we'll consider more investments," said Brad Stout, corporate director at Thiokol Corp. in Ogden, Utah.

Too tardy

But Alpha was too late for consideration at General Electric Power Generation in Schenectady, N.Y., which will retain its VAX as a data repository but will bring in millions of dollars worth of Hewlett-Packard Co. HP 750s to act as high-end servers. The reasons cited by GE's Rob Rabben, cluster systems manager, included high prices. Management "saw us sucking money up" for the VAXs, he said. "I'm a Digital junkie and like VMS, but the HP systems run fast, and they're cheap." Seconding the price issue was Price Waterhouse's National Administrative Center in Tampa, Fla.

Another mixed bag of plans comes from DG users, some of whom are quite content with DG's bread-and-butter systems. Dennis Doyle, president of DG's North American Data General Users Group, said DG's proprietary MV users are "happy with the new systems that are coming out."

"We have a good working system," said Bill Rigby, data processing manager at the State of Mississippi Department of Community and Economic Development in Jackson. He said any changes are unlikely in the near future.

Doyle conceded that some users are taking a hard look at moving off DG but said it is not "a mass exodus."

"Our intention currently is not to change anything with our hospital management system [on MV], but we will be moving to open systems for clinical applications," said Bruce Reirden, vice president of information services at Women and Infants Hospital of Rhode Island in Providence.

Out of six DG users contacted last week, two were considering a move to open systems, and two had just bought DG's Aviion Unix workstations.

Michael Kaiser, director of administration at the Victim Services section of the University of Pittsburgh Medical Health Care Division in New York, said that the university will seek to reduce costs and to ease application development across platforms by bringing in open systems in the next year or so and will ultimately replace its MV system.

> "I'M A DIGITAL junkie and like VMS, but the HP systems run fast, and they're cheap."
>
> ROB RABBEN
> GENERAL ELECTRIC
> POWER GENERATION

The most movement is likely to come from Wang users, many of whom began to turn over their proprietary bases several years ago. A substantial number of current and former VS users, such as Joe Caruso, head of corporate systems and technology at American Express Co. in New York, are going to personal computers and LANs, according to Matt Gillman, president of the International Society of Wang Users. LANs are a "natural progression," Gillman said, given that most VS shops have them installed already and technicians have PC experience.

Users aren't just snubbing the VS. Wang's Office/2000 strategy misses the mark as well, observers said. "If someone comes along with word processing on a PC, then you unhook your Wang. There's no need to run those types of applications on a big, costly machine," said John Cunningham, former Wang president.

Even Wang's imaging technology may not be enough. Metropolitan Life Insurance Co. in New York runs a "very successful" imaging setup in the long-term disability department, anchored with Wang software and VS boxes, said Art Boyanjian, assistant vice president.

But as it looks to move imaging to other areas, "we will review products from multiple vendors, such as Wang, IBM and FileNet," Boyanjian said.

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Taming the health care cost monster

CONTINUED FROM PAGE 1

tools for draining an administrative swamp, said Mark Schneider, a medical technology analyst at management consulting firm Arthur D. Little, Inc.

Using a complex computer model, the Cambridge, Mass.-based firm estimates dramatic savings based on application of technologies to specific health care-related cost items (see chart this page).

Technology alone cannot lower health costs or improve quality. However, "a technological infrastructure that reduces the hassle factor and waste in administration" and spurs quantum increases in the quality and quantity of care is well within reach, Alice Lusk, president of Electronic Data Systems Corp.'s health and benefits division, said in recent testimony before the health subcommittee of the U.S. House of Representatives' Ways and Means Committee.

Lusk specifically cited the centralized and nationally integrated claims processing, management, payment and adjudication system that EDS created for parent firm General Motors Corp. The 3-year-old system has saved the automobile manufacturer some $800 million so far.

And while many big companies saw health care costs rise 20% or more last year, GM's cost increases were in the single digits, according to Lusk.

Libenson: *Cut $60K*

Surgical precision

Arthur D. Little estimates annual cost reductions of more than $36 billion are possible through four different health care applications:

- Electronic management and transport of patient information will decrease costs by almost $30 billion.
- Electronic submission and processing of health care claims offer a potential reduction of almost $6 billion.
- Costs of hospital materials and supplies will be diminished by more than $600 million through the use of electronic inventory management systems.
- The use of videoconferencing for professional training and remote medical consultations will reduce costs by over $200 million.

CW Chart: Janell Genovese

Good for the goose

What is good for GM appears to be good for the U.S.A.:

- In Salt Lake City, Latter Day Saints Hospital uses an automated patient information system to detect adverse drug events — allergies, unpredicted drug interactions, dosage problems and the like — and alert the staff to their possible occurrence.

The system, according to Dr. T. Allan Pryor, co-director of medical informatics, catches adverse drug events 60 times better than did practitioners. Latter Day Saints Hospital has yet to put a dollar amount on the savings.

However, a study commissioned by Ontario's provincial government estimated that the elimination of adverse drug events would save Ontario hospitals roughly $140 million a year.

- In St. Paul, Minn., an expert system that spots irregularities in doctors' bills is saving Fortis Benefits Insurance Co./Woodbury an estimated $540,000 a year, said medical management coordinator Donna Hummer.
- In Miami, 585-bed Cedars Medical Center canceled its contract with a medical records transcription bureau.

Instead, the hospital put terminals in the homes of the transcriptionists, who now telecommute to work across 9.6K bit/sec. leased lines to Cedars' information system.

Net savings to Cedars amounted to $60,000 a year simply because of a switch away from the outside service, according to the hospital's vice president and chief information officer, David Libenson.

And that's just for starters. "Productivity is up 40%, and employee turnover has gone from 33% to zero," he noted. "So we're saving at least 40% of total cost in addition to the $60,000."

- In Highland Park, Ill., an electronically enabled just-in-time inventory management pilot allowed Highland Park Hospital to whittle its $260,000 warehouse

Slashing health care costs

A technology-driven re-engineering of the U.S. health care system promises to shrink costs at a stunning rate, Arthur D. Little, Inc. submits in a sampling — and says that bit figures are conservative

Proposed change	Projected annual savings
Use electronic means to supply extensive diagnostic and educational information to patients.	$5 billion
Reduce hospital/emergency room visits through computerized patient management systems.	$8.3 billion
Through same, reduce hospital stays.	$1.9 billion
Let patients "visit" the doctor on-line via teleconferencing and home health services.	$15.3 billion
Eliminate file clerk labor costs by automating hospital record-keeping.	$198.7 million

CW Chart: Janell Genovese

Try a terminal bedside manner

"If half the hospital staff are nurses, the logical place to put [IS] technology is with them," says Fred Pirman, senior vice president at Humana, Inc. in Louisville, Ky. Labor accounts for 60% of most hospitals' costs, with nursing representing half of this figure, he adds.

Yet only about 150 to 200 of the nation's 7,000 hospitals have experimented with bedside terminals, according to Bill Donovan, editor of "Inside Healthcare Computing," a biweekly newsletter published in Long Beach, Calif.

The roadblock, according to Donovan and others, has been creating "intuitive" systems that also clearly address clinical rather than administrative or accounting requirements.

"You can't say to a nurse, 'We have a great new system for capturing charges.' If the only thing you're going to do is generate a bill, you'll be much less likely to get [clinicians] involved," said John Page, executive director of the Healthcare Information and Management Systems Society, a 4,000-member group within the American Hospital Association.

St. Joseph's Hospital in Milwaukee already deploys wall-mounted touch-screen systems; recently, it began testing wireless portable terminals. While St. Joseph's found time savings varied widely, depending on the type of ward and type of patient being treated, it also documented a lower hours-per-patient day — a measure of nursing time per patient — wherever bedside units were in service.

Projected savings of some four hours per nursing shift could translate into $1.22 million in annual savings for St. Joseph's, according to figures cited by management consulting firm Arthur D. Little.

St. Peter's Medical Center in New Brunswick, N.J., has forestalled $450,000 in charges to the hospital during the last 18 months by creating a combined bedside and patient care review system.

Nurses at St. Peter's record patients' vital signs and medical procedures by way of a wall-mounted system that reads bar codes on hospital inventory or preprinted procedure charts.

"Information from the patients' rooms and other hospital systems downloads into the care management system, which is looked into daily," said Betty Manco, vice president of nursing, adding that the hospital's savings during the past year and half "wouldn't have been realized just by putting in the bedside system."

The lion's share of the basically clerical savings from bedside systems will be in nurses' time rather than money, according to Arthur D. Little. Moreover, many experts pointed out, such gains quickly extend to patients in terms of care: The time that nurses do not spend on clerical work can be devoted to patients. So can the dollars saved by hospitals — $902 million in transcription-related costs in the U.S. alone, according to Arthur D. Little estimates.

"You're also less likely to have the sort of error that results in malpractice," Donovan added, noting that the audit trail from such systems can actually make a hospital less vulnerable to malpractice lawsuits.

ELLIS BOOKER and NELL MARGOLIS

Snipping paper cuts costs

Electronic transmission of patient information could save the U.S. some $30 billion in annual health care costs, according to computer-modeled estimates compiled by the Cambridge, Mass.-based management consulting firm Arthur D. Little.

The gains will be made, according to Arthur D. Little and the concept's many other proponents, by replacing bulky, time-consuming and often inaccurate paper and telephone marathons with on-line, real-time networked transactions.

Promed, the New Haven, Conn.-based subsidiary of Blue Cross/Blue Shield of Connecticut, has cut $300,000 worth of administrative costs from its parent's bottom line by processing claims across what it said is the first statewide hospital/practitioner medical management network.

In neighboring New York, the State Department of Health is mounting a pilot program that will link 12 hospitals in a standardized claims billing, processing and payment system. The Chicago-based American Hospital Association has an electronic claims network under consideration.

Electronic processing could knock $322 million off the yearly bill. "And our estimates are conservative," analyst Mark Schneider said. Others — the American Hospital Association and U.S. Health and Human Services Secretary Louis Sullivan, for example — project savings in the $25 billion ballpark.

Health care IS activist and Travelers Insurance Co. President Joseph Brophy hailed the mid-July launch of an on-line, real-time network that aims to all but eliminate paperwork and phone calls among health care professionals as a momentous occasion [CW, July 27]. Not only could the proposed network halve the current multibillion U.S. health care administration bill, Brophy said, but it could also open a new industry niche.

A slew of vendors developing practice systems are crowding the starting gate. "Now they're asking 'Where are the standards?' " he says. "As soon as the standards are here, they're going to be out there selling the doctors."

NELL MARGOLIS

inventory costs down 70% to $78,000.

The megasavings are down the road, but don't expect a smooth ride. "It's easy to say, 'Let's automate.' It's hard to do it," said the CIO at a major East Coast teaching hospital who requested anonymity.

According to the CIO, an automated billing system slated to go live this fall at the hospital is being counted on to save millions of dollars in the future — but as of today, "it's cost us millions of dollars, and it's getting more expensive all the time.

"Everybody raves about the savings, but nobody tells you about the extra work that your personnel are going to have to do, or the way the regulations you're automating keep changing or the fact that every state has different ways of classifying patients," the CIO said.

Another issue that gets short shrift in the eagerness to hail information technology as a quick fix is the fact that implementing technology and using it productively are not the same, said Professor Steffie Woolhandler at Harvard Medical School.

Until recently, for instance, one major urban hospital cited by Woolhandler assigned new identification numbers to each patient, even if the patient had been there many times.

"Not only was this a waste of time for the patients," Woolhandler said, but "it also made the entire on-line medical record less than useful for diagnostic purposes."

In addition, a recent article in *The Wall Street Journal* flagged a frustrating prospect: Watchdog associations and technologies, created specifically to lower medical bills by rooting out redundancy and fraud, are in some cases inflating the bills by costing health care providers more than the mistakes and misdeeds that they prevent.

Said the anonymous CIO: "There's a real rat's nest of things going on."

Maintenance can be key

If information technology can shrink the country's bloated health care bill by billions, will back-room costs dull the shine of up-front savings?

Not if users follow the example of smart health care and information systems professionals who are already keeping a tech-driven lid on health care costs.

At Cedars Medical Center in Miami, Chief Information Officer David Libenson canceled all maintenance agreements with most equipment vendors. He then contributed the gross amount, about $1 million over four years, to an "insurance pool" from which Cedars draws to pay the same vendors for necessary tune-ups and repairs — "but only when the equipment actually needs it," Libenson said. The shift is shrinking Cedars' technology maintenance costs by about 25%.

A similar strategy is saving North Oakdale Medical Center, which runs 380-bed Pontiac General Hospital in Pontiac, Mich., some $219,000 a year in maintenance. Also, materials management director David Batkie said the hospital is pocketing between $27,500 and $100,000 a year in rebated premiums.

"There's no reason everyone can't do something like this," Libenson noted. "The U.S. is paying close to $1 trillion in health care. Suppose 5% goes for capital expenditures — that's $50 billion. Suppose maintenance is only 10% of that — that's $5 billion. Now, suppose the equipment only lasts four years beyond warranty and that we can only save 25%: Aw, gee — what if you could only save $5 billion?"

Finding the right computing platform for the job has also proven priceworthy at Cedars. When the time came to replace an old IBM 5520 system with 27 workstations attached, Libenson said, "We didn't rush to a PC network." Instead, the hospital switched its workers to a Unix-based network of AT&T 3B2 processors loaded with full office automation software. "I can put a workstation into a PC network for about $3,000 today," Libenson noted. "It costs me about $600 to add a user to ours."

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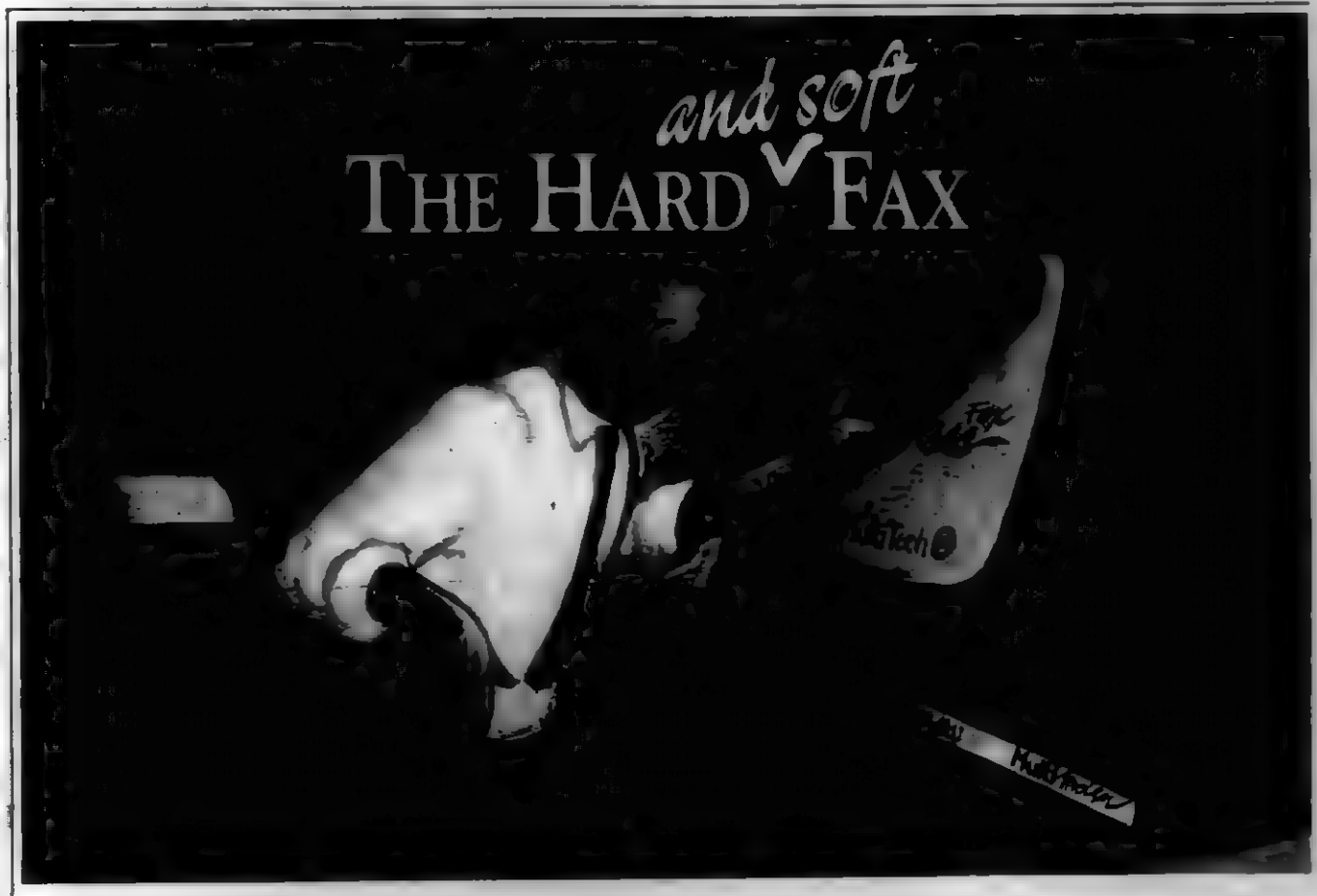

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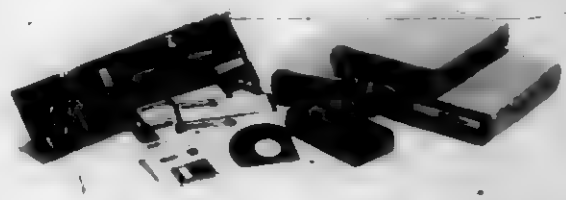

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NEWS SHORTS

Sybase buys into multimedia

Sybase, Inc. said last week that it will acquire Gain Technology, Inc., a Palo Alto, Calif., multimedia tool kit vendor. Sybase will pay for Gain by issuing 2 million shares of new stock — worth $50 million to $60 million — in a deal that should close in September. Gain, which will become a Sybase subsidiary, is expected to produce $15 million a year in sales for $160 million Sybase. Gain's software stores images and text in an object-oriented database from Objectivity, Inc. in Menlo Park, Calif.

NCR opens disaster recovery site

NCR Corp. last week entered the facilities side of the disaster recovery business, announcing the opening of a 300,000-sq-ft workgroup recovery center. The Rochelle Park, N.J., site will be run by NCR's Data Services Division, best known for its data processing services in the financial industry. The hot site, which will serve the metropolitan New York area, contains computers and work areas able to support a total of 200 users.

American Express launches facility

American Express Travel Related Services Co. last week formally opened its New York Payment Services Center on Staten Island, N.Y. The facility will process American Express' worldwide payment operations using an IBM Series/1 for data entry and Banctec, Inc. image processing hardware and software for check processing. The Banctec system processes 37 million customer checks annually for American Express. The new facility will house 250 employees.

Hayes sued by competitor

Sierra Semiconductor Corp. last week filed a suit against Hayes Microcomputer Products, Inc. in San Jose Federal Court charging trade libel, false and misleading advertising and unfair competition. The suit was prompted by a series of allegedly inflammatory Hayes ads claiming that an escape sequence used by some modem manufacturers, including Sierra, will cause "untold chaos" and that "the only solution to the crisis is to replace their modems," Sierra said.

Consortium eyes fast backplanes

General Electric Co., AT&T, Honeywell, Inc., and IBM have formed the Optoelectronic Technology Consortium to develop multigigabit/sec., fiber-based backplanes for multiprocessor computers and telecom switches. Backed by $8 million in Defense Advanced Research Projects Agency funding, the project aims to develop "precompetitive" technology.

Chase outsources in Brazil

A senior information systems executive at Chase Manhattan Bank NA last week said that the $97 billion banking company has outsourced its Brazilian data center operations to IBM-Brazil for an unspecified cost. The executive said Chase typically spends $1.5 million annually to maintain its Brazilian data center and that the decision to outsource will yield Chase some small cost savings.

Short takes

Greg Carroll took over as president of the **Computer Dealers and Lessors Association**, succeeding Kenneth Bouldin, who had been president since April 1988. . . . **IBM** and **PacifiCorp Capital, Inc.** settled an IBM-initiated suit over remanufactured memory. PacifiCorp will be required to tell customers when it uses memory remanufactured without IBM's consent. . . . **Sun Microsystems, Inc.** will use products from **Sybase** throughout its worldwide operations. It has an unlimited use license. . . . **Information Builders, Inc.** will introduce low-priced "starter kits" for its EDA/SQL database access product line in the fall. . . . **CompuServe Information Service** is providing its users with the chance to go job hunting electronically, through access to the Adnet Online, the electronic help-wanted advertising service.

Northgate readies new PC line

Mail-order firm plans aggressive pricing strategy for Slimline ZXP

BY MICHAEL FITZGERALD
CW STAFF

EDEN PRAIRIE, Minn. — Northgate Computer Systems, Inc. last week confirmed plans to replace its Slimline personal computers with a new line this month. The new models, which will feature processor upgradability, the use of virtual cache and local-bus video, are also expected to sport a short-lived price advantage.

Phil Deering, Northgate's marketing services manager, said the company's base systems will cost less than Compaq Computer Corp.'s 486-based Deskpro/I, which currently ranges in price from $1,879 to $2,549 without a monitor (see chart).

The new line, called the Slimline ZXP (for zero-insertion force expandable processors), will begin shipping the week of Aug. 24, according to Deering. He said Northgate's sales force will begin selling the new line to major accounts this week.

Under pressure

Analysts welcomed the new line, but they said continued product and pricing pressure from vendors such as Compaq will further challenge the struggling mail-order vendor, which recently sold 51% of its stock to an investor group after Everex Systems, Inc. backed away from a deal to buy it.

"The pricing seems pretty aggressive, but the problem is, what kind of margins will they get on this?" said Steve Widen, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "Other companies are going to come out with aggressive pricing, too, so the question is do they have the staying power, and I don't have the answer for that."

Both Compaq and IBM are expected to make major product moves in September, and Widen cited Dell Computer Corp. and Leading Edge Products, Inc. as other companies rumored to drop prices.

Deering said Northgate expects to reduce prices in the future as well.

Northgate will use the full line of Intel Corp. 1486-based processors, including the 486SX, 486DX and DX2 products.

Deering would not comment on whether Northgate would specifically use the rumored 33/66-MHz DX2 or 33-MHz 486SX processors, but he said that if Intel delivered these products this month, as expected, Northgate will support them.

Use of a zero-insertion force, or ZIF, socket in the new line will provide for simple upgradability. Northgate also intends to eliminate its math coprocessor socket to make way for Intel's upcoming plastic packaged processors.

The use of virtual cache involves eliminating the cost of cache memory. Cache is used to speed up PC performance. Northgate's virtual cache design will use write buffers to eliminate wait states during the processor write cycle. Deering said performance will at least equal that of systems with cache.

The advantage of the local bus comes when a user upgrades the processor. In an ordinary system, video performance improves only somewhat after a processor upgrade. With a local bus scheme, video improves in direct proportion to the processor speed.

The next generation

Northgate's coming family of Slimline ZXP desktop computers will replace its Slimline systems

Product features

Northgate will use the full range of 1486 processors from Intel. All the products will come with a local-bus video and virtual cache that uses a write buffer, and they will be fully upgradable through a ZIF socket.

Preliminary pricing

One example is a 25-MHz, 486SX-based ZIF expandable processor, with 4M bytes of RAM, 120M-byte hard drive, Panasonic Super VGA monitor and 1M-byte of video RAM, which lists for $2,149.

CW Chart: Janell Genovese

Everex mulls restructuring, other cost-cutting measures

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Onetime personal computer highflier Everex Systems, Inc. may be wishing for a parachute. It will not make money in the fourth quarter and may lose money for the year.

In addition, Everex confirmed last week a report in the *Silicon Valley Business Journal* that it is considering ways to cut costs. Cost-cutting measures could include a restructuring, although the company refused to comment on reports that it will lay off more than 20% of its work force.

Worse, some industry observers, who requested anonymity, said Everex is on their short list of PC companies that may not survive. These same analysts said the company has told them it wants to cut operating expenses from its current 20% of revenue to 15% or 16%, which one analyst said implies a cut of 400 to 500 people. The company employs between 2,300 and 2,400 people.

"Look, people have tough quarters. We are going to survive," said David Zacarias, Everex's chief financial officer.

Eric Zimits, an analyst at William K. Woodruff & Co. in Dallas, called it this way. "Everex is one of the weaker participants in the market, and it has to take things [such as layoffs or belt tightening] one step further than healthier companies. But it should make money for the year," he said.

While Everex posted solid results in 1990, the company lost money in 1991. Analysts said it has had problems getting products to market and staying focused, as it sells a number of peripherals in addition to systems.

The company has also cast about for ways to expand its channels, recently abandoning an effort to buy mail-order PC maker Northgate Computer Systems, Inc.

Others said company founder Steve Hui, who owns an ostrich ranch, was caught with his head in the sand by events such as Compaq Computer Corp.'s June product release and price cuts.

Genelle Trader, vice president of marketing at Everex, would not comment on whether layoffs were being considered. She said Everex expects to have a plan in place by the end of the month. She also firmly denied a report in the *Silicon Valley Business Journal* that Everex will abandon its midrange PC lines to focus on its high-end Step Cube line of servers and its low-end MaxLogic line.

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Outsourcer Confirms demise of reservation coalition plan

BY MARK HALPER
CW STAFF

FORT WORTH, Texas — After spending $125 million over 3½ years, a user consortium developing the state-of-the-art Confirm travel industry reservation system all but disbanded last week, undone by the insurmountable task of integrating a reservation database and decision support software.

"We have decided we'll stop development of the system unless our partners decide to come back into the process," said Joseph Atteridge, president of AMR Information Services, Inc., the lead player in the four-member Information Consortium (Intrico) working on Confirm.

The other Intrico partners — Hilton Hotels Corp., Marriott Corp. and Budget Rent A Car Corp. — had until last Friday to decide whether to rejoin Confirm. Atteridge was skeptical at midweek that they would rejoin.

AMR, based here, stated in a press release last month that it took a $109 million write-off for its second quarter ended June 30 to reflect "anticipated losses associated with Confirm."

The Confirm system had been billed as the first computerized reservation system that would fully combine airline, hotel and rental car operations. Its collapse comes as several outsourcing companies, including Electronic Data Systems Corp., IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary and Perot Systems Corp., feverishly chase travel industry clients in their own efforts to build an all-encompassing system.

One coveted prospective client, The Hertz Corp., is entertaining outsourcing offers from EDS and ISSC while weighing information systems changes.

Intrico's demise enhances the possibility that its members could seek partnerships with other companies. Marriott, for instance, is believed to have held outsourcing negotiations with EDS during the last 18 months.

Intrico partners were relying heavily on expertise from AMR, a data services and outsourcing company that is a sister to American Airlines in the AMR Corp. fold. AMR was leveraging know-how from American's Sabre airline reservation operations and from a separate AMR Corp. unit that provides yield management software.

Atteridge said the task of tying together Confirm's Transaction Processing Facility-based central reservation system with its decision support system proved to be overwhelming.

"We found they were not integratable," he said. "The data flow between them was not smooth."

The problem had surfaced earlier this year when Intrico disclosed it would delay Confirm by 18 months until the end of 1993 [CW, May 11].

It is unclear what will become of the lines of code that AMR has developed to date and whether all of the consortium members will claim ownership to that code.

"We have not had those discussions," Atteridge said, adding that as the partners dismantle their joint-development effort, "that will be one of the negotiating points."

Microsoft ships Mail 3.0 at last

After months of providing previews and demonstrations, Microsoft Corp. officially shipped Mail 3.0 last week. The software was promised for the end of June.

It includes support for the Messaging Application Programming Interface, which allows diverse applications to be "mail-enabled."

Mail 3.0 is available now for a list price of $695, including a 10-workstation license. Additional workstation licenses are available in 5-, 20-, 100- and 500-workstation packs for prices ranging from $395 to $22,500.

In addition to Mail 3.0, Microsoft unveiled Schedule for Windows, a calendaring application for workgroups and individuals. Schedule, which allows users to schedule tasks and invite other users to meetings via electronic mail, is the first of two workgroup applications Microsoft said it would ship this year.

Pricing for Schedule begins at $195 for a two-workstation starter pack. Additional packs are available.

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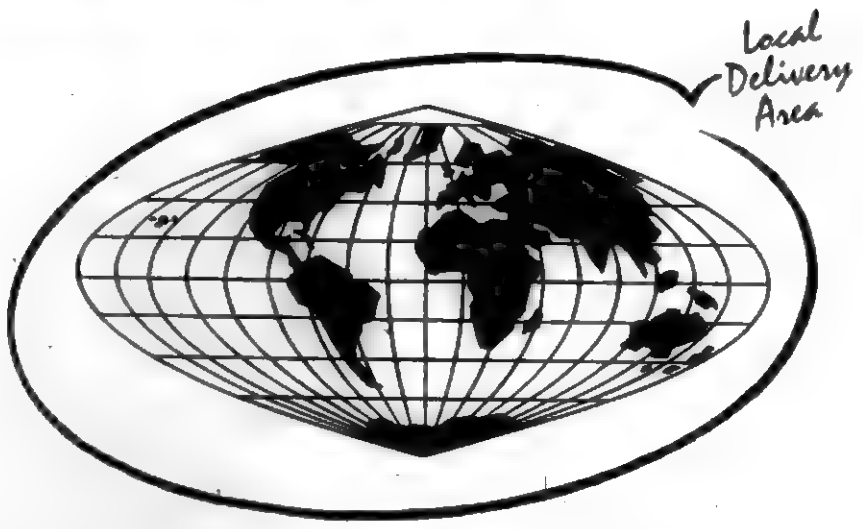

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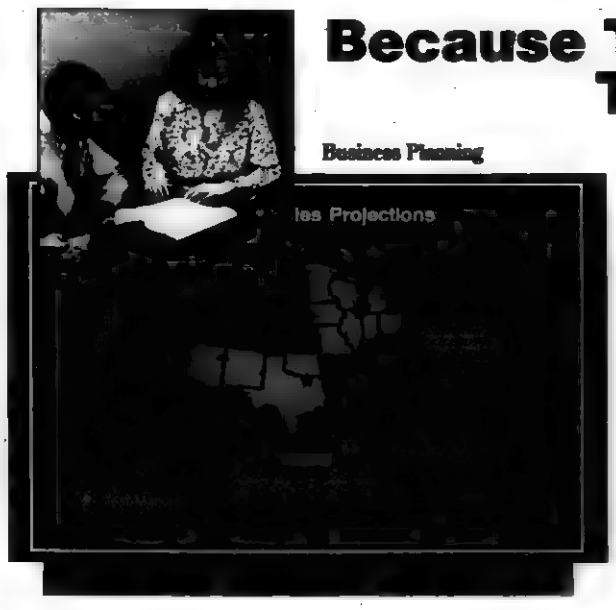

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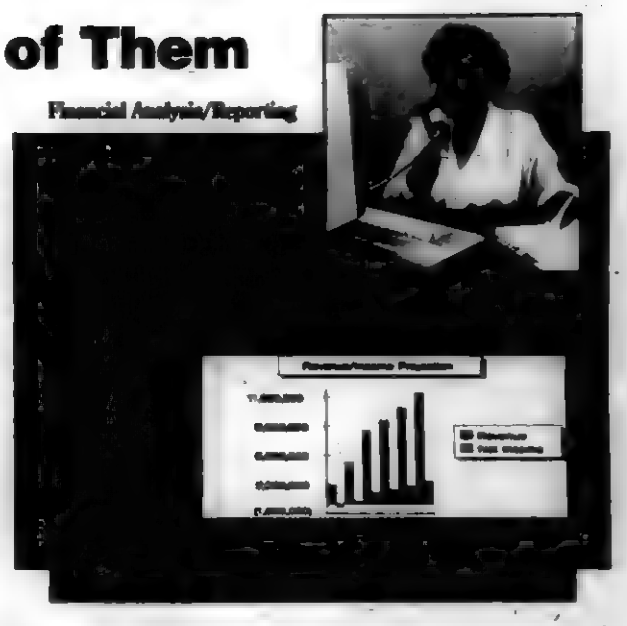

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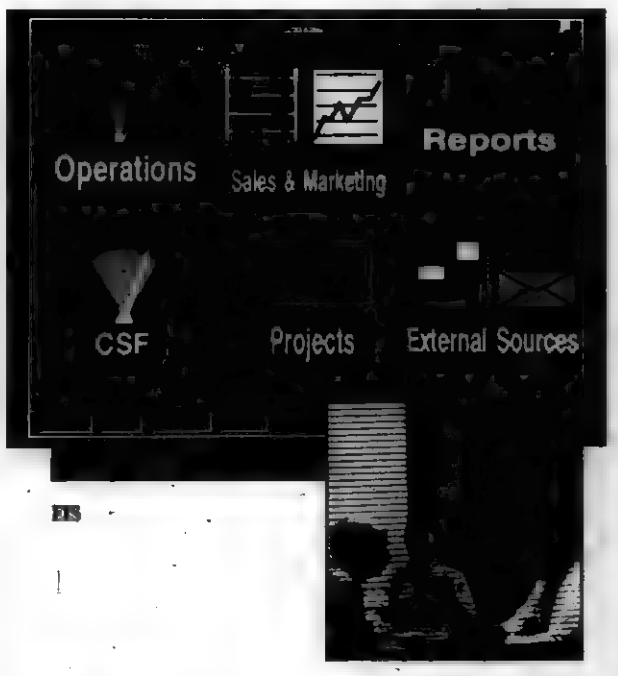

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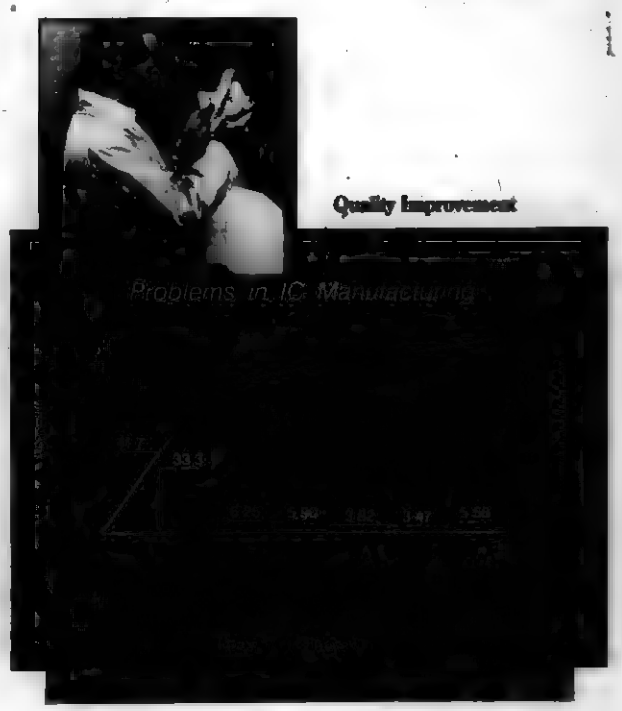

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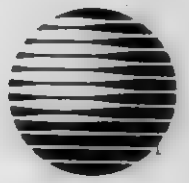

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Clinton pushes investment in high technology

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Taking a cue, perhaps, from departed presidential candidate Ross Perot, Arkansas Gov. Bill Clinton held an electronic town meeting at Tandem Computers, Inc. last week. He used the opportunity to advocate federal policies that would encourage investment in high-tech firms.

Anchoring a nationwide teleconference with 100 downlinks that reached 8,500 Tandem employees, Clinton answered questions called in from remote sites as well as those from an audience of 200 at Tandem's headquarters. He directed some of his commentary toward fueling economic growth by changing the country's investment practices.

"The way the American budget is organized, we make no distinction between borrowing for investment and borrowing to spend," Clinton said, adding that good investments include new factories, more research and development and better education.

Clinton promotes high-tech programs

Clinton has pledged to double the rate of government spending on investment, which is currently about 9%, by ensuring that every dollar taken from military R&D will go into R&D for civilian technologies. "Our country ought to operate more like the best global companies," he said. "We ought not to resist change and [become] a country that has a high-wage, high-growth strategy."

Members of the audience were impressed by the breadth of the discussion, but they wanted to hear more about high technology and computers. "His comments were not specific, but he felt he had to address the need for some kind of comprehensive industrial policy," said Chip Greenlee, manager of finance industries marketing at Tandem.

Some observers approved of Clinton's idea to create a civilian equivalent of the Defense Advanced Research Projects Agency (DARPA), which stimulated defense research. Clinton has said his administration will create a nonmilitary DARPA to help develop technologies and bring new products to market.

Intel loss may open chip market

BY MICHAEL FITZGERALD
CW STAFF

SHERMAN, Texas — Cyrix Corp. scored a major win in a lawsuit against Intel Corp. that may open the door for extensive competition and innovation in the microprocessor arena.

A federal judge ruled two weeks ago that Cyrix's FasMath math coprocessor, which mimics Intel's 80387 coprocessor line, could be legally made by SGS Thomson Microelectronics, Inc. under the protection of SGS' extensive cross-licensing patents with Intel.

The judge extended the decision to include any products SGS might make for Cyrix, not just math coprocessors.

This raises the possibility that a major semiconductor company with extensive cross-licensing agreements such as SGS could build chips designed by anyone, even if these designs infringed on patents.

"This decision is of much more importance for other companies who are thinking about cloning some of those parts. This opens up the whole issue of semiconductor companies [without fabrication plants] gaining access to broad-based patents," said Drew Peck, an analyst at Donaldson, Lufkin & Jenrette Securities Corp. in New York.

F. Thomas Dunlap, Intel's general counsel, said considerations such as these made the decision fly in the face of patent law. "This is a decision unique to the state of Texas."

While the case, and therefore the decision, does not address questions about whether Cyrix's design infringes on Intel patents, Intel acknowledged that it would be unable to pursue this issue until early next year, when a separate trial against Cyrix begins.

In the meantime, analysts said Cyrix will gain some credibility in the chip market.

"Cyrix won both a legal case and marketing momentum," said Ken Lowe, an analyst at Dataquest, Inc., a consulting firm in San Jose, Calif. "It's going to open the door for a lot more companies to look at their chips."

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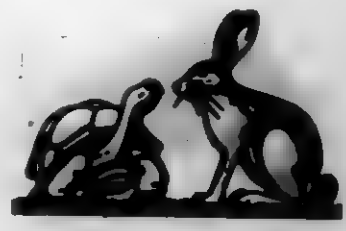

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All models include high-resolution 1024 x 768 video and preinstalled Microsoft MS-DOS 5.0 as published by Compaq

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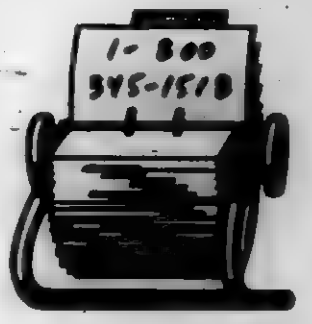

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ADVANCED TECHNOLOGY

TECH TALK

Making waves unseen

■ Utilizing new supercomputer software, designers may soon be able to study in finer detail how electromagnetic waves interact with the surfaces of aircraft, missiles and other objects, which raises the possibility that vehicles could better hide from radar detection. Cray Research, Inc. recently claimed a breakthrough in electromagnetic simulation and design with the development of a software tool that reportedly helps aerospace engineers understand how electromagnetic waves impact and scatter from a vehicle's surface. Cray said the Electromagnetic Design System (EMDS) is the first such product available for supercomputers. The product is in beta-test form now, and it is awaiting release for Cray's Y-MP supercomputers. The company also indicated that a future version of EMDS will model electromagnetic waves at the electron level, which will make it useful in integrated circuit design.

Eye on the future

■ As part of a recent program sponsored by Apple Computer, Inc., college students tried to provide the computer industry with a look at the computer of tomorrow. Teams of students from seven universities produced prototypes of futuristic computers that included portable and wearable computers, a computer that translates sign language into voice display and one that uses the Global Positioning System to provide landscape architects with precise site information. The university teams were asked to create interfaces for a family of three related computers to provide Apple with feedback on how people want to use computers.

Upcoming

■ Virtual Reality '92, an exhibition and conference focusing on virtual reality, artificial reality and cyberspace, is scheduled for Sept. 23-25 in San Jose, Calif. It is sponsored by Meckler Corp. in Westport, Conn.

Big things come in small buttons

Able to stick to virtually any object, memory buttons provide a wealth of information

BY MITCH BETTS
CW STAFF

Technologists have long promised "information at the touch of a button" and have seldom delivered. But a new technology, sometimes referred to as "smart buttons," makes good on that promise in the most literal way.

In this case, the technology starts with a "button," a stainless-steel can that looks like a watch battery and is about the size of a dime. Inside the button's protective (and conductive) shell is a special read/write microchip that holds up to 512 characters of information.

Next comes the touching part. With a handheld data terminal and a penlike probe, the user touches the probe to the button, hears a "knock" sound that confirms the electrical connection and then reads the stored data or updates it.

The buttons are cheap enough — roughly $2 to $7 each — that users can attach them with adhesive backing to virtually anything, from employee security badges to big-ticket equipment that must be monitored or tracked in the field. For example, a button that contains a record of all service calls could be stuck on a furnace.

"What's driving this technology is having the information attached to whatever it's describing," said Kevin R. Sharp, a Tucson, Ariz.-based consultant specializing in automatic identification systems. In other words, imagine having a big sticky-note attached to any object, even objects that get rough handling or are subjected to harsh environments.

"Originally, it didn't impress me ... but then I noticed at a trade show that the vendors just got mobbed, mostly by users with very specific problems that they could solve with buttons, because of the [relatively low] price point," Sharp said.

So far, the beta-test users have declined to go public with their pilot implementations, but Sharp said one of the most promising applications is access control for high-security buildings.

A button attached to an employee's identification badge is pressed onto an electronic lock that determines whether the employee can enter that area and then time-stamps the employee's entrances and exits. The button has a unique serial number etched into its memory that makes it tamper-resistant and impossible to copy.

Vendors said dozens of other applications are possible, including stick-on buttons for hospital ID bracelets, hazardous waste drums, fire extinguishers, factory work-in-progress, medical samples, cargo containers, fleet vehicles, storage tanks and even ID tags for livestock.

Laboratories are one *place that can benefit from button technology*

Choices

Memory buttons fall into the same technology niche as bar codes and radio-frequency ID tags. However, all three should be viewed as complementary rather than competing techniques, according to Bert Willoughby, a Pipersville, Pa.-based consultant on automatic identification technology.

"They all have their place in the factory and warehouse of the future," he said. For example, buttons could be used to track maintenance tools, generators and compressors that are exposed to bad weather, oil and the kind of rough treatment that would obliterate a bar-code label.

In addition to simple asset tracking, the advantage of the button technology is the ability to write onto the chip every time maintenance is performed for that piece of equipment, Willoughby said. "You can change the information content of that button at will and at essentially zero cost. With bar codes, you have to change the label," Sharp added.

The pioneer of the button business is Dallas Semiconductor Corp., a specialty chip maker in Dallas that introduced its Touch Memory buttons in July 1991. Several other vendors sell handheld, read/write devices for the Touch Memory buttons (see chart below). For example, System Integrators, Inc. in Chesterfield, Mo., markets a pen/probe that plugs into the GridPad, a pen-based computer from Grid Systems Corp.

The Touch Memory buttons are powered by an internal battery that lasts 10 years and can withstand temperatures from minus 4 to 158 degrees Fahrenheit. Secure versions can be protected by a password.

In March, Dallas Semiconductor was joined in the button market by MacSema, Inc. in Albany, Ore. MacSema's brass buttons are made with erasable programmable read-only memory chips that do not need an internal battery — the power comes from the data reader — so they can retain data longer and survive more severe temperature ranges.

"If you're dealing with outdoor environments, unheated warehouses or high-temperature industrial processes, the batteries become a real liability," Sharp said. However, MacSema's buttons are 50% more expensive.

For information systems managers, the challenge will be integrating buttons with mainstream computer systems. A few vendors offer the ability to upload the data captured from the buttons into a personal computer via a special docking station or an RS-232 serial interface.

IS managers used to dealing with central databases will have to learn a new way of thinking: With memory buttons, the information is very widely dispersed and not easily managed.

"The hardware integration issues are easy. But the software issues about how to manage that distributed data and how to back it up and how to keep it coordinated when multiple people need access to it — those are real tough issues that need to be solved," Sharp said. "And that is what IS managers get paid big bucks to do."

The vendors

Vendors of memory button systems include the following:

- **Cannac Systems Ltd.**, Mississauga, Ontario.
- **Control Module, Inc.**, Enfield, Conn.
- **Dallas Semiconductor Corp.**, Dallas.
- **Dynasys Technologies, Inc.**, Clearwater, Fla.
- **MacSema, Inc.**, Albany, Ore.
- **System Integrators, Inc.** Chesterfield, Mo.
- **Videx, Inc.**, Corvallis, Ore.

CW Chart: Michael Siggins

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	OS/2: Win-OS/2 Full Screen	DOS 5.0 & Win 3.1 Full Screen
WordPerfect® (spellcheck)†	38.5 sec	43.6 sec
AmiPro™ 2.0 (print)††	95.1 sec	104.6 sec
Preemptive multi-tasking of Win apps	YES	NO
Crash protection	YES	NO

IBM

*In Canada, call 1 800 465-7999. Tests conducted by NSTL. System under test is a PS/2 57SX w/4MB RAM and an 8513 VGA display. Under Windows 3.1, applications were loaded and/or executed from the Windows 3.1 Program Manager. Under OS/2, applications were also loaded and/or executed from the Win-OS/2 Full Screen Program Manager. Both Windows 3.1 and Win-OS/2 use a disk cache of 64KB. †Word processor spellcheck: The time required to spellcheck a document with no spelling errors. Open the WordPerfect for Windows 5.1 document entitled "macro.doc". Select TOOLS from the menu bar, then select SPELLER. Select OPTIONS from the SPELLER menu bar, and deselect all of the options. Click OK. Test was timed from the click until the user regained control of the application. "Macro.doc" contains 21 pages and is 47,455 bytes. ††Word Processor Print: The time it took to print a word processing document. Open the AmiPro 2.0 document entitled "printest.sam". Select FILE from the menu bar, then select PRINT. Select FROM page 1 to 1 and click OK. The test was timed from the click until the first page completed printing on the printer. Windows 3.1 used the IBM LaserPrinter 4029 PS17 PostScript printer driver shipped with the Windows 3.1 software package, and Win-OS/2 used the IBM 4029 v2.1 (17 font) PostScript printer driver shipped with the OS/2 2.0 Operating System using LPT1.OS2. NSTL makes no warranties, express or implied, as to results to be obtained by any person or entity from use of the services or the results thereof, or any information or data included therein. NSTL makes no express or implied warranties of merchantability or fitness for a particular purpose or use with respect to the services and/or results thereof, or any information or data included therein. NSTL makes no recommendation or endorsement of any product. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1992 IBM Corp.

EDITORIAL

Playing hardball

Professional athletes competing in team sports really have it made. They negotiate a salary — often well into seven figures — and then go out and play ball. Should they happen to play particularly well, they clamor to sit down again and do something distinctly American — they *renegotiate* for a better deal.

The beauty of this arrangement from the ballplayer's point of view is that it is a one-way street. Should the athlete have a dismal season, like most any one of the Boston Red Sox this year, for example, the team ownership has no right to sit the player down and renegotiate a lower salary commensurate with performance.

Ahhh, if only it were so in the business world.

Guess what? A growing number of users who have outsourced parts of their information systems operations have taken a page from the athletes' handbook and have renegotiated some of those long-term contracts signed in the past few years.

Speaking at his own outsourcing conference last week, The Yankee Group founder Howard Anderson cited a number of factors contributing to a kinder, gentler negotiating environment. For one thing, users are entering a new generation of outsourcing — what The Yankee Group calls "smartsourcing." It is characterized by users taking a more selective approach to outsourcing while maintaining a relatively high level of control over those parts of the operation turned over to the vendor.

Anderson labeled outsourcing heretofore as a "one-trick pony" that targeted cost-containment primarily, and he added that outsourcing has "proved to be the canard it is." While the outsourcing providers might well disagree with Anderson, this increasingly selective outsourcing coupled with growing user wariness is resulting in vendors' willingness to sit down at the renegotiating table.

As one major outsourcing provider told me, "The users are just a lot smarter and more demanding, and we have no choice but to follow their lead. We've got to show them a lot more added value than just saving money. We've also got to build contracts that are flexible enough to respond to the business environment itself."

In the final analysis of this situation, we have yet another expression of the ongoing empowerment of the user. To date, the manifestations of this empowerment have included more user-amenable software licensing, much more aggressive large systems hardware pricing and now the ability to renegotiate long-term outsourcing contracts.

Kind of like when a so-so ballplayer unexpectedly hits 35 home runs in a season.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

No place for government intervention

It would be a sad day for the vitality of information in the U.S. if David H. Rothman's proposal ["Information access for all," CW, July 6] came to pass.

Rothman envisions a beautiful idea — electronic libraries. But then he proposes getting the government's nose into the tent with a tax on televisions to finance purchasing the computers and paying for instructors.

We might address the moral issue first: What right do people who want to access books through computers have to do so at the expense of people who prefer to watch television?

Second, having the government finance the Tele-Read concept would mean letting the government control it; this would inevitably lead to either a direct government monopoly on downloadable libraries or heavily regulated public utilities.

We should be lobbying not for government subsidies but for a governmental environment that will not block the way of experimentation and innovation.

Gary McGath
Penacook, N.H.

.....

I was appalled at David Rothman's recommendations.

Sure, increasing computer literacy and universal access to on-line information are swell goals. But it never ceases to amaze me that some people in the information business just don't get it. We want digitized literature? Require it by law!

Gee, just imagine how much more successful companies such as Apple and Microsoft would have been if only they'd had government subsidies and preferential treatment when they were starting out!

Richard Knudson
The Information Management Group
Chicago

Virus book unworthy of publication

In the article "Virus fighters fume over little black book" [CW, June 29], experts reacted to the ethics of the publication of Mark Ludwig's book, which contained real virus code.

The publication of viruses is reprehensible, in part because the author cannot control how the virus will behave in the population at large.

Indeed, he cannot know enough about the population to even begin to predict.

It is still more reprehensible because knowledge of a virus is essentially sufficient for its use — nothing else is required.

Ludwig's action is motivated by nothing more than greed; he deserves the censure and notoriety that will surely be his.

We are all somewhat poorer for the actions of Ludwig and his publisher. Even terrorists do not poison the well.

William Hugh Murray
New Canaan, Conn.

Readers deserve thorough research

The general rule is that in mixed company, one should never discuss religion, politics or word processors. We all have a position — deeply entrenched if not well-thought-out — and little or no tolerance for someone else's. Hence, your Product Spotlight on new word processors [CW, July 20] took on an ambitious and emotional subject.

If you are going to take a stance, then you should at least be thorough in your research and hands-on product testing.

In three separate places in the article, Alan Radding swoons over Ami Pro's ability to find the recipient's address in a letter and create an envelope and points this up as a differentiating characteristic of the product.

Even the most casual perusal of Microsoft Word's Toolbar (or documentation) would have demonstrated that it has precisely the same feature.

My point is not that the packages are identical or even equal, but that incomplete research can create artificial differences on which your readers may base purchasing decisions.

Irwin L. Goverman
Deloitte & Touche
Los Angeles

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CIOs, get out of your cocoons

TIM BRYCE

It has often been said that there should be two presidents of the U.S.: one to deal with politics and another to tend to the true affairs of government.

The same could be said about chief information officers. Although they should be tending to matters involving the state of information systems, they are often too preoccupied with politics and gamesmanship.

A CIO is supposed to be the focal point for a company's information resources, acting as both chief architect and information broker. Although the position often comes with much pomp and circumstance, all that is for naught if the CIO cannot effectively tend to this pivotal role.

Wearing many hats

In order to do the job properly, a CIO must deal with a wide spectrum of people and situations, not all of them pleasant. He has to find answers for end users concerned about the status of their development projects or problems with existing systems; deal with technicians who argue over tactics of implementation; listen critically to vendors marketing the latest technical panacea; and justify expenditures to accountants.

Sound hectic? It is. And that's why CIOs often try to insulate themselves by building an electronic cocoon of voice mail and E-mail. By coordinating these two technologies and using them as screening devices, it is almost possible to avoid human contact altogether.

Of course, the elusive CIO doesn't want to avoid *all* contact — just contact that draws him into the day-to-day fray and distracts him from hobnobbing with the corporate brass. As problems rise through the organization, the CIO simply adds another layer of management to deal with the problems.

The CIO's final sentry is his secretary. Instead of serving as an expediter, for many CIOs, the secretary has more of a "pit bull" role, with explicit orders to keep anyone from disturbing the boss.

In addition, CIOs frequently speak with forked tongue. Although they may balk at technical discussions with their own staffs, some CIOs love to overwhelm executive management with their technical verbosity.

Conversely, they dazzle the technical staff with management jargon, discussing the "global impact" and "bottom line strategies." As a consequence, the CIO fails miserably as translator between management and the technicians. He plays a different part for each group, making sure neither group can understand (or attack) his grandiose ideas.

Insulated by E-mail and voice mail, protected by platoons of managers and his diligent secretary and lulled by his repetition of catchphrases, the CIO can finally relax. That sense of peace and security is false, however. Executives and users want to know why their needs aren't being met, and IS professionals are milling around in confusion, waiting for their marching orders.

Without proper management, chaos will reign, and the CIO's tenure will be brief. How can an IS department plan for the future if there is a revolving door at the top?

CIOs must shed their insular layers and become accessible to their own people and executives. Only then will IS be synchronized with the goals of the business.

Bryce is a management consultant in the Tampa Bay area of Florida and co-author of the book, The IRM Revolution: Blueprint for the 21st Century.

The business of immigration: Talent should be the passport

MITCHELL GORSEN

Our immigration laws should be liberalized to allow more highly skilled foreigners into the U.S. on a permanent basis.

Today, only 1 in 10 foreign workers is permanently admitted to the U.S. based on skill, and there is an annual cap of 65,000 temporary nonimmigrant professionals. We need to lift the ceiling.

Many large technology companies have cut back operations and laid off workers, particularly in the area of computer hardware, but a long-term labor shortage remains.

Logging interest

Last year, UCLA surveyed 200,000 incoming freshmen in the U.S. and found that less than 1% expressed an interest in computer programming. Ironically, the demand for software professionals between 1990 and 1991 rose over 10%. These trends suggest that the pipeline to America's high-tech talent pool is beginning to run dry.

Replenishing the labor pool is a critical issue for the U.S. technology industry. Over the long term, this will require greater interaction between industry and academia and an educational system that places high priority on explicit technical expertise such as software engineering or factory automation.

HIGH-TECH TALENT GAP

In the next 5 to 10 years, however, the talent search must be conducted on a global scale and supported by federal government policies that promote the immigration of highly skilled technical professionals.

The U.S. is not the only post-industrial nation facing a high-tech talent gap. Immigration is rapidly becoming a matter of national competition.

Despite the technology gains immigrants have already brought to America, current U.S. immigration policy is not enlightened. Rather than expedite the entry of human capital, the immigration system does the opposite; it is an antiquated machine fueled by a mix of country quotas, ceilings, excessive forms and fees, unreasonable documentation and delays.

Any agenda for renewed U.S. economic competitiveness must include a new set of policies governing the immigration of high-skill, high-tech professionals. The revamping should support:

- Dramatic increases in the numerical and procedural preferences available for professionals, executives, investors and designated shortage occupations.
- Expedited processing of computer-generated and stored forms and documentation.
- Simplified forms electronically linked to an integrated information system shared by the Immigration and Naturalization Service, the Department of State, the Department of Labor and other interested agencies.
- Equitable and reasonable compensation of temporary foreign workers and visitors and the elimination of loopholes that allow wage and salary levels set by foreign employers at predatory levels.
- Enactment of the immigration reciprocity provisions in the pending North American Free Trade Agreement.

Immigration policy is one of the lightning rods of American politics. Liberalization even has its critics within the technology industry. These are often professional services firms, which point to systematic abuses of the visa process, particularly where foreign-based employers import highly skilled workers into the U.S. but pay them at sweatshop rates.

That's a problem, but it can be addressed easily through changes to the federal regulations governing the visas of visiting workers.

Our competitive future depends on our ability to design and develop high-tech, high value-added products and services. We can't do this without a rich pool of technical talent and innovation.

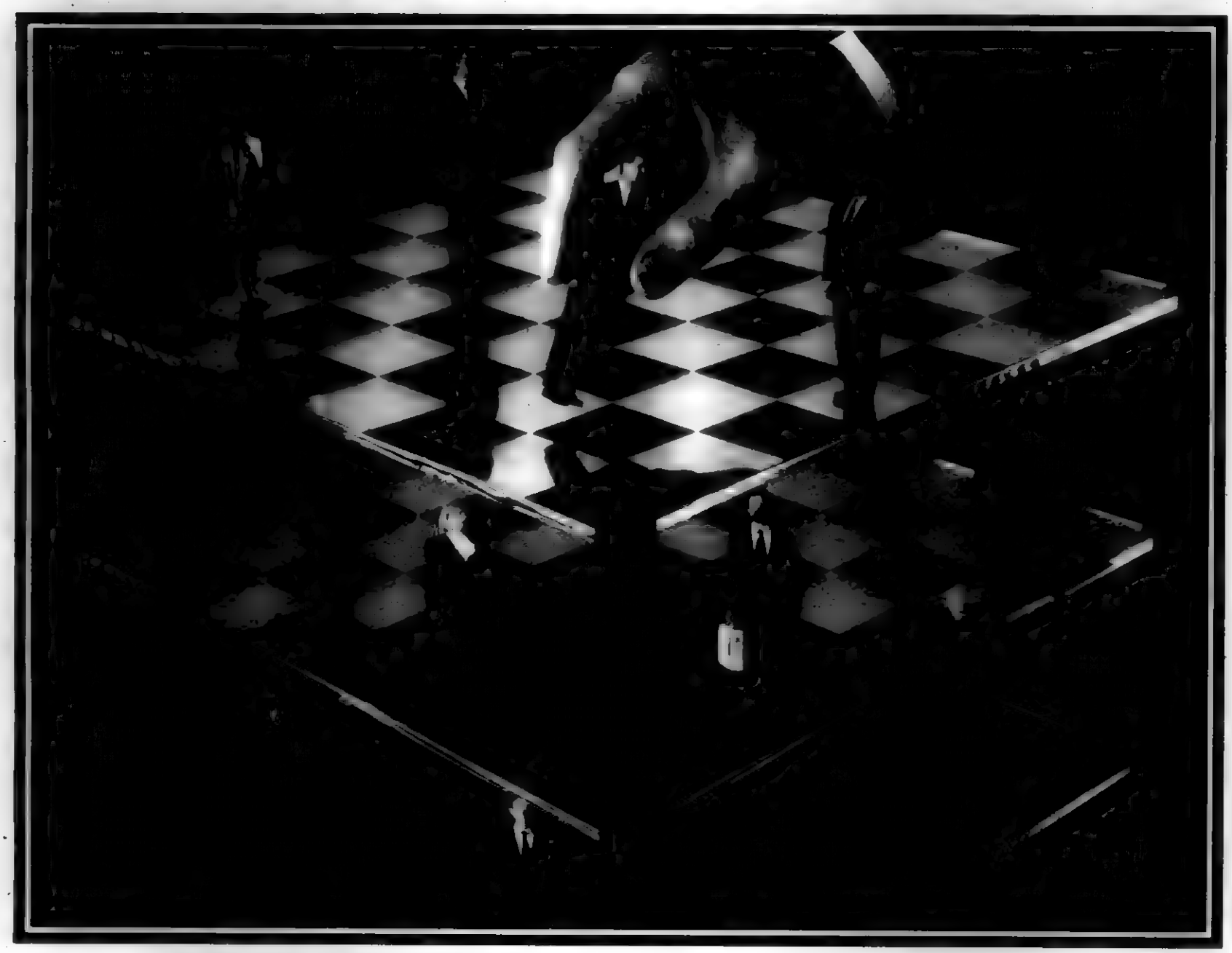
With those resources, however, we can create technologies that redefine the status quo and create wealth, jobs and opportunities for everyone.

America's great democratic traditions and personal liberties are a powerful force in attracting foreign professionals. That's a competitive advantage.

It's time we recognized that fact and put the advantage to work for us.

Gorsen is vice president of the Information Technology Association of America.

YOU CAN'T KEEP THE COMPETITION IN CHECK UNLESS YOU ANTICIPATE ALL THEIR MOVES.



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Robust AST announces broad price reductions

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — In almost a single breath, AST Research, Inc. last week announced record sales and profits for fiscal 1992 and cut prices across most of its product line, including up to 47% off its notebooks.

Mike Morand, vice president of marketing at AST, said in a prepared statement that the company made the price cuts to compete more effectively in the current environment of vicious price cutting.

Industry observers said the price cuts were not as impressive as they might sound, particularly since AST's major price cuts came on their notebook products, the Intel Corp. 80386SX-based Premium Exec line. The lowest priced Premium Exec is now $1,395 with a 40M-byte hard drive. Prices overall were cut between 42% and 47% and between 12% and 20% on its color notebooks. Its lowest color notebook price is now $2,895.

Clearance sale?

Most of "those notebooks are old products at this point, so it looks like they're just pricing them for a close-out sale," said Bruce Stephen, director of personal computer hardware research and pricing at International Data Corp. in Framingham, Mass. "I think the whole announcement is a precursor to doing a new product blitz."

It has been rumored that AST is readying a line of new products for release in the fall.

The price cuts did give AST some products that clearly are competitive with new low-cost lines from vendors such as Compaq Computer Corp. For instance, the price of its 25-MHz 386SX-based Bravo 3/25s dropped 31% to $895. But prices on the rest of the Bravo line fell between 11% and 29%. AST cut prices on its Power Premium line up to 17%.

The company reserved its biggest price cuts on nonportables for its servers, which now sport slight enhancements and 14% to 30% lower prices.

AST also cut prices on its monitors and storage option kits.

AST was nearly the last major vendor to cut prices in the wake of Compaq's sweeping announcement of the Prolinea and Deskpro/I lines recently. Analysts said AST's earnings were likely to slip.

AST reported profits of $68.5 million on sales of $944.1 million for fiscal 1992, up from $64.7 million on sales of $688.5 million in 1991. For the fourth quarter, AST saw profits drop to $18.6 million from $20.4 million in the year-earlier period, though sales rose from $211 million to $266.3 million.

Report writing made simple

End users can process host data at the desktop with Intelligent Query tool

BY CHRISTOPHER LINDQUIST
CW STAFF

At one time, "ad hoc report" was something of a contradiction in terms. Collecting, processing and formatting data were jobs for information systems departments, not end users. A variety of easy-to-use report writer/querying tools are changing that.

One such tool is the recently introduced Intelligent Query Version 3.0 from IQ Software Corp. in Norcross, Ga. Meanwhile, a second vendor, Business Objects, Inc., claimed to provide similar capabilities for personal computer users seeking to access Oracle Corp. databases (see story below).

Intelligent Query allows users to gather and format data using pop-up menus and a screen painter. A wide range of operating platforms — DOS, Unix and VMS — as well as more than 60 database formats — including Oracle, Novell, Inc.'s Btrieve and Fox Software, Inc.'s FoxBase — are supported, allowing users transparent access to a diverse amount of information across an enterprise.

Gary Alexander, manager of accounts payable systems at General Electric Co.'s Corporate Information Technology Group, uses Intelligent Query to allow end users in accounts payable to utilize server-based data rather than having to go to a mainframe — and expensive mainframe time — for the information. Going to the mainframe required the use of querying tools beyond the grasp of most end users.

Alexander was looking for a query tool that would allow him to treat multiple physical databases as a single logical file. After looking at a half-dozen different products, he settled on Intelligent Query. "This was the only product that allowed us to do that," Alexander said.

Another user, Clark Lennert, president of Micro Electronic Data Systems, Inc., was particularly impressed with Intelligent Query's ease of use. "It looked too easy to be true," he said, "so I evaluated several other products, and [Intelligent Query] came out on top as far as ease of use and [support for] multiple platforms."

Users generate reports with Intelligent Query by navigating a series of menus using arrows and the Enter key to choose fields. Once retrieved, data can be cut and pasted to create a custom report in the desired format.

Simple bar graphs and histograms can be created and added to the reports. Information can also be exported in various formats. Intelligent Query is available at a starting price of $500 for the DOS version and $2,000 for the VMS version.

Product
Intelligent Query Version 3.0

Vendor
IQ Software Corp., Norcross, Ga.

Description
Database-independent report writer and query tool intended to be easy enough for end users. Supports more than 60 database formats and three operating systems (VMS, MS-DOS and Unix).

Current situation
Users are often required to know SQL or rely on IS personnel to create reports using SQL query tools.

Price
Single-user DOS licenses start at $500. VAX licenses begin at $2,000.

CW Chart: Michael Siggins

Query package hides SQL complexity

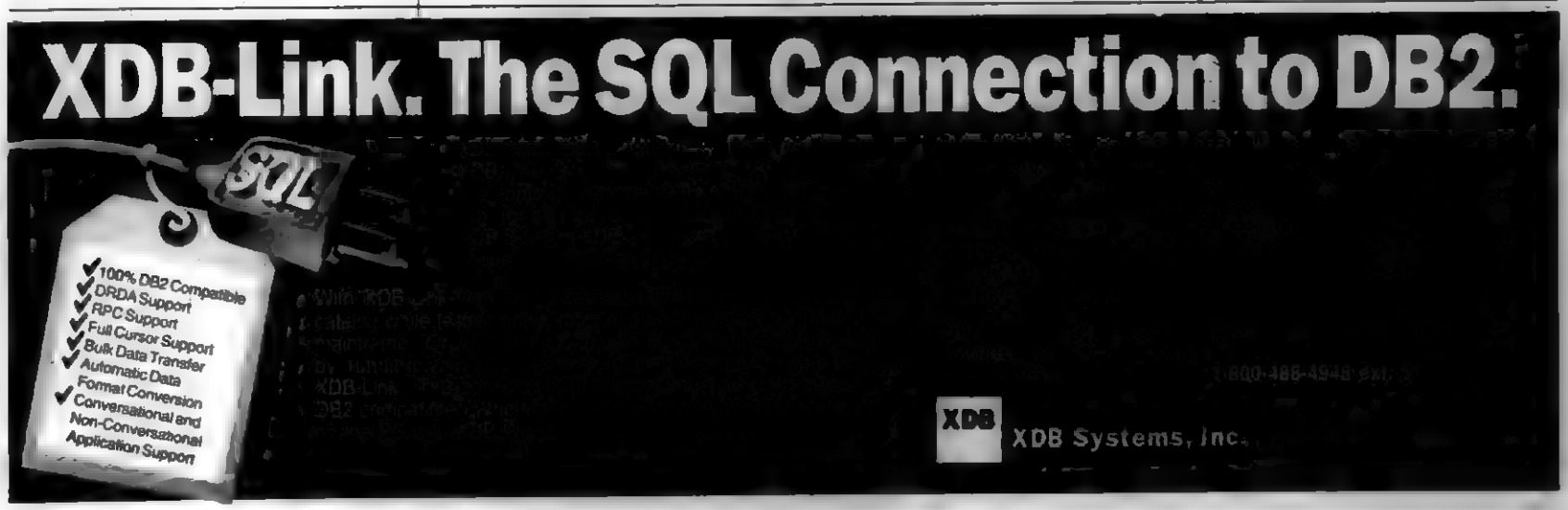
BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — A 2-year-old European end-user database query package arrived in the U.S. this summer, promising to hide SQL complexities from end users. Business Objects, Inc., a firm that opened offices and introduced the product here, provides an icon-based interface on personal computers.

The BusinessObjects package, which runs against the Oracle Corp. relational database, is intended for users of Microsoft Corp.'s Windows. Its icon-based screen allows users to ask questions of Oracle databases and even to make better use of Oracle's financial application packages. It also allows them to "navigate" through the database without outside help.

However, information systems programmers must help end users set up the "objects" on the screen. "IS' responsibility is to create these objects and to deliver them to the end user," company President Bernard Liautaud said. "The IS person turns the raw data into meaningful information." In effect, the users are assembling "views" of the underlying database based on building blocks.

The firm, with 300 user sites, is porting the package to other relational databases, including Digital Equipment Corp.'s Rdb and IBM's DB2. Support for interfaces such as the Open Software Foundation's Motif for Unix, IBM's OS/2 Presentation Manager and Apple Computer, Inc.'s Macintosh is also planned.



Make way for a better map

Travelers' desktop mapping system helps match doctors and clients

BY MITCH BETTS
CW STAFF

HARTFORD, Conn. — For The Travelers Corp., with 70,000 physicians, 11,000 hospitals and more than 1 million insured people to track, the days of wall maps and colored pushpins are gone.

Today, the big health insurer is using a desktop mapping system to get a picture of the geographic distribution of its preferred physicians and hospitals, as well as the location of the people they are supposed to serve.

The primary use of the mapping system is to compare the former to the latter, according to William Rohrer, manager of technology products at Travelers' managed care and employee benefits operation.

The goal is for Travelers' network of health care providers to closely match where the clients' employees live or work. The maps are used as a marketing tool to show prospective business clients that using Travelers-affiliated doctors will not be a burden for employees.

Visual advantages

The same thing could be accomplished with computer printouts, but business executives like visual presentations better. "Maps are a powerful way to display complex relationships between geographic locations without having to wade through mounds of tabular reports," Rohrer said.

If the maps show that Travelers' managed-care network has some geographical gaps — areas where employees are too far from a physician — then Travelers knows it needs to sign up some doctors in that area, he explained.

The rule is that employees should not have to travel more than 30 miles or 20 minutes to reach a Travelers-affiliated physician or hospital.

The mapping system runs on Intel Corp. 1486-based computers located at Travelers' five regional offices. The systems currently run MapInfo for DOS 5.1, a desktop mapping package from MapInfo Corp. in Troy, N.Y., but Rohrer said Travelers is migrating to MapInfo for Windows 2.0.

Two critical success factors for the system are that the 486 personal computers have big hard disks (120M bytes) to hold the databases and 8M to 10M bytes of random-access memory to quicken the repaint of the on-screen maps. A third factor is that the process of geocoding — that is, assigning longitudes and latitudes to the client's database of employee addresses — is handled by a mainframe system because doing it on a PC was too slow, Rohrer said.

Travelers uses ***computerized mapping to enhance its 130 managed care networks across the country***

At headquarters, Travelers has a compact disc of digitized street maps from the U.S. Bureau of the Census, which can be downloaded by the regional offices whenever they need to create a map.

In the future, Rohrer said, the desktop mapping system could be used to analyze demographic trends in health care and monitor Travelers' workers' compensation business.

BOARDWATCH

Chris Lindquist

OS/2 gains in systems war

• Not-so-quiet on the operating systems front. With all the claims, counterclaims, claim jumping and disclaimers going on between Microsoft and IBM, it's just about impossible to tell which one is really doing better in the operating system war — well, armed conflict. However, if amount of traffic on the bulletin boards is any indication, interest in OS/2 is on the rise.

A few months ago, the ratio of Windows to OS/2 messages on several systems was often 10:1 or more. That gap is closing. Of course, some would argue that the bulletin board networks only attract the upper percentage of power users, who don't represent the population of PC users.

That may be the case, but if you ever wonder what influence power users have on the market, just talk to IBM about the PC, Quarterdeck about Desqview and Intel about the 80386. They were all power user "toys" at one point, too.

• Ctrl-Alt-Destroy! One rather macabre-minded Usenet reader posed the question of whether anyone had ever been killed by a computer, excluding electrocution. The question was raised after another user reminisced about the "scary" 729- and 2400-style IBM 9-track tape drives.

Apparently, the user heard a crash one day and barely avoided being hit by a several-pound tape reel that had broken loose during a high-speed rewind. It's another good argument for progress. The worst computer-related accident I've ever had is a paper cut from a floppy disk label.

• Squeaky wheels get the grease. Several bulletin board users have said that they have been sent the recently released Ami Pro Version 3.0 as a reward for submitting bug reports about the previous version to Lotus' technical support line. The users all seemed excited and pleased with the special treatment, though one kept a healthy skepticism. "I've carefully saved [Version 2.0] so it's available later, in case [Lotus] drops the ball," he said.

• Build-it-yourself bug. Do you have a consultant who keeps telling you a bug "can't be fixed?" Maybe there's a reason. A bulletin board user/mainframe consultant in Canada said his firm had a client who wouldn't allow it to bring down a memory region on a certain system in the middle of the day — something the consultant deemed a necessity.

So what did the firm do? "We simply wrote a small transaction that ate memory and quickly crashed the region," he said. When the client asked the consultant to fix the bug, the crafty consultant informed him that the bug was "intermittent" and not worth tracking down. I bet IS managers have nightmares about things like that.

Any bulletin board-related tips, ideas or tales to tell? Know any boards I should be checking out? If so, reach me at Usenet address chrisl@unixland.natick.ma.us or on CompuServe at 72360,2005.

HELP LINE

IBM OS/2

Part of a series of user tips provided by personal computer software vendors, based on questions commonly asked of their customer support personnel. This week's tips deal with IBM's OS/2 2.0.

Q Do I need to reformat my hard disk to install OS/2 2.0?

A No. If you have any version of DOS or OS/2 already on the disk, you may choose not to format during installation. But you will only be able to use the "FAT" file system on that drive, as installing High Performance File System (HPFS) on a FAT drive requires reformatting.

Q I have Microsoft Corp.'s Windows on my system. I want to run OS/2 2.0 and still use Windows applications. Do I need to keep Windows installed? Also, I have DOS programs I still use. Do I need to keep DOS on, too?

A No. You can save disk space and run more efficiently by using the copy of Windows code (called WIN-OS2) from OS/2 2.0. OS/2 2.0 has DOS built right in, so you can remove DOS from your disk and still run DOS programs.

Q I have an Intel Corp. 80286-based machine but want to run OS/2 2.0. Can I use an AOX, Inc. card to replace the processor and run OS/2 2.0?

A Yes. OS/2 2.0 will run on systems changed to an Intel 80386SX or higher using AOX cards, provided the AOX card is up-to-date. If you have any problems running OS/2 2.0 with an AOX card, you can contact AOX and ask for the latest "flash-prom" update for your card.

Q If I accidentally make a copy of a template, or if there is a folder or object that is unshreddable, how can I get rid of it?

A Folders and templates are represented in the OS/2 file system. You can use a command prompt to get rid of these unwanted items. Change into the "OS!2 2.0 Desktop" (or OS!2_2.0_D) if you are on FAT) directory. Folders are represented as directories and templates as files.

Simply traverse the directories to get the right folder, then remove the directory (the RD command) for the unshreddable folder or the Delete command for the unshreddable template. Remember that to remove a directory, it must be empty.

IN BRIEF

Sharpen your shop

■ **Norton Publishing Co.** last month announced it was shipping OnTheJob Employee Scheduling Software for Microsoft Corp.'s Windows. OnTheJob schedules employees by matching their skills, availability and preferences, thereby reducing overtime costs, improving schedule quality and sharpening handling of crisis situations. The suggested price is $495.

■ **Aox, Inc.** announced its latest upgrade boards. The Stax SX 25-MHz and MicroMaster 486SX 25-MHz allow IBM Micro Channel Architecture-based Personal System/2 users to bump their Intel Corp. 80286- and 80386-based boxes up to 80386SX and I486SX levels. The Stax SX lists for $495. The MicroMaster is priced at $1,600.

■ **Adaptec, Inc.** and **DP-Tek, Inc.** announced TrueRes image-enhancement technology called ASICs that will improve the quality of laser printers' output. Adaptec will use the technology in its ImageCard controllers, allowing printers to quadruple resolution and improve grey scale and smoothing capabilities.

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DATAMATION—SEPTEMBER 1, 1991

Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

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Software Products

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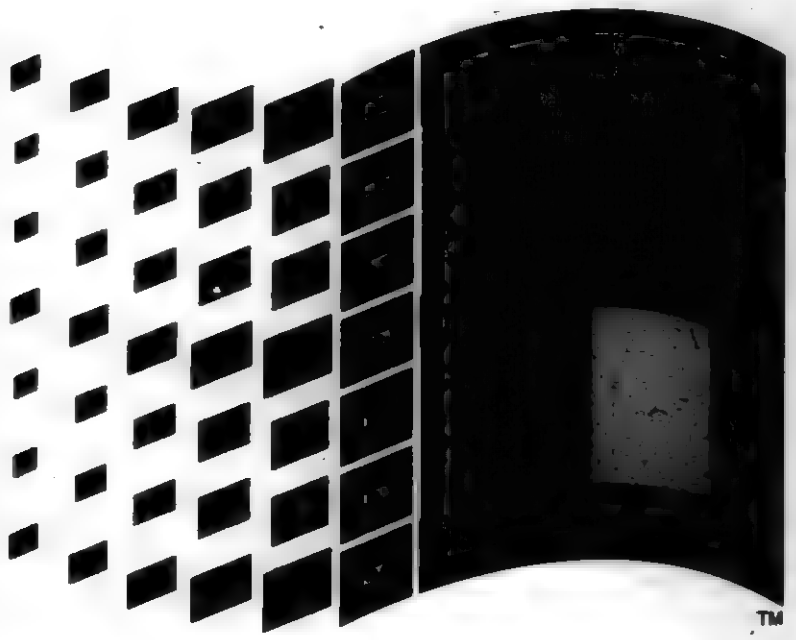

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*Source: Dataquest 1991 Top 10 Companies' factory unit shipments of personal computers based on Intel® processors. **Suggested retail price. Reseller prices may vary. Offer good through 12/31/92. Offer good only in the 50 United States. © 1992 Microsoft Corporation. All rights Corporation. IBM and PS/2 are registered trademarks of International Business Machines Corporation. Intel is a registered trademark of Intel Corporation. All company names are trademarks and/or registered trademarks of their respective manufacturers.

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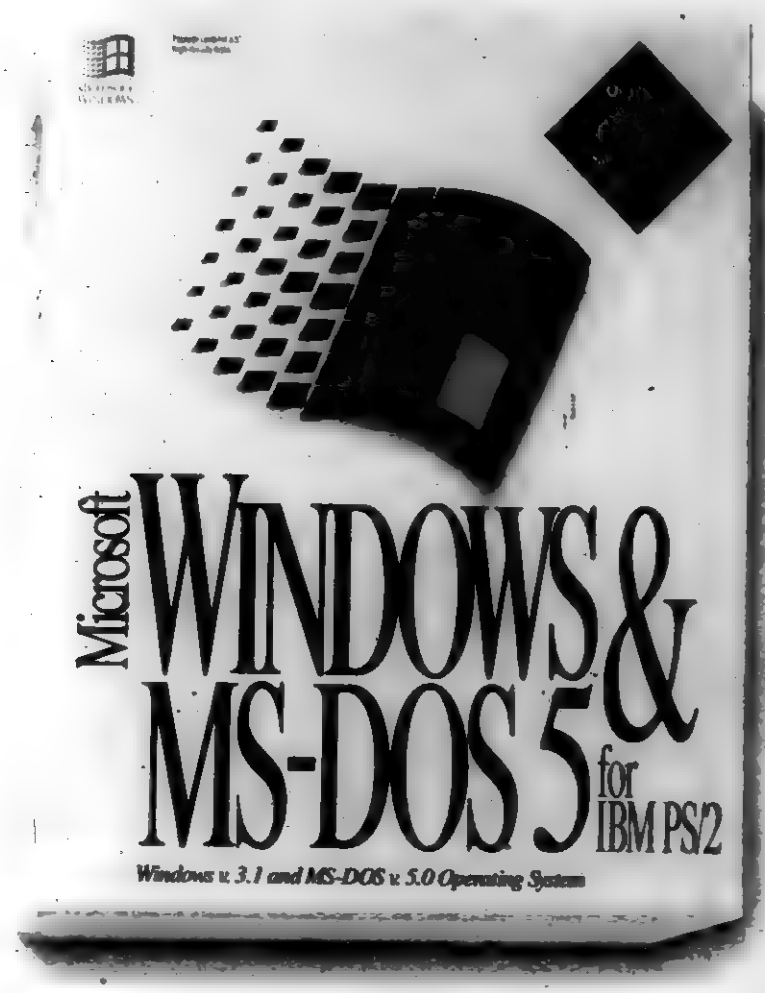

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Toshiba updates Dynabook

Portable features word processor, spreadsheet, DOS software in ROM

BY LORI VALLIGRA
IDG NEWS SERVICE

TOKYO — Toshiba Corp. has introduced a new version of its popular Dynabook portable computer that includes word processing, spreadsheet and DOS software in a read-only memory (ROM) chip, reportedly making it easier for first-time computer users or others unfamiliar with DOS-based computers to more easily acclimate themselves to the systems.

The new Dynabook EZ includes Japan's best-selling word processor, Ichitaro Dash from Just System Corp., as well as Lotus Development Japan Ltd.'s 1-2-3 spreadsheet and DOS, in ROM. Toshiba has already started marketing the computer in Japan.

ROM-based programming has been a goal of Lotus Japan President Saburo Kikuchi, who predicted in an interview several years ago that home and personal computers would not become widely popular unless ROM-loaded software made them easier to use. This would apply especially for those people who are not computer-literate.

When the Dynabook is turned on, an icon-based menu appears, and users can select functions from the screen.

The computer, with an operating system, applications and utilities for frequent tasks such as formatting floppy disks, is priced at $1,860.

The programs in ROM reportedly operate faster than conventional software loading via floppy or hard disk drives. It also is intended to help those who are not technically inclined to avoid the arduous task of loading new software.

> ONE DRAWBACK to ROM, according to analysts, is that it will not be upgraded with new features in successive software versions.

A Toshiba spokesman said almost half of the inquiries to hardware and software companies in Japan involve problems with installing software.

Toshiba added that with ROM, users avoid the risk of buying programs with computer viruses in them.

One drawback to ROM, according to analysts, is that it will not be upgraded with new features in successive software versions.

The Dynabook EZ is based on a 16-MHz Intel Corp. 80386 microprocessor and has 2M bytes of standard memory, expandable to a maximum of 10M bytes.

Space allocation

The ROM includes 64K bytes for the BIOS, 1M byte for the Japanese Kanji ideograph font, a 512K-byte dictionary, 512K bytes for MS-DOS and 2M bytes for the Ichitaro and Lotus programs.

The system has one 3½-in. floppy disk drive and a 40M- or 60M-byte hard disk drive option. The optional drives are priced at $800 and $960. The display is a monochrome LCD.

The system runs on either AC or a battery, although the battery's life is only 1.8 hours. The system weighs 5.28 pounds, including battery pack.

Toshiba has ambitious plans for the system: The company said it aims to sell about one million Dynabooks in the first year of sales.

HP reaches agreement to emulate Macintosh

Plans joint marketing of Xcelerated's Liken

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. announced last week that it has entered a joint marketing agreement with a San Diego-based software company under which HP is offering an Apple Computer, Inc. Macintosh emulation program for HP workstations.

The agreement with Xcelerated Systems, Inc. calls for both companies to market Xcelerated's Liken package for the HP Apollo 9000 Series 700 workstation family.

The companies are funneling sales through Xcelerated's distributor and reseller channels, an Xcelerated spokesman said.

Building the bridge

The vendors are positioning Liken as a means to help Macintosh users migrate to HP workstations and to permit HP workstation users to run software not currently available to them, such as Aldus Corp.'s PageMaker and Microsoft Corp.'s Excel, according to analysts.

Liken users would load the program onto the workstation, which would require an X Window System software system, the 6.0 or later version of the Macintosh operating system and 16M bytes of memory. Liken would then enable users to run shrink-wrapped Macintosh applications.

Performance would be approximately that of a Motorola, Inc. 68030-based Apple Macintosh IICI, according to an Xcelerated spokesman.

Xcelerated said the software will be available this month, priced at $695 for a single-user fixed license and at $895 for a floating license. The company is also selling 10-packs of fixed licenses for $5,980, with 10-packs of floating licenses priced at $7,495.

The HP agreement marks Xcelerated's second Liken accord with a Unix workstation vendor. In January, the software company entered a similar agreement with Sun Microsystems, Inc.

The availability of Macintosh emulation software for HP workstations comes as HP embarks on what some analysts called an onslaught on Sun's dominant position in the workstation business, and should help HP continue to take market share from its rival.

Surge expected

According to Daratech, Inc., a Cambridge, Mass.-based research firm, HP's share of total Unix workstation hardware sales through computer-aided design and manufacturing and computer-aided software engineering resellers will jump from 4.6% last year to 19.9% next year.

By comparison, Sun's share will plunge from 69.1% to 43.9%, the company estimated. Daratech based its predictions on an opinion survey of resellers conducted in June.

About 18.7% of the survey respondents said they believed HP will be the dominant Unix workstation supplier in five years. In a similar survey a year ago, only about 3% expressed the same view, according to Daratech.

By the same token, the number of respondents who said Sun will be the dominant Unix workstation vendor in five years dropped from 49.1% last year to 38.7%.

NEW PRODUCTS

Software application packages

Autodesk Retail Products has introduced the Autodesk 3D Concepts for Windows, a three-dimensional conceptual design software package.

The company's 3-D computer-aided design for DOS and Microsoft Corp.'s Windows interface are incorporated into Autodesk 3D Concepts. A color-coded icon called the Rotation Cube allows users to change the orientation of an object or set of objects. With a visible ground plane feature, the 3-D frame of reference is established, so users can identify the top or bottom of a model at a glance. Autodesk 3D Concepts offers a new 3-D editing tool called Sculpt Mode that lets users add, subtract, intersect and section parts of models.

The product costs $249.

Autodesk Retail Products
11911 N. Creek Pkwy. S.
Bothell, Wash. 98011
(206) 487-2233

PC Publishing, Inc. has announced Success, presentation graphics software for Lotus Development Corp. 1-2-3 users.

Success takes graphics and data from any 1-2-3 worksheet to create slides, speaker notes, handouts or overhead transparencies. The program combines DOS speed with a graphical interface and features dialog boxes, pull-down menus and resizable windows. Success has a viewer feature that allows users to preview any operation at any time. Files can also be previewed before they are imported.

Success costs $159.95.

PC Publishing
58 Charles St.
Cambridge, Mass. 02141
(617) 225-2570

SalesLink Systems has introduced Version 1.2 of SalesLink for Windows.

The product is sales force automation software that includes an agent capability to automate various tasks and complies with Microsoft Corp.'s Windows Pen Computing. Customizable sales process reports can be created via Dynamic Data Exchange links to sales call information stored in a personal information management module. By defining event triggers and actions, the agent capability can be used. When it is defined, the agent can sound an alarm, display a message, launch another application or print a report.

SalesLink for Windows costs $895 per user.

SalesLink Systems
Business and Technology Center
1840 Oak Ave.
Evanston, Ill. 60201
(708) 866-0400

Ares Software Corp. has announced FontMinder, a font organization and management application for IBM personal computers and compatibles running Microsoft Corp.'s Windows 3.1.

The product can organize fonts into lists of obtainable fonts and established fonts. Users can create a font pack containing any number of Adobe Systems, Inc. Postscript Type 1, TrueType or mixed format fonts, according to the company.

All installation and deinstallation is done in one window within FontMinder, and Master Font Library can be printed listing all fonts and font packs by name, weight and format.

FontMinder costs $79.95.

Ares Software
Suite D
561 Pilgrim Drive
Foster City, Calif. 94404
(415) 578-9090

Peripherals

Always Technology Corp. has announced the AL-1000, a high-speed Small Computer Systems Interface (SCSI) adapter.

AL-1000 connects a variety of SCSI devices to the external parallel port of a personal computer.

Fixed and removable media such as optical, floptical, compact disc/read-only memory and tape drives are included. According to the company, the AL-1000 has a parallel-port inquiry scheme that optimizes performance for a broad selection of parallel-port chips.

The adapter can be used with older computers that have unidirectional printer ports and with current high-speed bidirectional and enhanced parallel-port-based computers.

AL-1000 costs $199.

Always Technology
Suite 101
31336 Via Colinas
Westlake Village, Calif. 91362
(818) 597-1400

QMS, Inc. has introduced the QMS 860 Print System.

The product is a high-resolution, reduced instruction set computing-based print system based on the company's Crown multitasking operating system. Features include network and multiplatform connectivity, 600 by 600 dot/in. print engine, 11 by 17 in./A3 paper-handling capability and emulations of industry-standard languages.

According to the company, the printer can connect seamlessly to a variety of hosts or networks.

The base model of the QMS 860 Print System costs $4,495.

QMS
1 Magnum Pass
Mobile, Ala. 36689
(205) 633-4300

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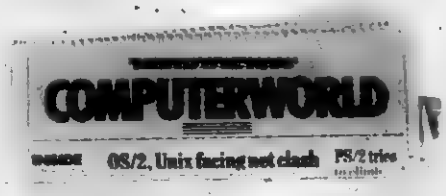
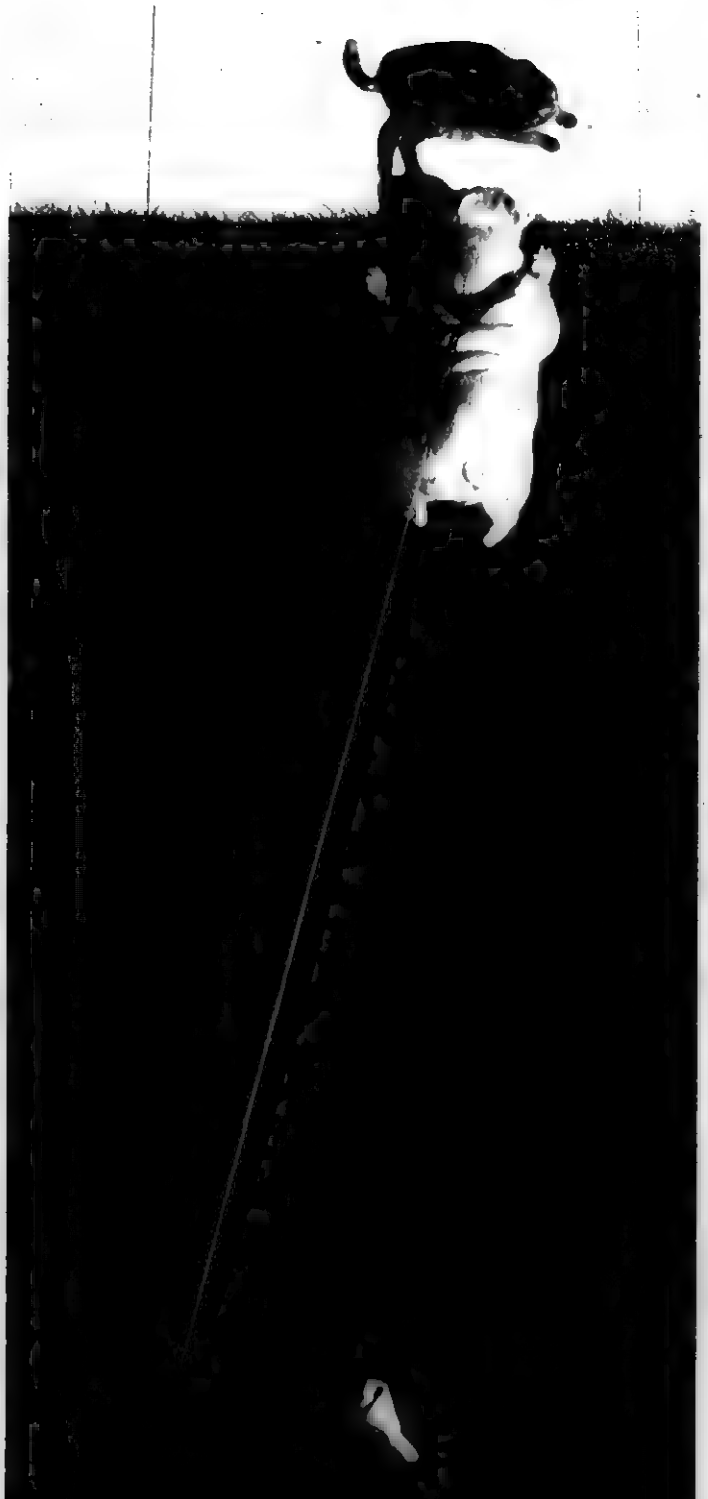


The Newspaper of IS

White Paper

NETWORK PRINTERS



Until now, network printers have had the same fifteen-foot restriction.

With HP network-ready LaserJets, you can put your printers where your users are.

Now you can forget about tethering your printers to some faraway server. Because network-ready LaserJet printers can be placed anywhere along your network. Just plug them in as you would PCs and you're ready to roll.

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HP LaserJet IIP *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,* Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3073 for the HP Connectivity Solutions Guide.

HEWLETT PACKARD

*For operating HP-UX, SunOS and SCO UNIX, $100 in additional software is required. All prices are suggested U.S. list prices. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries.

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Introduction

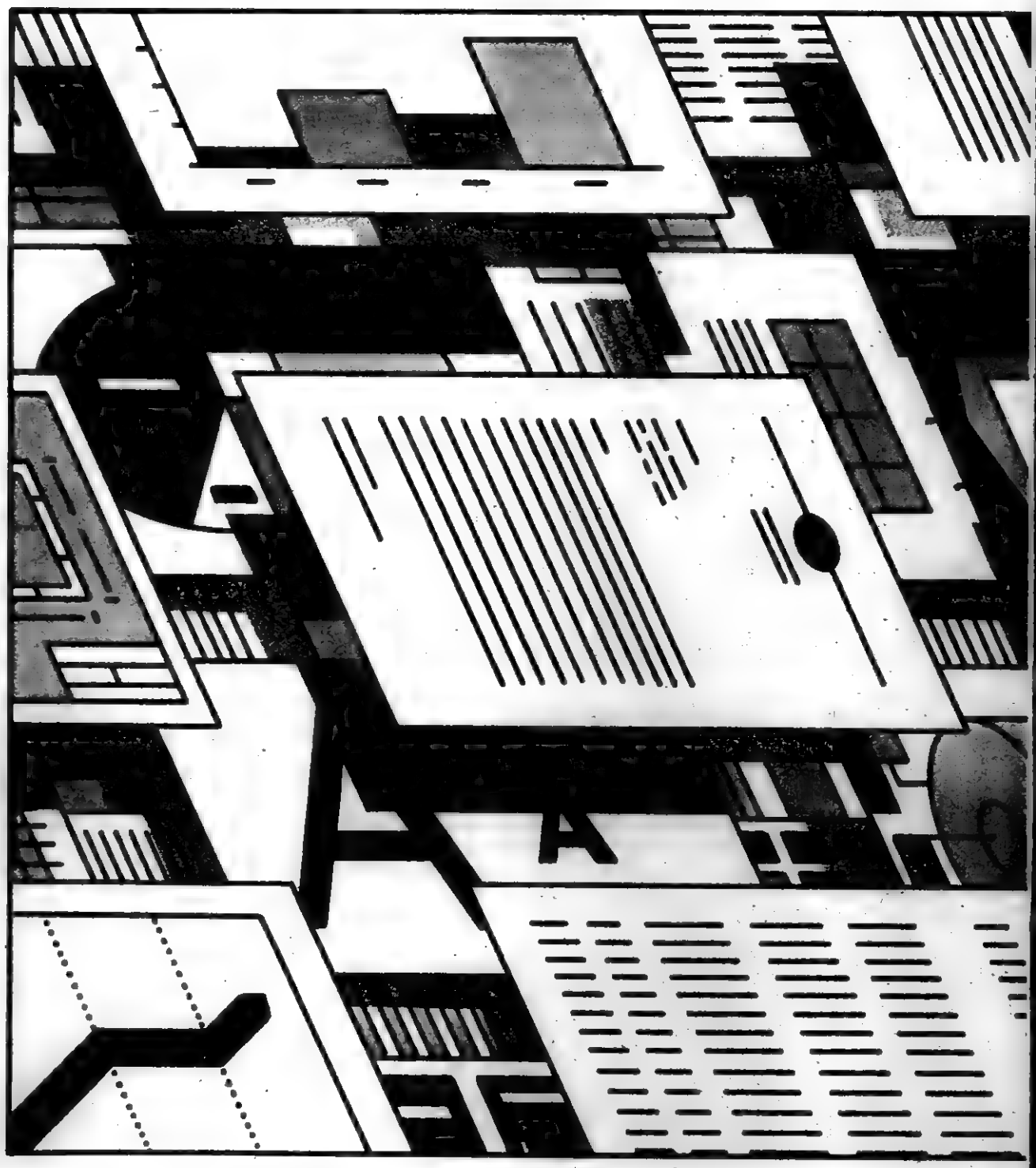
Local area networks have certainly made their impact felt in the computer world. Although some criticize them for their utilitarian applications — they are largely used to link PCs with local printers and storage devices — the fact remains that localizing printer and memory capabilities has vastly changed the nature of computing.

Liberated from the tyranny of centralized, mainframe environments, users have become more productive within departmental workgroups. This local processing trend is strong and growing; IDC research indicates that, by 1996, users believe that 69% of PCs will be attached to LANs. As is frequently the case with technology trends, there is a downside to the great LAN proliferation: integrating printers is a complex challenge for LAN administrators. Despite the printer's importance to users, they are not a top priority for network operating system suppliers. As a result, printer and third-party vendors who make accessories or enhancement products have inherited the challenge of network administration.

Currently, printer interface and software technologies are years away from offering the ability to transmit any print job and have the system intelligently and transparently print it at the closest available printer. Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will continue for the next three to five years. Until it is resolved, network configurations will fail to maximize printer capabilities.

There are, however, interim solutions that ease the burden of printer administration. Although these fixes will not do the job over long periods of time, the day will come when print management software, which is currently in its nascent stages, will seamlessly accommodate different data streams on LANs.

This White Paper was written independently of the *Computerworld* editorial department
by Angele Boyd, Director of Printer Research,
at International Data Corporation.
For more information on the content of this White Paper, or for information on
International Data Corporation, please call 508-872-8200.
For more information on the White Paper Program, please call 508-879-0700.



NETWORK PRINTERS

THE RAPID PROLIFERATION OF LOCAL AREA NETWORKS (LANs) AND PRINTERS IS BRINGING THESE TWO PROMINENT TECHNOLOGIES TO A CONFLUENCE THAT WILL INCREASE THEIR UTILITY AND PROVIDE THE COST-EFFECTIVENESS REQUIRED TO JUSTIFY THE GROWING LEGIONS OF DESKTOP COMPUTERS. ■ ALTHOUGH PRINTERS OBVIOUSLY REPRESENT A FAR MORE MATURE TECHNOLOGY THAN DO LANs, LASER PRINTERS ARE EXPERIENCING SIGNIFICANT GROWTH, IN PART BECAUSE THESE PRINTERS ARE FINDING THEIR WAY INTO MORE AND MORE CORPORATE NETWORKS. THIS CONTRIBUTES TO LAN GROWTH, WHICH IS STIMULATED BY THE ABSORPTION AND PURCHASE OF NEW AND MIXED-PLATFORM NODES, SERVERS AND PERIPHERALS SUCH AS PRINTERS. ■ DESKTOP COMPUTERS ARE BEING CONNECTED AT A HIGH RATE AS CORPORATIONS STRIVE TO LEVERAGE THE HUGE CAPITAL INVESTMENTS THEY MADE IN THESE SYSTEMS DURING THE PAST DECADE. ■ IN A FOURTH-QUARTER 1991 IDC SURVEY,

of 1,600 U.S. users across vertical markets (excluding government and education), respondents report 44% of their PCs are connected to LANs. Respondents expect this LAN penetration rate to accelerate, predicting 60% of their PCs will be attached to LANs by year-end 1992. IDC's total market data indicates a similar but slightly tempered trend when portable PCs are included. During 1989, 26% of installed PCs were linked to LANs. That number escalated to 34% in 1990 and 42% in 1991. By 1996, IDC predicts that 69% of PCs will be on LANs.

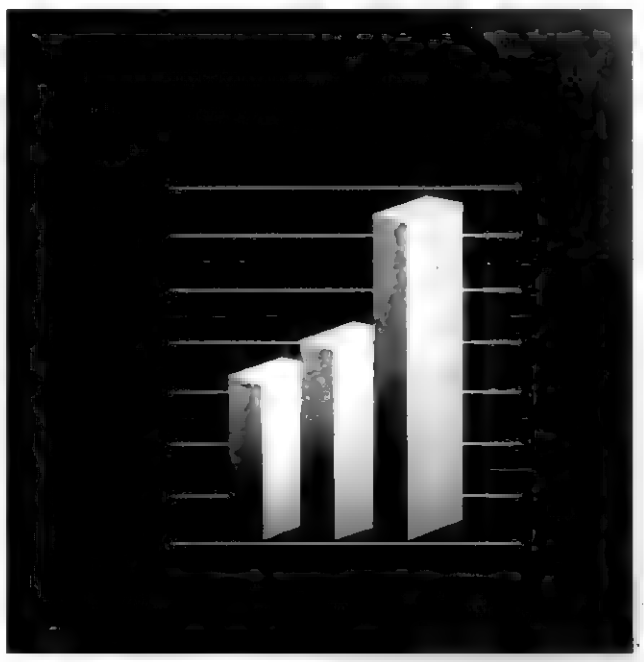
Additional IDC research indicates that, on the printer side, 30% to 40% of laser printers outputting 11 pages per minute (ppm) or fewer sold to business users are linked to LANs compared with 65% to 70% of 12-19 ppm models. Twenty-five to 35% of line printers and 30% to 35% of high-speed serial dot matrix printers are destined for LANs.

Intuitively, it seems LAN installations will be motivated by the need to share applications. And in fact, sharing peripherals such as printers is a leading reason for installing networks. A December 1991 *Infoworld* subscriber study finds that printer sharing and storage device sharing are the most cited reasons for installing LANs. These two reasons are cited by 84% and 74% of respondents, respectively.

The nature of the LAN hierarchy is changing. Increasingly, LANs are comprised of different platforms such as workstations, PCs, Macs, minis and mainframes. And a large percentage of LANs are bridged to another LAN, wide area network (WAN), minicomputer or mainframe. In such cases, printers are accessed across the platform.

PRINTING PROBLEMS PLAGUE LAN ADMINISTRATORS

Integrating printers is a complex problem for LAN administrators. Although printers are important to users, they remain a lower priority for Network Operating System (NOS) suppliers, who continue to focus on data access, communication and security. As a result, printer and third-party vendors who make accessories or enhancement products are left to solve the network administrators' problems.



"Common problems experienced by end users include excessive waiting times, inaccessible or inconvieniently located printers, and problematic network print management features."

Once a printer is shared by at least two users, every printer feature should be remotely and dynamically accessible by each user. In an ideal world, the printer/NOS should be able to transmit any print job, regardless of font, data stream or required forms, and have the system intelligently and transparently print it at the closest available, appropriate printer. Notification of job status would then be communicated back to the user.

At this point, printer, interface and software technologies are years away from this ideal. This is less attributable to technical limitations than it is to the lack of cooperative development between printer and software suppliers. There are, however, solutions available today that will make printing and print administration more user-friendly to users and network administrators alike.

Currently, the NOS limits user knowledge and control of the print function except in rare instances where there is some degree of two-way communication between printer and network users. More typically, when a print job is transmitted across a network, there is limited control over which printer will be utilized, and no guarantee that the job will be printed in the form requested. At best, the typical NOS notification regarding a specific job informs the user if the printer is busy, shut off or out of paper. "Busy" can mean anything from being truly occupied to some type of printer malfunction.

The NOS may also permit the user to determine and change the job's print queue status within the constraints determined by the LAN administrator. However, the user is usually limited in printer choice, since the LAN administrator has generally predefined print queues for specific applications, print format parameters and particular individuals' access.

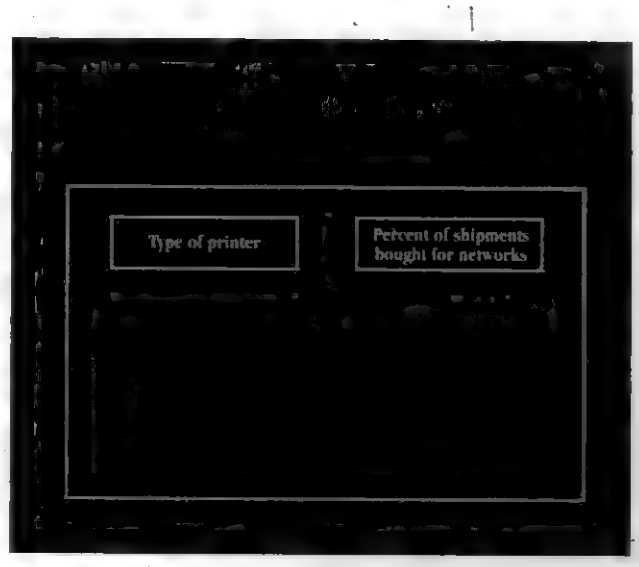
Further, the user's ability to determine font type, page orientation (portrait or landscape), or graphics content may not be respected for a number of reasons. For instance, the printer's random access memory may be inadequate to accommodate the requested fonts and graphics. Or, the desired fonts may be unavailable at the printer. In these instances, at a minimum, the user should

be informed that there is a problem, and be given options for dealing with it.

Where possible, the problem should be solved transparently for the user. This could happen in the case of best-fit font substitution. However, due to the wide variety of printers and network environments, the kinds of solutions mentioned here may not be available.

Common problems experienced by end users include excessive waiting times, inaccessible or inconveniently located printers, and problematic network print management features. Most important network print management features involve communication to users concerning breakdowns, job completion, low consumables and intelligent routing and font downloading.

Unfortunately, due to the heterogeneous hardware and software environments being connected, solutions tend to be customized for individual problems. This state of affairs will persist for the next three to five years. Limitations in printer designs, along with those in application and NOS software printer support, have resulted in network configurations that fail to maximize printer capabilities.



PLANNING TO MEET THE CHALLENGES

With careful planning, network printing problems can be avoided by addressing five areas. They are: capacity, homogeneity versus heterogeneity, printer location needs, software applications, and graphics/images and font usage.

Capacity

Capacity refers to the number of users, the number and size of jobs, and the type and size of media users require. It is important to consider current and future capacity needs.

In assessing capacity the goal is to be able to select the right number of printers, as well as the correct printing speeds and features. It is important to know whether users tend to print many short (up to 10 pages-per-document) jobs, a few long jobs, a mix of short and long jobs, or small jobs with high-volume bursts at the end of transaction periods.

IDC studies show that the most common speed of network-based printers regardless of network capacity is 8 ppm. This is true despite the fact that such speed is only appropriate for small workgroups of three-to-four users. Although there is an increasing availability of low-cost sub-8 ppm personal, single-user printers, the trend for the LAN printer market is away from such devices.

Largely as a result of cost-conscious management, standalone desktop computers are being networked, and the hidden costs of ownership (consumables, maintenance) of personal page printers are viewed skeptically. The clear trend is toward higher performance page printers that are suitable for sharing by five-to-twenty users.

"It is wise to examine printer use patterns. Sometimes, printers are used as convenience copiers."

Fortunately, a new class of laser printers, the most common printing technology shared on networks, is available. At 15-20 ppm, these printers run at twice the rated speed of earlier 8-11 ppm models, and are designed to be shared by five-to-ten users, but may accommodate up to twenty.

These printers often list for under $5,000, and typically range from $2,400 to $16,000. Their monthly duty cycles — the maximum pages per month recommended by the manufacturer — range from 25,000 to about 50,000, which makes them appropriate for small to midsize workgroups. They are available from a number of vendors including Data-products, DEC, Fujitsu, Genicom, Hewlett Packard, Image Systems, QMS, Texas Instruments and Toshiba.

When choosing printers, paper handling is important to consider. The larger the number of users sharing the printer, or the longer the print jobs, the greater the need for a printer with large capacity input and output. This situation also calls for output handlers with a job offset capability and/or mailboxes/sorters.

Low-to-mid volume output is considered to be 300-600 pages per person per month, while high volume is 1,000-1,500 pages per person per month. Eight ppm printers often only have one 200-250 sheet input bin, a slightly smaller output bin and no job offset capability. In contrast, the new breed of workgroup printers often has two 500-sheet input bins, job offset and/or optional (additional cost) mailbox/sorters.

It is also wise to examine printer use patterns. Sometimes printers are used as convenience copiers. This practice increases print capacity needs, although it may be appropriate under some conditions. A cost-benefit analysis can determine when such conditions exist and whether it makes sense to select personal, rather than shared, printers for networked users. Generally speaking, the lower the laser printer speed, the greater the cost to produce a page. More on this can be found in the article appearing in the April 20, 1992 issue of *Computerworld* entitled "Six Steps to Calculate Cost of Ownership."

Thus, giving everyone on the net-

work his own four-to-six ppm personal laser printer is less cost-effective than sharing workgroup printers on the network. There are times when personal printers are appropriate, i.e., when the user is high-ranking, someone who requires stringent security or someone whose job requirements warrant a dedicated printer.

Consideration should also be given to network users who need to print on 11x17 inch (ledger) paper, on two sides of a page (duplexing), and envelopes. Ledger paper is sometimes used for large spreadsheets, or for printing pamphlets and newsletters. Not all workgroup printers support 11x17 inch paper. It tends to be either a standard feature or not available at all.

Duplexing is popular in paper-intensive industries. Duplexed output costs less to mail, file, archive and otherwise store. When available, it is usually an option on low-to-mid speed (20 ppm and less) printers. It is usually either standard or not available at all on higher speed printers.

Envelope printing is generally available on personal and workgroup printers. Capacity varies, running up to 75 envelopes, and should be evaluated before before making a commitment.

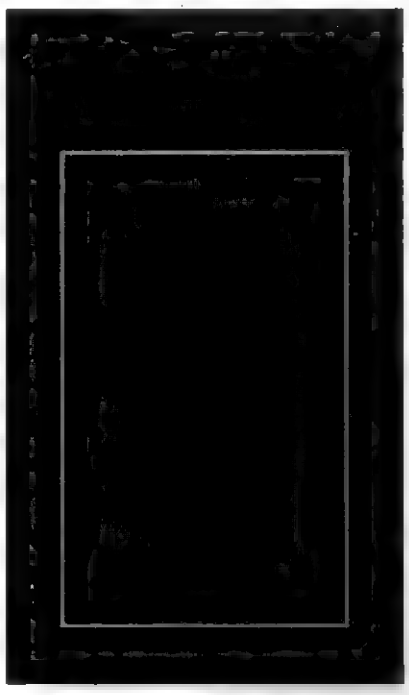
Homogeneity Versus Heterogeneity

Planning for a heterogeneous network with PCs, workstations and minicomputers that have shared printer capabilities requires understanding the physical interface, protocol, and page description language (PDL) requirements for the mixed platforms.

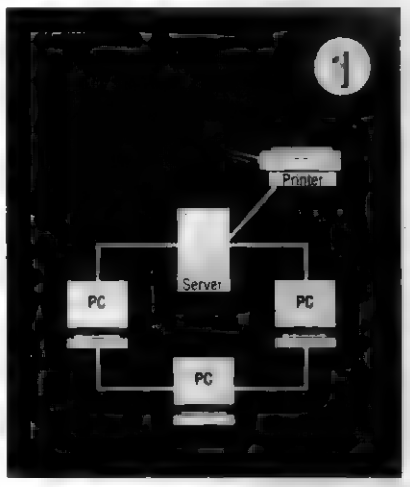
The NOS is simply a conduit for the mixed formats and does nothing to translate them into a specific printer standard. Even when the NOS provides print services to support mixed platforms, the user must still find a printer that can handle them and their PDLs.

It is still common to use a parallel interface to attach a laser printer to a PC server. However, this is changing in favor of direct network interfaces to LANs such as Ethernet and Token Ring. The Macintosh uses either its own version of a serial interface or a Localtalk interface.

Direct connection to the network is preferable, so take note of what topology (Ethernet or Token Ring) the network employs. When choosing a network printer, be sure the printer's physical interface matches network requirements.



"...much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on network operating system software."



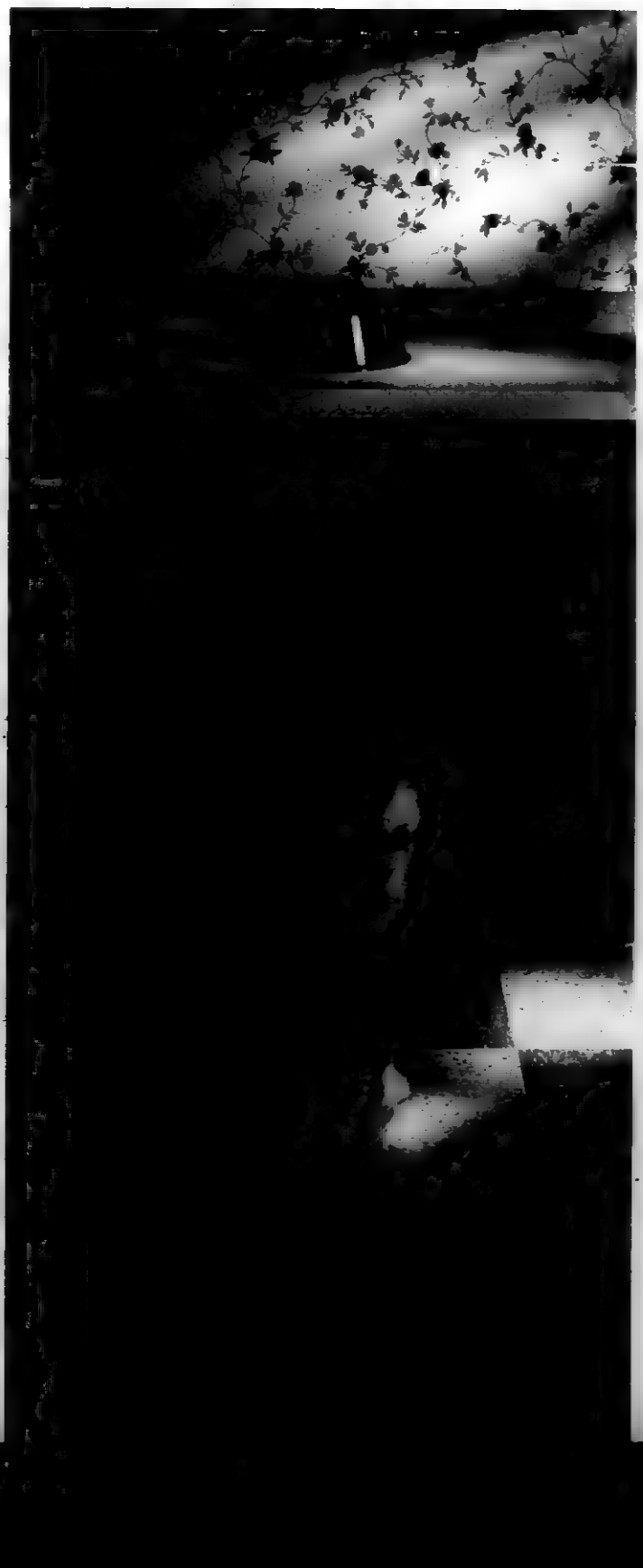
In some instances, simultaneous operation of more than one printer port is desirable, and some printers support this. For example, the parallel and Ethernet ports can be operated together. However, it is important to determine if both ports can switch between PDLs, or whether they are fixed to support the same PDL. HP's PCL and PostScript are the two most common PDLs. In addition, TCP/IP and Appletalk are two protocols that may also require support.

Novell's Netware 3.11 (the 386 extension to the Netware name has been dropped), which was announced at Networld in February 1991, is an example of vendor support for mixed LANs. Netware 3.11 enables client devices based on DOS, Windows, Macs, OS/2 or Unix to share file and print services on a Netware LAN. Mac support was available on Netware 286 but not the 386 version, and Unix support was not provided at all. TCP/IP support is also integrated in 3.11.

Digital Equipment Corp.'s support for Unix, Ultrix and VMS in DECnet and TCP/IP environments, in addition to its support for PCs and Macs through Pathworks, are other examples of vendor support for complex LANs. Sitka's TOPS software offers more than just PostScript printer sharing across Sun workstations, PCs and Macs; it is a complete network operating system that lets each of the three platforms share files in their native mode.

Printer Location Constraints and Network Connectivity Options

A key issue in planning for network printing is deciding where the printers should be located. In the past, technological limitations required that printers be attached to servers. This still presents logistical problems. For example, if the server must be secured after normal working hours, user access is constrained. If a user's system is concurrently acting as both a server and user node, that user will be inconvenienced every time someone comes into his office to print a job.



Until now, waiting for network printing has required the same amount of patience.

HP network-ready LaserJet printers help your users get their output faster.

With an HP network-ready LaserJet printer, your users won't go begging for fast output. Network-ready LaserJets avoid parallel bottlenecks and print up to fifteen times faster than ordinary machines. Since your file server is relieved of some print-server functions, your printing network flexibility increases almost immediately. You'll enjoy faster transaction times. Greater security. And increased speed across your entire system.

HP LaserJet III *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX®, Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3074 for the HP Connectivity Solutions Guide.

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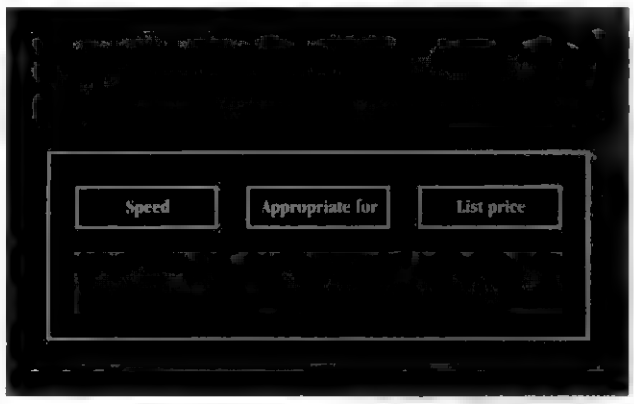
There are four major network printer connectivity options to consider:

- server-attached
- shared via user node with spooling done remotely
- shared via user node with spooling done at user node
- direct to network with network adapter.



Server-attached

Presently, the most common attachment for LAN printers involves having one or more printers attached to a server responsible for file management, printer support and other services. The server may be a computer or a dedicated hardware box. At present, the principle NOS vendors can support a range of server/printer ratios from five-to-eight or five-to-sixteen through either serial, parallel or remote attachments.

This configuration is a legacy of the earlier days of NOS, when server connections were the only type of printer support that network operating system software provided. The NOS vendors, at that time, were much smaller companies, unable to fund a wide variety of system options. They also realized that offering other attachment options would only have stimulated third-party vendor competition.

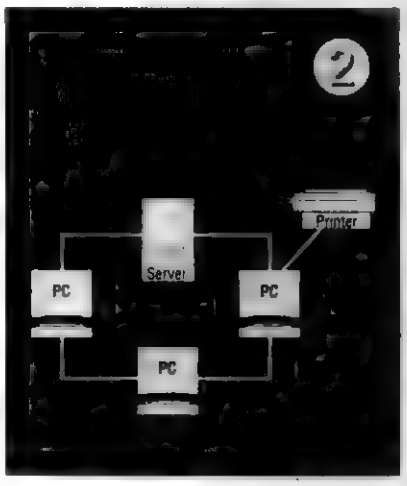
Over the past three years, much of the effort spent on developing revenue from server hardware has been replaced by greater emphasis on NOS software. As an example of this phenomenon, consider Novell's withdrawal from the server market and DEC's Source Kits, which provide the necessary host software to drive DEC's Printserver printers from non-DEC Unix servers. With this new emphasis, the capability to support alternative printer attachments not tied to specific server hardware offers a competitive advantage for NOS vendors.

Tied to this has been the printer and printer accessory vendors' desire to make sure printers can be attached anywhere on networks. This has been such a major issue that several vendors, including Intel, Lexmark and Castelle, have developed very small network adapters that are transparent to the NOS and allow the printer to be physically attached anywhere on LAN cabling. The printer's serial or parallel interface is plugged into the network adapter, which, in turn, attaches to Ethernet or Token Ring network cabling.

Shared via User Node with Spooling Done Remotely

The second most common LAN printer configuration is comprised of a workstation, usually a user's node, whose printer can be accessed by several other users on the network. The workstation does no spooling, and as a result, only one person can print at a time. Multitasking environments such as Unix and Windows prevent user interruption during print jobs.

However, in other environments, when a printing job is being processed, the node's ability to concurrently process other software is appreciably slowed. For this reason, the number of users with access to this printer is limited, usually to no more than three to five people.



A variation of this set-up is to have spooling done on a remote server. This allows print jobs to be simultaneously sent to the printer. In this variation, one or two printers are attached to the workstation. Novell, the most popular NOS supplier, now provides support for remote printing from the server, except under Entry Level Netware (ELS). ELS does not support remote printing because it supports only four to eight users.

Shared via User Node with Spooling Done at User Node (Concurrent Server)

This third LAN printer setup employs a concurrent server — a workstation used as a server providing print spooling and file service as well as end-user capacity. This configuration is not common because it suffers from the same problem as the shared node's printer mentioned above: the node's ability to concurrently process other software needs is appreciably slowed. This configuration can also present a data security risk. If an application crashes, the server function of the workstation is similarly affected.

Direct to Network with Network Adapter

This is the least common configuration, but one that is increasingly being used because of its advantages. It consists of a printer with a built-in Ethernet or Token Ring interface connected directly to the LAN. By separating the file server function from the printing (spooling) function, data security is better addressed. Also, direct-connect printers benefit from enhanced transmission speeds on Ethernet and/or Token Ring. This provides a significant benefit for large Postscript, high-resolution, color- and graphics/image-intensive files being sent to a printer or a typesetter/imagesetter.

Traffic on the network and the interface to the printer are bottlenecks when it comes to speed of printing. When multiple print jobs are sent simultaneously across the network to the server, there is

a delay while each job gets into and out of the server's print queue. More time is lost if the printer is attached to the server via a parallel interface instead of Ethernet or Token Ring. The contrast in communication speed is vast — Ethernet's maximum speed is 10M bit/sec and Token Ring's is four or 16M bit/sec while a parallel interface allows only 10K bytes/sec.

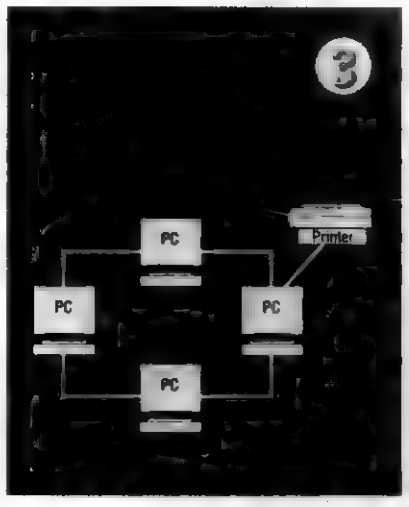
Since there is a direct relationship between an interface's performance and its price, high-speed Ethernet and Token Ring interfaces which list between $700-$900 are commonly used for higher cost printers. Accordingly, higher speed printers (15 ppm+), color devices, and high-resolution devices (600 dpi+) are appropriate candidates for those two cabling schemes.

A number of printer vendors have begun to offer Ethernet and Token Ring interfaces as options on their workgroup printers. These include HP, Toshiba, QMS, Apple and DEC. In addition, third-party vendors such as Intel and Castelle offer external network adapter cards for printers. These allow the connection of two-to-four printers per card.

Software Applications

Knowing the applications and their versions is critically important. One of the most frequent problems encountered by users is their job not printing at all, or printing incorrectly. This frequently happens because the user unknowingly sends the job from an application configured to move output in a specific printer emulation format, to a printer whose current set-up does not match the incoming format. Network printers must be able to print and switch between the emulations supported by applications.

The ability of a printer on a network to seamlessly handle multiple data streams has high utility to both users and network administrators. This is particularly valuable in mixed networks where there is a need to support multiple data streams. Postscript, PCL, DEC ANSI, IPDS, Epson, and line printer have the leading page description language/ emulation market shares. Currently, because of the inability of most laser printers to automatically switch emulations, a PostScript printer is often set up to accept only PostScript while a separate printer may be designated for PCL output.

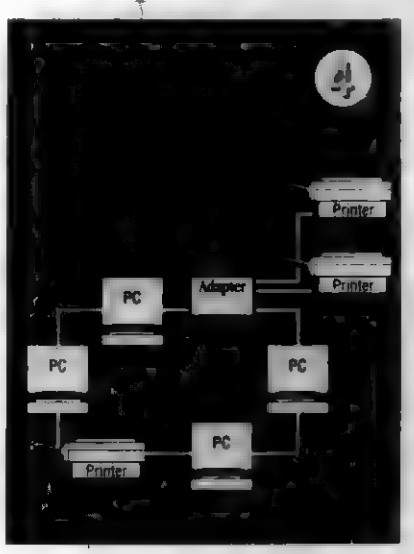


This limitation is changing as several non-impact printer suppliers including HP, QMS, DEC, Tektronix and Talaris offer printers that sense the incoming data stream and print them accordingly. Adobe, which developed Postscript, has just announced support for emulation switching.

Graphics/Images and Fonts

As graphics make output more sophisticated in terms of images and fonts, the amount of data being transferred across the network increases. This has implications for the amount of required printer memory and network bandwidth required to transfer the job to the printer.

With fonts there is also the issue of WYSIWYG, the ability to see on the screen exactly what will be printed. To support the growing sophistication of user output, it is important to choose network printers that have memory expansion capabilities, WYSIWYG fonts, support for high bandwidth interfaces, and CCITT-based image compression capabilities.



Most workgroup/network printers have generous memory expansion capabilities. While many offer a number of fonts on the printer, not all are WYSIWYG fonts. PostScript and PCL support image compression, the ability for a printer to decompress data is also expected to become important.

NEXT GENERATION NETWORK PRINTING

Several printer and NOS characteristics build a case for print management software on the network. There is a need to transparently manage and distribute printing resources such as fonts, printer data streams and paper handling capabilities to users across the network. Print management software, currently in its nascent stages, will seamlessly handle different data streams by either locating an appropriate network printer that can handle the necessary data stream or translating it into a bitmapped code that is sent to a printer conveniently located near the requesting end user. Print server software from Insight Development Corporation offers a number of these capabilities.

It makes sense for print management software to assume much of this responsibility for groups of lower cost, lower performance printers. This way, it is not necessary to justify the incremental cost of the added intelligence and two-way communication interfaces needed to allow remote and transparent user access. Given that many LANs today are still relatively small — averaging twelve nodes — less expensive printers will continue to proliferate, making a compelling case for intelligent print management software.

In addition to reducing costs, printers running intelligent print management software can charge back to departments based on individual departmental usage.

It's never been easier to manage your entire printing network.

With HP network-ready LaserJet printers, you can monitor your network right from your desk.

HP network-ready LaserJets are actually seen as additional nodes on your network. Which allow you to manage from one location and take full advantage of the features in your network management software. There's even a new diagnostic feature which lets you track the success of data transfer between your server and a network-ready LaserJet.

Network-ready LaserJet printers were engineered in cooperation with NOS vendors. So they work seamlessly with your current network and operating system. Including Novell Netware (Novell-certified), 3COM 3+Open, Microsoft® LAN Manager, and IBM LAN Server. Or the HP-UX, SunOS, and SCO UNIX® operating systems. Even Macintosh environments.

HP LaserJet III *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

Network-ready LaserJets easily hook into your mainframe, minicomputer, UNIX®, Macintosh, and PC operating systems. So to better oversee your network, see an HP network-ready LaserJet today.

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Sunsoft adds image tool to Solaris API

BY MELINDA-CAROL BALLOU
CW STAFF

CHICAGO — Sunsoft extended the Solaris graphics application programming interface (API) by introducing an imaging library with open hardware and software interface specifications.

Dubbed XIL, the new API offers developers a standard interface for developing imaging and full-motion video products that are portable and scalable across Solaris-based systems. XIL adds to Sunsoft's XGL interface for two- and three-dimensional geometries, which increases the company's graphics offerings for Solaris on Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC) and X86 platforms, Sunsoft officials said.

XIL is an interface for imaging applications that is layered between higher level programming interfaces and system software. It contains three primary components: a programing interface specification for basic imaging functionality; a higher performance implementation of this specification tuned for the SPARC system; and the hardware interface specification for hardware manufacturers to develop XIL imaging accelerators.

XIL offers a full 30 frame/sec., 640- by 480-video window on standard SPARCstation 2 workstations and fast compression technology to provide storage savings.

OS/2 faces Windows in the NetWare world

Microsoft now claims the lion's share of NetWare users, but IBM is gearing up for a major fight

ANALYSIS

BY MICHELE DOSTERT
CW STAFF

As IBM and Microsoft Corp. struggle for the hearts and minds of personal computer users, both companies seem to realize that selling the best stand-alone operating system will not be enough, and both are looking at the networked world.

Currently, Windows has a huge lead in the Novell, Inc. NetWare local-area network arena. According to Novell's 1991 figures on NetWare clients, OS/2 accounted for only about 3% of NetWare clients; DOS and Windows accounted for about 87%. However, that was the old OS/2; IBM hopes that the new, multitasking OS/2 2.0 will gain more acceptance in the LAN world as well as on stand-alone PCs.

Early adopters of OS/2 2.0 on NetWare are enthusiastic, praising both OS/2 and Novell's OS/2 Requester, the connectivity piece supplied by Novell for OS/2 clients.

Overkill warning

Sean McRae, senior systems technican at John Hancock Mutual Life Insurance Co. in Boston, said he likes OS/2's multiple session capability, but he cautioned that OS/2 may be overkill for many corporate desktops. "You have to trade off Windows' ease of use and large application base against OS/2's stability and multitasking," McRae said.

"If you just need to jump back and forth between applications, Windows is fine," McRae said. "But if you really need large processes running in the background, such as communication services or large database queries, OS/2 is better. That's why, although our internal standards program recommends Windows, we support OS/2 — because some clients really need it."

Like many IBM shops, McRae's OS/2 desktops are connected simultaneously to IBM mainframes and NetWare LANs. He warned that teaching NetWare and IBM's Extended Services to coexist is not a trivial task. "The technology works, and you can step your way through it, but it's not for the faint of heart," he said.

Christian Spence, senior network engineer at PC Edge, a large San Jose, Calif.-based NetWare reseller, said he is excited about OS/2 as a LAN client. "I crawled into OS/2 2.0 in beta in the middle of last year, so I've pounded on it a lot; it's robust, it's stable, and best of all, it's multitasking.

"Using the Virtual DOS Machine capability, I can log in as an OS/2 user, open several different DOS windows and log in to each window with a different name. You can actually have several utilities running at the same time. This means you can be managing your LAN with the Console utility and have other applications running at the same time, and you're not I/O bound," Spence said.

Spence said he particularly likes OS/2's tight integration between the graphical Workplace shell and OS/2.

Quest for perfection

Microsoft has put a lot of development and testing effort into ensuring that Windows 3.1 is a better NetWare client than Windows 3.0. Users of Windows 3.0 were plagued by an inability to properly configure Windows for NetWare. Both Novell and Microsoft were constantly issuing new patches.

Windows 3.1 is now shipped with a NetX file that discovers and maps network connections and notifies users of any configuration problems.

"Windows 3.1 is certainly a lot better on the LAN then 3.0 was," Spence said, "but it still runs on top of DOS, which limits the multitasking functionality."

Windows New Technology (NT), scheduled for release in 1992, will have full 32-bit multi-

Continued on page 58

OS/2 v. Windows as NetWare clients

OS/2 2.0

Strengths
- True multitasking efficiently handles big background queries for power users.
- OS/2 Requester Virtual IPX allows users to run multiple network sessions, accessing different servers and using different logons.
- Loads IPX and NetBIOS at start-up.
- Can log in and out of network from within OS/2.
- Workplace shell tightly integrated with operating system.
- More stable code.

Weaknesses
- Added power equals added complexity.
- Users unclear on IBM's long-term operating system strategy.
- Integrating with IBM mainframe environment and NetWare simultaneously is not simple.
- Limited application availability.

Windows 3.1

Strengths
- Easy to use.
- Lots of applications.
- Can be loaded and run from the network drives.
- New configuration utilities to simplify LAN use.

Weaknesses
- Can't run multiple network sessions simultaneously.
- DOS kernel won't allow true multitasking.
- Must exit Windows to log in and out of LAN.
- Lingering hostility over LAN incompatibility with 3.0 release.

CW Chart: Michael Siggins

$48,288,416,000

By the end of this week Computerworld readers will have spent over $48.2 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

The Newspaper of IT

WordPerfect answers the most-asked question about electronic mail.

Click on "Send" in many of today's e-mail packages, and the urgent message on your screen will disappear, perhaps never to be heard of again.

You'll have no way of learning if it was ever delivered, or opened. You'll have no way of checking what you sent to whom, or when. And if you ever need to retract a message for corrections, well, *no way.*

So it's no wonder that in surveys of the features users would most like to see incorporated into their e-mail packages, message tracking ranks at or near the top. Except, that is, in surveys of WordPerfect® Office users.

An In Box Is Not Enough

In addition to the In Box that every e-mail package offers, WordPerfect Office gives you an electronic Out Box. So in addition to all the usual things you'll be able to do with your incoming mail (including read, reply, forward, save and print), we give you unusual control over your *outgoing* messages as well (including the ability to reread, rethink, rewrite and retract).

And the Out Box is just one of the features that separates WordPerfect Office from the rest of the e-mail pack.

E-Mail Everyone Can Agree On

If people would simply agree on a single computer platform, hooking everyone up with an e-mail system would be no trick. But since *that* shows no signs of happening, WordPerfect Office is available for all of the most popular platforms, including DOS, Windows, Mac, UNIX, VAX and Data General.

With WordPerfect Connections (included in Office 3.1), a DOS and Windows LAN can connect seamlessly (and transparently) with VAX and UNIX LANs, for example. So a message that goes out in Windows can arrive in UNIX and lose nothing in the translation.

Getting Your Message Out

Far-flung empires will find WordPerfect Office equally accommodating, with gateways to messaging systems that include Novell MHS, IBM OfficeVision, DEC, X.400, SMTP, MCI Mail and AT&T EasyLink, among others.

And unlike e-mail packages that simply deliver the mail, WordPerfect Office includes powerful Calendar and Scheduling functions that provide entirely new ways for your people to work together productively.

Let Us Show You How It Works

With WordPerfect Office, the possibilities are nearly limitless. And the technical support for users and administrators is widely acknowledged to be the best in the business. To learn more, contact your WordPerfect Representative, or for a free video demonstration, call (800) 526-5064.

(Until you have a more effective means of business communication up and running, the telephone will have to do.)

WordPerfect

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PC net keeps health care costs in check

BY CAROL HILDEBRAND
CW STAFF

With health care costs becoming sky-high, providers need to keep operations as lean as a long-distance runner. The networked personal computer environment at St. Agnes Medical Center in San Joaquin, Calif., not only saves costs, it has made the whole operation run more efficiently.

The 320-bed facility serves more than 1 million people regionally, and it has been working on reducing information systems costs for several years now. For St. Agnes, the answer to cutting costs was found on a local-area network. The center is integrated on an Ethernet 10Base-T network, with applications integrated throughout the departments onto the LAN.

Kevin Shimamoto, the center's director of information technologies, said the network has a twofold effect. "Integration helps improve productivity by being able to get data throughout the hospital more easily. And when people are being more efficient, the hospital saves money. It helps keep costs down."

Between 460 and 490 PCs are on the network, as well as approximately 75 laser printers. The network is run from a data center about a half-mile away, which is linked via fiber-optic cable. The data center has a large variety of Compaq Computer Corp. servers, ranging from 25-MHz, 386-based boxes all the way up to 50-MHz 486s. Shimamoto said that by the end of the fiscal year he planned to bring about 90% of the servers up to the 486 level and prune the total number down to about 10 to 15 servers overall.

The most complex application currently running is a surgery scheduling system that combines three different departments.

The first department is surgery scheduling, which is able to maximize operating room facilities. That program is linked to materials management. As soon as a surgery is scheduled, a "pick ticket" is created on-line and sent via the LAN to materials management.

That department picks all the materials necessary for the procedure, from the syringes and gloves to the more intangible things: "If the doctor wants Mozart played in the operating room, it will go on that," Shimamoto said.

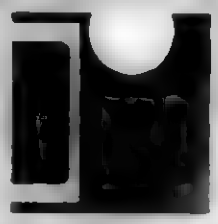
From there, the on-line list proceeds to distribution, which assembles the materials and sends them to the operating room.

All materials used during the surgery are automatically debited from supplies and the reorder goes to purchasing. The purchasing department uses purchasing software to be linked via modem to the hospital's main suppliers to speed supply ordering.

Shimamoto said that the scheduling system, which has been in place for approximately two years, was able to be implemented because of enthusiastic support from the heads of each of the three departments involved.

"Buy-in from the heads of those particular areas was the single most important thing that made the process work," he said. He added that the process went fairly smoothly, although not without a few glitches.

ON SITE



St. Agnes Medical Center
San Joaquin, Calif.

- **Challenge:** Increased operational efficiencies with an eye toward reduced health care costs.
- **Technology:** PCs and Compaq servers linked via Ethernet.
- **Results:** New interdepartmental communications and new applications made possible without increased staffing.

Emphasis on efficiency

Among the other projects in place at St. Agnes are a computerized payroll system that has cut payroll processing to less than 10 man-hours of pay, as well as associated costs.

An on-line fund-management program allowing the center to boost donations and track them more efficiently while maintaining staff size has also been established.

Shimamoto said that his next big goal is to move all remaining asynchronous traffic over to Ethernet packet speeds of 10M bit/sec., as well as to move the minicomputers over to reduced instruction set computing-based systems. As it migrates to a graphical environment, the center is going to need multitasking abilities, he said.

IN BRIEF

Novell deal extended

■ **Novell, Inc.** has expanded its NetWare 3.11 Premium maintenance, management and upgrade protection program. Originally announced for new users of NetWare 3.11, the promotion has been extended to users of the network operating system. The program will run through October.

■ **Hewlett-Packard Co.** ported HP Omniback, its network-backup management system, and HP OpenSpool, its print management system, to **Sun Microsystems, Inc.** SPARCstations running SunOS.

■ Smart hub maker **NetWorth, Inc.** put a price tag on its NetWare Application Engine, a module allowing users to bundle Novell NetWare server functions into their intelligent wiring hubs. The Irving, Texas-based vendor is charging $4,995 for the module running NetWare Runtime — a single-user version of NetWare 3.11 minus file, print and directory services. Modules without Runtime cost $3,995.

Traditional LAN sales growth to slow as new servers emerge

BY MICHELE DOSTERT
CW STAFF

CAMBRIDGE, Mass. — The stratospheric growth of the local-area network operating system market will level off during the next three years, according to a recent study by market research firm Forrester Research, Inc.

Instead of the 45% to 50% annual growth rates the U.S. market enjoyed from 1989 to 1991, Forrester Research predicted growth of only 18% in 1992, declining to 12% in 1995.

The report, "New LAN OS Pastures," was authored by Forrester Research analyst Mary Modahl and cited several reasons for the predicted slowdown. First, Forrester Research forecasts a decline in personal computer shipments.

In addition, the report noted that many of the PCs being delivered now are laptop machines that are not intended as LAN clients.

According to Modahl, low-end, peer-to-peer networks are eating away at the 5- to 15-node LAN market. She said this trend should accelerate when Microsoft Corp. releases its Windows New Technology product, which is slated to include built-in, peer-to-peer networking.

The report said that while Novell, Inc. may cease to grow at breakneck speed, there is not much chance for other vendors to wrest control of the basic network services market from Novell. Instead, vendors must deliver additional servers for mail, database and communications into existing Novell NetWare LANs.

Forrester Research said it expects the early growth in new server software to be concentrated in the communications server market, but that both mail and database servers will boom in 1993.

Shifting gears

While growth may slow in traditional LAN operating system sectors such as file and print servers, new types of servers will bring faster gains

Revenue in millions					
	1991	1992*	1993*	1994*	1995*
File/Print Servers	$435	$547	$640	$720	$798
Additional Servers	$99	$205	$371	$497	$636
Total	$534	$752	$1,011	$1,217	$1,434

*Projected

Source: Forrester Research, Inc.

CW Chart: Michael Siggins

A different view

Novell resellers, however, are generally more optimistic about future growth than Forrester Research is.

Toby Victor, president of ISYX, a Rockville, Md.-based reseller, said, "To maintain an exponential growth rate for more than a few years is difficult; eventually, the growth number has to slow down. But a decline in growth is a lot different from a decline in actual sales.

"Our Netware distribution center is running at 109% of quota for the first half of 1992, and the biggest LAN purchasing season is traditionally the third and fourth quarter," Victor added.

Victor said there are so many desks that still do not have a PC, so many stand-alone PCs and so many LANs still to be upgraded that there should not be a slowdown anytime soon.

OS/2 faces Windows

CONTINUED FROM PAGE 55

tasking functionality. It remains to be seen whether NetWare users will adopt OS/2 now or wait for Windows NT.

Novell is staying neutral in the desktop client wars.

"Most OS/2 users are in corporations, and corporate users are usually networked, so most OS/2 users are LAN clients. The OS/2 Requester has been strategically important for both us and IBM. But we're committed to supporting all popular desktop clients with full functionality," said William Donahoo, marketing director for Novell's desktop systems group.

PC Edge's Spence thinks OS/2 has a future on the LAN. "We don't have a lot of customers for it yet. Given IBM's past mistakes, many users were leery. But as the reviews come in, more and more of our customers are looking at it," he said.

Predicting future market share of OS/2 has made fools of many industry analysts, and few are eager to repeat the mistakes they made in past years.

"I think LAN users are still unclear as to what advantages OS/2 has over Windows as a LAN client," said Barry Gilbert, an analyst at the Acton, Mass., office of market research firm Infocorp, "and they see no reason to spend a lot of time and effort evaluating it. I think IBM still has a lot of OS/2 marketing to do."

NEW PRODUCTS

LAN hardware

Madge Networks, Inc. has introduced the SmartCAU, an intelligent Token Ring wiring concentrator.

The product is compatible and interoperable with the IBM 8230 Controlled Access Unit and supplies fully automated fault recovery and management capabilities.

Network management software is included that enables users to manage SmartCAU remotely from a personal computer workstation connected to the Token Ring network. Automatic detection, location and isolation of faults on the network are key features.

A Dual Reconfiguring Ring detects faults on the trunk and switches data onto the backup ring path. This feature also keeps the network running while remaining invisible to users.

SmartCAU costs $2,995.

Madge Networks
42 Airport Pkwy.
San Jose, Calif. 95110
(408) 441-1300

LAN software

Alloy Computer Products, Inc. has started shipping MultiNode.

MultiNode combines peer-to-peer local-area network and multiuser DOS technology, creating a high-performance networking system that supports personal computer workstations and terminals.

The product includes multitasking features, Novell, Inc. compatibility and connectivity and has communications server features. MultiNode consists of two software Modules: MultiNode Station and the MultiNode MultiServer.

MultiNode Station prices range from $99 to $889. MultiNode MultiServer prices range from $195 to $1,095.

Alloy Computer Products
1 Brigham St.
Marlboro, Mass. 01752
(508) 481-8500

Workgroup software applications

Altia, Inc. has announced Avid Design, a human interface design software package.

The product provides intuitive, mouse-driven graphical design capabilities, accelerating instrument and control systems development and eliminating the need to write graphics code.

According to the company, realistic human interface prototypes can be created in days, not months.

A graphical editor helps create and assemble components for an instrument front panel and allows hierarchies of complex elements to be treated as a single structure. A library of prebuilt components is provided, enabling users to create component libraries for recall.

Avid Design costs $4,900.

Altia
7240 Fleetwood Court
Colorado Springs, Colo. 80919
(719) 598-4299

CaseWare, Inc. has introduced the CaseWare/PT Problem Tracking System.

CaseWare/PT addresses change requests and bug reports supporting new development and maintains existing software.

Users have complete visibility and control of engineering change requests through all the phases of design, source code development, documentation and maintenance. Key features in the system include fully integrated defect/change tracking, problem report capture, modification, query and reporting.

CaseWare/PT costs $3,500 per user.

CaseWare
108 Pacifica St.
Irvine, Calif. 92718
(714) 453-2200

Modems

NEC Technologies, Inc. has introduced the UltraLite 14.4 Data/Fax Modem, a product compatible with the NEC UltraLite SL/20, SL/20P and SL/25C notebook computers.

The UltraLite 14.4 Data/Fax Modem supports V.32 bis, allowing for data transmissions of up to 38.4 bit/sec., and has capabilities such as 9.6K bit/sec. fax send/receive and enhanced cellular capability. Other features include data encryption, flash read-only memory, Microcom Networking Protocol (MNP) 4 or V.42-compliant error protection and MNP 5 or V.42 bis data compression.

The modem costs $699.

NEC Technologies
1414 Massachusetts Ave.
Boxboro, Mass. 01719
(508) 264-8000

Global Village Communication, Inc. has announced the PowerPort series of internal fax/data modems.

The three products in the series were designed for Apple Computer, Inc. Macintosh users. They provide data transmission, send-and-receive fax capabilities and the company's GlobalFax software.

PowerPort/Gold is a V.32 bis modem that has built-in V.42 error correction and data compression. PowerPort/Silver and PowerBook users can connect to an office network via AppleTalk Remote Access. PowerPort/Bronze was designed for heavy users of fax services.

PowerPort/Gold costs $795, PowerPort/Silver costs $595, and PowerPort/Bronze costs $295.

Global Village Communication
Building 8
685 E. Middlefield Road
Mountain View, Calif. 94043
(415) 390-8200

Unix

Chronology Corp. has announced that it will offer a version of its TimingDesigner software package for Unix workstations supporting X Window System.

According to the company, TimingDesigner provides users with the ability to accurately model and analyze the worst-case timing of complex digital circuits by tightly linking an interactive diagram editor with a custom timing spreadsheet.

TimeDesigner enters and modifies complex timing diagrams and can calculate critical timing margins.

TimingDesigner costs 4,995.

Chronology
2721 152nd Ave. N.E.
Redmond, Wash. 98052
(206) 869-4227

Workstations

Mobius Computer Corp. has announced the Mirage Series Model IPS/2 Unix workstation, a Sun Microsystems, Inc. Scalable Processor Architecture (SPARC)-based system that is compatible with Solaris 1.0.1 and SPARCware applications.

The Mobius Mirage is configured with 16M bytes of random-access memory expandable to 128M bytes and has three SBus slots and space for three internal drives or other peripherals.

Mobius Mirage IPS/2 has 1,152- by 900-pixel resolution, 256 colors and five types of built-in I/O ports: Ethernet, two serial ports, an external Small Computer Systems Interface-2 port, a sound port and Solaris 1.0.1.

The diskless Mirage IPS/2 costs $6,990, and the disk-full Mirage IPS/2 costs $8,590.

Mobius Computer
Building 4.410
5635 W. Las Positas
Pleasanton, Calif. 94588
(510) 460-5252

Excalibur Technologies Corp. has announced the PixTex/EFS electronic text and image filing system.

PixTex/EFS was designed for Sun Microsystems, Inc.'s Scalable Processor Architecture workstations and servers running Unix in a stand-alone or networked environment.

Text and images are gathered from disks, scanners or fax machines and indexed and filed using Sun workstations under OpenLook. Images and documents are stored in an electronic equivalent to a file room, where users can create file cabinets, drawers and folders to arrange information.

Prices start at $23,600.

Excalibur Technologies
Suite 1095
2000 Corporate Ridge
McLean, Va. 22102
(703) 790-2110

Hertz Computer Corp. has introduced the Hertz 486/50E.

The product has 50-MHz capability and can be used as a stand-alone workstation or a workgroup file server. A standard Hertz 486/50E is configured with 8M bytes of random-access memory and 256K bytes of secondary cache memory.

There is a 3½-in. or 5¼-in. floppy disk drive and a 1,024 by 768 Video Graphics Array board with 1M byte of RAM. Eight I/O expansion slots, two serial ports and one parallel port are included.

According to the company, the system achieves new levels of throughput running existing applications and can maximize the full graphical and multitasking potential of Microsoft Corp.'s Windows, OS/2 and other operating platforms.

Prices for the Hertz 486/50E start at $2,149.

Hertz Computer
325 Fifth Ave.
New York, New York 10016
(212) 684-4141

Electronic mail

Cayman Systems, Inc. has updated GatorMail, its electronic-mail gateway application with Release 2.1 of GatorMail-M and GatorMail-Q.

Release 2.1 of GatorMail allows users of QuickMail and Microsoft Corp.'s Mail on LocalTalk or Ethernet to seamlessly exchange mail with minicomputer and workstation users on Ethernet via Simple Mail Transfer Protocol.

Enhancements in performance features include full support for Apple Computer, Inc.'s MacTCP 1.1, support for System 7.0 and a new enclosure handling system.

Prices for GatorMail-M and GatorMail-Q software start at $595.

Cayman Systems
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 494-1999

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People have always b
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computing envir

The good news, however, is there's a solution. Lotus Notes® software. A breakthrough technology that's helping organizations overcome the technological roadblocks found in most mixed computing environments, which often stop good ideas from ever going anywhere.

You see, Lotus Notes is a flexible workgroup computing environment that signals a better way for end users to work together...while giving IT and MIS professionals a better way to more effectively leverage their company's existing hardware, software and network investments.

Let's face it. Many companies have spent fortunes on technology over the years and have begun to wonder just how well it's paid off. With Notes, the benefits are immediate. Companies can finally begin connecting people and ideas for more informed decisions. Regardless of group size, location or network configuration.

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How People Are Using Lotus Notes

Strategic Planning	*Project Management*
Sales Management	*Sales Presentations*
Industry Newswire	*Policy Handbook*
Customer Service Tracking	*Electronic Mail*
Forms Routing	*Financial Profiles*
Quality Management	*Telemarketing*
Contract Library	*Technical Support*
Correspondence Tracking	*Job Postings*
User Group Discussions	*Credit and Collections*

Lotus Notes runs on the most popular networks (Novell,® IBM,® Microsoft,® Banyan® and DEC™). And,

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IN BRIEF

Genie to cut daytime access rate

■ Until Sept. 7, **Genie**, the General Electric Information Services data network, will reduce its $18-per-hour daytime access rate to $12.50.

■ The **University of Illinois-Chicago**, the **Argonne National Laboratory** and the **University of Chicago** will test Switched Multimegabit Data Service (SMDS) as an alternative way of connecting with the Internet. SMDS, which is a high-speed, packet data network topology for the public-switched telephone network, offers speeds of 1.5M to 45M bit/sec. The Internet is the global academic and research data network.

The trial is being orchestrated by **CICNet, Inc.**, a data networking company located in Ann Arbor, Mich., and founded by several Midwestern universities. **Ameritech Corp.**, the Chicago-based regional telephone holding company, already has one SMDS trial under way in Michigan and plans to offer commercial SMDS to customers in Michigan and Illinois by year's end.

■ **BT North America, Inc.** recently completed the installation of a frame-relay network for supercomputer maker **Meiko Scientific Corp.** BT North America's Global Network Service is said to link local-area networks at Meiko's Waltham, Mass., and Bristol, England, sites using Transmission Control Protocol/Internet Protocol. This in turn enables developers to access computers on both sides of the Atlantic and to develop and debug code on an interactive basis.

Meiko previously used X.25 links that could not handle the speeds needed for such interaction.

Mobile use presents access challenges

BY JOANIE M. WEXLER
CW STAFF

Data communications managers immersed in hooking together disparate departmental networks to give users painless access to corporatewide data are soon to face an even thornier challenge — if they haven't already.

Users on the go have begun to demand the same access to client/server applications running across corporate internetworks that are available to them when they are sitting at their fixed work areas.

Accommodating these mobile users is problematic from at least three perspectives, depending on where the user is attempting to access the network: the sluggish speed of dial-up communications lines compared with local-area networks, the inflexibility of network addressing schemes and security.

Wandering users looking to extend their client/server computing to a hotel room or other noncorporate site have a bandwidth problem.

Though public carriers are working on increasing the speeds available in the public-switched network to become more LAN-like, services such as frame relay and Switched Multimegabit Data Service are currently slated for availability only at contracted corporate sites — not to individual users accessing the public network from ad hoc locations.

For example, Byer California, a women's clothing manufacturer in San Francisco with seven nationwide corporate sites, is becoming increasingly dependent on graphical information for viewing garments, said Michael Higgins, technical support manager. However, if a user travels anywhere other than the firm's corporate offices, "we have a bandwidth issue," Higgins said.

"A color picture of a garment is about 5M bytes, which travels well over Ethernet and frame-relay networks. But sending it over a 4.8K bit/sec. serial line is out of the question," he said.

While some modems are now claiming speeds of up to 57.6K bit/sec., "Many PCs won't run reliably at these speeds" over serial lines, noted John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

Delmarva is attempting to run X Window System-based client/server network management applications remotely so that managers "don't have to drive to the network control center every time there is a problem." But he said most dial-up speeds are "brutal" on X applications.

Security-wise, because of "so many hackers out there," Ernst & Young Southern Management Consulting in Atlanta has not yet implemented remote dial-in ac-

Continued on page 67

Phone outage drives FAA to backup strategy

BY GARY H. ANTHES
CW STAFF

Disaster struck at 10:10 a.m. on Tuesday, Sept. 17, 1991, when AT&T cut over to diesel generators at a switching center in lower Manhattan, N.Y. The move, part of a power-saving agreement with Consolidated Edison Co. of New York, Inc., triggered a massive telephone outage that left air traffic controllers in the Northeast on hold and 85,000 air passengers on the ground.

Never again, said the Federal Aviation Administration (FAA), and two weeks ago MCI Communications Corp. unveiled its solution: a virtually fail-safe, dedicated national network to carry voice, data and radar images for the FAA's National Airspace System (NAS).

Called Lincs, for Leased Interfacility NAS Communications System, the network will provide digital paths that link 20 regional FAA centers, 80 major airports and a host of other FAA facilities and MCI backup sites that equal 265 major nodes and serve 5,000 FAA locations. Lincs will be the operational network of the FAA, and its principal users will be tens of thousands of air traffic controllers and pilots.

The network was designed to offer 99.999% availability, or no more than 5.3 minutes of downtime a year, and any one network failure is to be repaired in less than 30 seconds. The FAA's mostly analog network currently goes down for roughly 35 hours a year.

According to MCI, Lincs will achieve the higher reliability through a combination of redundant components and diverse routing at three levels. At the highest level, the Lincs National Backbone Network will connect 20 major air traffic control centers across the country, with traffic flowing over fiber-optic or microwave paths at T1 (1.5M bit/sec.) or T3 (45M bit/sec.) speeds.

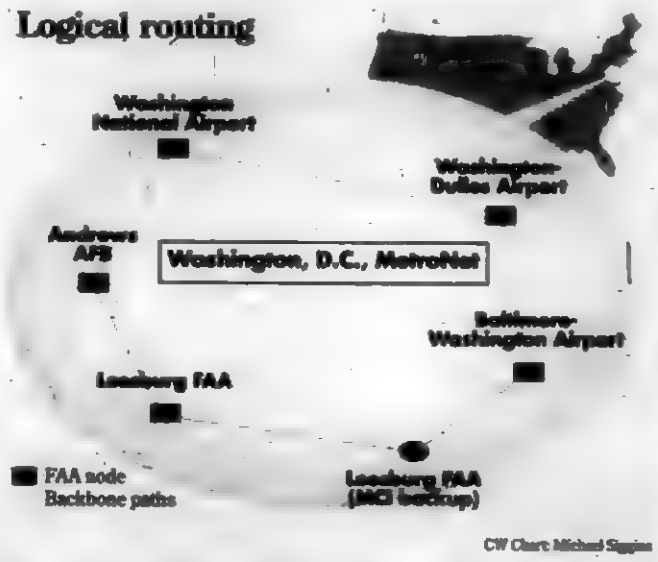
Each of the 20 centers — called Air Route Traffic Control Centers (ARTCC) and serving regional "airspaces" — will be connected to at least two other centers to allow alternate routing. Each connection is made via two physically separate circuits — either two from MCI or one from MCI and the other from another long-distance carrier.

At the second level, each ARTCC will be mirrored by a nearby MCI backup node with an identical Newbridge Networks, Inc. 3600 series intelligent multiplexer, which itself contains redundant components. Every FAA facility served has a connection to both its regional ARTCC and to the MCI alternate node.

At the lowest level, ring subnetworks will connect airports in metropolitan areas or local access and transport areas. Each node will contain dual multiplexers and diverse paths to two other nodes.

Even the network management center is to be backed up, with the primary facility in Reston, Va., mirrored by a center in Sacramento, Calif.

"We'll be able to see remote sites instantaneously and diagnose remotely," said Mike Serbousek, branch manager for FAA Lincs at MCI. "Now, at remote sites, there's really no capability to tell when something's down unless someone is looking at it or it's alarmed."



CW Chart: Michael Siggins

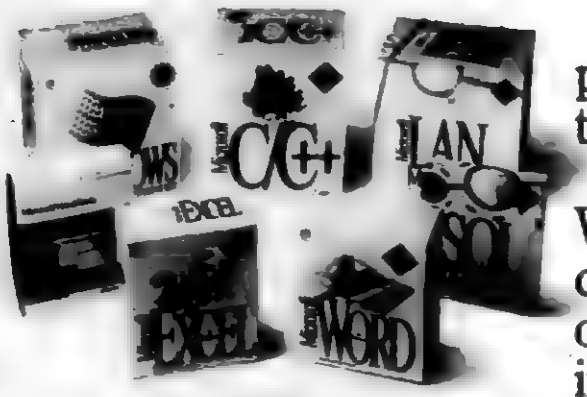
Improved reliability

David Joyce, Lincs program manager at the FAA, described network performance data from existing carriers as "vague and not very current." He said real-time reporting from MCI via the network management centers will enable much better control and trouble response.

Single-vendor accountability will also contribute to reliability, Joyce said. He said the FAA's national network consists of arrangements with more than 400 long-distance and local exchange carriers. "Dealing with multiple vendors gets to be very nightmarish when you're trying to restore service," he said.

In addition to a big boost in reliability, the FAA hopes the 10-year, $856 million outsourcing deal will save operating costs. MCI said Lincs is slated to become operational initially in the Seattle airspace during the first quarter of next year. It is scheduled to be implemented in Southern California in the second quarter of next year and nationwide by the first quarter of 1995.

Everybody talks a in corporate America. some of th



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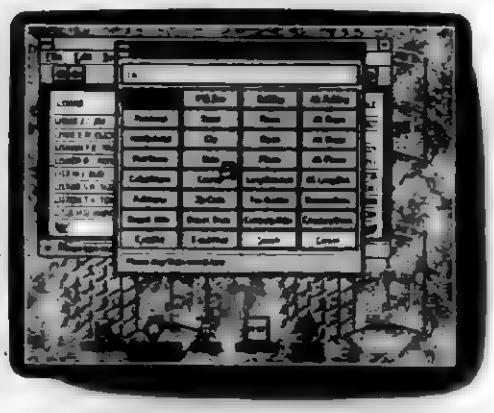
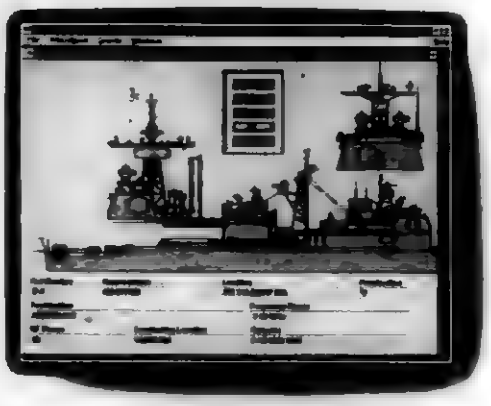


CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

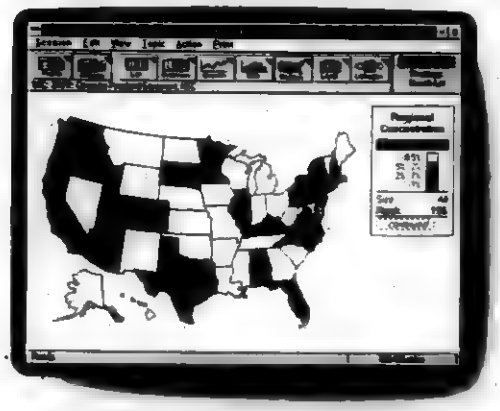
Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

© 1992 Microsoft Corporation. All rights reserved. The Windows World Open competition was sponsored by ComputerWorld, Windows Watcher, Windows World and Microsoft. Winners were selected by five independent Windows experts. Choice of development tool was not a criterion for entrance in the contest. Microsoft is a registered trademark of Microsoft, Inc. Bridge Tool-kit is a trademark of Sophisticated Microsystems Corporation. Q+E is a trademark of Pioneer Software Systems Incorporated. Superbase is a registered trademark of Precision Incorporated.

bout the problems We'd like to talk about e solutions.

Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.

Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.

Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

Microsoft
Making it easier

Printed in the USA. For more information inside the 50 United States, call (800) 541-1261, Dept. HDS; outside the 50 United States and Canada, call (206) 936-8661. Customers in Canada, call (800) 563-9048. Microsoft is a registered trademark and Visual Basic and Windows are trademarks of Microsoft.

Telecommunications revamp heals New York hospital's ills

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — New York Hospital-Cornell Medical Center was granted a charter by Great Britain's King George III in 1771. And until recently, the telecommunications infrastructure at the nation's second-oldest hospital seemed nearly as antiquated as its ancestry.

The hospital was suffering some management and performance inefficiencies from the lack of a structured cabling plant that would allow network segmentation, explained Paul Epstein, data network manager.

Previously, the hospital ran one huge coaxial cable-based Ethernet network that supported a few hundred users "who would each be affected by a [data traffic] collision," he explained.

Barry N. Kriesberg, director of technical support services, noted, "We had wiring here that was almost like a rat's nest." The rat's nest carried the hospital's patchwork data networking infrastructure of Transmission Control Protocol/Internet Protocol (TCP/IP), Apple Computer, Inc. AppleTalk and Novell, Inc. IPX protocols.

Planning for growth

But that is changing. In the mid-1980s, hospital management asked its telecom division to develop a hospitalwide communications strategy. It wanted to not only support voice and data but also provide the bandwidth necessary to add future applications such as teleradiology — transmission of radiology images over the data network.

That strategy is being realized with multiple fiber Ethernet backbones, an AT&T unshielded twisted-pair cabling plant that was completed in December and a corresponding all-out shift to 10Base-T local-area networks. 10Base-T and fiber wiring hubs from Network Resources Corp. in Milpitas, Calif., and Cisco Systems, Inc. multiprotocol bridge/routers form the base of the data networking infrastructure.

Most of the hospital's 500 dumb terminals will be replaced by personal computers containing 10Base-T network adapter cards, Epstein said. While the myriad protocols are likely to remain, the hospital is trying to standardize on TCP/IP wherever possible, he added.

The hospital's new data center on 38th St. — which became operational this month — occupies two floors. An AT&T Systimax Premises Distribution System (PDS) links individual 10Base-T networks — Ethernet networks that run over unshielded twisted-pair — into multiple hubs on each floor. The 10Base-T hubs all feed into two fiber concentrators on one floor via the fiber Ethernet riser backbone.

The fiber concentrators link into a Cisco router, which sports a T1 wide-area connection to a matching router in a sub-basement that is shared by the hospital's 23-floor main facility at 68th St. and six other buildings. The sub-basement also houses multiple concentrators.

The hierarchy of hubs and concentrators allows the network to be segmented into 14 networks to boost performance and render the network more manageable, Epstein said.

Activity with standards

In addition, because of current standards body activity, the Systimax PDS wiring closet will likely allow an upward growth path to data transmission speeds of 100M bit/sec. An American National Standards Institute Fiber Distributed Data Interface working group is expected to approve a standard for running 100M bit/sec. over copper wiring by year's end.

Overall, the hospital uses 18 departmental file servers running Novell's NetWare 3.11 network operating system. It recently installed two Novell gateway links to the IBM 3090 mainframe.

Kriesberg said the telecom division, which operates independently of the information systems group, has spent $750,000 to move its telecom network applications and equipment, including telephone systems, data communications systems and wiring, to 38th St.

Payback could come by avoiding future changes to the network. In the past, Kriesberg explained, New York Hospital's telecom division was constantly playing catch-up with its tangled telecom infrastructure. With the networking overhaul, the hospital has ample room for growth.

Senior editor Joanie M. Wexler contributed to this story.

ON SITE

The New York Hospital-Cornell Medical Center
New York

- **Challenge**: To provide a long-term path for connectivity among New York Hospital's departments and buildings while consolidating IS operations under one roof.
- **Technology**: AT&T's Systimax Premises Distribution System, Northern Telecom's SL-100 PBX, Cisco routers, Novell NetWare-based file servers, an IBM 3090 Model 200 mainframe, an IBM SNA gateway, an IBM AS/400 minicomputer.
- **Expected results**: To provide an eventual path for teleradiology transmissions and other future applications; to improve voice and data connectivity among all departments and three main campuses; and to save 80,000 sq ft in data center floor space.

A healthier situation

New York Hospital's data center manager Bob Henn said the impetus for moving the facility's data center to two floors on 38th St. was twofold: By leasing less costly space on 38th St. and renting out 80,000-sq-ft space at its pricier 68th St. location for clinical use, the hospital can get a better return-on-investment.

In addition, the move means that the IS staff is no longer disjointed, with everyone now working together in the new data center location.

The hospital has also moved its payroll and other back-office operations to the new location.

In addition to an IBM 3090 Model 200 mainframe, the new data center houses a Northern Telecom, Inc. Meridian private branch exchange, another AT&T Systimax PDS cabling plant, several IBM 3990 disk controllers, strings of IBM 3390 disk drives, four Cisco Systems routers, three Novell network servers and an IBM Systems Network Architecture gateway.

A fifth router will soon be added to the hospital's White Plains facility to tie an IBM Application System/400 minicomputer to the mainframe over a T1 link, Henn said.

Although he would not discuss the cost savings expected from the data center move, he said productivity will be improved by having all of the hospital's IS staff members under the same roof.

THOMAS HOFFMAN

Unisys paves path for SNA-to-Unix connectivity

BY THOMAS HOFFMAN
CW STAFF

BLUE BELL, Pa. — Unisys Corp. moved last week to get a leg up on IBM in the world of connecting Unix platforms through IBM's on Systems Network Architecture (SNA).

Unisys introduced its Communications Access Processor (CAP), a network processor that reportedly integrates Unix and IBM SNA networks seamlessly across heterogeneous environments. CAP is said to combine multiple network architectures over a single SNA backbone and allow SNA users to access Unix while preserving their investments in hardware, software and training in SNA systems such as 3270 terminals. Unisys claims to do this by loading key SNA elements such as VTAM configuration into the CAP box. This reportedly eliminates the need for communications to pass through a mainframe.

Analysts said they expect the product to be a boon for Unisys. The Business Research Group, a Boston-based consulting firm, said SNA networks comprise 77% of large enterprise networks in North America. But many SNA shops are downsizing their corporate applications to lower cost, distributed systems based on open standards such as Unix, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect — all supported by the CAP system.

Carl Pitasi, vice president of the enterprise network strategy service at Gartner Group, Inc., a Stamford, Conn.-based consultancy, said CAP fills a major void for SNA connectivity. "It's the most significant networking product Unisys has come out with in the past few years."

CAP enables any IBM 3270 terminal in an SNA network to access Unix applications and let Unix applications look like mainframe programs. CAP can be used for simultaneous multiple-environment applications development, as well as managing and distributing data between SNA and Unix networks.

Jon Tempas, vice president for networking products marketing at Unisys, said CAP does not add to users' mainframe processing load because the communications processor includes the host System Services Control Point, which manages user access to applications. As a result, the network manages user sessions independent of the host computer.

> ANALYSTS EXPECT THE product to be a boon for Unisys.

Tempas said CAP helps reduce user costs by replacing expensive applications that historically have run on IBM mainframes. Users of personal computer local-area networks with Unix servers can also execute SNA applications using CAP, he said.

So far, Unisys has shipped six early units of CAP, including one to Baylor University and one to The Limited Credit Services in Columbus, Ohio. Limited Credit Services, which began testing the system in November 1991, went live in January this year, supporting 200 users.

CAP is slated to be available in September in two configurations. CAP 200, which supports up to 30 communications lines, is priced at $70,865. CAP 250, which supports up to 180 communications lines, is priced at $94,392.

Both systems provide SNA access to Unix System Laboratories, Inc.'s Unix System V, Release 4, initially by using Unisys U 6000 series Unix servers. Tempas said Unisys is working on a similar processor to facilitate Unix-to-Unisys 2200 series mainframe connectivity. That system is slated for availability in the first quarter of 1993.

Integrated network debuts for trading floor operations

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — A recently introduced digital switching system designed to integrate voice, data and emerging technologies such as videoconferencing and multimedia holds promise for use by traders and brokers in financial services companies.

Tradenet MX, a communications system designed by IPC Information Systems, Inc., is similar to a private branch exchange switching system.

Although the system is initially configured to support the large voice requirements for Wall Street trading floor operations, Tradenet MX can also accumulate the bandwidth necessary to support imminent videoconferencing, imaging and multimedia applications by aggregating individual links, according to Rick Bozzuto, executive vice president at IPC.

Glad to hear it

This could be good news for one user who has been testing the system since August 1991. Maggie Naymick, a voice communications analyst and Tradenet MX beta-test user at Cowan & Co. in New York, said the firm will likely purchase the system and will possibly add videoconferencing applications. Cowan & Co. uses Picturetel Corp. videoconferencing equipment.

Tradenet MX consists of a redundant array of Sun Microsystems, Inc. Scalable Processor Architecture reduced instruction set computing microprocessors, which are interconnected by a matrix of pathways.

The 25 million instructions per second microprocessor boards route calls through the system in less than 100 msec, according to the vendor.

Neil Olsen, director of software engineering at IPC, said each communications link in the system can handle 7.6M bit/sec. throughput. Each switching element supports 19 links.

Bozzuto said IPC is looking at adding other telecommunications capabilities, such as Asynchronous Transfer Mode and frame-relay interfaces. The system currently supports T1 links.

According to Bozzuto, Tradenet MX, formally unveiled in April, will begin shipping in October. Pricing is dependent on system configuration because each installation is customized.

Candle upgrade aids VTAM troubleshooting

BY ELLIS BOOKER
CW STAFF

LOS ANGELES — Candle Corp. recently upgraded its performance monitor for IBM's Virtual Telecommunications Access Method (VTAM).

Omegamon II for VTAM Version 150 includes a VTAM trace facility for ferreting out and reporting on errors in VTAM data streams. Candle developers said the trace facility obviates the need to invoke IBM's Generalized Trace Facility (GTF).

"Running traces the old way [using GTF] was such a pain, you often wouldn't do it," said Jerome Vitner, supervisor of network software at a major airline, which has been using the product since May.

In addition, the tool is simple enough for operations people to use.

"In the past, a systems programmer would have to be called in to run the GTF," Vitner said.

The trace function is one of several new features in the Candle product, which was officially announced in Chicago last month at the Enterprise Expo show.

THE TRACE facility obviates the need to invoke IBM's Generalized Trace Facility

Like past releases, the latest version integrates with Candle's OmegaCenter software.

Omegamon II for VTAM Version 150 is available now and ranges in price from $38,500 to $67,000, depending on IBM host model.

Mobile use presents access challenges

CONTINUED FROM PAGE 63

cess to users, though users are "clamoring for access" to client/server applications and electronic mail, said Greg Evans, regional technical administrator.

Evans said he will likely implement remote network access when he sees security at the hardware level: encryption read-only memory on modems, bridges and other communications devices. The scheme he envisions would require the device to send an encoded signal identifying itself to a serving device to glean network access.

For users taking their office computers with them to other intracorporate sites, Higgins noted that reconfiguring a computer's network address becomes cumbersome.

"I have a vice president downstairs with a [Apple Computer, Inc.] PowerBook [portable computer]. When he travels to New York, he has a subnetwork address mismatch and has to reconfigure his PowerBook" by typing in the correct address change, Higgins said.

WANDERING USERS looking to extend their client/server computing to a hotel room or other noncorporate site have a bandwidth problem.

"This assumes users can remember the address of the various locations they're in," Higgins explained, when generally, "anyone important enough to have a PowerBook" is not technically sophisticated.

Two efforts are under way to ease addressing and routing problems among fluctuating corporate Internet Protocol-based network segments by working groups of the Internet Engineering Task Force (see story below). However, as there is no corresponding body for users of other corporate protocols, such as Novell, Inc.'s IPX or Digital Equipment Corp's. DECnet, there is currently a gap for many mobile users.

In fact, Paul J. Severino, president of router maker Wellfleet Communications, Inc., recently told *Computerworld* that "one of the biggest issues our customers are asking us for help with is accommodating mobile users."

Internet group moves to address woes of traveling computer users

Users of large TCP/IP networks are fortunate to have the Internet Engineering Task Force (IETF) to iron out specific issues that crop up with the protocols.

For example, a project dubbed Mobile IP is under way by an IETF workgroup to allow traveling computers to maintain their identity when moved. Using the Mobile IP protocol, a computer will "temporarily assume a local address and have messages forwarded to it," said Greg Vaudreuil, secretary of the Internet Engineering Steering Group.

While the technical details have not been nailed down, the group expects a proposed Mobile IP standard by March 1993, he said.

A more mature effort called Dynamic Host Configuration was expected to be submitted for proposal last week. The protocol, which will run on users' computers and network servers, will automatically configure visiting users' computers with an appropriate network address, Vaudereuil explained. Currently, users must type in their new address information.

"This will go a long way toward helping corporate users move from location to location," Vaudereuil said.

JOANIE M. WEXLER

NEW PRODUCTS

Customer premises equipment

Ascom Timplex, Inc. has introduced the EntreeLink+ System, a high-performance network access system.

The EntreeLink+ provides full integrated voice, data and image transmission and has resident network management capabilities for private networking applications. Up to 44 I/O ports are included for flexible access to digital networks and to support applications such as high-speed local-area network data transfer.

According to the company, the product's synchronous and asynchronous data channel speeds of up to 1.984M bits/sec. and 19.2K bits/sec., respectively, meet most network transmission needs.

Prices start at $5,200.

Ascom Timplex
400 Chestnut Ridge Road
Woodcliff Lake, N.J. 07675
(201) 391-1111

Links

Xylogics, Inc. has introduced the Micro Annex ELS, a Unix terminal server.

The Micro Annex ELS is available with 8 or 16 ports and has the capabilities of a terminal server and an Annex communications server. Users receive the functionality of a multiprotocol asynchronous terminal server that permits the distribution of serial ports throughout their network and connection for modems, terminals, printers and other serial devices to an Ethernet. Features include the ability to access any Transmission Control Protocol/Internet Protocol or Digital Equipment Corp. Local-Area Transport-based network host, network management via the Simple Network Management Protocol, full modem controls and port password security.

The Micro Annex ELS costs $1,895 for the 8-port server and $2,495 for the 16-port server.

Xylogics
53 Third Ave.
Burlington, Mass. 01803
(617) 272-8140

Gateways, bridges, routers

Network Application Technology has added host security and bridging capabilities to its LANB/280.

The product is a stand-alone remote Internet Protocol router designed to extend central networks to remote Transmission Control Protocol/Internet Protocol (TCP/IP) local-area networks.

The host security allows the LANB/280 to restrict access to desktops, hosts and applications, and the bridging function allows the product to pass through non-TCP/IP packets. Point-to-Point Protocol over the serial link is used.

The LANB/280 costs $2,995 as a stand-alone unit.

Network Application Technology
1686 Dell Ave.
Campbell, Calif. 95008
(408) 370-4300

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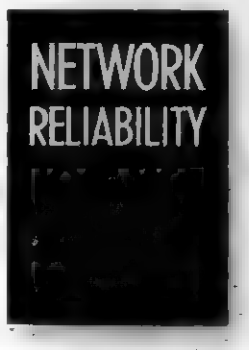

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Merger adds complexity to HMO systems strategy

BY JEAN S. BOZMAN
CW STAFF

CYPRESS, Calif. — A recent merger brought new complexity to information systems at $1.2 billion PacifiCare Health Systems, Inc., a Southern California health maintenance organization (HMO). Suddenly, PacifiCare became a mixed-vendor shop hosting both Digital Equipment Corp. and Hewlett-Packard Co. machines.

PacifiCare is organized as an umbrella organization for HMOs throughout the West. During the last five years, it grew from a $306 million organization to one that expects to have more than $1.7 billion in revenue in 1992.

Since 1989, it has operated a homogeneous computing environment based on DEC VAX computers. Anchored by a VAX 9000 running the production database, the computer room also has four VAX 6000s that host office automation software, including DEC's All-in-1.

The December merger with Health Plan of America, Inc. in Orange, Calif., brought an HP 9000 Model 870 inside this DEC-only shop, along with 15 new IS employees. The HP system has a Unix operating system, a Pick Systems emulator called UniVerse from VMark Software, Inc. in Framingham, Mass., and Pick applications. The HP computer was brought in because several of the HP applications were superior to PacifiCare's applications, IS managers said.

PacifiCare decided to undertake a comprehensive inventory of its applications, aided by Ernst & Young consultants who conducted an IS audit of the merger.

"One of the underlying premises of the merger is that we would look at the best and most functional systems," said Rich Kislowski, PacifiCare's chief information officer. "We didn't say 'someone's going to win, and someone's going to lose.' We asked which systems provided the most benefits and whether that functionality was on the DEC or the HP."

During the current

Continued on page 75

ON SITE

Richard Kislowski

PacifiCare
Cypress, Calif.

- **Challenge:** To manage merger that transformed the HMO into a mixed-vendor shop.
- **Technology:** DEC VAXs and the HP 9000, with users switching between environments via X Windows.
- **Results:** Some HP-based applications proved superior to the VAX-based packages during evaluation period and will be retained.

The almost paperless office

Firms use on-line access to reduce reliance on central printing resources

BY JOHANNA AMBROSIO
CW STAFF

The paperless office — that pipe dream of the early 1980s — may be coming to fruition after all, in a fashion. More and more users are discovering they can cut costs and improve service to their customers by providing on-line access to reports that have traditionally been printed in and distributed by the data processing center.

On-line access, which is one form of a discipline called output management, allows companies to scale back their central printing resources, sometimes dramatically.

But end users and their paper are not easily parted, so the technology must be accompanied by an aggressive selling campaign, according to people who have done it (see story below).

Nordstrom, Inc., a Seattle-based department store concern, started its on-line reports program more than two years ago. To date, the firm has saved approximately $2 million, according to Kurt Dahl, production services manager.

"When we started, our paper production was growing at over 21% annually, and we were printing over 7 million pages each month," Dahl said. Had they not done anything, that rate would have been about 10 million pages each month by now. Instead, they print about 4 million pages each month, he added.

The $2 million figure assumes a per-page cost of 1.2 cents, which is the actual paper cost. If other costs, such as storage and labor to retrieve files, are added, the cost can be calculated at closer to 25 cents per page.

Nordstrom is using InfoPak from Mobius Management Systems, Inc. to help automate the process of electronically distributing reports. Users can view and manipulate reports, as well as print them locally. In addition to the dollar savings, users get faster access to fresher information, and they can customize

Continued on page 74

Separation of worker and paper

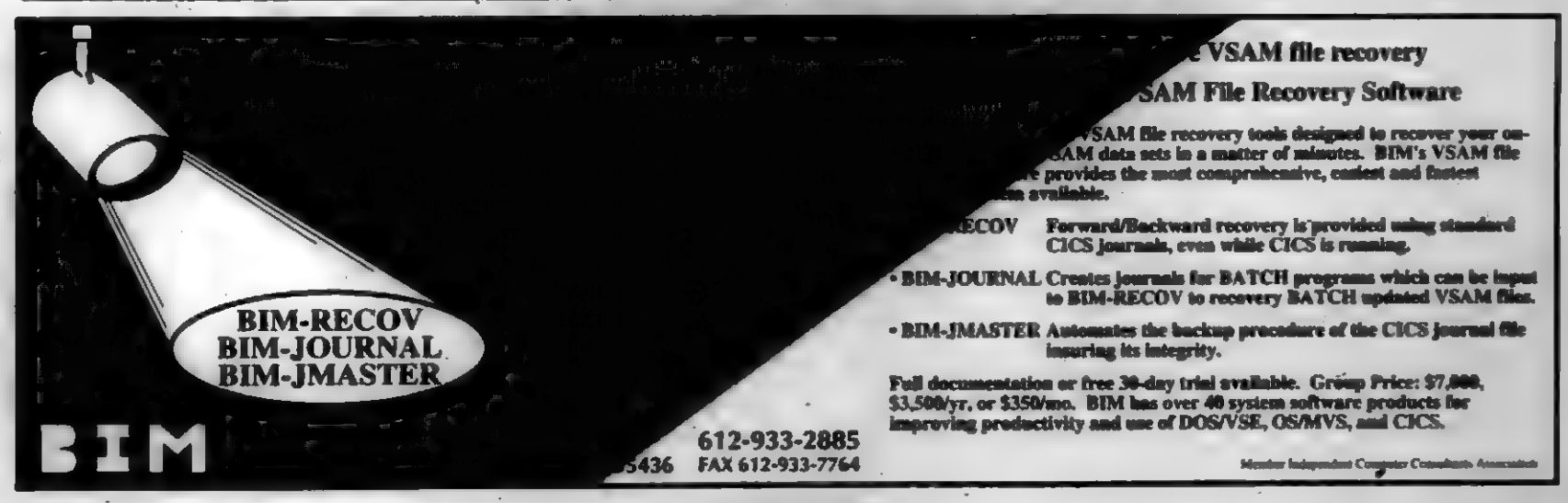
Technology is not enough to implement a successful on-line reports program; users must often be sold on the concept.

"I am personally convinced that taking away your kid's security blanket is easier than getting paper away from users," said Breck Churchill, a consultant at The Churchill Group in Overland Park, Kan. "The issue is not which technology you choose to replace paper; it's how you sell it. People hate change."

The following techniques, suggested by Churchill and by users who have instituted an on-line program, may make the selling job easier:

- Know the mind-set of your users — their needs and their fears.
- Be prepared for the most common objections, including scrolling limitations, notation requirements and the dislike of having to log on to get to information.
- Get your customers committed to a trial run. However, do not give them a cutoff date because that will immediately set up an antagonistic situation, and users will fight the program tooth and nail.
- Tie the program to efforts to help the environment, a tack successfully taken by Nordstrom. "We tell people how much paper they're saving and how many trees that represents," said Kurt Dahl, production services manager. Nordstrom also runs contests to encourage paper reduction, publishes an annual newsletter to keep everyone up to date and is about to begin planting trees for every percentage point of paper reduction.
- Work with upper management. Bob Petrohovich, a computer operations analyst at Whitehall Robins, helped begin an on-line program at his previous employer. "We first approached the management in each department to get the push going and explain cost and productivity benefits. Then we met with the users to explain the details," he said.

JOHANNA AMBROSIO



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ABC Radio seeks parity for IS teams

Commercial IS plays catch-up with broadcast systems that have brought market success

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Two very different levels of technology users have emerged at ABC Radio Networks, but now, information systems managers hope to build at least some level of parity by driving the network's business processing systems to catch up to the program transmission systems.

The latter unit is using leading-edge technologies such as Digital Audio Transmission Systems to stay a step ahead of the network's competitors by broadcasting a wider variety of programs to affiliate stations. ABC Radio, a Capital Cities/ABC, Inc. subsidiary, claims that its broadcast technology has helped it gain a 42% share of radio advertising in the U.S. and a 37% share of commercial affiliate stations nationally.

Playing computer catch-up

But while ABC is now on the leading edge of broadcast technology, its computer systems fell behind the times during the 1980s, according to Jasmine Alexander, senior director of IS at ABC Radio. Alexander has been busy trying to integrate a slew of dissimilar systems to support ABC Radio's back-office environment.

When Alexander arrived in 1990 after directing IS at the Wilkes-Barre, Pa., *Times Leader* newspaper, ABC Radio's back office housed dozens of standalone Apple Computer, Inc. Macintoshes.

Since that time, the company has built a data center and linked more than 150 personal computers and Macintoshes over Novell, Inc.'s NetWare 3.11 network operating system. The network's finance and clearance applications run on an IBM 3090 mainframe in Capital Cities' Hackensack, N.J., data center, with links to the New York offices via a Novell Systems Application Architecture gateway.

Sending it out

Because ABC Radio's IS department has only five people, the bulk of applications development is outsourced to third-party vendors. For example, Fusion Systems Group Ltd., a New York-based systems integrator, developed ABC Radio's sales proposal software system.

That project was completed in April for the network's New York offices. The network's Los Angeles, Detroit and Dallas offices began using the software last month. The system accesses sales and marketing information from a Sybase, Inc. database running on a Digital Equipment Corp. VAX 4000 minicomputer, which is used to help generate sales proposal reports.

Alexander is busy with other projects. The network recently requested bids for a project to redesign the company's research systems.

ABC Radio is also in the process of installing a wide-area network that would link PCs, Macintoshes, a DEC VAX 4000 and an IBM RISC System/6000 at Satellite Music Network in Dallas via routers. That network will allow affiliate stations to better communicate with one another regarding commercial slots. In addition, the new network will smooth communications between affiliate stations and New York.

The project, scheduled to be completed later this month, will provide affiliate stations with access to a database of information that duplicates sales and other data housed in New York.

In addition to the DEC VAX, the broadcaster deploys four Hewlett-Packard Co. HP 1000 minicomputers that support commercial scheduling and office automation systems.

In fact, ABC Radio uses nine operating systems to support front-end and back-office operations. Alexander is hoping to whittle these down to two or three operating environments by the end of next year. Though no decision has been made yet, Alexander said the network is leaning toward Unix.

Front-end operations supporting program transmissions are directed by Richard Martinez, vice president of engineering at ABC Radio. For 10 years, the network has relied on Data General Corp.'s Eclipse S/140 minicomputers to carry the network's entire broadcast schedule to affiliate stations.

Though the minicomputers have not missed a beat, Martinez said, new systems are being installed to support a new wire news service called ABC Newswire being offered by ABC Radio, Reuters and Gannett Co. That service will begin today.

To support the increase in communications processing resulting from the new wire service, ABC Radio is now installing two HP 9000 Model 330 minicomputers. The systems will process messages sent to affiliate stations for distribution over a packet-switched network. Currently, the network transmits 300 messages per day. With the HP 9000s helping to process information for the wire service, the load will be increased to thousands of daily messages, Martinez said.

ON SITE

ABC Radio Networks
New York, N.Y.

- **Challenge**: To maintain the network's leading-edge approach to front-end IS operations while playing catch-up with back-office IS operations.
- **Strategy**: Use compression to increase satellite transmissions to affiliates; downsize back-office operations from seven operating systems to two.
- **Goals**: To double its national market share of affiliate stations; bring back-office operations into latest generation.

County rides imaging wave

BY ELLIS BOOKER
CW STAFF

SACRAMENTO, Calif. — Taking into account the increasing cost of storing and handling government paperwork, Sacramento County was able to justify the deployment of an imaging system in one of its departments.

End of story? Hardly.

Making correspondence and records of the county clerk's office available on-line is only the first application on a platform that goes beyond document imaging and will eventually be the storehouse for text, graphics, images, audio and video.

"It's our belief that anyone in the organization who is entitled to information should be able to access it," said Russ Waltrip, director of information systems for the county.

Waltrip picked the Image and Records Management (IRM) system from IBM as the platform for this environment.

The first IRM application supports the clerk of the board of supervisors and maintains the agenda minutes and correspondence flowing in and out.

The application uses a DB2 index on one of the two mainframe hosts, as well as five OS/2 servers running OS/2 1.3. The user workstations are IBM Personal System/2s running OS/2 Presentation Manager.

During his evaluation of the imaging market, Waltrip found "tons of LAN-based imaging applications" that would have worked if his needs had been restricted to one department.

"But when you're talking about multiple LANs, databases and servers . . . the ability to scale wasn't there," he said. Sacramento County currently has 49 local-area networks in place.

Asked about future IRM projects, Waltrip said he is excited but hog-tied by the current budget stalemate in California. "Yes, I have another application planned. But as of now, I don't have a budget," he said.

But he hinted that a likely next step will be the electronic storage of county property, utility line and voting maps. The maps would be available to the county's 60 or so departments.

True Blue client/server

Developed jointly with American Management Systems, Inc. in Arlington, Va., the IRM system uses a true client/server architecture with OS/2 hosts and OS/2 Presentation Manager client workstations.

IRM was designed to handle any binary large object that can be digitized: Objects are stored in their native format and run under the application needed.

IRM is the traffic cop, cataloging both the data object and its attributes so the calling application knows what kind of object is being retrieved and how to display it. It runs on IBM mainframes under IBM MVS/ESA or MVS/XA in conjunction with DB2 and CICS.

IBM also offers ImagePlus for MVS/ESA mainframes, AS/400 midrange processors and PS/2s on LANs.

The almost paperless office

CONTINUED FROM PAGE 71

their reports as well.

Whitehall Robins, Inc., a pharmaceuticals supplier in Richmond, Va., is expanding its on-line program to keep selected reports for up to two years, said Bob Petrohovich, a computer operations analyst. Right now, the time limit is 90 days.

Petrohovich's group is meeting with user groups to introduce the concept and work out details. "Certainly they want to keep everything for two years, but it's a give-and-take process," he said. He added that so far the on-line program has "cut printing expenses by a third."

Although the on-line programs increase the need for direct-access storage devices (DASD), Petrohovich said, "You know what it's going to take going in, so it's not a surprise." Other observers added that the cost of additional DASD and tapes is negligible compared with the savings.

That may be one reason why on-line access to reports seems to be an increasingly popular phenomenon. "We're seeing a tremendous interest in how to get information in electronic form out to end users," said Arnold Farber, president of Farber/LaChance, Inc., a consulting firm in Richmond, Va.

"To do this you need two types of tools: hardware that allows the boxes to be physically connected and to give access to data, on disk or tape, in minutes," he said. "You also need a software tool to search for and modify information on-line."

These software packages are available from many mainframe software vendors. They include Sysout Archival and Retrieval System from Goal Systems International, Inc.; CA-Dispatch from Computer Associates International, Inc.; Bundl from Legent Corp.; and Control D from 4th Dimension Software, Inc.

In addition, some new players are coming out with personal computer versions; one of these is Acquire from UniSolv in Phoenix. It runs on a PC local-area network.

But not even the best intentions always work. "We haven't had much success," said David Potemra, manager of computer processing at Dresser Industries, Inc. in Dallas. Though on-line reports have been available to end users for more than three years, few people outside the data center use the option.

"We're decentralized, and we charge back for our services. People pay for what they use, and they buy their own paper," Potemra said. "We can't force them to do anything."

Comdisco expands VAX recovery capabilities

BY MELINDA-CAROL BALLOU
CW STAFF

CHICAGO — While Digital Equipment Corp. is regrouping financially and managerially, Comdisco Disaster Recovery Services is adding a VAX 6620 system to its group of DEC equipment to expand its recovery options for DEC customers.

"It's a pretty significant addition," said Chuck Gladfelter, director of midrange systems at Comdisco. Comdisco previously had four centers in various locations. The smallest of these centers offered systems with a capacity of only six VAX units of processing (VUP), while the largest center provided systems with 60 VUPs. "This addition doubles the capacity of our largest center up to 120 VUPs and significantly adds to our capabilities," he added.

DEC subscribers make up roughly 15% of Comdisco's business, with the rest being mostly dedicated to purely IBM shops or shops that mix IBM platforms with those of other vendors.

The performance requirements of these subscribers are increasing, thus necessitating the equipment upgrade for Comdisco, according to Gladfelter.

"When we started, if you had 12 VUPs of capability, that was a lot. Today, we're running into lots of shops that have an excess of 100 VUPs. They are committing to DEC and continuing to move in that direction," he said.

Gladfelter added that there are two primary DEC markets for Comdisco: pure DEC shops and IBM subscribers who have DEC systems integrated with IBM mainframes.

IN BRIEF

Users install fewer but larger mainframes

■ The mainframe may not be dead, but the number of installed systems and sites is decreasing, according to a recent report from **Computer Intelligence**. The mainframe's peak was in 1989, and since then the estimated number of IBM or plug-compatible mainframes has declined 12%, from 27,274 to 23,920. During the same period, the number of IBM and compatible mainframe sites decreased 9%, from 16,631 to 15,114. Customers are installing fewer but larger mainframes and are combining multiple data centers into "megacenters," the report added.

■ **US West** has ordered a $10 million **Unisys Corp.** 2200/9222 dual-processor mainframe and has purchased two Unisys M9780 cached disk subsystems that provide 20G bytes of storage. The contract also includes services to help the telecommunications concern migrate.

■ **Unisys** has signed a three-year agreement to buy customized matrix printers from **Bull Italia**. The new model, the AP1371, is based on the existing Compuprint 1070 and has throughput of 540 pages per hour. The AP1371 is available immediately for use with Unisys mainframes, Unix-based systems and personal computers.

■ **Pace Membership Warehouse**, an Englewood, Colo.-based subsidiary of **Kmart Corp.**, purchased $100,000 worth of financial and construction software from **J. D. Edwards & Co.**, a firm in Denver that caters to IBM's midrange machines. Pace intends to build 28 new warehouses this year and will use the packages to schedule and track construction when building begins this month.

■ **Integris**, the systems integration unit of **Bull HN Information Systems, Inc.**, signed a $500,000 deal with the state of Mississippi to build imaging technology into the state's Public Employees Retirement System. The state hired Integris, based in Billerica, Mass., to construct a client/server architecture using Unix servers and DOS-based PCs as clients.

NEW PRODUCTS

System software

System Industries, Inc. has started shipping the S12480 Automated Tape Librarian (ATL).

According to the company, the S12480 ATL has 288 3480-compatible tape cartridges online in a compact silo, which can be expanded to an integrated system of more than 1,800 cartridges. Switch-selectable Improved Data Recording Capability with compatible data compression and expansion cabinets gives the product a storage capacity ranging from 58G bytes to more than 1T byte.

The S12480 Automated Tape Librarian unit costs $175,000.

System Industries
1855 Barber Lane
Milpitas, Calif. 95123
(408) 432-1212

Micro Technology, Inc. has introduced the StingRay Starter Kit Program.

The product consists of one StingRay server configured with a StingRay controller channel, plus three 2G-byte StingRay 200 storage elements and cabling and connection devices. The StingRay Starter Kit is an alternative for users who have Digital Equipment Corp.'s Hierarchical Storage Controllers and only require the addition of requester cards and RA drives to achieve their storage needs, the company reported.

The StingRay Starter Kit costs $35,000.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

Executive Software, Inc. has announced Version 6.0 of Diskeeper/Plus, an on-line defragmenter for VAX/VMS.

New features include the ability to create Diskeeper/Plus jobs from a menu system or a command line interface at the DCL prompt, plus the option to locate the Diskeeper/Plus files on any disk in the directory. Templates can be made that consist of the most common Diskeeper/Plus job specifications used on a regular basis, and Version 6.0 allows for user-defined default values.

Prices range from $250 to $10,600, depending on configuration.

Executive Software
6th Floor
701 N. Brand Blvd.
Glendale, Calif. 91203
(818) 547-2050

BMC Software, Inc. has announced Release 4.2 of Recovery Plus for CICS and Recovery Plus for VSAM, products that recover CICS and batch VSAM 20% to 40% faster than previous versions, the company reported.

When CICS has files open for updating, Release 4.2 provides backups for these files, ensuring data integrity and offering 24-hour availability of VSAM files for CICS. Recovery Plus for VSAM Release 4.2 has a dynamic spill file for out-of-space conditions on journal or log date sets.

Pricing for Release 4.2 of Recovery Plus for CICS and Recovery Plus for VSAM starts at $4,000 and $2,000, respectively.

BMC Software
Suite 320
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77478
(713) 240-8000

Database management

Neon Systems, Inc. has introduced Shadow for DB2.

The product is designed to facilitate remote use of DB2 databases. DB2 applications can be run on systems that do not have DB2 installed. Extensive interactive facilities are included for controlling remote database access and can be used to analyze and debug SQL applications. Shadow for DB2 supports all TSO and batch DB2 applications.

Shadow for DB2 prices range from $9,950 to $55,000.

Neon Systems
Suite 4140
6464 Savoy Drive
Houston, Texas 77036
(713) 975-3563

Software application packages

Multitrak Software Development Corp. has released Version 2.8 of the Multitrak enterprisewide work management system.

The system provides the framework and the facilities for monitoring and managing projects, resources and services. Users can prioritize, schedule, and evaluate performance and productivity. Enhancements include extended project and resource attribute support, extensive screen redesign and FastPath navigation between screens.

Multitrak Version 2.8 begins at $40,000 for the IBM MVS mainframe version.

Multitrak Software
119 Beach St.
Boston, Mass. 02111
(617) 482-6677

Merger adds complexity to HMO systems strategy

CONTINUED FROM PAGE 71

evaluation period, IS executives are being guided by users at both HMOs and by the consultants. One conclusion reached so far is that the Health Plan of America claims application for individual doctors worked better than a similar PacifiCare system. However, a claims application for large group practices was deemed to be more efficient with the PacifiCare software.

It will take 12 to 18 months to rewrite many of the HP applications for the DEC machines. Many applications selected by the evaluation team will have to be rewritten by the firm's 125 programmers and by 10 contract programmers. Meanwhile, users who need to access both the HP and the DEC systems must toggle though four screens on an X Window System terminal.

The X terminals work well, but 500 employees had to undergo a week of training to use them, said Leo Collins, director of computer and communications technology at PacifiCare.

Some people had trouble adjusting to the sight of four 80-character, 24-line screens at once. "They start typing in the wrong window, and they don't understand why nothing's happening in the part of the screen they're viewing," Collins said. Users move between windows by clicking a mouse.

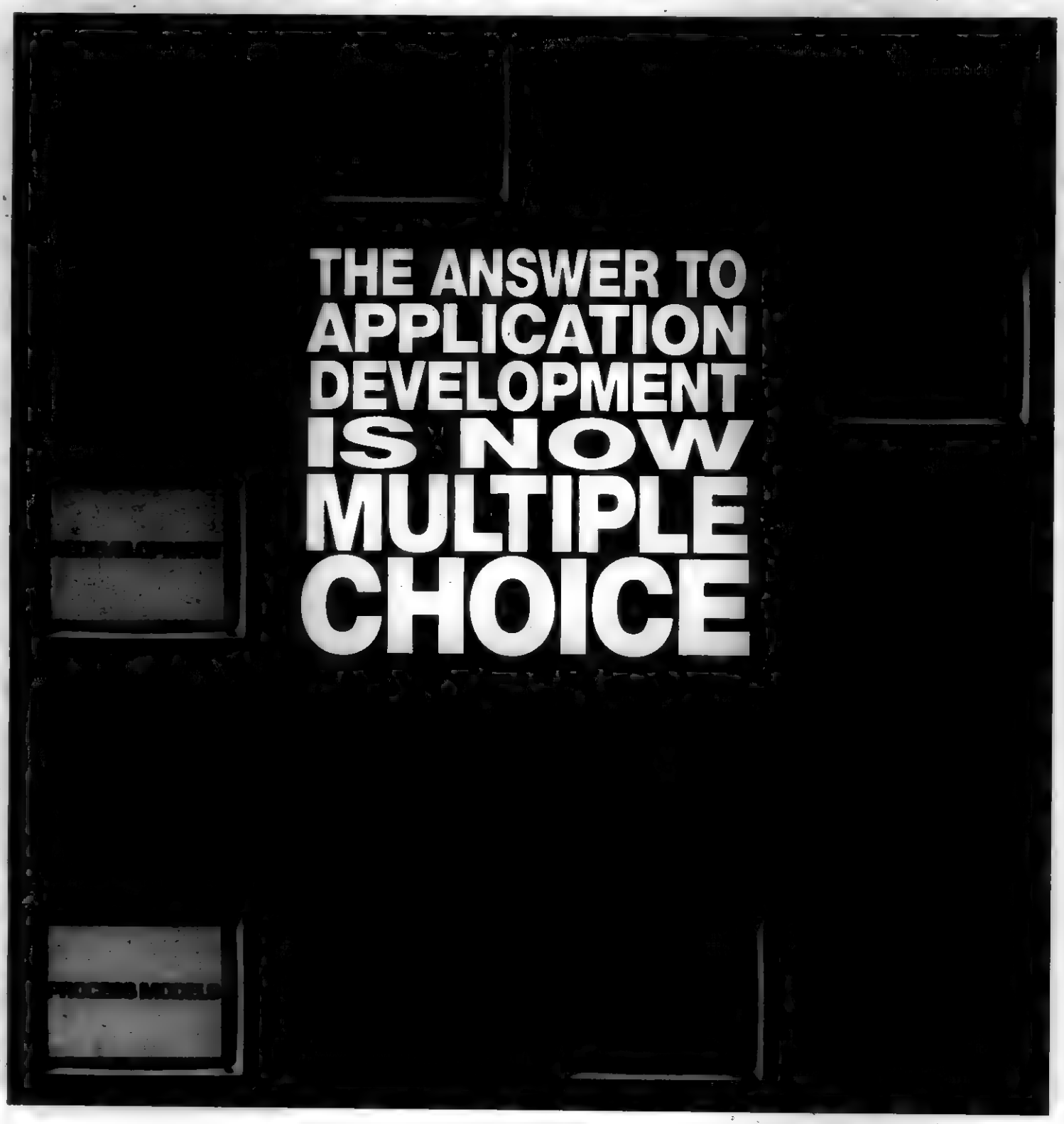
Kislowski plans to continue the coexistence of the DEC and HP systems, which are tied together with DECnet and Transmission Control Protocol/Internet Protocol networking protocols, for at least a year. But he wants an integrated environment in which the DEC hardware will handle most of the applications from both HMOs by 1994. At that point, the X terminals may no longer be necessary.

Keeping up

Meanwhile, PacifiCare's IS infrastructure is being readied for larger work loads. The VAX 6000s that host the firm's office automation software were upgraded early last month. The underlying Rdb engine, which supports on-line claims and customer profile systems, is being upgraded to release 4.0B this summer. The production database, which lists 800,000 members, requires 10G bytes of storage and is growing at the rate of 70M bytes a week. Overall disk storage is 230G bytes.

PacifiCare recently ordered one of the first DEC VAX 10000 machines; DEC announced the VAX 10000 last month, and it is scheduled to be installed by December. "It's a forklift upgrade," said Kislowski, who added that DEC's biggest VAX will boost processing power from 80 VAX MIPS to 120 VAX MIPS. The new machine will support 700 simultaneous users; the VAX 9000 supports 500 concurrent users, Collins said.

Uptime is also expected to improve, although PacifiCare's VAX 9000 provided two years of service. "The VAX 9000 never really lived up to the reliability we had hoped for," Kislowski said.



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COMMENTARY

Ann Winblad

Entering the enterprise era

Pundits are calling the 1990s the era of enterprise computing. It's the era in which the last 30 years of computing paradigms roll up into one contented family, allowing desktops access to all computing resources.

In this new computing paradigm, not only do the historical computing paradigms mesh, but corporate IS departments and end users also begin to blend into one noncontentious, heterogeneous computing environment.

The Berlin Wall that separates the microcomputer and mainframe environments is expected to simply disappear in this decade.

For those in corporations responsible for designing, building and maintaining this era of enterprise systems, new systems development strategies and tools must be built now.

During this progression toward enterprise computing, corporate IS programmers have continued to benefit from the improvement of tools to design,

Continued on page 80

Users blazing Amdahl's Huron trail

Although it has only about 30 users, the AD/Cycle alternative wins fans in mainframe shops

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — One year after its introduction, Amdahl Corp.'s Huron application development environment has gained a small but devoted following of users who like the product's productivity benefits but worry about whether Amdahl is a long-term player in the software business.

Conceived as an alternative to IBM's AD/Cycle, Huron is being marketed as an integrated tool kit for mainframe sites that boosts productivity through the use of business rules and prototyping. So far, fewer than 30 mainframe users have signed on. Some of these would-be pioneers seem less afraid of the new technology than they are relieved to make a dent in their application backlog.

Full steam ahead

Grumman Corp.'s Grumman Data Systems Division in Bethpage, N.Y., appears to have few reservations about Huron's potential as a platform-independent method of writing a new generation of applications.

"We've been laying out a strategy for migrating all of our systems to Huron," said Bernie Rachowitz, director of corporate information systems at Grumman Data Systems. "Huron will help us to migrate our old application code while still maintaining the IBM databases, including IMS and DB2."

Huron applications can be linked to many data sources, including flat-file databases, IBM-compatible relational database management systems and, soon, Unix databases, through the use of a built-in RDBMS. In theory, applications can be written once and run in MVS or Unix environments without change.

Grumman's old applications are largely written in Cobol; new applications will be written in the Huron programming language, Rachowitz said. Fewer than 10 Grumman programmers, working with Amdahl software engineers, developed prototype applications, some in only six weeks. A 26,000-line program became a 1,000-line program in Huron, using 300 business rules, Rachowitz said.

HURON PRODUCT CLOSE-UP

- **PRODUCT:** Proprietary application-development environment for mainframe sites running IBM's MVS operating system and Unix.
- **VENDOR:** Amdahl Corp.
- **INTRODUCED:** March 1991.
- **KEY COMPONENTS:**
  Huron Metastor Facility: Acts as data repository keeping track of where data is stored.
  Huron Rules Language: An abbreviated procedural language with fewer than 20 basic rules or statements.
  Huron Database System: A relational database specifically designed for use with Huron.

Grumman's two-month evaluation of Huron ended in December, and a few Huron programs are slated to go into production this year. Programmers are able to tackle Huron programming after a week or two of training, users said, but full mastery of Huron may take several months.

During the next two months, the number of Huron programmers at Alberta Treasury in Alberta, Canada, will grow from six to 30 because IS managers said they think Huron can shorten the development cycle, according to Neville Rogne, manager of direct customer banking for 140 branch banks. Alberta Treasury began a four-month evaluation of Huron in February and signed up in June. "We went into the trial with an assurance that we would see a 3-to-1 improvement in development time," Rogne said. "We saw about a 5-to-1 ratio on average."

However, Alberta Treasury also found a performance penalty associated with Huron's ease-of-use features. One Huron-based CICS program ran against a 1.5 million-row VSAM file and finished slower than expected, although Rogne would not quantify the performance delay. "Obviously there is a trade-off to get that kind of flexibility," Rogne said, "but it was an acceptable speed at an acceptable cost."

Not a bed of roses

There is a downside to embracing a new technology like Huron, analysts noted. It is not clear whether the product will be a success in the market because there is so much competition.

The system requires an entirely new — and proprietary — programming discipline. Programmers must use a high-level rules language, an on-line data repository and an extended RDBMS to get work done.

Last month, Huron was enhanced with the addition of Unix support for both mainframe and workstation systems. The desktop version of Huron will reduce entry price from $525,000 to $10,000. Amdahl's best strategy for selling Huron is to couple Huron with the sale of systems integration or consulting services, analysts said.

Object-oriented tool smooths CASE models

BY GARRY RAY
CW STAFF

Developers of real-time systems will be able to get early feedback on their designs with a new object-oriented computer-aided software engineering (CASE) tool announced last month.

Called Objectime, the tool is the result of a multiyear development effort by Bell-Northern Research Ltd. in Ottawa. Bell-Northern is the research and development subsidiary of Canadian telecommunications company Northern Telecom Ltd.

According to senior marketing manager Garth Gullekson, Objectime, which has been under development since 1986, is widely used in both companies.

Objectime allows graphical modeling of applications using Bell-Northern's real-time object-oriented modeling methodology. The methodology comprises an application's structure, which specifies the encapsulated components of a system; its behavior, which specifies how these components will react to events; and its inheritance, which allows components and behaviors to be reused. "We wanted people to focus on inheritance and encapsulation from Day 1," Gullekson said.

Once a design has been completed, Objectime provides an integrated runtime environment for validation and execution of the model.

Currently available on Sun Microsystems, Inc. Sun 4 workstations and Hewlett-Packard Co.'s HP 9000, Objectime pricing begins at $20,000.

Cadre's C workbench merges 6 modules

BY GARRY RAY
CW STAFF

Programming in C may be a badge of honor among coders, but a new tool from Cadre Technologies, Inc. may add to C the same sort of coding discipline that Cobol shops have known for years.

Called Ensemble, the new C workbench from Providence, R.I.-based Cadre is an assemblage of six modules that can be used to design new programs or to reverse-engineer and enhance existing C programs, said Caine O'Brien, director of product marketing at Cadre. Together, the tools produce flow diagrams, software metrics and documentation, O'Brien said.

Two Ensemble modules, System Understanding and Function Understanding, are said to read existing C programs to determine general and specific program structure, including all data structures. Another, the Construction module, can build ANSI-compatible C code from the Ensemble design environment, while Test Generation and Test Verification can execute a program.

Untangling code

Ensemble beta-test user Doug Smith, a senior software engineer at General Electric Co.'s Aerospace Division in Syracuse, N.Y., used the workbench to reverse-engineer a tactical software system provided by a subcontractor. "It gave us the ability to look at the design and see what spaghetti code really looked like," Smith said. The program "was not very well-structured," he said.

Smith added that without Ensemble, reverse-engineering the 25,000 lines of code "would have been done by hand.... [The workbench] did overnight what would take a human being a couple of weeks."

Emphasizing the benefits of reverse- and forward-engineering existing C programs, tools like Ensemble are "beginning to turn C into something more professional and are giving [the language] more discipline," said Adrian Bowles, vice president and director of the advanced software development research service at New Science Associates, Inc. in Westport, Conn. He said that despite a massive movement recently toward C programming, "the world of C programmers hasn't been characterized by discipline."

Available on the Sun Microsystems, Inc. Scalable Processor Architecture FCS, Ensemble will also be shipped for IBM's AIX, Digital Equipment Corp.'s Ultrix and Hewlett-Packard Co.'s HP/UX operating systems by the fourth quarter. Pricing for each module ranges from $3,000 to $6,000.

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As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

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Target

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Venkat (Vinnie) Tiruviluamala
Director, CPC/CPPC Information Systems
SONY Corporation

"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."
Bill Palm
President, Canadian Technology Services
Canadian Airlines

"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."
James R. Eagle
Director, Systems and Programming
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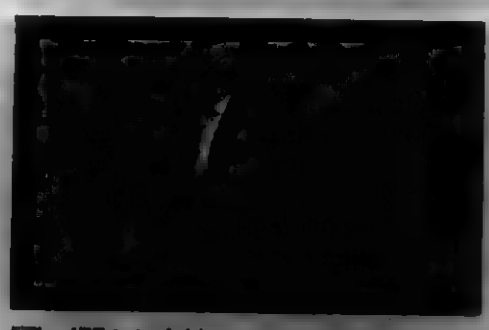
First Federal Lincoln



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Margaret Kubeitis
Research Programmer, IS&S
University of Illinois

"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."
K. E. Peacock
Data Administrator
City of Saskatoon, Saskatchewan

IN BRIEF

Sun gets new C tool

■ **Metaware, Inc.** in Santa Cruz, Calif., will be providing its C compiler for **Sun Microsystems, Inc.**'s Scalable Processor Architecture (SPARC) and Solaris versions of CodeCenter, an integrated C development environment from Cambridge, Mass.-based **CenterLine Software, Inc.** Called CenterLine-C, the compiler will be offered as an alternative to the C compiler that was previously included with Solaris 1.0 and 2.0.

■ Fourth-generation language (4GL) provider **Progress Software Corp.** in Bedford, Mass., and **Object Design, Inc.**, the Burlington, Mass., vendor of the Objectstore object-oriented database management system, have announced a strategic development and marketing agreement that will combine the two products. The firms said it marked the first integration of a 4GL and an object-oriented DBMS.

■ Cobol vendor **Micro Focus, Inc.** in Palo Alto, Calif., and **Hal Computer Systems, Inc.** in Campbell, Calif., have inked a deal that will allow Hal to resell a variety of Micro Focus Cobol products for its forthcoming SPARC Version 9 computer systems.

■ Database tool vendor **Uniface Corp.** in Alameda, Calif., has joined the independent software vendors program at **Oracle Corp.** The agreement provides both companies with a means to share technology, marketing and sales activities.

■ Cobol tool vendor **Netron, Inc.** in Downsview, Ontario, has acquired Toronto-based **Noma Industries'** 50.1% controlling interest in Netron, according to the company. Noma President Rudy Koehler said the sale was completed in order to "focus on efforts in our core manufacturing and distribution businesses." Effective with the sale, Netron became 100% privately held, according to company documents.

Winblad

CONTINUED FROM PAGE 77

code, reorganize and maintain legacy Cobol systems. But the programmer's workbench, gradually built over the last few decades, is not adequate for enterprise programming.

While programming approaches have remained relatively the same on legacy systems, commercial developers of PC applications systems have completed much of the change from an application-centric to a task-centric programming style. This new-style, object-oriented programming has become de rigeur on the PC. First C and now C++ have become the core component of the PC programmer's workbench.

Design, coding, debugging and management of complex class hierarchies of C++ did bring some additional challenges to the programmer. However, the rapidly improving programming tools, substantial sources of class libraries and evolving operating systems have allowed class libraries to intermingle with standard APIs and foundation classes, mitigating much of the challenge of object-oriented programming.

As a minor participant in the creation of the Cobol legacy, I can empathize with the large intellectual investment in code and programmer training. But corporations that ignore the enterprise computing model and the new object-oriented architectures will be trapped between two different worlds.

Currently, reusability benefits are far from the mainframe legacy. The most successful strategy has been to package object-oriented trappings around tired old systems using object-based GUI front ends. This approach has been referred to as shrink-wrapping or freezing the legacy code, making changes on the outside as if the legacy code were one large object.

Early programming tools such as those from Easel simply glued PC access to old data, but newer programming tools such as those from Powersoft and Gupta support the full object environment available on the PC. These new tools also provide additional class libraries and support application deployment in a client/server environment independent of the DBMS, although an RDBMS underpinning is assumed.

Not easy decision

Building the core enterprise programming environment does require some choices. These include whether a cross-platform (multiple client) tool or a "best of breed" product should be chosen for each platform.

A comprehensive workbench may also require buying into a single vendor's foundation strategy, such as the forthcoming Microsoft Application Framework, or selecting individual class libraries a la carte.

An important future of the workbench strategy will ultimately require one or more object messaging approaches, such as OLE, ToolTalk or Taligent. And developers will have to commit either to learning C++ and multiple class libraries or to focusing on less intensive API strategies using C or C++ code generation tools.

With the arrival of off-the-shelf tools from compilers to object-rich development environments, Cobol programmers will have less need to learn C and deal with the 800 APIs in Windows or hundreds of Unix APIs. The shift in the 1980s to RDBMSs was more difficult.

If they haven't already, programmers should now turn their attention to evaluating and selecting from this new generation of off-the-shelf, object-oriented programming tools. Along with this must come strategies for integrating legacy systems.

The benefits are real and available to both programmers and users. Programmers will obtain the benefits they need to get their work done. And end users will become active participants in the information of the enterprise.

Winblad is a partner at Hummer Winblad Venture Partners in Emeryville, Calif., and a co-author of Object-Oriented Software, published by Addison-Wesley.

Object innovators

Winners of the *Computerworld* Object Application Awards Program were honored at the recent ObjectWorld Show in San Francisco.

The winning companies were represented by, from left, Robert Rhodes at Wacker Siltronic Corp. in Portland, Ore.; Jeffrey A. Jones at Kash-N-Karry Food Stores, Inc. in Tampa, Fla.; Martin Ruexsch and Hermann Schmitt at Landschaftsverband Rheinland in Koln, Germany; Peter Meenan at General Electric Corporate Research and Development in Schenectady, N.Y., and Boyd Inman at United Artists Theatre Circuit, Inc. in Englewood, Colo.

NEW PRODUCTS

Compilers

TeleSoft has announced RISC-Ada/SPARC/R3000 and RISC-Ada/SPARC/80960, real-time Ada compiler products.

Using Sun Microsystems, Inc.'s Scalable Processor Architecture-based workstations and servers, the products develop real-time applications for the R3000/R4000 and Intel Corp.'s 80960 processors. TeleSoft's proprietary Optimizing Compiler Technology is included, which generates faster target code.

These cross-compilation systems also have an X Window System-based graphical user interface, an Ada-knowledgeable programming environment and the AdaTracer graphical source-level debugger.

Pricing ranges from $21,000 to $42,000.

Telesoft
5959 Cornerstone Court W.
San Diego, Calif. 92121
(619) 457-2700

Application development tools

XVT Software, Inc. is shipping Release 3.0 of the XVT Portability Toolkit and Version 1.1 of the XVT-Design graphical design tool.

Users can design an application and run it on six different graphical user interfaces and more than 26 different platforms. The tool kit provides an enhanced approach to window creation, which allows for dynamic and resource-based window definition and creation and hierarchical menu support.

Pricing for Release 3.0 of Portability Toolkit ranges from $1,450 to $4,400; XVT-Design ranges from $1,200 to $2,900.

XVT Software
4900 Pearl E. Circle
Boulder, Colo. 80308
(303) 443-4223

CenterLine Software, Inc. has unveiled CodeCenter 4.0, a Unix C programming environment.

CodeCenter 4.0 offers users a variety of capabilities for writing, building, prototyping, testing, debugging and maintaining C programs in heterogeneous development environments.

Improvements include CenterLine-C, an optimizing ANSI C compiler for Sun Microsystems, Inc. Scalable Processor Architecture workstations, advanced dynamic code and data visualization capabilities, enhanced debugging and faster object code runtime error checking.

CodeCenter 4.0 is priced at $2,995.

CenterLine Software
10 Fawcett St.
Cambridge, Mass. 02138
(617) 498-3000

Information Builders, Inc. has announced Release 2.5 of Level5 Object for Microsoft Corp.'s Windows 3.1.

The product is object-oriented, knowledge-based application development software. New data interfaces and faster execution provide users with the large production applications facilities offered in Windows 3.1. Level5 Object Release 2.5 supports full implementation for SQL, external program interfaces, decision support rules and stored procedures.

The product costs $995.

Information Builders
1250 Broadway
New York, N.Y. 10001
(212) 736-4433

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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
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60. Sys. Integrators/VARs/Consulting Mgt.
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
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70. Medical, Legal, Accounting Mgt.
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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
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BUYERS' SCORECARD

PacBase, IEF lead rising CASE satisfaction

BY DEREK SLATER
CW STAFF

Slow growth in the computer-aided software engineering (CASE) market has raised questions about whether the technology has lived up to its promise. However, user satisfaction with leading integrated CASE (I-CASE) products is on the rise, according to a Buyers' Scorecard poll.

All four of the products included in a similar survey last year [CW, April 22, 1991] earned higher overall scores this time around.

CGI Systems, Inc.'s PacBase tool set clambered into a first-place tie this year, with an overall score of 76, up five points from the previous poll.

Last year's winner, Texas Instruments, Inc.'s IEF, gained two notches in its overall score, up from 74 to 76, to tie with PacBase. (1991 scores have been converted to base 100 for comparison.)

Finishing out the survey were Arthur Andersen & Co.'s Foundation products at 68, up three points year-to-year; and KnowledgeWare, Inc.'s Information Engineering Workbench/Application Development Workbench (IEW/ADW) at 66 (a rise of three points).

Another significant I-CASE player, Intersolv, Inc., was created by last year's merger of Index Technology Corp. and Sage Software, Inc. Intersolv offers a modular product line. Its ratings are not included in the charts because an insufficient number of users who employ both the design and the code generation modules responded to the survey.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their I-CASE systems in 16 specific areas.

The users also rated the importance of each category. (See the methodology on the following page for a complete explanation of the scoring process.)

CGI Systems' PacBase topped a number of important areas, including ability to increase speed of applications development. Recent enhancements to the product line include the introduction of RE/Cycle, a repository-based maintenance program for Cobol applications that was released in April.

PacBase's repository also earned the top score in the survey (8.9). PacBase emphasizes maintenance and production of applications rather than high-level design, according to the company. A relative weakness is ease of use, in which PacBase finished third.

IEF users noted the TI product's high level of integration and ease of use; IEF finished with the highest ranking in both areas. In contrast to PacBase, IEF emphasizes a rigorous high-level methodology; the product topped the planning, analysis and design features category.

Arthur Andersen's Foundation captured its best marks in responsiveness of vendor service and support for local-area networking. Foundation has been sold primarily in conjunction with the company's extensive consulting services, though Digital Equipment Corp. has recently begun to resell elements of Foundation as part of the DEC Cohesion development strategy [CW, May 11, 1992].

Arthur Andersen has also added a new version of its design tools that runs under Microsoft Corp.'s Windows environment.

Full life cycle CASE tools

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: PacBase, 20; IEF, 43; Foundation, 18; IEW/ADW, 38.

Total possible score 100 **Mean score** 72

Product	Highest ratings	Lowest ratings
CGI Systems' PacBase SCORE 76	Data repository capabilities	Training time required
	Support for local-area networking	Overall ease of use
	Ability to increase application quality	Documentation
TI's IEF SCORE 76	Code generation capabilities	Support for local-area networking
	Integration of life cycles	Training time required
	Planning, analysis and design features	Documentation
Arthur Andersen's Foundation SCORE 68	Responsiveness of vendor service	Code generation capabilities
	Support for local-area networking	Ability to increase programmer productivity
	Integration of life cycles	Training time required
KnowledgeWare's IEW/ADW SCORE 66	Planning, analysis and design features	Support for local-area networking
	Ability to increase application quality	Efficient programming capabilities
	Overall ease of use	Ability to increase speed of development

KnowledgeWare's IEW/ADW, which emphasizes a flexible development methodology, earned a strong score in ease of use. The company announced a graphical user interface generator earlier this year.

Other recent enhancements announced by KnowledgeWare include an OS/2-based maintenance program and an Ada code generator.

Users rated the IEW/ADW and Foundation products in a third-place tie in value for the dollar — well behind PacBase and IEF. •

RATINGS IN ORDER OF IMPORTANCE

PacBase shines in four of the most important areas, particularly in data repository capabilities.

User importance rating:

8.7 Ability to increase application quality

IEF 8.4
PacBase 8.3
Foundation 7.0

8.4 Ability to increase programmer productivity

PacBase 7.7
IEF 7.4
Foundation 6.3

8.3 Ability to increase speed of applications development

PacBase 7.4
IEF 7.3
Foundation 6.3

8.2 Responsiveness of vendor service

PacBase 7.9
IEF 7.7
Foundation 7.6

8.2 Data repository capabilities

PacBase 8.9
IEF 7.5
Foundation 6.7

8.2 Value for the dollar

PacBase 7.5
IEF 7.5
Foundation 6.1

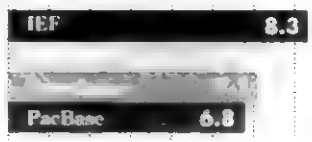
RATINGS IN ORDER OF IMPORTANCE

(Full life cycle CASE tools, continued from previous page)

Texas Instruments' IEF tops five of the remaining 10 ratings categories. The four products are widely differentiated in support for local-area networking, but users rated that as one of the less important criteria.

8.0 Quality of technical support

8.0 Planning, analysis and design features

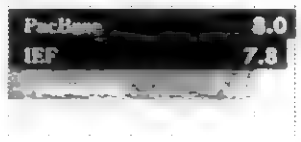


8.0 Overall ease of use

7.9 Integration of life cycles within product set

7.8 Code generation capabilities

7.7 Efficient programming capabilities



7.6 Support for local-area networking

7.6 Documentation

7.5 Effectiveness of testing

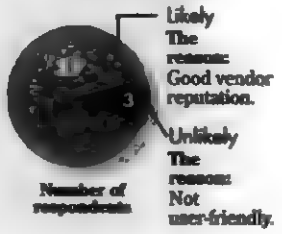
7.5 Training time required to use product

Loyalties

Would you buy the product again?
(Reasons are based on the most frequently stated responses.)

PacBase

Responses: 30

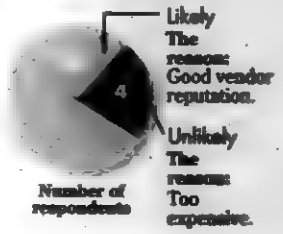


IEF

Responses: 43

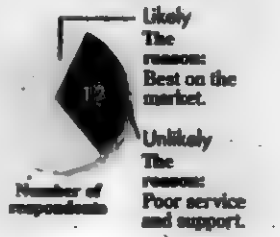
Foundation

Responses: 18



IEW/ADW

Responses: 38



Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers. Quotes are selected from users' responses.)

PacBase

Likes

Good repository

"The repository avoids duplication of code and data elements, and the specifications are reusable."

Dislikes

Hard to learn

"The learning curve is high."

IEF

Likes

Good integration

"The total integration of the life cycle yields a quality product as an end result."

Dislikes

Poor report generation

"The report generation capabilities are the biggest weakness."

Foundation

Likes

Good integration

"It lays out the steps very well."

Dislikes

Hard to learn

"It isn't user-friendly."

IEW/ADW

Likes

Good integration

"Nicely integrated — it takes you from the analysis stage to the finished product."

Dislikes

Lack of integration

"Going from analysis to design is difficult."

Vital statistics

Total number of respondents: 129

What is your position?

IS director	12
IS manager	11
Project manager	18
Applications development manager	26
Other	62

How long have you been involved with full life cycle CASE?

Five or more years	42
3-4 years	56
1-2 years	25
Less than one year	5
Don't know	1

What is your responsibility for CASE?

Evaluate or recommend vendors	106
Set standards for your organization	105
Determine need	97
Select vendors	96
Establish purchase agreements	57

What hardware platform are you using for your CASE software?

MainFrame	66
Stand-alone PCs	40
Networked PCs	40
Other	8

METHODOLOGY

Products included in this week's Buyers' Scorecard are the market-share leaders among integrated computer-aided software engineering tools.

User names were obtained from nine vendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 43 users for TI; 38 for KnowledgeWare; 18 for Arthur Andersen; and 30 for CGI Systems.

Ratings from nine Intersolv users follow but were not included in the score because they are less than the 18 minimum number of respondents required:

- Application quality — 8.3
- Programmer productivity — 7.8
- Speed of development — 7.2
- Responsiveness of service — 8.0
- Data repository — 8.0
- Value for the dollar — 7.8
- Ease of use — 7.1
- Quality of support — 7.3
- Planning and design — 8.0
- Integration of life cycles — 8.6
- Code generation — 8.4
- Programming capabilities — 8.0
- Support for LAN — 7.8
- Documentation — 7.1
- Testing — 7.3
- Training time — 6.5

ACKNOWLEDGMENTS

Computerworld thanks David Sharon, CASE Associates, Inc. and the CW Database Division for their assistance in preparing this Buyers' Scorecard.

Asset management

The 'buy, buy, buy' days are over, and it's time to track all that equipment and software. Problem is, inventory systems aren't yet up to snuff.

BY ARIELLE EMMETT

How do hundreds of modems just "disappear"? Short of grand theft, they usually don't — but if you aren't aware of their existence, they might as well not be there, right?

Through high turnover, fast technology changes and general neglect, it is not uncommon for data centers to lose track of their equipment and software — where it is, what it's connected to, what they're paying for it, which version is being used, how many people are licensed to use it and when the lease is up.

"You've got to know what's out there: the data sets, the files, the programs and all the tables that go with the system," says Nancy Wong, manager of computer operations at Pacific Gas & Electric Co. "It would be disastrous to find out you left something behind."

Wouldn't it be nice, then, to have a system that could automatically collect and record information on all your computer assets and store it in one central database; detect and record any changes that are made; graphically represent how everything is linked together; include local-area networks and remote sites in its compilation; and alert you to problems and changes that occur in daily operations?

The asset management software that exists (also called inventory management software) can do some of that.

Packages such as **Computer Associates International, Inc.**'s CA-Netman, **IBM**'s Information/Management, **Peregrine Systems, Inc.**'s Peregrine Network Management System and **Legent Corp.**'s IS Inventory and Asset Manager, among others, have expanded into areas outside of basic asset management, into the realms of problem tracking and resolution and change and configuration management.

But there are some glaring weaknesses. Chief among these are a lack of automation and no seamless way to collect information on equipment distributed throughout the enterprise. These mainframe-based packages are also on the expensive side, in terms of both price and maintenance, and the payback is not easily quantified. You can get personal computer- or LAN-based versions rather than mainframe-based versions, but you have to be careful not to lose something in functionality.

Some observers doubt that these products will ever be as helpful as users need them to be. In fact, some don't believe the data center products are necessary and advise that you go right for the ones that track what's on the LAN. However, vendors say they're working to add the needed functionality. Whether you build your own system or work with one of the available systems, one thing is sure: A well-run data center is one that knows its assets and measures so it may better manage. •

Emmett is a free-lance writer based in Wallingford, Pa.

INSIDE

- *Other features: Help desk, change management.*
- *Weaknesses: Automation, LAN integration.*
- *Popularity poll.*
- *How LAN links may be forged.*
- *One user's frustrations.*
- *Product listings: Inventory and change/configuration management systems.*

Cost

- A few thousand dollars for PC-based systems.
- $30,000-plus for mainframe packages.
- Large hidden costs, including installation, customization, ongoing maintenance and training.
- Hard-number paybacks unavailable.

Benefit

- Top performing data center clients at Herndon, Va., consultancy Compass America, Inc. (which overwhelmingly have inventory software installed) have 20% to 60% lower costs over Compass' average data center clients.
- Combined with efficient problem tracking, "it enables managers to make decisions based on hard numbers," says Peter Balbus, director of strategic planning at Compass.
- Soft benefits include the ability to control costs, track and manage changes, rejuvenate underused assets and forge a closer link among distributed computers, users and information systems.

More than inventory

Asset management packages do more than just collect information on hardware and software and store it in a database. The following features are increasingly being incorporated into these systems:

- **Contract administration,** including linking parts and serial numbers with financial information on equipment leases, expiration dates, depreciation, etc.
- **Help desk features,** such as tracking equipment problems and logging them in a centralized problem resolution database.
- **The ability to monitor equipment availability** and downtime and broadcast messages and alarms.
- **Change management,** which tracks changes in software and hardware.
- **Configuration management,** which allows users to build conceptual and sometimes schematic views of how their equipment and network elements connect. Also includes the ability to track software and hardware configurations and changes right within a host and can include the ability to manage PCs and terminals on remote networks.

Weaknesses

There are at least three as-yet-unresolved issues in the inventory software game, according to observers and vendors of these systems.

1 The ability to automate data collection. No package automatically records information; systems administrators must manually input, update and maintain all data.

2 The ability to transparently update the database when changes occur. Again, no system can automatically record changes, although there is some degree of automated linkage with other programs. For instance, **Computer Associates International, Inc.**'s CA-Netman and **IBM**'s Info/Man, among other products, can accept problems logged in from certain other network and resource management systems.

If certain conditions are detected on the network, a problem database will automatically open at the help desk level. This feature allows the help desk to have central control over everything going on in the data center.

3 The ability to integrate the database into other activities being performed, such as software distribution. In the last two years, distributed issues have become increasingly relevant. "There's a feeling of 'I need to get control, to know where my spending is,' " says Phil Carrai, a product manager at Legent. Currently, there are no on-line, real-time links between LAN servers and mainframe inventory management programs.

Aside from some rudimentary batch file data-dumping capabilities, mainframe inventory products do not routinely scan or share processor chores between themselves and LAN-based PC inventory products. Systems administrators have to write customized exits to other packages to centralize information in one database.

"We can upload consolidated reporting information to the mainframe [from a LAN], but it's not done in on-line, real-time mode," says John Staudenraus, CA-Netman product champion.

Popularity poll

It's anyone's guess how popular these packages are. Peter Balbus, a consultant at Compass America, Inc., a Herndon, Va., firm that does metric analyses of data center costs and efficiencies, estimates that a quarter to one-third of all Fortune 500 companies now have asset management software and that European companies are way ahead of the U.S. in recognizing its value.

"The numbers are constantly growing, and the questions we're getting about them are constantly increasing," says Arnold Farber, president of Farber/LaChance, Inc., a Richmond, Va., data center automation consulting firm.

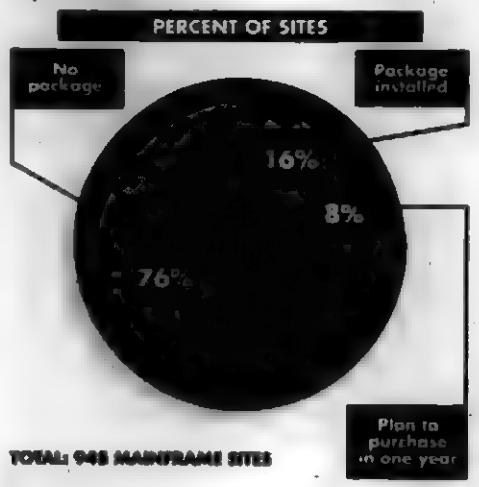
Other studies indicate a somewhat lower concentration (see chart at right).

Thomas Nolle, president of CIMI Corp., a computer consulting firm, agrees with the lower figure. "Our numbers show that less than 20% have it, and less than 15% of the data centers ought to," he says. That's because of these systems' weakness on the LAN.

"Ninety-three percent of the MIPS are out on somebody's desktop," he says. "If you're not going to inventory that, why inventory at all?"

Taking stock

Very few data centers have inventory management software installed



Source: Xephon/WPWS

Linking up for more functionality

The biggest complaints about these packages include their inability to collect information on distributed computing platforms and their lack of automation.

Vendors are moving in various directions to add this sort of functionality:

▶**Batch input.** Some products allow files from PC-based inventory packages to be "dumped" into their database in batch mode. **Computer Associates International, Inc.**'s CA-Netman, for example, allows consolidated PC files to be uploaded to the mainframe database.

"PCs doing administration of a couple hundred pieces of equipment, such as an end-user configuration, may want to shoot a consolidated report up to the mainframe," says John Staudenraus, CA-Netman product manager.

Thomas Nolle, president of CIMI Corp., says a distributed mainframe to micro link requires a terminate-and-stay-resident program on the PC that the inventory program is managing.

There is a negative to this: A program would remain active within the PC while the user is conducting other work. This, unfortunately, consumes valuable system resources.

▶**EDI link.** Philip Carrai, a product manager at Legent Corp., says electronic data interchange (EDI) may finally solve the problem of populating an inventory database by dumping product, order and contract records directly into a data center asset management system. Ideally, the electronic link would be seamless, and information would be dumped simultaneously along with a purchase order.

Legent does not yet have an EDI hook, but "that's the direction you need to take," Carrai says.

"There is really no standard way of categorizing or updating databases, although a lot of work is being done in this area, especially to create links between inventory and EDI ordering systems," Carrai notes.

▶**Scanning programs.** Ultimately, asset management software writers need to develop scanning programs enabling the system to pick up data in different remote environments.

CA, for example, recently purchased Scancom PC Management, a PC querying capability from **Scancom Ltd.** in the UK that will "ultimately allow us to electronically query the hardware and software in a user's configuration," Staudenraus says. CA has not disclosed a date for releasing this software or the technology into Netman's own product line, however.

Pie in the sky as this may seem, the pressure is increasing to reach such a goal.

"When you look at the total dollars in a distributed enterprise, they tend to be significant," Carrai says. "If you can control and manage these expenditures, the payback can be significant."

ARIELLE EMMETT

In real life: A user's frustration with inventory

BY ARIELLE EMMETT

As a vice president at J. P. Morgan Services, Inc. in Newark, Del., Ralph Solomito and his global network control group have the heart-pounding task of supporting $600 billion to $800 billion in electronic transfers each day.

Solomito's job is to keep constant surveillance of a global corporate network, which includes multivendor local-area networks and wide-area networks, two corporate data centers, diverse large-system hardware plus more than 19,500 IBM terminal sessions and multipoint connections to Europe, South America, the Far East and Canada.

> "IF THESE networks are not available . . . we're talking about serious consequences. That's why it's key to have an effective problem and change management system."
>
> RALPH SOLOMITO
> J. P. MORGAN SERVICES

Solomito says his job is made a bit less hair-raising by Morgan's consolidation efforts (the corporation has reduced 11 technical centers to two since 1984), plus an enterprise effort to centralize problem, change and inventory management. "If these networks are not available or the connectivity isn't there, we're talking about serious consequences," he says. "That's why it's key to have an effective problem and change management system."

So far, the company has had to work hard to get such a system, and Solomito is still dissatisfied. Morgan's problem and change tracking system was primarily built in-house, although a customized version of IBM's Information/Management plays a role as a repository for change and trouble-ticket information.

"I'm very disappointed in Info/Man," Solomito says. "If the product would provide the flexibility and the reporting capabilities that I believe a true enterprise management system should have, then the amount of work we've had to do over problem and change would not have been necessary."

The database is rigid, he says, so it is used as a storage system for network events and changes, even though the product does have a configuration capability. "It can't produce a user-friendly report," he says. The staff has also written exits and front ends to its 14 other element management databases to handle its strategic view of one central facility to monitor Morgan's global technology interests.

At present, Solomito says, Info/Man "neither allows us to accept distributed processes into a central facility nor does it interface easily or effectively with other automation products."

To integrate network and system messages and alarms, Morgan purchased Multivendor Automated Expert Manager (MAXM), a RISC System/6000-based product from International Telemanagement Corp., which collects problem "event" information as well as system messages on the network from IBM's NetView.

The data is sent automatically from MAXM to Info/Man, where trouble tickets are opened up. Similarly, Info/Man records changes to the network based on requests made through the Morgan network help desk.

Solomito says he is working with IBM to address needed changes. Dennis Jones, a marketing support representative for IBM's Info/Man, says the package will undergo modifications that will make it compliant with SystemView, complete with pull-down menus and a Windows interface. ●

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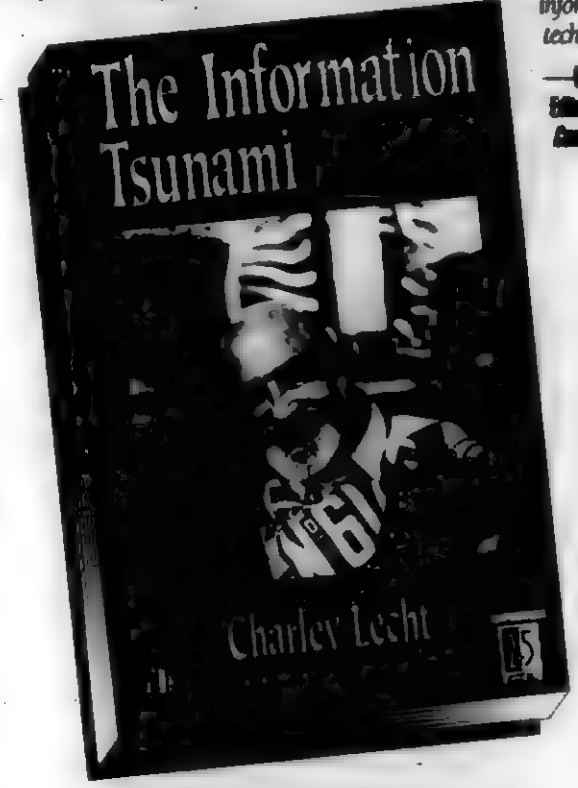

A Futurist Looks Back

Charley Lecht, noted futurist and *Computerworld* columnist, presents his view of the turbulent 1980s, a time when change fell on the computer industry like a tidal wave. Lecht's book of essays addresses the "four horsemen of cybernetics" — the technical, political, psychological and financial powers that drive the computer industry. Sometimes serious and other times uproariously funny, these essays cover many topics — artificial intelligence, robotics, holography, integrated chip manufacturing, programming, legal issues, and the rise of Japan as a computer super-power — in a highly readable style that offers not only a look back, but a futurist's forecast of things to come.

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Taking inventory

Popular mainframe systems

	OPERATING SYSTEM	GENERAL DESCRIPTION	DATABASE	NETWORKS	INSTALLED BASE	PRICE
Atlanta On-Line Systems, Inc. (404) 955-3376 Data Processing Inventory System	MVS, VSE, OS/2	Mainframe- or PC-based. Asset, configuration, operations and problem management for hardware. Software version control and network configuration management	Nonrelational	LAN Manager, SNA	175	$6,995 (VSE), $7,995 (MVS)
Computer Associates International, Inc. (516) 342-6000 CA-Netman/Mainframe	MVS, VM, VSE	Asset, configuration, problem and change management; hardware, software and network problem tracking	VSAM or Datacom/DB	SNA	1,200	$20,000-$100,000
Legent Corp. (703) 734-9494 IS Inventory and Assets Manager	MVS	Asset, configuration and problem management; software version control, hardware location and capacity; software configuration, licensing and problem management; network configuration and problem management	Nonrelational	SNA	70	$21,800-$59,800, depending on license type and CPU size
MacKinney Systems (417) 882-8012 DP Manager	VSE, MVS, DOS, OS/2	Help desk/inventory management system. Asset, configuration, change and problem management; Software configurations, software distribution, licensing and problem management. Network configuration and problem management	VSAM	Any NetBIOS-compatible LAN	300+	$3,000 (MVS), $1,995 (VSE), $995 (single-user PC), $1,995 (LAN)
Software Engineering of America (516) 328-7000 Keys	MVS/XA/ESA, VSE	Problem/change management system. Asset, configuration, change and problem management for hardware, software and networks. Version control for software, software distributions and licensing	VSAM	NP	52	$12,500-$35,000
Peregrine Systems, Inc. (619) 437-2400 PNMS		Asset, configuration, change and problem management. Software configuration, licensing, version control and problem management. Network configuration and problem management.	Relational, DB2	Novell, TCP/IP, SNA, NetBIOS-compatible LANs	300	$39,000 starting price

For information about IBM's Info/Man/Manager, please contact your local IBM representative.

What's important

Users rated their inventory packages on a scale of 1 (poor) to 5 (excellent) using 12 criteria

Satisfactory or better
- Problem tracking 3.4
- Support for help desks 3.2
- Hardware inventory management 3.2

Somewhat less than satisfactory
- Vendor support 3.0
- Software inventory management 2.9
- Value for money 2.9
- Network configuration management 2.9

Mediocre to satisfactory
- Financial information 2.7
- Change management/Version control 2.7
- Ease of use 2.6

Less than mediocre
- Software distribution control 1.7
- Controlling illegally copied software 1.6

Total sites surveyed: 149

Source: Zephon/WPWS

MAINFRAME
PROS:

- More robust programs.
- Connectivity to other network and change management products.
- An emphasis on enterprisewide management.

MAINFRAME
CONS:

- Requires customization to interface to user's operating environments.
- Not oriented toward tracking myriad small PC components.

◄ LEADING PLAYERS

Here's how the leading vendors differentiate their products:

Computer Associates International, Inc.'s CA-Netman: Fast response time, broad functionality in problem/change, inventory/financial and configuration management, according to CA.

Integration among these function areas is tight, according to John Staudenraus, CA-Netman product champion, so that problems, inventory and changes to hardware and software are all logged and tracked against each other for use by a central help desk.

The product features an automated link between problem, change and inventory management, including automatic opening of a problem ticket into the inventory database when the mainframe detects an error. Some programming required to interface into user's operating environment and also to load in raw data.

IBM's Information/Management: Known for its versatility, problem and change tracking and rich feature set. However, the system is also notorious for the amount of system administration it requires, in terms of both updating data and writing custom interfaces to other systems.

Legent Corp.'s IS Inventory and Asset Manager: Concentrates only on asset and financial management, including forecasting, which is a principal strength, according to Phil Carrai, director of product management. The package does not have a native problem and change tracking system, but it can interface with IBM's Info/Man to provide that functionality.

Peregrine Systems, Inc.'s PNMS: Especially strong in equipment and network availability tracking, says Bebe Brown, product author at Peregrine. Also offers support for a broad range of hardware platforms as well as customization, including an applications generator and source code, which are available to help customers tailor their own interfaces. PNMS is also unusual in that it offers its own relational database, although support for DB2 is available. In the war of network management standards, Peregrine's Len D'Amico says, "We are prepared to support HP's OpenView or IBM's NetView."

ARIELLE EMMETT

PERSONAL COMPUTER

CONS:

- **Most do not interface with other mainframe change and problem management software.**
- **Less sophisticated change management.**

PERSONAL COMPUTER

PROS:

- **Better asset tracking of micro components.**
- **Less expensive, in terms of price and maintenance.**
- **Shorter learning curve.**

FOR YOUR INFORMATION

For a comprehensive listing of LAN inventory packages, see the Jan. 27, 1992, issue of Product Spotlight. For a listing of help desk-oriented inventory management products with call-logging and call-tracking features, see the June 1, 1992, Product Spotlight.

Leading PC systems

- **Bendata Management Systems, Inc.**
  (719) 531-5007
  Heat
  Price: $2,995
- **Computer Associates International, Inc.**
  (516) 342-6000
  CA-Netman/PC
  Price: Not provided
- **Consultbet Computing, Inc.**
  (416) 441-0363
  PC Administrator - Inventory
  Price: $599 - $1,699
- **Corporate Software, Inc.**
  (617) 828-7727, ext. 1247
  Quetzal Software
  Price: $8,000 - $12,000
- **Magic Solutions, Inc.**
  (201) 529-5533
  Support Magic
  Price: $3,995 (single-user)
- **Midnet Systems, Inc.**
  (415) 332-0188
  InfoTrak
  Price: $1,295 - $9,995, depending on numbers of users
- **Vycor Corp.**
  (301) 220-4450
  DP Umbrella
  Price: $1,995 (single-user), $3,995 (five users)

(See mainframe chart for other systems that run on the PC)

▲ TAKE HEED ON PCs

Makers of PC inventory packages are attempting to take more of an "enterprise-wide" view in their products. You still have to be careful about getting true data center functionality when going the PC route, however. While some truly cover large-system issues, others are better used for LAN inventory only.

Weaknesses show up particularly in the financial and configuration management areas. For instance, be sure that the system can handle complex leasing and rental arrangements that are necessary in the mainframe and midrange worlds.

PC-oriented packages can't always depict a host-centric view of your system — not good when you need it to build a schematic view of your system configurations.

Field sizes can pose another problem; some people complain that they can't even fit the price of their large and midrange systems into the fields provided by some of the PC packages.

There are some systems that are strong in their data center orientation. PHH, a $4 billion financial services company, found Trident Systems, Inc.'s InfoTrak to be particularly strong for the enterprise. The company made the purchase because it wasn't getting much use out of its CA CA-Netman system, says Alvin Wilson, PHH's director of quality assurance. "A decision was made simply to find something easier to use than Netman," he says.

InfoTrak was also selected because it "allowed a whole lot of people across different platforms to access information through a LAN," says Bill Fleishman, a consultant at Baltimore Systems Group Ltd., which recommended the product.

Software change management

	OPERATING SYSTEM	GENERAL DESCRIPTION	DATABASE	NETWORKS	INSTALLED BASE	PRICE
Legent Corp. (703) 734-8494 Endevor	MVS, DOS, OS/2, MS-DOS	Configuration, change and problem management. Software version control, software configuration and problem management	Nonrelational	Novell, Vines, LAN Manager, DECnet, AT&T Stargroup	5,400 (workstation), 850 (mainframe)	$5,000-$100,000 (workstation); $27,000-$150,000 (mainframe)
Optima Software, Inc. (916) 646-3800 Change Man	MVS XA, ESA, MS-DOS, OS/2	Change and configuration management, operations management, version control. Tracks software distribution and problems. Automatically sends updates to change management system (IBM's Info/Man)	Relational, DB2	Novell, Vines, LAN Manager, DECnet, SNA	100+	$40,000 (starting price - mainframe); $10,000 (starting price - network)
Softool Corp. (805) 683-5777 CCC/Manager	MVS, VM, VMS, Unix, OS/2 2.0, DOS/Windows 3.0	Change and configuration management, distribution, and problem management, software version control	Proprietary	Novell, Vines, LAN Manager, TCP/IP, DECnet	2,500+	$995 (PC stand-alone); $30,000 (starting price - mainframe); $30,000 (starting price - midrange)
Software Maintenance and Development Systems, Inc. 508-369-7398 Aide-De-Camp	Unix, VMS	Configuration management, stores and organizes information for the data center such as distribution, operations and change management. Also tracks purchasing and maintenance costs and software version control	Proprietary, object-oriented	Novell, Vines, LAN Manager, TCP/IP, DECnet, SNA	NA	$1,000-$3500, depending on number of users

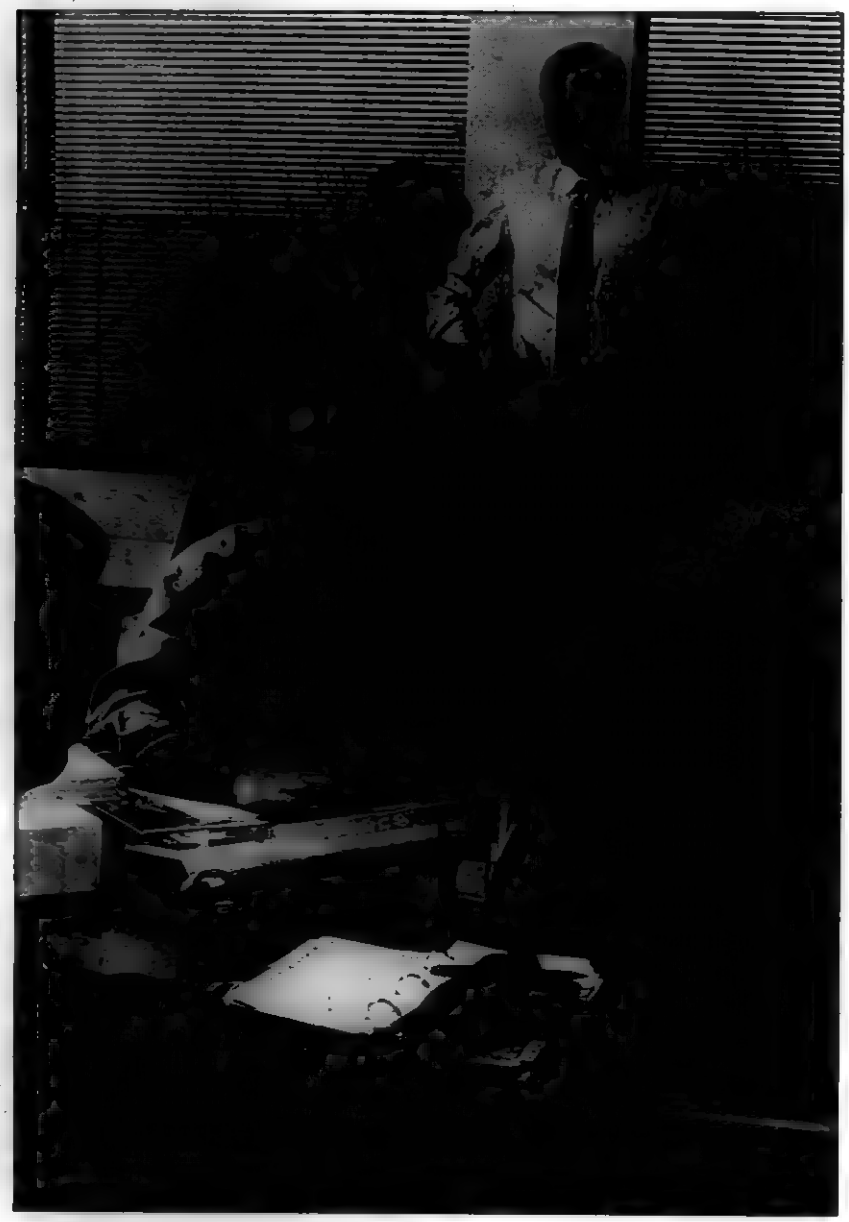
◄ CLOSE KIN

Some close relatives of asset management software are "software change management" systems. These tools help you control things such as installing a new version of a spreadsheet throughout the corporation, controlling software licensing and tracking software changes.

A leading mainframe-based tool is Legent Corp.'s Endevor, which accounted for one-fifth of the software change management licenses at 244 sites in a recent study by Xephon/WPWS, a London-based market research firm. IBM's Information/Management accounted for 14% of the licenses. Also popular was Computer Associates International, Inc.'s CA-Librarian Change Control Facility.

A leading PC-based tool is Softool Corp.'s Change Configuration and Control/Manager, which provides asset management, version management and change management. The latter helps track software migrations and turnovers throughout an organization.

Integrated software speaks for itself.



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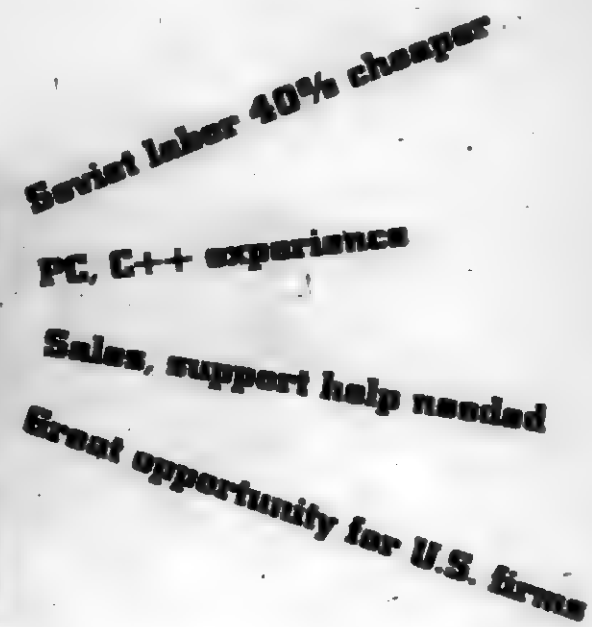


BY JOHN S. MORRISON

In my mind, the mammoth building at 80 Leningradsky Prospect that houses Almaz Scientific Industrial Corp. symbolizes the painful transition now occurring within the former Soviet Union.

We walk past the cypher-lock identification system, past the guard booths and into a darkened building where staff members once conducted highly classified research and engineering work related to the Soviet version of the Strategic Defense Initiative program. We stumble through empty, pitch-black hallways, where only an occasional window provides visibility. Our guide, Alexander Birger, chief of the department in the computer-aided design area, seems like Orpheus leading us through the netherworld.

"Only two months ago, your visit here would not have been possible," he says.

Finally, we reach a small, lighted room. A handful of software engineers greet us and begin to demonstrate original software tools they hope to commercialize. The large, state-owned facility is serving as an incubator for this 15-man enterprise — an enterprise that represents a single point of light in an otherwise darkened institution.

The ensuing demonstration of object-oriented simulation and test tools for personal computer board design is punctuated by moments of entrepreneurial angst.

"Our group has not been paid in two months," Birger says. "Soon it will be more profitable to sell cigarettes in Gorky Park than to develop new technology in Russia."

"What will it take to keep this engineering team alive?" I ask.

Birger thinks for a moment, then calculates an individual's salary, converting rubles to dollars. "Two hundred dollars a month."

.....

As Russia and other members of the Commonwealth of Independent States (CIS) struggle to reshape their laws and institutions, capitalism and entrepreneurship are starting to take hold. One of the most promising footholds is software production, as I discovered when I visited Moscow in early June.

With the disintegration of the Soviet Union in 1988, state institutions formerly dedicated to defense or heavy industry now serve as incubators for emerging commercial software entities.

The opportunity for U.S. companies is great. They can work together with CIS companies in the field of software production, offering their expertise in areas in which CIS companies have been experience-poor — advertising, sales, billing, shipping, customer support and so on — while gaining access to software manpower that is typically a factor of 100 cheaper than in the U.S.

However, low cost does not mean low talent. CIS engineers and programmers have varied skills, mostly geared to the DOS environment (see story page 92), although there are production facilities experienced in Digital Equipment Corp. and Burroughs Corp. (now Unisys Corp.) environments. Work is mainly done on multiple networked PCs, a situation that emerged because of the dearth of state-of-the-art processors. The lack of such processors has also driven development of efficient computing algorithms.

Here's how specific CIS developer expertise shakes out:

• **Programming languages.** A surprising number of software development efforts within the CIS are using object-oriented programming and object-oriented design to build production software systems. A study by Technology Transfer International, Inc. of 40 sites in the CIS revealed that 72.5% used C++, second only to C language use, which was occurring in 80% of the sites. The 40 sites broke down to 18 in Moscow, nine in Tallinn, seven in St. Petersburg and six in Kiev. These sites were selected

Continued on page 90

Morrison is president and founder of Technology Transfer International, Inc. in Colorado Springs. He is currently working with Ed Yourdon of *American Programmer* and Lev Weinberg, Boris Yeltsin's enterprise adviser, on a project titled "Software Production in the CIS — Low-Cost Sources of Engineering Talent in the Soviet Union." For information on how U.S. companies can participate in the study, contact Morrison at (719) 260-0925.

Yeltsin adviser wants programming partners

Weinberg's plan includes Soviet contract labor, packaged software support, direct dealerships

When Lev Weinberg was developing software associated with engine testing and ground-based equipment, he didn't imagine he'd one day be Boris Yeltsin's enterprise adviser, helping to shape reform directions and defending the idea of giving priority to high technology. But his background, which includes experience with joint ventures and international economics, made him a logical choice.

Weinberg was director general at a first-of-its-kind joint venture with a French company and an Italian company called Interquadro. Interquadro was a computer services company that tested local-area networks, developed customer-specific process control applications and created custom applications. It had several dozen programmers, a bunch of Motorola, Inc. 68000 and PC-compatible machines and LANs with Western-manufactured adapter cards and Novell, Inc. software.

During his time at Interquadro and after he left the organization late last fall, he was president of an association consisting of joint venture directors.

Besides his work with Yeltsin, Weinberg is chairman of Investment Programs, Inc. and a personal consultant to IBM Moscow. He has coordinated the activities of 15 firms in the systems and software business that develop projects based on IBM equipment.

Alex Gigiayi, a friend of Weinberg's, acted as an interpreter during Weinberg's discussion about one of his newest ventures in the CIS — oversight of a "software trading house," an entity oriented toward contract software development services and marketing, sales and support of CIS and foreign software products.

Weinberg: *Russian labor is 30% to 40% cheaper*

About a year ago, I set up a software [trading] house, what I'd call a software supermarket or distribution center with over-the-counter sales.

The first major objective of the software trading house is to find the partners who will contract local programmers for large portability projects. My first proposal came from General Motors Corp. One of the departments in General Motors required a huge migration effort. They asked me to help find a team of capable programmers. This is the kind of job for which Russian programmers are well-equipped. The labor cost savings they could realize using the Russian workers may be 30% to 40%.

It's really tough to persuade a decision maker in the States about cost savings using an outside labor force. A common view is that a company in Russia is not reliable enough. My thought was to set up an intermediary company in Switzerland that could take this bridging responsibility. No one cares from which countries my Swiss partners hire the workers for their systems.

I prefer to work with large system development efforts on a contractual basis. Any Western partner may use the pool of programmers, many in the defense industry, who have experience integrating large systems.

My second major objective is to support ready-made [packaged] software. Here, I emphasize products that have a large, knowledge-intensive component. [Because certain software in the CIS is built by people who have high levels of very specific scientific and mathematics knowledge, it must be used by people who have similar expertise. For example, software for PC board design requires that the user have some specific engineering expertise. — Ed.]

The third major objective is to offer direct dealerships [services]. We have one such relationship with Borland International, Inc. We offer services making necessary revisions and adaptations for local conditions; such adaptations may include translation into the Russian language.

The fourth and final objective is to set up a kind of "slavery" market. We want to find jobs for programmers who would otherwise leave the country to work abroad. We give them a percentage for consultation services.

The task of this software trading house is to put these four objectives together.

IBM's search for top coders

About a year ago, Weinberg handled a special project for IBM — pinpointing the Top 50 "most able, professional" Soviet programmers. He compiled his list, then asked Soviet colleagues who were working in the U.S. to put together a similar list of capable programmers that remained in the CIS. There was a 70% correlation between the lists.

Concentrating on the Top 10 people, he investigated the scale of system each was capable of managing. He used a formal modeling approach, designing a model of a large data processing site at a bank. He wanted to figure out whether each person on the list was capable of retaining the conceptual model of the entire enterprise in his mind.

In the end, Weinberg zeroed in on seven programmers with the potential to be system architects on IBM's large-scale software projects.

Continued from page 89

because they had the ability to construct large software systems (100,000+ lines of code), had a project metrics collection and used modern software engineering languages.

Other languages in use at the sites included assembly language code (55%), Pascal (42.5%) and Fortran (12.5%). Lisp and SQL were each used at 7.5% of the sites.

▪ **Applications.** The most popular application in the study was simulation (70%), followed by graphics (65%), databases (60%), communications (32.5%), expert systems (30%), computer-aided design (27.5%) and computer-aided software engineering (27.5%).

In general, the broad emphasis on mathematics and hard science in the former Soviet Union has resulted in theory-rich software that encapsulates and integrates concepts from diverse intellectual fields. Many of the software developers are physicists, geologists and mathematicians first and software engineers second.

The primary emphasis is on developing decision and control systems, as evidenced by the types of software spin-offs commonly found in the CIS. Most concentrate on artificial intelligence, control theory, simulation or training.

Entrepreneurs in the CIS, such as Lev Weinberg, chairman of Investment Programs, Inc. (see story above), are attempting to unite loose networks of talented engineers and make these talents available to foreign companies on a contract basis.

In the meantime, CIS programmers have not been idle. While in Moscow I had the opportunity to look at the following Russian software projects firsthand. What I saw modified many of my preconceived ideas about the quality and technical capability of Russian software engineers:

▶ **PC board design software.** A group at Almaz Scientific led by Birger has developed board design software called Sympatia. The system is used for simulation, test generation and test analysis of digital devices as well as large-scale integration and very large-scale integration (VLSI) components. It is conceptually similar to the LM-500 Universal Hardware Modeler produced by Logic Modeling in Milpitas, Calif.

In coming up with a product, Birger says, his group read product literature from a variety of Western companies and identified problem areas with board design software — namely, that these products were deficient in coupling design capabilities with test capabilities. This is the area the team targeted for improvement with Sympatia. The system is implemented on an IBM PC AT using object-oriented design and the C++ language. The design objects are PC boards, matrix VLSI chips and other digital units.

▶ **Expert systems development and power plant control software.** Intelligent Information Technologies Ltd. has married research into AI with control system theory in producing its power plant control software. The company integrates simulation, AI and human decision-support systems in an expert systems shell, real-time control system and plant process simulator.

The Expert System Development

Continued on page 92

The origins of private firms

1988 was the watershed year for software entities in the Soviet Union because prior to that time, private companies were illegal. Even so, software development was alive and well and taking place within state institutions and monopolies.

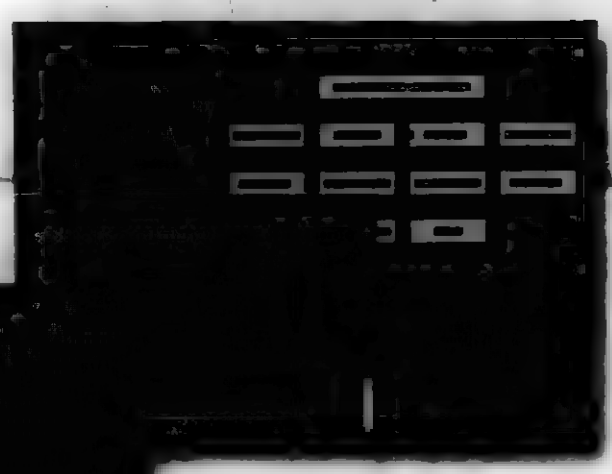
Today's "private" CIS software companies had their roots in the phenomenon of "piggyback" teams, according to Cyril E. Volkavitsky, deputy chief editor of *Man and Computer Newspaper*. Piggyback teams were groups of developers that used a state institution's resources (office space and equipment) to do their small-scale software work in narrowly focused areas such as inference engines, simulation models of laser systems, numerical methods and PC board design. However, these teams would remain distinct business entities, not necessarily always sharing their knowledge with the institution.

Nor did the state institution's managers have the market savvy to exploit the work these groups did that was related to the company's business objectives, Volkavitsky says.

"The potential commercial value of these piggyback products may actually outweigh the yearly production of other products in a particular state-owned company," he says. "However, the bosses are never witty enough to figure out which geese bring golden eggs and which bring ordinary ones."

The survival of these private firms may depend on their gaining knowledge, most likely from foreign partners, in advertising, sales, support and other operational functions.

Executive



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Piracy problems behind former Iron Curtain

Software entrepreneur says more affordable software, improved support would alleviate situation

I stayed with Jury Mordovskoy's family in their apartment during my week-long visit to Moscow. Mordovskoy is a former Soviet Army major turned software entrepreneur. His company, Sigma Technologies, has put together a network of people across the CIS to find technology of interest to Western firms for sale or license. Software is Sigma's forte because it encapsulates algorithms and scientific expertise — "brainware" plentiful in the former Soviet Union.

Mordovskoy has spent a lot of time evaluating the emerging PC software market within the CIS, a market characterized by high prices and piracy of Western software.

Such piracy, while not to be condoned, does have an "upside" — CIS developers (and potential U.S. contract laborers) have been able to familiarize themselves with Western programs. Studying what gives these programs value in the market helps CIS developers fashion their skills and programs accordingly.

.....

Some 21% of the software within the Russian market is paid for in rubles, while 11% is paid for in hard currency. The remaining 68% is pirated. High prices, the unavailability of legitimate copies and the absence of maintenance services probably account for most of this pirating.

The ruble prices of many software products are very high in Russia. In the U.S., for example, the cost of workstation software is typically not greater than the workstation user's salary for one month. In Russia, the price of workstation software is three to 10 times the salary of the highest paid software professionals.

In those cases in which legitimate copies of packaged software are available at affordable prices with maintenance support, pirating has diminished significantly.

For example, a joint venture called Magnit is distributing [and supporting] Nantucket Corp.'s Clipper database system. According to Magnit's data, there are more than 10,000 illegal users of Clipper Version 5.01 in our country. Companies that sell products without a manufacturer's license charge between 50 and 4,500 rubles for pirated copies (between 50 cents and $45). Despite the fact that almost everyone who would like to have a copy of Clipper has a pirated version, sales of legitimate copies are increasing.

Strolling in *downtown Moscow (left to right): Larissa Mordovskoy, Jury Mordovskoy and John S. Morrison*

The moral of the story is that the best way to make users honest is to support them with high-quality service.

The trade in intellectual property is a very delicate and complex matter. Our country is somewhat inexperienced in "productizing" software. However, we are rich in "brainware." Foreign firms such as IBM have shown strong interest in our algorithms. But then, there is no copyright protection for algorithms. So we have only one solution — encapsulate our algorithms in software.

We certainly know how to write programs, but we need to do a better job at marketing and supporting them abroad. We have robust academic traditions in compiler design but very little experience with database management systems.

This last lamentable fact partially explains Russia's low share of the world software market (less than 1%), even though the number of programmers in Russia and the U.S. is about the same (about 300,000).

[Footnote: Russia recently passed copyright legislation that will protect the intellectual property rights of software developers. However, while it makes pirating illegal, it will not put sanctions against pirating into effect until 1994.]

JOHN S. MORRISON

Micros back in (former) USSR

Mordovskoy says Russia had no computer market before 1988 because of the realities of a Soviet planned economy and its absence of private companies. Any computers produced — typically similar to IBM 360s and Digital Equipment Corp. minis — were for scientific, research and development and industrial needs. Centralized ministries decided which hardware to install at which location, and customers were tied to specific manufacturers.

While the stock of mainframes and minis hasn't changed much, microcomputers have been the main growth area in computing power, with the number of micros nearly doubling to 1.5 million units from 1990 to 1991. The impact has been that CIS software and programming have been dominated by micro-based applications.

Here's how the PC industry shakes out, according to Mordovskoy's research:

- **Hardware.** CIS has less than 2% of the total world number of micros. These units are mainly IBM PC clones, with local industry producing machines in the IBM PC XT class. PCs with Intel Corp.-based 80286 and 80386 processors are assembled in limited quantities.

There is a near total absence of Apple Computer, Inc. Macintosh computers and their analogs.

- **Manufacturing.** Thirty-eight percent of microcomputers in Russia were manufactured in Asia, 33% in Western Europe or the U.S. and 29% in Eastern Europe.
- **PC operating environments.** DOS is the leading software operating environment (73%), followed by Microsoft Corp.'s Windows (18%), Unix (8%) and the Macintosh environment (3%).
- **PC software.** The most widely used software types are programming languages (30%), text processors (25%), databases (20%) and spreadsheets (15%).

Electronic mail is poorly developed and is mostly found in bulletin board systems. The two computer service networks that enjoy the greatest use are Fido, which has about 2,000 users, and Relcom, which has access to Internet via gateways in Finland and Germany.

Continued from page 90

Tool (ESDT) is an object-oriented environment for creating decision-support systems, dynamic object simulations, technical diagnostic systems, intelligent computer-assisted instruction systems and intelligent databases.

User interface features include menus, hot keys, on-line Help and a library of reusable modules. It works on an IBM PC.

I viewed a product developed using ESDT — a control system for a power plant, called Operator. The system executed on multiple networked PCs and had an object-oriented, graphical interface. Potential applications of Operator include plant process monitoring systems and self-training operator simulators.

▶**Health diagnostic system.** The Monada system is the biometric equivalent of computer diagnostics used in automobiles. The patient holds a reference electrode while the diagnostician probes electric field intensities at the body's acupuncture points.

The software associated with this system is highly graphical and runs on an IBM PC. It displays the acupuncture pathways and points as an overlay on the outline of the human body. As the diagnostician measures the acupuncture points, the software develops a picture of the patient's health, using pictorial graphics and sound to cue the diagnostician.

The system also sets up a database for each patient and provides a dialog-based tutorial for diagnosticians in training.

On the packaged software front, the following offerings reveal the technical sophistication and scientific orientation of many software production facilities:

- **Interprognoz-AT.** This package uses the ideas of the mathematical chaos theory and target forecasting to predict the location of gold and diamond deposits, oil and gas fields and underground water. It takes as its input aerial imagery and geological survey data.
- **OptoCAD.** This application package simulates and assists in the design of laser systems used in science, industry and medicine. It has a modular architecture, with each module describing a mathematical model of a laser-associated element. It has a graphical user interface.
- **KID.** The Association of Computer and Childhood, or KID, markets educational software. Software in the form of games not only teaches children but also evaluates their mental capabilities, diagnoses problems and identifies learning impediments. KID hardware consists of an IBM PC AT or Personal System/2 for teachers and up to eight machines for children (IBM PC XTs networked to the teacher's workstation).

Like Germany or Japan after World War II, investment in the CIS not only holds the promise of great reward but also carries clear risks. The survival of many CIS companies is tenuous, given the floundering economy and the lure of foreign job markets. While many companies are capable of producing innovative software of high quality, they lack the marketing and operational savvy of their more established foreign counterparts.

Certain CIS entities, such as Sigma Technologies (see story above), which is pinpointing technologies for sale or license to Western companies, are trying to get the word out about CIS software talent. But it may take collaboration with foreign companies that can provide guidance on business infrastructure to solidify CIS' fledgling software market. ●

MANAGER'S JOURNAL

THE CEO VIEW

Full steam ahead with re-engineering

Despite internal opposition, PHH chief is molding his business into a global competitor

When PHH Corp. decided to consolidate its multiple data centers into two sites, it met considerable resistance from some subsidiaries used to having their own. But Robert D. Kunisch, chairman, president and chief executive officer, gave a speech now known among employees as the "get on the train or get in front of it" speech.

Gradually, Kunisch is wearing down the resistance in his quest to turn "a collection of businesses" into a globally integrated provider of business services. Based in Hunt Valley, Md., PHH is a $4 billion company that manages vehicle fleets, employee relocation and real estate services for more than 2,000 other businesses around the world.

Kunisch and his top information systems executive, Richard A. Bolandz, want to use information technology to help bridge the gap between the vehicle and real estate sides of the business so both sides can share sales leads and provide one-stop shopping for multinational clients [CW, March 9]. In a recent interview with Mitch Betts, *Computerworld*'s national correspondent, Kunisch described the role of technology in transforming PHH's maturing stable of businesses into more nimble competitors.

■ On re-engineering PHH's business:
Historically, PHH has been a collection of companies. Over and over again, the shareholders were paying for new information systems for each of the operating companies, even though in some cases they were in the same business.

In today's world, we've got to find ways to reduce that duplication of investment. The challenge that we have is pulling the companies together on a global basis and then making sure the shareholders pay for the technology only once. For example, we went out and built a credit-card processing system for fuel managers in Germany with an investment of several million dollars. In reality, that should have been built for fuel management operations in the U.S. and Canada, too.

So beyond removing the technical diversity and consolidating data centers, we're also trying to come up with a common data architecture and a commitment to building the larger global systems *once*. We just can't continue making big investments in individual systems that should really be developed on a global basis.

The challenge we have in management is getting people to work together and seeing the value of that synergy with their sister companies. We deal with issues such as pride of authorship, turf issues and international cultural differences. The people issues are the toughest.

We've had service problems in our various companies because they were so structured, with specialists doing each function. Through business re-engineering, we've formed teams of generalists to serve customers.

Well, generalists do multiple functions, such as appraisal, purchase, calculation of equity, listing and resale of the home. Before asking a specialist in one function to handle 10 functions, they've got to be properly supported with data and technology.

■ On using IS for sales and marketing:
We're building an international marketing database so that sales and marketing people in any PHH business or location can network and share leads. A lot of what we do is "relationship selling," since we don't sell a tangible product. The high-level contacts developed by PHH FleetAmerica can be shared to help PHH Homequity get a foothold [at the same company], for example.

The technology can also [serve as] a sales aid by explaining our various services [to the staff]. Pricing of fleet leasing is a very complicated subject, for instance, and a lot of salesmen shy away from it. The first thing we had to do was make the technology as user-friendly as possible.

■ On electronic data interchange with customers:
As any business matures, you have to find ways to do it in a more efficient and effective way in order to improve your profit margins dramatically. One way to do that is to tie our clients electronically into us, to make that choice of leaving us much more difficult.

For example, a customer like IBM wants paperless transactions. They want to be able to specify, order, deliver and monitor a leased vehicle without any paper, including the billing. We're now testing that in the UK.

■ On multimedia applications:
In our business we have tremendous applications for video and computers to assist clients in the decisions they have to make. Why can't we have a client observe a specified fleet vehicle right on the screen?

It's something that excites Rick [Bolandz] and the technology company we formed. At first, we'll apply it to our own business, but later on, I see applications in other markets.

■ On planning and justifying IS investments:
Our business and technology plans are directly aligned. When the business plans are done, they are reviewed by Rick [Bolandz] and his group, who then must build an information technology support plan, including areas where they can find high-impact technology solutions for the business. Then it all gets confirmed by the board of directors. I think there are very few boards that look at information technology plans.

It's hard to quantify the payback of an information system. But I can always demonstrate to the board of directors that our leadership position and success is linked to using technology to support the business plans.

■ On the maturity of the IS function:
It still has a long way to go. We very rarely are on time and on budget in a project. I think IS departments are overly ambitious [when promising completion dates]. They want to perform to such a great degree, and we place such a high demand on them, that they don't want to let us down. So they miss the deadline. I think if they were more realistic on the front end, we'd all be a lot happier.

Robert Smith Jr.

The CEO: *Robert D. Kunisch, 50; graduate of New York University.*

The career: *Vice president of sales at Homequity, Inc., acquired by PHH Corp. in 1971. Rose to the top of PHH's relocation and real estate business. Named corporate president in 1984, CEO in 1988 and chairman of the board in 1989.*

Accomplishments: *Has kept PHH — No. 59 on Fortune's list of diversified service companies — focused on its core businesses and quality service. Annual revenue in 1992 nearly $2 billion. Active in Baltimore civic affairs, including the United Way of Central Maryland.*

INSIDE

▶ Book review. Page 96.

▶ Calendar. Page 96.

Computerworld Readers Deserve Only the Best

MAGAZINEWEEK.
The Newsweekly of Magazine Publishing

Bill Laberis
Editor in Chief, Computerworld
375 Cochituate Road
Framingham, MA 01701

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Donald L. Nicholas
Editor in Chief, MagazineWeek

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Editor in Chief, MagazineWeek

BOOK REVIEW

Examining EDI in outline fashion

Image Processing Systems in Business: A Guide for MIS Professionals and End Users
By Robert J. Thierauf
Quorum Books, New York, $55

Although not a new technology, electronic document imaging has advanced tremendously in the past few years and has at last becoming a viable answer for users seeking to do away with paper.

The resulting ground swell of interest in imaging has also left many interested users groping for some more detailed information.

Regrettably, Robert J. Thierauf's book is not the place to start educating yourself on the subject.

Image Processing Systems in Business often reads less like an informative textbook and more like a details-stuffed seminar outline. (Thierauf is a Professor of information and decision sciences at Xavier University in New Orleans.)

A patient reader will eventually get to most of the key technical and management aspects of imaging, but even so, this 265-book does not cover all of its topics equally.

Particularly disappointing are the handful of paragraphs that are each allotted to the product lines of leading computer systems vendors such as Wang Laboratories, Inc. and IBM.

However, one of the best aspects of Thierauf's book is the great number of descriptions of imaging installations at end-user companies.

These site reports — gleaned from trade press stories — often tell not only how imaging was deployed inside a company but also why imaging was picked to answer a particular problem.

ELLIS BOOKER

BEST BOOKS

IN BRIEF

Glass maker picks IS head

■ As part of a corporate realignment at **Libbey-Owens-Ford Co.** aimed at continuing an increased focus on technological excellence that began five years ago, **Tom Allen** was recently named director of information systems and technology. Allen joined the Toledo, Ohio-based glass manufacturing firm in 1984. He most recently served as director of control systems technology.

.....

■ Colchester, Conn.-based crafts and games manufacturer **S&S Worldwide** has promoted **Tom Kennedy**, its manager of operations, to the post of vice president of operations. Kennedy, who joined S&S in 1988, is responsible for company operations including manufacturing, fulfillment, human resources and IS.

.....

■ **U.S. Trust Co.**, a financial services company based in New York, recently promoted its Computer Services Division data center manager, **Richard Sorrentino**, to the rank of vice president. A 24-year U.S. Trust veteran, Sorrentino heads a center that oversees all online computer systems for the company. Also wearing new vice presidential stripes at U.S. Trust: **Samuel Rosenfeld**, formerly a programming manager at The Bank of New York and currently a project manager in the Systems Development Department of U.S. Trust's Computer Services Division.

.....

■ Office-oriented technologies hyped as paper-banishers — fax machines, electronic mail, cellular phones and overnight delivery, for instance — have not only failed to deliver the paperless office, says Accountemps founder **Robert Half**, but they have saddled office workers with the chore of processing greater heaps of data than ever before. The overload, Half says, has a dicey trickle-up side effect: In a recent independent market research study commissioned by Accountemps, 200 large-firm executives reported some 10.7% of their work weeks were wasted hunting down information that has fallen between the cracks.

.....

When you have news about staff changes or business trends, be sure to drop a note and photo or have your public relations department write to Nell Margolis, senior editor, Management, Computerworld, ***Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.***

Big bucks buy scant tech clout, survey says

BY NELL MARGOLIS
CW STAFF

A whopping $14.1 billion or so poured into technology by the nation's largest banks in the past year is not making technology leaders out of the institutions that footed the bill, according to a report released last week by the trade newspaper *American Banker* and New York-based market research firm Ernst & Young.

The jointly produced Annual Banking Technology Survey showed the respondent banks — 68 biggies accounting for some 28% of the industry's total technology spending — still playing catch-up with smaller, fleeter firms.

Notwithstanding the huge amounts of bank dollars spent in the much-publicized pursuit of technology leadership, their responses revealed a hefty inventory of aging technology: 77% of bank programming done in old Cobol; 84% of the respondent banks' applications lodged on mainframes; and 80% of the mainframe application portfolios at an average age of approximately six years.

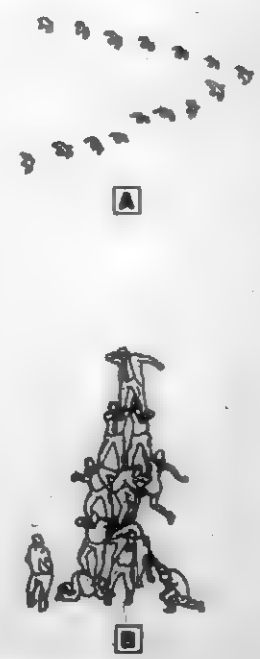
"A few banks are investing heavily and managing their technology very well," said Ernst & Young banking partner Diogo Teixeira. "But a large number . . . are so far behind technologically that it may be impossible for them ever to catch up."

Ironically, noted David Shpilberg, Ernst & Young's director of information technology consulting, banks may be held back from joining technology's next generation as a direct result of their pioneer stance in the last.

"Many banks are so committed to older, proprietary technologies that it is hard for them to get different computers to even talk to each other," he said. "Without the basics of a networking infrastructure in place, it is impossible to move on to more sophisticated applications like distributed computing."

Or, perhaps, like computer-aided software engineering (CASE): Despite wide bank acclaim for the technology's importance, the survey showed a paltry 3% of respondents actually using CASE design and analysis tools for more than 50% of all new application development; only 7% reported code generation tools in use.

Does your company have a migration path?



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CALENDAR

AUG. 16-22

Sigcomm '92. Baltimore, Aug. 17-20 — Contact: Dr. Sidhu, Menlo Park, Calif. (301) 455-3028.

Windows & OS/2 Conference. Boston, Aug. 19-21 — Contact: CM Ventures, Inc., Emeryville, Calif. (510) 801-5000.

AUG. 23-29

Interex Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew, Interex, Sunnyvale, Calif. (408) 738-4848.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Parr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Chicago, Aug. 25-26 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cohesion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, IDS Strategic Decisions, Norwell, Mass. (617) 878-6650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Hanslip, DMA Computerfest, Dayton, Ohio. (513) 263-3378.

AUG. 30-SEPT. 5

Primavera Systems, Inc.'s Ninth Annual User Conference. Philadelphia, Aug. 30-Sept. 2 — Contact: Primavera Systems, Inc., Bala Cynwyd, Pa. (215) 660-5830.

Surface Mount International Conference. San Jose, Calif., Aug. 30-Sept. 3 — Contact: SMTA, Edina, Minn. (612) 920-7682.

International Training Conference & Exposition. Anaheim, Calif., Aug. 31-Sept. 2 — Contact: Russell F. McKinnon, Trade Associates, Inc., Rockville, Md. (301) 468-3210.

SEPT. 6-12

Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 13-19

Buzzaco '92/East. Boston, Sept. 15-17 — Contact: Buzzaco '92, Norwalk, Conn. (203) 852-0500.

DOS-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acucobol, San Diego, Calif. (619) 689-7220.

DevCon '92. Phoenix, Sept. 18-23 — Contact: Microsoft Fox, Inc., Perrysburg, Ohio: (800) 927-6368.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 239-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The Fifth Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lemelin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Seisnors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept 29-Oct.2 — Contact: Computer Intelligence, La Jolla, Calif. (619) 450-1667.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

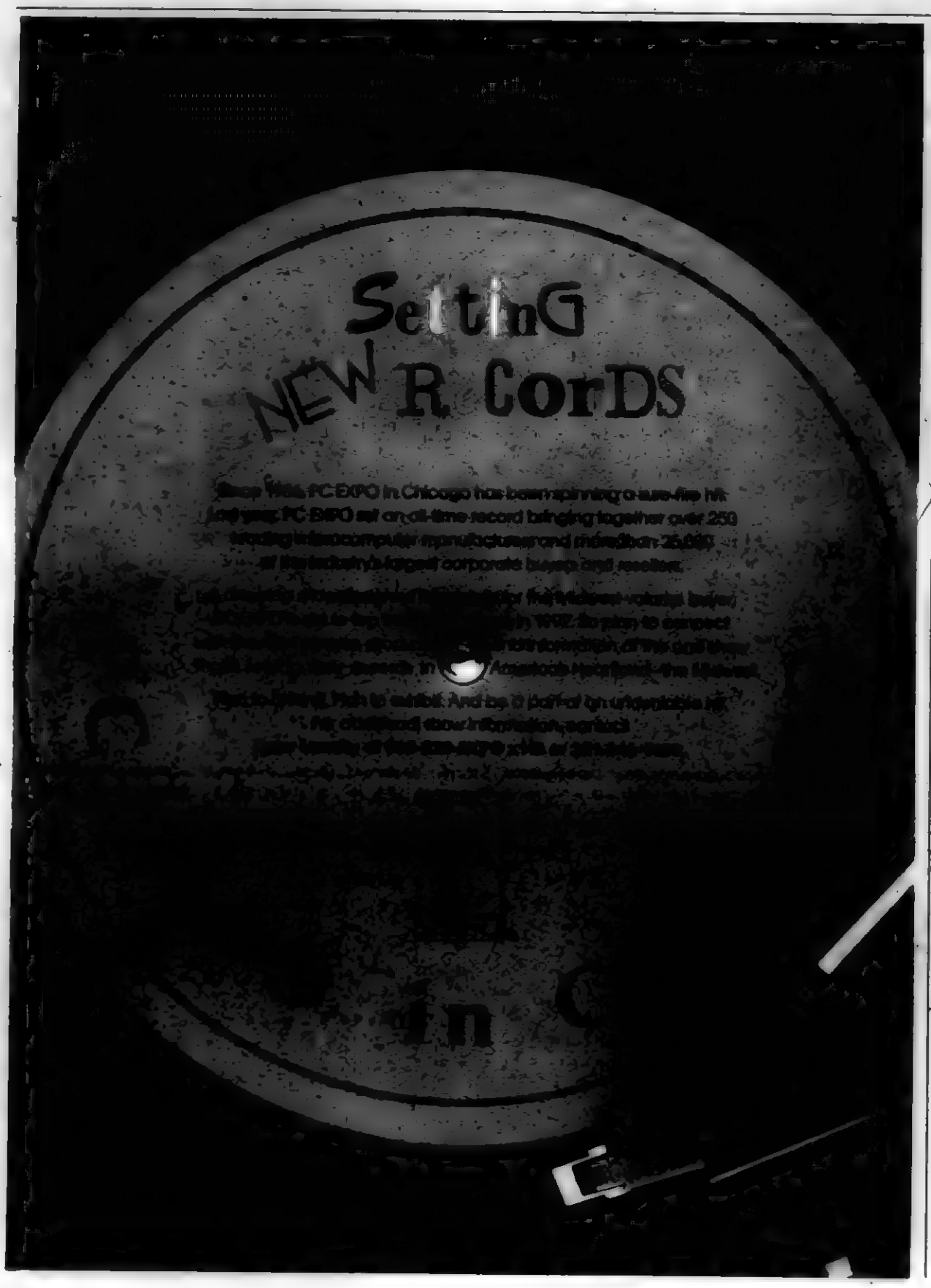
Repository Ad/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository Ad/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Seam-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

OCT. 11-17

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.



WANT QUICK ACCESS TO PRODUCTS?
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Page 104

Early retirement: Look before you leap

BY SALLY CUSACK
SPECIAL TO CW

When a company dangles a lucrative early retirement package, many information systems professionals take the money and run, assuming they can enjoy a long, much-deserved vacation and look for employment later on — if need dictates.

Unfortunately, need often dictates that people in their fifties keep working. While the provisions of a such a package may initially seem adequate, career counselors say many people change their mind about the arithmetic after a few months.

Rather than leaping and then being forced to look at hard financial realities, experts advise that a person offered an early exit deal spend some time looking at his current cost of living, outstanding obligations and the holes that inflation could make in a nest egg. Finding another position isn't as easy as people often expect.

"The financial position that people think they're moving out into is not necessarily that much of a cushion if they don't find work soon. They'll run out of cash," says Edward Perlin, president of Edward Perlin Associates, Inc., a management consulting firm specializing in data processing compensation.

In addition, executives may not realize the toll inflation can take over the years if they don't have an inflation kicker built into their retirement plan, a feature companies include less and less.

It used to be that every $10,000 of retirement pay would last a month while you're looking for other work. But these days, that same $10,000 must be spread over a month and a half or two months.

Jerry Kanter, director of the Center for Information Management Studies at Babson College in Wellesley, Mass., says a skills assessment is necessary for IS people who have determined they need a weekly paycheck even after the retirement package.

However, most people currently eligible for early retirement worked in the days of the large, bureaucratic company, where it is sometimes difficult for them to keep current in the latest technology while doing their everyday work, Kanter says.

For example, working on a large Cobol project doesn't require learning the popular personal computer-based spreadsheet programs or database packages — skills that are almost a prerequisite for employment at almost any level these days.

Kanter, who took an early retirement package from Honeywell Information Systems, Inc. several years ago at age 57, suggests re-establishing oneself in current technology by learning PC skills such as spreadsheets, databases and client/server. This can be self-taught at home or through specialized courses.

"The key is to work on [your options] ahead of time and not wait for the letter," Kanter says. Even if a company is not in financial difficulty, you should be thinking about options, he adds. "Anything can happen to anyone through a merger or an acquisition."

Cost-cutting style

Early retirement programs seem to be more in vogue today as a cost-cutting measure. Large companies such as IBM, Aetna Life and Casualty Co., The Travelers Corp. and Digital Equipment Corp. have been known to offer lucrative programs for early retirement.

Perhaps most crucial for early retirees in need of a steady income is the age factor. Chick Bisberg, president of information technology recruitment at Two-Party Systems, Inc. in Livingston, N.J., says some people grab the proffered package, thinking they can get a job tomorrow.

But the reality is that most people eligible for early retirement hold fairly senior-level positions and higher salaries, and companies can often hire someone younger for a smaller salary.

Bisberg acquired 180 new IS candidates last year, and between 25 and 30 of these people had taken early retirement plans. He estimates that perhaps four or five of them have found other IS positions.

Ken Graham, vice president of IS at the Robert Mondavi Winery in Oakville, Calif., agrees that jobs are not easy to find for older candidates. Graham, who had years of IS experience at a competing winery, signed on at Mondavi in the late 1980s.

He says it was easier for him to pick and choose because he had independent income.

Networking is one way to get ahead and sound out the current employment situation. Raymond O. Vander Vliet, vice president and general manager of Bank of America's San Francisco data center, strongly advises IS professionals to improve their network.

A 30-year veteran of IBM, Vander Vliet was 51 when he took an early retirement option in 1989. Feeling "too young for the rocking chair," he took a position at the bank the following month.

"That Big Blue blanket is pretty secure, and I had to make sure my networks were intact and learn there were other worlds out there," Vander Vliet recalls.

Local computer user groups are also a good place to talk to others who are familiar with the latest technology and can exchange ideas. Kanter says finding a mentor, either a friend or user group member who can help you learn about various technologies, is also helpful.

Whether you decide to obtain a similar position at another company, become an independent IS consultant or enter another field, your chances of obtaining the job you want will improve if you are prepared.

Cusack is a free-lance writer based in Marstons Mills, Mass.

Advice

Before you accept an early retirement offer, take some advice from firsthand experiences of early IS retirees and employment experts:

- Thoroughly assess both your current and near future financial situation. Take into account inflation, dependent children and elderly parents, as well as monthly bills, bank account balances and investments.
- Examine the marketability of your current skill set, and take the steps necessary to become current in today's technology.
- Use and expand your network; many full-time jobs and independent consulting contracts are delivered by word of mouth. Join local computer user groups.
- Talk to those who have taken a similar package, and compare notes on the advantages and disadvantages.

SALLY CUSACK

ANALYST/ CONSULTANT

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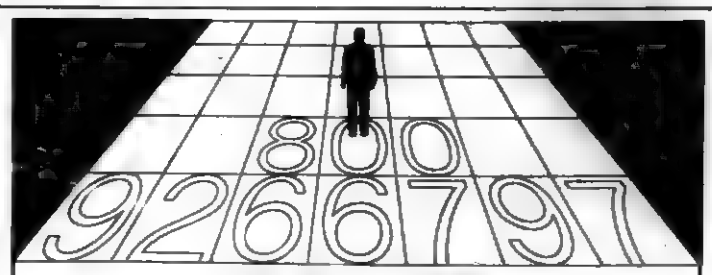

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Investment houses go for broke hiring IS professionals

BY LESLIE GOFF
SPECIAL TO CW

Since Wall Street went bust a few years back, the operative word at many brokerage firms has been "broke."

Big investment houses axed thousands of jobs after the 1987 crash, including many information systems professionals'.

Yet judging from the upbeat attitude of many in the field, you'd never know it. In fact, several IS and human resource managers in the industry say they are actively seeking new hires for systems positions.

"Financial services is a very good growth area for IS," declares Deborah Bresette, vice president of human resources at Fidelity Systems Co., the Boston-based IS division of Fidelity Investments.

Firms are trying to distinguish themselves in a tough market by offering customers fast, easy access to timely information, she explains, so IS remains a top priority.

Crazy? Consider that several other major brokerage houses say that they, too, are hiring at least as many IS staff members as in recent years and sometimes more.

"Most of us recognize that we can't afford the boom and bust management style of the past: Business is good, hire; business is bad, fire," says Robert Benmoache, executive vice president of administration, operations and IS at PaineWebber, Inc. in Lincoln Harbor, N.J. "We have to be more long-term about how we approach [hiring] now."

As proof, Benmoache says he'll hire about 10% of his IS staff during the next 12 months, while present employees are trained in new technologies.

Or consider Alex. Brown & Sons, Inc. The Baltimore company has been expanding its staff by 7% annually, and will do so again in 1992, according to Thomas Shipley, manager of IS and a principal at the firm.

Similarly, Charles Schwab Corp. in San Francisco is hiring new personnel to maintain and enhance mainframe systems while current staff is trained in computer-aided software engineering (CASE) and workstations, says Dawn Lepore, senior vice president of development at the information services division.

The new hires will play a key role in a major initiative to revamp existing systems, Lepore says.

Is it possible that the continuing recession and the stubborn 7% to 8% unemployment rate had no effect on nationwide IS hiring in financial services?

Not so fast, says Martin Frank, a New York-based mainframe programmer who has six years of brokerage experience.

A consultant for the last two years and currently between projects, Frank sees a discrepancy between what IS departments say and what they do. He contends that the recession has indeed taken a heavy toll on IS jobs.

"A lot of programmers are sitting at home watching cable," Frank says. "There is a lot of work to be done, but companies are loathe to hire people to do it because their profits could downturn and then they're stuck with extra people to take care of."

Who's right? There appears to be truth on both sides.

"We're being careful about where we're hiring and where we're applying people," Lepore concedes. In many cases, firms such as Charles Schwab and PaineWebber are focusing on retraining present employees in new technologies rather than recruiting new staff.

"We're being careful about hiring for the right areas," Lepore says. "But we are actively hiring."

IS chiefs contend jobs are available for dream candidates who combine technical and interpersonal skills with business savvy and an understanding of users.

Although experience in the industry is important, companies say, technology professionals from other businesses have a decent chance of finding work if they are proficient in workstation, database or CASE technologies.

As everywhere, demand for mainframe Cobol programming skills has tapered off in favor of C++ and Unix. Programmers experienced in Oracle Corp., Sybase, Inc., The Ask Cos. or SQL relational databases are also in demand. So are those with local- and wide-area networking and telecommunications knowledge.

And, of course, IS managers say knowing the securities business is a strong plus.

Bresette and others say the long-term career outlook is good for both technical specialists and development managers in brokerage firms, thanks to rapid technological change.

"The outlook is still positive for people who have been in the market for a while if they get additional training," Shipley says. "But they need new skills to vie for the positions currently available and those available in the near future."

That's the same path that Frank is taking. Frank says he plans to spend the summer studying CICS, DB2 and personal computer programming in hopes of landing a management or project management job.

But what if you're an outsider farsighted or crazy enough to set your sights on an IS job at a securities firm? How do you start?

Besides following the basics — preparing a two-minute bio, bringing an extra resume — Bresette advises scheduling several 15- to 20-minute informational interviews with human resources and IS staff members at brokerage firms.

"Usually HR people will respond well because companies want good relations with the community," she says.

Goff is a New York-based free-lance writer.

Outlook: Brokerage

Where the jobs are: Best opportunities are in the Northeast, especially metropolitan New York. Florida is also becoming popular.

Salaries: Super. As much as 50% higher than other industries. An IS pro with three to five years of experience averages $40,000 to $65,000. Bonuses can add $20,000 to $30,000. IS directors make $250,000 to $1 million a year. Best pay for all levels is at big Wall Street firms such as Goldman, Sachs & Co.

Hottest job titles: Programmer/analyst, business analyst, LAN manager, database manager, systems manager, IS director.

Hot technical skills: C, Unix, Oracle, Sybase, Ingres.

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Information provided by George Davidson, chief executive officer at George Davidson & Son, Inc., a New York consultancy.

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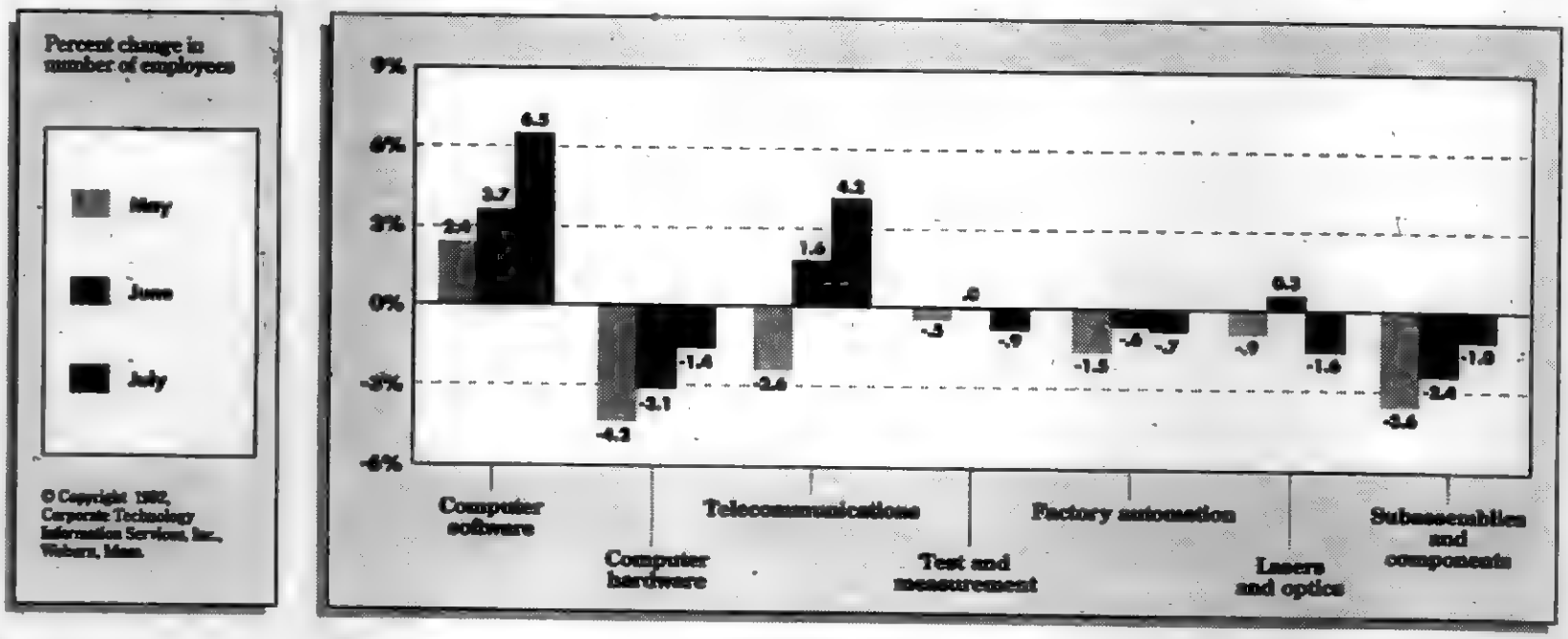

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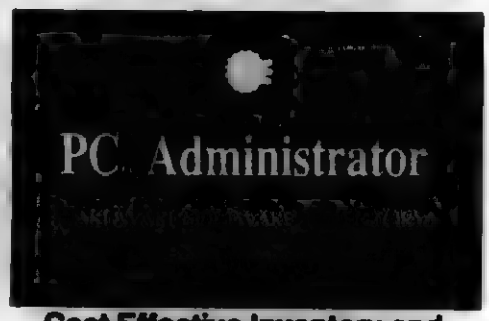

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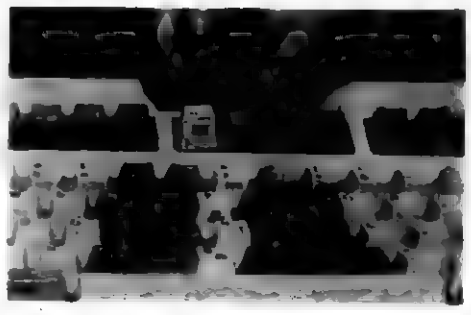

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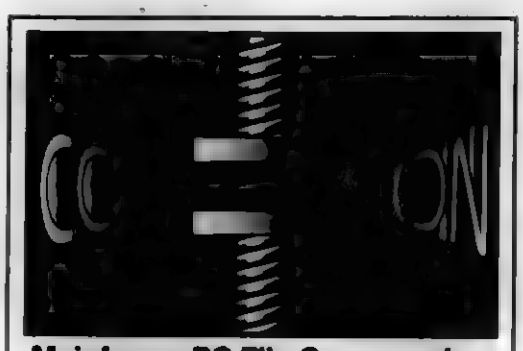

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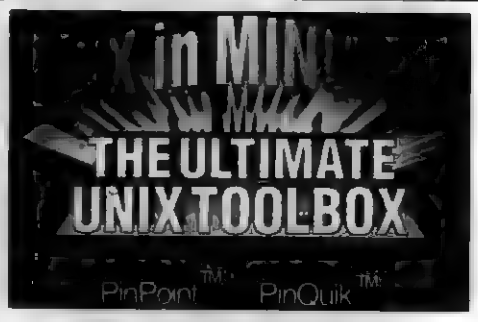

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What you must know to keep telecom costs low

BY CAROLINE J. MICHEL
SPECIAL TO CW

When it comes to choosing telecom service, cost is one of the Top 3 concerns, closely followed by reliability and security.

If only costs were easier to control. The fact is, even with prices for digital service expected to drop and many discount programs in place, there are no specific rules to determine which carrier or service is the cheapest.

To help you pick the best carrier, here are a few factors that affect telecom costs the most:

•Location, location, location. These three words are critical for choosing a network service. How far your site is from the interexchange carrier, how remote your location is, the distance between your site and an interexchange carrier's digital point of presence — these play a large role in your final costs.

Location is a concern especially in the U.S., where there are local and interexchange carriers. That's because it's up to the buyer to coordinate the services of each, which isn't easy because they don't always match each other service for service.

Additionally, service availability may not be consistent between local and long-distance carriers. For instance, many local carriers don't offer fractional T1 or the breadth of switched digital services. Often this makes it necessary for users to lease a line to the interexchange carrier.

•City pairs. Carrier prices vary greatly. Usually, the longer the distance, the more divergent the cost. Common denominators between carriers' leased line pricing comprise monthly recurring charges and per-mile charges. These vary from carrier to carrier and can significantly impact monthly network costs.

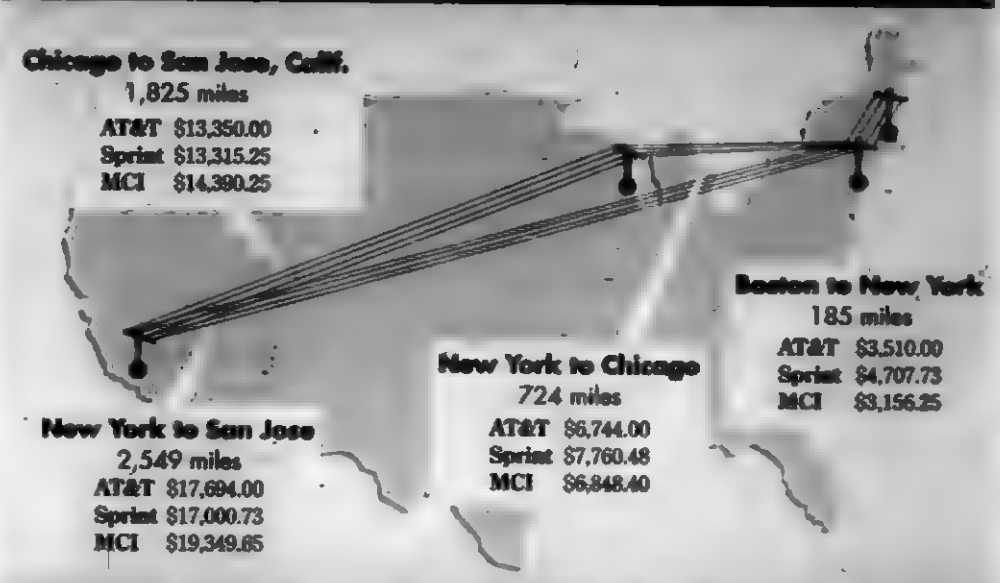
•Customer premises equipment. If you don't feel you've gotten a full return on investment from your existing equipment, you may want to base your selection on the capabilities of that equipment.

However, some of the newer service options require specific customer premises equipment, which you might need to purchase directly from the interexchange carrier. While carrier-provided customer premises equipment can be desirable, be aware that buying this equipment could tie you to that carrier's service more closely than carrier-dependent customer premises equipment.

•Discounts. Carriers may offer both volume and standard term discounts for specific offerings. High volume and lengthy contracts will garner better discounts, which can run as deep as 5% to 20%. More important is to make sure you will be able to alter the initial service contracts for little or no penalty. This convenience isn't often publicized but can be negotiated.

Michel is an analyst in International Data Corp.'s Carrier Services Program in Framingham, Mass.

Selected T1 long-distance leased service prices



Additional long-distance leased service prices

		Boston to NY	NY to Chicago	NY to San Jose	Chicago to San Jose
56K	AT&T	$1,000.20	$2,022.60	$4,395.10	$3,453.90
	Sprint	$963.70	$1,030.84	$1,483.34	$1,265.10
	MCI	$944.75	$1,893.28	$4,119.78	$3,236.50
256K	AT&T	$1,106.49	$1,764.07	$3,990.57	$3,107.29
	Sprint	$2,270.48	$2,946.24	$4,138.24	$3,645.80
	MCI	$1,884.54	$1,733.12	$3,795.37	$2,977.25
768K	AT&T	$2,595.70	$4,137.24	$9,356.74	$7,286.10
	Sprint	$3,254.18	$4,533.62	$7,709.62	$6,466.10
	MCI	$2,680.10	$4,231.64	$9,441.14	$7,370.50

Prices reflect interexchange carrier monthly recurring and access costs

Source: AT&T, Sprint Corp., MCI Communications Corp. and International Data Corp.

CW Chart: Michael Siggins

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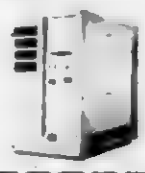

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The BoCoEx index on used computers

Closing prices report for the week ending July 24, 1992

	Closing price	Ask	Bid
IBM AT 339	$450	$700	$200
PS/2 Model 30 286	$500	$900	$300
PS/2 Model 35SX	$1,175	$1,300	$800
PS/2 Model 55SX	$1,000	$1,300	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$2,000	$2,500	$1,500
PS/2 Model 80	$1,500	$1,800	$1,100
PS/2 Model 95	$4,400	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$500	$600	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$1,850	$2,250	$1,400
Apple Macintosh Classic	$750	$875	$500
SE	$725	$775	$500
IIX	$2,550	$2,850	$2,000
IICI	$3,100	$3,600	$2,460
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The major operation of the Sewerage and Water Board of New Orleans is providing water, sewerage and drainage services for the City of New Orleans.

Parties interested in obtaining this RFQ should contact the Sewerage and Water Board's Purchasing Department by phone at (504) 585-2124 or by FAX at (504) 585-2150.

ATTN: FLEET SOFTWARE COMPANIES

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For further information, contact Linda Marckese, CPPB, Senior Buyer, at 813-893-7220.

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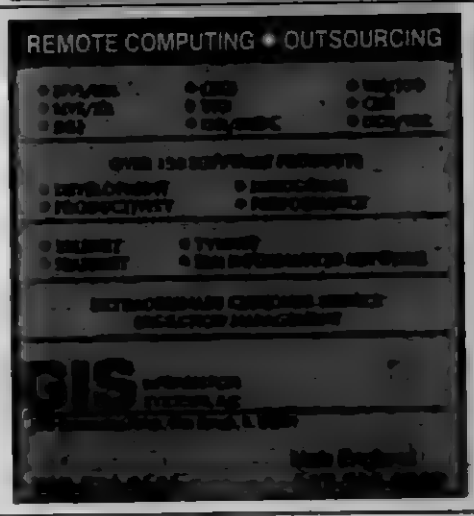

STOCK TRADING INDEX

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RECOMMENDATION CHANGES

UPGRADED FROM BUY TO STRONG BUY: Informix Corp. (Alex. Brown & Sons, Inc.). Second-quarter results for Informix (IFMX) were extremely strong. Well ahead of Wall Street predictions, the company's reported revenue was $60.3 million, marking the fourth quarter in a row that it has posted better than expected operating results.

Overall, during the second quarter, Informix, a supplier of Unix-based relational database management systems and application development tools, experienced strong growth. Near-term problems appear minimal, and for the long term, expect a 30% annual revenue growth that will be cushioned by the company's current strong new product cycle.

UPGRADED FROM BUY TO STRONG BUY: Maxtor Corp. (Bear, Stearns & Co.). Stronger than expected earnings were posted by Maxtor (MXTR). Revenue was recorded at $327 million, rising 39% from last year. Strength from the disk drive industry and the force of new products such as the 200M-byte 3½-in. drive provided the revenue growth. Maxtor has put a great deal of investment into research and development spending — a move that should enable a steady pace of new product launches and continued revenue and earnings momentum.

DOWNGRADED FROM BUY TO HOLD: Micrografx, Inc. (Needham & Co.). Richardson, Texas-based Micrografx (MGXI) generated 87% of its total revenue from three products: Designer, Charisma and Windows Draw. The remaining revenue came from clip art and imaging editing products and from graphics-oriented systems software products and services. International markets accounted for 53% of fiscal 1992's revenue.

Micrografx reported that it will reach Wall Street revenue estimates in the $13 million to $15 million range. This leaves a large gap for disappointment because plans of surpassing those estimates never materialized, and a revenue shortfall leaves room for a bad earnings surprise. Renewal of a contract with **IBM** to design OS/2 systems software development is anticipated, but it is still unclear when a new contract will be signed.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JULY 31, 1992

TOP PERCENT GAINERS

AI Corp.	58.33
Cray Computer (L)	27.78
Data Switch Corp.	25.03
Printronix Inc.	23.81
Silicon Graphics	21.92
Dataram Corp.	20.95
Borland Int'l Inc.*	20.50
Parametric Technology	20.00

TOP PERCENT LOSERS

Wang Labs Inc. (b)*	-18.18
Advanced Logic Research	-14.29
Sequoia Systems Inc.	-13.73
Group I Software	-13.16
Evanex Systems Inc. (L)	-12.00
Software Toolworks Inc.	-12.00
Meca Software (L)	-11.11
Cognitronics Corp.	-8.47

TOP DOLLAR GAINERS

Borland Int'l Inc.*	8.13
Parametric Technology	6.75
Computer Sciences*	6.38
Wellfleet Communications	5.88
Legent Corp.*	4.63
Stratus Computer Inc.*	4.25
Policy Management Sys.	4.13
Silicon Graphics	4.00

TOP DOLLAR LOSERS

Group I Software	-2.50
Octel Communications Corp.	-2.50
Struct. Dynamics Research	-1.30
Sun Microsystems Inc.*	-1.25
Cognetronics Corp.	-1.13
Digital Equipment Corp.*	-1.13
Bachman Info. Systems	-1.00
Sierra Semiconductor (L)	-1.00

Exch	52-Week High	52-Week Low		July 31 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 3.18%**			
OTC	15.00	6.75	3 COM Corp.*	12.13	-0.25	-2.02
NYS	89.50	56.25	American Info Techs Corp. (H)	89.50	1.75	2.58
NYS	44.88	32.88	AT&T*	44.00	1.00	2.33
OTC	4.25	1.00	Ariel Communication Corp.	1.25	-0.13	-9.09
NYS	50.63	40.25	Bell Atlantic Corp.	47.50	0.75	1.60
NYS	53.25	43.38	Bellsouth Corp.	52.75	2.13	4.20
NYS	7.25	4.13	Bolt, Beranek & Newman	4.50	0.00	0.00
NYS	66.88	39.63	Cabletron Systems	54.50	2.00	3.81
OTC	31.00	15.00	Chipcom Corp.	24.25	2.25	10.23
OTC	53.38	18.63	Cisco Systems Inc. (H)	53.38	1.63	3.14
OTC	35.25	8.00	Compression Labs Inc.	8.00	0.00	0.00
OTC	3.38	0.88	Data Switch Corp.	2.19	0.44	25.03
NYS	23.63	12.38	Digital Comm. Assoc.*	19.13	0.38	2.00
OTC	17.50	8.00	Digital Systems Int'l Inc. (L)	9.00	0.38	4.35
OTC	7.00	3.63	DSC Communications	6.00	-0.13	-2.04
OTC	10.88	4.75	Fibronix Int'l Inc.	6.00	0.50	9.09
OTC	37.50	10.50	Fibronics Corp.	15.25	-0.25	-1.61
OTC	3.38	1.13	Gandalf Technologies Inc.	2.89	0.13	4.88
OTC	2.25	0.69	Gateway Communications	1.44	0.22	17.97
NYS	5.50	2.13	General Datacomm Inds.	3.75	-0.13	-3.23
ASE	5.88	0.50	Go Video	2.88	0.13	4.55
NYS	35.00	28.13	GTE Corp.*	34.88	0.75	2.20
NYS	70.63	50.00	ITT Corp.	67.75	2.75	4.23
OTC	36.13	25.25	MCI Communications Corp.	33.75	1.38	4.25
OTC	14.50	2.25	Microcom Inc.	3.38	-0.25	-6.90
NYS	18.25	9.50	Network Equipment Tech.*	10.13	-0.13	-1.22
OTC	25.50	6.75	Network General	9.50	0.00	0.00
OTC	20.00	8.50	Network Systems Corp.	11.50	0.75	6.98
OTC	17.88	5.50	Newbridge Networks Corp.	17.00	1.25	7.94
NYS	49.25	33.75	Northern Telecom Ltd.*	34.88	-0.38	-1.08
OTC	65.00	28.50	Novell Inc.*	55.00	1.00	1.85
NYS	83.00	69.13	Nynex Corp.*	83.00	2.63	3.27
OTC	37.50	18.50	Octel Communications Corp.	24.00	-2.50	-9.43
OTC	9.88	4.00	Penril Data Comm. Ntwks. (L)	4.25	0.00	0.00
OTC	53.00	17.00	Picturetel Corp.	19.00	0.25	1.33
OTC	18.75	9.75	Proteon Inc.	14.63	1.13	8.33
NYS	25.50	11.63	Scientific Atlanta Inc.	25.50	0.88	3.55
NYS	66.25	51.50	Southwestern Bell Corp.	65.88	1.25	1.93
NYS	27.25	20.75	Sprint Corp.	23.25	1.13	5.08
OTC	13.75	4.00	Standard Microsystems Corp.	11.63	0.13	1.09
OTC	35.13	14.25	Synoptics Communications	35.13	2.13	6.44
NYS	39.50	32.88	US West Inc.	39.50	0.50	1.28
OTC	41.25	22.25	Wellfleet Communications	39.00	5.88	17.74
PC and Workstations			**Up 0.90%**			
OTC	15.00	4.50	Advanced Logic Research	4.50	-0.78	-14.29
OTC	70.00	42.75	Apple Computer Inc.*	46.75	0.88	1.91
OTC	32.25	12.00	AST Research Inc.*	13.88	0.75	5.71
NYS	19.25	9.00	Commodore Int'l	9.63	0.00	0.00
NYS	37.50	22.13	Compaq Computer Corp.*	29.50	0.00	0.00
OTC	29.00	13.91	Dell Computer Corp.	23.00	2.50	12.20
OTC	7.75	2.13	Everex Systems Inc. (L)	2.75	-0.38	-12.00
NYS	34.00	21.25	Harris Corp.	26.50	1.13	4.11
NYS	85.00	44.63	Hewlett-Packard Co.*	73.50	2.00	2.80
NYS	29.75	14.13	Silicon Graphics	22.25	4.00	21.92
OTC	35.88	20.75	Sun Microsystems Inc.*	26.75	-1.25	-4.46
NYS	31.25	22.50	Tandy Corp.*	24.75	0.50	2.06
NYS	11.13	5.13	Zenith Electronics	7.50	-0.38	-4.76
OTC	25.50	4.50	Zeos International Ltd. (L)	4.75	-0.13	-2.56
Large Systems			**Up 2.26%**			
ASE	20.63	11.63	Amdahl Corp.*	13.63	-0.50	-3.54
NYS	16.13	7.50	Cambex Corp. (H)	15.38	-0.13	-0.81
NYS	16.38	5.75	Convex Computer (L)	6.50	0.63	10.64
OTC	19.63	1.88	Cray Computer (L)	2.88	0.63	27.78
NYS	52.25	23.25	Cray Research Inc.* (L)	25.13	1.00	4.15
NYS	22.50	7.13	Data General Corp.	9.00	0.13	1.41
NYS	89.13	33.25	Digital Equipment Corp.*	39.25	-1.13	-2.79
NYS	106.38	81.63	IBM*	94.75	2.25	2.43
NYS	124.75	93.50	Matsushita Electronics	97.50	2.50	2.63
OTC	19.75	9.50	Pyramid Technology	10.50	0.25	2.44
OTC	17.88	7.50	Sequent Computer Sys.	16.13	1.13	7.50
OTC	18.38	5.00	Sequoia Systems Inc.	5.50	-0.88	-13.73
NYS	54.25	34.13	Stratus Computer Inc.*	46.00	4.25	10.18
NYS	15.13	9.50	Tandem Computers Inc.*	11.13	0.25	2.30
NYS	11.75	3.63	Unisys Corp.*	10.25	0.38	3.80
ASE	7.50	2.00	Wang Labs Inc. (b)*	2.25	-0.50	-18.18
Software			**Up 4.61%**			
OTC	88.50	38.00	Adobe Systems Inc. (L)	38.00	1.75	4.83
OTC	13.25	2.50	AI Corp.	4.75	1.75	58.33
OTC	45.00	11.50	Aldus Corp.	14.63	0.13	0.86
OTC	19.75	10.13	American Software Inc.	14.00	0.13	0.90
OTC	20.00	7.50	Ask Computer Systems	15.13	2.13	16.35
OTC	57.25	23.25	Autodesk Inc.	42.50	3.38	8.63
OTC	37.75	8.25	Bachman Info. Systems	10.25	-1.00	-8.89
OTC	42.50	29.00	BGS Systems Inc.	36.50	0.63	1.74
OTC	79.00	37.25	BMC Software Inc.	52.75	4.00	8.21
OTC	20.50	9.00	Boole & Babbage	18.25	0.50	2.82
OTC	88.75	36.50	Borland Int'l Inc.*	47.75	8.13	20.50
OTC	11.25	3.63	CE Software	5.13	0.63	13.89
ASE	14.38	6.50	Cheyenne Software Inc.	11.75	1.25	11.90
OTC	20.38	7.25	Cognos Inc.	8.75	-0.13	-1.41

Exch	52-Week High	52-Week Low		July 31 Close	Wk Net Change	Wk Pct Change
NYS	17.00	7.50	Computer Associates*	14.50	0.75	5.45
OTC	21.50	8.50	Comshare Inc.	10.13	1.38	15.79
OTC	47.88	6.50	Essex Corp.	8.00	0.50	6.67
OTC	20.88	9.25	Goal Systems Int'l (H)	20.88	2.50	13.61
OTC	23.50	11.50	Group I Software	16.50	-2.50	-13.16
OTC	6.63	3.50	Hogan Systems Inc.	4.38	-0.25	-5.41
OTC	36.25	18.50	Information Resources	24.75	-0.25	-1.00
OTC	37.75	5.50	Informix Corp. (H)	37.75	1.25	3.42
OTC	22.75	12.50	Intergraph Corp.	15.00	0.75	5.26
OTC	15.00	5.13	Interleaf Inc.	9.63	-0.38	-3.75
OTC	20.25	8.50	Intersolv Inc.	15.13	1.63	12.04
OTC	30.00	10.50	Knowledgeware Inc.	13.50	0.75	5.88
OTC	45.25	20.25	Legent Corp.*	40.00	4.63	13.07
OTC	40.75	15.50	Lotus Development*	18.25	-0.50	-2.67
OTC	7.38	2.00	Meca Software (L)	2.00	-0.25	-11.11
OTC	22.25	8.50	Mentor Graphics	8.00	-0.75	-8.57
OTC	20.50	8.50	Micrografx Inc.	9.38	0.25	2.74
OTC	89.84	47.84	Microsoft Corp.*	72.75	0.00	0.00
OTC	21.13	9.88	Oracle Corp.*	18.63	-0.25	-1.32
OTC	41.25	13.88	Parametric Technology	40.50	6.75	20.00
OTC	11.00	3.50	Phoenix Technologies	4.63	-0.25	-5.13
OTC	25.25	10.63	Platinum Technology	18.75	-0.50	-2.90
OTC	46.50	27.75	Progress Software Corp.	40.25	2.25	5.92
OTC	28.63	4.00	Quarterdeck Office Sys.	4.75	-0.13	-2.56
OTC	32.75	10.25	Rainbow Technologies Inc.	19.00	1.25	7.04
OTC	29.50	8.75	Rasterops	11.25	-0.25	-2.17
OTC	17.25	5.38	Ross Systems	8.00	0.00	0.00
OTC	26.25	7.50	Software Publishing Corp.	9.50	1.25	15.15
OTC	8.50	2.00	Software Toolworks Inc.	2.75	-0.38	-12.00
OTC	7.25	1.75	Spinnaker Software	3.00	0.25	9.09
OTC	16.50	6.25	State of the Art	7.25	0.00	0.00
NYS	25.25	11.63	Sterling Software Inc.	16.50	0.38	2.33
OTC	30.00	13.00	Struct. Dynamics Research	15.00	-1.50	-9.09
OTC	31.75	15.00	Sybase Inc.	30.38	2.13	7.52
OTC	61.00	18.00	Symantec Corp. (L)	21.00	0.88	4.35
NYS	15.50	5.25	Systems Center Inc.* (L)	6.75	1.13	20.00
OTC	34.25	8.88	System Software Assoc.	26.25	-1.00	-3.67
OTC	23.75	14.50	Walker Interactive Systems	16.75	1.50	9.84
OTC	6.63	2.13	Wordstar	2.63	0.13	5.00
Semiconductors			**Up 2.25%**			
NYS	21.50	7.38	Advanced Micro Devices	8.88	0.38	4.41
NYS	11.13	7.00	Analog Devices Inc.	9.75	0.38	4.00
OTC	14.13	6.75	Atmel Corp.	8.63	-0.25	-2.82
OTC	14.13	4.75	Chips and Technologies	5.00	0.25	5.26
NYS	22.63	7.38	Cypress Semiconductor Corp.	9.25	-0.38	-3.90
NYS	10.13	6.25	Dallas Semiconductor	9.88	0.25	2.60
OTC	68.75	38.50	Intel Corp.*	58.75	1.50	2.58
NYS	9.88	5.50	LSI Logic Corp. (L)	5.88	0.38	6.82
NYS	22.38	11.13	Micron Technology	16.25	1.25	8.33
NYS	85.63	54.00	Motorola Inc.* (H)	85.63	2.00	2.39
NYS	11.50	3.88	National Semiconductor*	10.25	0.50	5.13
OTC	27.00	10.13	Sierra Semiconductor (L)	10.13	-1.00	-9.00
NYS	41.88	26.00	Texas Instruments* (H)	41.88	1.38	3.40
OTC	10.50	5.88	VLSI Technology	6.50	0.38	6.12
OTC	9.75	2.13	Wafertech	3.13	0.13	4.17
ASE	5.63	2.00	Western Digital Corp.	4.63	-0.25	-5.13
OTC	32.50	17.25	Xilinx	22.75	2.00	9.64
OTC	11.50	4.63	Zilog Inc.	8.75	-0.25	-3.57
Peripherals and Subsystems			**Up 5.59%**			
OTC	10.00	2.75	Archive Corp.	7.75	-0.13	-1.59
OTC	24.63	11.25	Banctec Inc.	24.63	2.88	13.22
OTC	23.50	7.00	Cambex Corp.	13.00	1.88	16.86
ASE	12.25	4.88	Cognitronics Corp.	10.75	-1.13	-9.47
NYS	23.88	12.50	Conner Peripherals*	21.50	1.13	5.52
ASE	19.88	3.47	Dataram Corp.	15.88	2.75	20.95
NYS	19.25	5.88	EMC Corp.	16.50	2.38	14.72
OTC	9.38	4.75	Emulex Corp.	7.00	0.13	1.82
OTC	23.00	14.25	Evans & Sutherland	15.50	0.75	5.08
OTC	20.63	18.25	Exabyte	31.25	1.50	5.04
OTC	27.25	15.75	Intelligent Info. Systems	24.50	-0.50	-2.00
OTC	11.25	4.63	Iomega Corp.	5.50	0.00	0.00
OTC	34.75	12.00	IPL Systems Inc. (L)	15.25	2.25	17.31
OTC	24.50	10.75	Komag Inc.	15.00	1.50	11.11
OTC	14.00	2.63	Maxtor Corp.*	12.75	-0.25	-1.92
OTC	12.63	5.75	Micropolis Corp.	10.38	0.63	6.41
NYS	100.38	83.50	3M Co. (H)	100.00	1.63	1.65
OTC	7.75	3.50	Printronix Inc.	6.50	1.25	23.81
NYS	28.75	7.00	QMS Inc.	7.75	0.00	0.00
OTC	18.00	8.88	Quantum Corp.	13.75	0.00	0.00
OTC	12.75	5.13	Radius Inc.	11.50	0.88	8.24
NYS	12.88	5.88	Recognition Equipment	8.25	0.50	6.45
OTC	13.13	5.38	Reton Inc.	9.50	0.25	2.70
OTC	17.63	7.25	Seagate Technology*	15.38	0.25	1.65
NYS	78.00	28.13	Storage Technology*	36.00	-0.13	-0.35
NYS	30.88	18.00	Tektronix Inc.	18.38	0.13	0.68
NYS	82.25	52.63	Xerox Corp.	74.75	2.25	3.10
Services			**Up 3.45%**			
OTC	18.00	11.88	American Mgmt. Systems*	17.13	0.38	2.24
NYS	5.38	2.88	Anacomp Inc.	3.38	0.00	0.00
OTC	18.00	12.25	Analysts Int'l	16.75	0.00	0.00
NYS	49.00	30.25	Auto Data Processing*	44.88	2.25	5.28
NYS	24.16	12.50	Comdisco Inc.*	16.75	1.25	8.06
OTC	13.50	7.75	Computer Horizons	9.50	-0.25	-2.86
NYS	94.88	52.25	Computer Sciences*	85.63	8.38	10.78
NYS	10.13	7.00	Computer Task Group	8.50	0.38	4.62
OTC	40.50	15.00	CompUSA Inc.	28.25	1.75	7.14
OTC	19.25	7.50	Corporate Software (L)	8.00	0.50	6.67
OTC	30.75	13.50	Egghead Discount Software	18.50	1.00	5.71
NYS	23.00	23.19	General Motors E (EDS)*	27.63	1.75	6.76
OTC	30.38	6.25	Intelligent Electronics	10.63	0.38	3.66
OTC	14.88	2.75	Manpel	10.75	0.88	8.86
OTC	15.75	7.00	Microage Inc.	8.63	-0.38	-4.17
OTC	27.50	14.16	Paychex	24.38	-0.13	-0.51
NYS	73.00	47.25	Policy Management Sys.	70.13	4.13	6.25
NYS	43.63	19.63	Reynolds and Reynolds	43.63	1.63	3.87
OTC	32.00	21.25	SEI Corp.	23.25	0.25	1.09
OTC	24.38	16.88	Shared Medical Systems	19.13	-0.63	-3.16
OTC	26.25	13.50	Sungard Data Systems	25.50	-0.25	-0.97
NYS	4.88	1.13	Ultimate Corp.	2.00	0.13	6.67

KEY: (H) = New annual high (L) = New annual low
* Companies tracked in Computerworld Stock Index

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IN BRIEF

Earnings highlights

■ Second-quarter profits at **Sybase, Inc.** more than tripled compared with last year's second quarter on a 59% jump in sales to $57.7 million. North American sales were up 67%.

■ Profits plunged 65% at **Quarterdeck Office Systems** on nearly flat sales of $12.2 million. The company blamed the profit decline on competitive pressure from **Microsoft Corp.**'s Windows and IBM's OS/2.

■ **Computer Sciences Corp.** logged a 33% increase in sales and a 12% gain in profit. The commercial side of the business was up 78% while revenue from the public sector rose only 7%.

■ An $11.5 million restructuring charge contributed to a $16 million quarterly loss at **Systems Center, Inc.** Revenue went up slightly to $31 million. The company said it will sell off its IBM Application System/400 and Unix utility products and focus on systems and network management.

■ **AST Research, Inc.** neared the billion-dollar mark with sales of $266.3 million for the fourth quarter and $944.1 million for the fiscal year. But intense price competition knocked quarterly profits back 8% to $18.6 million.

■ Just down the road, **Advanced Logic Research, Inc.** saw quarterly profits fall by more than half to $1.6 million on flat revenue of $52.7 million. The company blamed a squeeze on gross margins.

■ The acquisition of **Mips Computer Systems, Inc.** dragged down profits at **Silicon Graphics, Inc.**, which took a $109 million quarterly loss, including merger charges. But 1992 sales were up 24%.

Streamlining restores Informix to health

Software firm's prescription calls for focusing on core development — and farming out the rest

BY JEAN S. BOZMAN
CW STAFF

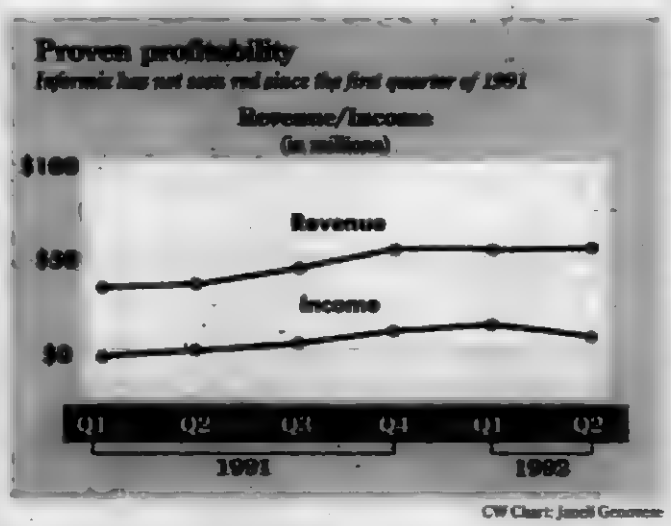
MENLO PARK, Calif. — Analysts credit Informix Software, Inc.'s turnabout from a year of losses in 1990 to a growth spurt this year to both a recent reduction in overhead and a restructuring of its engineering organization late last year.

Such is the reversal of Informix's fortunes — that the $179 million firm plans to surpass $200 million in sales this year by following a new formula for success: Invest in databases and tools and buy the rest.

Industry analysts said that changes in the company's software engineering group were instrumental in putting Informix research and development back on track. The changes were ordered by Chuck House, senior vice president of product management and development, who was hired from Hewlett-Packard Co. in July 1991 to place a new focus on development.

"We're doing all the core development internally, and we're bolting on the rest," Informix Chief Executive Officer Phil White said last month. "We get a lot more done that way, and with fewer dollars invested."

For example, the firm is working with Sequent Computer Systems, Inc. on a parallel processing data-query product and with Siemens AG on a data dictionary/repository, White said. It licensed HP's SoftBench framework for third-party computer-aided software engineering (CASE) tools and is leaving the applications business to its network of 2,000 value-added resellers (VAR). Meanwhile, Informix engineers are putting the finishing touches on the Informix 6.0 database, due to ship in 1993.



CW Chart: Janell Genovese

Internal development ran into trouble in 1990, as the engineering staff struggled to juggle several projects: maintaining multiple versions of two database engines, migrating from character-based tools to graphical user interface (GUI) tools and addressing the need for CASE tools. As a result, a multithreaded server release has been delayed until next year — and a full GUI version of Informix 4GL will ship in phases.

Informix's dilemma was a function of its size, analysts said. "A lot of companies hit $150 million in annual revenue, as Informix did, and they have to stop and re-evaluate what business they are really in," said Peter Kastner, a software analyst at Aberdeen Group in Boston.

"They had a database, some office automation tools and [Innovative Software, Inc.'s] Wingz [graphical spreadsheet]. The synergy of those products wasn't all that obvious, and the company wasn't big enough to keep all those major product areas up to snuff," Kastner said.

Now, three technology centers, each of which is evaluated on a profit-and-loss basis, develop new products separately. A new product delivery center maintains several releases of existing products, enabling development teams to hand off maintenance and documentation.

A product development center will maintain at least two "code streams" for existing database and tools products, White said. "We will need to maintain multiple releases in multiple [operating] environments around the world."

Tension relief

Industry analysts said the reorganization at Informix helped ease the in-house tension between development teams that began in 1989, the year after Informix acquired Innovative Software in Lenexa, Kan. Now, they say, Informix figures it can grow its revenue and increase its share of the growing Unix database market.

But the company will face strong competitors as it expands. "Informix says they can take a bigger percentage of a bigger market," said Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Stamford, Conn. "But the big guy, Oracle, is growing faster, too, and that could squeeze the other database vendors."

White said he believes Informix can keep its costs lower than a big competitor such as $1.1 billion Oracle Corp., which maintains a large, costly direct sales force. In contrast, White said, the low-end Informix SE database, sold by VARs with packaged applications, brings in revenue with relatively low overhead costs.

Key vendors taking piracy fight to the BSA

BY CHRISTOPHER LINDQUIST
CW STAFF

"There's enough of a pie that there can be more than one slice."

That was the Software Publishers Association's (SPA) response to a recent announcement by six SPA members that they will pursue both domestic and international piracy litigation through the Business Software Alliance (BSA).

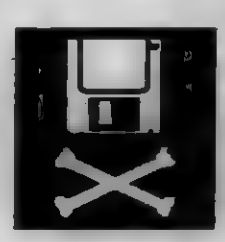
The six — Aldus Corp., Lotus Development Corp., Autodesk, Inc., Novell, Inc., WordPerfect Corp. and Microsoft Corp. — are also members of the BSA, a business software consortium launched in 1988. Both the SPA and the BSA have pursued software pirates through legal avenues.

Change in focus

The move marks an expansion of the eight-member BSA's focus from strictly international issues to one that includes a domestic program. As a result, the six firms will now be able to consolidate all litigation (and cut costs) through one group rather than two.

"We've had problems here justifying funding two different operations that are essentially doing the same things," said Ryan Richards, international counsel at WordPerfect.

While the change will undoubtedly funnel more money through the BSA — settlement money won from defendants in piracy suits is returned to the BSA fund for use in future litigation — an SPA spokeswoman indicated that her organization still considers the BSA to be complementary.



Indeed, at one point in the summer of 1990, it was announced that BSA and SPA would join forces and become one organization, with the BSA functioning as the international arm of the group. Both groups are almost singularly focused on pursuing intellectual property rights.

However, it was decided that the two would be "happier to just be sister organizations," according to SPA counsel and director of litigation Ilene Rosenthal.

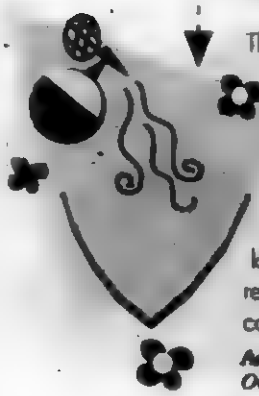
According to the SPA, all six BSA members in question will retain their memberships in the SPA, a claim that was confirmed both by WordPerfect and Lotus.

Richards said that while WordPerfect sought to gain the efficiency of working through one organization — the BSA — for all its litigation, it still found considerable benefit in remaining an SPA member.

"The SPA is much broader and much larger," he said. "It gives us a chance to stay in touch with the software industry as a whole."

Founded in 1984, the 950-member SPA provides market data and deals with piracy litigation and education.

freaky RESUMES

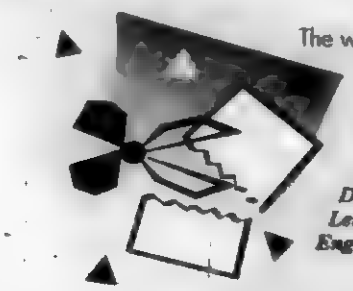


There are several I recall. One was from a person familiar with Lotus. Another was from a computer operator who had spent three years training on a system but didn't know what kind. I've also received a resume sent on scented, colored paper.

An MIS supervisor
Owens-Corning Fiberglas Corp.
Amarillo, Texas

Some applicants are wanna-bes but have no clue. I'd say about 20% of our applicants address their resumes to West Minister College. I want to know who the East Minister is. Some claim to work with machines that don't exist. They have just enough information to get it wrong.

Frank Herriott
Director, computer services
Westminster College
Salt Lake City



The weirdest resume I remember getting was one that was cut off on the second page. I never knew what his education or experience was.

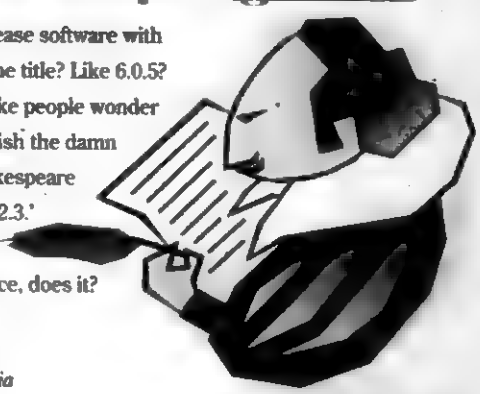
Regis Garbo
Data center director
Lever Brothers
Englewood Cliffs, N.J.

Do you have any resume horror stories? If so, call Lory Dix or Jodie Naze at (800) 343-6474.

WYSIWYG

Work in progress

"Why do we release software with numbers after the title? Like 6.0.5? Doesn't that make people wonder why we can't finish the damn thing? Like Shakespeare writing 'Hamlet 2.3.' It just doesn't inspire confidence, does it?



Stan Cornyn
President
Warner New Media
Burbank, Calif.

Tech Trivia

1. At the 1979 West Coast Computer Faire, the first Apple clone appeared. What was it called?

2. According to John McAffee's book, *Computer Viruses*, which computer was probably the first to be infected by a virus? Was it the Xerox 530, the DEC PDP-11 or the IBM 360?

3. IBM once sold a computer known as the Model 5150. By what name is it more commonly known?

1. The Orange
2. The Xerox 530
3. The IBM PC, introduced in 1981

Polish President Lech Walesa (right) played host to Dell Computer's staff at his office in Warsaw during the launch of Dell Poland in May. Dell Chairman and CEO Michael Dell (left) presented Walesa with a Dell color notebook. (In background, a Walesa aide.)

Source: "Newness" newsletter, April 1992. Special thanks to the Computer Museum, Boston.

WYSIWYG Design: Stephanie Faucher

INSIDE LINES

Red ink watch

▶ With year-end results due out this week, Wang has steadfastly declined to comment on what analysts are calling a precarious financial situation. Wang Class B stock has skittered to an all-time low as Wall Street worries that the company may book a negative net worth of more than $25 million. If so, creditors can call in outstanding loans that Wang may not have enough cash to cover. Some analysts have publicly speculated that Wang may be forced to file for Chapter 11 bankruptcy before the year is out. As of last week, however, Wang had filed no such papers with the local U.S. Bankruptcy Court.

Users 'dis' Wang VS

▶ Wang may say it isn't de-emphasizing the VS line, but the U.S. Society of Wang Users (USSWU) certainly is. Its annual meeting, slated for November in Boston, will feature outsiders such as a Banyan user group, the Boston Computer Society and vendors such as HP, Sun and Microsoft. Steve Jobs is even booked as a keynote speaker. "We're definitely moving away from the Wang name toward more open themes," said Ramsay Miller, chairman of the Americas Pace Special Interest Group, which is an organization of users of Wang's Pace database. USSWU "sees the need for this distance," Miller said.

Malaise strikes Microcom again

▶ Officials at networking company Microcom in Norwood, Mass., last week confirmed a 13% across-the-board layoff that affected 55 employees. The move follows a shareholder meeting last month that indicated a possible top-level management shakeup and/or a shift in product emphasis that will likely be officially announced Aug. 14, a spokesman said. Microcom's stock price plummeted from $7 to $2.50 per share on July 6 — the latest development in its see-saw financial results since 1991.

They can't thank you enough

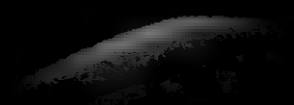
▶ IBM is getting ready to announce that it has shipped one million copies of OS/2 2.0 since releasing it at the end of March. This amount exceeds what some industry observers expected the company to do for the full year. A spokesman would only say that the company is on its way to the one million mark. One source said to expect IBM to throw a "Thanks a Million" party sometime this month. Meanwhile, a source was invited to join the MS-DOS 6.0 beta-test program. With the beta test just beginning now, the new version should appear next year.

Happy Birthday, Charles

▶ IBM may have a penchant for Tuesday announcements, but CA founder Charles Wang has expressed a liking for always buying a company near the time of his birthday. Not surprisingly, a source in the know says to look for a CA acquisition sometime the middle of this month, probably the 17th or 18th. On the record, CA says it will roll out a new PC software support program for its third-party developers, along with several mainframe-based products set to debut at the Systems Software (user group) Conference in New Orleans Aug. 16-17. Also, CA-Unicenter for Unix software, an integrated system designed to manage HP's HP/UX operating environment, is currently in beta testing and will be shipped by the UnixExpo trade show in New York next month. The product was announced in October 1991.

Everyone's a critic. Industry watchers everywhere all have theories on why Massachusetts' once-rich, once-powerful Route 128 minicomputer monsters are now on the skids. Lumbering reaction to fast-changing market demands combined with a basement-dwelling local economy zapped companies such as DEC, DG, Prime and Wang Labs, they say. But John Cunningham, former president of Wang, says it was status quo thinking in the top ranks that contributed the most to the poor shape these firms are in. "It's sad that the three individuals who birthed the three largest companies here . . . turned out to be the major cause of these companies' declines," he said. What shape is your company in? Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

Where are you headed with your applications development?



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COMPUTERWORLD

BUSH ■ CLINTON: Technology imperatives
See page 25

Paper products player axes services unit

Kimberly-Clark said to eye sale of group

BY NELL MARGOLIS
CW STAFF

DALLAS — Kimberly-Clark Corp. is quietly dismantling — and may be poised to sell — a subsidiary that it spun out in 1988 to rocket the $6.8 billion paper products player into the outsourcing and software development markets.

Some 43 staff members at Kimberly-Clark Computer Services, Inc. received pink slips late last month, bringing the subsidiary's head count down to about 25, a Kimberly-Clark spokeswoman said.

The computer services arm had 100 employees at its peak and was down to about 68 before the layoff.

Kimberly-Clark Computer Services "is discontinuing all business development," spokeswoman Tina Barry said.

Back to basics

The parent company — which is widely viewed as being among the nation's most enlightened users of information technology — will refocus its resources on its core paper products business, particularly as that business expands overseas, said Gary McGinnis, former information technology vice president at Kimberly-Clark Computer Services.

The layoff, Barry confirmed, leaves just the bare-bones manpower needed to honor the company's stable of software development contracts — a list that includes customers such as IBM subsidiary Integrated Systems Solutions Corp. and Diamond

Continued on page 16

Host makers: Let's make a deal

IBM, HDS, Amdahl offering 40% to 50% discounts on mainframe gear

BY JOHANNA AMBROSIO
CW STAFF

Mainframe vendors are caught up in a discount frenzy that users last week described as a mix of *The Price is Right* and Crazy Eddie's.

The well-known television game show and the now-defunct chain of East Coast electronics stores have nothing on the 40% to 50% discounts now being offered by all three major mainframe vendors — IBM, Hitachi Data Systems Corp. and Amdahl Corp., users and other observers said.

A vice president at a major grocery wholesaler who recently completed negotiations for six IBM Enterprise System/9000 models said he was offered a hard-dollar discount of 20%, which brought the cost of a $10 million machine down to about $8 million. IBM also threw in soft-dollar discounts, such as some free software licenses and maintenance for a few months, which brought the total discount into the 40% range.

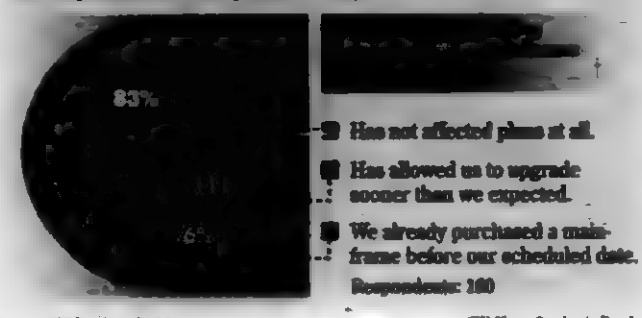
"It's incredible," he said. "All the vendors are wheeling and dealing."

Specific discounts are based on the hardware and software in-

Continued on page 15

Vendors bearing bargains

Discounts had little effect on the majority of respondents surveyed but did persuade some to purchase early



Source: CW Database Division

CW Chart: Stephanie Pincher

IS cover-up charged in system kill

Did AMR deception do in travel system?

BY MARK HALPER
CW STAFF

FORT WORTH, Texas — The outsourcer that was developing the highly touted Confirm reservation system for a travel industry consortium may have covered up deep-rooted technical problems long before they emerged at a user site, according to a letter written by Max Hopper, American Airlines' information systems chief.

Word of the alleged deception spread last week as outsourcer AMR Information Services, Inc. and its three user partners — Hilton Hotels Corp., Marriott Corp. and Budget Rent A Car Corp. — discussed how to dismantle the travel information consortium, known as Intrico, now that Confirm development has ceased.

A source close to Intrico said the alleged cover-up is believed to be a focal point in the negotiations as the three users consider whether they were misled by AMR Information Services into continuing to invest in an operation plagued with problems in da-

Continued on page 10

Teamwork key to workgroup success

BY ROSEMARY HAMILTON
CW STAFF

SAN JOSE, Calif. — Workgroup computing has been touted as the next savior of productivity, but information systems executives and observers said it will be a surefire dud unless companies first address the organizational challenges it presents.

"It is a big-time change, even if you're used to automation, and you have to be mindful of that," said Elaine Bond, a senior consultant and fellow at The Chase Manhattan Bank NA, a Lotus Development Corp. Notes user site.

At the Groupware '92 conference held here last week, many executives said workgroup computing has as much to do with work processes and people as it does with technology.

Executives said that to make workgroup projects worthwhile, managers should consider two key strategies: implementing tools for a specific business need or process and being ready to motivate employees to work in teams.

For example, American Express Co. does not look at groupware as a technology issue alone, said Joseph Caruso, director of corporate systems and technology. Instead, it is rolled into the company's overall quality initiative and applied as part of this corporate strategy.

"Groupware isn't a onetime fix," Caruso said. "It will be part of a continual process."

Looking for a fix

Several managers who now claim success with groupware said the tools were brought in to fix a specific problem.

Sheldon Laube, national director of information and tech-

Continued on page 14

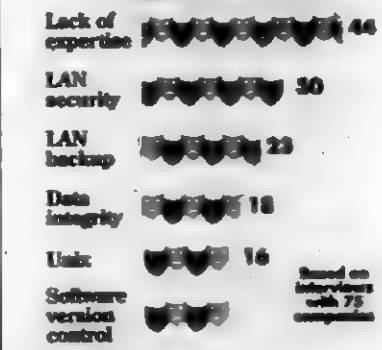
PLATFORM PLUNGE

Downsizing thrills 'n' chills

Small systems, big problems

LAN-related issues rank high on users' lists of downsizing concerns

Number of respondents
Multiple responses allowed



Source: Forrester Research, Inc.

"The savings are there, but this is a daunting task," says Paul Ricker, IS vice president at G. Heileman Brewing Co.

Despite problems with cost overruns, a lack of skilled workers and various LAN headaches, there is hope for downsizers.

This week, *Computerworld* presents a special report on downsizing. **Part I: Executive Report** examines frontline frights and fixes, page 65. **Part II: In Depth** reveals tips and techniques to ensure success, page 69.

INSIDE

Apple's Ian Diery believes the Macintosh is positioned to fend off encroaching low-cost, Windows-based PCs. Page 12.

IBM partners with Blue Cross/Blue Shield of New Jersey to remedy rising health care costs. Page 6.

Early users say Novell's E-mail plan and Banyan's Vines 5.0 have shortcomings. Pages 4 and 44.

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IN THIS ISSUE

NEWS

4 **SunSelect's** NetWare SunLink ships.

4 It's on the right track, but **Novell's** new NetWare Global Messaging Server does not yet support the mix of protocols and APIs that will set it apart.

6 **Blue Cross/Blue Shield of New Jersey** signs a five-year, $52 million technology development pact with IBM's **ISSC.**

7 Vendors might be flocking to **Intel's** DX2 66 chip, but users are still not terribly excited.

8 **Borland** releases new Quattro Pro sans **Lotus**-like menus, per a recent court order.

12 Macaholics are treated to an array of new products at **MacWorld Exposition,** held in Boston last week.

15 **Micronics Computers** and **Gateway 2000** announce joint development of a line of PCs that feature advanced local-bus architecture.

16 **Gupta Technologies** will update the SQL Windows and Quest tool families.

20 Retailer **Home Depot** replaces **Data General** minis with **Hewlett-Packard** RISC- and Unix-based midrange systems.

Quotable

"The mind-set is different from what I've seen before. It's like going to a used car lot. No matter what kind of a great deal you get, you always walk away feeling like you've left money on the table."

DAVID MOORE
MELLON BANK

On mainframe discounts. See story page 1.

DESKTOP COMPUTING

29 Computers keep **IndyCar** drivers honest.

WORKGROUP COMPUTING

39 Kennel sends Unix packing.

44 New Product In-Site: Users of **Banyan's** Vines 5.0 like its new features but say it is difficult to install.

ENTERPRISE NETWORKING

47 **Boole & Babbage's** new Auto/Command product automates control of distributed computers.

LARGE SYSTEMS

53 **Mobil** will spend $1.5 million or more on **J. D. Edwards** business tools.

APPLICATION DEVELOPMENT

59 **Pacific Gas & Electric** chooses Windows for its 20,000-PC revamp.

MANAGER'S JOURNAL

73 Industry Close-up: IS managers at retail banks struggle to plan ahead amidst merger mania.

EXECUTIVE REPORT

65 The grubby political, technical and money issues at the downsizing front lines.

IN DEPTH

69 Downsizing your applications, from front-end GUIs to multiplatform databases. By Eric P. Bloom.

DEPARTMENTS

6, 16 News Shorts

21 Advanced Technology

24 Editorial

74 Calendar

80 Computer Careers

87 Marketplace

92 Stocks

93 Computer Industry

94 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **Did AMR Corp.'s outsourcing subsidiary deceive investors** about the technological health of the now-sidelined Confirm travel reservation system? Could be, according to American Airlines' IS chief Max Hopper. **Page 1.**

■ **Downsizing isn't always the cost-saving magic bullet it's cracked up to be,** say IS chiefs at companies that are switching to smaller, networked computers. New market research studies confirm front-line reports of cost overruns, a shortage of skilled workers, poor LAN and systems administration and a lack of client/server tools and software. To avoid these pitfalls, consultants and seasoned IS managers advise choosing your applications carefully and linking them closely with user needs. **Pages 65 and 69.**

■ **IBM's networking blueprint for peaceful multiprotocol coexistence** benefits IBM developers more than it does users, observers say. **Page 8.**

■ **People issues can be as challenging as the technology** when implementing a workgroup strategy, IS executives at Groupware '92 say. **Page 1.**

■ **Companies are beginning to explore standardized career planning** for IS staffers. A new DPMA program outlines skill sets and academic backgrounds required for more than 200 professional IS job titles. **Page 80.**

■ **Guilty, says Judge Keeton: Borland infringed on Lotus copyrights to 1-2-3.** A trial is still to come, and Borland will appeal, but copies of Quattro Pro that assume the Lotus position are already making their way into the channel. **Page 8.**

■ **Mainframe discounts can range up to 50% and sometimes even more,** users say, as vendors scramble to compete. **Page 1.**

■ **OK, you've got thousands of images stored on optical discs.** How do you index them? It's a question that IS managers are tackling as imaging systems mature. **Page 53.**

■ **Kimberly-Clark folds its flagging computer services subsidiary** to refocus resources on its paper products core. **Page 1.**

■ **Straightening out the spaghetti wiring of data networks** may be getting easier with the advent of graphical configuration management systems. **Page 50.**

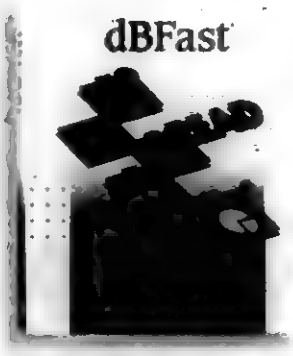
■ **Is the heat from Microsoft's Windows** starting to bake graphical user interface pioneer Apple? No, a top executive says: Apple is prepared to compete effectively in the future. **Page 12.**

■ **New Macintosh models are on the way, and prices may be falling** as Apple heads into a busy late-summer, early-fall season. A new PowerBook is here as of last week; new Macintoshes and price structures should be close behind. **Page 29.**

■ **Blue Cross/Blue Shield of New Jersey joins forces with Big Blue itself** in a technology development alliance aimed at speeding the Garden State to the forefront of automated managed health care. **Page 6.**

■ **On site this week:** Pacific Gas & Electric uses a lesson learned in the early stages of its PC strategy — i.e., you have to make the system look right — to shift from vanilla MS-DOS to a graphical environment. **Page 59.** When your clients have fangs and claws, you want your computer to do the job right. That's why pet motel Kennelwood Village has a multiuser DOS system. **Page 39.** A new approach to networking could save restaurant chain Friendly Ice Cream 87% in its annual transmission fees. **Page 47.** Portable computers help keep million-dollar race cars running at peak performance and could lead to improvements in the design of the family car. **Page 29.**

Attention All dBASE Users: Your Windows Have Arrived.



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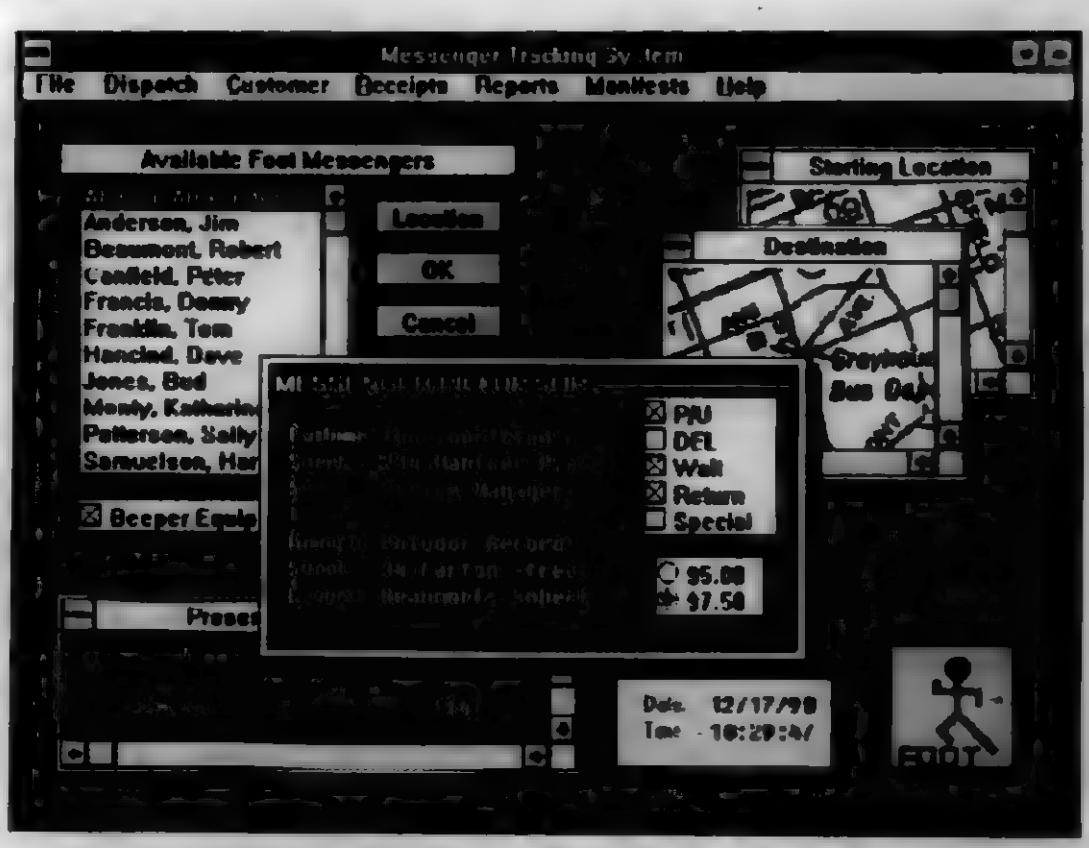

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Novell ships messaging server

Pricey product fails to support mix of messaging protocols and APIs

BY MICHELE DOSTERT
CW STAFF

PROVO, Utah — Amid fierce competition to snare corporate distributed messaging accounts, Novell, Inc. last week began shipping a version of its distributed NetWare Global Messaging Server. However, that version needs beefing up if the company is to follow through on its promise of interconnecting disparate electronic-mail systems.

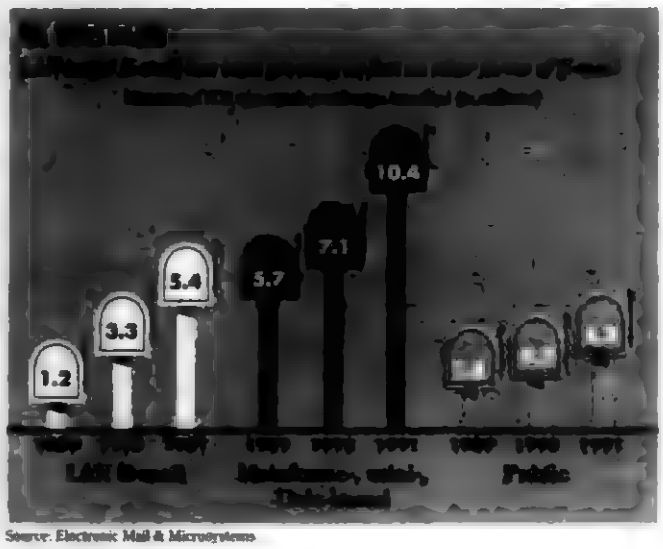
The current shortfall: Although the product is touted as an integrator/translator of different messaging protocols, the initial version handles just Message Handling System (MHS)-oriented messaging. Moreover, a high price and system complexity may forestall a quick acceptance, users said.

Novell also disclosed another facet of its enterprise strategy, announcing an enhanced version of its MHS mail service aimed at stand-alone workgroups or those that might want to hook into the corporate messaging backbone.

MHS 2.0, slated to ship in October, adds NetWare directory synchronization, support for longer names and enhanced asynchronous communication support to the previous version, Novell said.

First step only

While users such as Tony Ferlazzo, a product manager at Pacific Bell in San Ramon, Calif., who beta-tested NetWare Global Messaging Server, said they are encouraged that "Novell is thinking beyond MHS and recognizing that large organizations have more than a LAN-based system," NetWare Global Messaging Server does not yet support the mix of messaging protocols and application programming interfaces that are purported to be its eventual strength.



Source: Electronic Mail & Microsystems

The initial Global Messaging Server — a set of NetWare Loadable Modules announced in March for NetWare v3.11 servers [CW, March 23] — supports only Novell MHS-oriented messaging.

The capability to mix and match X.400, Simple Message Transfer Protocol, IBM's Systems Network Architecture Distribution System and other standard messaging environments — the functions that render the product an enterprise messaging switch — will follow sometime before the end of the year, according to Novell.

The absence of these other protocols means the message server is initially applicable primarily to NetWare-only environments. The X.APIA gateway interface to industry-standard X.400-based messaging servers will be the first non-MHS API supported.

Beta-test users said they are nonetheless encouraged by Novell's enterprise direction. "We have probably 3,000 E-mail users, including our vendors and customers, and a good 50% to 60% of all our messaging happens with outside customers and vendors that are not PC-based. This product will help us integrate those users," said J. R. Mose, a senior network engineer at Computerland Corp. in Walnut Creek, Calif.

Stumbling blocks

However, users mentioned two caveats: complexity and price. "It's a pretty complicated product to install," said Ferlazzo, although he indicated that this is the case with most multiprotocol messaging systems.

Mose noted that because "everyone's budgets are tight now," the server's $1,095 to $7,295 price "is a little high."

This is particularly an issue at large corporate sites where Novell is trying to position itself as an enterprise vendor. The $7,295 price is for 250 users; a 1,000-user network, then, would require four servers, totalling about $30,000, plus some hardware costs.

By comparison, SoftSwitch, Inc.'s $30,000 to $300,000 distributed Enterprise Mail Exchange, announced in June [CW, June 8], comes as a five-product family that does not charge on a per-user basis and includes Data General Corp.'s Aviion hardware.

SoftSwitch accounts typically support 20,000 users, the Wayne, Pa.-based company said. With its current pricing, a Novell solution in such environments would cost almost $600,000.

CW senior editor Joanie M. Wexler contributed to this story.

Making connections

Efforts to build both portability and connectivity in the same system have often come up short in one or both areas. Novell aims to change that with last week's introduction of NetWare PalmDOS 1.0, an operating system.

PalmDOS 1.0 is based on DR DOS 6.0 from Novell's Desktop Systems Group. It will allow palmtops equipped with Personal Computer Memory Card International Association cards — credit-card-size LAN adapters — to access remote files and use printers on the network, the company said.

Although no ship date for the system was specified, software developer's kits for the new PalmDOS 1.0 are shipping now, according to Novell.

Novell said it expects PalmDOS to eventually appear on a wide range of handheld products, including palmtop computers and other systems, such as pocket translators, data-capture devices and enhanced portable telephones, that deliver applications in hardware form.

Dataquest, Inc. in San Jose, Calif., has projected that the handheld market will grow from 1 million units sold in 1992 to 6 million units in 1995.

Novell intends to see that wherever data goes, LANs will be sure to follow.

MICHELE DOSTERT

Sun delivers Unix client link for NetWare LANs

BY JOANIE M. WEXLER
CW STAFF

BILLERICA, Mass. — Software that allows Novell, Inc. local-area network clients to access Unix servers began shipping last week from a Sun Microsystems, Inc. subsidiary to an industry hurtling toward the widespread amalgamation of disparate computing environments.

Observers attested to proliferating demand for such integration products, but a lack of Apple Computer, Inc. support has some early users of NetWare SunLink — announced in April by SunSelect [CW, April 20] — considering a NetWare-based integration attack instead.

NetWare SunLink, Sun's NetWare for Unix port, sits on top of Sun's Solaris Unix operating system as an alternative to Novell's NetWare v3.11, for which there are Novell NetWare Loadable Modules (NLM) that allow Unix clients to hook into NetWare servers.

Eases heavy load

Conversely, SunLink is aimed at Unix-heavy shops looking to allow NetWare clients to access Unix servers in order to satisfy the growing need for business units running different computing platforms to share corporatewide data.

"The industry is seeing a high necessity" for melding Unix and NetWare worlds because of the "sheer numbers" of installed PCs and the growth of Unix, said Kevin Orcutt, a systems analyst at Silver Spring, Md.-based Century Technologies, Inc., a NetWare SunLink beta-test site.

While NetWare SunLink is based on v3.11, not all of v3.11's functionality has yet been ported to the Sun product.

For example, NetWare v3.11 ships with the capability to route NetWare's IPX, Transmission Control Protocol/Internet Protocol and Apple's AppleTalk protocols within a corporate site. NetWare SunLink does not provide the AppleTalk capability — an issue for both Century and Antarctic Support Associates, another early NetWare SunLink user.

> "APPLETALK NOT BEING routed is definitely an issue."
>
> DAVE WALDEN
> ANTARCTIC

"My one dilemma with NetWare SunLink is the lack of Apple support," Orcutt said. He explained that vice presidents clamoring for network access in his firm have Macintoshes, and "you have to accommodate your VPs." The Apple support might influence whether he upgrades from NetWare v2.15 to v3.11 or to NetWare SunLink, he said.

"AppleTalk not being routed is definitely an issue," agreed Dave Walden, a senior analyst at Denver-based Antarctic, a contractor for the National Science Foundation (NSF). Walden accidentally tested NetWare SunLink for three weeks when SunSelect shipped it to him unrequested on two Unix servers he ordered for evaluation.

However, he said he intends to recommend NetWare SunLink to the NSF for procurement as an alternative to the current "painful" process of converting Macintosh files to DOS, then to Unix, through various utilities within Macintosh and Sun operating systems.

Orcutt said Sun told him that Novell has not released the Apple code to developers yet, but when it does, Sun will support AppleTalk routing.

Another minor issue, he said, is that "to gain full NetWare configuration options, you have to have both a PC and a Sun workstation." He explained that this is because not all of the control console packages from Novell have been made available to Sun yet. Orcutt indicated that he would like to see closer ties between the two firms "so more stuff would get ported over."

Novell options for Unix/NetWare integration include NLMs that allow the two networks to share file and print services or let NetWare clients run terminal emulation sessions on a Unix host.

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Chairman and CEO
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John Sculley
Chairman and CEO
Apple Computer, Inc.

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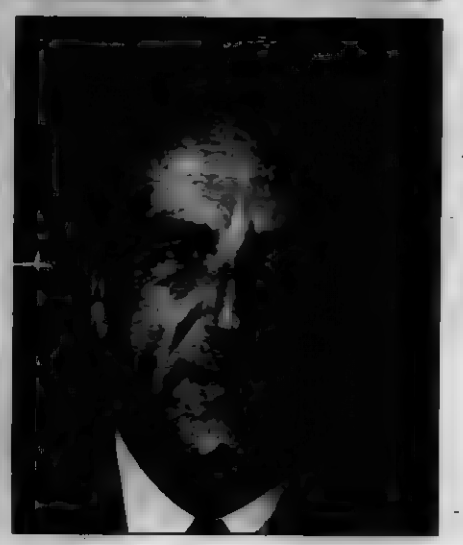
President and CEO
Oracle Corporation



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NEWS SHORTS

Storage Tek delays Iceberg, again

Storage Technology Corp. late last week said best testing and production of its high-end disk array will be delayed by at least one quarter from previously revised estimates. This means production units of the mass storage subsystem will not be available until the first quarter of next year, at the earliest. Beta testing is expected to commence in the fourth quarter, though a company spokesman refused to be pinned down on an exact time frame. The revised estimates are based on continuing complications encountered in integrating, testing and debugging the subsystem's microcode, the company said. Storage Tek had originally expected to beta-test the disk array — known as Iceberg — during the first half of 1992 and to begin production during the second half. Earlier this year, the Louisville, Colo., company pushed back beta testing and production to the third and fourth quarters, respectively.

OSF plans to rev Motif GUI

The Open Software Foundation (OSF) last week launched plans for the next generation of its Motif graphical user interface (GUI), inviting vendors to participate in an Aug. 18-19 workshop for the GUI Application Interoperability Architecture, or GAIA, project. The next version of Motif is to be expanded with an application programming interface that supports data interchange and application interoperability on the X Window System and between X and non-X environments.

TSC fires manufacturing exec

Chicago-based systems integrator Technology Solutions Co. last week abruptly dismissed Woodrow Chamberlain, vice president of its recently troubled manufacturing practice. It was under Chamberlain's watch that the manufacturing division hit a wall of uncollected receivables and came under suspicion for loose business practices [CW, July 13].

More router vendors take low road

Cisco Systems, Inc. and CrossComm Corp. are following in Proteon, Inc.'s recent footsteps to address simplified, inexpensive routing needs. The multiprotocol Cisco 3000 includes the user-demanded flash erasable programmable read-only memory (EPROM) for centralized router updating. Cisco also reduced the price of its low-end IGS router without flash EPROM by 20%, bringing some models in at around $4,000. CrossComm said it will unwrap today its ILAN Jr. for Token Ring, starting at $6,000.

Harris wins NASA pact

The Kennedy Space Center in Florida has awarded a contract to Harris Corp. for more than 300 Night Hawk real-time computers to be used with future space launches. The five-year contract is valued at more than $10 million, with options that could make it worth more than $15 million.

Short takes

Chips and Technologies, Inc. said it will shift its microprocessor development focus to concentrate on single-chip systems that integrate numerous functions, much like its own integrated PC/Chip. . . . Five computer companies allied last week to promote international standards for service and support information in distributed computing environments. The Distributed Support Information Standards Group includes **Bell Atlantic Business Systems Services, Inc., Hewlett-Packard Co., ICL PLC, Microsoft Corp.** and **Sun.** . . . **Lotus Development Corp.** signed a development agreement with **Digital Equipment Corp.** to develop Unix versions of its 1-2-3 and Ami Pro software for the Alpha workstation platform. Lotus will handle the development, and DEC will assist in marketing the software. . . . **Data General Corp.** will resell and support **Next, Inc.** workstations late this year. DG will position the Unix-based Next boxes as clients to its Aviion servers. . . . **Reply Corp.** is the first licensee of **IBM's** homegrown 386SLC chip. It was also first to buy IBM's 1M-byte single in-line multichip modules.

More news shorts on page 16

Blues aim to cut health care costs

IBM, ISSC, N.J. Blue Cross team up on information technology pact

BY NELL MARGOLIS
CW STAFF

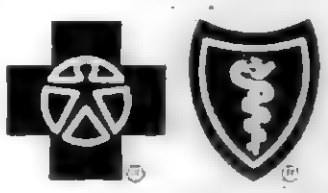
NEWARK, N.J.— Blue Cross/Blue Shield of New Jersey, IBM and its outsourcing subsidiary, Integrated Systems Solutions Corp. (ISSC), last week inked a $52 million, five-year technology development pact aimed at establishing a new high-water mark in managed health care.

Together, the allies — including IBM specialty software development partner and alliance subcontractor Policy Management Systems Corp. — plan to provide extensive electronic links between health care providers, payers and patients.

Blue Cross Chief Information Officer Al Sturzione called the pact a cornucopia of goodies:

- For patients, it could mean a sweeping cut through red tape and quantum improvements in administrative service and medical care.
- It could also give New Jersey pioneer status in automated health care, which is widely viewed as an essential route out of today's high-cost, low-care bind [CW, Aug. 3].
- The deal would also give IBM and ISSC a showcase account in the coveted health care management niche. That is good news because ISSC has come under fire from rivals.

The alliance game plan, Sturzione said, is to mount six projects a year during the pact's five years. Each is to be fully implemented within 12 to 27 months. All 30 projects, he added, "are either in the final planning or execution stage right now."



Among the technology initiatives on tap are the following:

- An extensive Blue Choice and Provider database.
- An extensive claims network.
- Image-based electronic claims processing, mounted on imaging workstations and using high-speed scanners and optical jukeboxes.
- Sales automation.
- Extensive, integrated multiparty office and administrative automation.
- Automated enrollment, reporting and auditing.
- A system to allow users on-line access to enrollment data.

According to a panoply of experts, such technological advances, widely applied, could save approximately $30 billion in U.S. health care administrative costs.

The alliance, Sturzione said, will be administered by a series of committees, each composed of Blue Cross, IBM/ISSC and Policy Management Systems representatives. No employees will lose their jobs as a result of the deal, he said.

The idea for the alliance, according to Sturzione, grew out of an outsourcing investigation that stalled when "we realized we were already running too tight a shop for outsourcing to save us any money." When the negotiations derailed, Blue Cross and ISSC turned instead to talks of a partnership.

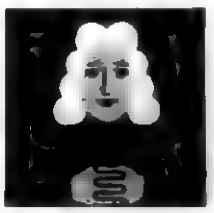
In January, Blue Cross/Blue Shield of Massachusetts signed a 10-year, $800 million outsourcing and development deal with Electronic Data Systems Corp. aimed at similar goals.

Rival challenges IBM outsourcing practices

BY MARK HALPER
CW STAFF

DALLAS — IBM is once again on the defensive over its outsourcing subsidiary, as a rival has rekindled 18-month-old charges regarding the unit's legality.

Affiliated Computer Systems, Inc., based here, contends that Integrated Systems Solutions Corp.'s (ISSC) outsourcing practices violate a 1956 consent decree that barred IBM from the computer services business unless it created a separate subsidiary.



Although IBM formed the ISSC subsidiary in May 1991, Darwin Deason, Affilitated's chairman, claimed the unit violates the spirit of the decree because the outsourcer uses IBM's sales force and name and receives special pricing on IBM equipment not offered to other outsourcers. IBM, moreover, continues to run outsourcing jobs obtained before it formed ISSC, which is a clear violation of the decree, he added.

In an Aug. 4 letter to IBM President John Akers, Charles Young, president of Affiliated's outsourcing subsidiary, noted that "a number of companies engaged in the service bureau business have questioned the legality and propriety" of IBM's outsourcing practices.

IBM did not respond to queries by press time.

IBM established ISSC following allegations by Affiliated and others that IBM was violating the decree, though IBM never conceded violations. At the time, IBM said it formed ISSC for business reasons.

Young's letter to Akers requests that IBM provide Affiliated and other outsourcers that use IBM equipment "with a complete inventory of all IBM data processing equipment that has been sold, leased or otherwise made available to ISSC, along with a statement of the prices, terms and conditions of the sale, lease or use of each such piece of equipment."

Young further states that the consent decree stipulates that IBM must provide that information on request. Young also asks IBM to notify Affiliated and others "of any data processing services provided by IBM to ISSC and the rates charged."

The consent decree issue remains an open file at the U.S. Department of Justice, which has received requests during the last year from industry association Information Technology Association of America (ITAA) and others to investigate ISSC.

Caught in the middle

The Department of Justice does not appear to be aggressively probing the matter, however. Last year, it asked the ITAA to send it more information, which an ITAA spokesman said the association did not do. ITAA walks a fine line between serving IBM and its other members. ITAA believes it is up to the Justice Department to determine whether IBM is violating the consent decree, the spokesman said.

Richard Irvine, the Justice Department attorney in charge of the matter, referred inquiries to a spokeswoman, who did not return phone calls.

"The Justice Department would sure serve the industry well if they would address the issue," noted Jim Mann, president of Sungard Data Systems, Inc., a Wayne, Pa.-based outsourcer and disaster recovery specialist. Rival outsourcers such as Sungard must balance concerns over the issue with their reliance on IBM for products.

HP Q3 may sag with economy

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co.'s financial resilience showed signs of softening last week, as the company disclosed that earnings for the third quarter ending July 31 will come in below analysts' expectations.

HP attributed the slide to weakness in "parts of our computer systems business," which analysts said likely means the company's proprietary line of minicomputers, and in its test and measurement and analytical products businesses.

At midday Friday, the day after the disclosure, HP's stock was off $11, trading at around $60 a share.

The surprise announcement followed word earlier in the week that HP had reorganized its workstation and mini group. HP "moved around furniture" a spokesman said, though a few operations, such as customer service and workstations and servers, were elevated.

Slight increase

HP said earnings for the third quarter will register somewhere between flat and 15% higher than the 76 cents per share reported in the same period a year ago. Analyst estimates for the third quarter were in the $1.12 per share range.

"We're not immune to the economy," the HP spokesman said last week. "Maybe people thought we were."

HP's announcement follows a series of quarters in which HP has bucked computer industry trends by reporting robust growth. For the second quarter ending April 30, for instance, HP reported a 40% increase in net earnings and a 12% increase in sales.

Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco, said HP told him that third-quarter orders for all products were up between 10% and 12%, compared with a weak third quarter last year.

Order figures are expected to translate into similar revenue performance when HP reports its numbers Aug. 18. Herwick anticipated sales would be down between $200 million and $300 million from the $3.9 billion he had projected.

Meanwhile, in the reorganization of its Computer Systems Organization (CSO), HP disbanded its Network Systems Group and broke out that group's constituent operations into stand-alone units reporting directly to Wim Roelandts. Roelandts will take over the CSO as general manager once Lew Platt, who is executive vice president of CSO, succeeds John Young as president in November.

New units include the Workstation Systems Group, headed by Gary Eichhorn, and the Systems and Servers Group, headed by Rich Sevcik. In his new post, Sevcik, who had run HP's proprietary mini operations, picks up responsibility for the HP 9000 Unix minis.

Bernard Guidon, who had run the HP 9000 operations, will become CSO's European marketing manager.

With the reorganization, HP also moved worldwide customer support operations out of the CSO and elevated the unit to report directly to Young.

Vendors hungry for Intel chip

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Though two weeks ago it delayed a next-generation microprocessor while it fired up its stove, Intel Corp. this week will start popping the DX2 66, currently its most powerful microprocessor, out of the oven.

Most users contacted, however, shrugged their shoulders at the incremental power increase, just as they did at the delay of Intel's next-generation chip, the P5 [CW, July 27].

"There are always situations where you need whatever power you can get, but it will definitely fill a relatively small niche here," said Roger Bender, a former president of the Microcomputer Managers Association, Inc.

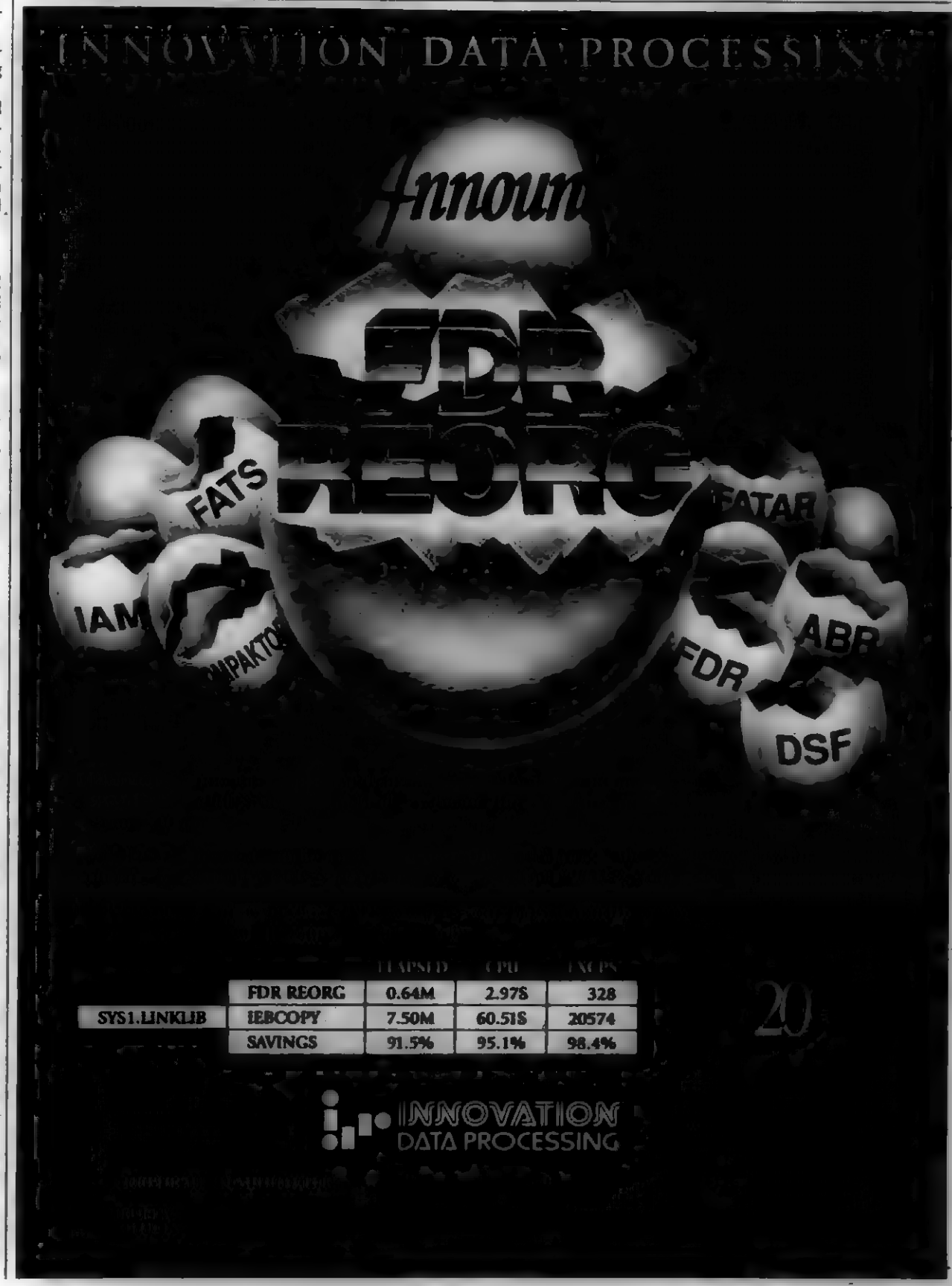
Still, the arrival of the 33-MHz/66-MHz DX2 chip was greeted by hordes of hungry vendors, led by IBM, Compaq Computer Corp., AST Research, Inc. and Dell Computer Corp.

Intel said it already has 20,000 orders for the chip, which reportedly will offer a performance increase of about 30% over the 50-MHz 486DX and 70% over the 33-MHz 486DX. Those orders are double the number Intel had in hand when it released the 50-MHz DX2 earlier this year.

IBM plans to put the new processor in upgrade cards for its Personal System/2 Models 90 and 95, and Compaq plans to announce new systems based on it — the DeskPro 66M and DeskPro 4/66I — as well as upgrade cards for current M and I series users. Base pricing for a diskless DeskPro 4/66I will be $2,749.

Compaq also plans to offer upgrade boards for the SystemPro and SystemPro/LT server families. Dell, meanwhile, plans to offer four new systems starting with the 486P/66 ($2,499), which includes a 120M-byte drive.

While Intel said the new DX2 would remedy the difficulty of designing systems around its 50-MHz 486DX, analysts pointed to the need to battle competitors for its introduction.



Users yawn over IBM's networking scheme

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — IBM last week attempted to heat up the as-yet lukewarm reaction to its networking blueprint for the peaceful coexistence of applications written to different network interfaces in a press briefing here.

However, some observers remained adamant that the crux of the blueprint, IBM's still-developing Common Transport Semantics (CTS) software, will benefit IBM developers more than users.

CTS, which was announced in March, allows applications written to different interfaces to coexist but does not help programmers develop new business applications because they still have to learn a multiplicity of higher level application programming interfaces (API), said Robin Layland, an engineering consultant at The Travelers Corp. in Hartford, Conn.

Layland and others cite emerging, higher layer "middleware" interfaces from other vendors as more useful to in-house developers.

CTS allows users to retain their existing applications but mix and match the underlying networking protocols among Systems Network Architecture (SNA)/Advanced Peer-to-Peer Networking, Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI).

For example, "Users can bring in TCP/IP applications without uprooting their existing SNA applications," said Frank Daubeck, president of Communications Network Architects, Inc. in Washington, D.C.

The software is similar to a multiprotocol router because it combines multiple protocols on one network but does not assist in the issue of different protocols intercommunicating.

CTS has been stamped with no official delivery date, though IBM executives and analysts said it will be delivered "shortly."

"I don't have a high opinion of the blueprint because I don't see this solving a user problem," Layland said. He explained that most users have become accustomed to supporting multiple protocols. Rather, he said, "I have corporate programmers writing Cobol programs. When you present them with [multiple APIs], it gets too complicated."

"This is nice for IBM," he added. "If they write a file-transfer program and they don't know what protocol you're going to run it over, they can just write to that common layer, which makes their development easier." Layland said CTS does not address applications talking to applications, however, "and that's where middleware comes in."

To date, IBM has not announced any work with a "middleware" offering to reduce the number of verbs a developer would have to know to program to a variety of interfaces. Firms offering insulating middleware include Horizon Strategies, Inc. in Needham, Mass., and Peer Logic, Inc. in San Francisco.

A 'nice' start

While observers said they feel IBM could do more for users in this area, they do not deny that what IBM is doing is "nice."

Nomura Research Institute America, Inc. in Staten Island, N.Y., for example, is benefiting from IBM's efforts to create a level playing field for supporting different applications.

Lionel Geltman, assistant vice president of technical services at Nomura, said he has worked with IBM for two years to get TCP/IP-to-CICS connectivity in place for joining front- and back-office data "to let traders know where they stand" and to insulate developers in each camp from having to learn new APIs to blend the environments.

He acknowledged that products from Horizon Strategies and Peer Logic would "certainly be good, competitive alternatives," but he explained that when his connectivity issue arose two years ago, those products were not available.

Judge sides with Lotus on suit

Borland Chief Philippe Kahn calls judgment a 'nonevent'; will appeal

BY CHRISTOPHER LINDQUIST
CW STAFF

BOSTON, Mass. — Borland International, Inc. last week began voluntarily removing from dealer shelves versions of Quattro Pro that offer the Lotus Development Corp. menuing system, following a court ruling that the product infringes on the look and feel of Lotus 1-2-3.

John Owens

"WE'VE SAID IT was theft all along."
JIM MANZI
LOTUS

A Lotus menu-less version of the spreadsheet was available as of last Monday, according to the company. Borland said the Lotus menus would be made available to users requesting them "for a nominal fee."

Borland may also find itself taking a trip to the bank if a jury trial still pending awards Lotus damages, which some observers predicted could run into millions of dollars. The actual effect on Borland customers is expected to be minimal.

Despite a negative judgment by U.S. District Judge Robert Keeton, Borland claimed it will eventually prevail in the legal battle. Lotus sued Borland for copyright infringement in 1990 shortly after Borland filed a suit in California requesting that the court declare Quattro Pro to be noninfringing on 1-2-3. A battle for jurisdiction ensued; Lotus won.

Judge Keeton's ruling "flies in the face of copyright law and will be reversed on appeal," claimed Philippe Kahn, Borland founder and chairman.

Lotus apparently felt otherwise. "We are obviously thrilled with this," said Lotus Chief Executive Officer Jim Manzi. "We've said it was theft all along."

Observers indicated that the decision is not likely to have any major impact on software copyright law as a whole. The effect of the judgment will probably be "very limited to this case," said Lee T. Gesmer, a partner at Lucash, Gesmer & Updegrove in Boston.

However, the effect on Borland could be dramatic in a monetary way, despite Kahn's assertion that the judgment is a "nonevent."

"It will hit Borland hard when Lotus starts throwing around damage numbers," Gesmer said. Such numbers could be in the tens of millions of dollars, he estimated.

Lotus cannot count its winnings yet, however. While Judge Keeton, who has presided over all of Lotus' previous copyright violation cases, did hold that Borland had infringed on Lotus' copyright, Borland will appeal his ruling. Keeton also called for a jury trial to determine some remaining questions, such as the extent of the infringement.

"I conclude that a jury trial is essential before final disposition of this case," Keeton wrote in his judgment. A tentative trial date of Nov. 2 has been set.

Some users said they believe Borland will remain standing, whatever the outcome. "Borland is a very smart company," said George Roukas, systems director at a Fortune 500 financial services company. Kahn "will make a payment, and it will hurt for one year, and he'll move on and cream Lotus in another way." However, damages would only exacerbate the pain of Borland's recent less-than-stellar financial performance.

THE RULING "will be reversed on appeal."
PHILIPPE KAHN
BORLAND

Other users are taking a wait-and-see attitude. Sheldon Laube, national director of information technology at Price Waterhouse, which recently inked a 25,000-workstation software licensing deal with Borland, said he was unconcerned with the judgment — for the moment. "When it affects our business relationship, that's when I'll be concerned," he said. "That's not the case right now."

Lotus' financial benefit may be a one-shot affair as well. Recent reports indicated that applications are moving to graphical interfaces and common user interface standards. If the trend continues, copyrighted interfaces will fade in importance.

Users do not have to worry about at least one issue: that Lotus may request a recall of already-sold packages of Quattro Pro. A Lotus spokesman said Lotus has no plans to request such a recall.

Senior editor Rosemary Hamilton contributed to this story.

Legal jousting

Lotus has waited two years to get a partial judgment on its copyright infringement suit against Borland

July 1990
Lotus files suit against Borland, alleging that Quattro Pro infringes on 1-2-3's look and feel.

March 1991
Judge Robert Keeton rejects Borland's request for a one-year discovery period.

May 1991
Lotus requests a summary judgment stating that 1-2-3 is copyrightable and Borland copied elements of it.

March 1992
Summary judgment motions from both parties denied.

July 31, 1992
Judge Keeton orders partial summary judgment against Borland, stating that it had infringed Lotus' copyright of 1-2-3.

CW Chart: Michael Siggins

IBM blueprint encircles key protocols

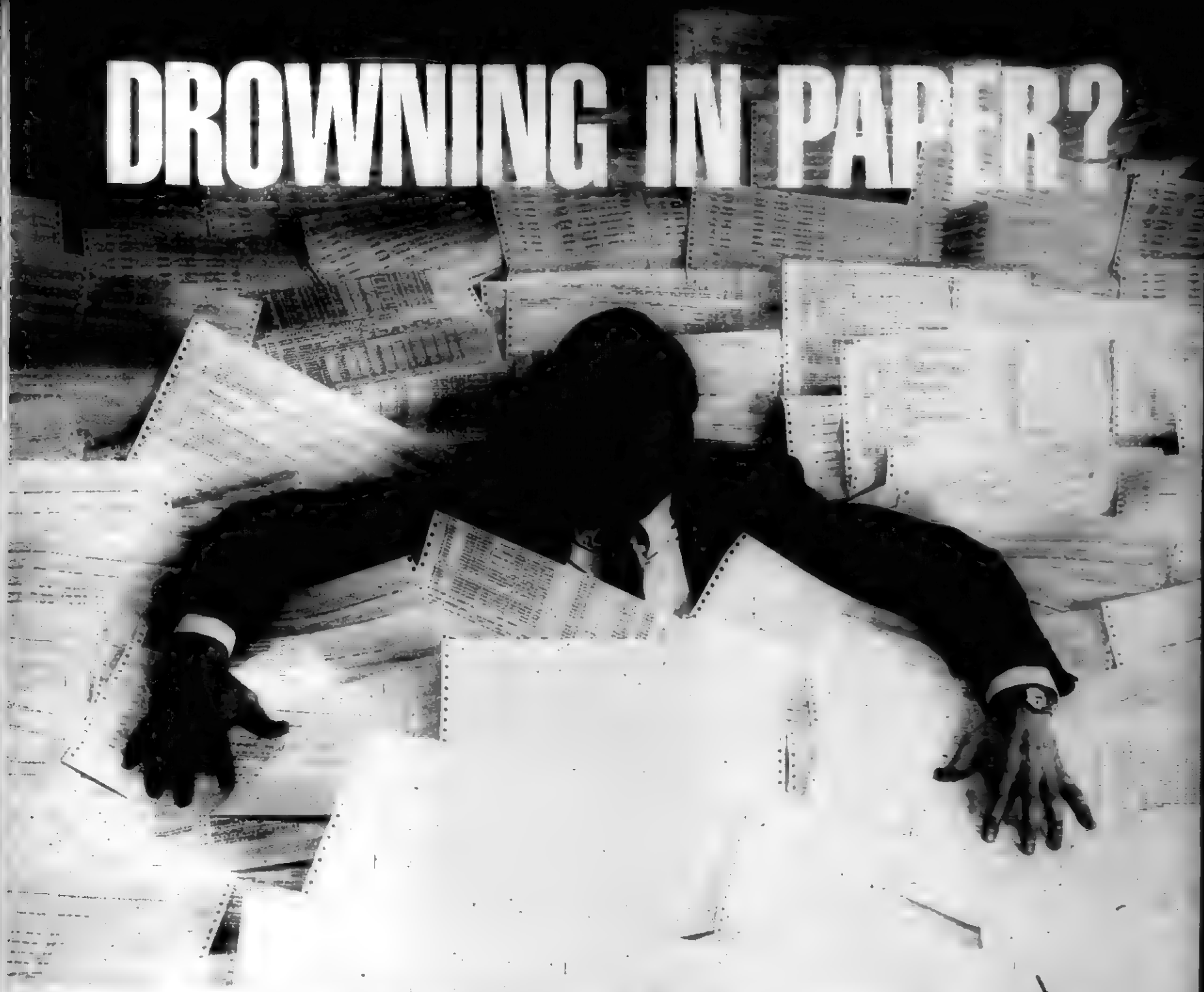
With its networking blueprint, IBM is "positioning SNA, TCP/IP and OSI as peers," said Dorene Palermo, IBM's networking systems director. She explained, however, that IBM has beefed up its investment in TCP/IP so that it now accounts for the largest piece of its networking software investment pie.

Nonetheless, "rumors that IBM is backing away from OSI are untrue," she said. "We've just adjusted our delivery" to match the respective purchasing rates of TCP/IP and OSI products.

To help spur OSI, IBM will roll out an as-yet unannounced service next year where IBM personnel will install OSI products on IBM mainframes "and demonstrate that they unequivocably interoperate with other vendors' systems," said Peter Crotty, OSI product administrator. He explained that OSI installation snafus have been giving OSI a bad rap.

JOANIE M. WEXLER

DROWNING IN PAPER?



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IS cover-up charged in system kill

CONTINUED FROM PAGE 1

tabase, decision support and integration technologies.

The three partners declined to comment on the issue of the cover-up and the disposition of Intrico's assets.

At issue is the disbursement of funds and assets, including millions of lines of decision support, database software and application software code and some $125 million that the four companies invested over 3½ years, according to Intrico's sole remaining executive, Vice President of Finance David Mellinger.

Confirm, which was to draw on yield management software from another subsidiary of parent AMR Corp., was to have been a leading-edge comprehensive travel industry reservation program combining airline, rental car and hotel information. As partners, Hilton, Budget and Marriott had lined up as the first three customers, and Intrico had grand plans to market the service to others.

Major problems surfaced when Hilton came on-line last April as Confirm's first beta-test user. Intrico then announced an 18-month delay, culminating in the recent decision to cancel the project altogether [CW, Aug. 3]. Unbeknownst to its partners, the project allegedly had problems that had been festering for months.

In a letter dated May 1 and sent to employees of American Airlines' IS division regarding "our Confirm [system] problem," Hopper noted: "Some people who have been part of Confirm RS management did not disclose the true status of the project in a timely manner. This has created more difficult problems — of both business ethics and finance — than would have existed if those people had come forward with accurate information. Honesty is an imperative in our business — it is an ethical and technical imperative."

An AMR spokeswoman last week said Hopper was unavailable for comment. She said AMR is investigating whether managers did conceal information.

Hopper, who runs American's Sabre reservation system and other American information systems, had been dispatched as a troubleshooter to sister company AMR Information Services after problems surfaced at Hilton in April. The problems Hopper encountered included one widely reported difficulty integrating Confirm's Transaction Processing Facility reservation system with MVS and DB2-based decision support systems containing customer information.

Confirm was also crippled by an underlying flaw in AMR Information Services' decision support system, alleged Charles Biebighauser, who until two weeks ago was Intrico's vice president of operations. He left about the same time as Intrico President Gordon Stevenson.

Because of an AMR Information Services design error, Confirm's DB2 database was virtually unrecoverable in the event of a crash, Biebighauser claimed. That was because in the development of the DB2-based decision support system, the company mistakenly implemented a version of Texas Instruments, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering tool in which IEF generates its own database structure, Biebighauser said.

For a system the size of Confirm, AMR Information Services should have implemented a version of IEF in which the structure is dictated, he said. "The system was so big that what IEF generated would have been impossible to maintain."

It also failed to complete several applications, including a rates program, Biebighauser claimed. "The fundamental issue is, [AMR Information Services] didn't deliver," he said.

After Hopper surveyed the technology disaster scene, AMR Corp. replaced 22 AMR Information Services employees, firing eight, according to Biebighauser. A crew from Hopper's Sabre operation was named to help salvage the project.

Among the AMR Information Services workers who left about that time was John Mott, who was president of its Travel Services Division, the operation overseeing Confirm development, according to the AMR spokeswoman.

Doors open

The collapse of the Intrico reservation consortium opens opportunities to outsourcing and integration companies seeking a piece of travel industry action.

Intrico members Hilton, Budget and Marriott had planned to cut over to Confirm, Intrico's aborted cross-industry reservation system. Now they must reconsider.

Hilton and Budget already use Confirm's developer, AMR Information Services, as a systems manager for their North reservation system. The two firms are part of a joint entity called Compass, but it is not clear if they will stay with AMR Information Services. Both declined to comment last week. Marriott also was not talking, except to say that it is continuing to enhance its own Marsha reservation system.

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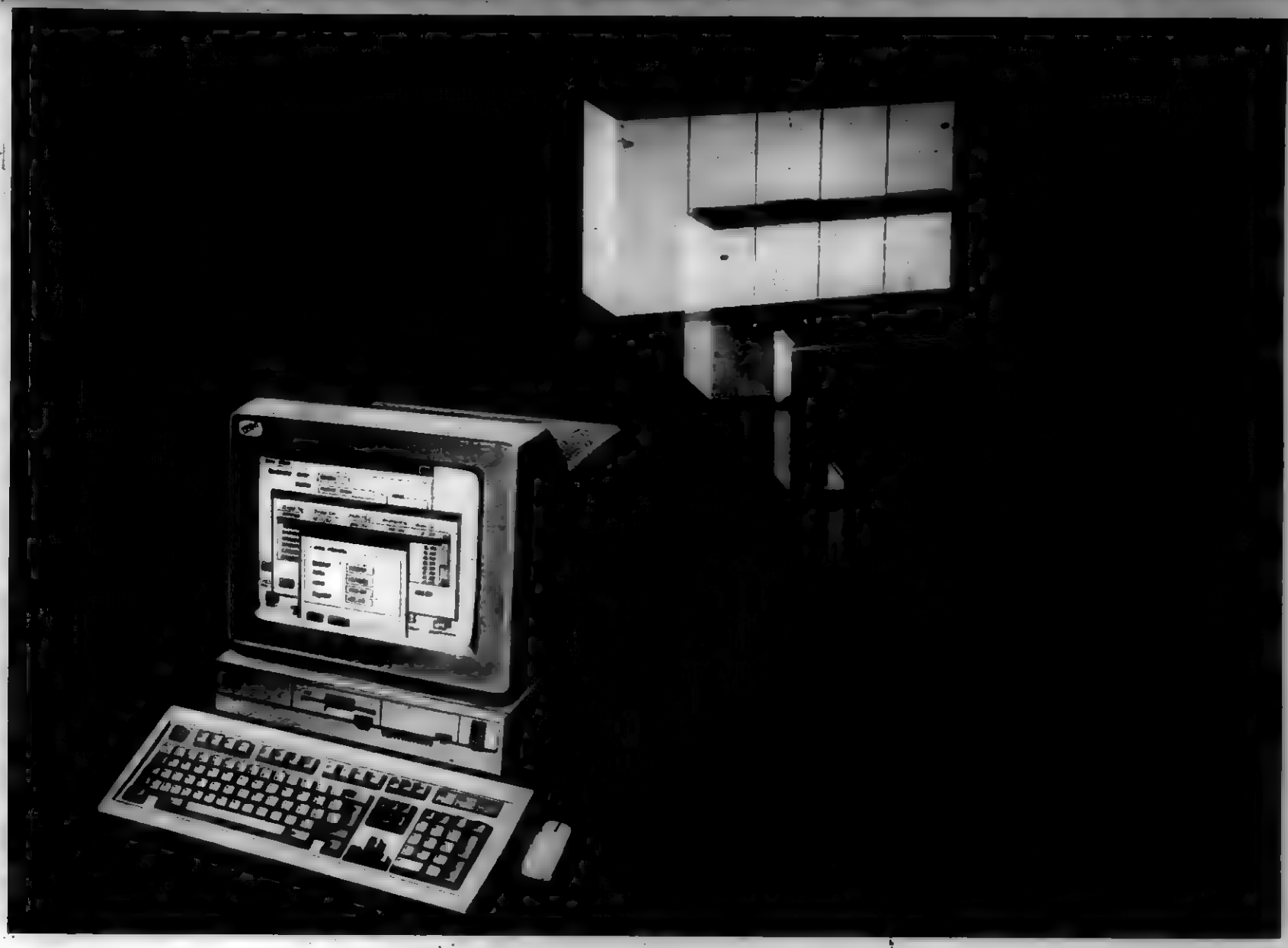

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Apple confident in war with Windows PCs

Wielding price cuts and applications, company looks to bring its multimedia experience to bear

BY MICHAEL FITZGERALD and JAMES DALY
CW STAFF

BOSTON — In the face of a furious charge by personal computer makers touting the ease-of-use capabilities of Microsoft Corp.'s Windows, an Apple Computer, Inc. executive last week said the company is better prepared to handle the jousting than ever before.

For starters, Apple has adopted the same armor as its competitors — price cuts and a new low-cost line of PCs (see story page 30). It will also attempt to leverage applications such as QuickTime and its general multimedia experience to give it a leg up on DOS vendors trying to use multimedia to sell more machines.

"People think just because Microsoft is doing well, they're kicking the hell out of us, and it's just not true — our performance has improved since the introduction of Windows," Ian Diery, Apple's recently appointed executive vice president of sales and marketing, told a select group of reporters last week. "It is an environment we have to compete with, yes, but we think that if you want innovation, you can't buy Windows — you have to buy the Macintosh."

Diery said products such as QuickTime, a multimedia platform and other advanced multimedia products will give users capabilities they will not gain in the Windows environment for up to 18 months — until Windows New Technology becomes more stable.

Still, data from one market research firm suggested Apple is slipping from its role as the dominant graphical user interface (GUI) platform.

Computer Intelligence's monthly survey of corporate sites showed more sites buying Windows (15%) than Macintoshes (14%) in May, the first time that has happened. The numbers for June showed that 18% of the sites surveyed purchased Windows, compared with 14% that bought Macintoshes.

"Many people are starting to make a comparison [between Windows and the Macintosh] and leaving Apple out of the equation," said Dan Ness Jr., an analyst at La Jolla, Calif.-based Computer Intelligence. Ness said Apple's PowerBook and last week's price cuts were both solid responses to the new competition.

Diery acknowledged that Apple could no longer charge its traditional premium, saying, "We can maintain a premium on price, but we can't be exorbitantly more expensive than the clone market anymore."

Many Macintosh users contacted last week said that despite the savage price wars in the IBM-compatible realm, which are making PCs with GUIs cheap, they had little reason to leave the Macintosh.

"The price of the Mac has dropped pretty significantly over the past year, and I think they are pretty close [to IBM PC clones] in terms of price and performance," said Barry Eisenberg, a computer specialist at Hughes Aircraft Co.'s Ground Systems Group in Fullerton, Calif.

Two at a time

Ben Berry, manager of computer services at Hughes, added, "We've standardized on both the Mac and PCs" and have no intention of moving off one platform in favor of the other.

Several users agreed with Rick Marolt, information systems manager at Great Central Insurance Co. in Peoria, Ill., who said, "Our PC purchase decisions are made independent of price; they're based on the planned use of the equipment." These users said the Macintosh continues to serve functions that PCs cannot, particularly in the desktop publishing realm.

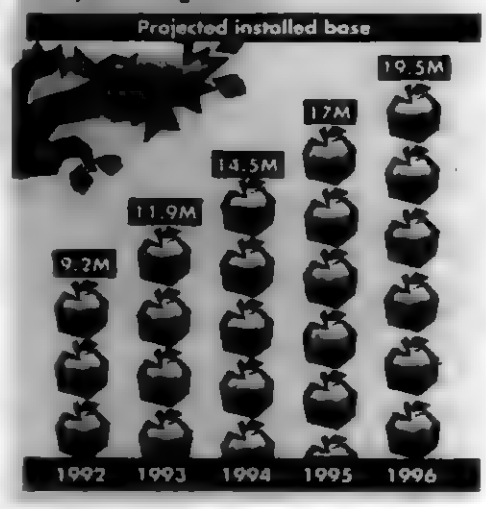
Still, Diane Coleman, manager of marketing systems at Fleetguard, Inc. in Nashville, has some Macintoshes installed but has stopped buying more. "It's primarily functionality that drives our purchasing decisions, and the Mac doesn't offer what we can get on any of the clones for the same price," she said.

Ness said that in the long term, Apple must shore up its relationships with software developers to prevent an exodus to Windows-based products.

"If you look at the titles, the Mac seems to have slipped behind in software development schedules, while Windows products have been pushed ahead," Ness said.

Growing the orchard

The installed base of the Apple Macintosh is expected to achieve a compound annual growth rate of 20% through 1996



Source: International Data Corp. CW Chart: Stephanie Faucher

Third parties target PowerBook

BY MICHAEL FITZGERALD
CW STAFF

BOSTON — The converted heard their sermon and left all the happier for it at the three-day revival meeting known as MacWorld Exposition, held here last week.

Macaholics in attendance came for the latest products, and third-party vendors obliged — many pursuing the peripherals market for Apple Computer, Inc.'s new PowerBook portable personal computers.

For instance, Applied Engineering, a Dallas-based division of AE Research Corp., released CommPort, a data modem with 14.4K bit/sec. data transmission rates. This is scheduled to ship before the end of the year, and it will give PowerBook users the ability to do cellular and other wireless communications.

Another company, Newer Technology in Wichita, Kan., released ColorBook, a screen upgrade that turns PowerBook Models 140 and 170 into an active-matrix color portable. While pricey ($5,295 for the screen and 6M bytes of random-access memory), it drew attention at the show.

"It is expensive, but the PowerBook is my main computer, and I'm looking to do animation and presentations so I'm interested in it," said Thomas J. Kinstler, manager of technical services at Metalplate Galvanizing, Inc. in Birmingham, Ala.

MACWORLD EXPOSITION

Apple released the PowerBook 145, a souped-up replacement for its PowerBook 140. The 145 contains a 25-MHz 68030 processor from Motorola, Inc., up from the 16-MHz processor that the 140 had. At a base price of $2,399, it costs less than the 140.

Enterprise-oriented products were also announced.

- **Radius, Inc.**, a San Jose, Calif.-based company, released RocketShare, a multiprocessing extension to Apple's System 7.0. The extension will cost $499 and is slated to ship this month.
- **Cayman Systems, Inc.** released GatorLink, a dedicated remote-access server. The Cambridge, Mass.-based company will begin shipping systems next month for $1,899.
- **Lotus Development Corp.** demonstrated Notes for Macintosh, which is scheduled to ship in the fourth quarter.
- **Echo Logic**, a spin-off from AT&T's Bell Laboratories, demonstrated its product for the first time. The product, called FlashPort, allows Macintosh software to run on a RISC System/6000-based system. Echo Logic is working with software developers to license its product.
- **La Cie Ltd.**, a division of Quantum Corp., released Version 5.4 of Silverlining, a software package for Small Computer Systems Interface management and disk formatting.
- **Computer Associates International, Inc.** released an updated version of Cricket Draw.
- **DayStar Digital**, a Flowery Branch, Ga.-based maker of Macintosh accelerators, announced TurboStar, a 68040 accelerator that is scheduled to ship in November.

Singer punctuates end of Apple keynote address

▶Even as a $7 billion corporate animal, Apple can still pull heart strings. The music that introduced and closed Apple Senior Vice President Fred Forsyth's keynote address at MacWorld was written, on a Macintosh, by Johnnie J. Wilder Jr. Wilder, the lead singer for 1970s/1980s Top 40 group Heat Wave, was rendered a quadriplegic after a car accident. At the end of Forsyth's address, Wilder came rolling out on stage to show how he uses the Macintosh to write music, using a special device that attaches to his head. Wilder, accompanied by a Macintosh, sang the Heat Wave hit "Always and Forever," moving the crowd to give him a lengthy standing ovation.

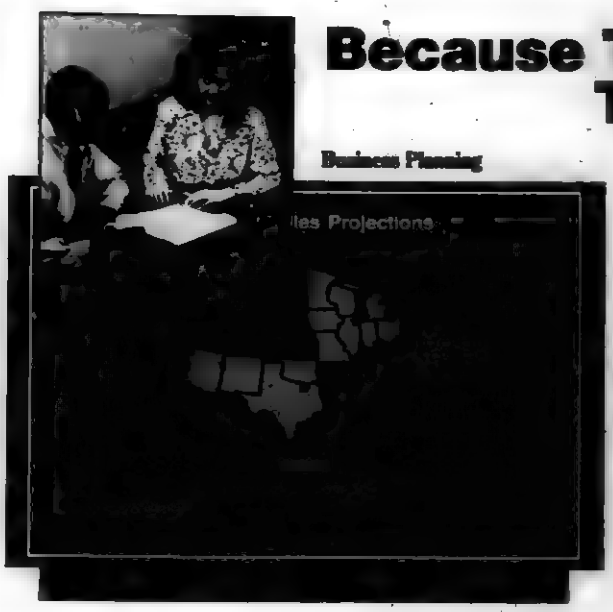
▶The biggest draw on the show floor was not products at all, but **Ben & Jerry's Homemade** ice cream. No less than half a dozen vendors gave away Peace Pops to those who endured a product demo, and they had more demand than they could handle. Other freebies came from **Central Point Software**, which gave prizes to anyone who would roll a pair of oversized dice. Lucky seven earned you a free copy of MacTools.

▶**Maxx Corp.**, maker of Snooper, a virus protection product, outfitted its booth staffers like doctors (they handed out tongue depressors). Its booth featured a "MacPatient," a sheet-covered mannequin in a hospital bed that had a Mac Classic for a head. The patient had an ice bag on its head, an IV in its serial port and a truly sick "expression" on its monitor.

▶For a panel on Unix where **Apple** and **Sun Microsystems** officials battled to see who could give the most effective sales pitch, the Sun people wore suits and ties, while the Apple-ites dressed down. Still, one show attendee was overheard lamenting, "You actually see suits and ties here now."

▶While **Berkeley Systems** had its Flying Toasters out in force, **Baseline Software** had the most paraphernalia. Besides a man in a moose suit who walked around distributing brochures, it gave out pins with sayings such as "I Like Icon."

Compiled by Michael Fitzgerald



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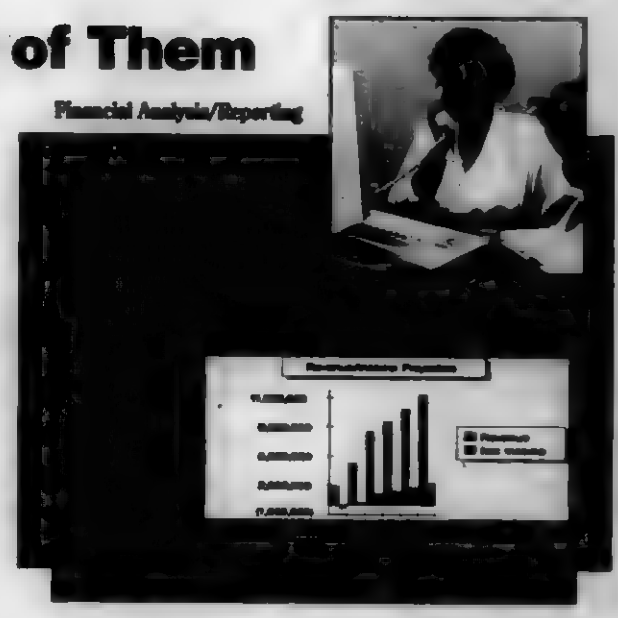

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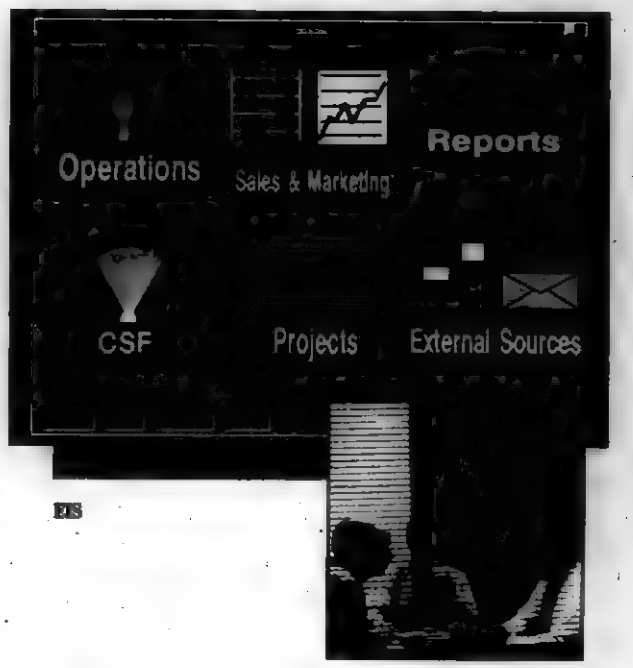

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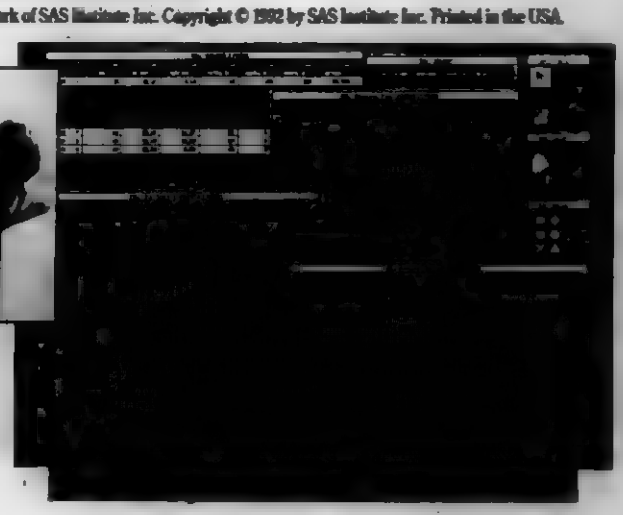

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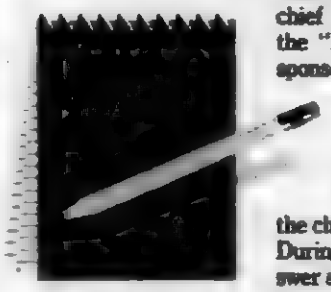
Borland sets delivery for Object Exchange

▶**Borland** is scheduled to ship Object Exchange, the key piece of its workgroup strategy, sometime in the first half of 1993. Object Exchange was announced as an architecture earlier this year, and the company has been skimpy with details since then. Chairman Philippe Kahn said at last week's Groupware '92 conference that the software will work with Borland applications, as well as with other vendors' software. He added that it will operate as an intelligent agent guiding the workgroup process. He did not elaborate, however.

▶Although it announced a megadeal last month for a suite of Borland applications, **Price Waterhouse** has no plans to cut back its Lotus commitments. The company plans to increase the number of Notes users to 20,000. About 13,000 of Price Waterhouse's employees use the software today.

▶Not exactly best friends: Following his keynote address, Jim Manzi, chairman of **Lotus**, had a run-in with Stewart Alsop, who wears three caps as editor-in-chief of *Infoworld*, publisher of the "PC Letter" newsletter and sponsor of the Demo conference.



He is also not likely one of Manzi's favorite people (Alsop published an open letter to Manzi late last year requesting that the chief executive officer resign). During a brief question and answer session, Alsop asked Manzi if Notes is a closed or open system, and Manzi naturally talked up its openness with such points as the number of different operating environments it supports. Dissatisfied, Alsop then asked for a vote from the audience to determine how many people thought Notes was open vs. how many people thought it was closed, a point often pressed by Lotus groupware rivals Borland and **Microsoft**. Alsop then pointed out to Manzi that more people perceived it as closed.

▶In kicking off a special Notes user group meeting at the conference, Kevin Brown, who runs the Boston Notes User Group, said there may soon be a National Notes User Group established.

▶David Stone, a **DEC** vice president, said companies need to give users a little slack in experimenting with workgroup technology so they can become comfortable using it. As an example, DEC is currently supporting 7,000 active electronic conferences over its electronic-mail and VAXnotes network. Fully one-third are personal conferences that discuss everything from basketball to movies to how to buy a car. "It shows people like to use this mechanism," Stone said.

▶Carl Di Pietro, a former vice president of human resources at **Marriott** and now an independent consultant, managed an electronic decision center during the last nine months for the hotel chain. The center, equipped with standard personal computers and VisionQuest group decision software from Collaborative Technologies Corp., allows meeting participants to present ideas anonymously. Di Pietro, who studied the 300 meetings that took place at the center, claimed it helps people respond truthfully rather than tell their meeting leader (typically a boss) what he wants to hear. What is more, the average meeting was completed in one-tenth of the time it would normally have taken.

▶Insider politics: A scheduled highlight of the conference was a debate between John Landry, Lotus' chief technology officer, and Richard Schwartz, Landry's counterpart at Borland, for the two to challenge each other's approach to groupware architectures. As the hour approached, Esther Dyson, editor and publisher of the "Release 1.0" newsletter and debate moderator, decided the session was billed as too controversial. Ray Ozzie, president of Iris Associates and creator of Notes, was called on to fill in for Landry. Ozzie and Schwartz were quite polite.

Sun enters groupware market

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — A Sun Microsystems, Inc. subsidiary unveiled its first product for the emerging groupware market last week but snubbed the Groupware '92 conference as an inappropriate coming-out party.

"We are focusing in the groupware arena, but [ShowMe] is more for desktop conferencing," said Byron Ryono, director of SunSolutions, a newly formed development group within Sun Technology Enterprises.

Attending a meeting without moving from a SPARCstation is the aim of ShowMe, which allows Sun users to view documents, graphics and other images displayed simultaneously on their workstation screens.

At $349 for a single-user floating network license, ShowMe runs under Solaris 1.0 and OpenWindows Version 3 and requires a Transmission Control Protocol/Internet Protocol-based local-area network.

Still a ways to go

"This is the beginnings of groupware for Sun, and it's a nice package as far as it goes," said Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif. "But it doesn't go far enough."

With ShowMe, only one user can change the document being viewed by the group, Kirzner noted. "There's a lot of groupware that is more sophisticated than this product," she said.

"Groupware is one of the hottest new fields in which computing technology can help us," noted Nancy Karen, corporate director of strategic information management at Nynex Corp. in White Plains, N.Y., one of Sun's large customers. Although she was unfamiliar with ShowMe, Karen said Nynex is already deploying and developing its own internal groupware applications.

Teamwork key to workgroup success

CONTINUED FROM PAGE 1

nologies at Price Waterhouse, a Notes showcase account, said the initial installation "wasn't about technology" but was aimed at solving a core business problem. Price Waterhouse was in search of a way to improve communication among staff members.

The idea was to pool expertise so that staffers would not be presenting ideas already hatched in other parts of the organization.

David Daniels, a senior planning consultant at Metropolitan Life Insurance Co., said one of the company's first Lotus Notes installations also resulted from fixing a specific business problem. In this case, the company's publication group needed a better system to prepare documents as well as a method to store and retrieve research.

Yvonne Hemsey/Gamma Liaison

Chase Manhattan's *Elaine Bond: Workgroup computing is a 'big-time change'*

Solving problems

"We could have made a management decision to just organize it better," Daniels said. Instead, the group installed Notes for writing, editing and storing documents. "This was a case of solving a real problem. And the benefit with starting with a well-defined need is you can justify the investment."

Meanwhile, Bechtel Corp. in San Francisco installed VAXnotes, a Digital Equipment Corp. mail and conferencing product, about a year ago in its IS department.

"For a while, no one was using it," noted William Ramage, a systems architect in the automation integration method group.

It was not until the company held workshops to outline the ways in which VAXnotes could help users and to "ask for commitments" that the system began to be used.

Reward offered

Once a workgroup project is under way, managers need to support it with a reward system geared to teams, executives said. This is particularly difficult for companies that promote individual achievements and where status is based on an individual's knowledge.

"It's hard for people to feel good about sharing information if for so long people have been rewarded when they are the only ones with the information," David Stone, corporate vice president of international engineering and strategic resources at DEC, said in a speech at the groupware conference.

Daniels said he suspects IS will have to become more schooled in the people issues to make workgroup technology more successful.

"What we are dealing with here is far-reaching, and a lot of it is communications — the way people think and the way they work," Daniels said. "A lot of people [at Groupware '92] are really groping [around] with this. It's a lot, particularly for technologists who are not necessarily experts in this field."

Aldus cuts work force

SEATTLE — Lean economic times drew blood at yet another company last week as Aldus Corp. announced a restructuring and layoff.

The graphics software developer is reducing its U.S. work force by about 11%, or 101 people, effective Aug. 7. The layoffs will affect the company's headquarters, the consumer division in San Diego, a development center in Dallas and the company's regional sales offices. A company spokesman said that although the restructuring will also entail some internal reorganization and shifts of responsibilities, the main focus is the layoffs.

Aldus President Paul Brainerd said the move was in response to poor economic conditions, both internationally and domestically. The layoffs also reflect increasing competitive pressure within the graphics software field, he said. That arena has grown almost to the saturation point as vendors vie to jump onto the graphical interface bandwagon.

Aldus, which produces PageMaker, its flagship product, posted a loss of $899,000 on net revenue of about $38 million for the quarter ended June 30.

CORRECTIONS

In an article about the Open Software Foundation (CW, July 27), analyst Paul McGuckin's employer was erroneously reported as Dataquest, Inc. McGuckin is the program director for mid-range computing strategies at Gartner Group, Inc.

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In the July 27 issue, a chart on page 97 incorrectly reported Software Publishing Corp.'s profit. The company earned $679,000 in the second quarter.

Host makers: Let's make a deal

CONTINUED FROM PAGE 1

cluded in the deal, how much money the customer has spent with the vendor in the past year and the importance of the account to the vendor. The grocery executive said other users told him of hard-dollar discounts ranging up to 35% off mainframe list prices.

Paul Maszszak, director of data processing operations at C. R. Bard, Inc. in Murray Hill, N.J., confirmed that he has seen total discounts of 40% to 50%, adding that "sometimes you can even do better. It's a buyer's market, better than anything I've seen before. Everything is negotiable."

Doug Underhill, vice president at CSX Technology in Jacksonville, Fla., said, "It does raise the question of whether the prices were too high to begin with."

> "NO MATTER WHAT KIND of a great deal you get, you always walk away feeling like you've left money on the table. It's the good old American way."
>
> DAVID MOORE
> MELLON BANK

Techniques that some customers use include playing the three mainframe vendors against one another. In these hard-pressed economic times, that threat is often enough to get some good deals.

Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said, "We've never seen more of a supply/demand imbalance. For the first time I can remember, all three mainframe vendors are offering the latest and greatest mainframe technology. Competition is fierce, and customers are still managing information technology budgets conservatively as we slowly come out of the recession."

Furthermore, Cassell said, the pressure is on to sell during the summer so the vendors can record the completed transaction by the end of the fiscal year.

Some of the mainframe makers disputed these accounts. Art Cohen, director of business practices management at IBM, said, "To my knowledge, we're not discounting any differently this year than we did last year." He said IBM's practice of providing volume discounts based on total dollar amounts still holds.

An HDS spokesman said, "Discount is a relative term." He agreed that although discounts are in the 40% range, last year's discounts were even higher — in the 60% range.

"It's still higher than we'd like to see, but it's not as high as last year's record," he said.

Robert Djurdjevic, president of Amex Research in Phoenix, said that although deep discounting is occurring, "it is not to the extent that some customers are claiming. To some degree it is earning stripes with their management. It's useful to show to the bosses that they're beating up on IBM."

He likened the situation to what occurred in 1989, another year when discounting was said to be high. "By the time the year was finished, IBM showed double-digit growth in both revenue and profits. You cannot have it both ways, with the vendors making money and also providing deep discounts. There's a lot of haze out there in the marketplace, and in such an environment, there are a lot of truths and half-truths," Djurdjevic said.

Regardless of whether this year holds the all-time record, just about everyone agreed that users will retain the upper hand for the indefinite future. "I don't think there's any going back," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh.

"The mind-set is different from what I've seen before," he said. "It's like going to a used car lot. No matter what kind of a great deal you get, you always walk away feeling like you've left money on the table. It's the good old American way."

Firms announce local-bus pact

Micronics Computers, Inc. and Gateway 2000 hailed a local bus last week, as the pair announced joint development of a line of personal computers featuring advanced local-bus architecture.

Designed to comply with VL-Bus, the local-bus standard backed by the Video Electronics Standards Association, the Intel Corp. I486-based machines will offer extremely high-performance video and peripheral I/O based on the local bus, the companies claimed.

Gateway 2000 President Ted Waitt pointed out that the local-bus design is 4 to 10 times faster than Extended Industry Standard Architecture (EISA) or XT/AT bus design.

Local-bus architectures speed processing by providing a direct 32-bit link of the CPU to local-bus slots or on-board devices. This allows the bus to operate at the same speed as the system's CPU, which eliminates the bottleneck effect that XT/AT, EISA and Micro Channel Architecture bus architectures have.

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DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA128	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA/DL	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD, Soft Upgrade
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
DS6	DSU/CSU	56 Kbps	DDS	Low Cost 56K Sync.
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/MR2	DSU/CSU	56 Kbps	DDS	DDS with Sec. Channel
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NEWS SHORTS

AT&T revamps leased-line pricing

AT&T last week filed revisions for simplified Tariff 9 (leased-line) service pricing that will generally increase short-haul rates — including T3 service — while decreasing long-haul rates. Depending on how the mix of services washes for a given customer, this "could result in whopping increases in leased-line costs" to users, said Frank Daubeck, president of Communications Network Architects, Inc., a Washington, D.C.-based consultancy. The prices will better align the network services with their underlying costs, AT&T claimed.

Motorola unit wins test license

Iridium, Inc., a Motorola, Inc. affiliate, received an experimental license from the Federal Communications Commission to launch and test five satellites deployed in polar orbits approximately 420 nautical miles above Earth. Iridium had proposed an integrated satellite and terrestrial wireless communications system featuring voice, data, fax and radio-determination satellite services. Launches of the experimental satellites are planned for 1996.

DEC leads mail-order pack

Digital Equipment Corp. now ranks ahead of Dell Computer Corp. and IBM in direct mail sales, according to *Direct Marketing* magazine's annual list of the "Mail Order Top 250." DEC's direct mail sales increased to $1 billion in 1991, pushing the company to No. 16, up from No. 36 the previous year. IBM, with $900 million in mail-order revenue, was ranked as the second-largest computer maker using direct mail, moving up to 21st place from 43rd last year. Dell, which placed as the leading computer vendor for direct sales during 1990, is ranked at No. 94 this year, following Gateway 2000 Ltd. at No. 75 and CompuAdd Corp. at No. 80.

FBI wiretap bid called premature

U.S. Rep. Edward J. Markey (D-Mass.) said the FBI's proposal to make all voice and data networks suitable for wiretapping is "premature." Markey, chairman of the House Telecommunications Subcommittee, cited a General Accounting Office report that the FBI has not fully studied the costs, benefits or technical feasibility of its proposal.

Intel ships cost-cutting printer chip

Intel Corp. will ship its 82961KD printer coprocessor chip, which works in printers with its 1960 KX microprocessor and uses technology that can compress a page into memory and then print it in bands. Intel estimated that printers can save 60% on dynamic random-access memory spending.

Datapoint, NT settle 10-year suit

Datapoint Corp. has settled in principle a back-royalties claim filed against it by Northern Telecom, Inc. in 1976. The claim alleged that Datapoint infringed on a Northern Telecom patent for data entry software that Datapoint developed for its general-purpose computers. Datapoint agreed to pay close to $30 million over the next 10 years, a Datapoint vice president said.

Short takes

Banyan Systems, Inc. has affixed a $10.50 per-share price to its initial public offering announced in June. . . . **The Asset Group**, a $65 million, year-old nationwide consortium of network integrators, last week terminated **ILAN, Inc.**'s membership, saying ILAN was unable to meet its financial obligations. The Asset Group said it expects to open offices in key Midwestern cities to handle ILAN's accounts. . . . **Frame Technology Corp.** will acquire **Datalogics**, a competitor in electronic document publishing. Datalogics will operate as an intact entity, and a stock swap is expected to be approved and completed by the end of the month. . . . **Control Data Systems, Inc.**, the computer company spun out from Control Data Corp. earlier this year, has begun trading on the NASDAQ stock exchange under the ticker symbol CDAT.

Gupta readies updated tools

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Gupta Technologies, Inc. last week said it plans to ship updated versions of two tool lines — SQL Windows applications development tools and the Quest end-user query tool — by early next year.

The company also outlined an ambitious product development strategy that calls for a new data dictionary and an enhanced version of SQLBase, as well as plans to bolster flagging support services.

The $23 million firm told the 400 users in attendance at its third annual developer conference that key additions will include extensive connections to Microsoft Corp.'s Windows technology, including native support for the Windows New Technology operating system.

New features

In addition, Chief Executive Officer Umang Gupta said SQL Windows 4.0 will also feature extended support for Microsoft's Distributed Data Exchange and Object Linking and Embedding technologies. The firm plans to update Quest, its year-old end-user query tool, by adding SQL Windows extensions and more connectivity to Microsoft Windows applications. The CEO also said Gupta's SQLBase relational database will support Microsoft's Open Database Connectivity specification for SQL access by next July.

Gupta Technologies has sold 13,000 SQL Windows licenses worldwide to users who develop personal computer-based database applications that run against a wide variety of relational database management systems. The target RDBMSs include PC stand-alone databases, IBM's DB2, Oracle Corp.'s Oracle 6.0 and local-area network databases written as Novell, Inc. NetWare Loadable Modules (NLM).

At the same time, the company announced plans to build a data dictionary but did not provide a delivery date.

Also on Gupta's plate is SQLBase 5.1, a version of the company's SQLBase RDBMS certified by Novell for NetWare. The existing SQLBase 5.0.2 can run as an NLM, but by fall, users will be able to install SQLBase 5.1, which is still undergoing beta tests, according to the company.

Industry analysts said the firm, in which Novell holds a 19% stake, must husband its resources if it is to succeed. "They're such a small company that they have to decide whether they're going to be a tools company or a database company," said Darlene Brown, a software analyst at Gartner Group, Inc. in Santa Clara, Calif.

Gupta maintained that Gupta Technologies will continue down both paths, as evidenced by its new tools and plans revealed last week to enhance SQLBase with two-phase commit, stored procedures and triggers, features now standard in other RDBMS products. But to save money, the company will jointly develop many new products with others: A new IBM Application System/400 router, announced last week, was written under contract to IBM, and Jarrah Technologies in Balgowlah, Australia, is working with Gupta to develop the Pegasus data dictionary.

Cowboy logic

"All and all, we are on the right track," Gupta said. "But as Will Rogers said, if you stand still on [the track] for too long, you're going to get run over. And we don't intend to be run over." Gupta said he expects his 8-year-old firm to reach $32 million in revenue by 1993. Yet he openly acknowledged support problems as the company's licenses grew to 13,000 for SQL Windows, 18,000 for the SQLBase database and 12,000 for Quest.

By next year, the firm will boost the technical support staff from 30 to 40 employees to handle more than 200 phone calls a day. Some users, however, said they have noticed improvements in Gupta's phone support service already.

Paper products player axes service subsidiary

CONTINUED FROM PAGE 1

Shamrock, Inc. — and its sole outsourcing contract with an external customer. The latter involves a 10-year deal to run nationwide information systems for Homeland Stores, Inc., an Oklahoma City-based grocery chain.

Kimberly-Clark is reportedly in the midst of negotiations to sell the subsidiary to Dallas-based outsourcing firm Power Computing, Inc., according to sources close to the consumer goods manufacturer. As of press time last week, neither company was available to respond to questions about the possible deal.

Kimberly-Clark Computer Services is winding down, Barry said, because "the business didn't achieve results consistent with Kimberly-Clark's expectations of 20% return on equity."

According to several highly placed sources close to the company, all of whom requested anonymity, the subsidiary was founded with the goal of hitting $100 million in revenue by 1992; that goal was not within reach, the sources agreed.

In addition, the division was unable to recruit top talent. "Kimberly-Clark never understood that, in an entrepreneurial venture, you have to offer either equity participation or big bucks if you want to lure the best talent. Neither was available at Kimberly-Clark Computer Services, and top candidates went elsewhere," one source said.

Following a trend

The effective end of the services subsidiary group adds Kimberly-Clark to the growing list of major commercial companies that tagged their IS shops as potential profit centers only to find that buying into the outsourcing bonanza and selling into it are distinctly different propositions.

"Lots of firms have said to themselves, 'Hey, we have a very well-run shop; let's tune it up and sell on the outside what we sell on the inside,' " said Susan McGarry, an analyst at Boston-based market research and consulting firm The Yankee Group. "Agway did it; Mellon Bank did it."

Mellon Bank Corp. — assailed by competition from big-league outsourcers and hard hit by the recent failure of one of its largest outsourcing customers — is currently reassessing its future as an outsourcing vendor [CW, March 2].

What users-turned-vendors fail to appreciate is that "running your own shop and managing a customer's are two very different disciplines, with different pricing models," McGarry noted. For starters, she said, large commercial firms as a group tend to underestimate the subtle but vast financial and cultural chasm between marketing a service to other corporate divisions and competing in brutally competitive external markets.

In fact, during its almost four-year lifetime, Kimberly-Clark Computer Services sold its outsourcing services to only one external account: Homeland, a "nearly $1 billion" grocery chain, according to its IS director, William Rulla. Last winter, Homeland signed a 10-year, "over $30 million" IS outsourcing deal with Kimberly-Clark Computer Services.

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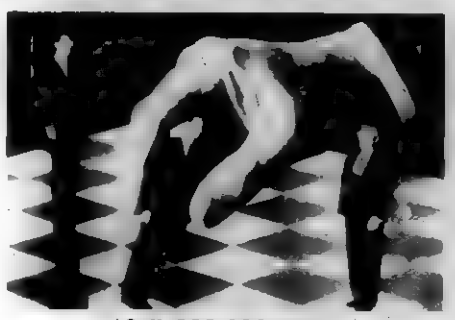

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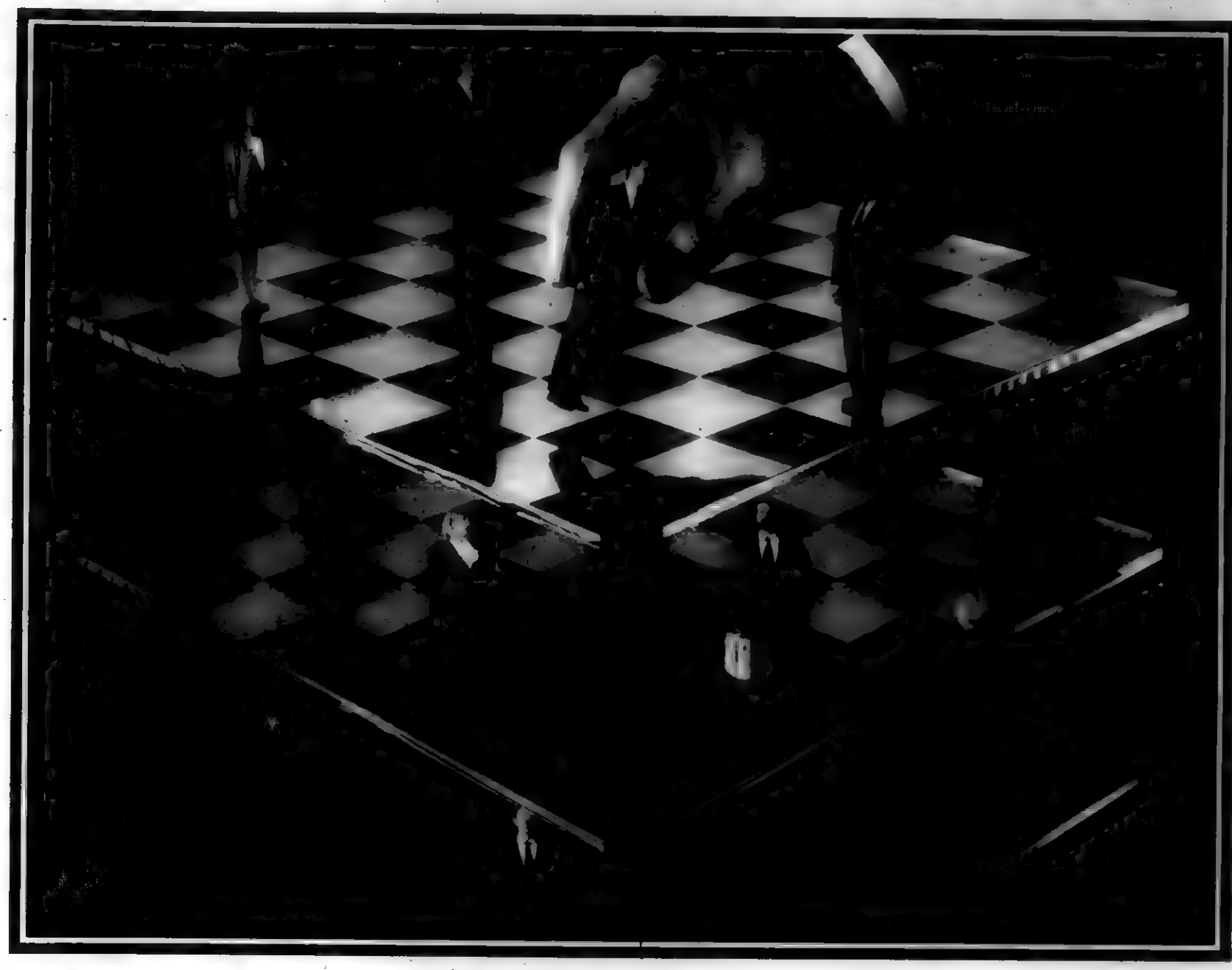

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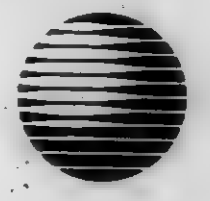

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Home Depot gets Unix 'renovation'

BY THOMAS HOFFMAN
CW STAFF

ATLANTA — Escalating transaction processing demands have led the nation's largest home improvements retailer to start swapping Data General Corp. MV 2500 and 3500 minicomputers at each of its 200 outlets with Hewlett-Packard Co.'s RISC- and Unix-based HP 9000 Model 827 midrange systems, according to W. Andrew McKenna, senior vice president of corporate information systems.

Faced with an 80% annual growth rate in transactions processed three years running, The Home Depot, Inc. recently decided to replace its proprietary minicomputers with cheaper and faster reduced instruction set computing (RISC)- and Unix-based systems. The switch is expected to provide each Home Depot outlet with the increased transaction processing capacity needed to support burgeoning operations such as tracking merchandise movement from the firm's point-of-sale terminals.

Starting in June, Home Depot swapped systems at 54 outlets. McKenna plans to complete the replacement of more than 200 in-store systems by October, he said.

McKenna would not disclose the cost of the project but said Home Depot paid considerably less than the $25,000 list price for each HP machine. Factoring in the company's plans to install HP units at each new store during the next four years, analysts targeted the Home Depot/HP deal to be in the $10 million range.

McKenna said the HP systems have already begun to justify their purchase. "We've already saved a great deal [of money] in price/performance," McKenna said. He added that the DG minicomputers "were out of gas and limiting our ability to do business."

Indeed, the company has experienced explosive growth in its 13-year history. Sales for the $5.1 billion retailer have been growing at an impressive 35% annual clip. In 1991, store sales rose 11%, and the addition of 25% more stores each year has helped fuel the increase in transactions processed.

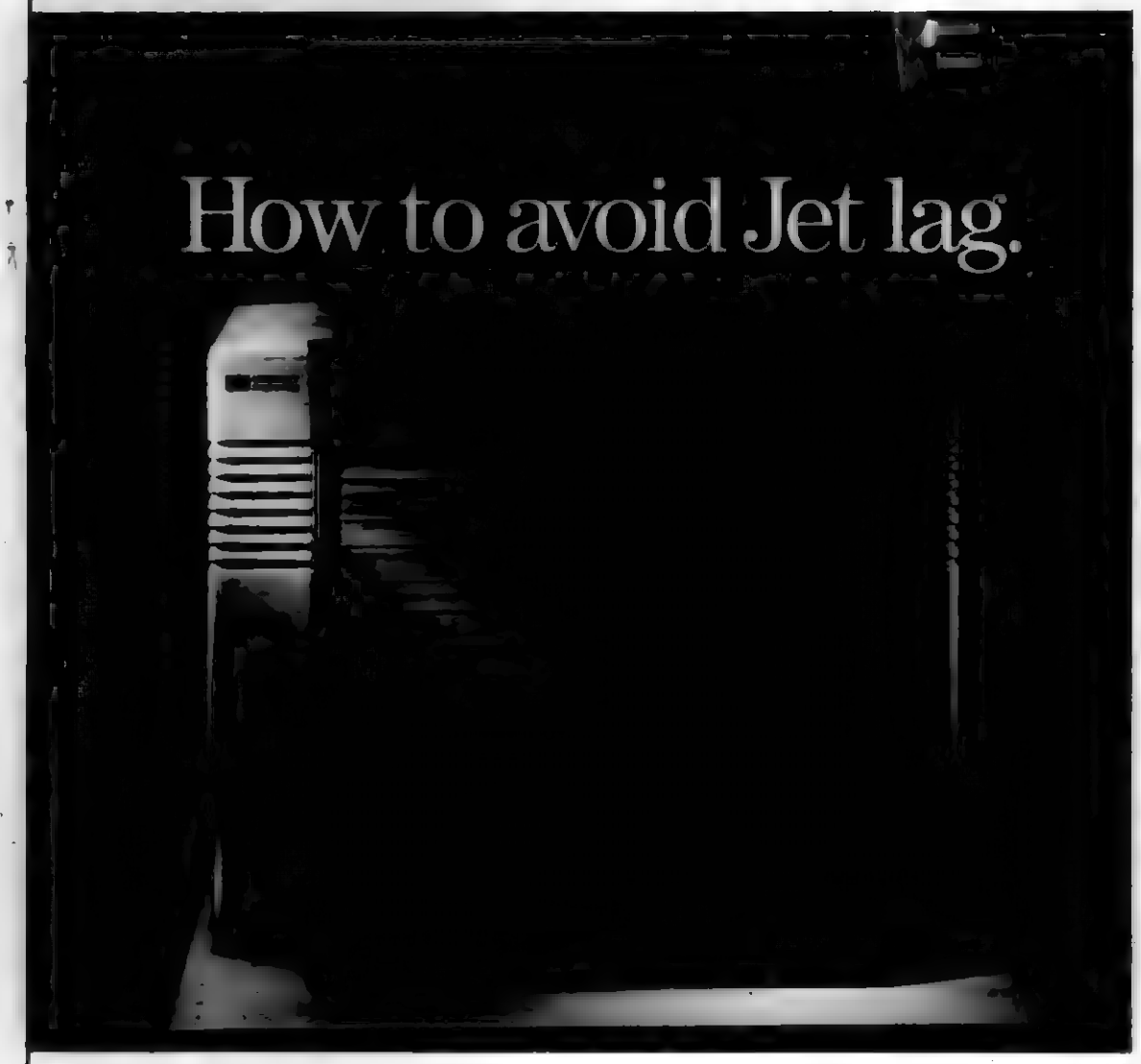
Branching out

McKenna, who came to Home Depot three years ago after working for the firm as an IS consultant with Deloitte & Touche, said the company will have 214 stores in 17 states by the end of this year. By 1996, the company plans to increase its presence to 500 stores in 35 states.

Seventy-five percent of the firm's stores are in Florida, California, Texas and Georgia, but the company has recently been expanding its operations in the Northeast. A spokesman said the firm plans to enter the Pacific Northwest and Midwest markets in 1993.

McKenna said the new HP systems will be linked via satellite to an IBM 3090 400J mainframe at the company's main data center in Atlanta and to the remaining DG MVs at the firm's two regional data centers in South Plainfield, N.J., and Fullerton, Calif.

The IBM 3090 400J in Atlanta is being upgraded to a Model 600, McKenna noted, and there are plans to replace that unit with an Enterprise System/9000 mainframe within two years. The IBM 3090 Model 600 is slated to be up and running by the end of the month.



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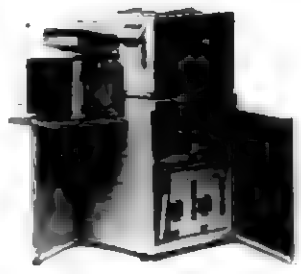

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HEWLETT PACKARD

Sweet deal may force IS change

BY ELLIS BOOKER
CW STAFF

CHICAGO — Archibald Candy Corp.'s information systems department will put on some weight in the coming months, as the department upgrades its corporate data center and absorbs the operational systems for 200 new retail locations.

Cleveland-based Chocamerican, Inc., the U.S. holding company of Midial SA in France, agreed last week to sell its 200 Fanny Farmer Candy Shops, Inc. retail stores to Archibald unit Fannie May Candy Shops, Inc. for an undisclosed amount.

The sale will make 77-year-old Fannie May the largest retail candy chain in the country, with 450 outlets. It already operates 250 retail stores in the Midwest, Mid-Atlantic and Florida regions.

Archibald plans to upgrade from the current IBM Application System/400 Model B70 to a Model E70, according to Sharon Gunia, vice president of IS.

Gunia, who has seven employees in her department, said she expects to "handle the volume with our current staff." She added that Fanny Farmer's inventory, personnel and store leasing data would be whipped into Fannie May's applications.

For the longer term, she said, the candy concern was evaluating point-of-sale (POS) technology for the outlets, which currently use cash registers.

"We've been looking at POS and will certainly be taking a much harder look now," she said.

The two candy retailers said they expect to conclude the sale before the end of next month.

ADVANCED TECHNOLOGY

Neural networks take on real-world problems

BY HAL GLATZER
SPECIAL TO CW

Making computers work more like real brains than light switches hasn't been easy, but practical applications of neural networks are emerging. The most dramatic — though they're also the hardest to bring to market — are those involving pattern recognition.

In writing conventional software, programmers anticipate likely inputs and issue instructions for responding to them. A neural computer, however, responds to inputs on its own and in much the same way that biological neurons do: Just the right combination of incoming signals will trigger an outgoing signal.

A network of silicon neurons will "learn" to recognize patterns by having "wrong" answers corrected, by "remembering" what is "right" and then by trying to make subsequent choices come closer to the correct ones.

These systems are not stand-alone decision makers; so far, they are only helpmates. For example, by transferring to a neural net much of its know-how for measuring the sulfur content of coal, Science Applications International Corp. in Santa Clara, Calif., has developed a computer that detects explosives in baggage before they can get aboard an airplane. These machines are now installed at New York's Kennedy Airport and other airports.

Russ Cole, Science Applications' division manager for explosive detection products, explained that when various materials absorb low-energy neutrons, they release gamma rays at different rates in characteristic "signatures" or patterns.

The company had been exploring new applications for this phenomenon. They had developed equipment to distinguish high- from low-sulfur coal on a conveyer belt, for mine and electric utility operators. By altering the software, they enabled the computer to detect nitrogen — the key element in explosives. If something in a bag produces the signature of a mass rich in nitrogen, the system alerts a human security guard to examine it by hand.

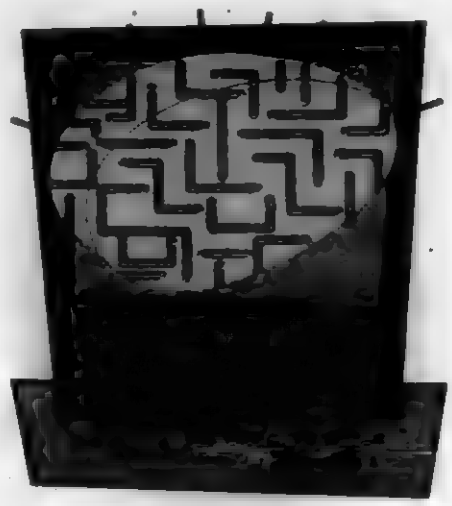
Medical applications

Neuromedical Systems, Inc. in Suffern, N.Y., uses a neural network to make Pap smear tests more reliable. "Searching for abnormal cells on a laboratory slide containing half a million cells is like looking for a needle in a haystack," said Marjorie Rothenberg, Neuromedical Systems' vice president of marketing.

"This is not quantitative analysis," she said. "When cytology [cell-study] technicians have to visually examine every slide, their error rate is often between 15% and 50%. That means as many as half of the positive cases may be missed." The Papnet system that Neuromedical Systems developed "optimizes the combination of machine vision with human intelligence," Rothenberg said.

The system, using a chip set developed by HNC, Inc. in San Diego, picks out 128 of the most abnormal-looking cells, based on criteria that it has learned in much the same way that human lab technicians learn to recognize them. The computer then displays these images on a color monitor for cytologists to review.

"We feed it thousands of images of normal and abnormal cells in varying positions of overlap and juxtaposition, using different color stains," Rothenberg said. When Papnet is confronted with a new image, it assigns a score to that image along a normal/abnormal continuum.



Jamil Gasmene

Papnet was developed in-house and patented by company founder Mark Rutenberg; its hardware and software are proprietary. Some 25 laboratories now use the Papnet system, paying Neuromedical $5 per slide.

Rothenberg cited clinical studies at Montefiore Medical Center in New York, showing that the error rate for Papnet is less than 3%.

Financial applications

The numbers on the bottom of paper checks are printed with magnetic ink, and computers have been reading them magnetically for years. But Verifone, Inc. in Redwood City, Calif., has found a better way to do it. A maker of credit-card systems, Verifone has now added a point-of-sale (POS) check reader called Onyx. It was jointly developed with San Jose, Calif.-based Synaptics Corp., which produced the I-1000 neural net chip set used in Onyx.

"In the real world, half the checks that pass quality assurance are still outside the ANSI specification for printed check numbers. Though people can read them, they make trouble for conventional magnetic check-reading machines by being blurred, off-center or incomplete," said Quresh Sachee, Onyx's product manager.

The neural network-based system "sees" the image with what the company calls a silicon eye. By looking for certain shapes, it can recognize characters whether they are accurately printed or out of spec — even if they are incomplete, according to Sachee.

Onyx is intended to resemble the POS verification of credit cards, with which most consumers are now familiar. A salesclerk swipes the check through a slot. Onyx reads it, and the data is sent via Onyx's RS-232 port to the store's computer, which dials for authorization. Onyx costs between $200 and $300.

Researchers are continually working to improve neural networks and to develop ideas that could eventually emerge from the laboratory as commercial products.

At least one pioneer, however, prefers to remain a theoretician. Bernard Widrow, a professor of electrical engineering at Stanford University, developed some of the original neural network software in the 1960s.

"What I've mainly found," he said, "is that the right way to do things like this is by letting the system design itself. It has to be done in software; you can't do it with hardware." The same could be said of all the recent neural network developments.

Glatzer is a New York-based writer.

Virtual reality steals the show at Siggraph

BY ELLIS BOOKER
SPECIAL TO CW

CHICAGO — The longest lines at the recent Siggraph '92 were outside virtual reality demonstrations sponsored by several vendors.

As attendees strapped on virtual reality helmets and sensor-attached gloves for five minutes inside various computer-generated environments, virtual reality vendors insisted their technology was not just an amusement — a solution looking for a problem, as some have called it — but an interface that has already shown value in applications ranging from drug and architectural design to military simulations.

Virtual reality "is actually an important element, a next step, in computer interfaces," said Peter Cornwell, chief executive officer of Division, Inc. in Redwood City, Calif. Division was recently formed in a collaboration between two U.S. virtual reality companies — Crystal River Engineering in Groveland, Calif., and Fake Space Labs in Menlo Park, Calif. — and Division Ltd., a UK-based virtual reality company.

NASA

Virtual reality *is more than amusement, according to its backers*

One important doorway into that "real world" of third-party application software, Cornwell said, will be the development of virtual reality standards.

In fact, Division and Autodesk, Inc. announced at Siggraph a project to jointly develop platform and peripheral-independent interface standards for virtual reality applications.

Another notable standards-related development at Siggraph was the unveiling of a new version of PEX, the distributed three-dimensional network graphics protocol extension of the X Window System.

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IBM

EDITORIAL

High stakes

Take a stab at this quiz.

1. *In the past decade or so, IBM has reorganized itself:*

a. twice.
b. six times.
c. I've run out of fingers and toes.
d. some of the above.

2. *Each of these reorganizations has:*

a. fundamentally changed the way IBM does business.
b. lasted at least until the next reorganization.
c. been a boon to the stationery industry.

What the various reorganizations ended up being were simply one affirmation after another of business as usual at IBM, where the corporate office allocated development resources to reorganized divisions in line with the highest principles of bureaucracy and corporate politics.

As one longtime IBM senior executive told me recently, divisional hatchlings were allowed just enough autonomy and freedom to become successful. Then they'd be sucked back into the corporate, mainframe-centric abyss in another reorganization, just like the original PC division that experienced phenomenal success 1,500 miles away from IBM headquarters and then was absorbed and gutted.

But at last, it does appear that things are changing at IBM in a permanant way. As we reported last week, IBM is preparing to spin off the PC division into a separate subsidiary at the urging and direction of line execs, not at the behest of the board or senior corporate managers.

So what's new about that? What's new is that, taken in the context of other changes at IBM, it is becoming more clear that the company is undergoing a major shift in its fundamental operational philosophy. This shift will ultimately remake the firm into a more nimble international competitor — with clear benefits for its customers.

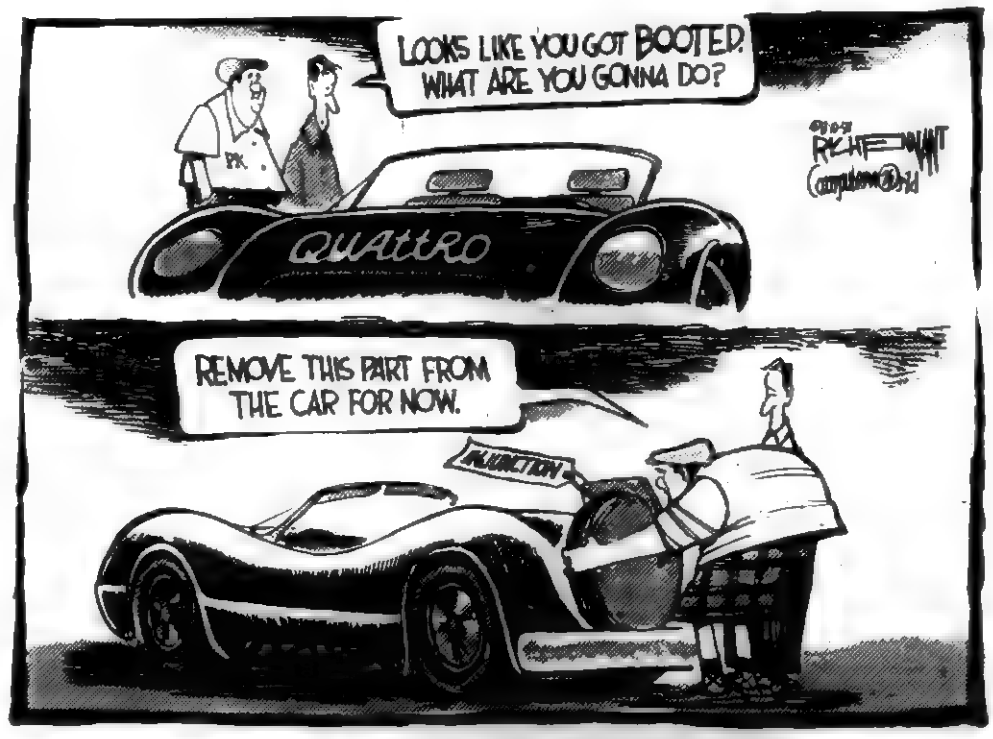
There are many signs of real change. IBM has formed unprecedented partnerships with competitors such as Toshiba, Siemens, Apple and others. The newly created business units and subsidiaries often find themselves competing with one another for services.

But most significantly, the division managers boast of newfound autonomy in decision-making and independence from a bureaucracy that seems to be fading fast. In the words of one subsidiary president, "The message I'm getting from the board is to push myself out to the far reaches of the [IBM] solar system. This is not the way it's been in the past."

Whether or not this decentralized strategy is successful, it does appear that IBM and Chairman John Akers have irretrievably rolled the dice in what is arguably the biggest gamble in the company's history.

Bill Laberis

Bill Laberis, *Editor in chief*



LETTERS TO THE EDITOR

Misunderstood hackers get no respect

I just read the replies to Chris Goggans' "Hackers aren't the real enemy" [CW, June 29], and I thought I'd address a few of the points brought up. I'm a hacker — which means that I'm every system administrator's nightmare.

Hardly. Many hackers are politically aware activists. Besides being fueled by an obsession for mastering technology (I call it a blatant disregard for such), true hackers live and obey a strict moral code.

All this talk about the differences between voyeurism and crime: Please, let's stop comparing information access to breaking into someone's house. The government can seize computers and equipment from suspected hackers, never to return it, without even charging a crime. I will not sit back and let Big Brother control me.

The Cruiser
Anytown, The World

Software escrow advice not well taken

Although Joel Gilman may be quite knowledgeable about computer law, his article, "Don't rush into an escrow" [CW, July 20], shows little insight into business realities.

The escrow decision should be guided by one factor — the extent to which the organization would be impacted by its loss. Whether software is mass-marketed or customized has nothing to do with the financial and business costs of replacing it.

As to his comments about a bankruptcy trustee's preventing release, we have been in the software escrow business since 1982, have released more source code than any other agent in the country, and the courts have never stopped us.

Adele S. Revella
DSI, Scottsdale, Ariz.

Name calling is out of control

I was prompted to write by "Lofty ideas don't build systems" [CW, June 15].

Let's talk about the people who create information systems. There is confusion about what people involved in this process call themselves. Francis Walnut's column furthers this confusion and voices some common but questionable conclusions.

Much of the confusion stems from people's need to slap a single label on anything, no matter how complex, and the failure to distinguish between job titles and the functions that make up the process.

It seems that there has always been a reluctance to call programmers programmers. This tendency is picking up speed as they are increasingly being called developers or, as in Walnut's column, implementors.

It's true that most programmers are not just coders. But is it reasonable to expect a single person to develop the people skills and maintain the technical skills needed to perform the job "end-to-end" as Walnut suggests?

David Mulligan
Warren, N.J.

Less can mean more

This is in response to "Put to the test" [CW, July 27].

As the developer of Pennsylvania Blue Shield's usability program, I'm thrilled to see that the benefits of usability engineering are finally becoming more accepted throughout the industry.

However, laboratories do not have to be expensive. The article indicates that labs can "range between $60,000 and $200,000 for the more sophisticated labs." Pennsylvania Blue Shield built its first usability lab for less than $12,000.

While certainly the $12,000 equipment is more limited in what it can do, the bottom line is that it works.

It works because Pennsylvania Blue Shield has what Dave Rinehart refers to in the article as a "sound methodology" for developing new applications.

Patricia C. Camvel
Camp Hill, Pa.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
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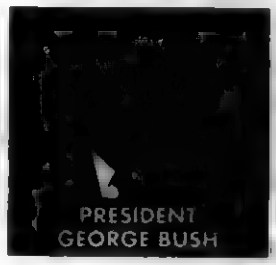
BUSH VS. CLINTON: Technology imperatives

■ *Spending for education, stimulation of private sector investment...*



Scientific and technological advancement has always been at the heart of our nation's pioneer spirit, pushing at the boundaries of our knowledge, creating economic opportunity, increasing our standard of living and making this world a healthier and safer place in which to live.

Indeed, the companies that have developed our advanced technologies have played a key part in what I believe is the greatest triumph of our time: the free world's great victory over totalitarianism in the Cold War. In addition, nearly all the great postwar inventions — computers, microelectronics, genetic engineering, fiber optics — were invented in America.

The U.S. still has the largest, most productive economy in the the world, and the 21st century will demand a new age of American competitiveness in a fiercely changing global marketplace. In order to compete, we must have the best-educated workers in the areas of science and technology.

Two of my administration's six national education goals call for making U.S. students the best in the world in mathematics and science achievement by the new century and providing teachers the flexibility to create disciplined environments conducive to learning.

My 1993 budget proposes increased funding to train the 770,000 elementary and secondary science and math teachers around the country, and it doubles the number of federally supported teachers receiving training in these areas.

More science scholarships

My proposed budget also increases funding for national science scholarships to $15 million and more than doubles individual awards to $6,000. Other major elements of my education initiative will provide excess federal computer and scientific equipment for precollege education.

My 1993 budget reaffirms my commitment to science and technology by placing particular emphasis on civilian research and development. We are investing in areas of R&D that not only support the mission requirements of federal agencies but that also have potentially broad applications in the private sector. Indeed, we are seeking to speed up the transfer of technology from federal labs to private industry.

My administration's support for high-performance computing and communications provides an excellent example of how the government, industry and academia can work together on the underlying research needed to develop new technologies. It will help achieve software innovations and seek to combine the power of major computing resources with extremely fast communications.

I believe we need to stimulate private-sector investment — the engine of our entrepreneurial economy. That's why I'm fighting hard to slash the capital gains tax rate and make the R&D tax credit permanent.

The challenge is clear, and my policies are making sure that the U.S. will lead the world into the future with even greater accomplishment.

■ *Rechanneling of defense funds, creation of high-skill work force...*

America is the world's greatest inventor, but we do not make the most of our genius. American scientists invented the microwave, the VCR, the color TV and the memory chip, but today other nations make the most of those products. We win the battle over patents only to lose the war over jobs, profits and wealth.

We need a national strategy to invest in technology, and the shift from a defense- to a civilian-based economy presents a tremendous opportunity. A Clinton administration will reinvest every dollar we cut from defense research and development in civilian R&D.

Robert Neubecker

We'll conduct a national jobs inventory to better direct our resources, and we'll create an education fund to retrain defense professionals in the latest civilian technologies.

Civilian DARPA

We'll also establish a civilian advanced technology agency modeled loosely on the Defense Advanced Research Projects Agency.

This agency will bring together businesses and universities to develop cutting-edge technologies. It will increase our commercial R&D spending and focus efforts on key industries such as biotechnology, robotics, high-speed computing and environmental technology.

A Clinton administration will also provide tax incentives that encourage improvements in technology. We will permanently extend the R&D tax credit to reward companies that invest in ground-breaking new products, and we'll provide a targeted investment tax credit to encourage investment in new plants and productive equipment.

We'll also offer a 50% tax exclusion to those who take risks by making long-term investments in new businesses that create new products.

But it isn't enough to invest in technology for today. We need to invest in our people for tomorrow.

George Bush thinks America can achieve a high-wage economy without a high-skill population. I disagree. I think that to compete in today's technology-intensive global economy, we need a highly skilled work force.

Lifelong education

A Clinton administration will create a revolution in lifetime learning. We'll improve education from preschool through high school and establish a National Service Trust Fund to give every American the right to go to college.

But we'll also establish a National Apprenticeship Program so that young people who don't go to college can achieve their full potential.

And, we'll require every employer to spend 1.5% of payroll for continuing education and training of all workers, not just executives.

We'll make sure that, as America develops better technologies, our work force is ready to use and market them.

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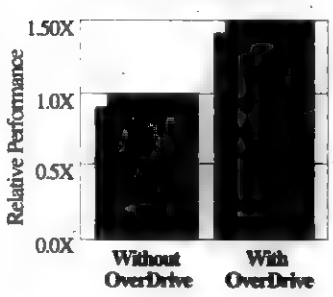

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Gentlemen, start your notebooks

Computer analysis is crucial in the high-stakes world of IndyCar racing

BY MICHAEL FITZGERALD
CW STAFF

WARREN, Mich. — From Loudon, N.H., to Laguna Seca, Calif., and points in between — significantly, Indianapolis — IndyCar racers cross the country with their cars in huge, custom-designed trucks filled with spare parts, tools — and notebook computers.

An IndyCar team typically travels with a virtual mobile data center, with notebooks providing the bulk of the computing power. Some of the more advanced teams have large databases, such as Penske Racing, Inc., which keeps two years of race data on compact disc/read-only memory.

In the high-stakes, split-second world of IndyCar racing, where improper responses to the conditions can blow a million dollar vehicle, computer analysis can provide an edge. Unlike the average consumer car, where the engine is set to run at a 14.7 fuel-to-air ratio, IndyCars get tuned to the best performance for the day.

"One thing it does is keep the drivers honest," said Paul V. Rochotte, an electronics engineer at Penske Racing. "At the end of each test, we sit down with the drivers and the engineers, and the driver talks about how the car handled, and we'll run the data and compare. They may say the car wasn't accelerating well out of a turn, and we'll run the data and see they actually shifted down to fifth."

Driven to Improve

But Richard Amacher, director of MIS at General Motors Corp.'s motor sports technology group, said the good drivers usually use the computer as a self-improvement tool, while the automakers use data to influence parts design.

All the software is custom-built. GM, for example, uses systems built to run under Microsoft Corp.'s Windows 3.0. Car makers, including GM and Ford Motor Co., send teams to support the racers that use their engines and to gather their own data on how the engines perform under various conditions.

There is a practical side to the racing as well, at least for companies such as GM.

"We're not into this for fun; racing is a test bed for things that might go in passenger cars," said Thomas J. Murphy, a programmer at GM's Technical Center. At GM, software developers such as Murphy spend two years with the Motorsports Group, then go back to passenger car

Continued on page 32

ON SITE

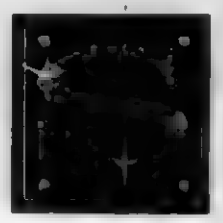
GM Motor Sports Technology
Warren, Mich.

- **Goal:** To improve race times through data analysis.
- **Technology:** 386SX notebook computers and customer-built databases.
- **Results:** More efficient tuning of engines and tracking of problems. Cars almost never run out of gas on the track. Technology use provides test ground for consumer cars.

Apple preps new Macs, joins price cut battle

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will join the savage price-cutting wars among personal computer makers next month when it marks down the price tags of several models in its Macintosh line, sources close to the company said recently.



In addition, Apple has reportedly penciled in Oct. 19 as the date when it will introduce three new Macintosh models featuring built-in compact disc/read-only memory drives. The machines will be priced from $1,500 to $2,700 and will take the place of the Macintosh SI and Macintosh CI, according to sources.

The new models will be designed for both multimedia and desktop publishing applications, and at least one of the machines will be sold through department stores or consumer electronics chains.

Apple last week introduced a new version of its midrange PowerBook 140 notebook computer at the MacWorld Exposition in Boston. The new model was designed to run at nearly the same speed as the top-of-the-line PowerBook 170.

The PowerBook 145 has a suggested retail price range of $2,399 to $2,799 and is the first PowerBook to have video capabilities. It comes with 4M bytes of memory and either a 40M-byte or 80M-byte disk drive. The model sports a supertwist display and is powered by a 25-MHz 68030 chip. The earlier PowerBook 140 used a 16-MHz 68030 chip.

The introduction of the PowerBook 145 is the first move in what is expected to be an overhaul of the popular PowerBook line; the 100 and 170 models are expected to be replaced in early October with two other PowerBooks that will offer a slimmer design, higher performance and an active-matrix display.

Although the extent of the overall Macintosh line price reduction was uncertain, observers predict it could be 10% or more.

Apple Chairman John Sculley has said in the past that a key piece of his strategy to boost the company's market share will be to remain price-competitive.

Macintosh price reductions could have serious consequences for Apple workers. When Apple chopped prices in the past, restructuring and layoffs sometimes followed.

While Apple had gross profit margins of 44% during its last fiscal quarter ending June 26, the company's margins are likely to drop into the 35% to 40% mark by the end of the year, according to analysts.

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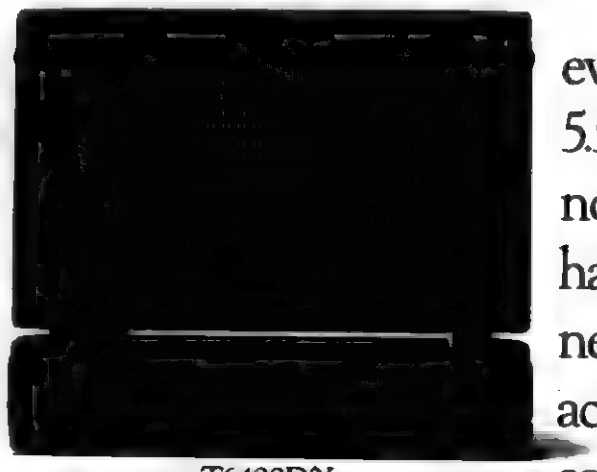
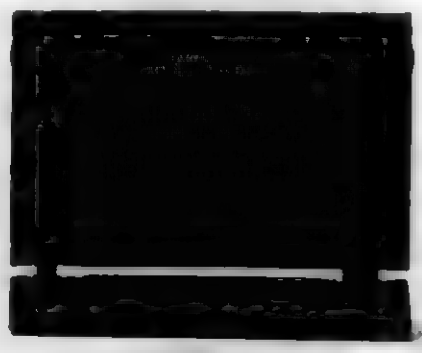
And we stand behind

When your job description includes buying portable computers by the tens, twenties, thirties and hundreds, you naturally want to know a bit more about the company that makes those computers than you'll discover by reading their spec sheets.



T6400DX

(Although our spec sheets do make excellent reading.)



T2200SX

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T3300SL/120MB

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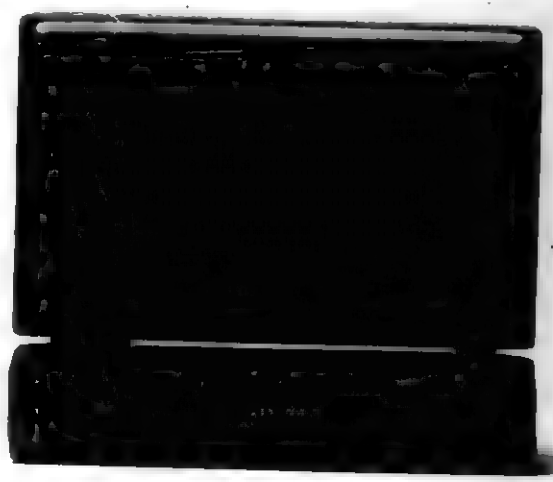
T6400SXC



We also provide the broadest range of accessories—adapters, modems, memory cards—to make your portables (amazing as it sounds) even more useful.

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T3300SL/80MB

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T6400SX

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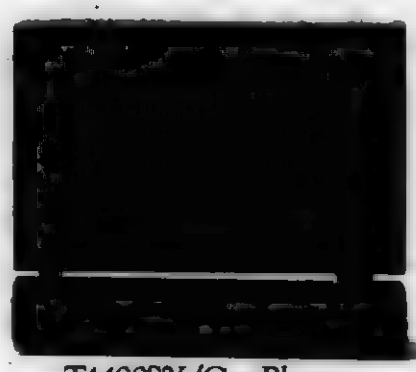

T4400SX/Gas Plasma

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intel inside

Which, after everything we've told you, does seem like the logical next step.

In Touch with Tomorrow

TOSHIBA

Casino, Blood added to virus watch list

BY JAMES DALY
CW STAFF

The dog days of August are peppered with many of the same annoying viruses that popped up last month — except for two nasty exceptions.

Casino and Blood are two rare but destructive viruses that share the same Aug. 15 trigger date, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La.-based developer of data security software.

Casino infects .COM files when directory commands or .EXE files are executed. Although it can be activated on any day (when it decreases the total system memory and available free memory), it becomes particularly destructive on Aug. 15, when it can destroy a personal computer's file allocation table (FAT).

When Casino kicks in, a slot machine will appear on the screen with a warning message. Once the slot machine portion of the virus has been activated, the data on the hard disk will be lost.

Blood is less destructive. It infects any .COM file in the root directory. On Aug. 15, Blood causes a system to reboot after an infected file is executed, usually the COMMAND.COM file on a PC. The system will then show a cascading screen effect, with characters randomly falling down the display. Any execution after Aug. 15 will result in the system hanging up.

As with all viruses, the dates of their expected occurrence are made for general awareness and are not exclusive. Skilled programmers can do a little tinkering under the hood to change a few lines of code and make the virus go off whenever they desire.

Experts advise scanning any new disk before it is used as well as the three basic rules of virus protection: backup, backup, backup.

Other August virus characteristics include the following:

• **Mendoza** — A rare strain of the Jerusalem or Friday the 13th virus that deletes the infected file and all files in its directory. It differs from Jerusalem in that it can crop up at any time during the last half of the year, instead of on Friday the 13th, which is the activation date for the most common Jerusalem virus.

• **Bad Guy 2, Exterminator, Demon** — All are forms of the 1-B virus, which is a nonresident overwriting virus that infects all .COM programs in the current directory. Infected programs will have the beginning of the program overwritten by viral code.

• **AH!** — This strain is based on the V1824 virus and infects .COM programs. Symptoms include a decrease in system and available free memory and system crashes.

• **Crew 2480** — A nonmemory resident infector of .COM programs that are more than 10K bytes in size. When activated, it changes the file date and hangs up the system, which then reboots.

• **Argentina** — A nondestructive virus that affects all .COM files, except COMMAND.COM files, through a terminate and stay resident infector. Symptoms include .COM growth and messages that pop up in Spanish and note the day's importance in Argentina's struggle for independence.

• **Day 10** — A nonresident direct-action infector of .COM programs. Symptoms include .COM file growth, file date and time change and hard disk corruption.

• **Alabama** — Remains resident and infects .EXE files only. It moves into memory when any infected file is executed. One hour after activation, the virus displays the following message in a flashing box: "Software Copies Prohibited By International Law Box 1055 Tuscambia Alabama USA." It affects runtime operation, corrupts program or overlay files and corrupts file linkage.

• **Frere Jacques** — Enlarges .COM and .EXE files and plays the tune "Frere Jacques" on Fridays. Available memory may decrease. Systems may crash.

• **Pay Day** — Increases size of .EXE and .COM files. The system may slow down. Files may be deleted on any Friday except Friday the 13th.

• **Taiwan** — Infects .COM files, including COMMAND.COM files. When an infected program is run on the eighth day of any month the virus will perform an absolute disk write for 160 sectors, starting at logical sector 0 on the C: and D: drives, overwriting the partition tables, boot sectors, FATs and root directories.

• **Monxla** — A nonresident infector of .COM files, including COMMAND.COM files. Infected .COM programs will increase in length by 535 bytes. Typically located at the end of infected programs.

• **Skism** — Host files are .COM; .EXE and overlay files. Skism may affect computer performance or functions, and it corrupts the programs it infects.

Dog day viruses

The primary defenses against computer virus infection are scanning of software packages and backup. A number of scanning applications are available from Symantec, Central Point Software, McAfee Associates and Fifth Generation Systems. Bulletin board services may also offer free shareware scanning packages.

According to FGS Virus Watch, these viruses are expected throughout the rest of this month:

August

All month: Crew 2480, Mendoza
Each Monday: Bad Guy 2, Exterminator
Each Tuesday: Demon, AH!
Each Friday: Alabama, Frere Jacques, Pay Day. Skism will hit the last two Fridays of the month.
Every 10 days (Aug. 10, 20, 30): Day 10
Aug. 8: Taiwan
Aug. 13: Monxla
Aug. 15: Blood, Casino
Aug. 17: Argentina
Aug. 18: Form 18
Aug. 24: Form

Special deals may tempt small PC sites

BY ROSEMARY HAMILTON
CW STAFF

Several smaller user sites contacted recently said that while they found the recent personal computer software megadeals intriguing, they did not expect such an offer to come their way.

"I don't buy in those quantities, so I don't play in that league," said Thomas Loane, vice president of information systems at Alamo Rent-A-Car, Inc., in Fort Lauderdale, Fla.

But Loane and other users may soon be surprised to find who is knocking at their doors.

Strategy shift

Smaller companies, typically those with a few hundred PCs, will likely be the next focus of attention as software companies try to build share in the Microsoft Corp. Windows market.

"I think what we will see very quickly is the scale of the license deals coming down," said Jeff Tarter, editor of "SoftLetter," an industry newsletter published in Watertown, Mass.

"The deals won't be for 25,000, but for 250," Tarter said.

Recently, Price Waterhouse signed an agreement with Borland International, Inc. to standardize on four applications for 25,000 users. Meanwhile, Andersen Consulting is finalizing a deal with Microsoft for use of a set of its applications for up to 65,000 users.

Some companies, such as Computer Associates International, Inc., already offer licensing agreements for smaller quantities.

Sanjay Kumar, a senior vice president at CA, said some of CA's licensing programs require a minimum of 250 machines, while a couple of policies require as few as 50 machines.

However, other companies are just now evaluating options that would be more favorable to smaller companies. Late last month, Lotus Development Corp. said it is developing a program in conjunction with resellers to offer volume purchase agreements to smaller, or "mid-tier," companies.

"We've licensed based on users, based on workstations, based on a server-concurrent user pricing scheme," said Bob Burns, manager of business development at Lotus.

Minimum purchase

Burns said the new volume purchase agreement will be ready in the fourth quarter. Currently, users must commit to a minimum of $100,000 per year to participate in some volume purchase deals.

A few users said the recently announced megadeals caused some concern. One customer said he hoped the smaller users would not get hit with higher costs to offset the price breaks that are part of the megadeals.

"My concern was they would go too far and then strike an average price where smaller companies would get penalized," said Keith Sievers, vice president of information processing and treasurer at Federal Kemper Insurance Co. "I'd hate to see it happen [where] you'd pay X amount for a site license and it wouldn't matter if you had five copies or fifty."

Start your notebooks

CONTINUED FROM PAGE 29

development. Murphy spent two years on the Cadillac Brougham development team before he changed pace.

John Faivre, another Penske engineer, said cars rarely run out of gas on the track now — a constant fear in the past — because fuel use is monitored closely. Engineers sometimes catch engine problems before they happen, as well, which can save a lot of money: An engine can cost $250,000, and an additional $100 per mile just for maintenance — $50,000 for a race such as the Indianapolis 500.

The typical IndyCar has three on-board computers, small black boxes that can be programmed to dictate how often the spark plugs fire or when fuel gets injected.

The three computers measure 16 or more variations of engine conditions with each rotation of the drive crank.

Small displays on the dashboard allow drivers to access a great deal of data, though usually they choose not to take their eyes off the road.

There is too much data than can currently be analyzed effectively during a race. For teams that use real-time data feeds — transmitted from the car at intervals as rapid as once per second during a run — up to 128 pages of data can be generated from just one lap, and a full race can produce up to 7M bytes of data.

While teams get up-to-the-second information on the car's performance, this is also costly: A basic system from a company such as Pi Systems Corp. in Portland, Ore., can cost $30,000 to $32,000.

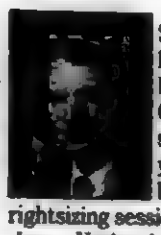
Plugging in the computer has joined tire changing and refueling during pit stops. Many teams focus on pulling data from the on-board computer, then crunch numbers as the car roars through the miles.

Racing engineers said that if you have done your job correctly during the week, the engineer who handles the computer during the race should be bored. Even so, they spend the race analyzing data and tracking miles per gallon — ideally, an IndyCar racer aims for more than 2 mpg.

WINDOWS VIEW

Jesse Berst

Back to school



So you've heard about the benefits of GUIs and rightsizing. Maybe you've even been to a few rightsizing sessions at trade shows. You've decided that your company has to move in that direction.

Now what?

Now maybe you should send yourself back to school. That's what some of your colleagues are doing.

In previous columns, I've talked about the need to retrain users and programmers to make the transition to the graphical interface. But IS managers and executives need periodic re-education, too. In fact, it's easy to argue that they should be the first ones to get retrained so they can lead the rest of the department in the right direction.

Indeed, the need for management re-education is great enough that training places like Microsoft University are now offering such classes. To see what this trend was all about, I recently spent some time at a Microsoft University management class titled "New Architectures for Enterprise Computing."

What kind of education is most important for IS managers? The first need, in my mind, is to get an up-to-date overview of options. This kind of "what it is" training was the focus of the class I visited. The three-day seminar divided its time between three crucial rightsizing topics: operating systems and environments, connectivity and client/server development.

The right path

Once you know where you are going, you need how-to education. Microsoft University, for instance, has an implementation class called "Managing the Migration to Client/Server Architecture." Other training companies have similar offerings.

I was intrigued by the type of people who populated the Microsoft University seminar. Over the past few years, we've seen a surge of people whose job is to monitor technology trends and plan future directions. It's a commentary on the confused state of the industry when companies have to dedicate full-time positions to the task of figuring out what's going on.

For instance, Michael Dechichio, a senior systems engineer at Travelers Insurance in Hartford, Conn., is part of a group responsible for workstation planning. Travelers has 12 mainframes, 30,000 PCs and 400 LANs.

"I was looking for a high-level overview," Dechichio said, explaining why he had signed up for Microsoft University's $1,195, three-day event. "We are already migrating. We have client/server apps out there, and we are building others right now. I wanted a look at the different architectures and strategies."

Many of the other students had similar responsibilities. One was a planner for a British Columbia government ministry. This agency has half of its operation set up on an IBM mainframe and the rest on PCs. Now it is trying to merge the two worlds.

Another student was a manager at Ford, which has about 6,000 PCs worldwide. Although Ford has always been an IBM shop, the recent IBM/Microsoft divorce has Ford wondering about the best migration path from DOS to a GUI.

Similar concerns prompted the IS director for Florida's Metro-Dade County to send himself back to school. Metro-Dade is an IBM mainframe shop with some DEC VAXs. The director is in the midst of making a decision on new tools. He says his organization must change its entire culture from a mainframe focus to a PC orientation.

Is a class like this worthwhile for IS managers? I think so, particularly for those responsible for platform decisions. "It worked out very well for me," Dechichio said. "It covered what I needed." Dechichio said he liked the approach of instructor Bob Jones, a consultant with two decades of experience. His only quibble: "The class was slanted more toward Windows than OS/2." Not surprising, perhaps because the course was sponsored by Microsoft.

Equal time

Jones did give time to all the different options, including those from other companies. And he gave students free rein to make comments.

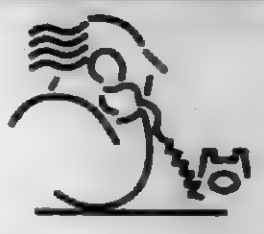
As with any wholesale change, the transition to Windows-based client/server computing is fraught with pitfalls. One of the most valuable aspects of a class like this one is the chance to learn from the mistakes and solutions of others.

The technology landscape is changing so rapidly that many of the old models don't work anymore. There is no clear, obvious path to the future. Indeed, the choices are so confusing that many companies dedicate full-time employees to the task of exploring the different options.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

HELP LINE

WordPerfect for Windows



Part of a series of tips provided by PC software vendors and based on questions commonly asked of their customer support personnel. This week's tips focus on Wordperfect Corp.'s WordPerfect for Windows.

Q Can I use the same printer drivers that I use in WordPerfect 5.1 for DOS?

A WordPerfect 5.1 for Windows uses the same printer drivers (.PRS files) as WordPerfect 5.1 for DOS. However, WordPerfect printer drivers that require a Terminate Stay Resident program to function in WordPerfect 5.1 for DOS will not work in WordPerfect 5.1 for Windows.

Q How can I speed up WordPerfect 5.1 for Windows?

A We strongly recommend using an Intel Corp. 80386-based machine or better with at least 4M bytes of random-access memory. If you are running multiple Windows applications, you may consider purchasing additional memory. Here are some additional tips:

- Upgrade to Windows 3.1, which does a better job of handling memory.
- Enhance performance by using a disk-caching utility such as SmartDrive, which ships with Windows.
- Minimize WordPerfect utilities such as Program Manager, Speller and Thesaurus after you first run them rather than closing them each time. This will speed up subsequent launch times.
- Increase the file handles in your CONFIG.SYS file. When you see *FILES=X*, increase the number to at least 30.

Q Should I use WordPerfect or Windows printer drivers?

A Each has advantages: Using WordPerfect printer drivers, you can use the same printer drivers as in WordPerfect 5.1 for DOS, choose from the 900-plus printers supported by WordPerfect and generally print faster.

Using Windows printer drivers, you can print TrueType fonts and screen fonts (fonts other than those built-in or downloaded to your printer) because they will print graphically. Also, you can print color graphics and rotated fonts on dot-matrix printers.

NEW PRODUCTS

Systems

Intelligent Security Systems, Inc. has announced Firmloc, a personal computer access control system.

Firmloc is a hardware/software combination security product that uses a smart electronic key with an internal microprocessor that cannot be duplicated.

The key receptacle connects to the parallel printer port on the PC and automatically locks the computer when the key is removed.

According to the company, the screen turns blank when the computer is locked, and the keyboard, floppy drives and mouse are immobilized, blocking all routes into the system. Once the user inserts the key again, operation resumes exactly where it had stopped.

Firmloc costs $249.95.

Intelligent Security Systems
Suite 1001
18031 Whispering Gables
Dallas, Texas 75287
(214) 869-3663

DataBusiness Systems has introduced PC-101, an Intel Corp. 80386-based, 33-MHz computer system. The product has a 101-style keyboard that contains all of its peripherals and components.

A key feature of the PC-101 is a slot for an 8/16-bit network card. This feature allows the product to operate as a standalone computer, workstation or local-area network.

PC-101 has external ports for an IBM Personal System/2 mouse interface and includes floppy and tape drives, a scanner or light pen and a bar-code reader. Options include an 80387SX math coprocessor, a 32K cache buffer, 2M to 16M bytes of random-access memory and a 2.4K bit/sec. Hayes Microcomputer Products, Inc.-compatible modem.

The standard PC-101 costs $1,495.

DataBusiness Systems
Suite 102
4630 Campus Drive
Newport Beach, Calif.
92660
(714) 252-0990

Software application packages

Marin Research has started shipping ProjectGuide for Windows.

The product is an applications-oriented front end for Microsoft Corp.'s Windows that creates project models for scheduling systems.

Users interact with "guides" that ask questions about the requirements of the project. A task list is generated, and a resource plan is customized for the requirements.

ProjectGuide Professional Edition supporting authoring costs $895. ProjectGuide Personal Edition, without authoring, costs $295, or $199 per copy for quantities of five or more. A full-function Working Model costs $50.

Marin Research
Suite 10
38 Miller Ave.
Mill Valley, Calif. 94941
(415) 389-5444

Macintosh products

Dayna Communications, Inc. has announced the DaynaPort E/II-3 NuBus Ethernet card for the Apple Computer, Inc. Macintosh II series of computers.

DaynaPort E/II-3 allows Macintosh connectivity to any Ethernet wiring scheme. The cards can automatically configure to whatever type of media they are connected to with an auto-sensing technology, according to the company.

DaynaPort E/II-3 has 64K bytes of random-access memory for performance in high-traffic machines such as file servers, and it is fully compatible with the System 6.0 and System 7.0 Macintosh operating systems and the Apple Ethernet driver.

DaynaPort E/II-3 costs $319.

Dayna Communications
Fifth Floor
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

Radius, Inc. has introduced PrecisionColor 8XJ, an accelerated, 8-bit color interface card for Apple Computer, Inc. Macintosh II computers.

The product consists of a NuBus-based accelerated graphics interface card that can display up to 256 colors on-screen.

Features include on-board acceleration, multiple resolution capability and on-the-fly resolution switching.

According to the company, PrecisionColor 8XJ's auto-install feature ensures easy installation when combined with a Radius display.

The Radius PrecisionColor 8XJ costs $599.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
(408) 434-1010

Aldus' PhotoStyler 1.1: Outstanding in its field

Technology Analysis — A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

PhotoStyler 1.1, created by U-Lead Systems and now owned by Aldus Corp., was the first available 24-bit image editing software for Microsoft Corp.'s Windows. Reviewers said it is the best in the field for its mix of usability and high-end power.

Ease of use: Most functions in PhotoStyler are fairly intuitive, according to *Infoworld*. The interface features two floating tool bars — one for Selection functions, the other for Painting tools.

Editing tools: The product offers a good selection of retouching tools and strong control over brightness and hue.

Paint/Draw tools: PhotoStyler includes only a line-drawing tool. However, PhotoStyler provides exceptional control over the shape and function of its numerous painting tools.

Output: *Windows* magazine said novice users will find the initial printer calibration process frustrating.

Documentation: The documentation is thorough and well-indexed.

Overall value: For users who need strong prepress color separations and other production-quality features, PhotoStyler's power is worth the hefty $795 price tag.

Aldus PhotoStyler 1.1

Reviews	Ease of use	Editing tools	Paint/Draw tools	Output	Documentation	Overall value
Windows magazine 7/92	Stands out	Awesome filters	Save your own brush shapes	Calibration is weak	Professional	Heavyweight winner
Infoworld 12/23/91	Very good	Advanced selection	Very strong	NC	Well-written, liberally illustrated	Pay a premium
PC Sources 6/92	Surprisingly intuitive	Superlative	Usual assortment	NC	Thorough	Hefty price tag
Byte 6/92	Paint and Select button bars	Powerful	Only one geometric tool	NC	Extensive on-line Help	The front-runner
NewMedia 8/92	NC	Dynamic effects	No Bezier tool	NC	Straightforward	Solid offering
Users:						
Lee Wojnar, Lee Wojnar Studios, Inc.	■■	■■	■	■■	■■	Cutting-edge
Elizabeth Wood, Egeland, Wood & Zuber, Inc.	■■	■■	■■	■▄	NC	Great artistic effects
Michael Johnson, Cypress College	■■	▄	▄	▄	▄	Good product
Analyst:						
Nathan Everett, The Dotron Institute	▄	■■	■■	▄	■	Quick gamma calibration

Key: ■■ Very good ▄ Good ■ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Short-term performance	Long-term viability
Glenn Powers, Dain Bosworth	■	▄
Jeff Bernstein, Cowan and Co.	■	▄

Aldus reported a net loss of just under $1 million for the quarter ended in June. Revenue was $38.9 million.

Aldus responds

Sheldon Fisher, senior product manager:

Output: Calibration does take some effort on the part of the user; it isn't necessarily for the novice user. Color technology still requires some expertise with the majority of these products. We're looking at continuing to expand the color support in PhotoStyler.

Image-In Color: Unique, powerful, quirky

Image-In Color 3.0

Reviews	Ease of use	Editing tools	Paint/Draw tools	Output	Documentation	Overall value
Windows magazine 7/92	Sometimes awkward	Extremely controllable	Supports pressure-sensitive devices	NC	Dull	As powerful as you'll find
PC magazine 12/17/91	Consistent interface	Sophisticated tools	Noteworthy color picker	Gray-scale printing not rich	Lacks index	Wonder if price is justified
Infoworld 12/2/91	Flexible	20 filters	Excellent color capabilities	NC	NC	Has the edge
Byte 6/92	NC	Incorporates text as bitmap	Lines, ellipses, curves, polygons	Automated printer calibration	NC	Interesting prepress features
NewMedia 8/92	NC	Basics plus spatial effects	Geometric shapes and Bezier curves	NC	Needs greater depth	Powerful
Users:						
Richard Drake, Advanced Digital Designs	■■	■■	■	▄	■	Very fast
Marilyn Stephens, 3M Co.	■■	▄	▄	■■	■■	Including text is difficult
Ken Blumstein, KB Imaging Associates	■■	■■	▄	■■	■	Handy color correction
Analyst:						
Colin Relph, Colorepro, Inc.	■■	■■	▄	■■	▄	Best color models available

Key: ■■ Very good ▄ Good ■ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Image-In is based in Minneapolis. Established in 1989, Image-In creates software products for graphics and desktop publishing. The privately held company does not release financial information; according to outside sources, annual sales are approximately $4 million.

Image-In responds

Kent Eittreim, technical support manager:

Documentation: Our manuals are more of a technical reference, so you can look up each function. The tutorials are an area we're working on right now.

Output: We cover all gray-scale functions that the printer is capable of. We're now shipping Version 3.1, which fixes some problems with EPS files.

Image-In, Inc. offers several versions of its image editing software: a low-cost black-and-white package, a color version and the top-of-the-line Image-In Color Professional, which enhances the basic Image-In Color product with more photographic filters and advanced selection and masking operations. The products run under Microsoft Corp.'s Windows environment.

Ease of use: Image-In Color is flexible, though reviewers said the interface has a few quirks. Some simple operations require multiple double clicks of the mouse.

Editing tools: The tool set is comprehensive, including dialog boxes for brightness and color balance, plus wave, spiral and blur filter effects. The Professional version provides color separations.

Paint/Draw tools: Image-In Color is unique in its support of Wacom, Inc. pressure-sensitive digitizing tablets.

Output: According to *PC Magazine*, the product's on-screen color reductions and gray-scale printing are relatively weak.

Documentation: Reviewers were unimpressed with the documentation.

Overall value: Image-In Color costs $495, while the Professional version costs $795. It is as powerful as any 24-bit image editor on the market.

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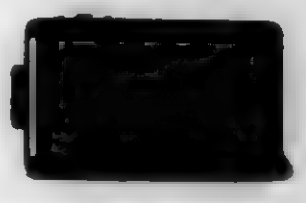

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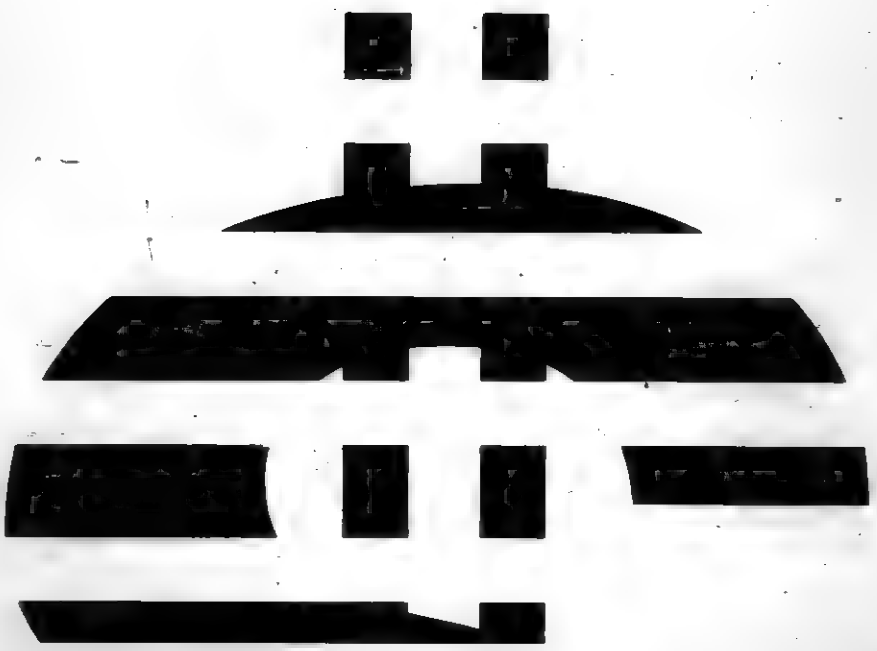

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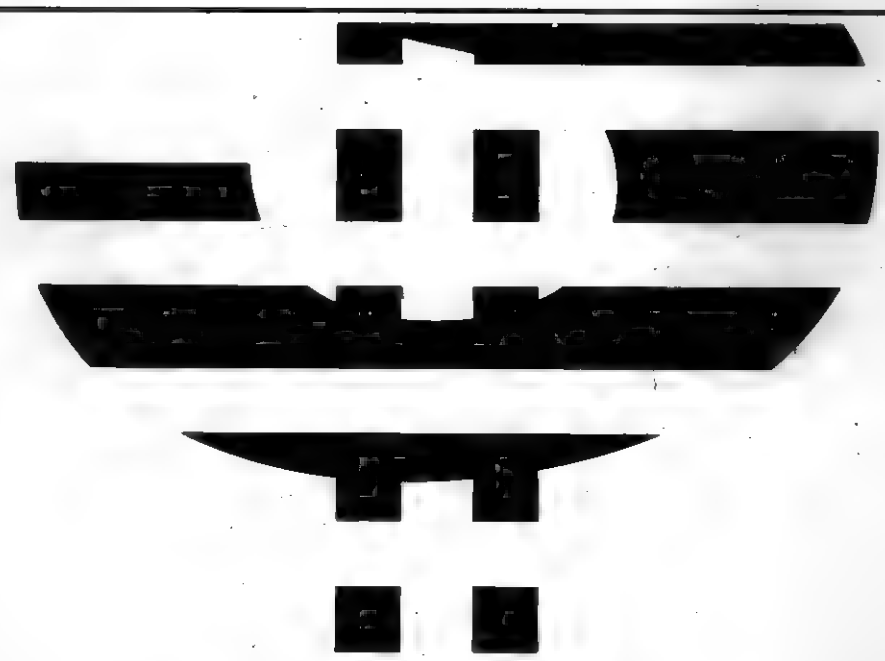
Just look at the cost of their AS/400 upgrade.



Inevitably, IBM says the only way to get increased AS/400 performance is to upgrade your CPU. And every time you upgrade, it means you're looking at new hardware, new software, additional memory, additional disk space, and greater service costs on an annual basis. (Ouch.)

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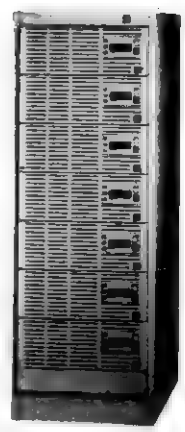

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For ComputerVision, the future is CADDS 5

BY KIM S. NASH
CW STAFF

BEDFORD, Mass. — ComputerVision is facing a turning point. With its proposal for an initial public offering filed in June, a fast, smooth release of a major upgrade to its flagship computer-aided design and engineering tool set is critical.

Yet that trouble-free launch is not a given, according to industry analysts. Some of the features new to this upgrade for CADDS 5, they noted, are old hat to rival products. Plus, ComputerVision has to drag itself out from under the poor reputation of its financially troubled, soon-to-be shut down parent, Prime Computer, Inc.

CADDS 5 Release 2 hit the market last month — about a year after CADDS 5 was first introduced and several months after comparable computer-aided design and manufacturing (CAD/CAM) products from other vendors. The upgrade sports features — such as improved parametric modeling and the ability to let several development teams work on a project at once — that now put it in the running against rival offerings from Parametric Technology Corp. and Structural Dynamics Research Corp.

However, as it tries to distance itself from Prime, ComputerVision will find that it has a lot of ground to make up, said Laura Conigliaro, an analyst at Prudential Securities, Inc. in New York.

A three-year, $14 million contract signed in January with General Electric Co. for CADDS 5 was a solid win for ComputerVision, even if the deal included Release 1 as well as the new offering, she said.

Yet Prime's shaky reputation has opened the door for competitors such as Parametric to rev up marketing and invade ComputerVision's turf, Conigliaro said.

Furthermore, users fracture the market by typically buying design packages from a mix of vendors. Texas Instruments, Inc., an early user of CADDS 5 Release 2, also designs with tools from Parametric.

Features noted

The new release of CADDS 5 is arriving in the nick of time, according to Gisela Wilson, an analyst at International Data Corp. in Framingham, Mass. Among the more notable new capabilities, she said, are the following:

- Concurrent assembly mock-up. The $9,500 module lets different design teams work on big multipart projects.
- Nurbs Surface Design. Car and aerospace companies in particular use nonuniform rational B-spline (Nurbs) techniques to design their products. The product, priced at $15,000, is said to improve a user's ability to smooth surfaces.
- Command line interface. Because they usually use a variety of products from different vendors, CAD/CAM users often prefer text commands over icons.

Unix in the doghouse at pet motel

BY JAMES DALY
CW STAFF

ST. LOUIS — A lot of systems managers are used to hearing their clients howl. But at Kennelwood Village, Inc. they may also bark, bite or pee on the carpet.

The furry clientele who regularly check into this 500-room pet motel are not your average overnight tourists, but they can be just as demanding. A reservation system not only needs to know how long Tootles the terrier is going to stay at Kennelwood, but also whether she needs to be flea-dipped or have her television set tuned to the Cable News Network or a rental movie (*101 Dalmatians* is a popular choice).

Until recently, a wheezing Unix system — The Santa Cruz Operation's SCO Unix running on an IBM personal computer clone — struggled to keep up to date with the 175,000 reservations, cancellations and scheduling changes made each year. According to project manager Emily Schumacher, Unix just wasn't doing the job.

"We were having a lot of trouble," she said. "It seemed as if anytime we even did anything even as simple as reindexing, the system went down."

Even when it was up and running, it was terribly slow, she added. One reason: running non-Unix-based applications such as Fox Software, Inc.'s FoxPro database under an emulator ate up resources. "Something had to be done," she said.

That something was the installation of IGC, Inc.'s VM/386 MultiUser, a powerful PC-based multitasking system based on multiuser DOS and running on a 33-MHz Intel Corp. 1486 processor from Computrend. Schumacher noted that the pet motel wanted a technology that was simpler than a local-area network.

Multiuser DOS products link dumb terminals and PCs to a central processor, thus getting LAN benefits at a fraction of the cost and complexity of actually installing a LAN. Although the idea is not new, it has gained momentum with the advent of powerful chips such as Intel's 80386 and 486.

Since multiuser DOS systems are really MS-DOS systems — they run DOS software, use DOS commands and follow DOS conventions — information systems managers can continue to use familiar DOS applications and commands. Their ease of support, maintenance and installation has thus made them a low-end alternative solution to

Continued on page 40

ON SITE

Kennelwood Village
St. Louis

- **Challenge:** To keep pace with a transaction load that includes 175,000 reservations and other changes each year.
- **Tools:** IGC's multiuser DOS.
- **Results:** System supports more users more quickly, with staff members better able to check room availability.

Unix in doghouse at pet motel

CONTINUED FROM PAGE 39

running a DOS shell under Unix.

"Kennelwood is a very large complex with remote satellites and eight point-of-sale facilities," said Marc Leeds, president of Compet Systems, Inc., a Prairie View, Ill.-based consulting firm that organized the switch. "They wanted all data integrated on the same server and capability for reservations and appointments to be made from any terminal."

In multiuser DOS systems, all access to the shared disk and file system is done directly to the bus, not across additional layers of network hardware and software. The DOS-based VM/386 was teamed with a customized software package from Compet to replace the Unix system. VM/386 MultiUser's processing power is consolidated with the Computrend PC equipped with two 860M-byte Small Computer Systems Interface (SCSI) drives. Leeds said the two SCSI drives solved the performance problems of the Unix system. "We run slower functions like word processing on one drive, while things like boarding, grooming and training schedules go on the other," he said. Schumacher added: "The speed increase is tremendous. It's like night and day."

The host can support up to 32 users on dumb terminals from Wyse Technology, Inc. Unlike LANs that juggle complex network traffic generated by multiple smart PCs, VM/386 circumvents the interference generated by multiple interface cards. VM/386 MultiUser also allows users to designate an intelligent multiport serial board as a standard DOS port. Applications can then poll those devices — rather than PCs — for data, thus increasing system efficiency while reducing the amount of system hardware.

The result is access for more users and greater efficiency. Customers doing business in one department can make reservations in another. Staff members can check on room availability and waiting lists from anywhere on the premises.

Leeds is an old hand at the data management needs of those handling the animal kingdom. His father, Robert, started the 400-room American Pet Motels in Chicago, which also discovered another benefit of VM/386 MultiUser: financial analysis. American Pet employees can pull the numbers for boarding, training and shipping and see how much money customers are spending.

Leeds cited one instance in which American Pet managers assumed that the majority of their business came from the Yellow Pages. But a computer analysis proved that customer referrals were much more important. Armed with that information, they saved money by cutting back on advertising and moving toward direct mail and customer incentives instead, Leeds said.

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IN BRIEF

Tricord, SCO unveil Unix tool

■ **Tricord Systems, Inc.**, developer of the PowerFrame line of servers, and **The Santa Cruz Operation** (SCO) last week announced new Unix software for fault-tolerant operation. Tricord's $350 Unix/FT software shell, which operates on the PowerFrame server, can reportedly provide SCO Unix users with fault tolerance and performance features previously unavailable to them. Unix/FT is a software implementation of redundant arrays of inexpensive disks (RAID) Level 1 that allows SCO Unix users to configure disk drives into mirrored arrays for crash-proof operation.

■ A business agreement between **Hewlett-Packard Co.** and **IBM**, announced early this year, yielded its first product last week: an interconnect optical-link card that speeds visual data to desktop computers. Both HP and IBM plan to independently market the $495 HOLC-0266 card, which connects the motherboard or I/O channel card of a desktop workstation or personal computer to a fiber-optic cable for serial, point-to-point links of up to 2 km. The HOLC-0266 is the first tangible sign of February's development and marketing alliance between HP and IBM, which targets the market for high-speed communication linking technology.

■ **Bell Atlantic Business Systems Services** has announced nationwide support for IBM RISC System/6000 hardware and software in an expanded program that offers an alternative to IBM maintenance for the Unix-based workstation and server line. In addition to round-the-clock coverage, Bell Atlantic's program offers other options such as two-hour response, reduced coverage hours or next-day response. Bell Atlantic's service organization supports more than 500 computer brands, including Digital Equipment Corp. and Sun Microsystems, Inc.

Survey says HP preferred

BY MARK HALPER
CW STAFF

DELRAN, N.J. — A recent workstation user survey by market research firm Datapro Information Services Group showed that users have a slight preference for Unix boxes from Hewlett-Packard Co. over machines from other vendors.

The Datapro survey also noted that workstation owners planning future purchases prefer sticking with their current vendor, while users who are considering switching vendors are most interested in Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC) platform.

Datapro, based here, sent questionnaires to 2,730 workstation users that asked them to rate their brand satisfaction 1 through 5 — with 5 representing excellent — in a multitude of categories.

Datapro divided the categories into three main areas: usage, selection criteria and service/technical support.

HP's Precision Architecture-RISC-based 9000 series 700 models scored highest in usage and selection criteria, and they ranked second in service/technical support behind Intergraph Corp.'s InterPro line.

After receiving 591 valid responses, Datapro reported that the HP Model 700s outpointed rival brands in the usage category, with a rating of 4.01. Next, Inc. machines scored a close second at 3.95, followed by Sun's SPARCstation at 3.82 and Silicon Graphics, Inc.'s Iris workstation at 3.76.

Those products were followed, in order, by Intergraph's InterPro, Data General Corp.'s Aviion, Digital Equipment Corp.'s DECstation, IBM's RISC System/6000 and HP/Apollo's Model 400 series, which is based on Motorola, Inc.'s 68000 microprocessor.

User ratings included independent measurements such as CPU performance, reliability, X Window System performance and stability of the vendor's Unix implementation.

The HP Model 700s took top rankings in CPU performance, X performance and workstation reliability, while Next was tops in application development tools and graphics performance. Sun bested all others in the stability of its Unix implementation.

The HP Model 700s also won overall in selection criteria at 3.94, edging out Sun at 3.87 and Silicon Graphics at 3.72. Selection criteria measured factors including price, for which the HP 700s received the highest ranking, and software availability, a category in which Sun took top honors.

In overall service/technical support, users preferred Intergraph's InterPro workstations at 3.68, compared with 3.57 for the HP 700s.

Other survey findings included the following:

- 60% of the respondents are using their workstation in a client/server environment, and another 13% plan to implement a client/server architecture within the next 12 months.
- Price was the most important selection criteria.

DEC jumps on X.desktop bandwagon

BY MELINDA-CAROL BALLOU
CW STAFF

BOSTON — Digital Equipment Corp. users will soon have easier access to the Open Software Foundation's (OSF) Motif via DEC's upcoming support of IXI's X.desktop, a Motif desktop manager. DEC jumped onto an industry bandwagon of X.desktop supporters recently with plans to license it for packaging with future DEC hardware running Open VMS, Ultrix and the OSF/1 operating system.

Previously, DEC users accessed Motif via DECwindows, and the IXI offering will "fill a hole in DECwindows, which was the lack of a consistent desktop manager," said Steve Grass, a senior product manager at DEC. "We had the applications and runtime libraries and services, but we needed the glue to put them all together, which is what X.desktop brings us."

DEC said it will also work with IXI to develop a Microsoft Corp. Windows New Technology version of X.desktop and integrate commonly used DEC applications with the desktop manager as a front end for Alpha and other environments.

X.desktop is a Motif-compliant, object-oriented desktop manager that is said to offer an easy-to-use, iconic view of files and programs. The ease-of-use feature was the primary draw for most of the vendors adopting X.desktop, industry analysts said, including IBM, The Santa Cruz Operation and NCR Corp.

IXI's X.desktop *'fills a hole in DECwindows'*

The financial agreement between the two companies was not disclosed, but officials said it is part of a "multimillion-dollar deal" to install X.desktop in DEC workstations that will begin shipping during the first quarter of next year.

"Customers require an implementation of Motif that is easier to use [and] easier to access arcane, object-oriented technologies," said Steve Widen, a senior analyst at WorkGroup Technologies, Inc.

IXI and DEC will also focus on creating an easier way to access DEC's Application Control Architecture (ACA) Services for linking applications across heterogeneous networks and operating systems via objects. DEC's ACA is part of the Object Management Group's (OMG) Object Request Broker, and IXI officials said they expect that X.desktop will ultimately be fully compliant with the OMG standard.

IXI's X.desktop will be offered as part of DEC's Network Application Support (NAS) 250 software. NAS 250 will be included free when a system is purchased, DEC officials said. DEC is now offering X.desktop at a discount of $200 for the low-end DECstation 5000/25.

Token Ring lab to open

BY JOANIE M. WEXLER
CW STAFF

SANTA CLARA, Calif. — An independent laboratory where Token Ring vendors can test the interoperability of their 16M bit/sec. adapter cards on unshielded twisted-pair networks is slated to open next month on the Synoptics Communications Co. campus here.

Synoptics is a maker of enterprise and workgroup wiring hubs, which include modules supporting Token Ring local-area networks. As a founding member of the lab, the company is joined by Token Ring heavyweights IBM, Madge Networks, Inc., Olicom U.S.A., Digital Communications Associates, Inc. and Texas Instruments, Inc.

In addition, "98% of the Token Ring vendors are in discussion with us" about participation in the lab, said Peter Tarrant, group line manager of LAN connectivity at Synoptics.

In the lab will be a 144-node LAN — the size specified in the neophyte standard for the technology. This is a difficult and expensive configuration for vendors to build within the confines of their own walls, Tarrant noted.

The standard for running the higher speed Token Ring network over the lower grade lines is about 18 months from completion, even though industry leaders such as Proteon, Inc. have been offering the technology for nearly two years.

"Since these are still early days [for 16M bit/sec. Token Ring], there are many different implementations out there," Tarrant said.

Tarrant added that Synoptics has seen its customer demand for Token Ring products increase from 5% in the first quarter of 1991 to 20% in the first quarter of 1992.

Putting higher speeds over unshielded wiring "has been trickier" than the lower 4M bit/sec. Token Ring speeds, according to Mark Brooks, a senior LAN specialist at the Teachers Insurance and Annuity Association-College Retirement Equities Fund, a large Token Ring shop in New York. But while Brooks said he is considering switching Token Ring interface vendors away from IBM, "we're not that concerned with interoperability because we're trying to keep a pure environment" to minimize administrative headaches.

The lab follows in the footsteps of the Fiber Distributed Data Interface interoperability laboratories at Advanced Micro Devices, Inc. and the University of New Hampshire.

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NEW PRODUCTS

LAN software

Novell, Inc. has introduced v3.011, a five-user version of NetWare for the Apple Computer, Inc. Macintosh.

The product allows users on Novell's multiplatform NetWare Version 3.11 to get transparent integration for their Macintoshes, regardless of the number of users hooked into NetWare's services, according to the company. New features include print accounting, printer keeper, printer logs and hold queues. The option to cancel print job notification is included, and Simple Network Management Protocol is supported.

Pricing for the product ranges from $495 to $2,995, depending on the number of users.

Novell
122 East 1700 South
Provo, Utah 84606
(801) 429-7000

Net-Source, Inc. has released SilverNet 2.1 Peer-to-Peer Network Operating System for IBM Personal Computers and compatibles.

New features include SilverEMail, SilverChat and Interoperable SilverMessage, according to the company. Compatibility for Microsoft Corp.'s Windows 3.1 is also provided with SilverNet 2.1. The product is the only network operating system compatible with all versions of DOS, the company said.

Users can send and receive electronic mail over the network with SilverEMail. SilverChat is a messaging interface that communicates in real time, the company said. Pop-up messages can be sent to users with SilverMessage.

SilverNet 2.1 costs $99 per node.

Net-Source
Suite 101
1265 El Camino Real
Santa Clara, Calif. 95050
(408) 246-6679

Cabling

North Hills, Inc. has announced the availability of five of its six new Lobe Attachment Concentrators.

Connections for unshielded twisted-pair and shielded twisted-pair media over a local-area network are provided by LAC5501, LAC5502 and LAC5503, according to the company. The LAC5504 and LAC5506 supply connections for coaxial cable over a LAN. The LAC5505, which will be available later this year, provides fiber-optic cable. All of the products support controlled access unit technology and have the capacity to add as many as 20 workstations to a LAN.

The LAC5501, LAC5502 and LAC5503 are priced at $1,885. The LAC5504 and the LAC5506 are priced at $3,800. Pricing for the LAC5505 is not yet available.

North Hills
575 Underhill Blvd.
Syosset, N.Y. 11791
(516) 682-7700

Electronic mail

Release Management Systems, Inc. has released OmniTrans.

The product provides electronic data interchange (EDI) message-handling capabilities that allow users to translate any message from or to any standard, mix of standards or proprietary formats, according to the company. The translations are not hard-coded and can be updated to show changing communications or new application requirements.

Runtime prices range from $1,000 or lower depending on volume platform. Development system prices start at $19,500.

Release Management Systems
Suite 204
17187 N. Laurel Park Drive
Livonia, Mich. 48152
(313) 462-1200

LAN hardware

Digital Equipment Corp. has introduced DEC EtherWorks EISA TP/BNC, a network interface card.

DEC EtherWorks EISA TP/BNC was designed to connect personal computers using Extended Industry Standard Architecture (EISA) to ThinWire or twisted pair-based Ethernet networks, according to the company. The 32-bit card includes 128K bytes of random-access memory and has self-test firmware in an on-board, 16K-byte read-only memory. The product offers software drivers that support the Novell, Inc. NetWare ODI v3.11 server, MS-DOS client and OS/2 client, the company said.

DEC EtherWorks EISA TP/BNC costs $595.

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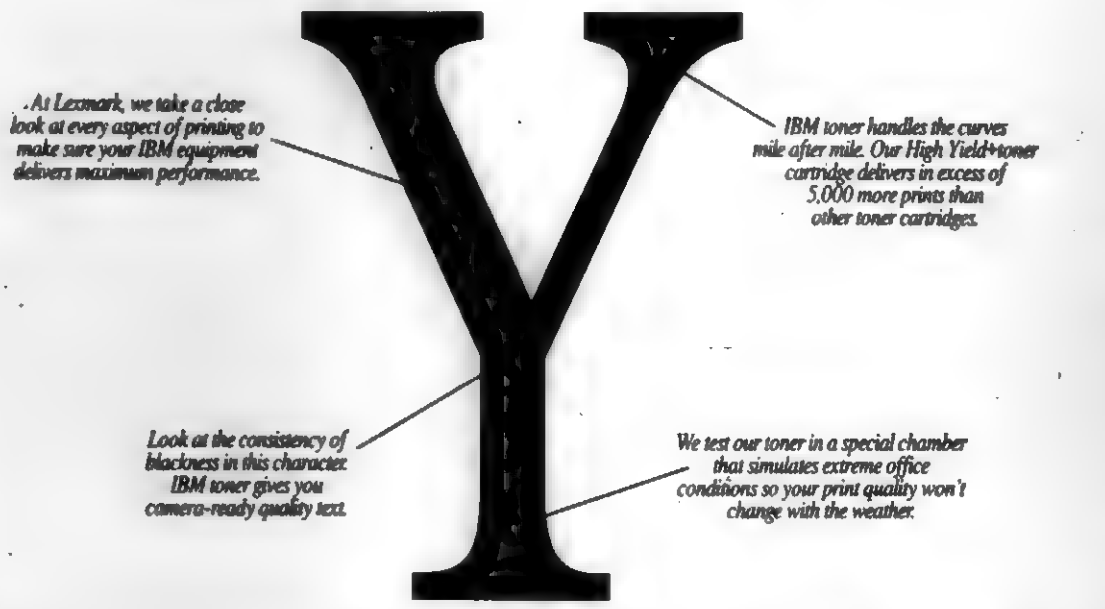

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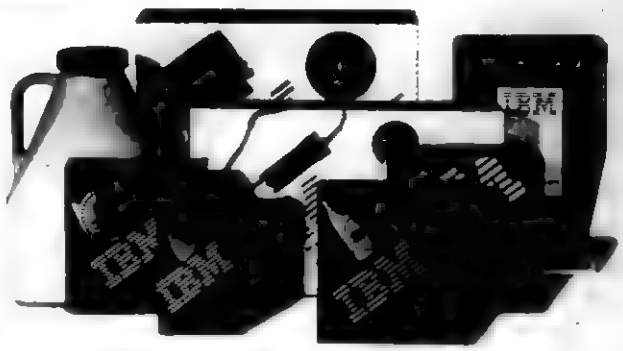

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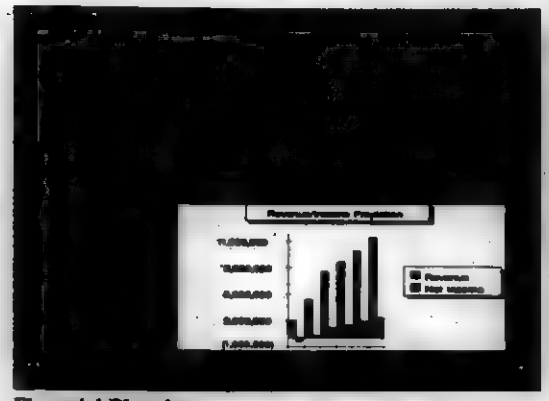
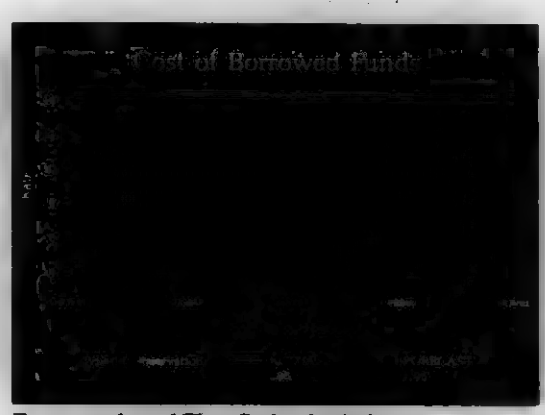
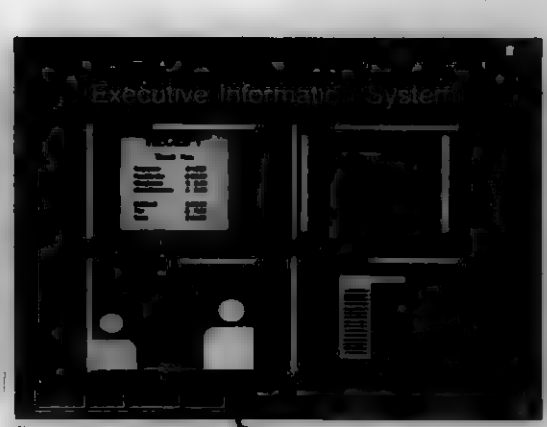


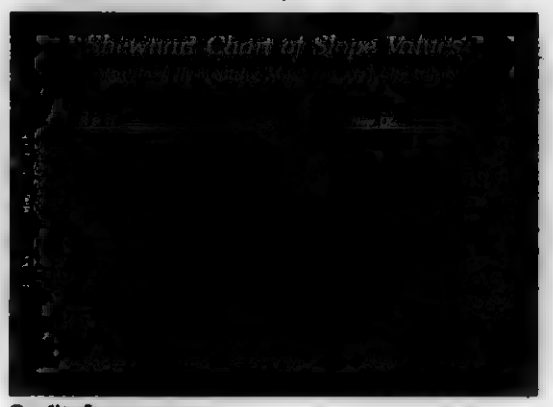
Financial Planning



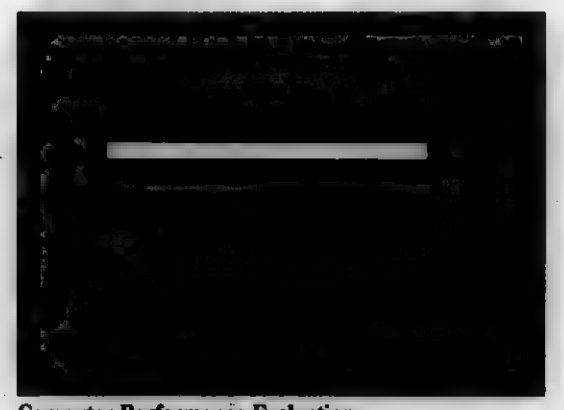
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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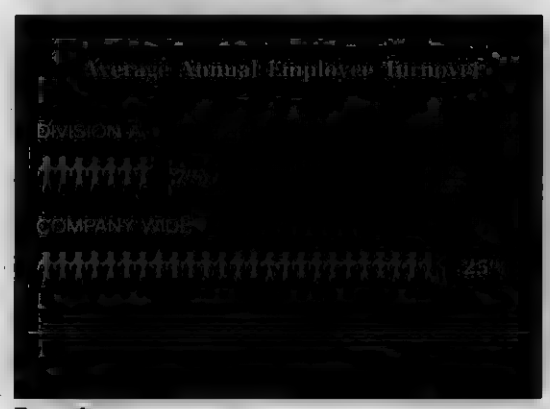


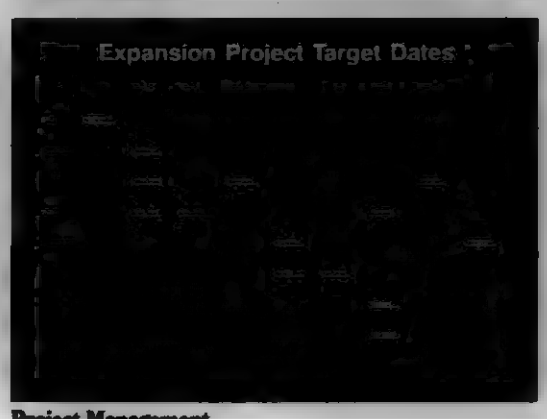
Reporting

Market Research

Business Graphs

Visualization

Data Analysis



Project Management

The rough road to Vines

Banyan's updated network operating system delivers on promises, but not without some initial user hassles

NEW PRODUCT IN-SITE

Computerworld's New Product In-Site is an evaluation based on interviews with major users of corporate and educational installations. The product under evaluation is being used in a production environment running live applications.

BANYAN SYSTEMS, INC.'S VINES 5.0

- Users are upgrading from Vines 4.11 to Vines 5.0 to stay current with the network operating system and to take advantage of its enhanced Macintosh compatibility, reworked file and print services and wide-area networking capabilities.
- Users are having difficulty installing and maintaining Vines 5.0. WAN connections have been difficult to establish; the new Macintosh file system has some bugs; and the new Vines File Store and print services require that previous file mappings be rearranged.

Is any network upgrade worth the hassle? Driving most upgrades is the promise of a better day: better user and administrator services, better network throughput and better connectivity.

Banyan Systems, Inc. is making all of those promises about its latest network operating system, Vines 5.0. And indeed, network managers who have taken the plunge say they have gotten what they bargained for.

But, according to their reports, they have also confronted a battery of delays, detours and perils in their journey from Banyan's previous operating system, Vines 4.11.

For this evaluation of Vines 5.0, *Computerworld* worked with four corporate and educational sites that were in various stages of implementation.

Some had completed the entire procedure and were fully operational. Others were in the middle or late stages of installation and were working on problems of varying complexity.

The least complex tasks were simple upgrades from Vines 4.X to Vines 5.0 servers. After installing Vines 5.0, users reported that new network services such as added printer support and remote administration consoles were readily available. Further complexity was added when 4.X and 5.0 servers resided on the same network. In such cases, some adjustments were required on specific applications to accommodate the different facilities of each network operating system.

Adding Apple Computer, Inc. Macintoshes seemed to pose few problems, although users reported some remaining bugs in the native AppleTalk support.

Despite any complications or difficulties, all the users were satisfied that the upgrade was a wise move.

RELIABILITY

Evaluators had high praise for Vines 5.0's reliability. Three of the four evaluators had upgraded more than one server to Vines 5.0 and reported that no failures had occurred since installation. The manufacturing company reported that internetworking between two servers — one running Vines 4.11 — over a T1 telecommunications line had caused a number of problems, including the denial of access to all users on the Vines 5.0 server. Some of this it attributed to a hardware problem, but the difficulty remained unsolved at press time. Users who had both 4.11 and 5.0 servers on a single network had not experienced similar problems.

Manufacturer: "It's just continual downtime right now because I can't communicate with [the server running Vines 4.11.5]."

Educational: "I haven't had to do any administrative work for a server down."

Integrator: "We've had no failures that have impacted our operation."

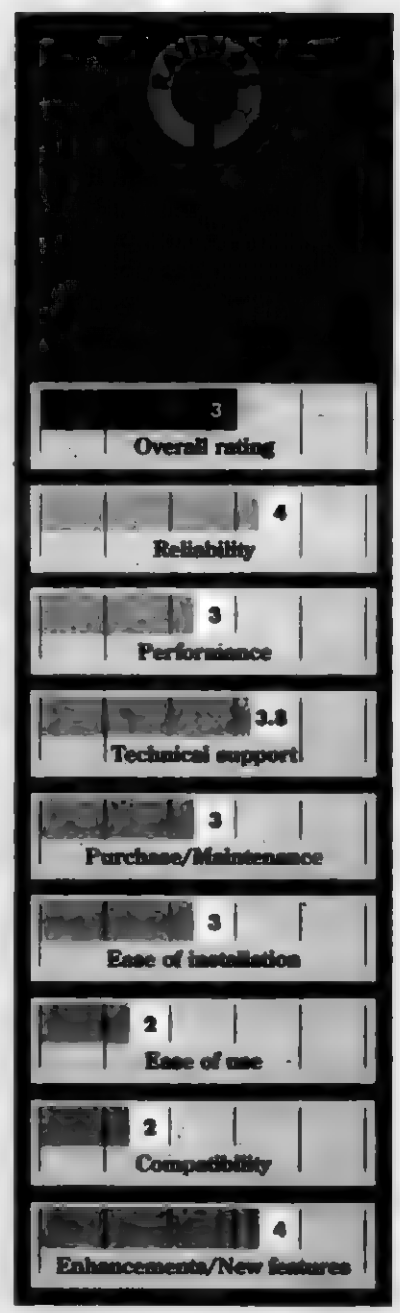
Telecommunications: "It has never failed. The things that have happened are minor."

PERFORMANCE

All evaluators found the performance of Vines 5.0 to be on par with previous versions. Despite a reworked file system that provides access to Macintosh files and richer control to system administrators over access rights, all users said that performance had not deteriorated from that of Vines 4.11.

None of the evaluators had run formal benchmark tests.

Integrator: "We have always found



INDUSTRY: MANUFACTURER

RATINGS	
Reliability	1
Performance	NC
Technical support	3
Purchase/Maintenance	3
Ease of installation	3
Ease of use	NC
Compatibility	1
Enhancements	NC
Overall	2.2

- **Hardware platform:** IBM PS/2; Syntrex 386-33
- **Type of network:** Token Ring
- **Number of users:** 120
- **Using previous version:** Yes
- **Applications:** Microsoft Windows and Excel, CAD, desktop publishing
- **Reason for purchase:** Ease of WAN connections to remote offices

INDUSTRY: EDUCATIONAL INSTITUTION

RATINGS	
Reliability	5
Performance	3
Technical support	2
Purchase/Maintenance	3
Ease of installation	5
Ease of use	2
Compatibility	3
Enhancements	3
Overall	3.3

- **Hardware platform:** IBM PS/2; Syntrex 386-33
- **Type of network:** Ethernet
- **Number of users:** 1,000+
- **Using previous version:** Yes
- **Applications:** E-mail, word processing, spreadsheet, database
- **Reason for purchase:** Macintosh connectivity

COMPUTERWORLD EVALUATION EXPERTISE

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Vines to be not necessarily the greatest speed demon. But performance, for the capabilities that it brings to us, is very acceptable."

Educational: "The benchmark is user input, and there have been no complaints."

TECHNICAL SUPPORT

This question refers to the amount of technical support needed to keep the network running smoothly. It indirectly points to the quality of the product from a support perspective.

Banyan 5.0 users rated the product at average to less-than-average for technical support.

Educational: "I was shipped a patch, and the patch outdated the software. When I patched the server, the clients could no longer use their software."

Telecommunications: "We've had situations where we were up the creek and [Banyan] dialed in [to our Vines 5.0 server] and installed a fix for us."

PURCHASE/MAINTENANCE

Users spent an average of about $8,000 upgrading from Vines 4.11 to Vines 5.0. They had previously spent up to $250,000 on servers and cabling to support their networks. In two cases — the educational institution and the integrator — the costs of the Vines 5.0 upgrade were significantly lower than average because of special pricing from Banyan.

Nonetheless, all users said that costs for the upgrade were about what they expected.

Manufacturer: Regarding Banyan's software-based wide-area networking modules, Banyan "makes it seem easy, but there is some hidden cost there." His installation required additional WAN modules.

INSTALLATION

Evaluators gave Vines 5.0 average to high ratings for single-server installations. In its documentation, Banyan said that installation to a single server requires 45 minutes, and evaluators called that a remarkably accurate estimate.

Getting that installation to function properly across multiple servers was another matter. In mixed environments of Vines 4.11 and Vines 5.0, users reported that file mapping had to be completely reworked to accommodate certain applications. The manufacturing company had not yet completed its plans to connect Vines 4.11 and Vines 5.0 servers over a T1 line.

Integrator: Installation "requires that your house be in order — in much better order than previous versions of Vines."

Manufacturer: "It was one of the fastest [installations] I've ever done."

EASE OF USE

In the eyes of network managers, Vines 5.0 is more difficult to use than previous versions. All evaluators said that was due to the increased range of functions provided with this version. All noted that establishing and administering the new file access rights and print services of Vines 5.0 was a more complex job than had been true in Version 4.11.

Educational: "The access rights are more difficult to manage, maybe because of the new types of files that [Vines 5.0] is allowing access to. There's more on the [administration] screen to manage."

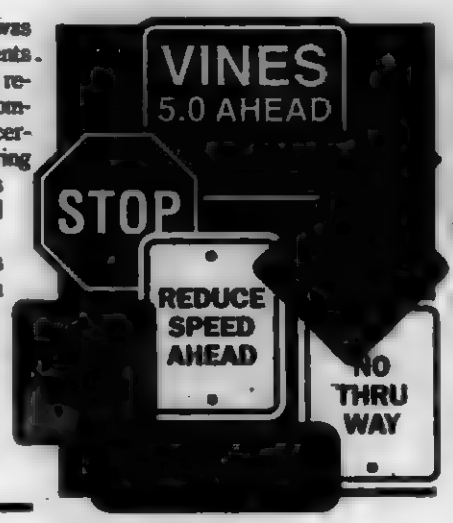
Integrator: "It's much more difficult than previous systems, but only because it is more complex. You're going to find it more complex, at least until you get used to it."

COMPATIBILITY

Vines 5.0 has much less compatibility with previous versions of the operating system than evaluators had expected. Because of its enhanced functionality, they noted, some applications and services that worked in Version 4.11 will not work with Version 5.0. Remedying those incompatibilities requires a thoughtful evaluation of the services and functions required by each application.

Educational: "Everything went fine."

Integrator: "If you have a 4.11 client, there are certain functions you cannot do on a 5.0 server. We got around most of those problems."



Manufacturer: "I cannot communicate from two servers of different rev levels."

ENHANCEMENTS

The enhancements made to Vines 5.0 include better print services; robust control over file access rights; AppleTalk support; an improved file system that supports Macintosh and MS-DOS files; a remote console for network administration and more. Evaluators said they were impressed with the range of file and print services, which they noted had been lost in prerelease hoopla about Macintosh services.

Evaluators who purchased Vines 5.0 primarily for its Macintosh features said they got about what they expected.

Integrator: The new Macintosh features "tended to mask all of the other features and functions in 5.0. And so we found some nice things there that we had not necessarily expected."

Telecommunications: "We thought [Banyan] would have done the file services first, then the print services, then file access. When they all came together, we were surprised that they worked. We were more surprised that they worked together."

Reported by Michael L. Sullivan-Trainor and Garry Ray, CW staff.

BANYAN RESPONDS

Here's Banyan's response to the issues raised in this evaluation:

Why a new version: 5.0 is the next major release of native Vines. We've retained our integrated network services, so StreetTalk directory services are in there with a lot of enhancements. Network management services have been enhanced. Security, file, print services and client support are all in 5.0. We added a new client type — Macintosh support — and redesigned the file system (Vines File Store).

Macintosh integration: Our customer base reflects the marketplace — 18% to 25% of the desktops are using Macintosh. Those installations are buying 5.0 to get Macintosh client integration. New customers are being drawn to Vines because of the Macintosh client support. Other customers just want to protect their investment, and they're taking advantage of the upgrade program or of other features we've added.

Installation: This is the first time we've made such a major upgrade between the file systems. Essentially, we've rebuilt a lot of the product. People who start fresh with a 32-bit file system won't have a problem, compared with going from the previous 16-bit to 32-bit file system.

Ease of use: When you add a lot of functionality and enhancement, you try to keep ease of use in mind. A lot of what we did in the product — rewriting screens, providing installation from tape, the way we implemented different commands — we spent a lot of time streamlining. What we've heard isn't so much that it's difficult, but that it's new and they didn't do it before.

Wide-area connections: Most problems with T1 changes would be a third-party issue. Full T1 server-to-server fractional support is something we're looking at for future products.

Macintosh bugs: We've had no reports of major bugs, and some issues may be better referred to Apple.

INDUSTRY: TELECOMMUNICATIONS

RATINGS	
Reliability	5
Performance	NC
Technical support	5
Purchase/Maintenance	NC
Ease of installation	3
Ease of use	NC
Compatibility	NC
Enhancements	4
Overall	4.3

- **Hardware platform:** CNS 486
- **Type of network:** Token Ring, Ethernet
- **Number of users:** 60
- **Using previous version:** Yes
- **Applications:** Microsoft Windows and Excel, Lotus' 1-2-3 and Notes, OS/2
- **Reason for purchase:** Macintosh support

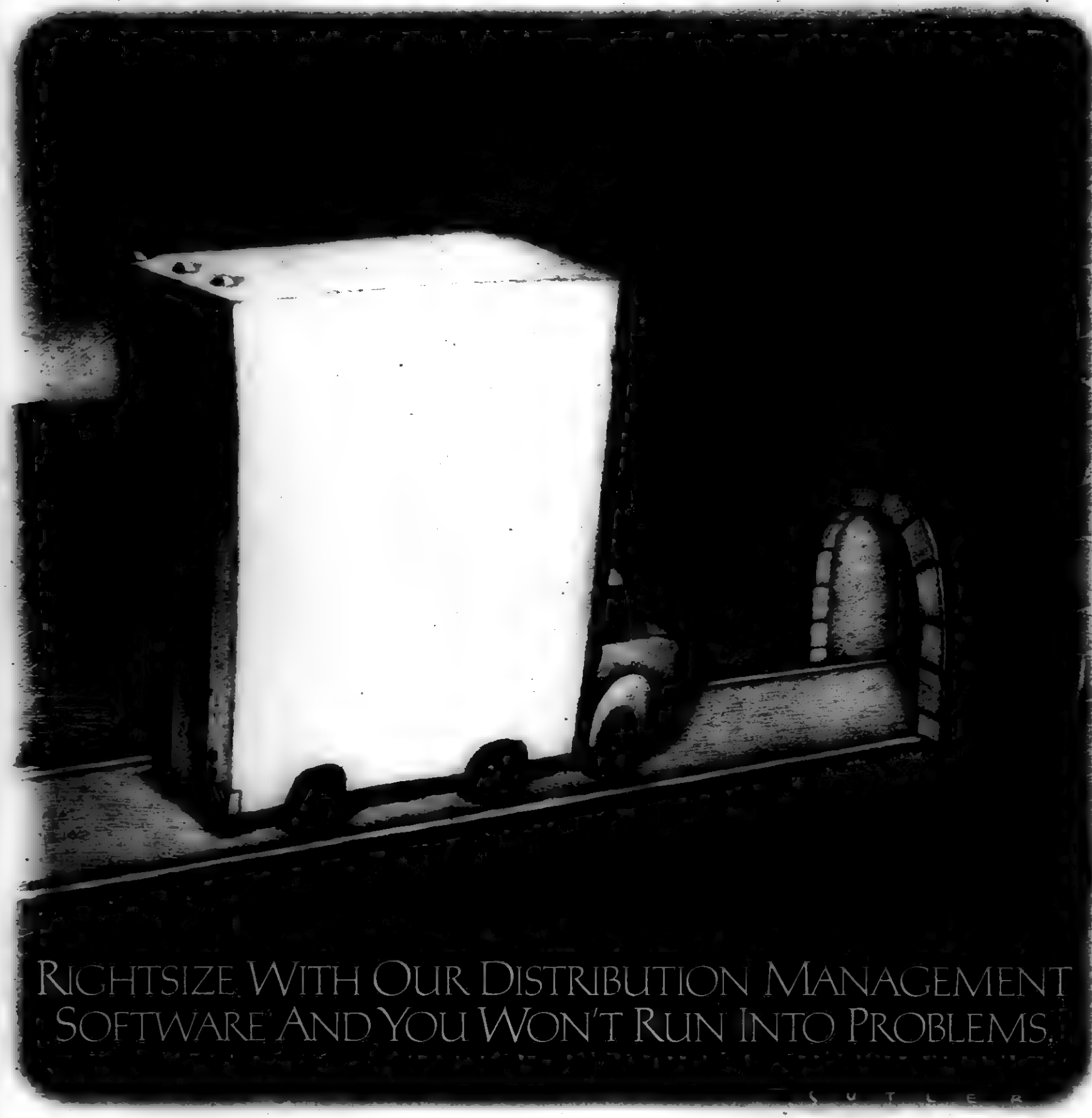
INDUSTRY: SYSTEM INTEGRATOR

RATINGS	
Reliability	5
Performance	3
Technical support	3
Purchase/Maintenance	3
Ease of installation	1
Ease of use	2
Compatibility	2
Enhancements	5
Overall	3.2

- **Hardware platform:** SystemPro, CNS 386
- **Type of network:** Token Ring, Ethernet
- **Number of users:** 65 locally
- **Using previous version:** Yes
- **Applications:** Borland's Paradox and dBase, Microsoft Windows
- **Reason for purchase:** Stay current with the product, better file system

METHODOLOGY: Product ratings and written information are based on the evaluations of four user organizations and product analysts who have extensive knowledge of the product. Each user has a version of the product installed at its site running production work loads. The material was gathered through written surveys and telecommuting. The users are members of the Computerworld Product Evaluation Council. Ratings are based on user expectations on a scale of 1 to 5, where 5 is above expectations and 1 is below expectations. Ratings are presented in order of importance to users.

NC: No comment



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Boole tool offers help for distributed networks

Handles alerts in mixed-vendor environments

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Corporate downsizing can create many islands of information that must be glued together by the enterprise network and monitored by central sites. That work is complicated by the fact that the largest information systems departments tend to be mixed-vendor shops.

In recognition of these two trends, Boole & Babbage, Inc.'s new Auto/Command product was designed to automate the control of distributed computers in an enterprise network.

Auto/Command, announced late last month, works with Boole's 2-year-old Net/Command product, which monitors distributed computers at 35 major sites worldwide. The new features can cut operating costs by reducing the number of network alerts demanding human intervention, Boole said.

Newfound freedom

One early user site, a Los Angeles branch of a large Fortune 500 company, found that Net/Command freed up operators from tending dozens of minicomputers. "People used to do health checks to make sure the applications were still running, that the networks were still running," said an IS manager at the site who preferred not to be identified. "We are looking for Auto/Command to do those health checks and then to initiate a recovery or bypass or network alert if something goes wrong."

Users will be able to write rules-based programs to monitor many kinds of proprietary and Unix minicomputers using IBM's Rexx fourth-generation language. The programs will change streams of ASCII data from the remote computers into a form that can be understood by the central site's Auto/Command console. Boole's Alert Logic Filter Editor feature will spot selected messages and react by sending out network alerts or by issuing a corrective command.

Observers said they expect Auto/Command to complement the movement to automated consoles at IBM mainframe sites.

"My company runs very lean," said Richard Antonini, computer resources manager at Stone Container Corp.'s Chicago headquarters. He installed Net/Command to track both IBM mainframes and Hewlett-Packard Co. HP 3000s last year.

"The automation process captures a lot of mundane tasks and lets the systems run themselves. That allows operators to become analysts who can dig into what's happening when something goes wrong," Antonini added. Stone Container, a $5.4 billion company, uses just two operators per shift at its Chicago data center.

Although Auto/Command issues network alerts, it has a different look and feel than IBM's NetView network management system, Antonini said. The Sun Microsystems, Inc. workstation that Stone Container uses as a Boole console has an icon-and-mouse system to move through windows showing all major sectors of the network. Icons in the shape of the company logo turn red when an alert is posted in a geographic region. IBM's NetView alerts can also be posted to the Net/Command console.

No rivals in sight

Industry analysts said Boole has few immediate competitors for its mixed-vendor automation tools.

"They are looking at the enterprise from top to bottom and moving toward management of a client/server network from a centralized command post," said Bill Strapko, a senior analyst at International Data Corp. in Framingham, Mass. Boole acquired the Net/Command product when it purchased Avant Garde Computing in 1990.

Although Boole may have a lead right now, that lead will not last forever, according to analysts. Computer Associates International, Inc. and Legent Corp. could also decide to adapt their IBM-compatible automated consoles for the Unix area, Strapko said.

Yet Paul Newton, Boole's chief executive officer, said he sees Auto/Command and Net/Command as catalysts for growth at his $100 million company. "Last year, our networking business was 7% of our revenue," Newton said. "This area could grow to be 30% to 50% of our business." Newton did not say how many years it would take for that product mix to be achieved.

Friendly's licks telecom costs

East Coast ice cream chain reaps double-dip benefits with new network

BY JOANIE M. WEXLER
CW STAFF

WILBRAHAM, Mass. — When Friendly Ice Cream Corp. realized that its annual telecommunications tab could potentially surge to $1 million by 1995, its information services department sought an alternative to the value-added network service it was using to communicate with 500 of its restaurants.

What the East Coast chain turned up was a sweet deal: a combination of third-party communications software and AT&T dial-up services anticipated to bring about an 87% reduction in annual transmission fees after a six-month payback, according to Andrew J. DeCusati, senior director of MIS.

Surprisingly, the cheaper scheme has not stripped the firm of functionality. Rather, the now-interactive configuration has provided Friendly's with the ability to remotely monitor and diagnose the network, update a restaurant's hard disk, download new menu prices and soon implement electronic forms distribution and messaging.

Pinching pennies

Part of the incentive for change was that the company's information systems expenditures — including more than $300,000 in yearly fees to network service provider BT North America, Inc. — did not cut it with the firm's relatively new, frugal owners, who bought the company in 1988 when it was losing money. Tennessee Restaurant Corp. purchased Friendly's, reduced personnel 15% corporatewide and issued a mandate that all departments work "smarter." This allowed "no chance of adding dollars to revitalize IS," said DeCusati, who arrived two years after the buyout.

An examination of Friendly's telecommunications setup revealed that the company could economically swap out its BT store-and-forward transport services for a combination of Xcellenet, Inc.'s RemoteWare Communications Management System and AT&T dial-up lines. The scheme included leveraging an existing T1 link between Friendly's headquarters here and its local central telephone office that was sitting virtually idle during off-business hours and using it for nightly polling.

The company launched the setup last fall when the BT contract expired, and DeCusati said he expects his yearly telecom fees to drop to $40,000. Friendly's installed the Xcellenet software centrally in under two man-weeks, he said.

Under the BT scenario, the network provider collected individual data files from each restaurant's local BT "mailbox," aggregated the data on its mainframe, converted it from ASCII to EBCDIC and then transported it to Friendly's headquarters each night over 9.6K bit/sec. leased lines, explained Paul J. Brosek, manager of Friendly's information center.

Now, headquarters polls the restaurants via the Xcellenet package, which works with Friendly's restaurant management software to ship sales, inventory, accounts payable and personnel data back to headquarters for quicker cash flow and sales analysis.

While the Friendly mainframe still houses the corporate Computer Associates International, Inc. IDMS database, it is now front-ended by two redundant IBM Personal Computer AT-bus Intel Corp. 1486-based clones running OS/2 that host the Xcellenet software.

DeCusati said his up-front, onetime costs for implementing the configuration comprised about $80,000 for the Xcellenet software and about $20,000 for the two PCs and 32 modems in the data center.

ON SITE

Friendly Ice Cream Corp.
Wilbraham, Mass.

Andrew J. DeCusati

- **Challenge:** To curb telecommunications costs spent on transmitting data between 500 restaurants and company headquarters under new ownership that slashed personnel counts 15% corporatewide.
- **Technology:** Replaced BT North America network services and reporting software with Xcellenet, Inc. communications software and AT&T dial-up services.
- **Bottom line:** Annual telecommunications charges expected to dive from $310,000 to about $40,000.

Here's the scoop

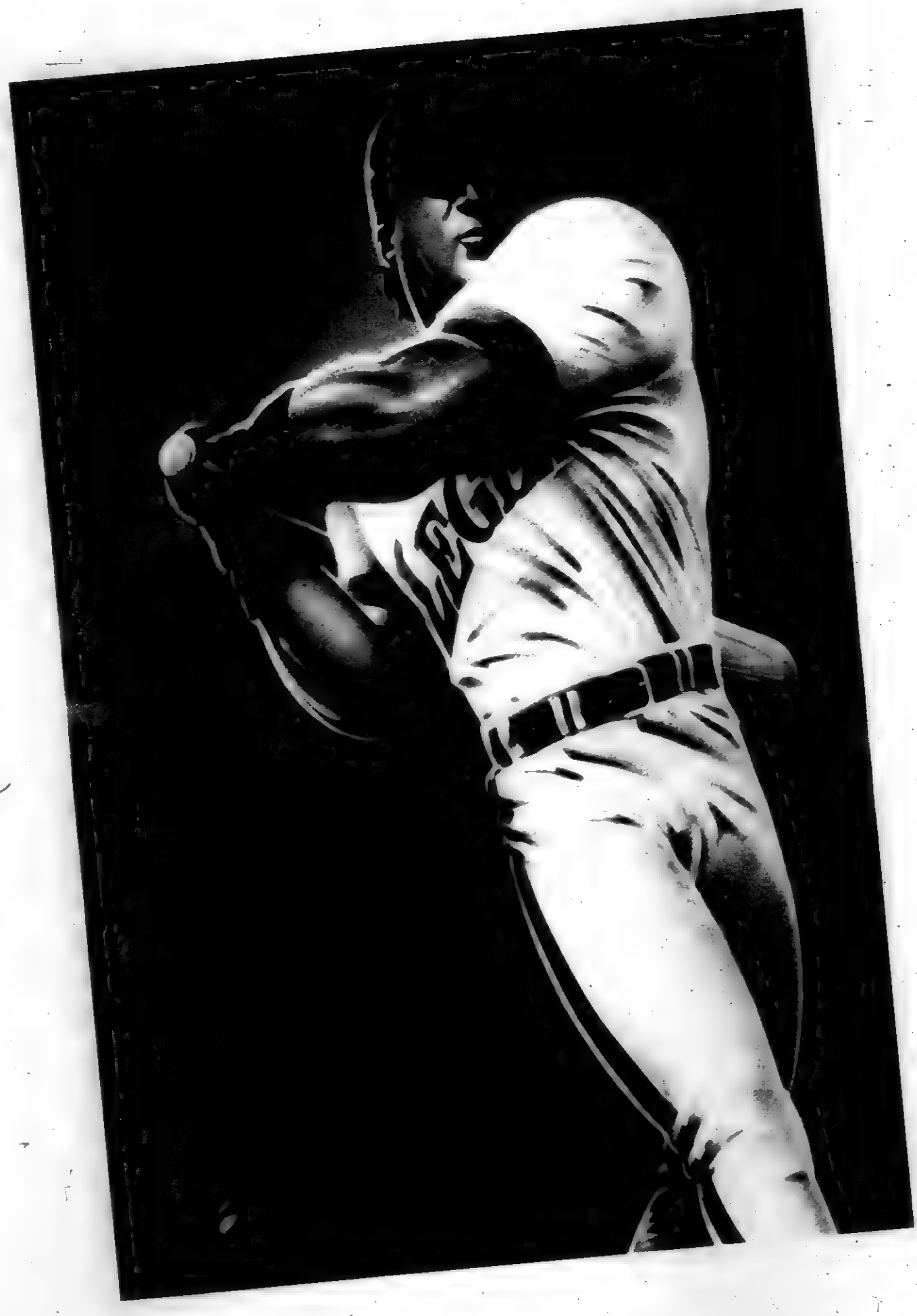
The next step for improving Friendly's IS infrastructure, said Andrew J. DeCusati, senior director of MIS, will be to "look at our point-of-sale gear and figure out how to use it to allow servers to spend more time on the floor."

This could include introducing wireless, handheld computers into restaurants for transmitting orders to in-kitchen workstations. This could speed up meal delivery and free up waiters to attend to customers, he said.

Currently, however, no appropriate handheld gear is on the market with enough storage for Friendly's 100-item menu. "Some are in prototype from companies such as Panasonic and Micros Systems, Inc., but so far they are cumbersome, expensive and have problems with communications," DeCusati said.

Friendly's would have to do some serious market research before initiating automated order-taking, he noted, because it would involve a re-engineering of how the company does business. "We don't know yet how people would react to us waiting on them with computers," he said. "After all, our name *is* 'Friendly's.'"

JOANIE M. WEXLER



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LEGENT

Wisdom of Salomon: Install a configuration tool

CLOSER LOOK
Configuration management systems

BY ELISABETH HORWITT
CW STAFF

Until about a year ago, administering the physical network at Salomon Brothers, Inc.'s New York headquarters was like trying to bring order to a bowl of spaghetti.

"Every desk here has at least four strands of fiber, and since we have about 4,000 people, that's lot of fiber," said Mark Sanders, vice president of network services at the investment firm. "What we found in the wiring closet was never in the documentation, so we would wind up installing new wires because it was cheaper than figuring out what old wires were for."

Syamken *wanted to design networks*

Salomon's situation is an extreme version of what a number of network managers are facing right now: the need to know who is using what on their networks so they can perform effective troubleshooting, inventory management, billing and support.

Salomon made order out of cabling chaos with the help of Command, a combination graphics/data-based network configuration management package from Isicad, Inc. in Anaheim, Calif.

A second company, The Graphic Management Group, Inc. in Valhalla, N.Y., offers two products with similar capabilities: Graphics Networker, based on DOS, and Aperture Networker, based on the Apple Computer, Inc. Macintosh. A Microsoft Corp. Windows version of Aperture is due out in the first quarter of 1993, Graphic Management said.

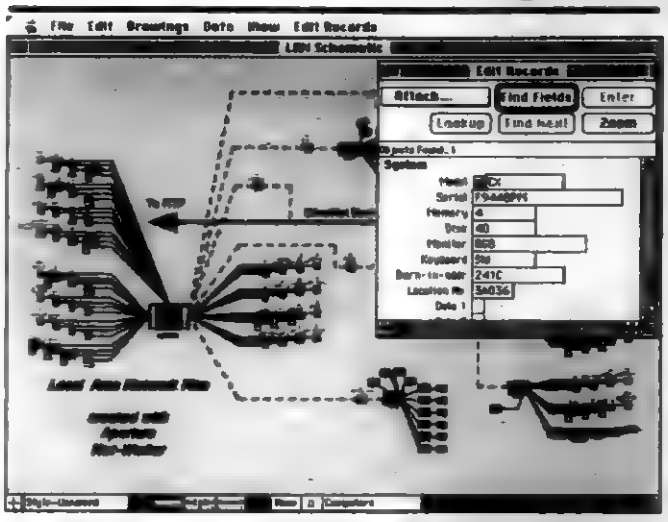
With these products, a graphical user interface depicts cabling and network configurations so devices, users, workstations and offices appear as icons on a topological map. By pointing to an icon, the user can call up records from the database that provide key information about the device, such as what version of software a workstation has installed, the vendors explained.

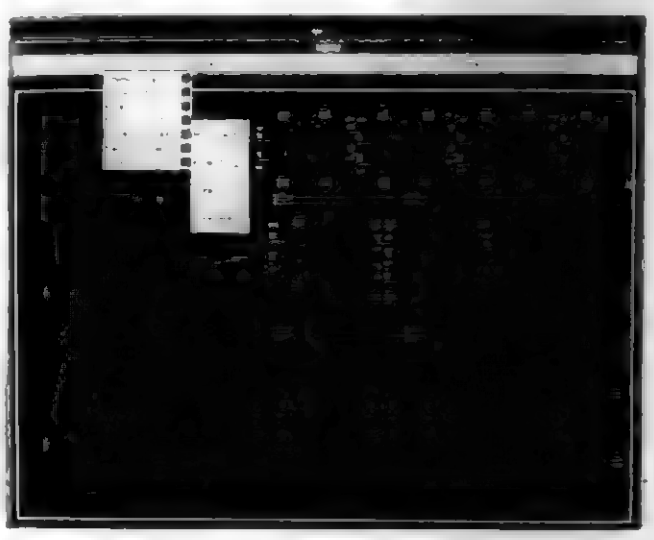
The products represent "a strong combination" for configuration management because users "can easily design the network, including all the physical cabling and devices that sit on it, while at the same time build a database of information, including inventory, attributes and all connectivity involved in the network," said Ginny Mellinger, a director at International Data Corp., a research firm in Framingham, Mass.

Users tended to agree. If Salomon had not installed Isicad's Command, the investment firm would now be spending millions of dollars a year to manage the millions of miles of cabling at its headquarters building, according to Sanders.

"I was looking for something I could use to design networks, both local and remote, that would also give me a look and feel for what we have in-house," said George Syamken, data communications manager at H. B. Zachry Co., a construction company in San Antonio. Graphic Networker "is as easy to use as I hoped, and it's helped me out big-time."

"You can click on a graphic, ask 'what is this?,' and [Aperture] gets the data from the database," said Mark Goldenberg, a systems support engineer with the antisubmarine warfare system division of Hughes Aircraft Co. "Or you can pull down the organizational database, ask the system to 'find all the people in this organization,' and it will highlight their locations on the drawing."





Graphic Management's Aperture *(top) and Isicad's Command enable the design and management of networks*

A major value of the products is their ability to support a variety of network administration applications, including inventory, billing, troubleshooting and design, users said.

Goldenberg's division originally bought Aperture to "know what's where," including computers, networks and cabling, across a 750- to 1,000-person facility, he said. "We very quickly found other uses for mixing graphics and data, such as keeping track of cables end to end and determining which signal goes on which pin on giant matrix panels."

In addition, Goldenberg, who is the primary personal computer support person for his division, can call up Aperture to find out the configuration of a system before he goes out on a trouble call.

"This saves me from having to gather the information when I get there and maybe having to go back to my office" to pick up a needed piece of equipment or software, he added.

Room for improvement

However, users said they see room for product improvement.

For example, Isicad user Avi Meir Lev, facility coordinator at U.S. Bancorp, noted that "the interface between database and graphics is adequate but a bit kludgey. The ideal would be that you pick something out on the map, like a workstation or user, move it [to another location on the map] and drop it down. That does not happen; you have to manually go in, undo and redo."

Isicad responded that it plans to offer a new version of Command in mid-1993 that allows users to pick up a piece of equipment and use a cut-and-paste graphics feature to instruct the system to change everything behind the scenes.

In addition, Goldenberg noted that he would like to see Simple Network Management Protocol support with the Aperture product, though Graphic Management said it has no plans to support the de facto standard at this time.

Vital statistics

Isicad's Command
Platform: Unix workstations
Price: $17,000 to $25,000

Graphic Management Group's Graphic Networker
Platform: PCs running DOS 3.0 and higher
Price: $2,495

Graphic Management Group's Aperture Networker
Platform: Apple Computer Macintoshes
Price: Aperture Professional — $1,995; Aperture Networker — $2,495 (includes: Aperture Professional application plus symbols for network devices, database structures, port structures and sample projects for managing computer network)

A tale of two vendors

Both vendors' product enhancement strategies focus strongly on their ability to exchange information with other vendors' systems. However, their tactics differ significantly.

Isicad

- **Direction:** Integrate Command with popular network management products via Simple Network Management Protocol (SNMP). Supported so far: Hewlett-Packard Co.'s OpenView Network Node Manager and Cabletron Systems, Inc.'s Spectrum.
- **To come, mid-1993:** A new version with The Open Software Foundation's Motif-like interface and integrated help-desk module, which will track moves, adds and changes and track problems through to resolution.
- **User response:** Mark Sanders, Salomon Brothers: "We hope to install the OpenView to Command connection in the next 18 months. Then, if the OpenView screen showed that a workstation had lost its connection to the network, operations people could use Command to pull up a trace of each circuit applying to that particular station."

The Graphic Management Group

- **Direction:** Provide a Microsoft Windows version of Aperture by early next year. An upcoming version of the Apple Macintosh version of Aperture, due out late this year or early next year, will be able to import data from other databases that conform to SQL or Apple's Data Access Language.
- **User response:** Mark Goldenberg, Hughes Aircraft: "Our telephone, network circuit, personnel, room and billing data are all mainframe-based. I have to have some of that data to see how well a network is going to function, so I download it from the mainframe and import it into the Aperture program. Eventually, I hope I won't have to import the data at all, just use the SQL hooks. . . . It would be nice if they got into SNMP on Windows."

NEW PRODUCTS

Network management

Independence Technologies, Inc. has enhanced its IView System Manager Software.

The IView System Manager monitors and controls software and hardware in networks that house products from multiple vendors, the company reported. New features include enhanced Alarm Forwarding, Distributed Management, Line Management and Dual Discovery. Users can purchase an option called Centurion that offers the same features and has a limit of 100 managed devices.

IView System Manager costs $14,500.

Independence Technologies
42705 Lawrence Place
Fremont, Calif. 94538
(510) 438-2000

Security Dynamics, Inc. has announced the ACE/Server for HP/UX, an access control software product for Transmission Control Protocol/Internet Protocol client/server networks.

The product supports Hewlett-Packard Co.'s UX operating environment. ACE/Server was designed to protect HP workstations from unauthorized users, the company reported. Network resources are protected and controlled, even if internal or external entry is attempted through a gateway, remote dial-up or direct connection.

ACE/Server for HP/UX starts at $5,000.

Security Dynamics
1 Alewife Center
Cambridge, Mass. 02140
(617) 547-7820

NetWorth, Inc. has announced HubView, a windows-based hub management application.

HubView fully integrates with Novell, Inc.'s NetWare Management System, providing a Microsoft Corp. Windows-based graphical user interface and port-level control for NetWorth concentrators and hubs. According to the company, the Simple Network Management Protocol allows users to enable and disable individual ports and configure automatically involved backup links for complete physical-layer fault tolerance.

Prices range from $2,000 to $4,000.

NetWorth
8404 Esters Road
Irving, Texas 75063
(214) 929-1700

WAN software

CrossComm Corp. has introduced the X.25 WAN module for its Ilan Universal Router.

The product uses Ilan's protocol-independent routing technology, which allows the X.25 module to route most protocols in the IBM/Token Ring environment over public or private networks.

According to the company, users can configure Ilan with X.25 and other combinations of local- and wide-area network modules to solve many internetworking challenges.

The X.25 module costs $950.

CrossComm
140 Locke Drive
Marlboro, Mass. 01752
(508) 481-4060

IN BRIEF

Carriers announce bandwidth tariffs

Several carriers recently announced tariff approvals or contracts in support of previously announced high-bandwidth network service offerings.

The flurry of activity underscores recent efforts by many carriers to get ahead of customers who are increasingly asking for high-speed facilities to support applications such as interconnected local- and wide-area networks capable of videoconferencing and high-volume imaging traffic.

■ **New York Telephone**, a Nynex Corp. subsidiary, said it had received approval from the state of New York's public service commission for its Integrated Services Digital Network (ISDN) Primary Rate Interface tariff. The telephone company has offered an ISDN basic-rate service, designed for Centrex service and single-line customers, since last April.

■ Furthering its Synchronous Optical Network (Sonet) deployment, **Pacific Bell** announced a three-year contract to buy broadband/wideband digital cross-connect and Sonet lightwave/multiplexing equipment from AT&T Network Systems.

■ **CompuServe, Inc.** announced it would remarket routers for Frame-Net, its nationwide frame-relay service. The company said it would offer products from **Cisco Systems, Inc.** in Menlo Park, Calif., and **Wellfleet Communications, Inc.** in Bedford, Mass.

■ **Pacific Bell** received a regulatory green light for its Switched Multimegabit Data Service (SMDS). Starting in September, SMDS will be offered at the DS1 rate of 1.5M bit/sec. throughout Los Angeles, San Francisco and Sacramento; a DS3 rate of 45M bit/sec. will be offered on a limited basis, according to Pacific Bell.

The telephone company is also testing a frame-relay service, which it plans to introduce next year.

What are VSAT users saying about AT&T Tridom?

At AT&T Tridom, there is nothing more important than standing by our customers — and it shows.

It shows in the 1992 *I/S Brand Preference* survey on wide area networks conducted by *Computerworld* where AT&T Tridom swept five categories including *Best Technology, Best Price/Performance, Best Service/Support, Best Documentation,* and *Prefer to Do Business With.*

It shows in the 1992 *Users' Choice* survey conducted by *Data Communications* in which AT&T Tridom was voted the *Best Overall VSAT Vendor* with the *Best Technology.*

And it shows by what industry analysts are saying. A recent *Yankee Group* report lauded AT&T Tridom's shared hub service capability, technical superiority, and facility for combining VSAT technology with terrestrial data services.

These achievements have occurred for one simple reason: *We make it our business to be totally responsive to our customers' networking needs.*

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404-426-4261, FAX: 404-514-1737

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There are many ways to decrease the time it takes to run utilities. Make sure you examine products carefully because you'll find that other vendors achieve speed at the price of dangerous integrity trade-offs.

Like all BMC products, REORG PLUS does not gain speed at the price of data integrity.

The speed and safety of REORG PLUS has been proven in some of the biggest production shops in the world. So, regardless of how large and complex your data becomes, REORG PLUS can efficiently handle it. REORG PLUS is an investment in not only speed, but safety.

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IBM Business Partner

Edwards to supply Mobil applications

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Mobil Corp., the giant oil company based in nearby Fairfax, Va., has taken another step in its standardization campaign by selecting a suite of business applications software from J. D. Edwards & Co. (JDE) to run on IBM Application System/400 minicomputers worldwide.

The value of the contract is $1.5 million for the initial phase and could grow to $10 million during the next five years, officials at Denver-based JDE said at a recent briefing.

Mobil will install JDE's financial, distribution and manufacturing software modules on a site-by-site basis, beginning with marketing and refining operations in Mexico, Colombia, Nigeria and Egypt.

Last year, Mobil selected the AS/400 as the standard hardware for its midsize operations around the globe, replacing a hodgepodge of IBM System/36s, Hewlett-Packard Co. and Wang Laboratories, Inc. minicomputers and personal computers.

"We're trying to clean up our act," said J. P. Bailleux, manager of systems and computer services at Mobil's oil marketing and refining division.

Global standardization

Through standardization of computing platforms, Mobil expects to gain efficiency in training and technical support.

"We hope that, eventually, the man transferred from Fairfax [headquarters] can walk into a Mobil office anywhere in the world and use the same kind of systems and software," Bailleux said.

"We're among the few companies that are truly standardizing across the world," he said.

After a rigorous study of the top AS/400 software vendors, Mobil settled on the JDE software because it met the users' functional requirements and because JDE has a network of support consultants in most of the foreign locales where the software will be installed.

Training and support are especially important for Mobil's operations in developing countries. "The system has to be sophisticated enough to run the operation," Bailleux said, "but not too complex for the local skills."

Indexing woes vex IS pros

Keeping track of scanned documents is imaging's unsolved dilemma

BY ELLIS BOOKER
CW STAFF

CHICAGO — On the cusp of achieving that long-sought goal of banishing paper records to the ash heap of history, some information systems professionals are nervous.

Their concerns can be summed up in a single word: indexing.

Bruce Silver, director of image management systems at BIS Strategic Decisions in Norwell, Mass., put it simply: "It's not a solved problem."

Most existing imaging applications follow the same process: A scanned image is presented to a clerical worker, who tags the image file to a database record. The database record is filled out with information about the record, including key words, and is then stored. Without the database record as a pointer, the image object, for all intents and purposes, ceases to exist.

"You can submit the image to [optical character recognition] and create a full-word index," Silver said. But describing the document's content for the index, he said, is still a labor-intensive duty beyond the capabilities of current systems.

Undoubtedly, this will be a job for future artificial intelligence engines, he added. Another promising solution may be standardized markup languages that describe a document's content at its creation (see story at right).

The worry over indexing is intensified by at least two other issues.

First, there is the realization that as paper documents are captured digitally, the amount of information maintained in electronic format will increase enormously.

By most estimates, less than 10% of the data currently handled by corporations and government agencies is in digital form. The vast majority remains, for now, on paper. It is no stretch of the imagination that as businesses continue to do away with paper they will, in exchange, have to manage databases containing tens or hundreds of millions of documents.

The second issue is more operational and addresses how imaging systems are currently being deployed.

According to many analysts, users of imaging have largely addressed departmental, rather than enterprisewide, issues. As a result, a single corporation with three imaging systems from the same vendor may find itself with three incompatible indexing schemes.

This is not a problem "until you want to connect systems," said Susan Cisco, who this year completed her doctorate in library and information science at the University of Texas at Austin after a three-year study of indexing as it relates to document imaging.

According to Cisco, if indexing issues are addressed "on the front end," disparate systems could be connected automatically. But Cisco's study, which concentrated on imaging in the pe-

Continued on page 56

Consider this

Before heaving millions of pages of correspondence and paper files into an electronic document imaging system, experts said, users should make the following preliminary assessments about the imaging system's all-important indexing scheme:

• Will enterprise access be necessary?
Most imaging systems deployed today are for departmental applications. Thus, indexes reflect the needs of individual departments. But if enterprise access is in the cards in the future, consider the needs of other users in other departments.

• Will databases across departments be merged?
Although two indexing schemes can be mashed together through interface programming after the fact, a far better approach is a common "data model" adhered to by all current and future applications.

• Has the corporate records management department reviewed the indexing scheme?
Imaging users often fail to consult in-house experts such as the corporate records department. This group may have valuable suggestions on the design of the index and may even know of relevant, emerging indexing standards.

ELLIS BOOKER

Survey pegs computer downtime costs at $4 billion

BY MELINDA-CAROL BALLOU
CW STAFF

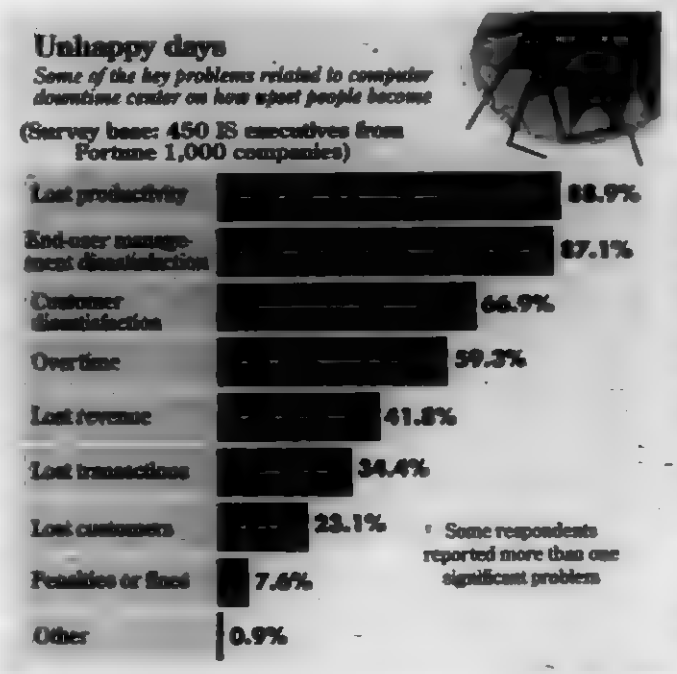
Computer downtime cost U.S. businesses $4 billion, primarily through lost revenue, last year and occurred nine times per year in the average company, according to a recent survey of 450 information systems executives at Fortune 1,000 companies.

The study was funded by Stratus Computer, Inc. in Marlboro, Mass., and was conducted by the Strategic Research Division of Find/SVP, a research company based in New York.

Survey participants were asked about the costs and other impacts of computer system failures, and users from the following seven industries were interviewed: banking, securities, retail, manufacturing, telecommunications, health insurance and travel/transportation.

Industry analysts said that the results of the survey seemed reasonable, if a bit conservative, and that the survey highlighted a key issue for businesses not only in the Fortune 1,000 sector but also across the board.

Users interviewed for the survey agreed. They said their businesses lost an aggregate $3.4 billion in annual revenue because of unplanned computer downtime.



The average revenue loss per hour of downtime was $78,191, with several companies reporting hourly losses of $500,000 or more.

Thumb-twiddling

Productivity costs associated with computer downtime indicated that it caused workers more than 37.3 million idle hours, which translated into $400 million in lost productivity last year.

When combined with the $3.4 billion in lost revenue, the total losses amounted to $4 billion, the survey concluded.

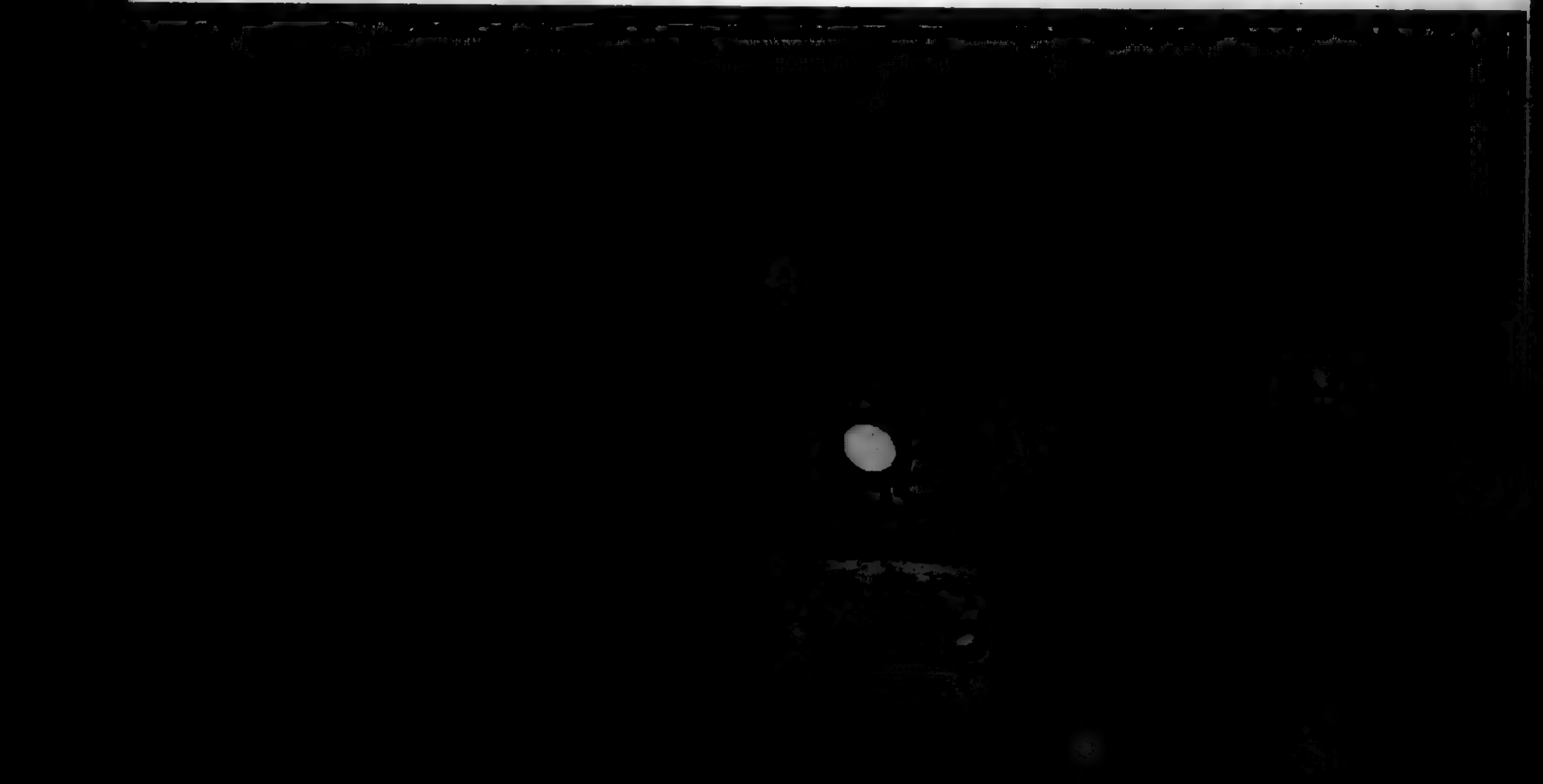
These figures did not include overtime costs, which were incurred by 60% of the responding companies, or customer loss, which affected 23.1%.

The survey also found that each time unplanned outages occurred, systems were down for an average of four hours.

Seventy-five percent of the

Continued on page 56

Bursting bubbles.



The computer that mad

The bubble in the middle doesn't really exist. It's just an image made from reflections of the sky, of the ground, of the other bubbles.

Only they don't exist either. The whole picture is a mathematical fantasy, and the giant computers that put men on the moon would have struggled to create it.

But an IBM RISC System/6000™ which can sit on your desk, did it easily using RISC technology which was invented by John Cocke, a research scientist at IBM. The RISC System/6000 isn't the only RISC computer, but it is the most advanced thanks to another idea (also Dr. Cocke's) called superscalar technology.

e this picture is also making history.

In an historic test at a national research lab, a RISC System/6000 was pitted against a Cray® supercomputer for selected applications, and it won. But even more startling, the same lab has since replaced one of its Crays with a network of our smaller machines.

We point this out, not to brag (well, maybe a little), but because the RISC System/6000 is fruit of IBM's huge investment in research, and it shows how our process is changing.

We spend over $6 billion a year on R&D, and we probably do more pure research than anyone. But lately, our top scientists work more closely with real products, and it helps. For the RISC System/6000, the man who pioneered its basic technology also led it to market. And the original lab team not only stayed with it, half of them moved from New York to Texas to join the development team.

As a result, our customers (often researchers themselves) can have massive computing power at affordable prices, to help them improve their own products.

But what hasn't changed about IBM research is the value of a person like John Cocke, who is one of 58 IBM Fellows. It's a title he earned by having great ideas, and it gives him the one thing he treasures most. Complete freedom to have more of them.

IBM®

BMC shifts strategy with new DB2 tool

BY JOHANNA AMBROSIO
CW STAFF

BMC Software, Inc.'s Change Manager, a new tool for users of IBM's distributed DB2 database management system, represents a strategy shift for the company.

"We've been providing tactical products for 12 years," said Max Watson, BMC president and chairman. A tactical product solves a specific problem and can be cost-justified in six to nine months. "Our long-term strategic direction now is to ensure that all of our customers' data in IBM mainframe databases will be available, reliable and synchronized.

Change Manager does both, he said, by not only solving "immediate heartburn" but also fitting into the longer term direction "for us and for customers."

Added to Alter

Change Manager is essentially an extension of another BMC product, Alter for DB2, which was introduced in 1987. Alter helps database administrators and programmers make changes to objects in a DB2 catalog. These objects can include tables, indices, views, storage groups and table spaces.

With Change Manager, customers can keep multiple DB2 catalogs in sync. It does not matter where the DB2 catalogs are, whether they are on different machines in various physical geographies or in different regions on the same machine.

At the heart of the new product is BMC's Change Definition Language (CDL), which helps programmers define what changes they want implemented in DB2.

The language is intended to be a user-friendly front end onto DB2's Data Definition Language (DDL) and is similar to an English front end masking the complexity of SQL, BMC executives said.

CDL still generates DDL, which DB2 requires, but it means less work on the part of the programmers.

Ed Chopski, a database administrator at CSX Technology in Jacksonville, Fla., has been field-testing Change Manager for several months. "We have three mainframes with four DB2 subsystems and keeping all the changes in sync can be quite a chore," he said.

Change Manager "takes the existing DB2 table, compares it to what you want it to look like and generates the statements to make that happen," Chopski added. He said that making changes takes about "half as long" as it took with Alter.

Positive feedback

Change Manager has been beta-tested at three sites, with about 45 customers placing orders, BMC executives said. The Fleming Cos., a grocery wholesaler in Oklahoma City, hopes to have Change Manager installed by the middle of the month, said Dorsey Douglas, a database administrator.

"We've been using DB2 for about 2 ½ years, and our applications are growing," he said. "We've had problems moving objects and data from one DB2 subsystem to another."

Fleming recently began using Alter as well. "In the old days it would have taken me four days to move 350 objects from one DB2 subset to another," Douglas said. "Now it takes me a half day, and I can spend my time doing more important things like working with developers and not being a clerk."

Pricing for Change Manager begins at $26,000.

Downtime costs $4 billion

CONTINUED FROM PAGE 53

respondents also indicated that downtime will become even more of an issue for them as their dependence on systems increases, and also as they become more reliant on data communications networks, which they noted would leave them more vulnerable to on-line system failures.

The study also found that systems downtime was caused primarily by failure of disk drives (26.4%), computer hardware (24.3%) and software (22.3%), with communications processors causing 10.8% and data communication networks causing 10.4% of failures. Human error was the least likely cause, according to respondents, with an occurrence rate of 5.9%.

The downtime concerns of users of fault-tolerant systems who were interviewed last week ranged from mission-critical applications and human safety on the part of air traffic controllers and highway dispatchers to a securities firm's sheer business necessity.

"Downtime is one of those things in the financial industry that just cannot be tolerated," said Simon Sarofsky, a vice president at Herzog, Heine, Geduld, Inc., an investment firm in New York.

Much at stake

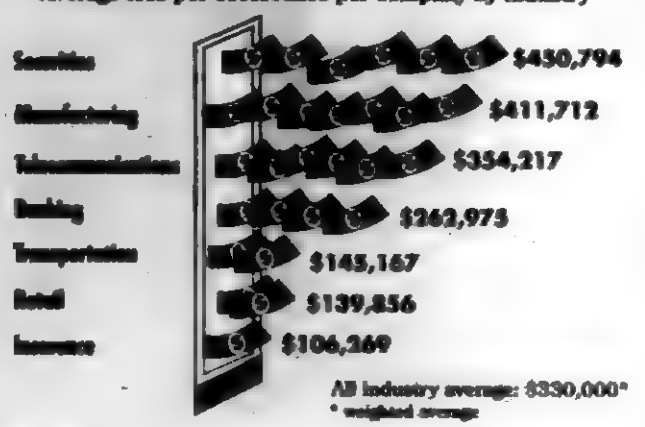
"We're talking about people's lives and public safety," said Leroy Siebert, assistant chief at the information management division of the California Highway Patrol, based in Sacramento.

"The issue for us was not so much the loss of revenue or number of shipments, more that [our applications are] mission-critical, dealing with security and safety," said Jim Fraser, the city of Houston's division manager for aviation IS.

In-securities

A computer outage is likely to cost a securities firm four times what it costs an insurance company

Average loss per occurrence per company by industry



Source: Strata Computer, Inc.

CW Chart: Janell Genovese

Indexing woes vex IS pros

CONTINUED FROM PAGE 53

troleum industry, found such planning to be the exception rather than the norm.

In addition, Cisco found that when it comes to creating an index for an imaging system, it is end-user departments that are calling the shots. Of 50 respondents to a questionnaire asking "who designed the index," 19 said end users.

"The salient point is the end users are driving not only the purchase of the imaging system but the indexing scheme as well," Cisco said.

Client-oriented

Connecticut Mutual Life Insurance Co. in Hartford, Conn., was one company that sought to avoid such departmental biases long before it began installing its first imaging application from FileNet Corp. two years ago.

"We decided several years ago to be client-oriented," Vice President Roger Thibodeau explained. A decade ago, he said, "contract policies" were the basic element of the company's IS. "If you had five contracts with us, we saw you as five customers," Thibodeau said.

That changed about five years ago, when the insurance carrier created a "client file" under IBM DB2 on its corporate mainframe. "When we introduced imaging, it was a natural for us to create an index for the image file [under the same DB2 resource]," Thibodeau said.

When agents log on to the mainframe, they see an "inventory" of all the documents in a client's folder.

Nevertheless, Connecticut Mutual's DB2 index of documents is not very detailed. "We don't define 'To' or 'From' on correspondence," Thibodeau explained. "You have to figure out the labor costs you incur by doing this sort of index, compared to the labor costs of infrequently going into the correspondence to find a particular document," he said.

Likewise, Thibodeau said he could not make a business case for scanning the 1.3 million paper file folders, representing every file contract in force at the time. "Sure, we went and took a look at what it would take to scan and index these 70 million documents. But we couldn't justify the cost," he said.

Instead, Connecticut Mutual put its money in making the DB2 index as flexible as possible.

Correct indexing is also critical in order to write associated records near each other on a single optical disc, the storage subsystem of choice for document imaging. This is because write-once read-many (WORM) optical drives have considerably slower retrieval speeds than magnetic disks or tape.

Elias Safdie, director of systems delivery at the DMR Group, Inc. in Boston, told the case of one automobile leasing company that filed its paperwork on a WORM chronologically. This worked fine unless records for one customer were spread among multiple optical discs.

"These guys didn't buy a jukebox, so the disks had to mounted by hand," Safdie said. "Eventually, workers found it quicker to go to the paper files."

A possible solution

If standardised indexing codes could be written at the time of the document's creation, everyone would save time and money.

This is the goal of markup languages, including the Standard Generalized Markup Language (SGML), an International Standards Organization standard. SGML has been given a boost by the government's Computer-aided Acquisition and Logistics Support initiative, which requires SGML.

SGML has benefits for both searching and displaying documents. Once titles, authors and other document elements are tagged in SGML, they can be searched for by the database. Also, a user interface can take the SGML tags and display them in a variety of ways, according to the user's needs.

Showing the value of SGML is the Core Project, an electronic-publishing experiment seeking to provide scholars with on-line access to all American Chemical Society journals since 1980, as well as chemistry abstracts. The project is a collaboration among Cornell University's Mann Library, Bellcore — which is translating the original typography files into SGML — the American Chemical Society, the Chemical Abstracts Service and the Online Computer Library Center, Inc., a nonprofit organization serving 10,000 libraries worldwide.

Dublin, Ohio-based Online Computer Library Center is building the database for searching the text and graphics. But the center's Stuart Weibel conceded that Core Project will work in part because "we're dealing with a much more narrow universe than a commercial business would have."

The complete Core Project database is expected to be mounted this fall.

ELLIS BOOKER

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   ☐ 9+ months ☐ No current plans

4. How many printers do you plan to purchase during the next 12 months?
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NEW PRODUCTS

Database management

Micro Data Base Systems, Inc. has announced the MDBS IV.

MDBS IV is a high-performance database engine used as a Novell, Inc. Netware Loadable Module. MDBS IV has an on-line transaction processing database management system that uses entity-relationship modeling and client/server architecture.

This version has a 300% improved speed over the MDBS IV DOS version, and the database server is fully 32-bit compiled and multithreaded. It can run with as little as 512K of random-access memory.

The MDBS IV starts at $7,000.

Micro Data Base Systems
2 Executive Drive
Lafayette, Ind. 47903
(317) 447-1122

System software

BMC Software, Inc. has announced Data Packer/OS.

According to the company, the product cuts direct-access storage requirements 60% to 90% without risking data integrity for MVS-based sequential and partitioned data sets. Data Packer/OS reduces the subsystem I/O load and elapsed time for sequential batch processing.

Features include a transparent implementation and a simulation mode to assess the impact of compression prior to actually compressing the data.

Data Packer/OS prices start at $7,500.

BMC Software
Suite 320
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77478
(713) 240-8800

Kisco Information Systems has announced Squash Release 3.0, a source file compression program for the IBM Application System/400.

Enhancements include a recoded compression algorithm and improved access speed for the On-Line Archive feature. Release 3.0 of Squash allows source files to be reduced by 75% to more than 90%. It then returns that disk space for other use.

The program source code in the source files that the AS/400 stores takes up more disk space than is necessary. With Squash, users can store programs in a compressed format, providing more disk storage space.

Squash has a onetime license fee of $500 per machine.

Kisco Information Systems
Suite 121
120 Beverly St.
Mt. Kisco, N.Y. 10549
(914) 241-7233

IBM updates RISC family

IBM has announced a new family of reduced instruction set computing-based System/88 fault-tolerant computers, which double the power and improve price/performance over earlier versions of the product, according to IBM officials.

The computers operate with matched or duplexed pairs of processors and other hardware components and are repackaged versions of the X/AR systems from Stratus Computer, Inc., which were announced last month [CW, July 20].

The new machines are available with 32M to 512M bytes of duplexed memory and support up to 105G bytes of duplexed direct-access storage, officials said.

IBM also announced a 1.46G byte disk drive for the System/88 direct-access storage device (DASD) subsystem.

The new entry-level 4596 Model 229 is priced less than the current entry-level 4576 Model 910 but offers twice the performance, IBM officials said.

Prices for the 4596 models range from $119,000 to $337,900, and all models are expected to ship by December. The System/88 DASD subsystem will be available by the end of this month.

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	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.8	7.1	8.1	7.6
Price/Performance	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	8.8	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	8.8	8.4	8.9	9.1	8.8	9.0
PRODUCT SUPPORT						
Documentation	8.9	8.2	8.8	5.7	6.2	7.3
Vendor Training	8.7	7.8	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.5	7.2	8.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.8	6.4	6.9	7.0
Frequency of Releases	8.8	7.5	8.7	7.2	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.8

Compiled from the 1991 Datapro Reports on Software/Computer System Online Software, available for each product listed (January 1991). The statistics are based on actual users of the products as surveyed by Datapro.

VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	ADVAN-TAGE	INGRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	8.00	8.19	5.90
Memory requirement	7.37	8.16	4.25	8.19	5.22
Ease of programming	8.03	7.09	6.06	6.20	5.80
Ability to manipulate data	9.19	7.41	7.44	8.81	5.97
Sorting capabilities	9.02	7.44	7.69	8.66	5.78
Provision for software security	8.56	6.93	7.26	5.07	5.78
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.61	7.05	6.15	6.10	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	8.09	7.66	7.66	6.61	6.11
Satisfaction with product portability	8.52	7.04	6.22	5.56	5.13
Overall quality of product	8.64	7.37	6.69	6.32	5.44
Product Features Average	8.64	7.10	6.61	6.14	5.60
SUPPORT FEATURES					
Provision for customer support	7.74	6.86	5.76	5.77	5.50
Charges for training time	4.89	4.49	4.58	5.64	4.56
Provision for technical support	7.81	5.76	5.72	5.87	5.22
Provision for marketing support	6.89	5.66	6.09	6.13	3.80
Documentation & product information	8.76	5.73	6.56	6.46	5.56
Frequency of updates & revisions	8.49	6.86	6.34	5.67	5.00
Support Features Average	7.73	5.79	6.04	5.90	4.94
Overall Average	8.34	6.66	6.65	6.08	5.32

Rated on everything from performance and reliability to service and support, PROGRESS trounces all of its competitors in the 1991 Datapro user surveys and the 1991 VARBUSINESS Software Report Card.

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CPWADV0810

IN BRIEF

Object technology invasion

Object-oriented technology will seep into information systems shops in three phases during the next several years, according to a survey conducted by **Forrester Research, Inc.** The Cambridge, Mass.-based market research firm discovered that companies will manage the massive reorientation that object technology requires by first retraining the development staff during the next two years. Then users will try new tools in self-contained workgroup applications, after which users will embrace object-oriented development corporatewide by the late 1990s, Forrester said.

LBMS, Inc. released Systems Engineer Version 4, an upgrade to the Houston-based company's Microsoft Corp. Windows-based integrated computer-aided software engineering tool set. It is priced at $5,000 for the workstation and $7,500 for the repository.

Unix development tool maker **Suite Software** in San Francisco is shipping SuiteDome, a tool that was designed to let users build and run distributed applications across multivendor networks.

SuiteDome, priced from $2,500 to $75,000 per node including a class object library, supports **IBM, Hewlett-Packard Co., Digital Equipment Corp.** and **Sun Microsystems, Inc.** workstations.

DOS-, IBM OS/2- and **Microsoft Corp.** Windows-based application development tools from **Micro Focus, Inc.** are now available to the **U.S. Postal Service** via the Microcomputer Software Acquisition Project contract that was recently awarded to **General Technology.**

Graphical look gives PG&E a fresh start

BY CHRISTOPHER LINDQUIST
CW STAFF

Find someone who is learning to read. Hand him copies of *The Wall Street Journal* and *USA Today*. Which do you think he will look through first? He will probably go immediately to the one that is easier to read, more colorful and more inviting.

The same holds true for the difference between a DOS prompt and a graphical user interface (GUI). Simply dropping personal computers in front of users does not guarantee productivity gains. If the users are intimidated, just the opposite may occur. To be effective, they must feel that the PC is another tool for doing their jobs. That was a lesson learned by Pacific Gas & Electric Co. (PG&E) that caused the utility to rethink its approach to the delivery of information technology.

"We actually had a vision several years ago of trying to move us to an on-line enterprise," said Arthur Beckman, manager of information technology services at PG&E. "We started trying to implement that, and we were quite a ways down the path, and we said, 'Boy, it really isn't meeting the true needs of the people.'"

Complicated ingredients

That realization changed PG&E's focus from becoming an "on-line enterprise" to being an "empowered enterprise." But while being on-line was primarily a technology issue, empowerment is equally split into technological and cultural parts. And converting either part is no small task when you manage more than 20,000 PCs.

A big portion of the technological side of the equation is GUIs and the advent of PCs that are powerful enough to make them feasible. At PG&E, Microsoft Corp.'s Windows 3.1 running on Intel Corp 80386- and 1486-based machines provides a common look and point-and-click simplicity to a wide variety of applications — both third-party and those developed in-house.

The user reaction to a graphical environment was heartening. As an example, Beckman pointed to a character-based payroll system that "people hated." The system is now being converted to a fully graphical Windows environment that presents a representation of an actual time sheet.

"The metaphor which they're used to dealing with in the paper form is now in electronic form," Beckman said. He added that he has been to prototyping sessions for the new system where clerks who "would sit there and tell you how they hate the thing, within five minutes are telling you, 'God, this is great!'"

Mass appeal

Indeed, users found the new technology so appealing that PG&E nearly doubled its original estimates of how many graphical workstations would be converted in the first year, raising the total from 4,000 to nearly 9,000. "That was definitely because people really wanted this stuff," Beckman said. "There was a definite pull going on out there."

But while new technology can make a system more inviting, it takes people to spread the word about what is available and to convince others that something is worth trying. As a result, PG&E has devised various ways to familiarise users with technology and bring information systems out of the back room.

The IS department makes presentations to other departments on an almost daily basis. Videos describing the uses of new technology are available, and users are encouraged to take part in testing programs for new products. Open houses allow users to meet IS personnel and see demonstrations of the latest available technology.

A noble ambition

All this is done with the goal to "get [technology] in front of people so they can use it as they would any other tool," Beckman said.

The tactics seem to have worked. Several user-initiated and even user-developed projects have been completed, and more are under way. Among them are an electronic bulletin board system that is used to buy and sell natural gas and an accounting and budgeting system that gives local foremen immediate access to detailed, current information about their operations, rather than the 6-week-old information that used to be circulated on paper reports.

Still, Beckman said, he is not trying to turn his users into programmer/analysts. Instead, "we are trying to put a suite of end-user tools in front of them where they can do this type of thing," he said. "We provided the tools and the infrastructure so that people can be picking things off the shelf to help them be more competitive in their job."

And if the users are more competitive in their jobs, the company can be more competitive. "Employees and the enterprise as a whole really are using information technology aggressively and competitively on behalf of the company," Beckman said.

ON SITE

Arthur Beckman

Pacific Gas & Electric
San Francisco

- **Challenge:** To enable some 25,000 end users to more effectively use computer technology in their jobs.
- **Methods and technology:** 386- and 486-based user workstations running Microsoft's Windows along with a wide variety of Windows-based applications and development tools. Internal trade shows used to familiarise users with the products and services available to them.
- **Results:** Users are able to visualise and execute computerised solutions to company problems. Users also feel closer to the process and the IS department.

Oracle set to release graphical tool suite

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. has been on a product kick this summer, introducing its Oracle 7 relational database on June 15 and both a secure database and a revamped suite of financial applications last month. Yet one more shoe is about to drop: a suite of graphical development tools.

According to users, the new tools may be demonstrated at the International Oracle Users Group meeting scheduled for next month in San Francisco. Actual delivery is expected sometime next year.

User and analyst sources said the product family is composed of several elements, including the SQLForms 4.0 application developer, the SQLReport-Writer 2.0 report generator and the underlying graphics technology called Toolkit 2.0.

Users of the current SQLMenu front end for developers will find that it will be rolled into SQLForms 4.0 and will not continue as a separate product, sources said.

Oracle's application development tools are used at most Oracle database sites, although a significant percentage have third-party tools from Powersoft Corp., Uniface Corp., Progress Corp., JYACC, Inc. and other companies.

Waiting game

Many users seem willing to wait until next year for the new tools, primarily because they can start Oracle 7 database application work today with SQLForms 3.0.

"It's going to be real nice to have the new features, but you don't have to have all that graphical stuff to fill a database field," said Warren Capps, director of Oracle systems at STR Corp. in Reston, Va.

At least one top Oracle executive confirmed that the tools introduction will cap a makeover of the entire product line.

"We're going to roll out new versions of virtually every product we have," said Jerry Baker, vice president of Oracle's Product Lines Division.

During the next 12 to 18 months, Baker said, product shipments will include SQLForms 4.0, SQLReport-Writer 2.0, an end-user tool for viewing networked databases called Browser 1.0 and a group authoring package called Bookviewer 1.0.

Whenever the suite is released, it may be the last product splash that Oracle makes for some time.

COMMENTARY

Sesha Pratap

Recycling software

Many software development organizations are adopting object-oriented techniques and technologies in the hope of increasing software reuse.

Software reuse will increase as software groups move to component-based development and begin to use interactive programming environments to aid in the transition.

Traditional programming

The traditional unit of most software development is the file. Program code and data contained in collections of files are compiled and linked together to form a complete program.

Debuggers are used to control the execution of the program and to examine the state of the program when it is stopped.

Compilers and debuggers support a static, file-oriented model of development where the unit of execution, testing and debugging is the complete program.

But the model presents several obstacles to effective software reuse. First, it makes it difficult for programmers to prototype and experiment with reusable software components by requiring a complete program for execution and debugging.

The file-based model also does not encourage programmers to develop reusable software because it is very difficult to isolate and work with subsections or components of a program.

Since programs are physically linked together, software reuse is also impaired by the dependencies that creep into a program.

These dependencies are difficult to avoid and isolate because the code for a component or collection of components can be distributed over several files and can have dependencies to many other program and system files.

Component-based development

Naturally, the key to software reuse is that software be developed using reusable components. These programs would consist of individual components that are linked together to create an application. A component is a stand-alone entity that performs a service by receiving and sending messages or information along with other components.

Component-based programming shifts the development process from creating a single, linked program to reusing existing components and assembling a program in an incremental, iterative manner. The development process of writing, executing and debugging code happens with individual components instead of with a compiled program.

Unfortunately for software development organizations, a computing environment that will support component-level development is several years away. This computing environment would consist of an object-oriented operating system, an object request broker and standard components to provide system services. The only computing environment that contains these capabilities today is the NextStep environment, which provides a proprietary object-oriented environment with many reusable components.

SINCE PROGRAMS ARE physically linked, software reuse is also impaired by the dependencies that creep into a program.

Interactive programming

In the absence of standard, widely available object-oriented computing environments, software developers can improve software reuse by using interactive programming environments that support component-level development.

In order to support component-level development, a programming environment must offer the ability to execute, test and debug individual code fragments or objects. Also, the environment should provide work space for creating new data and objects interactively. Interactive programming environments (IPE) have been used for languages such as Lisp and Smalltalk and are now available for languages such as C and C++.

IPEs allow programmers to write, execute, test and debug code fragments without requiring a complete program. Programmers can experiment directly with class libraries and existing software components to better understand how these objects can be used.

Software reuse can be greatly improved if developers can adopt a component-based development model. In the absence of an object-oriented computing environment that supports component-based development, programmers can improve software reuse by using programming environments that support component-level development.

Pratap is president, chief executive officer and cofounder of Centerline Software, Inc. in Cambridge, Mass.

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NEW PRODUCTS

Application development tools

Matesys Corp. has introduced a new version of ObjectView 2.0.

According to the company, ObjectView 2.0 is a professional development tool that supports every aspect of a client/server development project.

The product can support industry-standard programming languages, which enable users to build complex applications. New features include a debugger, object data dictionary and open architecture.

ObjectView prices range from $999 to $2,999.

Matesys
Suite 175
900 Larkspur Landing Circle
Larkspur, Calif. 94939
(415) 925-2900

Bristol Technology, Inc. has announced HyperHelp 2.0.

Designed for OSF/Motif and OpenLook, HyperHelp 2.0 is a hypertext-based facility. New features include an OpenLook Viewer, PostScript printer support, FrameMaker file support and multimedia capability.

Other key features include a single function application programming interface and the ability to perform full text searches.

HyperHelp 2.0 costs $4,000 for a binary license and $25,000 for a source-code license.

Bristol Technology
898 Ethan Allen Highway
Ridgefield, Conn. 06877
(203) 438-6969

Arnet Corp. has introduced the Arnet OS/2 device driver, a product that conforms to the Asynchronous Communication Device Interface OS/2 Extended Edition 1.2 standard from IBM.

Programs written in languages such as C/2, Macro Assembler/2 and Pascal/2 gain access to the driver via the Asynchronous Communication Device Interface. Application programs using the device driver can access Arnet's MultiPort serial port boards, providing additional communications port devices for up to 32 ports in a personal computer, the company reported.

Prices start at $269.

Arnet
Suite #6
618 Grassmere Park Drive
Nashville, Tenn. 37211
(615) 834-8000

Better CASE translation

A new application development framework could ease the woes of those seeking to integrate disparate computer-aided software engineering (CASE) tools.

Called Toolbus, the CASE integration platform from The Barton Group in North Andover, Mass., uses a proprietary "model mapping system" to translate data from various CASE tools into a common file format, according to company officials. Once done, these information models can be shared among all tools residing on the Toolbus platform. The system also allows migration of existing CASE models from one tool or repository to another, they said.

Shipping since early July, Toolbus works with a number of CASE products, including those from Bachman Information Systems, Inc., KnowledgeWare, Inc., Popkin Software and Systems, Inc., and Texas Instruments, Inc. Platforms include IBM's MVS, VM and OS/2 and Digital Equipment Corp.'s VMS.

GARRY RAY

VMark releases GUI tool kit

VMark Software, Inc. recently announced NewLook, a graphical user interface tool kit for use with the company's Universe relational database.

The tool kit, which the Framingham, Mass.-based company said provides 80 functions including scroll bars, push buttons and dialog boxes, currently runs under X Window System- and character-based terminals. Support for Microsoft Corp.'s Windows and Apple Computer, Inc.'s Macintosh will be available later this year, the company said.

NewLook, which can be used to develop new Universe applications or to upgrade existing applications, is available at prices ranging from $395 for ASCII terminals to $10,000 for unlimited access to Universe applications.

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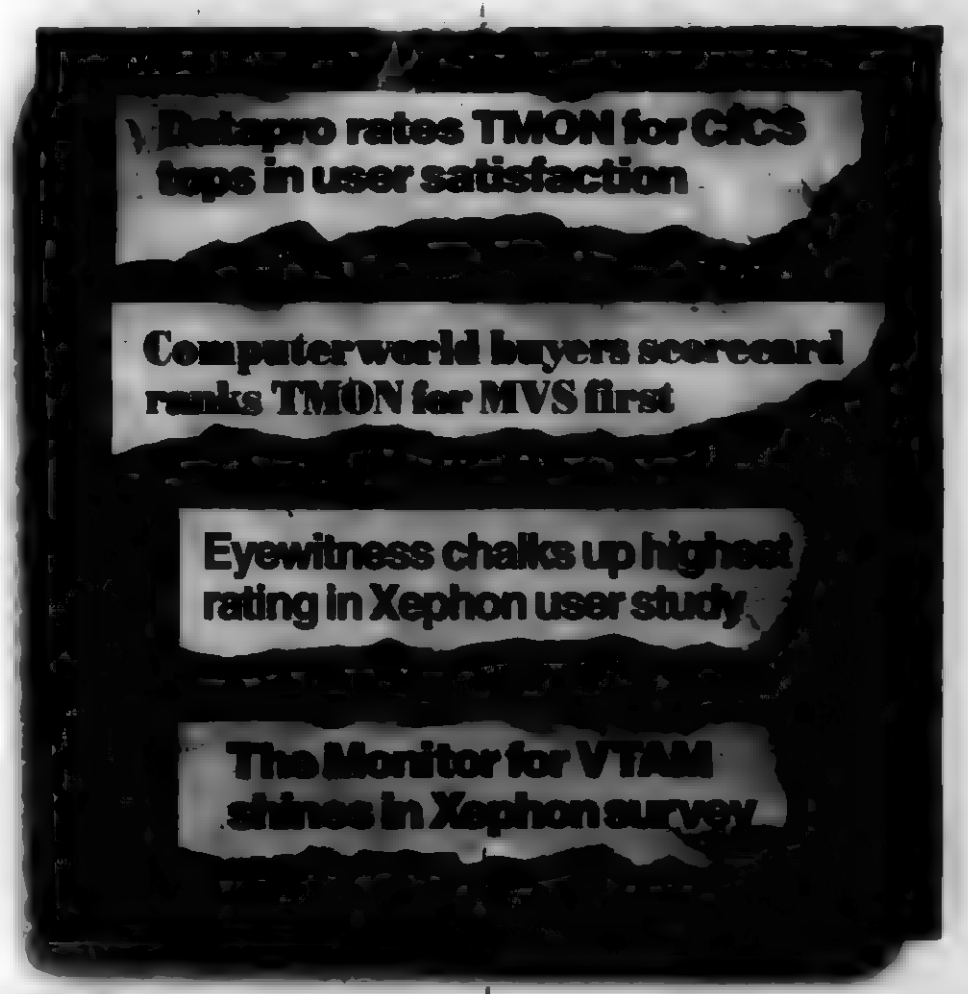

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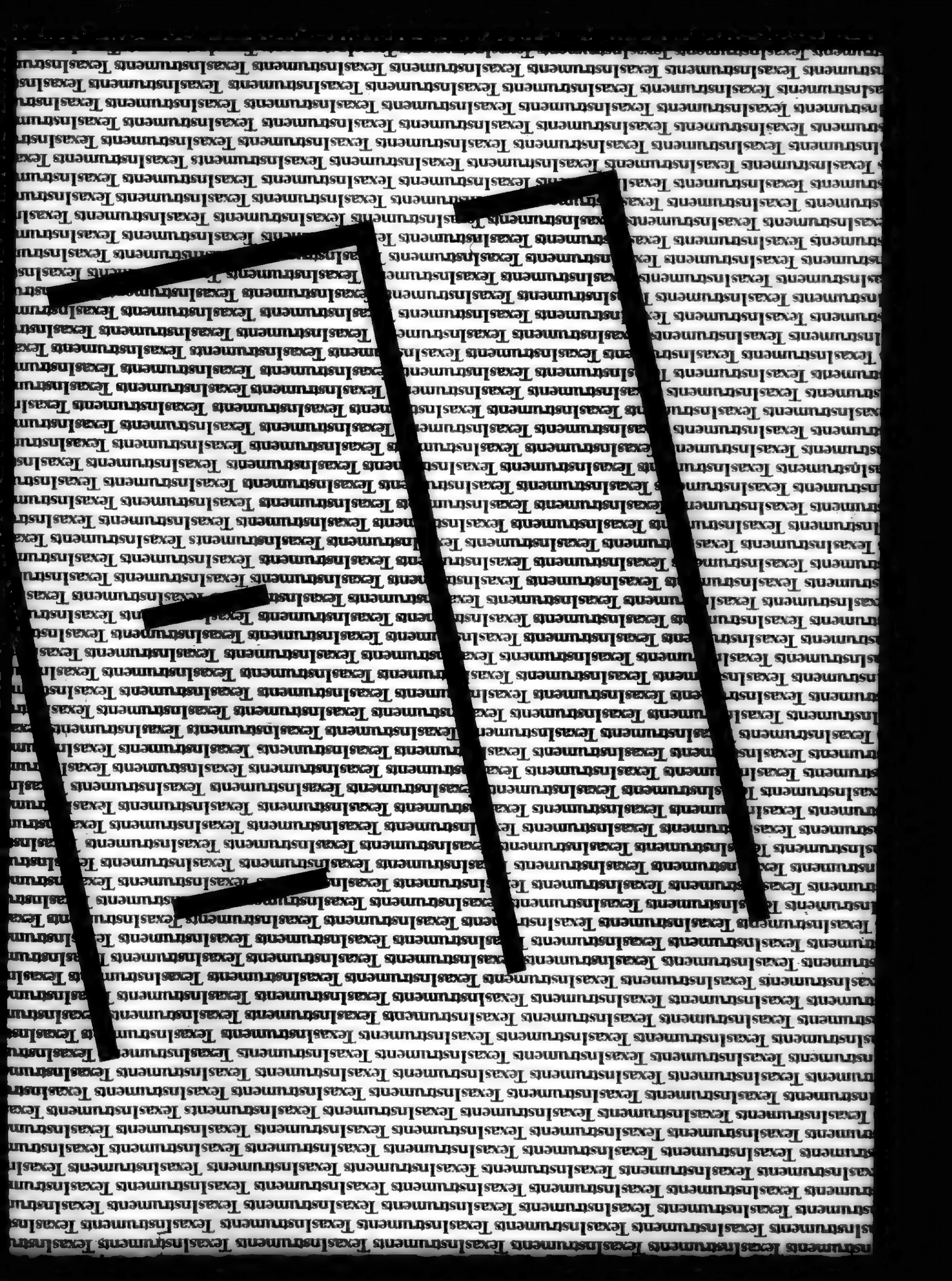

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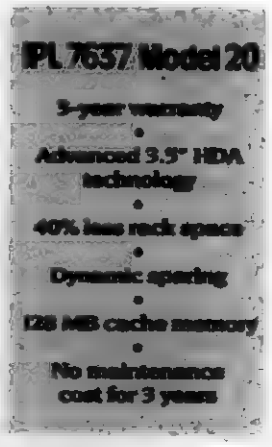

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Dirty downsizing

Forget what zealots and slick mags tell you. Here's some straight talk on the grubby political, technical and money issues at the front lines.

BY ALAN RADDING

Keyport Life Insurance Co. fought its way through the downsizing wilderness to the promised land but savored the milk and honey only long enough to discover a bitter aftertaste.

"Security, backup and recovery are problems," says Leslie Laputz, vice president of information services at the Boston insurer. For example, running backups over Ethernet with a personal computer is painfully slow (five hours nightly, 10 hours for full backup), even with two tape backup units. "This environment," Laputz concludes, "is not as mature as the mainframe."

Apparently, other users and vendors agreed and formed The Major Open Systems Environment Standards Group, or Moses, an informal new group aimed at leading downsizers to safety (see story page 67).

Second thoughts in paradise? Downsizing success stories sound so easy: Shoot the mainframe and convert to Unix networked systems running the latest off-the-shelf software for a fraction of the cost.

But lost and dirtied information systems managers say getting to downsizing heaven is a difficult journey. The road is full of treacherous twists and turns, they warn, especially when client/server is involved.

"The savings are there, but this is a daunting task," says Paul Ricker, vice president of IS at G. Heileman Brewing Co. The La Crosse, Wis., company has downsized Amdahl Corp. mainframes and an IBM 3090 to two Pyramid Technology Corp. servers.

IS managers and consultants cite a litany of obstacles: culture shock, staff retraining, lack of application software and development tools, system integration snafus and inexperience with networking. "Unix has a ways to go" before it matches the best mainframe policy and procedures, agrees William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Loosely defined, downsizing usually refers to shifting applications from a mainframe to a smaller platform, such as a midrange system, a Unix server or a PC local-area network. Scaled-down systems are often smaller only in price and may provide more millions of instructions per second, storage, memory and throughput. These small new dynamos serve as conventional hosts or as part of a client/server system.

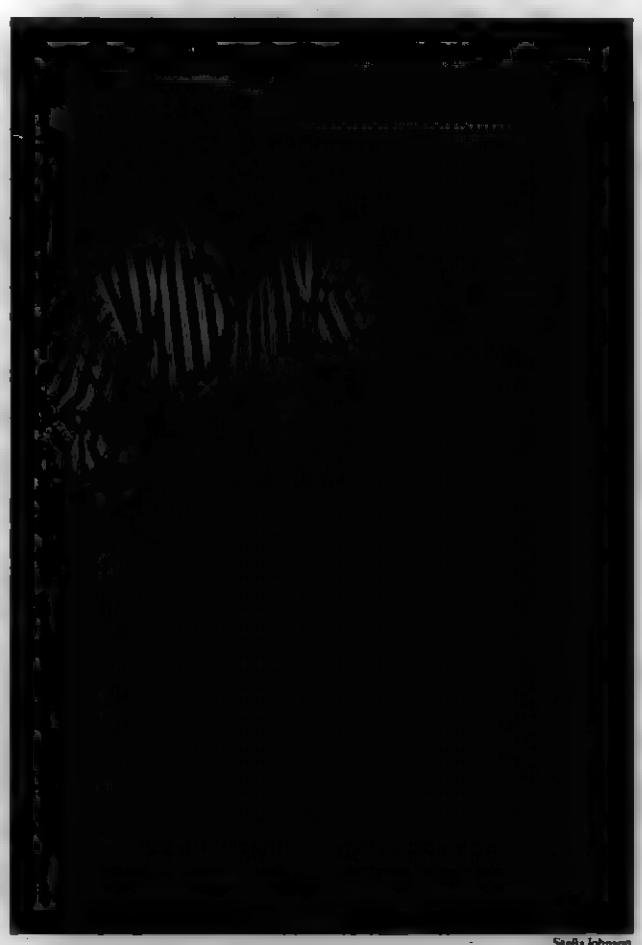
While the downsizing craze began to sweep IS shops in the mid- and late 1980s, many Fortune 1,000 companies are only now taking the plunge. And more are discovering that it's dirty business.

"There is no tradition of operating a Unix glass house," explains Mike Prince, director of information services at Burlington Coat Factory Warehouse, Inc. in Lebanon, N.H., a downsizing legend. "There is no body of common procedures."

Do it yourself

To cope, some users have developed their own procedures and resources in hopes of duplicating the rich administration tools found on proprietary mainframes. The smart (and lucky) ones do fine.

Keyport, for example, is proceeding in its four-year conversion from two IBM mainframe hosts to Ethernet and a NetFrame 450 superserver from NetFrame Systems, Inc. in Milpitas, Calif.



Stella Johnson

Downsizing at Millipore: *Three-year effort has yielded big payoffs — and challenges, Poulin says*

A key agent processing function was converted in April 1989; the first policies followed 11 months later. By the end of this year, Laputz says, 250,000 policies in several product lines will be switched over. So far, he says, the move has helped slash $1.3 million from the IS budget (now at about $5 million). But with IS interest in client/server booming, such success stories might be harder and harder to come by.

A report on downsizing last December by Butler-Cox Foundation, a division of CSC Index, Inc.,

Continued on page 66

Radding is a free-lance writer based in Newton, Mass.

KEY POINTS

▶A small, informal new group of users and vendors hopes to build a downsizing support system for IS managers. See story page 67.

▶Arvin Industries finds downsizing from mainframes to a VAXcluster is mostly evolution. See story page 66.

▶Certain applications don't downsize well: those with very large databases, thousands of users, strong security needs and 24-hour availability. See story page 68.

▶Keyport Life, G. Heileman Brewing, Burlington Coat Factory, Millipore, Trimark Investment Management, J. M. Huber, Andrew Jergens and Mead Data share experiences. Stories begin this page.

▶Tips from Concord Group Insurance, an experienced downsizer. See story page 68.

▶FAST FACT: Only 4% of 75 Fortune 1,000 firms interviewed by Forrester Research had "no interest" in downsizing.

QUOTABLE:

"Don't underestimate the difficulties."

Paul Ricker
G. Heileman Brewing

Dirty downsizing

CONTINUED FROM PAGE 65

cited several key technical and management risks of downsizing. The report says problems "derive mainly from the immaturity of client/server technology, especially that available for PCs."

Cited were less robust systems software, incomplete and unfamiliar systems development tools, inexperienced developers and incomplete systems and network management tools.

Add other possible gotchas, says Ted Klein, president of the Boston Systems Group, such as IS and user resistance and poor alignment with corporate direction, and you have a potentially fatal threat. "Each one can be deadly if it sneaks up on you."

Computerworld asked several IS managers and consultants to share their downsizing experiences, advice and cautions. Their tales follow.

One of the biggest lures of downsizing is the potentially big savings. Butler-Cox estimates that downsizing from a mainframe environment to client/server can slash ownership costs 20% to 30% over five years. For minis, savings can hit 10% to 25%, the firm says.

Delayed gratification

But as Millipore Corp. in Bedford, Mass., discovered, payoffs might not happen right away. Efforts to consolidate three U.S. data centers and downsize began in 1989 and are still under way, says Dan Poulin, director of information services. The goal is to shift from IBM, Data General Corp. and Hewlett-Packard Co. hosts to two Sequent Computer Systems, Inc. servers running Oracle Corp. software on a Transmission Control Protocol/Internet Protocol (TCP/IP) network.

Millipore, which manufactures technical separation equipment, figured the new setup would require one-third fewer IS staff members, and it budgeted accordingly, Poulin says. The company hired consultants to supplement its staff during the early stages of the conversion. Up-front investments were also made in networks, user workstations, hardware and software and training.

However, actual spending was more than initial projections, Poulin says, declining to cite specific figures. "But we're ending up with a lot more computing resources" and lower long-term costs, he says.

It's easy for downsizing savings to look very attractive, but beware of oversimplifying, cautions Allan Froehlich, a principal at Nolan, Norton & Co. His advice: "Watch out for cherry picking," or choosing a few ideal applications for downsizing.

IT'S A DIRTY JOB . . .

People issues

1. *Traditional IS and users may resist.*
2. *New staff with new skills needed.*
3. *Tricky to align downsizing with corporate goals.*

J. M. HUBER CORP. in Edison, N.J., a diversified natural resources and manufacturing company, hired consultants to help create a customer-oriented attitude in IS.

[illegible] INVESTMENT MANAGEMENT, a large Toronto-based mutual fund, retained outside experts to implement Unix and TCP/IP and train in-house staffers.

IT'S A DIRTY JOB . . .

Application development

1. *Few development packages available for client/server.*
2. *Lack of integrated tools forces use of many different products.*
3. *Replacing mainframe screens and reports can be long and laborious.*
4. *Building GUIs is slower than mainframe application.*

[illegible] found a software [illegible] good mutual fund [illegible] the company.

[illegible] CO., a [illegible] company, used [illegible] an AS/400 as an occasion [illegible] off-the-shelf software.

Initially, Froehlich says, cost justifications for such jobs can look terrific. But when you consider functions that remain on the mainframe, things can look less appetizing.

Another difficulty with starry-eyed justifications, he adds, is identifying just what services you will (or won't) get.

"Are are you going to have to do without some things?" Froehlich asks.

People pressure

While many IS chiefs agree that downsizing can be a lifesaver, positive feelings are far less universal among IS staffers and users.

"We had to deal with a total mind-set change among the MIS people," says Paul MacPherson, supervisor of systems architecture at Toronto-based Trimark Investment Management, a large Canadian mutual fund company.

Trimark Investment went from running a large IBM System/38 Model 700 supporting 145 users to a Pyramid Technology Corp. MIS 12 server running Oracle and supporting 150 users on Next, Inc. workstations. The project goes on-line this month.

Better price/performance, open systems and a freedom from reliance on a single vendor were the big motivators, according to MacPherson. The firm decided to downsize its Unit Holder Systems Administration application, the core mutual fund system consisting of about 1,000 programs.

A key part of the effort involved replacing a host-to-terminal Synchronous Data Link Control network with a TCP/IP network. So Trimark Investment hired consultants for the dual job of handling the conversion and developing TCP/IP and Unix skills for in-house IS staffers.

"Employees must have hands-on experience. They can't just attend classes," says MacPherson, who was hired specifically to bring Unix and TCP/IP leadership to the project. That kind of combination of retraining, new hires and consultants is a popular choice of downsizing companies.

Still, people issues can be among the toughest. "Where is the organization going to get the right people?" asks William Freitag, managing consultant at the Computer Task Group in Bel Air, Md. "Staffing is a major pitfall."

J. M. Huber Corp. in Edison, N.J., focused on changing IS culture, says John Shiels, vice president of IS. "People in IS are going to resist" downsizing, he says. "Even for those who don't resist, there will be tremendous cultural changes."

During the next five years, the $1 billion diversified natural resources and manufacturing company will phase out an IBM 3090 mainframe and switch to an IBM RISC System/6000 running Oracle. Division and corporate financial systems will switch by year's end.

Shiels says the cultural change was reflected in how IS treats users. As part of the downsizing preparation, consultants were brought in to work on IS attitude. "We have to learn to be customer-driven and responsive," not autocratic, as in the past, Shiels says.

The result? "The vast majority were receptive to learning new skills," Shiels says.

Chronic software shortage

Even though trained IS people are in place, experienced downsizers say, a lack of applications software and software development tools can be another serious stumbling block.

"More than 60,000 packages are now available for PCs, workstations and minicomputers," the Butler-Cox study notes. "There are, as yet, very few for client/server systems."

That means IS managers must tackle the dirty job of converting existing applications to the downsized system or simply writing new ones.

When Keyport Life began hunting, Laputz soon discovered that "there

The accidental downsizer

Switching to smaller systems is rarely a neat, tidy process. Ask Calspan, the research and development division of Arvin Industries, Inc. The diversified Buffalo, N.Y., manufacturer didn't quite know what it was setting loose when it began a three-year downsizing effort in 1987.

Freed from the rigid control of a centralized IBM mainframe, the division's 120 engineering-oriented users took off in every direction, following the shift to a two-node VAX 8200 cluster, says James Campobello, VAX systems manager.

For example, one group of users set up a TCP/IP network and brought in a terminal server to handle Unix terminals. All was well, Campobello says, until users tried to connect to the VAX.

"There are terminal servers that do TCP/IP and LAT [the VAX terminal network protocol], but they didn't buy one of those," Campobello says.

Other users put in Apple Computer, Inc. Macintoshes without making any provision for handling backup, he says.

"People get in trouble when they don't have a design in place before they start," says Edward Parrish, vice president of the Executive Insight Group, located in Bryn Mawr, Pa. "They just hand things off, and before you know it, things are out of control."

Today, Calspan runs a mix of 40 to 50 assorted Unix workstations, another 40 to 50 Macintoshes, a dozen or so PCs and various terminals connected, more or less, to the VAX Ethernet backbone in a variety of ways. The cluster consists of a VAX 8550 and a MicroVAX 3100 Model 30.

However, Campobello fears that much of the cost savings and advantages of downsized, distributed systems are being eaten up by continual maintenance and cumbersome multistep conversions.

Despite the problems, he acknowledges that there's no turning back.

"There are some real good things: The cost savings — even after you've figured in the hidden costs — are terrific," Campobello says. "And the users love it.

"I don't know where we are going to replace the VAX down the road with completely distributed, open systems," he says. "There never was a plan. It's been more like an evolution that we shepherded along."

ALAN RADDING

was nothing out there in network software for insurance processing." So the company hired TriMark Technologies, Inc. in Buffalo Grove, Ill., to develop new software using the Magic/PC fourth-generation language (4GL) from Aker Corp. in Irvine, Calif.

The first prototype was delivered in a few months, and user demand for the graphical user interface (GUI)-based environment mushroomed. New enhancements drove software costs over budget, but Laputz says executives didn't complain because users were getting additional functionality.

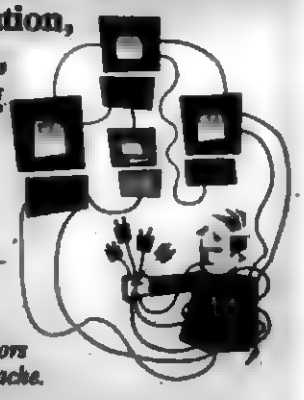
Trimark Investment took another approach: It found a software vendor with a good Canadian mutual fund package and purchased the company. MacPherson says the vendor now serves as Trimark Investment's programming department.

Heileman Brewing opted to postpone writing new systems. In the last three years, it downsized to two Pyramid servers, replacing its IBM 3090 and two Unisys Corp. A series machines. The IS group spent nine months replicating as closely as possible the 3090 screens and reports in the new Pyramid/Oracle environment.

With the older Unisys applications, however, the company plodded through a complete software development process with some applications still not finished, Ricker says.

IT'S A DIRTY JOB . . .

Administration, integration, networking



1. *Security, recovery and backup less mature than on mainframes.*
2. *Coordinating multiple vendors a major headache.*
3. *Failures on PC nodes much harder to isolate. Certain LANs too slow for downsized environment.*

[redacted] in LaCrosse, Wis., [redacted] LANs and bridges [redacted]

[redacted] in Boston [redacted] Ethernet to [redacted]

"If I did it again, I would just mirror what we had because speed is the key," Ricker says. He says it appears that the faster a company gets to the downsized platform, the sooner it begins reaping the cost savings, which in Heileman's case was several million dollars a year. "Once you are in the new environment, you can start rewriting applications," Ricker says.

On the other hand, The Andrew Jergens Co., a Cincinnati-based manufacturer of lotions and soaps, didn't have problems with application software when it began converting from an IBM 4381 mainframe to an Application System/400 in 1989, says Charlie Browning, director of IS.

Browning says the firm found suitable host-based, off-the-shelf packages to replace most of the obsolete, home-grown applications written in assembler language. "One of our goals for downsizing was to bring our software up to industry standards," he says.

The company, however, had less success finding good LAN packages, he says. Since 1989, the company's PC population has swelled from a handful to more than 300 spread over a dozen LANs.

"We bought some specialised applications, but they gave us problems," he says. These industry-specific packages had no equivalents on the AS/400 and were not current with the latest LAN operating systems and drivers. "The vendors were still using old releases of the software, and their support was weak."

Organizations that opt to develop their own software may encounter development tools that are less than robust. "There is no integrated set of tools," Computer Task Group's Frietag notes. "You will have to use a combination."

According to the Butler-Cox study, most client/server tools are fairly new and have "significant limitations," especially in performance, integrity and ease of use.

"We're still out there looking for the right tools for networking and client/server," Millipore's Poulin says. He says the company can "hammer out the basics" with the existing Oracle tools, but "we're still looking for more."

Ironically, Poulin says, the lack of tools makes him look back longingly at proprietary systems. "DECnet comes with more tools," he says. "It's a lot easier than TCP/IP."

Even where tools are available, development is still hardly a breeze.

Consider Mead Data Central, Inc. The Dayton, Ohio, manufacturing and information services company downsized its internal administrative systems from an IBM 3090 running IDMS to an NCR Corp. 3000 running Unix with OS/2 and DOS on the desktop.

According to Gary Whitney, director of systems evolution, Mead picked a 4GL from Uniface Corp. because it allows fast prototyping. Even so, he says, building a GUI is a lot harder than building a plain 3270 application.

"With the GUI, you have to worry about menu bars, buttons, keyboard mapping," Whitney says.

Networking tie-ups

Say you're lucky enough to best the big problems — people issues, lack of application software and development tools and the operating environment. You still need to roll up your sleeves and tackle some other big obstacles, particularly systems integration and networking.

Sheila Johnson

Keyport's Laputz: *Persistence pays off*

Unlike proprietary shops, downsized IS must interact with multiple computer, network and software suppliers, which experienced IS hands say can be chaotic. "There is a whole different way of dealing with vendors," Trimark Investment's MacPherson warns. With the System/38, the firm had to deal with only one vendor (IBM), which took responsibility for making everything work. In the downsized environment, he says, "we have seven major vendors under our roof."

In this environment, solving problems means dealing with two, three or more of those vendors simultaneously. "The key is orchestrating the vendors," MacPherson says. "We learned quickly not to meet with them one at a time. You have to get them all in the same room, or all you'll get is finger-pointing."

His tactic: Assemble all vendors at once and make them cooperate to confront a problem.

On the networking side, many shops ignore the many hassles that can crop up. "The mistake people make is that they don't look at the communications side early on," Ricker says. To avoid problems, Heileman installed an X.25 backbone, Ethernet LANs running LAN Manager and bridges before embarking on downsizing.

Even in the best planned shops, simply adjusting to and running LANs can be a headache. "We're still coming to grips with the operational aspects of LANs," Browning says.

In the mainframe environment, networking problems could be resolved at the data center, he notes. "With LANs, any failure at a PC is much harder to diagnose. It's been a learning process for us," he says.

Keyport was less fortunate: The insurer discovered its 2.5M bit/sec. Arcnet LANs were too slow for the downsized environment and had to upgrade to Ethernet halfway through the project, according to Laputz.

The bottom line: No pain, no gain. "Don't underestimate the difficulties," Ricker warns. •

Holy Moses! Send help!

Don't let the numbers fool you. Even though many companies are switching from mainframes to smaller networked platforms, users are still largely on their own.

"One shortcoming when you downsize is that there isn't a support network," notes Mike Prince, director of information services at Burlington Coat Factory Warehouse.

To beat that problem, Prince and five other users and vendors formed a new group last year that hopes to spot downsizing trouble spots (such as backup) that need standard procedures and technology.

New group *supports downsizers, Prince says*

The Major Open Systems Environment Standards (Moses) Group also includes US West, Millipore, BT and internal IS departments from Oracle and Sequent.

So far, the group has met twice: in Denver in April and again in Bellevue, Wash., in July. Members plan to meet again in September in San Francisco.

Another aim of Moses, Prince explains, is to encourage Unix market vendors to address common concerns. Eventually, Prince says, he hopes Moses will be a vehicle that lets IS managers get together and talk about downsizing concerns.

To contact Moses, use the following Internet address: inmoses@us.oracle.com

ALAN RADDING

"DEC hit by Du Pont downsizing" [CW, May 25, by Nell Margolis].

"More than downsizing" [CW, April 20, by Elisabeth Horwitt].

"County thinks small, dumps 4381 for LANs" [CW, April 6, by Christopher Lindquist].

"Giving downsizing the hard sell" [CW, March 23, by Jean S. Bozman].

"Merrill Lynch alters net to cut costs" [CW, Feb. 3, by Joanie M. Wexler].

Also of interest:

Report: "Downsizing Computer Systems," CSC Index, Inc., June 1992, (617) 492-1500.

Report: "Mainframe Replacements Accelerating," Forrester Research, Inc., (617) 497-7090.

Schussel's Downsizing Journal, $199 for 12 issues, Digital Consulting, Inc., (508) 470-3880.

An expanded "Downsizing Expo" runs Aug. 25-27 at the Moscone Convention Center in San Francisco. Sponsored by Digital Consulting, Inc., the show includes conferences on downsizing, interoperability, business re-engineering and a related products exposition. Highlights include 16 technical tracks, a one-day executive track, a Japanese downsizing conference and an imaging showcase. For information, call (508) 470-3880 between 9 a.m. and 5 p.m.

FIRST PERSON

Lessons from a seasoned downsizer

BY DIRK FAEGRE

Downsizing has become the latest stampede in the computer industry, with a herd of hardware vendors, analysts and information systems managers touting the benefits of trading mainframes for client/server systems. But for a few of us, this "new" trend is an old story.

A relative handful of companies made the move years ago. The people following in their footsteps might do well to learn from their experiences.

My company is a good example. Concord Group Insurance Co. moved to a combined mainframe/workstation environment in the mid-1980s, with 300 Unisys Corp. CTOS workstations linked to a Unisys A series mainframe. We have never looked back.

Here are some of the lessons we learned:

• Have a concrete reason to downsize. More bang for the hardware buck is the usual reason for downsizing. But the real question you should be asking is "What can downsizing do for the *people* in my organization?" Downsizing has the potential to improve people's lives in the workplace, promoting teamwork and improving productivity.

Example: At Concord Group, the touch of a key gives users a whole series of responses never possible with a dumb terminal. Psychologically, that makes happier campers.

• Don't just port applications; improve them. Too many IS managers think of downsizing in terms of blindly moving their mainframe application over to the client/server network. They should instead rethink their application to take full advantage of the new environment.

Example: In the old system, users filled out on-screen forms on the mainframe. Terminal data could only be sent in single blocks; errors could be spotted only after transmitting. The delayed feedback resulted in lots of wasted effort.

The CTOS system gave us the opportunity to rethink the process. Using Progress Software Corp.'s fourth-generation language (4GL), we developed an application called Action+Plus that provides instant feedback throughout the data entry process.

The application performs validity checks on the dates, ages, license and registration numbers at the keystroke level, not minutes later. This has resulted in a dramatic increase in productivity and has made data entry much less frustrating. It's clear that we could reduce the staff by about 20% or halt future growth because of downsizing.

• Think application portability during development. When we began writing Action+Plus, the Progress 4GL was not available on CTOS systems. But we were able to begin the project under DOS, then move it to the native CTOS later on, all without missing a beat. We later tested the finished application on a DOS personal computer and a Sun Microsystems, Inc. Unix workstation. It ran perfectly in both environments.

> OPTIONS ARE KEPT open by not being locked into a particular platform too early.

Bottom line: Options are kept open by not being locked into a particular platform too early.

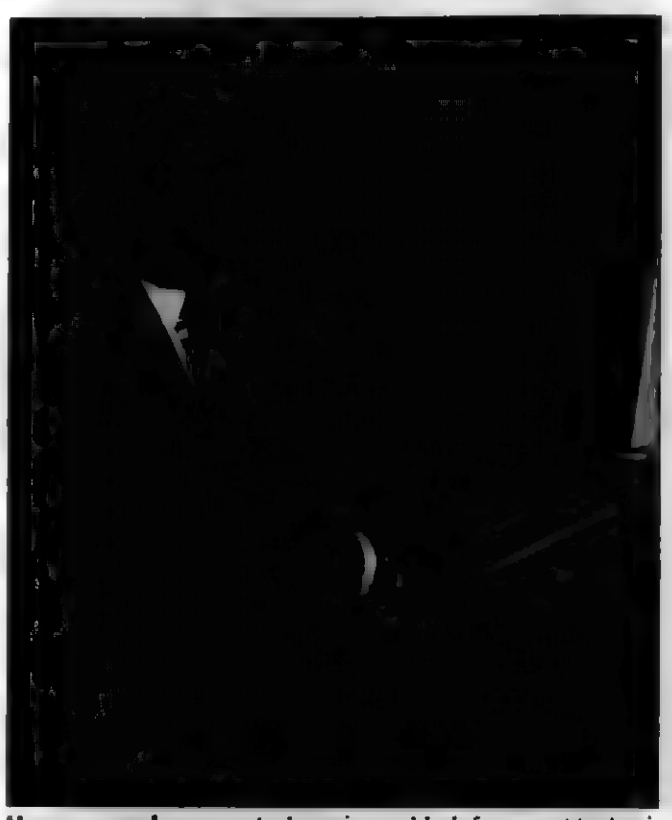
• Harness the power of multiple processors. Client/server systems may look small in comparison to the mainframe, but when they work as a "team," they can carry large loads.

Example: In our design of Action+Plus, we created a distributed system in which tasks can be sent to idle workstations with a single keystroke. That has been especially useful for agents who must churn out a succession of lengthy business reports at the end of each month.

Now, one of our agents completes his month-end process using 14 networked machines, which all process different reports at the same time with no user intervention.

When a given workstation completes the processing of one report, it can immediately pick up another, enabling the agent to close a month in just a few hours.

This approach represents an easy way to employ the power of parallel processing.



Have a good reason *to downsize and look for new opportunities, Faegre advises*

• Don't eliminate the mainframe — surround it. As smaller systems loom larger in the planning process, the mainframe is sometimes forgotten. A better strategy is to build the client/server system around the mainfame, fitting the most appropriate task to the most appropriate platform.

Example: Our Unisys A-10 is connected to the motor vehicle departments in New Hampshire, Maine and Vermont. This link enables any agent at any office to run a motor vehicle report on an individual.

Whereas other insurers send computer tapes back and forth and wait up to several weeks to verify license records, we get the information in about 15 seconds.

This immediate response means our agents don't waste precious resources trying to sell insurance to someone with a suspended license or, worse, providing insurance coverage to an undesirable individual.

At the moment, we believe the mainframe is still the best solution for widely scattered agents. I am not aware of any Unix servers capable of supporting 1,500 clients as gracefully as the A-10 does.

• Think of downsizing as a productivity improver. The most successful installations view downsizing as an ongoing process. They are constantly developing new applications and adding more workstations. •

Faegre is a systems administrator at Concord Group Insurance Co. in Concord, N.H.

ADVICE

Beware these untouchables

A little downsizing discretion is often the better part of valor. Experts say heaps of headaches can be avoided simply by knowing what to downsize — or what not to.

Certain applications and systems will resist most attempts at downsizing, according to Ted Klein, president of the Boston Systems Group.

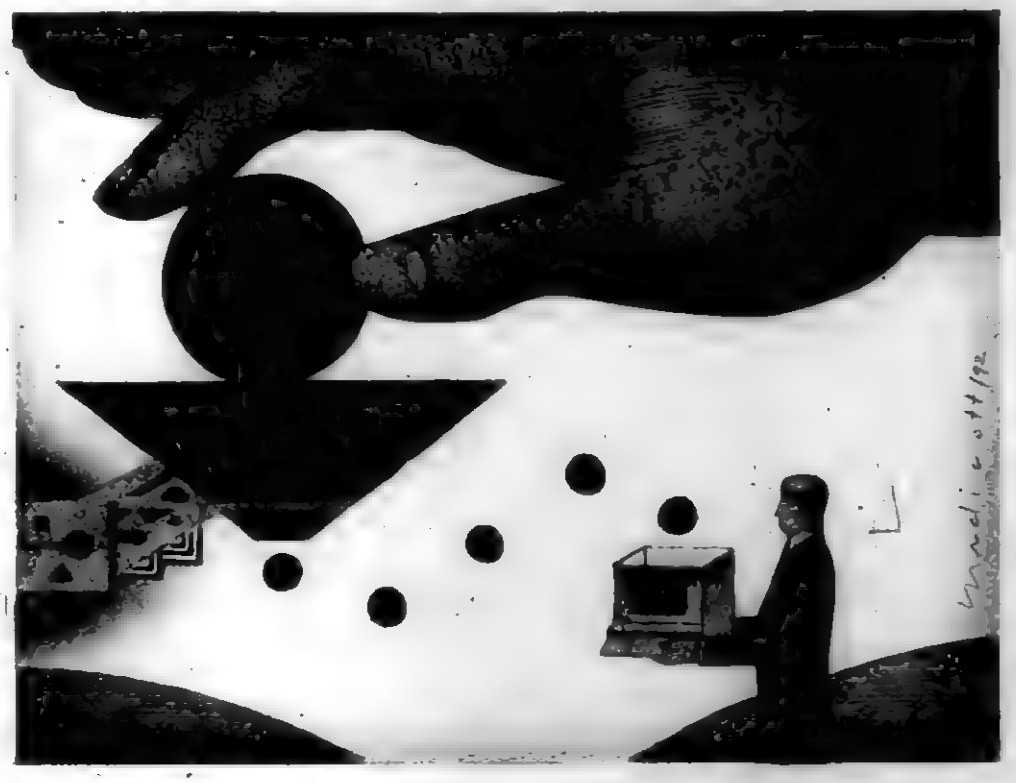
Until hardware and software becomes more state of the art, Klein advises organizations to avoid downsizing the following:

- Applications with very large databases that cannot be easily partitioned and distributed.
- Applications that must provide very fast database response to thousands of users.
- Applications that are closely connected to other mainframe applications.
- Applications that require strong, centrally managed security and other services.
- Applications that require around-the-clock availability.

DOWNSIZING
Part II: Tips and techniques

Getting down

Did you know there is more than one way to move to smaller platforms? In fact, there are at least seven, depending on your situation.



James Endicott

BY ERIC P. BLOOM

Wallpaper is one option. But then again, something more extreme might be warranted. No, we're not talking about interior design. These choices have to do with something at least as traumatic as home remodeling: downsizing.

The decision to move to smaller platforms may seem like a tough one, but actually, that's the easy part. The real killer is figuring out exactly how to do it. There are a bunch of possibilities, ranging from the "wallpaper" approach, in which you simply front-end existing mainframe screens with a graphical user interface (GUI), to the other extreme, in which you have applications access and update data across various hardware platforms. The approach you choose depends on what your users need and how completely your company wants to move to off-host technologies.

Below are the various techniques available, how they work and in which situations they work best:

1 The wallpaper approach. This option's name is derived from the fact that it changes your system's look without significantly changing its structure. Wallpapering entails front-ending your 3270 mainframe screens with a GUI. There is no need to do any mainframe modifications.

When front-ending a 3270 screen with a GUI screen, you read the data passed from the mainframe and display its contents to the user in a different format. In effect, you write a personal computer program that treats the 3270 buffer like a data file. But in actuality, you write a PC-based program that controls a mainframe-based application.

This technique, by enabling you to move your entire development effort to the workstation, can speed development time and takes advantage of easy-to-use PC development tools.

Another plus is that you can reduce mainframe processing cycles by building PC-based error checking, Help and menu-bypassing logic into the PC application. Wallpapering your machine with a GUI can make all your mainframe applications look and act the same, even though they're from different vendors.

That's not to say that front-ending a mainframe application with a GUI has no downsides. In fact, it's sometimes been described as "putting lipstick on a pig." For instance, because the mainframe software is not aware of the PC-based front end, it does not take advantage of the pre-edited data and re-edits all incoming data. In this way, it expends CPU cycles.

Another disadvantage of this method is the burden it places on your staff. Not only will your staffers have to support all existing mainframe code, but they will also need to support additional PC-based code.

2 Modified wallpaper approach. The modified wallpaper method, like the wallpaper approach, front-ends a mainframe with a GUI. However, it goes its namesake one better by automatically executing PC-based software like electronic mail, word processing packages, groupware products and other PC tools, enhancing mainframe functionality. It also moves certain screen edits from the mainframe to the PC screen, improving mainframe performance and reducing processing time.

The idea behind this is simple: If the front-end program is passing data between the 3270 buffer and a PC-based GUI, it can analyse that data and perform actions on it.

With this approach, you bypass edits on the mainframe that have been completed

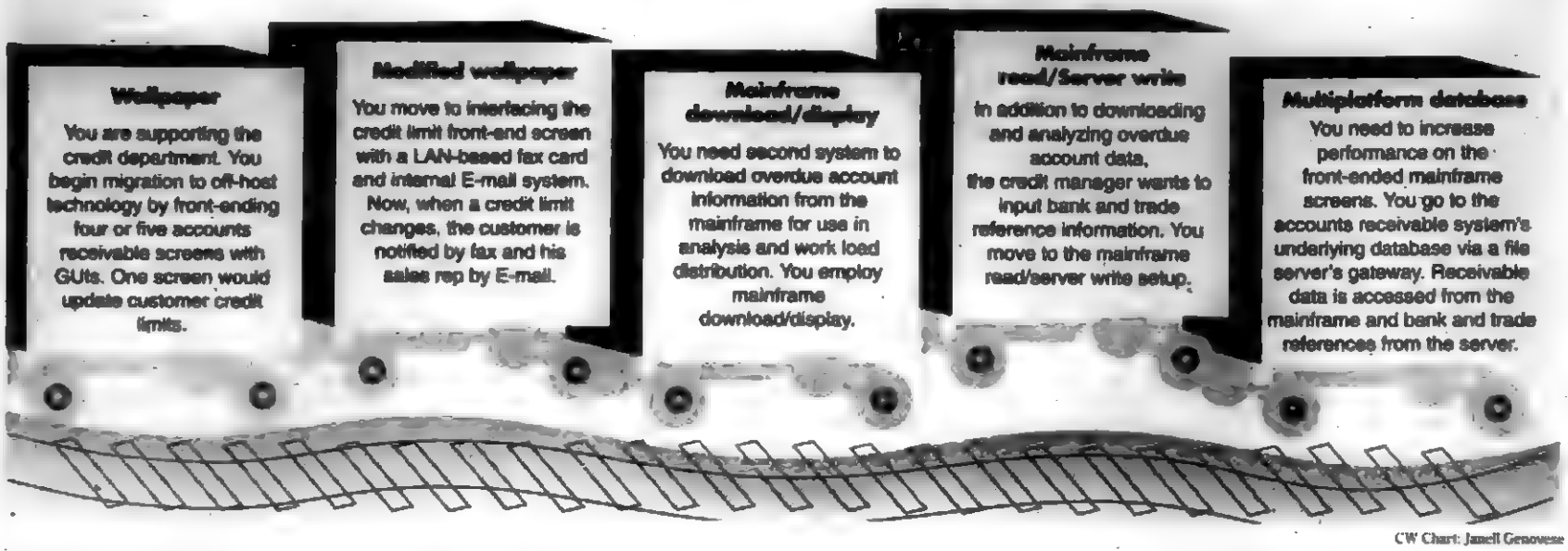
Continued on page 70

Bloom is a principal consulting manager at Fidelity Investments in Boston, an adjunct faculty member at Boston University and the author of various books on Cobol, C, Pascal and Windows-based application software.

- **'Wallpapering' can speed development**
- **Slow migration might be the ticket**
- **A downsizing quiz**

Slow train to downsizing

Deploying a few downsizing approaches in succession can be a good plan for measured migration to small platforms



CW Chart: Janell Genovese

Continued from page 69

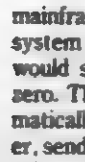
by the PC front end, thereby reducing mainframe CPU cycles.

To understand how this approach can be used to enhance applications functionality, consider how it might help a credit department process information on a customer who has not paid his bill.

The credit manager, accessing the mainframe-based accounts receivable system through a PC-based front end, would set the customer's credit line to zero. The front-end software would automatically fax a form letter to the customer, send an E-mail message to the customer's sales rep and update the marketing group's Unix-based lead tracking system.

The credit manager's productivity is greatly improved because he does not have to manually send a fax, call the sales rep and log on to the marketing system.

However, be advised that you will need additional design and development time to define the best system interconnections and perform needed mainframe program changes. You will also have more code to maintain.



Mainframe download and display approach.

In the mainframe download and display approach, the mainframe periodically downloads a data file of detail and/or summary information to the PC or local-area network server. Once downloaded, PC-based applications read, summarize, display, analyze and print this data.

This approach is ideal for analytical tasks in which up-to-the-minute data is not required. It can be used to supply executive information systems or statistical analysis and report generation systems.

Mainframe download and display is not overly expensive to implement because it can often be developed using existing technologies. For example, you could write a Cobol program that reads your production databases and creates a sequential file that can be downloaded using the file transfer in your PC-based 3270 emulator. Once downloaded, this data can be accessed via any PC package that can read sequential ASCII files.

Other ways the data can be downloaded include the following:

- Via a server gateway using IBM LU6.2.
- By writing to a magnetic tape and then reading it from a tape drive on the server.
- By connecting your data to both the mainframe and the LAN. This can be achieved by placing your mainframe-based data on a database machine that is both channel-attached to the mainframe and connected to your LAN via a protocol.

There are some drawbacks to approaching downsizing this way, however. Moving large data sets from the mainframe to a smaller platform can be time-consuming and can tie up mainframe, network and server resources. Also, downloaded data cannot be used to update the mainframe. The fact that data is stored twice (once on the mainframe and once on the server) can raise data integrity, security and disk space issues.

The dynamic download and display approach.

This method downloads specific pieces of information in the time they are requested rather than entire files.

It permits simultaneous access to data from various mainframe and server databases and works best for applications in which up-to-the-minute information is required on single records or small sets of records, such as customer inquiries about account balances or order status.

The way dynamic download and display works is that a query is passed from the file server or user workstation to the mainframe. The mainframe returns an answer that is displayed on the screen or used within a specified process or calculation and then discarded.

This process is generally accomplished in one of two ways: either via a high-speed link between a LAN server and the mainframe or via a 3270 connection between the mainframe and the user workstation.

There are some negatives to weigh before choosing this approach. On-demand querying of production databases can affect production system performance. The fact that a user's workstation or server must be continuously connected to the mainframe can tie up mainframe, network and PC-based resources.

In addition, the downloading of large data sets during the day can be time-consuming and place further strain on the mainframe, network and servers.

Mainframe read/Server write approach.

Like previous approaches, this technique uses mainframe data as input to server-based applications. In this instance, however, the "official" copy of certain corporate data is being stored on a platform other than the mainframe.

In the mainframe read/server write method, mainframe-based data may be periodically downloaded to the server or sent dynamically as needed. A credit department, for example, may at times download a list of customers with overdue bills from the mainframe accounts receivable system, checking those against server-stored trade and bank reference information. Or a user who enters account numbers into the server could cross-check them against a downloaded mainframe master file of account numbers. In this way, the company can ensure data quality.

The greatest advantage to the mainframe read/server write approach is that it reduces mainframe data storage and CPU costs by placing selected types of data on a less expensive, off-host platform. It also enhances the usefulness of mainframe and server data by allowing the user to view data from both machines on his screen at the same time.

Because mainframe information is downloaded periodically, it's important to make sure server-based applications are working with current data, not data that was downloaded a week ago. Also, because corporate information is being stored on the server, the server must be backed up and maintained like any other production machine.

On the technical side of things, if your data is downloaded periodically, it can be placed in your database server with read-only access. If your data is retrieved dynamically from the mainframe, your application will have to be connected to

Continued on page 72

Testy situations

We'd like to test your downsizing acumen. Below are various situations in which one of the seven downsizing approaches discussed in the main story applies.

Can you decide which approach is best for which business situation? Good luck. Answers are on page 72.

Business situation 1: Users need to access and update information that physically resides on more than one platform.

Business situation 2: You have a well-built mainframe application with a poorly designed user interface. You don't want to do any massive mainframe changes.

Business situation 3: Users want account information on a particular customer when the customer calls. You decide you don't want to download entire mainframe data files but only specific pieces as needed.

Business situation 4: Users want to enter and validate general ledger journal entries off-line for eventual upload and batch processing.

Business situation 5: You are front-ending a mainframe with a GUI, but users could benefit greatly from integration with PC tools such as E-mail and work-flow technologies.

Business situation 6: Users want to develop a system that has no need for mainframe information.

Business situation 7: Users want to analyze summarized mainframe data for statistical analysis. There is no need for up-to-the-minute information.

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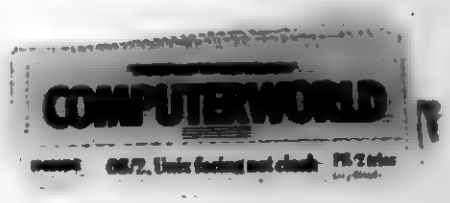

The Newspaper of IS

Continued from page 70

both the mainframe and your server-based database simultaneously.

This connectivity can be attained in a number of ways. One option is through gateways in the server-based database that provide mainframe access. Another option is to access your mainframe data via the application programming interface in your 3270 emulator, tying into the mainframe via a 3270 session.

The server-only approach. This is the approach that usually comes to mind when most people think of "downsizing." Here, all data and stored procedures associated with data are stored on the server, and the application is stored on the PC (client). The environment would typically contain a relational database on the server and a GUI-based development tool.

Target users are companies having mature LAN or wide-area network infrastructures that can ensure companywide access to applications and data.

The advantages to this approach are that it is free from the complications associated with mainframe connectivity. It provides faster development times, lower priced hardware, greater functionality and easy-to-use graphical interfaces.

Yet without integration with existing mainframe software, it may become more complicated to create executive information systems and other applications because information has to be pulled from various platforms around the enterprise.

The multiplatform database approach. The multiplatform technique enables your application to read, manipulate and update databases on both the mainframe and the server. It is likely the form all downsizing will eventually take.

If your users need to access and update data on both the mainframe and the server and if you don't want to require users to enter the same data into two systems, this is the approach for you.

Not only does this setup eliminate manual processes associated with updating multiple systems, but it can also minimize internetwork traffic by placing data on the server most likely to need it.

However, this level of interaction comes at a price: The setup is complex to design, build and maintain. It requires expertise in mainframe development, client/server development, distributed database design and data communications.

You must not only normalize the database but also figure out which data is appropriate for which platform.

Once built, the multiplatform system requires constant maintenance; there will usually be a pending software upgrade.

As if that weren't enough, there is a potential risk of data corruption caused by inconsistencies between the mainframe and the server database. Take special note of the dual commit process, in which two pieces of related data or copies of the same piece of data are put in separate databases at the same time. If one database is updated and the other is not, you may run into trouble, such as when an order is entered on the server without a deduction in the number of items in the related mainframe inventory database.

While you can implement each of these approaches individually, you can also deploy a number of them as part of a migration plan to off-host computing (see chart page 70). The idea is to begin your downsizing activities with the lower-risk, less technically complex approaches, such as wallpaper and data downloading, and migrate to the more complex designs as users and developers gain more experience in off-host technologies.

Taking incremental steps toward downsizing can help you gain internal momentum by developing a track record of successes. But expect to pay a little more; your development costs will increase because systems are continually being enhanced and/or redeveloped. ●

Answers to quiz:

▶**Answer #1:** Multiplatform database. If your data resides on multiple platforms, you don't want to require the user to enter the same data into two systems.

▶**Answer #2:** Wallpaper. Gives users a friendly front end for accessing the mainframe.

▶**Answer #3:** Dynamic download and display. Up-to-the-minute information is needed from a single data record so that users get the record at the time of need.

▶**Answer #4:** Mainframe read/server write. General ledger charts of account information can be downloaded and used to validate entered transaction data.

▶**Answer #5 :** Modified wallpaper. Assist the user by providing connectivity to fax cards, E-mail, spell checkers and other PC-based tools.

▶**Answer #6:** Server only. If no connection to the mainframe is required, it should be easier to develop using PC- and LAN-based tools.

▶**Answer #7:** Mainframe download and display. If the mainframe-based data is summarized via a Cobol program and downloaded to the server, the summarized data can be accessed using any PC-based spreadsheet or statistical tool.

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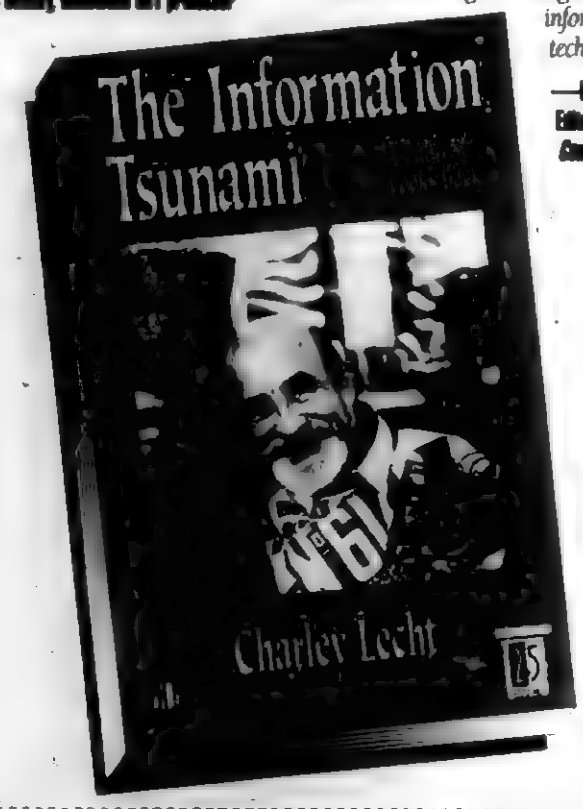

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MANAGER'S JOURNAL

EXECUTIVE TRACK

The U.S. Army has the very model of a modern information systems director: **Maj. Gen. Samuel A. Leffler**, selected for assignment as Commanding General of the Army's Information Systems Command (ISC). Leffler, who will succeed **Lt. Gen. Peter A. Kind**, is currently serving as deputy commander at the worldwide ISC headquarters at Fort Huachuca, Ariz. Kind, meanwhile, has been nominated by President Bush for reassignment to Washington, D.C., as director of IS for Command, Control, Communication and Computers, pending Senate confirmation.

At Philadelphia-based **Cigna Corp., Eric O. Scheffler** — former vice president and IS officer for the insurance firm's property and casualty division — has moved into a new position as IS officer with the specialty marketing division. His successor at the property and casualty division is **Kathleen Taylor**, who formerly headed up corporate systems. No one has yet been named to replace Taylor, who also advances from vice president to senior vice president.

Marshall Sprigg, IS director at **Exxon USA** in Houston, recently retired after more than three decades of service to the oil giant. Now in the post is **James C. Bowen**.

Sea-Land Service, Inc. has named **Thomas D. Murphy** and **William C. Donovan** to head up its worldwide information resources and telecommunications network. Murphy is currently serving as vice president of information technology systems at the Edison, N.J.-based freight company and sits on the senior management committee. He reports to President and Chief Executive Officer John P. Clancey. Donovan, who has been an outside consultant to Sea-Land since last November, now signs on as vice president of technology services, reporting to Chief Financial Officer Robert J. Grassi.

Stable plans for rocky times

Industry upheaval has banks turning to standard practices, third parties

INDUSTRY CLOSE-UP

IS in Banking

BY ALICE BREDIN
SPECIAL TO CW

When J. Carryl Seaman came to HomeFed Bank FSB in San Diego last August as chief information officer, HomeFed was looking for a buyer. By this fall, the bank will be sold, and amid all the turmoil, Seaman has to plan for the future.

"We know there are certain things we need to put in place, regardless of who our investor is," Seaman says.

Many information systems department heads find themselves in situations similar to Seaman's. Mergers, acquisitions, consolidations and failures are keeping IS managers in suspense: They don't know if their institution will be in operation from one day to the next or if they'll be working for someone else in the morning (see chart page 75).

All this commotion has made planning a bear. How do you plan systems and staffs in uncertain times?

The answer, according to IS executives and consultants, includes going with standardized practices and open systems, curbing (but not killing) new system purchases and relying on third parties.

Getting it together

"Banks want flexibility," says Laura Jean Stuart, president of Stuart Research, a company in Cambridge, Mass., that deals with IS issues in the banking industry. "IS managers cannot map out the next 10 years, so they are not getting drawn into proprietary systems. They are taking a building-block approach of assembling open systems."

At The Chase Manhattan Bank NA, "we have a standardization of platforms and a limited number of platforms that make it easy to integrate a portfolio or [acquired] company into Chase," says Craig Goldman, CIO at Chase.

The platforms include DOS, IBM's OS/2 and Microsoft Corp.'s Windows.

Chase has a standardization group coordinated by three IS people — two senior business systems planners and a manager of architecture and standards development. This group sets mandatory standards and optional guidelines, based on input from business staff members, for everyone at Chase worldwide, according to Goldman.

For example, the current personal computer standard is an Intel Corp. 80386-based box running DOS 5.0, Windows 3.0 and Novell, Inc.'s NetWare 386.

Any technology purchase that does not fall within these guidelines must go through an exception process to prove why it is necessary, according to Goldman.

Sam Gros

This infrastructure, he says, has been the best way for him to plan for a changing future.

"We don't have 14 different alternatives now," says Peter Lacovara, vice president in the information strategies, architecture and standards department.

Continued on page 78

High-tech tools could help cut legal bills

BY ELLIS BOOKER
CW STAFF

Move over, Perry Mason — make room for the information systems director.

A slew of high-tech tools demonstrated to legal educators from around the globe, who gathered in Chicago last week for a conference on information technology are not likely to cut lawyers out of the picture, experts said — but they may well cut the bill.

A follow-up to a meeting arranged by Harvard University Law School two summers ago in Salzburg, Austria, last week's event was sponsored by Chicago-Kent College of Law and Lotus Development Corp.

"We're firmly convinced these systems should ultimately be a great investment for reducing the cost of practicing law," said conference attendee William Boyd, a professor of law and director of computer development at the University of Arizona College of Law.

In one demonstration, for example, transcripts and other material from a "courtroom of the future" were available on-line to lawyers.

Another possibility is the use of expert systems to help litigants settle their differences before they reach the already overburdened courts.

Both Boyd and Kent College's Ronald W. Staudt said automation could eventually reduce the amount of time lawyers spend on routine functions, such as preparing documents.

But Staudt added that automation cannot yet make sharper lawyers. "Their jobs, in fact, have become more complex as networks and databases have given them access into ever-growing amounts of case law and precedent," he said.

Last week's conference, Staudt said, covered several broad technical areas, including artificial intelligence and expert systems; computer-aided instruction, including multimedia and hypermedia; and computer-assisted research via on-line services.

But just about as much attention at the three-day conference, he added, was directed at the state-of-the-art building in which it was held.

Designed to provide access to current and future computerized resources, the Chicago-Kent building has been fully wired with some 800 data ports in halls, classrooms and at 450 seats in the library. From these ports, students and faculty equipped with laptops — the school this month is purchasing 30 portables as part of a pilot program — access a 10Base-T Ethernet.

"They'll be able to plug into a server with about 3G bytes worth of data and programs," Staudt said, adding that users will also be able to access, via an X.25 gateway, Westlaw and Lexis, the country's two largest on-line databases of legal information. Westlaw is a service from West Publishing Co. in St. Paul, Minn; Lexis is operated by Mead Data Corp. in Dayton, Ohio.

CALENDAR

AUG. 23-29

Interop Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew, Interop, Sunnyvale, Calif. (408) 738-4848.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Parr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Chicago, Aug. 25-26 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cohesion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, BIS Strategic Decisions, Norwell, Mass. (617) 878-8650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Hamlip, DMA Computerfest, Dayton, Ohio. (513) 263-3378.

AUG. 30-SEPT. 5

Primavera Systems, Inc.'s Ninth Annual User Conference. Philadelphia, Aug. 30-Sept. 2 — Contact: Primavera Systems, Inc., Bala Cynwyd, Pa. (215) 660-5830.

International Training Conference & Exposition. Anaheim, Calif., Aug. 31-Sept. 2 — Contact: Russell F. McKinnon, Trade Associates, Inc., Rockville, Md. (301) 468-3210.

Surface Mount International Conference. San Jose, Calif., Aug. 30-Sept. 3 — Contact: SMTA, Edina, Minn. (612) 920-7682.

SEPT. 6-12

Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 13-19

Buscon '92/East. Boston, Sept. 15-17 — Contact: Buscon '92, Norwalk, Conn. (203) 852-0500.

DOD-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acucobol, San Diego, Calif. (619) 689-7220.

DevCon '92. Phoenix, Sept. 18-23 — Contact: Microsoft Fox, Inc., Perrysburg, Ohio. (800) 927-6368.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The Fifth Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lemelin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Sensors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29-Oct.2 — Contact: Computer Intelligence, La Jolla, Calif. (619) 450-1667.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 1 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

Stable plans

CONTINUED FROM PAGE 73

in New York. "The bank says, 'We have worked on these products, and we certify they are the right ones to use.' It saves a lot of time and research."

Chase's scrutiny of purchases is not unusual and underscores how conservative banks are being with their money.

According to an *American Banker* survey of 150 technology managers at bank holding companies, technology spending at banks during 1991 grew at a rate of only 2%, a big drop from the 10% to 15% growth rates of the 1980s.

For IS decision makers like J. W. Pieper, executive vice president at First City, Texas-San Antonio, plans are geared to modifying current systems rather than buying new ones. Without knowing what's ahead, wholesale changes are just not viable.

"We wouldn't do things like change all of our ATMs because a new owner may not be compatible," Pieper says.

For the last 10 years, First City has been acquiring banks and consolidating its operations. The bank is also in the process of recapitalization.

At the First National Bank of Chicago, requests to upgrade systems or purchase new products are taking a back seat to more urgent IS concerns: The bank has been on the acquisition

Planning tips

- Create a modular, standardized system within your company to maintain flexibility.
- Buy rather than build. It's cheaper and it ensures compatibility with future partners or owners.
- Create new departments to handle conversions or standardization. This enables regular IS department to continue to run smoothly.
- Use contract labor to enable your department to grow and shrink on demand.

SMART Q

Is there a way for your business to turn

EDS helped River Forest Bancorp answer yes. Information technology applications developed and managed by EDS help River Forest Bancorp save $1 million a year in operating costs. The **holding company has used these savings to rapidly expand** its business through acquisitions. And improvements EDS made to the bank's systems are helping customers get better, faster service. As a result, deposits increased by $275 million from 1990 to 1991. In addition, River Forest's **stock price rose nearly 40% during 1991** and more than 250% since 1988.

EDS quickly converted the systems used by the three banks that River Forest acquired in 1990 to one com-

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trail and the IS department is converting new banks, making changes to meet regulations and fixing systems that aren't working, says Chuck Shoemaker, senior vice president at the bank. "The IS department is very busy," he notes.

HomeFed Bank's Seaman

For those pursuing new technology, purchases must have direct ties to the bank's core businesses; otherwise, they don't have a prayer. Being the technology leader isn't as important as making the best use of current products, says Seaman, whose goal is to keep HomeFed efficient for whoever purchases it.

"Most of what we do for the future is to make us a viable business," Seaman says.

The new technology he is concentrating on includes a servicing system for the mortgage banking department and a system to manage bad assets.

Chase Manhattan's Lacovara

The use of outsourcing and contract labor has lightened some IS chiefs' planning burden, especially in the area of staffing, which has enabled them to stay flexible at a reasonable cost, managers say.

In 1988, First City turned 100% of its processing activities over to Electronic Data Systems Corp. The third party oversees technology requests and recommendations and hires staff.

Bank executives say the contract enables the institution to deal with its changing needs in a way that a static staff could not. "We could never have a data processing staff that doubled overnight," Pieper says.

The use of contract personnel fits in with Banc One Services Corp.'s approach to turbulent times.

The bank does short bursts of planning through its conversion management group, which operates on a 180-day plan to brief Banc One computer operators, telecom staff and other bank personnel about upcoming acquisitions and imminent changes.

The group is also responsible for mapping the application systems within Banc One to incorporate new data and for moving files from the acquired bank to Banc One's system.

Ron Cybyske, senior vice president in information services, said the group has 25 core employees, but that number expands and contracts as needed.

Go with the flow

"We bring in anywhere from 20 to 25 [analysts and programmers] from the contract services company per month with the ebb and flow of our conversions," Cybyske says.

In the last year and a half, Banc One has completed almost 60 conversions.

Until the economic outlook brightens for the banking industry, the only certainty is that things are going to remain uncertain.

"The most together bank CIO I know makes decisions based on a series of operating principles, not on what the bank will look like in a year," says Philip Lawrence, vice president of CSC Index, Inc. in Cambridge, Mass.

Did you know?

Since the middle of the 1980s, between 100 and 200 banks have folded every year, according to the Federal Deposit and Insurance Corp. So far this year, 61 banks have failed. The FDIC has predicted that that number could reach 200 by the end of 1992.

Bredin is a free-lance writer based in New York.

Nothing funny about reducing costs

Planning for banks these days is like going through a fun house. You never know when the floor will drop out from under you or when you've taken a false turn. The key is that you've got to keep moving ahead. To make the situation even stickier, most IS chiefs are under pressure to cut costs. Here's how HomeFed Bank does it:

- **Economies of scale.** J. Carryl Seaman, HomeFed's CIO, looked at the layout of the IS facility to determine if moving equipment could boost productivity and cut costs. This could mean relocating a printer in a room with computer operators, thereby eliminating the need for a separate person to run the printer.
- **Staff absorption.** Seaman moved functions from the IS department back into other parts of the bank. For example, human resources took over determining when IS employees would be reviewed, and he put number-crunching for IS back into accounting.
- **Staff reduction.** Seaman talked to software vendors and industry peers to find out how many people are necessary to support certain technologies. He cut staff size to the bare bones, but he kept staff up in critical areas such as CICS.

UESTION:

operating costs into operating capital?

mon, streamlined system. It's used by seven of the holding company's eight banks. River Forest is now positioned to **provide customers with a broader range of services** in more locations.

"We've turned all our technology needs over to EDS," says Robert J. Glickman, President of River Forest Bancorp. "Doing so has helped us **lower costs and improve profits**." In fact, since 1988, on a nationwide basis, River Forest has consistently ranked first or second on return-on-equity among its peer group banks.

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IS leaders working to cure societal ills

BY THOMAS HOFFMAN
CW STAFF

With the Cold War over and the federal defense budget drastically reduced, Americans have been anxiously waiting for the Bush administration to channel its energies and new-found capital toward reengineering the nation's education, environmental protection, health care and public transportation systems.

And as Capitol Hill debates the allocation of the peace dividend, a few visionaries have been studying how information technology can be applied toward improving many of these fields. For example, The Diebold Institute for Public Policy Studies, Inc. has been studying various infrastructures such as the nation's highway and health care systems for the past nine years.

John Diebold, chairman of the Bedford Hills, N.Y., research group, has spent the bulk of his 40-plus years in the information technology industry providing management consulting. Now, Diebold is applying his expertise toward improving society.

He is not alone. Throughout the country, information systems leaders are exploring ways and means of targeting their talents — technological, managerial and personal — at the task of shoring up crumbling national infrastructures and closing societal gaps.

Start locally

One chief information officer said he believes these projects, like others he has been involved in, work best when first approached at the local level. "The most significant change I have seen in the public sector is usually at the local level," said Jonathan Palmer, CIO at Barnett Bank of Jacksonville NA and chairman and chief executive officer of Barnett Technologies, Inc., the Florida-based bank's information services subsidiary. Palmer was a member of a local school board for eight years.

"As a school director," he said, "it was clear to me that public education can benefit from IT professionals lending their expertise to teaching or training." But first, he added, technologists and educators need to develop partnerships. "There's a requirement for people in information technology to become better versed in education before leaping to conclusions with answers to these problems," Palmer noted.

"I think leaders in the private sector should become more involved, without getting totally frustrated by the bureaucracy involved with this," said Craig Goldman, CIO at The Chase Manhattan Bank NA in New York. "Professionals in all industries need to exercise more social conscience," he added.

"In the massive infrastructure erosion and deterioration, every person can make a contribution, regardless of what their professions are," noted David M. Carlson, senior vice president of corporate IS at Kmart Corp. While Carlson said he believes that volunteering is an important element to help improve decaying infrastructures, he does not think there should be a professional code of ethics making it obligatory for IS professionals, or anyone, to volunteer for such projects.

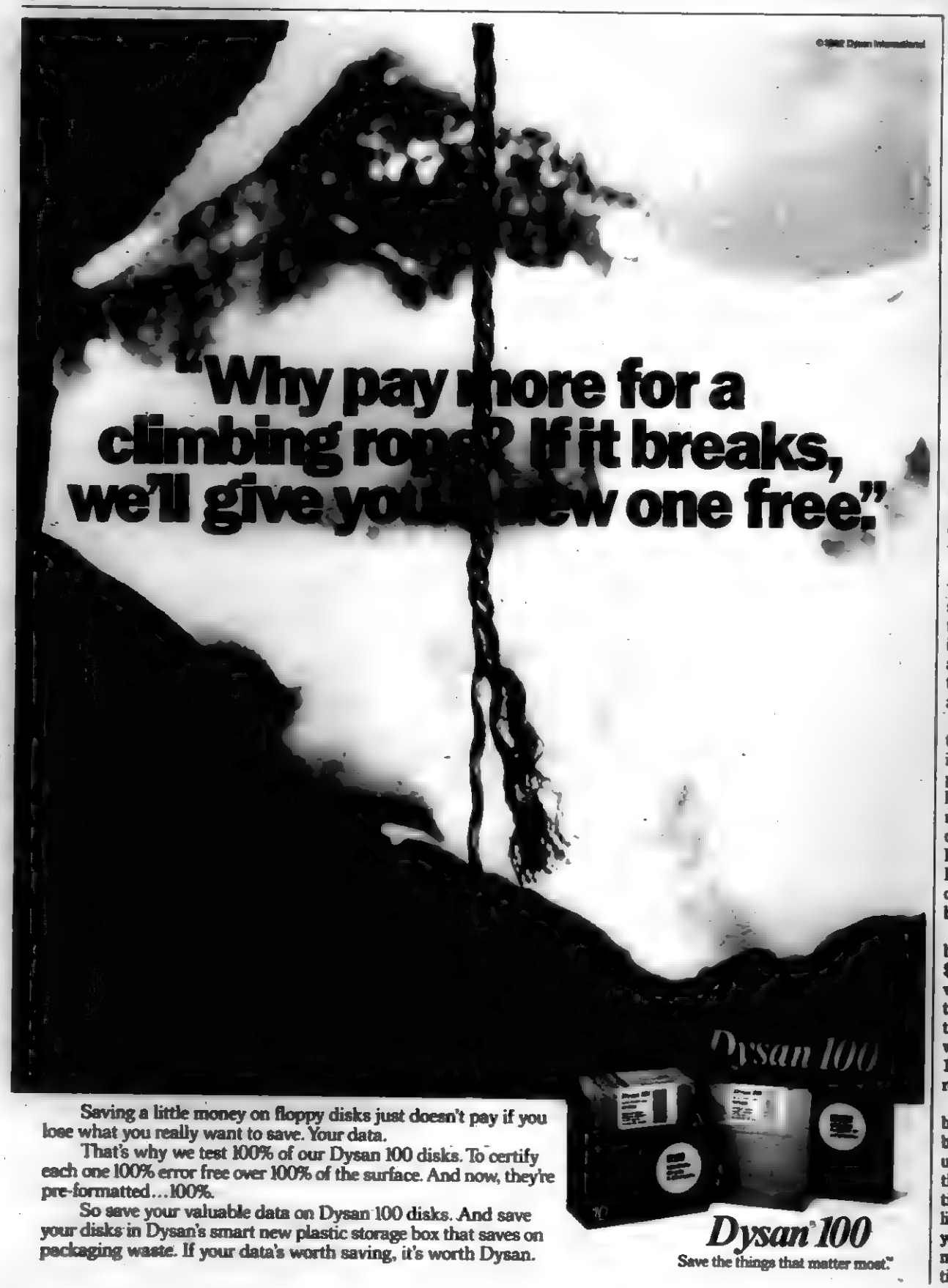
> "PROFESSIONALS IN all industries need to exercise more social conscience."
>
> CRAIG GOLDMAN
> CHASE MANHATTAN

"Our focus has first been to get a fix on what's happening here in improving infrastructures and how IT can be applied to that end," Diebold said. He added that the institute's work includes comparisons among the U.S., the European Community (EC) and Japan, and how each entity is approaching these projects.

To date, Diebold said, both Japan and the EC have surpassed the U.S. in applying information technology toward improving a number of infrastructures. But he said he expects that to change as the result of greater public awareness, in addition to recent and pending legislation. For example, Diebold said the Federal Highway bill that Congress passed in December 1991 will boost the efforts to rebuild and improve the nation's roadways.

Further studies conducted by The Diebold Institute concluded that roughly $300 billion is wasted each year on highway inefficiency. Although Diebold admitted that more work is needed to quantify the benefits of Intelligent Vehicle Highway Systems (IVHS), he reasoned that 15% to 25% savings may eventually be realized.

One example of IVHS technology is a bar-code scanning device used at toll booths. Such a tool would allow drivers to use smart cards to pay tolls — a move that could lead to reduced traffic congestion. In addition, analysts said they believe that many vehicles in the next 10 years will contain computer screens with maps to identify points of traffic congestion and provide alternate routes.



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Items of interest from publications, speeches, surveys and research projects

What recovery?

■ With the economy still not quite in recovery, information systems departments are practicing caution in their hiring patterns. A recent CompuSearch poll of 400 companies found that fewer firms will add to their IS rosters during the second half of 1992 than were planning to do so in the first half of the year.

Only 30.5% of the companies surveyed said they would increase staff in the second half of the year, compared with 35.8% during the first half of the year.

Source: *"DP hiring slows during second half of 1992,"* DP Budget, *August 1992.*

Decade of change

■ A lot can happen in a decade. Researchers at the Sloan School of Management predict that in the year 2000, client/server will be the predominant technology, electronic mail will be as common as the telephone, and an international highway of business communication (the billion-bit backbone network) will be completed and in regular use.

The success of the information technology organization in the next 10 years will depend on how well an IS department takes responsibility for managing technology-driven change.

Source: *"Critical IT Issues: The Next Ten Years,"* by Robert I. Benjamin and Jon Blunt, Sloan Management Review, *Summer 1992.*

Employers feel sting of stress injuries

■ Lawsuits are on the rise as the number of injuries allegedly caused by repetitive stress climb. Repetitive-stress injuries are responsible for 56% of all workplace injuries, with 185,000 cases reported in 1990, according to *Business Week*.

The majority of the complaints are filed by people who work as data processors, reporters and telephone operators. In the past, employees would file their suits against the manufacturers of the equipment because worker's compensation laws prohibit employees from going after their employers.

However, the Americans With Disabilities Act, which went into effect July 26, may make it easier for workers to sue employers if they have become disabled on the job.

Source: *"Repetitive Stress: The Pain Has Just Begun,"* by Michele Galen, Business Week, *July 13, 1992.*

Friendly fire

■ A recent study conducted by three professors for *MIS Quarterly* reveals that IS executives are more worried about employee errors and acts of God than hackers, viruses or competitive spying. Asked what they considered to be the three biggest threats to the security of IS, 131 randomly selected top IS executives named accidental entry of bad data by employees, natural disasters and accidental destruction of data by employees. Threats of computer viruses and access to the system by hackers or competitors followed close behind, however.

Source: *"Threats to Information Systems: Today's Reality, Yesterday's Understanding,"* by Karen Loch, Houston Carr and Merrill Warkentin, MIS Quarterly, *June 1992.*

Well, it sounds good

■ A recent national survey of 121 senior executives found that although 88% reported that their companies had used re-engineering to improve organizational performance, less than half knew precisely what the term meant.

Seventy-eight percent said their companies had used expanded automation for the same purpose, while 77% mentioned restructuring.

The companies surveyed consisted mostly of manufacturing, insurance and utility companies.

Source: *Telephone survey by Gateway Information Services, March 1992.*

Programming becomes women's work

■ The dearth of software professionals in Japan has eroded some old barriers. The number of working women in Japan has risen dramatically, and the biggest rise has been in computer-related work. The number of women doing programming and other software-related work has risen 250% in the last five years.

Source: *"Japanese Women Breach Job Barriers,"* Industry Week, *July 6, 1992.*

Compiled by Kelly E. Dwyer, assistant editor, features.

Check out the Marketplace Pages on Page 87.

Are you still trying to keep pace with your office workflow?

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Can canned plans help career climbers?

BY ALICE BREDIN
SPECIAL TO CW

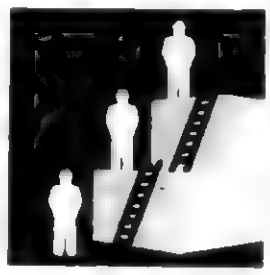
Can an information systems career be systematically planned? A small but growing number of large U.S. organizations think so.

Taking a cue from the British, Baxter Healthcare Corp. and more than a dozen others are exploring standardized professional development for IS staffers.

"There is a complete lack of standards in the IS industry, which leads to a lack of understanding of what titles mean," says Ralph Jones, president of the Data Processing Management Association (DPMA), the 30,000-member Park Ridge, Ill.-based group that is promoting the idea in the U.S. "It also leads to employees not knowing how to move ahead in their careers."

The DPMA's new Professional Development Program (PDP) outlines skill sets and academic backgrounds required for more than 200 professional IS job titles, ranging from programmer to chief information officer.

Backers say the approach gives workers a clearer idea of what it takes to advance and encourages more, higher quality training. Motivation also increases, they say, and hiring is easier because standardized titles do not vary widely from company to company.



"When Company A is interviewing a person from Company B who says he was a senior programming analyst, the person at Company A doesn't really know what that means," says Bob Wysocki, president of TMS Group, a Worcester, Mass., management training company that developed the DPMA training program.

So far, 16 U.S. firms have made varying levels of commitment to the new program, including GE Nuclear, Ideal Industries, Mickler and Associates, The University of Notre Dame and the Internal Revenue Service.

Help for managers

"It is difficult to know when to promote someone and what skills they should have to move on to another job," explains Steve Westby, manager of IS at GE Nuclear in San Jose, Calif. "A program like this could make that job easier for managers."

Westby says his firm decided to try the program because the company needed help defining job descriptions for a 12-member network services group.

According to the DPMA, similar career-standardization programs are now used by nearly 100 companies in the UK, Europe and the Middle East. The idea is especially popular with British firms and some government agencies that have used since the mid-1980s a program that was developed by the British Computer Society that the PDP is modeled after.

"The program encourages participants to take control of their careers and learn new things," says Dawn Roberts, resource and recruitment adviser for Shell-Mex House. The London-based firm has used the plan since 1989.

Despite some early resistance from fears of increased administrative work loads, Roberts says the effort is now seen as a valuable adjunct to company training programs. Trainees seem enthusiastic about learning new skills, which can be used anywhere in the industry, she adds.

The first U.S. company to purchase the entire DPMA program is Baxter Healthcare. The Deerfield, Ill., firm began implementing the structure in January at its North Cove, N.C., plant.

"We believe that training and development are key to getting and retaining good technical people," explains Richard Parrow, information services manager.

Eleven IS staff members — three supervisors and eight employees — now participate for a cost of about $5,000, Parrow says.

Varied options

Companies can buy the DPMA program in two ways. For $1,495, they can acquire the Industry Structure Model, which can be tailored to internal training and development needs.

Or, for a $3,500 basic flat fee plus a site fee of $1,500, they can buy the complete program, including training and materials, and consulting from the DPMA and its members. In addition, there is a fee for each participant, ranging from $100 to $150 per person, depending on the number of participants.

The idea of standardized career planning is also drawing interest in academia.

Lou Berzai, a professor specializing in business computing at Notre Dame, plans to use the PDP to teach students about job skills and career opportunities.

For more information on the PDP, contact the DPMA at (708) 825-8124.

Bredin is a free-lance writer based in New York.

How it works

Supervisors play a key role in the DPMA's new career standardization program. Here's a quick look at how the typical process proceeds: As preparatory steps, a company must appoint a coordinator, identify program participants, process DPMA applications and schedule supervisor training.

Once supervisors have been trained, a supervisor helps an employee participant create an individual training plan for the development "cycle" (usually one year).

With supervisor guidance, the employee lists tasks in four categories: academic preparation, job experience, on-the-job training and professional development. Employees then track their progress in individual log books.

The career motivation portion of the professional development program assigns a series of tasks to each employee that charts a course for employees to move from one job — or cell, as the development program calls it — to another.

After a company begins the program, supervisors participate in a one-day training session. Supervisors are normally the employee's daily supervisor, but not always.

The DPMA says the program requires a time commitment of about three hours during the year for each participant.

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Take advantage of our experience and let The Registry assist you in your next career move.

The Registry

Get exposed to client/server

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chick Bisberg, president of Two-Party Systems, Inc., an information technology recruitment firm in Livingston, N.J.

Q I am a systems analyst with a background in large IBM mainframe applications development, but I'd like to take my career toward the client/server environment. During the next two to three years, what can I do to make my way into the client/server arena?

A Get acquainted with the systems and user managers in your firm who are currently developing or looking into local-area network/server technology, and discuss the chance to work on their projects citing your C skills and long-term interests.

Beyond that, try to become familiar with pertinent LAN/server software (get hands-on experience if you can) through such channels as vendors or industry shows.

Prepare for internal opportunities, and position yourself for the future.

Q I'm a programmer/analyst with 25 years' experience with NCR Corp.'s proprietary language and banking applications. My job is about to end. How can I make my resume look appealing to a non-NCR company?

A Your resume must be factual, but there's no harm in highlighting each of the banking applications areas you've been involved in, in order to emphasize the transferability of your knowledge to another bank. Also, be sure to mention any leadership roles you've played, as well as any non-NCR hardware or software you know well.

Finally, remember that many NCR shops also use other brands of computers on which you might be trained and get worthwhile experience for the future.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I am a data processing manager. The employees at my company receive average annual raises that are 2% to 3% higher than those of managers. Is this normal?

A The percentages you quote do seem a bit skewed to nonmanagers. You should consider discussing the perceived inequity with managers at other local companies to gain perspective on how their organizations handle the issue. Do this discreetly, and if you decide that your firm's policies don't make economic or managerial sense to you, maybe it's time to look around. Remember, though: You may have perks as a manager that your subordinates don't enjoy.

Q I have completed a course at a local programming school and am working part-time toward a bachelor's degree in computer science. I feel I have the talent to be an applications programmer, but I haven't had much luck in obtaining an entry-level position. What can I do to improve my situation?

A Look for opportunities your current skill set qualifies you to handle, and emphasize your eagerness to move into programming during each interview. Focus on companies that have hired graduates of your programming school before, and complete your bachelor's degree on time. Be sure to put your current degree program and your programming school training at the top of your resume.

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TIP of the MONTH

Being too perfect can hurt an IS professional

➤Being a perfectionist can be an impediment because you fiddle with the details for so long that you miss targets. The best way to put that perfectionism to work is to build enough time into the project schedule to allow for a post-implementation review.

Tim Schwab, director, systems program and operations
Health Midwest, Kansas City, Mo.

➤A perfectionist can get bogged down in the details and lose sight of competitiveness and changing technology. Of course, to go too far in the opposite direction means there would be no reliable implementation of systems. The trick is to strike a balance between the importance of details and deadlines.

Rob Diehl, manager of telecommunications — Loveland
Hewlett-Packard Co., Loveland, Colo.

➤Perfectionists have a tendency not to let the final product go. They want to continually revise and change it, which prevents them from completing projects on time.

Don Livingston, technical support manager
Dallas Morning News, *Dallas*

➤The price you pay for being a perfectionist is time. I'd rather spend an extra day on a project and sleep at night. I haven't seen perfectionism hurt many IS careers, but I've seen how inadequate research and inattention to detail can cause problems.

Tim Riddell, director of technology
FMC Corp., Dallas

➤I consider myself a perfectionist, and it's only helped my career. Because of my willingness to pay attention to details I've had the opportunity to be cross-trained on all the systems within the organization.

Dennis Pinon, system control center technician
Nordstrom, Inc., Seattle

Compiled by Jill Vitiello, a free-lance writer based in East Brunswick, N.J.

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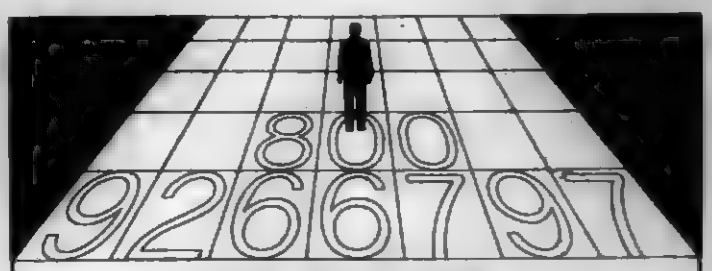

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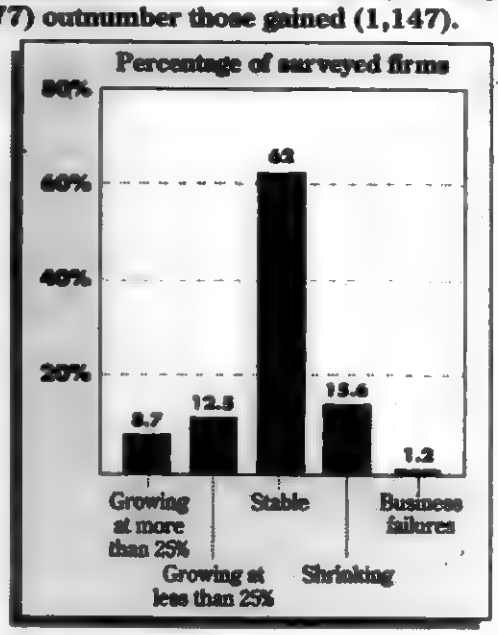
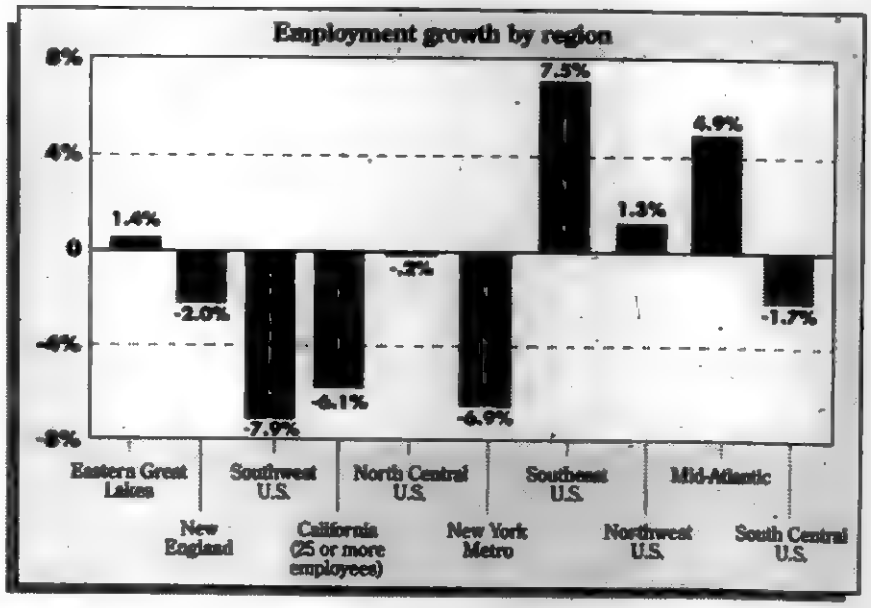
Computerworld/Corptech Career Index

Photonics – While the number of firms growing (68) actually outnumber those shrinking or failing (54), the number of employees lost (1,577) outnumber those gained (1,147).





Confessions of a hardware salesman

BY ANONYMOUS
SPECIAL TO CW

I am a computer hardware salesman, and I've had to change a lot in the past couple of years. Business is tight. Competition is cutthroat. A guy like me can barely afford a decent European automobile anymore.

Remember the early '80s? I took orders like a shorthanded waitress. Now, the only time I hold a pen is to demo a pen-based system, which never works with the customer the way it did in my office that morning.

But I've survived for 17 years. I've survived selling in Silicon Valley. I've survived recessions, cutbacks and takeovers. To do it, I've had to be a little "flexible." In these schmooze-or-lose '90s, a salesman has to know the tricks of the trade.

And if you promise not to tell anyone, I'll let you in on a few of them. They're not dishonest. They're not unethical. They're just a shot in the arm when the tape drive I'm selling is such a dog that 10 minutes after it's installed it falls over backward and crushes an operator.

Remember, I don't actually follow these practices. Neither does anyone at my company. But I'm convinced that my competition does — 30 minutes after I leave, and all day before I get there. So watch out!

The Pet Store Close.
You know you want the equipment. I know you want the equipment. But you're a little reluctant. Maybe it costs a lot. Maybe you didn't make room for it in the budget. Or maybe it's because the model I just demonstrated has smoke coming out the back.

So here's where I try the Pet Store Close: Once you take that puppy or kitten home, nine times out of 10 it's home for good. "Look, I'll leave it here with you. Use it for as long as you like. If you change your mind, we'll come back and deinstall it, decable it, rip the thing right out of the raised floor, repack it and ship it back to the plant, at the meager cost [to you] of about $14,000. But we can work out those details later. So what was that purchase order number again?"

Disparage the competition.
Disparagement? It's unprofessional. It's misleading. I would never disparage the competition.

Unless I'm losing. Sometimes a little fear, uncertainty and doubt can go a long way. Look at it this way: If you were about to buy a superserver from the competition, and I just happened to know that Leona Helmsley was about to buy that company, wouldn't you want to know about it? Heck, I'd tell you. It's my job to tell you stuff like that, even when it's true.

Hardware first!
Every company has a wise guy who thinks you should first buy the software and then buy the hardware. He thinks you should first find the right application and then find something that will run it. He'll even propose that cheap, efficient software is better than outrageously expensive extra memory.

Don't listen to this guy! This kind of attitude could cripple the industry. Nobody sees software. But hardware is right there. You can smell it. You can touch it. Every 13-year-old kid has software at home. But a water-cooled, nine-way, 90 million instructions per second processor — those babies look great, even when they're down.

So when I meet up with someone like this, I usually try to get him transferred to Kansas.

The Demo Shell.
Speaking of software (gosh, I really hate software), once in a while I've been known to demo some, if it helps me sell a bunch of hardware.

That's where the Demo Shell comes in. When I show a prototype system, my screens work. My function keys work. I can show Help text, color and a pie chart or two.

But you should always notice who's driving, who's sitting at the keyboard or messing with the mouse. Me. Always me. Because 99% of the time, this thing is just a shell, and if I haven't shown you a function or 12, it's because we have not written them yet.

But if I drive, you'll never know that, and by the time you do, we'll hopefully have the code ready, or know when it will be ready, or at least I'll have delivered the hardware and cleared the check.

Buy now.
There's a new product announced every day, and you want to wait before you buy. But I've got a warehouse of soon-to-be-no-longer-current products, and I get megabonuses for selling the stuff.

So I need to persuade you to buy today rather than three days from now, when we announce the follow-on product with twice the performance for half the price. "You can't sit on the sidelines forever. If there's a benefit now, why not take advantage of it?"

What's the worst that can happen? I sell you a big-bucks, big-commission box that is obsolete before the check clears? If your chief financial officer understands the industry, he won't blow his stack. We can always march into his office and tell him that now we'll need the big-bucks, big-commission upgrade.

The last guy wins.
Finally, here's the best trick of all. I always look for one of those two-year sales cycles. I let the competition spend the big bucks on demos. I let them foot the bill on benchmarks. I let them convince the CFO that he needs the system, a direct-access storage device, tapes, personal computers and network and training services.

And then, in month 24, for the first time, I show up. I wriggle my way into your office, and I demo my "me-too" system.

Nothing better. Nothing fancy. Might not even meet all your requirements. But you're so tired and cranky and anxious to get started, you're ready to buy anything.

And since I haven't yet spent a dime on marketing or trials or benchmarks or anything, I discount the heck out of my price. The CFO winds up overjoyed. The competition winds up blindsided. I wind up with a sizable commission check. And you wind up with a mediocre system, a handshake and our 800 support number in Nebraska — "Please hold for the next available representative."

The writer is a hardware salesperson in a major Midwestern city.

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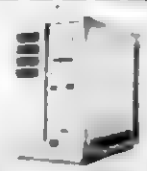

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The following items are the criteria by which the proposal will be evaluated. These criteria are listed in their order of importance with the first criteria listed as being the most important:

1. Total project cost (inclusive of all MTA internal costs).
2. Compliance with the requirements of the Technical Specification, section. The reserve capacities of the primary and secondary "Hot Sites" (e.g. CPU, DASD, Telecommunications, power,). The vendor's policy on technological upgrades and the ability to service the future MTA needs.
3. The ability of the MTA to access the "Hot-Site" (for testing or disaster recovery purposes) regardless of the type or location of the disaster.
4. Proximity of the primary "Hot Site" to the MTA Data Center.
5. The availability and ability of Vendor staff to assist MTA staff as required in data and actual disasters. The stability and technical acumen of the vendor's staff at the "Hot Site".
6. The number of secondary sites, which are compatible to MTA'S requirements, available within the vendor's organization in the continental United States and their locations related to the MTA Data Center and the guaranteed availability of them.
7. The Vendor's past experiences in providing Disaster Recovery Services of equivalent magnitude.
8. Responsiveness to this RFP; the criteria will include, but not be limited to, providing the information requested, providing the information in the format requested and acceptance of MTA Terms and Conditions.

RFP NO: 2-01-92102-0
DATE/TIME: 9/30/92,4PM
For: "Emergency Computer "Hot Site" Facility"

NIS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg. Suite 508, Jackson, MS 39201 for the following:

RFP No. 2238, due Thurs. 9/10/92 at 3:30 p.m. for technical services for the management and assistance of a project to upgrade the AMS Governmental Financial System Release 6 to Release 8 for the DEPARTMENT OF FINANCE AND ADMINISTRATION. No Charge.

RFP No. 2240, due Wed. 9/23/92 at 3:30 p.m. for payroll software for the DEPARTMENT OF EDUCATION. No Charge.

Detailed specifications for each RFP with a charge may be obtained by submitting a written request accompanied by the appropriate payment. No phone requests will be accepted. NOTE: Valid forms of payment are corporate checks on a Mississippi bank, certified check or POSTAL money order made out to Central Data Processing Authority. No cash or out-of-state checks. For RFPs with no charge call Kelli Brown @ 601-359-2604. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

REQUEST FOR QUALIFICATIONS

The Sewerage and Water Board of New Orleans is soliciting statements of qualifications from organizations capable of providing data processing facilities management for its Information Systems Department. The company providing this service must be qualified and experienced with the latest technology in the field. The scope of the work consists of three major areas for a Mainframe and PC/Network environment: operations, maintenance and development. At present, the Board's intention is to continue to use its current hardware, software and applications.

The major operation of the Sewerage and Water Board of New Orleans is providing water, sewerage and drainage services for the City of New Orleans.

Parties interested in obtaining this RFQ should contact the Sewerage and Water Board's Purchasing Department by phone at (504) 585-2124 or by FAX at (504) 585-2150.

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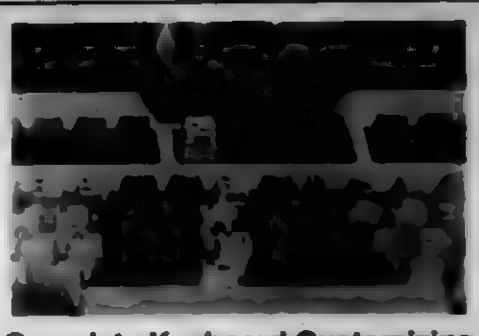

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- Charles A. Mills
President
Firesign Computer Company

Firesign Computer Company is a data communications software developer with 17 years in the business. Having tripled in size during the past two years, this San Francisco-based company retains rep firms on the East Coast and in Europe to service a worldwide customer base that extends as far as Australia and New Zealand. For President Chuck Mills, finding new sales prospects for the company's flagship product Outbound means advertising in *Computerworld Direct Response Cards* every month.

"Outbound's claim to fame is unattended file transfer. Supporting MVS and VM mainframes and OS/2, DOS, and Windows PC networks, it is the only product whose main thrust is unattended mainframe-to-PC file transfer. Virtually invisible to the PC user, Outbound saves time, provides flexibility, and eliminates training - all while automatically ensuring consistent reliability.

"By its very nature, Outbound has a cross-industry and cross-functional appeal, with potential users ranging from mainframe network software managers to information center professionals to project analysts. So when it comes to targeting our audience, we need a broad-spectrum advertising vehicle with a broad reader base. It's no surprise, then, that *Computerworld Direct Response Cards* have proven to be our best choice.

"In computer trade press advertising, *Computerworld Direct Response Cards* are first in quantity and quality - and lowest in cost per qualified lead. They consistently generate over 70 responses every month - and a full two-thirds are very qualified leads. Some months, we've even received as many as 120 responses. On a cost-per-lead basis, *Computerworld Direct Response Cards* are also our best value dollarwise.

"As an added benefit, I see *Computerworld Direct Response Cards* having an equalizer effect. Here, unlike other advertising vehicles, companies with smaller advertising budgets like ours stand out and make just as big an impact as much larger companies. *Computerworld's* large circulation also gives us reach to the right cross-section of potential buyers. And, since we continue to receive responses for many weeks after each deck hits, we obviously benefit from both a long shelf life and an active pass-along readership.

"As long as *Computerworld Direct Response Cards* remain our top lead generator, we'll definitely maintain our advertising presence in every deck. Looking ahead, I also foresee expanding our *Computerworld Direct Response Card* advertising should we develop a new data communication software product requiring similar exposure."

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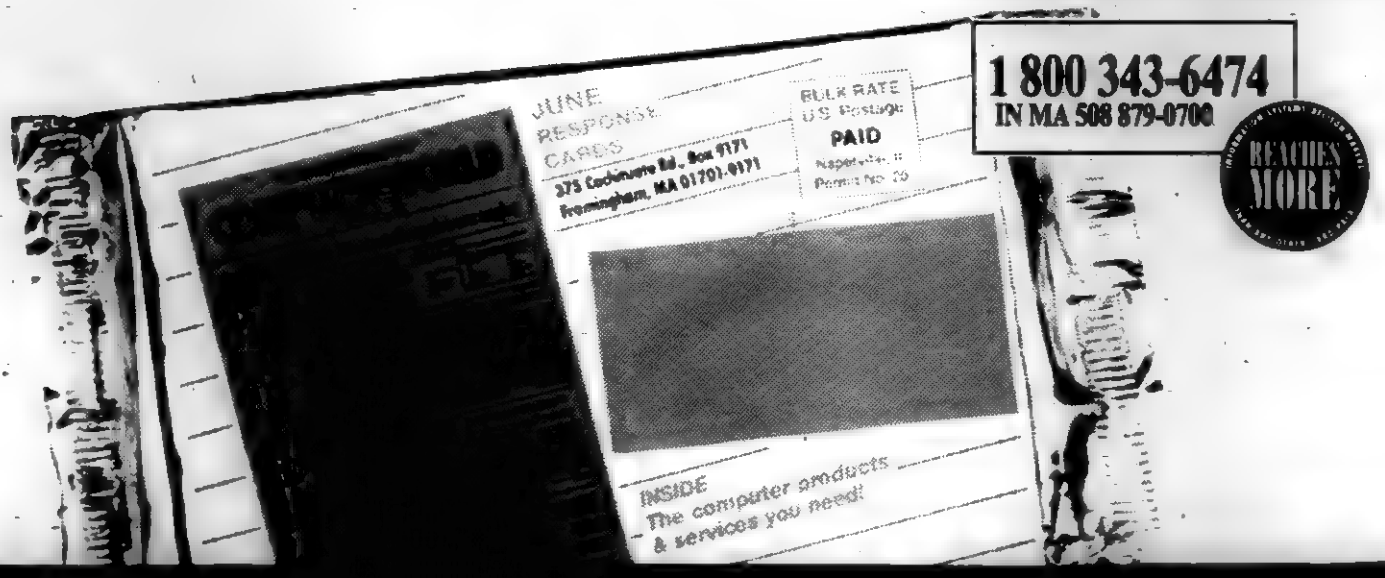

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ADVERTISERS INDEX

AT&T Business Communications Services	18-19
AT&T Tridom	51
BMC Software	52
Borland International	28, C4
CANAC Telecom	40
Chipcom	C3
Command Technology	29
Compaq Computer Corp.	35-37
Computer Associates	3
CW Circulation	71
CW Marketing	39
CW Recruitment	4, 42, 61, 79
Dysan International	78
EDS	74-75
EMC Corp.	38
Filenet	79
Genicom	57
Hewlett-Packard	20
IBM	22-23, 54-55
IDG Books	72
Information Builders	17
Innovation Data Processing	7
Intel	26-27
IPL Systems	64
Landmark Systems	61
Lawson Associates	46
Legent Corp.	48-49
Lexmark	42
Micro Focus	11
Oracle Corp.	5
Progress Software	58
Ross Systems	10
SAS Institute	13, 43
Software Engineering of America	9
Sterling Software	60
Texas Instruments	62-63
Toshiba America	30-31
Unisys	76-77
Universal Data Systems	15
Workstation Group	41

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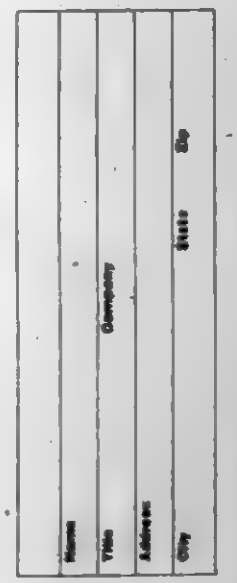

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STOCK TRADING INDEX

Industry Almanac

INITIAL PUBLIC OFFERINGS

The Houston-based investor relations firm of Sommers & Associates reported that during the second quarter of 1992, computer-related initial public offerings (IPO) sprung upward in both number and dollar volume. Increasing more than 160%, dollar volume totaled $1.1 billion, compared with $425 million in the first quarter. Eighteen computer-related IPOs were completed. First Data Resources, Inc. — the credit-card processing spin-off from American Express Co. — accounted for $770 million of the total raised. Noncomputer IPOs were down 4% in number and 15% in dollar volume for the quarter. A total of 149 deals from all industries raised $8.3 billion in the quarter, compared with 155 completed IPOs with a total value of $9.8 billion in the first quarter.

LISA DAVIDSON

Newly public

A sampling of second-quarter IPOs

	IPO date	Amount raised ($M)	Offering price	Recent share price
Mentor Graphics, Inc.	May 13	$3.5	$3.50	$4.50
Chipsoft, Inc.	April 2	$41.2	$12.50	$11.00
Centocor Corp.	June 18	$29.3	$11.00	$16.00
Dataworth Corp.	May 28	$5.0	$5.00	$3.50
Equitrac Corp.	June 11	$16.5	$11.00	$10.63
First Data Resources, Inc.	April 9	$770.0	$22.00	$27.75
Kronos, Inc.	June 5	$18.0	$12.00	$13.50
MicroTouch Systems, Inc.	June 30	$18.2	$13.50	$18.75
Softronics Systems, Inc.	June 4	$27.0	$9.00	$9.75
Network Computing Devices, Inc.	June 4	$24.0	$12.00	$12.75
Optical Data Systems, Inc.	May 21	$17.1	$9.00	$13.75
Sapient International Corp.	May 29	$33.4	$11.50	$11.63
Star Electronics	May 7	$36.0	$12.00	$7.00
Supercomputer Technology	May 15	$18.0	$9.00	$10.25
The Learning Co.	April 28	$22.0	$11.00	$11.25
Y-Intercept Software, Inc.	May 14	$16.2	$9.00	$7.50
Wellfleet Communications Corp.	June 24	$5.4	$5.38	$6.25

Source: IDD Information Services, Sommers & Associates

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 7, 1992

TOP PERCENT GAINERS

Iomega Corp.	31.82
Cray Computer	21.74
Meca Software (L)	18.75
Penril Data Comm. Ntwks.	17.65
Gateway Communications	17.39
Hogan Systems Inc.	17.14
Quarterdeck Office Sys.	15.79
Network General	15.79

TOP PERCENT LOSERS

Egghead Discount Software	-39.19
Mensel	-31.40
Hewlett-Packard Co.*	-19.90
Zeos International Ltd.	-18.42
Intelligent Electronics	-14.12
Borland Int'l Inc.* (L)	-13.61
Ultimate Corp.	-12.50
Fibronix Int'l Inc.	-12.50

TOP DOLLAR GAINERS

Harris Corp.	2.63
Iomega Corp.	1.75
Network General	1.50
Standard Microsystems Corp.	1.38
Boole & Babbage	1.25
Chipcom Corp.	1.25
Komag Inc.	1.25
General Motors E (EDS)*	1.25

TOP DOLLAR LOSERS

Hewlett-Packard Co.*	-14.63
IBM*	-7.63
Egghead Discount Software	-7.25
Borland Int'l Inc.* (L)	-6.50
Novell Inc.*	-6.13
BMC Software Inc.	-4.25
Apple Computer Inc.*	-3.38
Mensel	-3.38

Exch	52-Week High	52-Week Low		Aug. 7 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 0.38%**
OTC	15.00	6.75	3 COM Corp.*	11.38	-0.75	-6.18
NYS	69.88	56.25	American Info Techs Corp.* (H)	69.00	-0.50	-0.72
NYS	44.88	32.88	AT&T*	43.63	-0.38	-0.85
OTC	4.25	1.00	Antel Communication Corp.	1.25	0.00	0.00
NYS	50.63	40.25	Bell Atlantic Corp.	47.38	-0.13	-0.26
NYS	53.25	43.38	Bellsouth Corp.	52.63	-0.13	-0.24
NYS	7.25	4.13	Bolt, Beranek & Newman	4.50	0.00	0.00
NYS	85.88	36.63	Cabletron Systems	54.50	0.00	0.00
OTC	31.00	16.50	Chipcom Corp.	25.50	1.25	5.15
OTC	53.50	18.63	Cisco Systems Inc. (H)	50.13	-3.25	-6.09
OTC	35.25	7.00	Compression Labs Inc. (L)	7.50	-0.50	-6.25
OTC	3.38	0.88	Data Switch Corp.	2.00	-0.19	-8.59
NYS	23.63	12.38	Digital Comm. Assoc.*	18.88	-0.25	-1.31
OTC	17.50	8.00	Digital Systems Int'l Inc.	9.00	0.00	0.00
OTC	7.00	3.63	DSC Communications	6.63	0.63	10.42
OTC	10.88	4.75	Fibronix Int'l Inc.	5.25	-0.75	-12.50
OTC	37.50	10.50	Fibernet Corp.	14.88	-0.38	-2.46
OTC	3.38	1.13	Gandalf Technologies Inc.	2.75	0.06	2.31
OTC	2.25	0.69	Gateway Communications	1.69	0.25	17.39
NYS	5.50	2.13	General Datacomm Inds.	3.75	0.00	0.00
ASE	5.88	0.50	Go Video	3.00	0.13	4.35
NYS	35.00	28.13	GTE Corp.*	34.88	0.00	0.00
NYS	70.63	50.00	ITT Corp.	67.75	0.00	0.00
OTC	38.13	25.25	MCI Communications Corp.	33.38	-0.38	-1.11
OTC	14.50	2.25	Microcom Inc.	3.63	0.25	7.41
NYS	18.25	9.50	Network Equipment Tech.*	10.38	0.25	2.47
OTC	25.50	6.75	Network General	11.00	1.50	15.79
OTC	20.00	8.50	Network Systems Corp.	12.25	0.75	6.52
OTC	17.88	5.50	Newbridge Networks Corp.	16.13	-0.88	-5.15
NYS	49.25	33.75	Northern Telecom Ltd.*	35.75	0.88	2.51
OTC	65.00	28.50	Novell Inc.*	48.88	-6.13	-11.14
NYS	83.50	69.13	Mynex Corp.* (H)	81.50	-1.50	-1.81
OTC	37.50	16.50	Octel Communications Corp.	23.50	-0.50	-2.08
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.00	0.75	17.65
OTC	53.00	17.00	Picturetel Corp.	17.50	-1.50	-7.89
OTC	18.75	9.75	Proteon Inc.	14.00	-0.63	-4.27
NYS	26.25	11.63	Scientific Atlanta Inc. (H)	25.75	0.25	0.98
NYS	66.38	51.50	Southwestern Bell Corp. (H)	65.38	-0.50	-0.76
NYS	27.13	20.75	Sprint Corp.	23.38	0.13	0.54
OTC	13.75	4.00	Standard Microsystems Corp.	13.00	1.38	11.83
OTC	35.50	14.25	Synoptics Communications (H)	33.75	-1.38	-3.91
NYS	40.00	32.88	U S West Inc. (H)	38.13	-1.38	-3.48
OTC	41.25	22.25	Wellfleet Communications	36.25	-0.75	-1.92
PC and Workstations						**Off 5.03%**
OTC	15.00	4.50	Advanced Logic Research	4.50	0.00	0.00
OTC	70.00	42.75	Apple Computer Inc.*	43.38	-3.38	-7.22
OTC	32.25	12.00	AST Research Inc.*	13.00	-0.88	-6.31
NYS	19.25	9.00	Commodore Int'l	9.50	-0.13	-1.30
NYS	37.50	22.13	Compaq Computer Corp.*	29.13	-0.38	-1.27
OTC	29.00	13.91	Dell Computer Corp.	22.75	-0.25	-1.09
OTC	7.75	2.13	Everex Systems Inc.	2.69	-0.06	-2.28
NYS	34.00	21.25	Harris Corp.	31.13	2.63	9.21
NYS	85.00	44.63	Hewlett-Packard Co.*	58.88	-14.63	-19.90
NYS	29.75	14.13	Silicon Graphics	21.38	-0.88	-3.93
OTC	35.88	20.75	Sun Microsystems Inc.*	25.00	-1.75	-6.54
NYS	31.25	22.50	Tandy Corp.*	24.00	-0.75	-3.03
NYS	11.13	5.13	Zenith Electronics	6.88	-0.63	-8.33
OTC	25.50	3.88	Zeos International Ltd.	3.88	-0.88	-18.42
Large Systems						**Off 0.20%**
ASE	20.63	11.63	Amdahl Corp.*	13.88	0.25	1.83
NYS	16.13	7.50	Candian Corp.	15.75	0.38	2.44
NYS	16.38	5.75	Convex Computer	8.50	0.00	0.00
OTC	19.63	1.88	Cray Computer	3.50	0.63	21.74
NYS	52.25	23.25	Cray Research Inc.*	25.13	0.00	0.00
NYS	22.50	7.13	DataGeneral Corp.	8.38	-0.63	-6.94
NYS	66.00	33.25	Digital Equipment Corp.*	37.25	-2.00	-5.10
NYS	106.38	81.63	IBM*	87.13	-7.63	-8.05
NYS	121.25	92.50	Matsushita Electronics (L)	95.00	-2.50	-2.56
OTC	19.75	9.50	Pyramid Technology	10.00	-0.50	-4.76
OTC	17.88	7.50	Sequent Computer Sys.	16.50	0.38	2.33
OTC	18.38	5.00	Sequoia Systems Inc.	5.75	0.25	4.55
NYS	54.25	34.13	Stratus Computer Inc.*	46.88	0.88	1.90
NYS	15.13	9.50	Tandem Computers Inc.*	10.63	-0.50	-4.49
NYS	11.75	3.63	Unisys Corp.*	9.63	-0.63	-6.10
ASE	7.50	1.75	Wang Labs Inc. (D)* (L)	2.25	0.00	0.00
Software						**Off 2.05%**
OTC	68.50	35.75	Adobe Systems Inc. (L)	35.88	-2.13	-5.59
OTC	13.25	2.50	Al Corp.	4.63	-0.13	-2.63
OTC	45.00	11.50	Aldus Corp.	13.25	-1.38	-9.40
OTC	19.75	10.50	American Software Inc.	13.88	-0.13	-0.89
OTC	20.00	8.50	Ask Computer Systems	14.75	-0.38	-2.48
OTC	57.25	23.25	Autodesk Inc.	41.00	-1.50	-3.53
OTC	37.75	8.25	Bachman Info. Systems	10.25	0.00	0.00
OTC	42.50	29.00	BGS Systems Inc.	37.25	0.75	2.05
OTC	79.00	37.25	BMC Software Inc.	48.50	-4.25	-8.06
OTC	20.50	9.00	Boole & Babbage	19.50	1.25	6.85
OTC	86.75	35.00	Borland Int'l Inc.* (L)	41.25	-5.50	-13.61
OTC	11.25	3.63	CE Software	4.88	-0.25	-4.88
ASE	14.38	6.50	Cheyenne Software Inc.	12.00	0.25	2.13
OTC	20.38	7.25	Cognos Inc.	8.38	-0.38	-4.29
NYS	17.00	7.50	Computer Associates*	14.38	-0.13	-0.86
OTC	21.50	8.50	Comshare Inc.	9.88	-0.25	-2.47
OTC	47.88	6.50	Easel Corp.	7.25	-0.75	-9.38
OTC	25.50	11.50	Group I Software	17.50	1.00	6.06
OTC	6.63	3.50	Hogan Systems Inc.	5.13	0.75	17.14
OTC	38.25	18.50	Information Resources	24.25	-0.50	-2.02
OTC	39.25	5.50	Informix Corp. (H)	36.25	-1.50	-3.97
OTC	22.75	12.50	Intergraph Corp.	14.25	-0.75	-5.00
OTC	15.00	5.13	Interleaf Inc.	8.75	-0.88	-9.09
OTC	20.25	8.50	Intersolv Inc.	15.00	-0.13	-0.83
OTC	30.00	10.50	Knowledgeware Inc.	12.25	-1.25	-9.26
OTC	45.25	20.25	Legent Corp.*	40.25	0.25	0.63
OTC	40.75	15.50	Lotus Development*	17.25	-1.00	-5.48
OTC	7.38	1.88	Meca Software (L)	2.38	0.38	18.75
OTC	22.25	6.50	Mentor Graphics	7.75	-0.25	-3.13
OTC	20.50	6.50	Micrografx Inc.	9.38	0.00	0.00
OTC	88.84	51.34	Microsoft Corp.*	70.75	-2.00	-2.75
OTC	21.13	8.88	Oracle Corp.*	17.88	-0.76	-4.03
OTC	41.25	14.63	Parametric Technology	39.00	-1.50	-3.70
OTC	11.00	3.50	Phoenix Technologies	4.88	0.25	5.41
OTC	25.25	11.00	Platinum Technology	16.00	-0.75	-4.48
OTC	46.50	27.75	Progress Software Corp.*	39.50	-0.75	-1.86
OTC	26.63	4.00	Quarterdeck Office Sys.	5.50	0.75	15.79
OTC	32.75	10.25	Rainbow Technologies Inc.	18.00	-1.00	-5.26
OTC	29.25	8.75	Rasterops	10.50	-0.75	-8.67
OTC	17.25	5.38	Ross Systems	7.25	-0.75	-9.38
OTC	26.25	7.50	Software Publishing Corp.	8.75	-0.75	-7.89
OTC	8.50	2.00	Software Toolworks Inc.	2.50	-0.25	-9.09
OTC	7.25	1.75	Spinnaker Software	2.75	-0.25	-8.33
OTC	16.50	6.25	State of the Art	6.75	-0.50	-6.90
NYS	25.25	12.13	Sterling Software Inc.	17.50	1.00	6.06
OTC	30.00	13.00	Struct. Dynamics Research	14.00	-1.00	-6.67
OTC	31.75	15.00	Sybase Inc.	28.13	-1.25	-4.12
OTC	51.00	18.00	Symantec Corp.	18.63	-2.38	-11.31
NYS	15.50	5.25	Systems Center Inc.*	7.75	1.00	14.81
OTC	34.25	8.88	System Software Assoc.	28.13	-0.13	-0.48
OTC	23.75	14.50	Walker Interactive Systems	15.75	0.00	0.00
OTC	8.63	2.13	Wordstar	2.56	-0.06	-2.36
Semiconductors						**Up 0.03%**
NYS	21.50	7.38	Advanced Micro Devices	9.38	0.50	5.63
NYS	11.13	7.00	Analog Devices Inc.	9.88	0.13	1.28
OTC	14.13	6.75	Atmel Corp.	8.50	-0.13	-1.45
OTC	14.13	4.25	Chips and Technologies (L)	5.13	0.13	2.50
NYS	22.63	7.38	Cypress Semiconductor Corp.	8.75	-0.50	-5.41
NYS	10.25	6.25	Dallas Semiconductor	10.25	0.38	3.80
NYS	68.75	38.50	Intel Corp.*	58.63	-1.13	-1.88
NYS	9.88	5.50	LSI Logic Corp.	5.88	0.00	0.00
NYS	22.38	11.13	Micron Technology	16.00	-0.25	-1.54
NYS	87.75	54.00	Motorola Inc.* (H)	84.63	-1.00	-1.17
NYS	11.50	3.88	National Semiconductor*	11.00	0.75	7.32
OTC	27.00	9.25	Sierra Semiconductor (L)	10.00	-0.13	-1.23
NYS	42.38	26.00	Texas Instruments* (H)	39.75	-2.13	-5.07
OTC	10.50	5.88	VLSI Technology	6.75	0.25	3.85
OTC	9.75	2.13	Wafertek	3.13	0.00	0.00
ASE	5.63	2.00	Western Digital Corp.	4.50	-0.13	-2.70
OTC	32.38	17.25	Xilinx	22.00	-0.75	-3.30
OTC	11.50	4.63	Zilog Inc.	6.75	0.00	0.00
Peripherals and Subsystems						**Up 0.37%**
OTC	10.00	2.75	Archive Corp.	7.75	0.00	0.00
OTC	24.75	11.25	Banctec Inc.	24.75	0.13	0.51
OTC	23.50	7.00	Cambex Corp.	11.88	-1.13	-8.65
ASE	12.25	4.88	Cognitronics Corp.	10.75	0.00	0.00
NYS	23.88	12.50	Conner Peripherals*	20.38	-1.13	-5.23
ASE	19.66	3.72	Dataram Corp.	15.38	-0.50	-3.15
NYS	19.25	5.88	EMC Corp.	17.88	-0.63	-3.38
OTC	9.00	4.75	Emulex Corp.	7.75	0.75	10.71
OTC	23.00	14.25	Evans & Sutherland	15.50	0.00	0.00
OTC	40.63	18.25	Exabyte	30.50	-0.75	-2.40
OTC	27.25	15.75	Intelligent Info. Systems	24.00	-0.50	-2.04
OTC	11.25	4.63	Iomega Corp.	7.25	1.75	31.82
OTC	34.75	12.00	IPL Systems Inc.	15.25	0.00	0.00
OTC	24.50	10.75	Komag Inc.	16.25	1.25	8.33
OTC	14.00	2.75	Maxtor Corp.*	13.60	0.25	1.98
OTC	12.63	5.75	Micropolis Corp.	10.00	-0.38	-3.61
NYS	100.88	83.50	3M Co. (H)	100.25	0.25	0.25
OTC	7.50	3.50	Printronix Inc.	6.50	0.00	0.00
NYS	26.75	7.00	QMS Inc.	8.25	0.50	6.45
OTC	18.00	8.88	Quantum Corp.	13.63	-0.13	-0.91
OTC	12.75	5.25	Radius Inc.	10.63	-0.88	-7.61
NYS	12.88	5.88	Recognition Equipment	8.13	-0.13	-1.52
OTC	13.13	5.38	Reuon Inc.	9.25	-0.25	-2.63
OTC	17.63	7.25	Seagate Technology*	14.88	-0.50	-3.25
NYS	78.00	28.13	Storage Technology*	33.38	-2.63	-7.29
NYS	30.88	16.00	Tektronix Inc.	18.63	0.25	1.36
NYS	82.25	52.63	Xerox Corp.	74.88	0.13	0.17
Services						**Off 4.93%**
OTC	16.00	11.88	American Mgmt. Systems*	17.50	0.38	2.19
NYS	5.38	2.88	Anacomp Inc.	3.50	0.13	3.70
NYS	19.00	12.25	Analysts Int'l	16.75	0.00	0.00
NYS	49.00	30.25	Auto Data Processing*	44.25	-0.63	-1.39
NYS	24.18	12.50	Comdisco Inc.*	16.50	-0.25	-1.49
OTC	13.50	7.75	Computer Horizons	9.00	0.50	5.88
NYS	84.88	52.25	Computer Sciences*	64.50	-1.13	-1.71
NYS	10.13	7.00	Computer Task Group	8.00	-0.50	-5.88
OTC	40.50	15.00	CompUSA Inc.	24.50	-1.75	-6.67
OTC	19.25	7.00	Corporate Software (L)	7.00	-1.00	-12.50
OTC	39.75	11.25	Egghead Discount Software	11.25	-7.25	-39.19
NYS	33.05	23.19	General Motors E (EDS)*	28.88	1.25	4.52
OTC	30.38	6.25	Intelligent Electronics	9.13	-1.50	-14.12
OTC	14.88	2.75	Mensel	7.38	-3.38	-31.40
OTC	15.75	7.00	Mentage Inc.	9.25	0.63	7.25
OTC	27.50	14.88	Paychex	24.75	0.38	1.54
NYS	73.00	47.25	Policy Management Sys.	70.63	0.50	0.71
NYS	44.50	19.63	Reynolds and Reynolds (H)	41.50	-2.13	-4.87
OTC	32.00	21.25	SEI Corp.	23.25	0.00	0.00
OTC	24.38	16.88	Shared Medical Systems	19.75	0.63	3.27
OTC	38.25	13.50	Sungard Data Systems	24.00	-1.50	-5.88
NYS	4.50	1.13	Ultimate Corp.	1.75	-0.25	-12.50

Note: Goal Systems Int'l was acquired by Legent Corp. and was removed from our list accordingly.

KEY (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Sun suffers profit slide

■ Vicious price-cutting in the workstation arena hit **Sun Microsystems, Inc.**'s bottom line last week as the Mountain View, Calif., company reported that profits for its fiscal fourth quarter declined 43% to $37.7 million from the comparable period last year. Revenue, however, reached a record $972.7 million, up 3% from last year's fourth quarter.

■ Outsourcing giant **Electronic Data Systems Corp.** posted second-quarter earnings of $157.1 million, up 12% from the year-earlier period. Revenue increased 20% to $2.02 billion in the quarter.

■ **Legent Corp.** completed its $400 million acquisition of **Goal Systems International, Inc.** Legent also established a customer service division to be run by former Chief Executive Officer David Wetmore, who joins the company's board of directors. In addition, Legent formed five strategic business units — VSE Data Center Management, Inter-platform Communications, Disaster Recovery, Database Tools and Information Technology.

■ Smarting from losses, application development vendor **Easel Corp.** in Burlington, Mass., has agreed to merge with **Enfin Software Corp.**, an object-oriented tools firm in San Diego, in a stock swap valued at $7.8 million. Sales were up 9% for its second quarter, but Easel reported a $586,000 loss for the quarter, compared with a $1.2 million profit for the same period a year ago.

■ **Seven Rosen Funds** in Dallas has closed on a $65 million venture-capital fund that will address financing needs in the computer, health care, telecommunications and software markets.

DOS applications start gradual decline

BY CHRISTOPHER LINDQUIST
CW STAFF

WASHINGTON, D.C. — DOS is still king of the software hill, according to recent Software Publishers Association (SPA) figures, but the venerable operating system's grip is slipping as graphical user interface (GUI) applications continue an accelerated climb toward the top.

At $647 million last quarter, DOS applications still make up more than half of all software sales in North America. However, that figure indicates a 4% sales decrease relative to the same quarter last year.

It is likely that the decrease is a harbinger of more dramatic slips down the road.

Early sign

"I think if anything there's going to be an acceleration," said Neal Hill, a senior software analyst at Forrester Research, Inc. "It really is the first visible sign of the victory of GUIs vs. character-based interfaces."

Meanwhile, Microsoft Corp. Windows applications leaped some 98% from last year to $311 million. Apple Computer, Inc.'s Macintosh-based software shot up as well — 51%, to $216 million.

RIP DOS?

DOS has begun its decline, while graphical applications are gaining speed

*Includes Apple II, OS/2 and Amiga DOS, etc.

CW Chart: Michael Siggins

While the SPA tracks OS/2 applications sales, these were not among the top three operating environments, according to the association.

In total, according to the SPA figures, application software sales grew 19.8% compared with the first quarter of 1991, to an estimated $1.22 billion.

Word processors continued to dominate the individual category sales charts with sales of $172 million, a 4% increase.

Spreadsheets followed at $165 million, a 9% rise over the same quarter last year.

The largest increase came in the utilities category, which experienced 74% growth over last year, according to the SPA.

The SPA uses sales figures from its more than 900 members to track the personal computer software industry.

Everex, Zeos try to hang on as PC market shakeout nears

BY CAROL HILDEBRAND
CW STAFF

The other shoe has finally begun to drop in the personal computer industry price wars, as the ravaged bottom lines of several second- and third-tier vendors attest to. According to analysts, this is just the beginning of a much-predicted shakeout in the PC arena, and the trend should continue throughout the year.

"It will continue probably this way for the rest of the year, with a fair number of people falling out one way or another. It's not a soft landing; it's hard times," said Michael Murphy, editor of "The California Technology Stock Letter," published in Half Moon Bay, Calif.

One of the worst hit is Everex Systems, Inc., which has announced that it does not expect to be profitable for the quarter that just ended.

The company last week said it is cutting costs by terminating about 10% of its work force, currently at about 2,450 employees, and pruning the number of products available in each of its PC families. There have been reports, on which the company refused to comment, that it would cut as much as 20% of its staff [CW, Aug. 3].

An Everex spokeswoman said the company was aiming to get its operating expenses down from 20% of revenue to 15% or 16%. Research and development will not be affected by the cuts, she said.

> "SMALLER COMPANIES CAN'T fund research and development, marketing and can't afford to play in an expanding game."
>
> RICHARD ZWETCHKENBAUM
> IDC

Also cutting back is Zeos International Ltd., which last week laid off 93 employees in the wake of an $11.1 million loss for the second quarter of 1992, after posting a $1.9 million first-quarter deficit.

Zeos is also facing a cash crisis: The company's line of credit has been halved to $8 million, and Zeos said its bank will not renew the credit line, set to expire in December. The company said that while it had about $748,000 in short-term debt, its long-term ledger is debt-free.

Richard Zwetchkenbaum, an analyst at International Data Corp., a market research firm in Framingham, Mass., said that with all the possible fat squeezed from PC manufacturing and components, the question of survival comes down to available cash.

"It's an expensive game to play in," he said.

With the current price crunch, "smaller companies can't fund research and development, marketing and can't afford to play in an expanding game," Zwetchkenbaum said.

Compaq Computer Corp.'s "advantage is that they can sacrifice short-term profits and throw some money around, and some smaller vendors will not be able to respond," he added.

Zwetchkenbaum pointed to Compaq's recent deal with Conner Peripherals, Inc., in which Compaq sold back its stake in Conner for approximately $80 million, as another bonus cash flow for the company to play with.

IBM execs opt for retirement

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — Approximately a half-dozen IBM executives have taken the company's early retirement option, company spokesmen confirmed last week.

Among the highest ranking executives to leave was Rich Goldberg, assistant general manager of software marketing in IBM's Programming Systems Unit. Another was Dick Butler, director of systems and programming at IBM's Enterprise Systems unit. Neither has taken a position with another company, sources said, although both are said to be considering job offers.

The departure of both men surprised Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "They were closet ITO-ers," he said, referring to the Individual Transition Option, the name IBM gave to its early retirement plan. "Both are quality people."

Other IBM executives who left the fold by July 31 include:

- Pat Kearny, general manager of a consulting unit at IBM United States. She reported to Marty Clague, general manager of the Consulting, Software and Services Group.
- Beverly Brown, director of enterprise data marketing at Programming Systems. She reported to Goldberg.
- Kathy Vieth, manager of new development applications for tablet systems. She worked out of the Personal Systems line of business in Boca Raton, Fla.

A spokesman said IBM is sticking with its earlier estimate that 32,000 people — approximately 9% of its work force — will leave by the end of the year under the ITO plan.

Actually, the number of employees leaving the company worldwide will be closer to 35,000 — the majority of them through the early retirement program. The net number of 32,000 is based on the hiring of 3,000 new employees by year's end, the spokesman said, primarily in such areas as technical support, programming and scientific research areas.

The spokesman said it will be at least another week until the final number of U.S. departures is known.

TRENDS

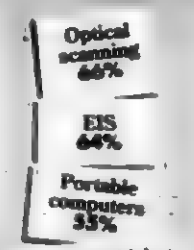
Health care IS

Rising medical costs and patient care concerns drive automation in health care

Technology in favor

High-tech wishes in hospitals include optical scanning technology and EIS

Percentage of respondents eager to have technology



Integration first

Integrating existing applications peaks the most interest of IS officials while the latest and greatest hardware hardly raises their pulse rates

Percentage of respondents concerned with issue

Top challenges during next two years

- Integrate existing applications — 16%
- Increase use/acceptance of applications by care providers — 27%
- Establish remote links to physicians — 11%
- Tailor existing applications to better meet needs — 8%
- Acquire new applications — 6%
- Other — 2%
- Upgrade current hardware — 0%

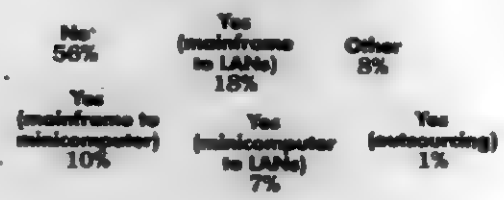
HRx priorities

Health care IS executives' goals for technology in 156 hospitals are nearly identical to that of their peers in other industries. The top goal is management. The biggest exception: Only 7% of respondents expect technology to generate additional revenue compared with 15% for other industries.

Downsizing . . . not!

Although not planning to upgrade hardware, most sites are committed to their mainframes — with no plans to downsize in the coming year

Percentage of respondents



Base: 548 health care professionals

Source: Hewlett-Packard Co., Healthcare Information and Management Systems Society, Business Research Group

CW Chart: Michael Siggins

NEXT WEEK

John Seely Brown, the director of Xerox's Palo Alto Research Center, says PARC is hot on the trail of ubiquitous computing. The idea is to get rid of interfaces, embedding computers into everyday surroundings and objects (like sketch pads). It'll take wireless nets, advanced chips and smart badges, but computing will come to the masses. See In Depth.

Tom Zimberoff

Road warriors, step aside: Today, everyone in the corporation wants to travel with PC in hand — not to mention with modem and fax and printer in hand as well. With all those people working remotely, IS has a new job description: choosing worthy peripherals that won't require tons of support. For a look at available travel accessories, see Product Spotlight.

INSIDE LINES

A separate peace

▶ Mark Sept. 2 as the date for IBM to announce that it will spin off its Personal Systems Division as a wholly owned subsidiary, according to sources close to the company. IBM will keep the RISC-based Advanced Workstations Division within IBM proper, but it is looking to split off OS/2 and the PC hardware group into one separate unit, sources said.

Complexity breeds delays

▶ IBM is telling customers in briefings that software to enable Sysplex — or the linking of many high-end processors into one — will be delayed. The Sysplex version of CICS, for example, was originally slated to be available next year but has been delayed until 1994.

Building a bigger Sun(dial)

▶ Just shy of its one-year anniversary, the SunExpress telephone sales subsidiary of Sun Microsystems is shifting its focus to concentrate more on end users than on VARs. Next week, the company will announce a new pricing structure and changed business plan to grab more user interest.

Less risky approach

▶ It looks like Amdahl's forthcoming parallel processor will be positioned against other RISC-based servers, such as DEC's Alpha machines. Last week, Amdahl CEO Joseph Zemke hinted that shipments of Amdahl's SPARC-based parallel processor, which would host Unix applications and relational databases, would begin in 1993. Zemke told analysts that Amdahl's knowledge of mainframes would give it a performance advantage over other vendors' RISC computers.

Transaction reaction

▶ A face-off between benchmark auditors over Transaction Processing Performance Council (TPC) policies raised some hackles at a San Francisco software conference last week. David McGoveran, a Santa Cruz, Calif., database specialist who audits TPC benchmarks for corporate customers, charged that the TPC's vendor-heavy membership creates "self-serving benchmarks" that are used out of context in industry advertising. "The specs allow the vendors to waffle on the benchmarks," said McGoveran, who also criticized closed meetings at the TPC's San Jose, Calif., offices. Tom Sawyer, an independent auditor who verifies official TPC results, responded by saying the TPC advisory council is a serious oversight group that forces vendors to resubmit questionable test results. Both auditors noted that vendors also have the right to refuse to publish unfavorable test results.

Midrange midlife kicker

▶ IBM is a month away from expanding its AS/400 line, according to sources. A high-end model with a four-way processor is in the offing and is currently installed at several customer sites, according to one analyst.

Freeze! This is a RAID.

▶ Ten systems and storage companies, including IBM, NCR and Seagate Technology, formed a RAID Advisory Board last week. The firms are promoting disk array storage standards, according to Joe Molina, chairman of the new group. But the notion of setting RAID standards left one storage analyst shrugging his shoulders. "Users aren't looking for standards. Most haven't even seen arrays in operation," said Jim Porter at Disk/Trend in Mountain View, Calif.

Philip Stromer filed a lawsuit against Sun after he was fired from his technical writer position for alledgedly using his work computer to hurl graphic and insulting messages across a companywide, national E-mail network. Stromer, who admits he pushed the boundaries of good taste, said his intent was purely sarcastic, and he always signed his own name to the messages. In the lawsuit filed in California's Santa Clara County Superior Court, Stromer says Sun violated his right to free expression. Readers have a right to free expression, too. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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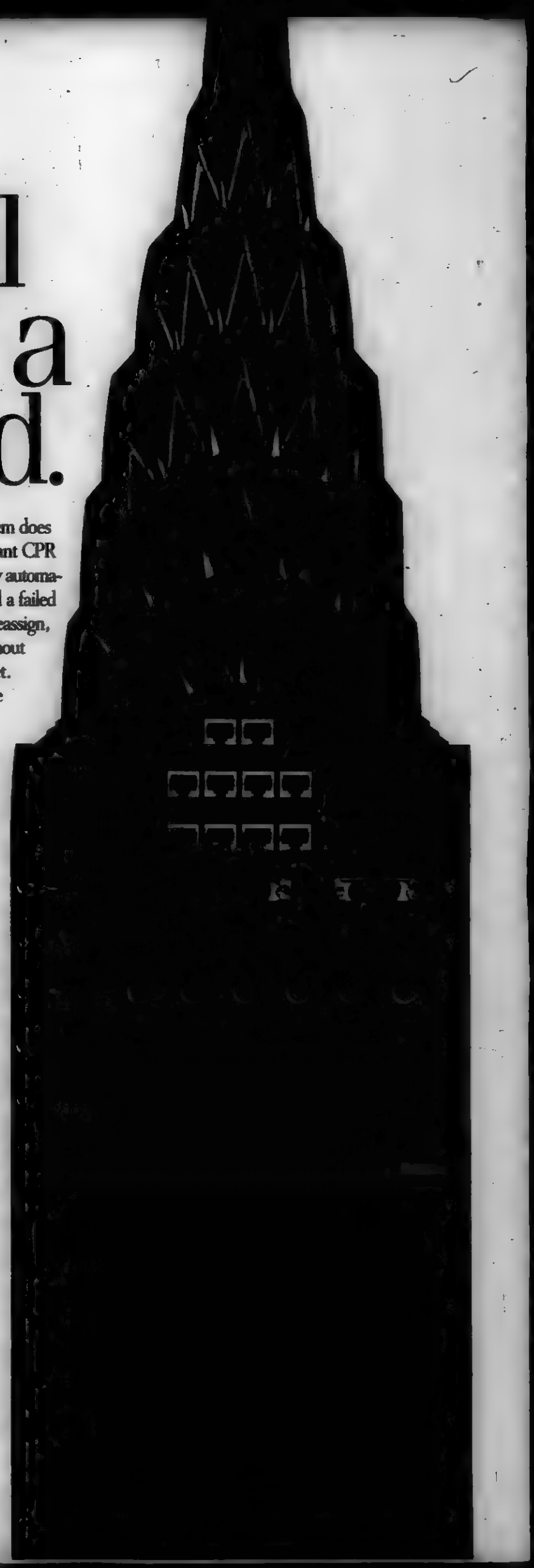

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Four out of five 1-2-3 users prefer Quattro Pro

When a group of Lotus 1-2-3 users compared Quattro® Pro 4.0 and 1-2-3 side-by-side, they made a startling discovery: four out of five Lotus users preferred Quattro Pro. They found it easier to use, richer in features, and more productive. The study was done by Usability Sciences Corporation, a highly regarded independent testing laboratory. (Coincidentally, this is the same company Lotus uses to do its usability studies.)

Borland dumps old Lotus menus, keeps macro compatibility

About 90% of Quattro Pro users use only the Quattro Pro native menus. They no longer use the old Lotus slash key. And it's now obvious that Lotus doesn't want other companies supporting its outdated user interface either. Therefore, Borland has decided to give users what they prefer. Borland is now shipping Quattro Pro 4.0 with only the more efficient native menus—the ones users love. And Quattro Pro still has 1-2-3 file, publishing style, and macro compatibility.

The final mistake: Lotus goes it alone

Lotus' latest strategy of closing the menu-command standard is the final blow to users. After all, what is Lotus known for? *The best technology?* Certainly not. *The best spreadsheet?* Not even close. *Litigation rather than innovation?* Absolutely. And now Lotus is on the verge of losing its largest asset: users who have invested in the Lotus menu standard. By making its menu system a closed standard, Lotus is not the only loser. You lose, because Lotus is apparently trying to eliminate your right to choose. Fortunately, you don't lose much, because 1-2-3 users prefer Quattro Pro's better design and Quattro Pro can still run their 1-2-3 macros.

Quattro Pro 4.0 is . . .

". . . the best DOS spreadsheet you can buy."
PC/Computing, March 1992

". . . the ultimate DOS spreadsheet."
PC Magazine, April 28, 1992

". . . the best non-Windows spreadsheet . . ."
PC World, March 1992

". . . the best DOS spreadsheet ever."
Office Technology Management, February 1992

"The best DOS spreadsheet in the world."
PC User (U.K.), March 24, 1992

Lotus closes standard, loses the war

So Lotus may have won a small battle by keeping a menu system to themselves, but they'll lose a very big war with their Berlin Wall customer strategy. Borland, on the other hand, has always believed that open standards promote competition, spur innovation, and grow markets.

Lotus and Ashton-Tate: history repeats itself

Ashton-Tate® tried to establish a closed standard too. They tried to force users into their camp and to keep out the competition through litigation. Borland's acquisition of Ashton-Tate reversed this. Borland dropped Ashton-Tate's lawsuit against Fox and paved the way for competing products from several companies. Customers have won, because they can freely choose other products compatible with the open dBASE® standard.

Quattro Pro: the best DOS spreadsheet

Quattro Pro has won 42 awards, dwarfing Lotus in side-by-side comparisons. And Quattro Pro 4.0 has been called the best DOS spreadsheet by leading computer trade publications. It's proof that competition works.

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COMPUTERWORLD

House bill would restrict air reservation systems

Alleged advantages of Sabre and Apollo targeted

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. House of Representatives last week put the airline industry on notice that strategic information systems can sometimes provide too much of a competitive advantage.

The House, responding to reports that the two dominant computerized reservation systems have abused their market power, passed legislation that would put new restraints on American Airlines' Sabre system, United Airlines' Apollo system and other airline-owned reservation systems.

The bill would once again try to eliminate the systems' bias toward their respective host carriers' flights and to break the contractual ties that make it very difficult for travel agencies to switch system vendors.

A similar bill is stalled in the Senate because of opposition led by Sen. Wendell Ford (D-Ky.), so enactment would require a tricky end run around Ford's aviation subcommittee. However, the House vote of 230-160 puts more political pressure on the U.S. Department of Transportation to issue its long-delayed reservation system regulations, perhaps as early as Sept. 1.

Sabre and Apollo officials attacked the bill as regulatory

Continued on page 16

Hughes zeros in on PC costs

BY MICHAEL FITZGERALD
CW STAFF

LOS ANGELES — A year after the Cold War's demise dropped like a bomb on defense contractors, Hughes Aircraft Co. has signed an innovative personal computer purchase agreement designed to help it reshape for the future.

A flexible, "living," two-year Commodities Purchase Agreement that Hughes signed with two Southern California resellers will generate substantially lower PC prices in part through purchasing custom-built PC clones, among other cost-saving measures.

To start, Hughes, with an installed base of 30,000 PCs, should save money dealing with just two resellers instead of as many as 20. The pact comes at a time when the $7.7 billion General Motors Corp. subsidiary is attempting to build its commercial revenue from 20% to 50% of total sales.

By combining the purchase agreement with a cost-conscious leasing component that is still under negotiation, Hughes' Corporate Action Group took a radical step forward in its approach to cutting costs and changing the status quo at the company. For example, on a cultural level, the pact could pack more punch by persuading Hughes' heretofore decentralized units to buy into the centralized purchase plan to reap lower prices.

"Normal is no longer acceptable," said Vivian Szeto, a Hughes contract negotiator who capped a 15-month process with four months at the negotiating table, pounding out the best deal she could find.

Alan Levenson

Berry led the leasing drive at Hughes

"This two-part concept was initially thought of as crazy, as it had never been done before," Szeto said. "But we had to say, 'Why do things only because they've been done a certain way in the past?' "

Hughes hopes to benefit not only from lower priced PCs but also from reduced administrative costs and improved turnaround time.

But even Hughes is not sure what it might save because as the company's organization changes, it is uncertain how many PCs it will buy, said Ben Berry, manager of computer services at Hughes. And there is no way of telling how many PC man-

Continued on page 14

APPN patents to be enforced

IBM's decision could cool interest in protocol

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — IBM stirred up a hornet's nest last week when it warned a gathering of developers that its Advanced Peer-to-Peer Networking protocol — its much-vaunted "open blueprint" for multivendor, enterprisewide communications — is protected by at least eight different patents.

The message from IBM, according to several attendees at a peer-to-peer Systems Network Architecture conference held here, was: "Buy our license, which includes the patents, before you even think about developing APPN network products."

Developers' dilemma

The patent question could well prove to be a stumbling block for would-be APPN developers — at least in the short term. The license for APPN Network Node, which defines the systems that coordinate communications across the enterprise, is not scheduled for general release until next year. In addition, the price has not been disclosed by IBM. However, industry sources estimated that it will be in the hundreds of thousands of dollars.

Enforcement of the APPN patents could cool whatever enthusiasm the industry has for adopting the protocol as an industrywide standard, sources said.

Continued on page 12

Crash test

Mainframe database management systems earn solid user satisfaction grades in the important area of system availability and recovery from crashes

See Buyers' Scorecard, page 66

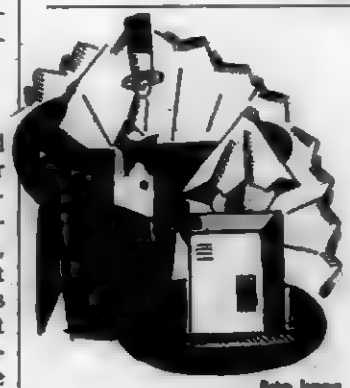
Product	Score
Software AG's Adabas	8.8
CA's CA-Datacom	8.7
Cincom's Supra	8.6
IBM's DB2	8.2
Oracle's Oracle	7.9
IBM's SQL/DS	7.7

Maximum score: 10

MAINFRAME METAMORPHOSIS

Not a disappearing act

BY JOHANNA AMBROSIO
CW STAFF



Robin Jareaux

First in a two-part series on mainframe computing.

The mainframe may be wheezing a bit in its old age, but it is not dead — not by a long shot. In fact, it will survive into the next century, albeit in some new roles, according to users and observers.

What has changed dramatically, users said, is the way they think about host systems. "The mainframe mentality is dead," said Tom Gildea, vice president of business information services at Helene Curtis, Inc. in Chicago. "The notion of starting with the mainframe as the centerpiece of the computing environment is over." Instead, big iron is perceived by large systems users as just one of many options currently available.

Based on interviews with 40 users, vendors and analysts, it is clear that mainframes are evolving from central, monolithic, applications-based machines into specialized, interconnected

Continued on page 62

INSIDE

The war of words continues unabated as IBM and Microsoft carry on their battle for the desktop. Page 4.

Pitting mainframe vendors against one another could allow the state of Wisconsin to save taxpayers up to $3 million annually. Page 6.

Product Spotlight — More mobile computing equals another responsibility for IS: Choosing equipment that lends a competitive edge. Page 73.

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IN THIS ISSUE

NEWS

4 **Apple** has four new PowerBooks in the oven, two of which can dock to desktop stations and cost less than $3,000.

4 **IBM** crows about its millionth OS/2 shipment — and **Microsoft** returns the fire by boasting about Windows NT.

6 The state of Wisconsin, using a new set of bidding rules, procures mainframe discounts of about 60% from **Amdahl** and **HDS**.

8 **Lotus** will port its business applications to the **HP** 9000.

8 The **EISA** consortium wants to establish a faster standard for its bus.

8 Vendors introduce PCs based on **Intel**'s new 33/66-MHZ DX2 starting at a low $2,199.

10 **DEC** deepens discounting with cuts and/or credits of up to 35%.

12 **Storage Tek**'s Iceberg won't ship until at least the first quarter of '93.

14 **Legent** reassures users of products from the recently acquired **Goal Systems** that they have no reason to fear their investments.

24 It was a rough fiscal year for KnowledgeWare: The company took a 98% hit in profits.

Quotable

"It would be foolish for IBM not to make APPN an open architecture if it wants the protocol to succeed, and here it seems like they are trying to close it. . . . I don't understand IBM."

PAT MAYER
MORTGAGE GUARANTY

On IBM's warning that the protocol is patented. See story page 1.

DESKTOP COMPUTING

37 **CA** faces an uphill battle in the PC arena.

WORKGROUP COMPUTING

45 **Microsoft** seeks new direction for its LAN Manager product.

ENTERPRISE NETWORKING

53 Faxing: Data lines vs. phone circuits.

LARGE SYSTEMS

61 How users chose **Amdahl**'s 5995M processor.

APPLICATION DEVELOPMENT

69 A closer look at reverse-engineering.

MANAGER'S JOURNAL

81 CIOs are 'in.'

PRODUCT SPOTLIGHT

73 How to select the right portable modems, printers, adapters and more for your traveling staff.

BUYERS' SCORECARD

66 **Software AG**'s Adabas gets the gold among mainframe RDBMSs, with **Oracle** and **CA** close behind.

IN DEPTH

79 John Seely Brown says powerful chips, wireless nets and intelligent badges will cause interfaces to disappear.

DEPARTMENTS

6, 16 News Shorts
28 Advanced Technology
32 Editorial
83 Calendar
84 Computer Careers
91 Marketplace
96 Stocks
97 Computer Industry
98 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **The mainframe is not dying, but it is evolving,** both technologically and in terms of how major corporations put it to work. Five to 10 years out, big iron will be used primarily as a data server hanging off the network. It will also be more modular and much less expensive than it is today. **Page 1.**

■ **The PC marketplace is also changing to meet corporate demands** in both pricing and products. Apple, for example, will enhance its popular PowerBook portable line this October with four new models, including two that can be docked to desktop machines. **Page 4.** Hughes Aircraft is making a preemptive strike on PC costs through an innovative buy-and-lease agreement. The highly decentralized company may not see the kind of savings it hopes for, however. **Page 1.**

■ **Taxpayer savings of $1 million to $3 million** annually should result from the state of Wisconsin's data center consolidation plan, which kicked off with some massive discounting from mainframe vendors. **Page 6.**

■ **On the heels of yet another delay** with its Iceberg disk array, Storage Tek wants users to visit its disk array laboratory. **Page 12.**

■ **Congress took a stab at the airline** industry last week with a new bill that would limit the use of strategic IS reservation systems. **Page 1.**

■ **Legent set some minds at ease** last week about its merger with Goal Systems. The company outlined its approach to merging both product lines. **Page 14.**

■ **Working in IS at vendor firms** may provide insider access to technologies, but IS directors say their staffs face the same career challenges as IS professionals in any company. **Page 84.**

■ **Convenience increasingly means having the right card** — be it a credit card, an ATM card or, now, a PCMCIA card. The Personal Computer Memory Card Industry Association has spurred development of credit card-size storage devices, modems and now, LAN adapters for notebook computers. **Page 73.**

■ **John Seely Brown, director of Xerox's Palo Alto Research Center,** envisions tomorrow's computers embedded in the world around us. **Page 79.**

■ **Software re-engineering** is taking hold in companies that believe they can save on maintenance costs while recasting legacy systems for moves to new platforms. **Page 69.**

■ **Microsoft appears to be changing its strategy for LAN Manager,** working to bundle LAN Manager elements into its system software: Windows and Windows NT. **Page 45.**

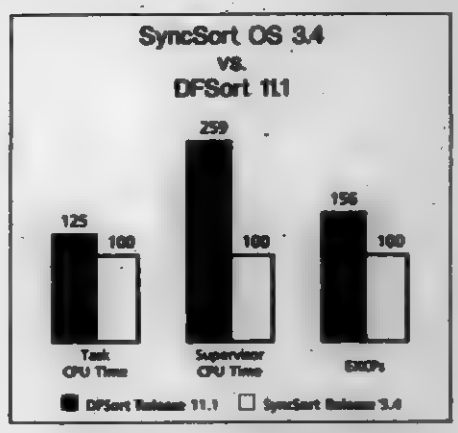
■ **Integrating fax and data communications** may make sense, but relatively few user organizations are actually doing it. **Page 53.**

■ **Computer Associates is launching a new push in the PC software market,** trying to leverage its mainframe expertise and its acquisition of PC database supplier Nantucket Software. **Page 37.**

■ **Early users of Amdahl's 5995M mainframes** say they went to the IBM-compatible system because of the growth path within the product line. **Page 61.**

■ **On site this week:** The corporate growth of a New York courier service outstripped the abilities of its manual systems as well as its first few tries at computerized order processing. Now Choice Courier Systems is confident a DG Aviion system can handle future success. **Page 49.** Standard Register has kicked off a client/server project featuring its mainframe as the server, running Cincom Systems' Supra database management system. **Page 61.**

HERE'S WHERE WE LEAVE THE COMPETITION.



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Apple readies new PowerBooks

Notebooks, set for fall debut, can dock to desktop stations; cost under $3,000

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc., which knows a good thing when it sees it, is expected to enhance its popular PowerBook portable computer line this October with four new models, including two that can be docked to desktop machines.

Perhaps the most interesting of the fall rollouts are two models called the PowerBook Duo, which will feature a docking mechanism that when attached to the console will enable the 4-pound machines to act as a desktop computer together. They are expected to sell for less than $3,000 as a package.

The Model 100 and Model 170 are expected to be replaced with two PowerBooks that are slated to be a pound or more lighter than existing models, run as much as 32% faster and offer a higher resolution screen.

The rollouts will follow the recent introduction of the PowerBook 145, a replacement for its midrange Model 140, at the MacWorld Exposition in Boston. The new model was designed to run at nearly the same speed as the current top-of-the-line PowerBook 170 [CW, Aug. 10].

Pressure high

In recent months, Apple has faced continual price/performance pressure from increasingly faster and cheaper portables from manufacturers of IBM Personal Computer clones. That has helped prompt Apple executives to reexamine the PowerBook configurations, according to Senior Vice President Roger Heinen.

The new models could open the PowerBooks up to a whole new class of user, particularly on the low end. So far, sales of the slower and less feature-packed PowerBook 100 have been below expectations, Heinen said.

"The slower speed and lack of an internal floppy really hurt the 100, and it never took off the way Apple thought it would," said Pieter Hartsook, editor of "The Hartsook Report," a Macintosh newsletter published in Alameda, Calif. "If Apple refreshes the low end, it could appeal to a whole new group of users who were never very impressed with the 100."

In May, Chairman John Sculley said that a color PowerBook is in the offing and could be available as early as the first quarter of 1993. Additionally, Apple has said it will open up its distribution channels by selling several Macintosh models, including members of the PowerBook line, through retailer Sears, Roebuck and Co.

Apple has also moved toward attracting users of IBM-compatible portables with its SuperDrive, a 1.4M-byte drive that can read, write and format DOS and OS/2 disks and that all the PowerBooks either have or can accommodate.

Big business

PowerBooks have been a brisk seller overall since they arrived in October 1991. They are on their way to becoming a billion-dollar annual business for Apple, according to Sculley.

That is expected to continue as the PowerBooks ride a market dynamic: Sales of notebook PCs are expected to make up more than half of the nearly 5 million mobile PCs projected to ship in 1995, according to Norwalk, Conn.-based research firm Inteco Corp. Apple executives are counting on the PowerBook to ride the crest of that wave through a series of price cuts and performance enhancements.

IBM ships millionth OS/2; Microsoft rather 'amused'

BY ROSEMARY HAMILTON
CW STAFF

Last week, IBM pulled off what some industry observers thought was almost impossible: It passed the 1 million mark for OS/2 2.0 shipments.

Within hours of IBM's announcement, Microsoft Corp. challenged the total as "suspect." To show that it can also play the numbers game, Microsoft reported it had shipped 10,000 Windows New Technology (NT) developer's kits since early last month.

Microsoft's Walker: *Actual usage, OEM support must be considered*

Even though industry analysts said the IBM number is probably overblown because it likely includes thousands of giveaways, they also said it shows that OS/2 will carve out a respectable niche, particularly among corporate users.

"It says IBM is gaining serious consideration in many accounts," said Tim Bajarin, president of Creative Strategies International, Inc. in Santa Clara, Calif. He said that when giveaways and IBM internal users are cut from the total, the actual shipment number is closer to 700,000, "which I think is still quite significant."

IBM's Cannavino: *Three-quarters of number are new OS/2 converts*

Bajarin and other analysts predicted that IBM will pass the 1.5 million to 2 million mark by year's end. IBM said a 2 million-plus estimate was reasonable.

Dwayne Walker, director of Windows NT and networking products at Microsoft, said IBM's current total is meaningless unless you look at other factors, such as actual usage, application support and OEM support.

"On the one hand, we are somewhat amused," Walker said. "They aren't talking about usage numbers, nor are they talking about how many applications are shipping that directly exploit the OS/2 environment. We are outselling IBM massively every single day."

He said the latest tally on NT developer's kits, which averages out to roughly 300 shipments per day, illustrates Microsoft's momentum in the desktop market.

Not surprisingly, James Cannavino, an IBM vice president and general manager of the Personal Systems Division, said the IBM numbers speak volumes for the success of its newest operating system. He said about one quarter of the total is composed of upgrades from the OS/2 1.3 base, while the remainder is classified as new 2.0 users that come primarily from the DOS or Windows user base.

Industry analysts said both IBM and Microsoft are using their latest numbers as just the newest weapons in the ongoing desktop war. While Microsoft challenges IBM with hiding 2.0 giveaways in its total, it likely has its share of freebies among the 10,000 NT developer's kits as well, analysts said.

"The bottom line is that some people expected 2.0 to be dead out of the block," said Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "One million is enough to get some critical mass."

Could have done it better

On hearing that IBM's OS/2 2.0 shipments had passed the 1 million mark, one industry analyst joked that he was surprised IBM had reached that point because it "did so many things wrong."

James Cannavino, vice president in charge of IBM's Personal Systems Division, certainly would not phrase it that way. But he agreed last week that "in reality, we could have done a better job" handling some portions of the 2.0 rollout.

IBM had planned a very aggressive marketing campaign in the weeks following the March 31 debut of 2.0. But the company did not pull that off, in part because it was so tied up with organizing its 2.0 distribution and support mechanisms. "We spent more time than we would have liked getting the channels loaded and the support system in place," Cannavino said.

The question, then, is why wasn't IBM ready, given the strategic importance of OS/2 to the company?

"That's a fair criticism," Cannavino said. "We worked very hard to get the product the way we wanted it, and that team building the product used up all the time we had. So the rollout was kind of slowed."

Despite the initial glitches, Cannavino said that he is impressed with 2.0's progress and is planning to release the previously promised aggressive marketing campaign in the coming weeks.

ROSEMARY HAMILTON

Paradox 4.0 is shipped

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. finally shipped its Paradox Version 4.0 relational database last week.

The product boasts much-improved performance, according to the company. Indeed, Borland claims the recent release will perform as much as 10 times faster than the current Paradox 3.5. The package was expected to ship earlier this year but was delayed to allow Borland to complete extensive beta testing, the company said.

Neal Hill, senior software analyst at Forrester Research, Inc., said the most significant enhancement came in query response times on multiuser systems. "In some instances, the performance is from 8 to 10 times better," he said.

> "IN SOME instances the performance is from 8 to 10 times better."
>
> NEAL HILL
> FORRESTER RESEARCH

Hill indicated that users can now decide whether a query will be restarted each time a table is updated, as in the current version, or be continued using the previous data, which is a much faster technique. "Rather than think for the users, [Borland] will let the users think for themselves," Hill said.

Paradox 4.0 supports the DOS Protected Mode Interface memory management in Microsoft Corp.'s Windows 3.0 and higher, allowing it to run in Protected Mode under Windows.

Development via GUI

The Paradox Application Language has been improved to let users develop applications with mouse support, pull-down and pop-up menus and dialog boxes.

The product supports SQL connections with a variety of databases, including Oracle Corp.'s Oracle 6.0, Microsoft's SQL Server, IBM's OS/2 Database Manager and Digital Equipment Corp.'s VAX Rdb/VMS 4.1.

The Paradox interface has also been enhanced to be more Windows-like with pull-down menus and a more graphical feel.

The product is available for a list price of $795. A local-area network license is available for $395 for each additional user.

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NEWS SHORTS

Report slams cover-up

The House Judiciary Committee approved along partisan lines a staff report accusing senior officials at the U.S. Department of Justice of stealing case-tracking software from Washington, D.C.-based Inslaw, Inc. It also called for an independent counsel to probe the affair. Inslaw charged, and two federal courts have agreed, that officials under former Attorney General Edwin Meese stole Inslaw's software and conspired to drive the firm out of business. The court decisions were later thrown out on jurisdictional grounds. Committee chairman Jack Brooks (D-Texas) said, "The evidence . . . clearly raises serious concerns that a high-level conspiracy against Inslaw did exist and that great efforts have been expended by the [Justice] Department to block any outside investigation into the matter."

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ComputerVision IPO debuts at $12

ComputerVision Corp. went public last Friday at $12 per share. Prime Computer, Inc. had first cut the stock's asking price from $20 per share to between $14 and $16 and then to $12 since a June initial public offering (IPO) filing. A spokesman for Shearson Lehman Brothers, Inc., Prime's primary bondholder, blamed the dropping stock price on "deteriorating market conditions for IPOs." At press time, 4.8 million shares had traded, and the $12 price remained steady.

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Industry backs free trade

The computer industry gave a tentative thumbs-up last week to the U.S.' free-trade agreement with Canada and Mexico. While the details have not yet been made public, the accord is said to provide for duty-free movement of computers among the three countries if they contain motherboards assembled in North America. Trade associations said they were pleased by reports that the agreement contains strong provisions for protecting patents and software copyrights. Congressional approval of the deal is not assured, sources said.

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Interface links NetView, DECmcc

Phoenix Network Technologies, Inc. announced Six2View, said to be an interface between IBM's NetView and Digital Equipment Corp.'s DECmcc network management systems. The Six2View server will reportedly collect DECnet alerts from multiple DECmcc stations and send them onto NetView via the IBM LU6.2 connection supported by NetView Version 2 Release 2. The initial release is scheduled for this month.

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X/Open, OSF eye DCE integration

The X/Open Consortium Ltd. and the Open Software Foundation (OSF) last week pledged to integrate the OSF's Distributed Computing Environment (DCE) specifications into X/Open's Common Applications Environment, a set of de facto and international computing standards for multivendor interoperability. Pulling DCE into X/Open's standards environment will flesh out X/Open's distributed computing framework by supporting personal computer and mainframe systems as well as Unix systems.

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Short takes

Novell, Inc. announced a 128-session version of its NetWare for **IBM**'s Systems Application Architecture (SAA) local-area network-to-host connectivity product. A promotional conversion program running through Jan. 31 lets users trade in old non-Novell Systems Network Architecture gateways and upgrade to the NetWare for SAA platform at a reduced price. . . . **Data General Corp.**'s OpStar storage family now supports write-once read-many and rewritable storage on the same subsystem. . . . **Beyond, Inc.** began shipments of electronic-mail software for **Microsoft Corp.**'s Windows. BeyondMail includes advanced functions such as rules-based formulas that allow users to construct work-flow and workgroup applications. . . . **BellSouth Telecommunications** deployed a 2.5G bit/sec. Synchronous Optical Network system between the inland Grenada and Tupelo, Miss., a primary network route in the state.

More news shorts on page 16

State wins big in host price war

Data center consolidation could save Wisconsin $3 million annually

BY JEAN S. BOZMAN
CW STAFF

MADISON, Wis. — The state of Wisconsin expects to save taxpayers $1 million to $3 million annually under a data center consolidation plan that offers the added benefit of finessing discounts of more than 60% from heavily contested bids for two mainframes.

Industry analysts said it was one of the highest discounts they have seen in a period of high discounting activity among vendors [CW, Aug. 10].

The discounts were made possible by a 1991 act of the Wisconsin legislature that allowed the utility to vary the bid specifications during the negotiating process and to request additional rounds of bidding. Previously, state officials were tied to seeking out competitive bids for specific sets of requirements that could not change.

"The legislature exempted us from state procurement laws and regulations, so we're now able to buy computers just like anybody else," noted Neal Steinhoff, administrator of Wisconsin's division of information technology services, or Info-Tech Services, computer utility.

The 1991 legislation created a statewide computer "utility" to operate all state data centers. The utility is consolidating three of the state's six data centers in a new building within blocks of the state capitol. It will employ 91 information systems staffers — 30 less than the state had before.

Big savings expected

After completing the consolidation in December, IS costs are expected to drop by $1 million to $3 million a year. Up-front costs, exclusive of the computers, include $5 million to construct raised-floor computer rooms in two stories of a new 10-story state office building.

The new 350 million instructions per second mega-data center will house two new mainframes: an Amdahl Corp. 5995M Model 4550, slated for installation late this month, and a Hitachi Data Systems Corp. GX 8320, which was installed in mid-July. The state spent about $23 million for the two mainframes and used 500G bytes of disk drive capacity. The HDS machine was acquired by trading in an existing HDS EX 310, but the vendor provided at no cost 1G byte of solid-state disk capacity and training worth $250,000.

The state traded in an IBM 3090 Model 300, an IBM 3090 Model 500 J and an Amdahl 5890 Model 300 E as part of the two mainframe deals.

"They really wanted the business," Steinhoff said of the IBM-compatible mainframe vendors.

The Amdahl machine was technically acquired at 57% of list price, but after adding in maintenance credits, the total came to 64% of the list price.

IBM was the odd vendor out in the bidding, ending up with a contract for just $2.5 million in yearly system software revenue and about $300,000 in cartridge tape drives and printers.

Wisconsin's computer utility hired consultants from Ernst & Young, Andersen Consulting and Gartner Group, Inc. to guide state IS managers as they prepared their requests for proposals and evaluated bids.

Throughout two rounds of bidding, consultants sat in nearby rooms, totaling up the value of hardware and services provided at no cost, or "soft" credits.

"We validated the numbers by coming up with a number that represents the value of the 'soft' credits thrown in by the vendors," said Jann-Marie Halvorsen, director of financial advisory services at Gartner Group. These soft credits included training, software, upgrades and maintenance services, she said.

During the height of negotiations, "we told the vendors when they were high and when they were low," said James Klauser, secretary of Wisconsin's department of administration that operates the Info-Tech utility. "We didn't whipsaw them. We just let them know where they were [in the bidding] and pressured them to negotiate."

Way off

Steinhoff said IBM's bid missed the mark by $4.5 million, including CPUs and disk drives. Under IBM's bid, Wisconsin would have paid $27.5 million instead of $23 million. "We told them they were off by millions of dollars, and they didn't respond. They said they were giving us the best price they've given anywhere, and they didn't believe us. I wanted IBM, but I wasn't about to pay millions extra for it."

The consultants' logistical support maintained an apples-to-apples comparison that resulted in low prices — and guaranteed upgrade costs at flat rates through 1995.

Wisconsin promised it would have a mixed-vendor shop when it handicapped the first winner, HDS, by adding a $1.5 million premium to its bid during the second round of negotiations. "We thought it would be worth $1.5 million to us to have a mixed-vendor shop, to have technical support from two companies and to have competition on the next upgrade." The deals were signed in June.

Help from above

The state of Wisconsin would not have been able to play hardball during two rounds of mainframe bidding without an extraordinary level of support from the state's legislature and its administration — from the governor on down.

In 1987, newly elected Gov. Tommy Thompson expressed an interest in trimming state IS costs and in making Wisconsin's use of information technology more efficient. Two years later, he formed a committee of experts from private industry, state agencies and Wisconsin data center managers to study the problem. In January 1990, the committee hired Ernst & Young to help draft recommendations for state action.

"We started a project called ITSPI, for the Information Technology Strategic Planning Initiative," said Bruce Jacobs, senior manager at Ernst & Young's management consulting group in Indianapolis. "It was an effort that involved more than 20 state agencies, 20 consultants and as many as 100 people at its peak." The committee's study, delivered in March 1991, recommended consolidation and competitive bidding.

Called Info-Tech Services for short, the computer utility was able to bypass many provisions of the state's procurement laws, allowing it to act much more like a private corporation. "State procurement law prevented Wisconsin from getting good deals because it didn't allow them to go back and get multiple passes at vendor bids," Jacobs said.

JEAN S. BOZMAN

WHAT HAVE BILL GATES, SCOTT MCNEALY, JOHN SCULLEY, JOHN YOUNG AND LARRY ELLISON AGREED TO COOPERATE ON?

New DX2 systems enter PC fray

33/66-MHz clock-doubling chip spawns barrage of microcomputers

BY CAROL HILDEBRAND
CW STAFF

The unabating PC price wars, coupled with a desire to lure users into embracing the 486 platform, had vendors last week introducing their new high-end machines at low-end prices.

"Usually when you see the introduction of a new processor, you see machines that carry somewhat of a price premium. This time, the vendors are jumping right by that stage," said Matthew Cain, an analyst at Meta Group, Inc.

A whole slew of personal computer vendors last week announced machines based on Intel Corp.'s new 33/66-MHz clock-doubling DX2 chip [CW, Aug. 10]. Companies including Compaq Computer Corp., Digital Equipment Corp., Dell Computer Corp., Advanced Logic Research, Inc. (ALR) and IBM entered the fray with machines that started as low as $2,199.

The DX2 33/66 machines will not have an 'immediate broad-based' appeal for users, analysts predicted, although certain power-hungry segments will snap them up.

Eric Singleton, information systems director at the Orange County, Fla., appraisor's office, is one such user in search of power. Singleton's shop recently moved from a mainframe environment to PC local-area networks, and he said he was very interested in the new machines, particularly at the prices announced. "It's very satisfying that the price trend is continuing, even with the new chips. We're not just getting rock-bottom pricing on yesterday's technology," he said.

Pricing was clearly the paramount issue as vendors vied to have the most competitive machine. For example, ALR lowered prices on its new boxes a scant few hours after they were first announced to position them several hundred dollars under Compaq's price point.

Analysts said the actions were dictated by several issues. The continuing price wars played a part as vendors struggle to stay competitive.

A second factor was Intel's processor strategy. Analysts said the company is hoping to coax as many users as possible over to the 486 platform before it introduces its next-generation chip, the P5, early next year.

John Murphy, editor of "The PC Street Price Index" in Cherry Hill, N.J., pointed out that the price of a fully configured 25-MHz 386SX box has dropped 31% during the last seven months. "The 16-MHz 386s are dead, and the 20 MHzs are dying," he said.

By pricing the DX2 attractively, Intel is enabling PC vendors to pass the savings on to end users in the form of low-priced boxes, a trend backed up by market research estimations.

Richard Zwetchkenbaum, an analyst at Framingham, Mass.-based International Data Corp., cited figures showing that 33.8% of all IBM-compatible PCs shipped in the U.S. in 1992 will be 486s, compared with 8.3% in 1991. At the same time, he said he expects a 19% price drop in 486DX systems, compared with a 7.5% price decline for IBM-compatible machines overall.

"It's not that the price war is over; it's that people are buying more powerful systems," Zwetchkenbaum said.

Priced to move

Many DX2-based PCs unveiled last week sport aggressive price tags, in spite of the premium chip inside

	Name	Hard drive	RAM	Price
DEC	DECPC 466ST	245M-byte IDE drive	4M bytes	$4,319
Compaq	DeskPro 4/66i Model 120	120M-byte drive	4M bytes	$2,249
Dell	Performance 486P/66	120M-byte drive	4M bytes	$2,499
ALR	Flyer 320V 486DX2/66 Model 120 DW	120M-byte drive	4M bytes	$2,499

CW Chart: Michael Siggins

Lotus strikes suite deal with HP for Unix apps

BY MARYFRAN JOHNSON
CW STAFF

PALO ALTO, Calif. — Hoping to boost sales of its Unix workstations in commercial accounts, Hewlett-Packard Co. last week struck a deal with Lotus Development Corp. to bring its full suite of business applications to HP 9000 workstations and server platforms.

By early next year, HP/UX Unix users should be able to run Lotus' Notes, CC:Mail, AmiPro and Freelance Graphics. Already available on HP 9000 platforms are the Lotus 1-2-3 spreadsheet and Lotus Realtime products.

Lotus also has Unix plans with IBM and Sun Microsystems, Inc.

"Having Lotus on your products is a signature of credibility in the marketplace," said George Weiss, an analyst at Gartner Group, Inc.

While HP may be gaining a showcase set of business productivity applications, several analysts said Lotus stands to benefit even more by expanding its Notes groupware application beyond Intel Corp. and IBM OS/2 platforms into more powerful, networked Unix environments.

"You can't go into a Fortune 500 company and make a pitch only for Intel machines," said David Rome, general manager of the Unix business unit at Cambridge, Mass.-based Lotus.

The HP/Lotus deal will require some tinkering to integrate CC:Mail and HP's OpenMail electronic-mail systems. Yet company officials said the two products will "play well together," giving customers access to HP's messaging backbone through the familiar client user interface of CC:Mail.

Running Lotus applications on HP machines might also appeal to workplaces where technical users trade up to more powerful workstations and hand down their old machines to other staff members. "Managers like to run under one similar operating environment and save administrative costs," said John Logan, an analyst at Aberdeen Group in Boston.

Scientists and engineers also have to write memos and proposals, analyze statistics and churn out technical reports.

"We are seeing more and more of what you'd consider standard business applications being ported to Unix machines," said Mike Horgan, a systems engineer at Hughes Data Systems, Inc. in Anaheim Hills, Calif. Yet when Horgan received a free copy of Lotus 1-2-3 with an HP 9000 Model 710 workstation, he never loaded it or used it.

"We use our Unix workstations for engineering-type applications and strictly PCs and Macs for desktop work," Horgan explained.

Then again, as prices for low-end workstations plummet into the high-end personal computer space, Horgan and other users said they could envision a greater interest in trying out business applications under Unix.

Senior editor Rosemary Hamilton contributed to this story.

EISA consortium's push for faster bus begins in earnest

BY MICHAEL FITZGERALD
CW STAFF

The Gang of Nine may ride again, according to industry sources.

Behind the new activity from the Gang of Nine — also known as the Extended Industry Standard Architecture (EISA) consortium — is a desire to establish a new, faster specification for its EISA bus, sources said recently. The new bus probably will not appear in systems much before the end of 1993 and will probably be concentrated in the multiprocessing server market.

EISA machines can transfer data at 32M byte/sec. right now, and the "Fast EISA" specification would allow for 133M byte/sec. Analysts and users have said that problems with bus I/O speeds can impede data flow, which is important to high-powered servers.

The EISA consortium was started by Compaq Computer Corp. when IBM introduced the Micro Channel Architecture (MCA) bus. The group released EISA in November 1989. EISA members have continued to meet informally, but a push for a new bus by several lesser lights of the consortium met recently with approval from Compaq and AST Research, Inc., signaling a shift in both companies' previous stance on changing EISA.

One reason may be that this emphasis on servers could give EISA the market presence it has failed to establish in the desktop market.

"The only place where [EISA] matters is on multiprocessors," said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

At the EISA group's most recent meeting held July 8 at Wyse Technology, Inc., representatives of Compaq and AST decided to put their weight behind a new specification that will quadruple the EISA bus' throughput to 133M byte/sec.

According to the sources, Digital Equipment Corp., Corollary, Inc. and Distributed Processing Technology, a disk controller manufacturer based in Maitland, Fla., pushed the new design, but Compaq demurred, initially saying it did not want to rock the boat on EISA.

Fear, uncertainty, doubt

Compaq and AST have shifted their thinking because of "a combination . . . of IBM ramping up — we've got FUD to fight — but also, with the advances we're seeing in processor capabilities, we're beginning to see that we're going to want a faster bus," said Michael Krieger, AST's director of advanced systems marketing.

IBM recently made significant enhancements to MCA, doubling its throughput capability in a recent Personal System/2 Model 95 announcement.

A Compaq spokesman acknowledged that "there is a perception we've dragged our feet on [a new EISA bus], but it's entirely because we don't think there's a market for it yet." He said Compaq has versions of a new EISA bus running in its laboratories. He added that Compaq thinks the product has a future but is not needed until faster subsystems exist. Neither Compaq nor AST see the current EISA initiative as written in stone.

Analysts contacted agreed that demand would probably be slight right now.

"The server makers desperately want parity checking, but I don't think it's of much concern to end users yet," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

The Compaq spokesman said the new EISA bus will not appear in systems this year, and sources at other companies in the group agreed that no product plans including the bus are on the board.

Some of the original Gang of Nine are less active in this reinvigorated group. Most of the gang consists of companies with an interest in multiprocessing.

CORRECTIONS

In "User group offers .INI editing relief" [CW, July 20], a contact number for the Windows Users Group Network was left out. The number is (215) 565-1861.

.....

The Foundation computer-aided software engineering tool set was incorrectly attributed to Arthur Andersen & Co. in the Aug. 3 Buyers' Scorecard. Foundation is a product of Chicago-based Andersen Consulting.

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DEC expands credits to drive customer demand

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. has aggressively expanded its discounting credit mechanisms in an effort to pump up sales and improve its financial picture, according to industry analysts.

DEC has been offering greater user "allowances," or credits. So far the allowances, along with discounts, have in the best cases amounted to price cuts of as much as 35% for VAXs, analysts said.

Although these deals are not generally as economical as those occurring in the mainframe market, for example [CW, Aug. 10], DEC is feeling the heat generated by the pricing policies of IBM and others.

"If you look at the big picture, DEC is under a lot of pressure to keep the sales momentum up," said Ray Small, program director of Financial Strategies Services at Gartner Group, Inc., a market research firm based in Stamford, Conn. "Across the board, pricing is being gutted by 40%. Hardware is becoming a commodity — I wouldn't be at all surprised to see this level of discounting holding up."

He said the best DEC deals have been in the area of 30% to 35%, which he described as "aggressive."

Small added that the lower prices often come in the form of discretionary allowances rather than a "discount, but it amounts to pretty much the same thing," he said.

DEC officials, however, refused to confirm this as a strategy. "I don't believe it's a trend, though there may be a point here and a point there," a DEC spokeswoman said. "In fact, we have seen allowances go down with the advent of user licenses."

DEC is also looking to expand its customer base beyond VMS and Ultrix. Toward that end, the company will offer Alpha migration tools targeting competitors' platforms, including IBM's System/36, System/38 and Application System/400 and systems from Wang Laboratories, Inc., Unisys Corp. and Prime Computer, Inc., internal sources said.

DECstation users frustrated by DEC's earlier policy of not porting OSF/1 to their platforms [CW, May 18 and 25] can instead look forward to tools that will ease the migration to Alpha OSF/1. These are expected to be announced next month at Unix Expo, according to internal DEC sources.

Industry analysts praised the GEM compiler technology and PALcode layer in Alpha, which make it possible for applications to be moved across to Alpha "fairly easily," but said that having such capabilities will not ensure sales by any means.

"DEC still has to overcome political barriers and convince users that it will work," said Chris Christiansen, research director of multiuser systems at International Data Corp., a market research firm based in Framingham, Mass.

While DEC attempts to generate revenue to ease its financial position on the one side, the streamlining of operations on the other is taking a variety of forms.

Wiring board unit sold

Even as DEC managers begin to implement significant layoffs, DEC sold its Greenville, S.C., Printed Wiring Board facility to AMP-AKZO Corp., a Hauppauge, N.Y., printed wiring board manufacturer. AMP-AKZO will take over the DEC facility and will offer employment to the 475 employees currently working there, DEC officials said.

AMP-AKZO is a joint venture between $9 billion AKZO, based in Arnheim, The Netherlands, and $3 billion AMP, Inc. in Harrisburg, Pa. DEC officials said DEC is seeking to specialize more than it has in the past via the sale.

"Our manufacturing strategy is to return to our core competencies and to deinvest in those areas where we can't differentiate ourselves," a DEC spokeswoman said.

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USX spins off IT subsidiary

PITTSBURGH — USX Corp. last week spun off a separate information technology subsidiary designed primarily to provide systems integration, consulting services and computer resources to other process-industry companies.

The new unit, which is part of USX subsidiary USX Engineers and Consultants, Inc., will be led by Norbert J. Connors Jr. Connors, who had been general manager at USX's computer technology unit since 1987, is now vice president of information technology at the newly formed group.

The 100-person information technology unit has evolved during the past five years, as USX's computer technology unit began handling the computing requirements for USX divisions that were either spun off or sold during that time, according to Connors.

In 1991, USX entered a joint venture with Kobe Steel Co. in Japan to form USX-Kobe, a galvanized steel manufacturer. Connors said the computer unit developed an order-entry tracking system for the joint venture.

THOMAS HOFFMAN

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GSA Contract Number GS00K90AGS5251-PS02

SPARC tool moves firm to open systems

BY ELISABETH HORWITT
CW STAFF

MENLO PARK, Calif. — Network General Corp.'s Sniffer is finally moving out of its proprietary isolation but not quite fast enough for users who want to integrate the local-area network analysis tool with their Simple Network Management Protocol (SNMP)-based integrated LAN management platforms.

Tools such as Sniffer monitor the LAN and perform in-depth analysis to determine the exact source of problems.

Last week, Network General announced Sniffmaster for X (SM/X), a Sun Microsystems, Inc. SPARCstation version of Sniffer that can run concurrently on the same SPARCstation as Hewlett-Packard Co.'s OpenView, Sun's SunNet Manager or Cabletron Systems, Inc.'s Spectrum, the company said.

However, co-residence is still a far cry from what users want: to perform the full range of network management tasks, including LAN analysis from one system, said Ginny Mellinger, a senior analyst at International Data Corp. in Framingham, Mass.

"It's a step in the right direction to have Sniffer on SPARCstation, but I am pushing them to support RMON [Remote Network Monitoring] on their servers," said Peter Ho, a senior network systems engineer at Los Angeles oil firm Unocal Corp. RMON support would let SM/X interact with Unocal's existing SNMP-compatible system.

Network General is moving to address user integration needs in the following ways:

- Integrate SM/X with Novell, Inc.'s Network Management System and SunNet Manager.
- Announce an expert system version of Distributed Sniffer in the first quarter of next year.
- Announce this week a joint agreement with Cabletron to integrate SM/X with Spectrum.
- Extend Sniffer servers' currently limited SNMP support and add RMON next year.

SM/X is said to offer significant savings by sharing a console with a Unix-based network management system such as SunNet Manager.

Each DOS-based Sniffer user also requires a dedicated console, at a total cost of about $8,000 per user. In contrast, one SM/X system can serve multiple network managers equipped with X Window System terminals or X workstations.

SM/X is slated to ship next month for $7,995.

Frosted Storage Tek users to see Iceberg

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp. last week again invited users to visit its Iceberg disk array laboratory here, following the disclosure of a second delay that will push first shipments into the first quarter of 1993 at the earliest.

The prolonged delay [CW, Aug. 10] is slowly eating into Storage Tek's time-to-market advantage over competitors IBM, Hitachi Data Systems Corp., Amdahl Corp. and Memorex Telex N.V., which are also preparing high-capacity IBM 3990-compatible RAID-5 drives. EMC Corp. in Hopkinton, Mass., already markets an IBM-compatible RAID-1 product that handles disk mirroring.

Behind the delay are problems with redundant arrays of inexpensive disks (RAID)-specific coding, said David Weiss, senior vice president of marketing at Storage Tek. But basic microcode work that duplicates the function of IBM's 3990 controller for Iceberg is finished, he said. Weiss said Storage Tek engineers had underestimated the amount of time the microcoding would take.

Tricky coding

Industry analysts said they believe Storage Tek is still struggling with some unanticipated problems. "It's a technical, complicated product, and they're not finding it easy to write the microcode required to do all the advanced functions," said Bob Callery, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Iceberg is based on disk drives from Hewlett-Packard Co. and a proprietary controller that delivers IBM 3990 functions along with RAID's disk mirroring and error-recovery features. Users had ordered some 140 Iceberg units for early shipment. About 1,200 orders were expected through 1993.

Shared Medical Systems Corp. is one customer that plans to visit Storage Tek's laboratories this week to view 15 working Iceberg models hooked up to IBM Enterprise System/9000 and IBM 308X mainframes. The Malvern, Pa.-based provider of data services to hospitals and medical clinics has big plans.

"We have someone going out to Storage Tek on Monday and Tuesday," operations manager Joe Falco said. The firm, which has 2T bytes of disk drive capacity, had an Iceberg on order for installation in the fourth quarter, he said. "It was one unit for evaluation of whether it was going to do what it was supposed to do."

Earlier this year, information systems manager Joe Novoshielski told *Computerworld*: "We will sweep the floor with Iceberg and . . . replace everything in the shop," if it performs as advertised [CW, Feb. 3].

However, some users have already said they will not take Storage Tek's offer of an inspection tour. Mellon Bank Corp. in Pittsburgh, with 1.4T bytes of disk drive capacity, is planning a trip for early next year, when the product is ready for shipment. "I think it's a shame they stumbled," said David A. Moore, senior vice president of technology, products and services at Mellon, "but if you look at the complexity of the microcode, it was not surprising."

Iceberg represents a low-cost, high-performance alternative to more expensive high-end disk drives, Moore noted. "We're looking at Iceberg from a price/performance and reliability standpoint, but there are other things out there," Moore said, pointing to IBM's enhanced 3390 drives.

IBM's triple-capacity version of its conventional high-end IBM 3390 disk drive will impact Iceberg sales, predicted Paul Wolfstaetter, program director at Gartner Group, Inc.'s Large Computer Strategies Group.

"There's no learning curve for the customer, and the list price for the triple-capacity drive will be $3 to $5 a megabyte," he said, compared with Iceberg's $6 to $10 per megabyte.

Quality argument

Storage Tek defended its policy of taking more time to prepare the Iceberg product for market, saying it would preserve quality control. Securities and Exchange Commission rules required that the delays be revealed, Weiss said.

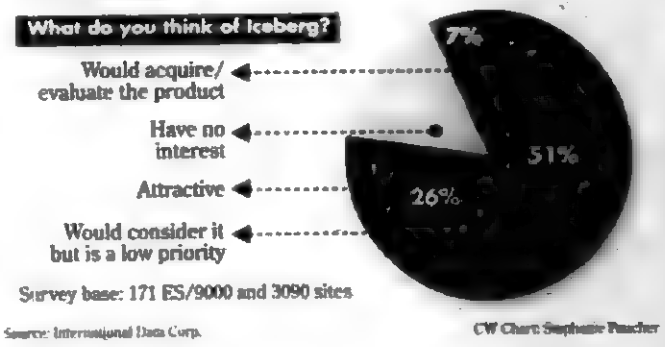
"It's not like the proverbial delay in your airline flight, where you only hear about the delays a half-hour at a time," Weiss said. "We can see the end of the new function we have to code, and we believe this [schedule] is a correct assessment of what we can do."

Upon news of the delays, Storage Tek's stock dropped Aug. 10 by more than 6 points to 27¼, just above its 26⅝ low for the year. At press time last Friday, it increased to 29⅛.

Original plans called for Iceberg to double Storage Tek's sales in a few years. But the company announced 10 days ago that Iceberg beta testing would be delayed until the fourth quarter and that Iceberg would not be shipped until first-quarter 1993.

Melting market potential

When Storage Tek finally rolls out the Iceberg, its reception may be less than desirable



Survey base: 171 ES/9000 and 3090 sites

Source: International Data Corp.

CW Chart: Stephanie Faucher

APPN patents to be enforced

CONTINUED FROM PAGE 1

"It would be foolish for IBM not to make APPN an open architecture if it wants the protocol to succeed, and here it seems like they are trying to close it," added Pat Mayer, a local-area network administrator at Mortgage Guaranty Insurance Corp.

With protocols such as Transmission Control Protocol/Internet Protocol gaining ground as rival enterprise networking standards, "IBM should make it as easy as possible" to implement APPN, Mayer added. "It's likely that we will implement APPN, but I think that a lot of vendors that might otherwise have supported it won't now. I don't understand IBM."

IBM APPN architect Marcia Peters provided IBM's perspective. "In my opinion it is impossible to develop [APPN Network Node] products without using technology that is protected by those patents," she said. But this should "be no surprise" to vendors because IBM announced its plans for licensing APPN Network Node last March, Peters added. "IBM deserves a fair return on its investment" of millions of dollars on developing the architecture, she said.

On the other hand, the cost of a license will be low enough that vendors can price their APPN products competitively, Peters said, declining to be more specific.

Vendors were very surprised by IBM's disclosure, said Don Czubeck, a conference attendee and president of Gen2 Ventures, a Saratoga, Calif.-based research house. "It was well-known that IBM is licensing its source code for the APPN Network Node, but some people didn't seem to know that even if a vendor wanted to write its own APPN software, it will still require a license from IBM."

3Com Corp., Network Equipment Technology, Inc. and Novell, Inc. found themselves above the fray, having already signed up for APPN licenses from IBM under reciprocal technology agreements. On the other hand, Cisco Systems, Inc., Systems Strategies, Inc., Brixton Systems, Inc. and "anyone else who is doing APPN software today has a problem staring them in the face," Cisco spokesman Wayne Clark said. "In the long term, we're interested in licensing APPN Network Node; in the short term, this affects us."

Long reach

Indeed, the patent question extends much further than APPN development, according to Kevin Kalajan, senior product manager at Sun Microsystems, Inc. subsidiary SunConnect. For example, a protocol called adaptive session level pacing, which comes under the APPN patents, is also used in the far more numerous Advanced Program-to-Program Communications products and installations, he added.

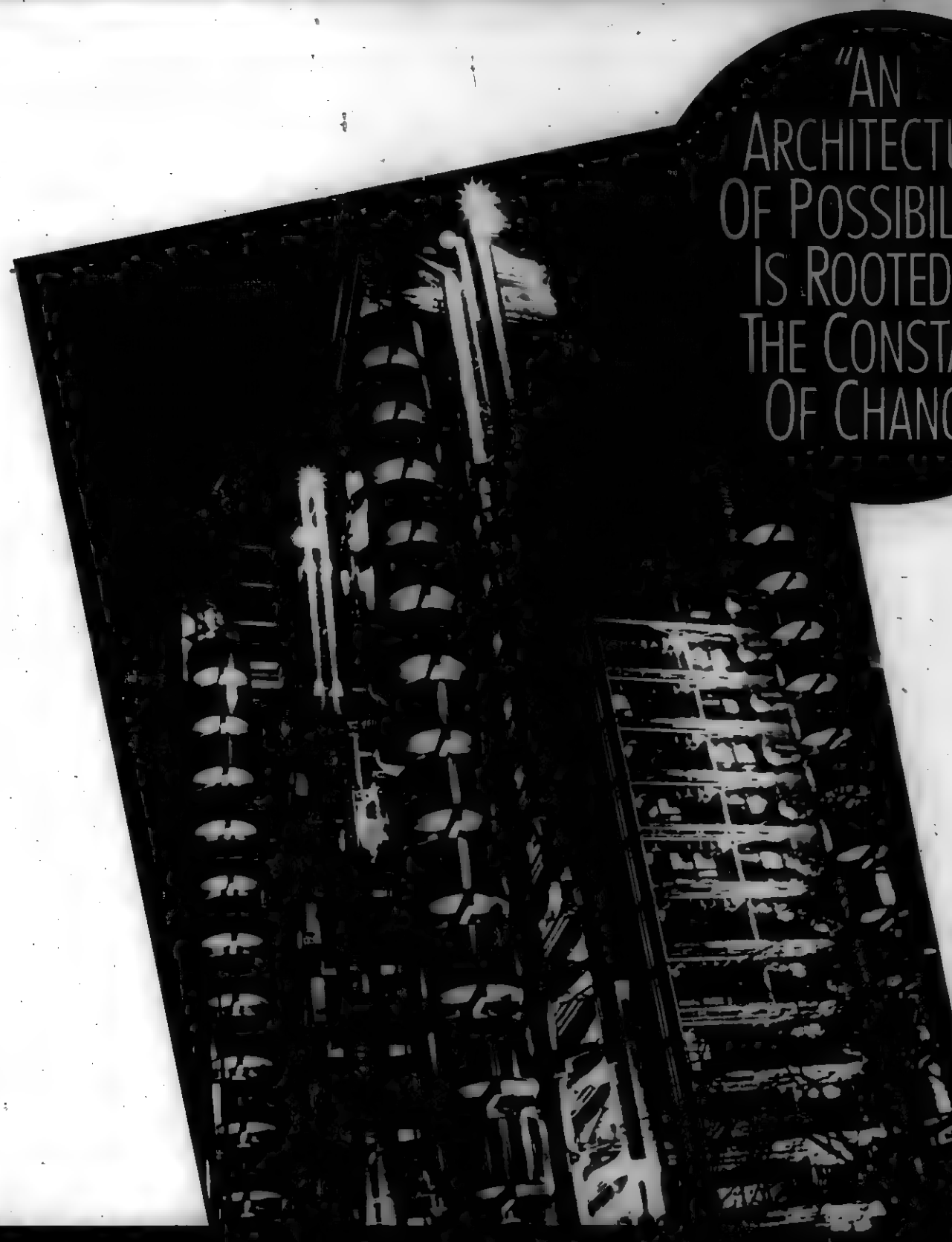
"The real question is how much IBM plans to enforce" the patents, Kalajan added.

It was unclear whether the patent issue will affect end users who wish to develop their own APPN systems in-house but have no intentions of selling it.

One possibility is that IBM will unbundle the patents from the license, which would allow vendors to obtain just those patents they need to continue their work, Clark said. IBM has indicated that it may do this by year's end, he added.

Also raised at the conference was the question of whether IBM intends to enforce the patents on, or charge a license fee for, APPN End Node.

End node products, several of which are now on the market, can access APPN resources but cannot perform the sophisticated directory and routing functions defined by Network Node. IBM intends to clarify its position on End Node shortly, according to Peters.



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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Legent reveals plan for merging Goal products

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp., which recently consummated its merger with Goal Systems International, Inc., last week outlined its approach to consolidating both product lines. Users briefed by Legent said they were satisfied that their product investments would be protected.

There is little redundancy in the combined product line, which now includes 130 items. However, some widely used products in two areas — automated operations and output management — do offer similar functions (see chart). Legent said it will migrate products in those areas to unified "superset" products that offer the best features from each camp and ensure upward compatibility.

Premier Bank NA in Baton Rouge, La., was one of 15 companies that joined a user task force to help Legent map out its strategy for developing the superset products. "I just went away skipping and dancing" after a day and a half of meetings with Legent and Goal product managers, said Sybil McDonald, an assistant vice president and business analyst at the bank.

Legent's Nicastro *likens upgrades to new releases*

Three years ago, Premier Bank evaluated Legent's Bundl and Goal's SAR/Express Delivery products for automated report distribution and gave Goal the nod. Now, McDonald said she hopes to get the best features of both product lines and then some. "They promised things that neither product had but everyone wants, like electronic notepads. The feeling I got was we'll be better off than we are now," she said.

Legent said that within 12 to 18 months it will bring out new releases of Bundl and SAR/Express that contain enhancements to those features that are to survive in the superset product, which will emerge 12 to 24 months later.

The two product lines for automation of data center operations will follow a similar approach. Goal's OPS/MVS kernel will be surrounded with the modular components of Legent's AutoMate/MVS, such as the Relational Data Framework and the System State Manager.

Tom Cunningham, operations manager at Progressive Cos. in Mayfield Village, Ohio, said he was satisfied with the plan for AutoMate/MVS, which he runs on two IBM 3090/600s and an Amdahl Corp. 1400. "My concern was, how were my 20,000 [user-written] AutoMate rules going to be protected? But their approach will protect our investment; in fact, it will strengthen it."

Legent said it will also give users tools to help with file conversions and other chores necessary to move to the superset products. However, upgrading to those products will be much like installing a new release of an existing product, according to Suzanne M. Nicastro, director of product management at Legent's $120 million-a-year Data Center Management Group.

Greg Thomas, a senior technical analyst at Bethlehem Steel Corp. and a user of both Legent and Goal products, called the merger "almost the best of the best scenarios." In addition to getting the best features from both AutoMate and OPS, he said, the merger will bring a less obvious benefit: "We had good support from both companies in the past, but they were competitors. Now, they won't have to spend a lot of energy competing. They can focus on me and my needs. I see that as a definite plus."

With expected sales this year of $410 million, Legent is now the third-largest provider of systems management software after IBM and Computer Associates International, Inc.

Bumping heads

Product overlap between Legent and Goal

Application	Legent	Goal
Automation of data center console operations	**Automate**...600	**OPS**.....550
Automation of report distribution and administration	**Bundl**.....150	**SAR/Express**, 1,200

Source: Legent Corp. CW Chart: Michael Siggins

United we stand

The superset operations automation product for the mainframe will combine the functionality of Legent's AutoMate/MVS with the Goal OPS/MVS kernel and will include the following features:

- SQL-based data storage that provides a relational data cache for automation information.
- Multiaddress space architecture to take advantage of MVS multitasking.
- A single-message repository to store, search and browse through system messages.
- Automated resource management to manage the operational status of critical system components.

The superset PC-based product for operations automation will combine elements of Legent's AutoMate/XC kernel with the functionality of Goal's OCF and OPS/Relay and will have these features:

- Support for monitoring mainframe information from LANs.
- Graphical display of system activity on the PC.
- Conformance with IBM's SystemView.
- LU6.2 capability for data transfer from PCs to mainframes.

The superset product for output management will combine the functionality of Legent's Bundl with Goal's SAR/Express kernel and will offer the following features:

- Concurrent post-JES processing for high-performance data collection.
- Pre-JES capability for real-time processing and reduced I/O to the JES spool.
- Optical disc support as an alternative to microfiche.
- Bar-code support for report tracking and statistics.
- Collection and balancing facilities for verifying reports.

Hughes zeros in on PC costs

CONTINUED FROM PAGE 1

agers will take advantage of the agreement.

"It's better to lead people by showing them benefits rather than by holding a big stick in front of them," Berry said. "We think, if the [purchasing agreement] keeps costs lower, they'll want to use it."

Szeto would say only that Hughes typically spends millions of dollars annually on PC hardware alone. Still, as Hughes shrinks, this could change. During the next six quarters, more than 9,000 of the company's 60,000 employees will be laid off as it blends seven divisions into five, centralizing common functions where it can.

Hypothetically, Hughes could save at least $1.2 million annually if it purchased 2,500 custom-built PCs under the new agreement: Custom-made PCs would cost $3.75 million; a deal for similarly configured Compaq Computer Corp. DeskPro/I Model 120s would cost $4.95 million, before adding in the monitors.

Leasing will also save Hughes money while keeping the company on the cutting edge of technology, analysts said. Leasing PCs in bulk, however, is not common, according to industry statistics from the Computer Dealers and Lessors Association, which showed that $1.9 billion was spent on leased PCs, workstations and terminals in 1991. Analysts said the dire economy makes buy/lease deals and efforts at partnerships more likely in the future.

"I've been getting a fair number of inquiries on leasing; I think that's increasing," said Jack Karp, a vice president at Meta Group, Inc. in Westport, Conn.

Capital-constrained Hughes made leasing a major component of its new purchasing agreement because it wants to keep all PC purchases under the $1,500 Federal Acquisition Regulation expense cap. Hughes treats the monitor, CPU and keyboard as separate items so it can spend more than $1,500 for an entire system. Its arrangement with Micro Assistance Group (see story at left) lets it buy a 33-MHz 386DX-based box with a monitor and keyboard for less than $1,500.

Hughes' PC Price Evaluation subcommittee is working on a deal that will allow it to buy even 33-MHz 486DX-based PCs for less than $1,500 from appointed resellers. But servers, high-level notebook computers and high-end Macintoshes from Apple Computer, Inc. (more than half of Hughes' PCs are Macintoshes) cost more than $1,500 and will ideally be leased.

Szeto said she thinks deals such as the one Hughes has just signed herald a new future for major corporations. "It would be foolhardy not to do this with all the rightsizing and downsizing going on," she said.

Into the wild blue yonder

Hughes aggressively sought partners that were not adverse to sharing risk. The two resellers it will work with on the PC purchasing deal were the low bidders responding to Hughes' request for proposals, said Timothy Leber, manager of customer systems support at Hughes Enterprise Information Systems.

Hughes and the two resellers created a "living" contract, which allows for substantial tweaking as the parties' needs change.

As an example of Hughes' daring, the only DOS-based vendor currently approved under the contract is a small Phoenix-based systems integrator, Micro Assistance Group (MAG). MAG builds IBM clones according to component specifications established by Hughes. MAG was selected because "it has the right attitude — they want to do things proactively," Leber said.

MAG supplied only 400 PCs to Hughes in the last year, while the company tested how the relationship would work. Hughes appears to be taking a leap of faith that MAG can continue to deliver PCs in a timely manner.

Vivian Szeto, a contract negotiator at Hughes, said negotiating the buy/lease pact with the resellers — Sun Computers, Inc. in Carson, Calif., and Infosystem Computer Center in Torrance, Calif. — was "extremely challenging," but she said she is happy with the outcome.

The same two firms will handle leases when the agreement is signed, she said. Sun will be used primarily for the Apple Computer, Inc. Macintosh, and Infosystem will handle MAG equipment and other IBM PC-compatible boxes.

Still, Hughes is looking for a second approved source of "expense" PCs, because several groups within Hughes complained of being limited to one source.

MICHAEL FITZGERALD

August 3, 1992

TO: Modem Users
FR: Multi-Tech Systems
RE: Hayes' Recent Ad ("Tick, Tick, Tick. Boom! You're Dead")

You may have seen the recent ad from Hayes Microcomputer Products, showing a time bomb along with the headline "Tick, Tick, Tick. Boom! You're Dead." Because of our concerns about the deceptive nature of this ad and the "test kit" mentioned in the ad, we took legal action. On July 29, at our request, a Minnesota federal court judge restrained Hayes from distributing its test kit.

Having seen the ad, you might wonder what Hayes was talking about. The ad says your modem may be "fatally flawed", without explaining what the flaw is. They simply call it a "time bomb" that endangers "your data, your company and even your job." Hayes offers you a free "test kit" to "uncover the bomb", and suggests that you replace your "flawed" modem with a Hayes modem.

To clear the air a little, the issue Hayes is referring to in their ads is modem escape sequences. Escape sequences are used to switch a modem from on-line data mode into command mode, usually for the purpose of telling the modem to hang up. There are several escape methods, including timing dependent in-band escape sequences (like Hayes'), and various timing independent escape sequences (aka "TIES"), including out-of-band escape sequences using a BREAK signal. All of these escape methods are effective. However, Hayes' position is that any modem that does not use their escape method (and thereby license their patent) will be highly prone to accidental escapes, which will "paralyze the data" and cause "untold chaos". That is the "bomb".

Multi-Tech modems have been designed with quality and reliability in mind. They give you a choice between timing independent in-band and out-of-band escape sequences. We have seen no false escapes. As far as we know, neither has the industry. For that reason, we were troubled by the Hayes message that the design was a disaster.

We were even more troubled when we saw the Hayes test kit. The test kit's "Modem Escape Reliability Test Files" make a TIES modem escape "on purpose". This result is then intended to convince you that the TIES modem is prone to escaping "accidentally". Once we saw that the test was rigged, we took steps to stop Hayes from confusing the industry for their own purposes.

The Court's July 29 order recognizes that "the public has an interest in basing its purchasing decisions on accurate information about products and competitors. Multi-Tech has demonstrated that permitting Hayes to issue the test kit in conjunction with the advertisement would likely undermine that public interest." As we understand the order, the Court sought to protect both Multi-Tech and the industry from the impact of Hayes' deception.

Negative advertising is bad for everyone. In this case, it's bad for Hayes, bad for Multi-Tech, and bad for you. We regret having to run an ad like this one, but feel we have no choice but to respond. Thank you for listening.

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Mounds View, Minnesota 55112
(612) 785-3500 (800) 328-9717
FAX 612-785-9874

NEWS SHORTS

Move afoot for common mail calls

The X.400 Application Program Interface Association (XAPIA) last week began recruiting vendors and messaging service providers to help develop a Common Mail Call as an "open" set of APIs. These help move electronic mail between desktop applications running on different platforms and across different mail systems and local-area networks. Replacing proprietary mail calls with common calls aims to reduce mail-enabled application development headaches.

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Embarc signs GE, IBM E-mail nets

Subscribers to Embarc, Motorola, Inc.'s next-generation wireless paging system, are now able to receive messages from General Electric Co. and IBM E-mail networks. The two X.400 gateways are the first of many planned with information network providers, Embarc executives said.

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RAID advisory board formed

Seagate Technology, Inc., Data General Corp., IBM and seven small storage companies banded together to form the RAID Advisory Board in an effort to set standard terminology to "clear up user confusion" about redundant arrays of inexpensive disks (RAID). John Hartjen, manager of mass storage marketing at DG, said users are unsure which storage needs are best met by which of the five RAID levels. The board plans to write several white papers and other educational materials during the next year. Micropolis Corp. declined to join the group, and Storage Technology Corp. said it is still undecided whether to join.

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CPIC to comply with X/Open

IBM told a gathering of developers last week that upcoming releases of its Common Programming Interface for Communications (CPIC) will comply with an X/Open Consortium Ltd. version of the protocol. IBM also said it would implement the Open Systems Interconnect (OSI) Common Management Information Protocol on top of its Systems Network Architecture transport protocols, rather than on OSI, according to Don Caubeck, an attendee of the conference and the president of Gen2 Ventures.

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RBOC to sell Cisco, ACC routers

US West's Advanced Communications Services business unit last week reportedly signed an agreement with router leader Cisco Systems, Inc. to market Cisco products alongside imminent new data services, including frame relay and Switched Multimegabit Data Service. The move follows an announcement the previous week that US West will also market internetworking vendor Advanced Computer Communications' bridge/router line.

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Short takes

Unified Systems Solutions, Inc. released Network Management Translator, which is said to enable AT&T's Accumaster Integrator Network Management System to manage devices via the Simple Network Management Protocol. . . . **Gupta Technologies, Inc.** and **Hewlett-Packard Co.** agreed to jointly develop an interface between Gupta's SQLBase personal computer LAN database server and HP's AllBase/SQL relational database and TurboImage database. The interface will be based on **Microsoft Corp.**'s Open Database Connectivity API for SQL access. . . . **Apple Computer, Inc.** has named John Floisand president of Apple Pacific. . . . Apple and the National Science and Technology Board in Singapore have announced the opening of the APPISS Research Center to conduct joint technology research. Efforts will focus on new technologies that cater to the complex Asian writing systems and research on related technologies such as handwriting and speech recognition. . . . **Digital Communications Associates** (DCA) is now shipping Remote LAN Node 1.1, asynchronous remote communications software that comes bundled with a new Intelligent Client Multi Port Adapter Card from DCA and an Ethernet card from **Standard Microsystems.**

Budget remaps outsourcing plan

Considers partnership with EDS or AMR for new car reservation system

BY MARK HALPER
CW STAFF

LISLE, Ill. — Budget Rent A Car Corp. and Electronic Data Systems Corp. are discussing the development of a computerized reservation system that would supplant a similar project that until recently was to be handled by AMR Information Services, Inc.

Switching outsourcing vendors is just one of several recourses that Budget is considering now that AMR Information Services has ceased development of the Confirm reservation system, Budget Executive Vice President Kevin McShea said.

Budget's other options, McShea said, include the following:

- Continue to tap AMR Information Services, which processes both Budget and Hilton Hotels Corp. on a system called North.
- Build a new system in-house. Budget had planned to cut over to the Confirm system on Sept. 30, once AMR Information Services completed development of Confirm, an integrated airline, automobile and hotel reservation system. AMR Information Services was the development partner in Information Consortium, also known as Intrico, which included users Budget, Hilton and Marriott Corp.

Budget recently abandoned its Confirm plans after technical problems surfaced amid suspicions that AMR Information Services hid its development difficulties for months from consortium partners [CW, Aug. 10]. Those problems led Budget, Hilton and Marriott to abandon Intrico; they are discussing disbursement of funds and assets.

Hilton and Marriott declined to discuss their options now that Intrico and the Confirm project are dissolving.

McShea, who is a member of the Intrico board, said Budget's outsourcing contract with AMR Information Services expired in January, and the two companies have continued doing business since then under "a gentleman's agreement."

He maintained that despite Budget's "disappointment" in AMR Information Services' Confirm development efforts, Budget has not lost confidence in AMR Information Services as a raw data processing provider.

Pros and cons

If Budget were to continue on the North system, however, it would not benefit from the functionality it would have received under Confirm, which would have been state-of-the-art.

McShea praised EDS' reservation system smarts, noting that the outsourcer has acquired from clients functionality such as car rental, point-of-sale and hotel property management systems, which it has combined with its own system. Some of that functionality has come from EDS' 1½-year-old equity/outsourcing deal with National Car Rental System, Inc. in Minneapolis.

The Budget executive pointed out that Confirm, while it was to have had robust reservation and decision support capabilities, would not have included some of the integrated features offered by EDS, at least initially.

"There's a distinct difference between [AMR Information Services'] Confirm strategy and EDS'," McShea said. AMR Information Services "was attempting to build a new technology solution from the ground up. EDS' strategy of acquiring solutions has made them capable and quicker to market with a broader portfolio."

Meanwhile, McShea said, Budget is seeking to recoup the money it invested in the Intrico partnership, which lasted for about 3½ years. He declined to state how much Budget is seeking but claimed that AMR Information Services' alleged cover-up of technical problems is not causing Budget to seek additional compensation.

He also claimed that Budget is not seeking software code, noting that "we don't want dirty code." Sources, however, noted that some of the Confirm software modules are in good shape and are still usable.

House bill would restrict air reservation systems

CONTINUED FROM PAGE 1

overkill and said it unfairly penalizes them for building highly successful business systems. American said it had invested $1.3 billion in Sabre through 1991 — and lost $165 million before it turned a profit — so it is entitled to some rewards from the high-risk investment.

Robert L. Crandall, American's chairman and president, called the House legislation "a special-interest bill intended to benefit less successful CRS owners and certain airlines that didn't have the foresight to invest in computerized reservation systems."

American launched Sabre in 1976 after other airlines declined to participate in an industrywide system.

Famous as the classic example of a "strategic information system," Sabre has been especially lucrative for its owner. A 1988 government study showed that ownership of Sabre provided American with additional bookings worth $100 million to $200 million a year because travel agents tend to book flights on the carrier that provides the system.

The Sabre information system is so valuable that Crandall told a Society for Information Management audience last year, "If you told me I had to sell either the airline or the system, I'd probably sell the airline."

Risky business

The Sabre story illustrates the political and legal risks that companies run when they use information as a competitive weapon, according to Peter Marx, an information industry attorney in Wellesley, Mass.

However, Marx said, IS executives should not be cowed by the risks. His advice: "Charge ahead. You should be so lucky to end up in the position of Sabre."

The House action is the latest episode in a long-running antitrust battle over Sabre and Apollo, which control more than 60% of the reservation system market. In 1984, the government outlawed system display bias, but in the last few years, American and United have repelled antitrust lawsuits filed by competitors such as Continental Airlines and Northwest Airlines.

Critics said Sabre and Apollo have an "architectural bias" that makes it slightly more difficult to look up information and book flights on nonhost carriers.

The House bill requires the elimination of architectural bias by Sept. 30, 1994. The bill also bans the reservation system vendors' practice of prohibiting travel agents from adding third-party hardware or software or using a terminal to access other reservation systems.

To make it easier for travel agents to switch vendors, the House bill limits contracts to three years and bans automatic extensions, minimum use requirements and excessive financial penalities for breaking a lease. The Transportation Department's reservation system regulations are expected to be very similar to the House bill.

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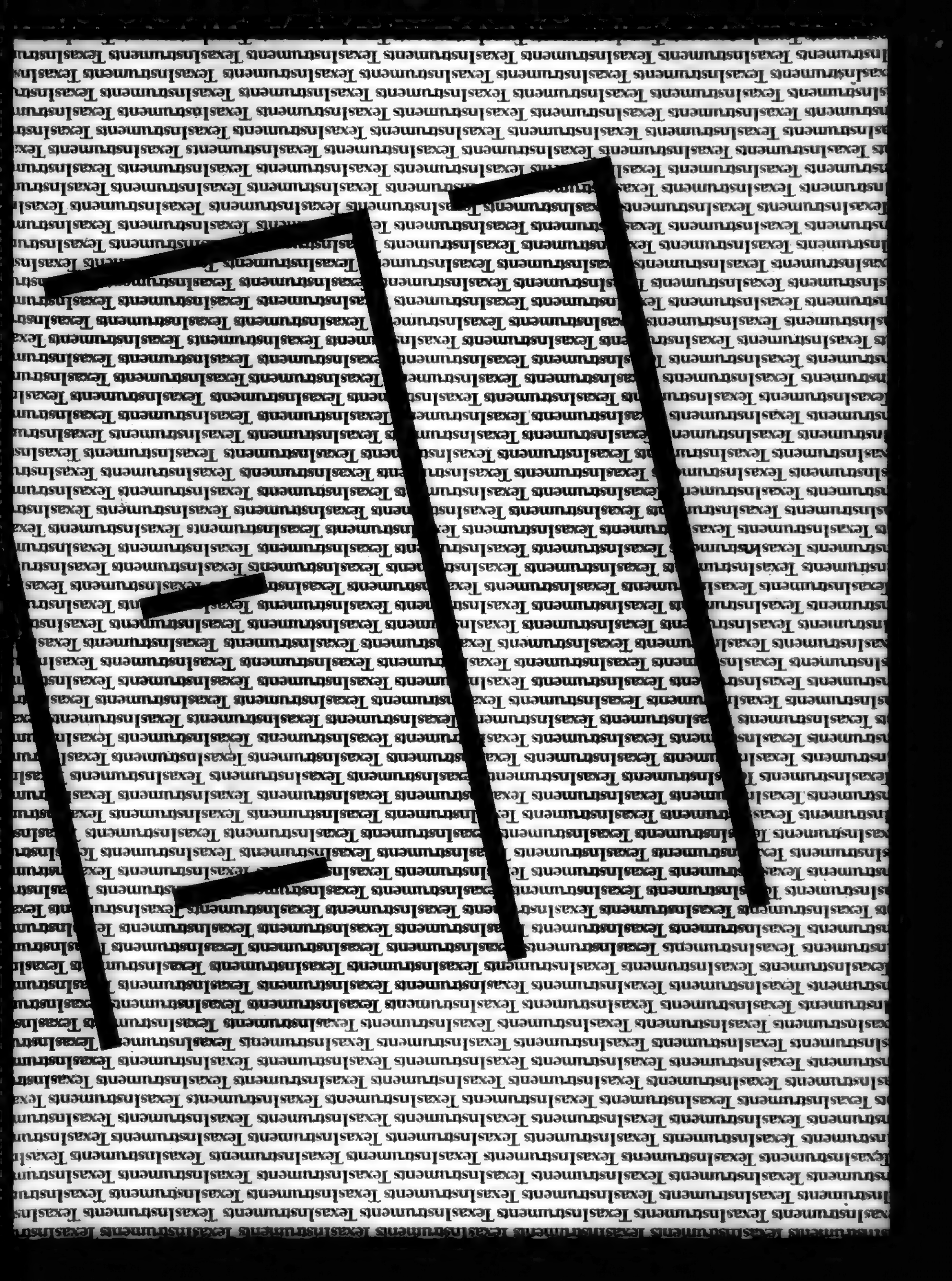

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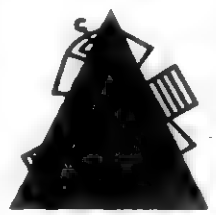
EDS takes over retailer's app development

BY MARK HALPER
CW STAFF

CHICAGO — Montgomery Ward & Co. last week handed over its application development to Electronic Data Systems Corp. in an estimated $100 million, multiyear deal that will land the retailer's developers on the EDS payroll.

The announcement came on the eve of an anticipated disclosure by EDS that it has signed a five-year licensing pact with Texas Instruments, Inc. for TI's Information Engineering Facility (IEF) integrated computer-aided software engineering development tool, a move that would raise the possibility that EDS would implement IEF at Montgomery Ward.



According to one source, EDS' Montgomery Ward deal grew out of the retailer's interest in developing and implementing a new point-of-sale (POS) system. Neither company would confirm that that was the driving force behind the agreement, which calls for EDS to take over across-the-board development in POS, merchandising, distribution, financial, electronic data interchange, database and other operations.

Gregory Granello, vice president of sales and marketing at EDS' Commercial Services business unit, said negotiations also touched on the possibility of EDS' taking over data center operations but that Montgomery Ward decided to keep that function in-house.

"For the time being, we're not doing the data center," Granello said, declining to elaborate on whether EDS plans to continue to pursue a data center contract with the retailer. Outsourcers such as EDS often use development or integration jobs as stepping-stones to data center assignments.

While EDS has won development projects with other large retailers, including Montgomery Ward rival Kmart Corp., last week's contract marks the first time EDS has taken over entire development operations for a retailer that continues to run its own data center, according to Granello.

Earlier this year, EDS won an estimated $160 million data center and distributed computing job with Salt Lake City-based Smith Food & Drug Centers, Inc. That contract called for EDS to take over application development (CW, May 25).

Neither Granello nor a Montgomery Ward spokeswoman would divulge the value or duration of the Montgomery Ward pact.

The Montgomery Ward spokeswoman said EDS has offered jobs to all of Montgomery Ward's development employees, who have two weeks to make a decision. About 150 employees are involved, she said.

The spokeswoman said the retailer weighed proposals from other integrators that she declined to identify. She said the company determined that EDS could develop programs faster than Montgomery Ward's own staff had.

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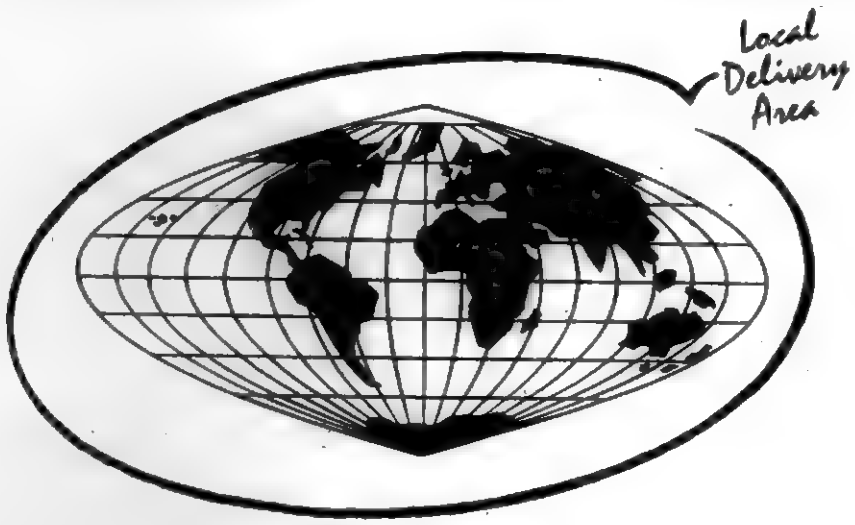

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Borland readies product rollouts

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. is scheduled to announce a fleet of development tools this week — among them upgrades to ObjectVision and Borland C++.

ObjectVision Pro Version 2.1 ($495) includes an enhanced version of the ObjectVision graphical development tool with Paradox 3.5 and 4.0 file compatibility, a faster Paradox Engine and support for Paradox Memo fields and Binary Large Objects (Blob). This is bundled with Turbo C++ for Windows 3.1, SQL Connection, a multimedia tool kit and a graphical report writer.

Blob support is also included in the Borland Paradox Engine Version 3.0. An object-oriented access layer has been added for use by C++ and object-oriented Pascal programmers. The $299.95 package allows Paradox programmers to integrate external applications with Paradox data.

Borland will also ship Version 3.1 of the Brief programmer's text editor. Both DOS and OS/2 versions will be included in one package for a list price of $249.95, the company said.

In addition, the company has a pair of compact disc/read-only memory (CD-ROM) offerings, including Borland C++ and Application Frameworks Version 3.1 for CD-ROM ($19.95 to current Borland C++ and Application Frameworks users) and the Borland Language KnowledgeBase, a database of tips, bug reports and technical answers about Borland products.

Another disc, the Borland Applications KnowledgeBase, is also available. Each disc has a list price of $249.95. A yearly subscription with quarterly CD-ROM releases is available for $495.

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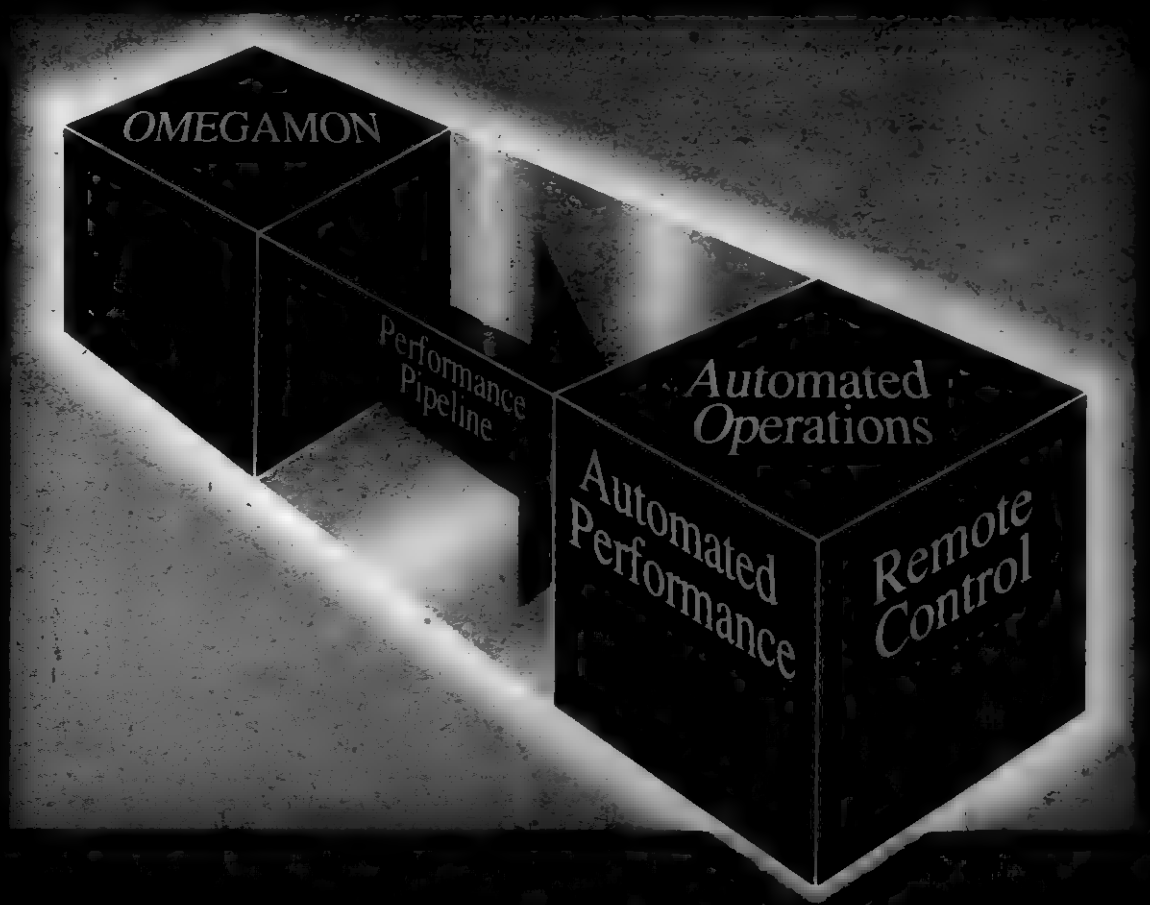

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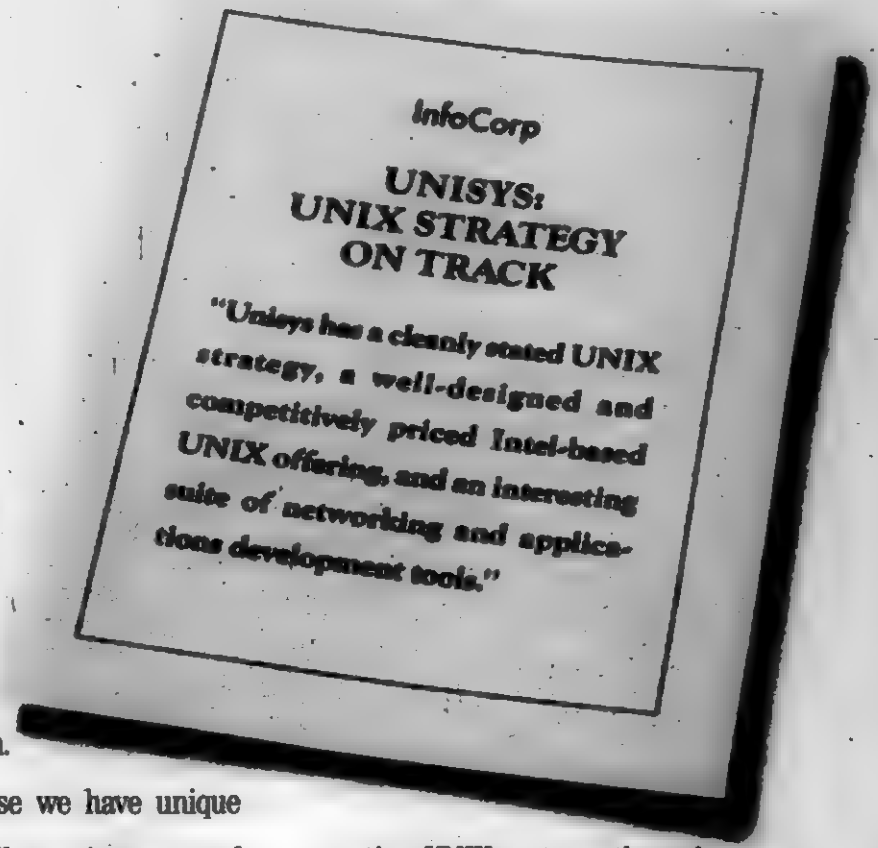

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KnowledgeWare's profits fall

User disenchantment with CASE cited as major setback

BY KIM S. NASH
CW STAFF

ATLANTA — KnowledgeWare, Inc. last week reported a 98% nosedive in profits for fiscal year 1992 — to $260,000 — from the comparable period last year. A first-quarter loss, coupled with expenses related to getting acquired products to run with its development workbench, was the primary drag on earnings.

The company would have reported a loss for both the year and the quarter — in which it earned $2.3 million — were it not for income it received from a three-year, $25 million product sale to IBM that began rolling during 1992's fourth quarter.

The computer-aided software engineering (CASE) tool maker — which is also an IBM AD/Cycle partner — booked three consecutive profitable quarters after reporting a loss for first-quarter 1992. Money from the IBM deal totaled $7 million for the fourth quarter and $9.4 million for the year.

The year was a tough one for the company. General user disenchantment with CASE hurt KnowledgeWare and other application development vendors, including Easel Corp., which recently reported a quarterly loss of $585,000.

KnowledgeWare also laid out an undisclosed sum for tweaking products from recently acquired companies and establishing a new consulting services operation.

Looking forward, KnowledgeWare plans to emphasize CASE consulting services to help users get started with the Application Development Workbench (ADW) in addition to simply selling the CASE workbench, according to Don Addington, chief operating officer.

Ed Acly, an analyst at International Data Corp., noted that services are the way of the CASE industry as a whole. Half of rival Texas Instruments, Inc.'s estimated $125 million in CASE-related revenue for 1991 came from services, he said.

Addington added that one of the "key" areas of focus for the company is supplying "best-of-breed CASE component tools and services" to users. This seems to be a shift from KnowledgeWare's historical adamant, integrated-CASE stance.

Acly agreed. Citing KnowledgeWare's widely criticized "weak" code generator as a "tenuous at best" link between ADW's upper and lower CASE pieces, Acly said, "they've never had a real integrated product line anyway."

The company has promised to ship an enhanced version of ADW, its flagship integrated CASE workbench, by year's end. Enhancement plans for ADW Release 2.7 include rapid application development features as well as the roots of support for Unix-based development.

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Profits	$5.30M	$15.30M
	Q4 '92	**Fiscal '92**
Sales	$34.00M	$115.10M
Profits	$2.30M	$0.26M

*Record high

CW Chart: Michael Siggins

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Banyan Vines to include OSI suite

BY MICHELE DOSTERT
CW STAFF

WESTBORO, Mass. — Banyan Systems, Inc. last week revealed that its forthcoming Vines network operating system for The Santa Cruz Operation's SCO Unix will include a suite of Open Systems Interconnect (OSI) products.

Vines for SCO Unix will ship next month, Banyan said; the OSI products, which work with SCO-based Vines through gateways, are scheduled to ship in March.

Banyan is licensing the new product set from Retix Corp., an OSI supplier in Santa Monica, Calif. Retix and Banyan also agreed to cooperate on support issues for Banyan's OSI customer base.

Banyan's new OSI product set will comply with the Government Open Systems Interconnect Profile (GOSIP) Versions 1 and 2. The four server-based software options include Virtual Terminal; File Transfer, Access and Management; Local-Area Network Transport; and Wide-Area Network Transport. The options run on the SCO Unix operating system, which is compliant with the government-endorsed Posix standard.

"We are very pleased to see Banyan [providing] OSI integrations and GOSIP support in a form that will simplify our GOSIP migration plan," said Richard Campbell, chief of research and development at Federal Deposit Insurance Corp.'s MIS branch.

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Coral Networks ships fledgling broadband switch

BY JOANIE M. WEXLER
CW STAFF

MARLBORO, Mass. — After 2½ years of snafu-ridden development, a revolving management team and near-fatal financing problems, internetworking start-up Coral Networks, Inc. last week shuttled a bare-bones version of its Broadband Enterprise Switch out the door.

The switch gained attention when it was announced in January 1991 for its potential as a do-it-all communications device that blends the redundancy and functionality of telecommunications equipment with local internetworking performance. However, its late arrival and neophyte status mean that one major Coral challenge will be to keep food on the table while filling in the gaps in the device's original promise, some observers said.

The initial version — the CX1600 — routes two protocols, Internet Protocol and Novell, Inc.'s IPX. The CX1600 also emphasizes slow-to-be-accepted Fiber Distributed Data Interface (FDDI) networking, and some of its attractive features are likely to be years away.

For example, Convex Computer Corp., which has been involved in beta testing the product "since Day 1," is looking to benefit three to four years out, said Coyne Gibson, manager of information technology at the Richardson, Texas, firm.

This is when Gibson said he expects the switch to combine the functions of his Cisco Systems, Inc. routers and Stratacom, Inc. T1 multiplexers.

Gibson noted that Convex has a long-term goal to build a "universal transport network" that doesn't differentiate between different types of data packets and voice. "This is a box that will ultimately do that job," he said.

Not all users can wait. For example, a large software company that also evaluated the CX1600 said that although it found the product innovative, the functions it needed right away, such as Ethernet-to-FDDI bridging, were not there.

In addition, "Asynchronous Transfer Mode [ATM] is coming up real fast," said Nick Lippis, president of Strategic Networking, Inc. in Rockland, Mass. ATM is a standards-based cell-switching network technology hoped to one day blend local- and wide-area networks. Coral has not announced its ATM strategy.

Coral also has to overcome a muddled history. Its switch was originally positioned as a communications device containing "everything known to the internetworking community," said Coral President John Thibault, who acknowledged some initial positioning problems.

Thibault also conceded that one week after the product was announced, the firm discovered a six-month development delay. The company then recruited Thibault from Codex Corp. in June 1991 as the company's third chief executive in its two-year history, whereupon one of Coral's two lead investors, TA Associates, left $6 million on the table. In the sluggish economy, Coral was forced to scurry for fresh financing, which it found in the eleventh hour from Sevin Rosen Funds and Gibralter Trust [CW, Jan. 6].

Today, Coral's switch is positioned as "the Tandem or Stratus" of the networking community because all of its components are redundant, Thibault explained. However, its centralized architecture, in which multiple networks share one processor, "means there is some level of single point of failure" associated with it, Lippis observed.

Enigmatic performance

There has been little known testing of the CX1600's performance, one of its touted strengths.

Beta-test site Convex Computer reported routing at "near wire speeds" and bridging "at wire speeds, no problem," said Coyne Gibson, manager of information technology.

In addition, Scott Bradner, a Harvard University consultant who heads up independent internetworking benchmark testing, attested to Coral claims that the CX1600 fills 100% of available LAN bandwidth when performing FDDI-to-FDDI bridging at all packet sizes.

Bradner's benchmark tests of Internet Protocol routing, however, show a throughput of just 25,000 packets per second out of a possible 180,000. Given these numbers, Bradner said, Coral's claims of guaranteed 100% WAN bandwidth use "would seem overenthusiastic."

No WAN testing of Coral equipment has been done at Harvard or Convex, according to Bradner and Gibson.

Coral President John Thibault said the firm's WAN throughput claims are based on T1 and frame-relay throughput tests at beta-test sites, although he declined to name them.

JOANIE M. WEXLER

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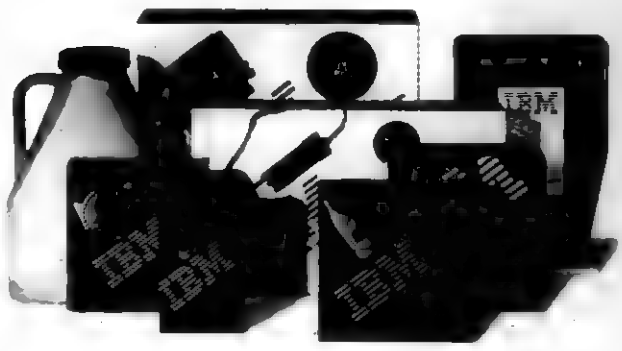

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ADVANCED TECHNOLOGY

DRAM advances pave way for new adventures

BY MICHAEL FITZGERALD
CW STAFF

Dynamic random-access memory leads a split life in the computer world. On the one hand, it acts as the cockroach of electronics: It comes in a small, hard shell, has lots of legs, lacks glamour and is everywhere. On the other hand, it's like the human brain: Systems could not live without it, and with it, people can generate some very exciting things.

This dual nature creates a paradox where some can say "memory chips are not exciting" — as Sherry Garber, an analyst at In-Stat Research, Inc. in Phoenix, concedes — yet they follow the business of memory chips with great interest.

Garber, for instance, can spout information on current happenings in the DRAM market as though it had the drama of The Battle of Midway. These issues include things like the move to 3.3V chips in place of today's 5V chips or a current hot button in DRAM development, the coming of synchronous DRAM. This kind of DRAM will run at the same speed as the system processor. One reason DRAM is cheap and widespread is that it runs slower than static RAM.

Face-off coming

Advanced against synchronous DRAM, according to Garber, is the new memory architecture design proffered by Rambus, which will also speed up DRAM performance. Rambus has licensed its technology to Mitsubishi, Fujitsu Ltd., NEC Corp. and Toshiba Corp., and these companies will face off with those pursuing synchronous DRAM designs.

No matter which technology wins, Garber said, "it all means faster performance of DRAM."

The current state of the art is the 16M-bit DRAM, shipping this year. DRAMs typically have a three-year development, so by 1995, the 64M-bit DRAMs currently under development should ship and become the dominant mode of RAM inside computers. By 1998, 256M-bit DRAMs will appear and ramp up to an era of dominance.

"When you get [to 256M-bit DRAMs], with that kind of capacity you're talking about maybe some new realms, and applications like HDTV could really benefit from cheap memory," says Drew Peck, an analyst at Donaldson, Lufkin & Jenrette, Inc. in New York. "So consumer electronics could be the big beneficiary of them. Who knows what kind of technical applications we could see for the consumer as they become available?"

As a system brain, DRAMs hold the entire application program and some subroutines for access by the processor, and they hold all the data that will be processed. So when a program such as IBM's OS/2 comes along and needs 8M bytes of RAM just to run effectively, users have to start looking for a lot more RAM just to run a program.

Ordinarily, a system would like to pull in all of, say, a 30M-byte database to run a search. But without enough space on the DRAM, data must be "swapped" in and out from where it is stored, a chunk at a time, until the entire database has been searched. While hard drives operate in milliseconds, this still takes time. So a system with a 256M-bit DRAM could store 32M bytes of programs or data. That is more than enough room on a single chip for OS/2 and several applications.

Thomas Way

Smaller than a button, *a DRAM chip can open doors of opportunity for advanced applications*

A 256M-bit DRAM, then, "basically represents the dream of every software developer — a huge, unbounded linear memory array," said Michael P. Florio, vice president of marketing at Arbor Software, Inc. in Santa Clara, Calif., maker of Sbase, which acts as a networked spreadsheet analysis tool. "I think it will contribute significantly to the evolution of software."

Florio said the huge linear address spaces would allow programs to be written where the whole data set is resident in memory, which will improve performance by orders of magnitude.

Advanced applications

Much higher capacity DRAMs could well yield the memory to easily run highly sophisticated applications that include full-motion video and voice, which would make the use of these applications nearly commonplace.

"I don't think we'll reach significant technical roadblocks, but the finances will present major hurdles," said Douglas Grose, senior location manager at IBM in Burlington, Vt. "We're starting to see it today with 256M-bit development. The issues with purity of materials and retooling equipment require ever higher amounts of dollars to be invested."

Hence the recent move by Toshiba to add its name to IBM's joint venture with Siemens to build the future of DRAMs, capable of holding 256M bytes of data.

At the time, Michael Attardo, general manager of IBM's technology products line of business, said having the three participate in development will cushion the blow of a $1 billion development cost and spur them to reaching market first with the new technology, the key to making significant money.

Breaking the copper-based backplane bottleneck

BY ELISABETH HORWITT
CW STAFF

IBM, Honeywell, Inc., General Electric Co. and AT&T have come together in an alliance to bring the broad bandwidth of fiber to multiprocessor computers and next-generation telecommunications switches.

The object of the Optoelectronic Technology Consortium is to "break the bottleneck" of the copper-based backplanes in use in multiprocessor systems that have a top throughput of 100M to 200M bit/sec., an AT&T spokeswoman said.

The potential benefit to end users of the project is "better information processing equipment at a reasonable price" on the computer side and "a telecommunications switch capable of doing enhanced broadband services at a lower cost," said Phil Anthony, head of the optoelectronic devices department at AT&T Bell Laboratories.

The consortium hopes to have technology ready to be implemented in commercial systems by the end of the 30-month project, he added. Users can expect to see products about two years after that, Anthony said.

The first phase of the project is to develop technology to replace the current, copper-based architectures, "when you need a higher speed between boards and chips," Anthony said.

The project was organized to encourage vendors to come up with system architectures that can take advantage of the higher bandwidth backplanes, Anthony said.

Right now, for example, system architects must put a memory cache directly onto the microprocessor chip because the backplane will not support high enough speeds between chip and cache, he added.

Fiber-based backplanes are particularly needed in "environments where multiple processors are sharing data rapidly among themselves in order to coordinate on an overall task," said John Crow, manager of network prototyping at IBM's T. J. Watson Research Center.

The project represents the first major effort to develop advanced switching technology that can be used by either computers or high-speed telecommunications switches, Anthony said. "Traditionally, those two areas are developed entirely separately, but they need not be. Both use computers, circuit boards and silicon [integrated circuits]."

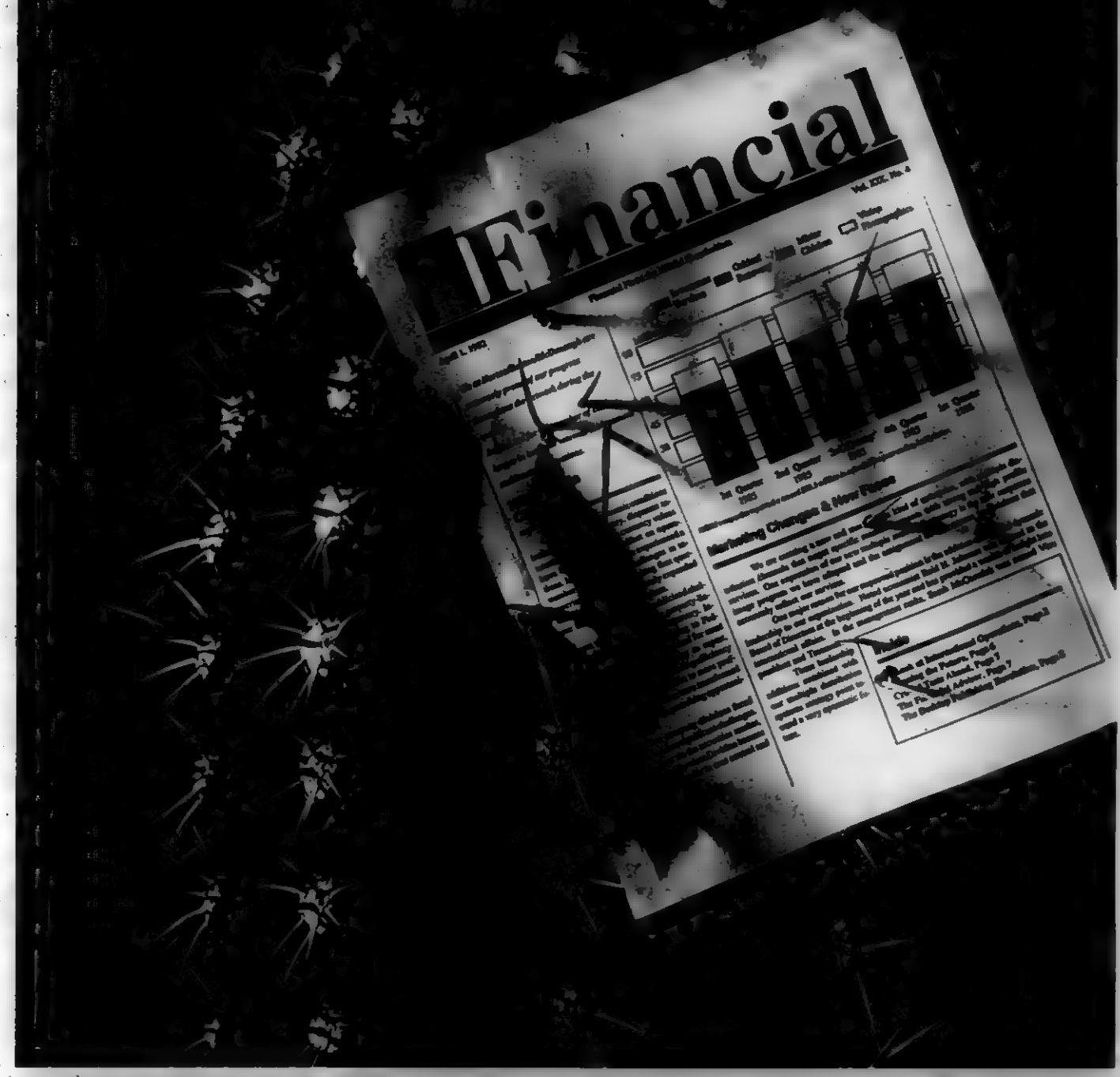
In addition, the project will work to develop high-speed links for military applications such as signal processing and image detection.

By having four major vendors work together on the same advanced technology, the project aims both to accelerate development and save money by eliminating the "reinventing the wheel" syndrome across the industry, project spokespeople said.

The consortium will share the results of its work with a user group that includes the members of the consortium and leading computer firms, semiconductor manufacturers and government agencies.

The project aims to develop advanced fiber-optic electronic components and demonstrate data transfer through 32 parallel, 500M bit/sec. lines. Four of those 16G bit/sec. lines will then be combined in parallel to achieve 64G bit/sec. transmission, AT&T said.

The project is backed by $8 million from the Defense Advanced Research Projects Agency.



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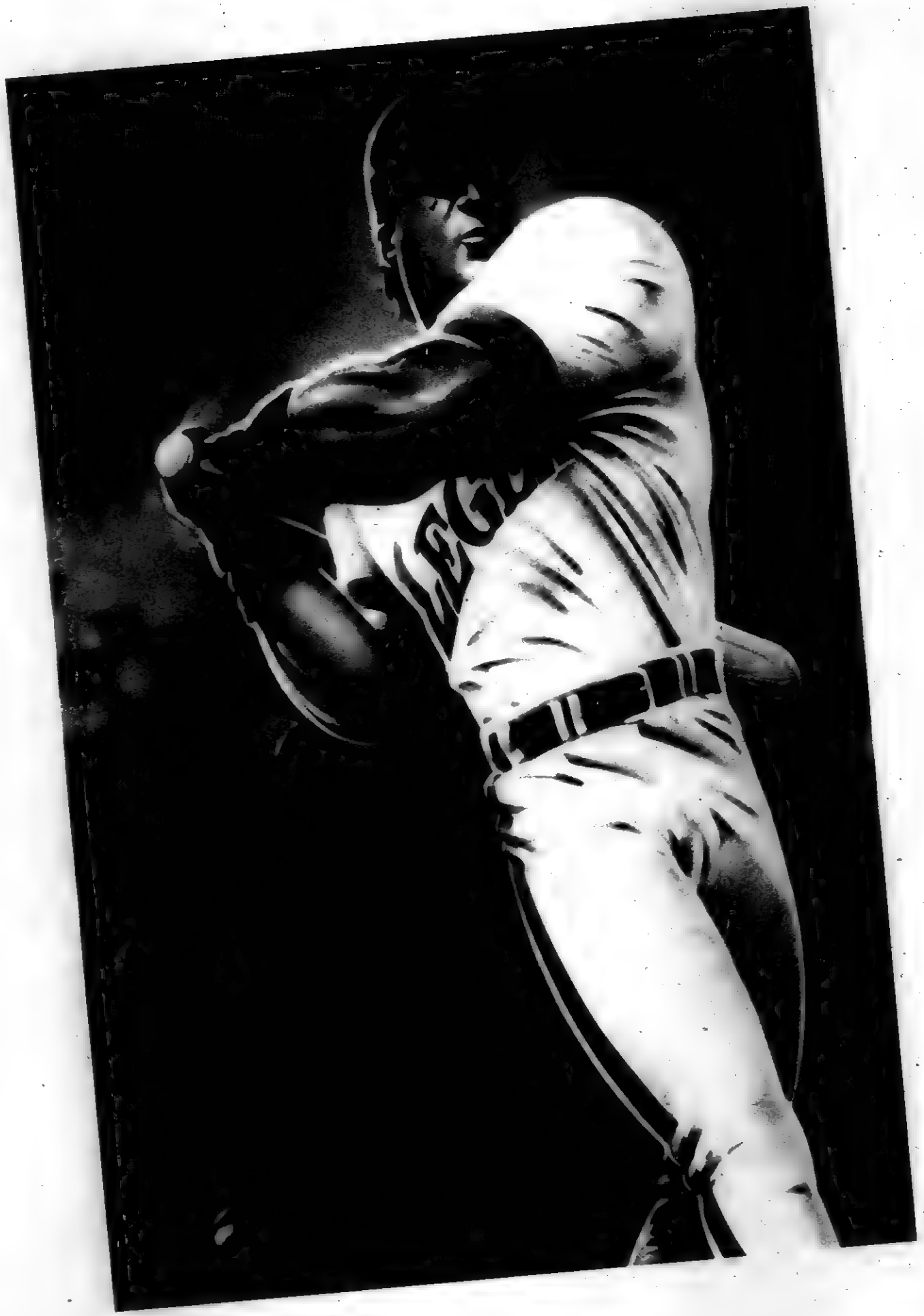

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EDITORIAL

Sour gripes

You have to write it off as just more dirty politics in this campaign season. One contender puts his best foot forward, touting all the benefits of some program. Then the other contender rises up to throw water onto those claims, disputing and mocking them.

Clinton vs. Bush? Not!

This is Microsoft vs. IBM. Each is campaigning hard for the hearts and minds of corporate users, and the issue is the desktop operating environment.

Last week's announcement by IBM that it has shipped the millionth copy of OS/2 unleashed a flood of sound bites designed to counter IBM's horn tooting and, if nothing else, demonstrated that Microsoft is taking the OS/2 threat seriously.

However, there are those who are starting to more carefully scrutinize Microsoft's actions and words, public and otherwise, with an increasingly wary eye and wondering whether the company is getting too big for its britches (see story page 33).

I'm starting to hear many of the same kinds of barbs and accusations directed at Microsoft that used to fly at another industry leader not so long ago — and that, ironically, was IBM.

Many of the IBM bashers of yesterday were simply jealous of the tremendous leverage IBM had built for itself, and there's no question that many of Microsoft's detractors are just that — green with envy. But in this era of partnerships and alliances, many of Microsoft's friends are talking a lot behind its back.

Recently I met with one such partner, who summed up much of the feeling out there by saying, "We have to work closely with Microsoft, but I truly wish I didn't have to." Fear or jealousy? Who knows. When you've got the likes of DEC hustling to align its company-saving Alpha chip technology with Windows NT, it's clear Microsoft has some big friends.

But, even the industry pundits are starting to pick sides in the campaign. One well-known columnist, charging gross interference by Microsoft in the editorial process, quit *PC Week* and *PC Magazine* in a highly publicized furor. Another newsletter pundit in an "open letter to Bill Gates" called on Microsoft to be a better corporate citizen, citing a growing sense of resentment toward the company by other firms.

One IS director with a multimillion dollar budget told me he tried to engage Microsoft's help in setting a downsizing course away from his shop's IBM mainframes. He didn't get far. In his words, "I got the feeling Microsoft didn't think I was big enough for them."

So while the slings and arrows launched by one's competitors and pundits might not amount to diddly, the world's biggest software company might want to look beyond its well-deserved success and listen carefully to the rumblings starting to make their way to the surface.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Programmers: Step into users' shoes

Why would anyone gripe about Bob Frankston's opinions in his article, "Programming no longer enough?" [CW, July 27]. He is absolutely right.

The legal community is searching for ways to improve individual client relations and to lower fees via automation as a way to stem the deteriorating public view of the profession in general.

Some firms have even developed expert systems for document assembly for clients to use. Programmers everywhere should take heed and learn to step into the users' shoes before thinking about the first line of code.

Users are starting to like the democratization of information technology. Companies throughout the world are scrapping mainframes in favor of personal computer networks.

Just as users will no longer crawl to the glass-walled temple of the mainframe gods praying "Please, oh please, may I have my reports now," one day they will no longer hire a programmer who doesn't also know the user's job inside and out.

Frankston's comparison of programmers and lawyers is very perceptive. I am a lawyer now, but I spent 10 years in information systems before going to law school. I am currently employed as the IS director at a major law firm.

Programmers, consultants and other IS types must keep in mind that they are support for their "clients" and not the stars of the show.

Matthew J. Ahearn
Roseland, N.J.

Tribute to Unix, not MPE portability

This is regarding "Cheerio to Unix, cereal giant says" [CW, July 20]. You were quite correct, if a little too whimsical, when you reported that General Mills "tried Unix, but it did not inhale."

However, you drew the wrong conclusion from the brief porting period required to move the warehousing software from HP/UX to MPE/IX. This success is a testament not to MPE portability but to Unix portability, particularly the portability of Unix-hosted applications.

The story also has "corporate politics" written all over it. One division takes the initiative for a new technical computing base using Unix. Following normal Unix operating procedure, it relies on its software vendor for software maintenance. Before the project even has time to take off, centralized corporate IS undercuts it and gets it canceled.

In the interim, it gets to pay more for a proprietary platform, becomes more dependent on its platform vendor and cuts itself off from the main venue for innovation in multiuser systems — the Unix environment.

All in all, this whole exercise seems to be a perfect demonstration of how not to direct your computing infrastructure.

Andrew D. Wolfe Jr.
Salem, Mass.

Layoffs not a wise alternative for DEC

Regarding "No time to lose" [CW, July 27]: I can't believe how easily people come to the conclusion that DEC needs to lay off 20,000 employees in order to regain its cost structure.

First of all, DEC had massive layoffs last year and so far, that doesn't seem to have helped much at all. I work at a company that is completely a DEC shop, and we have a great deal of faith in the products, services and solutions that DEC provides.

The reason for this is because I know of no other company that offers so many good products and couples them with excellent service and support. DEC has always been a company that does many things and does them well.

What has made DEC a success is its ability to commit resources to new products and solutions without sacrificing quality of sales, service and support.

How is this accomplished? People! Could DEC do as well in sales, service and support without 20,000 employees?

Perhaps, but I seriously doubt it.

Eric Mink
Bethel, Conn.

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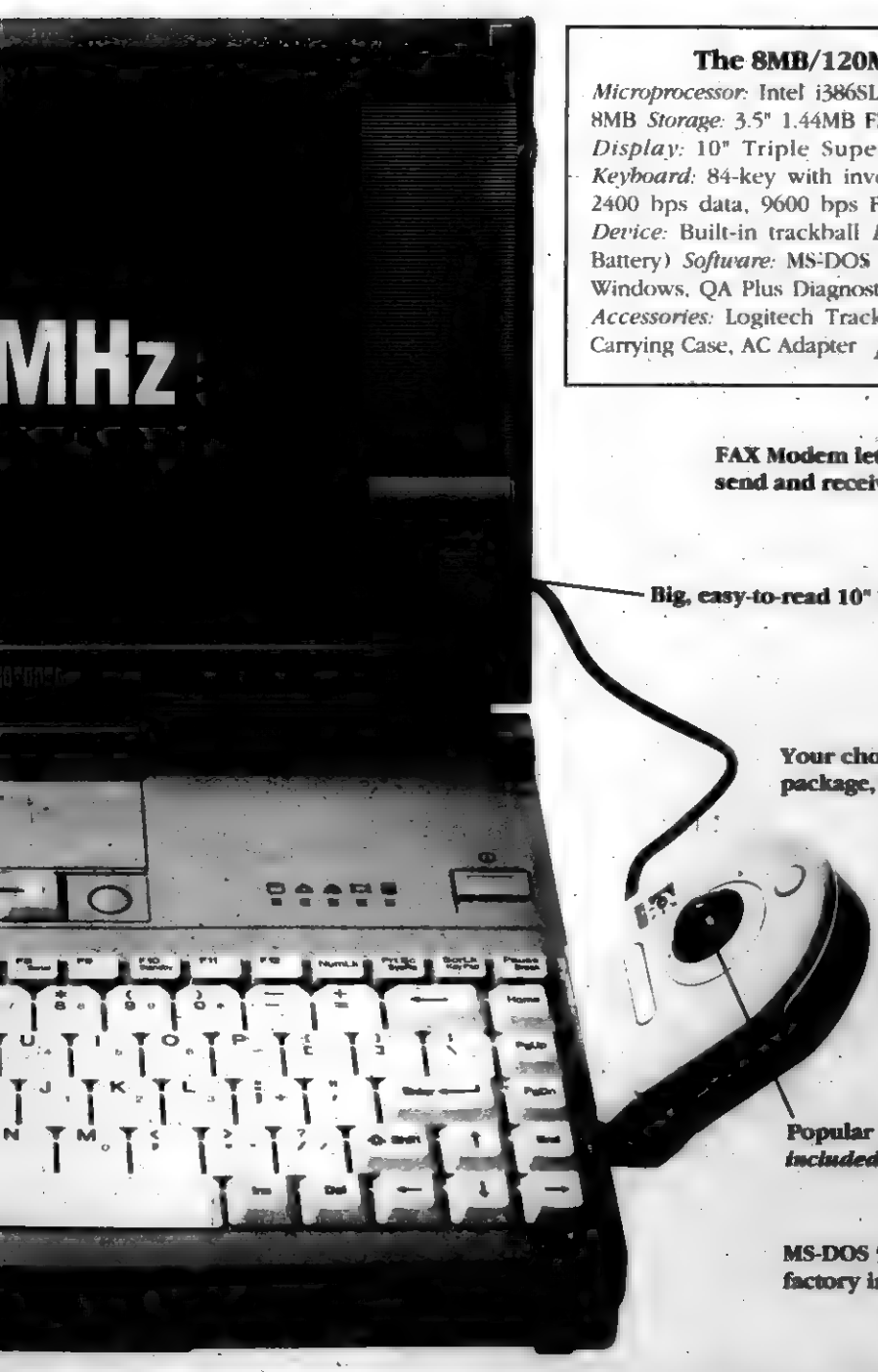

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Microprocessor: Intel i386SL running at 25MHz *Memory:* 8MB *Storage:* 3.5" 1.44MB Floppy, 120MB IDE Hard Disk *Display:* 10" Triple Super Twist Backlit, VGA LCD *Keyboard:* 84-key with inverted T cursor keys *Modem:* 2400 bps data, 9600 bps FAX (send/receive) *Pointing Device:* Built-in trackball *Battery Life:* 4 hours (NiMH Battery) *Software:* MS-DOS 5.0, Windows 3.1, FAXit for Windows, QA Plus Diagnostics, Choice of Lotus Software *Accessories:* Logitech TrackMan Portable, Black Nylon Carrying Case, AC Adapter *Price:* $3,295

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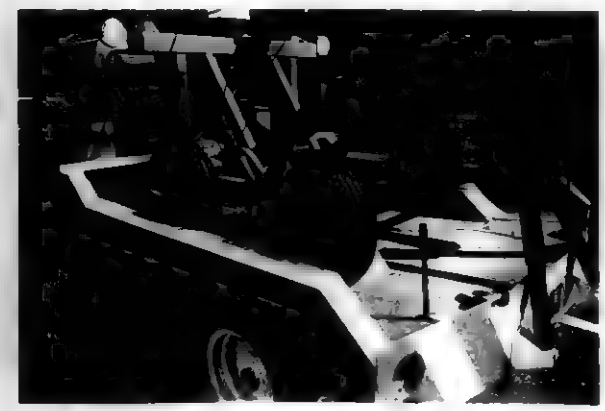

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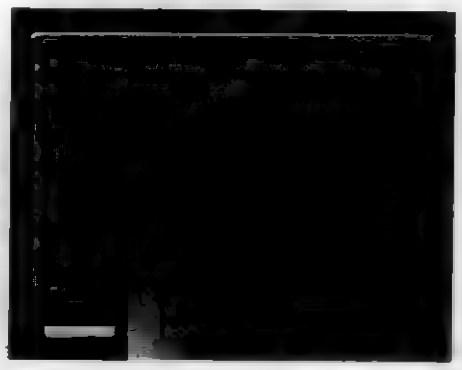

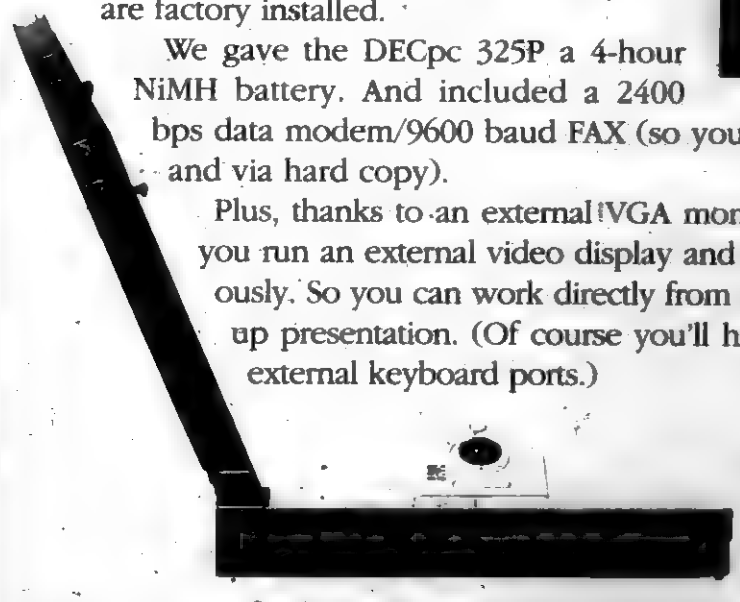

We gave the DECpc 325P a 4-hour NiMH battery. And included a 2400 bps data modem/9600 baud FAX (so you can touch base electronically and via hard copy).

Plus, thanks to an external VGA monitor port, the DECpc 325P lets you run an external video display and the monitor display simultaneously. So you can work directly from your Notebook and give a full-up presentation. (Of course you'll have serial, parallel, mouse and external keyboard ports.)

Like all Digital Notebooks, the DECpc 325P also comes with "one of the most important hardware power saving capabilities found in SL systems — Resume®, which allows the notebook to power down to the exact point where it left off" (INFOWORLD, June 8, 1992). In other words, it keeps your place in an application when you power down, and lets you pick right up without rebooting.

To make the DECpc 325P Notebook even easier to use in the toughest environments (at night on airplanes, in direct sunlight, etc.) we added a big 10-inch Triple Super Twist (TST), high-definition VGA Display. For working in close quarters, there's a trackball built right in. And, yes, we also included the popular Logitech™ TrackMan® Portable.

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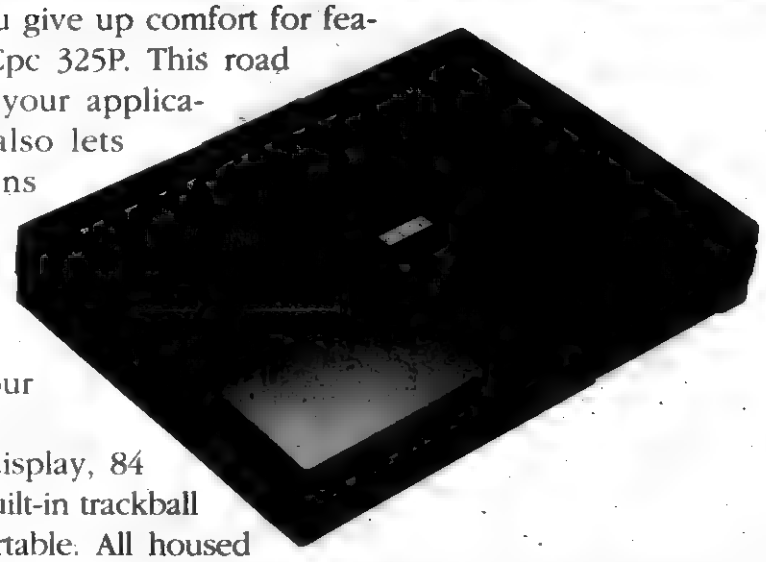
Some notebooks make you give up comfort for features. Not the 6-pound DECpc 325P. This road wonder not only performs your applications remarkably well, it also lets you do video presentations from your Notebook, has all the ports you need and runs on a 4-hour NiMH battery but it does it all without intruding on your comfort zone.



It comes with a 10-inch display, 84 sculptured keys and both a built-in trackball and a Logitech TrackMan Portable. All housed in a mere 8.7 inches x 11.7 inches x 1.7 inches. Because the DECpc 325P was engineered to fit your suitcase, your briefcase, and your backpack — it was designed to fit all your needs, including your budget.

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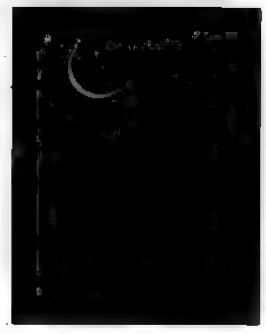

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DECpc 325P

	COLUMN A **Base system**	COLUMN B **OPTIONS (circle your choices)**
Microprocessor:	Intel 25MHz i386SL	25MHz 80387SL 25MHz Coprocessor
Memory:	2MB	Upgrade to: 4MB, 6MB, 8MB
Storage:	3.5" 1.44MB Floppy, 80MB IDE Hard Disk	Upgrade to: 120MB IDE Hard Disk
Display:	10" Triple Super Twist Backlit VGA LCD	External 14" VGA Color Monitor
Keyboard:	84-key with inverted T cursor keys	Extended 101-key Industry Standard
Pointing Device:	Built-in Trackball Logitech TrackMan Portable	
Communication:	Serial, parallel port	9600 baud FAX/Modem Pocket Ethernet
Battery:	4-hour NiMH	Extra Battery Pack
Software:	MS-DOS 5.0, Windows 3.1, QA Plus Diagnostics, Choice of Lotus Software	
Carrying Case:	Black Nylon	Black Leather
Adapter:	AC	Car Adapter ALSO: Expansion Chassis, Portable Printer, FAX Modem, External 14", VGA, Color Monitor, External 101-key Industry Standard

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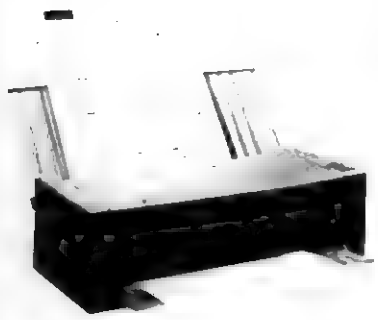
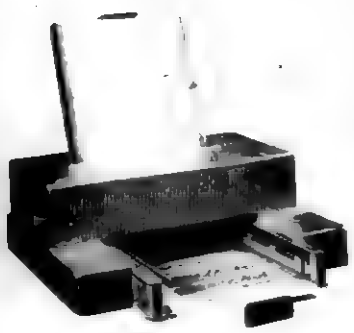


Print Technology:	Bubble ink-jet with 50-nozzle printhead
Printer Speed:	Up to 160 characters per second
Print Resolution:	300 x 300 dots per inch
Paper Handling Sizes:	8.5" x 11"; 8.5" x 10.5"; 8.5" x 14"
Envelope Handling Sizes:	Standard office envelopes Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2) Up to 36 lbs. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman) Proportional spacing, Letter Gothic
Cartridge Slots:	One (for font or emulation cartridges or RAM cards)

DECjet 1000 Order No.: FR-LJ16P-AA Price: $329

DECjet 2000: Handles larger print runs with speed and reliability.



Print Technology:	Bubble ink-jet with 50-nozzle printhead
Printer Speed:	Up to 360 characters per second
Print Resolution:	300 x 300 dots per inch
Paper Handling Sizes:	8.5" x 11"; 8.5" x 10.5"; 8.5" x 14"
Envelope Handling Sizes:	Standard office envelopes Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2) Up to 36 lb. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman) Proportional spacing, Letter Gothic
Cartridge Slots:	Two (for font or emulation cartridges or RAM cards)

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Why successful companies fail

Hint: Customers won't stay for long when their requests aren't heeded

JOHN J. CULLINANE

My company almost went belly-up twice, once when it was 2 years old and again when it was 20 — ironically, I would discover, for the same reason.

Both times, the company had fallen into the classic technical trap of building software it felt customers ought to like instead of what our customers wanted to buy.

Our first survival challenge — we were down to $500 in the bank — required cutting back from nine employees to five and committing to finally providing those product features that customers had been asking for all along.

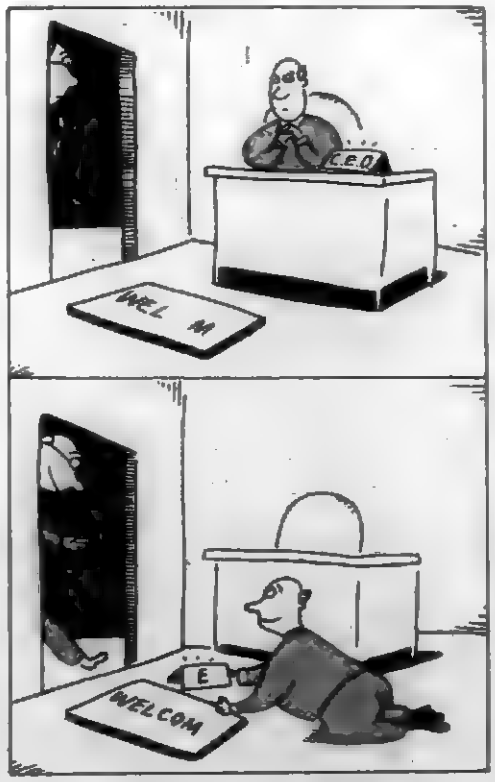
The close call of our early days impressed upon me the importance of being customer-driven. It also taught me that this direction has to come from the top of the organization.

Advocates

Few companies have a Chief Customer Advocate, but every company should. In my experience, it's very easy for a company, particularly a growing, successful one, to get out of sync with its customers.

CEOs are the logical choice to fill the post of Chief Customer Advocate. No one with less clout can do the job because in technical organizations, trying to match what your customers want to buy with what your people can or want to develop can be a "tractor pull."

Only the CEO has the power to force a match of customer requirements with development resources and strategies. Only the CEO has the power to go around the company's technical organization to meet customer requirements — through third-party agreements if necessary. Only the CEO can effectively shoot someone's favorite product that has outlived its usefulness.



M.E. Cohen

Operating on the basis of what customers want is not something that ever truly becomes second nature for a company. Ironically, I believed that being customer-driven was immersed in our corporate culture as a result of our first, near-fatal experience. I thought it could never happen to us again. Then it did.

What happened was that in handing over management of the company, I unintentionally left customers without their traditional advocate.

For a few years, the company had coasted along on momentum. Then it ran into serious trouble. Bringing in new management only made things worse. As in the early days, it was hurtling down the road to bankruptcy.

Reluctantly, if only to protect my own interests, I had to step in and reclaim the company.

The more I dug into the situation, the more painfully obvious it became that we had fallen into the old we-know-what's-best-for-our-customers trap again. In a changing market, customers and prospects wanted open systems architecture. Instead, we were giving them proprietary technology, which no one wanted, regardless of how good it was.

NO ONE WITH less clout than a CEO can match what your customers want with what your people develop.

At the time, it was almost too late to do anything. Nevertheless, we moved fast, cut costs and re-established our focus on the customer exactly as we had done during our first crisis.

Making it happen was a battle, but we started to make money again, making possible a $400 million merger with Computer Associates. Believe me, this was infinitely superior to going bankrupt.

Having a strong customer advocate at the top can work wonders for a business. I know. I've seen the difference close up . . . twice.

Cullinane is founding chairman of Cullinet Software, Inc. and the Massachusetts Computer Software Council. His book, The Entrepreneur's Survival Guide: 101 Tips for Managing in Good Times and Bad, will be published by BusinessOne Irwin next month.

Microsoft blows smoke, just like the old IBM

GARRY N. RAY

Many of you remember the old IBM. Before a federal judge said it shouldn't do such things, the company would fearlessly preannounce its "product plans" months, years or decades into the future, impeding or killing competitors who had real products to sell.

IBM's masterful use of fear, uncertainty and doubt (FUD) as a marketing tactic may seem long ago and far away, but you can get a sense of the way things used to be by listening to Microsoft. Like the IBM of old, Microsoft has the technical talent and product inventory needed to sustain sales and keep customers happy. But the Redmond, Wash., cash machine also churns out a prolific body of myth, mystery and doubletalk.

• **Example A:** The Microsoft dream makers have lately been maligning the long-term prospects of Lotus Development Corp.'s Notes workgroup software.

Saying that the forthcoming (always forthcoming) Windows for Workgroups will include peer-to-peer networking and embedded facilities for E-mail and that it will interact with a vaguely referenced object-oriented database, Microsoft salespeople have been hinting, quite nakedly, that Lotus' Notes is an obsolete product on the fast-track to the dumpster.

Ignore the facts

Never mind that Notes works and has real, live customers. Never mind that Microsoft doesn't explain how its three nonexistent technologies have anything to do with Notes, let alone with each other.

Bottom line: FUD. Connect technologies that aren't related. Imply but don't promise. Criticize, but don't say why. Keep everyone guessing.

• **Example B:** During the recent rollout of Microsoft's long-rumored Windows NT, the company said that nearly 100 developers had announced more than 150 application development tools. An IBM spokeswoman complained to me that those numbers are "cooked" because they include "unfair" categories such as program editors and utilities. IBM, she said, does not list such programs among the 138 OS/2 2.0 development tools it says will be shipped by year's end. Sounds like the student teaching the master.

Bottom Line: FUD. Throw numbers at customers — the bigger, the better. Hope that no one asks what the numbers mean. If they do, offer more numbers, and explain them in excruciating, mind-numbing detail.

• **Example C:** Has anyone been keeping track of Microsoft's Grand Plans for the future of computing? It is becoming a lengthy list, and Microsoft watchers often pass the hours making spurious connections between one model and another, filling in the blanks. Customers, lacking more solid information, listen to them.

Bottom Line: FUD. Provide schematic models that imply a strong vision of the future. Don't fill in the details. Keep the customers guessing.

Good old days

In a happier time, when the milkman delivered to your door and gas jockeys wiped your windshield, the customer was always right. But times have changed.

Now the model for vendor behavior is to baffle, befuddle and scare the customer with vague warnings and unsettling "future plans." The theory seems to be that a confused customer is a compliant customer.

Maybe.

Ray is a Computerworld senior editor, application development.

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It means you can get to a spreadsheet by simply clicking "Spreadsheet." Summon a word processor by stroking "W." And access a DBMS by selecting, you guessed it, "Database."

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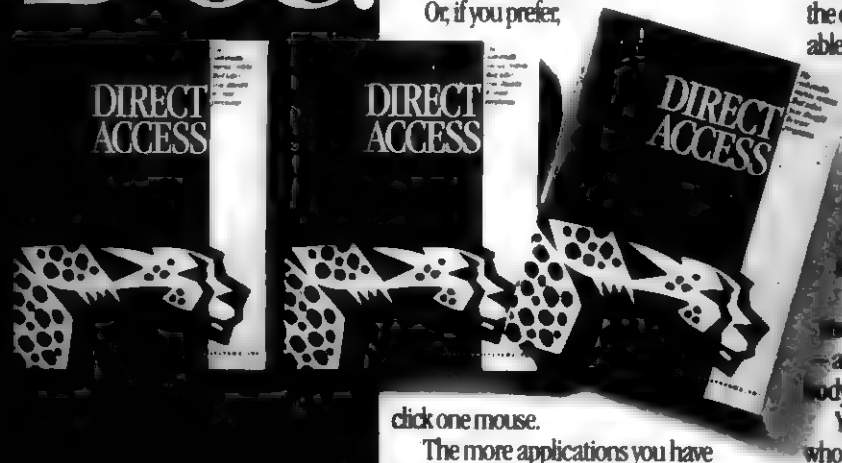

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SECURITY CHECK

James Daly

The newest virus threat

The major buzz in the computer security community continues to be the Virus Creation Laboratory (VCL), a nasty new authoring program that began popping up on bulletin boards last month and one that could dramatically change the nature of virus fighting.

Designed by a hacker called Nowhere Man, the VCL makes virus writing a snap by including a development environment written in Borland C++, well-written documentation and a user-friendly environment that offers pull-down windows.

VCL-generated viruses can be encrypted, can resist debuggers and can contain up to 10 of 24 preprogrammed effects, including file corruption, file deletion, disk corruption and computer lock-up.

Some are wondering if it would be possible to fight fire with fire and write a virus that will seek out and destroy VCL-generated viruses based on unique strings of code within the program. Technically, this is possible, but security consultants, including David Stang at the International Computer Security Association (ICSA) in Washington, D.C., warn that a virus designed to destroy another might easily become more of a problem than the one it seeks to dismantle. In other words, you can knock a wing off

Continued on page 41

Can CA break its mainframe shackles?

Analysts have mixed feelings about vendor's chances of gaining major PC software market share

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — Best known as a mainframe software company, Computer Associates International, Inc. is launching its latest personal computer software push in part by trying to leverage its mainframe strength.

But the company faces a string of challenges as it tries to boost its PC market presence by promoting links between desktop systems and its host-based software and by expanding its Microsoft Corp. Windows and database products. One challenge is its own identity.

"We've become a very Windows-oriented company, and I wasn't even aware that CA has Windows-based products," said Candace Marullo, manager of workstation administration at Lyondell Petro Chemical Co., a Houston-based firm that also uses CA-ACF2 and CA-Netman mainframe applications.

> "I THINK THE biggest misconception [about CA] is that . . . they don't understand the desktop."
>
> SHAKU ATRE
> CONSULTANT

During the past 18 months, CA has steadily built up its suite of graphics, Windows and application development-based products, either through acquisition, development or migration from its mainframe cache. Some of CA's PC products are downsized versions of their mainframe counterparts, such as the CA-IDMS PC database management system.

CA's Sokol: *Making analysts aware of firm's PC plan*

Upcoming ports to IBM's OS/2 2.0 operating system and other near-term releases will increase CA's PC product portfolio, but the question remains whether the $1.5 billion software giant can wrest any sizable market share away from PC software powers such as Microsoft, Lotus Development Corp. or Borland International, Inc.

Divided they stand

Analysts are divided on the issue. "I think the biggest misconception [about CA] is that since they've been dominant in the mainframe market, they don't understand the desktop, or that they'll acquire [PC software] products and kill them," said Shaku Atre, president of Atre, Inc., a Rye, N.Y.-based consultancy.

Atre said she believes it will take time for CA to carve its niche in this market. One way to accomplish this, Atre said, is for CA to develop bridge software to link mainframe and desktop computers by utilizing its mainframe software expertise.

Sanjeev Varma, a senior analyst at New Science Associates, Inc. in Mountain View, Calif., said he does not give CA much of a chance to excel in the PC software industry because he believes the company is poorly positioned against industry leaders. But he said CA can achieve some level of success in the PC arena if it can provide transparent access from the desktop to other platforms and offer a wide range of superior products. "Otherwise, they can't make much of a dent in the PC software market," Varma said.

Marc Sokol, CA's director of product strategy, said he is trying to change what he sees as analyst misconceptions about CA's PC direction. "Because we're not dominant in areas such as word processing and spreadsheets, analysts aren't aware of us," said Sokol, who recently embarked on a barnstorming tour to raise analysts' awareness of CA's PC software strategy.

Presently, only 10% to 12% of CA's annual revenue is PC software-based. However, those figures only include shrink-wrapped software and retail

Continued on page 42

CA's lineup

CA-dBFast: A dBase/Xbase development language and database for Microsoft Windows. Currently available in Version 1.7C, will be upgraded to Version 2.0 by November. Expected enhancements include an active dictionary/repository, a visual application designer and improved performance of the database engine.

CA-Clipper: A dBase/Xbase-compatible database compiler for Microsoft's DOS operating system environment. Currently available in Version 5.01, Version 5.2 is due for beta testing in November and will include object-oriented enhancements.

CA-SuperProject for Windows: A project management software package that exploits Windows' Multiple Document Interface.

CA-PHIPS: A high-resolution image processing system for Windows.

CA-SuperCalc: A Lotus Development Corp. 1-2-3-compatible spreadsheet for MS-DOS users.

CA-Cricket Presents: An integrated desktop presentation program for Apple Computer, Inc. Macintosh and Windows environments.

CA-Compete: A multidimensional management and decision tool for Windows that can manage up to 12 business dimensions.

CA-Textor: A Windows word processor.

ACCPAC Simply Accounting: An entry-level accounting system.

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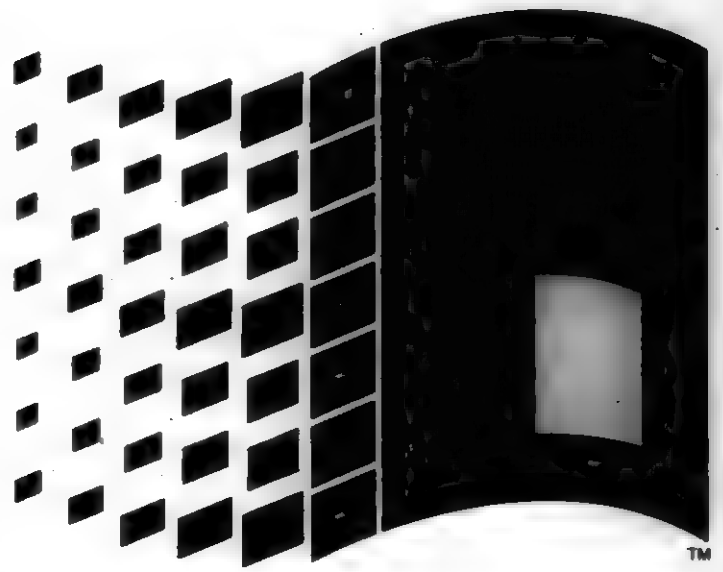

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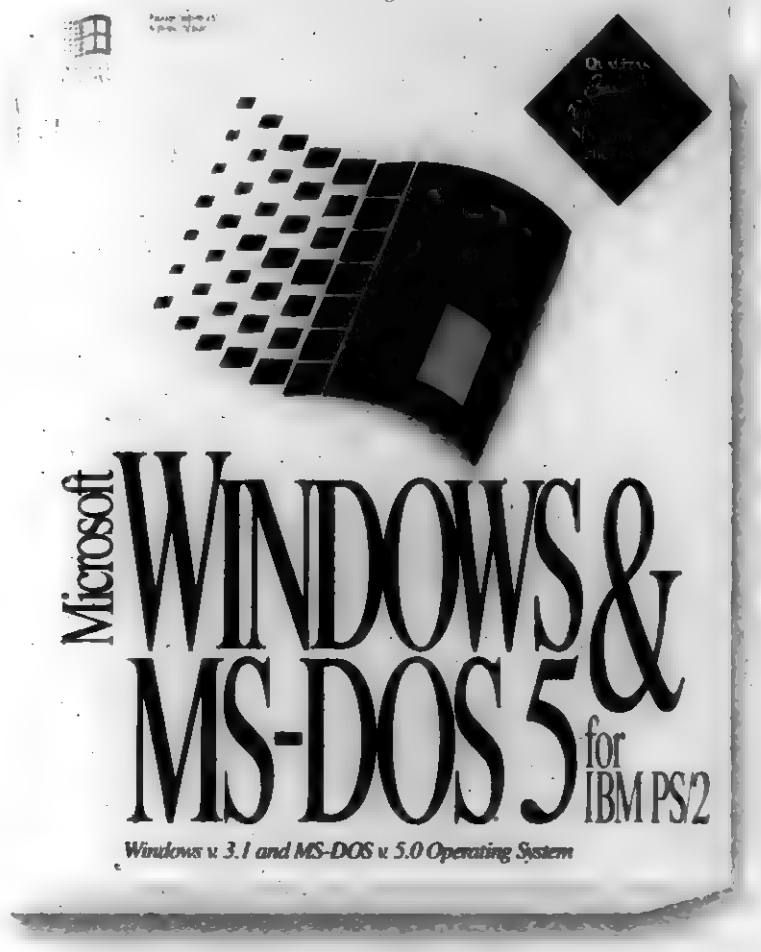

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THIS IS WHAT A MASSACRE LOOKS LIKE IN THE WORLD OF APPLICATION DEVELOPMENT.

DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.8	7.1	8.1	7.6
Price/Perform Return	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	8.9	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	8.6	8.4	8.9	9.1	8.8	9.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.5	7.2	8.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.5	8.4	6.9	7.0
Frequency of Releases	8.6	7.5	6.7	7.2	7.7	7.2
Responses to User Request	8.8	7.5	7.8	7.0	7.9	7.2
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.9

Compiled from the 1991 Datapro Reports on Software/Computer Systems Software, available for users (product based). Ratings from users. The results are those of current users of the products as surveyed by Datapro.

VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	ACCESS-SQL	INGRES
PRODUCT FEATURES					
Ease of use	9.02	7.07	6.00	4.19	5.90
Memory requirement	7.37	6.16	4.25	6.19	6.22
Ease of programming	9.03	7.09	6.06	6.20	6.50
Ability to manipulate data	9.19	7.41	7.44	6.81	6.67
Sorting capabilities	9.02	7.44	7.69	6.65	6.78
Provision for software security	8.56	6.93	7.28	5.07	5.78
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.81	7.05	6.15	6.19	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	9.08	7.68	7.86	6.61	6.11
Satisfaction with product profitability	8.39	7.04	6.22	5.58	5.19
Overall quality of product	8.94	7.37	6.69	6.32	5.44
Product Features Average	8.84	7.10	6.61	6.14	5.80
SUPPORT FEATURES					
Provision for customer support	7.74	5.99	5.76	5.77	5.50
Charges for training time	5.68	4.49	4.59	5.64	4.56
Provision for technical support	7.51	5.76	5.72	5.67	5.22
Provision for marketing support	6.89	5.68	6.09	6.13	5.80
Documentation & product information	8.74	6.72	6.69	6.46	6.56
Frequency of updates & revisions	8.96	6.68	6.34	6.57	6.00
Support Features Average	7.76	6.30	6.04	6.05	4.94
Overall Average	8.34	6.69	6.35	6.09	5.45

Rated on everything from performance and reliability to service and support, PROGRESS trounces all of its competitors in the 1991 Datapro user surveys and the 1991 VARBUSINESS Software Report Card.

Topping the Datapro surveys for the fourth year in a row, users give PROGRESS a rating of 9.3 for overall satisfaction. The highest mark ever awarded. Against all comers, PROGRESS is unsurpassed in all 15 categories (okay, we tie once). With a 9.0 or higher in eight categories.

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Also, PROGRESS becomes the first product ever to capture all 18 categories of the VARBUSINESS Report Card. Racking up 9's in five categories, where no one else even gets an 8. Anywhere. So, if you're considering a 4GL/RDBMS for building and implementing high performance applications that are fully portable across major platforms, isn't it time you rated PROGRESS? For more information about our products and services, or for our fully functional Test Drive, call **800-4 PROGRESS.**

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Daly

CONTINUED FROM PAGE 37

an attacking aircraft and make it useless, but it has to crash somewhere.

Others suggest more severe legal measures that include shutting down all the virus bulletin boards in the world.

In last month's issue of ICSA's "Virus News and Reviews," Certus International Corp. Chairman Peter Tippett called for legislation that would make the creation, modification, sale or distribution of a virus punishable by a fine, imprisonment or both.

■ TRW continues to be a popular target for malicious hackers. Two unidentified persons have used the "Ripco" bulletin board to electronically publish a detailed manual, complete with dial-up numbers, geographical codes and methods for conning bureau subscribers into divulging their passwords, for penetrating TRW's credit bureau database. How did they get the information? One author of "TRW Masterfile" claims to have worked at TRW in customer service for two months.

TRW spokeswoman Susan Murdy downplayed the manual, saying her company is moving to a new security system and the manual was more focused on conning unsuspecting subscribers out of their passwords than hacking.

■ Have you experienced a virus attack on your Macintosh network recently? Microcom may be able to help. The Norwood, Mass.-based firm has announced Virex 4.0, an antivirus package that detects and eliminates viruses on an Apple Macintosh-based network.

Using Virex 4.0, network administrators can do a network-wide scan for viruses, schedule periodic network scans and disinfect computers across AppleTalk and Ethernet networks. Virex 4.0 is scheduled to begin shipping in October with a suggested retail price of $99.95.

■ Dallas oil mogul T. Boone Pickens and former Republican congressman John J. Rhodes are among the backers of Digital Development Corp. (DDC), a Phoenix-based company that has developed a unique hardware and software solution for fighting viruses.

While many virus scanning applications require knowledge of a virus' signature to detect its presence, DDC uses memory stored in a computer chip to search out the rogue programs.

DDC's hardware scans the hard disk of a computer before the software is run. Once the integrity of all operating system files is verified, the normal boot sequence is allowed to finish.

If corrupted files are detected, the boot sequence is temporarily suspended and the corrupted files are repaired or replaced.

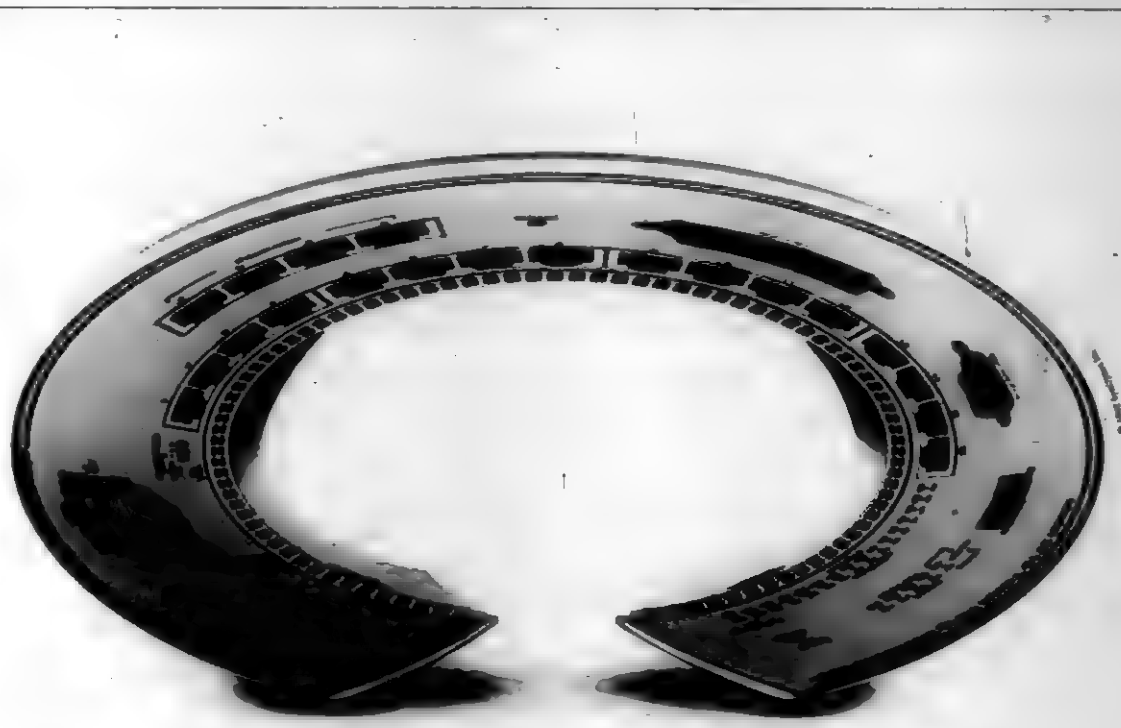
DDC President Stephen A. Lentz said the firm hopes to license the technology to a chip-making company and have the product on the market as part of a semiconductor package within a year.

■ Security Dynamics, Inc. (SDI) in Cambridge, Mass., recently made its ACE/Server security product available to remote users by adding support for Cayman Systems' GatorLink AppleTalk Remote Access (ARA) server. The ARA allows users of Apple's PowerBook or Macintosh computers to simultaneously dial in to a network.

At the heart of SDI's technology is the SecurID Card — a token displaying a randomly generated access code that changes every minute. Users enter their personal identification number followed by the current access code displayed on their SecurID card to gain access to a computer system or network.

■ Mark Nov. 16-18 on your calendar for the Computer Security Institute's 19th Annual Computer Security Conference in Chicago. A who's who of the computer security industry is expected to attend. Call (415) 905-2626 for more information.

Daly is a Computerworld West Coast senior correspondent.



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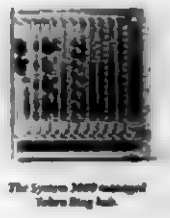

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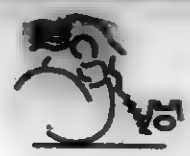
Quattro Pro 4.0



Part of a series of tips provided by PC software vendors and based on questions commonly asked of their customer support personnel. This week's tips focus on Borland International, Inc.'s Quattro Pro.

Q Why won't my mouse work with Quattro Pro 4.0 when I run it in Windows?

A Windows uses its own mouse driver. You need to install the mouse driver that came with the mouse in order for Quattro Pro to use it.

Q I can't get Quattro Pro 4.0 to use fonts. It also will not print landscape. Why?

A Your destination is probably set to PRINTER. Under the /Print/Destination menu, there are two categories: Draft printing and Graphic printing. In order to get fonts, or landscape output, choose one of the graphic quality destinations. Try setting the destination to GRAPHICS PRINTER.

Q In Quattro Pro 3.0, the color of the spreadsheet in character mode was blue. In Quattro Pro 4.0, it is black. Is there any way to get it back to the way it was?

A From within Quattro Pro 4.0, choose Options Colors Palettes Version 3 colors.

Q The Quattro Pro 3.0 installation asked me which fonts I wanted to build. The Quattro Pro 4.0 installation didn't build any.

A Quattro Pro 4.0 uses Bitstream's new scalable font technology. Since it builds fonts very quickly, Quattro Pro 4.0 will build the fonts when you print, as it needs them. This saves you disk storage space.

Q Why am I getting asterisks in my spreadsheet columns instead of numbers?

A The column is not wide enough for all the characters in the cell. Simply increase the width of the columns to accommodate them.

Q When I print a spreadsheet with line drawing in it, the bottom line and the last line on the right do not print.

A The information for line drawing is stored in the top and left area of each cell. The information for the bottom line and left lines are therefore in the row below and in the column to the right. Be sure to include these rows in your print block when you print.

Can CA break shackles?

CONTINUED FROM PAGE 37

sales, Sokol said. Other software products, such as CA-IDMS-PC, CA-OPERA-PC and CA-DATACOM-PC, interoperate between PC and mainframe environments. Because they are not distinct PC products, Sokol said, their sales are not included under PC software revenue.

The company has made inroads into certain markets, such as application development. In June, CA acquired Nantucket Corp., a Los Angeles firm widely known for its Clipper dBase/Xbase-compatible database and application development tool set.

Later that month, at PC Expo, CA announced its strategy to continue separate development activities for both CA-Clipper, as it is now known, and CA-dBFast, its own Xbase/dBase development suite for Windows.

Both paths will eventually lead to CA's next-generation, object-oriented platform, called Aspen. Aspen will be demonstrated at Comdex/Fall '92, with availability for beta testing in the fourth quarter.

Three years behind?

Yet Varma said he believes CA will continue to lag behind Borland in the PC database market. Varma estimated that Borland commands a 70% market share and is "at least three years ahead of everyone else in terms of object-oriented development."

At CA, Sokol said the firm plans to focus on PC-based accounting and application development software. To gain market share in the PC arena, Sokol said, CA will continue its acquisition strategy when there is a financial or technological incentive to do so.

"Writing systems from scratch is very risky, and we'll only do it when we have to. If we can gain competitive advantage, we'll acquire," he said.

Sokol said he is also working to defuse criticism lodged by analysts who have said CA fails to support the user communities and products it acquires.

"We work very hard to make sure that PC support is exemplary," Sokol said. He added that CA is scheduled to announce a new PC support program later this month for its third-party developers. "We can't afford to get a [bad reputation] on our support for our PC clients."

NEW PRODUCTS

Peripherals

The Professional Electronics Division of Mitsubishi Electronics America, Inc. has introduced the AM-2752A.

The product is a 27-in. monitor that has a horizontal scanning range of 15.5 KHz to 39 KHz and a vertical scanning range of 45Hz to 100Hz, according to the company.

The AM-2752A was designed to perform in a variety of video applications ranging from computer graphics to large-scale presentations.

Analog sync audio input and a switchable clamp function are included, and the AM-2752A incorporates Mitsubishi's Dynamic Beam Forming technique.

The AM-2752A costs $3,700.

Mitsubishi Electronics America
Professional Electronics Division
800 Cottontail Lane
Somerset, N.J. 08873
(908) 302-2855

Avery Commercial Products Division has introduced Microsoft Corp.'s Windows-based software for its Personal Label Printer.

The labeling software is compatible with Windows 3.0 and 3.1 and supports Windows TrueType fonts. According to the company, the product features sophisticated graphics, clip art and address recognition.

Users can import logos and graphics, change fonts and place text anywhere on the label template.

An Auto Print mode surveys the Windows clipboard for addresses, contains them in an address book and automatically prints labels in the background, according to the company.

The Avery Personal Label Printer, including the new software, costs $249.95.

Avery Commercial Products Division
818 Oak Park Road
Covina, Calif. 91724
(818) 915-3851

Samsung Electronics America's Information Systems Division has started shipping Finale 8000.

Finale 8000 is a 300 dot-per-inch non-impact laser printer modeled after Intel Corp.'s 1960 32-bit reduced instruction set computing processor. The product is optimized for use with both Microsoft Corp.'s Windows 3.1 and all Apple Computer, Inc. operating systems, including System 7.0.

Finale 8000 has an assortment of features, including 14 bit-map fonts, Samsung Auto Emulation Protocol, one parallel and two serial ports and two Hewelett-Packard Co. font cartridge-compatible slots.

Finale 8000 costs $1,995.

Samsung Electronics America
Information Systems Division
105 Challenger Road
Ridgefield Park, N.J. 07660
(201) 229-4000

SyDOS, a division of SyQuest Technology, has introduced SyDOS Puma 44 and Puma 88.

The Puma 44 and the Puma 88 are removable disk drives that use Winchester hard disk technology. Both products are external subsystems that have a self-contained power supply and a dedicated parallel port adapter. A removability feature allows users to transport, lock up and back up data.

According to the company, the products plug into the parallel port of almost any DOS or Microsoft Corp. Windows-based desktop, laptop or notebook personal computer.

The Puma 44 is priced at $638, and the Puma 88 is priced at $799.

SyDOS
Suite 110
6501 Park of Commerce Blvd.
Boca Raton, Fla. 33487
(407) 998-5400

Systems

Diamond Flower Electric Instrument has introduced Model 420VSX, an upgradable personal computer.

The product is a complete system that can be configured to increase processing speed by using the company's Processor Upgradable Microcomputer Architecture (PUMA) technology.

With PUMA, processing speed can be increased to 33 MHz by placing an Intel Corp. I486/33DX microprocessor into the PUMA daughterboard. Model 420VSX contains an Intel I486/20SX CPU and has the ability to send video signals directly to the CPU, according to the company.

Model 420VSX costs $1,895.

Diamond Flower Electric Instrument
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8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigfa receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

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60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
95. Other _____ (Please specify)

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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management; Software Developers
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13. Treasurer, Controller, Financial Officer
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70. Medical, Legal, Accounting Mgt.
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Microsoft refocuses LAN Manager strategy

ANALYSIS

BY MICHELE DOSTERT
CW STAFF

It's been two years since Microsoft Corp. began selling a LAN Manager product under its own label. Unlike its luck with its other applications and operating systems, however, Microsoft has had limited success in the local-area network marketplace.

The market share for Microsoft LAN Manager and OEM versions of the product hovered between 10% and 15% in 1991, according to The Burton Group, a Salt Lake City-based LAN research firm.

In the face of apparent defeat, Microsoft is effectively changing the rules of the networking game by bundling LAN connectivity into its desktop operating systems. By 1992, the Redmond, Wash.-based giant will have four LAN platforms available to its customers.

"Basically, Microsoft is conceding the file-and-print market to Novell and just giving those services away with its desktops," said Mary Modahl, a LAN analyst at Forrester Research, Inc. in Cambridge, Mass. "It is repositioning its LAN Manager product as a high-end network services product."

At the low end of Microsoft's bundled connectivity strategy is its forthcoming Windows for Workgroups product, scheduled to be available in 1993. Along with a suite of productivity tools, including Microsoft Mail and scheduling tools, the DOS-based Windows for Workgroups will have peer-to-peer networking capabilities built in. This will allow Windows for Workgroups users to share files, printers and the like without buying a server or LAN operating system.

"Windows for Workgroups is going to really impact the low-end network operating systems, such as Artisoft's LANtastic and NetWare Lite," said Jamie Lewis, an analyst at The Burton Group. "Bundling LAN connectivity with Windows is going to help move a lot of people to the

Continued on page 49

Connectivity options

Microsoft's selection of networking products at the workgroup level is growing with the development of Windows NT. Key products include the following:

• Windows for Workgroups
Provides basic workgroup print and file sharing. Will compete with low-end, peer-to-peer network operating systems such as Artisoft's LANtastic and Novell's NetWare Lite.

• OS/2-based LAN Manager 2.1
Provides client/server power, access to databases, enterprise connectivity. Allows multiple-domain scalability.

• Windows NT
Client and server pieces of LAN Manager will be bundled with Windows NT, allowing NT users to have a 32-bit, single-domain LAN without buying a separate network operating system.

• LAN Manager NT
The Windows NT kernel will add 32-bit multiprocessing power to LAN Manager; it will support multiple-domain security and connectivity.

MICHELE DOSTERT

USL suit raises Berkeley Unix hackles

BY MARYFRAN JOHNSON
CW STAFF

The touchy legal topic of intellectual property rights is at the heart of a David-and-Goliath-style conflict that is pitting Unix System Laboratories, Inc. (USL) against a fledgling software firm and the academic Unix community.

At issue are the kind of copyright and licensing protections that corporate users are increasingly attentive to, but that Unix followers have seldom had to worry about.

Earlier this month, USL, the 65% AT&T-owned subsidiary, filed a lawsuit in federal court against the University of California at Berkeley, charging 106 counts of patent and copyright infringements, breach of contract and other violations.

It was the second shoe dropping in a lawsuit that USL is pursuing against Berkeley Software Design, Inc. (BSDI), a small software company based in Falls Church, Va.

System base
The university's Networking Release 2 (NET2) Unix source tape — supposedly free of any AT&T or USL copyrighted Unix code — is the foundation of BSDI's BSD/386 operating system, now installed on personal computers at some 300 beta-test sites.

For many of the 300 customers who bought BSDI's Unix operating system, the lawsuit has blown an enormous black cloud over their plans.

"I really like the people at BSDI, but there's no way I would recommend their product to a customer right now," said Phillip Vogel, president of Bartal Design Group, Inc. in Englewood, N.J.

Low license fee
Vogel's seven-employee firm designs specialized electronic equipment, such as the flashing yellow lights on the back of Conrail trains. Like BSDI's other customers, Vogel was attracted by the share and share alike atmosphere encouraged by BSDI, as well as by the $1,000 source license fee. A comparable license from USL would cost $100,000.

BSD (Berkeley Software Distribution) Unix got its start years ago under U.S. Department of Defense contracts, which fueled development of the Unix variant on the Berkeley campus. BSD Unix grew into the beloved child of technical and scientific users, as it offered a variety of enhancements and software development improvements over AT&T Unix.

"You're either a phone company person or a Berkeley person," Vogel said. "That big polarization between the USL people and the BSD people has been there since forever."

For its part, USL claims this lawsuit is necessary to protect its corporate assets and to send a clear message that it will defend its property. From the BSDI point of view, the lawsuit is por-

Continued on page 48

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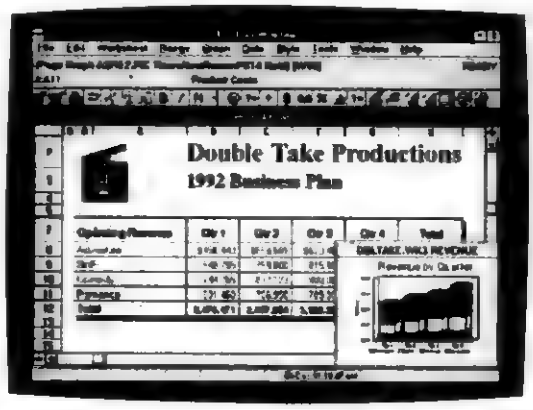

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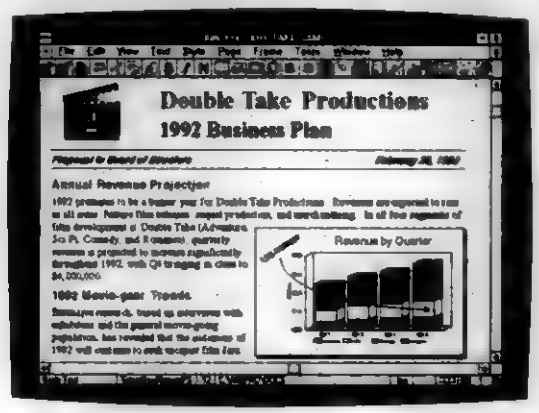

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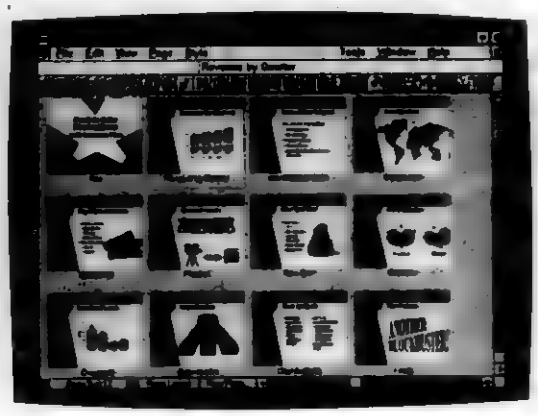

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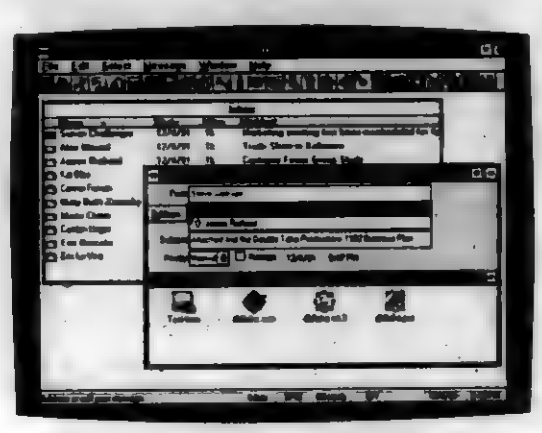

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IN BRIEF

Sun/Xerox pact covers imaging

■ **Sun Microsystems, Inc.** and **Xerox Corp.** have signed yet another joint marketing and sales agreement, this time aimed at developing document imaging, information management software and integration services for the manufacturing and utilities industries.

Included among the Xerox applications that will run on Sun's SPARCstations and servers is Chess, an advanced manufacturing and resource planning system; DocuPlex, an engineering documents management system; and GlobalView workgroup productivity software.

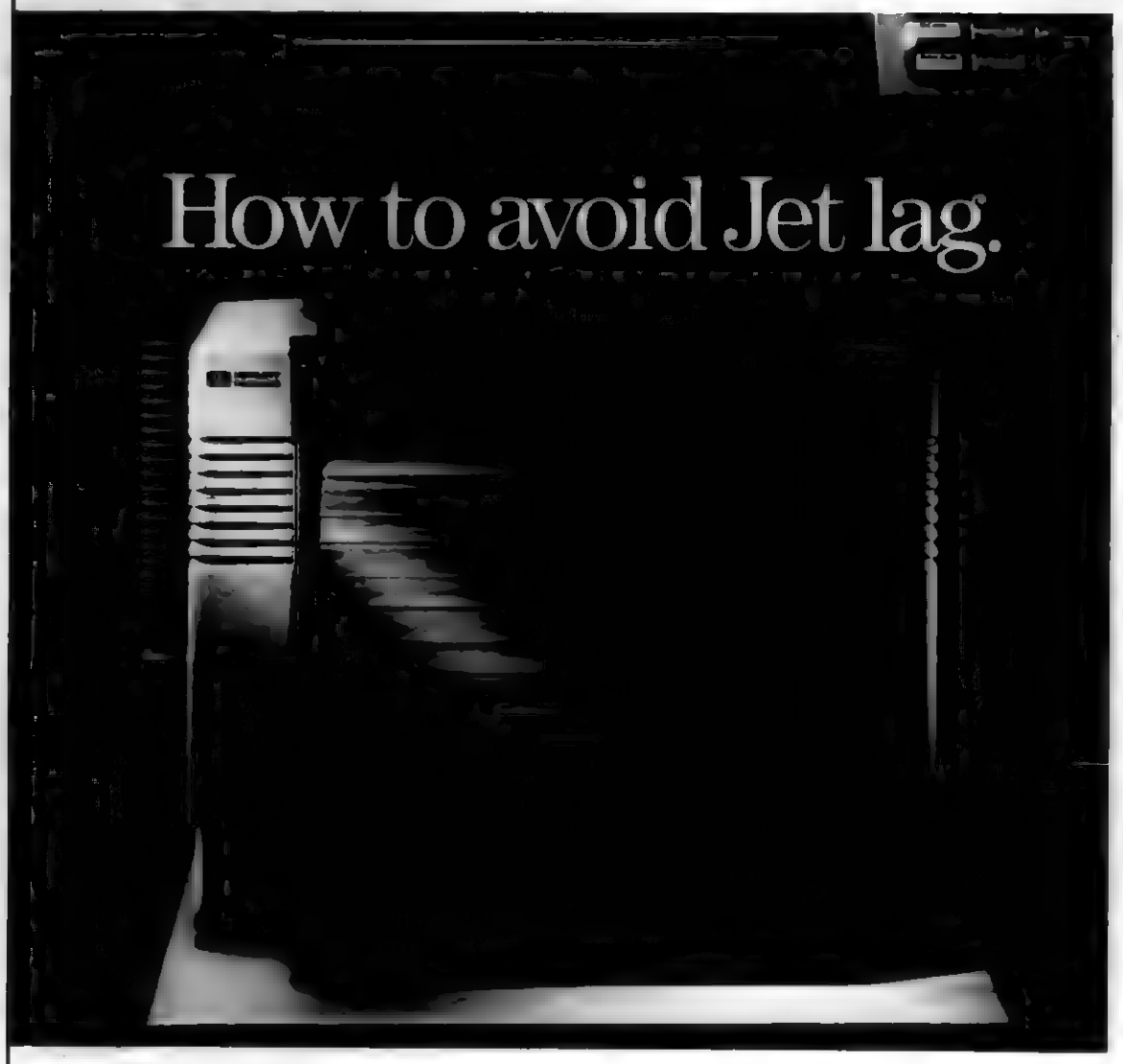
Sun and Xerox expect to generate at least $20 million in combined worldwide business during the next year, company officials said.

■ A recently announced systems integration contract between **IBM** and **Motorola, Inc.**'s Altair Product Operations in Arlington Heights, Ill., is intended to enable IBM's Customized Operational Services (COS) Division to resell Motorola's line of Altair wireless products through 200 IBM branch offices nationwide. Motorola's wireless product line includes the Altair Plus, a wireless Ethernet local-area network, and the Altair VistaPoint system, a wireless LAN link for Ethernet networks up to 500 feet apart. IBM's COS organization sells physical network devices and consulting services.

■ **Powercore, Inc.**, a developer of network-based and stand-alone time management software for MS-DOS, Microsoft Corp.'s Windows and Apple Computer, Inc. Macintosh platforms, has introduced an enhanced version of its workgroup scheduling software and a single-user product.

The products, Network Scheduler 3 ($395) and TimeVision ($119), provide comprehensive scheduling options, full support for LANs and wide-area networks and import/export options for palmtop devices. They are packaged as combined Windows/DOS products to allow users to choose either version.

■ **GigaTrend, Inc.** in Carlsbad, Calif., is now shipping the company's MasterSafe tape backup software that backs up and restores multiple LANs and WANs using communications technology that complies with Novell, Inc.'s Storage Management Service. MasterSafe backs up data over Datapoint, Inc. ArcNet, Token Ring, Ethernet and fiber-optic topologies. MasterSafe's network backups or restores are performed at a tape station on the network rather than on the file server or workstation. MasterSafe is priced at $2,995 for a software kit.



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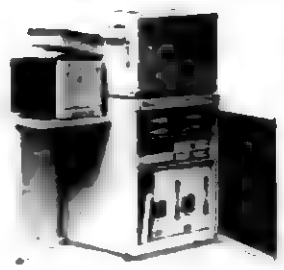

Enhance the high-capacity HP LaserJet IIISi printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

USL suit raises hackles

CONTINUED FROM PAGE 45

trayed as a harrassment action intended to drive the small firm out of business.

Adding fuel to the furor, USL has so far refused to identify exactly which parts of the code have allegedly been copied in the BSD/386 system. "They're going to continue looking like the bad guys until they get around to showing that some violation really occurred," said Dick Dunn, a BSDI customer and president of Eklektix, a software development and consulting firm in Boulder, Colo.

One issue that particularly upsets BSDI's followers is a part of the lawsuit seeking to prevent BSDI from hiring anyone with extensive knowledge of Berkeley Unix source code. That is considered a chilling portent for future code-sharing and Unix development.

"There is nothing here of concern to Unix licensees," said Larry Lytle, a USL spokesman. "There is nothing for users of Unix technology to worry about and nothing here to concern programmers with extensive Unix knowledge."

Despite the outcry from one corner of the Unix market, "no one has flat-out denied [that] USL's intellectual property rights" are being violated, noted Maureen O'Gara, publisher of the "Unigram X" newletter. The lawsuit, she observed, has "stirred up a hornet's nest of academic fear and loathing against USL and has created a cadre of naive tech weenies ready to form a lynch mob."

At Unix consulting firm /Sys/admin, Inc. in San Jose, Calif., the BSD/386 operating system is replacing USL's System V, Release 4 Unix, which was plagued with operational problems, company President Bjorn Satdeveza said. "Even if USL wins this lawsuit, there is no way we would continue with SVR4," he said, citing networking problems and system crashes. "We're going ahead with BSDI and hoping for the best."

Analysts who follow the commercial Unix market had little sympathy to spare for BSDI's role as David to the Goliath of USL and AT&T. "The academic communities had free access to Unix source code, and these guys from BSDI thought they could take it and build a business on it," said Rikki Kirzner, a Unix analyst at Dataquest, Inc. in San Jose. "Now USL is is putting the nail in the coffin and right through their heads."

Unix is their Choice for long-term growth

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Downsizing usually infers migration from large, centralized environments to smaller, less powerful distributed systems. At Choice Courier Systems, Inc., downsizing actually meant rightsizing to a smaller but more powerful transaction-intensive system - while staying with the Unix environment.

Choice, which claims to be the nation's largest land-based courier service, is a 28-year-old, $40 million company with 500 motorized couriers and 700 foot couriers who deliver packages primarily in the Northeast and Mid-Atlantic states.

In six years, Choice has driven its order processing system from a slow, manual one handling 2,500 orders per day to a highly automated system processing more than 9,000 orders daily. In between, the company went through several generations of a customized host-based Unix system. Today, Choice runs its business on a Data General Corp. Aviion server that was designed to handle the ongoing growth and to provide higher reliability than the previous system.

Looking back to 1985, Mike Beck, vice president of finance and administration at Choice, said the company searched unsuccessfully for off-the-shelf software programs to fit its transaction processing needs before deciding on a hardware platform. Because no one on staff at Choice had the technical background to build a system, Choice decided in 1985 to work with Precision Programming, Inc., a Ridgewood, N.J.-based consultancy.

Unix the choice

Charles Fishman, president at Precision, suggested that Choice develop its own Unix-based software programs and convinced Beck that Unix was the operating environment of the future. Beck sent Gerry Daley Jr., Choice's billing manager who had been designated as the future data processing manager, to work with Fishman at Precision for six months.

In 1986, Fishman and Daley developed Unix-based programs written in C. Choice then purchased a Unisys Corp. XE 550 midrange system in early 1987. The system ran AT&T's Centex operating system software, an early version of Unix. It supported 75 users, including dispatchers using personal computers at seven offices in New York with connections through modems and multiplexers.

Within months, heavy transaction processing brought system crashes. The problem was caused by the inability of the system software to handle the company's expanding transaction processing load.

ON SITE

Choice Courier Systems
New York

- **Challenge:** To replace a processing system that could no longer handle growth in a business that went from 2,500 to 9,500 deliveries per day in a five-year span.
- **Strategy:** Replace Unisys minicomputer with more powerful Data General Aviion server.
- **Expectations:** Aviion was designed to handle several times more than the firm's current 130 active users and to provide higher reliability with RAID storage subsystem.

"Unix couldn't handle all the system calls from dispatchers, finance, accounting and several other departments," said Daley, who is now director of data processing at the company.

"We had never developed disaster recovery or fail-safe programs, so it all became a harsh reality," Beck added.

Daley said Unisys support staffers worked to modify the system to support increased transaction processing, and Choice was able to add 50 users from 1987 to 1991.

During this time, Choice grew, mainly through the acquisitions of several New York-based couriers. To handle the growth, Choice added two Unisys minicomputers and automated its branch operations. But by 1990 the systems were "maxing out," according to Daley, and Choice began looking at new platforms in conjunction with plans to move to a new corporate headquarters.

Precision tested a dozen different machines for Choice, including an IBM RISC System/6000. After putting the units through rigorous transaction processing testing, only one machine met all of Choice's specifications, Daley said: a four-processor DG Aviion 6240 midrange computer.

Daley and Beck cited several reasons behind the decision. "It seemed that Data General was more committed to Unix than any of the other vendors whose systems we tested," Beck said.

Impressive RAID

Beck was also impressed by DG's research and development efforts with Unix. Although Beck said the company's relationship with Unisys was excellent, the Blue Bell, Pa.-based computer maker had stopped manufacturing the particular model Choice was using. "Maintenance became very expensive," he said.

Daley said DG's use of redundant arrays of inexpensive disks (RAID) for storage also played a key role in Choice's decision. "Downtime is very costly to us," Daley said. "If a [circuit] board blows out, it's easy to replace. But if you lose a [disk] drive, then there's a long process to recover the data. RAID rebuilds lost data on its own."

Daley added that the Aviion system, which was up and running by July 1991, was designed to support 1,000 users. Choice now has 150 users on the system.

Choice has since installed single-processor Aviion 4300s in its Washington, D.C., and New Orleans offices. Choice's Boston office will continue to use a Unisys minicomputer.

NetWorker updated

PALO ALTO, Calif. — Legato Systems, Inc., a vendor of backup and recovery software, recently announced NetWorker 2.0, a new version of its backup software for Novell, Inc. NetWare sites. NetWorker was designed to allow a NetWare-based server to back up and recover data from both NetWare and Unix-based systems.

The new release, which is scheduled to be shipped this month, reportedly allows a NetWare 3.11 server to back up and recover data from NetWare 3 series servers and from 11 popular Unix platforms, including computers from Sun Microsystems, Inc., IBM and Digital Equipment Corp. The NetWorker product is installed on a NetWare 3.11 server with an attached tape drive and can be ordered with optional high-capacity cartridges or jukebox support, according to the company.

Prices range from $750 for up to 10 clients to $4,000 for 250 clients. Client software is available in either high-end Unix workstation or 386-based packages priced at $1,500 each.

MICHELE DOSTERT

Microsoft refocuses strategy

CONTINUED FROM PAGE 45

Windows platform; and when they do, the low-end market will shrink considerably."

Microsoft is also bundling free connectivity with its 32-bit Windows New Technology (NT) product, due out by the end of 1992. Although Microsoft has not yet announced specifics, it is expected that Windows NT will be shipped with both the client and server pieces of LAN Manager bundled in. This will allow users to set up a multiserver, single-domain client/server LAN without extra cost.

"Basically, Microsoft is giving away LAN Manager with Windows NT, hoping to lure users to the LAN Manager NOS," Lewis said. "But I don't think NetWare users will throw away their NetWare LANs just because they now have NT. Even though the LAN software will be free, the cost of changing over and retraining and supporting the new LAN will be high."

Lewis said Microsoft's bundled network operating system/operating system strategy may do well with users who have not yet chosen a LAN operating system; however, that market is shrinking, he said.

For users who need the multiplatform connectivity and the multiple-domain security and management of a full LAN Manager network operating system, Microsoft will offer the product on both OS/2 and Windows NT.

Tool box

Microsoft plans to ship enhancements to LAN Manager 2.1 in September. The products, positioned as a productivity package, will include the following:

- A Windows administration tool that lets LAN supervisors remotely administer Windows clients.
- New Windows client software.
- A DOS/Windows Printstation utility that allows any workstation to act as a print server.
- New OS/2 2.0 client software.
- New Systems Network Architecture connectivity utilities and protocols.

The Windows NT version will be released simultaneously with Windows NT. LAN Manager NT, with a 32-bit kernel, will compete head-to-head with Novell's NetWare 3.11 and yet-to-be-released 4.0. Most analysts said they expect Microsoft to roll out a string of enterprise connectivity add-ons to NT LAN Manager in 1993 and 1994.

Microsoft's current LAN Manager product, 2.1, is based on an earlier 16-bit OS/2 — not the 32-bit OS/2 2.0 that IBM is currently shipping. Given the current state of often-public hostility between IBM and Microsoft, some LAN Manager users are uneasy about Microsoft's continued commitment to their OS/2-based LAN Manager.

Microsoft has said it will do an OS/2 2.0-based LAN Manager but is not yet committing to dates. "We don't consider OS/2 2.0 to be solid yet, especially with IBM admitting that it is rewriting the graphics part of it," said Ruth Warren, Microsoft's product manager for LAN Manager. "Moving to an OS/2 2.0 platform isn't trivial — all the drivers have to be rewritten, for instance — and we want to make sure it's solid before we start."

Warren said Microsoft is also committed to transparent interoperability between OS/2- and NT-based LAN Manager.

DCA unveils DECnet tool

ALPHARETTA, Ga. — Personal computer-to-host connectivity supplier Digital Communications Associates, Inc. (DCA) recently announced a version of its IrmaLAN Windows client for Digital Equipment Corp.'s DECnet/SNA Gateway.

The new product is intended to allow users of Microsoft Corp. Windows in a DECnet environment to access IBM mainframe applications via IBM's Systems Network Architecture (SNA).

It was designed for users of DEC's Synchronous Data Link Control or channel-attached DECnet/SNA Gateways in DEC Pathworks-based networks who need IBM 3270 terminal emulation in the Windows environment.

The new IrmaLAN Windows client is for use with Windows 3.1 and includes support for up to five sessions, copy and paste, a variety of productivity tools, DCA's QuickScript application and graphical keyboard remapping. The client also supports All Points Addressable graphics, which allow users to view and paste mainframe graphics into Windows applications.

Apple announces a
between Windo

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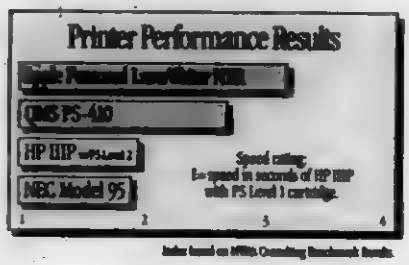

The RISC-based Personal LaserWriter NTR dramatically outperforms the HP LaserJet IIIP, the QMS PS-410 and NEC Model 95.

The LaserWriter NTR comes standard with Adobe PostScript Level 2 and LaserJet II PCL compatibility, a parallel port to connect to your Windows PCs and an AppleTalk® port to connect to your Macintosh® computers. And since both of these ports are simultaneously active, it can receive documents from both Macintosh and PC users without flipping any switches.

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On the left, conventional laser printing. On the right, Apple PhotoGrade printing. Which will do more for your image?

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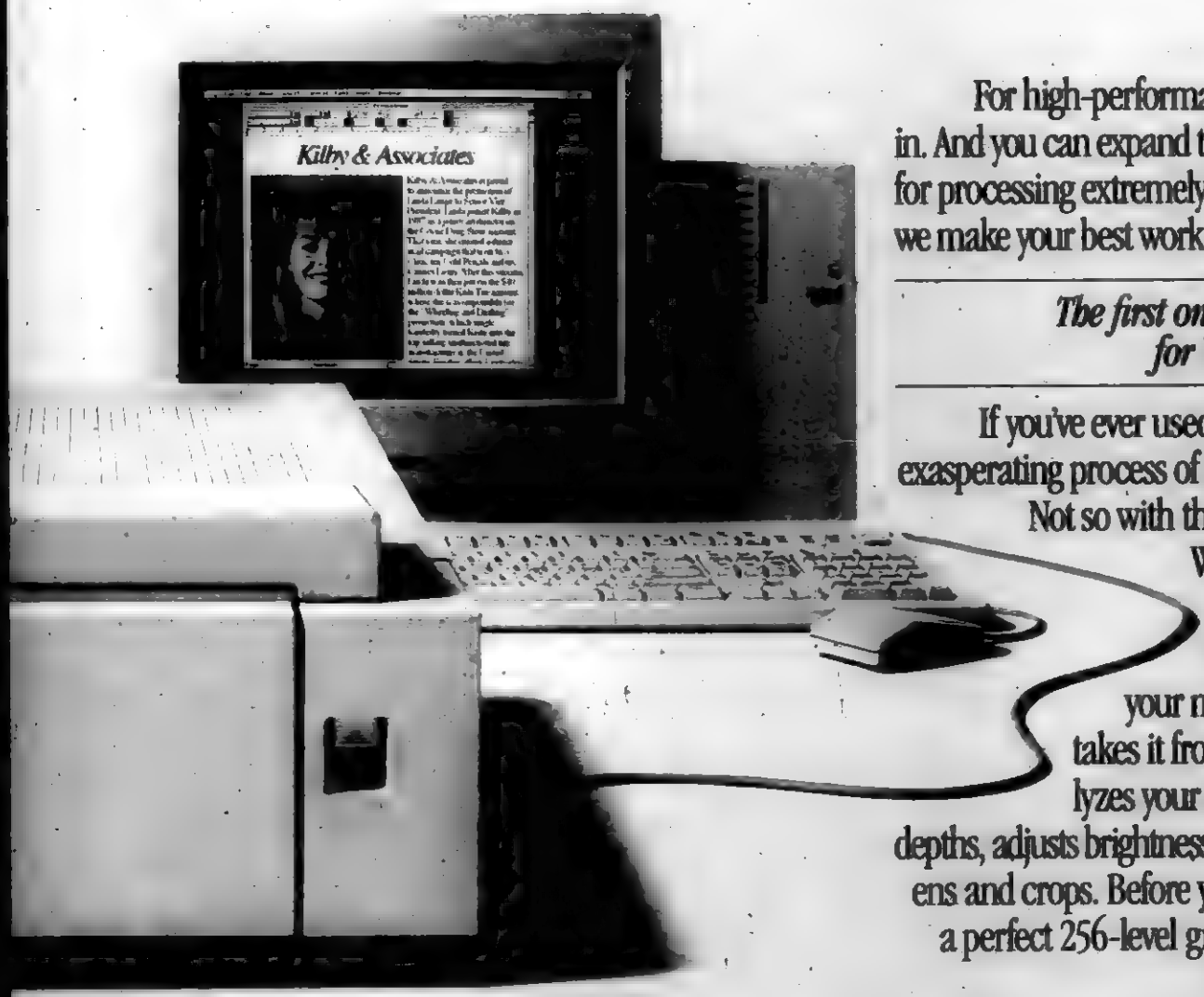

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COMMENTARY

Joanie M. Wexler

'Open, channel D'

Communications managers who were fans of *The Man from U.N.C.L.E.* TV show in the 1960s probably recall with cynicism how agents Napoleon Solo and Illya Kuryakin effortlessly tapped into U.N.C.L.E. headquarters in New York from obscure global sites that barely had running water — let alone digital phone service.

For communications support in their weekly, mission-critical task of thwarting world annihilation, Nappy and Illya would simply whip out wireless, pencil-size devices, flip a switch and mutter "Open, channel D" into them. Never once did they fail to be rewarded with an instantaneous, clear-as-a-bell connection to U.N.C.L.E.'s head honcho, Mr. Waverly.

Public network architects should have paid close attention to Waverly's boys. After all, U.N.C.L.E. really foreshadowed an imminent goal of corporate communications users in today's global environment: one for personal, dial-up voice/data phone numbers or addresses assigned to individuals rather than to fixed work areas.

Ease is the key

The concept is to allow users to access who and what they want from wherever they are — and to do so without having to fiddle with technology any more than Nappy and Illya did. This becomes a particularly thorny challenge in this dawning era of bandwidth-voracious client/server applications.

There is no question that on-the-road users not yet spoiled with functionality bestowed by their IS departments — and/or by our bank machine-on-every-corner society nourishing the Type A population — soon will become more demanding. Today, most of us accept limited (and often frustrating) connectivity while on the road.

But, soon, nomadic users accustomed to full client/server access in the office will be hounding IS to let them interact with full-blown graphics and other high-bandwidth applications.

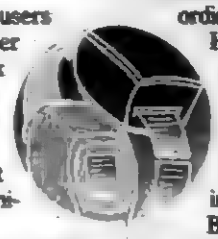
Continued on page 57

Sending fax as data can cut phone bills

ANALYSIS

BY GARY H. ANTHES
CW STAFF

A few large users have discovered they can speed transmission, improve quality and lower the cost of sending fax traffic by shipping it over data networks instead of analog telephone lines. However, despite much talk of merging fax and computer technology, few have taken the concept very far.



Experts say that users have not worked harder to improve the way fax is handled because they have no idea how much they are spending on the fastest growing of all communications media.

One company on the leading edge is Tokyo Electric Power Co., which sends its fax traffic between Washington, D.C., and Tokyo via data lines leased from AT&T, using advanced CCITT Group 4 digital fax equipment that offers store-and-forward transmission. According to Jose Conto, an electrical engineer, this allows the company to schedule faxes for delivery when international rates are lowest and to batch them in ways that take advantage of lower bulk rates.

Conto said digital transmission offers higher quality, and the Group 4 software allows automatic error correction not possible with the analog Group 3 gear more commonly used.

In addition, Group 4 speeds are much faster than Group 3.

Tokyo Electric had not yet been able to estimate the cost savings from sending fax as data, Conto said, but he pointed out that the method requires more advanced equipment, which at $12,000 to $16,000 per box is at least three times as costly as the analog equivalent.

According to Larry Roberts, chairman and chief executive officer of NetExpress, Inc. in Vienna, Va., $7 billion of the $50 billion in annual long-distance carrier revenues comes from fax traffic sent as analog signals over ordinary telephone lines.

He said fax usage is growing at 30% per year and by the end of the decade will surpass first-class U.S. mail in the volume of information moved.

But Roberts, whose company sells digital fax products and services, said most firms have no idea how much they spend on fax because charges are buried in telephone bills. Moreover, few attempt to track those costs, he said. "They know the number of machines they have, but they don't know their [traffic] volumes or costs, and they haven't found a way to control costs. There is no fax czar."

Roberts said companies could halve the cost of sending a fax page — which averages 8 cents or more over ordinary telephone lines — by sending fax as data. The savings are especially dramatic when sending large volumes of fax overseas, he said.

Last fall, the New York State Division of Criminal Justice brought up a digital network linking 75 Group 4 fax machines at 60 sites using a virtual private data network service from New York Telephone Co. Used for transmitting fingerprints, mug shots, photographs of accident scenes and the like, the network has reduced the time it takes to send a fingerprint from 14 minutes, using old fax gear, to one minute.

According to a spokeswoman, the fax network equipment cost New York $1.1 million but saves the state $500,000 a year in operating costs.

Despite the high onetime cost, digital fax equipment used with a carrier-provided virtual private data network will increasingly be the solution of choice for large fax users, predicted Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J.

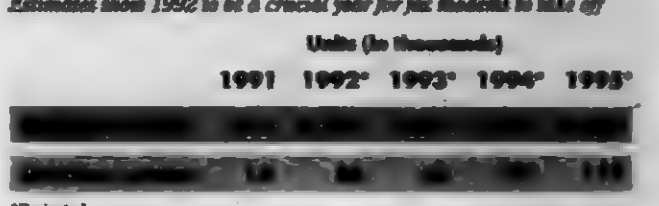
"You can deploy across your [internal] network any number of fax servers and tie them into your virtual private network," Rosenberg said. "You're paying for a bundled service, not per call, so you might as well stack up faxes on the server, then dump them out as you would any other data traffic."

However, companies that wish to take advantage of digital fax do not have to buy Group 4 gear or set up their own networks. The major carriers, including AT&T, MCI Communications Corp. and Sprint Corp., offer services that send customer fax traffic over digital circuits using store-and-forward technology. The carriers will maintain distribution lists for automatic fax broadcasting at predetermined times. For example:

- Miami-based Caribbean Communications Exchange uses AT&T's EasyLink to send information about new travel promotions to travel agents by broadcast fax. "Newsletters and mailers are not fast enough," said Robert Burke, chairman. "By using [the AT&T service], I'm able to capture the desks of 7,000 to 10,000 travel agents who specialize in the Caribbean."
- Bidnet in Albany, N.Y., uses its own computer network and MCI's Store-And-Forward-Exchange service to fax abstracts of government requests for proposals to its clients, a process that takes Bidnet a few minutes to transmit from its computer.

Over the hump

Estimates show 1992 to be a crucial year for fax modems to take off



*Projected

Source: BIS Strategic Decisions

CW Chart: Michael Siggins

Internal relief

Even if a user's fax leaves the premises over ordinary analog telephone circuits, there is much computer technology available internally to help relieve those lines at the fax machine. A $100 add-on fax board can allow users to send a file to another fax machine without having to print it first, and some commercial electronic-mail services offer E-mail-to-fax options.

Even more helpful is having a fax server on a local-area network, so LAN users can send and sometimes receive faxes at their desktops. In addition to the cost of the dedicated PC, this will cost about $1,500 for two boards and some software to serve a 15-person LAN, according to Judith Pirani, director of image communications at BIS Strategic Decisions in Norwell, Mass.

"It's like PCs," Pirani explained. "When PCs first came out, companies just plopped them everywhere and didn't worry about compatibility. The same thing has happened with fax machines. Now companies are looking at their phone bills, looking at people standing in lines to send faxes and saying there has to be a better way. That's where computer fax comes in."

The use of computer fax technology is exploding, she said.

CMI, Xcellenet make strides in remote site capabilities

BY ELISABETH HORWITT
CW STAFF

Modern times have come to two vendors that specialize in coordinating data communications across branches of retail stores, banks and fast-food chains with hundreds or thousands of remote sites.

During the past year, rivals Corporate Microsystems, Inc. (CMI) in Lebanon, N.H., and Xcellenet, Inc. in Atlanta have been steadily enhancing their respective communications servers to provide a great deal more than just data collection and downloading to multiple remote sites. In particular, the two vendors are targeting customers' migration of their remote sites from dumb terminals to intelligent desktop computers and local-area networks.

This eliminates branch offices' dependence on the central data center in order to do core transactions, according to Richard Villars, director of computer networking architectures at International Data Corp., a research firm based in Framingham, Mass.

"If you have your remote system tied in as a terminal and the network goes down, you lose

Continued on page 57

Everybody talks a in corporate America. some of th

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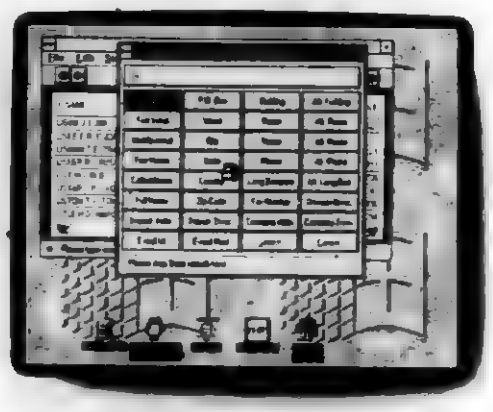
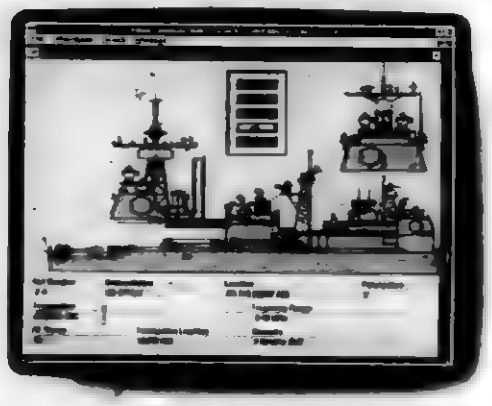


CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

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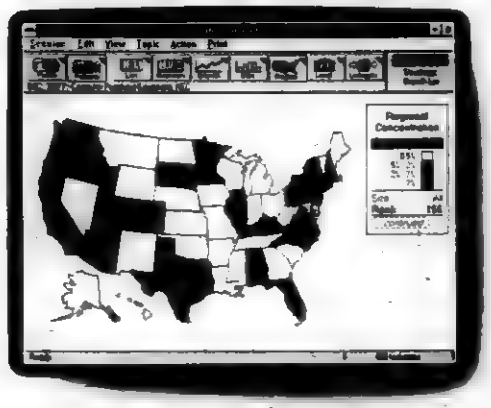
bout the problems We'd like to talk about e solutions.

Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.

Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.

Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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Wexler

CONTINUED FROM PAGE 53

This is already happening in companies such as clothing manufacturer Byer California, where VPs need to see 5K-byte graphical representations of garments from wherever they darn well choose.

Unfortunately, high-speed carrier networks are not likely to satiate these users in the near future, industry observers acknowledge. This is because imminent services such as SMDS, frame relay and ATM are targeted first as inter-*site* linkages, not as portable, personal communications systems.

If you're into symbolism, you might view *U.N.C.L.E.*'s "D" communications channel as a foreshadowing to an ISDN-oriented answer to this. ISDN just happens to have an intelligent signaling (or "D") channel. Perhaps the age-old promise of broadband ISDN as a dial-up, high-bandwidth worldwide communications infrastructure will eventually come full circle after all. It's the closest thing in concept we have to ubiquitous access for nomadic users.

But progress is definitely afoot. Mitch Kapor, Lotus' founder, is now hard at work advocating a national everyone-to-everyone telecommunications infrastructure. (I wonder if *U.N.C.L.E.* was one of his favorite shows?)

Home address

Vendors and standards groups are also bringing solutions to the table for remote access into corporate internetworks that overcome addressing problems. For example, an IETF working group has tackled a project called Mobile IP, aimed to allow users to transport their computer's network address with them from segment to segment within a corporate internetwork.

On the vendor side, an innovative-sounding remote access product announced last week by Centrum Communications in San Jose, Calif., creates a proxy network that users can dial into from wherever they are, use temporary, floating addresses and bridge or route to whatever LAN segment they want. It is one of an avalanche of remote user-oriented products that have been flooding the industry recently.

In the meantime, though, these problem solvers are still hampered by a relatively slow public network that, because of the magic of television, just didn't get in Nappy and Illya's way 25 years ago.

Or do you think it was because they only ran voice applications?

Wexler is a *Computerworld* senior editor.

Politics threaten debut of communications tools

BY JAMES DALY
CW STAFF

NAPA, Calif. — Governmental inertia could choke the burgeoning potential of a new range of lightweight communications products, warned experts gathered at a communications conference held here recently. They urged the Federal Communications Commission to move quickly to ensure the U.S.' place in the world market.

The arrival of personal electronics such as wireless lightweight computers, interactive newspapers and technology such as video on demand, depends on allocating the limited number of available radio frequencies among new and existing communication services swiftly and efficiently. These are two qualities the government is not known for, conference attendees complained.

"We're at risk as a nation of losing our competitive edge," said William Hilsman, a former top Pentagon communications expert who now heads International Mobile Machines Corp., a supplier of wireless digital access products in King of Prussia, Pa.

The key limiting factor facing the growth of these markets is not the availability of enabling technology but the allocation of the appropriate spectrum needed to support the market.

Costs of delay

The FCC, which oversees such spectrum allocation, has a reputation for dragging its feet, and that could prove costly to U.S. manufacturers.

Charles L. Jackson, a member of the National Economic Research Association in Washington, D.C., claimed that an 11-year delay in the FCC's approval of cellular communications cost U.S. vendor companies $86 billion.

Thus far, however, signs have been more positive. For example, the FCC recently voted to release 220 MHz of radio spectrum for "emerging technologies," a move that would displace utilities, railroads and others that have long used those frequencies for microwave communications. The FCC also plans to allocate 20 MHz of radio spectrum for use in wireless networks. The plan is tentative, pending receipt of public comment.

A snag has already developed, however. Sen. Ernest Hollings (D-S.C.) has sponsored an amendment to the FCC bill that would allow those companies that are to be stripped of their frequencies to keep their portion of the spectrum for another 15 years — a move that FCC chief engineer Thomas Stanley said could significantly delay the introduction of the new communication service.

Some vendors and other experts said they feel that unless the U.S. moves quickly to continue efforts to allocate spectrum for these emerging technologies, several potentially large markets could be lost to competitors in Europe and Japan.

Aggressive spectrum allocation activity by regulatory bodies in Europe and Japan are giving America's competitors a head start in the race for these markets.

"The U.S isn't going to lead the way if the various parts of the communications industry continue to bicker over how to slice the pie," said Gilbert Amelio, president of National Semiconductor Corp., which sponsored the two-day Communicating The Future conference.

Opportunities abound

The shift of communications services over to digital could present multibillion-dollar opportunities to many companies. Earlier this year, Apple Computer, Inc. Chairman John Sculley described a "personal digital assistant" called Newton that could sport radio-based communication services.

In addition, once TV signals are sent in digital format, networks might transmit electronic data services such as stock quotes or deliver on-demand motion pictures in just a few seconds over high-capacity fiber-optic wire, predicted Nicholas Negroponte, director of MIT's Media Lab.

"The next step in TV is not being high-definition, it is being digital," he said. "The people who don't think about it in that way are going to become part of the road instead of part of the steamroller."

Firms' remote site strides

CONTINUED FROM PAGE 53

your ability to do point-of-sale [transactions]," he said.

Both CMI and Xcellenet originally sold communications servers that could be programmed to automatically collect information from, or download information to, remote systems.

CMI's Mlink Advanced Communication Manager and Xcellenet's RemoteWare Communications Management System are used to poll thousands of fast-food restaurant branches for sales and inventory updates and to download price changes.

Smarter sites

However, the recently revamped products now do a lot more than upload and download, with many of the added capabilities geared to taking advantage of the expanding computer intelligence out at the branches.

Both products, for example, can now be programmed to distribute software to remote sites. Xcellenet's RemoteWare is said to support the creation of forms at the central site, which can then be distributed to remote sites for a fill-in-the-blanks query. This is a function that customer Friendly Ice Cream Corp. is looking to leverage soon [CW, Aug. 10].

Both vendors can now orchestrate communications among remote sites; for example, they can act as electronic-mail post offices for remote users. CMI has just added an application programming interface that enables the server to directly support popular E-mail applications, according to CMI President Theo Pozzy. A new version of Mlink, due to ship in September, will support a gateway to Lotus Development Corp.'s CC:Mail, he added.

Also available with the new Mlink release is the ability to interact with LAN nodes via Transmission Control Protocol/Internet Protocol, Pozzy said.

Xcellenet recently announced RemoteWare Version 1.4, which is said to use enhanced data compression to support speeds of up to 57.6K bit/sec. over a dial-up, V.32 modem. Formerly, the top speed was 19.2K bit/sec.

RemoteWare 1.4 is also said to route data to LAN nodes via the NetBIOS transport protocol.

Added support

The latest release of RemoteWare also supports Apple Computer, Inc. System 6.0 and System 7, AT&T Unix System V and IBM AIX remote nodes. Already supported are DOS, Microsoft Corp.'s Windows, OS/2 and Digital Equipment Corp. VMS remote nodes.

RemoteWare 1.4 is scheduled to ship this month. It is priced at $12,000 for the central server and from $220 to $500 per remote node.

Mlink runs on OS/2, AIX and Unix servers; RemoteWare runs on OS/2 servers.

Business seems to be booming: Xcellenet doubled in size during 1991 and said it expects to exceed that growth rate in 1992. CMI said it expects to double its growth in 1992.

Injunction halts Hayes' disk distribution

BY JOANIE M. WEXLER
CW STAFF

Modem pioneer Hayes Microcomputer Products, Inc. was recently served a temporary court injunction that prohibits the company from sending test disks to other vendors' customers to help them ascertain if their devices' escape sequence mechanisms are Hayes-compatible.

The injunction was prompted by complaints from rival Multi-Tech Systems, Inc. in Mounds View, Minn., about Hayes' advertising and educational programs, which instruct users how to determine whether modems use Hayes' 11-year-old escape sequence. Multi-Tech charged that the moves were hurting its business.

The injunction expires today, although Multi-Tech said it intends to ask the court to extend the restraining order until an as-yet-unscheduled court date.

Separately, Sierra Semiconductor Corp. in San Jose, Calif., has filed a false advertising and unfair business practices suit against Hayes, alleging "inflammatory and improper" advertising. The suit aims to force Hayes to cease running the escape sequence-oriented ads.

Escape plan

Hayes' escape sequence allows modems to differentiate between data that a user intends to transmit and commands intended for the modem itself. Without it, modems can interpret data as commands and break a transmission, Hayes spokeswoman Peggy Ballard explained.

Multi-Tech is one of a few modem vendors that have not licensed Hayes' patent on the mechanism. Company spokesman Paul Kraska said the firm challenges the patent's validity on the grounds that the scheme existed long before Hayes' implementation. Multi-Tech does not intend to pay license fees for a noninvention, he said.

For now, Hayes may continue advertising and sending out information to interested customers. But it is temporarily prohibited from issuing data disks with a sequence of ASCII characters that, when transmitted, would prove the tested modems either compatible or incompatible with the Hayes mechanism.

COMPUTERWORLD

1992 Computerworld Editorial Calendar (July-December)

Issue Date	Ad Closings Color*	Ad Closings B/W	Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
July 6	June 19	June 26	**Product Spotlight:** X Terminals **Buyers' Scorecard:** Integrated Image Processing Software		Starch Study	
July 13	June 26	July 3	**Executive Report:** LAN Maintenance: Who is Minding the Store?			Mails: July 15 Space Close: June 5 Mat'l Close: June 8
July 20	July 3	July 10	**Product Spotlight:** New Generation of Word Processing Software **Buyers' Scorecard:** Object-oriented Programming Software	Communication Networks West & Object World July 21-23, San Francisco	Starch Study	
July 27	July 10	July 17	**Executive Report:** Workgroup Computing Group(ware) Therapy: Making Workgroups Work			
Aug. 3	July 17	July 24	**Product Spotlight:** Inventory Management Software **Buyers' Scorecard:** Full Life-cycle CASE			
Aug. 10	July 24	July 31	**Industry Closeup:** IS in Banking **Executive Report:** Downsizing/Rightsizing	Windows OS/2 Aug. 12-14, Boston	Starch Study	Mails: Aug. 12 Space Close: July 3 Mat'l Close: July. 6
Aug. 17	July 31	Aug. 7	**Product Spotlight:** Peripherals for Travel (portable modems, printers, docking stations) **Buyers' Scorecard:** Large-capacity Mainframes			
Aug. 24	Aug. 7	Aug. 14	**Executive Report:** The New Spinoffs			
Aug. 31	Aug. 14	Aug. 21	**Product Spotlight:** The Latest in Frame-Relay Products and Services **Buyers' Scorecard:** Virus Detection Software		Starch Study	
Sept. 7	Aug. 21	Aug. 28	**Special Report:** Annual Salary Survey			
Sept. 14	Aug. 28	Sept. 4	**Special Report:** Annual Job Satisfaction/Job Performance Survey **Special Supplement:** Annual *Premier 100* Magazine		Starch Study	Mails: Sept. 16 Space Close: Aug. 7 Mat'l Close: Aug. 10
Sept. 21	Sept. 4	Sept. 11	**Product Spotlight:** Mainframes **Buyers' Scorecard:** Large-Capacity Mainframes	TCA Sept. 21-26, San Diego		
Sept. ■	Sept. 11	Sept. 18	**Executive Report:** Ensuring Data and Information Quality			
Oct. 5	Sept. 18	Sept. 25	**Product Spotlight:** EDI Products and Services **Buyers' Scorecard:** Disk Arrays			
Oct. 12	Sept. 25	Oct. 2	**Integration Strategies:** Integrating New Development Tools **Industry Closeup:** IS in Biotechnology	Networld Oct. 13-15, Dallas	Starch Study	Mails: Oct. 14 Space Close: Sept. 4 Mat'l Close: Sept. 7
Oct. 19	Oct. 2	Oct. 9	**Product Spotlight:** Project Management Software **Buyers' Scorecard:** Electronic-Mail-Enabled Applications			
Oct. 26	Oct. 9	Oct. 16	**Special Issue:** Annual *Campus Edition* **Executive Report**	Interop '92 Oct. 26-30, San Francisco PC Expo Oct. 27-29, Chicago		
Nov. 2	Oct. 16	Oct. 23	**Product Spotlight:** Work-flow Software **Buyers' Scorecard:** PC Graphical User Interfaces		Starch Study	
Nov. 9	Oct. 23	Oct. 30	**Executive Report**			Mails: Nov. 11 Space Close: Oct. 2 Mat'l Close: Oct. 5
Nov. 16	Oct. 30	Nov. 6	**Product Spotlight:** Best Buys in 486 PCs **Buyers' Scorecard:** 33Mhz 486 PCs	Comdex Fall Nov. 16-20, Las Vegas	Starch Study	
Nov. 23	Nov. 6	Nov. 13	**Integration Strategies:** Rise of the Specialist Integrator **Industry Closeup:** IS in Retail			
Nov. 30	Nov. 13	Nov. 20	**Product Spotlight:** Downsizing to Minicomputers **Buyers' Scorecard:** Midrange Systems (10 MIPS and higher)		Starch Study	Mails: Dec. 2 Space Close: Nov. 6 Mat'l Close: Nov. 9
Dec. 7	Nov. 20	Nov. 25	**Executive Report**			
Dec. 14	Nov. 25	Dec. 4	**Product Spotlight:** Windows Utilities **Buyers' Scorecard:** DASD		Starch Study	
Dec. 21	Dec. 4	Dec. 11	**Executive Report**			
Dec. ■ & Jan. 4.	Dec. 11	Dec. 18	**Special Edition:** Annual Forecast Issue			

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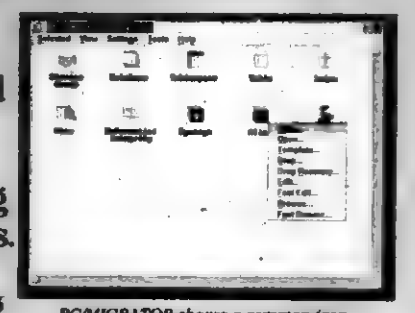

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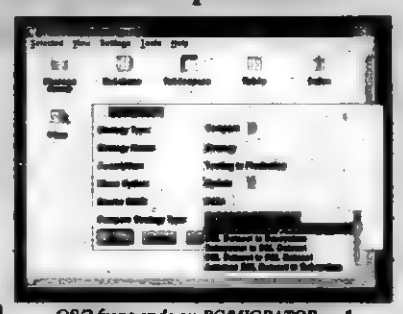

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Growth path is key for 5995M buyers

Amdahl's high-end mainframe line wins backing as early users move to consolidate data centers

BY JEAN S. BOZMAN
CW STAFF

The first wave of users who installed Amdahl Corp.'s 5995M processors said they chose their machines to help consolidate data centers and to expand to the line's larger models in stages.

Several users reported that they had installed Amdahl's newest processors with an eventual upgrade to the eight-way model's 311 million instructions per second processor in mind.

The 5995Ms, which have been shipping since December, are Amdahl's answer to IBM's Enterprise System/9000 series and run IBM systems software. As such, they are bid directly against IBM's machines and often against Hitachi Data Systems Corp.'s GX series processors. But it is the range of Amdahl's product line that most recent buyers said had influenced them.

Piece by piece

While IBM has been shipping its ES/9000s since late 1991, it has not announced its eight-way machine, which is expected in 1993. Even so, a 90-day delay in shipments of the six-way and eight-way Amdahl machines — originally scheduled for the second quarter — caused some sites to take their high-end models in two pieces.

"We are anticipating growth, and we are constantly reforecasting our [computing] needs," said Guy Battista, a vice president who manages the data center at Integrated Systems Technologies Corp. (IST), a Medford, Mass.-based subsidiary of First Data Corp. in New York.

The company had two IBM mainframes as well as an Amdahl machine before it installed a 5995M Model 3550 in March, and an upgrade to a six-way machine is already scheduled for this fall, according to Battista.

One advantage to having all IST applications running on one big Amdahl mainframe will be the ability to shift memory partitions as needed.

"It gives us more flexibility," Battista said. "If we had a need for more computer resources, I could borrow them from our test environment [partition]. When we had separate CPUs, I couldn't do that."

The University of Texas at Austin installed a 5995M Model 4550 in late June, displacing an IBM ES/9000 Model 720. Demand for computing at the 50,000-student university was outstripping the school's ability to install new mainframes, said Randy Ebeling, director of data processing. He said he sees the 5995M Model 4550 as a way to upgrade in stages.

"Our systems do millions of calls to the [Software AG Adabas] database a day. We have 1,350 users, and our need for computing capacity is doubling every two years," Ebeling said. "The Model 4550 we installed has 50% more capacity than the IBM ES/9000 Model 720 it replaced, and we expect that we'll have to upgrade it again in a year."

Early users described their 5995M machines as performing according to expectations. None described serious start-up or installation problems. Some performance problems cropped up during beta testing of the six- and eight-way machines, which prompted the shipping delay, noted Susan Gannon, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

IST, which has been using its Model 3550 in production for several months, found the machine performed as advertised.

"Right now, we do an average of 85 million to 90 million CICS transactions per month," Battista said, "so we're talking about more than 3 million CICS transactions per day."

IST's computer supports hundreds of on-line users during the day and runs batch processing at night.

The University of Texas' machine is very new, but no major problems have cropped up so far, Ebeling said.

Industry analysts said they believe Amdahl is willing to discount heavily to displace many high-end IBM systems [CW, Aug. 10]. Amdahl reportedly lent many of its older 5995A mainframes as "place holders" to hold data center space for the 5995Ms, several analysts said.

"Amdahl is trying to gain footprints in key strategic accounts and is willing to sacrifice some margins to get those footprints," said Mark Hess, vice president at Gartner Group, Inc.'s Large Computer Strategies Group. "It's not uncommon to see discounts beyond 50% from Amdahl."

Important step

"The vendors all believe it's a kind of annuity," Hess said. "Once you get the footprint, you've got all the subsequent upgrades, the memory and channel upgrades, and the maintenance and service for several years."

He estimated that Amdahl shipped between 50 and 75 systems in the first two quarters of 1992. That compares with International Data Corp. estimates of more than 200 Amdahl machines shipped worldwide in all of 1991.

Special features of the 5995M machines are often part of user decisions to install Amdahl computers, users said. Among these is a "concurrent" maintenance feature, which downloads microcode changes in 800 msec or less, allowing mainframes to keep running during an upgrade.

Amdahl 5995M

Announced: September 1990.

Shipped: December 1991.

Compatibility: IBM ES/9000 series mainframes.

Models: Versions ranging from three processors to eight. Six- and eight-way processors will ship in the third quarter.

Cycle time: 6.5 nanoseconds.

MIPS range: 142 MIPS (3550M) to 311 MIPS (8650M).

Price range: $14.2 million to $30 million.

User comment: "The Amdahl [5995M] Model 4550 we installed has 50% more capacity than the IBM ES/9000 Model 720 that it replaced, and we expect that we'll have to upgrade it again in a year." *Randy Ebeling, University of Texas*

Performance and prices do not include Amdahl's Enhanced Performance Feature.

CW Chart: Michael Siggins

Business forms maker eyes client/server plan

BY JOHANNA AMBROSIO
CW STAFF

DAYTON, Ohio — The Standard Register Co. has embarked on the client/server trail with a multimillion dollar order-entry project. In this case, the server will be the firm's mainframe.

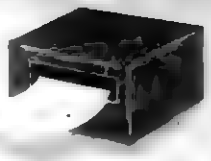
The application, when completed in two years, will run under IBM's OS/2 Version 2.0 on personal computers in the 50-plus sales offices and send information back to the corporate IBM Enterprise System/9000 Model 480 mainframe for processing, delivery and billing.

Standard Register, a 6,000-

Continued on page 65

ON SITE

Standard Register
Dayton, Ohio



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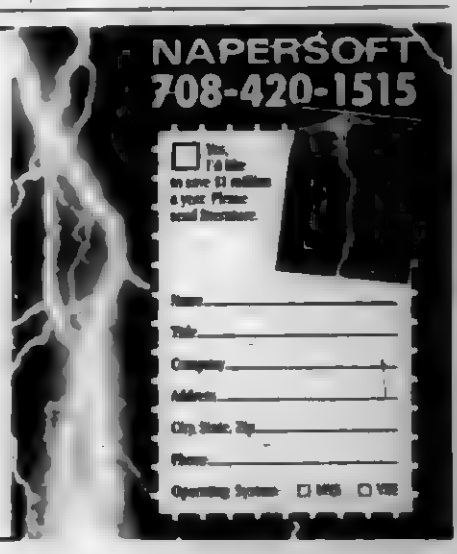


Mainframes not a disappearing act yet

CONTINUED FROM PAGE 1

processors dedicated to functioning, for example, as communications or database servers.

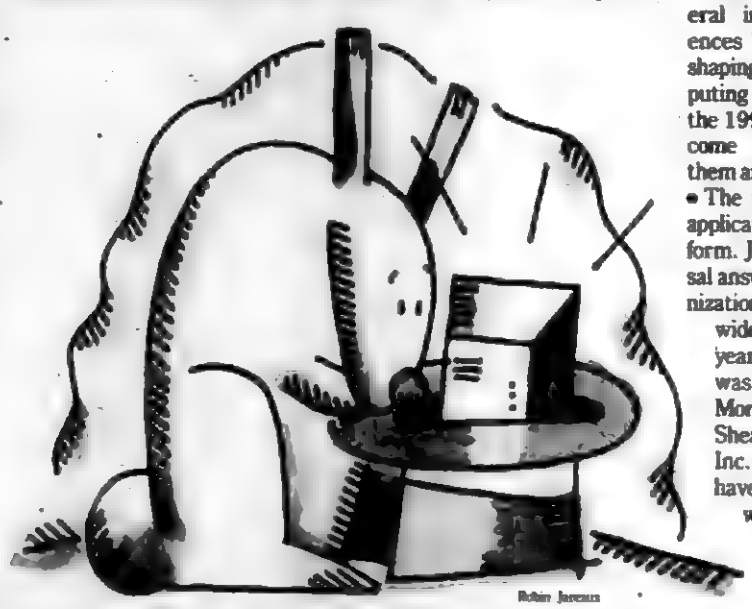
In this scenario, mainframes five to 15 years out will store and switch around data and information that is actually processed by desktop computers, and the bulk of the corporation's applications will reside on personal computers or local-area networks — in short, what mainframe kingpin IBM calls cooperative or distributed processing.

CSX Technology's *Sekeley says the dinosaur lives*

Future uses of mainframes will also focus on serving functions such as backing up LANs, distributing software changes and upgrades to LANs and tracking the comings and goings of all the other machines. Still, the mainframe will be only one entity among many on the network.

Mainframe vendors, particularly IBM, will respond to these changes both with a stepped-up price/performance curve and the addition of new technologies to the big iron, including special-function processors, massively parallel machines and other features intended to give users a continued reason to believe in big iron (see story below).

Users will continue to buy mainframes, although fewer in number and larger in size, analysts said. Specific long-term purchase strategies vary according to the user (see story next page).



Robin Jareaux

Many users are aggressively moving applications off the host system in an attempt to either cap mainframe spending or take advantage of newer computing platforms including workstations — or both (see chart). But this swirl of activity sounds no death knell for the mainframe or for the billions of dollars invested in associated systems and applications software.

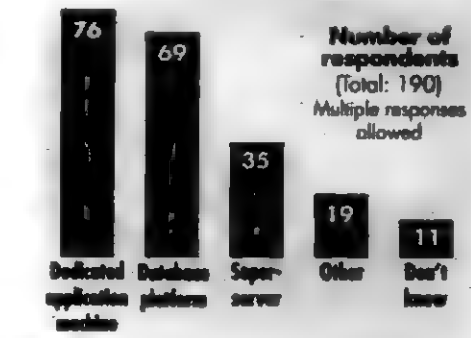
"The dinosaur is alive and well," said George Sekeley, president of CSX Technology in Jacksonville, Fla.

Still, there are several important differences between what is shaping up as the computing environment of the 1990s and what has come before. Among them are the following:

- The new mantra is to let the application dictate the best platform. Just as there is no universal answer within one large organization, the answers vary widely from shop to shop. "In years past, the mainframe was the only choice," said Ira Morrow, vice president of Shearson Lehman Brothers, Inc. in New York. "Now we have many possibilities, and we want to choose the right target for the right platform."
- The movement toward open systems means that many customers are looking for "open" options. Most users do not see the traditional mainframe falling into the open camp, although recent mainframe-class product introductions by NCR Corp. and Hewlett-Packard Co. may motivate the traditional "big-box" vendors to more quickly incorporate standards into their systems.

Changing roles

The mainframe is evolving into a different type of processor



Source: CW Database Division

CW Chart: Janell Genovese

Too good to pass up

- IS executives are finding the lower costs for nonmainframe platforms to be compelling, and they are selecting them where appropriate. However, most large corporations still do not trust their core, bet-the-business applications to anything but a mainframe. Many IS executives said they do not see that trend changing much before the end of the decade, and that there will likely be some applications — airline reservations systems and banks' customer information systems being the most-often-cited examples — that will not move off the mainframe for many years.

These users are quick to warn about the shortfalls of downsizing as well [CW, Aug. 10]. "Where it makes sense to offload, we will," said Ken Nelson, vice president of MIS at Reader's Digest Association, Inc. in Pleasantville, N.Y.

"But until I see the client/server platform providing equivalent stability, performance, consistency and reliability to the mainframe, it's just not where I'm comfortable putting my mission-critical applications."

At Reader's Digest, the main mission-critical applications include customer service and direct marketing.

The cost benefits of nonmainframe platforms, however appealing at first blush, may be deceptive.

"I don't believe organizations do proper costing of alternative platforms," said John Randolph, a member of the Management Board of Cabinet in Ontario. "People don't admit to how much money is really being spent. You have to look at the total cost of service and support; the hand-holding requirement is much greater for the alternative platforms."

For example, Randolph said, one of the Canadian government agencies asked for approval to

Big iron adapts to avoid going the way of the dinosaur

Big iron doesn't usually mean big changes. But these "dinosaurs" aren't standing still: In the next five to 10 years, mainframes are expected to be smaller, much less expensive and made up of a series of interconnected, specialized processors, as well as to feature more characteristics associated with "open" systems.

Within 15 years, perhaps sooner, today's top-of-the-line IBM machine will evolve into a massively parallel computer. Today's list price for an IBM mainframe is about $100,000 per million instructions per second (MIPS); discounting brings the price to about $60,000 per MIPS. Five or so years from now, analysts said, the per-MIPS price will have to drop to about $15,000 to be competitive.

Bill Wilson, assistant general manager at IBM's Enterprise Systems line of business, agreed that mainframes will become much less expensive during the next five years. Traditionally, he said, mainframes have followed a price/performance improvement curve of 15% to 18% per year. That will double during the next five years, he said.

One way vendors will make the mainframe less expensive to manufacture, and hence to sell, is by bringing new kinds of chips into the machine architecture.

Some analysts, such as Frank Gens at Technology Investment Strategies Corp. in Framingham, Mass., said they expect the mainframe complex to be front-ended by the reduced instruction set computing (RISC) chips IBM uses in the RISC System/6000.

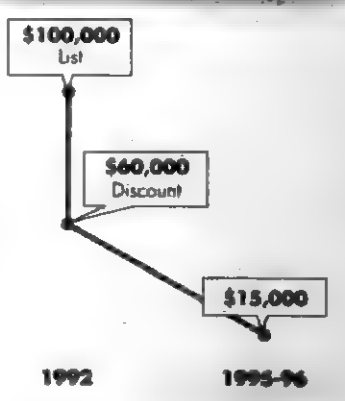
Along the way, Gens said, IBM will "open" the mainframe architecture by injecting its AIX Unix-like operating system into MVS and vice versa.

Other analysts, such as Jay Stevens, senior vice president at Dean Witter Reynolds in New York, said they expect to see by mid-decade a switch from the current 32-bit bipolar chips to less expensive but more powerful 64-bit, proprietary bi-CMOS semiconductors.

In the meantime, IBM will introduce its eight-way processor later this year, Wilson confirmed. IBM will continue to evolve its Sysplex, or "systems complex," which connects multiple microprocessors and makes them appear and act as a single unit. The software for this is expected to be ready by 1994, and some of the hardware is already shipping.

Free-fall

The cost of mainframe MIPS is expected to decline 85% during the next few years



Source: Gartner Group, Inc.; Dean Witter Reynolds

Sysplex will be the basis for the so-called "Planet" complex, which Stevens said he expects will be introduced in 1995 and will ship the next year. Planet will include parallel processing for database functions and special-purpose processors for handling I/O, memory management and other tasks. Performance for the total complex will likely be 2,000 MIPS.

IBM competitors Amdahl Corp. and Hitachi Data Systems Corp. are also exploring similar technologies.

Relatively speaking, the hardware will be the easy part, observers said. IBM already has prototypes running in the laboratories with 50 or so processors linked, according to Wilson.

JOHANNA AMBROSIO

move an application from a service bureau to an in-house Digital Equipment Corp. minicomputer and attached PCs. The agency requested 11 staffers to support the application: three for VAX hardware and software support and eight for the PCs.

"The smaller platforms are much more people-intensive; the handholding requirements are much greater," Randolph said. "And the life span is not as long."

Then there is the issue of semantics. "What's a mainframe these days?" asked Herbert Yarbrough, a senior IS analyst at Duke Power Co. in Charlotte, N.C. "You have to talk about how computers are used. We treat some Unix boxes as mainframes. If we put them in the glass house, support them with a programming staff and end users can log on and gain corporate-wide information access, you can call it a mainframe."

Joyce Rand

Nelson: *Reader's Digest will offload 'where it makes sense'*

Other users agreed that the definition of the mainframe is in flux, moving away from how many users it supports or how many instructions it processes, and toward a more functional view of what the machine does.

Even IBM is shying away from the classic definition. Bill Wilson, assistant general manager in IBM's Enterprise Systems line of business, spoke about "large systems that manage very large work loads better than very small systems." He defined "large work loads" as applications worked on by more than 25 simultaneous users that require several hundred gigabytes of data and tens of thousands of transactions per hour. He said a recent IBM survey of over 1,500 customers in the U.S., Europe and Japan showed that half of users' IS budgets "will be on something called large systems."

Wilson agreed, though, that the mainframe's role is changing. IBM and other large systems providers, including Amdahl Corp. and Hitachi Data Systems Corp., are positioning the mainframe as the integrator of the customer's total environment.

"If we execute well and make it easy for customers to manage that complex environment, then there's a growth market," Wilson said.

Other reasons the mainframe will not disappear overnight have to do with the human factor and because change usually takes longer than expected. Thomas Nies, chairman of Cincom Systems, Inc. in Cincinnati, said, "The investments we've made become an impediment to what we can do. But the major barriers are closed minds, not closed systems."

Next week, Computerworld *will look at the impact of downsizing on mainframe programmers.*

Strategies for mainframe purchases

Users are taking various approaches to their mainframe purchase plans 5 to 10 years out. Some will continue to buy big iron, although they may consolidate the number of mainframes along the way; others are capping large systems purchases and downsizing, although they will retain their existing mainframes.

Still others are aggressively downsizing to get rid of as many mainframe applications they possibly can.

The following is a sampling of mainframe purchase plans at five large organizations:

• Capping mainframe growth.

Robert Delaney, vice president of the Principal Financial Group in Des Moines, Iowa: "Our mainframe is still growing, but we're trying to move into a client/server environment so the mainframe will grow less quickly. We haven't really figured out who will win on the desktop — OS/2, Windows or DOS."

George Croth

Delaney: *Seeking to slow mainframe growth at Principal Financial*

Herbert Yarbrough, senior IS analyst at Duke Power Co. in Charlotte, N.C.: "We're spending as few dollars on the mainframe as we can, and we're moving processing cycles off to less expensive platforms. We're hoping not to have to grow the mainframe anymore, but I don't see it going away. We will continue to go to the mainframe for data."

• Still buying mainframes.

Ron Waid, technical director of host and capacity planning at The Travelers Corp. in Hartford, Conn.: "Our applications areas are not moving quickly to distributed architecture. Our mainframe MIPS will continue to grow at 10% to 15% for a while. A lot of the new development is taking place off the mainframe, but we're certainly not stopping mainframe development. We haven't been able to stop and say, 'No more mainframes.'"

David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh: "We're sorting out where to move what applications. We move 5 million checks each night through the system, and there aren't a lot of choices there. Our mainframe capacity has grown 18% to 20% per year, although it's begun to tail off this year.

• Aggressively downsizing.

Bill Dunn, director of technology management services at Pepsico, Inc. in Purchase, N.Y.: "There has not been one major system under development on a mainframe for at least a year. Our mainframe growth rates plummeted to 15% per year through 1988, and we went from 2,000 to 16,000 PCs. Then we started to see another decline to around 8% per year."

JOHANNA AMBROSIO

Empress RDBMS adds cross-platform functionality

BY MELINDA-CAROL BALLOU
CW STAFF

GREENBELT, Md. — Empress Software, Inc. will release a new version of the company's Empress relational database management system at Unix Expo next month that will offer distributed database capabilities across heterogeneous platforms, officials said.

Version 6 of Empress will initially be available for Cray Research, Inc., Silicon Graphics, Inc., Hewlett-Packard Co. HP 9000/400 series and Sun Microsystems, Inc. workstations and personal computers running Interactive 386IX.

It will be generally available on other Unix platforms in January and on Digital Equipment Corp. VMS and MS-DOS systems by midyear allowing users to access data across the network, officials said.

The translations required to access data interactively across platforms will be accomplished by the Empress RDBMS so that end users will be able to access data transparently, according to officials.

"Version 6 will offer a translation layer on top of our DB Server, which will handle dissimilarities across hardware architectures, the most important of which is that between 64-bit [Cray systems] and 32-bit engineering workstations," said Rich Grohol, a regional sales manager at Empress.

Empress' DB Server lets users make queries from remote nodes across the network. The DB Server handles load balancing and can fire up subprocesses that can run on separate processors. Users can therefore have multiple DB Server processes running on each node of the network, and those nodes can each have multiple servers and multiple clients.

Taking full advantage

"This is important for load balancing across the network so that users can take full advantage of their computing power and so that not all the queries are going through a single server on a single node on the network," Grohol said.

Industry analysts said the Empress database offers support for true variable-length binary large objects (BLOB), which can be indexed and manipulated by users, and the RDBMS primarily targets markets that do not require high transaction rates.

Empress is "more oriented toward scientific and engineering or other applications where there's a low chance of concurrent access and where you want to see data distributed and updatable across multiple servers," said Rich Finkelstein, president of Performance Computing, a market research firm based in Chicago.

Empress Version 6.0 will also take advantage of shared memory and shared libraries of the various systems so the time required to set and release locks can be reduced, Grohol said.

Users said they were attracted to Empress as a result both of its support for BLOBs and its distributed potential.

The upcoming distributed capabilities of Empress "are very important, and that's one of the reasons we chose it," said Bryan Williams, manager of device research operations at Colsa Corp., a computer systems and engineering company based in Huntsville, Ala. "We have all kinds of distributed experiments running on multiple vendor platforms — as many as 15 or 16 for one experiment, for instance."

The distributed capabilities of Version 6.0 of the Empress RDBMS will also be used for the U.S. Navy's $250 million Primary Oceanographic Prediction Systems (POPS). The RDBMS will be offered through Grumman Data Systems Corp., based at the Stennis Space Center in Mississippi, to the U.S. Naval Command. The POPS program uses Empress to distribute information across Cray supercomputers and other Unix workstations.

"Our first goal is to get out of proprietary systems and home-grown data management methods to move into a more robust world that's maintainable, distributed and not proprietary," said Randy Nottenkamper, POPS site manager in Monterey, Calif.

IN BRIEF

Ross makes Promix sales

■ **Ross Systems, Inc.** announced recently that it had sold about $6 million of its Promix process manufacturing system and related services. The system is headed for use at such customers as Du Pont Co., Monsanto Chemical Co. and Moyer Packing Co.

■ **Cray Research, Inc.** has unveiled plans to integrate the Ingres relational database management system onto its entire line of Cray Y-MP supercomputers. Ingres, from the Ingres Products Division of The Ask Cos., operates on about 40 platforms, with Cray at the high end.

■ **Applied Data Processing** will incorporate **PeopleSoft, Inc.**'s client/server human resources software into its turnkey applications, the companies announced earlier this month. PeopleSoft's financial software is not included in the agreement.

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Attention: Marketing

Business forms maker eyes client/server plan

CONTINUED FROM PAGE 61

employee, $700 million manufacturer of business forms, hopes to decrease the lag time between when a customer places an order and when the order is completed, according to Tom McGoldrick, director of information services. The goal is to reduce the time from 30 to 24 days.

"One of the key things we've realized is that salespeople should be selling, not coming back to the office and doing paperwork," McGoldrick said. "This will cut down on administrative overhead time, increase service levels to the customers and reduce the inventory in warehouses." He estimated that the project, called Strategic Technical Resource Assistance (Star), will pay for itself within two years.

Marty McDevitt, a business-forms industry analyst at Cleary Gull Reiland & McDevitt, Inc. in Milwaukee, said Standard Register wants "to remain one of the most competitive firms in the industry, and they want to compete on the basis of service. It's another way for the sales force to be more efficient."

Eventually the client/server technology will be extended to other applications, McGoldrick said. "We're being very careful to select the technology because it will be used for other applications," he said. For example, graphical user interfaces will be built onto the company's order-entry and distribution systems.

Relational core

Although McGoldrick was reluctant to detail specifics of the application because of its proprietary nature, he did discuss some of the technology Standard Register will employ. At the heart of Star will be Cincom Systems, Inc.'s Supra relational database.

Application development tools will include Applications Manager from Intelligent Environments, Inc. and AD/Advantage from Cincom. The 20-person development team will complete a prototype by November, with production rollout scheduled in phases over two years, according to Barbara Whitney, Star's development director.

"It's really a technology prototype as well as an application prototype," Whitney said. "A lot of the products we'll be using are very new, and some won't even be out until the third quarter."

The OS/2 performance monitor and tape backup systems are available for Version 1.3 of the operating system but not yet for Version 2.0. Therefore, the company will be testing these new products as well as trying to incorporate them into the order-entry application.

Standard Register already has roughly 750 PCs in its sales offices, although some may have to be replaced to handle the new application. No decision has been made on the type of PC that would be chosen.

"When we roll it out, we want each PC to have a standard configuration so we can manage everything from Dayton," Whitney said. "Where possible, existing workstations will be rolled in, but they will have to meet the compatibility requirements."

NEW PRODUCTS

System software

BMC Software, Inc. has started shipping Batch Control Facility.

The product offers a fast way to log IBM IMS batch jobs to buffered tape devices and automates the log closure process. It also reports on batch performance statistics that can be used in application tuning and capacity planning.

Pricing starts at $11,500.

BMC Software
Suite 320
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(713) 240-8800

BGS Systems, Inc. has announced Release 2.0 of the Best/1-Datacenter software package.

The product was designed for performance analysis, tuning and capacity planning of MVS and VM systems. System performance data is used to construct graphical representations of a data center's principal work loads, hardware configurations and performance variables. Users can estimate the performance impact of work load growth.

Pricing is from $40,000 to $100,000.

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128 Technology Center
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BUYERS' SCORECARD

Adabas stays one step ahead

BY DEREK SLATER
CW STAFF

Software AG of North America, Inc.'s Adabas received the highest user satisfaction ratings in *Computerworld*'s Buyers' Scorecard on mainframe relational database management systems for the second straight year.

Adabas earned an overall satisfaction score of 78, up from 72 last year [CW, Feb. 25, 1991]. Users indicated that Adabas' strengths — in areas such as system availability and recovery from crashes and performance in on-line transaction processing — are more important than its limitations.

Adabas is structured as an inverted list database that provides associative access to data based on special indexing procedures. SQL queries must be translated internally by Adabas.

"It can be extremely fast in on-line transaction processing," says David McGoveran, an analyst at Alternative Technologies, Inc. "If you're trying to do relational queries, that's not necessarily its strong point."

Adabas also scored high in the area of vendor service and support.

The overall order of finish closely mirrors last year's survey results. Adabas was again followed by Oracle Corp.'s Oracle, which provides a different set of strengths.

Oracle rose to industry prominence on the relational name tag, and its highest marks in the survey came in support for standard SQL and useful SQL extensions.

Oracle's final score of 76 was seven points higher than last year's tally. However, it finished back in the pack in several important categories, including performance in on-line transaction processing and providing effective user-defined data integrity.

Computer Associates International, Inc.'s CA-Datacom tied with Oracle for second place. CA-Datacom has added SQL support and relational functionality in its most recent release, Version 8.0 (and is thus termed "born again" by relational gurus). Users rated it above its competitors in vendor service and support, while it suffered lower scores in integration of DBMS and operating system security and in decision-support applications.

The runaway market share leader, IBM's DB2, finished fourth with an overall score of 73, followed by Cincom Systems, Inc.'s Supra at 72 and IBM's SQL/DS at 71.

IBM's tandem products finished second and third in support for standard SQL but dropped to the last two places in performance in on-line transaction processing.

DB2 users noted in verbatim responses that the product is solid and reliable but that it tends to place high demands on system memory and processing power.

Supra scored well in performance and data integrity areas but finished with one of the lowest scores in vendor service and support.

The survey measured users' satisfaction with their installed products. Users rated only their own products on a scale of 1 to 10 in 15 specific categories. See the methodology on the next page for a description of the scoring process. ●

Mainframe RDBMSs

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 40 users per product, except CA-Datacom (30) and Oracle (28).

Total possible score **100** Mean score **74**

Product	Highest ratings	Lowest ratings
Software AG's Adabas SCORE 78	Vendor service and support System availability and recovery	Useful SQL extensions Support for standard SQL
Oracle's Oracle SCORE 76	Support for standard SQL Useful SQL extensions	Vendor service and support Performance and system monitors
CA's CA-Datacom SCORE 76	System availability and recovery On-line transaction processing performance	Integration of CASE tools Performance and system monitors
IBM's DB2 SCORE 73	Effective programming tools System availability and recovery	Performance and system monitors Integration of CASE tools
Cincom's Supra SCORE 72	System availability and recovery On-line transaction processing performance	Performance and system monitors Distributed updating and recovery
IBM's SQL/DS SCORE 71	Support for standard SQL Distributed updating and recovery	Performance and system monitors Effective end-user tools

KEY RATINGS

Adabas placed first or second in the six categories that users rated most important.

User importance rating: 9.5

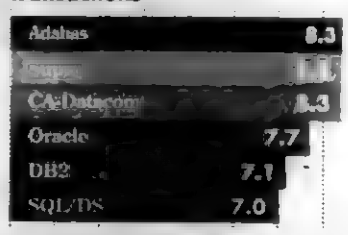
System availability and recovery from crashes

User importance rating: 9.0

Vendor service and support

User importance rating: 8.8

Performance in processing on-line transactions



User importance rating: 8.4

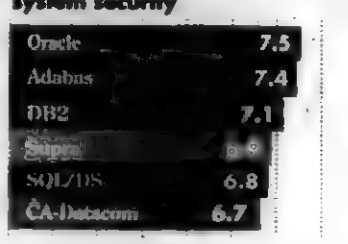
Effective user-defined integrity

User importance rating: 8.1

Effective programming tools

User importance rating: 7.5

Integration of DBMS and operating system security



RATINGS IN ORDER OF IMPORTANCE

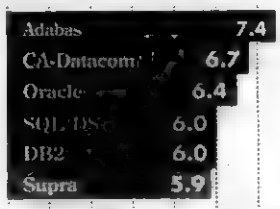
(Mainframe RDBMSs, continued from previous page)

7.5 Support for standard SQL

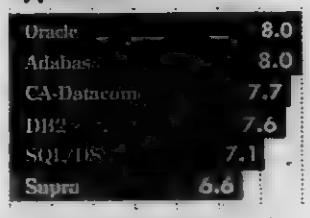
7.5 Effective end-user tools

7.4 Multilevel security features

7.4 Performance and system monitors



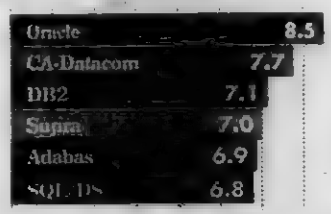
7.3 Performance in decision-support applications



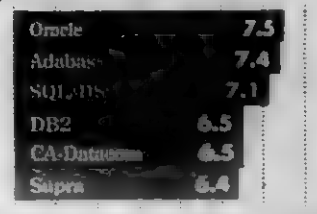
7.0 Auditing functions

6.9 Distributed updating, recovery and remote administration

6.6 Useful SQL extensions

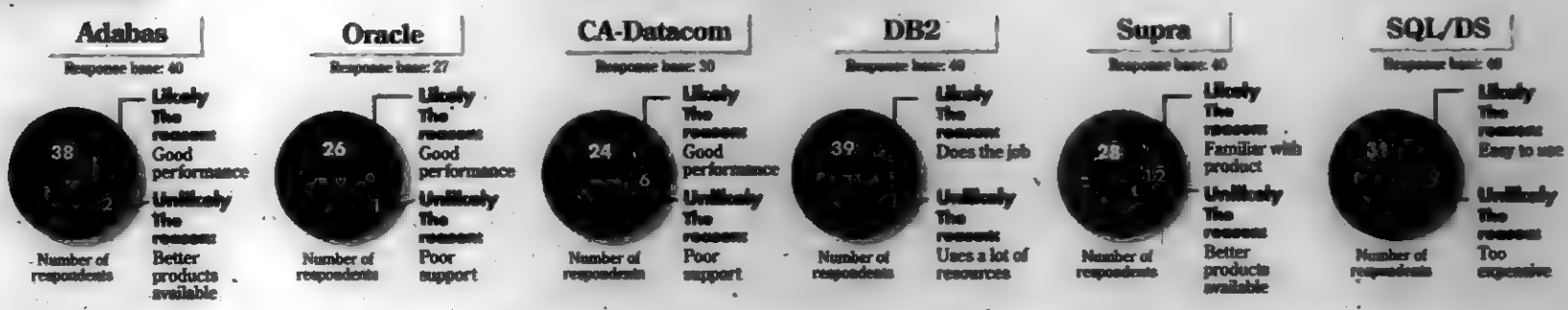


6.4 Integration of CASE tools



Loyalties

Would you purchase the product again?
(Reasons are based on most frequently stated responses)



Verbatim

What do you see as the strengths/weaknesses of this product?
(Reasons are based on most frequently stated responses)

[redacted]

Likes
Reliability
"It has very high system availability – never crashes."

Dislikes
Limited awareness
"There are no applications available for Adabas; the industry seems to be ignoring it."

[redacted]

Likes
Multiplatform support
"It is transportable; you can use it on any platform."

Dislikes
Difficult to use
"Sometimes you have to do too much just to get a simple result."

[redacted]

Likes
Ease of use
"The ease of use is outstanding."

Dislikes
Lack of tools
"There is a lack of software that is compatible with Datacom."

[redacted]

Likes
Ease of recovery
"The best thing is its ease of recovery and handling of problem situations."

Dislikes
Use of resources
"It consumes a lot of CPU resources."

[redacted]

Likes
Good performance
"It performs well and does not consume a lot of system resources."

Dislikes
Poor support
"The service is nearly nonexistent."

[redacted]

Likes
Ease of use
"It is easy for end users to do the queries."

Dislikes
Lack of tools
"SQL/DS doesn't have good development tools."

Vital statistics

Total number of respondents: 218

What is your position?

IS director	21
IS manager	29
Database supervisor	86
Other	82

In which industry does your company do the majority of its business?

Manufacturing	53
Government agencies	34
Education	33
Insurance	20
Retail	10
Transportation	9
Other	59

What is your responsibility for mainframe RDBMSs?

Evaluate or recommend vendors	196
Set standards for your organization	190
Determine need	174
Select vendors	165
Approve or authorize purchase	91

How long have you been involved with mainframe RDBMSs?

Five years or more	172
3-4 years	30
1-2 years	13
Less than one year	1
Don't know	2

METHODOLOGY

Products included in Buyers' Scorecard are market share leaders with relational database management system functionality, including SQL support, on IBM or compatible mainframes.

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 40 users each for IBM's DB2 and SQL/DS; 40 for Cincom Systems, Inc.'s Supra; 40 users for Software AG of North America, Inc.'s Adabas; 30 users for Computer Associates International, Inc.'s CA-Datacom; and 28 users for Oracle Corp.'s Oracle.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100. The ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: CW Database Division; David McGoveran, Alternative Technologies, Inc.

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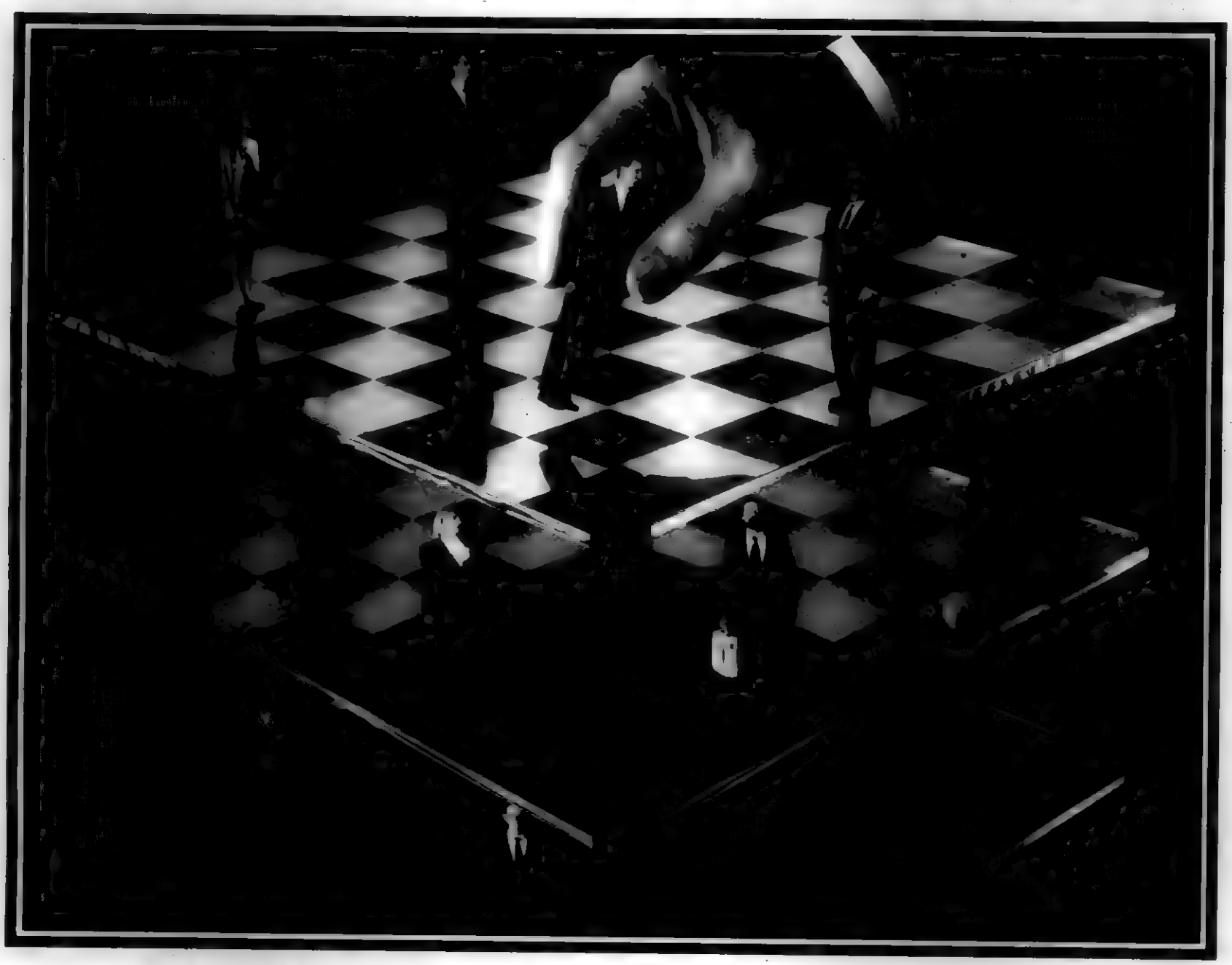

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Whipping worn-out code into new shape

CLOSER LOOK

Reverse-engineering

BY KIM S. NASH
CW STAFF

Some users are taking a step backward to go forward.

Re-engineering software programs — not to be confused with the current catchphrase, re-engineering the business process — is really a two-step affair. Reverse-engineering products analyze existing applications. They draw entity-relationship models and data flow diagrams showing the cause-and-effect patterns between tasks performed by chunks of code.

Re-engineering products bring that analysis forward, actually reworking and streamlining applications.

The process is taking root in systems departments for two reasons: to save on software maintenance costs and to clean up legacy systems in preparation for moving applications to different hardware platforms.

Estimates vary of the amount of money and time saved by wringing tangled systems through reverse-engineering tools, mostly because that is all that is available — estimates.

"Reverse-engineering vendors have been promising huge benefits for a few years now, but so far, I've seen limited success," said Andrew Topper, an analyst at Foresite Systems, Inc., an application development consulting firm in Okemos, Mich.

That is because most tools, including those from market leaders Bachman Information Systems, Inc. in Burlington, Mass., and Viasoft, Inc. in Phoenix, address only one side of the reverse-engineering equation. They adeptly manage the dividing and reordering of data structures but are not as powerful for understanding the business processes underlying the data, analysts and users agreed.

Reverse-engineering tools can help users understand the functions performed by blocks of code and how one task affects another.

In the average shop, about 60% of the time spent on maintenance is spent figuring out what the system is doing, according to Topper. Automating that work can realistically cut that "figuring" time to between 25% and 30% of total time spent on the overall maintenance function, he said. That is a far cry from the 5% figure bandied about by some vendors.

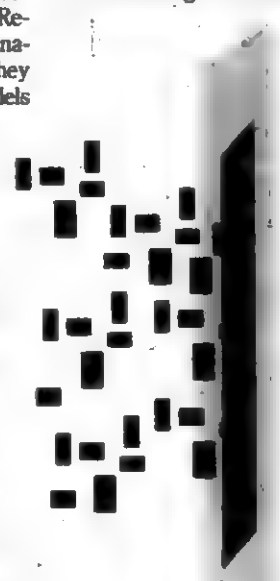
Nevertheless, there are promising projects under way. For example, Ultramar Canada, Inc., a petroleum refiner in Toronto, is using Bachman's flagship family of tools to design a database based on IBM's DB2.

When Ultramar's 100 or so programer/analysts begin breaking down Cobol applications within a year, the Bachman-made database will act as a storehouse for the revamped data files, according to Ian Wickins, supervisor of wholesale systems.

If reverse-engineering sounds intriguing, look before you leap. Consultants advise the following steps:

- Evaluate your application mix, including programming language, types of programs, transaction monitor and database.

Continued on page 70



Basic ingredients

A half-dozen key vendors offer reverse-engineering products designed to convert old applications into new, cleaner code

Bachman Information Systems, Inc.
Product: Bachman Series

CGI Systems, Inc.
Product: PacReverse

Interaolv, Inc.
Product: Design Recovery

Viasoft, Inc.
Product: Via/Renaissance

KnowledgeWare, Inc.
*Product: ADW/Maintenance Workstation**

Texas Instruments, Inc./Price Waterhouse
*Product: RE for IE**

* Announced, not shipping

CW Chart: Janell Genovese

Reverse-engineering in C

Considerably smaller than Cobol programs used for production applications, C programs tend to be less disciplined and less structured. In the past, "there's been a lot of hacking" in C development efforts, said Adrian Bowles, vice president and director of advanced software development research service at New Science Associates, Inc. in Westport, Conn.

For any company trying to unravel its C programs, there is a variety of new reverse-engineering tools that can be useful. However, anyone considering such a tool should ask a few preliminary questions.

"Are you trying to document the code; understand [the code] to fix it; or are you considering re-engineering your C code to maintain it at a higher level in the future?" asked Gene Forte, executive editor of "CASE Outlook," an industry newsletter published in Lake Oswego, Ore. Such questions dictate the tools that will work best.

The following is a sampling of tools that can be used with C programs:

• Program understanding and maintenance

Hindsight from Advanced Software Automation, Inc. in Santa Clara, Calif., handles documentation, interactive structure charts, static and complexity analyses.

Smartsystem from Procase Corp. in Santa Clara, Calif., provides modular tools for program filtering and viewing, function call graphing, syntax and consistency checking, debugging and editing.

• Charting and analysis

AutoFlow-C from Autocase Technology in Cupertino, Calif., converts C and C++ programs into flow charts and structure charts.

Clear+ for C from Clear Software, Inc. in Newton Upper Falls, Mass., produces flow charts, function cross-references and formatted source listings.

Logiscope from Verilog, Inc. in Dallas provides call graphs and metrics.

The McCabe Tools from McCabe & Associates in Columbia, Md., handles flow charts, structure charts and a variety of standard metrics.

• Development workbenches

C Development Environment from Interactive Development Environments, Inc. in San Francisco is an integrated environment with development, documentation, analysis and design tools.

Ensemble from Cadre Technologies, Inc. in Providence, R.I., is a modular workbench with charting, testing, metrics, design and reverse-engineering tools.

GARRY RAY

Lean tacos

Have you noticed that while you wait to board the red-eye flight to San Francisco, you can run over to a Taco Bell for a burrito to tide you over?

That is because Taco Bell has expanded its historic U.S.-only, restaurant-only business strategy to include airport outlets, sidewalk push-carts and other sites both here and internationally.

The company's redirected business strategy calls for a change in thinking among all employees but especially affects information systems, according to Jeff Buckner, a data analyst. The shift triggered an IS mandate to gather applications now spread across different divisions of the corporation, clean them up and store them in IBM's DB2.

The company outfitted its 60 programmer/analysts with $200,000 worth of Bachman's reverse-engineering tools.

The company is gradually turning its flat file, VSAM and IDMS applications into what it hopes will be leaner DB2-based applications.

Taco Bell purchased the tools before the business change but had not made much use of them until recently, according to Buckner. As a Bachman-certified instructor, he is leading several teams of 5 to 15 staff members through training on the products and the model-driven methodology behind them.

Buckner said that Bachman's tools have reduced by 50% the amount of time his staff spends on application analysis, and he said he expects even more savings as the project teams come up to speed.

"During the past six months alone, things have really been heating up as we've gotten better with the tool," he explained.

The biggest caution Buckner has for potential new users is this: "Spend a lot of time on education. Any project you try will be daunting at first."

KIM S. NASH

Caseworks revises GUI tool to support client/server

BY GARRY RAY
CW STAFF

As corporate developers become more sophisticated about client/server computing and graphical user interfaces (GUI), tool vendors are having to enhance and revamp their products to meet new demands.

A recent example is the revision of Caseworks, Inc.'s CASE:PM, a GUI designer and C-code generator for IBM's OS/2 Presentation Manager.

One of the first to enter the now-crowded arena for GUI design tools, the Atlanta company has released CASE:PM VIP, an updated version of the tool. Like other vendors of such tools, including Easel Corp. in Burlington, Mass., Caseworks has taken an add-on approach to answering the client/server question.

Through modular additions to the $3,495 program, which the company calls "designers," it intends to include support for a variety of client/server computing methods, delivering support for IBM's CICS OS/2, Advanced Program to Program Communication and High Level Language Application Programming Interface. Another designer, said Terry Flaherty, Caseworks vice president of marketing, will support SQL. All will be delivered during the fourth quarter, he added.

According to Flaherty, CASE:PM VIP uses this same "designer" technology to create various parts of the GUI. Designers shipped with the product include an application designer, which contains global application and platform information; a Dynamic Link Library (DLL) designer, which creates an OS/2 DLL containing all interface components such as windows and panels; and a variety of designers for other CASE:PM components, such as windows, panels, menus, data structures and user-defined application code. Two specific designers that support IBM's Common User Access '91 interface specification are the notebook and container designers.

Separately, Caseworks announced that it will license its proprietary knowledge bases for CASE:PM and its Microsoft Corp. Windows design tool, CASE:W. The knowledge bases, which translate GUI designs into C-language code, are normally encrypted and unavailable to users. Flaherty said licensed users will be able to customize these knowledge bases to generate C code that conforms to company standards or add proprietary features, such as a communications protocol, to the standard Caseworks environment.

Licenses for Caseworks' Open Knowledgebase technology begin at $35,000.

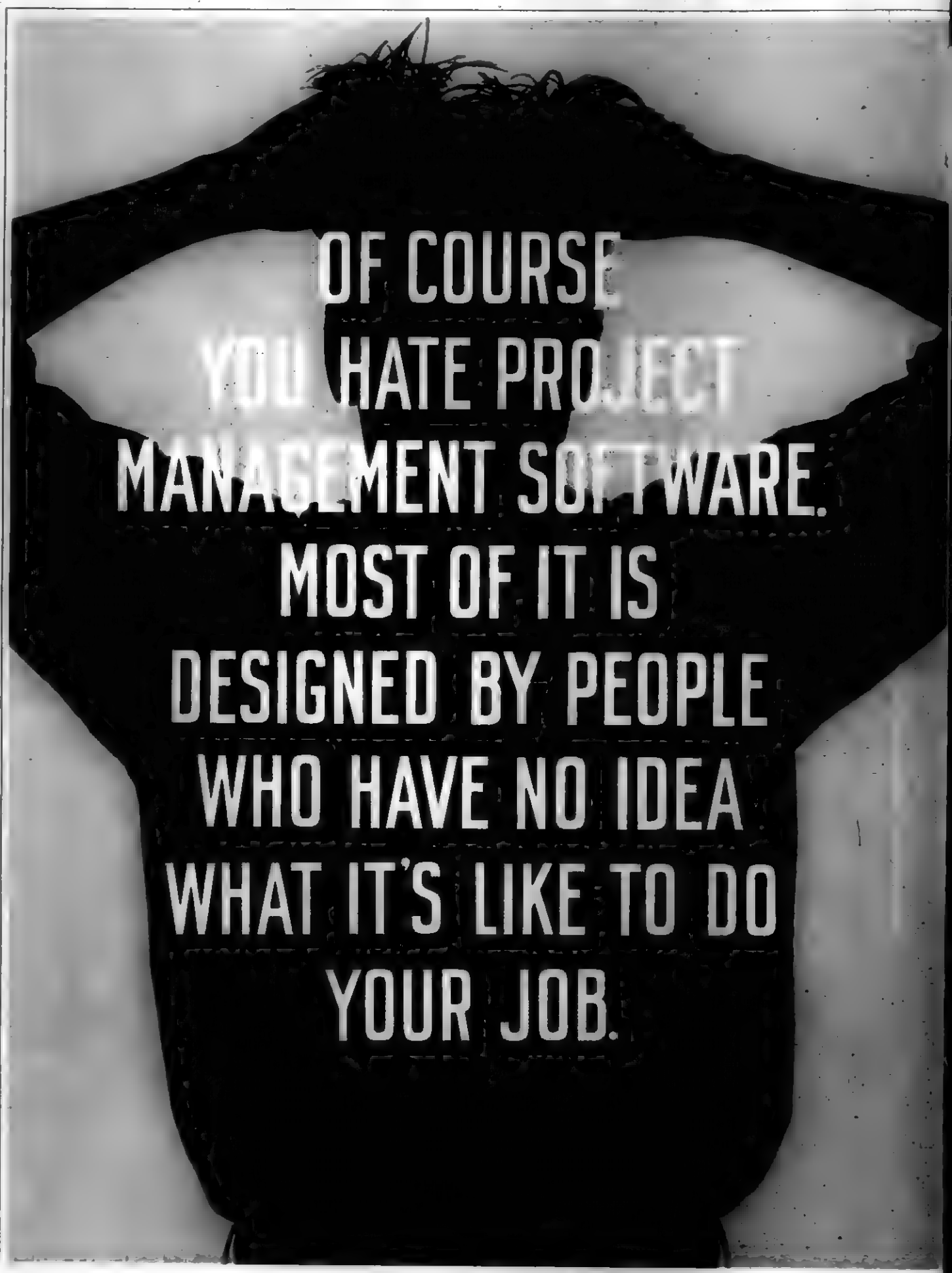
Whip code into shape

CONTINUED FROM PAGE 69

- Talk to at least five companies with comparable environments, avoiding canned customer references provided by the vendor.
- Remember the difference between data and process reverse-engineering — that is, current products cannot accomplish the latter.
- Be realistic. Existing tools can help uncover overly complex Cobol and sections of code that are not being executed.

Users have to be well-versed in the nuances of a given tool before they can expect to bring home the bacon, observers agreed. Extensive training is required, according to Jeff Buckner, a data analyst at Taco Bell Corp. in Irvine, Calif. Taco Bell, a division of Pepsico, is using Bachman tools for an extensive, if gradual, revamp of its entire portfolio of applications, Buckner said.

"We're struggling through a lot of changes right now," Buckner said. "Analysis is everything in reverse [engineering]."



NEW PRODUCTS

Application development tools

Watcom is shipping a line of client/server SQL database and application development tools.

The products were designed to help users deliver personal computer-based client/server SQL database solutions on a much wider scale. The Developer's Edition consists of a single-user SQL database server for stand-alone PCs and tools for C and C++ development of SQL applications. The Network Server Edition has a SQL database server that runs on a dedicated database server machine.

The Developer's Edition costs $795. The Network Server Edition costs $795 for a six-user version and $1,595 for an unlimited-user version.

Watcom
415 Phillip St.
Waterloo, Ontario
Canada N2L 3X2
(519) 886-3700

ProtoView Development Co. has released ProtoGen 3.0 for Microsoft Corp.'s Foundation Class code generation.

The product is bundled with a code generator for Borland International, Inc.'s Turbo Pascal for Windows, ANSI C and Borland's Owl C++ code generators. ProtoGen 3.0 features a menu designer, interactive test mode, controls on the main window and support for custom controls. It uses snap-in code generation technology, providing single-user interfaces to any one of the four generators. Four generators offer users a choice of target languages for selection and provide alternative implementations of the same user interface for comparison.

ProtoGen 3.0 costs $199.

ProtoView Development
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588

Logic Works, Inc. is shipping Version 1.1 of the Erwin/ERX database design software. Support for Oracle Corp.'s Oracle 7.0 is provided and offers enhanced reverse-engineering.

The product has an open architecture that allows users to move data to and from repositories, report generators, external data dictionaries and computer-aided software engineering tools using the ERX file format. It features automatic layout, copy and paste models and selective reporting and schema generation. Support for Gupta Technologies, Inc.'s Gupta SQLBase 5.0, Microsoft Corp.'s SQL Server 4.2 and Informix Corp.'s Informix 5.0 is included.

The product costs $1,995.

Logic Works
Suite 112
214 Carnegie Center
Princeton, N.J. 08540
(609) 243-0088

Languages

Blue Sky Software Corp. has released Version 4.0 of WindowsMaker Professional, a prototyper and C/C++ code generator for developing Microsoft Corp. Windows applications.

WindowsMaker Professional 4.0 creates applications for Windows 3.1 that can be migrated across platforms and languages. New features include creation of professional-looking applications and access to commonly used functionality, plus a new architecture using Switch-It Code Generation Modules. The modules consist of a knowledge base for generating code for a specific platform, allowing for language and platform independence.

The product costs $995.

Blue Sky Software
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365

Project management software seems to have one fundamental flaw: the people who design it usually aren't project managers. So they don't think the way you do. They give you functions you don't need or they oversimplify your job with products that soon become obsolete.

At ABT, we are project managers. Which is why we've designed a way to work based on a familiar way of thinking: yours. 1-800-4-PROJECT. Call us when you're good and mad.

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BY PROJECT MANAGERS.

APPLIED BUSINESS TECHNOLOGY

[redacted]

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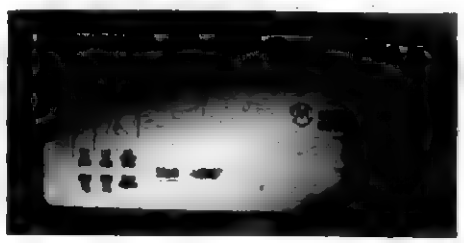
x744

The world's fastest dial modem can really make information fly.

For speed-sensitive, bandwidth-hungry applications – the ones users frequently complain about – Motorola Codex now offers the world's fastest dial modem.

Our new networked-managed V.fast modem, 326XFAST, is the only dial modem available today to provide throughput up to 115.2 Kbps async, 19.2 to 24 Kbps sync.



Motorola Codex's new V.fast. You just can't find a faster dial modem.

Anyone can move a ton of information. The question is how fast.

Speed like that is ideal for applications like remote LAN access that's notoriously slow, especially in a Windows environment. With V.fast, remote PC users can work just as productively as if they were on a local node.

It's also ideal for: multi-media and graphics-intensive applications, large file transfers, desktop publishing and off-peak polling. Plus, it's the perfect back-up for DDS and VSAT digital technologies and as a Switched 56 alternative.

Also, we ensure forward compatibility with the CCITT standard.

Like all of Motorola Codex's award-winning dial products, we back up V.fast with a 2-year warranty and a 24-hour replacement service. And it's available now from North America's most sophisticated Authorized Distributor network.

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MOTOROLA
codex

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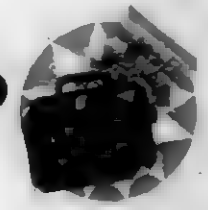
1-800-426-1212 Ext. 212
Fax# 508-261-1204.

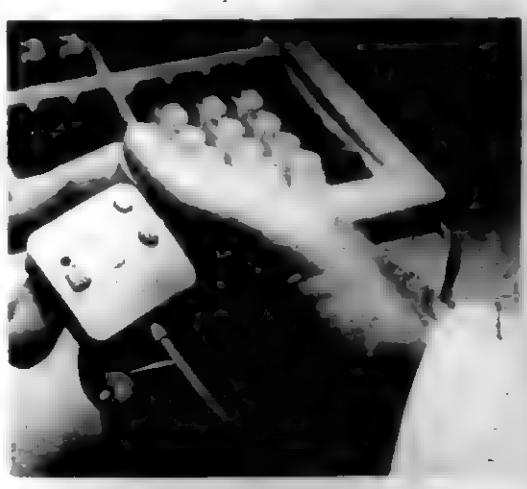
Travel accessories



With mobile computing on the rise, IS has a new task: Choose peripherals that give staff a competitive edge and a ready lifeline back to the office

Traveling pointing devices are becoming more important with Windows use on the rise. So far, though, nothing is quite as easy to use as the stay-at-home versions.

pg. 76



You can't have it all in portable printing. You can have some speed and an automatic sheet feeder — if you're willing to lug around 6 to 8 pounds. If you're not, you'll print 1 page a minute and feed sheets one at a time.

pg. 77

Portable modems top everyone's accessory list. Fast models are recommended for large file transfers, while slower speeds are OK for simple E-mail.

pg. 74

Pocket LAN adapters are handy for attaching notebooks to LANs, but performance has always been an issue. Now there are options that add speed into the equation.

pg. 77

It's no longer "pioneering" to carry a portable. From executives to salesmen to service people, every professional who travels will, at some point, carry a notebook or laptop computer and use it while on the road to dial into the office. Or fax a document to a client. Or broadcast an electronic message to his staff.

Even hotels, airports and public telephone companies have caught on: Only the truly backward hotel fails to supply modem hookups, and all but the most rural airports will soon be equipped with dataphones.

So congratulations on your new job responsibility. It's up to your staff to support the ever increasing number of remote and mobile users when they ask what's the best way to remotely access mainframe or server data. Or why their portable printer keeps jamming. Or why they can't edit their received faxes. Or how they can hook their notebook into the local-area network.

A mobile computing environment needs to do two things: allow users to work independently of the corporate structure and also tie in to the corporation when they need to. That means communications vehicles must be built, security must be addressed, and a computing architecture must be established to transmit timely data — possibly automatically — to notebooks in the field.

A good start is to equip travelers with the right equipment in the first place. And this is one market niche that's not at a loss for variety. There are portable compact disc/read-only memory drives and portable scanner adapters. There are vendors that specialize in carrying cases not just for notebooks but also for disks, phones and extra batteries. If you wanted to pack all the extras — single-outlet surge protectors, extra phone lines, duplex jacks, portable printer ribbons — you'd need extra bags.

The following pages will acquaint you with buying tips for the most in-demand accessories, the ones your users will soon be looking for, if they aren't already. To avoid future headaches, you'll want to start getting answers right about now.

Just a modem?! Not anymore

BY MARK LEASER

Modems were never considered a strategic product category — until the rise of mobile computing. Now, applications such as electronic mail, remote database access and sales order processing — which depend on a reliable modem — are an absolute necessity for mobile users. For some companies, modems and the applications that drive them are the first consideration in outfitting notebooks for executives, salesmen and service people.

Choosing the right modem is not as easy as it used to be. Two years ago, you picked either a "slow" 1,200 bit/sec. modem or a "fast" 2,400 bit/sec. internal modem. External modems were just too heavy.

Now users are more demanding, and there's more to choose from. The best way to make your choice is to look at five major considerations: speed, compression, error control, internal vs. external modem and fax capability.

A question of speed

▶Get ready for acronym city. Today's typical high-speed modem is described as a V.32, V.42 and V.42 bis modem. That means it has a speed of 9.6K bit/sec. (V.32), it can compress files to one-quarter of their original size (V.42) and it has an advanced error control system that makes sure the data is transferred properly (V.42 bis). When all is working optimally, the compression scrunches the file to one-fourth its original size, quadrupling the speed to 38.4K bit/sec.

You can get a faster modem; those with V.32 bis transmit data at 14.4K bit/sec. With 4-to-1 compression, speed is upped to 57.6K bit/sec.

Whether you need such speed depends on your application. For simple E-mail applications or small data files, a 2,400 bit/sec. modem without data compression is adequate. However, users who begin using E-mail for simple text transmission may eventually want to use the system to transfer spreadsheets and other large files.

If that's a possibility or if speed is a consideration, your safest buy is a 9.6K bit/sec. modem with 4-to-1 compression and V.42 bis error control.

The price gap is narrowing. Today, the street price for these high-speed modems is less than $500; buy direct, and you can pay closer to $299, such as for **Telebit Corp.**'s QBlazer.

In any case, both the sending and the receiving modems must be compatible to achieve the highest level of performance. But they don't have to be from the same manufacturer.

Popular 2,400 bit/sec. modems with V.42 bis compression and fax: Extech Data Systems (617) 890-7440 ($349); Megahertz Corp. (801) 272-6000 ($379); Telenetics Corp. (714) 455-4000 ($395); Ven-Tel, Inc. (408) 436-7400 ($229).

Internal? External?

▶Most notebook-toting road warriors won't look at an external modem. The thought of carrying another gadget is abhorrent, even if it fits in the palm of their hand. The benefits of an internal modem are numerous: no extra cables, batteries or power supply.

But external, or pocket, modems have their advantages. Consider the useful life of a notebook computer vs. that of a modem. A 9.6K bit/sec. pocket modem purchased today will probably still meet your needs in two years. It is unlikely that a notebook purchased today will do the same; when the notebook goes, so does the internal modem.

There is also a better selection of 9.6K bit/sec. modems in the pocket category. Today, most internal modems run at 2,400 bit/sec., but expect to see more high-speed internal modems in the next six to 12 months.

Unlike internal modems, pocket versions sometimes provide LED indicators that monitor modem transmissions. Both **Telebit Corp.**'s QBlazer and **U.S. Robotics, Inc.**'s WorldPort modem have this feature.

Finally, some pocket modems provide a jack to connect an acoustic coupler.

With the recent advances in modem chip sets from **AT&T Paradyne** and **Rockwell International Corp.**, modem manufacturers are now producing very small pocket modems with low power requirements. **Megahertz Corp.**'s P296FMV is a good example of these new external modems, weighing under 7 ounces and measuring 3.4 by 2.3 by 1 in. (see chart below).

External modems' longer potential life span increases the importance of a warranty. Warranties range from five years to lifetime options, such as for **Piiceon** and **Dallas Fax, Inc.**

Because of the extra manufacturing costs, external modems often cost more than internal modems. U.S. Robotics' WorldPort 2,400 bit/sec. V.42 bis external modem lists for $349, while its equivalent internal modem costs $299. On the other hand, Megahertz's external, high-speed 9.6K bit/sec. fax/modem is $50 less than its internal version.

Next year, we'll begin to see modems built around the Personal Computer Memory Card International Association standard (see story page 75).

Popular third-party modem vendors include Megahertz (801) 272-6000 and Holmes Microsystems, Inc. (800) 648-7488).

Lesser is president of the Executive PC Institute in San Diego, which specializes in sales force automation.

Speedy pocket modems

Modems capable of V.32 speed, V.42 bis compression

	SIZE (INCHES)	STANDARDS	ON/OFF SWITCH	FAX SEND/ RECEIVE	RJ11 TWIN JACKS	STATUS LIGHTS	PRICE
Dallas Fax, Inc. (214) 699-8999 9696 Pocket Fax/Modem	4 x 2.25 x .75	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32, V.32 bis/MNP-5, V.42 bis/MNP-2, MNP-3, MNP-4, V.42	Yes	Yes	No	Running on AC or battery	$328
Megahertz Corp. (801) 272-6000 The Megahertz P296 Pocket Laptop Fax/Modem	3.4 x 2.3 x 1	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42	No	Yes	No	None	$869
Microcom, Inc. (617) 551-1000 MicroPorte 4232 bis MicroPorte 1042	4.56 x 2.75 x 1.5	Both models support Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42. MicroPorte 4232 bis also supports V.32 bis.	Yes	No	Yes	Transmission speed, battery life, data terminal ready, power on	$899 (4232 bis) $649 (1042)
Telebit Corp. (408) 734-3333 QBlazer	2.3 x 2.4 x 2.4	Bell 103, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42	Yes	No	No	Send/Receive data, carrier detect, off hook, modem ready, data terminal ready, error correction, low battery	$599
Telenetics Corp. (714) 455-4000 Pony Express I Pony Express II	4.5 diameter (round)	Both models support Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32/MNP-5, V.42 bis/MNP-4, V.42, MNP 2-4. Pony Express I also supports V.32 bis.	Yes	Yes	Yes	Transmission speed, battery life, running on AC or battery	$695 (Pony Express I) $555 (Pony Express II)
Vocal Technologies Ltd. (408) 980-5181 Stowaway 14,400	2.2 x 3 x 0.8	Bell 103, V.21, Bell 212A, V.22, V.22 bis, V.32, V.32 bis, Fax Group III, Class 2/ MNP-5, V.42 bis	No	Yes	No	Transmit data, receive error correction, data terminal ready, carrier detect, off hook, modem ready	$499

Modem standards

Speed:	
Bell 103	300 bit/sec.
Bell 212	1,200 bit/sec.
V.21	300 bit/sec.
V.22	1,200 bit/sec.
V.22 bis	2,400 bit/sec.
V.23	1,200 bit/sec.
V.32	9.6K bit/sec.
V.32 bis	14.4K bit/sec.

Compression:	
MNP-5	2:1
MNP-7	3:1
V.42 bis	4:1

Error control:
MNP-2, MNP-3, MNP-4, MNP-10, V.42

Wanna fax?

Fax capabilities are available on internal and pocket modems for several hundred dollars more.

The typical fax/modem sends and receives faxes between a notebook computer and any Group 3 fax machine at 9.6K bit/sec. However, it may not transmit data at that rate. There are loads of fax/modems with a 2.4K bit/sec. data rate and a 9.6K bit/sec. fax speed.

Sending a fax is a lot easier than receiving one. Received faxes take eons to view, eat up disk space and spend forever printing. If you find a modem you like that has only send functions, you can save up to $100.

Receive capabilities are really worth it only when you have fax software such as FaxGrabber from **Calera Recognition Systems, Inc.** that can convert the incoming fax to a text file, allowing the user to edit it. Many fax/modems come bundled with fax software, but you may have to buy another package to get the features you want.

Faxing can be easy

▶OK, picture this: A salesman is meeting with a customer. Together, they complete a project plan using a spreadsheet. The customer asks for a printout. One glance at the guy's ancient dot matrix printer is enough. "I'll just send it to your fax machine," the salesman says.

The salesman connects the phone line to his notebook computer, loads the spreadsheet and selects "Print." But rather than selecting his regular printer, he selects a fax program. In minutes, his customer's fax machine is printing the spreadsheet, which looks a lot like it would on a laser printer.

Welcome to the new world of fax software. Many older packages required you to convert a document to an ASCII file before faxing; today's packages make it as easy as selecting "Print."

In the Windows environment, the programs function just like a printer. In the DOS world, packages such as WinFax Pro from **Delrina Technology, Inc.** redirect the printer output to a fax machine.

In addition to standard "send" and "receive" functions, these programs have a host of other capabilities. For example, you can fax a group of documents from several applications and include a customized cover sheet. Some companies are using this broadcasting feature to distribute product sheets and newsletters to customers and contacts.

Some vendors are bundling optical character recognition (OCR) software with their fax software. This converts incoming faxes into text that can then be retrieved into word processing software or other programs that accept ASCII text. Expect to pay about $50 more for OCR software.

In the end, the two most important factors to consider are ease of use and compatibility. The Windows programs all install and work like a printer. As for DOS, look for a package that does the same without requiring multiple steps.

Fax software

Bit Software, Inc.
(510) 490-2928
BitFax for DOS ($40)
BitFax for Windows ($79)

Ceere Corp.
(408) 395-7000
FaxMaster
Price: $249

Delrina Technology, Inc.
(408) 363-2345
WinFax Pro
Price: $119

Intel Corp.
(800) 538-3373
Faxability Plus ($119)
Faxability Plus/OCR ($249)

MagicSoft, Inc.
(708) 953-2374
MTEZ ExpressFax
Price: $99

SofNet, Inc.
(404) 984-8088
Faxit
Price: NP

Transfax Corp.
(310) 641-0439
Transfax
Price: $189

The future is on a card

BY W. BRYAN HASTINGS

▶Modems, LAN adapters and hard drives are starting to take on a new — and smaller — look altogether. This is due to the Personal Computer Memory Card International Association (PCMCIA), a group formed three years ago by Fujitsu Ltd., Lotus Development Corp. and a handful of other companies to set and promote a standard for solid-state memory cards and drives.

The group broadened its standard as the technology became available to build I/O devices, such as modems and LAN adapters, into the same small form factor.

Roughly the size of a credit card and several millimeters thick, PCMCIA devices are superior to rotating media in all respects. Devoid of moving parts, these solid-state devices are faster, more power-efficient and — a key issue for portable users — much more shock-resistant than hard and floppy disks.

PCMCIA's promotion is paying off. Credit card memory is down from more than $200 to $80 per megabyte, and half a dozen manufacturers include the current version of the slot (PCMCIA 2.0) in their portables, with several dozen more products expected on the shelves by the end of the year.

Should you get a PCMCIA-equipped system? If your portable will be exposed to a lot of knocks or vibrations — often the case with pen-based computers, palmtops and ruggedized portables — then the answer is a definite yes.

Otherwise, it's a question of whether you're willing to spend extra money for the extra performace. Apart from cost, a buyer should be concerned with compatibility issues if he wants to use the same card in different systems. Even though PCMCIA 2.0 cards are guaranteed to fit into 2.0 slots regardless of platform, interoperability — even among like platforms such as two Intel Corp. 80386-based computers — is not guaranteed.

Intel has stepped in with Exchangeable Card Architecture, a supplement to PCMCIA 2.0 that guarantees interoperability among similar systems.

Hastings is a free-lance writer in Keene, N.H.

The PCMCIA difference

On a card this size, several millimeters thick, you can have:

- **20M bytes of memory.**
- **An Ethernet LAN adapter.**
- **A 2,400 bit/sec. modem.**

However, you'll pay $70 per 1M byte vs. $5 to $10 for traditional hard disks for memory and $400 to $500 vs. $100 for the same performance modem. The credit card LAN adapter is comparably priced at $495.

Communicate!

▶Modems are not difficult to use. But modem software can be. You want users to be able to load the program, enter a few keystrokes and have the program dial into the system and handle the connection.

To qualify for consideration, a communications program should meet some basic requirements.

1) If the user will be dialing into a mainframe or mini, make sure it supports the proper terminal emulations.

2) It should include error protocols such as XModem, YModem, ZModem, ASCII and Kermit.

3) So that users don't have to enter long lists of esoteric commands, you will likely want the program to contain scripting or macro functions to automate dial-in sequences.

4) The program should include a dialing directory to support different phone numbers or dialing specifications. For instance, after connecting a modem to an office phone line, users may have to dial "9" to access an outside line. In a hotel, they may have to dial "8" and then "1."

Most of the popular packages meet these requirements (see chart); however, you do need to make sure your package is compatible with your fleet of modems, in terms of both brand and maximum speed capacity.

Above all, choose the package that has the best and most broad-based support. This includes the support offered by the developer as well as what's available from the modem manufacturer and services such as CompuServe, Inc.'s CompuServe and MCI Mail. That's because the first question a user will hear when he's having transmission problems is, "What communications software are you using?" If the user answers, "Procomm," "CrossTalk" or another leading package, he's in great shape.

Communications software

Datastorm Technologies, Inc.
(314) 443-3282
ProComm 2.4.3
($25-$50 for licensing)
ProComm Plus 2.01 ($129)
ProComm Plus for Windows
($149)

Digital Communications Associates, Inc.
(404) 442-4000
Crosstalk XVI
Price: NP

Hayes Microcomputer Products, Inc.
(404) 840-9200
Smartcom III
Price: $199

Microcom, Inc.
(800) 967-3529
Relay Gold
Price: $299 (DOS), $399 (Windows)

Software Ventures Corp.
(510) 644-3232
Microphone II for Windows
Price: $74.95

NP: Not provided

Printers: Closer, but not there yet

The good news is that print quality has gotten a lot better on portable printers. In terms of battery life, weight, ease of use and speed, however, portables are still about a year away from being ideal.

These printers are appreciated by those who really need them. Last year, only 15% of the people who own portable computers bought portable printers, according to Dataquest, Inc. Among that group, only about 40% say they move the systems around with any regularity.

Not that there haven't been improvements. You can get a very light printer, albeit without a sheet feeder. And you can get a speed of 6 page/min. — but you'll have to lug about 8 pounds of machine with you.

Vendors with products now in development are working on battery drain, size and weight, with systems expected to weigh between 2 and 4 pounds within a year, including the battery. Improvements are also expected in sheet feeders. Most major printers — with the exception of Citizen America Corp.'s PN48 — now have attachable feeders, but new products will have built-in mechanisms that are not so cumbersome.

Following are the leaders among a handful of portable printer vendors.

Canon Computer Systems, Inc.
(714) 438-3000
BJ-10EX
Price: $499

- **Weight:** 4.6 pounds with battery.
- **Size:** 12 by 8 by 1 in.
- **Technology:** Bubble jet.
- **Speed:** 83 char./sec.
- **Resolution:** 360 by 360 dot/in.
- **Emulation:** IBM ProPrinter, Canon LBP-LIISC, Epson America, Inc..
- **Fonts:** Four.
- **Paper handling:** Optional 50-page sheet feeder ($390).

Eastman Kodak Co.
(800) 344-0006
Diconix 701
Price: $549

- **Weight:** 5.9 pounds with battery.
- **Size:** 11.7 by 7.68 by 2.4 in.
- **Technology:** Ink jet.
- **Speed:** 3 page/min. (draft); 2 page/min. (quality).
- **Resolution:** 300 by 300 dot/in.
- **Emulation:** IBM ProPrinter, Hewlett-Packard Co. DeskJet Plus.
- **Fonts:** Three.
- **Paper handling:** Built-in 30-page, top-mount sheet feeder.

Mannesmann Tally Corp.
(800) 843-1347
MT735
Price: $999

- **Weight:** 8.3 pounds.
- **Size:** 11.4 by 8.7 by 2.3 in.
- **Technology:** Thermal transfer.
- **Speed:** 6 page/min.
- **Resolution:** 300 by 300 dot/in.
- **Emulation:** Epson America, Inc., IBM ProPrinter, Hewlett-Packard Co. LaserJet II, HP DeskJet Plus.
- **Fonts:** Four.
- **Paper handling:** Built-in 80-page, top-load sheet feeder.

The BJ-10EX has a huge share of the market and is comparable to the **Eastman Kodak Co.** Diconix 701 in terms of print quality and ease of use. Although it is lighter than the Kodak model, it is larger in dimensions and operates at a slightly slower print speed.

Mike McCormick, a sales manager at Torrance, Calif.-based K & M Co., says he is happy with the Canon BJ-10 now that he has enhanced the fonts with a software package. In fact, he compares its print quality to a **Hewlett-Packard Co.** DeskJet. "It's fine for letters and memos, but I wouldn't use it for a proposal for a new customer," McCormick says. "I also wouldn't use it for graphics because it looks like someone scribbled back and forth when an area is filled in."

McCormick says he likes the printer's simple design and the fact that a plastic cover comes down over all the buttons and switches so you don't have to worry about damaging the system. He's not so happy with its speed.

Dr. Arnold Friedman, a radiologist at Temple University Hospital, uses his BJ-10 as a desktop printer. "The print quality is as good as a laser printer, as long as I use good paper," he says.

The BJ-20 is Canon's newest model. It's faster than the BJ-10EX and has more fonts and a 50-page sheet feeder.

The Kodak 701 is faster than its closest competitor, the **Canon Computer Systems, Inc.** BJ-10EX, and almost as fast as the **HP** DeskJet. But it weighs nearly 6 pounds, and the company calls it a "mobile computer" rather than a portable, meaning that it was designed to be taken on the road when necessary.

With the built-in feeder, "you can put a stack of paper in the feeder and not have to worry about it," says Kim Schallhorn, an information systems programmer at Racine, Wis.-based Western Publishing Co.

"It was really easy to use because it has a menu that types instructions on a piece of paper prompting you on what to do next," she explains.

Peter Engeldrum, president of Incotek, Inc., a Winchester, Mass.-based consulting, research and design firm, compares the 701's print quality to the HP DeskJet. "It doesn't print as dark, but it has sharper lines and is less ragged than the DeskJet," Engeldrum says. A downside is its weight. "I wouldn't want to carry it," he says. "Also, the sheet feeder is awkward. I almost knocked it off a few times."

Kodak's 180, the first portable printer, is still actively marketed. Its print quality is poor and its speed is slow, but it is inexpensive and lightweight.

The MT735 is the most expensive of the portable printers. However, it prints quickly and with good quality and is best for users who need to print large numbers of high-quality documents.

"For our purposes, it's the only thing out there," says Ron Slater, systems and processing manager at Canton, Mass.-based Boston Mutual Life Insurance Co. "We go into a company and take insurance applications all day long that have to be printed out," he says.

The company has owned 40 of the printers for about four months. "The only downside is that you get 150 pages to one thermal ribbon, so people have to carry new ones and pop them in," Slater says.

At Jacksonville, Fla.-based Barnett Mortage Co., 120 of the firm's employees take the printers on the road for printing loan documents in the field. These need to be of high quality and printed quickly.

"It's faster than our HP II laser printer," says Bob Siedow, who orders equipment and provides hardware support for the operations department at Barnett. "And if you use the right paper, it can look like a laser printer."

Paper is an issue with the MT735. If you use heavy stock, it gets sucked into the printer and jams the system. You should use fine, smooth-surface paper, which is slightly more expensive.

Citizen America Corp.
(310) 453-0614
PN48 Notebook Printer
Price: $469-$549

- **Weight:** 2.5 pounds with battery.
- **Size:** 11.7 by 3.5 by 2 in.
- **Technology:** Thermal fusion.
- **Speed:** 1 page/min.
- **Resolution:** 360 by 360 dot/in.
- **Emulation:** Epson America, Inc., IBM ProPrinter, Citizen GSX.
- **Fonts:** Two.
- **Paper handling:** No sheet feeder. Single-page bottom and rear feed.

Citizen America Corp.'s PN48 is the lightest and smallest of the leading portable printers on the market. It is best suited for people who print only a small number of documents and who definitely need true portability.

David Buchinsky, an assistant administrator for diagnostic imaging at Temple University Hospital in Pittsburgh, uses the PN48 to print out documents at home or on the road when he is on call. "I can fit the printer, a computer and a power pack into a case that is no larger than most pocketbooks," Buchinsky says.

He says he was primarily attracted to the system because of its weight; however, he says, paper-feeding is inconvenient.

Print quality is a complaint for Dr. R. Wayne Porter, a general practitioner at the Duckworth Muse Medical Clinic in Piggett, Ark., who uses his PN48 to send letters to patients. "The multiple ribbon is only about half as dark as the single," Porter says, referring to the optional multiple-strike ribbon that claims 50 to 70 pages per ribbon. Single-strike ribbon yields 20 to 25 pages.

He has found that it helps to feed paper into the top of the printer rather than the bottom. "It's tricky to work it in, but it comes out darker for some reason," Porter says.

More storage

Face it. Even if you buy notebook computers with 120M-byte drives, sooner or later users will want more space. When that time comes, you can 1) Tell them to delete unnecessary files. 2) Buy disk compression software that can double the space. 3) Replace the original hard drive. 4) Buy a portable hard drive.

A growing number of manufacturers are producing pint-size hard drives that weigh about 2 pounds and fit in a briefcase along with a notebook personal computer. This fall you'll see even smaller drives — such as **Simplicity Computing, Inc.**'s PocketDisk, based on a 2½-in. drive and weighing less than a pound.

Installation is easy. An install program adds a driver to the main hard drive while you attach the portable unit to the printer port. A printer port on the drive lets you keep using the printer.

You do pay a premium for these portable drives, with 80M-byte versions costing about $700. However, they go up to 500M-byte configurations.

Vendors: Liberty Systems, Inc. (408) 983-1127; Simplicity Computing (800) 275-6525; Tidal Technology, Inc. (510) 748-7272; Vision Logic, Inc. (408) 437-1000.

MARK LEASER

Trackballs, etc.

You can travel with Microsoft Corp.'s Windows, but it's not so easy to travel with a traditional mouse. The cord is too long, and a surface is not always available. That's where traveling pointing devices come in.

The most prevalent is the miniature trackball that attaches to the side of a notebook's keyboard, about an inch away from the keys.

Microsoft and **Logitech, Inc.** are the leading vendors of these devices. While they are more convenient than the stay-at-home variety, they can be difficult to control with your thumb; the movement tends to be jumpy and the ball's motion sticky.

Appoint, Inc. in Pleasanton, Calif., offers a trackball-like device called Thumbelina that can be detached from the keyboard. Fremont, Calif.-based **Microspeed, Inc.**'s MicroTrac is similar.

Another option is the pen-shaped mouse, also available from Appoint. You hold the device like a pen, pushing the mouse button with your index finger and controlling the ball (located where the penpoint would be) by "writing" against any surface.

Other vendors are coming out with miniature mice, which look like traditional mice except smaller. These include Wheat Ridge, Colo.-based **Zirco, Inc.** and Appoint.

MARY GROVER BRANDEL

The well-connected mobile user

BY W. BRYAN HASTINGS

You can buy as many peripherals as you want for your notebook users, but put a check on your spending until you've grappled with the "connectivity thing." All those fancy accessories have to hook up to the notebook to be of any use at all.

The problem isn't so much getting a notebook that has ports; at this point, no self-respecting notebook is sold without a serial and parallel port, a slot for an internal modem and a couple of connectors for a desktop monitor, an external keypad and a bus slot, usually for an internal modem. Portable makers are building into the motherboard many functions normally found on desktop expansion cards, such as video controllers and parallel port systems.

The challenge is getting the right combination of connectors, especially with the ever-increasing variety of totable peripherals. If you've ever tried to use a modem and a mouse at the same time on a notebook with a single serial port and no mouse port, then you know what that's all about. You can also pick up accessories that help you augment the connectors you have.

Pointers

Always carry two 12-ft phone line cords, several "inline couplers" and a duplex jack: The lines let you put your notebook on a hotel desk and still reach the phone jack. You can use the couplers to join the phone lines, while the duplex jack keeps phone and modem connected simultaneously.

Call a hotel first to see if it has built-in data ports on its phones. That way, you can connect your modem and still use the phone. Avoid hotels with phones that are hard-wired to the wall.

MARK LEASER

Basic model

Nearly all notebooks and laptops supply the following ports:

Serial
Connects pocket modems and pointing devices such as mice.

Parallel
Appropriate for printers, LAN adapters and most external hard and floppy drives.

Connector to an external monitor
A 15-pin "D" connector that serves as a port for VGA and Super VGA displays, such as desktop monitors and projection panels. Some late-generation portables, such as those from AST, Dauphin, Dell and NEC, take advantage of this by offering Super VGA video controllers.

Internal bus slot
Generally intended for internal, proprietary modems. Much smaller than the standard 8- or 16-bit slot.

Numeric keypad connector
A 1/8-in. plug connector. A few notebooks use a PS/2 connector as a keypad connector.

Enhanced model

Others allow the mobile professional to create a more desktop-like PC from his portable:

Two serial ports
Allow you to use two serial devices at one time. Found standard on Dauphin's 500-GT and as an optional serial port board on AST, Compaq and some Zenith notebooks.

Parallel port
See above.

Connector to external monitor
See above.

Connector to full-size keyboard
Usually a PS/2 connector. Available on models such as NEC's UltraLite SL and Compaq LTE Lites. Some accept only a mouse; others accept either a mouse or a full-size keyboard.

Mouse port
Saves serial ports for other peripherals. Found on most late-generation notebooks. Most are PS/2 connectors that may serve double-duty as an external keyboard connector.

Internal bus slot
See above.

To the LAN — quickly!

▶Using pocket LAN adapters sure beats trying to juggle disks between a notebook and a LAN-attached PC or fumbling with file-transfer cables. And it's great giving your notebook instant access to the office network. But you've probably heard a lot of complaints about how slow they are.

These devices, usually the size of a pack of cigarettes, plug into the printer port of any portable, but the convenience is diminished by sluggish network performance compared with a network card.

There are a couple of ways to pick up the pace. One is by choosing the proper portable and LAN adapter. Near-bus card speeds can be achieved with a LAN adapter and portable that sport the Enhanced Parallel Port (EPP). The EPP is found exclusively on 80386SL-based notebooks and is active only on some, such as SL-based PCs in **Compaq Computer Corp.**'s LTE Lite line, **Zenith Data Systems**' Mastersport and Z-note series and **Dell Computer Corp.**'s 325NC and 325NLC notebooks. Only **Xircom, Inc.**'s adapters take advantage of the EPP.

If nothing less than true bus speeds will satisfy your LAN adapter demands, consider **Megahertz Corp.**'s T2 line of Ethernet and Token Ring adapters. These plug directly into the 100-pin external bus connector found on some **Toshiba Corp.** portables.

Perhaps the most interesting development in portable networking is **D-Link Systems, Inc.**'s PCMCIA 2.0-compliant Ethernet adapter. This slender device plugs into a PCMCIA 2.0 slot (see story page 75), making it the smallest LAN adapter available. By the end of August, the LAN card will be available at $495 for the Toshiba T3300SL, Dell 320SLI and **Librex Computer Systems, Inc.** T386SX notebooks.

There are about a dozen LAN adapter manufacturers in all. Arcnet and Ethernet adapters list for $200 to $450; Token Ring adapters have suggested retail prices of $700 to $800.

LAN adapters

Accton Technology Corp.
(510) 226-9800

CNet Technology, Inc.
(408) 954-8000

D-Link Systems, Inc.
(714) 455-1688

Megahertz Corp.
(415) 226-9800

Solectek Corp.
(619) 450-1220

Xircom, Inc.
(818) 878-7600

Options

▶There are more and more ports coming out that are intended for specialized uses. And if you use many peripherals, you may be interested in products that eliminate the need for ports or augment the ones that are there.

• **Small Computer Systems Interface (SCSI) connector to CD-ROM drive.** A 25-pin female "D"-style connector. Only **NEC Corp.**'s UltraLite SX/20 offers a built-in version for the company's portable CD-ROM drive. **Compaq Computer Corp.** offers a SCSI-II adapter that plugs into the external bus connector on some of its notebooks.

• **External bus connector.** Used for connecting external optional adapters and expansion stations.

• **PCMCIA slots.** Newest type of port that accepts memory, modems and now LAN adapter cards (see story page 75). Frees up the serial or parallel port you would otherwise use for these devices.

• **Xircom, Inc.'s Multiplexer.** If you find yourself wanting to use your printer and LAN adapter simultaneously but only have one parallel port, this $95 device allows you to keep your printer on-line and also attach to the LAN. Multiplexer, which works only with Xircom adapters, plugs into the printer port and offers two parallel ports for adapter and printer.

• **Built-in trackball.** Rather than having to dedicate a port to a mouse, some notebooks build the pointing device into the computer. Found on a small but growing number of notebooks, such as **Sharp Electronics Corp.**'s PC-6881, Compaq's color screen notebook and **Apple Computer, Inc.**'s PowerBooks.

• **Expansion stations.** If variety and number of ports is what you're after, expansion stations, offered by most major portable manufacturers, are the ultimate. They contain five full-length standard slots and several drive bays, so a user can plug in a network card, a CD-ROM or extra hard drive, a high-resolution video card, etc. They come in two forms:

▶**Expansion chassis.** This device is essentially a box that hitches to the external bus connector with a cable or a cartridge that clips to the back of a portable. It contains expansion slots only and ranges from the size of a desktop modem to about half the size of a desktop PC.

The smaller, cartridge-style chassis is especially handy for LAN technicians and other employees who travel from site to site and must access networks of different topologies at different locations.

▶**Desktop stations.** The larger expansion chassis is being slowly replaced by desktop stations, which are essentially CPU-less desktop PCs with a square hole in the front. A notebook slides into the hole to complete the system. In their fullest form, desktop stations come complete with desktop monitor, full-size keyboard and table chassis with expansion slots and drives. But desktop stations are expensive, listing for as much as $850.

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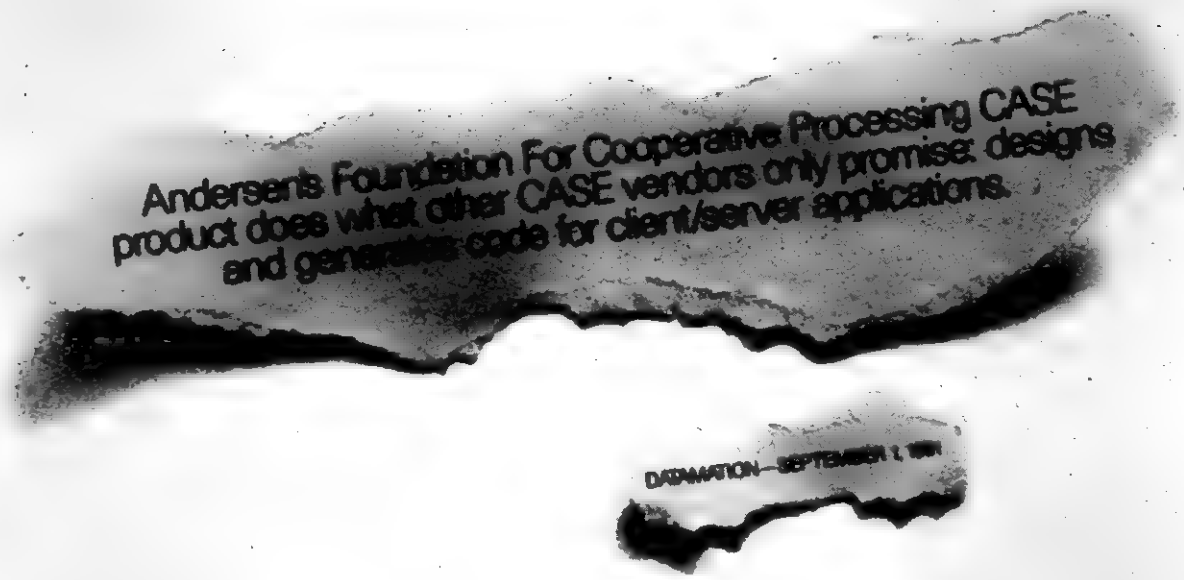

Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

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INTERVIEW

John Seely Brown

'One of the guiding principles for me is that technology is finally getting powerful enough to get the hell out of the way'

John Seely Brown, director of Xerox Corp.'s legendary Palo Alto Research Center (PARC) in California, is a self-proclaimed BMW fanatic who likes to think deep thoughts as he tears along Route 280 through the Silicon Valley.

Among his ruminations, and the subject of an article he wrote for *Harvard Business Review* in 1991, is the notion that corporate research laboratories can no longer create new products in a vacuum.

That subject is close to his heart. Brown is well aware of PARC's reputation in the computer industry as an organization whose innovations during the 1970s and 1980s were systematically siphoned off by companies other than Xerox (see chart page 80) to fuel the personal computer revolution.

In the two years since he became PARC's director, Brown has pushed hard to strengthen the collaboration between PARC and Xerox. Products with heavy PARC input are hitting the market, such as Xerox's advanced digital copiers and Paperworks, software that, he says, turns PCs into fax answering machines that receive or distribute information.

Brown, who holds degrees in computer science and math and held joint appointments at the University of California at Berkeley in computer science and cognitive psychology, must be doing something right: Six months ago, he was named chief scientist of the entire corporation. He reports to Xerox Chief Executive Officer Paul Allaire.

Brown joined PARC in 1978 after working at Bolt Beranek and Newman, Inc. in Cambridge, Mass., on advanced artificial intelligence research. In his current position as PARC director, Brown serves not only as chief administrator — keeping watch over all the research done by the 350-member staff — but also as Xerox's corporate liaison for research and development and as a member of Xerox's board of directors. He constantly rushes from coast to coast, recruiting new talent and talking about controversial new concepts of computing. "Several times a day, you hit something fundamentally new, and you get surprised," he says. "I love it!"

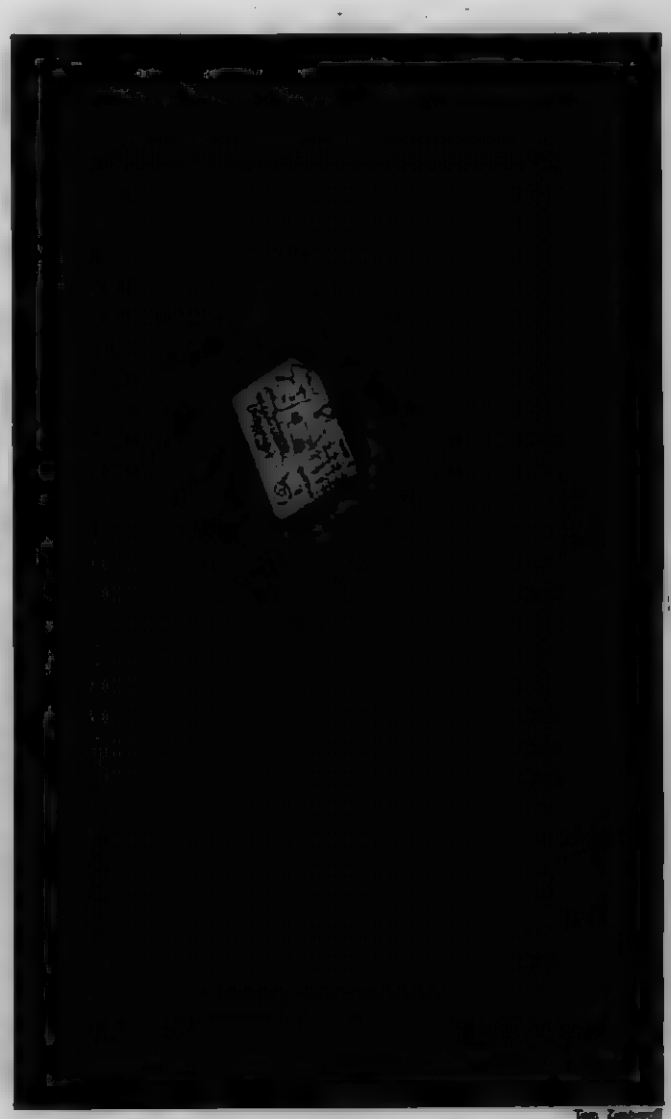
Among his current hot topics is "ubiquitous computing," an idea that PARC, as well as other laboratories such as Olivetti Research in the UK [CW, April 20] and MIT's Media Lab, is trying to put into practice.

The idea, Brown explains, is that the computers of tomorrow will be invisible to users, embedded into our environment rather than sitting as boxes on desktops. He envisions advanced chip technology that will allow the computerization of such mundane items as Post-It notes and blackboards.

Add some sophisticated wireless networking and whole rooms will be empowered with technology. Walls, floors and countertops will know which users are present and will configure the environment to their needs. User-friendly group communication and collaboration will occur instantly and naturally.

The speed with which such computing changes are taking place has Brown wondering whether he can keep pace in a research profession that is "a game of ultra-high-energy young people." That feeling is so strong that the youthful-looking Brown only reluctantly reveals his age: 52. With the apparent energy level of a BMW 750i, however, he need hardly worry.

During a recent trip to Cambridge, Brown met with freelance writer Glenn Rifkin to discuss PARC and his views on where computing is headed.



Tom Zimberoff

Brown: *Computers will be embedded in everyday objects. It'll take wireless nets, advanced chips, but computing will come to masses.*

Q How did you get involved in your current work?

A I came to PARC in 1978 [because I had the chance] to create a cognitive science group. It struck me that the constraints of the 1990s were not going to be technological constraints but cognitive constraints. I wanted to find out what things could help people understand how to use technology effectively and appropriately. I wanted to discover how people learn things and what makes something really learnable.

These were issues beyond icons. Icons and a mouse were kinds of interfaces that allowed users to learn new technology rapidly. But they only go so far. So I argued to Xerox that the key barrier to the future was going to be the move from how technology was used to how people appropriated new work practices around that technology.

Q Where are you taking PARC research today?

A We want to look not only at how an individual appropriates the use of technology but

Continued on page 80

Continued from page 79

how an organization does — the social embedding of technology and how it is used. We want to find out how an organization enacts new work practices, enabled by technology, to become much more productive.

Look at the current productivity paradox: There are very few productivity gains, even with all the spending on information technology in Fortune 1,000 companies. It may be that nobody has thought through new ways to organize that are enabled by these technologies.

Information technology may be a new kind of structural material, just like steel was 80 years ago.

Q That sounds like the concept of re-engineering.

A It's even more than re-engineering. It gets at how you start to tap and release the collective genius of an organization — how you organize for learning.

Q Can you explain the idea of ubiquitous computing?

A The computer world has focused on the box on the desk with the individual using it to the exclusion of everything else. Even with networked computers, you've still got individuals interacting with individual screens networked together. But this is not how people really learn and create. They collaborate over a common work space. I think of it as shoulder-to-shoulder computing, where we collect around one common space. This led to our idea of a live board [a computerized blackboard PARC created].

It was an observation of mine a half-dozen years ago that an amazing amount of productive knowledge work happens around the coffee pot. I'm calling it the distributed coffee pot challenge: How do you have the same kind of familiarity, the same kind of impromptu conversations around a distributed coffee pot, because that's where the action is.

In order to make computers more productive, we have to worry about a sense of virtual collocation, the ability for workers in disparate locations to feel as if they are together with co-workers.

Q So with ubiquitous computing, computers become embedded in the environment around us?

A Many people come to me and say, "What do tomorrow's user interfaces look like?" I say, "Tomorrow's user interfaces are invisible to you." For ubiquitous computing to work, computers have to become a part of the social and physical fabric of our space. They have to become a part of the artifacts we work with.

PARC's vision is of invisible computers in infrastructures that keep you better connected to the world, socially and physically. You won't see tomorrow's computational substrates any more than you see them in your car. You don't ask what operating system runs the computers in your car.

One of the guiding principles for me is that technology is finally getting powerful enough to get the hell out of the way.

I don't want more features; I want it to get out of the way. I want it to become transparent to what I want to get done.

Q Where are you currently on this quest?

A Inside PARC, this is operational in multiple forms. We're laying out the whole notion of how to build a smart building, so even the heating system, the air-conditioning systems know who is in what room and balance the system accordingly. All that is being merged with the ubiquitous computing. Office equipment, [intelligent] badge technology and new types of sensing technology are involved.

Invented here, commercialized there

In the past, companies took Xerox PARC ideas and turned them into products

PARC technology:	Later developed by:
Hardware	
Chip-making technology	VLSI Technology
Silicon compilers for chip design	Silicon Compilers
Portable computing	Grid Systems
Bit-mapped screen displays	IBM, Apple
Mouse- and icon-based computing	Apple
Laser printers	HP, Apple
Drawing tablets	Koala
Ethernet office networks	3Com
Software	
Graphics computing and computer animation	Pixar
Database-retrieval systems	Metaphor Computer Systems
WYSIWYG word processing	Microsoft
SmallTalk language, object-oriented programming	ParcPlace Systems, Digitalk
Desktop publishing and typesetting	Adobe Systems

Source: *The New York Times* — CW Chart: Stephanie Faucher

Q Does such computing have special requirements?

A It requires multiple levels of networking. We have infrared networking, spectrum networking, near-field effect networking, radio technology networking. We're finding out how you merge all these different kinds of networks that have different bandwidths.

Q Does PARC's focus on how breakthroughs get enacted and used signal a change in Xerox's attitude about its research center?

A In the '70s, PARC was peripheral to the corporation. In the '90s, PARC is central to the corporation. Xerox has embraced PARC's [digital research] and is beginning to ask questions about how digital technology can transform copying.

The DocuTech copier/printer you see on the market today is a symmetric multiprocessor scalable architecture. Hundreds if not thousands of MIPS are required for high-quality, high-speed copying today, let alone scanning, image processing and printing.

With digital copiers, what goes in can now be computed on, added to, augmented, cleaned up, synthesized to what goes out. We've broken the physical link in terms of photons, between input and output. And once you do that, there's a whole new world out there. The demands on computer science are astronomical, and we are heavily invested in scalable computing technology platforms, smart sense arrays, sophisticated solid-state imaging devices, all tied together to stress the foundations of computer science and physics.

Q PARC's reputation has been to invent and then watch someone else create a marketing success with the idea. Are things different now?

A Two things at PARC have changed: One is that we've moved from the periphery of the company to becoming an integrating force for the corporation. We've become the bridge from the digital copying world to the document world. That's a major event.

The second change is that we no longer operate in isolation. Before, a technology transfer meant throwing it over the transom to line divisions. Now we play a much greater role in shaping the corporate strategy. So you find a corporate long-term strategy that is informed by research as much as research is informed by the long-term corporate strategy.

In the old days, in most corporations, research worked on a 10-year time frame; engineering worked on a 10-month time frame. There's a real mismatch between these two time scales.

Q Do you have an example of how you've smoothed out that mismatch?

A Look at the Paperworks software product. Its current rendition is a small piece of software, [but we see it as a] first example of ubiquitous computing.

All of a sudden, every fax machine becomes a portal to my workstation. Wherever I am — I travel all the time — I can get any document I want at any time I want without a secretary by being able to fax these smart documents to my system, have it get interpreted in the system and have the system fax back relevant things.

It's a product that came out of PARC in less than a year. With that we've launched an entire new business division within the corporation that's 100 feet away from PARC's offices.

Q Are there other changes occurring at PARC?

A We're looking at technology transfer as much more of a dialogue or conversation between research and line organizations and our lead customers. Ideas don't necessarily get formed just in the head; amazing innovations really come from the world. So that's a different spirit, rather than the one that says we always know best, us vs. them. It's now a question of partnership, of co-production.

At the same time, there's been a return to the belief that our particular value-added to the corporation comes from challenging sacred cows, challenging background assumptions and thinking out of the box. I call that "pioneering research" or "radical research." It looks to be connected to real problems on one hand, so we expect our researchers to be marinating in the real problems of the corporation. But on the other hand, they should have the absolute freedom, if not the responsibility, to step back out of that marination and to think radical thoughts, to reframe the problems, to look for the fundamental core of the problems. That's a different kind of spirit.

Q Has Xerox gotten over PARC's reputation for creating innovative technology that others used to succeed?

A PARC would not be a crucial element for [Xerox CEO] Paul Allaire if we had not produced a fair amount of stuff for the corporation.

People overlook the fact that there is an amazing computational infrastructure that comes from PARC. Today, every copier has graphical user interfaces from PARC. Most of them have Ethernets inside them, distributed computers inside them. There is a myth here that's a little bit misleading. [Take, for example, the idea that Steve Jobs turned PARC ideas into Apple products.] Very few people in the PC world realize that we held a percentage of Apple when Steve Jobs came to PARC. So when Jobs came into PARC, we were aware of Apple.

Q So the prevailing story, that Jobs snooped around and found technology to use for the Macintosh, is misleading?

A Absolutely. We never intended to go into the PC business but into distributed computing. He wanted to go into PCs. So it was not that nonsensical to let him see some of the technology. •

The cost of having a vision

For John Seely Brown, the title of "visionary" isn't necessarily a comfortable one. Vision, he explains, may come more easily to those who have access to all the right resources.

"I came from Bolt Beranek and Newman and the DARPA community, where you tend to use million dollar machines as personal machines. Quite honestly, some of the accomplishments of PARC are much less spectacular if you remove the cost constraints.

"When you have a $1 million personal computer, you start to think and do things differently. And what seems to be so visionary is often an issue of removing cost constraints.

"Did PARC or Alan Kay invent personal computing and make it catch on? The same could be asked about the father of spreadsheets or word processing. Those guys showed you could do amazingly useful things in 4K and 8K machines. To me, they were as visionary as the rest of us. We get more of the credit. We could think bigger thoughts because we used bigger machines."

MANAGER'S JOURNAL

EXECUTIVE TRACK

In a special ceremony held late last month, **Spain W. (Woody) Hall Jr.** ascended to the post of executive director of the **U.S. Air Force**'s **Standard Systems Center** located at Maxwell Air Force Base's Gunter Annex in Gunter, Ala. Hall, who has been a member of the Air Force's Senior Executive Service since 1988, becomes the first civilian ever to head the center, which supplies all major Air Force, **U.S. Department of Defense** and other federal agency commands and bases worldwide with computer system design, development, acquisition, maintenance and management.

Hall's installation was followed by a retirement ceremony for his predecessor, Brig. Gen. **Rick Zehrer**, whose retirement ends three decades of military service.

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Effective Sept. 10, **The Washington Post** will have a newly created position — vice president of technology — and a newly promoted executive to fill it: **Ralph Terkowitz**, who has served as vice president of data processing at the Washington, D.C.-based newspaper since 1986. Terkowitz joined the paper 10 years earlier as a computer programmer and has held several information systems positions since then.

.....

In Walnut Creek, Calif., **Delbert Yamaki** has joined **Bank of the West** as vice president and applications manager in the systems and programming department. Yamaki was formerly a systems manager at **Citibank**. His new post is with one of California's oldest banks, which was founded in 1874 and has 100 branches.

.....

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Nell Margolis, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Keeping pace with CASE philosophy

Systems development managers rub elbows with key business-side execs

BY KIM S. NASH
CW STAFF

Sure, we already know that chief information officers hobnob with core executives on the business side of the house. But increasingly, systems development managers are joining that strategy-setting inner circle.

One striking side effect of the move to computer-aided software engineering (CASE) and the industry's new emphasis on re-engineering the business seems to be a boost in software builders' prestige.

These days, at companies such as Levi Strauss & Co. and Otis Elevator, Inc., application development leaders are showing up on high-level executive committees and helping to map their firms' strategic direction.

Development managers say that along with the tools of their trade, the philosophy behind it has changed and has propelled them to greater prominence.

"People who see CASE or other application-building products as [nothing but] tools are short-sighted," says Donna Rund, director of information engineering at Levi Strauss.

Three years of using CASE methods have brought Rund's development team and the firm's senior management together to craft a global architecture, she says.

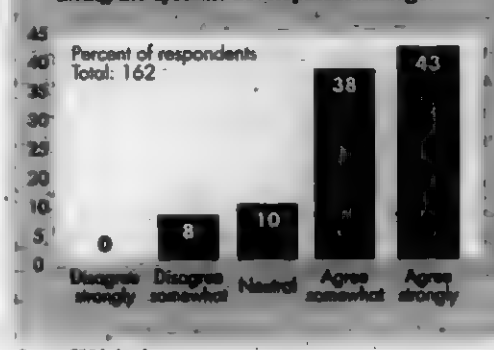
Rund participates in a cross-functional management group that

To page 83

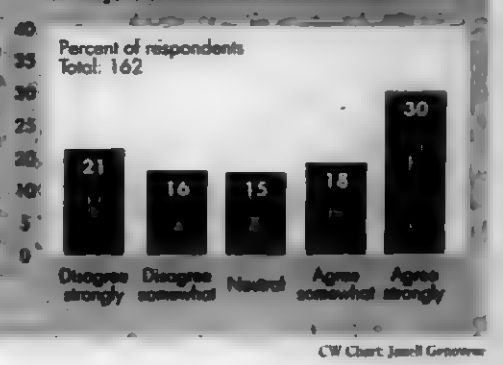
Development difficulties

Coping with interdepartmental changes and those affecting the entire business are formidable challenges for systems development managers

Transforming the systems development culture is one of the greatest challenges facing the systems development manager



Changes in the business environment have required us to reorganize the systems development unit in the last 12 months



Source: CSC Index, Inc.

CW Chart: Janell Genovese

Honey, I blew up the outsourcing contract

BY NELL MARGOLIS
CW STAFF

Six months after signing a contract to outsource its mainframe-based, nationwide data processing functions to a professional management firm in order to concentrate its own information systems resources on more strategic application development, Homeland Stores, Inc. learned that its outsourcer was on its way out of business.

That is the stuff an IS director's nightmare is made of.

But William Rulla, Homeland's IS director, said he is not planning on any sleepless nights.

Homeland — an approximately $30 million, 115-store grocery chain — has two safety nets on which to rely, he said.

For starters, it has its vendor's pledge of support. Homeland's data processing is outsourced to Dallas-based Kimberly-Clark Computer Services, Inc., a wholly owned subsidiary of $6.8 billion paper products giant Kimberly-Clark Corp. Recently, Kimberly-Clark decided to pull the plug on the 3½-year-old company, which was spun off in 1988 with lofty goals of gaining its parent a beachhead in the booming outsourcing and software development markets that apparently never quite materialized [CW, Aug. 10].

However, while ongoing business has ceased at Kimberly-Clark Computer Services, and approximately 80% of its work force has been laid off, the company is maintaining a large enough cadre of employees to honor all outstanding commitments to customers, a spokeswoman said earlier this month.

That promise of ongoing support, Rulla said, has been specifically reiterated to Homeland — Kimberly-Clark Computer Service's sole external outsourcing customer. The outsourcing arrangement, under which Homeland migrated from its IBM mainframe-based shop in Oklahoma City to a Kimberly-Clark data center in Neenah, Wis., "has been going just fine," Rulla said. "We expect that to continue."

And if it does not, he added, Homeland will fall back on its second layer of security: a hefty penalty clause in its outsourcing contract. Rulla declined to reveal the dollar figure specified, but noted, "It's very big; let's just say, it's big enough so that if it comes into play, I'll smile all the way to the bank."

One former Kimberly-Clark executive, who requested anonymity, speculated that the Homeland penalty clause is a driving force behind Kimberly-Clark's resolve to keep an able support force at Kimberly-Clark Computer Services, even as the subsidiary effectively shuts down. "Believe me," the executive said, "they're going to go a long way to avoid having to confront that [penalty clause] in court."

CIOs pushed to prove gains

BY NELL MARGOLIS
CW STAFF

An alarming number of firms that spent the 1980s investing to the hilt on information technology are getting a rude awakening in the 1990s, according to Harvard Business School assistant professor Gary Loveman. "When they ask, 'Where is the productivity gain from our investment,' " Loveman said, all too often the answer is, 'Darned if we can find it.' "

This stark assessment echoes the findings published recently by research and consulting firm Ernst & Young. According to the firm's annual banking survey, banks that invested some $14.1 billion in technology in 1991 alone are having a hard time tracking the investment into productivity gains [CW, Aug. 3].

This may be one of the scariest ideas to stagger out of the lab since Dr. Frankenstein forgot to tie his research down. And information systems chiefs, according to search firm executive John J. Davis, are among the first to feel the monster breathing down their necks.

"Until recently, visionary CIOs — strategists — were in great demand," noted Davis, whose New York-based firm, John J. Davis & Associates, specializes in executive searches in the IS area. "Now, the emphasis is shifting sharply to a proven ability to deliver."

Davis noted that chief information officers can draw some fairly pointed conclusions about what corporate management expects of them based on what comparable firms in search mode are looking for in their new IS chiefs. And regardless of the company's particular business niche, the shift from dreamers to doers is clear, Davis said.

"It isn't that the emphasis has shifted away from technology — it hasn't," he said. Rather, firms are coming to view technological acumen as necessary but not sufficient. It is a mix of attributes that Davis said "increasingly appears in mission statements of CIO posts." Some of the other attributes include the following:

- Sensitivity to basic business issues, especially those relating to customer service and operating efficiencies.
- A proven record of close involvement with day-to-day business activities.
- A history of bringing in projects on time and on, or under, budget.
- A bottom-line approach to replacing old technology infrastructures and doing it without hurting customer service.
- The ability to perform in a business environment that regards technology as one of many answers to business challenges and not always the best answer.
- Expertise in keeping staff trained in an ever-broadening array of technologies.
- Team building and interpersonal skills.
- Communications skills that operate at all organizational levels.
- A knack for delivering on the greatest number of the foregoing "druthers," all with a leaner staff and budget than the CIO used to have.

A daunting wish list indeed, but CIO aspirants do not have to fear that only Superman need apply, Davis said. "There are always trade-offs in our business," he noted, "and companies are realistic enough to know that no one will manifest all of the qualities they're looking for." Nevertheless, he added, the smart CIO will not disregard what is clearly the writing on the IS shop wall.

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Keeping pace with CASE philosophy

CONTINUED FROM PAGE 61

includes people from corporate planning and the company's executive management committee.

"If development groups see their job as simply moving to client/server architectures or learning object-oriented techniques, then the long-term strategy of the business will suffer," says Nicholas Vitalari, vice president of CSC Index, Inc., a consulting firm in Cambridge, Mass.

CASE taught Levi Strauss that "painful" lesson, according to Rund. The $4 billion San Francisco-based firm bought KnowledgeWare, Inc.'s tools in 1989 with the goal of applying CASE to a larger business mission, instead of using it simply as "a way to program a pile of code," Rund says.

However, even with that understanding from the start, CASE "really pointed up our deficiencies in business knowledge," she says. For example, in order to effectively design new systems, designers and programmers at Levi Strauss had to get closer to the users to learn how and why tasks were done.

"Since we started CASE, users have had a buy-in to our projects, which was not the way we traditionally worked," Rund says.

Levi Strauss is not alone. In CSC Index's 1992 Summit Survey of systems development directors, the more than 350 respondents cited "identifying and developing strategic information systems" among their Top 10 most pressing concerns.

Share of limelight

Application development groups are entering the limelight as business re-engineering gains momentum, agrees James Wetherbe, director of the MIS Research Center at the University of Minnesota. The same business trend that is focusing attention on developers is making them an increasingly business-savvy crew, he adds. Systems developers are learning skills pertaining to business, political dynamics and creativity along with the latest coding techniques, says Wetherbe, who helped devise CSC Index's third-annual survey.

"In the 1970s, we replicated manual procedures. Now we change and direct the business," Rund agrees.

Recognizing and acting on the difference between automating history and bringing radical change to an organization is where smart systems development leaders will set themselves apart, observers say. At Ultramar Canada, Inc., a petroleum refinery in Toronto, systems designers are continually cultivating business acumen, according to Ian Wickins, supervisor of wholesale systems.

"We're showing the business people ways to improve functions," Wickins says, citing a point-of-sale (POS) system installed last year at the suggestion of IS. He says that his team, which designed and wrote the POS applications, showed management that doing tasks such as credit card processing and order tracking on-line would cut down on paper outlay and save money.

The more than 90-member development staff is not an equal with business-side high-ups, Wickens says, "but we have made inroads, and largely because of innovative thinking."

Egalitarianism appears to be the rule at Farmington, Conn.-based Otis Elevator. Its entire roster of 8,000 North American employees is currently undergoing training in studying, streamlining and devising business functions, new and old.

The initiative is part of a plan to unify operations in the 163 countries where Otis does business. A Quality Leadership Team of IS and business managers is identifying and re-engineering common business tasks, says Peter Cobin, manager of technical analysis.

Speaking same language

Integral to that strategy is making application development more cohesive, Cobin says. Toward that end, the different divisions each blueprinted a business model that showed which functions were automated and which were not.

"Everyone from IS to accounting talks the same lingo now," Cobin says.

Observers agree that development skills of the past do not meet many of the problems facing IS shops today. Most notably, systems developers — not just top-level IS executives — need vision, CSC Index's Wetherbe says. "They need to be able to look at the same thing and see something different, which is what re-engineering is about."

Systems development critical issues for 1992

Timely response to systems requests has always been a high priority; this year it's No. 1

Top 10 Issues - North America	1992	1991	1990
Rapidly responding to system requests	1	1	4
Increasing developer productivity	2	2	2
Identifying and developing strategic information systems	3	3	3
Developing an information architecture	4	4	1
Dealing with maintenance, systems obsolescence and migration to new systems	5	5	6
Demonstrating the value of development projects to senior executives	6	7	11
Instituting a formal total quality management program in systems development	7	6	NR
Achieving support for cross-functional systems	8	8	8
Developing and implementing metrics for systems development	9	9	17
Managing end-user systems development	10	10	19

Survey of 215 systems development executives

Source: CSC/Index, Inc.

CALENDAR

AUG. 23-29

Interex Users Conference. New Orleans, Aug. 23-27 — Contact: Michelle Pettigrew; Interex, Sunnyvale, Calif. (408) 738-4848.

SynOptics User Group Conference. Washington, D.C., Aug. 24-26 — Contact: Dennis Parr, SynOptics User Group, Santa Clara, Calif. (408) 988-2400.

Marketing the IS Organization Internally. Chicago, Aug. 25-26 — Contact: The Ouellette & Associates Registrar, Bedford, N.H. (603) 623-7373.

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

Downsizing Expo. San Francisco, Aug. 25-27 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Colusion Conference. Boston, Aug. 26-28 — Contact: Stephanie Vickers, BIS Strategic Decisions, Norwell, Mass. (617) 878-6650.

Computerfest '92. Dayton, Ohio, Aug. 29-30 — Contact: Mark Hanslip, DMA Computerfest, Dayton, Ohio. (513) 263-3378.

AUG. 30-SEPT. 5

Primavera Systems, Inc.'s Ninth Annual User Conference. Philadelphia, Aug. 30-Sept. 2 — Contact: Primavera Systems, Inc., Bala Cynwyd, Pa. (215) 660-5830.

Surface Mount International Conference. San Jose, Calif., Aug. 30-Sept. 3 — Contact: SMTA, Edina, Minn. (612) 920-7682.

International Training Conference & Exposition. Anaheim, Calif., Aug. 31-Sept. 2 — Contact: Russell F. McKinnon, Trade Associates, Inc., Rockville, Md. (301) 468-3210.

SEPT. 6-12

Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 13-19

Buscon '92/East. Boston, Sept. 15-17 — Contact: Buscon '92, Norwalk, Conn. (203) 852-0500.

DOD-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acumbol, San Diego, Calif. (619) 689-7220.

DevCon '92. Phoenix, Sept. 18-23 — Contact: Microsoft Fox, Inc., Perrysburg, Ohio. (800) 927-6368.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Rousmaniz, Knowledge Industry Publications, Inc., White Plains, New York (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The 80th Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lemelin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Sensors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29-Oct. 2 — Contact: Computer Intelligence, La Jolla, Calif. (619) 450-1667.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, New Mexico (505) 986-0523.

Repository Ad/Cycle International User Group Conference. Chicago, Oct. 4-7 — Contact: Repository Ad/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Seam-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

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IS jobs in vendor firms: A taste of cutting edge

Working in the information systems department at a company that makes hardware or software can have big pluses, such as seeing prealpha software or having the latest hardware long before the rest of the world. But when you scrape the icing off the cake, these companies view themselves as "just another manufacturing company" with many of the same career challenges.

Chet Lakhani, vice president of information services at Irvine, Calif.-based AST Research, Inc.; Bruce Runyan, vice president of IS at Borland International, Inc. in Scotts Valley, Calif.; and Tom Minick, director of IS at the Apple Products Division, recently shared their views on IS career opportunities in vendor companies with Kelly E. Dwyer, assistant editor, features.

AST's Lakhani: *Programmer/analysts are in demand*

What's it like to work in IS at a vendor company?

•**Runyan:** When you get down to it, we're a manufacturing company, just like anyone else. But we get to play with the new stuff and set direction. We also use our MIS group to try out software. I think I'm pickier than most people. If Borland can't sell to me, we're never going to sell to corporate IS departments.

•**Lakhani:** Everyone is well-versed in an IS area. The quality of our information systems gets better because we have better input. These people are familiar with what the systems can do or cannot do.

•**Minick:** The minuses are obvious. Trying to build systems for some of the best technologists in the industry is a difficult thing. Everyone's got an opinion; in fact, the joke is that we have 14,000 systems analysts in the company. I think the standards are much, much higher because the demands of technical people are very extreme.

The advantage is that Apple is a very exciting company. We see and use and play and have access to technology well before other *Fortune* 100 companies.

What jobs are in demand?

•**Runyan:** I see two career paths. One is the business analyst, business generalist person, who's coming through for more technical education to find out how things work and what goes on in the back room. The other is high-end technology people. That's where I think the future is moving.

•**Lakhani:** Long-term demand will be in the area of people who are programmer/analyst types — not strictly programmer or analyst (as the IBM environment used to have) but the hybrid kind ... business people with technical skills.

•**Minick:** Probably the highest demand I see in the future would be in the area of architecture, modeling and advanced business analysis.

What skills do recent hires have?

•**Lakhani:** During the last 18 months, hirees are local-area network specialists, end-user support people and data communications people who can help me establish wide-area networks.

•**Minick:** In my organization, we have filled mostly programming positions, principally microcomputer programming, specifically Macintosh. But the kinds of programming are a lot different than in the past. These are people that have skills in C and object technique and can program on both minicomputers and microcomputers.

At a company level, we've brought in a lot of data modelers, a number of systems architects (and continue to do that) as well as generalist and business analysts — people who partner with our users.

Can you offer real-world advice?

•**Runyan:** You've got to be flexible and focus on your customers. You won't last long if you're in IS for just the job of coding.

•**Lakhani:** The people who want to make a career in IS are much better off getting exposure to as many software packages as possible. It builds your business base and also gives you insight into how other people help solve some real issues.

Apple's Minick: *I can't emphasize enough the business side of things*

•**Minick:** I think every person who wants to make IS their career should expect to spend at least two to five years of their careers outside of IS so that they understand the business that they're supporting. The technical skills are learnable; the business skills are not.

A typical career path would be five years in systems and two years out of systems, another five years in and two more out. Go into sales, marketing or support to learn to deal with customers and learn communications skills. I can't emphasize enough the business side of things — learning the business, understanding it, being able to communicate like our customers.

I would definitely learn modeling and architecture — it's a new emerging field and I'd spend time in it. Understand small computers and desktop computers. That's where the future is. It's not in the big iron that it's been in in the past. Of course, I'm not completely objective on that.

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JOB CLOSE-UP

Switch into client/server calls for broad background and bravery

BY CANDEE WILDE
SPECIAL TO CW

Programmers making the shift to client/server environments say they feel like Lewis and Clark on an expedition without a guide. The main reason: a lack of skills outside mainframe or stand-alone personal computer environments.

"A lot of new people coming in have only PC experience and have never worked in an IS shop," says Michael Proto, an office database manager at Pacific Gas & Electric Co. "They don't know the control procedures and testing rigor that a formal shop expects in critical application development."

Proto, a former mainframe programmer, says working with the new technologies has required some changes in thinking. Indeed, the skills for positions in the client/server world — ranging from application development analyst to systems analyst to senior systems analyst — call for a broad background.

For instance, Proto says he values his experience in a "more constrained" environment of traditional information systems because he says an IS background discourages the shoot-from-the-hip approach to solutions that PC purists often seem to exhibit.

Retraining adds up

Forrester Research, Inc. in Cambridge, Mass., estimates that Fortune 1,000 companies will spend more than $5 million in time, salary, materials and other costs to retrain IS staffs for client/server environments.

THOSE WHO are well-versed in both mainframe and client/server will be a greater asset to companies making the transition to smaller platforms.

For mainframe-oriented workers, retraining can be worth the effort: Salaries for client/server-related positions range from $35,000 to $80,000, depending on experience and job title.

Consultants and IS managers say three to five years of development experience in a corporate environment (not necessarily in client/server) is crucial for those looking for employment in this new arena.

In addition, Forrester recommends that hopefuls have knowledge of multiple platforms, rapid application development tools, object-oriented principles and relational databases.

Proto adds that "paying your dues in a large organization for a year or two is a worthwhile experience. I took some computer classes in 1980 when I made the transition to computers, and my impression was that the classes didn't match the realities of the corporate computing environment."

Indeed, IS managers say hands-on experienced is preferred over classroom training.

While many programmers are leaping enthusiastically into this new world, some Cobol programmers are resisting the new technology. Even entire companies may be slow to catch on.

Denise Davis, vice president of IS at VASA Insurance Group, Inc., says the 250-person Indianapolis-based insurance underwriting company failed to recognize the importance of retraining programmers for a mission-critical client/server environment.

She adds that the company had to bring in outside consultants to provide training.

One of those former consultants, Brian Lohss, says analysts must learn more than just the details of how products and software work.

For example, Lohss' current position as VASA's director of systems and programming requires him to work closely with senior management doing strategic planning and get hands-on experience with code.

Although delving into computer code might not appeal to everyone, Lohss said he likes it. He particularly enjoys combining "high-level strategic planning for future implementation of client/server architecture in our organization and the day-to-day of how something works."

Proto is responsible for the infrastructure surrounding SQL Server. He helps end-user departments develop applications and oversees certification of the product on the network. He also facilitates information sharing and identifies and reviews other products that will work with SQL Server.

One difference for many mainframe operators switching to client/server environments is the heavier involvement with users. John Adler, MIS director at Trans National, Inc., a travel agency based in Boston, says sitting down with end users to hammer out system wants and needs is one of his favorite parts of the job.

Adler says he does not find the complexity and breadth of options available with client/server systems frustrating. Instead, he views them as a challenge that often requires bringing "specialized people into the picture."

Adler also stresses the importance of being able to explain to senior management, in terms of time and money, how and why the new technology will benefit the company.

What advice do IS managers have for people hoping to grow in this field?

Become well-versed in both mainframe and client/server areas, Lohss says, so you'll be a greater asset to companies making the transition to smaller platforms.

"The person most valuable is somebody who has the desire to learn the client/server environment but has the flexibility to go back and do work on the mainframe when it is appropriate," he says.

Wilde is a free-lance writer based in Easton, Conn.

ANALYST/ CONSULTANT

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Network Management Consultant
Candidate will collect user requirements and architect enterprise solutions. Preferred protocol experience is SNMP, with experience in specific platforms (e.g. HP OpenView™) a definite plus. The applicant should have development experience (C or C++) and have strong written and oral communication skill sets.

Multimedia Consultant
Ideal candidate should have development and implementation experience with various media types (imaging, video, voice, etc.), and understand the network requirements (configuration, compression schemes, etc.) that the technology demands. The candidate should have working experience with relational/OO database technology as it relates to image and voice information handling.

UNIX Applications Development Director
Candidate should have a proven track record in developing state-of-the-art UNIX, relational database related business applications. The position requires both technical savvy and managerial skill sets. This individual should be able to interface with Fortune 500 clients and produce a functional business requirement document. Candidate should possess C++ and/or object oriented development skills.

Network Consultant
Candidate will collect user requirements, architect enterprise network solutions, and assist with network implementations. Design and implementation experience with the TPC/IP, SPX/IPX, DECnet, AppleTalk, NETBIOS, LU 6.2, bridging, and routing protocols is required. Experience with NetWare, LAN Manager, UNIX, SNMP based management systems and transmission equipment a is plus. The applicant should have LAN/WAN design experience and have strong written and oral communication skill sets.

Project Manager
Ideal candidate should be thoroughly versed in full systems life cycle, project management techniques, and software tools. Experience required with preparing project plans, managing multiple projects simultaneously, and controlling costs. The applicant must also possess strong interpersonal, written, and presentation skill sets. The position requires a technical understanding of LAN/WAN networks, client/server architecture, and system management. Experience in developing implementation plans, project schedule, and cost control mechanisms is required.

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EVERNET

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Human Resource Director
1633 Broadway, 41st floor
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Fax: (212) 767-4891

SYSTEMS ANALYST
(Ref #42792) to analyze, design & develop an integrated welfare system including process/data flow design, data & entity modeling, defining minispec action diagrams, tech. support for design of apps using DB2 on IBM 3090 using IBM 3090, MVS/ESA, DB2, TELON & WordPerfect for PC's used for system design, TSO, NETVIEW, REXX & CUSTS) & overall design of reports subsystem part of the system & meeting with users to gather requirements. ED & EXP: Bachelor's in Computer Sc, Engg, Bus Admn or Sys Analysis & 2 yrs exp in the job offered or as Sys Analyst or Prog Analyst or Consultant. RELATED EXP: designing & developing online app. software on IBM 3090 using DB2 & CUSTS. Requirement analysis & design using CASE Tools from Knowledgeware. Pay is $34,200/yr. 40 hr/wk.

SYSTEMS ANALYST
(Ref #42892) to analyze, design & develop an integrated welfare system including process/data flow design, data modeling identification, tech. support (for development of applications using MAPPER-36R1 on Unisys 2200/402 using: Unisys 2200/402, MAPPER 36R1, BRACKETS, LOTUS and WordPerfect for PC used for system design) & overall design of the system & meetings with the users to gather requirements. ED & EXP: Bachelor's in Computer Sc, Engg, or Bus Admn and 2 yrs exp in the job offered or as Sys Analyst, Prog Analyst or Consultant. RELATED EXP: designing & developing computer software using Unisys 2200, MAPPER 35, Express Lang & BRACKETS. Pay is $34,200/yr. 40 hr/wk.

SOFTWARE ENGINEER
(Ref #42892) to maintain, analyze & develop OBS Purchasing & Accounts Payable software on Unisys machines. DUTIES: database modifications & sys testing using Unisys 2200/A series systems, UDS DMS II, COBOL, SSG, HVTP, AIM, SPOMGR & PCR processor. ED & EXP: Bachelors in Computer Sc, Engg, Bus Admn or Sys Analysis and 2 yrs exp in the job offered or as Sys Analyst or Prog Analyst. RELATED EXP: software design & development on Unisys 2200 using SSG, COBOL, HVTP, SPOMGR & PCR processor & solving user problems. Pay is $34,200/yr. 40 hr/wk.

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(Ref #44892) to analyze, design, & develop consolidated omnibus budget reconciliation system including meeting with users to study existing system, data modeling, preparing detailed sys design & program specs & developing programs on IBM-PC using COBOL workbench & PC based CICS, IMS & DB2 plus then implementing & testing programs on IBM 3090 mainframe. ED & EXP: Bachelor's in Computer Sc, Engg, Bus Admn, or Sys Analysis & 2 yrs exp in the job offered or as System Programmer/Analyst, Analyst, Consultant or Sys Engg. RELATED EXP: sys development on IBM PCs using COBOL workbench & PC based CICS, & implementing programs developed with PC based DB2 & IMS software on IBM 3090 mainframe. Pay is $32,300/yr. 40 hr/wk.
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Software Vendor	160,264
for large-scale systems	71,152
for medium-scale systems	81,799
for small-scale systems	72,212
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for technical workstations	26,022
Non-CPU Computer Products Manufacturer	34,311
VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	82,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
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SOURCE: Stat Survey of Computerworld's Audience, June 1991.

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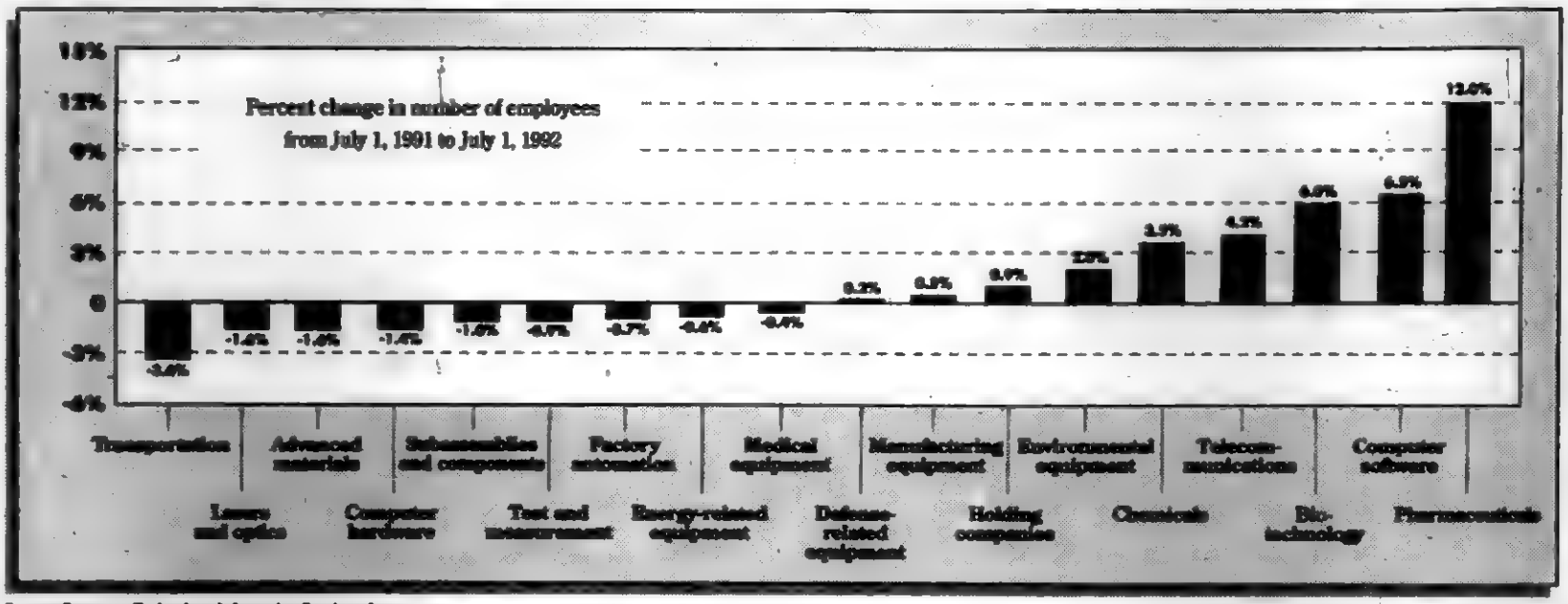

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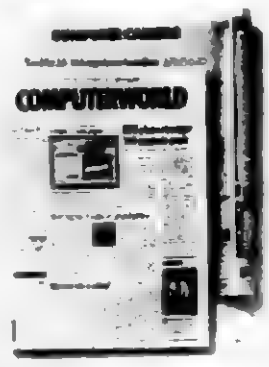

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Tools that LAN managers love

BY JILL HUNTINGTON-LEE
SPECIAL TO CW

Imagine a phone that constantly rings — one user after another complaining about network response time or that ubiquitous error message on a computer screen, "file server not found."

For local-area network administrators, there's nothing "imaginable" about it — it's their job. That's why most of them are constantly in search of tools that can make their job easier.

While the perfect self-contained solution hasn't arrived yet, LAN administrators contacted recently were able to respond quickly when asked to name the tools they wouldn't want to live without.

•Cable testers. Wires and cables may look innocuous, but more than 50% of LAN downtime is traced to cabling and physical connections.

That's why, when a LAN segment is down, LAN administrators grab their cable testers.

Once it is plugged into the network, the tester scans for where the cable in question is hiding out. It helps pinpoint and rule out any physical sources of network trouble by measuring cable length, resistance, noise and distance to faults.

Vahe Katros, network manager at Bentley College in Waltham, Mass., relies on Next Scanner from MicroTest, Inc. in Phoenix. The handheld device costs approximately $3,000.

According to Katros, the cable tester is indispensable and is the only way to determine if LAN faults are in the cable without spending hours restringing cable segments.

•Monitoring tools: One is not enough. Wiring is only one aspect of a LAN, and traffic is another. For keeping tabs on what travels over the network, the tool of choice is a monitor.

These tools report on the activity of network devices and signal changes in traffic patterns so that bottlenecks can be avoided before they occur. LAN monitors have almost become a commodity, differentiating themselves mostly by how they present the data.

While some simply collect information and spit it out, newer monitors promise to save the LAN administrator time by processing the statistics into a more digestible form.

Much to the dismay of most LAN managers, however, the intricacies of the network demand that they use more than one monitoring tool.

Dwight Lubansky, senior electronic engineer at Ciba-Geigy Corp. in Summit, N.J., needs to interconnect the various segments of his network. So he depends on three separate monitoring devices from Digital Equipment Corp. that sit between each segment and monitor traffic.

While the DEC tools have served him well, Lubansky is searching for multiprotocol monitors designed for Transmission Control Protocol/Internet Protocol environments.

"Right now we're evaluating Trakker," a LAN monitor from Concord Communications, Inc. in Marlboro, Mass., Lubansky says. Although Trakker is a relatively new tool on the market, Lubansky says he likes what he's seen so far — especially its "ability to look into the upper protocol layers and see through routers."

•Tools for mundane tasks. Everyone loves utility products that help make performing repetitive, mundane tasks easier.

Usually, these utilities are focused, small pieces of inexpensive software that generally cost less than $300, depending on the number of users.

Dave Von Colln, manager of end-user support at NASA in Washington, D.C., is always on the lookout for these products. Part of his job is to manage the applications running on a 150-node Novell, Inc. network, including the tedious task of debugging applications.

More often than not, Von Colln says he finds users are the source of application bugs. Much to his relief, Von Colln says the instances of user-induced bugs have dropped dramatically since he installed PC/DACs, a front-end security package from Pyramid Development Corp. in Rocky Hill, Conn.

"To get onto our network now, you have to log onto PC/DACs," he explains. "This prevents viruses from entering and also keeps out intruders."

The utility protects all executable files, thereby preventing users from making unauthorized changes to the software environment.

David Dingley, a PC/network support specialist at Andersen Consulting in Philadelphia, notes that many of these types of tools are not expensive, and some are even free.

"There's an abundance of shareware and public utilities that simplify tedious tasks, from setting passwords to doing print management," Dingley says.

He downloads tools regularly from CompuServe, Inc. and other services. "On a monthly basis, Novell uploads driver updates and new versions of software ... such as file server monitors," Dingley says.

•Home remedies. Some users end up writing their own tools to fill in the gaps.

"We have lots of in-house developed utilities and tools that either enhance existing products or replace features they lack," explains John Lhota, manager of Network Computing Systems at Barnett Technologies, Inc. in Jacksonville, Fla.

Huntington-Lee is principal at Brandywine Network Associates in Cinnaminson, N.J., and a member of the Association for Computing Machinery.

F.Y.I.

Tools developed in-house can fill gaps left by standard off-the-shelf LAN administration products, but roll-your-own software doesn't always cost less than commercial tool packages. According to a study by Infonetics Research, Inc., building your own LAN tools can cost 3 to 29 times more than purchasing equivalent functionality from a vendor. Unfortunately, it's the only choice for some applications.

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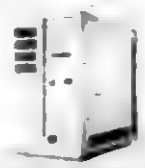

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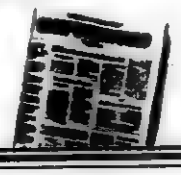

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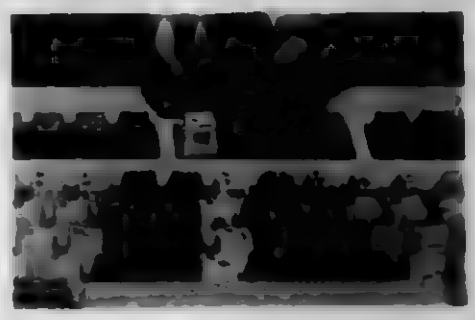

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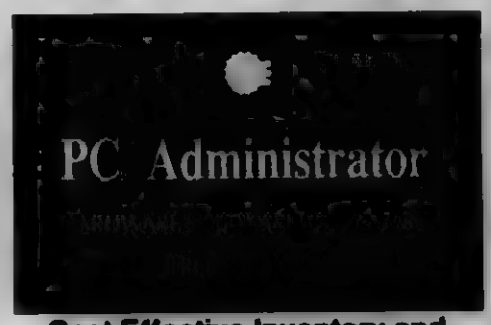

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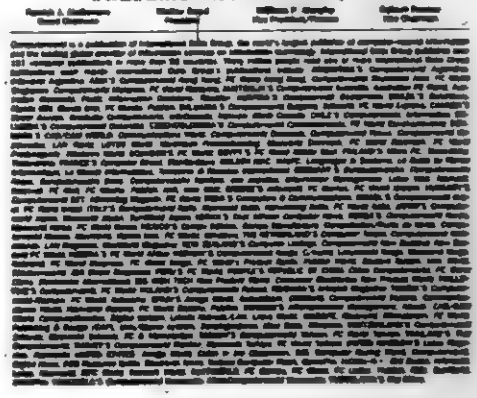

ADVERTISERS INDEX

Andersen Consulting	78
Apple Computer	50-51
Applied Business Technology	70-71
BMC Software	64
British Telecom North America	82
Candle Corp	21
CIE America	66
Compuserve	20
Computer Associates	5
CW Circulation	44
CW Editorial Calendar	58-59
CW Marketing	45
CW Recruitment	43, 65, 71, 82
Digital Equipment Corp	32/33
Fifth Generation	36
Hewlett-Packard	29, 48
IDC	62
Information Builders	68
Integris	24
Knowledgeware	26
Legent Corp	30-31
Lexmark	28
Lotus Development Corp	46-47
Micro Focus	11
Microsoft	27, 38-39, 54-55
Motorola Codex	72
Multi-Tech Systems	16
Napersoft	61
NETEC International	63
Oracle Corp	7, 9
Platinum Technology	60
Progress Software	40
Roim	66
SAP America	C3
SAS Institute	17, C4
Software 2000	10
Sybase, Inc.	13
Syncsort	3
Synoptics	41
Texas Instruments	18-19
Unify Corp	42-43
Unisys	22-23
Wyse Technology	34-35
XDB Systems	37

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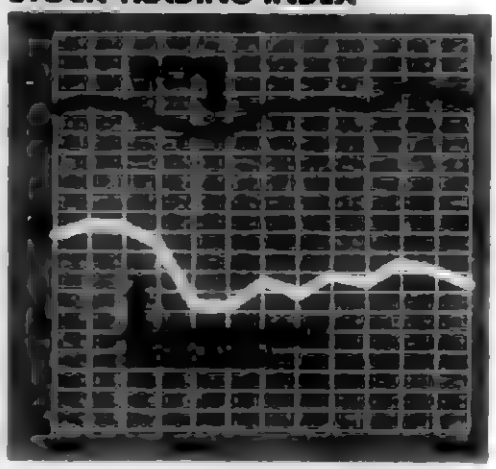
STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM BUY TO STRONG BUY: Synopsys, Inc. (Alex. Brown & Sons, Inc.). The fiscal third quarter garnered slightly better than expected results for Synopsys (SNPS), compared with the third quarter last year. The electronic design software vendor reported $16.1 million in sales and $12.4 million in profits during the third quarter of 1992.

The company recently introduced Synthesis Version 3.0, a product that should broaden Synopsys' share of the synthesis market. Version 3.0 was designed to perform multiclock cycle design, which would help produce higher quality chips faster. Version 3.0 can reportedly create chip designs that cannot be done by hand. Look for Synopsys to continue to reap benefits from an industry trend toward increased processor complexity.

DOWNGRADED FROM BUY TO NEUTRAL: Autodesk, Inc. (Alex. Brown). After the resignation of Autodesk (ACAD) President Alvar Green, the firm appointed Carol Bartz, former executive at **Sun Microsystems, Inc.** (SUNW), as chairman, president and chief executive officer. The company's new management needs to focus attention on an updated version of AutoCAD Release 12, a drafting package that was introduced 10 years ago.

Although Autodesk introduced other products at the same time, AutoCAD has been extremely successful for the company. There are some indications that AutoCAD's unit growth rate is flattening, but the product accounted for nearly 90% of the company's revenue.

DOWNGRADED FROM BUY TO HOLD: Symantec Corp. (Prudential Securities, Inc.). Sluggish sales of Symantec's (SYMC) DOS-based applications and utilities are a direct result of personal computer users shifting to **Microsoft Corp.**'s (MSFT) Windows environment more quickly than anticipated.

Despite Symantec's past success in the DOS arena, the company's lack of Windows-based products will likely stunt near-term growth. However, long-term growth looks a bit more promising, as long as Symantec's new products are rolled out on time and reach previous levels of market acceptance.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 14, 1992

TOP PERCENT GAINERS

QMS Inc.	19.70
Sequoia Systems Inc.	13.04
Software Toolworks Inc.	12.52
Intelligent Electronics	10.98
Corporate Software (L)	10.71
Easel Corp.	10.34
Cheyenne Software Inc.	9.38
Wellfleet Communications	8.50

TOP PERCENT LOSERS

Dataram Corp.	-48.78
Wang Labs Inc. (b)*	-33.33
American Software Inc.	-30.63
Data Switch Corp.	-21.85
Gateway Communications	-18.54
Gandalf Technologies Inc.	-18.18
Systems Center Inc.*	-16.13
Micrografx Inc.	-14.67

TOP DOLLAR GAINERS

Wellfleet Communications	3.25
Informix Corp.	2.75
Borland Int'l Inc.*	2.13
Synoptics Communications	2.00
Novell Inc.*	1.88
Parametric Technology (H)	1.88
Southwestern Bell Corp	1.88
Nynex Corp.*	1.88

TOP DOLLAR LOSERS

Dataram Corp.	-7.50
Matsushita Electronics (L)	-4.88
American Software Inc.	-4.25
Storage Technology* (L)	-4.25
Exabyte	-3.75
System Software Assoc.	-2.63
Stratus Computer Inc.*	-2.13
Rainbow Technologies Inc.	-2.00

Exch	52-Week High	52-Week Low		Aug. 14 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Off .18%**			
OTC	15.00	6.75	3 COM Corp.*	11.00	-0.38	-3.30
NYS	69.88	56.25	American Info Techs Corp.*	69.38	0.38	0.54
NYS	44.88	32.88	AT&T*	43.38	-0.25	-0.57
OTC	4.25	1.00	Ariel Communication Corp.	1.25	0.00	0.00
NYS	50.63	40.25	Bell Atlantic Corp.	48.63	1.25	2.64
NYS	53.88	43.38	Bellsouth Corp. (H)	53.88	1.25	2.38
NYS	7.13	4.13	Bolt, Beranek & Newman	4.50	0.00	0.00
NYS	65.88	36.63	Cabletron Systems	54.00	-0.50	-0.92
OTC	31.00	18.50	Chipcom Corp.	25.25	-0.25	-0.98
OTC	53.75	18.63	Cisco Systems Inc. (H)	49.00	-1.13	-2.24
OTC	35.25	6.00	Compression Labs Inc. (L)	8.00	0.50	6.67
OTC	3.38	0.88	Data Switch Corp.	1.56	-0.44	-21.85
NYS	23.63	12.38	Digital Comm. Assoc.*	18.63	-0.25	-1.32
OTC	17.50	8.00	Digital Systems Int'l Inc.	9.00	0.00	0.00
OTC	7.00	3.63	DSC Communications	6.50	-0.13	-1.89
OTC	10.88	4.75	Fibronics Int'l Inc.	5.38	0.13	2.38
OTC	37.50	10.50	Fibronics Int'l Inc.	13.50	-1.38	-9.24
OTC	3.38	1.13	Gandalf Technologies Inc.	2.25	-0.50	-18.18
OTC	2.25	0.88	Gateway Communications	1.38	-0.31	-18.54
NYS	5.50	2.13	General Datacomm Inds.	3.50	-0.25	-6.67
ASE	5.88	0.50	Go Video	3.00	0.00	0.00
NYS	35.63	28.13	GTE Corp.* (H)	35.00	0.13	0.36
NYS	70.63	50.00	ITT Corp.	66.75	-1.00	-1.48
OTC	38.13	25.25	MCI Communications Corp.	33.88	0.50	1.50
OTC	14.50	2.25	Microcom Inc.	3.75	0.13	3.45
NYS	18.25	9.50	Network Equipment Tech.*	10.63	0.25	2.41
OTC	25.50	6.75	Network General	10.00	-1.00	-9.09
OTC	30.00	8.50	Network Systems Corp.	11.00	-1.25	-10.20
OTC	17.88	5.50	Newbridge Networks Corp.	16.63	-0.50	-3.10
NYS	49.25	33.75	Northern Telecom Ltd.*	34.88	-0.88	-2.45
OTC	65.00	28.50	Novell Inc.*	50.75	1.88	3.84
NYS	83.50	69.13	Nynex Corp.*	83.38	1.88	2.30
OTC	37.50	16.50	Octel Communications Corp.	24.38	0.88	3.72
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.25	0.25	5.00
OTC	53.00	17.00	Picturetel Corp.	18.75	1.25	7.14
OTC	18.75	9.75	Proteon Inc.	13.75	-0.25	-1.79
NYS	26.75	11.63	Scientific Atlanta Inc.	26.75	1.00	3.88
NYS	67.25	51.50	Southwestern Bell Corp.	67.25	1.88	2.87
NYS	27.00	20.75	Sprint Corp.	23.00	-0.38	-1.60
OTC	13.75	4.00	Standard Microsystems Corp.	12.88	-0.13	-0.96
OTC	35.75	14.25	Synoptics Communications	35.75	2.00	5.93
NYS	40.00	32.88	US West Inc.	38.13	0.00	0.00
OTC	41.50	22.75	Wellfleet Communications	41.50	3.25	8.50
PC and Workstations			**Up 0.29%**			
OTC	15.00	4.50	Advanced Logic Research	4.50	0.00	0.00
OTC	70.00	41.50	Apple Computer Inc.* (L)	44.75	1.38	3.17
OTC	32.25	12.00	AST Research Inc.*	13.25	0.25	1.92
NYS	19.25	9.00	Commodore Int'l	9.25	-0.25	-2.63
NYS	36.75	22.13	Compaq Computer Corp.*	29.63	0.50	1.72
OTC	29.00	13.91	Dell Computer Corp.	24.00	1.25	5.49
OTC	7.75	2.13	Everex Systems Inc.	2.50	-0.19	-6.98
NYS	34.00	21.25	Harris Corp.	31.75	0.63	2.01
NYS	85.00	44.63	Hewlett-Packard Co.*	60.00	1.13	1.91
NYS	29.75	14.13	Silicon Graphics	22.13	0.75	3.51
OTC	35.88	20.75	Sun Microsystems Inc.*	25.75	0.75	3.00
NYS	31.25	22.50	Tandy Corp.*	24.25	0.25	1.04
NYS	11.13	5.13	Zenith Electronics	6.63	-0.25	-3.64
OTC	25.50	3.63	Zeos International Ltd.	3.63	-0.25	-6.46
Large Systems			**Off 3.02%**			
ASE	20.63	11.63	Amdahl Corp.*	13.25	-0.63	-4.50
NYS	16.13	7.50	Cerdian Corp.	15.38	-0.38	-2.38
NYS	16.38	5.75	Convex Computer	6.50	0.00	0.00
OTC	19.63	1.88	Cray Computer	3.38	-0.13	-3.57
NYS	52.25	23.25	Cray Research Inc.*	23.75	-1.38	-5.47
NYS	22.50	7.13	Data General Corp.	8.00	-0.38	-4.48
NYS	65.50	33.25	Digital Equipment Corp.*	37.88	0.63	1.68
NYS	106.38	81.63	IBM*	88.38	1.25	1.43
NYS	121.25	90.13	Matsushita Electronics (L)	90.13	-4.88	-5.13
OTC	19.75	9.50	Pyramid Technology	9.75	-0.25	-2.50
OTC	17.88	7.50	Sequent Computer Sys.	16.13	-0.38	-2.27
OTC	18.38	5.00	Sequoia Systems Inc.	8.50	0.75	13.04
NYS	54.25	34.13	Stratus Computer Inc.*	44.75	-2.13	-4.53
NYS	15.13	9.50	Tandem Computers Inc.*	10.88	0.25	2.35
NYS	11.75	3.63	Unisys Corp.*	9.75	0.13	1.30
ASE	7.50	1.50	Wang Labs Inc. (b)*	1.50	-0.75	-133.33
Software			**Off 2.45%**			
OTC	68.50	34.75	Adobe Systems Inc. (L)	37.63	1.75	4.88
OTC	13.25	2.50	Ai Corp.	4.38	-0.25	-5.41
OTC	45.00	11.50	Aldus Corp.	13.38	0.13	0.94
OTC	19.75	9.63	American Software Inc.	9.63	-4.25	-30.63
OTC	20.00	8.50	Ask Computer Systems	14.00	-0.75	-5.08
OTC	57.25	23.25	Autodesk Inc.	40.50	-0.50	-1.22
OTC	37.75	8.25	Bachman Info. Systems	9.75	-0.50	-4.88
OTC	42.50	29.00	BGS Systems Inc.	38.00	0.75	2.01
OTC	79.00	37.25	BMC Software Inc.	47.75	-0.75	-1.55
OTC	20.50	9.00	Boole & Babbage	18.63	-0.88	-4.49
OTC	86.75	35.00	Borland Int'l Inc.*	43.38	2.13	5.15
OTC	11.25	3.63	CE Software	4.63	-0.25	-5.13
ASE	14.38	6.50	Cheyenne Software Inc.	13.13	1.13	9.38
OTC	20.38	7.25	Cognos Inc.	8.38	0.00	0.00
NYS	17.00	7.50	Computer Associates*	14.38	0.00	0.00
OTC	21.50	8.50	Comshare Inc.	10.25	0.38	3.80
OTC	47.88	6.50	Easel Corp.	8.00	0.75	10.34
OTC	25.50	11.50	Group I Software	18.50	-1.00	-5.71
OTC	6.63	3.50	Hogan Systems Inc.	4.75	-0.38	-7.32
OTC	36.25	18.50	Information Resources	24.25	0.00	0.00
OTC	39.25	5.50	Informix Corp.	39.00	2.75	7.59
OTC	22.75	12.50	Intergraph Corp.	13.50	-0.75	-5.26
OTC	15.00	5.13	Interleaf Inc.	8.50	-0.25	-2.86
OTC	20.25	8.50	Intersolv Inc.	13.75	-1.25	-8.33
OTC	30.00	10.50	Knowledgeware Inc.	12.25	0.00	0.00
OTC	46.25	20.25	Legent Corp.*	40.00	-0.25	-0.62
OTC	40.75	15.50	Lotus Development*	17.38	0.13	0.72
OTC	7.38	1.88	Mece Software	2.25	-0.13	-5.26
OTC	22.25	6.50	Mentor Graphics	8.00	0.25	3.23
OTC	20.50	6.50	Micrografx Inc.	8.00	-1.38	-14.67
OTC	88.84	51.34	Microsoft Corp.*	71.00	0.25	0.35
OTC	21.13	8.88	Oracle Corp.*	17.88	0.00	0.00
OTC	41.50	14.75	Parametric Technology (H)	40.88	1.88	4.81
OTC	11.00	3.50	Phoenix Technologies	4.63	-0.25	-5.13
OTC	25.25	11.00	Platinum Technology	14.50	-1.50	-9.38
OTC	46.50	27.75	Progress Software Corp.	38.00	-1.50	-3.80
OTC	25.63	4.00	Quarterdeck Office Sys.	4.88	-0.63	-11.36
OTC	32.75	10.25	Rainbow Technologies Inc.	16.00	-2.00	-11.11
OTC	27.50	8.75	Rasterops	9.50	-1.00	-9.52
OTC	17.25	5.38	Ross Systems	7.63	0.38	5.17
OTC	26.25	7.50	Software Publishing Corp.	9.25	0.50	5.71
OTC	8.50	2.00	Software Toolworks Inc.	2.81	0.31	12.52
OTC	7.25	1.75	Spinnaker Software	2.75	0.00	0.00
OTC	18.50	6.25	State of the Art	6.50	-0.25	-3.70
NYS	25.25	12.13	Sterling Software Inc.	17.63	0.13	0.71
OTC	30.00	13.00	Struct. Dynamics Research	14.25	0.25	1.79
OTC	31.75	15.00	Sybase Inc.	28.63	-0.50	-1.72
OTC	51.00	16.75	Symantec Corp.	16.75	-1.88	-10.07
NYS	15.50	5.25	Systems Center Inc.*	6.50	-1.25	-16.13
OTC	34.25	8.88	System Software Assoc.	23.50	-2.63	-10.05
OTC	23.75	14.50	Walker Interactive Systems	16.13	-0.63	-3.73
OTC	6.63	2.13	Wordstar	2.50	-0.06	-2.46
Semiconductors			**Up 0.80%**			
NYS	21.50	7.38	Advanced Micro Devices	9.38	0.00	0.00
NYS	11.13	7.00	Analog Devices Inc.	10.00	0.13	1.27
OTC	13.88	6.75	Atmel Corp.	8.38	-0.13	-1.47
OTC	14.13	4.25	Chips and Technologies	4.50	-0.63	-12.20
NYS	22.63	7.38	Cypress Semiconductor Corp.	9.25	0.50	5.71
NYS	10.88	6.25	Dallas Semiconductor (H)	10.50	0.25	2.44
OTC	68.75	38.50	Intel Corp.*	58.63	1.00	1.71
NYS	9.88	5.50	LSI Logic Corp.	5.88	0.00	0.00
NYS	22.38	11.13	Micron Technology	16.38	0.38	2.34
NYS	88.13	54.00	Motorola Inc.* (H)	88.50	0.88	1.03
NYS	11.50	3.88	National Semiconductor*	11.50	0.50	4.55
OTC	27.00	9.00	Sierra Semiconductor	9.00	-1.00	-10.00
NYS	42.38	26.00	Texas Instruments*	41.13	1.38	3.48
OTC	10.50	5.88	VLSI Technology	6.75	0.00	0.00
OTC	9.75	2.13	Wafertech	3.25	0.13	4.00
ASE	5.63	2.00	Western Digital Corp.	4.75	0.25	5.56
OTC	32.50	17.25	Xilinx	22.50	0.50	2.27
OTC	11.50	4.63	Zilog Inc.	7.00	0.25	3.70
Peripherals and Subsystems			**Off 3.89%**			
OTC	10.00	2.75	Archive Corp.	6.88	-0.88	-11.29
OTC	25.75	11.25	Bancitec Inc. (H)	25.75	1.00	4.04
OTC	23.50	7.00	Cambex Corp.	10.75	-1.13	-9.47
ASE	12.25	4.66	Cognitronics Corp.	10.63	-0.13	-1.16
NYS	23.88	12.50	Conner Peripherals*	20.50	0.13	0.61
ASE	19.66	4.03	Dataram Corp.	7.88	-7.50	-48.78
NYS	19.25	5.88	EMC Corp.	17.25	-0.63	-3.50
OTC	8.88	4.75	Emulex Corp.	7.13	-0.63	-8.06
OTC	23.00	14.25	Evans & Sutherland	16.00	0.50	3.23
OTC	40.63	18.25	Exabyte	28.75	-3.75	-12.30
OTC	27.25	15.75	Intelligent Info. Systems	23.25	-0.75	-3.13
OTC	11.25	4.63	Iomega Corp.	7.00	-0.25	-3.45
OTC	34.75	12.00	IPL Systems Inc.	13.75	-1.50	-9.84
OTC	24.50	10.75	Komag Inc.	18.25	0.00	0.00
OTC	14.00	3.25	Maxtor Corp.*	14.00	1.00	7.69
OTC	12.63	5.75	Micropolis Corp.	10.13	0.13	1.25
NYS	101.25	83.50	3M Co. (H)	100.25	0.00	0.00
OTC	7.25	3.50	Printronix Inc.	6.00	-0.50	-7.69
NYS	26.75	7.00	QMS Inc.	9.88	1.63	19.70
OTC	18.00	8.88	Quantum Corp.	14.25	0.63	4.59
OTC	12.75	5.25	Radius Inc.	9.88	-0.75	-7.06
NYS	12.88	5.88	Recognition Equipment	7.88	-0.25	-3.08
OTC	13.13	5.38	Rexon Inc.	8.75	-0.50	-5.41
OTC	17.63	7.25	Seagate Technology*	14.75	-0.13	-0.84
NYS	78.00	26.88	Storage Technology* (L)	29.13	-4.25	-12.73
NYS	30.88	16.00	Tektronix Inc.	19.13	0.50	2.68
NYS	82.25	52.63	Xerox Corp.	74.00	-0.88	-1.17
Services			**Up 1.10%**			
OTC	18.00	11.66	American Mgmt. Systems*	17.50	0.00	0.00
NYS	5.38	2.88	Answorp Inc.	3.38	-0.13	-3.57
OTC	19.00	12.25	Analysts Int'l	16.88	0.13	0.75
NYS	49.00	30.25	Auto Data Processing*	44.38	0.13	0.28
NYS	24.10	12.50	Comdisco Inc.*	16.63	0.13	0.76
OTC	13.50	7.75	Computer Horizons	9.75	0.75	8.33
NYS	64.88	52.25	Computer Sciences*	64.50	0.00	0.00
NYS	10.13	7.00	Computer Task Group	8.25	0.25	3.13
OTC	40.50	15.00	CompUSA Inc.	24.50	0.00	0.00
OTC	19.25	7.00	Corporate Software (L)	7.75	0.75	10.71
OTC	30.75	10.75	Egghead Discount Software (L)	10.75	-0.50	-4.44
NYS	33.00	23.19	General Motors E (EDS)*	28.88	0.00	0.00
OTC	30.38	8.25	Intelligent Electronics	10.13	1.00	10.96
OTC	14.88	2.75	Manpel	7.13	-0.25	-3.39
OTC	15.75	7.00	Micrografx Inc.	9.00	-0.25	-2.70
OTC	27.50	14.66	Paychex	25.50	0.75	3.03
NYS	73.00	47.63	Policy Management Sys.	70.00	-0.63	-0.88
NYS	44.50	19.63	Reynolds and Reynolds	41.75	0.25	0.60
OTC	32.00	21.25	SEI Corp.	22.75	-0.50	-2.15
OTC	24.38	16.66	Shared Medical Systems	19.66	0.13	0.63
OTC	26.25	13.50	Sungard Data Systems	24.50	0.50	2.08
NYS	4.38	1.13	Ultimate Corp.	1.75	0.00	0.00

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Profits up at Gateway

■ Bucking the personal computer industry trend, **Gateway 2000** last week said second-quarter pretax profits soared 97% from last year's comparable period. Second-quarter revenue also climbed 97% to $248.6 million from last year's second quarter. The North Sioux Falls, S.D., firm said it shipped nearly 100,000 systems in the quarter ended June 30.

■ **Northgate Computer Corp.** posted a second-quarter loss of $10.1 million, compared with a $2.6 million profit in the same period last year. Revenue declined 22% to $34.6 million from last year's second quarter. A controlling interest in the Fremont, Calif., mail-order house was recently acquired by a Herndon, Va., investment concern [CW, July 13].

■ Fledgling wireless local-area network products developer **Windata, Inc.** said it completed a second round of financing totaling $5.75 million. New investors in the Northboro, Mass., firm include **Burr Egan, Delage & Co.** in San Francisco; **New Enterprise Associates** in Baltimore; and **Advent International Corp.** in Boston. Also anteing up were first-round investors **Bass Associates** in Palo Alto, Calif., and **Oak Investment Partners** in Menlo Park, Calif.

Short takes

Novell, Inc.'s board of directors has approved a two-for-one split of its stock for shareholders on record as of Aug. 26.... Frank Dodge, co-founder of **McCormack & Dodge** and now head of client/server applications developer **The Dodge Group** in Waltham, Mass., has joined the board of **Bachman Information Systems, Inc.** in Burlington, Mass. ... **Computer Horizons Corp.** in Mountain Lakes, N.J., has named John Sisto president of its recently formed systems integration subsidiary.

Judge reaffirms ruling against Apple

Refuses to overturn decision that Microsoft's Windows infringes on key Macintosh elements

BY JAMES DALY and CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — A federal judge has refused to reverse a 3-month-old ruling that has crippled Apple Computer, Inc.'s high-stakes copyright infringement suit against Microsoft Corp. and Hewlett-Packard Co.

U.S. District Judge Vaughn Walker denied on Aug. 7 Apple's request that he reconsider his judgment that 95% of Apple's 189 infringement claims are covered by a 1985 agreement between Apple and Microsoft.

The denial was the latest development in a case to determine whether Apple's Macintosh screen is subject to copyright protection.

Apple sued Microsoft and HP in March 1988, charging that certain audio and visual elements, including overlapping windows and the manipulation of icons, were not part of the 1985 agreement that gave Microsoft the right to use some of Apple's technology. That pact was used in the production of Microsoft's Windows 2.03 and HP's NewWave, which is based on Windows.

In mid-April, Judge Walker declared that many of the Macintosh screen graphics that Apple said the pair copied were either not protected by copyright law or came under the original 1985 technology licensing pact.

That ruling seemed to contradict an opinion that Judge Walker issued last year in which he upheld Apple's contention that the visual elements of the Macintosh screen display were not part of the 1985 licensing pact.

Sour taste

The lengthy seesaw courtroom battle has been frustrating for Apple, which is losing confidence in its ability to have Judge Walker see things its way. "We're disappointed by the decision," Apple spokeswoman Cindy McCaffrey said. "But we never based any of our business plans or goals on a victory in this case. So at this point nothing changes."

Microsoft also indicated that the decision would not have an impact on operations. "It's business as usual," Microsoft spokesman Collins Hemingway said. "We believe that we are free and clear as far as Windows."

The case still has a long way to go before it is resolved. Walker still did not rule on whether the other 23 disputed items in the newer Windows 3.0 — which ranges from proportional fonts to the use of muted color tones and the program's file manager — infringe on Apple copyrights. He also left open the question of whether HP has the right to use the same on-screen trash can symbol that the Macintosh uses to delete information.

Both sides have until Aug. 28 to respond to Judge Walker's latest decision. At that time, Apple must decide whether to pursue the suit, drop it or risk an appeal that could expand the decision from the specifics of this case to the generalities of look and feel. "It would be embarassing for them to have the Court of Appeals affirm Judge Walker's decision," said Lee T. Gesmer, partner at Lucash, Gesmer & Updegrove in Boston.

Could drop prices

Indeed, an Apple defeat would not only mean business as usual but could also lower some software prices because it would encourage developers to craft applications with capabilities similar to those of the Macintosh. But if Apple prevailed, it could squeeze huge damage or royalty payments out of Microsoft and HP.

Apple has previously estimated the amount of the alleged infringement at $5.55 billion in lost revenue.

Legal experts also said that an Apple victory could have had a dramatic effect on the industry because the Cupertino, Calif., firm would have gained control over critical computer technology.

Economy causes decline in mergers, acquisitions

BY KIM S. NASH
CW STAFF

FORT LEE, N.J. — The sad economy, among other factors, has thrown cold water on last year's deal-wheeling enthusiasm in the computer industry. Although companies are forming lots of technology-swap partnerships, the volume and value of mergers and acquisitions dropped like bricks during the first half of the year, according to a recent report from Broadview Associates, Inc., an investment banking firm.

The number of mergers and acquisitions contracts signed from January through June fell 23% to 227 this year, down from 295 deals inked during the same period in 1991.

Meanwhile, cash value plummeted about 50%. Mergers and acquisitions activity amounted to $9 million for the first half of this year, compared with $17.8 million for the first half of 1991. But much of the disparity is due to the $7.5 million deal between AT&T and NCR Corp., which artificially inflated 1991 figures, Broadview said.

Mergers and acquisitions activity probably will not dip any further, according to Paul Deninger, Broadview's managing director. Today's partnerships are crafted to take companies into new markets or to improve economies of scale, Deninger said, citing the merger between Goal Systems International, Inc. and Legent Corp. announced in April and completed this month. "Those kind of strategic deals won't stop," he said.

Reasons why

Other factors contributing to the slowdown this year include the following:

- Fewer outsiders are elbowing into the computer industry. Companies such as McDonnell Douglas Corp. and Lockheed Corp. invested heavily in computer sectors during the past few years as a way to diversify and decrease dependence on the dipping aerospace business. But now they are vacating the information technology arena.

"They just didn't have the technological savvy necessary to run computer companies," Deninger said. Other outsiders saw those deals disintegrate and decided not to get involved, he explained.

- U.S. firms in general are hanging on to the status quo, waiting for Wall Street predictions of an economic spark in this year's second half to ignite.

Picking a winner is all but impossible this year, Deninger said. Growth rates in all sectors have been less dramatic than in the near past, which may have put a pall over enthusiastic risk-taking among deal makers.

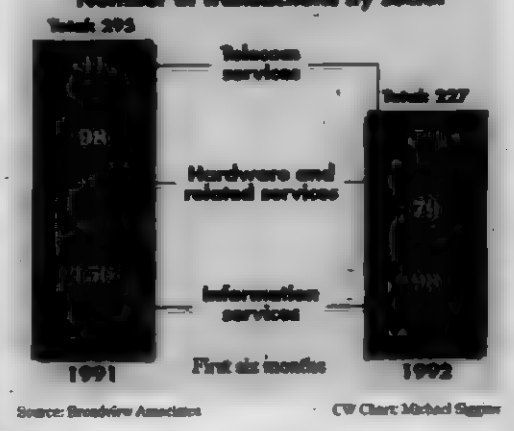
Politics has also played a role. Entrepreneurs are delaying potential moves until after the November presidential election, when the fate of the capital gains tax and others is clearer.

- Private companies that may have sought out partnerships to raise cash decided to jump into the booming market for computer-related initial public offerings early this year. However, investor cordiality waned after March.

"That window of opportunity is closed indefinitely," Deninger said.

No big deal

An increase in telecom service deals was offset by a steep decline in other sectors



Source: Broadview Associates — CW Chart: Michael Siggins

Networking and peripherals firms show more deal-making promise than systems and applications makers. Companies specializing in data communications products, such as Wellfleet Communications, Inc. and Cisco Systems, Inc., are in "fine" financial shape, Deninger said. He would not go so far as to say these companies are in play, but added that if "anyone is to get any deals going, it would be in this healthy sector."

Unlikely to be acquired or to merge — despite the scuttlebutt that flies every few months — is Novell, Inc., Deninger said. "Novell can't be acquired. It's too damn expensive," he said. "Who's got an extra $8 billion laying around?"

WYSIWYG

Michael Lans
Manager of Applied Information Technology
Brunswick Corp.
Skokie, Ill.

Red or *read*

As part of its exhibit, "Revelations from the Russian Archives," The Library of Congress is electronically disseminating formerly secret Soviet documents through America Online, Internet and Sovset. Included are materials from Stalin's reign of terror, the workings of the secret police, the 1962 Cuban Missile Crisis and Chernobyl.

Quips & Quotes

When computers crash "people lose billions of words that can never be retrieved by the user. Since it is lighter than air, this material rises and creates big black holes in the sky."
Columnist Art Buchwald on what really causes damage to the ozone.

The Dan Quayle Spelling Bee Award

The news media could use a little dose of that zero-defect, Total Quality Management religion. A search of the Dow Jones News/Retrieval database turned up 161 mentions of the phrase "Baldridge quality award." Of course, the famous quality award is named after the late Malcolm Baldrige — with just one "d."

B.D.U.s*

"When we had the Michelangelo virus scare, one of our users said, 'With the number of computers we have in the plant, how many people are going to get sick?' "
From Bill Smith
AM General Corp.
Mishawaka, Ind.

"One of our programmers, on the phone with one of our software users, was trying to help the user out with a problem and told the user to hit any key. To which the user replied, "Where's the N.E. key?"
From Guido Branca
Director, After Sales Services
Network Management Services Group
New York

*Brain Dead Users

Trade show no-show

Be wary of those attendance figures quoted by trade show managers because nearly half the time they are inflated. There are two types of deceptions:

- The "full-figure fake," where the figure includes not only the target audience but also such nonbuyers as spouses, students, exhibit personnel and the press.
- The "registration sidestep," where the show manager quotes registration figures as attendance, without accounting for no-shows.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: *Successful Meetings* magazine, May 1992; *The Washington Post* (June 2, 1992).

WYSIWYG design: Michael Siggins

INSIDE LINES

Wan Wang

▶ Talk about a bankruptcy filing from beleaguered Wang raged on last week as the company's year-end results failed to surface. Scuttlebutters said Wang's local printer delivered 4,200 copies of certain forms and packets Wang usually hands-out to employees receiving termination notices. Wang cut 1,000 workers earlier this year. Sources close to the company said another 4,200 layoffs are in the works. This could force Wang to pay out $126 million, triggering default of its loan covenants and possibly causing creditors to call in their notes.

Separate 'til the end

▶ Will IBM include OS/2 in a possible PC division spin-off? James Cannavino, general manager of the Personal Systems Division, said a more autonomous PC group would not be responsible for OS/2. "The software development team hasn't been part of that business, and it's my intention they won't be," Cannavino said. The goal is to make the PC hardware effort a scrappy, independent group that can more quickly react to competitors.

Getting very graphical

▶ Microsoft will offer yet another sneak peek of Windows NT at the Windows and OS/2 Conference in Boston this week. The company is preparing to show some NT features that previously have not been showcased in demos. These include system management features such as software distribution, performance monitoring and inventory control, says Dwayne Walker, Microsoft's director of Windows NT and networking products. Meanwhile, IBM is planning to present the one millionth copy of OS/2 2.0 to customer Caterpillar, Inc. In addition, Software Publishing Corp. is slated to unveil SuperBase IV Version 2.0. The upgraded package, which lists for $795, is said to include an improved user interface and connectivity.

Magnifying glass necessary?

▶ HP Vice President Bob Frankenberg teased attendees at a recent technology conference with details of its next-generation palmtop. Frankenberg said the company within six months will introduce a word processing version of its 95LX that will be capable of running Windows, will offer almost a full-size keyboard and will be in an "affordable" price range. Within two years, HP will have a version that offers a full-color display and two-way communication, he said.

No longer a peer

▶ John Hunter, IBM's director of architecture and telecommunications, jumped ship last week and headed for Landmark Systems, a small IBM-compatible software company in Vienna, Va. Hunter directed development of critical architectures such as APPN and IBM's multivendor networking "blueprint." He will be succeeded by Rick McGee, who oversaw the same basic areas in his former job, at a slightly lower organizational level, an IBM spokeswoman said. IBM would not comment on Hunter's reason for leaving, but industry scuttlebutt has it he took advantage of IBM's voluntary severance program.

A CASE for change

▶ Paul Hessinger flew the coop as chief technologist at Softlab, a CASE company owned by Germany's BMW. He replaces Pete Privateer, former strategic product planner at rival KnowledgeWare. Softlab offered in excess of $350 million to buy out KnowledgeWare five months ago, but the two companies couldn't come to terms. Hessinger will handle a combination of R&D and product positioning, according to a source within the Atlanta-based company.

Counterfeit versions of PKWARE, Inc.'s PKZIP data compression software are showing up on bulletin boards, according to a report by the Computer Incident Advisory Capability at Lawrence Livermore. Use of PKZIP files labeled PKZ201.ZIP, PKZ201.EXE, PKZIPV2.ZIP or PKZIPV2.EXE can lead to damage of hard disk data. PKWARE reports that the current version of PKZIP is 1.10. Know of any pilfered software? Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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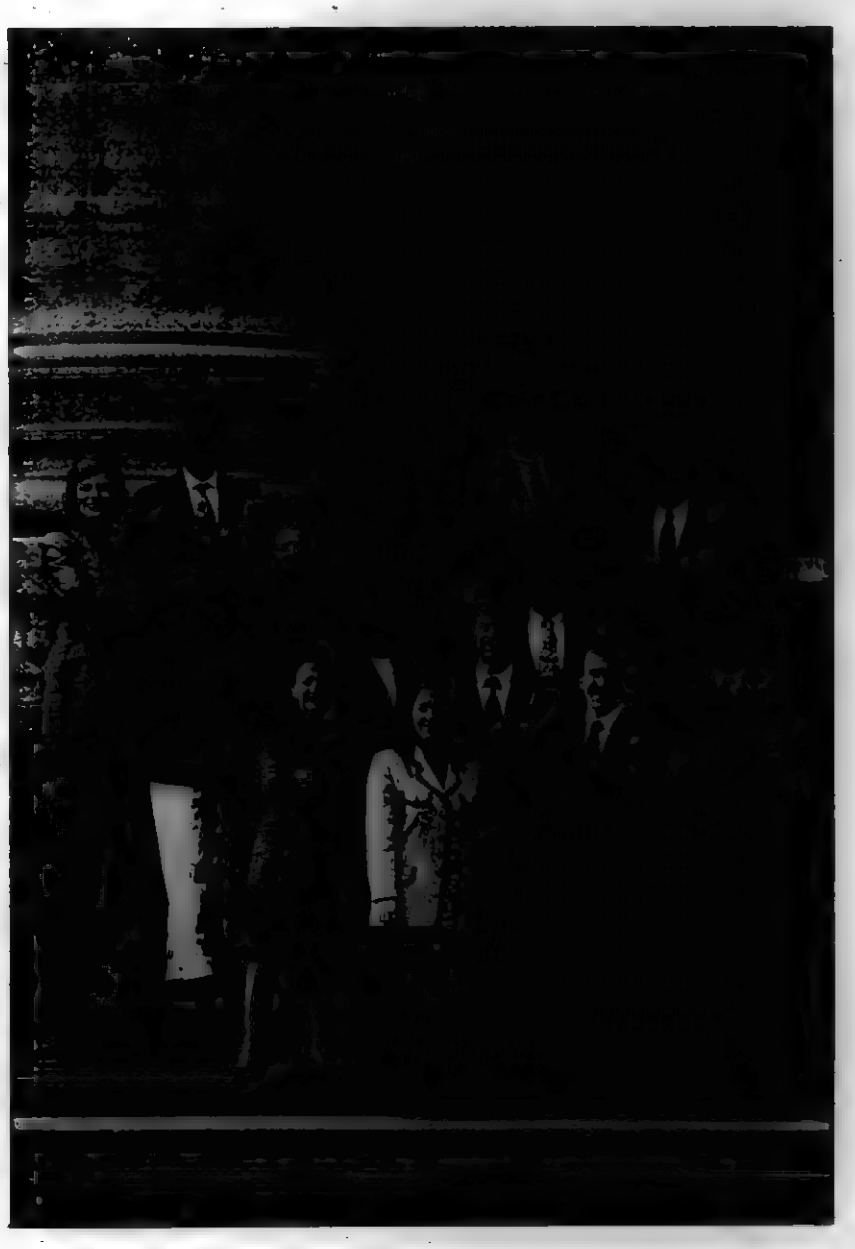

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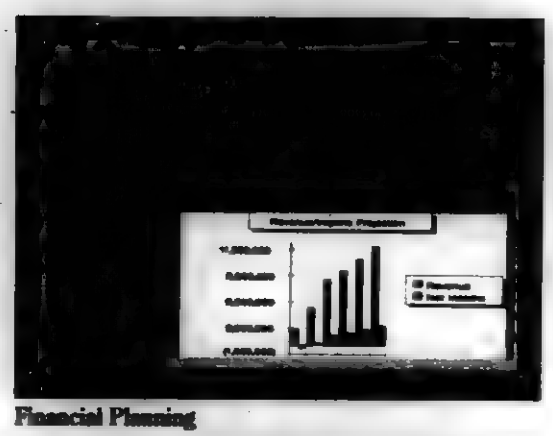
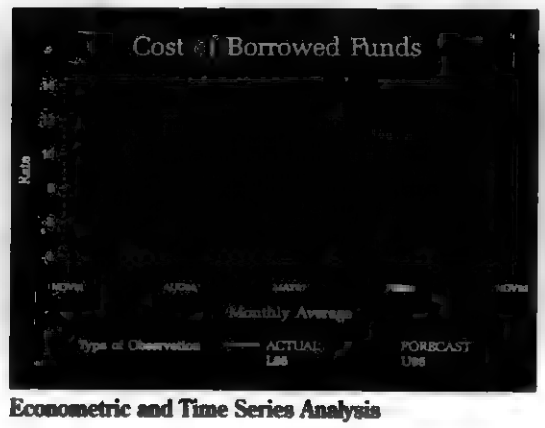
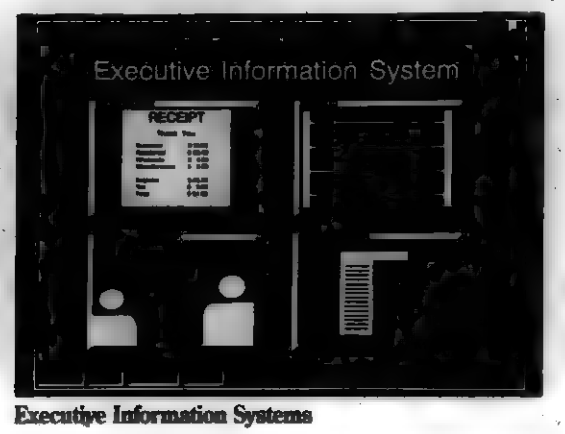


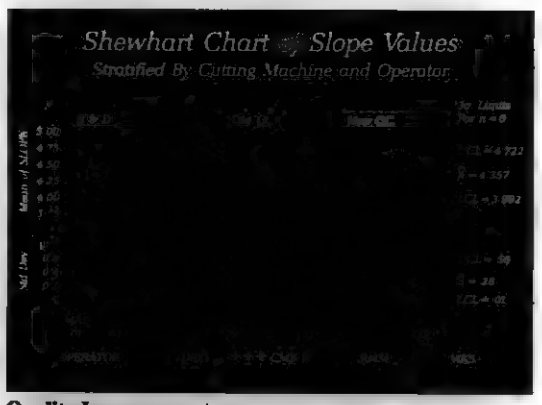
Financial Planning



Econometric and Time Series Analysis



Executive Information Systems



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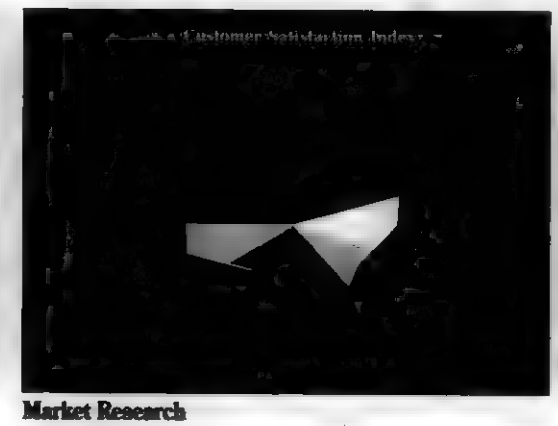

Market Research

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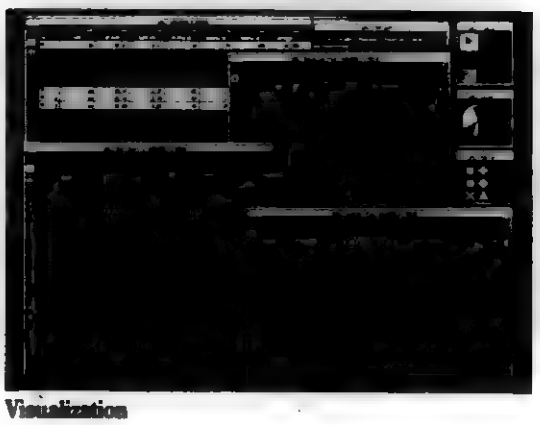

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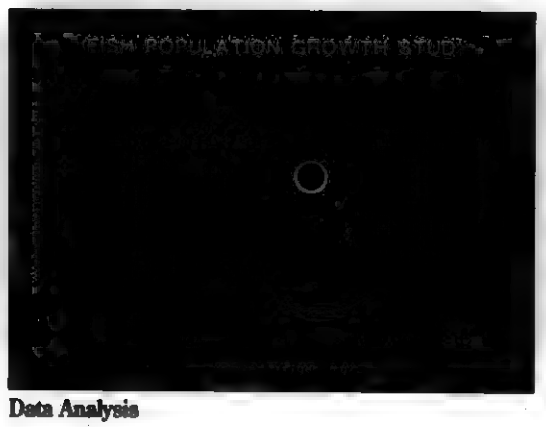

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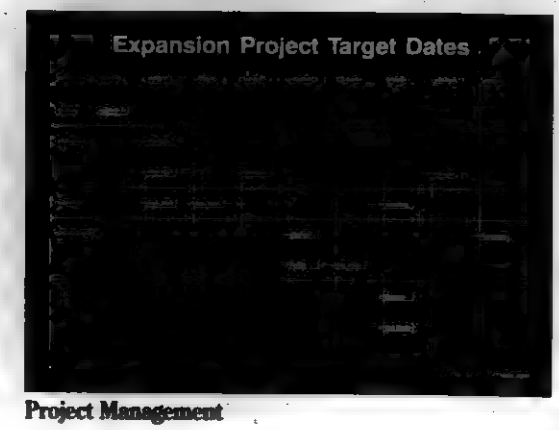

Project Management

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COMPUTERWORLD

Insurer cancels host policy

SystemPro network replaces mainframe/mini hodgepodge, slashing costs

BY CAROL HILDEBRAND
CW STAFF

COLUMBUS, Ohio — The Midland Mutual Life Insurance Co. is putting the final accents on a personal computer-based network that has turned its old data center into a company gymnasium. In the process, the $1 billion company has flattened the organization and sliced information systems costs by several million dollars.

Gone is a conglomeration of an IBM 4381, two Hewlett-Packard Co. 3000 Model 70s, an IBM System/36 and a Digital Equipment Corp. VAX 6210. In its place is a PC network anchored by 22 Compaq Computer Corp. SystemPros that serve about 315 clients. The system, in place since July 1991, is now getting the finishing touches as the company sends its big iron to the dustbin.

The difficulty of supporting various software packages for each of the hardware platforms played a major role in the decision to downsize. The company converted data from the mainframe applications over to one standard, PC-based insurance application for all its business groups, but it did not attempt to port the host-based software itself. Jerry Whetnall, assistant vice president of corporate sys-

Continued on page 6

Downsizing enticements

Storage savings: A 622M-byte VAX RA91 disk drive costs about $40,000. With PCs, The Midland can get four times the storage for one quarter the price.

System modularity: Using one vendor (Compaq) lets The Midland swap in faster motherboards more easily.

Lights-out processing: Batch jobs, like posting premium payments, can be activated by programmers from a PC at home.

HP aiming stations at office desktops

BY MARYFRAN JOHNSON
CW STAFF

CHELMSFORD, Mass. — While Hewlett-Packard Co.'s Unix workstations still play second fiddle to Sun Microsystems, Inc. in mainstream commercial accounts, HP's workstation division here is hatching new strategies to step out of Sun's shadow.

An expected Sept. 15 announcement of more powerful new workstations based on HP's 7100 "Thunderbird" Precision Architecture-RISC chip — which doubles the clock speed of the current chip to 100 MHz — should give the vendor an even more compelling price/performance display for commercial customers.

Even so, only an estimated 15% of HP's $1.6 billion workstation revenue last year came from sales to business environments. The bulk of the firm's revenue still comes from scientific and technical workplaces.

"The good news is that most of the commercial workstation opportunity is a green field opportunity," said Gary Eichhorn, general manager of HP's workstation systems group. "We are seeing a lot more business, more activity, more bids and more long-term projects."

Wanting it all

Commercial users said flashy performance is only a fraction of the larger equation involved in buying workstations. Hardware reliability, long-term costs of ownership, choice of software applications and reputation for

Continued on page 14

MAINFRAME METAMORPHOSIS

'Old-timers' wrestle with dinosaur image

Second in a two-part series on mainframe computing.

BY MITCH BETTS
CW STAFF

For laid-off information systems executive Curt Beaumont, the numbers told the story: hundreds of resumes sent out nationwide in 18 months, scores of job interviews and zero luck. That is how brutal the job market can be for IS executives with mostly mainframe experience.

"Because of my concentration on large mainframes, I became a dinosaur," said Beaumont, 47, who had to leave a 26-year IS career and a $95,000 salary for a $20,000 job as a cellular telephone consultant in Framingham, Mass. Money problems led to the breakup of his marriage and a new self-image. "I've had to downsize myself — my ego, expectations and

Continued on page 12

Charles Edinger

Former mainframer *Fred Corey picked up PC skills on his own, which saved his career*

Users doubt Wang's comeback potential

BY KIM S. NASH
CW STAFF

LOWELL, Mass. — Although Wang Laboratories, Inc.'s Chapter 11 bankruptcy protection filing last week shields the money-losing minicomputer firm from hungry creditors, it also erects a wall between Wang and its customers.

The majority of a dozen-plus users interviewed last week — along with another 256 surveyed by the CW Database Division — said they are no longer comfortable doing business with Wang.

For VS faithfuls, including American Express Co., the Port of Seattle and W. R. Grace & Co., Wang's $45.4 million operating loss for fiscal 1992 on sales of $1.9 billion and subsequent Chapter 11 filing came as no surprise. It largely served to reaffirm plans to vacate the VS or replace Wang service with that of independent third parties, they said.

"We have a great deal of sympathy for Wang. I offered my condolences to [Chairman] Rick Miller," said Marilyn Phillips, executive director at Haynes and Boone, a $60 million Dallas-based law firm that is dumping seven VS models and 340 Wang

Continued on page 16

What to do?

How will Wang's bankruptcy affect your future plans?

291 responses from 256 users at Wang sites

Percent of responses

- We will look for a new vendor: 37%
- We will maintain existing Wang hardware for the short term: 34%
- Our purchase plans have not changed — we will stick with Wang: 20%
- We will rely on Wang only for software and services: 4%
- Don't know: 5%

Source: CW Database Division

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INSIDE

Lotus may miss its year-end shipment schedule for 1-2-3 Release 2.0 for Windows. Page 4.

IBM confirms it will use the Mach 3 micro kernel instead of the NT kernel in the next generation of OS/2. Page 4.

Expecting an eight-way mainframe processor this year from IBM? Don't hold your breath. Page 6.

CA, Novell seek to bring host systems management to networked PCs. Page 10.

Executive Report — Spin-offs: Turning IS into dollars. Page 81.

IN THIS ISSUE

NEWS

4 IBM and **Microsoft** reveal battle plans at last week's Windows and OS/2 Conference in Boston.

4 Hoping to increase its value to corporate accounts, **Borland** offers support initiatives and a priority hot line.

6 User reaction is mixed as **IBM** announces that it will be late in delivering a mainframe upgrade.

7 DEC announces a family of PCs that will offer upgradability from 386DX to 486DX to 486DX2 by swapping in daughtercards or CPUs.

8 Intecom to announce that it has integrated a variety of features into its Integrated Business Exchange PBX.

10 Computer Associates says it will port its CA-Unicenter systems management software to **Novell**'s NetWare servers.

10 IBM and **Sears** team up to form a network outsourcing company called **Advantis**.

14 Minicomputer users complain and **HP** listens: The vendor is expected to announce a shift in sales and support strategies to appease small to midsize customers.

20 The Department of Energy and **NASA** select **Sprint** to boost bandwidth in three national research networks.

Quotable

"This is the worst stretch of unemployment in the data processing field I've seen in 10 years."

ROGER O'CONNOR
EDWARD PERLIN ASSOCIATES

On unemployment among IS professionals with mainframe backgrounds. See story page 1.

DESKTOP COMPUTING

53 GUIs need more than a fast CPU: A look at their graphics requirements.

60 Technology Analysis: **Symantec**'s Norton Desktop for Windows 2.0 has gotten faster; **Hewlett-Packard**'s ambitious NewWave 4.0 is still complicated.

WORKGROUP COMPUTING

61 The Navy's electronic personnel system has put its 55 tons of paperwork out to sea.

ENTERPRISE NETWORKING

69 3Com supports SNMP with its new LinkWatch product.

LARGE SYSTEMS

71 Maximum Strategy announces a multitasking RAID system.

APPLICATION DEVELOPMENT

77 The quest of application development centers.

77 TI will port its CASE tools to **Sequent Computer**'s high-end Unix machines.

MANAGER'S JOURNAL

89 A nonprofit computer security group is working to establish certification as a must for members of its field.

EXECUTIVE REPORT

81 Companies try to turn technology into cash by spinning out IS service businesses.

IN DEPTH

85 Are your cost estimates usually off? We have some guidelines, culled from IS chiefs, that can help put them on track. By Albert L. Lederer and Jayesh Prasad.

DEPARTMENTS

6, 14 News Shorts
25 Advanced Technology
28 Editorial
90 Calendar
95 Intelligence Files
97 Computer Careers
104 Marketplace
108 Stocks
109 Computer Industry
110 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **Times are hard for IS professionals with mainframe backgrounds.** Application downsizing has thrown many out of work and created the worst IS job market in 10 years, some recruiters say. The lucky ones are those who have sharpened skills in PCs and networking, where plenty of opportunity still exists. **Page 1.**

■ **Wang scrambles to remake itself** into a software/service company after filing for bankruptcy last week. Meanwhile, current VS minicomputer users are acting on contingency plans, with many set to move to IBM. Wang hopes its Office 2000 imaging-enabled office automation scheme will bring a smaller, leaner company back to life. **Pages 1, 16, 17.**

■ **Hewlett-Packard cranks up efforts to sell Unix workstations to commercial sites,** which today make up only 15% of its workstation business. One example: HP will start pushing client workstations to Series 800 server customers and the millions of LaserJet printer users. **Page 1.**

■ **Many IS shops today share a common problem:** Technology-cost estimates are missing their marks. A recent study of 115 organizations found that 63% of their projects went over budget. Tips for avoiding this fate include assigning the initial estimate to final developers, conducting feasibility studies and controlling user changes. **Page 85.**

■ **IBM and Sears team up** in hopes of becoming a powerhouse in the network outsourcing market. But the U.S.-oriented, Systems Network Architecture-centric venture may initially be at a disadvantage against global competitors. **Page 10.**

■ **Microsoft and IBM were looking ahead** at last week's Windows & OS/2 Conference. Microsoft is lining up troops to help push Windows NT into the market, and IBM is sketching out plans for OS/2's next generation, which will likely include the Mach 3 Unix kernel. **Page 4.**

■ **Many user companies are trying to turn huge technology investments into cash** by entering a hot new field: computerized distribution logistics. Companies spinning off for-profit distribution units include Roadway, Caterpillar, TNT Transport Group, Carolina Freight and Ryder Systems. Meanwhile, older IS spin-offs enjoy mixed success. **Page 81.**

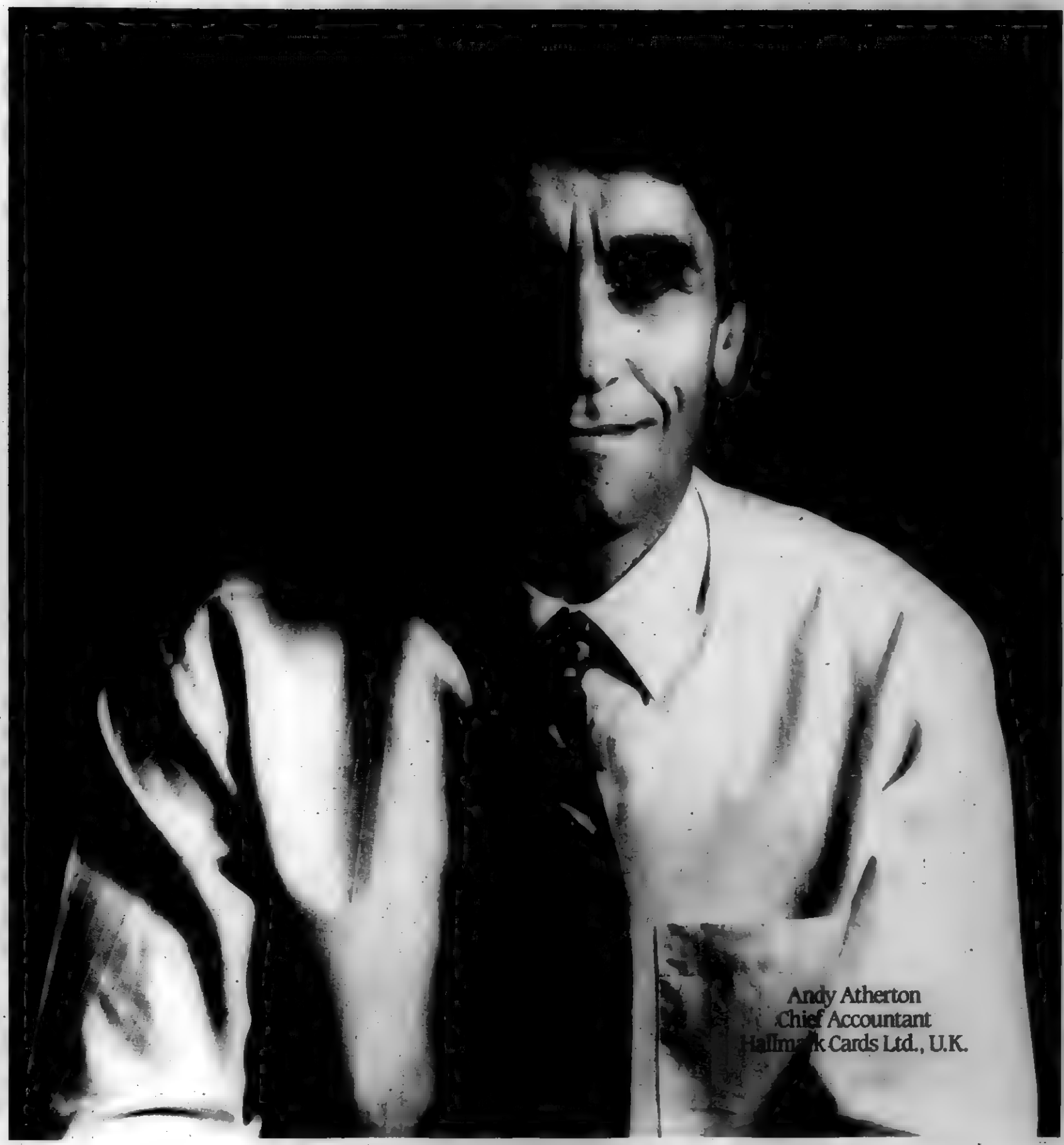
■ **A plan by CA and Novell to link up** in a "technology sharing" alliance draws excited reactions from users. Initial product plans will tie CA's Unicenter management tools to Novell's NetWare operating system. **Page 10.** Don't look for a trend in LAN management. The field remains fragmented, with users focusing on tools designed to manage a particular type of LAN. **Page 69.**

■ **IBM delays its eight-way mainframe,** originally planned for delivery late this year, until next year. Customer responses range from ho-hum to "Help! I'm running out of horsepower!" **Page 6.**

■ **Imaging systems are making their mark** in manufacturing firms, where they bring efficiencies in the handling of engineering drawings. **Page 71.**

■ **Graphical user interfaces bring some excess baggage,** such as the need for high-performance graphics gear. **Page 53.**

■ **On site this week:** The Midland Life Mutual Insurance Co. believes in simplicity, so it junked a tangle of different vendors' minicomputers and mainframes in favor of a Compaq SystemPro-based local-area network. **Page 1.** The migration to open systems can be a bumpy road, as Hughes Electronics Space and Communications Division can attest. **Page 72.** It's a federal government success story at the U.S. Navy's Human Resource Office, where a local-area network-based personnel system is being used as a model for other agencies. **Page 61.**



Andy Atherton
Chief Accountant
Hallmark Cards Ltd., U.K.

"These days, the first thing a software company needs is a good pair of ears. That's what makes CA special. They listen. They care about what I have to say. I'm very happy with how they've improved our financial software solution...especially with the changes I recommended myself."

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Borland to flesh out IS initiative

BY MARK HALPER
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. this week will launch a series of support programs as part of an initiative to increase its presence in corporate accounts.

The software vendor will begin offering support contracts, including options for a compact disc (CD) read-only memory-based technical support database, a priority hot line that provides fast access to senior technical support engineers and a priority bulletin board service on CompuServe.

This week's programs are expected to be followed by new marketing alliances with systems integrators and by a series of corporate-oriented educational seminars [CW, June 15].

Borland's corporate accounts program also includes revisions to its licensing program; these revisions are aimed at easing licensing restrictions to its products. Earlier this summer, the company entered into a licensing arrangement with Price Waterhouse under which the accounting firm will buy some 25,000 Borland products [CW, July 27].

Among the programs to be launched are the following:

- The CD-ROM program, called Borland KnowledgeBase CD. It gives corporate and government customers and developers access to technical information on problem reports, workarounds and other detailed information on Borland products.
- Borland is providing one CD with information on its application products and another that supports its language products. It will charge $495 a year.
- The Borland Priority Hot Line, priced at $500 a year for its database and spreadsheet products and $750 a year for Borland C++ objected-oriented programming language, gives customers toll-free phone access to a technical engineer. The Borland VIP CompuServe Bulletin Board ($500 per year) allows users to access all Borland forums and a special message board, and it includes a guaranteed four-hour response time to questions.
- The Borland Premium Support plan, which includes a comprehensive package of toll-free support, the CompuServe Bulletin Board and both KnowledgeBase CDs. The toll-free support and bulletin board includes separate contacts for each of four Borland products: dBase, Paradox, Quattro Pro and C++. It is priced at $3,995 per year.

Tardy 1-2-3 for Windows 2.0?

Lotus making sure new features make it more competitive with Excel 4.0

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. may miss its year-end shipment deadline for 1-2-3 for Windows Release 2.0, a company executive confirmed last week.

A Release 2.0 delay could be another setback for Lotus, which has been struggling to gain a strong foothold in the Microsoft Corp. Windows spreadsheet market since it arrived in 1991, already far behind Microsoft's lead and with an initially buggy product. However, Bob Holmes, a computer technology research analyst at Southern California Gas Co., said, "It would be better that they'd be late than deliver something like Release 1.0."

Frank Ingari, the company's vice president of marketing, said there "could be a modest adjustment" to the delivery schedule "but no major ones."

Slip-sliding away

In March, Lotus committed to a series of shipment deadlines for its spreadsheet products and promised to ship Release 2.0 by year's end. Release 2.0 is supposed to contain performance boosts and ease-of-use features, as well as deliver the initial implementation of the Chronicle workgroup application technology.

"The only thing I'll say is, something happened between then and now: Excel 4.0," Ingari said. In fact, he said the ship date may slip some because Lotus is reviewing additional features to include in Release 2.0 that would make it competitive with Excel 4.0. He did not specify what those features might be.

Lotus' Ingari: *There 'could be a modest adjustment' to the schedule*

"They aren't showing they can out-innovate Microsoft in spreadsheet features," said Jeff Henning, an analyst at BIS Strategic Decisions in Norwell, Mass., who estimated that Lotus now holds about 24% of the Windows spreadsheet market.

Ingari said that any additional features under consideration are the "5% fringe on the edge," adding that Lotus will not make major changes to the product. Ingari would not say when the product would ship to beta-test sites, nor would he estimate how long the beta program would take other than to say that beta tests can run anywhere from 10 weeks to six months.

Bill Higgs, a vice president at Computer Intelligence/Infocorp in Santa Clara, Calif., said he does not believe that the Chronicle technology could further complicate the beta-test program, even though it is the first time Lotus will be adding workgroup features to 1-2-3. Higgs said Lotus has been demonstrating Chronicle for nearly a year and is likely working with stable code at this point. "But any time you do a major revision, and [Release 2.0] is one, you are looking at a beta period of two to four months," Higgs added.

Ingari also said Lotus would rather take the heat for missing the deadline than stick to the schedule and release a buggy product.

IBM, Microsoft reveal plans for next-generation systems

BY ROSEMARY HAMILTON
CW STAFF

BOSTON — IBM and Microsoft Corp. used the Windows & OS/2 Conference, held here last week, to reveal more of their battle plans for the desktop.

IBM, riding high on its claims of 1 million OS/2 2.0 shipments, said work is under way for the next-generation OS/2 and that the company will likely proceed with the Mach 3 micro kernel from Carnegie Mellon University instead of the Microsoft Windows New Technology (NT) kernel.

Windows&OS/2 CONFERENCE

NT "is out of the question," while the Mach kernel is the "likely foundation . . . to move to an architecture of portability and much more object-oriented technology," said Fernand Sarrat, assistant general manager in charge of market development in the Personal Systems Group.

"This would move them somewhat more toward the Unix camp and could give them a more portable operating system," said Bill Higgs, a vice president at Computer Intelligence/Infocorp in Santa Clara, Calif.

The micro-kernel architecture will allow IBM to build a core operating system and service layer on which the "OS/2 personality and AIX personality" could be built, Sarrat said.

Microsoft, meanwhile, said it is putting together an NT infrastructure that will help propel the 32-bit operating system into the market.

Dwayne Walker, the company's director of Windows NT and networking products, said the up-front work could be "1.0 schizophrenia," meaning the lag time after new software is shipped before users are hesitant to embrace it.

Microsoft will unveil details next month on partnerships, channel strategies and training plans, Walker said. For instance, Sequent Computer Systems, Inc. is expected to soon announce its support of NT to run on its multiprocessor systems.

"They are putting in place the background works so they aren't left sitting without applications to take advantage of NT," said John Dunkle, president of Workgroup Technologies, Inc.

In addition, Walker said, Microsoft is on schedule to provide end users with beta-test copies beginning next month that it plans to ship to 20,000 users.

Both companies could not pass up an opportunity to take shots at each other. IBM said now that it had shipped 1 million copies of OS/2 2.0, and it is waiting for Microsoft to announce support for its applications.

Aimed at Microsoft, Walker's response was: "As long as they can run Windows apps, they have our support."

CORRECTIONS

Because of an editing error, Bill Wilson, IBM's assistant general manager, was inaccurately quoted in a story called "Big iron adapts to avoid going the way of the dinosaur," [CW, Aug. 17]. He said IBM "will have an eight-way processor sometime next year," and did not confirm a ship date of this year.

.....

In the story "DRAM advances pave way for new adventures" [CW, Aug. 17], Mitsubishi was referred to as a licensee for Rambus' synchronous dynamic random-access memory. In fact, Mitsubishi has developed its own and competes with Rambus.

Sun cuts sales tags

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. was active last week on several fronts, rolling out announcements on price cuts, multimedia training tools and its own "rightsizing" project with Oracle Corp.

The company unveiled price reductions of 10% to 35% for its mail-order SunExpress products and began shipping the first in a series of multimedia, on-line training tools for first-time Sun users.

Sun also highlighted its in-house "rightsizing" project with Oracle. This joint development effort is focused on creating the next generation of Oracle's financial and manufacturing applications for use at more than 50 Sun manufacturing facilities worldwide by 1994.

The companies are billing their efforts as the first time a distributed computing environment will address multisite, multiplant and multilingual requirements for a global manufacturing network.

Optimal usefulness

Sun is replacing its current set of mainframe-based database management system software with the Oracle 7 product. The co-development work will optimize Oracle's manufacturing and financial applications for the Sun 600 MP line of multiprocessor servers.

The mail-order price plunge moved SunExpress, one of Sun's subsidiaries, from list pricing to "street pricing" for customers ordering a variety of peripherals and software packages by phone. SunExpress includes more than 1,000 products from Sun and third-party suppliers.

The multimedia training set, called SunTutor, combines on-line audio, video, text, graphics and simulation in a self-paced training course that condenses more than 16 hours of classroom lectures. The set is scheduled to ship next month, priced at $395 for a single user, with 10- and 100-user site licenses available at $1,995 and $4,995, respectively.

"Sun has done a nice job getting on-line documentation on CD-ROMs, which makes it much more accessible for users," said Tom Kucharvy, president of Summit Strategies, Inc. in Boston.

Kucharvy noted that other workstation vendors, Hewlett-Packard Co. in particular, are also expected to take advantage of multimedia training tools to make their machines easier to use.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

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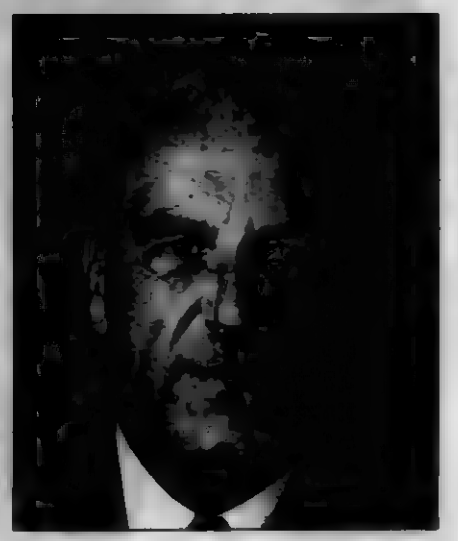
John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation



"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

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Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.

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NEWS SHORTS

Landmark Systems lays off 36

Feeling some fiscal pressure as it attempts to broaden its mainframe-centric focus, Landmark Systems has laid off 36 people, about 15% of its work force. Kathy Clark, senior vice president and co-founder, said the firm is refocusing its strategy to emphasize performance management products across all platforms, not just mainframes. Clark said the firm has also hired a new vice president of development and technology, John Hunter, a 23-year IBM veteran who most recently was IBM's director of communications architecture [CW, Aug. 17].

DEC, Ingres end bundling deal

Digital Equipment Corp. and the Ingres Products Division of The Ask Cos. announced last week that DEC's Ultrix SQL will no longer be bundled with DEC's Ultrix operating system. A new arrangement went into effect last week by which Ingres will provide a migration kit to Ingres 6.4, the latest release of the Ingres relational database management system, for licensed Ultrix SQL customers. It will also provide a migration path from Ultrix to DEC's OSF/1 operating system. Oracle Corp. will offer a migration kit for Ultrix SQL users to the Oracle RDBMS. DEC plans to port its Rdb to OSF/1.

Unix companies get together

Unix System Laboratories, Inc. (USL) last week struck a deal with The Santa Cruz Operation (SCO) that aims to increase the number of Unix applications on the market. Under the agreement, USL will supply the SCO with a host of application development tools, which SCO will include in future versions of SCO Unix, SCO Open Desktop and SCO C++. The deal essentially adds another convert to USL's Unix System V, Release 4 operating system. The SCO's installed base of 700,000 Unix systems is based on an earlier version of System V Unix.

Humana cuts back, plans IT spin-off

Humana, Inc. last week disclosed that it would trim its administrative staff by 400 — a move that will likely affect information systems operations, according to a company spokesman. The health care firm will launch an information technology subsidiary Oct. 1 that will offer quality assurance, technology assessment and management of clinical information systems to the hospital industry. The mid-month retirement of Humana IS director Fred Pirman Jr. is unrelated to either the layoffs or the reorganization. However, Pirman's office will remain vacant until the effect of both moves on internal IS can be determined.

Toshiba joins notebook price war

Next Monday, Toshiba America Information Systems, Inc. will attempt to shed its premium price image in the notebook computer market, according to sources close to the company. Toshiba plans to introduce three new systems, including an Intel Corp. 80386SX-based notebook with 2M bytes of random-access memory and a 60M-byte hard drive and two systems based on the 25-MHz 386SX. Street prices could start as low as $1,500.

Short takes

Last week, F. Grant Saviers, recent vice president of DEC's PC systems and peripherals, left DEC to become chief operating officer at **Adaptec, Inc.**, a Milpitas, Calif.-based vendor of Small Computer Systems Interface host adapters for PCs. . . . **Autodesk, Inc.** divested itself of two companies that made up its Information Systems Division: **American Information Exchange** (Amix) and **Xanadu Operating Co.** Amix will continue its operations as an independent purveyor of digitally stored information. . . . Genie, an on-line service provided by **General Electric Co.**, announced a new on-line RoundTable network for **Microsoft Corp.** Windows and New Technology users, developers and analysts that is independent of Microsoft and is slated to be open for public access today. . . . **Xircom, Inc.** announced the CreditCard Ethernet Adapter, a PCMCIA flash-memory card that lets users connect to an Ethernet 10Base-T network. Pricing is expected to be about $445.

More news shorts on page 14

IBM 8-way processor delayed

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM will not deliver a mainframe upgrade in the fourth quarter as originally planned. Instead, the company will unveil the new processor sometime early next year.

Speculation varied about why the date slipped, with some observers pointing to possible technical problems and others saying that the decision had more to do with marketing. A company spokeswoman confirmed that the much-vaunted eight-processor model will not be announced until next year and said that in any case, the processor is not late. "We have not committed to customers either announcement dates or delivery dates of the eight-way."

Customer reactions were mixed. Some said they were fast running out of mainframe horsepower, would soon need to make a decision about what to do and might look at non-IBM machines as alternatives. Others said the slippage would not affect them.

The new processor is said to compute about 410 million instructions per second (MIPS) vs. about 235 MIPS for the current top-of-the-line Enterprise System/9000 Model 900. Each of the eight processors will handle about 50 MIPS, compared with 40 MIPS in today's models, which have a maximum of six processors.

One customer said IBM approached him about taking early delivery "by year's end, and we considered it. We made no commitments, but they never got back to us," the user said. "If someone is not trying to close the deal, the product is probably not for sale."

Hanging on

Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla., said he installed a Model 640 last month to complement the Model 900 Alamo already had. He said he was looking forward to the new machine in order to consolidate everything onto one processor. "We're OK until the end of the year, but by Washington's birthday, I will need more capacity. I'll have to do something about that — maybe upgrade the 640 or add another machine."

Doug Underhill, vice president at CSX Technology in Jacksonville, Fla., said the delay would have "no impact" on his shop. "There is an appeal to being able to pack more work loads into a single processor. But it wasn't something that I need right now."

Observers cited different causes for the delay. Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said IBM's European operation disagreed with the decision to announce the new processor this year because it would disrupt the momentum of sales for the existing ES/9000 models. The firm will likely announce the machine in April, to ship by July, he said.

Jay Stevens, an analyst at Dean Witter Reynolds in New York, suggested that the delay might be due to technical problems with getting the MVS operating system to run across eight processors as a single unit. "IBM engineers have told me that they've had difficulties getting MVS tuned for the eight-way," he said. "But Amdahl has said 'No way,' so I don't know who's speaking truth." Nevertheless, Stevens said, he still expects IBM's new machine to be introduced in February and to be available by March.

But Amdahl Corp., which has promised its eight-way for the fourth quarter, may beat IBM to the punch. "That would be embarrassing for IBM," Stevens said. "The only customers who really need the upgrade path right now are the largest ones — the most important."

Insurer cancels host policy, chooses SystemPro network

CONTINUED FROM PAGE 1

tems at The Midland, acknowledged that the job was a big one. However, he said it was broken down into three stages during the course of about seven months from the end of 1990 to July 4, 1991, when the final mainframe data came over.

"We were building a Tower of Babel," Whetnall said. "I wanted to get to a single platform."

Whetnall added that although the company did take a financial hit when it had to buy out the leases on the big boxes, it made the money back within 18 months. "If I had stayed with the old system, my data processing expenses this year would have been about $6 million," he said. "With the downsizing, it's just under $2 million. You can cost-justify this stuff real easy.

"I can buy an entire 1.26G-byte system for less than I paid for a disk drive for a VAX," Whetnall added.

The end result has been both a money-saver and a business enhancer, he said. Overall, staff dropped from 360 to 205; Whetnall said his IS staff plummeted from 55 to today's low of 20 as a result of the downsizing. He has also decentralized his staff as the units moved apart.

Each unit has a couple of programmers assigned specifically to it that report to the general manager of that unit. This way, each group is free to concentrate on its priorities without having to wade through a centralized IS bureaucracy.

"I end up being the auditor, standards enforcer and chief of police," Whetnall said.

He said the mandate for change began as the 86-year-old firm reorganized itself into four separate business units in 1990. The impetus for that reorganization came from the chairman of the board at the company, which had a total of about 150,000 policies last year and plans to grow its business by about 10% this year.

Cheryl Currid, president of consultancy Currid & Co., pegged such high-level support as vital. "If you don't have top management that can make the leap of faith to say, 'Go ahead and try it,' you'll never get out of the starting gate," she said.

Whetnall said a major problem with a centralized data center was that when one group had a special need or upgrade, the other units suffered as well.

With the new setup, the servers are divided among each group; each unit has one server that handles standard business applications such as word processing, one or two servers that run the customized administration software for the insurance business and a test server that lets Whetnall try out any fixes or enhancements without having to use the actual production system.

He said the relatively low cost of PC servers enables him to easily afford the redundancy.

Dividing his system this way gives Whetnall the flexibility to separately address different business needs, as well as add and subtract staff support and computing power as needed, he said.

The system runs Novell, Inc. NetWare v3.11 over an Ethernet network with a fiber-optic backbone and coaxial connections to the workstations. Whetnall said he is looking to convert to a complete fiber-optic network by next year.

The Midland's 18,000 insurance brokers, scattered across the country, access the system via a wide-area network linked into CompuServe. "They just call the local CompuServe number and get routed onto our set of servers," Whetnall said.

Grid convertible revs up pen market

Combination notebook/pen-based tablet may draw sales where other products failed

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Calif. — Grid Systems Corp. will expand its pen computing line in the early fall with a hybrid product that it hopes will succeed where rival Momenta International, Inc. failed, sources said.

The Grid "convertible" will combine a pen-based tablet with a notebook computer, the sources said. Based on Intel Corp.'s low-power 20-MHz 80386SL chip, the device will feature two to three hours of battery life and a 120M-byte hard disk, as well as a back-lit screen. The product will also have two Personal Computer Memory Card International Association drives for flash-memory devices and is expected to be priced at $2,995, the sources said.

Momenta, which was the first company to produce a combined pen and notebook computer system, drew little interest, in part because its sleek machine uses a proprietary operating system and costs more than $5,000.

Surprisingly, the Grid machine is not expected to come with PenRight, Grid's operating environment. Instead, it will offer Go Corp.'s PenPoint or Microsoft Corp.'s Windows for Pen Computing software.

Sources described the system as between 2 in. and 2½ in. thick, slightly thicker than the normal notebook. From above, a user would see what appears to be just a screen with a pen, but pressing two indentations, one on each side of the screen, tilts the screen up and locks it into place behind the keyboard.

"It's a no-compromises notebook that also comes with a pen," one source said.

Kenneth L. Dulaney, Grid's director of laptops/pen-based marketing, refused to comment on specifics but did say, "We will have a pentop product by the end of the year."

Sources close to Momenta, meanwhile, said the company has ceased operations. One source said Momenta has not declared bankruptcy but has fired all but one employee and is trying to sell its technology.

Last week, Momenta's phones were being answered by a Momenta-employed receptionist, but Angelo Penzani, Momenta's spokesman, did not return repeated calls.

DEC to give PCs modular upgrades

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. will announce a new family of personal computers that offer a modular upgrade path across the line.

Dubbed the DECpc LP family, the products can be upgraded from 386DX to 486DX to 486DX2 processors by swapping in daughtercards or CPUs. They range in price from $899 to $2,199.

"While other vendors also have a modular approach, DEC's plan is to offer a single product family, from the low to the high end, that will allow users to make upgrades by merely replacing the CPU daughtercard," said Steve Widen, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

DEC will maintain seven worldwide integration centers with inventories of common parts. Users will have fast access to upgraded systems via daughterboards.

Definite draw

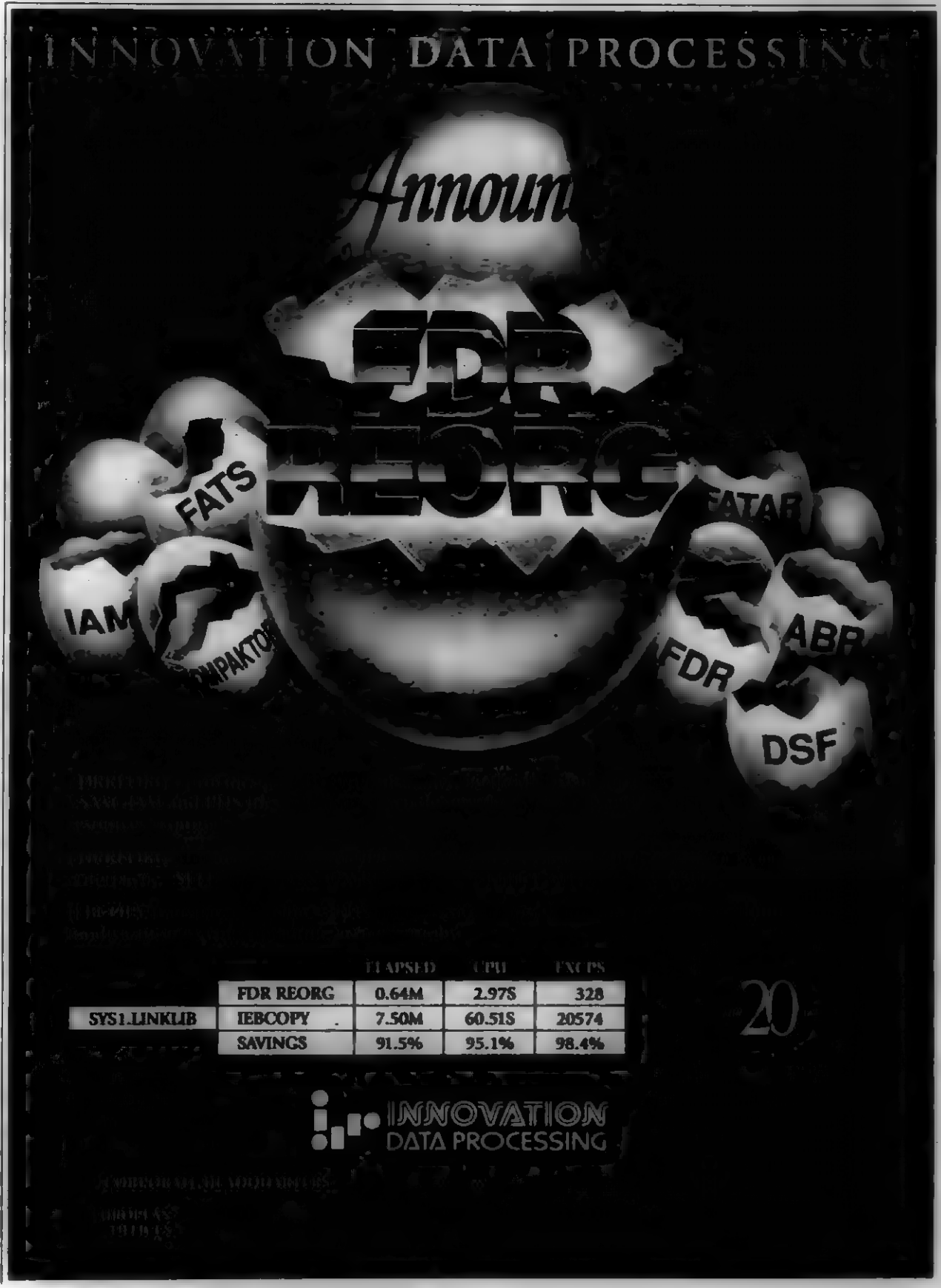
Some users praised DEC's pricing and the modularity of the new PCs. "The modularity of the systems would be a selling point for us. To be able to upgrade without trashing everything would be helpful," said John Limongelli, an analyst at Elliot Hospital in Manchester, N.H.

"It sounds as if this pricing brings them more in line with the competition," added Bill Lodge, project manager at Turner Corp., a non-DEC user in New York that recently downsized from IBM mainframes to Banyan Systems, Inc.'s Vines PC networks. "DEC has interesting products coming down the line with the Alpha chip and support of NT, but until now they've never had a serious presence in the PC market."

Others were skeptical, however, about DEC's strategy and its ability to win over non-DEC sites.

"DEC has improved their PC line, but when they pressed us to go with their PCs as a big DEC and big IBM account, we turned around and asked them why we should switch," said a user at a large banking firm who requested anonymity.

"Modular PCs are somewhat attractive, but users also become locked into a vendor's PC line because you can only buy the upgrade from them," added Peter Kastner, an analyst at the Aberdeen Group, a market research firm in Boston.



PC multiprocessing on horizon if AST rollout is any indication

BY MICHAEL FITZGERALD
CW STAFF

SANTA CRUZ, Calif. — When AST Research, Inc. showed off its latest server running The Santa Cruz Operation's (SCO) multiprocessing Unix last week, the infant personal computer multiprocessing business took another step forward.

Analysts pointed to this as another indication that microprocessor-based servers will soon be capable of truly replacing minicomputers and mainframes.

"This is a trend," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn. "Users are looking at PC boxes which have horsepower, reliability, scalability and security, and it's creating a tremendous demand in the marketplace for bringing mini and mainframe stuff down to this level."

Fiering cited high availability and better system security features and diagnostic tools as important pieces of the large systems world missing on PC servers.

AST and the SCO marked the event as the first time the SCO's MPX 2.0, a multiprocessing version of Unix, had run on fully symmetric hardware. AST's system was designed so that processing tasks are distributed evenly among the available CPUs. True symmetric multiprocessing (SMP) would give a 100% boost in performance for each new processor. AST acknowledged that this performance is not achieved by AST's Manhattan SMP superserver.

The Manhattan SMP supports up to four Intel Corp. 50-MHz I486DX microprocessors and 32G bytes of storage. Base price with one processor is $26,995. AST said it has 12 beta-test machines, mostly at software vendors, and will soon start a corporate beta-test program.

Michael Kreiger, AST's director of advanced systems marketing, said AST will focus on signing up value-added resellers for Manhattan, which he said will ship in December. AST hopes to find 100 resellers for Manhattan and expects to sell "well over" 1,000 units in the first year.

Intel gets involved

Among several recent moves for the multiprocessing market was one from Intel, which last week confirmed that it is developing an Advanced Programmable Interrupt Controller architecture that will replace its current 8259A chip. Commands from the microprocessor to the rest of the PC get transferred through the interrupt controller.

Intel said changes in software and the development of more powerful chips is driving the architecture's development.

For end users in a stand-alone environment based on high-level processors such as the upcoming P5, performance gains will be anywhere from 5% on up, according to Jag Bolaria, an Intel engineer. Far more significant gains will be made in a multiprocessing, multitasking environment, where every switched task means that the interrupt controller gets called into play.

"With the new operating systems, like OS/2, Windows NT and Unix, they're all multitasking, and there really is no interrupt controller for that," Bolaria said.

He said Intel will release a version of a new Advanced Programmable Interrupt Controller next month, but he said it could change several times before it appears in products.

Intecom ties LAN to phone switch

BY JOANIE M. WEXLER
CW STAFF

ALLEN, Texas — Former Wang Laboratories, Inc. subsidiary Intecom, Inc. has taken an innovative approach to survival in a long-saturated private branch exchange (PBX) market.

The vendor said it will announce today that it has integrated 10Base-T local-area networking, a Fiber Distributed Data Interface (FDDI) backbone, bridging, wiring hub capabilities and wide-area networking interfaces into its Integrated Business Exchange (IBX) PBX.

The goal is to turn the IBX telephone switch into an enterprise multimedia network backbone that can be managed collectively, said David C. Tucker, director of marketing. The enterprise voice/data/video network-in-a-box is managed by the Hewlett-Packard Co. OpenView product because "HP was the only vendor interested in ultimately managing traffic other than data," Tucker explained.

Intecom's InteLAN offering integrates a logical 100M bit/sec. FDDI backbone within the IBX and internally bridges the 10Base-T networks across it to boost performance, Tucker explained. The cost per port is $250, plus about another $100 per workstation for a 10Base-T adapter card. Users, then, pay a premium of approximately $250 a port for 10Base-T networking with the added FDDI backbone functionality.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

IBM, Sears blend networking strengths

Joint outsourcing venture Advantis could cement IBM's position in the domestic services market

BY ELISABETH HORWITT and NELL MARGOLIS
CW STAFF

SCHAUMBURG, Ill. — Can two less-than-successful value-added network players combine to make one dynamite network outsourcing company? That is what IBM is shooting for with its announcement last week of an agreement to align its network service with that of Sears, Roebuck and Co.

IBM Information Network (IIN) and Sears Technology Services, Inc. will combine to offer everything from network transport and electronic-mail services to designing, implementing and operating a customer's network, the companies said. Analysts said the market for such services is expected to reach $7 billion by 1994.

Called Advantis, the venture's two initial customers, IBM and Sears, are expected to make up 53% of its estimated $1 billion in first-year revenue, according to Boston-based research firm The Yankee Group.

Sears' nationwide network and 1,500-person staff of networking experts will position IBM "much more strongly" both as a value-added network that connects companies to their suppliers and customers and as an outsourcer that can meld a customer's network operations into its own, said John Rogers, European director at consulting firm Ledgeway Services. The question is whether the venture can attain unique advantages over such network outsourcing giants as Electronic Data Systems Corp. and AT&T, he added.

To be successful, Advantis also needs to extend its Systems Network Architecture (SNA) and its outsourcing outside the U.S., analysts said.

Sears, meanwhile, gets to gracefully exit the commercial network services business. By contributing Sears Communications Co., the retailer receives an estimated 20% to 25% stake in the joint venture.

Best of both worlds

IIN users seemed to have no doubts about the advantages of working with Advantis.

Blue Cross/Blue Shield, which evaluated Sears Communications before choosing IIN as its network provider last year, "hopes to get the best of both companies' combined strengths" from the merger, said Robert Schultz, a senior consultant at the company. Blue Cross also hopes to take advantage of special Sears services such as "data transfer products and maybe some different twists for E-mail," Schultz said.

"This is tremendously exciting to us," added Jerry Brager, chief executive officer at Laurence Harbor, N.J.-based Physician's Computer Network, Inc. His firm, which is 25% owned by IBM and uses IIN to route information among approximately 60,000 doctors' offices that subscribe to its medical networking services, will become an Advantis customer automatically.

Both users said they hoped to see some lower pricing from Advantis as a result of the economies of scale offered by combining the Sears and IBM networks. However, The Yankee Group suggested that both Sears and IBM have already taken advantage of any potential economies of scale in their networks. Syd Heaton, Advantis chairman and CEO, refused to "speculate on price changes."

The following is a rundown of the venture's strengths and weaknesses:

• **Service offerings.** The true blueness of Sears' network should make it a snap to integrate with IBM's SNA-centric information network.

On the other hand, there is such a thing as being too monolithic: Users and analysts expressed concern that Advantis' solid SNA-orientation may make it harder for the network service to meet its customers' burgeoning demand for high-speed, multiprotocol routing applications such as local-area network interconnection.

IBM is in the process of bringing into IIN — and thus into Advantis — certain key technologies it now uses internally that "lend themselves nicely to commercial offerings," Heaton said. Potential upcoming Advantis services include Integrated Services Digital Network, frame relay, multimedia and digital broadcast service, he added.

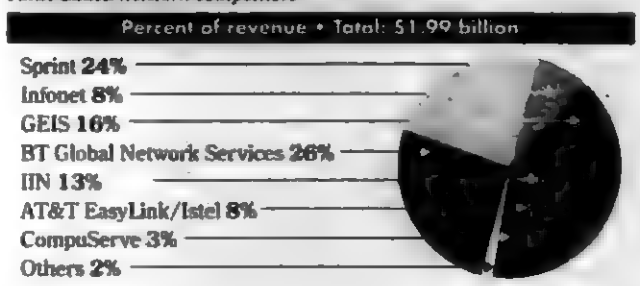
• **Covering the map.** The two firms' network infrastructures are complementary: Sears' network, originally built to reach out to Sears' consumers, provides inexpensive local phone access from some 20,000 sites nationwide. IIN has local nodes in fewer cities but provides the greater throughput for customer sites with high-volume traffic.

A major Advantis disadvantage is its focus on the U.S. market. While Advantis users will be able to communicate with overseas users via ties to IIN's overseas units, those groups are making their own decisions about whether to expand their network outsourcing offerings, Heaton said. This leaves IBM without a cohesive global network outsourcing strategy, while BT, Sprint Corp. and Infonet have all been aggressively expanding their global offerings.

Worse, while IIN grabbed 13.1% of the international value-added network market last year, most of its business was here. Overseas customers still perceive the service as overpriced, The Yankee Group said.

Bridge building

IBM hopes its partnership with Sears will allow it to leapfrog value-added network competitors



Source: The Yankee Group — CW Chart: Michael Siggins

Let's make a $1B deal

The IBM/Sears Advantis joint venture "will be a $1 billion company — and a profitable one" from Day 1, executives at both companies declared. Here's what else it will be:

• An amalgam of IBM's Networking Systems Services Division, including the IIN, internal telecommunications and Integrated Systems Solution Corp. (ISSC) network support as well as Sears' information systems subsidiary, Sears Technology Services (STS).

• Jointly owned by ISSC and Sears, with ISSC holding a majority stake.

• Outsourcing vendor to Sears, including Sears business groups Coldwell Banker Real Estate Group, Inc.; Allstate Insurance Co.; and Dean Witter Financial Services Group, Inc.

• Network service provider to all current IIN and STS customers, with consequent access from some 550 cities in 92 countries.

• Staffed by some 3,000 employees: all of STS' current 1,500 plus some 1,500 more from the various IBM networking units.

• Target markets will include ISSC's stated target industry niches, CEO Dennie M. Welsh said. These include retail, state and local government, health care, insurance, manufacturing and transportation.

NELL MARGOLIS

CA to port management software to NetWare

BY MICHELE DOSTERT
CW STAFF

NEW ORLEANS — Companies turning to distributed computing could eventually gain the same centralized control and automation of enterprise work procedures long afforded by the glass house if software under development at Computer Associates International, Inc. and Novell, Inc. comes to fruition.

Under a deal disclosed at CA's Systems Software Conference (SSC) here last week, CA will port its CA-Unicenter systems management software to NetWare servers. CA-Unicenter for NetWare will enable users to manage data, resources and business procedures across computing platforms distributed via networks.

From a central CA-Unicenter for NetWare console, for instance, an information systems manager could program, via CA/Novell's OS/2 Presentation Manager interface, specific populations of servers across the network to back themselves up at a given time.

A year away

CA-Unicenter for NetWare will be available in 12 to 15 months for Novell's NetWare v3.11, according to Kurt Seibert, vice president of strategic business alliances at CA. He said a version for the NetWare 4.0 operating system will appear "almost simultaneously."

Mary Welch, vice president of corporate planning at CA, said the companies are developing pricing models for a distributed computing environment based on models CA created with Hewlett-Packard Co. for CA-Unicenter for Unix.

Analysts said CA has a ready-made customer base for the Unicenter for NetWare product.

"CA is really tied into its customers. It sees them moving from mainframes to LANs, and it's determined to move with them," said Stan Schatt, a senior industry analyst for local-area networks at Computer Intelligence/Infocorp, a Santa Clara, Calif.-based research firm. Schatt said that more than a third of the applications being developed in sites with mainframes are being developed for the LAN platform.

SSC attendees with mixed NetWare and mainframe environments were enthusiastic about the software's potential.

"We're a Unicenter for MVS customer, so we think it's wonderful," said Phyllis Pallacios, SSC chairman and a computer support specialist at Peoples Natural Gas in Omaha. Peoples is in the early stages of adding NetWare to its IBM mainframe and Application System/400 environments.

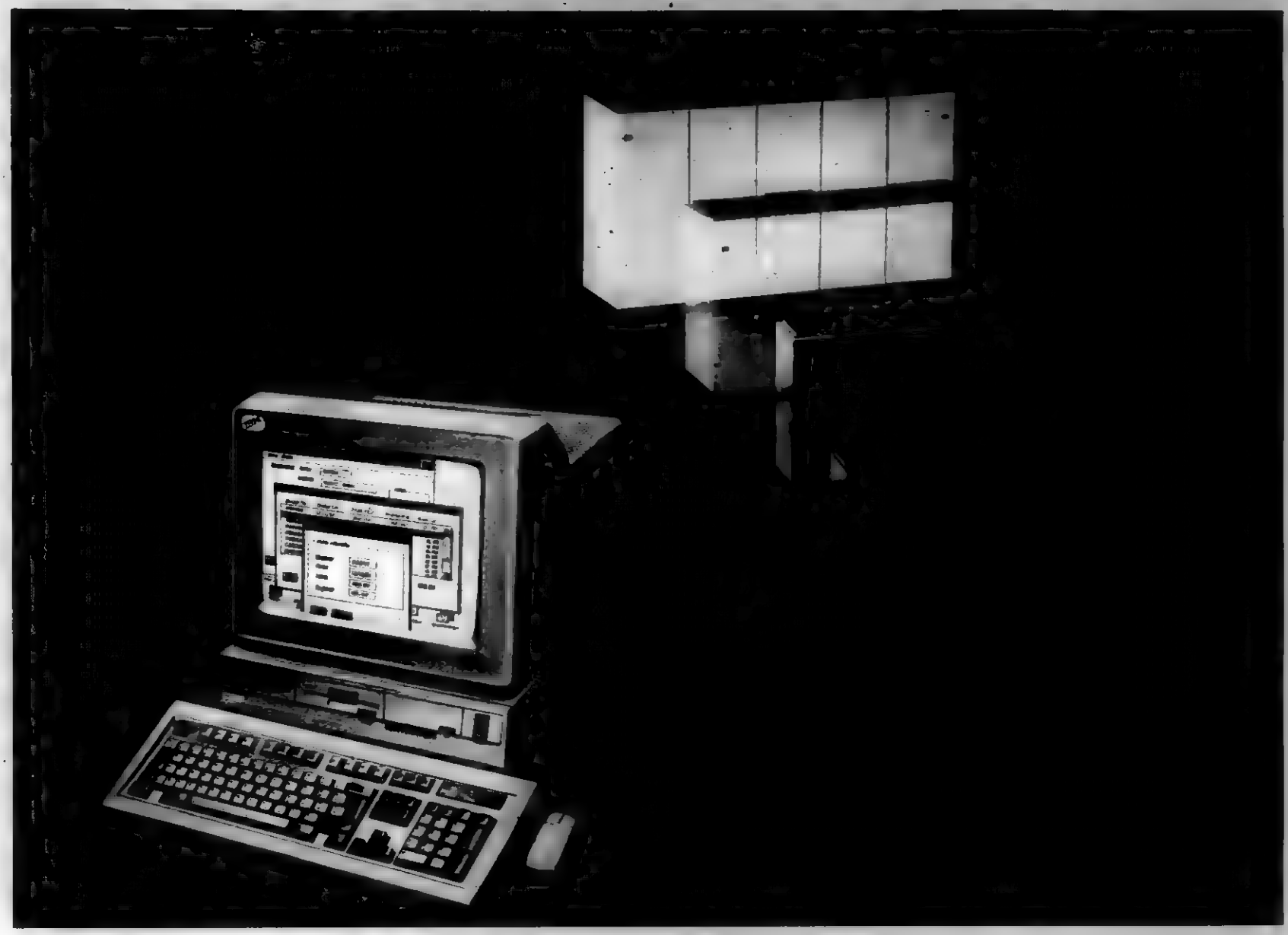
Regaining control

M. Nicholas Lovelace, IS review officer at Connecticut Mutual Alliance in Hartford, Conn., said his firm currently uses a separate LAN administrator for each of its 12 Novell NetWare v3.11 LANs, which serve 500 workstation users nationwide.

"Our main interest right now is to centralize control [of the LANs], and what CA is doing now [with Unicenter for NetWare] will allow us to do that," Lovelace said.

Officials at both vendor companies said there would be little overlap between CA-Unicenter for NetWare and Novell's own NetWare Management System (NMS). They explained that the CA/Novell product manages the business processes and data that run over the hardware/software network infrastructure, which is kept up and running by network management systems such as Novell's NMS.

Senior editor Joanie M. Wexler and correspondent Thomas Hoffman contributed to this story.



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GSA Contract Number GS00K90AGS5251-PS02

Wrestling with dinosaur image

Claudio Edinger

Programmer Welch *took an AS/400 course after she was laid off in 1991 — and six months later, she had a new job*

Continued from page 1

expenses," Beaumont said.

It was a steep fall for someone who had managed million-dollar budgets as IS manager at Codex Corp. and had then become an IS consultant before being laid off in 1990. By his reckoning, Beaumont failed to get an IS job because of his mainframe orientation, his lack of experience in certain industries and the perception that he was overqualified.

One more reason was fierce competition. IS layoffs caused by the consolidation of data centers, corporate mergers and bankruptcies have all conspired to produce a surplus of mainframe jockeys in the U.S. When an employer does post a mainframe job opening, the company becomes inundated with 300 to 500 resumes and can be extremely selective, IS personnel experts said (see story at right).

"This is the worst stretch of unemployment in the data processing field I've seen in 10 years," said Roger O'Connor, an expert at Edward Perlin Associates, Inc., a consultancy in New York.

MIS Network Associates, an organization dedicated to helping out-of-work IS professionals in the New York/New Jersey area find jobs, has 330 people on its roster and adds about 10 a week, according to meeting coordinator John Sampson. "I'm betting that 80% to 90% have almost exclusively mainframe experience," he said.

The troubles in the mainframe job market will only worsen as companies pursue technology downsizing strategies. Peter Burris, an analyst at International Data Corp. in Framingham, Mass., said that more than 40% of the large IBM mainframe shops reported that they are pursuing some form of downsizing, either moving current mainframe programs to smaller, distributed systems or focusing new applications development on those smaller systems.

No one argues that mainframe jobs will completely vanish anytime soon, given that there are roughly 24,000 mainframe computers in the U.S. that need care and feeding for the foreseeable future [CW, Aug. 17].

"There's still a substantial body of work for the mainframe folks, but it's just not expanding. All of the growth is in the PC and midrange areas," said Carol L. Covin, author of IS job-hunting guides for the Washington, D.C., and New England areas.

Once senior mainframe experts are laid off, it is especially hard for them to get reemployed because they expect relatively high salaries and have trouble changing industries. "It's hard to make the switch from defense to health or from banking to energy," Covin said.

The ones who are successful getting reemployed are those with experience in relational database management systems or computer-aided software engineering, said Shirley Bascom, manager at the North Canton, Ohio, office of Compusearch, a division of Management Recruiters International, Inc.

Dinosaur skills

But programmers with skills limited to Cobol and CICS — in high demand just a few years ago — are in big trouble.

"These guys with just plain Cobol/CICS [skills] are dead in the water unless they've got exposure to a database such as DB2 or expertise in a certain software package. Cobol/CICS is just not enough anymore," said Jack Ferrara, a principal and IS recruiting specialist at The Career Doctors, Inc. in Bethlehem, Pa.

"The mainframe guys are becoming dinosaurs. We have not placed one of these guys in a year," Ferrara said.

One of those dinosaurs is 32-year-old David Williamson, who was a Cobol/CICS programmer at Sherwin-Williams Co. in Cleveland. He has been unemployed since June and is considering changing careers. "I fear that my skills are getting somewhat archaic, outdated," he said.

IS career experts said people in Williamson's position should get some training in the hot technologies of the 1990s, including personal computer networks and midrange systems such as the IBM Application System/400, as well as C and Unix. That may mean two steps backward in terms of pay, but it will eventually produce 10 steps forward in terms of career, Ferrara said.

Susan Welch, 34, a programmer of large Honeywell, Inc. systems, did just that after she was laid off in March 1991. She took a course in AS/400 programming and six months later landed an entry-level AS/400 job at Penncor Services, Inc., a communications firm in Palmerton, Pa.

However, getting the right training is not always easy because "the schools aren't keeping up," Bascom said. For example, she said, "the two-year technical colleges are still turning out RPG II and Cobol people, who are not in demand. They need to produce RPG III people for the AS/400, and they need to produce C people for the new open systems environment."

Of course, savvy mainframe professionals are adding PC local-area network or midrange skills while they are employed to make themselves more attractive to both current and future employers.

Up by his bootstraps

Fred Corey, who lives in East Hartford, Conn., is one mainframe veteran who picked up PC skills on his own — and that saved his career when he was laid off from the Pratt & Whitney division of United Technologies Corp. in 1989.

After nearly a year without work, Corey said, he decided to try the training field and landed a job at Cigna Corp.'s IS training department in Hartford, where he teaches PC skills to Cigna employees, including mainframe programmers.

Corey gives this career advice: "Try to jump onto a rising star — whatever technology is going to be in demand 12 months down the road."

But for former mainframer Beaumont, that chance will never come. He died unexpectedly from a seizure Aug. 8.

By the numbers

Although there are no hard statistics on how many mainframe-oriented IS professionals have lost their jobs, circumstantial evidence suggests that the number is in the tens of thousands.

Economic pressures in banking, defense and other industries have closed data centers right and left and put many IS professionals out of work during the last three years [CW, June 1]. For example:

- First Interstate Bancorp in Los Angeles cut its IS staff by 68%, from 2,128 to 680, as it consolidated 11 data centers into two.
- Fleet Financial Group, Inc. in Providence, R.I., has cut its back-office staff by more than 3,000 since 1988 as it eliminated redundant data centers inherited from acquisitions and mergers.
- Pan Am Corp. in New York had an IS staff of 500 before it went bankrupt and ceased operations last December.

According to the U.S. Bureau of Labor Statistics, the number of employed computer programmers fell by 48,000 last year because of the economic recession and corporate restructuring. It is not known how many of these programmers were in vendor or user organizations.

Another clue is that the number of IBM and plug-compatible mainframes in the U.S. has declined 12% since 1989, from 27,274 to 23,920, according to Computer Intelligence estimates.

During the same period, the number of data centers decreased 9%, from 16,631 to 15,114, from consolidations.

MITCH BETTS

Downward spiral

The number of employed programmers in the U.S. dropped sharply in 1991

Source: U.S. Bureau of Labor Statistics

Older staff: First to go?

Every Tuesday night at the Knights of Columbus Hall in Ridgewood, N.J., a group of about 85 unemployed IS professionals meets to talk about which companies are hiring. They also discuss discrimination.

"We talk about the kind of people that get hired, and they're definitely not people over 40," said John Sampson, meeting coordinator for the group, known as MIS Network Associates.

Older employees — those with mostly mainframe experience and higher salaries — tend to be the first laid off and the last rehired, he said. "Discrimination based on age is pervasive," he said.

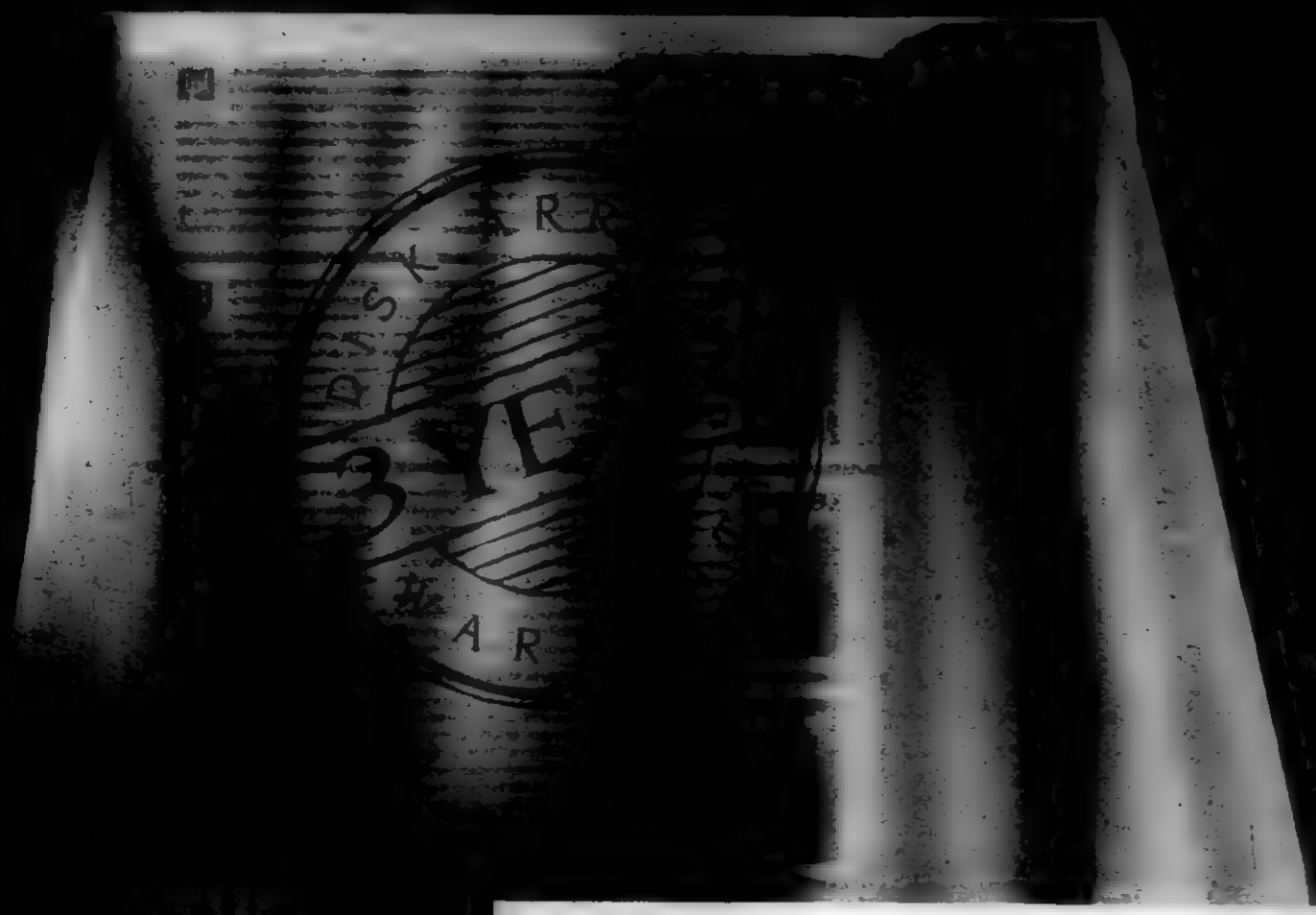
But other observers disagreed. One IS career expert said there may be isolated pockets of age discrimination in the IS field, but it is not widespread because talent is what really matters to employers.

Nevertheless, the IS field is beginning to see its first lawsuits alleging age discrimination. Earlier this year, 11 former IS employees of Eastman Kodak Co. claimed age discrimination in a legal dispute over their transfer to an outsourcing vendor.

In 1989, 24 laid-off workers in the Hartford, Conn., area — including several IS professionals — filed suit against Pratt & Whitney, alleging age discrimination.

"I felt very strongly there was age discrimination there, just looking at the cross-section of people who were let go," said 47-year-old Fred Corey, who spent 23 years in IS at Pratt & Whitney and is a plaintiff in the suit.

The company said its layoffs were conducted in a fair and humane manner.



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NEWS SHORTS

Wang shuffles execs

Attrition and restructuring at bankrupt Wang Laboratories, Inc. has already begun. Ken Olisa, a 12-year Wang veteran, resigned late last week as Wang's head of Europe, Africa and Middle East operations but will stay on as an outside consultant. Joe Tucci, executive vice president of operations, will now oversee those offices from headquarters in Lowell, Mass.

Sematech to lose federal funds

Federal funding for the Sematech chip consortium will be phased out during the next five years, according to a report from the U.S. General Accounting Office. The announcement was made even though Sematech — with $100 million a year from the U.S. Department of Defense and a like amount from member companies — is on schedule to demonstrate parity with the Japanese in the capability of semiconductor manufacturing equipment by year's end, according to the General Accounting Office.

High-performance advances

The White House Office of Science and Technology Policy announced last week both the creation of the National Coordination Office for High Performance Computing and Communications and the appointment of Dr. Donald Lindberg as its director. Lindberg will remain director of the National Library of Medicine at the National Institutes of Health. The new office is to coordinate the administration's multiagency effort to build a 1G bit/sec. National Research and Education Network and TFLOPS/sec. supercomputers and to coordinate that effort with Congress and the public, the White House said.

NET adds frame relay

Network Equipment Technologies, Inc. last week added frame relay networking capabilities to its T1 and statistical multiplexers. Users will reportedly be able to initiate frame relay transmission at the desktop, ship it over low-speed links to the corporate backbone, then leverage high-speed T1 and T3 (45M bit/sec.) links to ship the data to user destinations.

Bell Atlantic offers net integration

Bell Atlantic Corp. last week entered the network integration market with the formation of Bell Atlantic Network Integration. The business unit will provide planning and needs analysis, product integration and network implementation services through its existing network of 338 field service offices.

CA extends scheduler

In addition to its alliance with Novell, Inc. (see story page 10), Computer Associates International, Inc. last week unveiled plans for several new systems-related products. CA-7 for AS/400, an automated scheduling system for IBM's Application System/400 minicomputers, extends production control automation across multiplatform environments, including IBM mainframes. It costs $15,000. CA-RSVP is a $6,000 storage reporting facility for IBM MVS operating systems that utilizes VTOC and several system catalogs. CA-Examine/PC is a personal computer-based auditing tool for indentifying an organization's PC hardware and software inventory. Volume pricing varies from $8.50 to $22 with a minimum of 250 licensed PCs.

Short takes

As expected, **Banyan Systems, Inc.** announced that it plans to offer Open Systems Interconnect (OSI) support as a series of software options for Vines for The Santa Cruz Operation's SCO Unix [CW, Aug. 17]. . . . The **U.S. Department of Transportation** has extended its service contract with **Unisys Corp.** for an additional five years. The $201 million pact calls for Unisys to provide information services, operations research and engineering support. . . . Robert Fabbio, founder and former president of **Tivoli Systems, Inc.**, has left the company to develop and market computing services and software to help corporations make the migration to open systems.

HP to revamp customer service

Answers small-user complaints that support suffered after shift to VARs

BY MARK HALPER
CW STAFF

NEW ORLEANS — Some small to midsize Hewlett-Packard Co. minicomputer users are up in arms, saying the quality of support has declined since HP switched to a value-added reseller (VAR)-oriented sales strategy last year.

This week, HP is expected to heed their call by disclosing a shift in its sales and support program at the Interex users group meeting here.

At issue is a change implemented by HP last December in which the vendor began funnelling sales of less than $100,000 through resellers rather than the company's direct-sales force.

Ironically, HP said the shift was intended to boost support to what HP calls its smaller "B" and "C" accounts. But, as HP's chief of sales for the Americas, Manuel Diaz, conceded last week, the best-laid plans of mice, men and computer vendors go oft astray.

"This kind of transition takes longer than you think it will," Diaz said.

Diaz is expected to announce at the HP user conference a plan to form what he calls an integrated sales team that will combine resources from HP's direct-sales force, telephone sales support staff and VARs.

Diaz said HP will have the team in place by Nov. 1 in an effort to "remove some of the problems" that the smaller accounts have been experiencing.

One of the consequences of the December change was that users who were accustomed to visits by sales representatives were moved over to VAR and telephone support. The loss of face-to-face contact with their sales representatives left some users feeling unsupported.

"A lot of customers used to having a salesperson calling on them regularly are having to deal with a telemarketing person and are not very happy about that," said Jane Copeland, president of Austin, Texas-based software developer Holland House, Inc. and head of the advocacy committee for Interex.

Diaz said he would provide more details at the Interex conference of how the integrated sales team will work to address users' support needs.

Meanwhile, HP's support organization, called Worldwide Customer Support Operations, last week announced new programs that it said will enhance support across the entire user spectrum. The new program is intended to simplify service choices and to increase the number of personalized service options, the company said.

The program gives users several support options, including an assigned support team and HP response center. It also offers users specialized support in areas including multivendor networks, software and on-site licenses.

The program is an extension of the HP Premier Account Support program launched last May for users of the Corporate Business System, a high-end minicomputer that HP introduced at that time.

Hewlett-Packard aiming stations at office desktops

CONTINUED FROM PAGE 1

service and support count just as heavily.

Today, with hardware prices dropping, applications multiplying and ease-of-use features proliferating, HP and other workstation vendors are increasingly hopeful about cracking the PC lock on commercial desktops.

The changing HP workstation strategy includes:

- Targeting new applications in specific markets such as telecommunications, retail, financial services and customer service, rather than wasting efforts trying to dislodge Sun's installed base. Already counted among HP's telecommunications customers are GTE Telephone Operations, US West, BellSouth Corp. and Northern Telecom, Inc.
- Training the sales force to push the Series 700 workstations to two overlooked customer bases: sites with HP 9000 Series 800 servers and HP LaserJet printers.
- Phasing out, during the next several months, its high-end servers in the Series 700 line. This will eliminate a confusing overlap with the low-end Series 800 servers.
- Increasing investment in third-party software suppliers, ease-of-use software and Unix system administration tools.
- Producing low-cost, high-volume workstations that surpass the power of Intel Corp. high-end personal computers and sell in the $3,500 to $5,000 range.

"HP is doing well on commercial desktops. I would rate them second to Sun, which is far and away the leader," said Thomas Kucharvy, president of Summit Strategies, Inc. in Boston.

HP's Eichhorn: *Seeing a lot more bids and more long-term projects*

In the battle against Sun, analysts and users said HP's advantages are its leading position in Unix multiuser systems with the Series 800 and a thriving X Window System terminal business that is now 20% of its desktop volume.

The downside for all the workstation vendors is the minuscule market share — estimated at less than 1% — for Unix-based desktops in the PC-dominated commercial world.

Solid figures are hard to come by, but industry analysts predict that growth rates in the business/professional workstation market could exceed 50% annually during the next few years.

"We've had a very good experience with HP," said John Reitsma, manager of treasury technologies at Royal Bank of Canada's trading room in Toronto. Still predominantly an IBM mainframe shop, the bank has a niche of 125 HP Series 300 and 400 workstations in Toronto.

"There were times earlier on when you could see they were an engineering company making a transition," Reitsma said. "But today we hear from a lot of software vendors who are using the 700s as a development platform."

Several users said that while the Series 700's leading price/performance now gets HP in the door, it is often other factors such as hardware reliability and service and support that tip the scales in its favor.

At Citibank NA's Treasury Risk Management Division in New York, for example, HP won a new account based on its well-reputed support capabilities and its application performance.

"On Wall Street in general, HP never had a real presence. I think that's starting to change a bit," said John Martino, vice president of software development at the Citibank division.

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Users doubt a Wang comeback

Bankruptcy blues

Dissecting Wang's predicament

Assets:	$1 billion
Debt:	$1.3 billion
Layoffs:	5,000 worldwide, with 1,500 at headquarters
Recent stock price:	38¢
Timetable:	Hearing scheduled for today to map out spending allowances for daily operations

Swimming in red ink

Wang's Chapter 11 filing makes it the largest computer company to claim bankruptcy

Revenue and asset figures at time of filing

	Wang Laboratories, Inc.	Storage Technology Corp.	Memorex Telex Corp.	Alliant Computer Systems	Floating Point Systems, Inc.
Filing date	8/18/92	10/31/84	1/6/92	5/26/92	10/7/91
Revenue	$1,900M	$887M	$714M	$72M	$47M
Total assets	$1,418M	$1,266M	$1,643M	$62M	$62M
Status	Pending	Emerged 1987	Emerged six weeks later	Pending	Pending*

*The company is largely liquidated (case still in progress)

Source: The Bankruptcy DataSource

CW Chart: Michael Siggins

Continued from page 1

terminals and personal computers for a series of local-area networks.

For users such as Chris Drumm, MIS director at a large Atlanta law firm, Wang's biggest mistake was overhyping Office 2000 — an 18-month-old, next-generation office automation strategy — before it was ready to flesh out the plan with products.

For example, an IBM RISC System/6000 version of Pace, Wang's database/software development system, still has not shipped, although the company has been promising it for several months. The product is due out before the end of 1992, according to Miller.

Still, Drumm said he is disillusioned. "They have good ideas, but they're unresponsive to customer needs. They pay us lip service," he said.

Miller said he is "convinced" that Office 2000 is the right path. Office 2000 is a blueprint for redesigning and streamlining office work flow with imaging technology. The plan allows users to keep VS machines while incorporating Wang Integrated Imaging System and RS/6000 boxes into administrative offices.

The impending court-monitored restructuring will let Wang focus development resources "to make sure these products are brought to market over the next six months," Miller said.

Challenge: Keeping customers

Keeping its estimated installed base of 19,000 sites alive in the process is a twofold prospect: Wang must assuage fears about continued support of the VS line and provide a well-articulated path away from the VS to RS/6000 boxes, which Wang is reselling, users agreed.

While developers scramble to deliver on Unix promises, VS users should see no disruption in service or support of proprietary hardware, even while Wang lays off 38% of its 13,000-member work force, Miller promised.

Even so, many longtime VS shops are clearly exploring alternatives. Come September, Ted Hutton, systems manager for the Port of Seattle, will work with an outside consultant to lay down a future hardware plan.

"We don't have the budget to make a wholesale shift, but we'll go, sure and steady," he said, adding that LANs and as-yet undetermined Unix machines will replace the port's 10 VS models.

American Express, whose migration from Wang minis to PC LANs is nearly complete, expects to save two-thirds on maintenance costs with its new configuration, according to Joe Caruso, director of corporate systems and technology. "We'll see complete payback on our onetime charges within one year," Caruso estimated.

Horror stories

Wang and its creditors do not want to hear such stories. Without maintenance fees garnered from existing users, Wang has precious little income to live on during its restructuring.

"In the 48 hours since Wang filed, our phones have been going crazy," said Michelle Gibson, vice president at ICA, Inc., an independent VS service provider in Atlanta. Gibson, a former Wang saleswoman, said she expects a "horrible attrition rate" of users who currently rely on Wang for VS support and will now turn to third parties.

Gibson estimated that Wang service brings in an average of $600 million annually and said she "wouldn't be surprised if [Wang] lost $100 million in maintenance contracts right off the bat, due to scared users."

It is unclear whether Wang will get a sorely needed $75 million cash infusion from IBM, related to the three-year, $100 million reseller deal the two companies signed in June 1991. IBM invested $25 million in Wang up front when it signed Wang on as an OEM for the RS/6000 and Application System/400 lines.

But both parties emphasized the deal's vague language last week. "There *could* be an additional investment of $75 million," Miller said.

"It wasn't guaranteed but [was] based on [Wang's] meeting a certain level of sales performance," an IBM spokesman explained. That performance assessment is scheduled for January 1993, he added.

Neither party would enumerate precise sales objectives, but Wang has so far fallen short, according to industry watchers.

Wang officials testified during a September 1991 antitrust case brought against Wang by five resellers that as of June 1992 — a year after signing the IBM deal — Wang had sold just 18 AS/400s and 80 RS/6000s. One reseller estimated that since Open/image was unveiled in June, Wang has booked another 300 or so RS/6000s. Wang would not confirm the figures.

'IBM took Wang'

Edson de Castro, former chairman of rival minicomputer maker Data General Corp., echoed the general sentiment that Wang made a mistake agreeing to sell proprietary IBM minicomputers. "IBM took Wang for its installed base, and now what? The decision was positively naive," de Castro said.

"I think that if they emerge from

A HARD LANDING FOR A HIGHFLIER

THE EARLY YEARS

1920 An Wang born in China on Feb. 7.

1945 Emigrates to America.

1948 An Wang applies for a patent for core memories. Years later, he sells patent to IBM for $400,000.

1951 Wang Laboratories incorporated in Boston on June 30. Its first product, core memories, sells for $4 apiece.

1959 Warner & Swasey, a Cleveland machine tool company, buys 25% of Wang for $50,000 in cash and a $100,000 loan.

1962 Wang Labs builds Linasec, a text justification machine, for Compugraphic in Cambridge, Mass.

Wang Labs revenue hits $427,000.

1965 Revenue jumps to $2.5 million.

First Wang product – a $6,500 logarithmic calculating instrument called LOCI – hits the market.

1966 Introduction of Model 300 calculator

THE BUILDUP

WANG

1967 Wang goes public.

1967 Revenue climbs to $6.9 million.

1967 John Cunningham, future president of the company, joins Wang as a salesman in Chicago.

1968 Wang introduces the powerful and fast 700 calculator, which later becomes 70% of its business.

1971 Wang introduces the 1200, "a typewriter with a brain." Orders strong from the start, but printing problems turn boon to bust. About 80% of all 1200s are returned.

1972 Fred Wang joins company as programmer for a minicomputer that eventually becomes the VS.

1972 Company suffers first earnings decline; 40 people lose jobs

1973 Wang begins delivery of the $8,000 easy-to-use Model 2200 word processor.

STEADY CLIMB

1974

Fred Wang becomes marketing specialist.

The 2200 accounts for 50% of Wang revenue, but Wang's debts leap $12 million to $29 million.

1975

In September, Wang staff begins work on easy-to-use, LAN-like word processing system (WPS).

$75.8 million in sales of word processing and minicomputer equipment

1976

Another financial hiccup: Company is more than $50 million in debt, but revenue is only twice that.

1977

VS mini, modeled after the IBM 360, announced in October for commercial sites.

1978

Wang becomes largest worldwide supplier of CRT-based word processors. Company moves to Lowell, Mass.

Fred Wang becomes WPS marketing manager.

Wang employs 9,000. Revenue at $198 million.

1979

Introduction of Wang Integrated Information System, a combination of Wang WPS and VS.

Revenue, boosted by WPS sales, approximately $300 million.

Chapter 11, they'll be a wholly different company," said Henry Creal, an information systems analyst for the city of San Jose, Calif. The new Wang will be much smaller, he said, or it may be bought out by another vendor. "Either way, Wang won't be Wang," Creal said.

Miller agreed: "Our focus clearly has to be on software and services," which is a line company officials have been repeating since the debut of Office 2000 in March 1991.

"If anyone can emerge successfully, Rick Miller can," said Matt Gillman, president of the U.S. Society of Wang Users, citing the $575 million debt Miller erased in his three years at the helm.

To survive, Wang must get products out — and fast, emphasized Tom Wilmott, vice president at the Aberdeen Group in Boston. "Wang's words have to ring true from now on, not hollow," he said.

As for the product lines . . .

While Chairman Rick Miller told *Computerworld* last week that he has "no plans to sell any part of the business," users and analysts speculated that some product lines stand to fare better than others after Wang's pending restructuring. Here are the consensus predictions:

• **VS line.** Continued incremental upgrades, with no new high-end machine to improve on the top-level VS 12000, introduced earlier this year.

Meanwhile, both Wang and IBM continued the party line, saying that their 14-month-old reseller deal is "intact, with business as usual," as Miller put it. Wang will provide coexistence and migration products that let VS users move to IBM's RISC System/6000, Miller said, adding that Application System/400s are still available from Wang, too.

• **Pace, Open/Pace.** Wang demonstrated a Unix version of its database/application development system as early as September 1991 for The Santa Cruz Operation's SCO Unix. However, when Wang signed a reseller bargain with IBM in June 1991, the product was shelved, and Wang started work on Open/Pace for IBM's RS/6000.

That version has yet to see the light of market, but it is due before year's end. Selected users have seen the product, and they predict a November debut, probably during the annual meeting of the U.S. Society of Wang Users in Boston.

• **PC business.** Opinion is split. Some analysts said that considering Wang's "reasonable" success in the mass merchandising channel, the firm will keep the PC unit going.

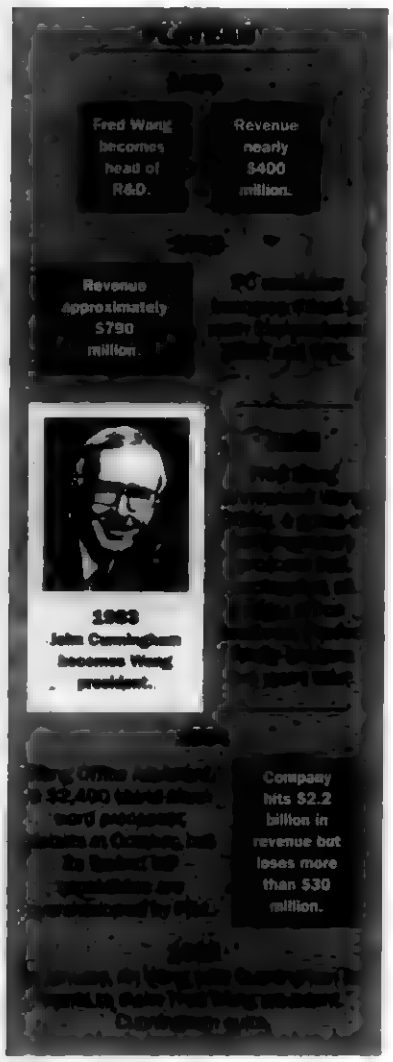
According to more critical observers, Wang has no chance in the cutthroat, low-margin PC market, where economies of scale determine who makes money. Miller's take: "We will always offer the latest in high-quality PCs. But we're attempting to reduce overall investment in manufacturing, so we may be working more closely with others" to produce PCs.

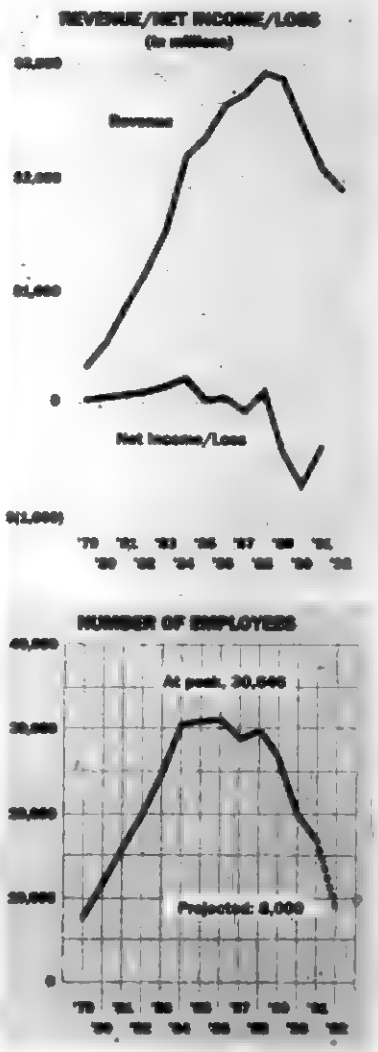
• **Imaging.** As the cornerstone of Wang's Office 2000 work-flow automation scheme, imaging development and marketing are not likely to be touched. Imaging is one of the few hopes Wang has, said Tom Wilmott, vice president at the Aberdeen Group in Boston.

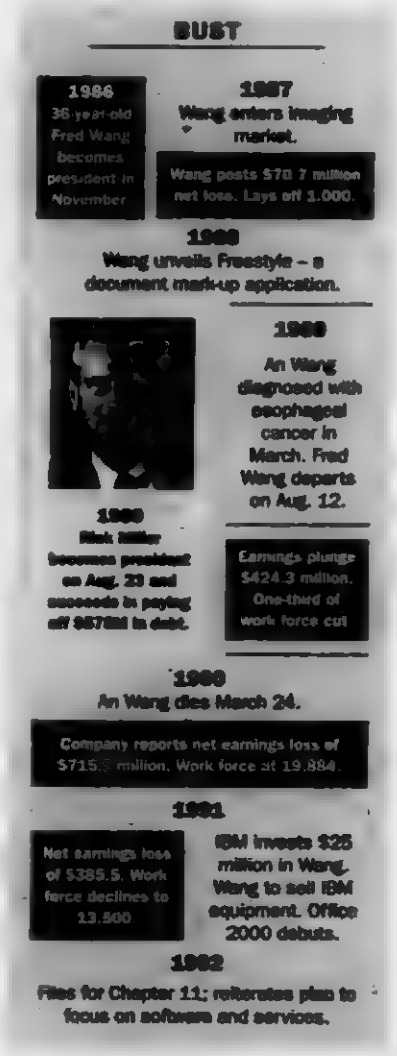
Wang, which introduced its imaging package for the RS/6000 last month, is at least two months ahead of FileNet Corp. in bringing out imaging for Unix, Wilmott said. "But if they don't have that product shipping in volume by mid-September as promised, they can just hang it up as a company," he warned.

• **SIMM.** Wang spent 10 months in court fighting several Japanese manufacturers for patent infringement on single in-line memory modules (SIMM). Wang won the case in August 1991 and is entitled to royalties from companies such as NEC Corp. and Toshiba Corp. on products they sold containing SIMM technology.

KIM S. NASH







Will Wang pull through?

Consensus among Wang watchers is that the company will have a tough, if not impossible, time pulling up its bootstraps and trudging away from the stigma of Chapter 11.

Although Wang Chairman Rick Miller pledged continued support and enhancement for the VS line, the majority of users interviewed last week said they are jumping ship now and expect to be completely off VS within two years.

That means Wang has a limited time to tread water on maintenance revenue accrued from existing customers and must get the reorganization going pronto, many observers noted.

Miller told *Computerworld* last week that he expects the bulk of the 5,000-person layoffs to be done within 30 days and the rest of the reorganization to be carried out "as quickly as possible."

Life may not be easy, though. Filing bankruptcy protection scares existing users and repels potential new customers. Strong rumors circulating for several weeks before Wang actually filed prompted some worried VS users, such as the American Stock Exchange in New York, to step up contingency plans.

Three VS minicomputers link 300 users at the Amex, which has been migrating applications from the minicomputers to local-area networks during the past two years, said Paul Doughty, director of data processing services.

"The fact that [Wang] is in Chapter 11 may help accelerate funding," he added.

Besides customer ill will, Wang must overcome other obstacles, according to Edson de Castro, former head of DG, including:

• **The grueling Chapter 11 process.** "The horrendous legal and accounting issues they have to deal with now will take their focus away from where it should be: products," de Castro said.

• **Clarifying Office 2000.** The 18 months since Wang outlined its office automation strategy does not appear to have been enough time for Wang to clearly explain Office 2000.

Overall, analysts were not optimistic about Wang's chances for survival. "I think they're up against one of the most serious turnaround challenges in the history of the computer industry. It would take a Herculean effort," said Mary Rhodes, director of intelligent document management at New Science Associates, Inc., a Southport, Conn., market research firm.

KIM S. NASH
and THOMAS HOFFMAN

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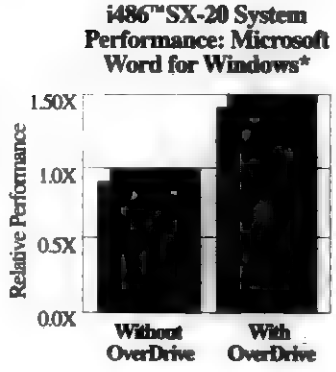

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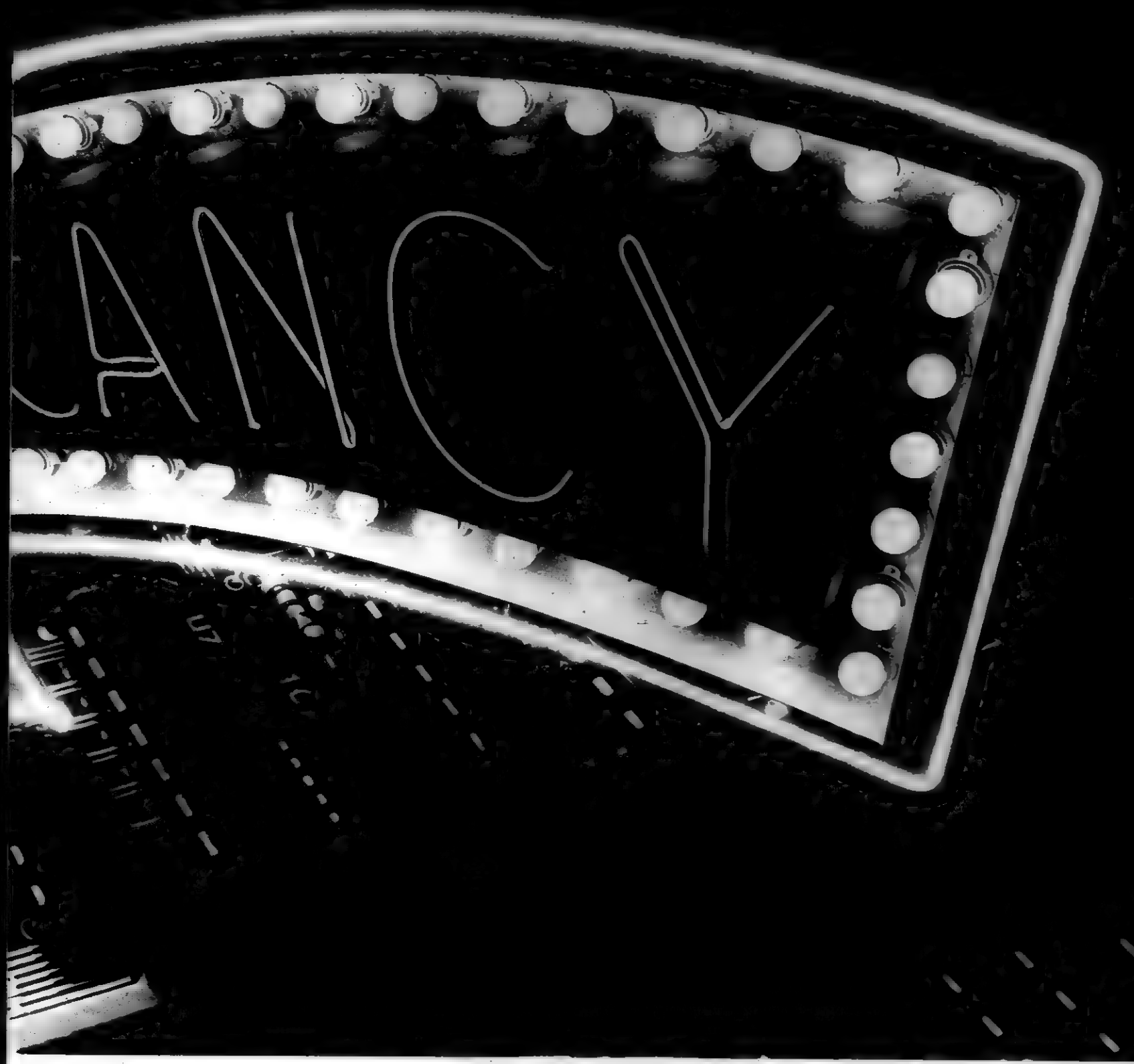

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Fed users to get ATM service from Sprint

Upgrade in network bandwidth will aid scientific research from genetics to global warming

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Energy and NASA last week selected Sprint Corp. to upgrade three national research networks to Asynchronous Transfer Mode (ATM) broadband service.

The huge boost in bandwidth for those networks will significantly speed progress in meeting the so-called "grand challenges" in science, such as global climate modeling and human genetic research, users at the agencies said.

ATM, which moves data in fixed-length "cells," is an emerging technology that will allow data networks to evolve from T1 (1.5M bit/sec.) speeds to as much as 622M bit/sec., the agencies said.

T1 can transmit 20 pages of a standard dictionary in one second, while ATM can move up to 8,000 pages per second.

The T1 networks to be upgraded are the DOE's Energy Sciences Network and NASA's Aeronet and Science Internet.

Joining Sprint in the $50 million, five-year effort are TRW, Inc., which is providing 11 ATM switches; Digital Equipment Corp. for network management hardware and software and systems integration services; and Cisco Systems, Inc. for network routers.

Sprint said it is rolling out ATM for the DOE and NASA on an "early availability basis," beginning later this year. Commercial availability is not expected until 1994.

"We'd expected to have to build the backbone and then find customers," said Dale Williams, an assistant vice president at Sprint's Government Systems Division. "Now we have the customer, and we have to go build the network."

Wave of the future

"This upgrade may show a path for the way the communications industry wishes to go," said David Nelson, director of scientific computing at the DOE. "We as users, as early buyers, are hopefully accelerating the process but not off toward left field."

Nelson said ATM will allow transfer of large files — "gigabytes heading toward terabytes" — from one research site to another.

He added that it will also enable "video to the desktop" — moving as "packetized" data — allowing researchers to collaborate face-to-face without traveling.

Nelson said the ability to move data at 622M bit/sec. will also enable "metacomputing" in which remote computers can be tightly coupled in real time for cooperative processing.

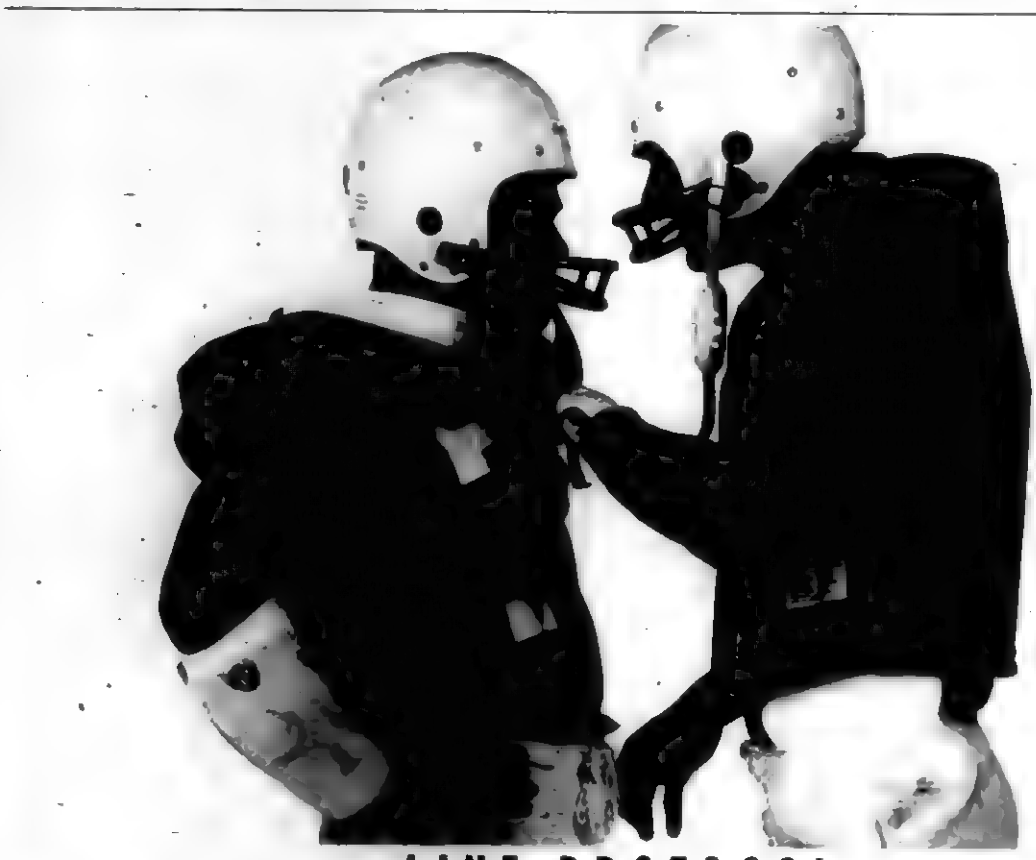
> "THIS UPGRADE may show a path for the way the communications industry wishes to go."
>
> DAVID NELSON
> DOE

For example, Nelson said, a Cray Research, Inc. vector supercomputer at the University of California's Lawrence Livermore National Laboratory could share a computational challenge with a Thinking Machines Corp. massively parallel computer at Los Alamos National Laboratory in New Mexico, software permitting. Each computer would then do what it does best, he added.

The ATM network will provide a service to users of the three government networks and will be available to serve commercial users as well, Williams said. A test network is to connect Sprint to a DOE site by the end of the year; a "preproduction" network serving seven sites is to be in place by mid-1993; and a production network for 33 DOE and NASA sites will roll out beginning in mid-1993, according to Nelson.

The project is funded under the government's interagency High Performance Computer and Communications initiative, one component of which is to develop a gigabit/sec. National Research and Education Network.

The upgrade of the three research networks is one step in the evolution to the National Research and Education Network, Nelson said.



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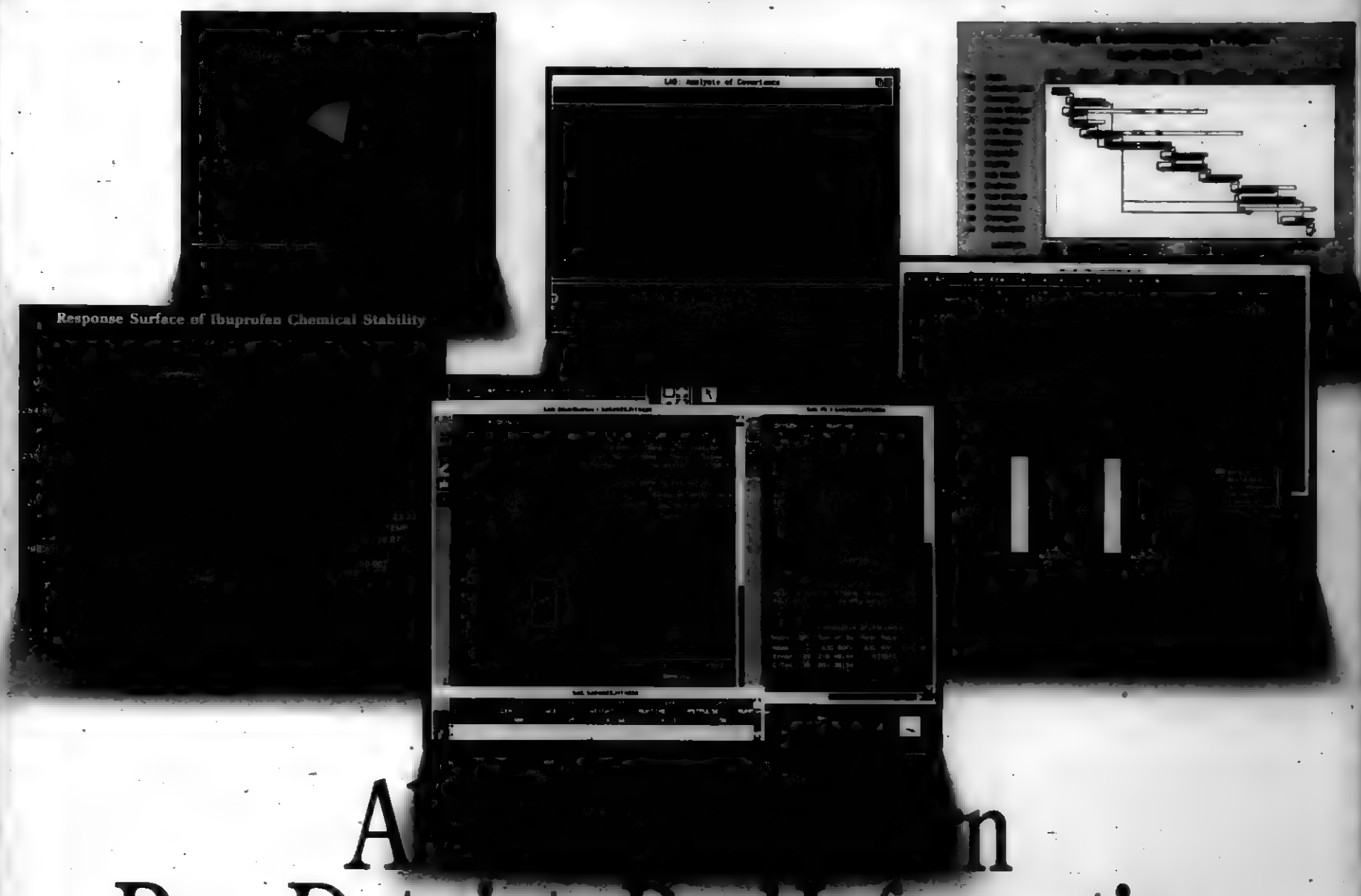

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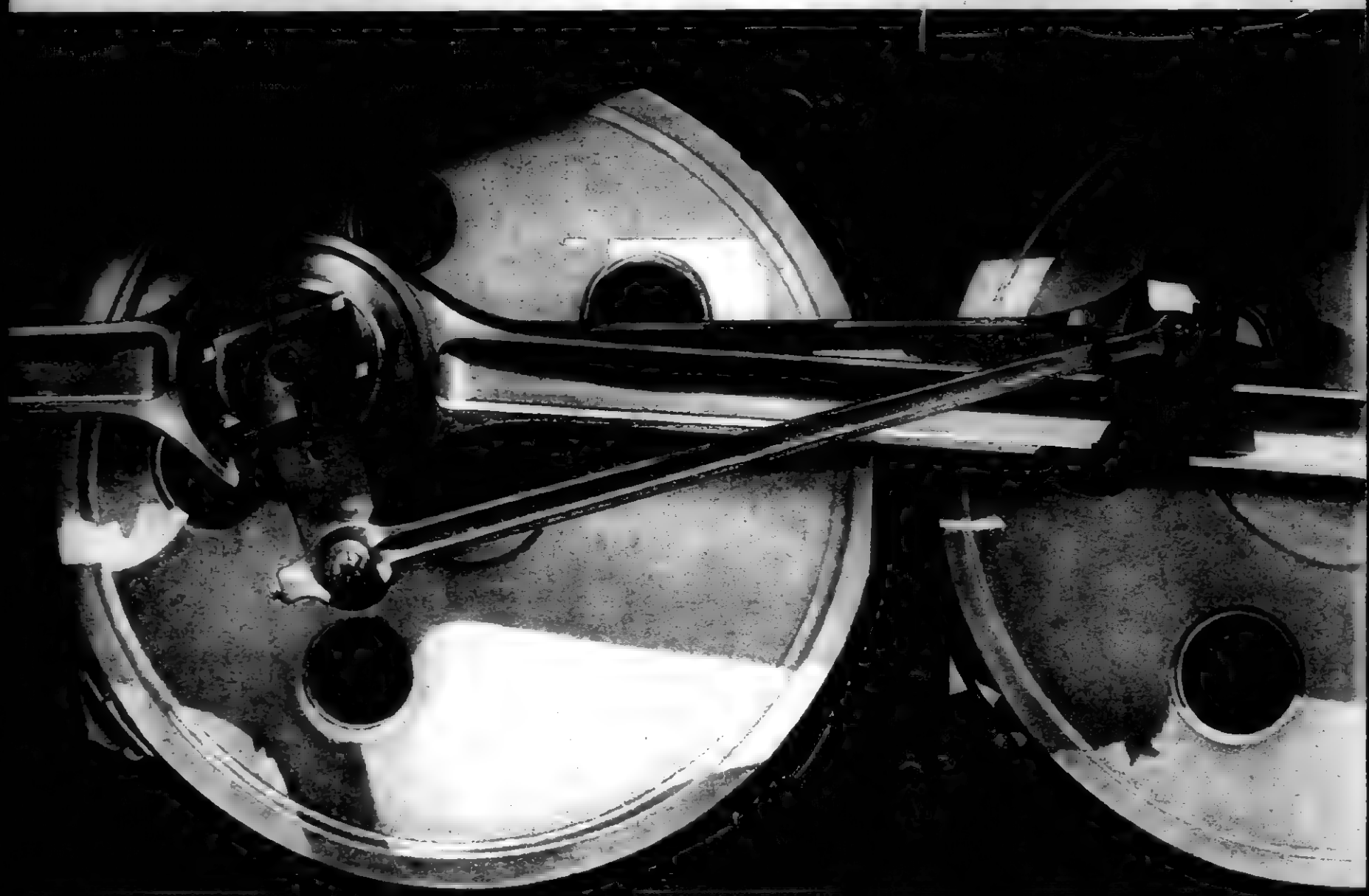
Systems integration.



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TECH TALK

Tackling the big ones

■ Solve this problem: How do you clean up groundwater pollution? Or this one: How can you make fuel burn more efficiently?

These are only some of the problems being attacked under six "grand challenge" projects funded by the U.S. Department of Energy. The projects are scheduled to receive a total funding of $20 million, including cost-sharing by universities, states, corporations and foundations, during the next five years. Nine national laboratories, 16 universities and more than 40 businesses are planning to participate in the projects.

They fall under the following headings:

- **Computational chemistry**, which studies the impact of various pollutants and the use of natural enzymes to clean them up.
- **Structural biology**, with researchers developing software to study proteins and diseases.
- **Computational fluid and combustion dynamics**, with computer simulation of more efficient engines, incinerators and power plants.
- **Petroleum reservoir and groundwater modeling**, seeking to develop algorithms and computer codes for modeling petroleum and water flow through porous geologic formations.
- **Numerical tokamak**, in which computer simulations will be used in an effort to reduce the development costs of fusion reactors.
- **High-energy physics**, with massively parallel computers being used to determine the basic properties of matter at the subnuclear level.

Reaching agreement

■ Mitsubishi Corp. in Tokyo and Verbex Voice Systems, Inc. in Edison, N.J., said they have developed a computer that recognizes continuous Japanese speech. The Japanese Voicestation, demonstrated last month in Tokyo, is intended to help users converse with and control computer-based systems with a natural and accurate interface.

Users: 'We want our data faster!'

Project targets goal of making storage devices capable of accessing data more quickly

BY JOHANNA AMBROSIO
CW STAFF

"Break the bottleneck" is the battle cry of a group of users and vendors working on the next generation of storage technology. The goal is to vastly increase the speed at which people can access their data by up to 50 times over today's systems.

Although the project is initially targeted at the scientific and technical world, some advances are expected to make their way into the commercial arena within five years.

The collaboration is called the National Storage Laboratory and is housed in the University of California Lawrence Livermore National Laboratory in Livermore, Calif.

The venture got under way formally in May, but hardware and software is still being delivered, and the bulk of the three-year project is scheduled to begin early next year, according to Richard Watson, the project coordinator at Livermore.

Multivendor push

Six vendors are providing software and hardware, including a 20G-byte disk array from IBM's Adstar storage company in San Jose, Calif.; a solid-state memory device from Zitel Corp. in Milpitas, Calif.; network switches and gateways from Network Systems Corp. in Minneapolis; and UniTree storage software from General Atomics' Discos Division in San Diego.

IBM's Federal Sector Division is the systems integrator, and Ampex Recording Systems Corp. is providing high-speed, high-capacity tape systems. Four National Science Foundation Supercomputer Centers, including those at the University of Illinois and the Pittsburgh center, are also planning to participate.

Indeed, the project's initial applications will be three for the scientific world: climate modeling, magnetic fusion energy research and real-time editing of computer-generated movies.

The common theme is that these applications require very large data sets that can take four hours or even longer to move from the supercomputer on which the data resides to the workstations being used by the scientists.

"The idea is gigabytes of storage at gigabit rates," said Don Olker, vice president of business development at Zitel.

The bottleneck today occurs because of the way data moves through the system, from a supercomputer through a file server and then into the workstation. The new architecture calls for data to be routed through a high-speed network or a switch between the storage device and the workstation.

Today's storage systems can move 8 million to 16 million bits of information each second. The project's goal is to move 100 million to 400 million bits each second.

To accomplish this, the National Storage Laboratory will assemble existing commercially available storage systems communicating over a high-speed network called High Performance Parallel Interface (Hippi).

As a model, the group is using the architecture from the Storage Systems Standards Working Group of the International Electronics Engineers.

"There's very little new invention required here; it's just a matter of applying a new approach in terms of connectivity," said Bruce Henry, a senior architect at IBM Adstar.

In this model, the data storage device — whether it is disk or tape or optical — is attached directly to the network instead of to a server. A lower speed network is used to send messages requesting data; the high-speed network is used to send the actual data.

"Network-attached storage architecture is going to be a major emerging technology in the server world," Watson said. "This is not the first time it's been thought of — it's the first time all the pieces are there to make it work."

This will, however, require more advanced storage management software, such as software that gives you the ability to manage multiple sites from one central control point, than what is commercially available today.

Another breakthrough will be needed in the area of storage hierarchies. In today's commercial systems, frequently used data is kept on disk, and less frequently used data is on tape. But if a new type of tape is added, it will require a new hierarchy: disk to new tape, old tape to new tape and so on. Today's storage systems cannot handle this level of complexity.

Years from market

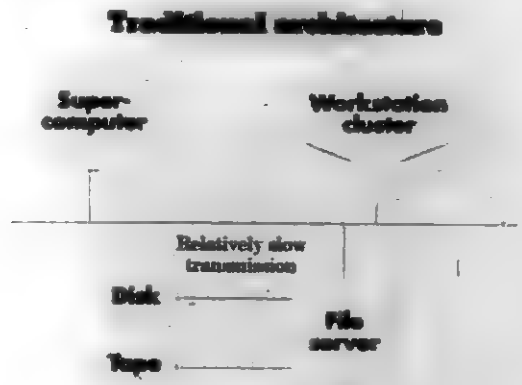
Although three years is the time frame for the project to be completed, it may take longer for the technical advances to find their way into the commercial world. "It's a bit early," said James Porter, president of Disk/Trend, Inc. in Mountain View, Calif. "The requirements for numbers of transactions, transfer rates and capacity are atypical for most of the computer industry."

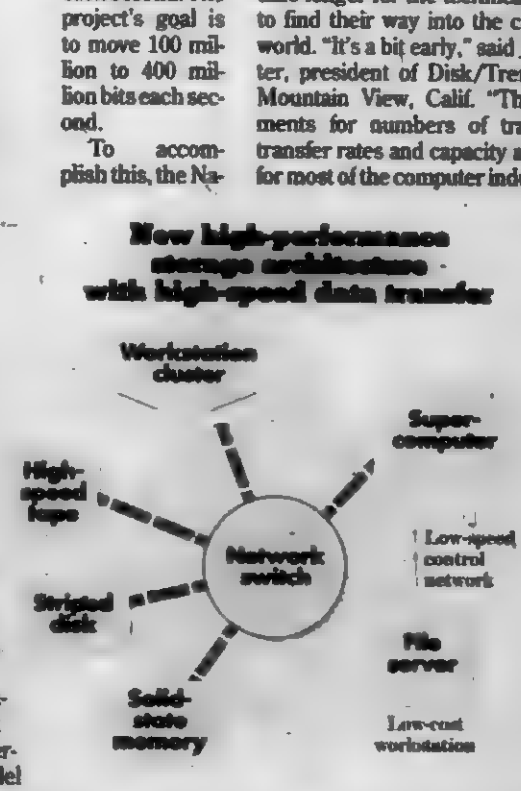
Still, he said, there may be "useful by-products" for the industrial sector in "improving the efficiency of some commercial systems."

Ken Hallam, a partner at ENDL Associates, a storage consulting firm in San Juan Capistrano, Calif., said, "The problem here is software. The new storage architecture says that where the data is stored — head, track, sector — is independent of the actual device. But that's not how software is written today; you need to know all those things."

"If a commercial application had very large files and wanted to access them very rapidly, there's no reason why this model wouldn't apply," Henry said.

However, he added, that would require that commercial processors have a Hippi channel in addition to Escon and other channel-attachment protocols used in many commercial environments today.





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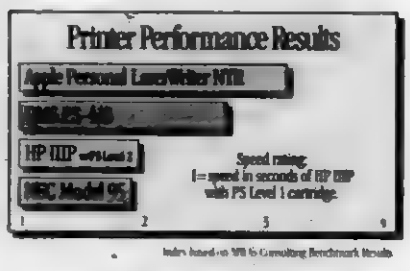

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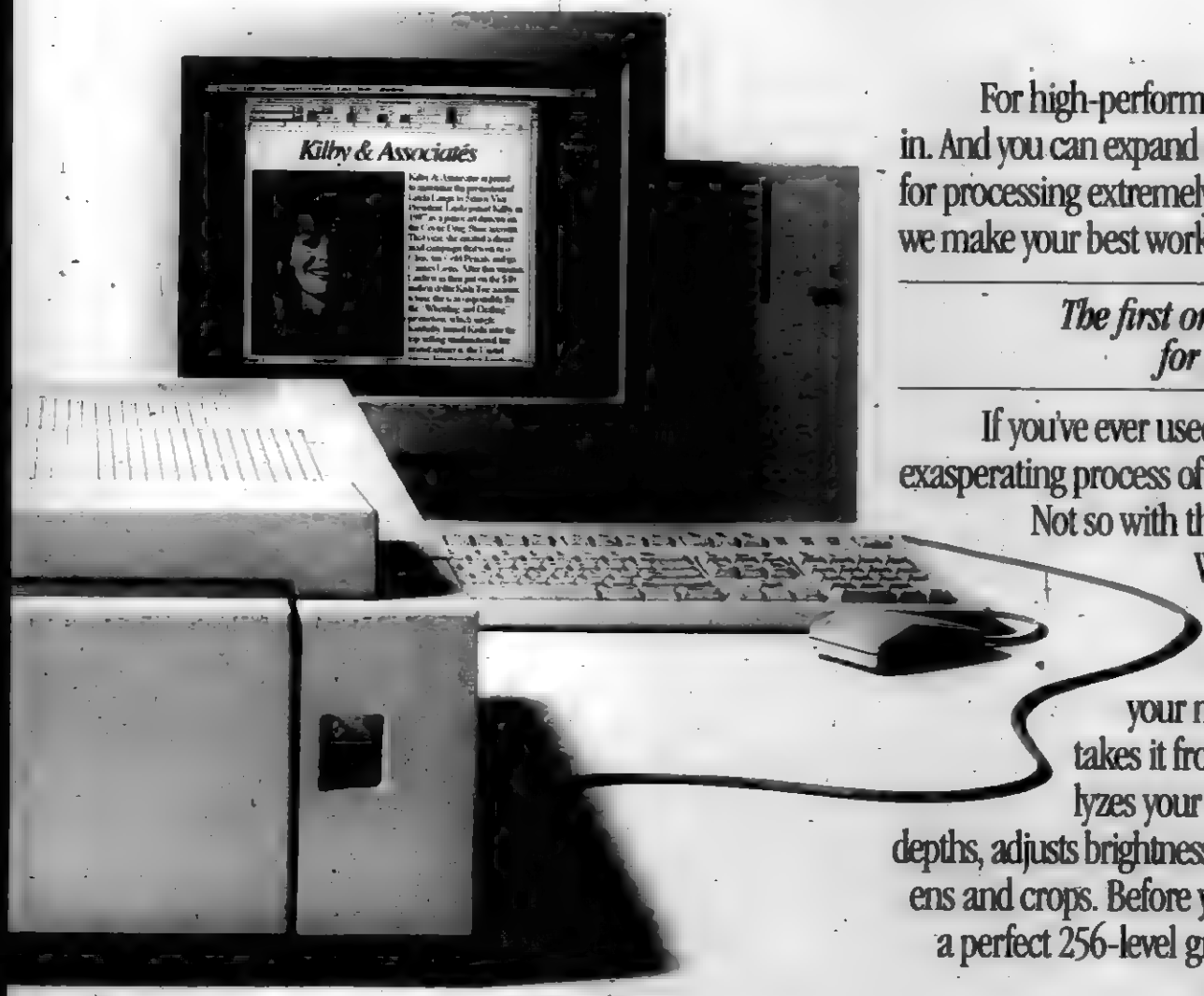

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EDITORIAL

Lessons

For all sad words of tongue or pen, the saddest are these: "It might have been!"
—John Greenleaf Whittier

When business school professors wish to make a point about lost opportunity, they often refer to the railroad companies. Those companies mistakenly thought they were in the railroad business when, in fact, they were in the transportation business. That erroneous judgment left the railroaders standing at the roundhouse while trucking companies, and later the airlines, roared by them.

Thus was the case with Wang Labs, which last week found itself running for protection from its lenders under the shelter of Chapter 11. Perhaps more than any other foundering computer company in history, Wang lost sight of its business. Therein lie the most poignant and wrenching lessons of the 1990s, not only for vendors but also — and maybe even more so — for the people who buy, deploy and manage information systems.

Understand that Wang was not just a case of another minicomputer company blown away in the PC revolution. This is a company that was an extraordinary technology innovator. Its founder invented mass storage. The company brought sophisticated desktop and palmtop calculators to the masses. It completely and irreversibly redefined the way work was done in the office. It was as though the company had stolen a page from the Bobby Kennedy school of thought: "I look at what could be and ask 'Why not?' "

So what happened? I recall a dinner meeting with two senior Wang officials three years ago, the week Chairman Rick Miller was brought aboard. I presented my guests with page after page of independent research that showed a Wang customer base growing wary of slack service and support. I showed them other data, none of it new to them, that indicated the rapidly growing user penchant for open systems computing. Meanwhile, Wang had little in the works to respond to these and other crying needs from its own customer base.

Its response? "When you're growing your revenue and profits at 30% per year, it's hard to think you could be doing anything wrong."

In the end, no one really cared about Wang's pioneering innovations in office automation. Similarly, no one in today's world really cares about the accomplishments of IS professionals in solving yesterday's problems with yesterday's technology, no matter how well it was done.

In all the recently written analyses about Wang's demise, the word "unforgiving" pops up consistently. An unforgiving market. An unforgiving industry. An unforgiving global economy. It is an environment in which nice guys who build great companies cannot afford to forget that they are only as good as what they do today.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Sees benefits of Repository Manager

While some may feel that IBM's plans for Repository Manager/MVS were too grand, we believe its objectives serve information technology well: to provide an enterprisewide, tool-enabled repository.

The major problem (and perhaps this is the real reason that you applaud IBM's move away from a host-based repository) could simply be that RM/MVS was not the right implementation of an enterprisewide repository product ["Out like a lamb," CW, July 20].

This leads us to the biggest issue in IBM's repository rollout strategy. The initial release of RM/MVS was billed as a "vendor" release, which means that IBM did in fact recognize the need to gather a large support base.

Most vendors will agree that the initial software, although it was well-documented, was quite intimidating and that there was very little expertise available in the marketplace (or available directly from IBM) to leverage a vendor's efforts.

By building an all-encompassing information model before putting it to the test with integrated, repository-based tools, IBM has asked the information technology community to take too large a leap of faith.

Similar to its current efforts to surround OS/2 with applications and application development tools, IBM needs to prove that repository-based development has real benefits.

Barry Brown and Lewis Stone
BrownStone Solutions

Is honesty the best policy?

This is regarding "IS cover-up charged in system kill" [CW, Aug. 10]. What really captured my interest is Max Hopper's observation: "Honesty is an imperative in our business."

On one hand, I'd like to see that phrase carved in marble and placed on the lintel of every data processing office in the world.

On the other hand, I know that honesty is one of the first casualties (along with quality) when a project becomes shaky.

Fortunately, resuscitating honesty is fairly simple, and the "bean counters" will appreciate that it won't cost a dime.

All management would have to do is stop shooting the messenger!

Certainly it would be nice if everyone were heroic enough to face the dangers of telling their superiors that a major problem has arisen.

However, it takes a hero, a novice or a fool to risk becoming the scapegoat when these things happen.

A novice will do it once; a hero will do it a second time; but as one grows older with more responsibilities and more to lose, being honest starts to look more and more quixotic.

William R. Rouza
Chula Vista, Calif.

Relcom: E-mail Russian style

It's great to see coverage of the Russian computing scene, and I applaud John Morrison's efforts to publicize and exploit (in the very best sense) Russia's immense reservoir of programming talent ["Programming perestroika," CW, Aug. 3].

But I would like to put in a good word for Relcom, an electronic-mail network akin to our Internet.

Relcom is a highly successful E-mail network, with more than 60,000 users from a community of 500,000 to 1 million personal computer users overall — a very respectable proportion compared with the U.S.

Relcom offers regular E-mail as well as a variety of local and international information services. Part of its success, of course, is that the telephone system as a whole is so bad: You let your computer do your dialing overnight.

I find Relcom incredibly valuable in setting up appointments, sharing information and simply keeping in touch, as do many of my Russian friends.

Incidentally, much of Relcom's funding comes from the banking and exchange communities, which use it to exchange financial information.

Esther Dyson
New York, N.Y.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Revising our technology policy

GORDON BELL

My bottom line for a better technology policy: Stop trying to centralize everything. Reduce government control and spending and distribute the responsibility for technology to industry groups.

The Executive Branch needs goals, plans with payback and accountability — not policies that enlarge an out-of-control bureaucracy. One only has to look at the High Performance Computing and Communications Initiative to see how big bucks and concentrated power can induce brain damage and wreak havoc.

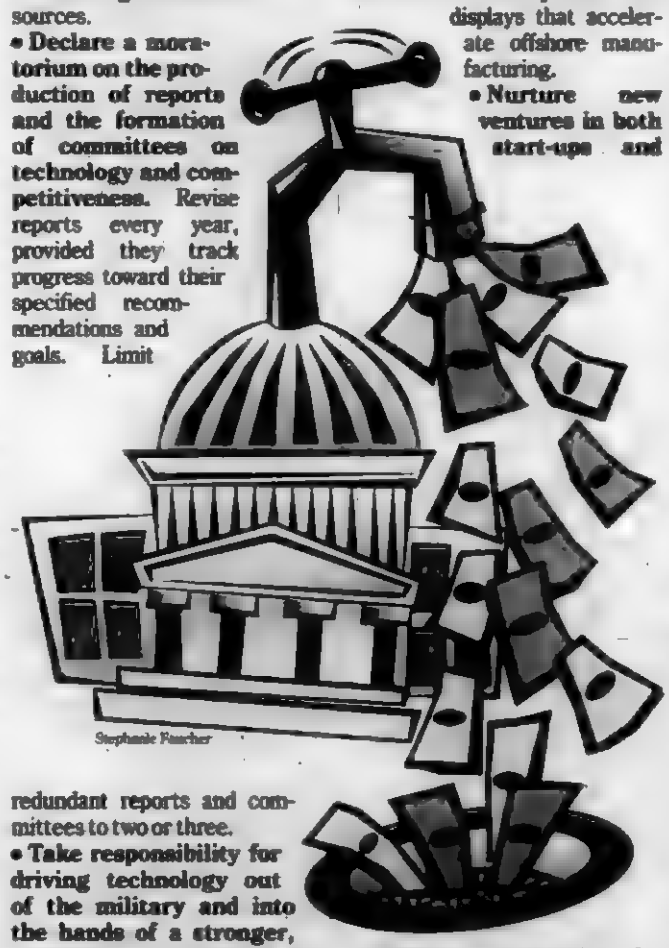
In the 1970s and '80s, the Defense Advanced Research Projects Agency (DARPA) supported university research that formed products, companies and even industries. Now DARPA controls the supercomputer market with a massive development and procurement budget, creating more government-dependent companies while concentrating on massively parallel machines that may be minimally useful.

Ready for action

I have some suggestions for increasing technology competence and reducing federal R&D spending that that can be executed immediately by the Executive Branch.

• **Assign technology management responsibility to self-organized industry groups with government partners.** These industry groups will lead the planning to regain technology leadership, including the formation of consortia or laboratories. Their plans would be self-funding and include redirected government resources.

• **Declare a moratorium on the production of reports and the formation of committees on technology and competitiveness.** Revise reports every year, provided they track progress toward their specified recommendations and goals. Limit redundant reports and committees to two or three.



Stephanie Faucher

• **Take responsibility for driving technology out of the military and into the hands of a stronger, reorganized Commerce Department.** Give the secretary of commerce equal power on the Cabinet and reorganise the Commerce Department so that people are responsible for industrial segments, not policies. Communication with industry would reduce blunders such as tariffs for the protection of dynamic random-access memory and LCD displays that accelerate offshore manufacturing.

• **Nurture new ventures in both start-ups and established companies.** Invest government funds that would otherwise go to agencies or labs in ordinary venture funds, stimulating technology transfer from government laboratory to commercial exploitation via start-ups. Reward venture intrapreneurship at large and endangered companies through R&D tax credits that stimulate new ventures.

• **Privatize federal labs and allow them to go into business.** The World Bank has just completed a study showing that privatization does create wealth. Reduce the $75 billion we spend on government R&D by requiring every lab to establish a timetable for privatization.

Immediately encourage labs to sell goods and services. Create external review boards to calibrate labs and aid transfer.

• **Address manufacturing as our highest priority.** Manufacturing engineers aren't even in the investment food chain the "research establishment" controls. This is an intellectual problem: Manufacturing is not considered academically respectable. The Japanese have it right. We have to change.

We also need to reward companies like Hewlett-Packard and IBM that are committed to manufacturing and discourage firms like Apple from becoming distributors for foreign products.

Output is the key, not budget control or policy. Applying any of these recommendations would move the U.S. in a positive direction, creating new models for growth.

Bell is a computer industry consultant at large, former head of R&D at Digital Equipment Corp., a member of various boards (including that of the Computer Museum) and winner of the 1991 National Medal of Technology.

Users unite! Let's stand up for our basic rights

JERRY GOLICK

What happened to the revolution? Where have all the young turks gone?

In the bright early days of the personal computer movement, we were going to liberate ourselves from the mainframe. Computers were going to be placed in users' hands. Long delays in applications development would be a thing of the past. Well, 10 years have come and gone. Are we any better off?

Today's microcomputers are as complex as mainframes and require specialists to handle their care and feeding. Users are being forced to buy hardware and software they really don't want. Basically, we never got any of that promised control.

It's time to assert our rights and throw off the yoke of complex computation. Time to remind those in power that we raised them up and we can bring them down.

I, therefore, have taken it upon myself to write a new manifesto of end-user rights. It's just a start.

A user manifesto

I have the right to intelligent interfaces. Users should not have to learn interfaces — interfaces should learn their users. Graphical user interfaces are not the end of interface research. In the meantime, the user should select the interface, not the developer.

I have the right to be mouse-free. Developers and manufacturers should not force the mouse down users' throats. Give us alternatives!

I have a right to software that works. Shrink-wrapped software has allowed developers to sell bug-riddled software at no risk to themselves. Developers must be held responsible for correcting bugs.

I will not tolerate or support planned software obsolescence. We are tired of being asked to buy the same program every year. Vendors are earning unfair profits by forcing users to pay for the same functions in a new wrapper.

I have a right to support services. Developers should guarantee access to support. Those who fail to meet minimum requirements should not receive our hard-earned dollars.

I have a right to interoperability. Software and hardware must work together. Developers and manufacturers must guarantee this or come under severe penalty.

I have a right to innovation. Where are the radical new hardware platforms? Where are the bold new directions in software? How long will we be asked to keep buying the same thing over and over again? We fear the creation of a new IS department built around the microcomputer. Already the technology requires experts and specialists. What has happened to the new wave thinkers?

I have a right to choose. No one should dictate the needs of the individual PC user. Let each of us choose the best solution for our requirements.

I have a right to be heard. We are the users. We will choose who will survive or perish. We are the supreme court, the ultimate judges. And we will be heard. Not in local bulletin boards or user groups. Not in developer-dependant forums. Not in vendor-sponsored trade shows. The strength of our commitment will be a force that will be felt. We can change the world.

Are you with me? Together, we can make a difference.

Golick is a consultant and trainer based in Montreal.

We make the most complete And we stand behind

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T6400DX

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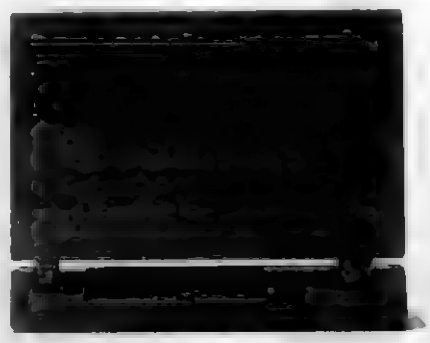

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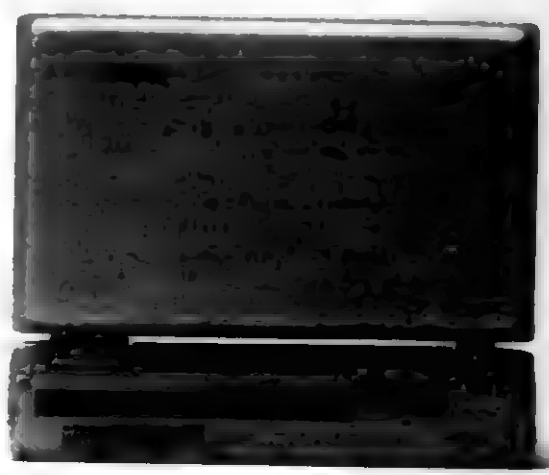

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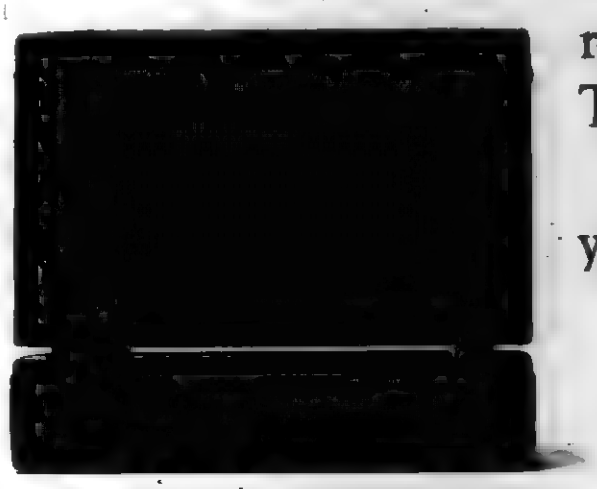
T6400SX



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White Paper

ENTERPRISE-WIDE IMAGING

Wang Makes Imaging Easy.

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Easy To Use.

Wang imaging solutions let you focus on the task, not the technology. We put the power of imaging at your fingertips, enhancing the applications that your organization depends on every day without requiring extensive retraining of users.

"I need imaging that adapts easily to our existing systems."
MIS Manager

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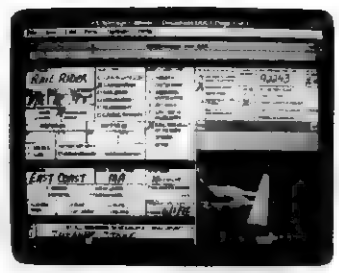

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Departmental Management

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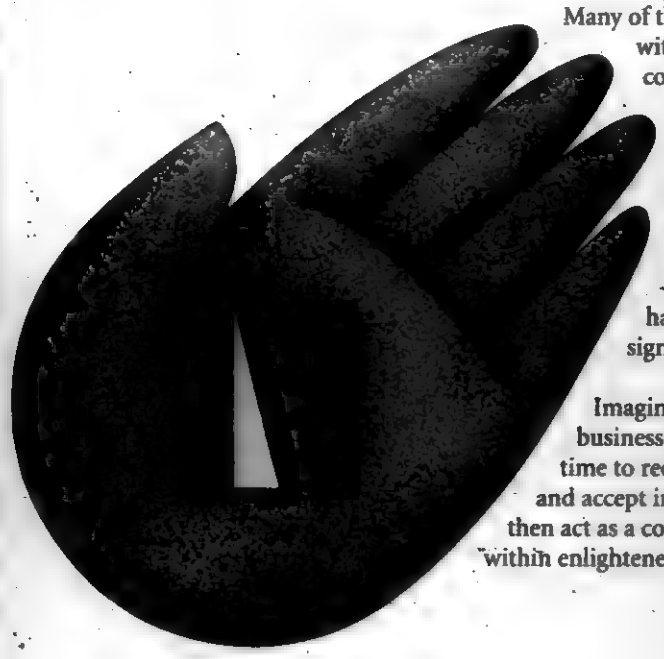
WANG OFFICES THAT WORK

Introduction

Image processing is a critical technology for many companies seeking a competitive edge, and enterprise-wide imaging is already playing a crucial role in some of the world's most successful companies. Despite its advantages, however, imaging has still not established a widespread presence in the U.S. business community. Even though it has gained more acceptance in foreign countries, it still has not fulfilled the hyperbolic claims made in its behalf.

Anemic economic conditions have certainly played a significant role in suppressing the growth of imaging. Although its potential is alluring, its price tag may be daunting. No promise of profits down the road can put nonexistent funds into capital budgets, and the future is now for businesses with their eyes locked on the bottom line.

Information Systems (IS) departments are among those hardest hit by the economic downturn. Frequently denied even the opportunity to have input on hardware and software buying decisions, they are unable to demonstrate the value they can add with imaging if given the chance. As a result, imaging and other new technologies such as reengineering, workflow software and groupware can languish unused.

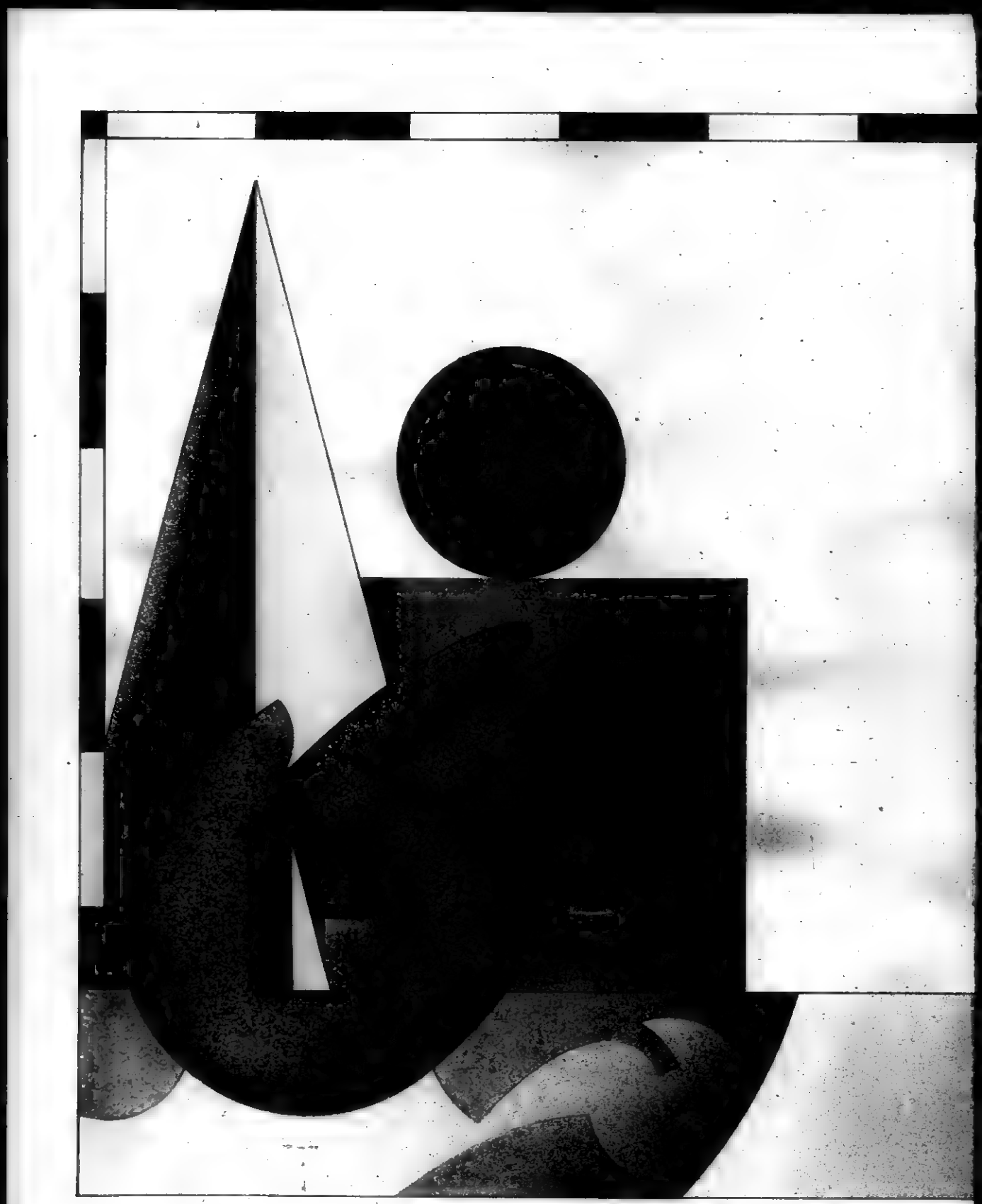


Many of the negative aspects associated with imaging have been overcome. Networks and image compression schemes are now largely standardized. Further, the price per seat has dropped from $100,000-plus in 1985 to $20,000 in 1992. And the cost per transaction — a truer indication of cost — has dropped even more significantly.

Imaging will flourish when the business community realizes that it is time to reexamine its outdated mores and accept internal change. Imaging can then act as a complimentary technology within enlightened organizations.

This White Paper was written independently of the Computerworld editorial department by Scott McCready, Director, Image Systems with IDC.

For more information on the White Paper Program, please call 508-879-0700.



IS professionals at home and abroad are under siege. Budgets in many cases are flat if not declining, and the IS influence over IS-related expenditures has been showing a marked decline in recent years. Many companies are throwing around terms such as outsourcing, downsizing and reengineering, in many cases with little thought. Given these difficult times, it is not surprising that many IS professionals simply do not have the time or energy to cope with new technologies such as imaging, workflow software, groupware, et al.

"It's difficult to take a long-term strategic perspective on technology when the alligators are already in your swimming pool," is the way one IS manager describes his inability to plan for imaging. He is not alone. A worldwide study of 5,000 IS professionals conducted by IDC's Worldwide IT Customer Directions and Strategies Group shows that only 14.2% of IS professionals in the U.S. and 12.6% worldwide intend to implement any significant type of imaging capability in 1992.

Despite this modest forecast, cost-conscious user-company top management must understand that imaging, when combined with a more enlightened approach to business practices in

general, can lift companies into a stronger competitive position. Effecting this kind of fundamental change in the traditional business psyche is difficult at best.

There are several arguments IS professionals give for not implementing imaging:

- Unless imaging can be implemented on an enterprise-wide basis it is difficult to justify the investment from a financial or architectural perspective
- Until imaging is available from system vendors, IS professionals cannot afford to invest significant resources
- On a cost-per-seat basis, imaging is simply too expensive
- Until there is a broad-based set of standards, imaging is too expensive to acquire, maintain and support
- Imaging is only good for specific departments and the onus is on them to interface with IS
- Imaging is flashy while microform technology is cheaper and legally acceptable.

Now that imaging is commonly based on standard networks, uses PCs without any specialized hardware boards, and is available from IBM, DEC, NCR and other leading vendors, the IS justification for not employing imaging on a broad-scale is eroding. Cost/seat prices have fallen from $100,000/seat in 1985 to generally less than $20,000/seat in 1992. Cost per transaction (a truer measure of cost) has fallen even more significantly over time.

The lack of specific ISO and de facto imaging standards is no longer a solid reason for not implementing image systems. There are CCITT Group 3 and 4 standards for compressing images, and many of the de facto standards used in the IS world — SNA, DECnet, etc. — are equally applicable to imaging.

IDC/Avante also believes the issue of imaging versus microform is moot. Microform is a valid technology for the long-term storage and retrieval of documents, and as such will be useful into the 21st century. Imaging is a less expensive way to process documents when they are in their active life cycle. Therefore, imaging and microform technology should be able to co-exist as part of a migration pattern in which active documents processed by imaging gradually become less active, or age to the point where it makes sense to store them on microform.

This is not to say that imaging is not effective in a file and retrieval mode, but retrieval rates have to be relatively high to justify the additional costs associated with imaging technology.

The primary remaining impediment to not implementing imaging concerns its applicability to a limited set of line-of-business activities. This is not a weakness but indeed a strength.

Imaging tends to yield the highest paybacks in industry-specific line-of-business activities. For example, insurance companies obtain optimal results by automating underwriting or claims processing functions. Banks typically benefit most from employing imaging in a mortgage loan servicing or credit card correspondence environment.

The challenge for IS is to find out which business problems respond best to imaging, and then implement imaging before the particular line of business installs its own maverick imaging system. In such a dynamic environment, the enterprise-wide IS architecture may be put at some risk. It is thus incumbent upon IS departments to become knowledgeable about their companies' business operations at increasingly lower organizational levels.

Imaging and associated technologies such as workflow software and groupware can propel IS into a position of prominence.

Although IS is increasingly gaining power in imaging system purchases, it is still left out of 60% of these critical transactions.

THE ERODING IS POSITION

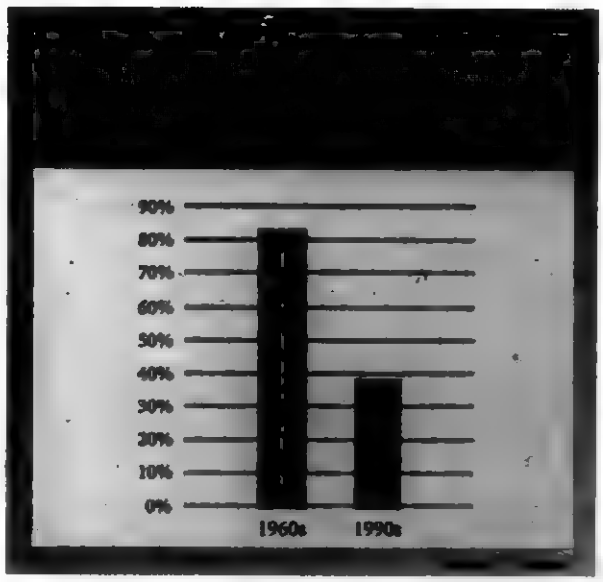
The trends of downsizing and outsourcing could not have happened at a worse possible time for IS professionals. Not only are they losing resources, but many IS shops are maintaining business applications that are 20 years old or older, and doing so without the promise of increased funds for support and maintenance. The problem is exacerbated because PCs and LAN purchases are eating into IS budgets dramatically. As the keeper of the enterprise-wide architecture, IS has been required to support an ever-divergent group of users requiring PC and LAN support, and demanding expensive departmental systems such as imaging.

Further, with desktop computers becoming as powerful as mainframes were 10 years ago, it is increasingly difficult to argue for a host-centric, central-control approach to automation. Client/server architectures are marching forth and the commodity pricing of computer power at the desktop and server levels shows no evidence of slowing. Therefore, the role of centralized IS departments will decrease as more and more companies refuse to write new mainframe applications, and more technologies such as imaging and OCR are put on networks. Add to this the pressure for open and standard systems, and it is easy to understand why IS is under siege.

On the bright side, the combination of PCs, LANs and existing network backbones creates the infrastructure IS requires to take its rightfully prominent place in corporate and organizational structures.

TROUBLE IN THE BUSINESS WORLD

How many people have not heard the term reengineering? Not many. But how many really understand what it entails? The common perception of reengineering is that of gut-wrenching change in business systems and a whole new set of business applications that must be written or rewritten. The fact that business systems were not engineered in the first place hardly seems to matter to senior management hell-bent on reengineering their businesses. What does matter is that more and more businesses are recognizing the need to change.



Even though IS is slowly exerting more influence on imaging system purchases, it is losing its overall clout on major technology acquisitions.

There are several business factors that suggest that all is not well in the business world:

- The quest for Total Quality Management (TQM) is rapidly becoming a national obsession
- There is an increasing focus on the top-line (market share, revenue growth) as opposed to the bottom line (profit)
- Commodity pricing for PCs, LANs and servers means that the system vendors cannot afford to do business as usual. The major vendors face many of the same issues confronting IS
- Only through a continuous improvement program (CIP) can companies raise customer service levels and product quality while reducing costs and empowering employees.

IS ENTERPRISE-WIDE IMAGING REALISTIC?

Given the transformations taking place in the IS function, is it reasonable to expect IS to envision and implement an enterprise-wide imaging environment? Perhaps more to the point, does it make good business sense? There is a three-part answer to these questions. An economic response, an organizational or logistical response, and a technical response.

Economically, it may make sense for some companies to employ imaging from an enterprise-wide perspective. The economic argument in some cases may be based on the ability to provide a new product or service that would not be possible without the use of image technology. However, for most companies the capital outlay for an enterprise-wide system must be spread over several years. Since most users must cost-justify the acquisition of image technology, this commonly limits imaging as an all-pervasive data type. Consequently, image technology has been limited to those areas where well-documented financial return was possible. Despite this trend, the shift from imaging in line-of-business applications to enterprise-wide use is slowly taking place.

Part of the reason for starting small may be attributed to simple economics, but certainly the limitations of the technology — most notably, its limitation to a single database domain — and the complexities of completing the necessary up-front analysis have also contributed significantly to the departmental adoption approach of image users.

Organizationally, the hurdles of employing imaging technology on an enterprise-wide basis are formidable. In these lean fiscal times, the frequent senior management philosophy is, "If you are going to fail, make sure you fail small." That is why the first imaging project is often in the area of a company where failure has no price and success has little or no impact. These initial imaging projects are also frequently not transferrable to other areas of the enterprise.

The organizational issues, more than the economic or technical considerations, pose the biggest obstacles to enterprise-wide imaging.

Technically, enterprise-wide imaging is possible. The challenge for vendors and users goes beyond connecting disparate computer architectures, or employing standard and open systems. The challenge is separating those vendors with connectivity from those vendors that can layer an appropriate product set on top of the existing information processing infrastructure.

Most imaging users are automating the paper process. Since paper transactions cross not only LANs and wide-area networks (WANs) and in many cases countries, users need an architecture that not only allows transactions to flow freely but also can track and control transactions. This is where most enterprise-wide efforts begin to fall apart.

The other problem is that image systems tend to be bought and implemented in a helter-skelter fashion by various lines of business. Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability.

Enterprise-wide imaging involves

more than simply integrating disparate computer architectures. It also requires access and customized views of the associated data and images. The definition of enterprise-wide access is not complex. Once a specific business function is automated with imaging technology, people beyond the newly automated department can also benefit from the imaging database. Therefore, it is necessary to find an economical method that provides casual access to this new database resource. This casual access should involve a consistent front-end that shields the user from the native interfaces.

Providing an enterprise-wide imaging system requires the use of sophisticated folder software, which allows users to view data and associated images for multiple management functions without storing the data and images multiple times.

Most of the system vendors, such as IBM and Digital Equipment, offer imaging based on their existing strategic architectures. For database management systems, this means Rdb and DB2. Networking is based on DECnet and SNA. The imaging system vendors are also catering to standards by supporting common databases, such as those available from Oracle and Sybase. 3COM and Novell are the most prominent network operating system companies. Interactive multiwindow desktop interoperability is commonly offered through Dynamic Data Exchange (DDE) under MS Windows 3.0.

"Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability."

Currently, no single vendor offers true one-stop shopping. The system vendors are trying to address standards. When it comes to workflow software, they fail to understand it from an application and system-resource perspective. The image vendors are closing in on workflow software application solutions, but they are not large enough to convince many large corporations to view them as significant automation suppliers.

Vendor	Workstations	Customer	Application
Sigma Imaging Systems	1,650	Empire BC/BS	Multiple
FileNet	175	Chemical Bank	Multiple
FileNet	200+	Phillips Petro	Accounting
IBM	<50	D. B. Kelly	Photo Inspection Records
IBM	1,500+	USAA	Claims Processing
IBM	1,000+	WCB of Ontario	Claims

There is still a limited number of enterprise-wide imaging systems.

THREE ORGANIZATIONAL MODELS

Enterprise-wide imaging systems generally reflect one of three organizational models. The first model is the traditional view. This model has a large number of workstations, is normally constructed with conscious architectural considerations, and is usually compliant with evolving standards such as those proposed by the ISO's Open Systems Interconnect model.

The second model of enterprise-wide architectures reflects the software changes IDC/Avante believes must happen if users are to widely implement imaging. These changes imply the use of folder software to present individual views of the data and images while only storing and manipulating one set.

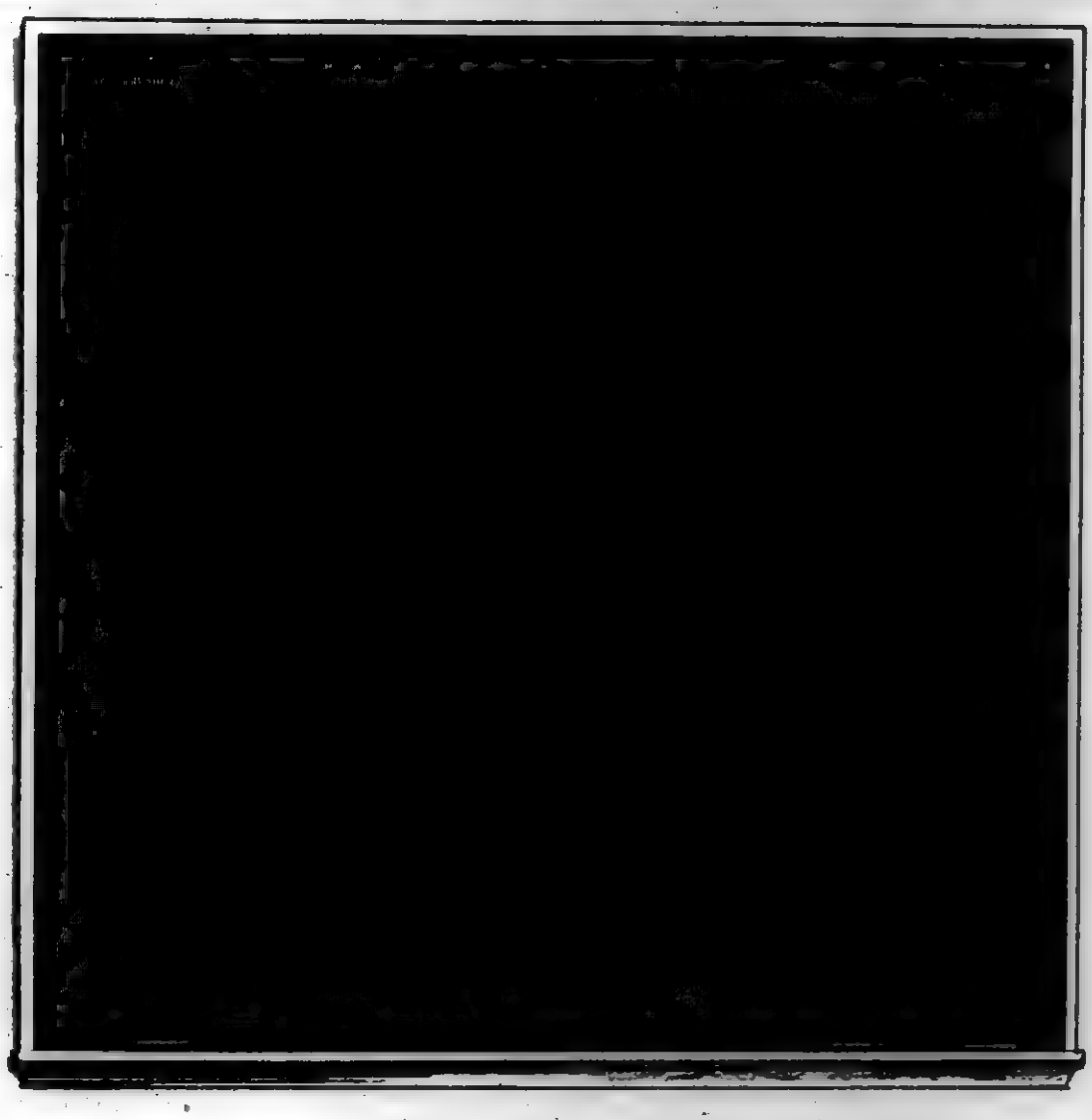
The third model is based on the premise that the concept of the enterprise is expanding to include not only the user company, but its suppliers, agents, customers and government. All of these groups may be found in a single image implementation.

Today, many vendors and users alike are stuck with the traditional model of enterprise-wide imaging. However, IDC/Avante sees a definite trend towards the second model, particularly in the insurance and healthcare industries. The third model is more applicable to truly innovative companies, mostly found in the financial sector.

VENDOR APPROACHES

Sigma Imaging Systems is one vendor that preaches the gospel of distributed processing and central records control. It strives to leverage its systems at all levels while offering the ability to expand systems incrementally without having to add gigabytes of storage or make other dramatic changes. Sigma has implemented a system at Empire Blue Cross/Blue Shield with these central concepts in mind. The system features 23 Kodak ImageLink 9000 scanners, processes 100,000 documents/day, includes six jukeboxes at three sites: Albany, N.Y., New York City and Yorkstown, N.Y.

The system automates multiple lines of business: medicare, a dedicated state service center and claims processing. The single catalog of images and the various jukeboxes communicate over an SNA network that links all sites. Work-



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The IS Call to Arms — 11 Steps to Change

Unless there is a general call to arms, IS will become a simple maintenance function with some network caretaker services provided by specialists. It will have no opportunity to add value or make critical decisions. The call to arms should include several elements. In order to fulfill them, IS professionals must:

1. Understand the business environments of their companies and determine the appropriate mix of technologies to accommodate those environments.

2. Fully leverage existing IS infrastructures.

3. Recognize that IBM and Digital will be the network providers of choice, while imaging, workflow software and groupware will more than likely come from companies such as Lotus, Plexus, FileNet, Action Technologies, Wang and Computron.

4. Recognize that outmoded development environments must go. Hard coding imaging solutions simply recreate nightmarish support and maintenance scenarios. Instead, users should use automation efforts to ensure that the workflow process is isolated from the business application, and eventually from the data application. The goal is to change the workflow without negatively impacting other processes.

5. Beware of vendors offering a new lease on life through image-enabling legacy applications. This may be a suitable migration strategy for some, but it may leave others in a technology purgatory between the old and new worlds.

6. Break down the communication gap between IS professionals and business people.

7. Be aggressive with major computer suppliers. IS must demand that the system vendors alone, or in partnership, provide the appropriate products and services needed to get IS out of their legacy environments.

8. Implement imaging with an enterprise-wide view in mind while being mindful of the changes enterprises are experiencing.

9. Understand that imaging and the issues associated with imaging are typical of the organizational and technological issues that IS will be confronted with in the next ten years.

10. Shift IS expenditures away from processing transactions and toward automating people and the relationships between them.

11. Recognize that we are in a unique point in automation history. The competitive battleground is not simply quality or the time required to get to market. Instead, the competitive battleground is based on creating value, which, in the words of Russell Redenbaugh, Chairman of Action Technologies, is "the new coin of the realm." As such, we are not so much automating the flow of paper or data. What we are really talking about is an overall automation environment that allows systems to allocate resources dynamically.

in-progress is distributed on OS/2-based systems, but the image catalog — which contains 22 million documents — is on an IBM ES/9000.

FileNet Corp. considers its implementation at Chemical Bank in New York City to be an enterprise-wide system. According to FileNet, the system currently includes two cities, five systems and nine applications. Its users share data and images in a variety of different ways. Application processing, charge-backs and customer service applications reside in one city while the users are in two cities. FileNet says the system qualifies as an enterprise-wide system based upon its having data available to a distributed set of people or multiple applications that may be co-located or distributed.

Wang Laboratories believes there are few, if any, image systems that are truly enterprise-wide. In fact, Wang argues there may not even be a demand for enterprise-wide systems in which anyone working in an organization has access to all information. With the exception of small and focused enterprises such as resume access in a recruitment environment, Wang believes the need for everyone to have access to all data is simply not required. Since there is a division of labor between departments, the company maintains that it is unlikely that one form of information has to be accessed by all groups.

Despite this position, however, Wang also believes it is very important for prospective imaging customers to consider the enterprise-wide imaging implications in their up-front analyses because it leads them into considering the possible impact of standards and the implications they may hold for future expanded imaging systems.

CHANGE...

Document management is changing. The process can be wrenching and expensive. Or it can evolve the Kodak way: film or digital or both, at a pace to match your needs.

MANAGED BY KODAK

Imaging by all means

Not surprisingly, IBM has done a lot of thinking about the issue of enterprise-wide systems. The company says enterprise-wide imaging has a lot more to do with the approach than with scale or scope of implementation. It cites a number of notable considerations, including the need for:

- Some element of work management
- An industrial-strength solution
- A conscious set of architectural elements.

THREE ENTERPRISE-WIDE SCENARIOS

IDC believes there are three possible scenarios for enterprise-wide imaging systems. While all three are different in definition they are certainly not mutually exclusive.

The first scenario includes hundreds of workstations as are found in implementations at USAA of Plano, Texas, and Putnam Investor Services of Quincy, Mass. These systems are absolute in scale, meaning the number of workstations they support can be expanded without limitation.

The second scenario is found in small companies where imaging is pervasive across the entire business. D.B. Kelly, which uses imaging to eliminate insurance fraud in the automobile inspection process, is an excellent example of this approach, which typically calls for fewer than 50 workstations. However, the ratio of workstations to employees is nearly one-to-one. D.B. Kelly is all the more remarkable because imaging allowed it to create a business that was not feasible without imaging.

A third scenario of enterprise-wide imaging comes into play when companies redefine their definition of the enterprise. IBM implemented an internal imaging system to handle customs documentation (IBM was the first company allowed by U.S. customs to destroy the original paper documents). Subsequently, the system is being expanded to include the customs brokers that handle IBM shipments at the different ports of entry.

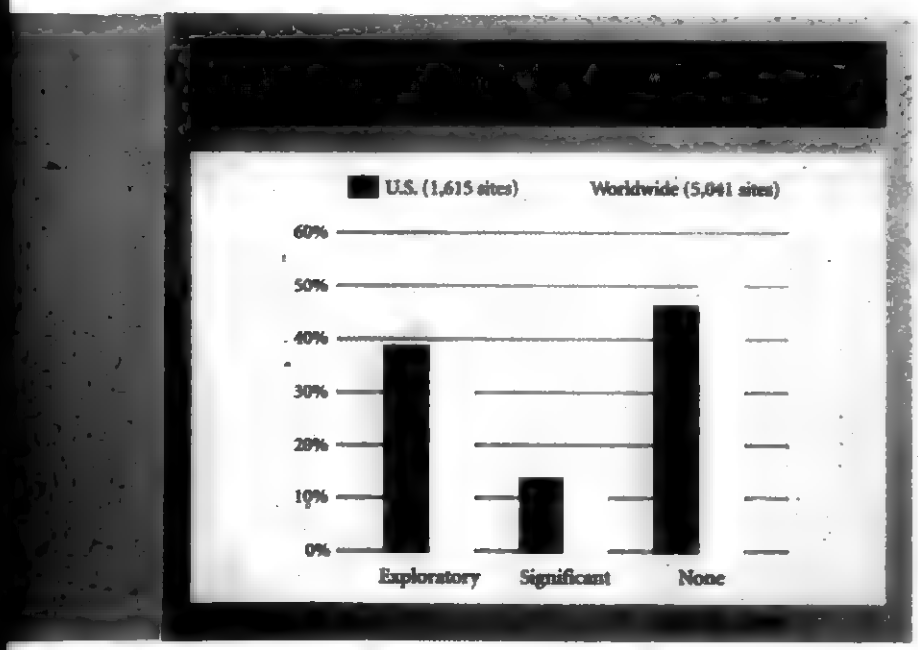
GLOBAL IMAGING IMPLICATIONS

IS managers in the U.S. are not alone in the struggle to place imaging, workflow software and groupware in perspective. As Europe marches toward a monetary union, many United Kingdom and European IS managers are also coming under intense pressure to provide a more seamless IS environment on an intercountry as well as an intracountry basis.

Despite the European unification efforts, however, it is a great mistake to perceive Europe as one market. The use and sophistication of imaging in various European countries is as varied as the business problems imaging solves in the U.S. For instance, Spain and Italy frequently implement file and retrieval applications, while Germany uses more workflow technology.

Far from being one market, Europe will remain a series of relatively unique markets well into the next century. Certainly the European Community (EC) simplifies many of the legal issues that U.S. companies must comply with in order to do business in Europe, but the driving factors behind the acquisition of new technology will still be different in each country.

As one European explained it, "We are all part of the EC but that does not mean we are similar or that we necessarily even like each other."



Users are cautiously committing themselves to imaging systems.

APPLICATION BRIEF

The State of Missouri, Employment Securities

This agency's job is to collect quarterly employment taxes. This means that once a quarter Employment Securities is literally deluged with thousands of checks. The result is that its processing cycle has huge peaks that last for 10 days.

Before implementing imaging, it took 10 days to pull the checks and get them to the bank. Anyone that was available from another department was requisitioned to pull checks because the state wanted to reduce float and make sure it could tell people that their payments had been received. It took approximately six weeks to get the information off the reports and get the basic

Industry	1992	1993	1994	1995
Banking	14%	17%	18%	20%
Insurance	7%	9%	11%	12%
Financial Services	6%	8%	9%	10%
Manufacturing	24%	25%	24%	24%
Transportation	5%	5%	6%	6%
Utilities	3%	3%	4%	4%
Government	21%	21%	20%	18%
Other	20%	12%	8%	6%

Leading Japanese imaging users in the manufacturing and government sectors frequently rely on electronic filing cabinet applications.

data into the agency's system. It then took another week to place the reports in numerical order. Eventually the reports were microfilmed, which took two more weeks.

The state's customer service representatives charged with replying to taxpayer inquiries did not have the necessary information until the end of the next quarter. Now, as soon as the check is pulled, the accompanying documents can be scanned and indexed. As a result, customer service has the information it needs within 48 hours of the check being pulled, and nine-to-ten weeks of waiting time is eliminated.

APPLICATION BRIEF
State Retirement Fund, Illinois

The State Retirement Fund was being forced out of its location, which was a problem because it had several million paper documents stored in cardboard boxes and on shelves. The fund had a finite number of dollars to spend, and had to decide whether to build special storage space into its next building or change its paper process. It opted for the latter, acquiring an image system in advance of the move to the new building. It used the system solely for converting paper to images. As a result, on moving day, everything moved but the paper records.

APPLICATION BRIEF
State of Louisiana, Department of Public Safety

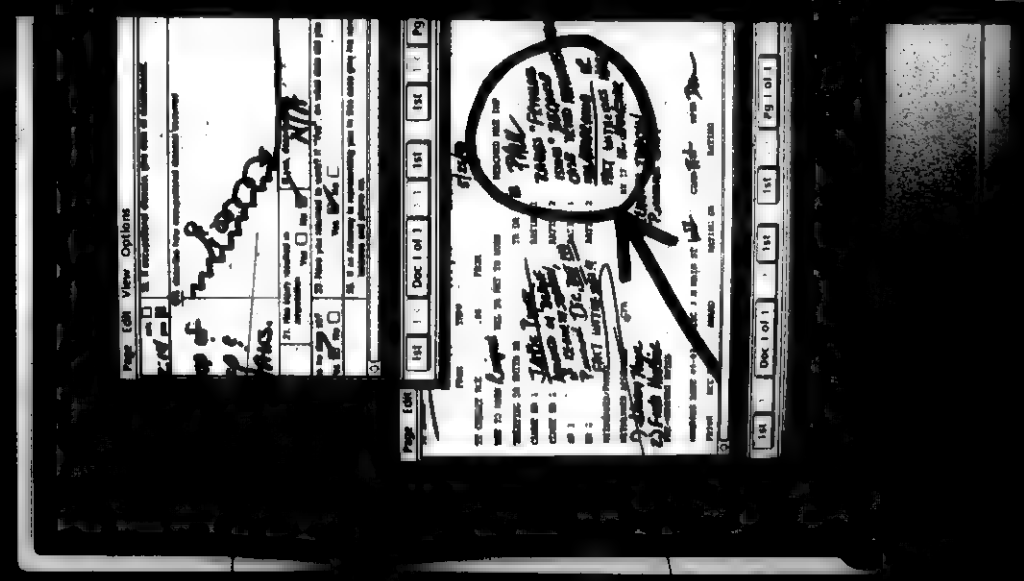
The State of Louisiana Department of Public Safety needed to supply information on drivers to many other agencies and departments. Problem drivers are a large part of that information, and tend to remain that way over time as they go in and out of the court system, amass police driving records and have their licenses revoked. Insurance company requests further compounded the state's information retrieval demands. In this environment, the state typically provides information to six outside organizations. Since placing this information on an imaging system, all files are readily available, and can be easily shipped across communication lines. The state's goal is to leverage imaging to the point where it no longer needs paper and microfilm, but can maintain information in an electronic folder. It also wants to include arrest histories — which are maintained separately from driving records — and mug shots in these electronic folders.

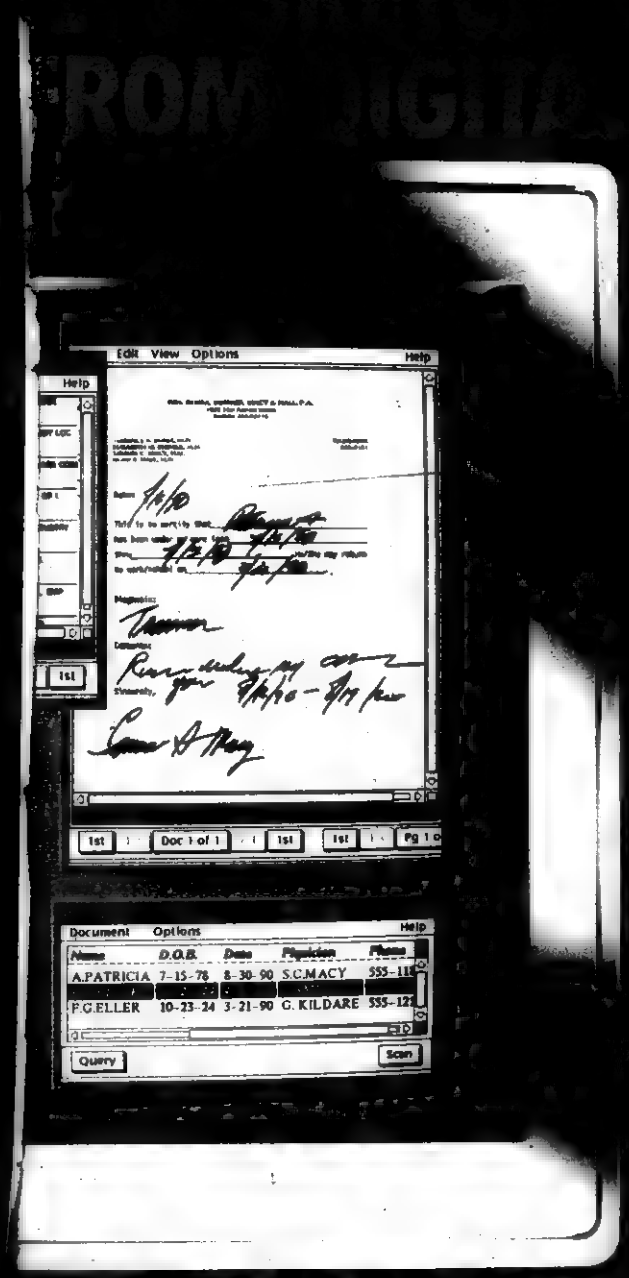
The state eventually wants this information to be accessible not only by the Department of Public Safety but by the court system and mobile units of the fire and police departments. The agency receives 12,000 pieces of documentation weekly, and has a 12-million-document backlog. So far, 2,000 terminals have been installed to fight the imaging battle.

APPLICATION BRIEF
American Republic Insurance Company

American Republic has $386 million in assets, $150 million in health premium income, $1.4 billion in current life insurance business and 200,000 policy holders. It installed an imaging system in order to bring a higher level of automation to its claims adjustment department in the health claims area. Currently this area handles 1,300 claims per day, which is a 25% increase in volume over last year.

American Republic estimates that its image system will save $1.25 million over the next five years on reduced staffing costs. An additional $48,000 is expected be saved in microfilm equipment and services.

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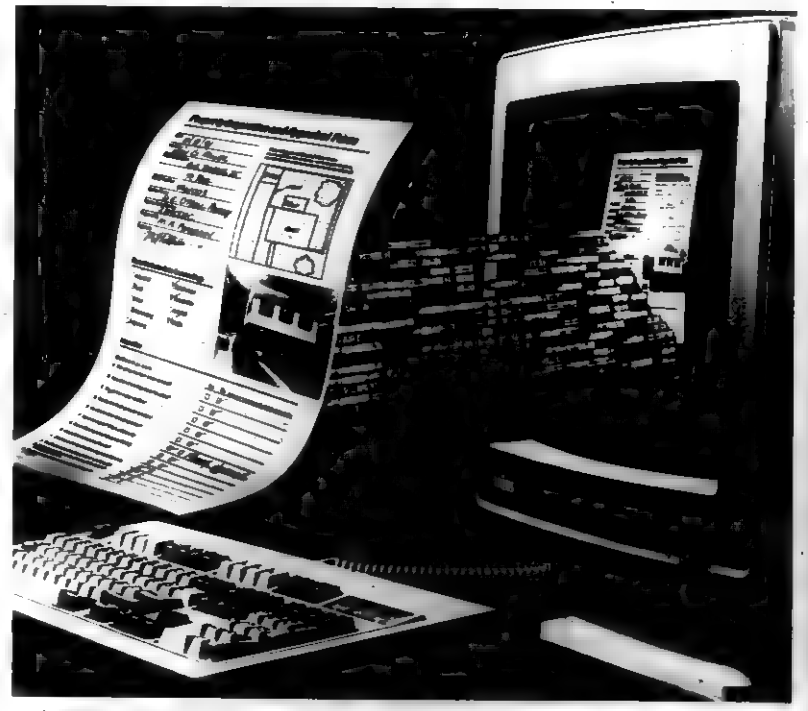

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COMMENTARY

Paul Gillin

View from the West

Notes from a recent West Coast swing:

Quattro Wow: If Borland's Quattro Pro for Windows is half as good as the demo I saw two weeks ago, this is a product worth waiting for. It is a lot more than a spreadsheet. It has true three-dimensional capabilities, a powerful graphics module and a database interface that should take full advantage of other Borland products waiting in the wings.

What is most impressive about Quattro Pro for Windows is its notebook metaphor. Picture your full year's worth of expense reports in a single 3-D volume with individual pages for each week. You can run all kinds of 3-D operations over these pages and move them around by just grabbing a tab and dragging. The notebook also puts an end to those annoying eight-character file names. Up to 256 pages can be combined in a single notebook.

Quattro Pro for Windows also embeds graphics within the spreadsheet and scales them so that they're readable in whatever space you have to work with. The graphics module is awesome. A right-button click gives you a menu of graphics options from anywhere within the graph, and you can scale and rotate 3-D graphs just about any way you want. You can even customize backdrops and individual bars to fill them with bit-mapped images for striking effect. The X-axis becomes the Y-axis with a single mouse click. And the menu buttons across the top — more than 150 of them — change to fit the mode you're working in.

The database desktop is a striking new concept. It lets you merge complex database queries with a spreadsheet front end, which cuts way down on screen development. You can even link bit-mapped graphics to database records and add things like buttons and scroll bars as a drag-and-drop operation.

Now here's the bad news. Borland has got problems. Quattro Pro for Windows

Continued on page 57

Move to GUI can put graphics to the test

BY CAROL HILDEBRAND
CW STAFF

With graphical user interfaces (GUI) currently hot out of the gates, many users looking to migrate to such operating environments as Windows or OS/2 are discovering that their hardware cannot pass muster. Not only is it a question of CPU, but a GUI also means a higher graphics hurdle to clear.

"GUIs are very hot, but there is a lot of demand put on the graphics by them," said Tom Ryan, executive director of the Video Electronics Standards Association (VESA).

Analysts said that users will want to consider the following display resolution and performance requirements for wide-open Windows capabilities:

- With chip manufacturers coming out with random-access memory-digital analog converter processors, which provide higher quality color, users are going to need better displays. Many analysts also insist that larger monitors are in order. Jon Peddie, publisher of "The PC Graphics Report" in Oakland, Calif., said that for a corporate Windows user, a 17-in. monitor with Extended VGA (1,024 by 768 resolution) would be necessary.
- The next performance enhancement is to use a graphics board that has bit block transfers (bitBLT). BitBLT takes the onus of moving things around on a screen off of the host processor and puts it on the graphics board, thus freeing the system from a time-consuming task. A similar enhancement is moving cursor support off of the host and onto the graphics board.
- Peddie also recommends having what he terms an input buffer, which allows the display board to take several instructions at once and hold them until the graphics board can process them, thus cutting down the use of the slow system bus.
- Another hot area right now is local-bus personal computers, in which the graphics board bypasses the system bus to speak directly to the host processor. With the clunky I/O bus out of the way, the speed increase is substantial.

The local-bus phenomenon has sparked a minitrend, with Epson America, Inc., Compaq Computer Corp. and Dell Computer Corp., among others, all coming out with proprietary versions of local-bus machines. This poses a problem to the board/chip manufacturers, International Data Corp. analyst Joan Carol Brigham said, as they have to jury-rig connections to each manufacturer's version.

However, VESA is set to ratify a features list for its local-bus standard by the end of the month, Ryan said. "The local bus really has potential. It will create killer PCs."

One interesting side effect of the advent of Windows is what is happening with graphics display standards. Graphics standards were critical in the DOS world, Brigham noted, because application software had to have a driver written directly to the hardware in a standard way. IBM usually set the standard, with the likes of Color Graphics Adapter, Video Graphics Array (VGA) and Super VGA making appearances.

However, IBM's current entry, Extended Graphics Array, may end up as more of a controller than a standard. "With Windows, the interface takes over and you have a Windows driver," Brigham said. "It becomes less of a hardware standards issue and more of a Windows compatibility issue."

The hotbed of activity in the Windows arena has graphics board and chip manufacturers hustling to provide innovative products in a market that many analysts say is overcrowded. Thus, a user looking to exploit the full graphical advantages of Windows will find a buyers' market when it comes time to upgrade graphical capabilities.

Windows is having "a real positive impact on the user," Brigham said. "Board vendors face tremendous competition in terms of price/performance. There are a lot of products at very low prices," she said.

Peddie estimated that there are more than 400 boards on the market for VGA alone.

High standards

Of the more than 15 display standards, the following are among the major ones that support Windows 640 x 480 resolution:

Name or category	Pixels	Lines
Video graphics adapter	640	480
Super VGA	800	600
Extended Graphics Array	1,024	768
High resolution or Extended VGA	1,091	768

CW Chart: Stephanie Faucher

Wyse back to basics with upgradable CPUs

BY MICHAEL FITZGERALD
CW STAFF

SAN JOSE, Calif. — A pioneer builder of upgradable personal computers has returned to its roots while carrying out a revamp of its entire product line.

Wyse Technology, Inc. was one of the first vendors to sell upgradable PCs back in 1987, but it abandoned the business in 1990 because only 4% of its users had upgraded.

Recently, Wyse released the Decision 486SI family. The line uses a Wyse-designed local-bus video subsystem, called Hyper16 Video, and is easily upgradable, according to the company. Wyse also uses a switch-upgradable motherboard, so the user can simply flick a switch after installing a new processor, instead of having to upgrade the entire motherboard.

Get organized

Analysts said the new systems and their prices were solid additions to Wyse's product line, but the company must improve its distribution.

"Where they have only 20 to 40 direct VARs today, their goal is to have 200 to 300 direct VARs. I think that's a challenge for them," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. Zwetchkenbaum pointed to the new products and a revamped field sales organization as major pieces of a strategy that, if executed properly, will help Wyse stay afloat in the turbulent waters of the PC industry.

Pricing for the new systems ranges from $1,729 for a 33-MHz Intel Corp. I486DX-based Decision 486SI-33DX to $2,399 for one based on the 33/66-MHz 486DX2.

Wyse also released new models for each of its multiprocessing Unix server families. The 6000I Model 645, a uniprocessor machine, uses a 33-MHz 486, and it is slated to ship later this month at a cost of $8,395. The 7000I Model 740MP supports up to three 33-MHz 486 chips and now has error detection and correction memory, remote diagnostic capabilities, improved connectivity and WY-9977 multidrop communication interface boards.

Microsoft Corp. is using the 7000I 740MP for Windows New Technology development, and it has created a hardware abstraction layer for it. The base price for the 7000I is $19,095.

The high-end Series 9000I 960MP can support up to eight 486DX2 50-MHz chips and 400 users. It is scheduled to ship this month at a cost of $9,895.

At least one Wyse value-added reseller (VAR) was pleased with the announcements.

"I don't know of any other vendor whose product line is as wide as theirs in Unix System V," said David Robinson, president of Digital Systems Management, Inc. in Lakeland, Fla. Robinson also resells Digital Equipment Corp. equipment.

3M to ship 'floptical' disks

BY MICHAEL FITZGERALD
CW STAFF

ST. PAUL, Minn. — Imagine a floppy disk that could hold 14 times as much information as it can now, in the same form factor. 3M Co. is slated to begin shipping its new 20M-byte 3½-in. "floptical" disks later this month.

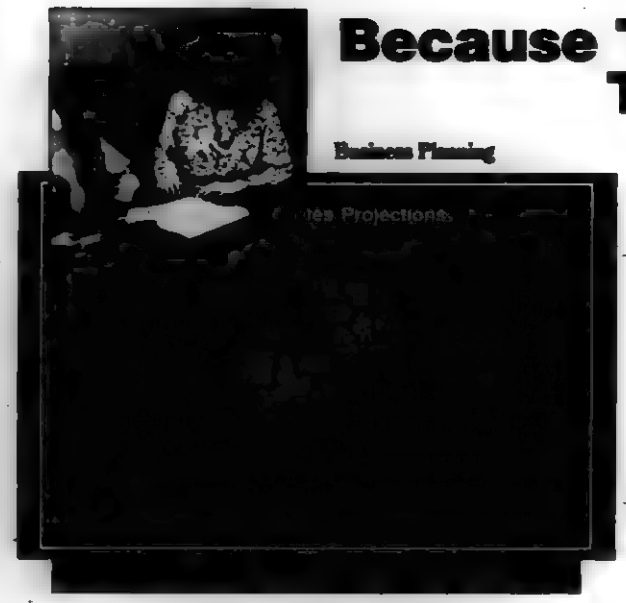
Users will be able to buy them through traditional retail channels. 3M has not set final pricing, but it said it is targeting them at $31.45 a disk. 3M expects street prices to be $105 for a box of five.

Analysts interviewed last week were split on whether they thought flopticals, magnetic disks that rival optical discs in capacity, would become popular.

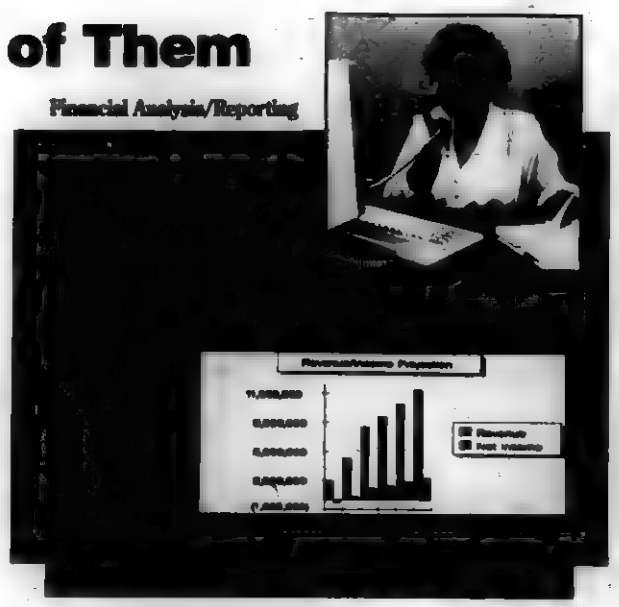
"It's a niche market," predicted Fara Yale, an analyst at Dataquest, Inc. "It's a good idea, but the price of both the drive and the media will prevent it from becoming a product for the masses."

James Porter, president of

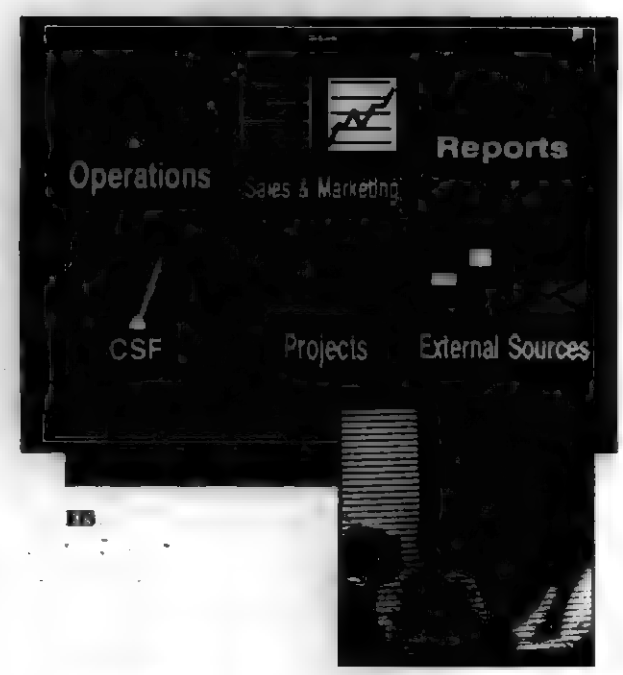
Continued on page 58

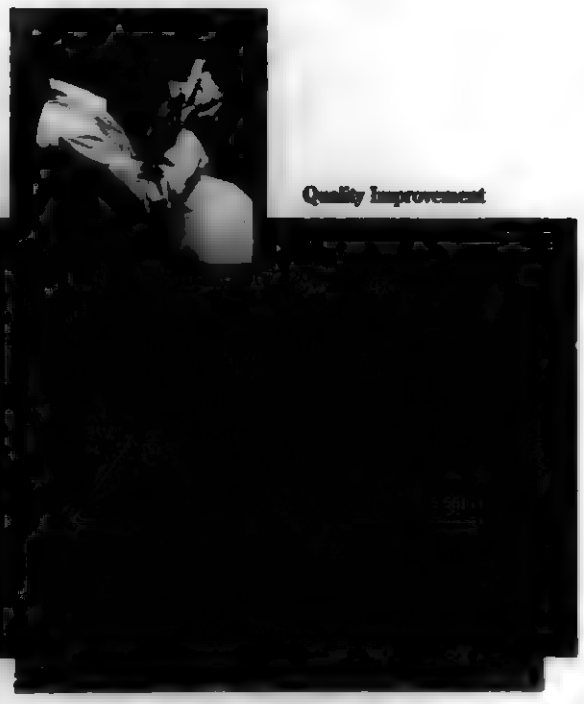


Because There Are More of Them Than There Are of You...



The SAS® System for Information Delivery





The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

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BOARD WATCH

Christopher Lindquist

Visions of Paradox

Summer is winding down, but the bulletin boards continue to buzz.

■ **A Paradoxical situation.** Everyone on Borland's BORDB forum seemed anxious to jump the gun on Paradox announcements — except Borland. Paradox 4.0 is finally being shipped, according to the company. But at least one user on CompuServe claimed to have it a couple weeks ago, much to the surprise of the Borland support staff. After some good-humored hounding, the culprit admitted to his hoax, saying he was only trying to break the tension of the wait for the upgrade.

Other users reported that one hardware vendor was announcing shipment of PCs with Paradox 4.0 bundled well before the database was shipping, and another vendor, Target Software in Allentown, Pa., posted a note about a third-party dialog box painter for 4.0. Now we'll see if the excitement is justified.

■ **No ifs, ands or butts.** A group of technical support folks on Usenet generally agreed that smoking and computers don't mix. "Machines don't like second-hand smoke any more than people do," quoth one. Their anecdotes sounded like medical reports: disk drives, keyboards and screens coated in tar, resulting in less reliable equipment.

■ **Thai-ing one on.** A response for when they say it can't be done: "It's one of those things where people say 'Even with a computer the size of the universe, it can't be solved in less time than it takes to count all the quarks in the universe, unless you buy the hackers more Jolt and Thai food than has existed in all of history.' "

■ **Parting advice.** "If you want to be a hero, never buy Version 1.0 of anything. Pioneers are easily recognized by the arrows in their backs." And, "Low serial numbers are trouble. High serial numbers are trouble too, but more people can tell you their horror stories."

I'm on my way to Computerworld's California office, and it's good to know that while everything else will change, my E-mail addresses go on forever. Have any suggestions, tips or comments? Send them to me via CompuServe at 72360,2005, MCI Mail with 549-8464 or over the Internet to christ@unisland.natick.ma.us.

Lindquist is a *Computerworld* staff writer.

HELP LINE

Ami Pro

Part of a continuing series of tips by PC software vendors, based on questions commonly asked of their customer support personnel. This week's tips focus on Lotus Development Corp.'s Ami Pro.

Q How can printing speed be increased?

A Choose Tools/User Setup/Options. Disable the "print in background" option by clicking off the X. Then turn off the Windows Print Manager in the printer section of the Windows Control Panel.

Q How can I move or copy text without using copy/paste?

A Select text, position the mouse pointer where you want to move text and hold CTRL + click the right mouse button. To copy text, hold CTRL + SHIFT + click the right mouse button.

Q How can I select (shade) all text in an Ami Pro document?

A Place the insertion point at the beginning of the file. Press CTRL + SHIFT + END.

Q How can I prevent the (shaded) word I'm looking up from disappearing when I use the Thesaurus icon?

A The word is not visible because there is a need to repaint the screen. Touch PgDn, PgUp; or to avoid this situation, choose Tools/Thesaurus.

Q How can Ami Pro be loaded with an option to create a new file or open an existing file rather than displaying an untitled document?

A Create a new file and just type: Function Opening () File Close () SendKeys ("[altf]") End Function. Then save the file as an Ami Pro Macro, naming it: opening.SMM. Choose Tools/User Setup. Enable the Run Macros program and write in the file name. Press OK.

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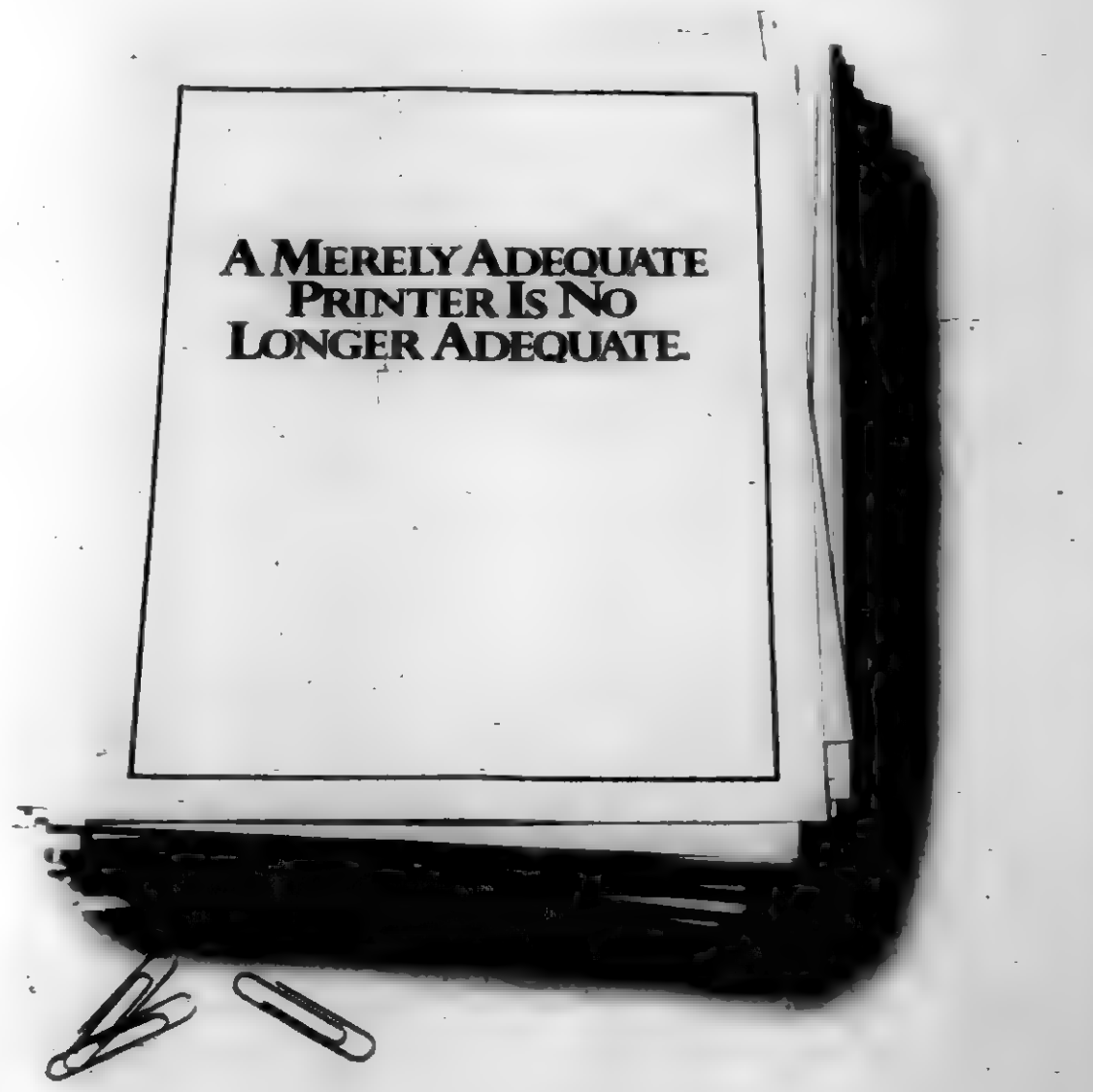

(Coming August 31, a new idea in network printers from Compaq.)

COMPAQ

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SEE US AT INTEREX, BOOTH #129

Gillin

CONTINUED FROM PAGE 53

is about three months late, judging by the fuzzy release date Borland discussed last year, and it's freezing purchases. The company has managed to squeeze out a new release of Paradox for DOS, but it's stopped even talking about time frames for Paradox for Windows, which it first demo'd a year ago.

Borland's latest reorganization puts dBase IV into the programming languages group, where it'll be sold as a tool for professional programmers. That underestimates the upgrade potential of dBase's user base and makes it a second-class citizen to Paradox. To top it all off, Borland is physically split up among more than a dozen buildings all over Scotts Valley, Calif. Isolation dampens morale.

Recommendation to Philippe Kahn: Hire yourself a professional manager. Your company is too big and diversified to be run like a bootstrap operation. The smart people at Borland need to concentrate on products, not reporting structures. A lot of people want Borland to do well, if only to counteract the Microsoft dreadnaught. But even a band of barbarians needs organization.

WYSIWIS. The two big bugaboos of electronic publishing are that documents are too big to transfer over a network economically and that a pretty document created on one machine won't look good on another unless the user has exactly the same software installed.

Now, along comes Adobe Systems with an approach you could call "What You See is What I Sent." Its Carousel software, due out in early 1993, is the most exciting new technology I've seen this year. Interleaf has a similar product called WorldView (shipping now) that's aimed at the high-end publishing market, but I haven't seen that yet.

Carousel makes high-quality electronically published documents readable by anyone with an inexpensive software "viewer." And it's machine-independent. In a demonstration, Adobe took a desktop-published front page of *Computerworld*, converted it to Carousel format and transferred it freely between different computers — DOS, DOS/Windows, Macintosh and Next. It looked almost exactly the same on all of them.

Carousel uses whatever fonts it can find on the target machine to recreate a page as accurately as possible on the screen or printer. Where it can't find a font, it mimics it using an Adobe technology that keeps all the line spacing and letter widths intact. You hardly notice the difference.

Best of all, Carousel compresses files by about a factor of 50 compared with PostScript. The *Computerworld* page took up a minuscule 28K bytes of disk space, including all the graphics.

What's neat about that is that a 28K-byte file is a snap to download from CompuServe or send out over the corporate E-mail system.

Imagine publishing your magazine, newsletter, product documentation, etc. and posting it on a bulletin board or shipping it on floppy disk. Adobe has even built some hypertext features into Carousel that let you skip around a document by clicking on headlines or icons.

Now, whether Adobe can actually *sell* Carousel in the quantities needed to assure success is another story. As a publisher, I hope it can.

Gillin is *Computerworld's* executive editor.

Tax preparation meets CD-ROM

NEW YORK — Research Institute of America, Inc. and Computer Language Research, Inc. recently entered into an agreement to bring to market what the companies claimed is the first integrated compact disc/read-only memory (CD-ROM) software package for small to mid-size accounting firms.

Research Institute's electronic research product, OnPoint, will be integrated with EasyGo, a tax preparation package from Computer Language, to create EasyGo with OnPoint, a CD-ROM system that will run on Intel Corp. 80386- or I486-based machines. EasyGo offers tax compliance, research, electronic tax forms, planning and practice management, all on a 600M-byte disk.

Stephen T. Winn, president and chief executive officer at Computer Language, said EasyGo incorporates all types of tax forms for city, state and federal taxes.

EasyGo with OnPoint is priced starting at $2,000 for four disks. Users will receive monthly updated disks to reflect changes in tax law, according to Louis Luccarelli, president and chief executive officer at Research Institute.

Winn said users who buy the disks before Oct. 15 are entitled to a free Toshiba America Information Systems, Inc. CD-ROM reader.

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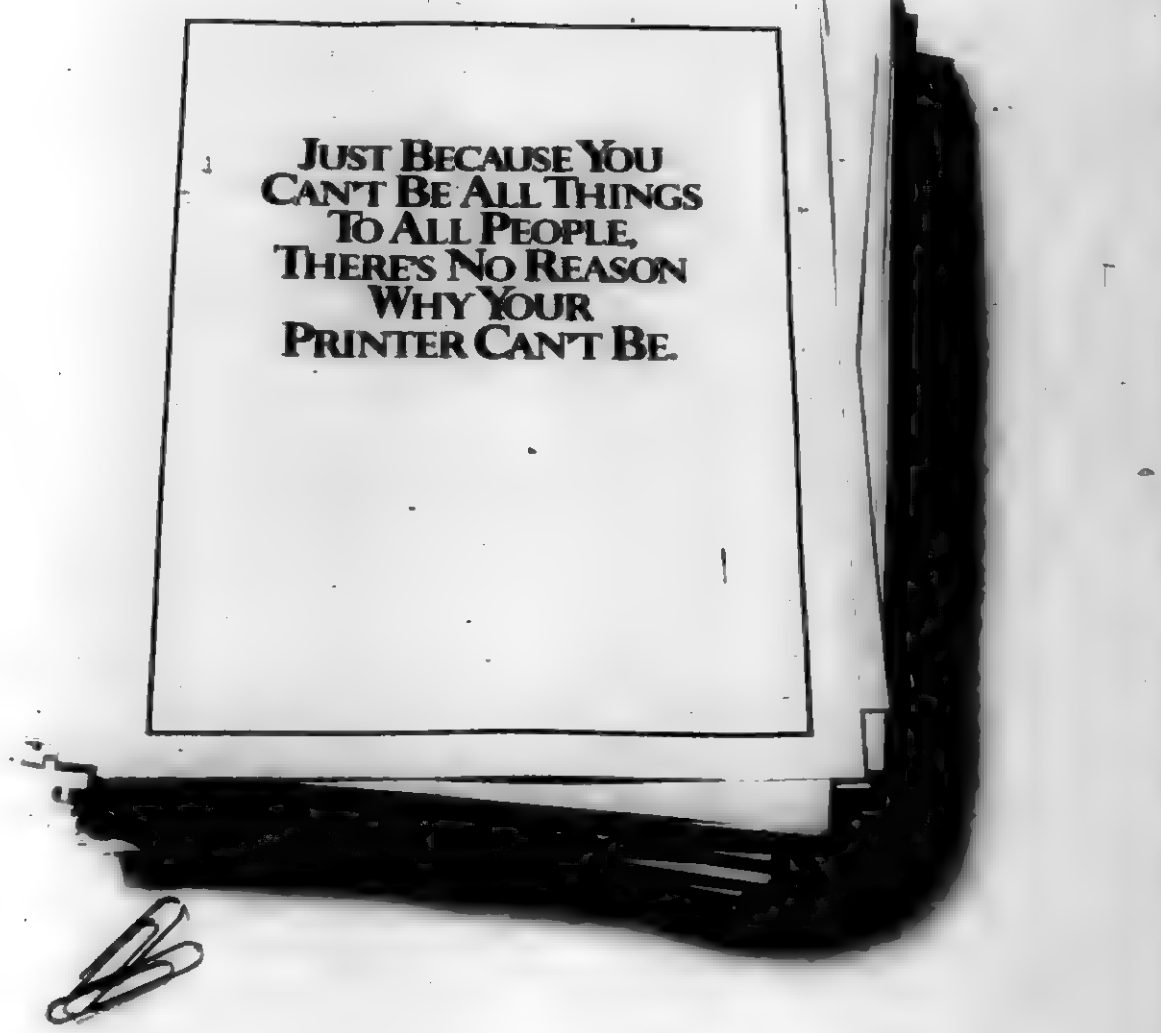
WHAT IS MOST impressive about Quattro Pro for Windows is its notebook metaphor. Picture your full year's worth of expense reports in a single 3-D volume with individual pages for each week.



(Coming August 31, a new idea in network printers from Compaq.)

COMPAQ

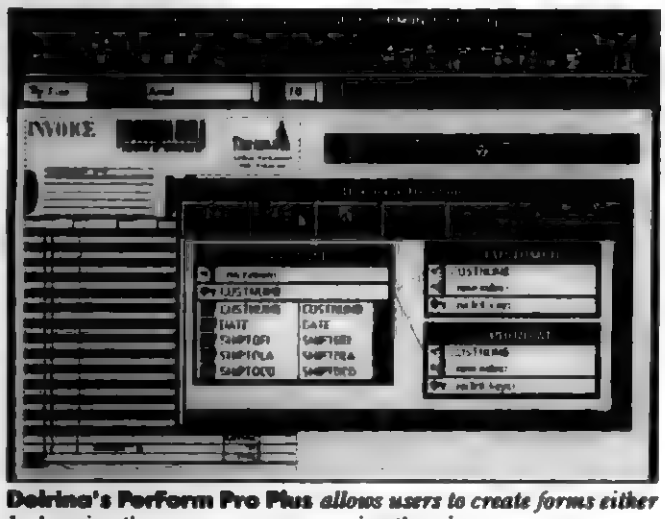
Delrina readies PerForm Pro Plus

BY CHRISTOPHER LINDQUIST
CW STAFF

Toronto-based Delrina Technology, Inc. has taken a slightly different tack on building personal computer-based applications.

Companies such as Microsoft Corp. and Borland International, Inc. created development tools by attaching a form designer to a development environment with Visual Basic and ObjectVision, respectively. Delrina has come at it from the other direction. It has added a development language and other tools to its forms-creation package.

The result is PerForm Pro Plus, a forms-based tool that works on several levels to automate form procedures. At the first level, PerForm Pro Plus allows users to create forms either by drawing them on-screen or scanning them in.



Delrina's PerForm Pro Plus *allows users to create forms either by drawing them on-screen or scanning them in*

The forms can then be printed as needed, which saves paper and form production costs. Secondly, these forms can be given "intelligence" that allows them to be filled in on-screen and perform such functions as calculations and data validation. The filled-in form is then printed.

Beyond this, the forms can be attached to various databases, such as Borland's Paradox or dBase, and used to automatically retrieve and update information. Finally, the forms can be attached to communications media such as electronic mail or integrated into other applications via Delrina's Intelligent Form Language to create dispersed, large-scale applications.

"The product looks quite stunning," said beta-test user Zul Zaver, an information analyst for the city of Calgary, Alberta. "It's a vast improvement over the old version."

In particular, Zaver said he was impressed with the enhanced user interface, which now offers button bars, and its increased support for external databases. "I think we'll be able to build far more sophisticated applications than before," he said.

PerForm Pro Plus will be available this month for a list price of $399. The PerForm Communicator E-mail communications module and a server-based SQL product is scheduled to ship later this year.

3M to ship 'floptical' disks

CONTINUED FROM PAGE 53

Mountain View, Calif.-based Disk/Trend, Inc., disagreed.

"I expect there is a really good chance a market will develop for these," he said. "It works, it's reliable, and for a lot of folks, it's very handy to have on the computer, and it just might take off."

Performance at a premium

One beta-test user said the product is ideal for him so far, despite its expense.

"We use it tremendously," said John Stewart, host of "Radio Computer Magazine," a syndicated radio show.

The show runs for 30 minutes, and one minute of sound can consume 6M bytes of storage space, which far outstrips the capacity of a conventional floppy disk.

Floptical technology is similar to the Bernoulli removable storage disks from Iomega Corp., but flopticals are smaller and cost less.

3M estimated that 10,000 floptical disks are now installed and that the base will rise to support a $750 million business by 1995. The drives are made by Insite Peripherals, Inc., which has licensed its technology to a number of vendors.

3M said larger personal computer programs such as OS/2 and Microsoft Corp.'s Windows 3.1, which consume many floppy disks, could be held on one disk now.

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IN BRIEF

Tandy ships 3800 HD

■ **Tandy Corp.** released the 3800 HD notebook, which uses the **Cyrix Corp.** CX486SLC chip. The notebook, which actually measures 12.2 by 10 in., comes with 2M bytes of random-access memory and a 60M-byte hard drive, weighs 6 pounds, and has a battery life of two hours. Its list price is $1,999; the company will distribute it in Radio Shack stores.

■ **Texas Instruments, Inc.** recently cut prices $300 to $800 across its entire line of TravelMate 3000 and 3000 WinSX products. A TravelMate 3000 with a 60M-byte hard drive now sells for $2,499, down from $2,799; TI's most expensive 386SX-based notebook, with a 120M-byte drive, is $3,199, down from $3,999. TI also dropped prices between $50 and $550 on its MicroLaser printers.

■ **SuperScript, Inc.** announced that **Kurta Corp.** will collaborate with it on a pen-based desktop personal computer. Kurta makes cordless pen input devices; SuperScript makes pen peripherals.

Biles releases new version of AIM-Supervisor

Eases information sharing

BY MELINDA-CAROL BALLOU
CW STAFF

HOUSTON — Biles & Associates has released a version of its AIM-Supervisor process manufacturing software that was designed to allow users to share information across applications and platforms more easily.

The new version supports both Wonderware Corp.'s NetDDE and Digital Equipment Corp.'s At a Glance software on top of DEC's Application Control Architecture (ACA).

Irvine, Calif.-based Wonderware's NetDDE extends Microsoft Corp.'s Dynamic Data Exchange (DDE), which allows Windows applications to exchange data as if they were on the same computer. NetDDE lets users access information across disparate platforms and networking protocols that support DDE, Biles officials said.

Data automation

Using the NetDDE interface, for instance, engineers can set up a system to bring real-time process data from the factory floor into a Microsoft Windows-based spreadsheet automatically. Biles' AIM-Supervisor, which runs on VMS, collects the data and forwards it to the spreadsheet application. The communications to the personal computer are taken care of by NetDDE.

"A process or manufacturing engineer can dynamically update a spreadsheet with real-time and historical information, and once that information is in his database, he can manipulate it and do new calculations," said John Hook, national sales manager at Biles. "People have done this in the past but it hasn't been automatic — they've had to key it all in or do flat-file transfers. Now engineers can get the data automatically without having to know anything about the system and get on with the work that they know best."

With At a Glance, users can bring data from AIM to users on a range of platforms regardless of DDE support. At a Glance, which runs on top of DEC's ACA Services, lets users integrate PCs or workstations running VMS, Unix or MS-DOS.

The two iterations of AIM offer varying advantages: The NetDDE interface offers AIM users easy access with their data to any of more than 1,100 DDE applications. The At a Glance interface requires a client/server implementation using ACA Services.

This means that users must write an ACA programming script for each client, but they can integrate data over operating systems that are not DDE-compliant, Biles officials said.

Support for the interfaces is shipping now in a prerelease version, and each is priced at $5,000. ACA Services and At a Glance must be purchased separately from DEC, but NetDDE is included. The AIM manufacturing system runs on VMS and Open VMS, and pricing starts at $16,000.

NEW PRODUCTS

Software application packages

Comshare, Inc. has released Commander Version 3.0, an executive management support system.

Commander 3.0 has a personal computer-based graphical user interface. The Desktop Builder incorporated into Commander 3.0 is an application builder that includes a new scripting language and graphical script generator, according to the company.

Additional features include remote application management, information and application security and change control.

Commander 3.0 costs $1,500 for a single copy. Volume discounts are available.

Comshare
3001 S. State St.
Ann Arbor, Mich. 48106
(313) 995-0398

Peripherals

The Information Systems Division of Mitsubishi Electronics America, Inc. has introduced Diamond Pro 17, a color monitor for personal computers, Apple Computer, Inc. Macintoshes and Unix-based systems.

The product was also designed for users who want a desktop monitor for Microsoft Corp.'s Windows and Open Look environments. Itacan be used for computer-aided design, manufacturing and engineering and for Unix users who are upgrading from monochrome monitors, according to the company.

Diamond Pro 17 can work with the Diamond Match Color Calibration System, which matches on-screen images with hard copy colors.

Diamond Pro 17 costs $1,599.

Mitsubishi Electronics America
Information Systems Division
5665 Plaza Drive
Cypress, Calif. 90630
(714) 220-2500

Kansai Electric USA has started shipping the serial version of its Kwik-Stor series of user-expandable printer and plotter buffers.

With standard Apple Computer, Inc. Macintosh or IBM single in-line memory modules, the buffers can be expanded to a maximum of 8M bytes, the company reported. The baud rate can be set to allow the product to receive data from the serial port of the CPU.

Kwik-Stor can then transmit data to the printer. Support for both hardware and X-On/X-Off handshaking is provided.

Serial prices range from $229 to $1,029.

Kansai Electric
Suite 220
2005 Hamilton Ave.
San Jose, Calif. 95125
(408) 377-7062

SIIG, Inc. has introduced Video Grabber Plus, a multimedia add-on board for AT computers.

Video Grabber Plus features video capture and live audio and video display. Images can be frozen and saved in an assortment of file formats ranging from 24-bit true color to 8 bits per pixel. The product is a video-card enhancement tool that has 21-bit color display support for 2 million colors simultaneously and color keying of 256 colors.

Video Grabber Plus plugs into a standard 16-bit XT/AT expansion bus parallel to the Video Graphics Array (VGA) card. It connects to the VGA card via its feature connector, the company reported.

Video Grabber Plus costs $495.

SIIG
6078 Stewart Ave.
Fremont, Calif. 94538
(510) 657-8688

PC Guardian has announced NoteGuardian, a hardware product designed to prevent theft of portable computers.

According to the company, NoteGuardian includes a custom design anchor with a built-in lock and a five-foot security cable. For portability, the cable folds into a compact carrying bag. The cable anchor is installed using existing features on the notebook.

PC Guardian costs $49.95.

PC Guardian
118 Alto St.
San Rafael, Calif. 94901
(415) 459-0190

Fax

Brooktrout Technology, Inc. has introduced the TR114, a universal port card that fits into an XT/AT-compatible bus slot.

The TR114 has a dedicated CPU and a digital signal processor on each channel for advanced fax and voice handling and format and compression conversion.

According to the company, the TR114 expands to include eight channels in a single XT/AT-compatible bus slot by using an optional four-channel daughtercard. The four-channel card includes four loop-start telephone interfaces.

TR114 supports Group 3 and 4 fax compression with automatic conversion of ASCII, Tag Image File Format and other files, which allows for binary transfer and eliminates the need for external data modems.

The TR114 costs $2,995.

Brooktrout Technology
144 Gould St.
Needham, Mass. 02192
(617) 449-4100

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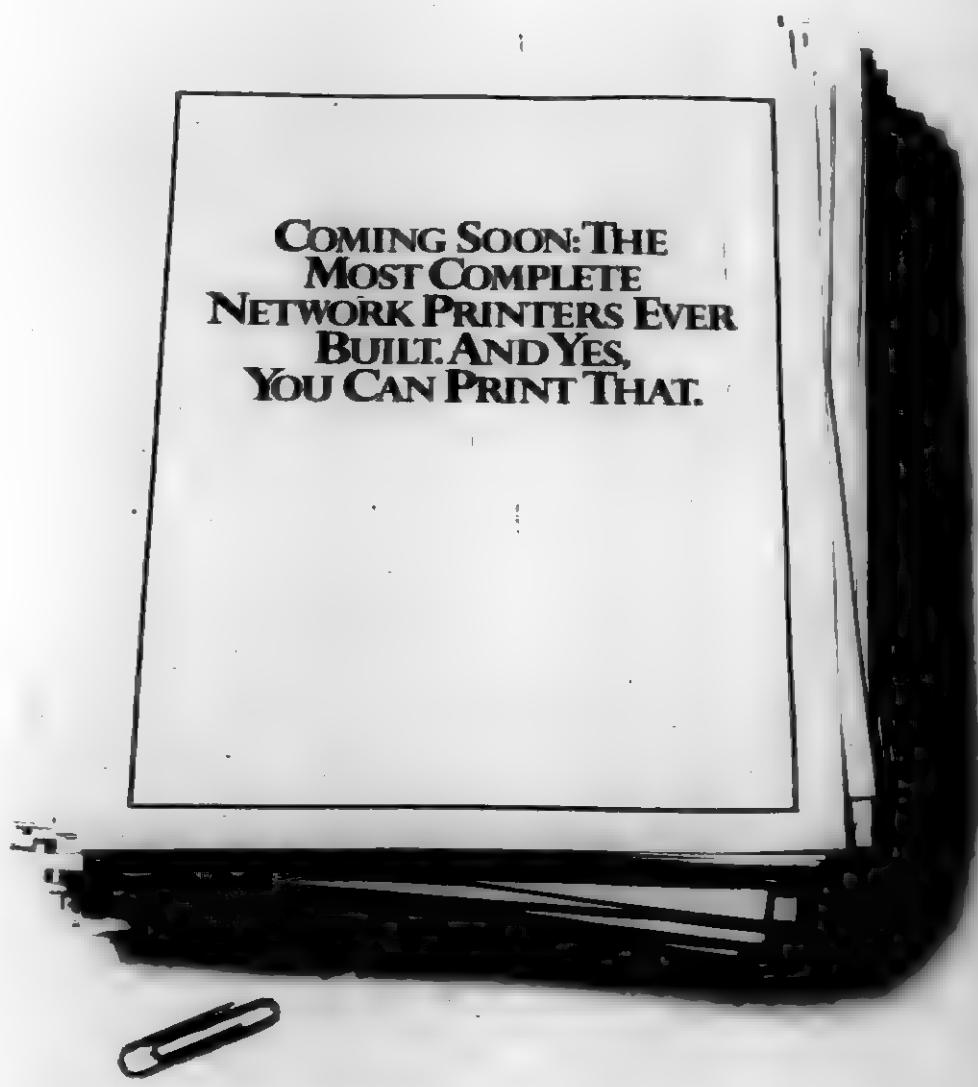

(Coming August 31, a new idea in network printers from Compaq.)

COMPAQ

Norton Desktop for Windows: Great value

Technology Analysis — A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

The second incarnation of Symantec Corp.'s Norton Desktop for Windows is greatly improved, reviewers said. The product provides a smoothly integrated file management shell for Microsoft Corp.'s Windows environment, and Version 2.0 is much faster than the previous release.

Ease of use: The Desktop space is usually very crowded, which can intimidate novice users; aside from that minor complaint, reviewers said, the product is very intuitive.

Speed: Speed was the Achilles' heel of the first Norton Desktop, but the new version is considerably faster. The install program allows users to pick and choose their configuration to save disk space if needed.

File management: A customizable button bar gives instant access to common file operations. Reviewers said file management on the Desktop is icon-driven and very intuitive.

Utilities: Norton Desktop includes full-function versions of Norton Anti-Virus and Norton Backup. It also has a solid text-editing module.

Overall value: At $149, Norton Desktop is an excellent value. It simplifies Windows file management and provides a good set of utilities as well.

Symantec's Norton Desktop for Windows 2.0

Reviews	Ease of use	Speed	File management	Utilities	Documentation	Overall value
PC World 9/92	Can be	[illegible]	[illegible]	[illegible]	Competent,	Good value, not
Infoworld 5/11/92	Not intimidating	Load time much quicker	Outshines Windows 3.1	Rich	Presented clearly	Excellent
PC [illegible] 8/18/92	NC	Dramatically faster	Improved file [illegible]	Editor's very [illegible]	NC	More robust [illegible]
PC Week 4/6/92	Easy to configure	NC	Drag and drop	Includes Norton Anti-Virus	NC	More complete and useful
PC Computing 5/92	NC	Improved	Great	Automatic uninstall	NC	Eliminates minor problems
Users						
Robert Cameron, A large accounting firm	Very good	Very good	Very good	Very good	Very good	Makes Windows much easier
Tom Miller, Tandem Computers, Inc.	Good	Good	Very good	Very good	Very good	Customizable interface
Brian Rodeck, Rodeck Computer Services	Good	Good	Very good	Very good	Good	Good added features
Analyst						
Mike Dolan, Corporate Computers	Good	Good	Good	Good	Very good	More for novices than power users

Key: Very good Good Fair Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Symantec reported profits of $7.7 million on revenue of $62 million for the quarter ended March 31. Profits for the same quarter in 1991 were $5.7 million on revenue of $41.5 million. Analyst Peter Rogers at Robertson, Stephens & Co. rated the firm's short-term performance and long-term stability as very good.

Symantec responds

Bill Whipple, product leader of technical support:

Ease of use: For the most part, it's fairly easy to remove icons from the desktop. You can also have it automatically snap everything onto a grid.

File management: Norton Desktop for DOS has compression technology. Under Windows, we haven't really received that much demand for it, but it's something we may address in the future.

NewWave 4.0: Powerful but slow

Hewlett-Packard's NewWave 4.0

Reviews	Ease of use	Speed	File management	Utilities	Documentation	Overall value
PC World 9/92	Puzzling [illegible]	Sluggish	Different but workable	Crude text editor	A jumble	Complicates things
Infoworld 5/11/92	Customizable	A bit slow	No DOS file management	Finder locates objects	Well-organized	A tad steep for individuals
PC Magazine 8/12/92	Steep conceptualization curve	Less taxing hardware requirements	Files appear as objects	Impressive automation tools	NC	Requires profound change
Computer Shopper 6/92	Anything but intuitive	NC	Icon-oriented	Agent facility provides scheduling	NC	Clearly defined benefits
PC User 7/92	Overly complex	NC	Drag and drop	Editable macro language	NC	Seven out of 10
Users						
Peter Haynes, U.S. Fidelity and Guarantee Corp.	Good	Good	Good	Very good	Fair	Effective menuing
Joe Geiser, Insurance Data Processing, Inc.	Very good	Good	Very good	Very good	Good	Impressive
John Dolstor, Los Angeles Municipal Court	Very good	Very good	Good	Good	Fair	Shelter from DOS file management
Analyst						
Karen Offerman, DataPro Information Services Group	Good	Fair	Very good	Very good	Good	Good front end for office systems

Key: Very good Good Fair Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

HP reported revenue of approximately $4 billion for the quarter just ended, an increase of 14.6% over the comparable quarter in 1991. Profits were flat at $.76 per share. According to William Milton Jr., an analyst at Brown Brothers Harriman, the company faces continued pressure on margins due to severe price competition.

Hewlett-Packard responds

Kevin Schofield, product marketing manager:

Ease of use: If you are strong technically with DOS, there is a certain amount of unlearning to do. Novice users who don't have those preconceptions may find it easier to pick up. But we know that many users are going to be technically savvy, and we continue to make it easier for them. We've made big strides in Version 4.0.

With Release 4.0, Hewlett-Packard Co. has repositioned NewWave as an object-oriented shell for Microsoft Corp.'s Windows environment. Reviewers found the new version to be very powerful and said learning NewWave's innovative interface requires a lot of time and effort.

Ease of use: NewWave shelters the user almost completely from standard Windows operations. Icons on the desktop represent tools or objects, rather than applications. Reviewers said the learning curve for this unique shell is very steep.

Speed: NewWave is fairly slow and resource-intensive, requiring about 8M bytes of hard disk space.

File management: Reviewers lauded the drag-and-drop file management capabilities.

Utilities: NewWave's utilities include a convenient finder for locating files and the Agent language for scheduling and automation of NewWave functions. The program does not provide utilities such as backup.

Overall value: The benefits of NewWave ($149) are smooth, visual file management, document management for groups and automation of system functions. Experienced users can benefit from the complex Agent macro language, and networked users will gain from the document management features.

Interface, flexibility sell user on Beyond Mail for Windows

BY ROSEMARY HAMILTON
CW STAFF

OVERLAND PARK, Kan. — North American Salt Co. recently picked Beyond, Inc.'s Beyond Mail for Windows as its corporate electronic-mail package, and it will soon begin installing it across its enterprise.

The firm selected Beyond Mail, which is far from a mainstream product today, because its messaging functions were comparable to the top sellers, such as Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail, said Michael Borbely, manager of networking and microcomputing at North American Salt. But, more importantly, it has a superior user interface and allows users to create customized workgroup applications, Borbely said.

Beyond began shipment of its Windows package earlier this month. In addition to basic E-mail features, the software allows users to include applications on the Beyond Mail platform that use its rules and forms technology. Users can also create work-flow and routing applications that include automatic-mail functions.

North American Salt is a privately held company that owns several salt and chemical businesses. It had revenue of about $600 million last year, Borbely said. Approximately 3,000 people work for the various North American Salt businesses.

"We came into this [E-mail selection] project with some very short and simple, but important, needs," Borbely said. "Beyond Mail provides the basics, and then there is a rules-based engine that walks over the rest of them," he said, referring to competitors' offerings.

North American Salt is working on some test applications that Borbely said will allow his group to write applications that boost the work-flow process, which they could not do with other E-mail packages.

Future applications

Borbely's group plans to write a Beyond Mail application that will automate the financial reporting process, which currently calls for plant managers to submit Lotus 1-2-3 spreadsheets each quarter. The Beyond Mail application is intended to automate the spreadsheet routing and consolidation process. It will also include triggers that will alert plant managers to send their spreadsheet data via Beyond Mail to headquarters. A Beyond Mail application will compile the data, and the tool will then automatically route a summary report to managers.

For now, however, the focus is to provide E-mail training to users, many of whom have not used E-mail before, Borbely said. "We will start at the executive level and then let it rain down through the ranks," he added. "We are sizing up our needs now to take it enterprisewide. Our initial implementation will be for no more than 1,000 users," he said.

Navy uses ESP to cut costs

New personnel system may become model for other federal agencies

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — The federal government gets plenty of criticism for botched system development projects, but occasionally Uncle Sam hits a home run. A personnel system developed in-house by the U.S. Navy appears to be such a winner.

The Electronic System for Personnel (ESP) substitutes electrons for the 55 tons of paper that were previously used to find, hire, transfer and promote civilian Navy employees. In addition to cutting costs and boosting productivity, ESP has fundamentally improved the relationship between the Navy's Human Resource Office here and the users it serves.

Marchesani: *'We act more as advisers'*

By the end of the year, ESP clones will be installed at four other Navy sites, which will bring the total number of users to 40,000.

The U.S. Department of Defense intends to use ESP as the foundation for a departmentwide system in its corporate information management program. In addition, several civilian agencies are eyeing the system for their own use (see story page 64).

ESP automates basic personnel management paper flows — requests for personnel actions, position descriptions, job applications and approval forms.

Images of these forms move from a variety of Navy offices through dial-up connections to a local-area network at the Human Resource Office.

A classification module enables managers in the field to electronically select or cut and paste position descriptions from a central library of 150 standard Navy job descriptions. The system prompts the user for information and responds with guidelines to help the manager select the proper job series and pay grade.

Users can then transmit the description to the personnel office with an electronic rendering of a personnel action request form. If the requested action is to fill an open position, the office can return to the user a list of qualified applicants selected from the Navy's master personnel database in Oak Ridge, Tenn.

ESP also allows managers to track the status of their requests as they move through the bureaucracy and provides reports containing various statistics related to personnel actions.

The original objectives for the system were the classic ones: to reduce manual effort, eliminate errors, speed processing and trim costs. But ESP has produced an important side benefit, according to Michael F. Marchesani, director of the Human Resource Office.

"Now managers don't call us with questions like, 'Where is my request to hire a secretary?' They can dial in and find that out for themselves," he explained.

Continued on page 64

ON SITE

U.S. Navy
Human Resource Office
Arlington, Va.

- **Challenge:** To automate 35-year-old manual processes that generate 55 tons of paper annually.
- **Approach:** Applications written in-house using FoxPro software from Fox Software move electronic forms over a Novell LAN linking 200 PCs. Smart cards for authentication will eliminate requirements for signatures on paper.
- **Results:** $500,000 investment has had one-year payback in labor savings, allowed office to cut clerical staff by 12 people and staff to evolve "from paper pushers to human resource analysts and consultants."

People have always b
together. Unfo
computing envir

The good news, however, is there's a solution. Lotus Notes® software. A breakthrough technology that's helping organizations overcome the technological roadblocks found in most mixed computing environments, which often stop good ideas from ever going anywhere.

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What's more, Notes is an extremely flexible environment that makes the development and deployment of all kinds of custom applications a relatively quick and easy process. Some typical applications include lead tracking, product planning, brainstorming, account management, reference libraries, call reporting, quality management and more. There are small and large companies, in fact, that have bought Notes to solve a specific problem, only to discover that it answered other needs as well.

How People Are Using Lotus Notes

Strategic Planning	*Project Management*
Sales Management	*Sales Presentations*
Industry Newswire	*Policy Handbook*
Customer Service Tracking	*Electronic Mail*
Forms Routing	*Financial Profiles*
Quality Management	*Telemarketing*
Contract Library	*Technical Support*
Correspondence Tracking	*Job Postings*
User Group Discussions	*Credit and Collections*

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Lotus Notes is an innovative workgroup computing environment designed to increase

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in Windows™ and OS/2®. Just as we've done with our 1-2-3® spreadsheet, we'll soon have Notes running on all major platforms, including Macintosh® and UNIX®. Again the objective is to provide users with a seamless way of working together whether they're in the office or on the road. No matter what platform they use.

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IN BRIEF

Faximum, HP unite

■ **Hewlett-Packard Co.** and **Faximum Software, Inc.**, will develop client/server fax software for Unix workstations, the two companies recently announced.

HP will provide client/server expertise and human-factors engineering, while Faximum will concentrate on building fax software in a server environment.

The two plan to build a Transmission Control Protocol/Internet Protocol network that runs under the Open Software Foundation's Motif and will support both PostScript and PCL printer languages.

■ **Lotus Development Corp.** recently snagged more CC:Mail business. It announced that **JWP Information Services, Sears Business Centers** and **Corporate Software, Inc.** will standardize on its electronic-mail platform. The three together licensed 3,000 CC:Mail nodes.

■ **CE Software Holdings, Inc.**, which makes QuickMail, an electronic-mail package for the Apple Computer, Inc. Macintosh, said it will bundle On Technology, Inc.'s Meeting Maker group scheduler with QuickMail.

CW singing conversion blues

Switch to Unix-based publishing system gives staff rude awakening

BY MARYFRAN JOHNSON
CW STAFF

Fourth in a series of reports on Computerworld's *own migration to a Unix-based client/server system.*

"All stressed up and no one to choke."

That slogan has been appearing on T-shirts in novelty stores this year, and *Computerworld* could probably use a case of them about now.

Overshadowing the normal stress of news deadline pressures are a host of troubles with our own $850,000 "rightsizing" project, which is taking the publication from a proprietary to a Unix-based publishing system that runs on IBM hardware.

Staff members involved in the conversion effort have been struggling with overdue hardware shipments, inexplicable software bugs, networking snafus, troubles with backup printing facilities and, most recently, escalating pressure from top management.

"I don't think we knew what would be involved with this," said Bill Laberis, editor in chief of *Computerworld*. "No one tells you."

Fuel to the fire

Further complicating matters are some upcoming special projects that cannot be accomplished if Atex, Inc.'s new Workgroup Publishing System software is not up and running smoothly by mid-October.

"We are under an extremely tight, extremely aggressive ramp-up schedule," said Catherine Gagnon, chief copy editor and a primary candidate for one of those T-shirts.

The appearance two weeks ago of a mysterious system-crashing bug was all the more maddening for the information systems department and the eight-member copydesk. The

CW's Gagnon: *'We're under an extremely tight schedule'*

bug freezes the screen and forces a reboot of the system, losing any changes not stored and saved. No one has been able to determine if the problem is the fault of the Atex application or Microsoft Corp.'s Windows 3.1 graphical user interface.

"Atex said this would be a stable product," Laberis said. "But when you talk to users, they don't think it's stable. They're finding it extremely buggy."

The ultimate gain from all this pain, however, should be faster, more flexible production of the newspaper, Laberis noted. *Computerworld* currently runs a proprietary version of the Atex publishing system on aging PDP-11 minicomputers from Digital Equipment Corp.

The client/server system will be anchored by two IBM RISC System/6000 servers that will work in concert to run the Atex publishing software and to provide mirrored backup and redundancy.

Hanging off the RS/6000 servers will be a network of 50 IBM Personal System/2s and personal computer clones on writers' and copy editors' desks.

As one of the first sites to install Atex's new Unix-based system, *Computerworld* has demanded and received a high level of attention from the vendor. Complaints about support last spring led to the assignment of a full-time Atex employee for the project.

Under the initial plan — which looks wistfully optimistic now that everything is months behind schedule — the *Computerworld* copydesk was to be 100% converted to the new publishing system this month.

Last week, the copydesk hit the 10-page production mark, and the goal is to roll out a half-dozen more pages each week through October. By January, all of the writers and editors should have joined the copydesk on the new system.

The first RS/6000 has been installed, and the second is due in early September. Any shipping delay for the RS/6000 could have serious consequences for that mid-October deadline. "Almost everything from IBM has been two to four weeks late," said Linda Nelson, *Computerworld*'s IS director.

Another obstacle is the office politics version of "Too many cooks spoil the broth."

"We are completely re-engineering *how* we produce our pages, and that introduces the possibility that politics can get involved," Nelson said. She recently began distributing a detailed report on the project each Friday afternoon to a host of managers from both the production and editorial sides of the company and to key vendors.

What about backup?

Another pragmatic concern is backup — in this case, a software problem at the backup facility for Perry Printing Corp. in Waterloo, Wis., the printer where *Computerworld* ships its pages for final printing and distribution.

A few weeks ago, the image-setting machine at Perry went on the fritz, and a handful of pages being produced under the new system had to be duplicated on the old system.

The problem was resolved by arranging for additional backup image-setting facilities at two other printing companies in Madison, Wis.

Computerworld is also coping with staff shortages. The systems department recently lost its No. 2 person, and the copydesk has been searching for another editor familiar with Atex software. Out of 300 resumes received, only one listed Atex experience.

Saber Menu System debuts

Saber Software, Inc., a Dallas-based maker of local-area network menu and administration utilities, is shipping Version 2.0 of its Saber Menu System for Microsoft Corp. Windows.

The new icon-based version runs under Windows 3.0 and 3.1 and was designed to simplify LAN/Windows management and administration. It boasts an Iniman utility, which gives LAN administrators networkwide control and automatic management of users' .INI files.

For the user, Saber Menu System 2.0 provides a point-and-click iconic front end with customizable screen views, personalized menus, security, screen blanking and network messaging. Saber Menu System is available in 1-, 10-, 25-, 100- and 250-user versions.

Navy uses ESP

CONTINUED FROM PAGE 61

"Now we act more as advisers, as counselors. We're playing the role of human resource specialists, not paper pushers."

After two false starts plagued by poor contractor performance, the Human Resource Office decided to do the job itself. The result was a $500,000 system coded in FoxPro from Fox Software, Inc. in Perrysburg, Ohio. It runs on a Novell, Inc. LAN that links 200 IBM-compatible personal computers to a server and supports 1.2G bytes of data storage.

The Navy is testing "smart cards" — wallet-size cards with embedded microprocessors — for electronically signing documents and authenticating the signatures of thousands of Navy managers outside the personnel office.

Strong impression

The U.S. Navy's Human Resource Office at Crystal City in Arlington, Va., has demonstrated ESP to 42 defense and civilian agencies of the federal government, and a number of them seem inclined to implement the system. Having been generated by a government agency, the software is free.

The U.S. Department of Agriculture, which administers personnel systems for 460,000 employees at several agencies, said it is likely to add ESP to its automated operations as a sort of front end or user interface.

"What's attractive is that ESP begins with the manager, not the personnel office," said Brad Foote, acting director of the automated personnel division. He said most government personnel systems require managers to fill out paper forms and send them to a human resource office for data entry.

"The council has reviewed the ESP and we're impresaed with it," said Philip Schneider, a member of the interagency Personnel Automation Council and assistant director of work force information at the Office of Personnel Management. "We're encouraging agencies to look at ESP as one of several options that are quite good and fairly easy to adopt."

"Its orientation is toward line management," Schneider added. "It helps cement an operating relationship between management and the personnel office."

LAN-to-host product ships

Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., said it is adding support for TN 3270 over Novell, Inc.'s NetWare for IBM's Systems Application Architecture (SAA) and Transmission Control Protocol/Internet Protocol (TCP/IP) to its micro-to-mainframe connectivity products.

TN 3270 is industry-standard terminal emulation software that allows users to access IBM hosts without going through an IBM server. The new support will allow users of DCA's Irma Workstation for DOS, Irma Workstation for Windows and Irma Workstation for Macintosh to access mainframes through non-DCA gateway products, such as NetWare for SAA or a TCP/IP internetwork link.

According to DCA, NetWare for SAA support will be included in its Irma Workstations for Windows, DOS and Macintosh near year's end. TN 3270 support will be included in the DOS and Windows Workstation products by the end of next year.

MICHELLE DOSTERT

PCs and voice recognition help co-op sell artwork

BY CAROL HILDEBRAND
CW STAFF

Mixing computers and art has always raised some eyebrows, with many artists turning a thumbs-down on computer-generated works of art.

But nobody can argue with the idea of creating a network to help art dealers better *sell* art created by humans.

Joe Sigel, the founder and chief executive officer of the Art Research and Trading Cooperative (Art Co-op) in Santa Fe, N.M., has harnessed together four personal computers, voice recognition software and fax and modem boards to create an on-line clearinghouse that lets dealers buy and sell limited-edition serigraphs and the like without spending a day on the phone.

"What's most unique is that we have been able to merge database technology with voice response and fax technology," Sigel said.

Hybrid system

The system runs on networked 386- and 486-based PCs. Two 24-port PCs run the voice response system, which encompasses Ease call-processing software from Expert Systems in Atlanta and voice boards from Dialogic Corp. in Parsippany, N.J. The third machine houses the fax engine, which is also from Dialogic, while the fourth PC contains the database itself, which is FoxPro, Inc.'s product. Sigel said the setup is a mixture of DOS and Unix because the fax boards are Unix-based.

Sigel, who deals in the secondary art market, said he first came up with the idea for the system as a reaction to the time-consuming phone calls he had to make looking for a specific work of art. As the phone calls rippled outward, the price of a work of art also tended to go up, as one dealer after another tacked on a commission once the work was found.

With Art Co-op, a dealer dials into the system and punches in a personal identification number and a member number. Each work of art in the database — currently about 16,000 titles — has its own identifying number. Using the phone and voice response technology, the caller can search for a specific work of art by title and author. A caller can check the latest trading price of a piece as well as receive a list of all the available titles by that artist. If a dealer decides he wants to buy a piece, it is as simple as pressing "1" on the telephone, Sigel said.

"Once somebody buys, the dealer sends the artwork to us within 48 hours. We inspect it and send it on out," he said.

Art Co-op acts as a clearinghouse for the deal. It faxes the invoice and purchase order to the respective parties and certifies the work and the funds.

The co-op deals in limited-edition prints, serigraphs, photographs and cast sculptures and collects a 10% commission for its pains.

However, Sigel pointed out that with purchasing and selling concentrated in one clearinghouse, the possibility for multiple commissions is nil. The dealer also saves time by working with one entity rather than creating a daisy chain of dealer inquiries.

Running since late last month, the co-op currently has about 1,000 U.S. art gallery dealers and 400 Japanese partners. Membership is free — the company makes its money on commission. Sigel said the network is not totally up to speed. "We're still inputting inventory," he said, adding that it should be complete in about three to four months.

Sigel said he originally planned the network to be computer accessible, "but I found that many gallery owners don't use computers. This allows the user an easier way of accessing the database," he said. He added that he is looking to add in PC access capability as the network matures.

Art Co-op's *PC-based network helps dealers sell artwork such as 'Jelly Bean Seeds,' pictured here*

Check out the Marketplace Pages on Page 104.

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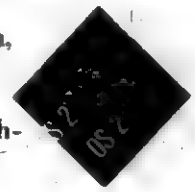

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IBM

NEW PRODUCTS

Electronic mail

Retix has announced OpenServer 400 for Unix Version 1.4, a product that provides coexistence between Open Systems Interconnect (OSI)- and Transmission Control Protocol/Internet Protocol (TCP/IP)-based networks.

According to the company, Version 1.4 provides users with the ability to achieve enterprisewide messaging, without altering their software and systems environment. The product was designed to make use of the multitasking Unix operating system and offers simultaneous use of OSI and TCP/IP stacks on the same local-area network adapter.

Prices start at $5,950.

Retix
2401 Colorado Ave.
Santa Monica, Calif. 90404
(310) 828-3400

LAN software

PrimeService has announced Connection NetWare for Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC).

According to the company, it enables Novell, Inc. NetWare users to access SPARC files and share data, print services and applications with SPARC-based workstations. Seamless integration lets user hardware and software applications and configurations remain unchanged when accessing the product. Connection NetWare for SPARC has security that is equal to or better than the native operating system, and it includes administration tools and utilities that are the same as the Novell NetWare personal computer line.

Connection NetWare for SPARC costs $5,795.

PrimeService
500 Old Connecticut Path
Framingham, Mass. 01701
(508) 620-2800

Spreadsheet Solutions Corp. has announced DigiTerm, a shrink-wrapped solution that distributes Telerate Digital Page Feed data across a local-area network.

Users of real-time Telerate data can receive information over LANs from personal computers running IBM's OS/2 operating system, the company reported.

Users can view multiple pages of Telerate Digital Page Feed on one screen, and Dynamic Data Exchange can be supported as an option.

Prices are based on the number of users on the network. The Telerate Digital Page Feed controller costs $650 per month, and the Presentation Manager terminals cost $50 to $75 per user per month.

Spreadsheet Solutions
600 Old Country Road
Garden City, N.Y. 11530
(516) 222-1429

Modems

Ven-Tel, Inc. has introduced the 24/2 with Fax, a Micro Channel Architecture V.22 bis modem.

The product, designed for IBM Personal System/2 models, has a send-and-receive fax capability. Support for CCITT V.42 and Microcom Networking Protocol 5 data compression is included, and a Group 3, Class 1 and 2 fax standard provides send and fax capabilities at 9.6K bit/sec., the company reported. The modem is bundled with Quick Link II Fax, a communications and fax software package.

Ven-Tel's internal 24/2 with Fax costs $370.

Ven-Tel
2121 Zanker Road
San Jose, Calif. 95131
(408) 436-7400

Best Data Products, Inc. has introduced the Traveler, a 9.6/4.8K bit/sec. send-and-receive fax and 2,400 bit/sec. data modem.

The Traveler is battery/AC operated and combines V.42 bis and Microcom Networking Protocol in one portable package. The Traveler has a background mode that allows users to continue working in their current program when receiving a fax. Users can view, rotate, print or delete faxes.

The Traveler costs $199.

Best Data Products
9304 Deering Ave.
Chatsworth, Calif. 91311
(818) 773-9600

LAN hardware

Xerox Corp. has announced the 7033 LAN Fax Server.

The 7033 LAN Fax Server allows for integration of the Xerox 7033 fax terminal into the network environment of Novell, Inc. local-area networks. Personal computer users can fax documents from a pop-up window on their screens.

It is not necessary to leave a computer application running under Microsoft Corp. Windows 3.0 or 3.1 or MS-DOS to fax a document. More than 350 fonts are supported using Hewlett-Packard Co.'s Printer Control Language printing format. Within their mailboxes, network users can access a list of faxes and either view, save, print, route, refax or delete each one.

The product costs $7,895.

Xerox
Xerox Square 05B
Rochester, N.Y. 14644
(716) 423-5090

XEROX

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Lynn L. Wells
Document Management Representative

When a major health insurer suddenly doubled its customer base, their MIS department quickly predicted disaster. The company's in-house document publishing system was already overloaded. They had to drastically cut the time it took to produce vital documents or risk the company's reputation for customer service. That's when they called Lynn Wells and the Xerox team.

Working together, they saw that merely upgrading equipment to add capacity was not the solution. So they took a fresh approach and completely redesigned the company's document publishing processes. Carefully building on existing systems, they integrated Xerox workstations, software, scanners and laser printers to create a custom publishing network.

Benefit booklets that once took forty-five days to publish now take less than five, a 900% increase in productivity. MICR-encoded checks and claims explanations are being printed and mailed together, saving $350,000 a year in postage. And forms are now created electronically, on demand, reducing costs by 30%.

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SNMP to manage 3Com cards

BY ELISABETH HORWITT
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. recently became the first major coaxial Ethernet local-area network adapter vendor to support Simple Network Management Protocol (SNMP). 3Com announced LinkWatch, a software package that enables an SNMP-based network management system to collect key information from its coaxial and 10Base-T Ethernet adapters. That information can include network activity, configuration data and error levels, 3Com said.

In addition, an SNMP management system can send commands down to a 3Com adapter to perform tasks such as shutting down an ailing personal computer, the vendor said.

The state of Wisconsin Department of Education has been beta-testing LinkWatch on a Novell, Inc. network of 250 PC nodes. The software has helped the department figure out "which users are experiencing excessive collisions and also who the volume users are," said Larrie Christianson, the department's LAN administrator.

LinkWatch also collects PC configuration information, in-

Continued on page 70

Proprietary LAN managers still prevail

BY ELISABETH HORWITT
CW STAFF

FRAMINGHAM, Mass. — Local-area network management is still extremely fragmented and is based primarily on proprietary systems: Users are focusing on tools designed to manage a particular type of LAN, rather than on centralized, integrated LAN management systems, according to recent research.

This state of affairs is expected to change soon as users begin to coordinate management of disparate LANs across the organization, according to a report by International Data Corp. (IDC), a Framingham, Mass., market research firm. More than half of the 200 network administrators IDC interviewed said they plan to centralize LAN network management responsibilities.

A major force drawing users to more centralized LAN management is the movement of the LAN industry toward Simple Network Management Protocol (SNMP)-based management. Earlier this month, 3Com Corp. became the first major Ethernet adapter company to announce software that enables its adapters to be managed by an SNMP system (see story at left).

Sniffing out support

Another important development in this area is Network General Corp.'s slow but steady progress toward full SNMP support on its Sniffer line of LAN analysis tools [CW, Aug. 17].

In addition, user demand for SNMP-based LAN management tools is growing.

For example, Household International, Inc.'s Financial Network Division recently selected ProTools, Inc.'s Foundation Manager over Sniffer, according to Nancy Craig, a senior business systems analyst at the firm. One of the reasons was that Foundation Manager supported SNMP, while Sniffer's support of the network management standard was weak at best.

The Household division has made SNMP compliance a requirement for its LAN management purchases because it intends to implement a centralized SNMP-based management system "down the road," Craig said.

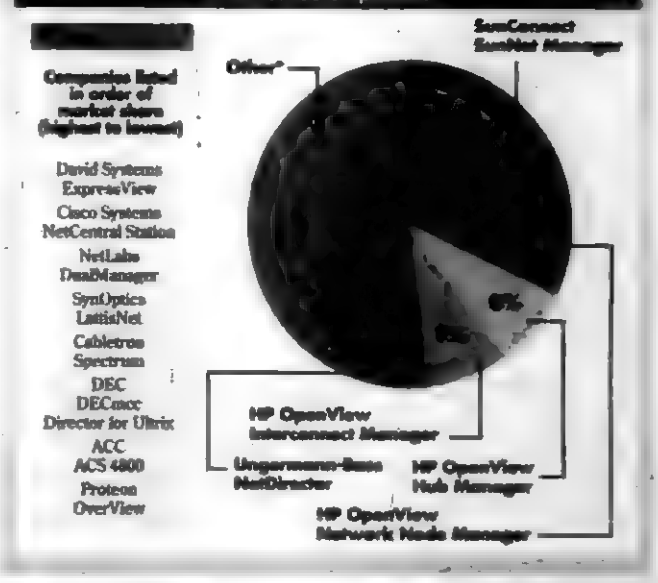
Last year, IDC found that Hewlett-Packard Co. and Sun Microsystems, Inc. were neck and neck in the Unix-based SNMP-based network management systems market in terms of total shipments (see chart).

Close behind them, however, were a number of SNMP-based systems that LAN hub and router vendors sell primarily to manage their own products, according to Ginny Mellinger, an IDC senior analyst who wrote the report. These include David Systems, Inc.'s ExpressView, with 6.4% of the market last year, and Cisco Systems, Inc.'s NetCentral Station, with 6.1%.

Ungermann-Bass, Inc.'s Net-

Home base

The leaders in Unix-based LAN management system installations are still those companies with large installed bases of their own computers



Source: International Data Corp. CW Chart: Stephanie Faucher

Director (8.6% of 1991 market share) and SynOptics Communications, Inc.'s LattisNet (4.3%) are "in a gray area," Mellinger said. The vendors market these products partly as management systems for their own hubs and partly as multivendor network management systems.

Cabletron Systems, Inc.'s Spectrum made a poor showing last year (2.4% market share), partly because it began shipping about halfway through the year and partly because "it costs too much. Not a lot of applications run on it, and it takes a lot of customization," Mellinger said.

Cabletron addressed Spectrum's pricing problem this year with a lower cost, modular version. The vendor has also announced a series of agreements with third-party network management vendors to integrate their applications into Spectrum. The latest of these, announced last week, is Network General.

IRS turns to X.400 as LAN mail package

BY JOANIE M. WEXLER
CW STAFF

ATLANTA — Every now and then it pays to dump products that only fuel continued investment in proprietary networks and augment management headaches.

Such was the case for the Internal Revenue Service when its Southeast region embarked on a plan to connect four disparate electronic-mail systems with one another and the outside world.

Rather than furthering the proliferation of varied local-area mail networks, the organization settled on a strategy to implement standards-based X.400 mail applications across both local- and wide-area networks.

This move allowed the agency to avoid investing in gateways between different local messaging networks, said Stephen Foley, a communications specialist and X.400 project manager.

Gateways translate messaging formats between different vendors' mail products, such as between a LAN system and an X.400-based wide-area backbone. The more systems you have, the more gateways and associated support expertise you need.

Starting over

Instead, the IRS region parted with its under-$50,000 investment in proprietary messaging software and started fresh with a native X.400 Open Systems Interconnect (OSI) application on its LANs from OSIware, Inc. in Burnaby, British Columbia. One OSIware competitor is Los Angeles-based start-up Isocor, which did not exist at the time of the IRS' evaluation. Onetime player Retix, also in Los Angeles, has discontinued marketing its X.400 client software.

While implementing X.400 at the LAN level is rare today, the IRS determined that "we are saving a great deal of money, we have open systems connectivity, and we are conserving staff by not having to build and maintain gateways," said John Davis, chief of the Telecommunications Systems Branch.

He estimated, for example, that the division will avoid having to add six to 12 support staffers across 12 districts by not installing mail gateways.

In the commercial sector, X.400 on the LAN is not yet common because the standard has a "more complex format" that requires more processing power, asserted Brad Friedlander, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass. Some industry observers also cite a perceived lack of functions in X.400 applications com-

Continued on page 70

API madness

The IRS views its enterprisewide messaging system as a "regional correspondence management system" that transports mail messages as well as mail-enabled documents, spreadsheets, database files and executable programs.

Therefore, the fact that the industry is divided on the issue of mail application programming interfaces (API) has communications specialist Stephen Foley worried.

"We're into mail-enabled applications, and my one fear is that we won't get a standard API," he said.

Standard mail APIs — or common hooks sitting on top of mail engines — would allow programmers to develop one set of applications that users could run over any mail engine.

There has been some recent movement toward convergence of some basic functionality between different vendor-backed API specs. The convergence is being spearheaded by the X.400 Application Programming Interface Association.

Basically, however, "groupware is a nightmare. It's tied to E-mail, which is tied to a vendor, which is tied to a proprietary API. Running groupware over four or five different mail systems is driving everyone nuts," Foley said. "I'd like [the different API camps] to agree on one spec. Then I'd like to go to OSIware and have them sell me that API."

JOANIE M. WEXLER

On-line services reach $9.6B

Financial sectors lead in five-year sales totals

BY ELLIS BOOKER
CW STAFF

Real-time systems in the financial sectors helped on-line services grow by 61.1%, to $9.6 billion in revenue between 1987 and 1991, according to a recent report by Simba Information, Inc. in Wilton, Conn.

"Online Services: 1992 Review, Trends and Forecast" found that half the industry's sales came from real-time systems for the financial community; on-line brokerage information services alone accounted for 48% of industry sales.

Consumer-oriented services such as CompuServe and Prodigy, while the fastest growing component of the industry, accounted for only 4% of revenues in 1991.

Clobbered by recession

"The biggest surprise was how bad a year 1991 was," said Simba analyst Chris Ewell, who noted that the recession dampened the use of on-line services for things such as credit checks and stock market updates.

More broadly, however, Ewell said business applications for on-line information networks are mature and may be saturated. "We're seeing growth rates just a bit higher than the rate of inflation" in this market, he said.

The hope for the on-line industry, Ewell continued, is the great and largely untapped consumer market. Simba predicts that on-line consumer services will grow 145%, and sales industrywide will grow 48% to $14.2 billion during the next five years.

But to crack the consumer market, on-line providers will have to improve the presentation of their user interfaces, making them more intuitive and graphical.

A limiting factor, Ewell said, is the network infrastructure, which at present lacks the bandwidth needed to offer images and graphics comparable in quality to that most pervasive of all consumer information media: television.

As on-line industry revenue increases, so does the number of on-line subscribers. The Simba report found that leading on-line services finished 1991 with nearly 5.4 million subscribers, an increase of 18% compared with year-end 1990.

Meanwhile, the number of database providers and databases rose to 2,120 and 4,869, respectively, according to the Simba report.

Cash market

The primary uses of on-line services are in the financial sectors, although there is rapid growth at the consumer level as well

	1990	1991	Percent of '91 market	Change
Brokerage	$4.40B	$4.65B	48%	5.7%
Credit	$1.64B	$1.67B	17%	1.9%
Financial news/Research	$1.44B	$1.58B	16%	9.6%
Legal/Regulatory	$671M	$711M	7%	5.9%
Professional	$581M	$615M	6%	5.8%
End user/Consumer	$239M	$344M	5%	43.9%
Marketing	$22M	$31M	<1%	37.8%
Total	$9.0B	$9.6B		6.7%

Source: Simba Information

CW Chart: Stephanie Faucher

3Com software tools support SNMP

CONTINUED FROM PAGE 69

cluding PC vendor, microprocessor type and cycle rate, operating system type and version, adapter type and configuration, user name, PC name, location and phone number. This information is typically not collected by a manageable hub, 3Com said.

Christianson praised LinkWatch's ability to automatically create a topographical map of the LAN and load configuration information based on each PC's net.config file. Hewlett-Packard Co.'s OpenView, in contrast, requires the network manager to load the information manually, "which is cumbersome and time-consuming," he added.

While SNMP has become a widely used de facto standard for the LAN bridge, router and hub industries, it has made scant inroads at the PC LAN adapter level, according to Brad Baldwin, an industry analyst at Gartner Group, Inc., a Stamford, Conn.-based research firm.

Indeed, while 3Com's SNMP product also supports 10Base-T hub-based LANs, it targets users who run their LANs over coaxial cable and thus cannot take advantage of the network management features — SNMP or otherwise — that most intelligent hubs offer, Baldwin said. Coaxial LANs still make up the majority of LAN installations, with coaxial and hub-based LAN shipments likely to be about 50-50 by year's end, he added.

The first of three

Although Cabletron Systems, Inc. now supports SNMP on its adapters as well as its hubs, 3Com is the first of the three leading Ethernet adapter companies to support SNMP, Baldwin said. The other two leaders are Standard Microsystems Corp. and Eagle Technology Corp.

LinkWatch is likely to appeal to users because the software license, which is valid for one installation and can manage up to 251 nodes, costs only $395.

Another appealing aspect of LinkWatch is the fact that most of the software resides on the adapter driver, so it takes up only about 2K to 6K bytes of memory on a DOS PC, according to 3Com. In contrast, other LAN workstation monitoring packages take 20K to 80K bytes on a DOS PC, 3Com said. Part of the software also resides on a Novell, Inc. NetWare server as a Netware Loadable Module.

LinkWatch, available now, was designed to work with 3Com's EtherLink family of adapters and NetWare 386 servers v3:11 or higher. The software package is said to interact with any network management system that conforms to the SNMP Management Information Base II standard. These include Sun Microsystems, Inc.'s SunNet Manager, 3Com's Isoview and HP's OpenView Network Node Manager.

Remote users get TCP/IP sans LAN

BY JOANIE M. WEXLER
CW STAFF

MEQUON, Wis. — The industry forged ahead with delivering networking capabilities to remote users recently when Frontier Technologies Corp. rolled out software said to bring full Transmission Control Protocol/Internet Protocol (TCP/IP) networking to far-flung desktops over telephone lines.

The company's product, dubbed Super-PPP, is software that is layered over the Microsoft Corp. Windows operating environment and Frontier's TCP/IP or industry-standard Open Systems Interconnect communications protocols.

This bestows on users TCP/IP functionality such as terminal emulation, file transfer, printing and Simple Network Management Protocol management over serial lines via the industry-standard Point-to-Point Protocol (PPP) without the user's having to be on a local-area network, the vendor explained.

PPP adds error correction, retransmission and speed to the older Serial Line Interface Protocol (SLIP) for remote TCP/IP networking, observers noted.

Best of both worlds

The product is intended to blend the SLIP economies of networking over phone lines "with the reliability of the X.25 protocol," which requires leased lines, said Ray Langford, engineering manager at Frontier.

Speedwise, PPP could translate into a tenfold improvement over SLIP, depending on the nature of the data, said Mike Kantrowitz, vice president of marketing at Human Designed Systems, Inc., an X Window System terminal vendor in King of Prussia, Pa.

Human Designed Systems bundled its own version of PPP into its X terminals after rigorous performance testing of PPP and SLIP, he said.

San Diego-based AGE Logic, a maker of personal computer X server software, is considering licensing Super-PPP to bundle into its software, which allows users to access multiple hosts simultaneously on a PC screen, said Peter Shaw, company president. AGE Logic's X server software is Windows-based.

> "THE PRODUCT is intended to blend the Serial Line Interface Protocol economies of networking over phone lines 'with the reliability of the X.25 protocol.'"
>
> RAY LANGFORD
> FRONTIER TECHNOLOGIES

Kantrowitz said a limitation of the Microsoft Windows version is that users cannot run applications locally because of the non-client/server nature of Windows. This means users must tax host resources to run applications remotely instead. The limitation, however, has to do with the Windows operating environment, not the network.

The $95 Super-PPP can also function as a low-end IP router if the PC has an Ethernet adapter card, Frontier said. The software is slated for availability next month.

IRS chooses X.400 as mail package

CONTINUED FROM PAGE 69

pared with feature-rich proprietary systems from the likes of Beyond, Inc., CC:Mail, Inc. and Microsoft Corp.

However, "we feel we're getting about 98% of those systems' features," Foley said. In addition, he noted, many proprietary LAN mail functions disappear once a message has been translated in a gateway and is shipped to another network.

The IRS maintains that within a year, its network will be less costly than a patchwork of proprietary systems. This is in part because the IRS' Southeast region is able to route message packets out over FTS-2000 network service provider Sprint Corp.'s X.400 transport service, which charges on a per-message basis. The other alternative would be to use the non-X.400-based Sprintmail wide-area mail network at a fixed monthly charge, the IRS explained.

The IRS Southeast region has 800 users on OSIware and expects that number to grow to 1,000 this year "for less than half of the annual cost of Sprintmail," Davis said.

Hardwarewise, the only investment the IRS made was in a dedicated Compaq Computer Corp. SystemPro server running The Santa Cruz Operation's Unix and OSIware software. It serves as a switching hub among the network segments.

Foley explained that the IRS customized OSIware's manual directory synchronization so that changes to the mail network are automatically updated enterprisewide. Meanwhile, the IRS intends to participate in a pilot of X.500 — X.400's directory counterpart currently undergoing interoperability testing by the three major long-distance carriers — next year.

"Right now, everyone in the IRS Southeast region can locate any other user in the region," Foley explained. OSI's X.500 would allow the region to expand that accessibility to all other X.500-listed users, he said.

Multitasking RAID for supercomputers debuts

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — Maximum Strategy, Inc., a small Silicon Valley firm that has been building redundant arrays of inexpensive disk (RAID) systems since 1987, last week announced a multitasking RAID system for supercomputers and parallel processors.

The new RAID drive will go to beta-test sites this month, and general shipments are to begin in September, the firm said.

The firm's new Gen 4 product can handle RAID-1, RAID-3 and RAID-5 functions simultaneously on different disk regions. That way, disks can be set aside for RAID-1 mirroring, RAID-3 high-performance or RAID-5 error-recovery features.

"You can dedicate a set of disks to operate in one RAID mode or the other," said Omri Serlin, president of Itom International in Los Altos, Calif. That would suit scientific computing, which typically deals with large data sets that can hamper high-speed disk performance.

Del Masters, Maximum Strategy's chief executive officer, said Gen 4 would be able to handle 500 I/Os per second to the supercomputer or Unix server. Data will be transferred in 64K byte units, Masters said.

The Gen 4 RAID Storage Server can support as many as 40 disk drives with sustained throughput of 90M byte/sec. for reads and 85M byte/sec. for writes. It conforms with the international standard for high-speed data transfer and is compatible with supercomputers from Cray Research, Inc., IBM and Maspar Computer Corp. Prices range from $175,000 to $475,000, Masters said.

The California Institute of Technology, a user of Maximum Strategy's Gen 3 RAID device since February, has had little problem with reliability since the product was installed.

"Even when our large supercomputers had [operational] problems, the Maximum Strategy box kept going like a soldier," said Roy Williams, senior staff scientist at CalTech's Concurrent Supercomputing Facilities.

Small and proud

Maximum Strategy was privately funded and grew by sales of its high-end peripherals to large systems vendors such as IBM, said Gary Smaby, principal at the Smaby Group in Minneapolis. "They are a bootstrapped organization and proud of it. They've done it all on their own."

The 30-person firm designs RAID controllers — but does not build them — and then packages the controller with disk drives from other vendors.

Although prices for the RAID devices seem high, they are priced to be less expensive than those sold by supercomputer vendors, Smaby said. "It is definitely an impressive technology, but it is still aimed at a limited market," Smaby noted.

Manufacturers turn to imaging

On-line engineering documents spell efficiencies for companies

ANALYSIS

BY ELLIS BOOKER
CW STAFF

Speed to market, fewer mistakes and the ability to adapt products quickly are some of the reasons a handful of manufacturers have begun installing electronic document imaging systems.

In addition to conventional applications of imaging in their clerical departments, manufacturers are using imaging as a tool for routing drawings and technical documentation among designers, engineers and the factory floor. For one aircraft maker, this has reduced the time needed to process drawings from as much as eight days to only 12 hours.

According to BIS Strategic Decisions in Norwell, Mass., the manufacturing sector (comprising both discrete and process manufacturing as well as pharmaceuticals) accounted for $228 million of the $1.9 billion imaging market last year. But that share should grow. The research firm predicted that manufacturers will represent $358 million of the $2.35 billion imaging marketplace in 1992.

Like imaging users in commercial settings such as banking and insurance, manufacturers are looking to imaging as a way to control, streamline and automate the flow of records.

At The Boeing Co.'s Commercial Airplane Group, for instance, an imaging subsystem known as Reference Engineering Data Automated Retrieval System (REDARS) reduced the flow time of engineering changes by up to 90% and cut by 80% the amount of time engineers and others waited to see data.

Deployed in December and using a high-speed Fiber Distributed Data Interface backbone network connecting some 200 Sun Microsystems, Inc. workstations, Boeing's system has more than 1T byte of information on 140 optical discs. The database includes more than 3 million graphics images created by Boeing's computer-aided design (CAD) system.

John Dykes

In the past, these CAD images would have been output to microfilm and pasted onto so-called "aperture cards." This required a staff of 100 people to sort, file and fetch the cards. Another 10 million to 12 million obsolete aperture cards are stored in the paper files.

"We've also reduced the amount of time it takes to get a drawing released from engineering and sent to the factory floor from six to eight days down to 12 hours," said Norman L. Eddy, senior manager of systems management at Boeing Support Services in Seattle.

Along with engineering diagrams, REDARS contains all of Boeing's technical documentation and parts lists.

REDARS also highlights two

Continued on page 72

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Migration woes promise gold

BY MARK HALPER
CW STAFF

EL SEGUNDO, Calif. — For Gary Osborn, chief information officer at Hughes Electronics Space and Communications Division, choosing Unix servers for the division's operationwide downsizing project has been a head-spinning lesson in the politics and conundrums of open systems.

As the company talks to suppliers to determine which platforms to install for a three-phase move off its eclectic collection of mainframes and minicomputers, Osborn said he has been nothing short of confused.

"All the vendors say they are what they are and that everyone else is a liar," Osborn noted. "I'm having a difficult time sorting it out."

Osborn's difficulties have not, however, prevented him from proceeding with some decision-making: He has tapped Hewlett-Packard Co. for four HP 9000 Series 847s for the first phase of the project.

No more going without

The first stage is an ambitious one: Putting integrated computing power in the hands of hundreds of designers, shop floor workers and business managers who until now "have simply gone without" the strategic information that the distributed HP system will start putting in their hands later this month, said Chris Pidgeon, chief information technologist at the division.

When the project is completed later this year, roughly 800 personal computers and Apple Computer, Inc. Macintoshes will tie into the HP 9000, accessing an integrated applications package called Cambridge from Cambridge Technology Partners that ties together information from Hughes' finance, scheduling, material, inventory, engineering and manufacturing operations.

In the company's current hierarchical model, information access for hundreds of shop floor workers, warehouse folks and designers typically means contacting a crony in Hughes' information systems shop who taps the requested data and then delivers it by paper, mouth, disk or some other medium. "Sneakernet" has been the norm here. The goal is near-instantaneous access.

"It takes them a week: They have to go through eight people and collect information in different media," Osborn noted. "By the time they get the information, it's useless."

These people include designers who need access to information, program managers responsible for building products and group business managers.

The workers have access to about 60 PCs now, but they use them to run basic spreadsheet applications, Osborn said. Hughes will tie the 60 into the HP 9000s just as it will the other 740 or so, through Transmission Control Protocol/Internet Protocol connections over Ethernet. The company plans to install 400 of the new machines by the end of this month and another 400 by year's end.

The company will also tie about 150 Sun Microsystems, Inc. workstations into the Cambridge software after it brings the PCs on-line, Osborne said. Those workstation users are designers who do not require business information as often as operations people. "We don't put them in a category of being decision makers," Osborn said.

Moving off the mainframe

In other downsizing plans, Hughes plans to take its manufacturing resource planning (MRP) software off the mainframe starting in the first quarter of 1993 and to move its engineering data off in the third quarter.

But, as it expands Cambridge with two more Unix servers and moves toward open MRP and engineering data solutions, Hughes will not necessarily choose the HP 9000 every time.

"It'll all boil down to price and performance," Osborn said. "We're right now benchmarking Sun to see if it could perform equal to or better than HP."

One consideration is what software is available for each platform. In the MRP evaluation, the company has decided to use Computer Associates International, Inc.'s CAS/AD, which CA recently announced it is migrating to HP's HP/UX operating system — CA's first large system Unix port.

But, according to Osborn, CA also plans to make the program available for Sun platforms, so Sun is very much in the running for the MRP job.

If Osborn and his staff are caught up in Unix fever, they have apparently not been completely swept away. Osborn noted that the company will continue to use a 3090 mainframe for financial programs that provide information on labor costs, purchase rates and subcontract conditions.

Osborn's reasoning on the financial program may be no more complicated than his hands are tied. His division shares the 3090-based financial information with other Hughes divisions from the parent's mainframe. "It's a corporate system, so I doubt I'll be coming off it," Osborn said.

ON SITE

Hughes Electronics Space and Communications Division
El Segundo, Calif.

Gary Osborn, CIO

- **Challenge:** To put integrated computing power into the hands of designers, shop floor workers and business managers.
- **Technology:** Hewlett-Packard HP 9000 Unix systems, 800 PCs and Cambridge Technology Partners software that ties together information from diverse operations.
- **Goal:** To reduce from one week to only seconds the time it takes to gather information from varied sources.

Manufacturers using imaging for documents

CONTINUED FROM PAGE 71

of the unique requirements of imaging in manufacturing: graphics and interfaces to CAD systems.

While banks, insurance companies and other commercial imaging sites have some need for graphics, notably for signature display and verification, a significantly larger percentage of the paperwork at a manufacturing company is devoted to technical drawings and schematics. REDARS, for instance, not only imports and exports data to a parts and document "accountability" system, but it also works with Boeing's CAD system.

According to some analysts, creating these CAD-to-imaging interfaces can be tricky because the graphics in imaging systems are raster-based, whereas CAD systems use vector graphics.

On the other hand, some manufacturers have found the process worth the work because the imaging system becomes a kind of common denominator for incompatible CAD systems.

This has been one of the benefits of the Apple Document Management and Control System (ADMACS), Apple Computer, Inc.'s 18-month-old global imaging system. ADMACS provides on-line access to more than 120,000 pages of drawings and product documentation (see story at right).

At Apple and other manufacturers, imaging coupled with document management and work flow software have also virtually eliminated the problem of building a part based on a design that has been modified and is no longer the current version.

The Gillette Co.'s North Atlantic Group is using an imaging system from Cimage Corp. in Ann Arbor, Mich., to store what will total more than 100,000 technical documents by year's end.

Like many manufactures, Gillette has maintained vast libraries of microfilm aperture cards to hold its technical documention. "It was a nightmare controlling these documents; we were drowning in a sea of paper," said Ed Ryan, group manager of project management and implementation at Gillette.

A final application of imaging in manufacturing relates to customer support.

Last year, Knoxville, Tenn.-based Whirlpool Corp. installed an imaging system from Online Computer Systems, Inc. in Germantown, Md. The imaging system provides customer service agents with access to two decades worth of service and product manuals [CW, Oct. 28, 1991].

In a recent member survey by the Association for Information and Image Management, 56% of the manufacturers responding said they were using imaging today; another 29% said they were investigating imaging.

Turnaround on a dime

When Jackie Streeter joined Apple Computer, the company built one kind of Macintosh.

When that changed and Apple began filling out its Macintosh line, Streeter, manager of worldwide product configuration management, began looking at alternatives to the paper-based system for tracking and exchanging engineering documents.

The result was ADMACS, or Apple Document Management and Control System.

With its core software from Alpheral, Inc. in Camarillo, Calif., and system integration services from Electronic Data Systems Corp., ADMACS was piloted 18 months ago; for the past year, it has been the official repository for some 120,000 Apple engineering documents.

Aside from substantial productivity gains, Apple has used ADMACS as a common window onto its diverse CAD systems.

Instead of arming each employee who needs access to the on-line drawings with "a $40,000 to $50,000 workstation, each loaded with $20,000 to $30,000 worth of CAD software," Apple is using its own Macintosh as the client for the imaging system, according to Tom Minick, director of information systems at the Apple Product Division.

About 600 employees have access to ADMACS today. The ADMACS host is a Digital Equipment Corp. VAX in Napa, Calif.

But Minick noted that because Apple elected to use the Macintosh — typically, a 4M-byte machine running Apple's System 7.0 operating system — and send the images across the corporate Transmission Control Protocol/Internet Protocol network, access to the engineering documents is theoretically available from every employee's desktop.

Before ADMACS, turnaround time for design changes could be as much as 25 days, with diagrams on microfilm frequently shipped back and forth to Apple's manufacturing sites worldwide.

Today, turnaround is 30 days and dropping. "Some changes are down to one day," Streeter said.

Streeter stressed that in addition to imaging, the ADMACS project was taken as an opportunity to redesign many business processes at Apple, resulting in even more efficiency.

In fact, that standardization of processes helped win Apple ISO/9000 certification on its first attempt — a rare feat. A European Economic Community business license, ISO/900 mandates standardized business procedures.

ELLIS BOOKER

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Software application packages

Integral Midrange, a division of Integral Systems Co., has enhanced the IBM Application System/400 versions of Integral's Human Resource and Financial products with Release 5.0.

Release 5.0 contains Systems Application Architecture-compliant commands and features color support and full use of all AS/400 utilities. Tools that control human resources-related functions are provided.

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Database management

Management Information Technology, Inc. has started shipping an enhanced version of DBAMaster.

DBAMaster 2.0 was designed as a four-function, automated monitoring and tuning device that lets Oracle Corp.'s database users detect and avoid potential system-crippling problems.

New features in this release include remote monitoring and multidatabase support, reduced storage requirements, tuning of the Oracle Parallel Server and support for Oracle Version 6.2. Row-level and chaining analysis, production reports with full table scan and monitoring over SQLNet are other new features.

Pricing begins at $2,500.

Management Information Technology
2895 Temple Ave.
Long Beach, Calif. 90806
(310) 424-4399

BrownStone Solutions, Inc. has enhanced Version 5.0 of its DataDictionary/Solution.

Enhancements include Scripting, Forms Facility and DDSMail. According to the company, Scripting offers users the ability to automate complicated dictionary tasks such as restructuring DB2 tables. Forms Facility provides external layouts that display a user view of a data dictionary without altering the underlying object definition. Users can send messages and receive results of automated operations via DDSMail.

Prices start at $60,000.

BrownStone Solutions
295 Madison Ave.
New York, N.Y. 10017
(212) 370-7160

Data storage

Ten X Technology, Inc. has developed the OptiChanger 28, a five-cartridge drive optical subsystem.

OptiChanger 28 uses 12-in., 5.6G-byte write-once read-many cartridges, which provides Sun Microsystems, Inc. Scalable Processor Architecture II users access to a minimum of 28G bytes of permanent data storage. OptiChanger 28 includes simultaneous access to both disk sides, fast disk spin up, spin down and disk exchange times.

The product does not require software drivers, and it features hardware data compression and 512K bytes of nonvolatile static random-access memory for enhanced cache buffering.

OptiChanger costs $39,950.

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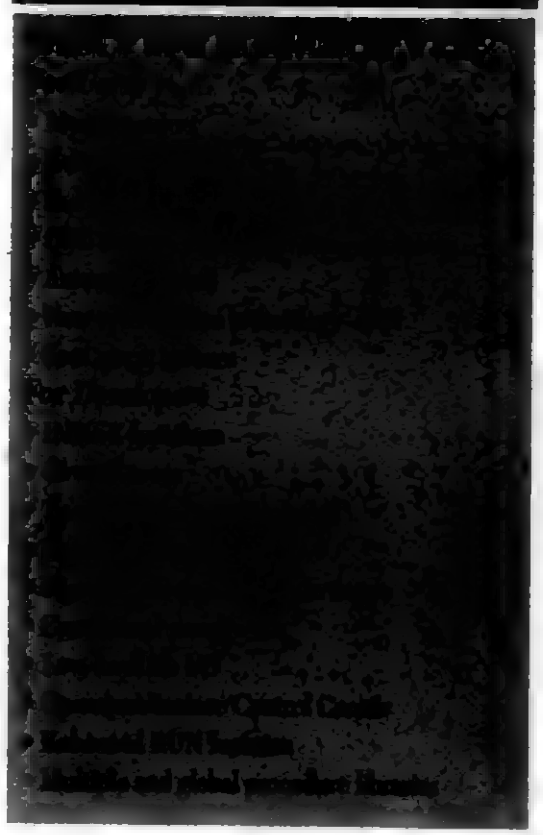

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IN BRIEF

Focus 4GL upgraded for AS/400

■ **Information Builders, Inc.** announced an upgraded version of Focus 4GL for IBM's Application System/400. Available immediately, Release 5.8 sports enhanced report writing and decision support modules, the company said. Prices range between $3,000 and $100,000.

■ Shortly after announcing a merger with Al-Corp, **Aion Corp.** introduced Logic Management System, a tool designed to let users — rather than information systems workers — modify an application's business process rules. The $2,000 to $5,000 product is currently in beta testing, with general release scheduled for later this year. Both companies emphasized that despite the merger, each firm's product lines would remain distinct and consistent with separate statements of direction that were outlined earlier this year.

■ Ada supplier **Meridian Software Systems, Inc.** in Irvine, Calif., has entered into a definitive agreement to be acquired by **Verdix Corp.** in Herndon, Va. Verdix, which develops embedded computer, technical computer-aided software engineering (CASE) and secure systems products for government and industry, will swap 1.2 million shares of its common stock — about 8% of its outstanding shares — for Meridian stock.

■ **Borland International, Inc.** will begin bundling **ProtoView Development Co.**'s ProtoGen Application Generator CASE tool with its Borland C++ Version 3.1 compiler and its Borland C++ and Application Frameworks 3.1. ProtoGen is an ANSI C code generator for interface design and implementation.

Development centers battle to get it done

BY GARRY RAY
CW STAFF

Call them application development centers, application enabling centers or technology centers. Whatever the name, they provide their organizations with evaluations, guidance and implementations of "bleeding-edge" development tools and methodologies.

But their unique role in the information systems organization and in the company as a whole poses some challenging management problems. Chartered with examining such diverse concerns as strategic planning, joint application development, systems planning, data modeling and everything in-between, application development centers often cannot implement the tools and methods they have discovered.

According to Jerry Weinberg, a Lincoln, Neb.-based consultant on IS and organizational change, "For every 100 development centers, 75 know what to do, and only 10 actually get the organization to do it."

Historically, application development centers have suffered from the problem of having a clear mandate to explore and evaluate advanced technology but little means or capacity to implement it in their companies.

At Texaco USA in Houston, an early attempt to create an application development center resulted in a "failure to implement because there was no mandate to do so," said Walter Viali, manager of the company's IS Enabling Center.

Even where there is a mandate to implement new tools and technologies, application development centers often meet substantial resistance from programmers and other IS staffers. The problem, Weinberg said, ■ "an emotional issue, not a technological issue."

Internal battle

According to Viali, "The initial clash was ferocious because development center people are very technical and perfectionists." The interests of these champions of leading-edge technology "were colliding with [programmers], who have a vested interest in the status quo," he said.

To solve the problem, Texaco placed Viali in charge of its application development and development center organizations. "I have some idea of where I'm going, and I'm not afraid of ruffling feathers or stepping on toes," he said. "That motivates them."

Most development center managers agreed that the vision of a leader was critical to the center's success. "The most important thing is to allow [staffers] to go out on their own, but with a vision of the way things should be," said Ron Gualtieri, a computer scientist and development center leader at EG&G Florida, Inc., a NASA contractor at Kennedy Space Center in Florida.

Gualtieri also makes sure his team is recognised internally through regular participation in a company newsletter and other public relations efforts, such as training members of the computer center in new technologies and keeping them posted on "our strategic direction over the next five years," he said.

Happier and busier

"What we're trying to do is to increase morale and the ability of the staff to get things done," said Dennis Farley, president of the Development Center Institute, Inc. and a development center manager at Ameritech Services in Indianapolis.

Using research from Zawacki and Associates, a Colorado Springs consultancy that has profiled a number of application development centers, Farley has been giving staffers more feedback and has been "structuring their jobs so that there aren't so many distractions," he said.

Robert Zawacki, principal of the Colorado firm, said in his recent study of development centers that staff members should be given more feedback and autonomy in their jobs. They also need to see the "wholeness of the project" and its relevance to the organization in order to be effective, he said.

Cardinal rules

Key steps in motivating the application development center staff

- **Create development center teams** that have a mixture of those who initiate and those who respond to new ideas.
- **Close the loop.** Structure development center positions to include general and specific, goal-directed feedback.
- **Provide more autonomy.** Set goals, give deadlines, and then back off.
- **Increase skill variety.** Development center staff members are learners and should have a forum to explore new ideas and technologies.
- **Increase task identity** — the wholeness or completeness of the project — by allowing staffers to visit user and staff meetings.
- **Increase task significance.** Reinforce the importance of the application development center by allowing personnel to give status reports and presentations.

TI speeds up Unix move through Sequent deal

BY KIM S. NASH
CW STAFF

DALLAS — Texas Instruments, Inc. has agreed to port its computer-aided software engineering (CASE) tools to Symmetry 2000, a line of high-end Unix-based machines from Sequent Computer Systems, Inc. The move is part of TI's strategy to lure customers looking to "right-size" systems from proprietary mainframe environments to smaller Unix systems.

Observers said TI is ahead of integrated CASE rival KnowledgeWare, Inc. in Atlanta in terms of development tools for Unix. KnowledgeWare said it ■ working on Unix tools and pegged 1993 to 1994 for their debut.

Meanwhile, vendors such as Cadre Technologies, Inc. and Interactive Development Environments, Inc. have built market share among technical Unix users.

Double dealing

IBM and Hewlett-Packard Co. signed separate deals eight months ago with TI [CW, Jan. 27]. TI's Information Engineering Facility (IEF) also runs on Unix hardware from Digital Equipment Corp. and Tandem Computers, Inc.

However, what makes the Sequent deal different from the others is the Symmetry 2000's capacity for on-line transaction processing in an open environment, according to Roy Brittain, vice president of business development at TI's Information Technology Group.

An early user agreed: IEF-built applications run on the Symmetry 2000 "achieve three to five times the price/performance ... compared with proprietary mainframes," said Steve Darrow, president of Claremont Consulting Group, Inc., a CASE consultancy in Beaverton, Ore.

It was fully integrated CASE for Unix, not economics, that attracted Oregon's Department of Environmental Quality to the IEF/Symmetry combination, according to Dennis Kirk, information systems manager at the department. The state agency, located in Portland, has started building new systems with IEF in a 3-year-old Symmetry environment. IEF replaces an ad hoc mix of report writers, forms generators and a fourth-generation language from Oracle Corp.

The department will keep Oracle's database management system but will throw out Cobol and Fortran tools, Kirk said.

"Environmental legislation changes continuously, and those tools don't let us alter programs quickly enough," Kirk explained, noting the 60- to 90-day limits tied to many new laws. Reusable IEF models let Kirk's staff locate appropriate blocks of code quickly and save programming steps, he said.

> WHAT MAKES THE Sequent deal different from the others is the Symmetry 2000's capacity for on-line transaction processing in an open environment.

For Sequent, the agreement is part of an effort to expand beyond its speciality markets, such as financial and scientific processing, into more mainstream commercial computing.

Sequent, also based in Beaverton, will sell Symmetry 2000 systems bundled with IEF by the end of this year. However, the IEF Central Encyclopedia, a repository needed for large-scale CASE projects, is not scheduled for release until early next year.

WordPerfect answers the most-asked question about electronic mail.

Click on "Send" in many of today's e-mail packages, and the urgent message on your screen will disappear, perhaps never to be heard of again.

You'll have no way of learning if it was ever delivered, or opened. You'll have no way of checking what you sent to whom, or when. And if you ever need to retract a message for corrections, well, *no way*.

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If people would simply agree on a single computer platform, hooking everyone up with an e-mail system would be no trick. But since *that* shows no signs of happening, WordPerfect Office is available for all of the most popular platforms, including DOS, Windows, Mac, UNIX, VAX and Data General.

With WordPerfect Connections (included in Office 3.1), a DOS and Windows LAN can connect seamlessly (and transparently) with VAX and UNIX LANs, for example. So a message that goes out in Windows can arrive in UNIX and lose nothing in the translation.

Getting Your Message Out

Far-flung empires will find WordPerfect Office equally accommodating, with gateways to messaging systems that include Novell MHS, IBM OfficeVision, DEC, X.400, SMTP, MCI Mail and AT&T EasyLink, among others.

And unlike e-mail packages that simply deliver the mail, WordPerfect Office includes powerful Calendar and Scheduling functions that provide entirely new ways for your people to work together productively.

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With WordPerfect Office, the possibilities are nearly limitless. And the technical support for users and administrators is widely acknowledged to be the best in the business. To learn more, contact your WordPerfect Representative, or for a free video demonstration, call (800) 526-5064.

(Until you have a more effective means of business communication up and running, the telephone will have to do.)

WordPerfect

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COMMENTARY

Martin Healey

Options to ponder when downsizing

The unavoidable problem with downsizing is that the new system is different from the old one. The new computer should be state-of-the-art technology that is cheaper than the old one, but the total cost of ownership needs much more consideration.

Unix systems, for instance, are relatively cheap to buy. But to make a comparison with, say, the IBM AS/400, you must add the price of a database management system, compilers or 4GLs and system management tools before a fair comparison can be drawn.

In most cases, Unix system management tools are relatively underdeveloped and can result in increased costs. With distributed systems, for example, "community management" tools are anything but established products, although there are hopeful signs from HP, ICL and Siemens-Nixdorf.

The right way

While getting the system environment wrong can be costly, the potential for getting the applications wrong is even greater.

There are two basic approaches to creating the applications for the new "downsized" system: developing them in-house or buying a packaged solution.

If programs are to be developed anew, now is the time to exploit different techniques. Relational databases, CASE tools (particularly for business analysis and system design), 4GLs and client/server architectures with GUIs are all serious candidates for consideration.

Use REXX for all procedure automation routines as well. It is the only job-control language (JCL) supported on multiple platforms, and it is good. It hurts to see people struggling with Unix shell scripts when the proper tools are available.

Rather than follow traditional development paths, packages normally have far more to offer today. Indeed the major drawback to packages is the "not-invented-here" syndrome because the same people who were responsible for developing older applications must control the implementation of the package. The cases where packages have been failures (apart from picking an inappropriate or simply bad product) are due to a lack of cooperation by both in-house programmers *and* end users.

Not-invented-here among users is as bad, if not worse, than among programmers. It is reasonable to expect some changes to business practices to fit the package if they are not radical.

Handle with care

A package is a building kit and should be treated by in-house staff as a very high-level language. It needs configuration and all the training and management procedures must be effectively implemented. The package will probably only achieve 80% of the requirements — the other 20% must be provided by specifically developed code.

But never modify the package code, or else future releases will cause trouble. And never accept a package for which the data structures are not fully specified and available for new programs. Avoid packages written in C or Basic unless an alternative cannot be found.

Packages offer a share of accumulated knowledge about applications because there is feedback from multiple users. However, the other source of accumulated knowledge is the older systems being replaced. Therefore, there is a temptation to convert the old programs to run in the new environment.

Code conversion, and the associated JCL and data conversion, is difficult and much more expensive than is often admitted. The key problem is that the mainframe provides both batch and teleprocessing services with the same databases. The batch, however, is optimized to take advantage of sequential processing with data prefetch, sorting and direct indexing. The new "downsized" system will be basically time sharing that does not provide any special batch capability or specialized transaction processing monitor.

In all fairness

To be fair, the RDBMS provides all basic services, such as transaction logging, roll-back and forward, etc., but an application system designed for mixed batch and transaction processing will never fit comfortably in a mainly interactive/transaction processing environment. Thus, even if the old code and data can be converted, the new application will be clumsy and will not exploit the technology of the new system. The danger of code conversion is finishing up with the worst of both worlds.

If it is difficult converting from one batch/transaction processing environment to another, conversion to an interactive environment will cause serious problems. Conversion would need to show major cost advantages to win over introducing a packaged solution today.

Healey is a consultant based in Cumbran, England

Apple rolls out tool upgrades

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. recently unveiled a platter of programming tool upgrades that include refreshed versions of MacApp, the Macintosh Programmer's Workshop (MPW) and MPW C++.

MacApp 3.0 is the latest version of Apple's object-oriented application framework and class library for Macintosh programmers. It equips developers with the objects needed to program standard elements of Macintosh applications such as scroll bars, multiple windows, printing, cut and paste, Undo and menus.

Version 3.0 adds System 7.0 support and a new version of the MacBrowse source code browser/editor and the ViewEdit interface building tools. It will be available for $395 on disks and $350 on compact disc/read-only memory (CD-ROM). Upgrades cost $250 and $200 on disk and CD-ROM, respectively.

Full of features

MPW Version 3.2.3 updates Apple's professional software development environment. It provides a foundation on which to create applications with features such as multiwindow editor, integrated compilers and tools, a full scripting language, a source-code control system and the ability to link together code written in multiple languages.

Version 3.2.3 adds tool performance improvements, command reference features and compatibility for Apple's high-end Macintosh Quadra. The upgraded development environment will sell for $150. An update will cost $25.

MPW C++ Version 3.2 is an object-oriented C++-to-C translator, designed to work with MPW C and the MPW Development Environment. Apple has enhanced C++ to support the Macintosh Toolbox and operating system, object-based functions and procedures. It will sell for $175, and an upgrade will cost $75.

The tools will be available through APDA, Apple's source for developer's tools, both as stand-alone objects and on the E.T.O. No. 8 Essentials. Tools. Objects CD-ROM, a CD-ROM based quarterly of Apple's software development tools. Site licenses and bundled applications are also available.

NEW PRODUCTS

Languages

Qualix Group, Inc. has announced the C++ Starter Kit, a collection of software and tutorial materials.

The kit was designed to be used with Sun Microsystems, Inc.'s Scalable Processor Architecture-based workstations. According to the company, the goal of the Starter Kit is to provide Unix users with an affordable way to learn C++ and to understand the object-oriented programming techniques that C++ supports.

The product consists of a Sun file system compact disc that has sample libraries and programs.

The kit costs $99.

Qualix Group
Suite 224
1900 S. Norfolk St.
San Mateo, Calif. 94403
(415) 572-0200

Code libraries

Carnegie Group, Inc. has released Rock 2.1, a frame-based, high-performance technology engineered for knowledge and information representation.

A C++ library, Rock 2.1 was designed to develop appplications that need the integration of complex data relationships and knowledge. The product features a new Interpreter module that lets users dynamically browse, modify and interact with a Rock (Representation of Corporate Knowledge) knowledge base during development, the company reported.

Enhancements include interprocess communication in a client/server environment, integration with relational databases and permanent storage of the knowledge base in an integrated frame base.

The base Rock development library costs $7,800.

Carnegie Group
5 PPG Place
Pittsburgh, Pa. 15222
(412) 642-6900

Application development tools

NeuralWare, Inc. has announced NeuralWorks Professional II/Plus, a neural network development tool for use on Silicon Graphics, Inc.'s Iris line of reduced instruction set computing-based systems.

The product was written in C and offers prototyping and concept testing of neural network designs for a number of data-intensive, time-sensitive and quality-dependent applications, the company reported. Features include an open architecture, graphical user interface and support for more than 22 major neural network types.

Neural Works Professional II/Plus costs $4,995.

NeuralWare
Building IV
Penn Center West
Pittsburgh, Pa. 15276
(412) 787-8222

Sky Computers, Inc. has announced Skyvec Release 3.0.

The product is a software tool kit designed for the Skystation and Skybolt application accelerator product lines. This release includes Skympx multitasking executive, a feature that simplifies software development and execution in application environments involving several tasks, the company reported.

Skyvec Release 3.0 prices start at $5,000.

Sky Computers
27 Industrial Ave.
Chelmsford, Mass. 01824
(508) 250-1920

Micro Focus has released Version 3.0 of Micro Focus 370 Assembler with Animator/370.

The Animator/370 is an advanced debugging tool that lets users analyze programs during execution. The company said the product was designed to allow mainframe users to use a personal computer to support standalone assembler or Cobol programs housing Dynamic Calls to assembler.

New features include Animator/370, On-Line Help and extended file handling.

Part of the Animator/370 is the Help/370 facility, an on-line description of the 370 instruction set. The extended file handler provides additional file processing capabilities and has a define-cluster option.

The full development set costs $1,250.

Micro Focus
2465 E. Bayshore Road
Palo Alto, Calif. 94303
(415) 856-4161

SmartStar Corp. has released Version 6.1 of SmartStar VMS, a VAX/VMS application development environment. SmartStar VMS now offers support for The Ask Cos.' relational database management system.

According to the company, enhancements have been made to the SmartStar Logical Database for heterogeneous database access. When the product is used in conjunction with an optional SmartDistributor component, users can simultaneously access a variety of database types. Features such as pop-up windows, pull-down menus and an OSF/Motif-like windowing interface are included.

Prices range from $2,000 to $140,000.

SmartStar
120 Cremona Drive
Goleta, Calif. 93116
(805) 685-8000

The new spin-offs

U.S. companies are trying to turn technology investments into cash with start-ups in a hot new field: Computerized distribution logistics

Tom Zimberoff

Menlo Logistics' Williford: *'Information is the key element to the logistics challenge'*

BY JULIA KING

When Jim Reeder joined Commodore Business Machines, Inc. as vice president of customer satisfaction, the West Chester, Pa.-based computer company had a customer service record that ranked it next to last among 25 computer makers, Reeder says. "I used to get a lot of hate mail," he recalls.

Now, a little more than two years after outsourcing its customer service operation to Memphis-based Business Logistics Services, a division of Federal Express Corp., Reeder says Commodore boasts a 99% customer satisfaction record.

"Now I get a lot of letters saying Commodore really knows how to take care of its customers," he says.

Driven by a need to pare costs and focus resources on key business functions, Commodore is typical of the growing number of companies shedding costly functions such as customer support, transportation and inventory management.

King is a free-lance writer based in Ridley Park, Pa.

Instead, more and more savvy businesses are contracting with a new, fast-growing breed known as third-party logistics providers.

And — surprise — many of the more than 50 new logistics firms are spin-offs of large companies rich in technology assets such as global electronic data interchange (EDI) networks, imaging and bar-coding systems, expert systems and computerized inventory management applications.

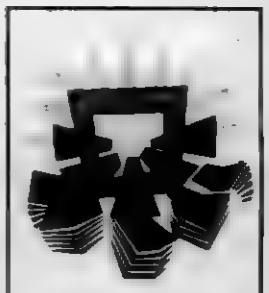
"Information is the key element to the logistics challenge," says John Williford, president of Menlo Logistics, a Menlo Park, Calif., subsidiary of Consolidated Freightways, Inc.

During the last few years, dozens of large corporations have spun off for-profit logistics units, including Roadway, Inc., Caterpillar, Inc., TNT Transport Group, Inc., Carolina Freight Corp., Ryder Systems, Inc., Airborne Freight Corp., Associated Air Freight, Inc., Kaiser Aluminum Corp. and CSX Corp.

Regardless of their differing roots and services, the spin-offs share a common interest: leveraging hefty technology assets and logistics know-how into new revenue.

"Without information technology, there would

Continued on page 82



Technology into dollars

KEY POINTS

▶New computerized distribution services focus on tracking shipping, storage and delivery operations. Key targets include computer manufacturers, apparel companies and automakers.

▶For IS, spinning off a distribution business often means new, challenging work, including integrating customer and in-house systems.

▶AMR and CSX have unveiled a new OS/2-based worldwide logistics information management system aimed at large Fortune 100 companies. Beta testers include Procter & Gamble and DEC. See story page 83.

▶Companies that have spun off commercial technology units during the last two decades have enjoyed mixed success. See story page 83.

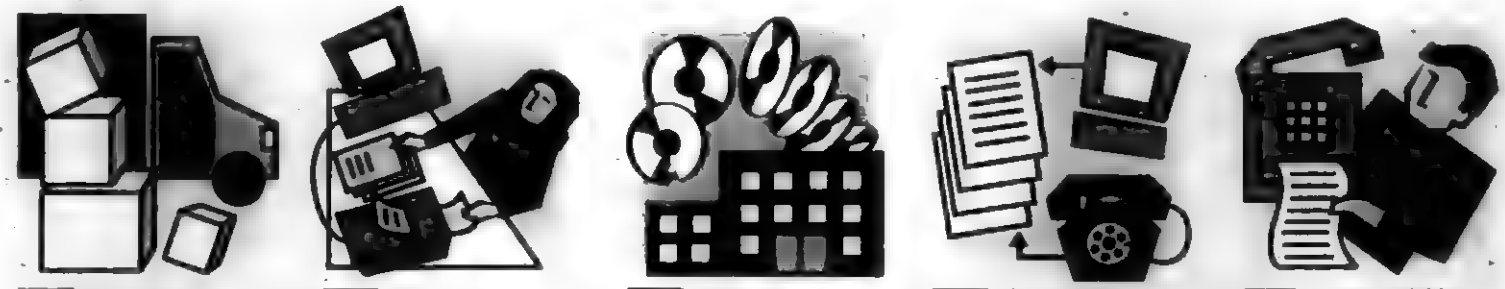
▶FAST FACT: A Northeastern University study estimated that 37% of Fortune 500 companies now employ one or more third-party logistics providers.

QUOTABLE:

"I used to get a lot of hate mail."

Jim Reeder
Commodore Business Machines

How computerized distribution systems work



1 **A look at Consolidated Freightways' system:** Freight is picked up and delivered to customer.

2 Bills of lading, delivery receipts and attachments are sent to image processing locations, electronically scanned and logged into the system.

3 Electronic images of the documents are then transmitted to main data center in Portland, Ore. They are stored on optical laser discs in an optical storage jukebox.

4 The next day, customers can access documents through a telecommunications link, a phone call to their local facility or image document services department.

5 Customer initiates request for hard copy of document, which is then sent to customer's fax machine within minutes.

Source: Consolidated Freightways, Inc.

CW Chart: Stephanie Faucher

In industry today, there's no doubt: It takes technology to keep track.

Little wonder that many companies are fashioning IS groups into commercial providers of distribution systems and similar services or creating new technology-driven units.

At the heart of today's logistics enterprises are sophisticated EDI networks. These often are coupled with state-of-the-art technology, such as integrated bar-code scanning systems and networked imaging systems that electronically track shipments and inventory.

Also key are software-based decision-support tools for optimizing when, where and how products should be transported, stored and distributed.

These tools, plus nationwide and international networks, let logistics companies offer customers a single source for booking transportation services for themselves and others. These services include tracking cargo shipments across carriers and through interstate commerce checkpoints, handling customer support functions and managing warehousing and inventory operations.

In turn, these third-party systems are linked to clients' financial and business applications. This enables customers to track all business processes — from order entry through product delivery and payment — from a single database record.

Cutting edge

Some logistics systems are on the cutting edge of technology. For example, Menlo Logistics, a Menlo Park, Calif., subsidiary of Consolidated Freightways, uses one of the trucking industry's first networked document imaging systems for tracking freight (see chart above).

Developed over a five-year period, the $10 million system was rolled out last year to handle the mountains of documents that accompany the 75,000 shipments Consolidated Freightways handles each day.

The system is backed by a massive EDI network, over which nearly 30% of Consolidated Freightways' shipping transactions, including bills of lading and invoices, are processed.

Last year, this high percentage of computer-to-computer transactions earned Consolidated Freightways an EDI Association award for electronically linking to more of its trading partners than any other U.S. company.

Now, documents generated at the company's 950 terminals are collected at 48 regional centers where they are fed into scanning machines, then transmitted to a main data center in Portland, Ore., where they are permanently recorded on optical discs.

The new spin-offs

CONTINUED FROM PAGE 81

be no third-party logistics," declares Stephanie Schafenacker, national account manager for customized logistics at North American Van Lines' High Value Products Division. "Investment in information technology is the cost of entering the logistics business."

Logical next step

Consultants agree that spinning off a logistics subsidiary is a natural for many companies invested heavily in hardware, software and networks to support their primary businesses.

"Information technology is clearly an area where companies look at outsourcing assets," notes Patrick Byrne, a vice president at A. T. Kearney, Inc., a management consulting company in Alexandria, Va.

The idea of parlaying technology into cash is nothing new. Dozens of companies set up computer services and outsourcing businesses in the 1980s. Many found the going tougher than expected, however (see story page 83).

The new wave of would-be service providers is zooming in on the more profitable business of handling distribution. Key targets include computer manufacturers, apparel companies, automobile makers and others looking to trim costs and improve by outsourcing noncore functions. It could be worth the trouble.

According to some estimates, the third-party logistics market, now about $6 billion a year, could hit $25 billion by the end of the decade.

Business Logistics, for example, now boasts a customer base of 300 companies in 40 different industries. That's enough to account for an estimated 7% of Fedex's $5.4 billion annual revenue.

Menlo Logistics landed a $100 million contract to handle all transportation and distribution operations for Sears, Roebuck and Co.

"Most companies are clearly not interested in making any further information technology investment to handle logistics operations," says Michael Runnager, vice president of business development at Exel Logistics Dedicated Distribution, Inc., a Westerville, Ohio-based subsidiary of NFC International Holdings (U.S.A.), Inc.

"Customers are interested in manufacturing and selling widgets," Runnager continues. "What we do via interfaces to their own systems is keep track of all the details — where the widgets are, their condition, expiration dates and where they are manufactured."

David Smart

Business Logistics' May: *Replacing 'traditional smokestack' approach to logistics*

According to a recent study by Northeastern University Professor Robert Lieb, 37% of Fortune 500 companies now employ one or more third-party logistics providers, primarily to handle warehousing and shipment consolidation.

During the next several years, consultants say, this percentage will climb even higher, as companies in every industry continue to focus in-house resources on revenue-producing activities. In fact, Byrne estimates that some 60% of the $581 billion U.S. companies now spend on logistics-related activities could be outsourced.

Early, sometimes spectacular, success stories are attracting eager information systems shops and service buyers alike.

At Commodore, for example, Reeder says 90% of customers' problems are now resolved in a single call to a toll-free, 24-hour hot line staffed by Business Logistics employees.

There's also a powerful cost incentive, Reeder says: For Commodore to handle the tasks outsourced to Business Logistics would cost twice as much — with far poorer results.

Virtually all third-party providers say their bread and butter is furnishing real-time data that lets customers track shipping, storage and delivery operations through a single database record.

Cutting the strings

The new spin-offs share a curious, mixed relationship with corporate IS. Many tapped the IS talent of parent firms to get started, then built their own IS groups once things got rolling.

Caterpillar Logistics Services, Inc., for example, customized the heavy equipment maker's technology, explains Vice President Steve Wunning, who heads the 30-member staff at the unit, which was formed in 1987.

"We've taken Caterpillar's technology and reprogrammed it to meet our clients' needs," he says. Corporate IS

specialists are called in as needed.

Menlo Logistics has centralized IS at corporate headquarters, according to Williford. This arrangement places 500 IS staffers at his disposal. Some technology — primarily EDI capabilities, imaging and freight tracking — are also imported from Consolidated.

Starting from scratch

In contrast, the 80-person IS staff at Business Logistics built the firm's stand-alone system from the ground up, company President Robert May says. "This is not a case of repackaging existing services," he says. Business Logistics applications are linked to Fedex's transportation systems.

At Consolidated, for example, an internal system was expanded and customized by Consolidated's and Menlo Logistics' IS teams, then opened up to companies in other industries.

Tom Zimberoff

Williford's IS team *at Menlo Logistics offers customers access to Consolidated's systems*

Williford says the arrangement lets Menlo Logistics customers access optimization modules and inventory management programs they never had before. He describes the service as "a very sophisticated inventory management system used by multiple customers."

Customers can now tap into Consolidated's full range of support functions, including centralized accounting, warehouse security and IS support.

Something for all

Individual services vary. Some third parties provide retailers and manufacturers with remote read-only access to their private databases to provide the instant data access required by just-in-time and quick-response programs. Others physically locate both hardware and software as well as personnel on a customer's premises.

Such arrangements create challenging new tasks for providers' internal IS groups. Among the biggest is seamlessly melding customer systems with in-house integrated logistics applications. The end result is that the provider's computer personnel become a sort of "shadow IS department" for the customer.

"In the end, we will look as much like a customer's information technology department as they want us to," Exel's Runnager says.

Even in less radical cases, the simplest projects mean lots of extra work.

For example, the 80-member IS team at Business Logistics had to develop a single, integrated logistics application to replace what May describes as "the traditional smokestack or serial IS approach to logistics."

An expert-based system was created to track customer service calls and warehouse diagnostic data on all Commodore equipment. Customer management gets a daily computerized report of all help desk activities.

Custom software also had to be written to enable the system to combine customer service, order entry, finance, inventory accounting and distribution applications.

Moreover, Business Logistics' IS staff members also provide warehousing and transportation management and customer service support and maintain an integrated logistics database for each customer, so it can download data into its own corporate system.

Finally, a "parts bank" service lets small and midsize companies warehouse spare parts and other inventory, which can be dispatched anywhere in the world on a next-flight-out basis.

But lest you be too impressed, beware: Just because logistics providers have well-known parents doesn't mean they are giants, warns Toby Gooley, managing editor of *Traffic Management Magazine*, a trade journal.

"These companies aren't as big as they would have you believe," warns Gooley, who spotted the "megatrend waiting to happen" two years ago. •

The old spin-offs

Making money with IS probably prickly but potentially profitable

BY MARK MEHLER

"I once knew a man who took off all his clothes and jumped in a mess of cactus. When I asked him why, he said, 'It seemed to be a good idea at the time.'"

Steve McQueen
The Magnificent Seven

During the last two decades, dozens of companies in every industry had what seemed like a good idea at the time: spin off information systems groups to compete in the commercial market for software and services.

It *did* sound tempting: Low investment, low risk, good business opportunity. TRW, Inc., Kimberly-Clark Corp., The Boeing Co., American Express Co., Black & Decker Corp., Nynex Corp., Martin Marietta Corp. and many others have taken the plunge. Their common dream: leveraging large technology investments into viable commercial businesses.

Look around today, though, and you're likely to see more than a few of those companies pulling cactus needles out of their balance sheets.

"At least two-thirds of the companies that have attempted to turn IS into separate profit centers have failed to achieve their objectives," says Howard Anderson, managing director at Boston-based The Yankee Group. Others say that might be on the low side.

Why no success?

The reasons for hard times and failure are many, according to IS managers and consultants (see chart page 84). Beyond a stagnant economy and huge cuts in defense spending, disappointing performance often boils down to the fact that spin-offs know more about technology than about business.

"Very few people running internal IS divisions think like independent business entrepreneurs," Anderson says. "They've been running sheltered workshops for years. They found out that competing in the outside market looks a lot easier from the inside."

Take Kimberly-Clark, for example. In the 1980s, the paper products maker spun off an outsourcing and consulting operation with a big splash. Earlier this month the company confirmed it has laid off most of its outsourcing/consulting staff and is looking to phase out of the business (CW, Aug. 10).

"They had unrealistic expectations of reaching $100 million in revenue within four years," a source close to the operation said. "And even if they had reached that goal, they would have needed to get much larger to compete against the EDSs and IBMs of the world."

Aerospace/defense contractors, in particular, have also been scaling back

Continued on page 84

AMR and CSX shake hands on logistics deal

Anyone who doubts that distribution logistics is hot, consider the following: Two of the biggest names in transportation are racing hand in hand into the multibillion dollar industry.

Last month, AMR Corp. and CSX Corp. unveiled a new worldwide logistics information management system that partners hope will be bigger than American Airlines' fabled Sabre reservation system.

Known as Encompass, the new offering is touted as the first integrated, "multimodal" global trading system. The goal, according to John Stow, president of Cary, N.C.-based Encompass, is to give customers "a single window to all trading partners."

Stow says this is accomplished by linking a subscriber company's suppliers, customers and other logistics providers through a single, system-neutral interface.

The two giants joined forces in April, announcing the formation of the joint venture. Each partner reportedly invested "tens of millions of dollars" since 1986 in hopes of cashing in on the booming market. Today the combined staff consists of 99 full-time employees, including 80 information systems professionals.

Company officials say the network-based service is different enough to distinguish itself from competitors. "The basic difference between us and third-party logistics companies is that they are linked to a physical service they are providing," Stow says. "We are into building an information system where different companies can look into data and then make decisions based on that data."

Encompass is a sort of party line, Stow explains, connecting shippers, carriers, freight forwarders and consignees. They can then communicate directly with one another and monitor one another's activities.

During beta testing, for example, Procter & Gamble Co. detected certain routing delays over the Encompass system. So the company was able to redirect inventory from European warehouses rather than tap products stored in safety stock locations in Japan.

Besides Procter & Gamble, other beta testers include Digital Equipment Corp., a major pharmaceuticals firm, three major ocean carriers and three major forwarders.

Encompass has also been working closely with 16 other global shippers, 14 major carriers representing all transportation modes and 12 third parties, including brokers, forwarders and logistics management companies, Stow adds.

Eventually, he says, the Encompass partners envision that freight forwarders and Fortune 500 firms will use Encompass in much the same way that travel agents employ American Airlines' Sabre system.

Encompass uses a combination of off-the-shelf and proprietary software, consisting of a message bus and an applications translation server. The main workstation is an IBM-compatible personal computer using OS/2, operating in either stand-alone or server mode. Pricing varies and includes installation, setup, subscription and transaction fees.

JULIA KING

The old spin-offs: A mixed bag

CONTINUED FROM PAGE 83

or abandoning outside product and service activities. The following are a few examples:

• **Boeing Computer Services** left the commercial integration market in 1991 after failing to make much of a dent in that highly competitive niche.

Nonfederal business grew less than 2% last year, accounting for only about $78 million of the unit's $1.92 billion in revenue. Boeing Computer still accepts commercial work but is not actively seeking it, according to a company spokesman.

• **McDonnell Douglas Systems Integration Co.** (MDSI) has sold its entire commercial IS operation piece by piece, says William Jackson, director of computer services. The $400 million unit was sold to Electronic Data Systems Corp. for $199 million in November 1991. MDSI, Jackson explains, "felt it needed cash to return to its core aircraft business."

As for the company's Unigraphics computer-aided design (CAD) software, Jackson says that top MDSI management was simply unwilling to make needed investments in the product line.

In the end, analysts say that MDSI, like Kimberly-Clark, simply could not create a large outsourcing base to get the economies of scale needed to compete with EDS or IBM. "Information services were viewed as a distraction," Jackson says.

• **Black & Decker** postponed in May a previously announced public offering of shares for PRC Advanced Systems, citing "current conditions" in the initial public offerings market. Revenue for PRC, Inc., the McLean, Va., IS arm of Black & Decker, was down 1.5%, to $688 million, in 1991.

• **TRW** announced in December that it would trim several arms of its $1.95 billion Information Systems and Services Group, including computer maintenance, real estate processing, and receivables management. Moreover, half of a $365 million fourth-quarter charge was chalked up to technology.

Overall, the company's IS operations lost $138 million in 1991, a far cry from the $49 million profit earned the previous year. Company executives have gone on record saying that computer-related operations could be closed down entirely if no buyers are found by mid-1993.

• **Nynex**'s IS operations suffered a 34% revenue drop last year, plunging from $1.3 billion to $861 million. Ongoing company efforts to focus on core businesses trimmed the company's software, services and distribution businesses.

Last June's sale of 77 Businessland,tfiInc. centers to ComputerLand Corp. was a clear signal that the firm is dumping its low-margin hardware and distribution businesses in favor of software and services, including AGS Computers, Inc. Outsourcing and multimedia are seen as strong (and hopefully profitable) new directions.

Not all bad news

To be sure, there have been some notable successes among the IS spin-offs, observes Scott Pollak, a program manager at G2 Research in Mountain View, Calif.

Andersen Consulting, the $2 billion-plus integrator spun out of Arthur Andersen & Co. as an autonomous operation in 1988.

Lockheed Corp. enjoyed 25% revenue growth in 1991, thanks to rollouts of new graphics, plotters and color printer products from CalComp, its $525 million Anaheim, Calif., computer subsidiary.

Then there is General Electric Information Systems (GEIS), a GE business unit that focuses on electronic data interchange (EDI), mail and related applications.

The unit began 26 years ago as a time-share outgrowth of GE's computer hardware business.

Art Hyder, manager of North American technical services, attributes GEIS staying power in part because it reports directly to GE chairman Jack Welch.

"We are on the same level as NBC or major appliances," Hyder says. "That is the only way to compete. You've got to be serious . . . and you've got to be flexible enough to adapt to the changes in technology and ride out the economic cycles."

James Hazel, marketing manager at Du Pont Information Engineering Associates, a computer-aided software engineering (CASE) vendor in Wilmington, Del., concurs fully.

Du Pont, which began offering commercial products and services five years ago, is only a $20 million business that has yet to achieve sustained profitability.

However, Hazel says parent Du Pont Co. understands that building an integration infrastructure to compete one day with EDS or Andersen Consulting is a long-term task.

"Management understands the nature of start-up businesses," he says. "Quite often, companies have [expectations for IS start-ups] that are too grandiose."

Du Pont offers rapid application development using advanced CASE tools and consults on design methodologies in the Digital Equipment Corp. and IBM worlds. More recently, it has expanded into executive information systems.

Even though the unit does not receive huge sums for marketing from its parent, Hazel says he is not worried. Systems integration is primarily a referral business, he contends. "Customers know Du Pont's overall reputation for quality."

Mixed results

The majority of companies that have spun out information technology as a strategic business report results that fall somewhere between a smashing success and abject failure.

While many companies haven't met initial objectives, they have not given up either.

• **FMC Corp.**, a Dallas-based financial services firm, began selling computer time and network outsourcing services in 1988. Its revenue is roughly half of what the company had hoped for, acknowledges Randall Gannaway, director of information resources, operations and technology.

He attributes the results to a long learning curve. "We are only just beginnning to figure out how to price and market our services," he says.

But FMC, which targets small outsourcing engagements in the Dallas-Fort Worth area, still has hopes that its "home-style" service approach to the commercial market will eventually yield big payoffs.

Rob Freshman

Weyerhauser's Mersereau: *'If [management] had the whole thing to do over, [we] would do it again'*

• **Martin Marietta** is also hanging on. Last year, the Bethesda, Md.-based firm folded its commercial IS business into a Florida-based missles and electronic group. The move seemed to work: In 1991, the unit enjoyed a modest 2% revenue increase, to about $560 million.

Large contracts with the U.S. Postal Service and the Department of Housing and Urban Development, a strong defense presence plus a healthy outsourcing business seem to bode well.

• **Weyerhauser Co.**, a large lumber company, similarly reports mixed results in its commercial IS program.

In spinning out Weyerhauser Information Systems in 1985, the parent company had two aims: diversify its product line and create a management model that would make the systems arm a more effective supplier to internal customers.

Susan Mersereau, formerly vice president of MIS, says Weyerhauser still offers commercial disaster recovery services in partnership with systems vendors. But the firm began backing out of the software business a few years ago.

"There was never a strategy to [achieve] a leadership position in software," explains Mersereau, who has been reassigned as a vice president in the total quality program. "Management underestimated what it takes to sustain such a product line. It never succeeded in becoming a core business here."

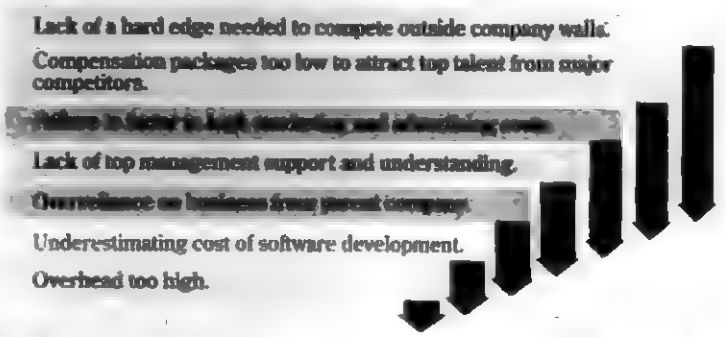
Mersereau adds, however, that while the product diversification strategy may not have worked out, Weyerhauser did achieve its second key goal.

"We've greatly improved our internal customer focus, and now we understand our cost structure," she says. "Our core processes, project and change management, billing and invoicing, had been loose. . . . We streamlined and tightened them up. If [management] had the whole thing to do over, [we] do it again." •

Mehler is a free-lance business and technology writer based in Jackson Heights, N.Y.

Why spin-offs fail

Many promising technology-driven ventures go belly-up because, according to consultants, they fail to recognize these major pitfalls:



Source: The Yankee Group

CW Chart: Stephanie Faucher

Putting estimates on track

Companies are plagued by poor project cost estimating, a recent study found. What follows are some tips on how to do it right.

BY ALBERT L. LEDERER
and JAYESH PRASAD

Cyndy Patrick

There is something very scary going on in companies today: Technology cost estimates are missing their marks. And we're not talking about isolated cases. Our recent study of 115 organizations found that cost estimates for more than three-fourths of the respondents' major projects were off. In 63% of those instances, companies said the projects came in "significantly" over budget.

The big, widely reported gaffes get all the play — like the $8 million estimate at Allstate Life Insurance Co. that turned into a $100 million system or a state of Oklahoma project estimated at half a million dollars and completed at a cost of $4 million. But the fact that more than half the companies we studied had overruns means that disasters, no matter what their size, are happening quietly but consistently.

"People are being fired, and organizations are outsourcing applications development" in response, says Naomi Lee Bloom, managing partner at Bloom and Wallace, a Fairfax, Va., consulting firm. "Top management is fed up with projects that don't deliver as promised."

Skewed cost estimates don't just damage a project leader's career aspirations and lighten company coffers. The ramifications go even deeper.

According to survey respondents, cost estimating is used to figure out staff numbers for projects, to control project implementation, to select and schedule projects and to quote charges to users (see story page 87). If there is some fundamental flaw in a company's cost estimating process, that flaw is going to run through more than just one isolated project — a lot more.

Why is the situation so bad? Because users make changes, people don't communicate, staff relies on early estimates and managers don't monitor what's going on.

The thing everyone wants to know is how to put together and manage a cost estimate. The following guidelines, gathered from what survey respondents said they did right and what they did wrong, might be just the ticket:

Assign the initial estimating task to the final developers. There was a high correlation in the study between companies with cost overruns and the use of different people to estimate and program systems. For these firms, the analyst who prepared the initial cost estimate handed it over to another staffer for development.

The problem here is critical: The developers are working "blind"; they don't know how the estimator arrived at the numbers. There is "a loss of the project's oral history, including how and why initial estimates were crafted," Bloom says.

A more subtle problem with split responsibility is that it may actually *foster* poor estimation and obscure who's at fault. The initial estimator — who doesn't analyze, design or program — has little pressure to be accurate. If there is an overrun, the estimator can claim that the developers were inaccurate.

The more savvy way to handle the situation is to have those analysts and programmers who will develop the system prepare an initial cost estimate during their feasibility study, when they are ascertaining user requirements. There will not be any miscommunication between estimator and developer

Continued on page 86

Lederer is professor of MIS and chair of the Decision and Information Sciences Department at Oakland University in Rochester, Mich. Prasad is assistant professor of MIS at the University of Dayton's School of Business Administration.

Meet the participants

The 115 companies in the Lederer — Prasad survey shake out as follows:

Manufacturing	32%
Insurance	17%
Banking/Finance	10%
Systems consulting	9%
Government	6%
Utilities	5%
Retail	5%
Education	4%
Other	12%

Continued from page 85

because they will be one and the same person. Developers, who would be intrinsically involved from estimation to implementation, would be alert to poor user requirement reporting that could result in unreasonably low estimates.

An added bonus is that the process builds commitment. The analysts and programmers who perform the estimates cannot attribute overruns to somebody else's mistake. Allen Bellows, manager of planning yard systems at Bath Iron Works Corp., a shipbuilding company in Bath, Maine, says his estimators were the same people who developed the company's fleet maintenance planning application, which came in within budget and on time at about three man-years. "Developers were more committed because they developed the schedule. Their credibility was at stake," Bellows says.

Delay finalizing the initial estimate until the end of a thorough study. Perception is partly to blame for a poor estimate. The fact is that most projects go through various reestimates to arrive at a final cost figure, but management and users typically remember only the first estimate. They "tend to lock in on the low number," says Martin LaBrecque, information systems vice president of the automotive sector at Allied-Signal, Inc. in Morristown, N.J.

Even though there may be pressure from business management ("I'm routinely asked for estimates with little time to think about them," LaBrecque acknowledges), it is imperative to delay announcing the estimate until it is as accurate as possible.

The first rule is not to blurt out an incomplete guess. The second is to get approval for a feasibility study, which will uncover costs to make the estimate more realistic.

The study should zero in on labor costs needed to analyze, design, code and test. Also, include initial testing costs and the money needed if the test reveals the need for modifications to initial requirements. Don't forget about screens and reports for users, inputs, permanent files and files fed into other systems.

Anticipate and control user changes. The 115 companies in our study rated user changes as "the cause most responsible for inaccurate cost estimates." These changes are sometimes so numerous that a final system may look nothing like the one originally proposed — the one used as the basis for a cost estimate. Sixty-three percent of all projects in the study had to be revised in response to changed requirements.

Such a moving target makes it tough to plan costs, but companies can fight back by anticipating the frequency or extent of potential changes. "Knowing the business functions of the users is the best way of anticipating future requests," says Charlie Buden, project manager at Dayton Power and Light Co., a utility in Ohio.

That entails finding out why users do things and asking how they expect their business environment (their job, the company, the industry, competitors, vendors) to change. Are there new laws in their industry that might change the way they work?

Developers must communicate openly with users, helping them define their business problems and ferreting out any overlooked tasks, such as a screen or report that needs producing. Techniques such as prototyping, use of computer-aided software engineering tools and so on can help here.

Another tactic is to discourage unnecessary user changes that will ultimately invalidate an estimate. At Dayton Power, for instance, changes to a project require executive approval, Buden says. It is important to note, however, that the emphasis is on "unnecessary" changes — those nice-to-haves unrelated to vital areas such as usability or security. It is very important that developers and users together define what constitutes necessary changes beforehand.

Monitor the progress of the proposed project. Seven of every 10 of the large projects in our study had in place a formal monitoring process, such as milestones, so managers could keep estimate and project costs in line. Eight percent of them used an independent auditor to keep tabs on the project's progress. This person could typically come from a separate department such as accounting or auditing or could simply be someone not associated with the development of the project.

"We almost always have a user project

The estimate ills

Our 115 companies reveal the Top 5 insidious diseases that plague their estimating efforts

Changeoholism

Users frequently request changes.

Forgetitis

Overlooked tasks.

Requirements amnesia

Users lack understanding of their requirements.

Miscommunication syndrome

Insufficient user and analyst communication and understanding.

Vague's disease

Poor or imprecise problem definition.

Source: Albert L. Lederer, Jayesh Prasad

How object orientation can help project management

BY ALEXANDER M. STEWART

As development projects become larger and more complex, overruns in both budgets and schedules have become commonplace. It seems that management's reflex response to a project plan is to estimate how much overrun it can tolerate.

One of the problems with most project management plans is that they are developed from scratch. Instead of drawing on a library of historical experience, the project planner has only his experience and a few principles with which to work. Schedules are often based on too much optimism.

This kind of thinking may not have to be the norm forever. Borrowing the object-oriented paradigm from software development and, applying it to project management can provide the basis for a more uniform approach to collecting and utilizing historical development experience on a widespread basis.

The first steps

While the object-oriented paradigm is still in its infancy, companies can keep it in mind as a future framework for communicating project experience from one project to another. In the best of all worlds, companies will set up an experience database in the form of an object (experience) library.

Every project consists of four phases: requirements, design, implementation and verification. In object-oriented terms, each of these phases would be represented as "activity objects." Each of these objects can be broken down into more detailed activity objects (tasks) that are conceptually the same as objects in the layer above them (see chart). Instead of looking at phases and tasks as unique, companies can stress the commonality in them.

In large complex projects, this decomposition process continues until the task size is small enough so a task can be performed in a reasonably short time period — say two weeks. Every task, down to the most minute, continues to have requirements, design, implementation and verification activities.

In the experience library, each activity object would be a conglomerate of the results of several development projects employing the same type of activity object. Each activity object would have to be rigorously described; in this way, it becomes easy for developers to search the experience library for objects that can be useful for a current project.

Examples of what might be in a library include a structured analysis task for a subscriber database or an object-oriented design task for an airplane brake control system.

In keeping with the object-oriented paradigm, each activity task (or phase) in a project has a set of external attributes. The attributes, such as cost, schedule and status, are what differentiate one task from another. The value of an external attribute depends on the size and complexity of the task. The relationship between attributes and size/complexity has to be based on experience.

For example, the cost and schedule attributes for a particular activity task are projections based on the experience of similar tasks in previous projects. When the task is complete, what it cost, how long it took to complete and how many problems developers discovered are values added to an experience database.

Reliability issues

To develop a reliable relationship between attributes and size/complexity, a company must collect metrics over a wide range of projects. Defining a uniform set of metrics and formally collecting them are critical components of making the object-oriented paradigm work.

Another possible category of objects in a project are work product objects. A work product is the physical result of an activity — the requirements document you hold in your hand or the software that runs on a computer. It comes into existence at the completion of the verification activity and can be modified later by an appropriate activity, such as a requirements or design task.

Like activity objects, work product objects have a type (unique library descriptions) and external attributes. The external attributes would be title, type (such as document or code), state and version.

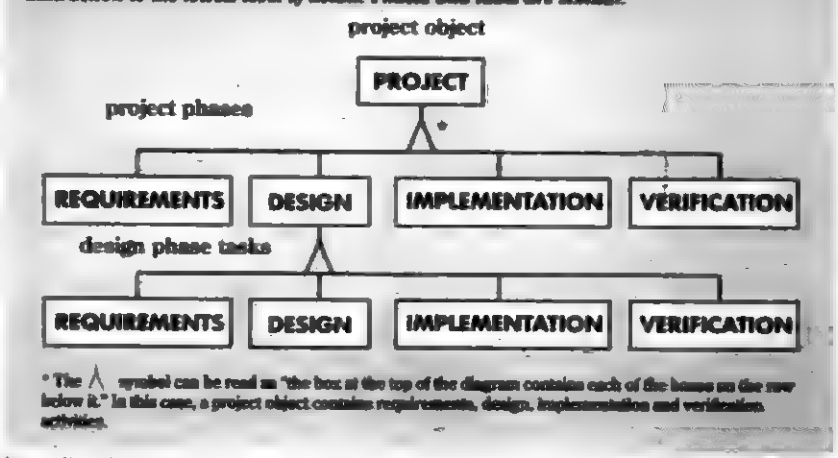
The experience library would contain prototypes of object classes (activity, product, etc.). A project planner could go to the library and select prototypes, using them as a basis for what he develops.

The planner could then spend analysis time only on tasks that involve new methodologies or techniques.

Because the objects he selects are based on experience, not speculation or gutless estimating, his project will have dependable costs and schedules. Products will be of a higher quality as a result of his not skimping on essential parts of the development process, such as requirements analysis and adequate testing. •

Where 'phases' and 'activities' overlap

This diagram shows that there is a continuity of concept from the highest level of abstraction to the lowest level of detail. Phases and tasks are similar.



* The ∧ symbol can be read as "the box at the top of the diagram contains each of the boxes on the row below it." In this case, a project object contains requirements, design, implementation and verification activities.

Source: Alexander Stewart

CW Chart: Janell Genovese

Stewart is a software development consultant at Kintail Associates, Inc. in Los Angeles.

manager who conducts project review meetings assessing schedule and budget, controlling the project's scope and authorizing changes," LaBrecque says.

American Management Systems, Inc. in Arlington, Va., uses three or four independent auditors for each of its projects, says Fred Forman, executive vice president at the company. The input of these auditors during a retail credit system project for hundreds of sites averted what could have been an "unpleasant situation," Forman says. The auditors pinpointed certain problematic parts of the plan, including how long the project would take and how much support it would need, so the estimates for the eight-figure project were more realistic.

Stringent, formal monitoring keeps developers on their toes as they strive to complete the project within the parameters of the estimate. Furthermore, knowing that managers will be following the project's and estimate's every move inspires great diligence and accuracy in the creation of the estimate.

Computing management should carefully study and approve the cost estimate. Even the best estimators make mistakes. That's why IS managers should study and approve the cost estimate rather than relying completely on the skills of estimators. Besides, having the department head involved probably increases the chances of a solid estimate. The study found a statistically significant correlation between the projects in which IS management signs off and more accurate estimating.

"In 1988, Ford implemented a life cycle methodology that incorporates management reviews of estimates to increase their accuracy," says Rich Wojtczack, manager of corporate technical planning at Ford Motor Co.

Rely on documented facts, standards and simple arithmetic formulas rather than guesses, intuition and personal memory. According to our study, there is a high correlation between accurate estimates and the use of documented facts, a simple formula and established standards. (See page 86 for a look at how an object-oriented paradigm and its idea of capturing and reusing experiences can be applied to project management.)

Don't rely solely on cost estimating software. Only 17% of our companies reported using a software package to help estimate the development costs of their large projects. We found that users of such packages were no more accurate in their estimates than were nonusers.

One cynic put the use of an estimating package this way: "First you come up with an estimate that you know management will accept, probably basing it on the amount of money the user has to spend. Then you follow the rules of the package to estimate the actual costs. That means taking a guess at parameters.

"If the software package produces an estimate that is too high, reduce the parameters to lower the estimate to the number you wanted in the first place. If the package produces an estimate that is too low, increase the parameters until you get the estimate you originally wanted. Management will be very impressed by the computer printout from the software-generated estimate, and that by itself may get the project approved. Don't worry about implementing the system within the estimate — let the programmers worry about that." •

Bad estimates' ripple effect

Cost estimating encompasses much more than just how much one large project is going to cost. That's why it is so critical to be accurate.

Here's how it is used to figure out staff numbers for projects, to control project implementation, to select and schedule projects and to quote charges to users.

- **Staffing:** A cost estimate typically includes the expected number of hours needed to complete a project (e.g., 4,500). A company has a standard number of productive hours for employees (e.g., 1,800 hours per year). Management decides when it wants the project finished (say in 6 months, or 900 hours). If you divide the project hours (4,500) by the man-hours to completion (900), you come up with the number of people — five — needed for the period.
- **Control:** In terms of project implementation, most people use hours from the estimate associated with particular, tangible accomplishments (milestones), counting hours until milestones are accomplished. If accomplishments begin to take more hours than planned, you take action (maybe revise the estimate, replace some people on the project team, etc.).
- **Selecting and scheduling:** Management contrasts the estimated number of hours required with the number of hours individual analysts and programmers have available so it can assign projects to available people.
- **Quoting charges:** The estimate is a dollar cost figure that information systems management might directly charge to users.

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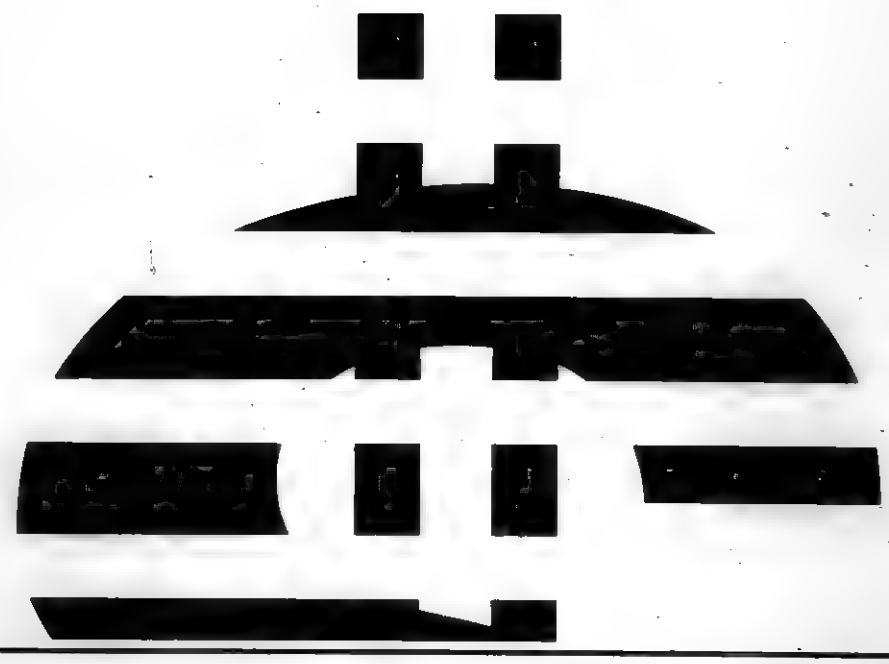

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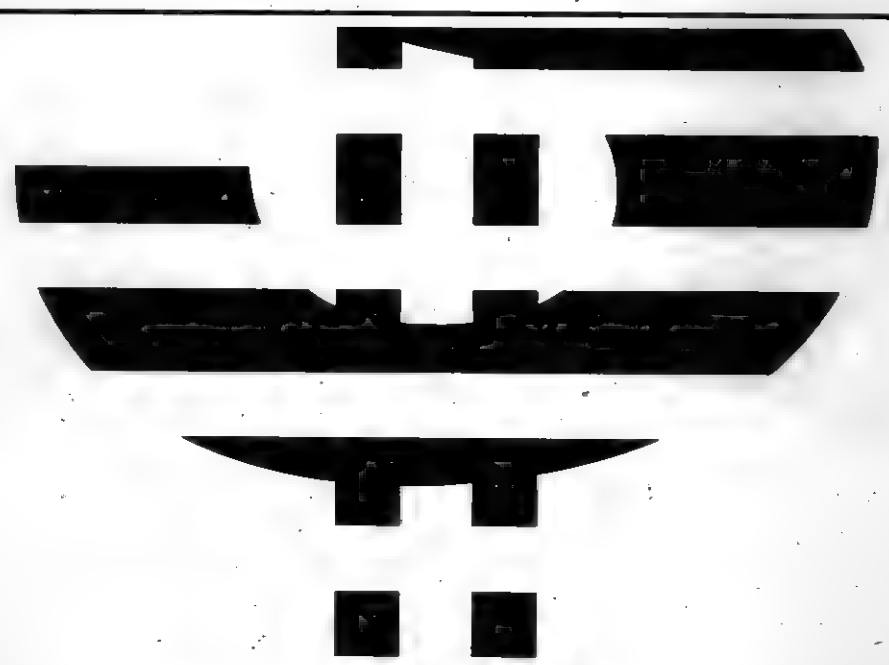

Inevitably, IBM says the only way to get increased AS/400 performance is to upgrade your CPU. And every time you upgrade, it means you're looking at new hardware, new software, additional memory, additional disk space, and greater service costs on an annual basis. (Ouch.)

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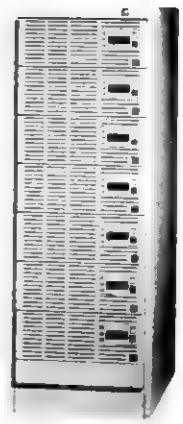

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MANAGER'S JOURNAL

EXECUTIVE TRACK

The Associated Group, an insurance and financial services company based in Indianapolis, recently named **Michael L. Wright** its senior vice president and chief information officer.

Before joining Associated four years ago, Wright served as executive vice president and chief operating officer of Baltimore-based American Health and Life Insurance Co. Prior to taking on his current CIO post, he was president and chief operating officer of Anthem Life Insurance Cos., an Associated subsidiary group.

.....

Thirty-eight year **Sears, Roebuck and Co.** veteran **Charles A. Carlson**, president of **Sears Technology Services, Inc. (STS)**, will retire within the next several months, as soon as the transition of STS to the newly formed Sears/IBM network outsourcing joint venture **Advantis** has been successfully accomplished.

The advent of Advantis was announced last week; the company is expected to be up and running by the end of the year, according to its founders. Carlson, who has served as president of STS since its founding in early 1990, is credited with helping to spearhead the new joint venture.

.....

The Washington, D.C.-based **Urban & Regional Information Systems Association (URISA)** recently elected **Laurel McKay** as its new president and announced three new board members: **Nora Sherwood Bryan**, **Peter Crosswell** and **Anne Hale**.

McKay is currently director of the development of Alberta, Canada's Land-Related Information System. Sherwood Bryan is information technology group manager at **Ernst & Young**. Crosswell, a consultant, now chairs the URISA Standards Committee, and Hale serves as director of geographic information systems and technology development at the **South Carolina Water Resources Commission**.

Security that's certifiably good

Seeking to lift profile of security pros, groups push to provide certification procedure

BY JAMES DALY
CW STAFF

What do the following people have in common: systems software specialist, internal auditor, chief of data management, head of software development, chief of communications management, network administrator and systems analyst?

Answer: They are all in charge of computer security.

Surprised? Don't be. The jumble of titles highlights the fact that data security is often considered an afterthought at many organizations — a responsibility tacked onto other responsibilities.

Not an afterthought

That is a dangerous attitude, says Richard Koenig, an independent security consultant who now heads the International Information Systems Security Certification Consortium, Inc. (ISC²), a nonprofit group pushing to provide the first specialized professional certification in the "infosecurity" field.

"Computer security is a very specialized art, but at many places it's treated as an afterthought," says Koenig, president of the Spencer, Mass.-based group. Adds Philip Chapnick, director of the Computer Security Institute in San Francisco: "A lot of people stumble into information security with no training. The company gets dinged on an audit and they quickly assign someone to do security."

ISC² was founded in 1989 by representatives of several professional organizations in conjunction with companies looking to easily identify individuals well-qualified for the task of resolving current and future information security issues.

"We need to quickly find people who we know can do the job, who know what they are talking about and can handle themselves well," says Hal Tipton, director of computer security at Rockwell International Corp. in Seal Beach, Calif., and vice president of ISC².

Koenig says ISC² is in the final stages of creating an examination for its Certified Information Systems Security Professional designation and hopes to hold the first tests next spring. The group will also hold training classes to prepare hopeful candidates for the test.

To get the certification program started quickly as well as to underwrite test development, ISC² directors set up an initial process whereby applicants can submit evidence of professional experience and qualifications to a review committee. Such qualifications include eight years in the data security field, with at least one year apiece in four of the 17 areas in which ISC² hopes to offer specializations: physical security, access control and cryptography, to name a few.

Under this "waiver of formal examination" process, approved applicants will be certified without having to take the exam, Koenig says. They will, however, need to pay the $250 test fee.

After the initial cycle, Koenig says, he hopes his group will certify more than 1,000 people a year.

Koenig says the certification process is intended to be "a starting point," not a Superman designation.

Let's get quizzical

ISC² security certificate hopefuls confront questions such as the following:

1. Who does David Kahn credit as the father of Western cryptology?

a. Genghis Kahn.
b. Kautilya.
c. Daniel.
d. Gorgo.
e. Leon Battista Alberti.
f. Reverend Blake Greenlee.

2. The strength of a cryptographic key is usually described by:

a. Multiplying the key length by frequency of change.
b. Dividing the number of possible keys by two.
c. Summing the key space.
d. Calculating the third harmonic of the key shift.
e. Calculating the coefficient of stochastic variance.
f. Subtracting the weak keys from the total key space.

3. Which of the following weakens the effectiveness of a password?

a. Increasing the number of password attempts.
b. Increasing the length of a password.
c. Increasing the size of the permissible character set.
d. Encrypting the password for transmission.
e. Encrypting the password for storage.
f. Masking the password or using a nondisplay field.

Answers: 1. e; 2. b; 3. a

Source: ISC² Group — CW Chart: Michael Siggins

What are the benefits of certifications? Koenig named several:

- The specialty tests will be able to identify applicants who have specific expertise, allowing organizations to streamline the process of job assignment and quickly assemble a security staff finely tuned to protect information in their specific environment, he said.
- Companies required to demonstrate a certain level of security proficiency in order to meet legislative or regulatory requirements will be able to certify that they have personnel who meet the criteria dictated.
- Additionally, "the qualifications of applicants can be assessed based on their achieving professional certification, rather than their ability to write a convincing resume," Koenig said.

Solid measure?

Good intentions notwithstanding, some users remain skeptical of the need for a certificate. "I know a lot of people who can't take a test worth a darn, but [who] are the best folks to have in the trenches when you're fighting a security problem," says Dennis Evans, a systems analyst in charge of network security at the Illinois Department of Revenue in Springfield.

Others say the certification process may provide a good foundation but warn against using it as a crutch.

"There is no substitute for real-world experience," says David Stang, chairman of the International Computer Security Association in Washington, D.C. "Continuing education needs to be heavily emphasized. I would hate to see us end up with a bunch of narrow specialists within the computer security discipline."

ISC² is not the only group to come up with the idea of standardizing data security training. Similar certifications are already offered by two other groups, although neither offers the degree of concentration on data security that ISC² promises.

The Institute for Certification of Computer Professionals in Des Plaines, Ill., does not focus directly on the information security function but does offer a subspecialization in its Certified Computer Programmer, Certified Data Processor and Certified Systems Professional designations.

Other organizations are also moving to provide a base of common knowledge to train future security professionals. The Computer Information Systems faculty at the University of Idaho, for instance, has developed an eight-step sample curriculum for teaching information security to students.

"It's not perfect," he says. "The certificate will be a measure of knowledge vs. the ability to apply it." Continuing education is built into the plan, he adds: Certified professionals will have to be recertified approximately every three years by taking a test dealing with new developments in the field.

Testing 1-2-3

The ISC² certification examination will consist of two parts: a core main review that evaluates an applicant's understanding of general information security practices and principles, and a number of specialty tests that will provide in-depth evaluation of specific areas of security.

Bank CIOs defend their systems strategies

BY THOMAS HOFFMAN
CW STAFF

Information systems executives at a few major U.S. banks have taken exception to the findings of a recent report that shows the banking industry still mired in the technological stone age despite huge dollar investments in information technology.

The 1992 survey of technology was issued by New York-based market research firm Ernst & Young in conjunction with trade newspaper *American Banker* and was based on responses from chief technology executives at 68 of the nation's 300 largest banks. It drew a bleak picture of banks slogging through an outdated, mainframe-heavy technology landscape, $14.1 billion worth of 1991 technology investment notwithstanding.

What we are seeing is the commercial legacy of the banks' technology legacy, Ernst & Young banking partner Diogo Teixeira said. Most, if not all, of the survey respondents continue to use outdated legacy mainframe systems to run more than 80% of their applications, he said, with a resulting drain on profitability.

But IS executives at several banks characterized their institutions as heirs, rather than victims, of legacy systems.

David A. Moore, senior vice president of information processing at Mellon Bank Corp. in Pittsburgh, said he believes alternate computing platforms, such as client/server-based or distributed computing environments, have not yet matured to the level required to process corporate-strength applications.

For example, Moore pointed out, major banks typically process between 4 million and 8 million checks per day. Only a mainframe, he said, can satisfy such number-crunching demand.

"The capabilities for high-volume transaction processing, reliability, security and connectivity needs for commercial banks can only be met with large mainframes," said Anish Mathai, vice president of technology strategic planning at Bankers Trust Co. in New York.

Ernst & Young's research shows that only a handful of banks have deployed leading-edge technologies such as check image processing and expert systems, Teixeira noted. On a scale of 100, the highest score the survey logged for any respondent bank in terms of technological advancement was 39. Teixeira declined to disclose the high scorer, but he said that many banks had scores close to zero.

Moore disputed the significance of such findings. "Check image processing has not evolved to the point where any bank has utilized it fully," he said. Mellon has been using FileNet Corp.'s file folder imaging system for nine years with good results, Moore said. The bank has also been testing IBM's check imaging systems for the past three years.

Many banks are in fact using leading-edge technologies to support their data centers, according to Teixeira. For example, he said, quite a few have been aggressive in updating their direct-access storage device technologies. Some use sophisticated on-line networks to support their telecommunications requirements, he added.

But these are the exceptions, Teixeira said. The rule remains technological catch-up at the banks. For example, few banks reported wide use of groupware, or software that is used to coordinate activities among multiple group members. The Chase Manhattan Bank NA in New York has been an early proponent of Lotus Development Corp.'s Notes groupware, but Teixeira said the $97 billion bank is an exception among its competitors. Only 6% of the banks surveyed are widely using groupware, he said.

Teixeira: *Few banks use E-mail regularly*

Waiting for advances

Mathai said that although he expects the use of groupware "to explode" throughout the banking industry over the next few years, he believes most banks are waiting for the technology to ripen.

Although the industry is using 766,000 microcomputers — a 19% increase from 644,000 last year — only 37% of the banks' locations have local-area networks, Teixeira said. The number of distributed computing systems is expected to grow from only 4% of the installed base today to 11% in 1995.

Barnett Banks, Inc., the nation's 18th largest bank in terms of assets, is moving aggressively to migrate many of its mainframe-based applications onto client/server environments, according to Jonathan Palmer, chief information officer at the Jacksonville, Fla.-based bank. Palmer said Barnett has roughly 700 LANs throughout its operations, most of them based on Token Ring or Ethernet.

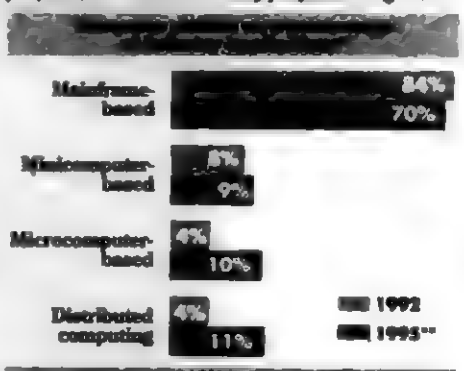
But at the same time, the bank is also migrating many of its mainframe applications from one box to another where they are most cost-effective, said Palmer, who is also chairman and chief executive officer of Barnett's information technology subsidiary Barnett Technologies, Inc.

"We need the storage, the data transfer and the processing power that the mainframe brings to bear," Palmer said.

Surprisingly, electronic-mail applications are being widely used by a mere 23% of the banking industry, according to the survey. Although the technology has been available for more than a decade, Teixeira said, "only a fraction of the banks are using it regularly." Both Moore and Mathai said their organizations were among that fraction. Palmer agreed that E-mail can be used more effectively. However, he added, banks do not deserve to be singled out. "E-mail is a tool that's certainly not being used to its fullest capabilities by any industry," he said.

Moving away from the mainframe

The mainframe will still be used more than any other platform, but it is also the only platform to regress



	Mainframes		Microcomputers	
	Available	Utilized	Available	Utilized
1990	38,000	28,500	650,000	32,500
1995**	62,000	46,500	1,600,000	80,000
2000**	200,000	150,000	72,000,000	3,600,000

*Based on a survey of 68 bank holding companies
**Projected

Source: Ernst & Young/American Banker — CW Chart: Michael Siggins

CALENDAR

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Rocky Mountain Computer Conference and Exposition. Denver, Sept. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

SEPT. 13-19

Software Development Conference and Seminar '92. Boston, Sept. 13-18 — Contact: Miller Freeman Publication, San Francisco, Calif. (415) 905-2741.

Buscon '92/East. Boston, Sept. 15-17 — Contact: Buscon '92, Norwalk, Conn. (203) 852-0500.

DOD-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Masbor Associates, Inc., Needham, Mass. (617) 449-4554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acucobol, San Diego, Calif. (619) 699-7228.

DevCon '92. Phoenix, Sept. 18-23 — Contact: Microsoft Fox, Inc., Perrysburg, Ohio. (800) 927-6368.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Rasmussen, Knowledge Industry Publications, Inc., White Plains, New York (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The 19th Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lemelin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Sensors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository Ad/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository Ad/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Scan-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

OCT. 11-17

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

OCT. 18-24

Info/Tech Management '92. Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Riscon '92 Conference and Exhibition. New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

Society of Information Management (SIM) 1992 Annual Conference. Universal City, Calif., Oct. 18-21 — Contact: SIM headquarters, Chicago, Ill. (800) 477-4561.

APICS Conference and Exhibition. Montreal, Oct. 18-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

OCT. 25-31

The 13th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

ASIS Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

Total Quality Management (TQM) '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

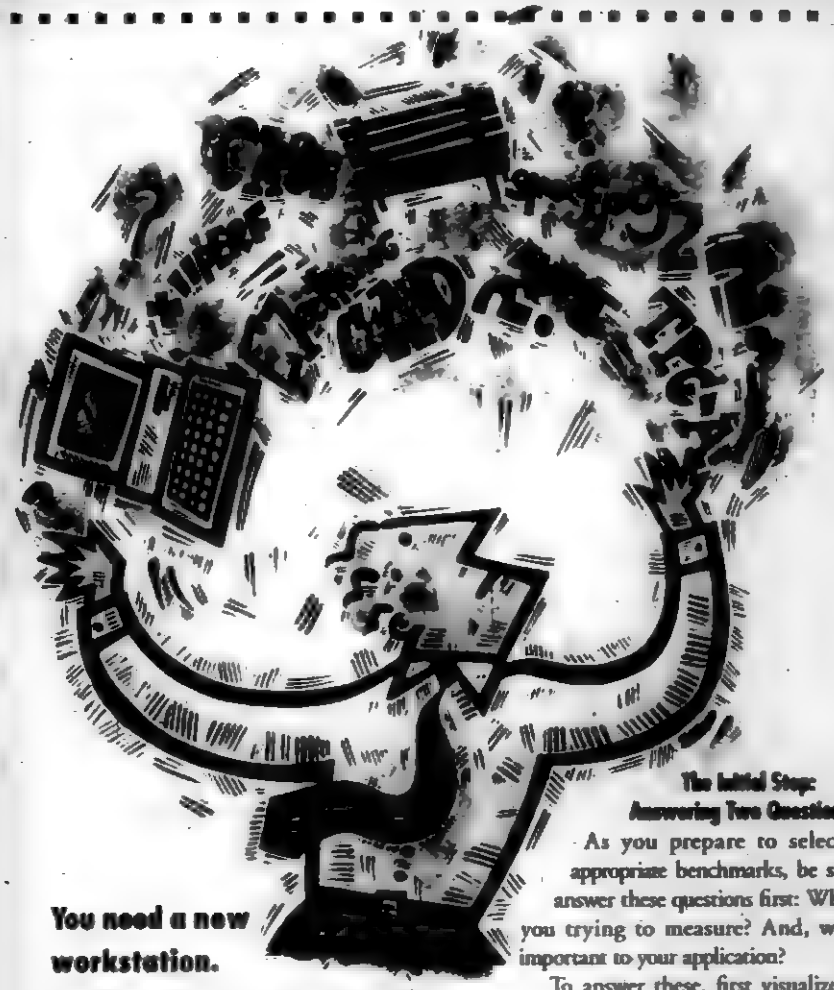
Expo Comm China. Beijing, China, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause Associates, Hong Kong. (011) 5-773-343.

NOV. 8-14

United States Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 662-3898.

12th Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalen, Tinius Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

Synergy '92. Anaheim, Calif. Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146



You need a new workstation.
But there are so many on the market. How do you decide?

Ask the right questions. Then, choose the right benchmarks.

You're planning to purchase a new workstation and you need some vital information to help you make the right choice. You need to find out whether System X can handle your particular application well enough to satisfy your business requirements and whether it's a better value than System Y. Ideally, this information would come from a direct comparison of the competing systems running your application under exactly the same conditions — a situation that's costly and not very likely to occur.

When you can't do side-by-side comparisons of actual applications, the next best information provider is the benchmark. Benchmarks measure everything from CPU to memory to I/O subsystems, and more. That's why it's up to you to choose the particular benchmarks that relate directly to your system's applications. Choosing the wrong benchmarks can be a waste of time and money. In the end, you may be misled into selecting a system that cannot do the job according to your requirements.

Before You Get Benchmarks, GET ANSWERS

The Initial Step: Answering Two Questions

As you prepare to select the appropriate benchmarks, be sure to answer these questions first: What are you trying to measure? And, what is important to your application?

To answer these, first visualize your application on a generic system in your environment. This generic system consists of eight basic components, including:

- Central processor
- Floating point processor
- I/O subsystems
- Memory
- Integer and logical ALU (Arithmetic Logical Unit)
- Network interface
- Operating system (utilities, compilers, databases)
- Graphics (for workstations).

Overall performance is determined by the interaction of these components with your application. Therefore, in determining what's important to measure, weigh these components according to your application's use of or dependency on each. The next step is to identify the benchmarks that measure the components most utilized by your application.

Major Benchmarks: What They Measure

Of the major industry-standard benchmarks, the following are likely to be your best sources of information prior to a system purchase. Most vendors will provide you with specific results of these on their own platforms.

SPECint92 and SPECfp92 (Standard Performance Evaluation Corporation)
Having replaced the original SPECmark, these measure processor speed, memory bandwidth, and compiler effectiveness. SPECint92 is a set of 6 Integer C programs. SPECfp92 is a set of 9 dp floating point FORTRAN, 3 sp floating point FORTRAN, and 2 sp C programs.

AIM II
This benchmark measures integer and floating point, I/O transfers, OS function and system calls, disk access, and data transfer over a UNIX pipe.

AIM III
Measuring CPU, floating point, I/O, memory, integer, and some system functions, AIM III can be used to compare relative performance of multiuser UNIX systems and can be customized for capacity planning. (Metric: AIM Performance Rating, Maximum User Loads)

AIM Milestone
AIM Milestone is functionally representative of real user loads in a multiuser environment. It measures system utilities speed and capacity for UNIX systems. (Metric: Utilities Index)

SPEC SDM
Measuring CPU, memory, compiler effectiveness, and I/O subsystems, SPEC SDM is representative of a UNIX software development multitasking environment. It also has a multistream metric for multiple processor systems. (Metric: Peak Throughput at scripts/hour)

TPC-A
This benchmark measures CPU, memory, I/O subsystems, terminal handling, and database performance. TPC-A is an online transaction processing benchmark and is database dependent. Some vendors use client/server or front-end/back-end configurations. (Metric: TPX-A and $K/TPS-A)

TPC-B
Measuring CPU, memory, and I/O subsystem and database performance, TPC-B should be used to compare relative performance of database managers. It does not, however, contain representative user interaction via terminal handling or think time. (Metric: TPS-B and $K/TPS-B)

Dhrystone
Dhrystone measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. (Metric: Integer MIPS)

Whetstone
Whetstone measures single- and double-precision integer processor and FORTRAN compiler efficiency. (Metric: KWIPS or WIPS)

Linpack
This benchmark measures single- and double-precision floating point using FORTRAN mathematical and scientific applications. (Metric: Sp MFLOPS, db MFLOPS)

CPU2
CPU2 measures CPU, memory, integer, and single-precision floating point. This benchmark is FORTRAN and fp intensive. (Metric: MVUPS)

X11PERF and GPC/PLB (for workstation graphics)
X11PERF tests aspects of X server performance from simple 2D vectors to complex 3D polygons. GPC/PLB is a set of picture-level benchmarks designed to measure relative performance of CRT-based displays.

NHfsstone
Measuring NFS server performance, NHfsstone is one of the very few network environment benchmarks in existence. It measures average response time for NFS transfers as the load on the server is increased.

Free Offer from AIM Technology

Take advantage of AIM Technology's Summer 1992 offer, and get critical benchmark data on the latest computing technology from Digital, IBM, Sun, Hewlett-Packard, NCR, and others. AIM — an independent third-party certifier of vendor performance — is offering a FREE issue of its Summer 1992 UNIX System Price/Performance Guide with your purchase of a one-year subscription ($29.95). That's five quarterly issues for the price of four. **For information, call Amy Yowell at 800-848-8649, (or 408-748-8649 inside California).**

Benchmarks continued ▶

Which Benchmarks Are Right for Your Applications?

Application	Components	Benchmarks
CASE Applications	Integer performance, 2D graphics, Disk I/O, Interactivity	SPEC SDM, SPECint92, AIM, Milestone, AIM III, Dhrystone
Electronic CAD	Integer and floating point math, Cache, 2D graphics, Disk I/O	Linpack, X11PERF, SPECint92, SPECfp92, Whetstone
Mechanical CAD	Floating point, 3D graphics, Memory, Disk I/O	SPECfp92, X11PERF, GPC/PLB, Linpack, CPU2, Whetstone
Database Applications	I/O, Database performance	TPC-A, TPC-B, AIM
Multipurpose Servers	Multitasking, Multiuser, I/O, CPU, Memory, Network interface	AIM III, SPEC SDM, NHfsstone
Scientific Applications	CPU, Floating point, Integer	SPECint92, SPECfp92, Dhrystone, Whetstone, Linpack, CPU2

To find out, establish which components are used in your application. Then, choose the benchmark that measures that component. Use this chart — listing specific applications, their components, and appropriate benchmarks — to help you decide.

Is There A VAX System or Upgrade in Your Future?

If you're in the market for a new VAX 4000, 6000, 7000, or 10000 system or upgrade, you can take advantage of 15 percent cost reductions on selected software and software license upgrades from industry-leading software suppliers, including:

- Andersen Consulting
- ASK Computer Systems
- Cognos Corporation
- Dun and Bradstreet Software
- EEC Systems, Inc.
- Ingres
- Lotus Development Corporation
- Oracle Corporation
- Progress Software
- Ross Systems, Inc.
- SoftwareAG
- Speakeasy Computing
- WordPerfect, Inc.

In short, a VAX system or upgrade purchase will guarantee you savings on more than 30 of the most popular business applications on the market today.

As CCC Found Out: VAX Systems Have the Future (and the Savings) Built Right In

Providing user access to a repertoire of more than 1.5 million titles, Copyright Clearance Center (CCC) of Salem, Massachusetts, found the solution to its growing business needs through the implementation of a VAX 6000 Model 610 system upgrade. Also, the company continues to use ORACLE as its relational database technology by taking advantage of last year's limited-time savings on software license upgrades.

FOLLOW IT UP WITH SOFTWARE SAVINGS.

Initially, CCC implemented Digital's VAX 6000 Model 310 because of the system's powerful CPU, increased memory and storage capacity, and high-speed networking capabilities. ORACLE was selected for its tight synergy with the VAX environment, in addition to its leading technology and third-party applications. What's more, ORACLE was able to provide CCC with SQL*Forms, RDBMS, and 4GL tools to generate applications quickly and to ensure flexibility in meeting business objectives.

With the Digital/ORACLE team, CCC was able to store its rights-holder and title information and process the considerable data and transactions necessary for photocopy permission. Plus, the company was able to respond quickly to customer requests and to adapt the system to accommodate future business challenges.

New Programs, New Business, New System Challenges

As CCC business increased, so did the demands on its VAX system. Additional computing power was needed to keep pace with projected growth. To that end, CCC teamed with one of Digital's largest distributors to formulate an upgrade plan that would protect CCC's current investments.

Boosting the current version of VMS running on the VAX 6000 Model 310 to VMS version 5.5 set the stage for an upgrade to the VAX 6000 Model 610. After only a two-hour conversion process, CCC gained ten times the computing power — without any disruption to its users. In addition, the upgrade allowed CCC to add 15 terminals, a new controller, increased I/O capabilities, and additional memory to accelerate the process and to cut database queries to sub-second response times.

With the purchase of this system upgrade, CCC acquired an ORACLE software license upgrade at a 15 percent savings.

Today, CCC continues to team its VAX system with ORACLE software to provide faster and better communications to publishers and customers.

For more information on VAX systems or software savings, call 800-DIGITAL (800-344-4825), press 2, and request ext. 24V.

Take the Electronic Connection

What's new in computing? Find out by using the Electronic Connection, Digital's online information and ordering service — all you need is a VT-compatible terminal or PC and a 1200/9600-baud modem. Simply dial 800-234-1998 between 7 A.M. and midnight EST, 365 days a year, for access to:

- The latest Digital news
- New product announcements
- Product descriptions and specifications
- Configuration tools
- Up-to-date pricing
- Software demos
- Training course descriptions
- Scheduling/shipping status

What's more, you can use the Electronic Connection to work up price quotes, or place orders directly with an approved credit agreement, reducing paperwork and turnaround time. All quotes come with 60-day price protection, and all Digital Business Agreement and GSA discounts apply. Plus, FASTship service — next-business-day shipping — is available for many Digital products.

The best part? You get it all at no charge. The Electronic Connection service is free — with no obligation to buy.

For more information or for assistance in accessing the Electronic Connection, call 800-DIGITAL (800-344-4825) and press 1.

Need It in a Hurry? Use Digital's FASTship.

Get what you need fast with Digital's FASTship service. With FASTship, your order is shipped the next business day — or sooner. What's more, we offer FASTship on 2,400 of our most popular products, including printers, video terminals, disk and tape options, networking products, and more.

Just look for the yellow FASTship highlight next to the product in your *DECdirect* catalog. Then specify FASTship service when you call or fax in an order — at no extra charge. What's more, all discounts and Trade-Up Values apply.

DECdirect accepts both credit card and invoice orders. To place an order, choose one of these options:

- Call 800-DIGITAL (800-344-4825).
- Utilize DECdirect's toll-free fax line at 800-234-2298.
- Access Digital's online Electronic Connection by dialing 800-234-1998 at 1200 to 9600 baud, from any Digital-compatible terminal or PC.

For more information on Digital's FASTship service, or to receive a copy of the latest *DECdirect* catalog, call 800-DIGITAL (800-344-4825), press 2, and request ext. 62X.

GETTING THE FACTS ON *Alpha Services*

YOU'VE HEARD THE STATEMENTS about Digital's high-performance Alpha technology:

Digital is paving the way to twenty-first century computing ... Today's VAX systems are Alpha-ready .... Your initial investment will always be protected.

Sounds good. But, you still have questions. You want more information — about Alpha itself, the migration process, and the service offerings that will be key in paving a flexible and cost-effective pathway to better computing solutions for the future. Here, Peter Jansen, Digital Services Alpha Program Manager, answers some of your most commonly asked questions regarding Alpha, and its ability to see your business through to the twenty-first century and beyond.

Q. Why should I change or move to Alpha?

A. Alpha represents the technology platform that will take today's computing environment well into the twenty-first century. With Alpha, the performance, productivity, and efficiency that you already have with VAX and DECsystem platforms is significantly enhanced. For example, Alpha extends your ability to:

- Access large decentralized and distributed databases, using object-oriented technologies
- Integrate knowledge-based systems and rules
- Integrate voice, data, and images
- Handle volumes of data movement.

In addition, the "openness" of Alpha technology will provide you with flexibility, long-term investment protection, and operational performance improvements. Digital will initially offer OSF, NT, and OpenVMS Alpha systems. OSF and OpenVMS will have the same open features available on today's VAX and DECsystem platforms.

Digital Services can support you in the process of reengineering your overall business, downsizing to a distributed client/server environment, and integrating Alpha into your existing computing environment — whether that environment is based on a current VMS, ULTRIX, non-Digital UNIX, or proprietary platform. Service offerings include:

- Specific application porting services
- Overall conversion and supporting tools
- Configuration services
- System management support, such as performance tuning and capacity planning
- Network design and management services
- Customer training and consulting services
- Hardware and operating system support on both Alpha and multivendor platforms.

All in all, Digital can provide a complete single source of support for your open computing environment.

Q. Does migration to Alpha mean costly changes and/or obsolescence of current computing equipment?

A. No. In fact, Alpha was designed to be integrated into your existing computing environment. This means you can take immediate advantage of improved system performance while maintaining compatibility with the computing environment already in place. Moreover, Digital can assist you in protecting your hardware/software investment by offering a flexible portfolio of migration, assessment, porting, configuration, and consulting services — whether you are evolving from an existing VMS or ULTRIX platform, or moving from another vendor's platform.

We have also set up Application Migration/Resource Centers throughout the U.S., Europe, and the General International Area (GIA) — centers that are designed to assist you in planning and implementing Alpha into your environments. Our new focus on multivendor support allows you to choose one vendor to manage your complete training needs, regardless of the technology or application.

Alpha's high-performance platform will pave the way for several emerging technologies such as AI, object-oriented databases, imaging, and multimedia. This will allow you to implement the system architecture necessary to support your business processes in order to maintain a competitive advantage.

Q. As an OSF or future NT customer, will I be forced to migrate? As a VMS customer, will I be forced to move?

A. The answer to both questions is no. Alpha will support OpenVMS, OSF, and NT — and all three operating systems will be compatible within their respective orientation. Also, all three systems will be compatible with many of the same industry standards. Digital's technology assessment consulting services can help you determine the environment that is truly optimal for your business.

As a VMS customer, you will not be forced to move. In fact, since OpenVMS will be offered with Alpha, you can integrate into your existing computer environments and run your existing applications though a simple recompilation process. As a result, you will be able to maintain a single VMS source.

In response to questions concerning other computing environments:

- ULTRIX customers will be able to move their applications to OSF with minimal effort — just like our VMS customers. Because OSF is based on the OSF standard, all applications based on OSF specifications will recompile and execute under Alpha.
- Applications developed under POSIX will move between OpenVMS and OSF as well as other POSIX-compliant systems. OpenVMS has also received XPG3-BASE branding from the X/OPEN Consortium.
- Alpha will be offered with NT from Microsoft and will support any NT application.

Most applications will recompile and execute under Alpha. Some applications can take maximum advantage of Alpha's performance capabilities as a result of tuning and performance optimization work.

Digital will support you with open training courses, such as our recently announced support for all Microsoft course offerings. In addition, qualified consulting services will help you build an open multivendor environment. All in all, Digital's consulting and training services will help you rethink, reengineer, retool, and reenergize your business processes.

Q. What is Digital doing to help me understand the need to plan for change and to help manage my computing environment?

A. We offer a full portfolio of Alpha services designed to assist you in the planning, design, implementation, and management aspects of Alpha as you begin to integrate and utilize this new Digital technology. These include:

Consulting Services
These offerings are designed to help you understand how to maximize the advantages of Alpha technology in redefining your business processes and in designing your information technology plan for the future.

Application Services
Providing a range of offerings, including tools and assistance, these services help you to fully integrate Alpha into your existing computing environment.

Configuration Services
These services are designed to assist you in understanding how to take maximum advantage of Alpha technology.

Learning Services
Offerings in this category are designed to provide your employees with training on Alpha technology and related products. Courses such as change management are also offered to help management deal with the evolving computer technologies of the '90s.

Hardware, Software, and Network Services
These services not only support Digital's Alpha products, but also provide multivendor support offerings, such as LAN integration, multiple OS support, hardware services, and support for industry-standard applications.

Q. Will I get stuck if I don't move to Alpha? In other words, will technology and support pass me by? On the other hand, if I choose to move to Alpha, will my current equipment become obsolete?

A. Whether you choose to move to Alpha — or choose not to at this time — you most certainly will not "get stuck." We will continue to provide enhanced Alpha-ready VAX systems that are board-upgradable to Alpha, as well as ongoing service for both VAX and DECsystem platforms. What's more, you will continue to receive all the advantages of OpenVMS and OSF whether you use VAX platforms, DECsystem platforms, or Alpha.

Applications currently used on VAX will be available on Alpha. To that end, we are working with software vendors to ensure the availability of more than one thousand initial applications for Alpha — with many more to follow.

Q. How does Alpha fit in with Digital's ongoing service strategy?

A. Alpha provides the industry with a proof point of Digital's commitment to Open Systems and continued price/performance leadership — the kind of price/performance leadership already offered by VAX systems. This commitment to Open Systems is supported by the licensing of the Alpha architecture, industry-standard operating systems (OSF, NT, OpenVMS), and broad-based applications support. Alpha supports, enhances, and enables Digital as a leading-edge, Open Services company — strategically positioned to be a single-source provider of multivendor services and systems integration capabilities.

Alpha can be a key enabler for you by providing key opportunities to reengineer unproductive business practices. Digital Services plays a leading role in providing you with the consulting and assessment needed to maximize your business opportunities.

For more information on Digital's Alpha Services, call Peter Jansen at 508-496-8857.

Your Financial Picture with Digital Leasing

Along with the general benefits of stretching your technology budget and implementing your business plans quickly, certain types of leasing can favorably "window dress" your company's financial statements — positioning your organization as one that is stronger, more liquid, and more profitable. To that end — and for maximum benefit from your leasing options — it's important that you distinguish between the operating and the capital lease.

Capital and Operating Terms Defined

A lease contract that is a true rental arrangement is called an operating lease. In this type of contract, you have full use of the system, while the lessor maintains system ownership. The operating lease is, in both form and substance, a lease.

However, a lease contract that transfers the characteristics and benefits of system ownership to you is called a capital lease. Although a lease in form, the substance of this type of transaction is that of a purchase — and treated just like any other company asset that has been purchased.

In other words, a capital lease is shown, or capitalized, on your financial statement as an asset. At the same time, a corresponding liability of the same dollar amount as the asset is recorded on the balance sheet. This liability is amortized over the life of the lease the same as the outstanding debt on an installment loan.

Classifying Your Lease

A capital lease reflects ownership, whereas an operating lease reflects usage only. In determining the classification of a lease — either capital or operating — the Financial Accounting Standards Board No. 13 (FASB 13) uses the following four criteria:

- The lease automatically transfers ownership to the lessee.
- The lease contains a bargain option.
- The lease term is equal to 75 percent or more of the estimated economic life of the leased property.
- The present value of the minimum lease payments, at the beginning of the lease term, equals or exceeds 90 percent of the fair market value of the property.

If any one of these four criteria is met, the lease will be classified as a capital lease. If none is met, the lease becomes, by default, an operating lease.

The Operating Lease Paints a Pleasing Financial Portrait

In the case of an operating lease, the leased system is not capitalized nor is the corresponding liability recorded on the balance sheet. What's more, the only expense appearing on your income statement attributable to the lease would be the lease rental expense.

This type of off-balance-sheet financing has many advantages, including dressing up your financial statements by improving your company's financial ratios, at least initially. As the operating lease does not create a liability on the balance sheet, your organization also appears to be less leveraged — making your financial picture more appealing to potential lenders. In addition, an operating lease helps you lower your asset base, as well as increase your reported earnings. In short, an operating lease enables you to remove a portion of your debt obligation from the balance sheet. Thus, your financial statements — and your entire organization — appear more solvent and less encumbered by debt.

Making your financial statements look as strong and healthy as possible to shareholders and lenders is high on your list of priorities. The use of operating leases can help you achieve this goal.

Take Advantage of Digital Leasing

Leasing — operating or capital — is one of the most popular and economically sound means of acquiring computer equipment today. Find out how your company can benefit from leasing Digital products by calling 800-322-3239 (or 800-343-3451 inside Massachusetts). We'll put you in touch with one of our leasing experts, who can answer your questions and provide you with a FREE copy of *An Executive Guide to Computer Leasing*.

TurboWare Packs Your System with HIGH-PERFORMANCE PUNCH

Digital and EEC Systems have great news for VAX 4000, 6000, 9000, and MicroVAX system users. It's called TurboWare — a performance package of Digital memory and EEC Systems SuperCache.

If you seek cost-effective system performance gains, Digital and EEC Systems give you the perfect hardware/software solution.

SuperCache, a software accelerator for VAX VMS systems, runs automatically and can generate significant performance improvements — as much as 2 to 15 times your current performance — within seconds of installation.

Utilizing caching technology, SuperCache uses 100 percent of your system's free memory to move data from frequently used files into main memory. However, it has the ability to return memory back to VMS upon demand. For high-performance results, it is necessary to have at least 10 percent or more free memory when using SuperCache — the more free memory available for caching, the greater the performance results achieved.

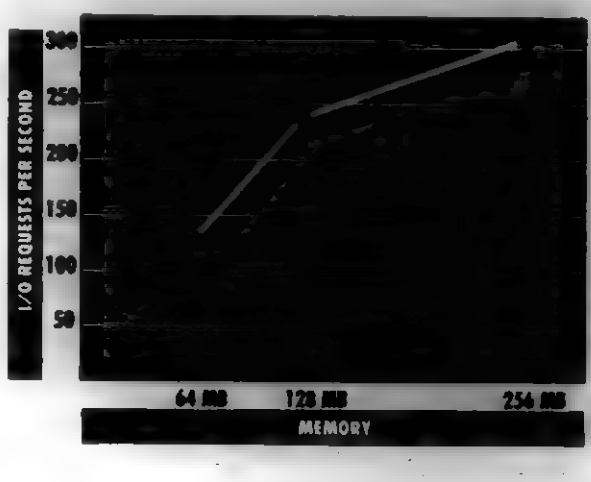
SuperCache capabilities combined with Digital high-performance, high-reliability memory options make TurboWare the ideal solution for all your applications, especially read-intensive applications. TurboWare increases system performance by eliminating I/O bottlenecks caused by slow disk response time.

For this reason, TurboWare significantly enhances billing, distribution, banking, and manufacturing systems applications.

Ultimately, TurboWare provides you with significant cost-savings through increased system performance and user productivity.

Call for Free Software Trial

For a free TurboWare brochure, or a 30-day free trial of SuperCache software and free consulting service during the same time period, call EEC Systems at 800-388-8872, or fax EEC at 508-443-9997.



How good is the SuperCache/Digital Memory team? The graph shows a doubling of I/O requests per second when SuperCache is added to a VAX 6240 (64 MB), running a software development testing application. What's more, the graph displays a continued increase in I/O requests per second being serviced as more Digital memory is added.

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Items of interest from publications, speeches, surveys and research projects

Patience pays

■ It's a common mistake for companies to set short-term financial goals for advanced manufacturing technology, according to Carol Beatty, an associate professor of management at Queen's University School of Business in Kingston, Ontario. Beatty, who recently completed a four-year study of advanced manufacturing implementations at 10 companies, says this approach almost always guarantees disappointment because many such projects take at least a year, often two, to install — and even then usually don't produce immediate benefits.

Only half the companies that try to implement advanced manufacturing technology actually reach their original goals, she says. The other half wind up dead-ended or off-track, usually because of management problems.

Source: *"Implementing Advanced Manufacturing Technologies: Rules of the Road,"* by Carol A. Beatty, Sloan Management Review, *Summer 1992.*

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Games CEOs play

■ Management consultant Charles F. Hendricks says he sees much of the current reorganizational activity in corporate America as shallow, knee-jerk reactions that give chief executive officers something to point to but generate little in the way of productive change.

"It is not a coincidence that terms such as *restructure* and *downsize* dominate management thinking," Hendricks writes. "Tables of organization and staffing are tangible — you can see them, you can count boxes, lines and people and, most importantly, you can write them down on a piece of paper. . . . CEOs, when they appear to be losing ball games, restructure and downsize and then show the investment community another piece of paper to demonstrate that they are in control — they are organized. 'So it is written, so it is done!' "

Source: *"The Rightsizing Remedy: How Managers Can Respond to the Downsizing Dilemma,"* by Charles F. Hendricks, published by the Society for Human Resource Management and BusinessOne Irwin.

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Give to get

■ Whitmire Distribution, a Folsom, Calif.-based wholesale distributor of pharmaceuticals, invested three years developing an inventory management system, which it provides free of charge to its 7,000 customers.

Reportedly, many customers have been able to reduce their on-site storage by up to 40%.

Source: *Financial Strategies section,* Inc. *magazine, August 1992.*

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Intelligence barriers in Europe

■ Collecting information on the competition can be tough for U.S. companies operating — or planning to move operations into — European companies, according to *International Business.* While business information is fairly accessible in the UK, Sweden and Belgium, many other countries present considerable challenges.

Among the toughest are the Netherlands, where public records on businesses are scattered in local town halls, and Germany, where the data protection law passed to protect individuals is also often used by companies to avoid releasing even basic information such as the number of employees on their payroll.

Source: *"Super Snoops,"* by Dave Savona, International Business, *May 1992.*

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Surviving the maquiladora audit

■ Hundreds of U.S. companies have opened assembly plants called "maquiladoras" across the border in Mexico to take advantage of Mexico's low labor rates and then send the assembled products back to the U.S.

However, to be sure that the products qualify for low import tariffs, the U.S. Customs Service must be able to audit the organization's cost accounting systems.

Companies must provide the government auditors with read-only access to the accounting systems and with programmers who can retrieve and sort the necessary data.

Source: *"Maquiladoras, From an Auditor's Point of View,"* by Willie del Barrio et al, Global Trade Talk, *July/August 1992.*

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Compiled by features editor Joanne Kelleher with contributions from Mitch Betts, national correspondent.

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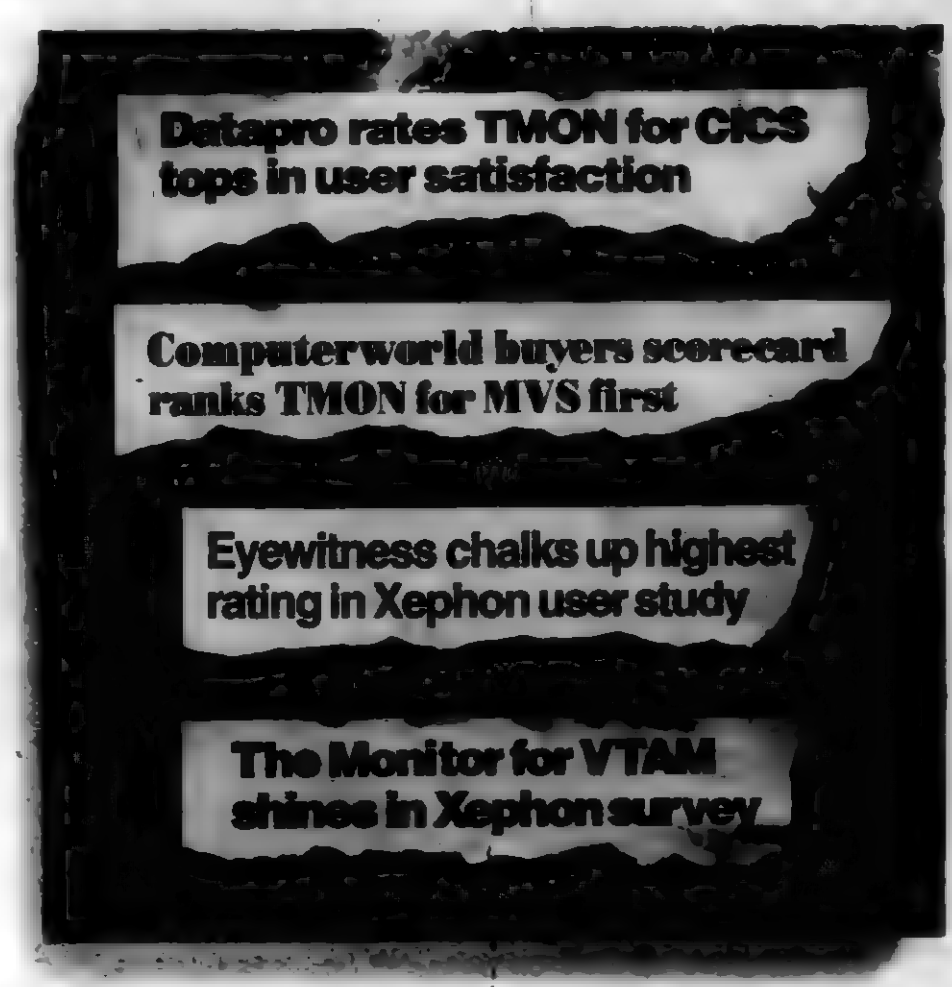

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Best of all, TNET is based on industry-leading performance monitors and proven problem management products. **World-class tools** that users and independent researchers alike rate number one in value, service, and ease-of-use.

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On Friday, July 31, 1992, a U.S. District Court ruled that Borland's Quattro® and Quattro Pro® spreadsheets infringe the copyrights of Lotus® 1-2-3.®

In its ruling, the Court concluded that "... the Quattro programs derive from illicit copying," holding that "Lotus has sued" and "Borland is liable."

Lotus innovated. Borland copied.

We sued to protect our intellectual property rights. And in winning we've helped preserve an environment in which independent software developers can freely develop innovative new products without fear that their creative work will be stolen. We sued to protect innovation, not to stifle it. Borland's copying is no different from someone plagiarizing *The Grapes of Wrath*, changing the ending, and calling it a new novel. It's really that simple.

But the courtroom is just one of the places where Borland® has lost.

They've lost in the marketplace, where 1-2-3 for DOS continues to dominate. Based on a recent report from the Software Publishers Association,* Lotus 1-2-3 accounts for seven out of 10 new DOS spreadsheet purchases and over 80% of all DOS spreadsheet revenue.

They've lost in performance categories, despite their claims to the contrary. For example, in a recent National Software Testing Laboratories performance test,** 1-2-3 Release 2.4 beats Quattro Pro 4.0 hands down in areas users care about most. The tests reveal that 1-2-3 Release 2.4 is four times faster than Quattro Pro 4.0 in retrieving a .WK1 file; 18 times faster at moving a block of data; three times faster at product load; one-and-a-half times faster at printing; and 35 times faster scrolling right or left in graphical mode.

They've lost on the innovation front, too. Lotus 1-2-3 was the first DOS spreadsheet to introduce innovative technologies such as true 3D worksheets, the Viewer, WYSIWYG display, DataLens,® and unique one-click SmartIcons.™ And we're still the only spreadsheet that offers true compatibility across platforms.

Who should you trust?

But perhaps most importantly, Borland lost what matters most to customers: credibility.

For instance, Borland told the Court they needed to copy our menus to achieve macro compatibility with 1-2-3. Now they tell their customers that the 1-2-3 menus aren't critical to compatibility.

So ask yourself: to what extent can you trust a company that values what is expedient over what is legal? And to what extent can you rely on the product it wants you to buy?

Here's our advice: choose the product, and the company, you can trust. Choose Lotus. After all, we're the best in the business at building innovative spreadsheets. Always have been, always will be.

Case closed.

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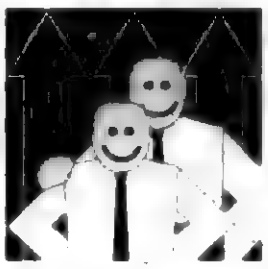
*Based on Software Publishers Association revenue and unit share data, May 1992, for North America. **NSTL standards used in tests performed on an IBM® AT® 286 with 640K memory. © 1992 Lotus Development Corporation. All rights reserved. Lotus, 1-2-3 and DataLens are registered trademarks and SmartIcons is a trademark of Lotus Development Corporation. Quattro, Quattro Pro and Borland are registered trademarks of Borland International, Inc. IBM and AT are registered trademarks of International Business Machines Corporation.

Mentors can help make or break a career

BY KATHLEEN GOW
SPECIAL TO CW

Mentoring saved Howard Piggee's job. And lack of mentoring almost cost Harvey Shrednick his.

Shrednick, senior vice president of information services at glassware company Corning, Inc., was nearly fired from the Corning, N.Y., company for failing to go through the proper chain of command on a personnel decision — a transgression that a mentor could have warned him about.



"I suffered from not having a coach," Shrednick says. "A mentor might have shared his mistakes."

He turned the experience around and hopes to help others avoid such mistakes by participating in Corning's formal mentor program. He now coaches Piggee, an information systems business manager at Corning's Science Products Division.

It's a good thing Piggee had a coach; without a veteran's insight into corporate culture and the style of particular players, he says, "there is a good possibility that I would have left the company soon after starting."

But while everyone seems to want a mentor, few IS professionals take the initiative to find one when there's no formal program.

Their resistance is understandable; many lower level professionals don't like to admit they need help with something. "They feel they can do it on their own — and they probably can — but outside support would make it easier," says James Lawler, vice president of sales management systems at the Advanced Office Systems Group (AOSG) of Merrill Lynch & Co. in Princeton, N.J.

Lawler, who also mentors IS students at Pace University in New York and St. Francis College in Brooklyn, N.Y., says, "People feel shy about asking for support, but some are very turned on about sharing their experiences."

AOSG's Patty Millward agrees. "I wanted guidance on making a career change," says Millward, associate marketing manager in business financial services in Chicago. "As a woman in a male-dominated field and company, I wanted to know, how do you handle this from a political perspective?" She identified a very visible woman in the company whom she wanted to emulate and approached her.

"I said, 'I have some career issues I'm dealing with; I really like your style and I would like to spend some time with you.' She was flattered and said, 'Sure,'" Millward says.

Building the relationship

While some people choose mentors to help them with interpersonal situations such as handling a tough boss, others look to their IS mentors for technical education and direction.

Marcia Duhart, a senior systems analyst at AOSG, selected a mentor with a strong systems background who had worked for the company for 18 years.

Some "mentorees" derive more benefit from being mentored by colleagues who work in other departments. Millward said that having guidance from someone in a different department fostered openness. "I could be frank with her, and she was candid with me," she said.

Millward's mentor gave her direction in negotiating for a higher position. "I had never negotiated before," she says. Her mentor pointed out from an employer's standpoint issues that would not be negotiable and how to present things in a subtle way.

Programs like those at Merrill Lynch's AOSG and Corning usually give initial training to both mentoree and mentor, setting guidelines for the relationship.

"You have to be flexible with schedules," Millward says, while at the same time making sure that your mentoring meetings are a priority. Some find it easiest to meet in either person's office during the workday. Others opt to meet for lunch in the freer environment of a restaurant.

The most important requirement for seeking out a mentor is knowing your objective: Do you want someone to answer day-to-day questions or someone who will get involved in your career?

The coach also needs to make the coachee comfortable by bringing up issues about the relationship. According to Piggee, "A long-term coach has to be willing to trust the coachee enough to share his experiences and feelings and give guidance that is maybe not the corporate line."

Gow is a free-lance writer based in Medford, Mass.

Ground rules

Once you've identified a potential mentor, the next step is to see if the other person is willing. When a relationship is established, veteran mentors and mentorees recommend that participants address the following:

Agree to terms at the first meeting.
- What does each party expect from the relationship? What are the boundaries?
- How much time should be spent? During work or after?
- When and where is it OK to call?
- What areas will be covered? Professional only?
- What level of confidentiality do you expect?

Be willing to accept responsibility.
- Mentorees are responsible for their own career.
- Mentorees should drive the relationship; set a specific agenda so that the mentor knows you are serious.
- Mentors should be willing to share experiences.
- Mentors should encourage two-way communication.

Do a process check every few months to make sure the relationship is still on target.
- Is it a two-way relationship?
- Is the mentoree taking any advice given?
- Is the mentor pontificating?

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You can't be fired for innovation

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is R. Max Steiner, a marketing director at Contract Solutions, Inc. located in Salem, N.H.

Q For the past three years, I have been developing my own database product. I believe I will have an excellent product to market. Can I be fired for developing my own product?

A Whether or not your employer has just cause to terminate you is dependent on your contract and any potential existence of a conflict of interest.

In most cases, you cannot be fired for trying to market a product of your own invention. However, you must not be in conflict with your current employers. Once you have prioritized your personal goals with your employment obligations, make sure you are not violating any contractual issues.

Do not attempt to develop a product that is competitive with your employer's. And never use your employer's invention or equipment to aid in your development efforts.

Q I am a programmer/analyst. Our department is using a System/38 and has no immediate plans to move to an Application System/400, so there's not much opportunity to expand my experience. Besides, I wish to work in a personal computer or workstation environment. What can I do?

A Volunteer at a nonprofit organization whose work you support. These groups are often in need of technical people to help with their databases. This would allow you to give back to the community, while at the same time expanding your skills.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I am a principal analyst at a large financial services organization. I have been approached about a possible management job and am unsure whether to accept. I do not want to wake up one day with my technical skills no longer in demand.

A First, take pride in being offered a promotion. Second, forget management vs. hands-on and focus on your own feelings. Do you feel challenged in your job? Is your company financially secure? Do you have a sense of loyalty to your company? If your answer to all these questions is yes, then accept your promotion with enthusiasm.

Once a decision is made to stay and pursue this promotion, then tackle the issue of management experience vs. hands-on experience.

Q If you pass an exam for certified computer programmer (CCP), certified data processor (CDP) and certified systems professional (CSP) and have these acronyms attached to your name, does it help you in your career?

A I have always questioned the effectiveness of certification programs. I have never had a client require certification in the backgrounds of candidates I place. Based on this experience, I would say that these programs do not help your career.

I do wish to stress that these programs can be useful. A person can take these certification tests to enhance his sense of professional worth.

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TIP of the MONTH

How to turn down overtime without damaging your career

➤Try to negotiate when the overtime is put in as opposed to saying no. We'll accommodate a shift of work hours if people can focus on a deliverable better that way over a short period of time.

Irwin Bernstein, vice president, planning/administration
Maidenform, Inc., Bayonne, N.J.

➤Let your boss know you have plans before you're asked by dropping him (or her) a note. We have weekly meetings here and talk about a lot of things – and availability is one of them.

Dennis Love, IS director and vice president
Acme Thread and Supply, Inc., Los Angeles

➤If there's a good reason for declining, that's OK. But the staff should be flexible for critical business applications, and management should be flexible for personal emergencies.

Regis Garbo, director, data center and telecommunications
Lever Brothers Co., New York

➤You would have to choose very carefully when you turn down overtime because having a commitment to your career is part of moving through the management ranks.

Julie St. John, vice president of transaction processing and management
Fannie Mae, Washington, D.C.

➤There are sometimes legitimate, unexpected needs for overtime. Crises happen and deadlines flip, and people have to pitch in. Overtime can be an opportunity for recognition and advancement. But mandatory overtime — on management's part — is fear-based, exploitive and oppressive.

Brian Graham, project leader
Administrative information services
Columbia University, New York

Compiled by Leslie Goff, a free-lance writer based in New York.

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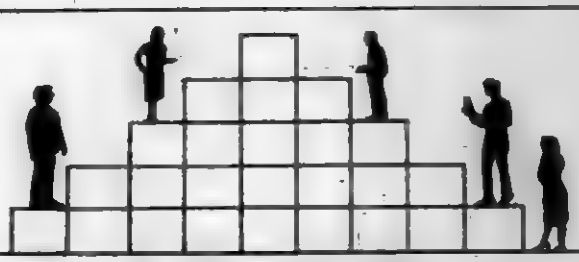

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Essex offers excellent compensation and benefits programs. For confidential consideration please send resume and salary history by September 4th to: Employment Department, Essex Group, Inc., MS-G19, P.O. Box 1601, Fort Wayne, IN 46801-1601. An equal opportunity employer.

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SYSTEMS ANALYST wanted. Duties: Analyzing the client company's image processing requirements & develop a system satisfying those needs in the most timely & inexpensive manner using latest computer image processing technology, then designing, developing & implementing the computer software needed to create this system. This will include implementing image processing & integrated multi-media data bases within a WINDOWS & DOS programming environment using Relational Database techniques. The database will contain pictures, descriptive text & test data for complete automobiles. Need Master's in Computer Engineering and 1 yr exp in the job offered or 1 yr exp as Software Engineer. At least 1 yr of the related exp. must include software development for MS WINDOWS & the related exp. or 1 grad. course must include image processing & relational database programming. Pay is $40,000 per yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #48492. Employer Paid Ad.

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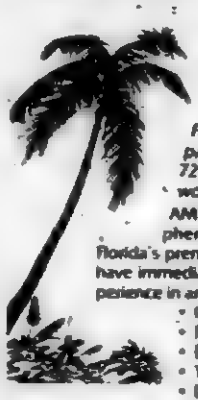

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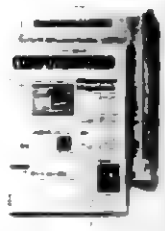

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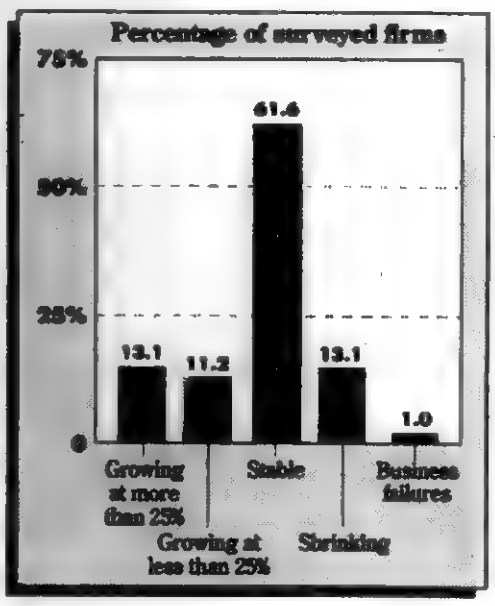

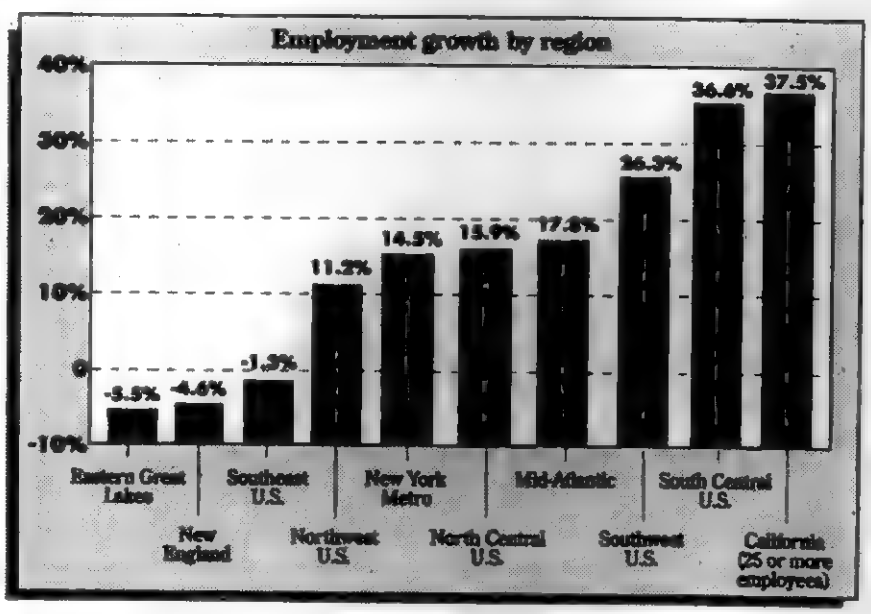

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Network Consultant
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Ideal candidate should be thoroughly versed in full systems life cycle, project management techniques, and software tools. Experience required with preparing project plans, managing multiple projects simultaneously, and controlling costs. The applicant must also possess strong interpersonal, written, and presentation skill sets. The position requires a technical understanding of LAN/WAN networks, client/server architecture, and system management. Experience in developing implementation plans, project schedule, and cost control mechanisms is required.

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The Registry

In search of better phone support

BY ALICE LAPLANTE
SPECIAL TO CW

Raymond Geitka had a simple question: Was the latest version of Textra, the standard personal computer-based word processor being used at his organization, available in a network version?

One day and seven long-distance phone calls to various parts of the country later, he got his answer — but not from Santa Monica, Calif.-based Peter Norton Computing, Inc., the company that sold him the package. "I just got bounced from one person to another," says Geitka, director of computing services at the University of Michigan in Dearborn.

The road to getting answers to software and hardware questions over the phone is all too often just as long and winding as Geitka's.

You can take the time to establish strong phone support from your vendor, but on the whole, information systems workers say it's not uncommon to suffer long waits on telephone hold, "not-my-department" brush-offs or — the worst — incorrect answers from technically inept people.

A survey by the Corporate Association of Microcomputer Professionals (CAMP) in Northbrook, Ill., shows that callers in search of support were placed on hold more than 77% of the time. Once on the line, support representatives weren't able to provide a solution 33% of the time.

Not all bad

It's not as though everyone is unhappy with telephone support. Research from Dataquest/Ledgeway in Framingham, Mass., shows that approximately 25% of users say telephone support is "ideal," and only a small percentage say it is "unacceptable." Fifty percent rated support "acceptable," which they defined as having between 67% and 87% of their questions answered correctly on a first call.

Although CAMP's results fall within this "acceptable" range, it's by a small margin, which indicates that vendors are not passing the support test with flying colors.

It doesn't help matters that it's new employees who often staff support lines. Another complication is the merger, acquisition and consolidation of companies in recent years. This was the case for Geitka. Although he had purchased Textra from Peter Norton Computing, the product was developed by another company, which is where he eventually found help. "Sometimes you have to go to the source in order to get an answer, but finding that source can be difficult," Geitka says.

Connections helpful

One way to get better telephone support is to know someone. IS managers suggest cultivating a personal relationship with someone in the vendor organization, through phone calls and other interactions. They warn to avoid overburdening "inside" sources by calling only when the problem can't be solved through the formal support hierarchy.

Offering to be a beta-test site or doing a vendor a favor can also result in special treatment.

"If you are willing to work with your vendor, they will go the extra mile for you," says Dave Burns, manager of systems and programming at Mueller Brass Co. in Port Huron, Mich. "Because Wang service people know us personally and can borrow equipment from us in a pinch to service other customers, we get rapid response when we really need help."

Part of learning the ropes is keeping careful records of who you last spoke with and how helpful they were.

The Fuller Co. carefully tracks the quality of support for all 12 of its software vendors and ranks them annually, says David Pinkus, manager of MIS at the Lehigh Valley, Pa.-based firm.

When it's time to renew a licensing contract, it helps to know the kind of service the vendor has been providing, Pinkus says. "Whenever I meet with a vendor, I'll always bring up where they rank in our survey and ways they can improve," he says.

It's hard to predict from the outset what kind of telephone support you're going to get. The software vendor who ranks 12 out of 12 — dead last on Fuller's list — is one of the largest and best-established software vendors in the world.

"You have to go through 27 different levels of voice mail in order to get to the right person," Pinkus says. On the other hand, another Fuller vendor is "one guy who works at home and debugs software while holding a baby in his arms," he says. "He gets a very decent rating because we can always reach him."

A lot of finger pointing goes on among vendors, Pinkus adds. "If a vendor doesn't have an answer or the resources to get me an answer, I'd rather they were honest about it," he says. "Then at least I know where I stand."

LaPlante is a free-lance writer based in Palo Alto, Calif.

Support wish list

Here's what users find ideal in a vendor's telephone support offerings:

A fax-on-demand service that faxes answers to complex technical questions.
Problem-tracking software to track a customer's history of problems and support requests.
Notification of where they stand in the "hold queue" and how long they are likely to wait.
Easier access to the developers of the product.
Elimination of "callbacks" for simple or routine questions.
Access to an on-line bulletin board to leave support requests and have them answered electronically.
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Source: Corporate Association of Microcomputer Professionals, Northbrook, Ill.

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Hughes Aircraft, the aerospace electronics giant, is a full products company involved in the research, development, manufacturing, and support of over 100 different technologies. With about 55,000 employees in Southern California, Arizona, and Colorado, Hughes provides 12,000 separate products, services, and functions to the defense, space-related, and commercial industries worldwide. Since John Wilhite's job as Manager, Corporate College Relations is to oversee the recruitment of the country's top technology graduates, he advertises in *Computerworld's Campus Recruitment Edition.*

"Every year, Hughes recruits somewhere between 250 and 300 new graduates. The mainstream of our hiring centers around students with engineering backgrounds. Generally about 75% of our student recruits are in the electrical, mechanical, and computer engineering fields. Another 20% or so have scientific backgrounds, primarily in computer science and physics. The balance of our recruiting, then, is for MBA graduates with strong orientation in MIS or CIS. With one advertisement in *Computerworld's Campus Edition,* we get unique reach to all three of our student audiences.

"During the past few years, computer engineering and computer science graduates have become an increasingly important part of our recruitment efforts. So we need a publication that not only targets the exact audience we're trying to reach but also delivers quality responses. Based on the recruitment success of our first advertisement, we know *Computerworld's Campus Edition* gives us the most direct contact with our target audience of computer and engineering graduates. It definitely generates quality responses from students with the right types of backgrounds.

"In addition to delivering advertising results, the issue's Annual Student Survey serves as an important research tool. Upon receiving data on how students typically view Hughes Aircraft, we felt we needed to strengthen our image in this area. For continued success in recruiting top technical talent, we find feedback like this invaluable.

"To be effective, it's essential that our recruitment advertisement appears in a quality publication that students will read. We know *Computerworld's Campus Edition,* with its meaningful content, will have a long shelf life. Clearly, it's a publication that students will take back to their rooms pass along to fellow students, and keep for future reference. That means our advertisement in *Computerworld's Campus Edition* keeps right on working long after the issue date.

"Again this October, we'll be relying on the cost-efficient reach of *Computerworld's Campus Edition* to take our recruitment message to engineering, computer, and business graduates at leading colleges and universities nationwide."

Computerworld's Campus Recruitment Edition. On October 31, 1992, this exclusive edition reaches 150,000 top students enrolled in America's top computer and engineering degree programs. It's an advertising vehicle that works for John Wilhite at Hughes Aircraft. And it's your best way to recruit America's best computer career students. For all the facts, call John Corrigan, Vice President/Advertising Director, at 800/343-6474 (in MA, 508/879-0700).

Your best way to recruit America's best computer career students ...

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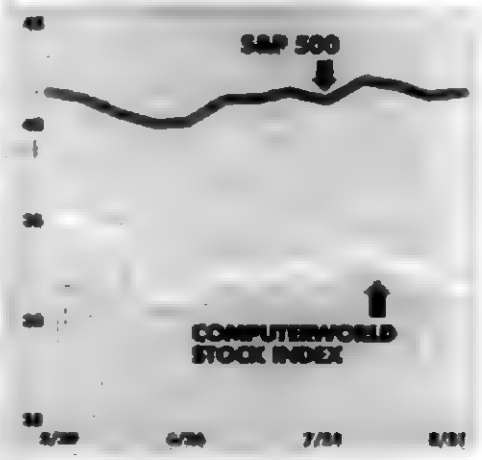
STOCK TRADING INDEX



Industry Almanac

FOCUS ON SOFTWARE

Software Scene
Donaldson, Lufkin & Jenrette Securities Corp.
New York
Aug. 1, 1992

Slowdowns in fiscal second-quarter earnings hurt many software firms' stock prices; only a handful have climbed since the end of May. Investor enthusiasm will not spark until earnings have either stabilized or accelerated.

Expect client/server offerings from **Cognos, Inc.** (COGNF), which is slated to ship PowerHouse Windows for Unix this summer. Business is churning faster for **Ross Systems, Inc.** (ROSS). The company, which traditionally catered to **Digital Equipment Corp.** (DEC) users, is now targeting — and making progress in — Unix and client/server markets as well.

LISA DAVIDSON

Assembling software

A gathering of current brokerage ratings

Aldus Corp.	Neutral	Hold
Artisoft, Inc.	Strong buy	Not rated
Autodesk, Inc.	Neutral	Not rated
Borland International, Inc.	Buy	Hold
Computer Associates International, Inc.	Buy	Not rated
Lotus Development Corp.	Buy	Hold
Microsoft Corp.	Strong buy	Buy
Sterling Software, Inc.	Buy	Buy
Sungard Data Systems, Inc.	Buy	Hold

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 21, 1992

TOP PERCENT GAINERS

Recognition Equipment	19.05
System Software Assoc.	12.77
Autodesk Inc.	11.42
Platinum Technology	11.21
Cambex Corp.	9.30
Cheyenne Software Inc.	8.57
Printronix Inc.	8.33
Ross Systems	8.20

TOP PERCENT LOSERS

Wang Labs Inc. (b)*	-75.00
Radius Inc.	-32.91
Commodore Int'l	-22.97
Artel Communication Corp.	-20.00
Spinnaker Software	-18.18
Pyramid Technology (L)	-16.67
Bachman Info. Systems	-15.38
Picturetel Corp.	-15.33

TOP DOLLAR GAINERS

Matsushita Electronics (L)	6.25
Autodesk Inc.	4.63
System Software Assoc.	3.00
Nynex Corp.* (H)	2.13
Micro Focus	2.13
Progress Software Corp.	2.13
Platinum Technology	1.63
Recognition Equipment	1.50

TOP DOLLAR LOSERS

WellFleet Communications (H)	-3.75
Chipcom Corp.	-3.50
Hewlett-Packard Co.*	-3.25
Borland Int'l Inc.*	-3.25
Radius Inc.	-3.25
Novell Inc.*	-3.25
Intel Corp.*	-3.13
Parametric Technology (H)	-3.00

Exch	52-Week High	52-Week Low		Aug. 21 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Off 2.27%**			
OTC	15.00	7.25	3 COM Corp.*	10.88	-0.13	-1.14
NYS	70.63	56.25	American Info Techs Corp.*(H)	69.75	0.38	0.54
NYS	44.88	32.88	AT&T*	42.75	-0.63	-1.44
OTC	4.25	1.00	Artel Communication Corp.	1.00	-0.25	-20.00
NYS	50.63	40.25	Bell Atlantic Corp	49.25	0.63	1.29
NYS	55.13	43.38	Bellsouth Corp (H)	54.38	0.50	0.93
NYS	7.25	4.13	Bolt, Beranek & Newman	4.25	-0.25	-5.56
NYS	66.88	36.63	Cabletron Systems	55.50	1.50	2.78
OTC	31.00	17.50	Chipcom Corp	21.75	-3.50	-13.88
OTC	53.75	18.63	Cisco Systems Inc.	47.25	-1.75	-3.57
OTC	35.25	6.00	Compression Labs Inc.	7.00	-1.00	-12.50
OTC	3.38	0.88	Data Switch Corp.	1.69	0.13	8.00
NYS	23.63	12.38	Digital Comm. Assoc.*	18.38	-0.25	-1.34
OTC	17.25	8.00	Digital Systems Int'l Inc.	9.00	0.00	0.00
OTC	7.00	3.63	DSC Communications	6.13	-0.38	-5.77
OTC	10.88	4.75	Fibronix Int'l Inc.	5.38	0.00	0.00
OTC	37.50	10.50	Fibronics Int'l Inc.	13.75	0.25	1.85
OTC	3.38	1.13	Gandalf Technologies Inc.	2.00	-0.25	-11.11
OTC	2.25	0.69	Gateway Communications	1.44	0.06	4.58
NYS	5.50	2.13	General Datacomm Inds.	3.38	-0.13	-3.57
ASE	5.88	0.50	Go Video	2.75	-0.25	-8.33
NYS	35.63	28.63	GTE Corp.*	35.00	0.00	0.00
NYS	70.63	50.00	ITT Corp.	66.63	-0.13	-0.19
OTC	36.13	25.25	MCI Communications Corp.	32.38	-1.50	-4.43
OTC	14.50	2.25	Microcom Inc.	3.88	0.13	3.33
NYS	16.25	9.50	Network Equipment Tech.*	11.00	0.38	3.53
OTC	25.50	8.00	Network General	10.25	0.25	2.50
OTC	20.00	6.50	Network Systems Corp.	10.75	-0.25	-2.27
OTC	17.88	5.63	Newbridge Networks Corp.	16.50	0.88	5.60
NYS	49.25	33.75	Northern Telecom Ltd.*	34.63	-0.25	-0.72
OTC	65.00	31.75	Novell Inc.*	47.50	-3.25	-6.40
NYS	88.38	69.13	Nynex Corp.* (H)	85.50	2.13	2.55
OTC	37.50	16.50	Octel Communications Corp.	24.75	0.38	1.54
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.25	0.00	0.00
OTC	53.00	15.88	Picturetel Corp.	15.88	-2.88	-15.33
OTC	18.75	9.75	Proteon Inc.	13.00	-0.75	-5.45
NYS	27.25	11.63	Scientific Atlanta Inc. (H)	27.25	0.50	1.87
NYS	68.88	53.75	Southwestern Bell Corp. (H)	68.63	1.38	2.04
NYS	27.00	20.75	Sprint Corp.	23.38	0.38	1.63
OTC	13.75	4.00	Standard Microsystems Corp.	12.00	-0.88	-6.80
OTC	35.75	14.25	Synoptics Communications (H)	34.00	-1.75	-4.90
NYS	40.00	32.88	US West Inc.	38.75	0.63	1.64
OTC	41.50	24.00	WellFleet Communications (H)	37.75	-3.75	-9.04
PC and Workstations			**Off 3.96%**			
OTC	15.00	4.50	Advanced Logic Research	4.75	0.25	5.56
OTC	70.00	41.50	Apple Computer Inc.*	44.75	0.00	0.00
OTC	32.25	12.00	AST Research Inc.*	12.50	-0.75	-5.66
NYS	19.25	7.13	Commodore Int'l	7.13	-2.13	-22.97
NYS	36.75	22.13	Compaq Computer Corp.*	28.75	-0.88	-2.95
OTC	29.00	13.91	Dell Computer Corp.	24.88	0.88	3.65
OTC	7.75	2.13	Everex Systems Inc.	2.50	0.00	0.00
NYS	34.00	21.25	Harris Corp.	30.75	-1.00	-3.15
NYS	85.00	44.63	Hewlett-Packard Co.*	56.75	-3.25	-5.42
NYS	29.75	14.13	Silicon Graphics	21.25	-0.88	-3.95
OTC	35.88	20.75	Sun Microsystems Inc.*	25.88	0.13	0.49
NYS	31.25	22.50	Tandy Corp.*	22.50	-1.75	-7.22
NYS	11.13	5.13	Zenith Electronics	6.63	0.00	0.00
OTC	25.50	3.13	Zeos International Ltd.	3.13	-0.50	-13.79
Large Systems			**Off 7.59%**			
ASE	20.63	11.63	Amdahl Corp.*	13.13	-0.13	-0.94
NYS	16.13	7.50	Cerdian Corp.	15.00	-0.38	-2.44
NYS	16.38	5.75	Convex Computer	5.88	-0.63	-9.62
OTC	19.63	1.88	Cray Computer	3.38	0.00	0.00
NYS	52.25	23.00	Cray Research Inc.* (L)	23.38	-0.38	-1.58
NYS	22.50	7.13	Data General Corp.	7.75	-0.25	-3.13
NYS	65.50	33.25	Digital Equipment Corp.*	35.13	-2.75	-7.26
NYS	108.38	81.63	IBM*	85.75	-2.63	-2.97
OTC	13.25	7.50	Kendall Square Research	6.50	-0.50	-5.56
NYS	121.25	88.25	Matsushita Electronics (L)	98.38	6.25	6.93
OTC	19.75	8.13	Pyramid Technology (L)	8.13	-1.63	-16.67
OTC	17.88	8.00	Sequent Computer Sys.	15.50	-0.63	-3.88
OTC	16.38	5.00	Sequoia Systems Inc.	7.00	0.50	7.69
NYS	54.25	36.75	Stratus Computer Inc.*	42.63	-2.13	-4.75
NYS	15.13	9.50	Tandem Computers Inc.*	10.50	-0.38	-3.45
NYS	11.75	3.63	Unisys Corp.*	9.13	-0.63	-6.41
ASE	7.50	0.38	Wang Labs Inc. (b)*	0.38	-1.13	-75.00
Software			**Off 1.53%**			
OTC	68.50	34.75	Adobe Systems Inc.	36.75	-0.88	-2.33
OTC	13.25	2.50	Al Corp.	4.25	-0.13	-2.86
OTC	45.00	11.50	Aldus Corp.	13.00	-0.38	-2.80
OTC	19.75	8.50	American Software Inc. (L)	9.13	-0.50	-5.19
OTC	20.00	9.38	Ask Computer Systems	13.50	-0.50	-3.57
OTC	57.25	23.25	Autodesk Inc.	45.13	4.63	11.42
OTC	37.75	8.25	Bachman Info. Systems	8.25	-1.50	-15.38
OTC	42.50	30.50	BGS Systems Inc.	38.00	0.00	0.00
OTC	79.00	37.25	BMC Software Inc.	46.25	-1.50	-3.14
OTC	20.50	9.00	Boole & Babbage	18.25	-0.38	-2.01
OTC	88.75	35.00	Borland Int'l Inc.*	40.13	-3.25	-7.49
OTC	11.25	3.63	CE Software	4.25	-0.38	-8.11
ASE	14.38	6.50	Cheyenne Software Inc.	14.25	1.13	8.57
OTC	20.38	7.25	Cognos Inc.	8.25	-0.13	-1.49
NYS	17.00	7.50	Computer Associates*	13.75	-0.63	-4.35
Exch	52-Week High	52-Week Low		Aug. 21 Close	Wk Net Change	Wk Pct Change
NYS	12.38	12.00	Computervision Corp.	12.00	0.00	0.00
OTC	21.50	8.50	Comshare Inc.	9.75	-0.50	-4.88
OTC	47.88	6.50	Essel Corp.	8.38	0.38	4.69
OTC	25.50	11.50	Group I Software	15.00	-1.50	-9.09
OTC	6.63	3.50	Hogan Systems Inc.	4.25	-0.50	-10.53
OTC	36.25	18.50	Information Resources	23.00	-1.25	-5.15
OTC	39.25	5.88	Informix Corp.	37.75	-1.25	-3.21
OTC	22.38	12.50	Intergraph Corp.	13.50	0.00	0.00
OTC	15.00	8.13	Interleaf Inc.	8.50	0.00	0.00
OTC	29.25	9.25	Intersolv Inc.	14.00	0.25	1.82
OTC	30.00	10.50	Knowledgeware Inc.	12.00	-0.25	-2.04
OTC	46.25	20.25	Legent Corp.*	40.50	0.50	1.25
OTC	40.75	15.50	Lotus Development*	17.25	-0.13	-0.72
OTC	7.38	1.88	Mesa Software	2.25	0.00	0.00
OTC	22.25	6.50	Mentor Graphics	8.00	0.00	0.00
OTC	37.25	27.25	Micro Focus	31.00	2.13	7.38
OTC	20.50	6.50	Micrografx Inc.	8.25	0.25	3.13
OTC	88.84	53.34	Microsoft Corp.*	69.75	-1.25	-1.76
OTC	21.13	9.88	Oracle Corp.*	17.50	-0.38	-2.10
OTC	43.00	15.50	Parametric Technology (H)	37.88	-3.00	-7.34
OTC	11.00	3.50	Phoenix Technologies	4.63	0.00	0.00
OTC	25.25	12.13	Platinum Technology	16.13	1.63	11.21
OTC	48.50	29.00	Progress Software Corp.	40.13	2.13	5.59
OTC	26.63	4.00	Quarterdeck Office Sys.	4.63	-0.25	-5.13
OTC	32.75	11.75	Rainbow Technologies Inc.	16.25	0.25	1.56
OTC	26.75	8.50	Rasterops	8.50	-1.00	-10.53
OTC	17.25	5.38	Ross Systems	8.25	0.63	8.20
OTC	12.13	8.50	Sapiens USA Inc.	10.88	-0.13	-1.14
OTC	26.25	7.50	Software Publishing Corp.	9.00	-1.25	-13.51
OTC	8.50	2.00	Software Toolworks Inc.	3.00	0.19	6.65
OTC	7.25	1.75	Spinnaker Software	2.25	-0.50	-18.18
OTC	16.50	6.25	State of the Art	6.75	0.25	3.85
NYS	25.25	13.00	Sterling Software Inc.	18.63	1.00	5.67
OTC	30.00	13.00	Struct. Dynamics Research	13.00	-1.25	-8.77
OTC	31.75	15.25	Sybase Inc.	28.50	-0.13	-0.44
OTC	51.00	16.00	Symantec Corp. (L)	17.25	0.50	2.99
NYS	15.50	5.25	Systems Center Inc.*	6.38	-0.13	-1.92
OTC	34.25	12.18	System Software Assoc.	26.50	3.00	12.77
OTC	23.75	14.50	Walker Interactive Systems	15.25	-0.88	-5.43
OTC	6.63	2.13	Wordstar	2.25	-0.25	-10.00
Semiconductors			**Off 4.73%**			
NYS	21.50	7.38	Advanced Micro Devices	8.63	-0.75	-8.00
NYS	11.13	7.00	Analog Devices Inc.	9.75	-0.25	-2.50
OTC	13.88	6.75	Atmel Corp.	8.13	-0.25	-2.99
OTC	14.13	4.25	Chips and Technologies	4.50	0.00	0.00
NYS	22.63	7.38	Cypress Semiconductor Corp.	8.75	-0.50	-5.41
NYS	10.88	6.25	Dallas Semiconductor	10.00	-0.50	-4.76
OTC	68.75	36.50	Intel Corp.*	58.50	-3.13	-5.24
NYS	9.88	5.50	LSI Logic Corp.	5.50	-0.38	-6.38
NYS	22.38	12.13	Micron Technology	15.63	-0.75	-4.58
NYS	88.13	54.00	Motorola Inc.*	85.13	-0.38	-0.44
NYS	11.75	3.88	National Semiconductor* (H)	10.13	-1.38	-11.98
OTC	27.00	8.75	Sierra Semiconductor (L)	8.75	-0.25	-2.78
NYS	42.38	26.00	Texas Instruments*	38.25	-2.88	-6.99
OTC	10.50	5.00	VLSI Technology	6.88	0.13	1.85
OTC	9.75	2.13	Weitek	3.13	-0.13	-3.85
ASE	5.63	2.00	Western Digital Corp.	4.50	-0.26	-5.26
OTC	32.50	17.25	Xilinx	19.75	-2.75	-12.22
OTC	11.50	4.63	Zilog Inc.	6.75	-0.25	-3.57
Peripherals and Subsystems			**Off 4.10%**			
OTC	10.00	2.75	Archive Corp.	6.63	-0.25	-3.64
OTC	26.25	17.25	Banctec Inc.	25.25	-0.50	-1.94
OTC	23.50	8.50	Cambex Corp.	11.75	1.00	9.30
ASE	12.25	4.91	Cognitronics Corp.	10.75	0.13	1.18
NYS	23.88	12.50	Conner Peripherals*	19.13	-1.38	-6.71
ASE	19.88	4.38	Dataram Corp.	7.00	-0.88	-11.11
NYS	19.25	5.88	EMC Corp.	16.50	-0.75	-4.35
OTC	8.88	4.75	Emulex Corp.	8.13	-1.00	-14.04
OTC	23.00	14.25	Evans & Sutherland	16.00	0.00	0.00
OTC	40.63	19.88	Exabyte	23.88	-2.88	-16.75
OTC	27.25	15.75	Intelligent Info. Systems	22.25	-1.00	-4.30
OTC	11.25	4.75	Iomega Corp.	7.13	0.13	1.79
OTC	34.75	12.00	IPL Systems Inc.	12.00	-1.75	-12.73
OTC	24.50	10.75	Komag Inc.	15.25	-1.00	-6.15
OTC	14.00	2.63	Maxtor Corp.*	13.38	-0.63	-4.46
OTC	12.63	5.75	Micropolis Corp.	9.13	-1.00	-9.88
NYS	101.25	85.25	3M Co.	98.25	-2.00	-2.00
OTC	7.25	3.50	Printronix Inc.	6.50	0.50	8.33
NYS	88.75	7.00	QMS Inc.	8.75	-1.13	-11.39
OTC	18.00	8.88	Quantum Corp.	13.75	-0.50	-3.51
OTC	12.75	6.00	Radius Inc.	6.63	-3.25	-32.91
NYS	12.88	5.88	Recognition Equipment	9.38	1.50	19.05
OTC	13.13	5.38	Reson Inc.	9.25	0.50	5.71
OTC	17.63	7.25	Seagate Technology*	12.88	-1.88	-12.71
NYS	78.00	28.88	Storage Technology*	27.88	-1.25	-4.29
NYS	30.88	16.00	Tektronix Inc.	19.25	0.13	0.65
NYS	82.25	56.88	Xerox Corp.	74.13	0.13	0.17
Services			**Off 0.39%**			
OTC	18.63	11.88	American Mgmt. Systems*	18.63	1.13	6.43
NYS	5.38	2.88	Anacomp Inc.	3.38	0.00	0.00
OTC	19.00	12.50	Analysts Int'l	16.75	-0.13	-0.74
NYS	49.00	30.25	Auto Data Processing*	43.88	-0.50	-1.13
NYS	24.16	12.50	Comdisco Inc.*	16.50	-0.13	-0.75
OTC	13.50	7.75	Computer Horizons	9.38	-0.38	-3.85
NYS	84.88	57.00	Computer Sciences*	65.50	1.00	1.55
NYS	10.13	7.00	Computer Task Group	9.13	-0.13	-1.52
OTC	40.50	15.00	CompUSA Inc.	25.25	0.75	3.06
OTC	19.25	7.00	Corporate Software	7.75	0.00	0.00
OTC	30.75	9.75	Egghead Discount Software (L)	10.00	-0.75	-6.98
NYS	33.06	23.19	General Motors E (EDS)*	28.00	-0.88	-3.03
OTC	30.38	6.25	Intelligent Electronics	9.00	-1.13	-11.11
OTC	14.88	3.00	Marcal	7.50	0.38	5.26
OTC	15.75	7.00	Microage Inc.	8.88	-0.13	-1.39
OTC	27.50	15.34	Paychex	25.50	0.00	0.00
NYS	73.00	48.50	Policy Management Sys.	69.88	-0.12	-0.18
NYS	44.50	22.38	Reynolds and Reynolds	41.75	0.00	0.00
OTC	32.00	21.25	SEI Corp.	23.13	0.38	1.65
OTC	24.38	19.88	Shared Medical Systems	19.88	0.00	0.00
OTC	36.25	13.50	Sungard Data Systems	25.50	1.00	4.08
NYS	4.38	1.13	Ultimate Corp.	1.75	0.00	0.00

KEY: (H) = New annual high (L) = New annual low
* Companies tracked in Computerworld Stock Index

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ABP

IN BRIEF

HP Q3 sales off 1%

■ As expected, **Hewlett-Packard Co.** last week posted third-quarter earnings of $191 million, off 1% from the year earlier period. Revenue for the quarter ended July 31 increased 15% to $4 billion. The Palo Alto, Calif.-based company attributed the earnings decline to a mixed sales environment: Demand for high ticket items was soft, while purchases of lower priced items remained strong. Meanwhile, HP was hit with a securities fraud class-action suit following a 17% decline on Aug. 7 on the price of its common stock after the firm's disclosure of lower-than-expected financial results [CW, Aug. 10]. HP said the suit is without merit.

■ **Dell Computer Corp.** announced record sales of $457 million for its fiscal second quarter, a 129% increase from the year earlier period. Net income in the quarter ended Aug. 2 increased 77% to $21.9 million, the Austin, Texas-based company said. Dell's strong showing contrasts starkly with less-than-stellar results recently revealed by **Zeos International Ltd.** and **Northgate Computer Systems, Inc.**

■ Cisco Systems, **Inc.** reported fiscal fourth-quarter net profits of $13.2 million, up 106% from the comparable period last year. Revenue rose 95% to $110.7 million in the quarter ended July 26, the Menlo Park, Calif., company said.

■ **Sequoia Systems, Inc.** reported a fourth-quarter net loss of $860,021 compared with a profit of $2.8 million in the corresponding period last year. Revenue in the period was $71 million, up 12% from the same period last year, the Marlboro, Mass., company said. The company attributed the loss to lower-than-expected sales related, in part, to delays in closing major transactions, the write-off of uncollected receivables and tightened credit terms.

Trade pact could spur exports to Mexico

Agreement offers vendors alternative to Far East manufacturing but could cost domestic jobs

BY GARY ANTHES
CW STAFF

WASHINGTON, D.C. — U.S. vendors of computer hardware, software and services said the recent free-trade agreement with Mexico will boost sales in the fastest growing market in North America and will provide an attractive alternative to Far East manufacturing sites.

The proposed North American Free Trade Agreement (NAFTA) preserves the tariff-elimination schedule in the 1988 U.S.-Canada Free Trade Agreement, and it will phase out the high duties on computer hardware imported into Mexico from the U.S.

Those tariffs boost the cost of U.S. products in Mexico by about 10% for parts, 15% for subassemblies and 20% for complete systems. It will have little impact on U.S. vendors that are pursuing Canadian business.

Big business

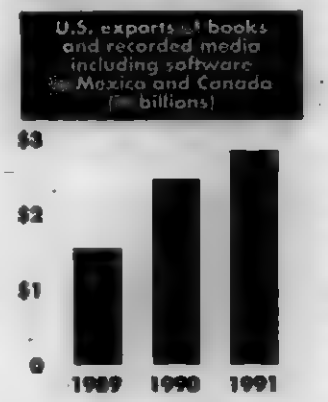
"Mexico is our fastest growing Latin American market, even with the 20% tariff," said William Fasig, manager of international government affairs and trade at Apple Computer, Inc. "As the tariff phases down, obviously that will have a significant impact on our business."

However, some industry sources said the greatest benefit will not be the reduced tariffs as much as NAFTA's stimulus to the Mexican economy as a whole, which now supports $1 billion in annual sales for information technology.

"Mexico is a developing country of substantial size, and it's at the stage of economic takeoff," said Edward J. Black, vice president and general counsel at the Computer and Communications Industry Association. "Small and large businesses are expanding, and all of them are prime candidates for buying our products."

Borderless business

Vendors hope the recent North American Free Trade Agreement accelerates growth in the Mexican and Canadian markets



Source: Office of U.S. Trade Representative

Cutting red tape

A spokesman for IBM said it welcomed trade reforms that will make it easier for U.S. firms to invest in the Mexican economy. He said that when IBM attempted several years ago to expand a Guadalajara plant that makes midrange systems and Personal System/2s, the company had to spend a lot of time negotiating away various restrictions that would have made the investment untenable. "That process will now be substantially eased," he said.

Perhaps sensitive to the charge that NAFTA will export American jobs to Mexico, and mindful that the agreement has not yet been approved by Congress, none of the major manufacturers polled by *Computerworld* said the agreement would encourage them to open plants south of the border.

But Gary Wilmarth, a computer trade specialist at the Hartford, Conn., law firm of Day, Berry & Howard, said low labor rates, the proximity to the U.S. and the free-trade agreement may cause some computer and electronic companies to shift operations in the Far East to Mexico.

Black said he supported that scenario and added that it would allow U.S.-based companies to leave some of their senior management and technical people at home where they can commute to Mexico from Florida, Texas or California relatively easily.

Promises, promises

In other terms of interest to the computer industry, Mexico promised to do the following:

- Strengthen intellectual property rights protections with the intent of giving computer software copyrights the same protection in Mexico as they enjoy in the U.S.
- Give owners of software copyrights the right to prohibit the rental of their programs.
- Treat U.S. computer services firms no less favorably than Mexican ones.
- Eliminate discriminatory restrictions on U.S. sales to and investments in the $6 billion Mexican market for telecommunications equipment and services.
- Not discriminate in favor of Mexican companies bidding on government jobs.

IBM jump-starts OEM business with chip deal

Reply says IBM's competitive prices key factor

BY MICHAEL FITZGERALD
CW STAFF

SAN JOSE, Calif. — IBM recently landed its first chip customer. Reply Corp., a $50 million manufacturer of Personal System/2 Micro Channel Architecture (MCA) clones based here, agreed to sell systems that use IBM's SLC microprocessor and random-access memory.

The OEM deal offers a glimpse into how IBM is approaching a new business that it hopes will generate billions in revenue by 1995 [CW, June 15].

Steve Petracca, Reply's president and chief executive officer and a former IBM employee, said, "It's going to take a while for them to close other deals" for the SLC.

"It's not nearly as easy for them to work with other people as it was for me," Petracca said. "I know which hurdles to jump."

Analysts contacted adopted a wait-and-see attitude about whether this signals that IBM can play a significant role in the OEM market. "If they can't get Reply, they can't get anybody," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. Zwetchkenbaum described Reply's focus to be on MCA, OS/2 and having a former IBM insider as head of the company.

Persistence pays off

Petracca said he approached IBM about selling the chip to him when it was first announced but was rebuffed. He said his refusal to take no for an answer eventually helped sway IBM. Once IBM agreed to talk with him, the pace of negotiations was surprisingly rapid.

"I said, 'We can get this deal done in 30 days and ship in 60 days,' and they thought I was crazy, initially," Petracca said. In fact, the first Reply personal computers with SLCs are scheduled to ship within 90 days of initial talks. "I'm sure they'd rather close a big deal with Michael Dell or NCR, but [those companies] can't move as fast as we can."

An IBM spokesman said Reply's small size did help close the deal quickly.

Petracca said he credited IBM with moving "very aggressively, from both a price and delivery standpoint. This isn't the same company I worked for."

Petracca said that IBM's willingness to sell both single in-line memory modules and the SLC at competitive prices was a key to his final decision to buy the SLC from IBM. Reply's SLC-based systems, which ship today, cost $1,195, $1,290 less than IBM's least-expensive SLC-based PC.

IBM's license agreement with Intel Corp. for the 386SLC prevents it from reselling the chip directly, but it can put it on an upgrade board. Accordingly, IBM and Reply designed a board specifically for Reply's systems.

Petracca called the SLC a major advantage for Reply, which plans to discontinue its line of 386SX-based systems. However, he acknowledged that his company will face significant challenges if IBM's scheduled Sept. 22 PC announcement is as sweeping as some expect.

> "I'M SURE they'd rather close a big deal with Michael Dell or NCR, but [those companies] can't move as fast as we can."
>
> STEVE PETRACCA
> REPLY

Nonetheless, "We've committed to our customers that we'll save them a certain percentage. We have the capability to do that," Petracca said.

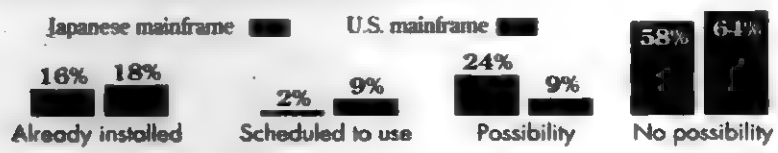
Reply recently cut prices by as much as 45%. The company's systems now sell for half the price of comparable IBM systems.

TRENDS

The status of application backlogs, Unix and other software issues in Japanese and U.S. companies

Opening up

27% of responding U.S. IBM mainframe sites are very likely to implement some form of Unix in the next 12 months compared with 18% of Japanese sites



Selection priorites

When choosing software, innovative and easy-to-use products are high on both countries' lists. Details such as documentation and support concern the U.S. more.

	Japan	U.S.
Ease of use	28%	23%
Features	23%	24%
Price	15%	13%
Support	8%	13%
Documentation	6%	18%

Top 5 list

Thinking growth

Japan's software market is relatively small compared with the U.S.', but it's growing fast

1992 software market growth

Packaged software market size	
$34 billion	$5.2 billion

Backlog fix

Application backlogs are common for all, but preferred solutions vary considerably

Top 3 Japanese solutions:		Top 3 U.S. solutions:	
Limit investment in hardware/software	38%	More use of productivity tools	31%
Hire or develop IS professionals	17%	Purchase packaged software	20%
Development support tools	14%	Retain outside programmers	16%

For companies with more than 1,000 employees

Base: 1,962 Japanese MIS directors; 1,349 U.S.-based senior software managers

Source: Sentry Market Research, Westboro, Mass.

CW Chart: Janell Genovese

NEXT WEEK

Which path? Is the ticket to the CIO suite an MBA? Or a master's in computer science? Or both? Next week, Computer Careers traces the career paths of **Nick Rudd**, CIO at Young & Rubicam, and Rich Nydick, vice president of IS at the Hibbert Group, to answer the age-old question. Their experiences may surprise you.

Claudio Edinger

While OS/2 Version 2.0 holds promise with its ability to multitask DOS and Windows applications, potential users with certain mixed-vendor environments need to be cautious, consultant Fabian Pascal says. Pascal, who has a non-IBM hardware setup, reveals some OS/2 quirks and how to get around them. See In Depth.

INSIDE LINES

Better late . . .

▶ Computer Associates is definitely getting serious about microcomputer software. At the opening of last week's Systems Software Conference in New Orleans, Phyllis Pallacios, the conference chairwoman, told the 1,200 attendees that CA was offering up to $1,000 worth of free micro software to each user in attendance. Though micro software sales make up only 10% to 12% of CA's $1.5 billion in annual revenue, the Islandia, N.Y., software giant hopes to leverage its large mainframe-oriented customer base with downsized PC-based applications.

Up the down escalator?

▶ It looks like IBM is not far away from hitting the mass market channels with new machines. In preparation for its big Sept. 22 product blitz, Big Blue is loading the channel with new configurations that have preloaded software — although whether the software is Windows is unclear. Sources say Service Merchandise will sell a $1,900 20-MHz 486SX PS/1.

Rainbow over the horizon

▶ Late September marks the introduction of the first color pen-based system. Dauphin Technology will announce the Dauphin 5500 Pentop, a 5½-pound system with an STN (passive-matrix) screen. Inside is a 25-MHz Intel 80386SL chip, 4M bytes of RAM and an 80M- or 130M-byte hard drive. Pricing was not available. IBM and NCR are expected to bring out new versions of their pen-based products next month as well.

Server flexing

▶ One user interested in Compaq's upcoming server announcement, which sources have pegged for NetWorld in October, said he expects to see a 100-MHz 486 machine from the folks in Houston. He also expects to see a radical SystemPro redesign, which could reflect the TriFlex architecture that has already been talked about. But some users are worried about compatibility between the new and the old Pros.

Stacked DEC

▶ DEC will shortly disclose a modular storage strategy replete with plug-and-play products. Users will be able to integrate a range of controllers and swap adapters for DEC's CI, VMS or SCSI-2 buses. These can then be attached to disk drives ranging from 2.3 in. to 5½ in. or a mix of tape and optical devices. Initial products will include a box that combines CI, DSSI SCSI and also FDDI, sources said. Software RAID implementations will also be available so users will be able to reconfigure their disk arrays to be compliant with either RAID-1, -3 or -5, according to an application's needs.

Parents spurned

▶ Not all Sears and IBM enterprises have signed up for the companies' new joint network outsourcing venture, Advantis. IBM/Sears joint venture Prodigy, the consumer information company, just extended its contract with Advantis rival BT Tymnet for another few years.

Aloha means hello and goodbye

▶ As their employer filed Chapter 11 last week, selected high-producing sales reps from Wang Labs partied in Hawaii, blissfully removed from the hoo-ha back on the mainland. The vacation was part of Achievers' Week, a program begun during Wang's heyday under former President John Cunningham to reward salesmen who beat quotas.

Word is that Apple USA Chief Robert Puette has fallen out of favor with the company's directors and may soon resign. Industry watchers say ex-HP exec Puette alienated Apple top brass with his reluctance to enter the mass market now ruled by IBM-compatible PCs. Puette's stature took another hit last month when he was moved under Ian Diery, formerly his counterpart at Apple Pacific. If there was a soap opera about Apple, would they call it As the Worm Turns? *Bad puns aside, phone, fax or CompuServe news tips to News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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*Among all the UNIX servers made today, the Sun SPARCserver 690MP recently scored the highest Transaction Processing Performance Council benchmarks for price and performance (TPC-A). Details will be included in the Database Performance Brief offered above.

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COMPUTERWORLD

Mellon slaps ex-IS exec with lawsuit

Shah's competing shop stole away bank's VPs

BY NELL MARGOLIS
CW STAFF

PITTSBURGH — Mellon Bank Corp. roared into court last week and charged its recently departed top-ranking information systems executive with plundering Mellon's IS resources to set up his own competing shop.

Former Executive Vice President of Information Management and Research Bipin C. Shah abruptly left the bank in late July after a scant six months in office to start his own financial transaction processing services firm, taking along four highly placed Mellon IS executives.

Early on, the Shah affair is tinged with irony. On his first official day on the job at Mellon, Shah had voiced doubts about the continuing viability of the bank's role as an outsourcer.

Last week, the $30 billion bank reiterated its dedication to outsourcing, announcing a long-

Continued on page 20

COMPUTERWORLD BUYERS FORECAST

Virus vexers

Users gave their PC antivirus software strong ratings in response to the question, "How satisfied are you with your software's overall ability to protect data?"

See Buyers' Scorecard, page 83

Product	Score
Microcom Virex	8.8
Central Point Anti-virus	8.4
Symantec Norton Anti-Virus	8.4

Maximum score: 10

'New' IBM sets major product revamp

BY JOHANNA AMBROSIO
CW STAFF

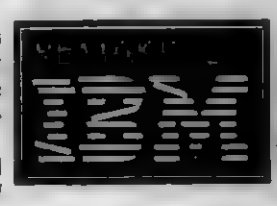
ARMONK, N.Y. — A barrage of product and corporate announcements due next month will showcase a new IBM unleashing its business units to battle it out for IS hearts, minds and 1993 budgets.

Information systems executives said they are delighted at the prospect of heightened competition within IBM.

"Turn them loose. If it results in more choices and better prices, I'm glad to see them take the gloves off," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh. "It's the good old American way."

Among the announcements expected in September are the following:

- High- and low-end Application System/400s, as well as a disk array for the midrange line (see story below).
- Lower priced Personal System/2s and the spin-off of the personal computer hardware business from the Personal Systems Division.
- New RISC System/6000 models and a transaction processing monitor that will position the Unix-based family to take on its mainframe siblings.
- Enhancements to make IBM's Advanced Peer-to-Peer Networking protocol better able to track resources across the network.



In fact, the only major division absent from the fall festivities will be Enterprise Systems, which may announce some software later this year but will hold off on new mainframes until early next year [CW, Aug. 24].

No holding back

The IBM corporate holding company will still function as a kind of ringmaster to make sure the fighting does not get too dirty and that product and some marketing plans are coordinated. However, observers said they expect the various lines of business to do whatever it takes to win IS dollars.

"As far as I'm concerned, the new IBM has stepped back and has let [the RS/6000 group] do their thing," said William H. Anderson, chief information officer at Prudential Securities, Inc. in New York. "There is nothing I'm aware of that prevents Austin [IBM's AIX development unit in Texas] from doing anything they are capable of doing today."

Craig Sultan, an analyst at Montgomery Securities, Inc. in San Francisco, agreed. "There

Continued on page 15

Big Blue fights AS/400 mid-life crisis

BY KIM S. NASH
CW STAFF

NEW YORK — IBM's planned announcement tomorrow of a mid-life kicker to the Application System/400 E series — just six months after unveiling the line — is an attempt to imitate the continuous product boosters common in Unix and personal computer markets, observers said.

So make way for the Model E95, a four-way processor expected to surpass the performance of the current top-end E90 by 20%. Also expected, according to analysts briefed by IBM, is a storage subsystem based on Level 5 redundant arrays of inexpensive disk technology.

IBM has to make such splashy moves to sustain market interest and match the fast-clip sales pace that the AS/400 has racked up since its introduction five years ago, analysts and users agreed.

AS/400 sales volume is expected to top 64,000 units sold worldwide this year, up 9% over 1991's 59,000 sold, according to International Data Corp. in Framingham, Mass. This is healthy growth, compared with the projected 2% decline in the number of Digital Equipment Corp. VAXs shipped this year.

Sharp, well-defined marketing efforts aimed at small to midsize businesses help IBM win new customers. "This is not just upgrade business from older System/36 or 38 sites," said Susan Gannon,

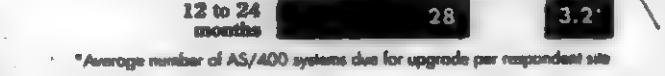
Continued on page 14

Family values

More than half of the 194 AS/400 sites responding plan to stay in the family when they upgrade their machines

When do you expect to upgrade your AS/400 processor?

Number of respondents who stated upgrade plans



*Average number of AS/400 systems due for upgrade per respondent site

Source: CW Database Division

CW Chart: Michael Siggins

Technology shifts, costs give buyers new 'lease' on PCs

BY MICHAEL FITZGERALD
CW STAFF

Pinched resources and rapid changes in ever cheaper personal computer technology appear to be leading many firms toward leasing desktop computers.

Analysts said corporations are becoming more interested in PC leasing. Hughes Aircraft Co., for example, recently revealed that it has decided to buy inexpensive clones and lease high-end PCs and servers [CW, Aug. 17].

"The asset base [of installed PCs] is getting so large that it makes a difference in the company's books," said W. Thomas Shipley, program director at Gartner Group, Inc. in Stamford, Conn.

The outlay for PCs has become a high enough cost that buying new ones can present a periodic spike in a company's capital budget. Leasing essentially smooths that spike.

While actual PC leasing data is sketchy, Shipley and analyst Jack Karp at Meta Group, Inc. in Westport, Conn., both said they have recently seen a sharp uptick in inquiries about PC leasing from their corporate clientele.

The Computer Dealers and Lessors Association said its members leased some $1.9 billion in PCs, workstations and terminals last year. That is down slightly from 1990 due to dramatic price erosion, though the number of units leased is believed to have increased.

"It's one of the fastest growing parts of our business," said Robert Bardagy, executive vice president of marketing at Comdisco, Inc. Bardagy said Comdisco may lease $100 million in PCs this year, as opposed to

Continued on page 8

INSIDE

Coping with a natural disaster: Some IS shops were prepared for Andrew; others were not. Page 6.

Downsizing converts sing client/server praises. Page 4.

Product Spotlight — The five questions to answer before frame-relay implementation. Page 87.

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IN THIS ISSUE

NEWS

4 A new Ethernet card from **3Com** outperforms competitors by up to 55%, the company claims.

4 Mainframe-to-PC LAN downsizing: Not just for PC zealots anymore.

6 Hurricane Andrew was by some accounts not only the worst natural disaster but among the worst computer disasters ever.

6 Personal digital assistant-type computers may outsell PCs by decade's end, according to a survey.

12 **HP** users unhappy with support say they don't plan full HP/UX conversion.

12 **Compaq** sets its sights on **HP** with two new network-ready printers.

14 **IBM** is expected to announce Network Control Program Version 6.2 with APPN support on Sept. 15.

15 **IBM**'s Personal Systems Division plans to secede on Thursday.

16 **Intersolv** departs the AD/Cycle alliance, citing the high cost of the **IBM** 'halo.'

20 **Kodak** adds applications to its Photo CD for business users.

24 **Symantec** introduces three more antivirus services.

Quotable

"Turn them loose. If it results in more choices and better prices, I'm glad to see them take the gloves off. It's the good old American way."

DAVID MOORE
MELLON BANK

On the increased competition among IBM business units. See stories page 1, 14 and 15.

DESKTOP COMPUTING

37 Firms begin to embrace small 'toylike' computers.

WORKGROUP COMPUTING

63 Peer-to-peer LANs still holding their own.

ENTERPRISE NETWORKING

71 Infinite options in distributed computing can be overwhelming.

LARGE SYSTEMS

78 The aftershocks of Wang's bankruptcy filing continue.

APPLICATION DEVELOPMENT

85 Programmers find that new C code generators speed development of Windows applications.

MANAGER'S JOURNAL

97 An IS spin-off is one result of the cost-cutting at **Humana**.

PRODUCT SPOTLIGHT

87 Frame relay can be tamed through solid equipment and services.

BUYERS' SCORECARD

83 **Microcom**'s Virex wins in user satisfaction with antivirus software.

IN DEPTH

93 OS/2 2.0 may be sexy, but it can be a bear in mixed-vendor configurations. By Fabian Pascal.

DEPARTMENTS

6, 16 News Shorts
28 Advanced Technology
32 Editorial
98 Calendar
100 Computer Careers
108 Marketplace
112 Stocks
113 Computer Industry
114 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **A September product rollout is once again planned by IBM, but it won't be the traditional big-iron blitz. Instead, next month will show the new IBM** as various divisions fight for IS hearts, minds and budgets. Among the expected products: new AS/400s and PCs, a transaction-processing monitor for the RS/6000 and networking gear. The expected PC hardware spin-off will get an official kickoff as well. **Pages 1, 14 and 15.**

■ **OS/2 Version 2.0 balks at certain mixed-vendor setups**, according to PC consultant Fabian Pascal, who spent several months studying OS/2 on non-IBM hardware. Although he likes the software, he says to watch out for compatibility and support problems using Extended Industry Standard Architecture and quirky windowed DOS sessions. **Page 93.**

■ **IS execs are getting serious about personal digital assistants,** better known by names such as Sharp's Wizard and the HP 95LX. One research firm expects them to outsell PCs by the mid-1990s. **Page 8.**

■ **Chalk up one debit and one credit for Mellon Bank.** The $30 billion bank's recently troubled outsourcing arm scores its biggest deal to date just as the bank sues former high-ranking IS exec Bipin C. Shah. **Page 1.**

■ **Frame-relay services promise to cut network costs by 50% or more — if they're properly planned, installed and tuned.** Otherwise, frame-relay networks can generate significant internal delays. That's why there are so few implementors — about 40 — and so many who are "just experimenting." **Page 87.**

■ **Can a technical degree get you to top IS positions faster than an MBA?** Not necessarily. Two executives, one of whom traveled the technical route while the other took the business track, show how they arrived in top IS positions. **Page 100.**

■ **Users are increasingly looking to lease PCs** as a way to cope with tighter budgets and the quickly changing desktop technology. **Page 1.**

■ **Compaq's bid for the printer market begins this week** when it unveils two network-ready units. Analysts say the company has a good shot at shaking up market leader HP. **Page 12.**

■ **IS executives at Downsizing Expo report savings of up to 50%** from replacing their aging mainframes with LANs and servers. **Page 4.**

■ **IBM's computer-aided software engineering initiative takes another hit as partner Intersolv pulls** out of the AD/Cycle alliance, saying membership fees were just too much. **Page 16.**

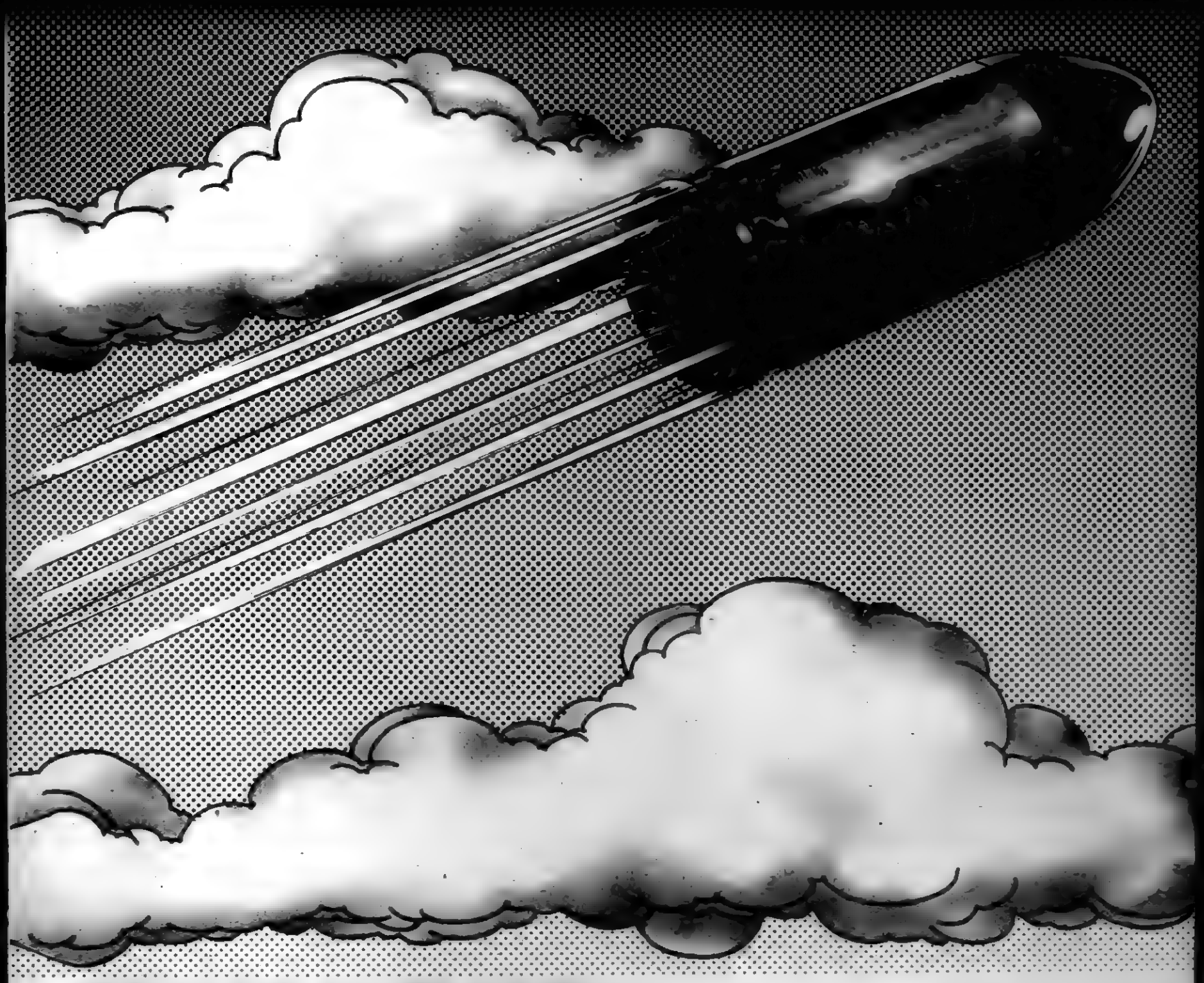
■ **Performance tuning has found a new starting point — the application.** Users who once focused tuning efforts on their mainframe systems software are now trying to make their applications run more efficiently. **Page 77.**

■ **Distributed computing is also a target** for efficiencies. Tools are becoming available to help users optimize a distributed system by predicting resource demand. **Page 71.**

■ **Low-end peer-to-peer networks** are healthier today than people thought they would be, defying the death knell that powerful client/server systems were expected to sound for it. **Page 63.**

■ **PC support personnel are more stressed out** than the average worker, largely ambiguous because of job expectations and confusion over their roles. **Page 61.**

■ **Code generators may help to make life easier** for Windows programmers, rolling design, prototype and coding into a single, automated step. **Page 85.**



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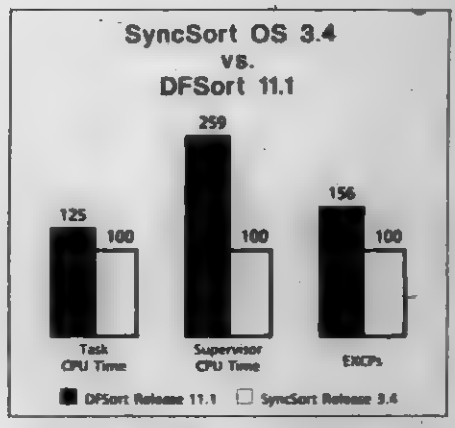

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Mainframe-to-PC LAN shift taking hold

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Downsizing was once the byword of missionary personal computer advocates who preached to the unconverted, railing against the high cost of centralized computing on mainframes. But at this year's Downsizing Expo, true information systems believers attested to the 30% to 50% cost savings achieved by moving mainframe applications to local-area networks, spurring pledges from the newly converted to follow in their footsteps by 1995.

Salt Lake County, Utah, is one such organization. The county plans to replace an IBM 3090 Model 170 by 1995 with a mix of IBM Application System/400 machines and Unix servers. Ken Schwartz, director of MIS, said the driving reason for his decision was simple: "Costs, costs, costs." He has a $5.5 million budget, 40% of which is dedicated to hardware.

More common than an IBM 3090 replacement, however, is the replacement of midsize, underpowered mainframes such as IBM 4300s. "Those machines have to go anyway, so why not move to state-of-the-art architecture?" asked George Schussel, president of Digital Consulting, Inc. in Andover, Mass., which sponsored the conference. "In two to three years, I think you'll commonly see PCs and networks of servers directly replacing mainframes."

Covia's Teflian: *Foresees hybrid nets*

Making the change to downsized systems — and re-engineering the enterprise at the same time — can be a dizzying experience, reported some who have done it.

"If you do it wrong, it could be the end of your business," noted Morti Tenenhaus, executive vice president of CompuCom Systems, Inc., a Dallas computer retailing firm. "Nobody likes to experience a [gravity] force of 1 or 2 or 3 Gs on an airplane, but we do it if we are told to do it by the CEO, and we learn to live with it."

He said CompuCom was forced to re-engineer its business and to use LAN technology to compete more effectively with other retail chains — some of which have since gone out of business.

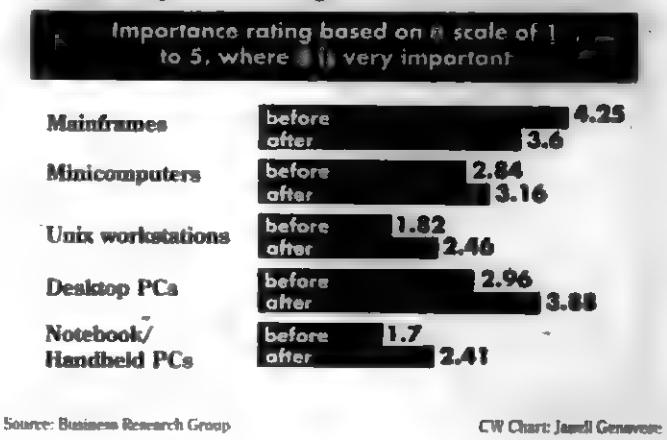
Some users have taken a more gradual approach to downsizing. Starting in 1988, United Parcel Service, Inc. installed 100 PC LANs that took over the handling of selected mainframe applications. Today, Atlanta-based UPS has 1,000 such LANs in place running 50 key applications — and a total of 35,000 PCs in the enterprise.

Despite the build-up in small systems, the payback for investing in downsizing came quickly at UPS, said Marc Dodge, a telecommunications manager at UPS in Mahwah, N.J. Savings will vary from project to project, but a 40% rate of return is possible in some cases, Dodge said. One $8 million downsizing project paid for itself in just six months through reduced labor and hardware costs and increased productivity.

However, UPS' mainframes remain intact in the company's Mahwah computer center, processing hundreds of thousands of on-line transactions per day — or large applications that require 5G to 10G bytes of data. "The mainframe is still a great place to store data," Dodge said. "We do a lot of local processing [on the LANs] and then send data up to the mainframe, where it is stored permanently." Central storage protects data integrity, he said.

One extreme to the other

After an enterprise is re-engineered, mainframes still have a role to play, according to 100 IS managers



Source: Business Research Group — CW Chart: Janell Genovese

PCs: Not total solution

Strict replacement of mainframes with Intel Corp.-based PCs is no longer seen as a comprehensive or even desirable solution. One reason is that even the most powerful Intel I486 PCs lack the memory capacity or channel bandwidth to support many data center on-line transaction processing applications.

Accordingly, some large sites plan to replace some of their mainframes with Unix parallel processors running relational databases in the mid-1990s. But because parallel processors are in their infancy as commercial machines, these sites are beginning to downsize by moving selected applications to LANs (see story at right).

Many large mainframe sites will choose to create hybrid networks of IBM-, Unix- and PC-compatible applications, said Mark Teflian, president of Covia Technologies, a subsidiary of United Airlines that sells IS shops the heterogeneous networking software it developed for Covia's own reservation systems.

"Meaningful downsizing will take place through distributed processing, not through putting a mainframe application on a smaller machine," Teflian said.

One such hybrid network project, although not connected with Covia's services, is taking place at GTE Telephone in Irving, Texas. That company plans to combine its IBM mainframes with Hewlett-Packard Co. Unix servers at 52 customer service centers nationwide [CW, March 16] (see story page 97).

Many users here did not hide the fact they have not yet embarked on full-fledged downsizing. But many of them said they are conducting pilot projects to prove that the concept works well in real life.

"We're a little on the late side," said Rob Sacco, manager of IS at GTE Products Corp.'s Sylvania Lighting Division in Danvers, Mass. "But after talking to 40 people here, I know there are a lot of people who are on the late side."

Think small

Downsizing Expo product announcements included the following highlights:

- **Sequent Computer Systems, Inc.** in Beaverton, Ore., showed one of its Symmetry 2000 Model 750 machines running Microsoft Corp.'s Windows New Technology operating system.

The system as demonstrated was connected through Novell, Inc.'s NetWare to several intelligent "client" personal computers running Windows 3.1. The large Sequent machine painted a fractal image on an oversize color monitor, breaking up the work among its 16 Intel I486 50-MHz processors. The image was stored in an Oracle Corp. Oracle 7 relational database management system.

- **AT&T's Application Development Solutions Division** in Orlando, Fla., announced a development platform that combines computer-aided software engineering tools and Cobol generators for downsizing mainframe Cobol applications. The Integrated Development Platform runs on a Unix server, but the Cobol code it generates can run on PCs or mainframes. The package will average $2,200 per developer's workstation, AT&T said.
- **MAI Systems Corp.** in Tustin, Calif., announced MAI Financial Solutions, a client/server accounting package that runs against Sybase, Inc.'s RDBMS. It runs on a variety of Unix machines.

Users can access data from PC front-end packages, including Microsoft's Excel and Lotus Development Corp.'s 1-2-3. Modules are priced from $40,000 per module, varying by CPU type and number of users.

- **Integris**, a year-old systems integration division of Bull HN Information Systems, Inc. in Billerica, Mass., said its UniKix CICS-compatible tool kit for DB2 now supports Oracle and Informix Software, Inc. RDBMSs. UniKix prices start at $8,000, but a typical developer's system is priced at about $50,000.

JEAN S. BOZMAN

3Com ups Ethernet ante with parallel-tasking adapter card

BY MICHELE DOSTERT
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. has begun shipping a new 16-bit Ethernet card that the company claims will outperform other 16-bit cards by as much as 55% — and also outperform 32-bit cards by up to 20%.

In addition to positive results from independent test laboratories, users and analysts are uniformly enthusiastic about the new card's price and performance. Claude King, a senior systems analyst at the University of Florida in Gainesville, said, "We have them running in 486/33 EISA-bus production servers, and we've seen 20% to 30% better performance."

He explained that in servers, the Network Interface Card is often the bottleneck; the new card has fixed that. "Not only is it a lot faster than its competitors, [but] at $187 per card, it's also cheaper."

The EtherLink III cards are based on a single-chip application-specific integrated circuit developed by 3Com. The card's speed is derived from a new technology called parallel tasking, which 3Com developed and is in the process of patenting. Parallel tasking means the card can process packets in parallel — in effect, it begins processing the packet as it is coming off the wire rather than waiting for the entire packet to be received in adapter memory, as current Ethernet adapter cards do.

Todd Dagres, an analyst who follows network interface cards for The Yankee Group, said he thinks 3Com is going to sell "a ton" of the cards: "I predict that it will increase their Ethernet market share from 26% in 1992 to over 33% in 1993.

"People who need more speed are not going to Fiber Distributed Data Interface to the desktop; they're just buying faster Ethernet cards. It's a growing market, and now 3Com has the hot product in it," Dagres added.

King listed several additional pluses. "The card doesn't use shared memory, which is good because we need every speck of our upper memory blocks to run Windows and networking; it can be configured and optimized for either 16-bit ISA or 32-bit EISA machines; and it's really easy to configure, either from the command line or via menus."

The 16-bit XT/AT bus EtherLink III card is currently available for both twisted-pair and coaxial media; 3Com intends to ship 32-bit Extended Industry Standard Architecture EtherLink IIIs in the fourth quarter of 1992 and a Micro Channel version of the adapters in 1993.

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NEWS SHORTS

IBM price hike targets hosts

IBM said last week that it is increasing hardware prices by 3% and software prices by 5%, effective immediately. The price hikes mostly affect the mainframe product lines because the RISC System/6000, Personal System/2, Application System/400 and disk storage devices are excluded. Customers who take delivery on merchandise before the end of the year will not have to pay the increased prices.

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Mentor lays out layoff plans

Mentor Graphics Corp. said it will lay off up to 300 employees by the end of 1993 — and freeze the salaries of the remaining 2,000-member work force until then — as part of a financial recovery plan outlined last week. Upcoming fiscal third-quarter 1992 results will take a $15 million to $25 million hit as a result of the restructuring. A "significant" portion of Mentor's top staff will be redeployed.

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Aldus pursues alleged virus source

Former Canadian computer magazine publisher Richard Brandow has been accused of planting a computer virus that tainted thousands of copies of Aldus Corp. software in 1988. Brandow, 28, allegedly arranged for a peace message to flash briefly on Apple Computer, Inc. Macintosh screens. The virus eventually infected a master disk for Aldus' Freehand illustration program, reportedly costing the firm $7,000 when it had to recall 5,000 copies. Brandow said the purpose of the act was to educate the public to the danger of viruses. He has been charged with malicious mischief and could face up to 10 years in prison if convicted.

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Librex to exit notebook market

Librex Computer Systems, Inc. late last week became the second victim of the raging personal computer price wars. The notebook maker has not made money since it was formed in June 1990, said Librex Vice President Daniel Crane, who blamed Taiwanese overcapacity for shrinking margins. Librex executives have until the end of March 1993 to sell the firm or license its technology. Pen-based vendor Momenta Technologies, Inc. recently closed its doors.

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AT&T cuts high-end network prices

AT&T last week dropped prices on two of its high-speed network offerings, including a 25% rate reduction on its Software Defined Data Network and Switched 384 Service and a discount plan for users of its Integrated Services Digital Network (ISDN) product who spend $4,800 annually on switched data over the ISDN D-channel.

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DEC teams up with Storage Tek

Digital Equipment Corp. and Storage Technology Corp. last week set up Rocky Mountain Magnetics, Inc., a joint venture to produce and sell inductive and magneto-resistive thin-film heads for disk drives. DEC, which holds a controlling 81%, expects to put $50 million into the firm.

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Short takes

Microsoft Corp. has made public a tape format specification for the Windows New Technology operating system. The specification is part of the Windows Open Services Architecture and comes from a development effort with **Maynard Electronics.** . . . This week, **IBM** and San Francisco-based **Grubb & Ellis Co.** are expected to launch **Axiom Real Estate Management, Inc.**, a joint venture that will kick off with some 80 million square feet of office, industrial and retail space. . . . **DEC** last week filed a shelf registration statement covering up to $1 billion in aggregate principal of its debt securities. The proceeds are slated for capital expenditures, restructuring and additions to working capital. . . . Richard Braddock, **Citicorp's** chief operating officer and president joined **Lotus Development Corp.'s** board.

More news shorts on page 16

IS blunts hurricane's impact

Prepared for worst, some data centers were hurt; others weathered fine

BY GARY H. ANTHES
CW STAFF

Thanks in part to timely and accurate weather forecasts, many data center managers in the lower Southern states were prepared last week for the onslaught of Hurricane Andrew, the costliest natural disaster ever to strike the U.S.

Even so, by the weekend, many companies in the hardest hit areas in Southern Florida and Western Louisiana could not be reached, and it was feared that some may have problems far worse than a temporary loss of computer cycles.

"Most of the customers we were able to reach had backed up their data and were in pretty good shape," said Carl McKinley, director of customer service at Maynard Electronics, a Lake Mary, Fla., division of Archive Corp. that makes data backup systems. "But south Dade County, Homestead, those areas — you can forget it. The last thing they are thinking about is their computer systems."

"This is the largest single disaster to affect computer facilities," said Tari Schreider, chief executive officer at Contingency Planning Research, Inc., a disaster recovery consulting firm based in Jericho, N.Y.

According to Schreider, by late last week 39 major companies had moved to backup processing sites provided by computer disaster recovery firms. Another 50 had put their vendors on alert. He said the numbers are likely to climb higher this week as employees return to businesses incapacitated by wind, water and lack of power.

The Miami data center of Philadelphia-based Comcast Corp. lies just north of an east-west line that separates those facilities that merely lost power from those that were blown away, said Douglas Murphy, director of MIS at the company.

Data centers more than 15 miles south of central Miami "may or may not still exist," Murphy said. "It looks like a bomb went off down there."

UPS reliance

The Comcast data center, which houses an IBM 4381 mainframe and other computer gear, was protected by security shutters, but other parts of the building suffered wind and water damage, Murphy said. When power failed, Comcast kicked in its uninterruptible power supply (UPS) and diesel generators.

Murphy said estimates of when power might be restored ranged from days to weeks. "In theory, the UPS can run indefinitely, but remember, it's a mechanical structure, and you have to keep it fueled and oiled. It's gone up and down, but we think we have it stabilized now."

The main data center of Miami-based Ryder System, Inc. is also equipped with a UPS, but Ryder elected to shift operations to a backup site in New Jersey, according to a computer operator at the mostly deserted Florida headquarters. "The backup facility is supporting all our users throughout the country and in the UK," he said.

A number of companies made arrangements that ultimately proved unnecessary when Andrew's worst passed them by. For example, one Miami-area company sent people and computer backup tapes to the Warminster, Pa., facility of Sungard Recovery Systems, Inc. but never initiated processing there.

Other firms did not arrange for a backup processing site and considered themselves lucky they did not need one.

Lucky in Louisiana

Saia Motor Freight Line, Inc. in Houma, La., kept its Unisys Corp. 2200 mainframe alive with a UPS after Andrew knocked out power to much of coastal Louisiana. "We've discussed having a hot-site arrangement several times but haven't done anything yet," said Robert Watson, senior systems analyst at Saia.

Asked what Saia would have done had it been hit hard enough to incapacitate the UPS, Watson said, "We'd have been in deep doo-doo. I don't know what we would have done." However, he noted that the firm did have tapes of key software and files stored off-site.

According to Schreider, Southern Louisiana is populated by light manufacturers with sales of between $10 million and $20 million running systems such as IBM System/36s, System/38s and Application System/400s. "Typically, these are not companies that go out and spend $500 to $700 a month for backup agreements," he said.

Some may be so small they do not need to. Jon Paul Olivier, director of computer operations at Gulf South Engineers, Inc. in Houma, said he wrapped his Digital Equipment Corp. MicroVAX II and his personal computers in plastic and moved them to higher ground before the storm.

Andrew afflictions

NEW ORLEANS — At the Regional Transit Authority (RTA), which operates the city's buses and fabled streetcars, a drive failure shut down an IBM AS/400 system before stormy weather had a chance to wreak havoc.

That failure last Monday created other hurricane-related problems, as the oncoming storm caused IBM to close business the next day and prevented it from sending its service rep to the customer site, noted John Sullivan, an independent consultant at the RTA's IS shop.

Mark Halper

A hand-scrawled sign *taped to a side RTA entrance lined with sandbags tells the IBMer who did not show how to get in*

Had the representative arrived Tuesday, that individual would have encountered locked doors at the deserted Maison Blanche department store, where the RTA's IS operations are located.

Both IBM and the RTA remained closed on Wednesday, and it was not until midday Thursday that the RTA expected to see its service person. In the meantime, it was making do without its maintenance and materials program.

MARK HALPER

WHAT HAVE BILL GATES, SCOTT MCNEALY, JOHN SCULLEY, JOHN YOUNG AND LARRY ELLISON AGREED TO COOPERATE ON?

Palm PCs make mini splash

Analysts predict personal digital assistants will soon overtake PC wave

BY MICHAEL FITZGERALD
CW STAFF

A wave of computing power that may prove as alien to personal computer managers as PCs once were to the glass house may be about to hit the realm of information systems.

The vanguard of these new computers, called personal digital assistants (PDA), is already here in the form of Sharp Corp.'s Wizard, Fujitsu Personal Systems Ltd.'s Poqet, Atari Systems, Inc.'s Portfolio and Hewlett-Packard Co.'s 95LX.

A survey by Technologic Partners shows that industry executives see these types of systems reaching 70 million units by the mid-1990s, outselling traditional PCs.

Some companies have made big buys already. For instance, Prudential Insurance Co. bought 10,000 Wizards for its agents, and Korea's Samsung Life Insurance Co. recently purchased 13,000 95LXs from HP.

"The whole appeal of these is [the idea of] . . . computerizing hitherto uncomputerized people. The potential payback is huge," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "The question of where they fit in an organization is what's being hotly researched by a lot of companies right now."

A swarm of new systems that are easy to hold in one hand is slated to arrive by year's end, and analysts said their low prices could bring them into corporations on an ad hoc basis (see story page 37).

Examples of new machines range from Apple Computer, Inc.'s Newton, which is expected in early 1993, to sub-3-pound, DOS-compatible devices from Gateway 2000 Ltd. and Zeos International, Inc.

James Cannavino, general manager of IBM's Personal Systems Division, said at a briefing in late May that the firm would also have a PDA. IBM said last week it will show several PDA prototypes at Comdex/Fall '92.

"I think they'll affect [IS] about as much as a cellular phone affects it," said Richard Shaffer, publisher of "ComputerLetter," a newsletter put out by Technologic Partners. "They'll be really handy but not a major factor."

IS "is going to have to be prepared for these things," countered Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing" in Brookdale, Calif.

Seybold said these devices could cause problems for networked environments in particular, as networks struggle to handle the "disappearing node" effect created by portables.

Hung jury

Users remain split on the value of PDAs and the impact they will have on IS. Those who have them installed see them as positive.

"I view it as an opportunity to get more information in people's hands," said Bob Martin, manager of executive support systems at Eaton Corp. in Cleveland. Martin uses HP's 95LX to run his schedule. "It's not our job to control things — our users need the ability to run the business."

"Personally, I think these are the future of computing," said Bill Bozym, IS planning and technology assessment specialist at Pacific Bell Directory in San Francisco. The directory unit has outfitted 300 salesmen with Fujitsu's Poqet system.

But other users expressed skepticism about handhelds.

"Mostly I see it as gadgetry," Rick Marolt, IS manager at Great Central Insurance Co. in Peoria, Ill., said, summing up several users' opinions.

Marolt hedged his criticism, though. "Something tells me it's going to make a big difference — something I haven't put my finger on yet."

Still, even users who regularly put their fingers on palmtop-type devices debate their worth.

"There is a movement [internally] that says [the Poqet] may not be a good long-term decision," Bozym said. "If you talk to the accounting/finance people, they think it's crazy to buy these, based on where we want to be in five years. Then again, [the Poqets] are being used."

Most analysts see these devices challenging IS departments as PCs once did, and some users agree.

"These definitely could in the future become a threat to MIS," said Edward Wysock, senior applications coordinator at Merck & Co.'s Human Health Division in West Point, Pa., which uses Wizards. "Clearly they have potential for replacing the laptop. Our MIS department relies on us to build applications" for special projects involving the Wizard.

Shooting for the stars

Toshiba's Satellite laptop targets low-cost market

	T1800	T1850	T1850C
Price	$1,799	$2,199	$3,299
Processor/ CPU speed	386SX 20 MHz	386SX 25 MHz	386SX 25 MHz
Hard disk	80M bytes	80M/120M bytes	80M/120M bytes
RAM	2M to 10M bytes	4M to 12M bytes	4M to 12M bytes
Display type	9½-in. VGA monochrome	9½-in. VGA monochrome	9½-in. VGA Ultra STN-LCD color
Weight	6.8 pounds	6.8 pounds	7.3 pounds
Battery life	3+ hours	3+ hours	2+ hours

CW Chart: Michael Siggins

Toshiba hopes Satellite launches sales sky-high

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — Toshiba America Information Systems, Inc. hopes the low-priced Satellite line it will launch today kicks its sales out of stationary orbit.

The new line marks Toshiba's effort to parry Compaq Computer Corp.'s Contura line of low-cost notebooks and may signal that Toshiba is once again becoming aggressive in the notebook market in an effort to win back lost market share.

"I think they'll get a good reaction" from the market, said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

The Satellite line will retail starting at $1,799 for a 20-MHz Intel Corp. 80386SX-based notebook with a 60M-byte drive. The line will feature a passive-matrix color notebook with a screen that clearly surpasses that of rivals AST Research, Inc., Dell Computer Corp. and Leading Edge Products, Inc., Bajarin said. With a list price of $3,299, street pricing for the notebook may fall to $2,500.

Targeted to the cost-conscious buyer more than to Toshiba's traditional corporate purchaser, it will sell through mass merchant channels.

Steve Lair, Toshiba's vice president of marketing, said the firm expects the Satellite line to cut into sales of the T2200, its best-seller on the low end.

Bajarin said he thinks the products will do well but may not surpass Toshiba's higher priced lines in sales.

"The value-type shopper is shopping in different places than the corporate buyer, and this gives Toshiba a way to play there. But there's still a tremendous amount of buying done on price/performance," he said.

The Satellite line features the same keyboard as the T4400, giving excellent play, and adds several nice touches, such as sliding doors for the ports and the modem jack.

Toshiba, long bashed by analysts for responding too slowly to trends in the portable market and being overpriced, appears to be changing.

For instance, $30 billion Toshiba Corp. cut prices on its portables only three days after Compaq introduced its Contura line in June, thanks to prodding by Atsutoshi Nishida, Toshiba America's president.

Technology shifts, costs give buyers new 'lease' on PCs

CONTINUED FROM PAGE 1

nothing three years ago.

User sites like Hughes and Eaton Corp., a Cleveland-based manufacturer, seem to confirm a trend. Eaton leases perhaps 5% of its PCs, usually for special projects of set length, but it is looking seriously at leasing more PCs, said Fred Zickert, microcomputer support manager.

"I'm not saying leasing has become a general way of going, but it's certainly being considered where it had not been in the past," Zickert said. "The state of the art [in PCs] is changing faster than the depreciation amount on the equipment."

Zickert added that increasingly modular PC designs make upgrading more realistic, as users can easily choose to add memory or other components during the life of a lease.

"Our corporate strategy is to lease, not to buy. With today's technology, unless you're going to throw it away, fiscally speaking, on your books, to purchase something in hardware or software is really unsound," said Patrick Thomas, MIS director at Hickory White Co. in High Point, N.C.

Thomas said a multiyear lease saves him the headache of fighting for new appropriations for information systems when new technology becomes available and from figuring out what to do with outdated equipment.

It was the ability to treat leased PCs as an expense that drove a number of lease decisions, according to users contacted.

"It goes down as an expense rather than a capital item, and with prices continually going down and capabilities going up, we'd rather lease than have them on the books," said Carrie M. Ulvestad, national manager of dealer and vehicle systems at Hyundai Motor America in Fountain Valley, Calif.

Hyundai leases servers and notebook and desktop computers.

Great outlet

Bill Wiley, operations coordinator at A & C Intercom Services, Inc., a Phoenix-based utility consulting firm, said his company turned to leasing two years ago because "we had a growth rate of 133% one year, and we had some issues of cash flow, so leasing was a great outlet for that growth."

Meanwhile, Hughes is negotiating a deal to lease systems that cost more than $1,500 apiece, the highest expense it can claim under U.S. Department of Defense regulations. Ben Berry, manager of computer services at Hughes, said the company wants to lease high-end PCs and servers because "capital is so tight."

Shipley said book value ratios of PCs are now exceeding those of mainframe and minicomputers at many large companies, and this has brought the cost of PCs to the attention of company controllers. He also cited the hidden cost of managing PCs when you own them.

"It costs a company between $250 and $500 just to touch a PC because of paperwork, etc.," Shipley said. He said some leasing companies, such as Comdisco and Chrysler Systems Leasing, offer completely electronic leasing, which saves costs. Leases tend to be flexible, giving users options in areas such as service, maintenance and upgrades.

Besides financial nuances, most users contacted cited the ability to avoid having obsolete equipment as a major plus to leasing.

At the same time, users in their first lease do have concerns about what happens when the lease ends.

"Until we've gone through it, I don't know how much lead time is involved, what it takes to convert people's information onto new machines, locate the new machines or what happens when hardware changes in and out of machines," Ulvestad said.

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Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation

"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
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LAN-to-host gateway debuts

Novell and Memorex Telex link NetWare, IBM mainframes

BY THOMAS HOFFMAN
CW STAFF

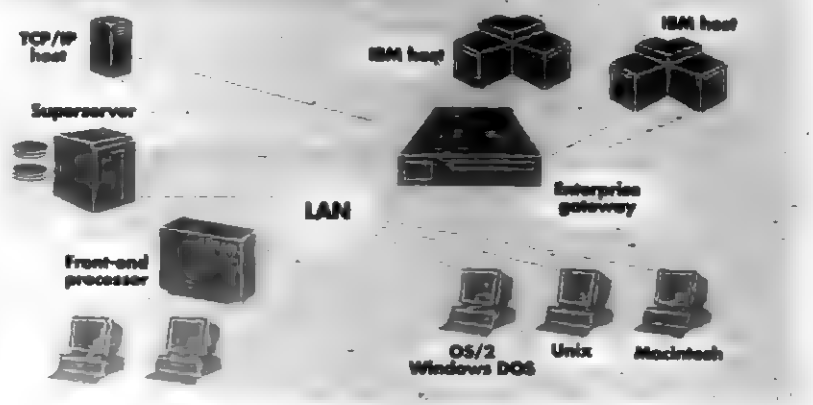
NEW YORK — Looking to leverage its large IBM 3270 customer base, Memorex Telex NV last week introduced a gateway that connects networked personal computers to IBM hosts via direct-channel attachment using Novell, Inc.'s NetWare for SAA local-area network-to-mainframe software.

Memorex Telex, which after IBM has the second-largest installed base of 3270 peripherals products, will resell customized versions of Novell's NetWare for SAA software to its installed base. In addition, Memorex Telex will provide training, systems integration and support services to NetWare and IBM host users.

Developed by Memorex Telex and Novell, the 9430 Enterprise Gateway supports IPX/SPX, Apple Computer, Inc.'s AppleTalk and Transmission Control Protocol/Internet Protocol (TCP/IP). The gateway will be made available in the fourth quarter. Pricing will range between $28,500 and $55,600, depending on system configuration. Memorex Telex will market the product.

An island no more

With Memorex-Telex's Enterprise gateway, networked PCs, workstations and servers can access IBM hosts via direct channel attachment



Jim Lindner, president of North American operations at Memorex Telex, said the two firms will develop other LAN-to-host connectivity products for large and midrange systems as well as storage devices shortly after the first product's rollout. Lindner said the firms plan to develop similar products for the airline industry.

The announcement was welcomed by IBM Systems Network Architecture (SNA) network users because the Enterprise Gateway eliminates the need for the front-end processors usually required for such connectivity. Channel connections provide improved throughput and response time with lower connectivity costs compared with front-end processors.

"We see this as a way of being channel-attached, while eventually eliminating the need for a front-end processor for communications" between LANs and hosts, said Alan Newton, director of MIS at A. Duda & Sons, Inc. in Oveido, Fla., which has been testing the gateway for a month.

Newton said his company will consider other options before deciding to purchase the gateway. So far, he said, the Memorex Telex product has proven to be a viable alternative to installing a front-end processor for the wide-area network that A. Duda & Sons is planning. The company is using an NCR Corp. COM10 5645 front-end processor attached to an IBM 3081 mainframe over an SNA network to support 150 users in three states.

David E. Pinkus, manager of MIS at The Fuller Co., a Bethlehem, Pa., manufacturer, also has a keen interest in the gateway. Pinkus said Fuller is attempting to move 140,000 of its mainframe-based engineering drawings onto PC LANs, so he sees a strong demand for improving his company's LAN-to-host connectivity. "Plus, we do not see the mainframe going away, and we are constantly looking for ways to link [different environments] together," Pinkus added.

Fuller is using Rabbit Software Corp. gateways to link its NetWare v3.11 network operating system to its IBM 4381 host via an Ethernet microwave bridge and T1 connections. Pinkus said that although this configuration has led to file transfer failures, he thinks the new gateway with direct-channel attachment may help solve this dilemma. "We're a big TCP/IP shop, and we think these products can eventually help solve some of our connectivity problems."

Analysts were also enthusiastic about the new product. "The agreement brings the LAN and host together in a good, workable solution," said Dick Boyle, program director of local-area communications at Gartner Group, Inc.

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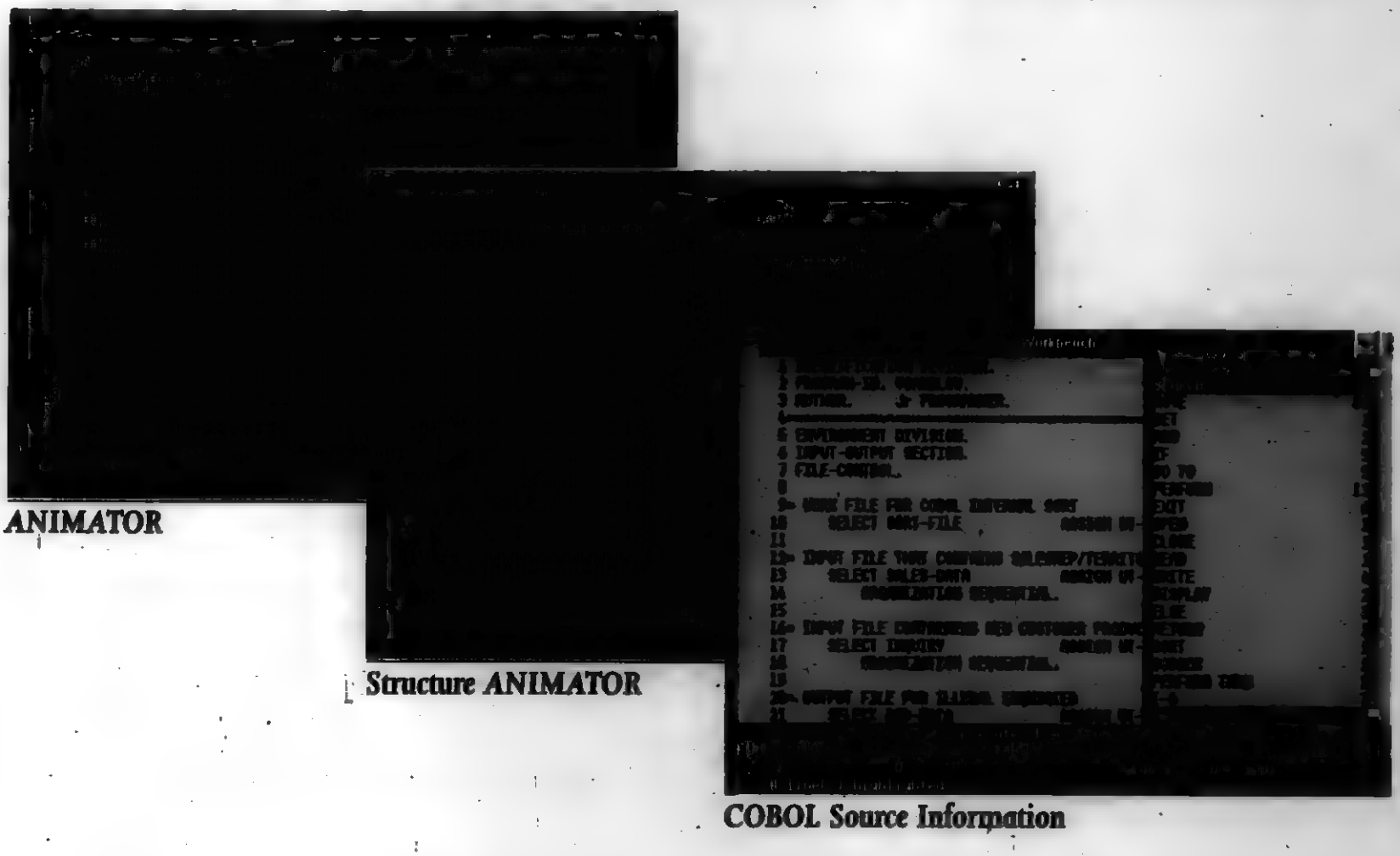

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HP users like MPE, but still explore Unix

BY MARK HALPER
CW STAFF

NEW ORLEANS — Information systems managers who run Hewlett-Packard Co. shops have intensified their interest in Unix, yet many plan to remain on HP's proprietary MPE operating system with its Unix hooks rather than migrate to full-blown HP/UX.

At the same time, shop managers from small to medium-size companies have serious misgivings about HP support, an issue the company said it will address with sales force changes this fall (see story below).

These are two of several findings from a survey presented by HP user group Interex at the group's annual conference last week (see chart).

In other results, open systems and industry standards jumped from fifth to third place in IS managers' rankings of strategic concerns, while Unix standards surged 11 places, from 19th place last year to eighth this year, according to the survey.

Good enough for some

But rather than go through the pains of migrating from HP's MPE operating system to its HP/UX version of Unix, a majority of the respondents expressed a preference to stay on the MPE system.

The most recent version of MPE, dubbed MPE IX, includes Posix hooks that some users said provide them with as much Unix functionality as they require.

According to Jane Copeland, who heads Interex's advocacy committee, 56% of the respondents said they will not migrate from MPE to HP/UX in 1992; 24% said they will. Most of the migration activity entails moving from older versions of MPE to versions with Unix hooks, such as MPE IX or the older MPE XL, Copeland said.

Several users at the conference explained that for mission-critical situations, they have more confidence in tried-and-true MPE than in the relatively unproven HP/UX. They said they also worry that HP/UX is not as secure an operating system as MPE.

But not all users are satisfied that "Unixized" versions of MPE are capable of handling certain Unix applications.

Chuck Cremer, HP systems manager at Ungermann-Bass, Inc. in Santa Clara, Calif., said his firm is concerned about a lack of Unix functionality in MPE IX and is considering using non-HP equipment running Unix.

The annual survey, which was sent this year to 3,200 IS managers, garnered responses from 820. Together they spend $945 million annually on information technology.

Shifting concerns

While database technology remains the key strategic concern for HP users, Unix standards are getting more attention

Top 10 strategic concerns

	1992	1991
Database technology	1	1
Interoperability & network integration	2	6
Open systems & industry standards	3	5
Professional development	4	4
Application development	5	3
Performance & capacity	6	2
LAN operations	7	8
Unix standards	8	19
Data management	9	9
Distributed data	10	10

Source: The International Association of Hewlett-Packard Users — CW Chart: Michael Siggins

HP to cut prices

HP is turning up the volume on its PC division, which until now has been a low-profile part of the company.

The company is expected to finally respond tomorrow to the industry price wars that so far have roared past it, announcing cuts of up to 26% on its entire family of Vectra PCs. A diskless 386 25-MHz machine will be offered for $999, while the company's 33/66 DX2 offering, now shipping, starts at $3,649.

Boris Elisman, product manager for the North American Personal Computer Division, said HP plans to pursue the PC market more aggressively. Other executives outlined plans to step up the use of HP's direct sales team to sell more PCs (see story at left).

Elisman said sales have increased 50% since May 18. International Data Corp. estimated that HP shipped 123,000 units in the U.S. last year, including single-user workstations.

John Dolstor, chief of information systems at the Los Angeles Municipal Court, said the new prices certainly affected his purchasing plans — he switched vendors. "We're moving to Vectras because of the prices. We're getting HP 486s at the cost of the others' 386."

CAROL HILDEBRAND

Whirlwind of HP support woes spurs sales shake-up

BY MARK HALPER
CW STAFF

NEW ORLEANS — High winds were not alone in stirring things up at the Hewlett-Packard Co. user conference here last week, where rancorous user complaints of diminished support prompted promises from HP of sales force changes.

"I haven't even seen my systems engineer for eight months," complained Ed Harms, a data processing analyst at Florida Roofing, Sheet Metal & Air Conditioning Contractors Self Insurers Fund in Winter Park, Fla.

A survey of HP users, meanwhile, showed consistent concern among users about the vendor's lagging level of support (see story and chart this page).

Manuel Diaz, HP's general manager of sales for the Americas, acknowledged HP's support shortcomings in a speech to about 3,000 attendees at the annual HP user group meeting. Diaz faulted HP for failing to tell users about a change made last year in which HP decided to sell to certain users via telephone and indirect channels rather than through the company's direct sales force [CW, Aug. 24].

HP's Platt: *Sales team to get involved in PC sales support*

Diaz outlined a plan calling for the direct sales staff to play a more active role in small to mid-size accounts.

Among the sales force changes that will mark the beginning of the Lew Platt era is a plan to form an integrated sales team that will dispatch direct sales staffers to accounts that now deal only with indirect or phone sales contacts.

Platt, who heads HP's computer operations and will take over for John Young as chief executive officer in November, outlined other forthcoming changes last week. One plan called for HP to increase personal computer sales by increasing the involvement of its direct sales team in the company's PC business. Currently, the direct sales team is geared toward the reseller channel.

HP, which has been riding a wave of success in the minicomputer and workstation business, is often criticized by industry watchers for its relatively lackluster performance in the PC business with its Vectra line.

Honing in

While stopping short of agreeing with that assessment, Platt said in a interview last week, "We recognize that PCs are a very important client in the overall client/server scheme. We're going to involve the direct sales force more in the sales of PCs."

He said HP will tap the direct force for PC sales to "a select group of major accounts" rather than relying on sales representatives to sell pervasively to the whole PC market.

"We're not going to have them running all over the place," Platt said.

Compaq creates elbow room with release of printer line

BY CAROL HILDEBRAND
CW STAFF

NEW YORK — Compaq Computer Corp. will make its first attempt today to elbow its way into the crowded printer market when it shows the first two offerings in what it said will be a comprehensive product line.

Pagemarq 15 and Pagemarq 20 are network-ready printers that will print between 17 and 20 page/min., including 11- by 17-in. pages, according to sources close to the company. Pricing is about $3,995 and $5,995, respectively, which analysts said is very aggressive for that printer class.

As part of its bid to offer one-stop shopping, Compaq will market the printers using a "hassle-free printing" marketing strategy, sources said. The machines offer support for Token Ring, Ethernet and Apple Computer, Inc.'s AppleTalk.

The printers also have both PostScript Level 2 and PCL fonts preloaded, as well as a feature called terminal-emulation sensing, which Adobe Systems, Inc. developed for Compaq. It automatically switches between the two font types, sources said.

An internal fax modem on the printers also allows users to send faxes from the printer, and print enhancement technology will enable users to print at either 300 by 300 dot/in. or 800 by 400 dot/in.

Analysts said that if any company has a chance at breaking Hewlett-Packard Co.'s hammerlock on the corporate printing market, Compaq does.

Rob Auster, an analyst at BIS Strategic Decisions in Norwell, Mass., cited the firm's strong dealer channel and expertise with networking as strengths of the new printers.

However, he said he expects Compaq to move away from networking and open up the line to be competitive with HP's offerings.

"Compaq has done their homework," he said. "HP is now going to have to respond to that. This is the first time that HP has been outjumped in printers."

CORRECTIONS

In "New DX2 systems enter PC fray" [CW, Aug. 17], the chart showed an incorrect price for the Compaq DeskPro 4/661 Model 120.

The correct price for the model is $2,749.

****

Electronic Data Systems Corp. did not buy an equity stake in National Car Rental System, Inc., as was reported in "Budget remaps outsourcing plan" in the Aug. 17 issue. It did, however, purchase all of National Car Rental's hardware and software.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Big Blue fights AS/400 mid-life crisis

CONTINUED FROM PAGE 1

an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Although the AS/400 continues to sell briskly — revenue was up 20% in 1992's first half compared with 1991 — the pace may level off by 1994 unless IBM can improve price/performance of the line, IDC analyst Steve Josslyn said.

Tomorrow's products "are really just fillers, but IBM has to make announcements often to reassure people that there is room to grow within the product line," Josslyn said.

IBM has been providing such reassurance, but it may have to appease users more often to combat stepped-up marketing efforts from Unix vendors, he explained.

Real performance pops will appear during 1993's first quarter, when IBM plans to refresh the line with a next-generation F series family. Analysts speculated that the F models will contain hooks from the proprietary OS/400 operating system to reduced instruction set computing (RISC) features.

IBM declined to say which RISC chips might power future AS/400s, but according to analysts, using the forthcoming PowerPC architecture would be wise. IBM is currently working with Apple Computer, Inc. and Motorola, Inc. to develop the PowerPC chip family.

However, some users said they want AS/400s to talk to IBM's Unix systems right now.

Atlanta-based Equitable Real Estate Investment Management, Inc. is looking to replace an older Wang Laboratories, Inc. system with an AS/400, mainly because the firm's applications run on that platform and not on the RISC System/6000, according to Robert Matthews, senior vice president.

Equitable runs an IBM 3090, a network of 20 RS/6000s and about 1,000 PCs. "One of our concerns is, how does an AS/400 fit into what we're moving to in the open environment?" Matthews said.

IBM's Application Business Solutions (ABS) group, which controls AS/400 development and marketing, is the first IBM division to roll out RAID systems. "ABS is a test bed for new technologies," Josslyn said, adding that IBM's first 16M-byte chip debuted on the midrange line.

Worldwide installed base

	1988	'89	'90	'91	'92*
IBM AS/400	27,100	68,500	113,850	166,241	216,256
HP 3000	35,450	42,500	50,185	59,865	69,876
DG Eclipse	22,557	27,195	29,525	38,164	29,162
DEC VAX	275,449	387,244	450,711	498,891	523,600

*estimated

Source: Computer Intelligence/InfoCorp — CW Chart: Janell Genovese

Users lukewarm

Test bed is the right description, judging from underwhelming user response to news of AS/400-related RAID products. Users such as Deans & Homer Insurance in San Francisco are content with disk drives for the short term.

"I see the value of [RAID], but the high cost outweighs that value," said Jerry Murphy, data processing manager, echoing sentiment from several users interviewed last week.

Meanwhile, although faster boxes are always welcomed, the market for the high-end E95 is limited, according to Gannon.

"The real growth opportunities are in migrating the users of smaller models, such as low-end AS/400s, upward," she said. IBM recognizes that jewel and is grabbing for it with pinpointed marketing plans.

In fact, observers said, the AS/400 owes its success largely to cunning marketing tactics from ABS. Consider the following:

• **Prepackaged goods.** ABS has invented sales programs aimed at small to medium-size businesses with relatively little computing know-how.

For example, Plug-n-Go systems consist of discrete vertical market-oriented programs preloaded on 9402 and 9404 models, while Migrate-n-Grow caters to System/36 and System/38 users looking to upgrade to AS/400s.

• **Alternative distribution.** IBM recently signed up three regional distributors — Arrow Electronics, Inc., Sirius Computer Solutions and Support Net, Inc. — to find and contract smaller resellers for low-end AS/400 machines.

A two-tiered take on distribution is not new — rivals Hewlett-Packard Co. and DEC use the method — but IBM has honed it to the low-end part of the AS/400 family instead of applying it to the whole line.

"They've carefully decided which customers to go for and are attacking," Josslyn said.

IBM to announce AIX software, new RS/6000s

BY MARYFRAN JOHNSON
CW STAFF

The Unix contribution to IBM's September product bonanza will underscore the importance of commercial transaction processing environments. On Sept. 22, IBM will announce a slew of AIX Unix-based software and at least three new models of the RISC System/6000, sources close to the company confirmed last week.

"This is going to be a pretty big announcement. It will definitely make AIX a more strategic product for them," said one commercial user who asked to remain anonymous. "It's an acknowledgment that they're shipping more units into the transaction world than into the engineering world."

Analysts and users familiar with IBM's product plans are expecting the following introductions at Unix Expo in New York:

• Availability dates and details about the AIX version of CICS, the Customer Information Control System that is IBM's mainstay transaction processing system and a key database access tool in mainframe environments.

• New distributed processing software for clustering RS/6000s, allowing users to run programs in multiple places while keeping close track of them.

• More specific time frames for delivery of the AIX database product, which will reportedly replace OS/2's Data Manager and provide a common database environment for AIX and OS/2.

• Additional computer-aided software engineering tools that operate in either database environment, which analysts said signals the eventual merging of OS/2 and AIX development efforts.

• A new low-end RS/6000, a midrange model and a topper for the current high-end RS/6000 Model 970. Analysts said they expect IBM to pump up the current 50-MHz clock speed to the 100-MHz chip speed coming in mid-September from competitor Hewlett-Packard Co.

"Basically, IBM will be exposing its enterprisewide client/server strategy," said Marc Schulman, president of Technology Strategies Group, Inc. in Stamford, Conn.

IBM front-end processor set for peer networking push

BY ELISABETH HORWITT
CW STAFF

IBM will make multiple efforts next month and later this year to ensure that users do not abandon their trusty 3745 front ends when they start migrating to IBM's "open" Advanced Peer-to-Peer Networking (APPN)-based architecture.

IBM first unveiled the architecture last March, billing it as the future de facto standard for multivendor enterprise communications. Its keystone is the APPN network node, which will coordinate communications across the enterprise between devices running IBM Systems Network Architecture (SNA), Transmission Control Protocol/Internet Protocol, Open Systems Interconnect and Novell, Inc.'s IPX, IBM said.

IBM is expected to prepare the 3745 for the role of APPN hub with the announcement of Network Control Program Version 6.2 with APPN network node support on Sept. 15, according to Richard Boyle, a program director at Gartner Group, Inc. in Stamford, Conn.

Frame expectations

At the same time, IBM is expected to announce frame-relay switching capabilities for the 3745. Previously, IBM had announced frame-relay direct terminal-emulation support, which allows the 3745 to access a carrier's frame-relay services, an IBM spokesman said.

As a frame-relay switch, the 3745 will be able to efficiently handle bursty, high-speed traffic as well as route a variety of local-area network protocols. Both of these capabilities have long been demanded by customers who want to interconnect their LANs over their IBM SNA backbones, which nine out of 10 IBM customers do, according to Boyle. However, the price for the necessary hardware and software enhancements could be high, Boyle said.

CSX Corp. is one company that "buys the concept" of APPN, according to Doug Underhill, an assistant vice president at the transportation firm. Underhill said he initially envisioned using IBM front ends as an APPN backbone, then moving gradually to router-like APPN nodes that would interconnect a local group of LANs or devices to the rest of the enterprise. The nodes would talk directly to one another, eliminating the need to route traffic through a central front end, he added.

The 3745 will have a lot of competition for the job of enterprise LAN switch — particularly from vendors such as Cisco Systems, Inc. that plan to implement APPN Network Node on their devices, sources said.

SNA considerations

A. Duda & Sons, Inc. will consider using SNA backbones to interconnect its LANs after reviewing other solutions, said Alan Newton, director of information systems at the Oveido, Fla., agricultural business. However, A. Duda & Sons may not wait for IBM's rollout: The firm is now testing Memorex Telex NV's 9430 Enterprise Gateway to link Novell NetWare LANs to an IBM 3081 mainframe (see story page 10).

Other IBM announcements that are expected either Sept. 15 or in the next couple of months include the following:

• Product details on the recently announced joint development and marketing agreement between IBM and Chipcom Corp. The agreement should build on Chipcom hubs that interconnect Fiber Distributed Data Interface, Token Ring and Ethernet products in areas such as Asynchronous Transfer Mode switching, bridging and routing and network management by IBM products, a source close to IBM said.

• Distributed Systems Management, a framework for running LAN management applications that will be based on IBM's SystemView architecture and run on OS/2 2.0 systems.

• Configuration, installation and distribution software that will work with IBM's mainframe-based Distribution Manager to coordinate the downloading of software updates to OS/2-based workstations.

Correspondent Thomas Hoffman contributed to this report.

'New' IBM sets revamp

CONTINUED FROM PAGE 1

is more internal competition, more freedom for the AS/400 salespeople to go after mainframes and for the workstation people to go after the AS/400. It's much more so than in the past, when IBM would try to sell customers the highest cost and most proprietary solution."

Still, customers may not entirely welcome some by-products of this independence. The days when users had a "high dependence on IBM for understanding the industry" are over, said Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "Customers will just have to pay more attention to the overall trends in the market," he said.

Another question is just how well the interdivisional warfare will turn out longer term. "If everyone is on their own, how does each individual agenda really help IBM?" one software company executive said. "As they break apart, will they be able to achieve a cohesive strategy for the company?"

An IBM spokesman said there are still some corporate structures in place to make sure havoc does not reign. "The Balkanization of IBM should not be presumed," he said. "There is still an overriding IBM corporation that all lines of business report to and through."

Among these structures, he said, is the Corporate Management Board, which meets monthly. Some 24 executives discuss cross-organizational issues.

To some observers, the new model makes sense, despite whatever dangers lie ahead. "After all, how successful was IBM before at accomplishing its grand schemes like AD/Cycle?" said Phil Reuppel, an analyst at Sanford C. Bernstein & Co.

Face-lift for IBM's PS unit

The changes looming next month for IBM's Personal Systems Division are more than cosmetic — they amount to an entire face-lift.

Caught between an inflexible corporate parent and a PC price war that demands hair-trigger responses, part of the Personal Systems Division will secede from IBM proper on Sept.. 3, sources said.

The new entity will include several divisions, each dealing with a separate market including notebooks and mobile systems, PS/2s, PS/1s, software and services. It will not include the RS/6000 line of workstations or OS/2.

Its day-to-day operations head looks to be Robert Corrigan, currently the Entry Systems Division vice president, who will report to James Cannavino, the de facto chairman.

The new group will stake its claim in the PC hardware market almost immediately, announcing new, more powerful PS/1s on Sept. 9. Less than two weeks later, on Sept. 21, the new unit will make a major PS/2 announcement that will include servers, desktops and notebooks as well as a new line of low-price PCs.

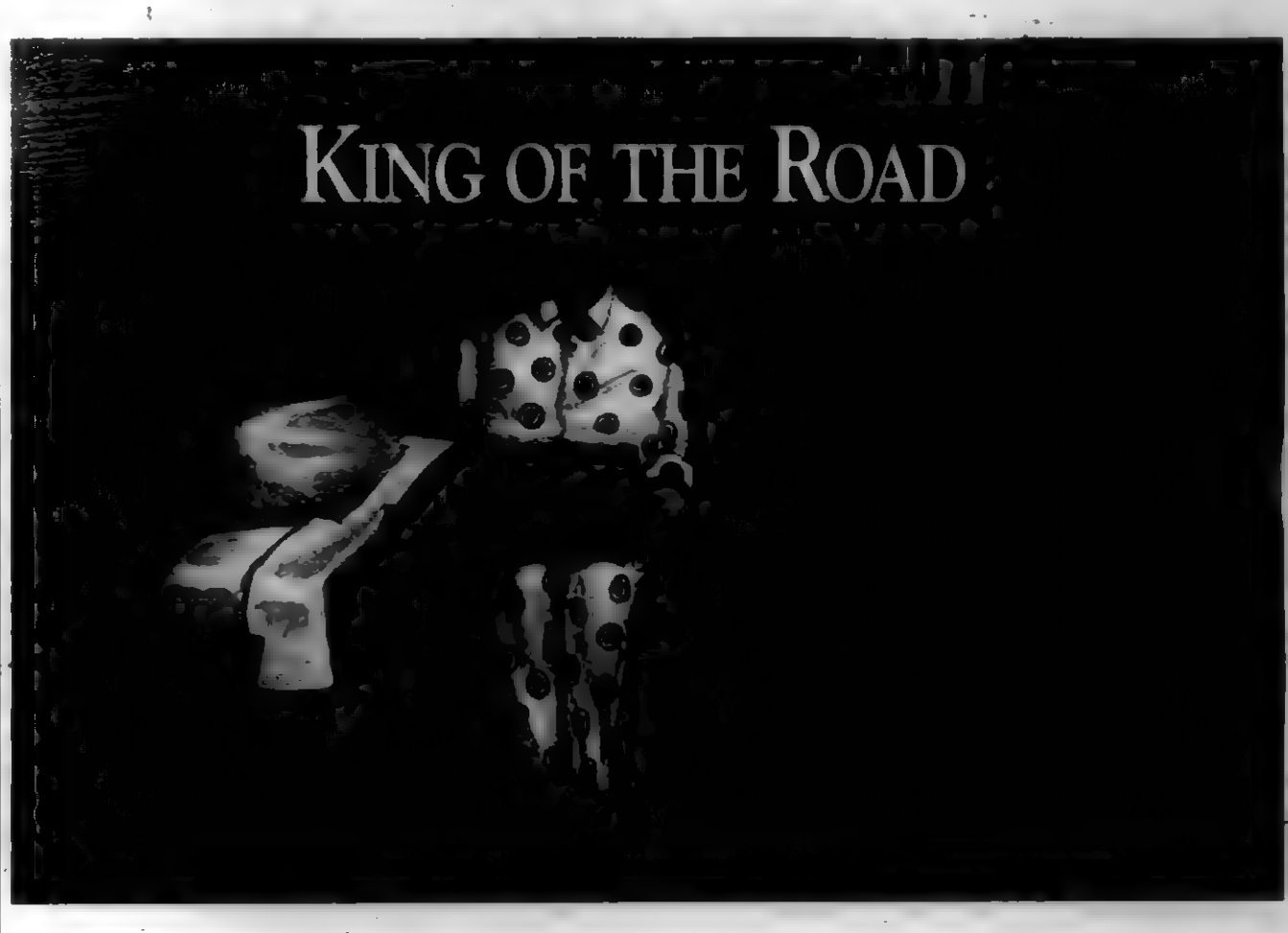
An IBM spokesman confirmed that new PS/1s were on the way, saying, "We intend to deliver a full family of PS/1 products in the very near time frame."

In fact, East Coast retailer Lechmere is already pushing the products. A 25-MHz 386SX with an 85M-byte hard drive, Video Graphics Array monitor and a slew of preloaded software, including Microsoft Corp.'s Windows, will cost $1,299.

The Sept. 21 announcement will see IBM unveil an entire line of "entry-level" PS/2s based on the AT bus architecture, while it expands the Micro Channel Architecture-based current PS/2 line, as well as the notebook line.

IBM is also exploring mail-order and built-to-order PCs, which it could announce on the same date, sources said.

CAROL HILDEBRAND and MICHAEL FITZGERALD



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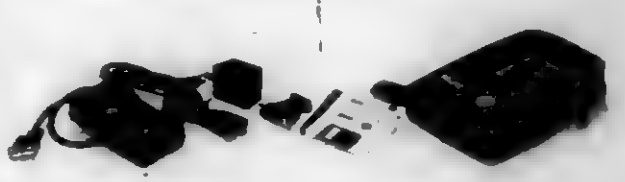

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NEWS SHORTS

Wang creditor commission named

IBM, Microsoft Corp., Chemical Banking Corp. and 10 other firms owed money by Wang Laboratories, Inc. were named to oversee the bankrupt company's Chapter 11 reorganization. The U.S. Department of Justice in Boston said last week that the so-called Creditors' Committee has the right to demand that Wang consult it before making major business decisions, to participate in restructuring Wang and to request that the court convert the Chapter 11 protection to a Chapter 7 liquidation proceeding. Wang said it will file a reorganization plan within 120 days.

Apple expands A/UX license

Apple Computer, Inc. last week upped the number of users able to access its A/UX 3.0 version of Unix from a single CPU with the announcement of a 32-user license. Previously, 16 users was the limit. A $2,500 32-user license is now available.

Oracle plans MP server

Oracle Corp. and NetFrame Systems, Inc. plan to build a multiprocessing version of the Oracle Server for native Novell, Inc. NetWare environments on the NetFrame superserver platform. Parallel multiprocessing technologies will access up to five processors on the superserver. It will be rolled into Oracle 7 and should ship with NetFrame sometime in 1993.

Unisys cuts PC prices by up to 66%

Add Unisys Corp. to the list of vendors waging a battle in the personal computer price war. Last week, the Blue Bell, Pa., computer firm cut prices from 47% to 66% on its entire line of PW2 Advantage PCs, including storage devices, math coprocessors and printers. Unisys also added a new unit, the PW2 4256 PC, a 25-MHz desktop device based on Intel Corp.'s I486SX processor. It is priced at $2,199.

HP utility speeds Windows access

Hewlett-Packard Co. last week announced Dashboard, a push-button utility panel that provides users with a speedier way to work with Microsoft's Windows. Dashboard appears at the bottom corner of a user's screen and features a series of quick-launch, push-button icons that can be customized like a car radio's preset buttons. Users can then launch applications in one easy step as well as organize program groups. Dashboard also allows multiple-screen views of programs. The retail price of the package is $99.

Altima sues Nissan over name

A federal district court judge in Illinois has denied Altima Systems, Inc.'s request for a temporary restraining order, prohibiting Nissan Motor Corp. from using the name "Altima" on a new sedan slated to go on sale tommorrow. Altima, of Concord, Calif., filed for relief and damages last week against various Nissan entities, claiming that it has spent more than $2.5 million since 1990 promoting its Altima trademark and computer line.

Short takes

ComputerVision Corp.'s parent company, **DR Holdings, Inc.**, filed for Chapter 11 protection following an impasse in negotiations between corporate partners that blocked reorganization of the firm. . . . A $6 million donation from **Microsoft** founder Bill Gates will enable **Stanford University** to complete its information sciences building by 1995. The new facility, to be known as the Gates Information Sciences Building, will house several disciplines currently scattered across campus. . . . **Leading Edge Products, Inc.** lopped up to 30% off its product line and shipped its 486SX 25-MHz systems. . . . Next month, HP will cut prices for its EtherTwist family of 10Base-T hubs up to 17%, to less than $80 per hub. . . . Mario Morino, **Legent Corp.**'s vice chairman and founder of predecessor **Morino, Inc.**, will retire Sept. 30, to pursue private interests.

AD/Cycle partnership in flux

BY JOHANNA AMBROSIO
CW STAFF

ROCKVILLE, Md. — Intersolv, Inc.'s announcement last week that it is pulling out of the AD/Cycle alliance it helped found is yet another sign of disarray in IBM's software development architecture, observers said.

"This speaks volumes about the lack of importance of AD/Cycle," said Stuart Woodring, an analyst at Forrester Research, Inc. "AD/Cycle has been in danger of being irrelevant for quite some time."

Still, the alliance will remain otherwise intact, with executives from four of the six remaining business partners saying that they are as committed as ever to the architecture. Indeed, as one partner was exiting last week, another entered: Sapiens International Corp., a Cary, N.C., vendor of object-oriented development tools, which is now the seventh member of the International Alliance for AD/Cycle.

Furthermore, observers said, IBM's announcements of AD/Cycle products for the local-area network and RISC System/6000 arenas, expected this fall, may inject some new life into the much-troubled computer-aided software engineering (CASE) framework.

"The Intersolv decision makes AD/Cycle unravel a little more," said Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "But I really doubt if others will pull out — they're getting more marketing benefit than Intersolv was."

Executives from Digitalk, Inc., Bachman Information Systems, Inc., Synon Corp. and Micro Focus confirmed they are not leaving the alliance anytime soon. Arnold Kraft, president of Bachman, said, "We foresee staying with AD/Cycle as long as it continues to meet customers' needs. Right now we're comfortable with it."

Only one other alliance vendor has left the coalition to date: Systematica Ltd., which filed for receivership in the UK earlier this year. Receivership is the British version of Chapter 11.

Unfinished business

AD/Cycle was introduced in September 1989 but has only a handful of corporate customers because a key component has not been finished. Repository Manager/MVS was supposed to act as the central control point for mainframe applications development.

Although there have been three releases of the Repository Manager, one important piece — the design portion of the Information Model — remains to be completed. The problem was essentially in designing a very complex piece of code, complicated by all the input from and to the business partners, as well as by performance issues.

Catherine Lewis, IBM's director of application development marketing, said that by year's end the design portion will be finished enough so that the entire Information Model can finally be incorporated into products.

Lewis also said that although IBM will refocus AD/Cycle to work with nonmainframe platforms, the Information Model "is a critical component of both" the old and new AD/Cycle environments. She added that no "substantial" recoding effort will be necessary to get existing AD/Cycle tools to work on the workgroup platforms.

"We will put an object layer on top," and that will require the business partners to do some rewriting of the tools to make them work with objects, Lewis said. "But the look and feel of the tools will be the same, and the customer investment will be protected."

Lewis waffled on IBM's long-range plans for Repository Manager/MVS. She said there are no immediate plans to withdraw the mainframe-based product from the market but did not deny that new releases may not be forthcoming. "Clearly, workgroup support is at the top of customers' requirements," she said. "Things sometimes go away because customers no longer want or need them."

But, Lewis said, IBM plans to merge "the two worlds of LAN and enterprise-level control. One size does not fit all."

High costs cause Intersolv to leave IBM CASE venture

BY KIM S. NASH
CW STAFF

ROCKVILLE, Md. — Intersolv, Inc.'s exit from IBM's AD/Cycle computer-aided software engineering (CASE) partnership last week was driven by the "enormous" expense of the IBM stamp of approval, a company executive said.

The CASE vendor's participation in the alliance cost the company $6 million in revenue because IBM got a piece of every Intersolv sale regardless of whether the AD/Cycle angle helped close the deal, according to Chief Executive Kevin Burns. By leaving the AD/Cycle partnership, Burns said he expects to boost the firm's revenue by $3 million to $4 million.

Several Intersolv users applauded last week's separation, saying they bought Intersolv's products for functionality, not the IBM halo. Plus, they just do not buy IBM's approach, they said.

"I say, 'Good for Intersolv,' " said Richard Lansing, vice president of technology at Chemical Banking Corp. in New York.

Lansing said he likes the AD/Cycle premise: a development framework that lets tools from different vendors cooperate. But the scheme's historic dependence on a mainframe-based repository does not jibe with his plans to shift CASE to local-area networks, he said. IBM's stated intention to build a LAN-based storehouse will not yield a product in time for Chemical Bank, Lansing said.

Missed opportunity

"IBM missed a great opportunity to take advantage of technology that Intersolv already tackled, but IBM went its own way, of course," Lansing said.

However, Lansing and other users said they were relieved to hear Intersolv's promise of continued compatibility with IBM products such as DB2.

"As long as their stuff works with IBM's, then I see no big deal" with Intersolv leaving the AD/Cycle fold, said Diane Weir, staff member at the Los Alamos National Laboratory.

Burns said the two companies have not severed technological ties. Intersolv will still receive early access to future IBM offerings, he added.

Discord between the vendors may have caused the separation, noted Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Burns said the relationship between IBM and Intersolv's 120 salesmen was "unnatural. We value our independence."

For instance, Excelerator II, a full life-cycle workbench, began shipping in May, replete with a LAN-based repository, something IBM has talked about but not delivered.

Furthermore, APS, Intersolv's code generator, threatens IBM's generator, Cross System Product (CSP), he said.

IBM, meanwhile, denied any rivalry. "We certainly did not see the competition between APS and CSP," said Catherine Lewis, director of application development marketing.

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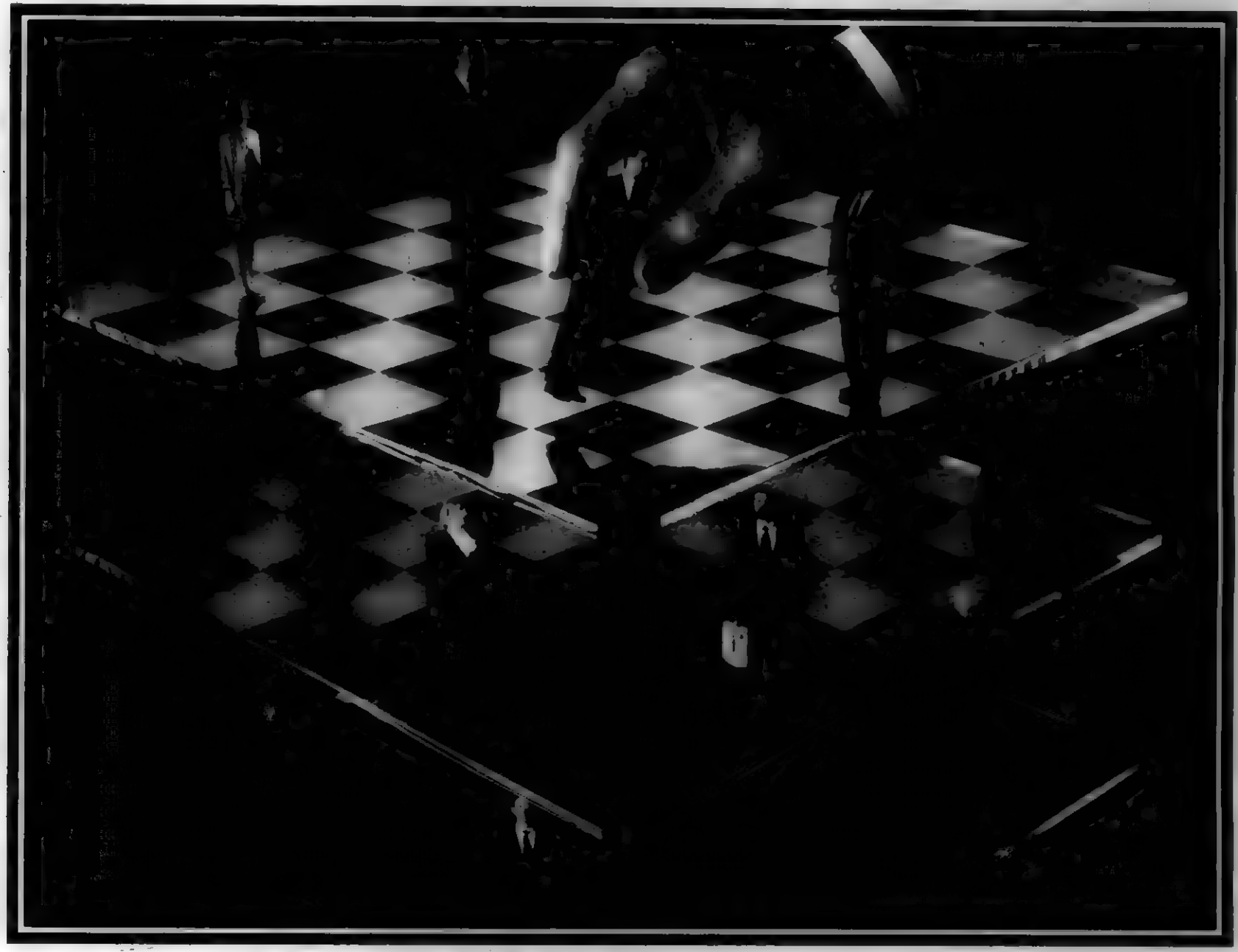

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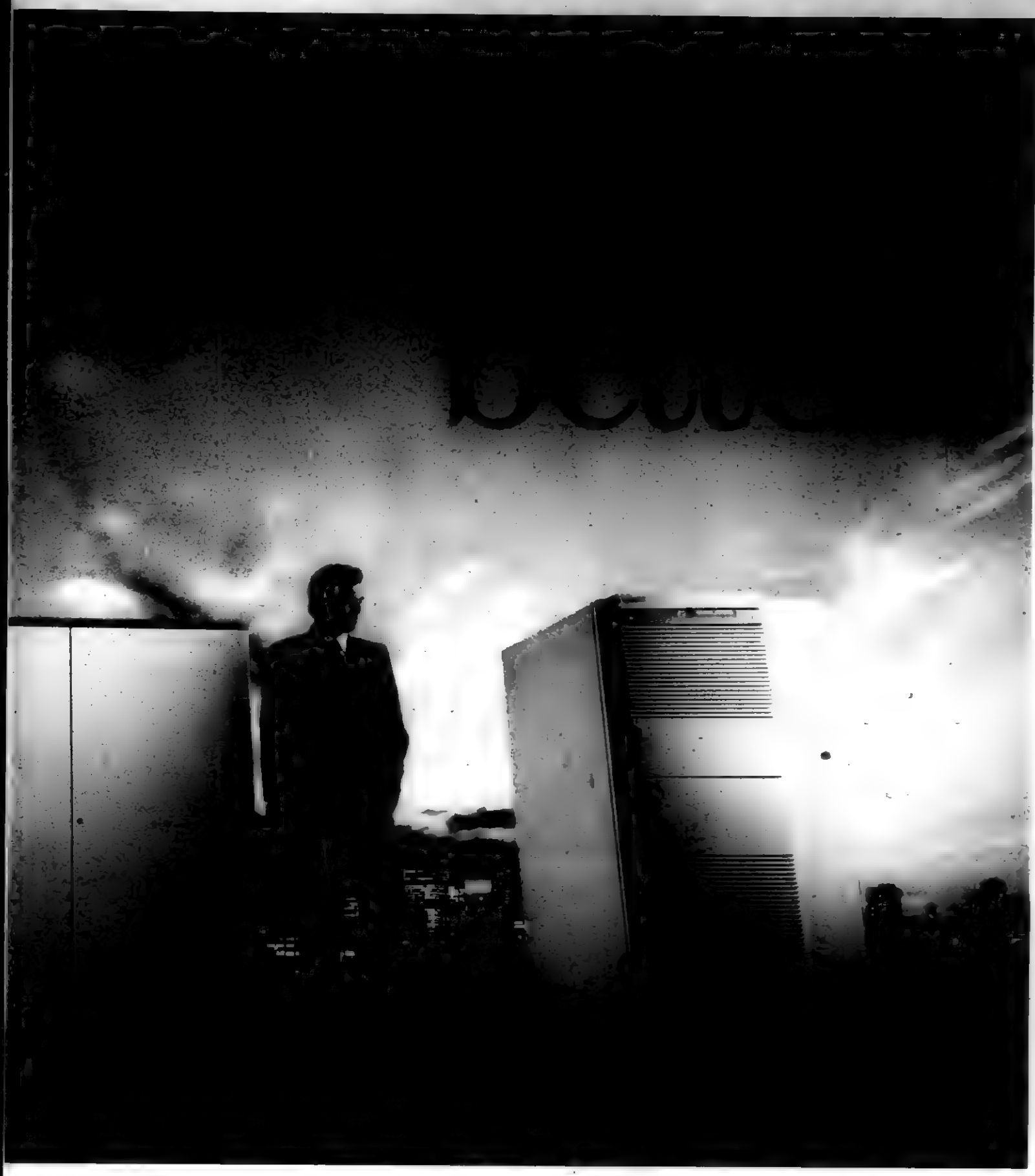

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Mellon slaps exec with lawsuit

CONTINUED FROM PAGE 1

term data processing contract with National Steel Corp. that is estimated by analysts to be worth $200 million to $400 million — the outsourcing arm's biggest deal to date.

The National Steel deal, noted Susan McGarry, an analyst at Boston market research firm The Yankee Group, is "a real coup" for the Mellon outsourcing group.

The latter's viability was reportedly under review after the bankruptcy of its then-largest outsourcing client, Dollar Dry Dock Bank, earlier this year [CW, March 2]. The Dry Dock outsourcing arrangement is being dismantled, a Mellon spokeswoman confirmed last week.

The National Steel contract "is an important affirmation of our outsourcing capabilities," said Allan P. Woods, executive vice president of Mellon's Financial Institution Services Division.

Changes all around

In addition to his duties at the helm of the outsourcing division, Woods also heads into this week as steward of part of Shah's corporate empire.

In an internal memorandum due to be released today, the bank announced a reorganization of its Technology Products and Services Department, which includes Cash Management, Network Services and Information Management & Research. The latter two divisions will report to Woods, as will Shah's replacement.

George DiNardo, former Mellon IS chief and now head of his own consulting and investment firm, described Woods as "not so much a technician as a world-class marketeer — a good man, and a good company man."

Shah, according to the charges detailed in Mellon's complaint, jockeyed himself into a position at the heart of the bank's strategic IS operations last March ostensibly to serve Mellon, but actually to help himself.

Shah bolted from the bank to set up Philadelphia-based bank transaction processing services firm Transaction Processing, Inc. Joining Shah two weeks later were other strategically key Mellon IS players:

- Network Services Division (NSD) manager Janet Hartung, whose responsibilities ran the gamut of the pivotal NSD's financial, technological and strategic activities.
- Senior NSD manager Elizabeth Costa, who ran the division's strategic development and financial analysis department.
- Senior NSD manager Paula Kramer, who was involved in the planning and implementation of marketing across a broad range of transaction processing activities.
- Senior NSD manager Gary Staub, a specialist in merchant payment systems.

DiNardo said he thinks Shah undertook his job at Mellon in good faith. Even during so short a tenure, "Bipin made a number of organizational changes," he noted. "He wouldn't have done that if he hadn't been serious about the job."

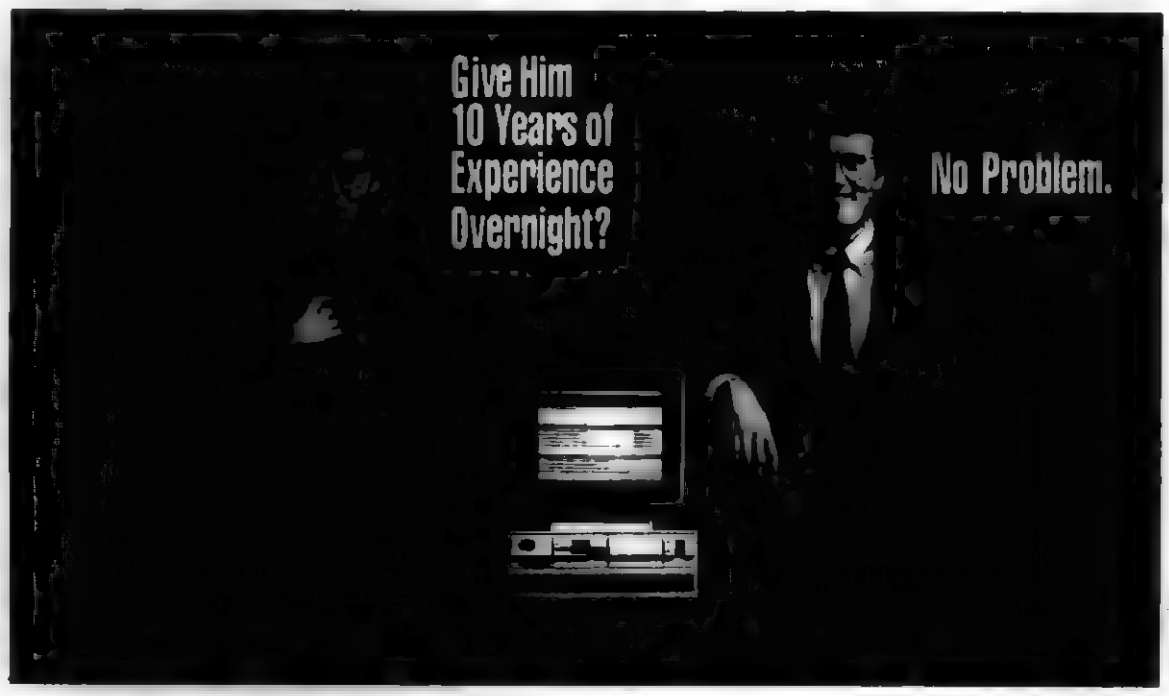
Shah could not be reached for comment at press time. He is expected to file his reply in approximately three weeks.

Mellon said it may file additional suits and/or amend its complaint to include further charges and defendants.

Meanwhile, observers agreed, both the upbeat and downside doings at Mellon are likely to have ongoing ramifications.

The National Steel contract, noted DiNardo — under whose stewardship outsourcing negotiations with the steel company kicked off — points toward a rich vein of future deals.

"MIPs rule," said DiNardo, dismissing the idea that it takes such 'extras' as software development aspects to make an outsourcing deal sexy. "This is where the untapped potential of outsourcing lies: You take your commodities and throw them onto someone else's iron." Mellon's, for instance. "This is a grand approach throughout Rust Belt America," he added.



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Kodak enhances Photo CD gear

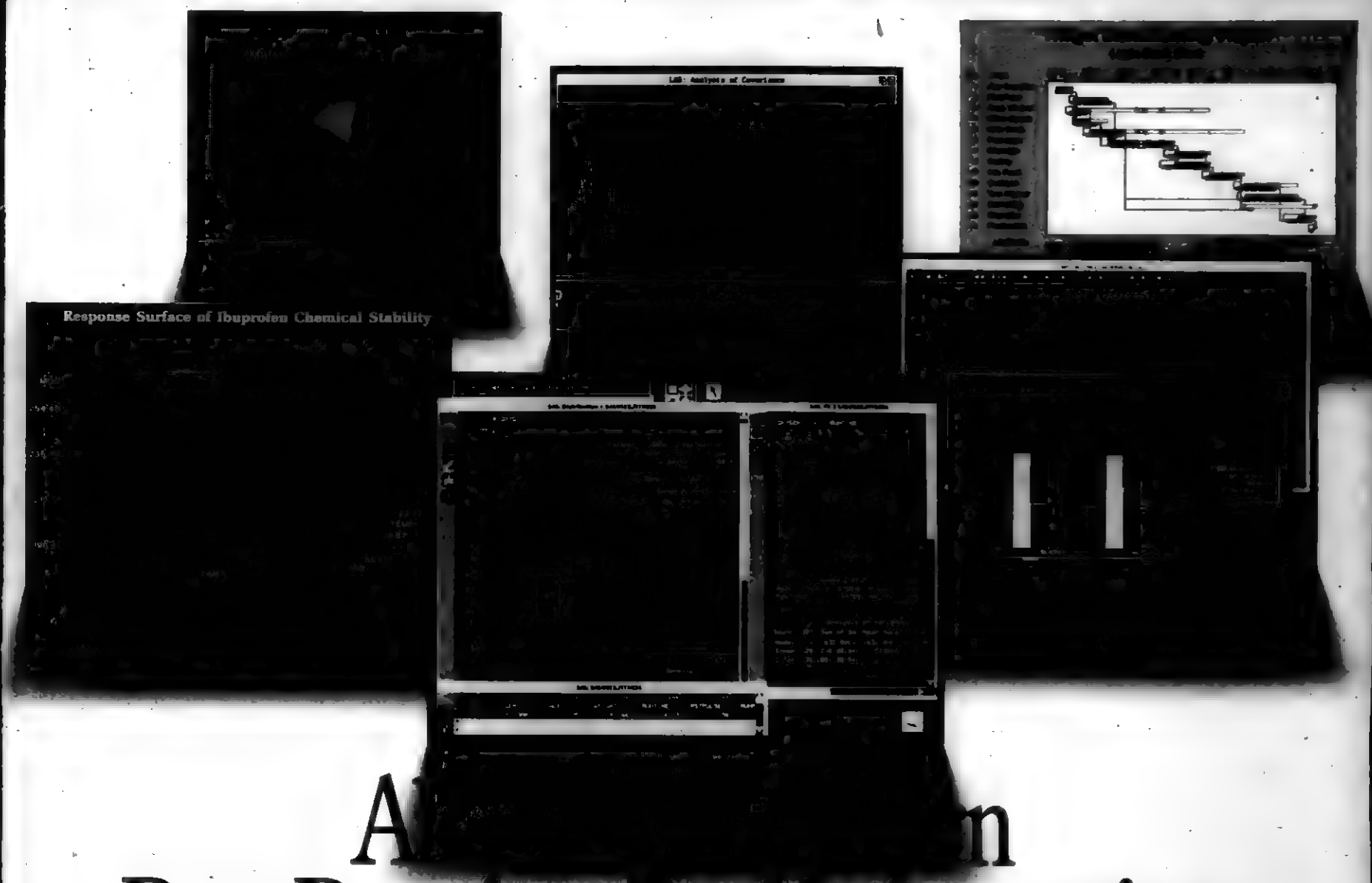
ROCHESTER, N.Y. — Eastman Kodak Co. last week beefed up its Photo CD product with the announcement of several applications targeted at business users.

First described two years ago, Photo CD offers camera owners the option of "printing" their photographs on a compact disc for later viewing and editing on either a television or computer monitor. Business applications include presentation graphics and document imaging.

According to Kristy Holch, director of scanner market strategies at BIS Strategic Decisions in Norwell, Mass., Kodak has been introducing pieces of Photo CD technology since 1990. But she said the technology, available to photo finishers for some time and only now hitting the consumer market, has lacked third-party software. "To fill the void, Kodak has come out with its own applications."

Kodak also announced a new business unit, Kodak Picture Exchange, that will provide on-line image databases. Kodak said it would sell its color printer technology to Apple Computer, Inc. and that future Apple systems will be able to read Photo CD discs.

ELLIS BOOKER



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IBM

Oracle unveils text-retrieval software pack

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. announced last week a text-retrieval software package that neatly dovetails with its Oracle 7 relational database. SQLTextRetrieval Version 2.0, written for some of Oracle's largest database customers, including BT, uses Oracle 7's Binary Large Objects (Blob) support to store images along with the text.

The Oracle product is an enhanced version of a SQLForms 3.0 utility called SQLTextRetrieval Version 1.0, which developers use to document changes in code.

About 100 of Oracle's large users applied the utility to corporate text applications but experienced performance problems when the text database exceeded 1G byte in size. To boost performance, the text database was stored outside the Oracle database, often on a hard disk.

Version 2.0 of the product solves these problems by using Oracle 7's Blob capability to store the text as a set of binary 1s and 0s. A special index reduces system overhead, while a compression feature squeezes text into a fraction of the database space.

"Filters" for standard personal computer word processing packages allow most PC clients to access the text-retrieval system. Oracle 7 users will be able to "browse" through networks for remotely stored documents, said Richard Barker, senior vice president of Oracle's UK-based European development center. Oracle 7 is expected to be in wide use sometime next year, observers said.

Industry analysts said the product is part of Oracle's multimedia strategy, which includes a forthcoming set of graphical tools. "Oracle wants to provide flexibility for developers of client/server applications who want to move into new data types," explained John Morrell, a senior analyst at International Data Corp. in Framingham, Mass.

Users of Version 1.0 will receive Version 2.0 free, Oracle said; new users will pay 30% of their Oracle database license. The package is available now.

Symantec steps up antivirus support

BY JAMES DALY
CW STAFF

SANTA MONICA, Calif. — Symantec Corp. moved last week to help users battle the increasingly complex and shifting problem of fighting computer viruses with the introduction of three new defensive support services.

The trio includes the AntiVirus Update Service, a package designed to keep users up to date on the latest viruses; the Norton Virus Scan, a DOS-only version of The Norton AntiVirus 2.0 that will be available for free on major bulletin board systems; and the Corporate Support Program, which provides an expansive educational and technical foundation as well as access to an antivirus emergency response team.

The core of the AntiVirus Update Service, which costs $69 a year, consists of quarterly virus definition reports containing information for detecting and repairing damage from newly discovered viruses as well as improved definitions for existing viruses.

Protection by scanning

The Norton Virus Scan allows users to easily add basic virus detection to their systems. The scan detects more than 1,100 known viruses, gives the user the option of removing infected files and scans both local and network drives. The technology can be downloaded from many major bulletin boards, including Symantec BBS, CompuServe and Internet.

Virus Scan users who wish to add repair and other capabilities can upgrade to the full version of The Norton AntiVirus 2.0, which sells for $129.

For more comprehensive protection, Symantec will also offer the Corporate Support Program. The package offers technical support services that include assistance from senior support engineers via a toll-free number, access to an on-call Virus Response Team, monthly virus update disks and evaluation of suspected virus samples.

Pricing is based on the size of the user's configuration, but the cost per unit will average less than $20, and substantial price breaks will be given to sites containing 2,000 or more personal computers, according to a company spokeswoman.

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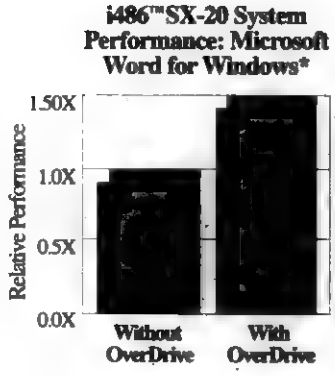

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ADVANCED TECHNOLOGY

TECH TALK

Storage advance

■ AT&T Bell Laboratories demonstrated a magneto-optic drive technique that can cram 45 billion bits into 1 square inch. The approach uses near-field scanning optical microscopy and is able to write and retrieve image bits with dimensions as small as 60 nanometers (about 1,000 times smaller than the diameter of a human hair). Bell Lab researchers said their technique, which offers nearly a hundredfold improvement over today's best commercial magneto-optical methods, could achieve drive densities of 200G to 500G bits per square inch.

DEC models molecules

■ Digital Equipment Corp. and Molecular Simulations, Inc. announced a strategic alliance to develop three-dimensional molecular modeling applications for DEC's new Alpha workstations and servers. Products from Waltham, Mass.-based Molecular Simulations already run on a host of supercomputers and high-speed workstations.

Supercomputer plans

■ Fujitsu Ltd. told the Association for Computing Machinery International recently that it intends to combine parallel processing and vector processing in a future line of supercomputers. Working with a prototype called the AP1000, Fujitsu said it achieved processing speeds greater than 300 billion floating-point operations per second.

Windows goes neural

■ UK-based Neural Computer Sciences has released a Microsoft Corp. Windows-based software package that provides a framework for creating neural networks. The product, called NeuDesk ($695), provides a menu-driven guide through the process of creating neural networks, prompting for input parameters and output formats. It then "learns" by repeatedly running real-life sample data and modifying its behavior until it achieves a consistent result.

Fooling the driver's subconscious

Renault uses advanced graphics technology to conduct research on safe driving

BY MARYFRAN JOHNSON
CW STAFF

In the Paris suburb where French carmaker Renault SA tinkers with technologies of the future, the job of fooling the subconscious falls to Andras Kemeny and his network of Silicon Graphics, Inc. workstations.

Kemeny and his team of Renault researchers are coordinating a massive European project to make driving safer, using Silicon Graphics' newest graphics software to create highly realistic visual simulations of cars driving through traffic on a busy highway.

Seated in a Renault car in the darkened test room, the driver faces a large projection screen that becomes the three-dimensional highway. The driver can see the car next to him signal and change lanes. He can glance in the rearview mirror at the simulated scene behind him. He can tap lightly on the brakes and slow down as another car cuts into his lane.

The point of generating such complex highway scenes is to test driver acceptance of real-time data exchange — via short-range radio communication — between the cars and outside devices such as electronic road signs and toll booths.

The trick is making this "cooperative driving" simulation appear so realistic that the test driver's subconscious is fooled into reacting normally.

Building that kind of reality can easily cost a company millions of dollars, but the trickle-down effect of advanced graphics technology at Silicon Graphics has made it possible for Renault to build its simulation environment for less than $200,000.

"It's very tough to fool the conscious because you always know you're sitting in a simulator," noted David Hughes, manager of visual simulation at Silicon Graphics in Mountain View, Calif. "But when you fool the subconscious, it's close enough to react normally and get the right feedback."

Renault's research into cooperative driving is one of the main elements of the Prometheus project, a $1 billion research effort funded by European Community governments and a consortium of major European car manufacturers. The project sponsors several streams of research devoted to safer driving and more efficient roadways.

"The auto market is changing very fast in Europe, and safety is becoming an important issue everywhere," Kemeny said. More research is focusing now on how to avoid accidents in the first place, he added, rather than simply protecting people from injury once a car crash happens.

Yet avoiding accidents requires information sharing, such as advance notice of icy roads or a warning signal that another car is in the driver's blind spot. By the mid- to late-1990s, onboard systems providing such information to drivers are expected to be available from European carmakers, Kemeny said.

Three years ago, Renault established a Silicon Graphics workstation network called Scaner, for Simulator of Cooperative Automotive Network at Renault. Now grown to a half-dozen machines, Scaner enables Renault engineers to test their cooperative driving systems in various traffic situations.

This simulated highway scene *enables Renault to test drive reactions to real-time data provided on road and weather conditions*

The network is also used to perform vehicle control system tests, evaluate new instrument design and conduct worst-case scenario experiments under varying road conditions.

Initially, the Silicon Graphics hardware and software were not sophisticated enough to produce high-quality simulation. Yet Kemeny was patient enough to wait for the firm's Reality Engine graphics system, introduced last month and slated to be commercially available in September.

Priced from $100,000, Reality Engine graphics consist of a three-board set for the Silicon Graphics Iris Crimson and Power Series systems. It provides interactive realism to users in application areas from scientific visualization and simulation to high-definition design and digital film production.

By making extensive use of Intel Corp. I860 XP floating processors, Reality Engine provides a high degree of parallel processing that can support as many as 1,500 textures in every frame. It enables levels of scene complexity previously possible only on more expensive, proprietary systems.

"This is the first time SGI machines have the performance and the real-time quality that allows a simulation," Kemeny said. "I have the feeling, with this type of system, that the technology will push the market."

"The hardware technology applied to graphics today is what we will see applied to general systems in a few years," said Ted Krum, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "The really amazing thing about Reality Engine is that within a couple of years, the price will be much lower and mainstream customers can justify it."

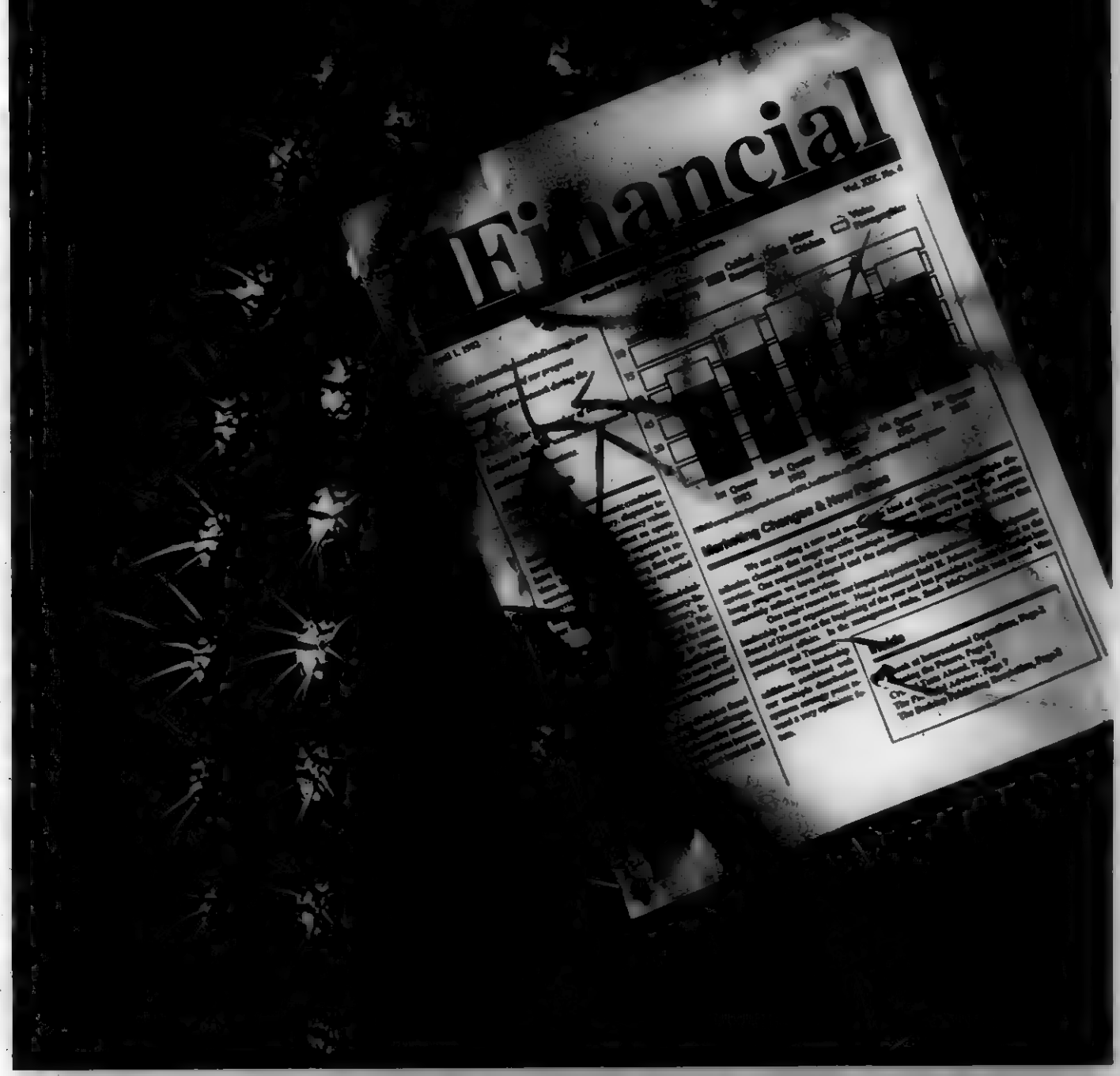
Automobile design is another use some car companies are finding for advanced graphics and visualization systems. "People want to be able to build fewer physical models of cars, which is time-consuming and very expensive," Krum pointed out.

Building automotive simulators is even more complex and "more difficult than building a flight simulator," Kemeny said. "On a three-dimensional road, the dynamics are much more sophisticated. From a visual point of view, everything is close, so details are very important. The car is in real contact with the environment."

During the Renault simulation, data on speed, acceleration and traffic situation is transmitted to the driver through an Ethernet local-area network, which simulates a real radio communication system.

Reality Engine, which can produce a wide range of visual effects in software, can also split the data output into several channels to display on multiple screens. That gives the vehicle simulator the ability to provide side windows and rear window displays.

Another application Renault is working on would provide drivers with safety information through an onboard "heads up display," which might show up as a colored arrow on the windshield, indicating the distance to the other cars on the road.



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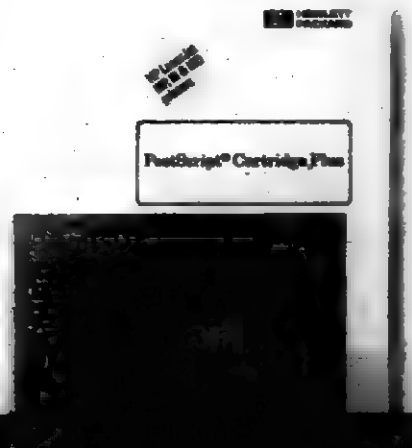

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EDITORIAL

Bewitched

Recently I took a slow and ever-so-sobering drive through my hometown of Salem, Mass. That pained excursion helped cement in my mind the importance of a national high-technology policy.

Incorporated in 1626, Salem is an old place, a city that at one time was one of the five busiest ports in North America. It's filled with architectural gems from the 17th and 18th centuries.

But on its outskirts stand the few remaining boarded-up tanneries, the ones that haven't burned. Those now-creaking hulks once teemed with immigrants and first-generation Americans, including my father and several uncles. The leather business has since gone south — all the way to Brazil and Argentina, cheap-labor havens whose governments have made it illegal to export untanned hides.

I also passed the enormous Parker Brothers facility, where scores of locals went to work making Monopoly, Ouija and other board games. It closed its doors too, when it was consumed in the corporate buyout mania of the 1980s.

There were two empty lumberyards and five boarded-up parochial schools. A car wash had replaced the old seven-story Owen Shoe Co.; 5-foot weeds grew where the sprawling Salem Shoe factory once stood.

Like I said, there are countries that won't let unfinished goods out and that make it very difficult for finished American products to get in.

I thought about Gordon Bell's provocative statements on a high-tech policy [CW, Viewpoint, Aug. 24]. I thought about our two presidential candidates' positions on the issue, on the same page earlier this month [CW, Aug. 10].

I also thought of what Roger Sippl, founder and chairman of Informix, said at a *Computerworld*-sponsored debate. Sippl said the government should simply make it easier for companies like his to get investment monies. They would do the rest, including creating hundreds of U.S. jobs. That's exactly what Informix did.

But, as Bell warned, should we reward high-tech companies that essentially act as distributors for foreign-made products? Like Apple, with its foreign-made PowerBook? Or DEC, with its plans to market Taiwanese-made PCs?

Should we instead make it more difficult (i.e., costly) to import high-tech products, screwing the customer in the process? What company or business will get fed by the Fed, and which will go hungry? Not only are there no easy answers; today there are no answers, period. Just politics.

The shabby ghosts of Salem's past, the empty few left standing, are silent indictments of failed industrial policies of the past. Yes, we need a high-tech policy, one that has at its heart the preservation and creation of jobs at home.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Old dog or new pup?

Kennelwood Village may have put Unix in the doghouse [CW, Aug. 10], but I suspect it is barking up the wrong tree.

Apparently it had grossly inadequate hardware for its application. Its old AT clone was a real dog when loaded with 175,000 records with access from multiple terminals. The newer, faster equipment it bought would have solved the hardware overload problem without replacing pedigree Unix with an offbreed operating system. Sounds like it compared an old dog to a new pup, without checking out the breeding.

Its application software decisions were also of uncertain lineage. For example, why run FoxPro in DOS emulation? Both FoxPro and dBase are available in native mode Unix versions.

If it really wanted to put on the dog, it could go to one of the new RISC machines like IBM's RS/6000. Unix allows you that kind of upward mobility. Multiuser DOS lash-ups don't. Kennelwood settled for a mutt.

John R. Culleton Jr.
Sykesville, Md.

A cool $1 billion nothing to freeze at

Using International Data Corp.'s survey [CW, "Frosted Storage Tek users to see Iceberg," Aug. 17], approximately 33% (7% plus 26%) of customers polled find Storage Tek's Iceberg product to be attractive and/or they would acquire/evaluate the product.

Assuming there are at least 5,000 Enterprise System/9000 and 3090 customers worldwide, if this survey is representative, then even at a minimum of one subsystem per customer, 1,650 systems could be sold in 1993.

At a cost of $1 million per subsystem, that's $1.6 billion in sales. Even half that number would be $800 million in sales, which is right on target with Storage Tek's first-year forecasted revenue for the product.

That wouldn't be too bad, would it?

Larry Thiry
Storage Technology Corp.
Philadelphia

Store data on server

Your article on downsizing titled "Getting down" [CW, Aug. 10] points out weaknesses in what you call the "Mainframe read/Serverwrite approach."

A variation on that theme that overcomes many of the weaknesses is to store the production data on the server (or multiple servers, if data is distributed across the company) and upload a mirror image of all or part of it to the mainframe periodically.

The server is used for data entry/validation and inquiries into individuals or groups of records, while the mainframe is used for corporatewide reporting.

The mainframe load procedures are simple: no complicated edits, just a straight load.

All mainframe reporting capabilities can continue to be used: executive information systems for top-level inquiry, and fourth-generation languages and Cobol for production reporting.

The other advantage of this approach is that historical data can be kept on the mainframe for reporting, while only current data is maintained on the server.

David L. Shapiro
DLS Associates
St. Louis

New 'Soviet' software initiative under way

Regarding "Programming perestroika" [CW, Aug. 3]: There is a project to seed a software industry in the Commonwealth of Independent States (CIS), advance the object-oriented art in the West and enable American software vendors to market integrated and complementary products.

The Manticore Eastern European Software Initiative will match the interests of CIS centers of competence in objects with the needs of Western firms that are undertaking advanced object-oriented analysis projects.

The CIS centers will be empowered by advanced software development environments, education in Western technology and market practices and residencies with Western independent software vendors. There will be graduate student exchange programs and other activities to build the skills needed to found a world-class ISV industry. For more information, please contact The Manticore Consultancy, 49 E. 86th St., New York, N.Y. 10028.

Harold Lorin
New York, N.Y.

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Feeling soaked by upgrades?

Users can and should demand protection from steady stream of new versions

JOE KING

As someone who has been using microcomputers for more than 12 years, I can remember the excitement of a long-awaited new release of a favorite software package. When a fresh version emerged after two or three years, I was always thrilled to see the long list of known bugs eradicated.

Now I'm a microcomputer manager, and new releases are no longer occasions for excitement. It isn't me that's changed. The industry has.

There is a disturbing trend emerging in the software industry: Vendors have discovered a tremendous new revenue stream in frequent upgrades, and they're making the most of it.

One major spreadsheet vendor will release no fewer than three upgrades in 1992. Retail outlets are dedicating sections of their stores to upgrades. Products are no longer known by their names alone: Almost all have a number as an important part of their identity.

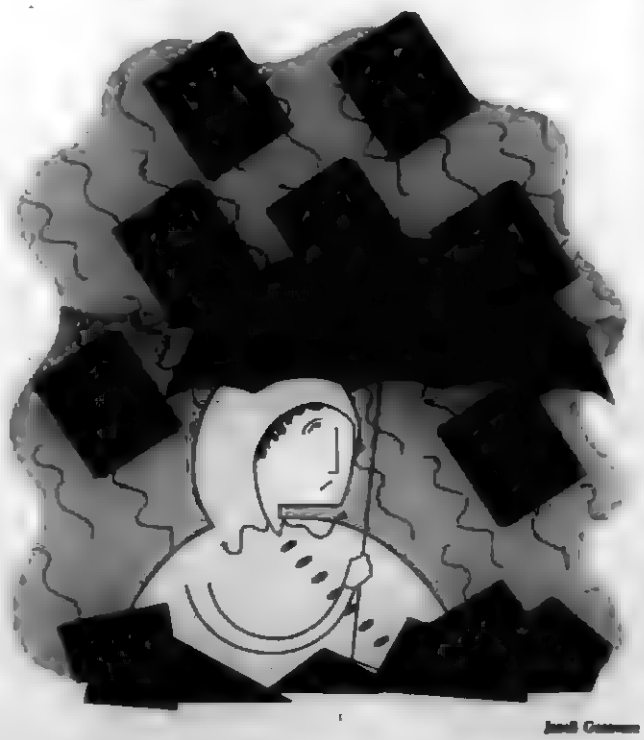
The victims of this madness are the end users and support departments charged with implementing these upgrades. The benefits of keeping up are no longer worth the price.

A week per license

Several years ago, the Microcomputer Managers Association released a position paper, titled "Corporate Buying Concerns," that pointed out the high cost in person hours to upgrade software products — approximately 45 hours for each license upgraded, when you count installation, de-installation, file conversion, testing and retraining.

That same paper pointed out that a major corporatewide upgrade could take a year and upgrades were appearing in such quick succession that new ones were sometimes announced before previous ones were completed.

That was in 1987. Now the situation is even worse. These days, Release 1.0 is commonly nothing more than an early beta-test version. We now see revisions that are "slipstreamed" into existence like a stealth bomber over Baghdad. There is no warning that they are coming, and they are potentially just as devastating to end users and support areas.



Janell Genovese

Version 1.1 is released in four months or so with the serious bugs fixed and perhaps a new feature or two added to meet "competitive pressures." In one case, a full Version 2.0 hit the market within a year of the first release!

One has to speculate that these problems are now greater in a Windows-OS/2 environment. Font drivers, nonexistent de-install support and complex .INI files make the job that much harder for the support staff.

Don't suffer in silence

What is a microcomputer manager to do in the face of this madness? My suggestion is not a new idea, but it is a rather simple one. Pick up the nearest phone and call your software publisher's local sales representative. Tell him that you are fed up with upgrade mania and want the following:

- Protection for the financial investment in your existing software licenses.
- Multiple version upgrade jumps.
- The ability to buy older versions of a product.
- Insulation from platform changes (Unix, OS/2, Windows, DOS).

In short, you want a software maintenance agreement. And while you're at it, couple the agreement with concurrent-user LAN licensing and competitive upgrades. You can save your company a ton of money.

King is assistant vice president of information systems at Continental Insurance Co. in Neptune, N.J.

Outsourcing: One to do job, another to check it

LOUIS FRIED

Earlier this month, *Computerworld* reported on the recent Confirm reservation system debacle [CW, Aug. 10], which left Hilton Hotels, Marriott and Budget Rent A Car trying to salvage something from a $125 million investment.

This is not the first time a major outsourced systems integration effort has failed; nor will it be the last. In fact, as applications expand in scope and integration becomes more complex, failures of multimillion-dollar development efforts seem to be occuring with greater frequency.

Such large development efforts are often put together by reasonable corporate chief executives who see a substantial business opportunity and who are convinced by a vendor that there is minimal risk.

Technological naivete

Having read about triumphant downsizing projects and successful adoptions of client/server architectures, CEOs are all too ready to believe that the technologies are mature and safe. In many cases, they have also apparently failed to heed the warnings of their IS managers.

There are any number of reasons a CEO might ignore good advice and plunge into a contract of this type. He might doubt the credibility of his IS chief. He may feel that the internal IS group is composed of "techies" who can't see the big business picture. Or he may simply be enchanted by the "glamour" of the vendor.

Whatever the reason, these deals continue to be made, and the failures are bound to continue, unless something is done to rectify the major flaw in most of these contracts — lack of oversight. Many of these disasters can be directly attributed to the failure of the customer to closely monitor progress of the project.

A good idea from DOD

Some years ago, the U.S. Department of Defense recognized a similar problem in its huge "outsourced" systems development efforts. As a result, the DOD made it a regulation that any programs it judged critical would have to be independently validated and verified by another contractor.

This contractor reports directly to the agency's contract manager and provides an impartial, technically qualified opinion in monthly status/progress reports and/or presentations.

I would be the first to agree that not everything originating from the government is a good idea, but this one has considerable merit.

The scope of verification and validation can vary from contract to contract but may include a review of the requirements, design specifications, system architecture, project control and software development methods and tools; participation in code walk-throughs and the development of interim and acceptance test plans; observation of interim tests; and participation in final acceptance testing.

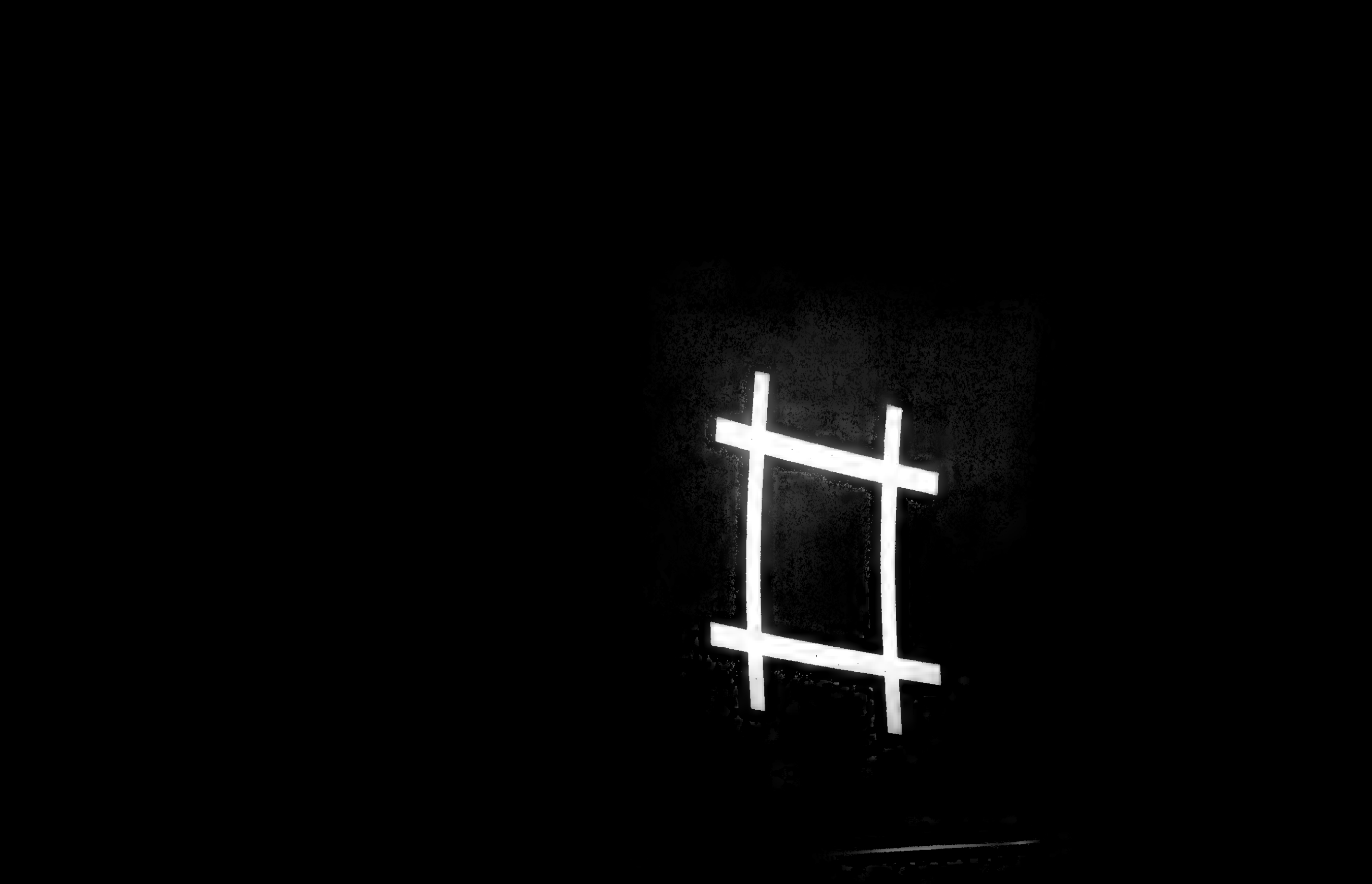
The contractor charged with independent verification and validation (IV&V) can also be asked to provide alternative courses of action if problems are discovered.

IV&V contracts typically add about 10% to the cost of a development effort; however, the payoffs have been considerable in an environment that was long plagued by cost and time overruns and failures in technical performance.

When millions of dollars are at stake, buying insurance is a prudent business move. IV&V can help catch problems before they turn into disasters and either ensure the success of the project or minimize the loss.

In this case, business executives could learn a lesson from the DOD.

Fried is vice president of information technology consulting at SRI International in Menlo Park, Calif.



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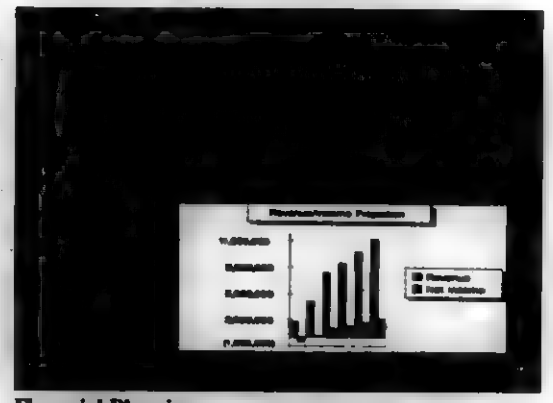
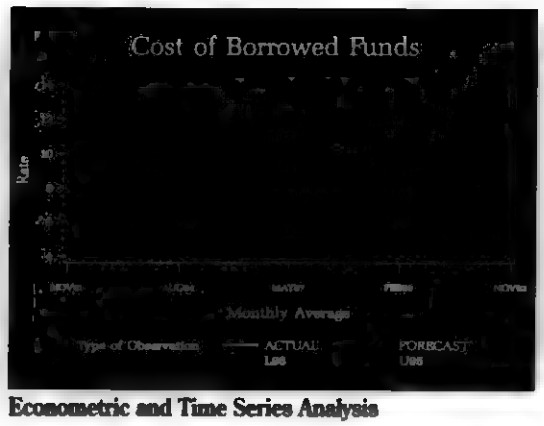
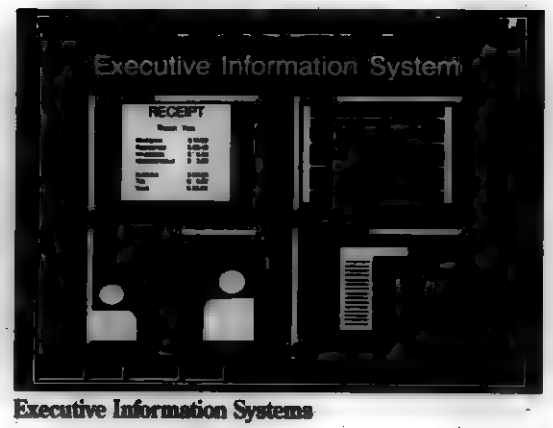


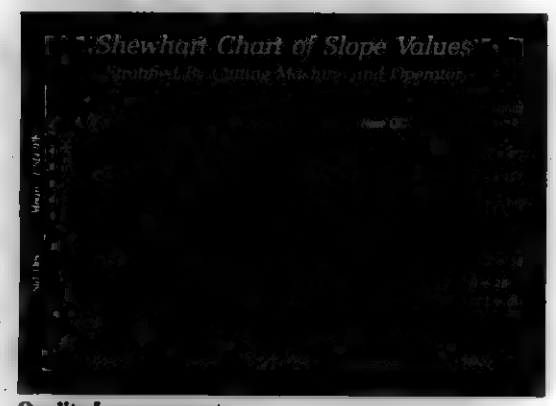
Financial Planning



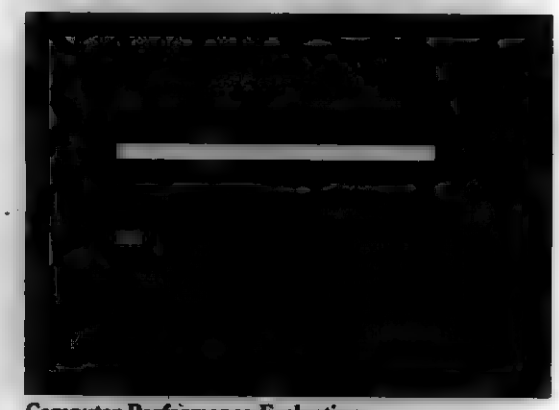
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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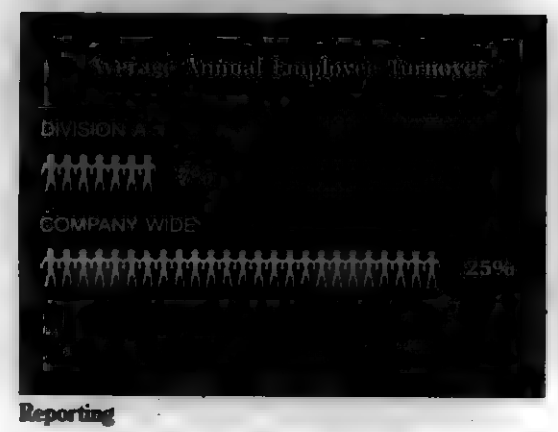
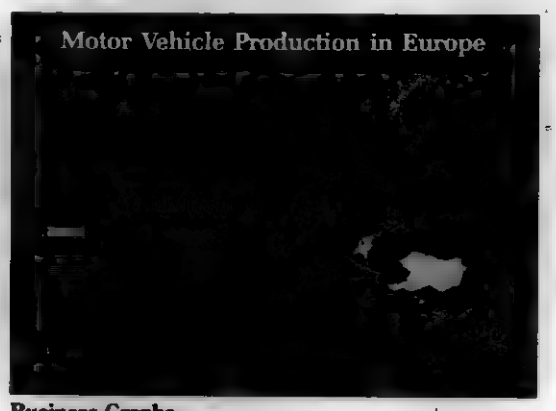
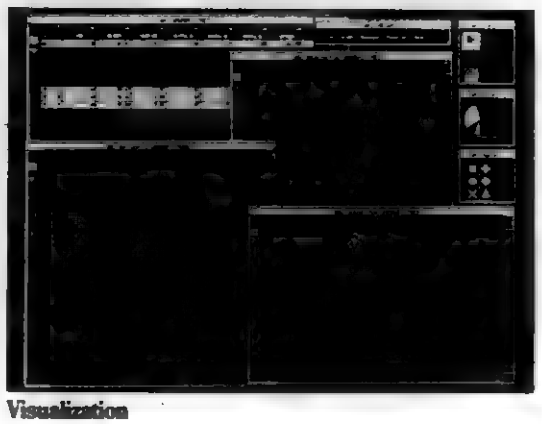


Reporting

Market Research

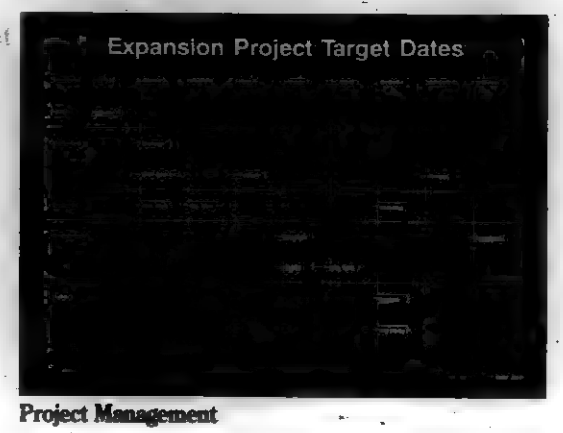


Business Graphs



Visualization

Data Analysis



Project Management

WINDOWS VIEW

Jesse Berst

GUI costs get gooey

How much will it cost your company to make the transition to a GUI? How much will your firm benefit?

I can't tell you with precision, of course. Every company starts with unique needs and conditions. But I can share some hidden expenses other firms uncovered when they made the changeover. And I can tell you about a survey this fall that — to my knowledge — will be the first comprehensive look at real-world costs and benefits.

Most companies must buy hardware and software upgrades when they switch to a GUI. Even so, you may encounter hidden costs, such as the following:

• **Memory upgrades.** "Whether it's Windows or OS/2, you have to add 2M bytes more than the manufacturer recommends," counsels Diane Taylor, manager of office consulting at Ernst & Young. Memory may be getting cheaper, but 2M bytes can run you $80 to $100 per PC.

• **Testing costs.** Taylor's group had to go through an extensive six-month testing cycle to make sure its new Windows platform was compatible with the company's extensive collection of software, including specialized tax programs, electronic mail and utilities.

• **Replacing utilities.** Many IS managers plan for upgrades to major applications but overlook utilities. Many DOS users have dozens of special-purpose pro-

Continued on page 40

'Toys' find their home in corporate IS

Three firms tell how today's smallest computers are enticing to users and maturing in business uses

BY MICHAEL FITZGERALD
CW STAFF

Palmtops, handhelds, personal digital assistants — call them what you will, but many information systems managers and analysts have always given them a different name: toys. Now, that is changing.

Handheld computers such as Hewlett-Packard Co./Lotus Development Corp.'s 95LX, Sharp Corp.'s Wizard and Fujitsu Personal Systems Ltd.'s Poqet still sell mainly to individuals for use as personal organizers, but some businesses have taken a serious interest in them because they are portable and cost only a few hundred dollars.

Brooklyn Union Gas

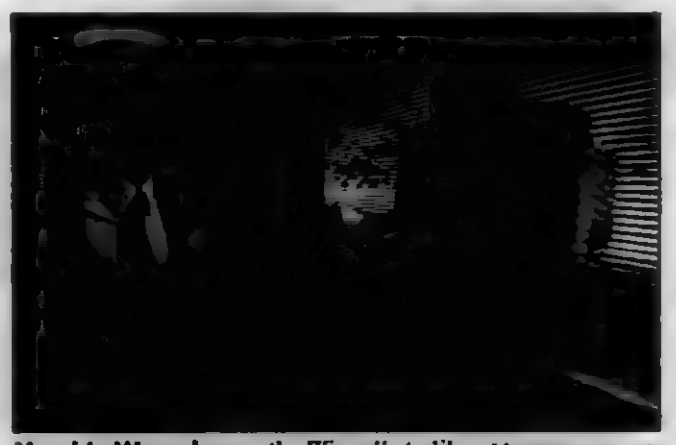
At Brooklyn Union Gas Co., for instance, about 100 Wizards are used for various purposes.

The utility company first used the Wizard in its customer service operations. The company had built a personal computer-based expert system using VP Expert from now-defunct Paperback Software, Inc. to guide customer service representatives through a maze of regulatory information when they help customers set up accounts. But there was only one PC for every five reps, and most chose not to use the computer.

"We wanted cheaper, widely usable products," said Connie Lamicela, a programmer/analyst at Brooklyn Union. The Wizard presented an inexpensive and easily available way to outfit all representatives. Now, each rep has a Wizard at his station, eliminating the need to go back to a PC and look up information.

Lamicela rewrote the VP Expert system in Basic to run on the Wizard, which is not DOS-compatible but does read ASCII.

The Wizard "fits into vertical applications where you just don't need all that power," Lamicela said. She acknowledged that the Wizard has limited use for people who type heavily but said the expert system uses a touch screen, and the machine's low price makes it more attractive than notebook computers in many environments.



Merck's Wysock *says the Wizard's toylike appearance generates interest — and use — among those who feel threatened by a PC*

Merck

Merck & Co. has also embraced Sharp's Wizard for a number of users and is readying a pilot of the new HandBook, a 2¾-pound small PC from Gateway 2000 Ltd. One staff computer expert in the sales group said that while the small systems look like a joke, looks are deceiving.

"They're toys when you look at them, but when you work with them, they're more," said Edward Wysock, senior applications coordinator at Merck's Human Health Division in West Point, Pa.

In fact, the toylike appearance of the Wizard has been a plus for Merck, Wysock said.

"Execs see it, and they pick it up because it interests them, but they won't touch their PCs in their offices. I don't think it's as threatening as a PC," he said.

Wysock said the company first bought Wizards to use as personal organizers. Merck now has between 500 and 600 Wizards, which executives and sales representatives use for expense report processing and meeting planning, among other things. Merck is also working on a program for the Wizard that will help Latin American managers run their sales territories.

Despite its tiny size, the Wizard is effectively as powerful as the original IBM PC, so it can be used for more data-intensive applications than it might appear.

Merck's reps in North America use the Wizard with a program called Calandar for Windows from Microsystems Software, Inc. in Framingham, Mass. The program lets Merck executives synchronize schedules for more effective meeting planning by downloading information from their PCs or through an on-line session.

Wysock said Merck may buy as many as 1,300 more Wizards in the next two months for the meeting synchronization and Latin American projects. It will also try several Gateway HandBooks. Wysock said the HP 95LX lacked the power and capacity financial applications would need.

Merchaid

But the HP 95LX suits Merchaid, Inc., a research firm in Portland, Ore., just fine.

"These have been a great time-saving device," said Beth Radich, a field supervisor at Merchaid. Merchaid owns some 60 95LXs and has used them to automate its retail-store data gathering, for which it previously used standard clipboards and paper forms.

Merchaid used to wait for forms to be sent back to its home office through the mail, then keypunched the data into the computer. With between 5,000 and 16,000 data points in each report, the process was long and the opportunity for error great.

Now, field researchers upload data from the 95LXs at the end of their day via the device's modem attachment, cutting at least three days from the process.

Radich said the size of the 95LX is what sold the company because the relatively bulky clipboards the researchers had to carry around became burdensome during the course of a day.

Still, while the project has gone "amazingly well," according to Radich, Merchaid has moved to the 95LX very carefully. After starting its research some 14 months ago, it began a pilot in its Seattle region six months ago and rolled the 95LXs out to the other researchers after a three-month test process.

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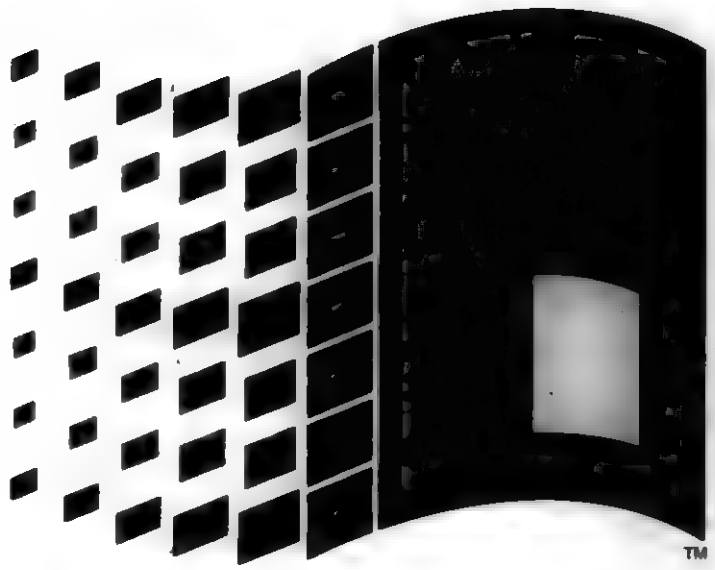

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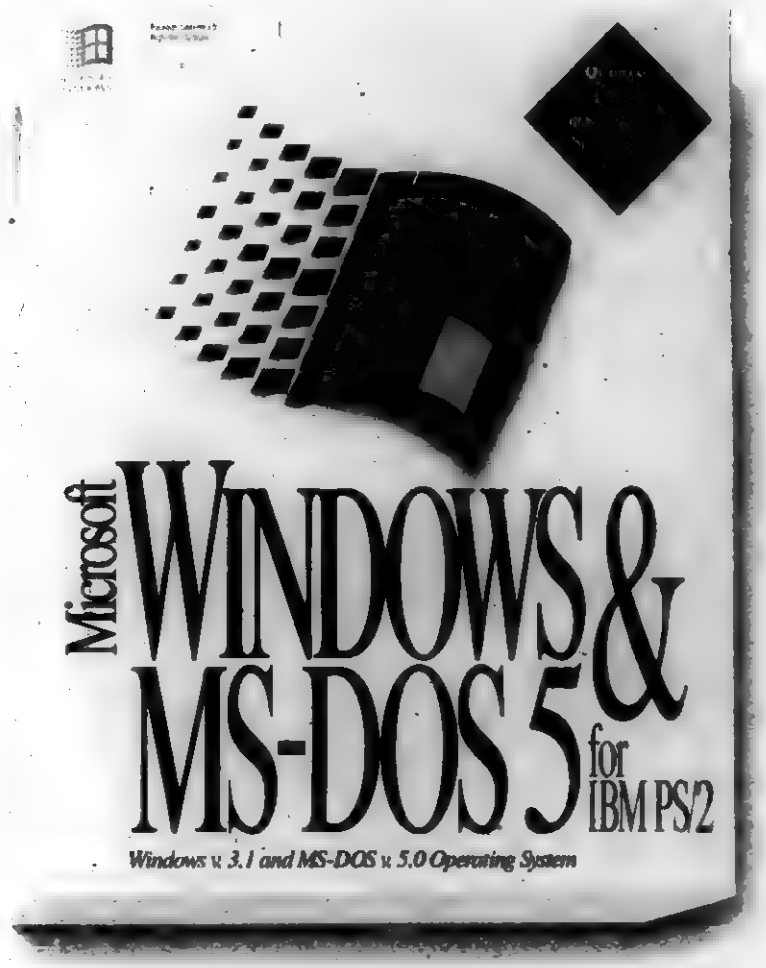

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Transportation firm chooses OS/2 for corporate standard

BY ROSEMARY HAMILTON
CW STAFF

JACKSONVILLE, Fla. — While many companies are preparing to support a mix of desktop platforms in the future, CSX Corp. is attempting to standardize on just one: IBM's OS/2 2.0.

Establishing a corporate standard may be easier for CSX than for some other companies: The bulk of users have not yet made the switch to personal computers and are not wedded to one PC operating system. Of the 20,000 desktops at the transportation company, 14,000 are dumb terminals.

The OS/2 selection was one of the first tasks for George Sekely, who assumed the top information systems slot at CSX Technology, the company's IS group, in June.

His first choice for the engine of CSX's desktop platform was the Intel Corp. 80386 chip and its future generations. "I didn't have much doubt that it would be the Intel chip, if for no other reason than plain economy," he said.

With that established, he added, the selection of OS/2 over Microsoft Corp.'s Windows or future operating systems was not difficult.

CSX's Sekely *eyes IBM's OS/2*

"The primary features of Windows, the pop-up menus, the user-friendly front end, is not really all we wanted for the industrial-strength applications," Sekely said.

He also said he does not intend to seriously evaluate Windows New Technology in the near future.

"I waited long enough for OS/2. Am I supposed to wait another two years for NT?" Sekely asked.

To CSX, OS/2 is a robust desktop operating system, which will be important as the company moves to a more cooperative processing environment.

Sekely also said that IBM has assured him it will provide "bridges" from OS/2 to future software from Taligent Corp., the joint venture of IBM and Apple.

"IBM is mostly likely to come through with that kind of a statement," Sekely said.

He said he expects CSX's migration to take "half a decade" because he is not interested in a wide-scale implementation.

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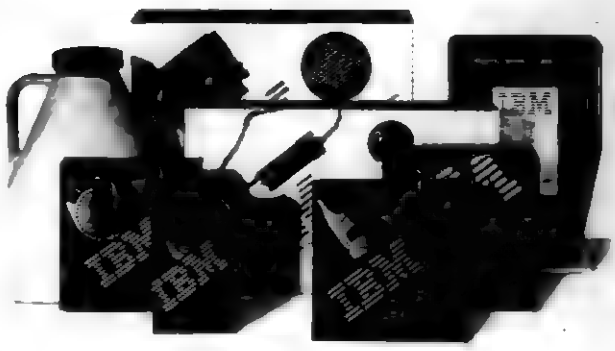

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Berst

CONTINUED FROM PAGE 37

grams. Sometimes these utilities can still be used under Windows. Often, however, they have to be scrapped, and replacements can cost $35 to $99 each.

• **Conversion costs.** When a Wall Street firm recently changed over to Windows, it had to hire a programmer for several days to create a custom conversion filter. It needed the specialized program to get thousands of documents from its character-based word processor into its new Windows word processor.

It has been more than two years since Windows 3.0 appeared on the scene. However, I am unaware of any research showing the cost/benefits of moving to a GUI. A forthcoming survey by the Microcomputer Managers Association (MMA) and *Computerworld* should address that question. It will be released at the MMA's annual meeting Sept. 16 in New York. The results will be published shortly thereafter.

In the meantime, I'll leave you with an encouraging case study. You can't switch from the character-based world to a GUI without spending money. If done right, however, the changeover might actually save you money.

That's been the happy experience of Theresa Doyle, vice president of computer and information services for the equity research division at Dean Witter Reynolds. Along with four computer systems analysts, Doyle tends to the computing needs of 110 users.

Those users are in the midst of converting to Windows right now. They made the switch because they wanted the benefits of the WYSIWYG environment of Windows.

Doyle says the move "hasn't been difficult at all," thanks to lots of planning. What's more, Doyle calculates the group will save $50,000 the first year, including onetime setup and training costs.

Doyle is in this pleasant position because the switch to Windows lets her eliminate expensive terminal rentals. Her group is now able to receive real-time market data through a Windows program. In addition, Doyle didn't have major capital expenditures to contend with. Since she leases all her equipment, she's simply been moving from 386s to 486s as the leases expire.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

White Paper

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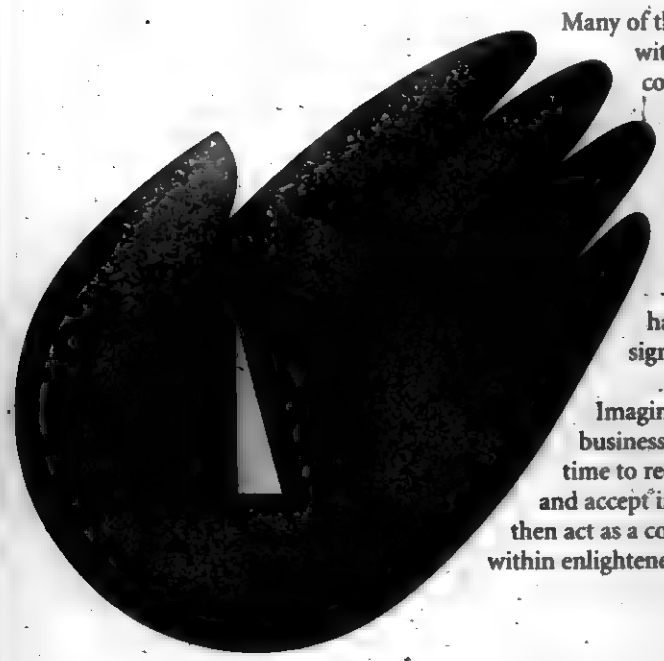
WANG OFFICES THAT WORK

Introduction

Image processing is a critical technology for many companies seeking a competitive edge, and enterprise-wide imaging is already playing a crucial role in some of the world's most successful companies. Despite its advantages, however, imaging has still not established a widespread presence in the U.S. business community. Even though it has gained more acceptance in foreign countries, it still has not fulfilled the hyperbolic claims made in its behalf.

Anemic economic conditions have certainly played a significant role in suppressing the growth of imaging. Although its potential is alluring, its price tag may be daunting. No promise of profits down the road can put nonexistent funds into capital budgets, and the future is now for businesses with their eyes locked on the bottom line.

Information Systems (IS) departments are among those hardest hit by the economic downturn. Frequently denied even the opportunity to have input on hardware and software buying decisions, they are unable to demonstrate the value they can add with imaging if given the chance. As a result, imaging and other new technologies such as reengineering, workflow software and groupware can languish unused.



Many of the negative aspects associated with imaging have been overcome. Networks and image compression schemes are now largely standardized. Further, the price per seat has dropped from $100,000-plus in 1985 to $20,000 in 1992. And the cost per transaction — a truer indication of cost — has dropped even more significantly.

Imaging will flourish when the business community realizes that it is time to reexamine its outdated mores and accept internal change. Imaging can then act as a complimentary technology within enlightened organizations.

This White Paper was written independently of the Computerworld editorial department by Scott McCready, Director, Image Systems with IDC.

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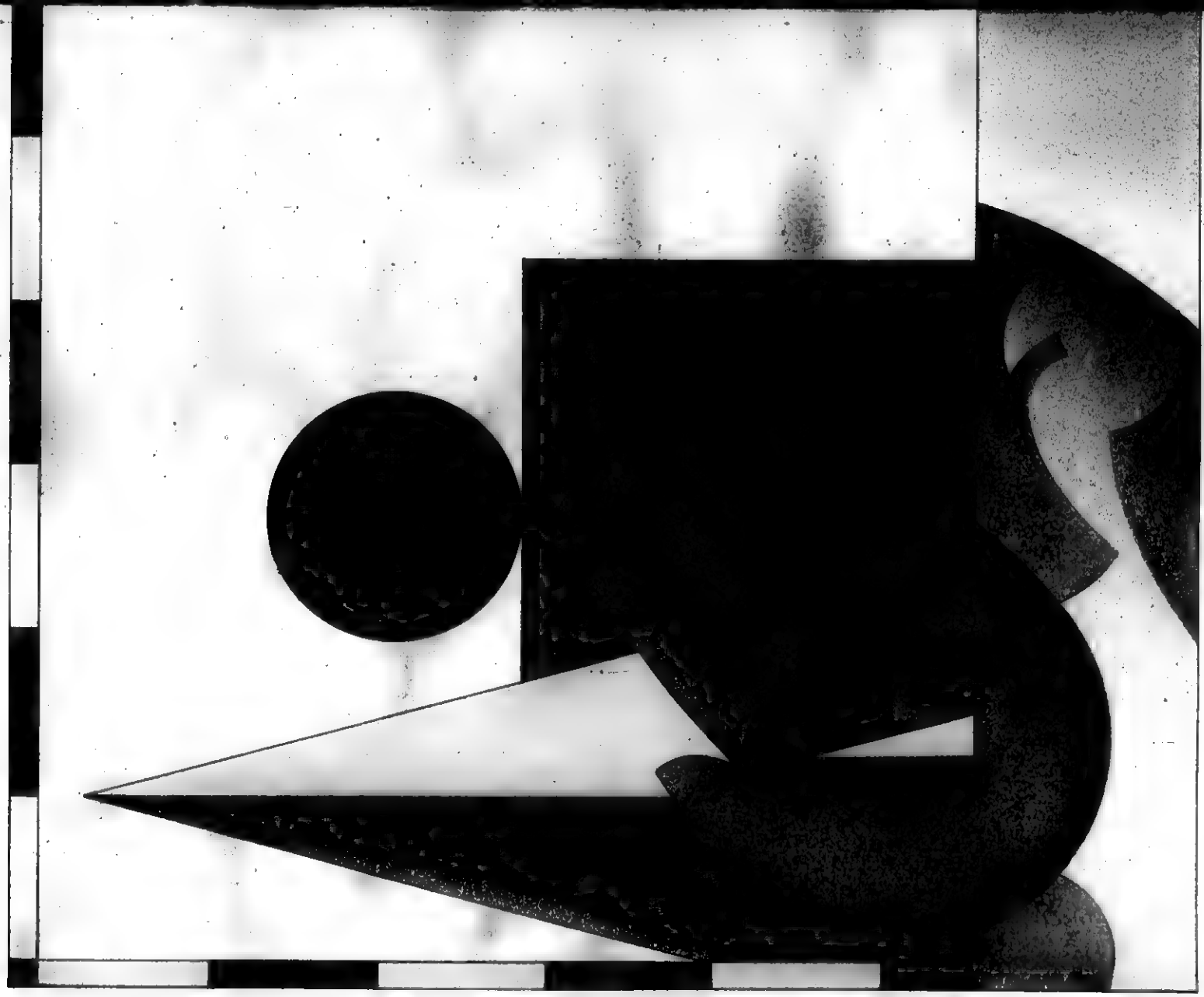
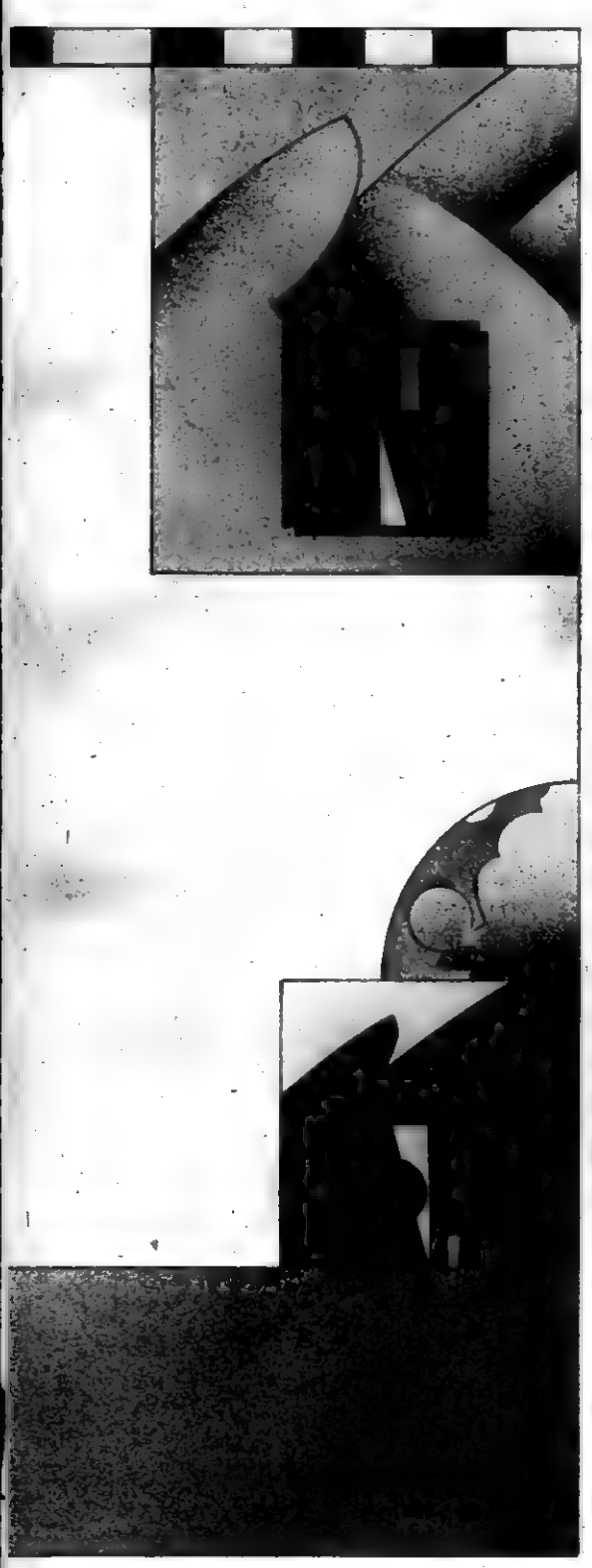




IS professionals at home and abroad are under siege. Budgets in many cases are flat if not declining, and the IS influence over IS-related expenditures has been showing a marked decline in recent years. Many companies are throwing around terms such as outsourcing, downsizing and reengineering, in many cases with little thought. Given these difficult times, it is not surprising that many IS professionals simply do not have the time or energy to cope with new technologies such as imaging, workflow software, groupware, et al.

"It's difficult to take a long-term strategic perspective on technology when the alligators are already in your swimming pool," is the way one IS manager describes his inability to plan for imaging. He is not alone. A worldwide study of 5,000 IS professionals conducted by IDC's Worldwide IT Customer Directions and Strategies Group shows that only 14.2% of IS professionals in the U.S. and 12.6% worldwide intend to implement any significant type of imaging capability in 1992.

Despite this modest forecast, cost-conscious user-company top management must understand that imaging, when combined with a more enlightened approach to business practices in

general, can lift companies into a stronger competitive position. Effecting this kind of fundamental change in the traditional business psyche is difficult at best.

There are several arguments IS professionals give for not implementing imaging:

- Unless imaging can be implemented on an enterprise-wide basis it is difficult to justify the investment from a financial or architectural perspective
- Until imaging is available from system vendors, IS professionals cannot afford to invest significant resources
- On a cost-per-seat basis, imaging is simply too expensive
- Until there is a broad-based set of standards, imaging is too expensive to acquire, maintain and support
- Imaging is only good for specific departments and the onus is on them to interface with IS
- Imaging is flashy while microform technology is cheaper and legally acceptable.

Now that imaging is commonly based on standard networks, uses PCs without any specialized hardware boards, and is available from IBM, DEC, NCR and other leading vendors, the IS justification for not employing imaging on a broad-scale is eroding. Cost/seat prices have fallen from $100,000/seat in 1985 to generally less than $20,000/seat in 1992. Cost per transaction (a truer measure of cost) has fallen even more significantly over time.

The lack of specific ISO and de facto imaging standards is no longer a solid reason for not implementing image systems. There are CCITT Group 3 and 4 standards for compressing images, and many of the de facto standards used in the IS world — SNA, DECnet, etc. — are equally applicable to imaging.

IDC/Avante also believes the issue of imaging versus microform is moot. Microform is a valid technology for the long-term storage and retrieval of documents, and as such will be useful into the 21st century. Imaging is a less expensive way to process documents when they are in their active life cycle. Therefore, imaging and microform technology should be able to co-exist as part of a migration pattern in which active documents processed by imaging gradually become less active, or age to the point where it makes sense to store them on microform.

This is not to say that imaging is not effective in a file and retrieval mode, but retrieval rates have to be relatively high to justify the additional costs associated with imaging technology.

The primary remaining impediment to not implementing imaging concerns its applicability to a limited set of line-of-business activities. This is not a weakness but indeed a strength.

Imaging tends to yield the highest paybacks in industry-specific line-of-business activities. For example, insurance companies obtain optimal results by automating underwriting or claims processing functions. Banks typically benefit most from employing imaging in a mortgage loan servicing or credit card correspondence environment.

The challenge for IS is to find out which business problems respond best to imaging, and then implement imaging before the particular line of business installs its own maverick imaging system. In such a dynamic environment, the enterprise-wide IS architecture may be put at some risk. It is thus incumbent upon IS departments to become knowledgeable about their companies' business operations at increasingly lower organizational levels.

Imaging and associated technologies such as workflow software and groupware can propel IS into a position of prominence.

Although IS is increasingly gaining power in imaging system purchases, it is still left out of 60% of these critical transactions.

THE ERODING IS POSITION

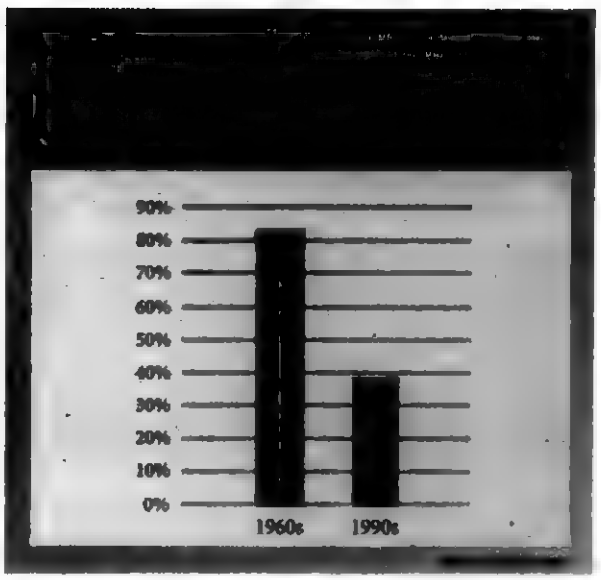
The trends of downsizing and outsourcing could not have happened at a worse possible time for IS professionals. Not only are they losing resources, but many IS shops are maintaining business applications that are 20 years old or older, and doing so without the promise of increased funds for support and maintenance. The problem is exacerbated because PCs and LAN purchases are eating into IS budgets dramatically. As the keeper of the enterprise-wide architecture, IS has been required to support an ever-divergent group of users requiring PC and LAN support, and demanding expensive departmental systems such as imaging.

Further, with desktop computers becoming as powerful as mainframes were 10 years ago, it is increasingly difficult to argue for a host-centric, central-control approach to automation. Client/server architectures are marching forth and the commodity pricing of computer power at the desktop and server levels shows no evidence of slowing. Therefore, the role of centralized IS departments will decrease as more and more companies refuse to write new mainframe applications, and more technologies such as imaging and OCR are put on networks. Add to this the pressure for open and standard systems, and it is easy to understand why IS is under siege.

On the bright side, the combination of PCs, LANs and existing network backbones creates the infrastructure IS requires to take its rightfully prominent place in corporate and organizational structures.

TROUBLE IN THE BUSINESS WORLD

How many people have not heard the term reengineering? Not many. But how many really understand what it entails? The common perception of reengineering is that of gut-wrenching change in business systems and a whole new set of business applications that must be written or rewritten. The fact that business systems were not engineered in the first place hardly seems to matter to senior management hell-bent on reengineering their businesses. What does matter is that more and more businesses are recognizing the need to change.



Even though IS is slowly exerting more influence on imaging system purchases, it is losing its overall clout on major technology acquisitions.

There are several business factors that suggest that all is not well in the business world:

- The quest for Total Quality Management (TQM) is rapidly becoming a national obsession
- There is an increasing focus on the top-line (market share, revenue growth) as opposed to the bottom line (profit)
- Commodity pricing for PCs, LANs and servers means that the system vendors cannot afford to do business as usual. The major vendors face many of the same issues confronting IS
- Only through a continuous improvement program (CIP) can companies raise customer service levels and product quality while reducing costs and empowering employees.

IS ENTERPRISE-WIDE IMAGING REALISTIC?

Given the transformations taking place in the IS function, is it reasonable to expect IS to envision and implement an enterprise-wide imaging environment? Perhaps more to the point, does it make good business sense? There is a three-part answer to these questions. An economic response, an organizational or logistical response, and a technical response.

Economically, it may make sense for some companies to employ imaging from an enterprise-wide perspective. The economic argument in some cases may be based on the ability to provide a new product or service that would not be possible without the use of image technology. However, for most companies the capital outlay for an enterprise-wide system must be spread over several years. Since most users must cost-justify the acquisition of image technology, this commonly limits imaging as an all-pervasive data type. Consequently, image technology has been limited to those areas where well-documented financial return was possible. Despite this trend, the shift from imaging in line-of-business applications to enterprise-wide use is slowly taking place.

Part of the reason for starting small may be attributed to simple economics, but certainly the limitations of the technology — most notably, its limitation to a single database domain — and the complexities of completing the necessary up-front analysis have also contributed significantly to the departmental adoption approach of image users.

Organizationally, the hurdles of employing imaging technology on an enterprise-wide basis are formidable. In these lean fiscal times, the frequent senior management philosophy is, "If you are going to fail, make sure you fail small." That is why the first imaging project is often in the area of a company where failure has no price and success has little or no impact. These initial imaging projects are also frequently not transferrable to other areas of the enterprise.

The organizational issues, more than the economic or technical considerations, pose the biggest obstacles to enterprise-wide imaging.

Technically, enterprise-wide imaging is possible. The challenge for vendors and users goes beyond connecting disparate computer architectures, or employing standard and open systems. The challenge is separating those vendors with connectivity from those vendors that can layer an appropriate product set on top of the existing information processing infrastructure.

Most imaging users are automating the paper process. Since paper transactions cross not only LANs and wide-area networks (WANs) and, in many cases countries, users need an architecture that not only allows transactions to flow freely but also can track and control transactions. This is where most enterprise-wide efforts begin to fall apart.

The other problem is that image systems tend to be bought and implemented in a helter-skelter fashion by various lines of business. Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability.

Enterprise-wide imaging involves

more than simply integrating disparate computer architectures. It also requires access and customized views of the associated data and images. The definition of enterprise-wide access is not complex. Once a specific business function is automated with imaging technology, people beyond the newly automated department can also benefit from the imaging database. Therefore, it is necessary to find an economical method that provides casual access to this new database resource. This casual access should involve a consistent front-end that shields the user from the native interfaces.

Providing an enterprise-wide imaging system requires the use of sophisticated folder software, which allows users to view data and associated images for multiple management functions without storing the data and images multiple times.

Vendor	Workstations	Customer	Application
Sigma Imaging Systems	1,650	Empire BC/BS	Multiple
FileNet	175	Chemical Bank	Multiple
FileNet	200+	Phillips Petro	Accounting
IBM	<50	D. B. Kelly	Photo Inspection Records
IBM	1,500+	USAA	Claims Processing
IBM	1,000+	WCB of Ontario	Claims

There is still a limited number of enterprise-wide imaging systems.

Most of the system vendors, such as IBM and Digital Equipment, offer imaging based on their existing strategic architectures. For database management systems, this means Rdb and DB2. Networking is based on DECnet and SNA. The imaging system vendors are also catering to standards by supporting common databases, such as those available from Oracle and Sybase. 3COM and Novell are the most prominent network operating system companies. Interactive multiwindow desktop interoperability is commonly offered through Dynamic Data Exchange (DDE) under MS Windows 3.0.

"Without some degree of IS coordination, many companies will rapidly acquire imaging systems from several vendors, thereby complicating the drive towards an enterprise-wide capability."

Currently, no single vendor offers true one-stop shopping. The system vendors are trying to address standards. When it comes to workflow software, they fail to understand it from an application and system-resource perspective. The image vendors are closing in on workflow software application solutions, but they are not large enough to convince many large corporations to view them as significant automation suppliers.

THREE ORGANIZATIONAL MODELS

Enterprise-wide imaging systems generally reflect one of three organizational models. The first model is the traditional view. This model has a large number of workstations, is normally constructed with conscious architectural considerations, and is usually compliant with evolving standards such as those proposed by the ISO's Open Systems Interconnect model.

The second model of enterprise-wide architectures reflects the software changes IDC/Avante believes must happen if users are to widely implement imaging. These changes imply the use of folder software to present individual views of the data and images while only storing and manipulating one set.

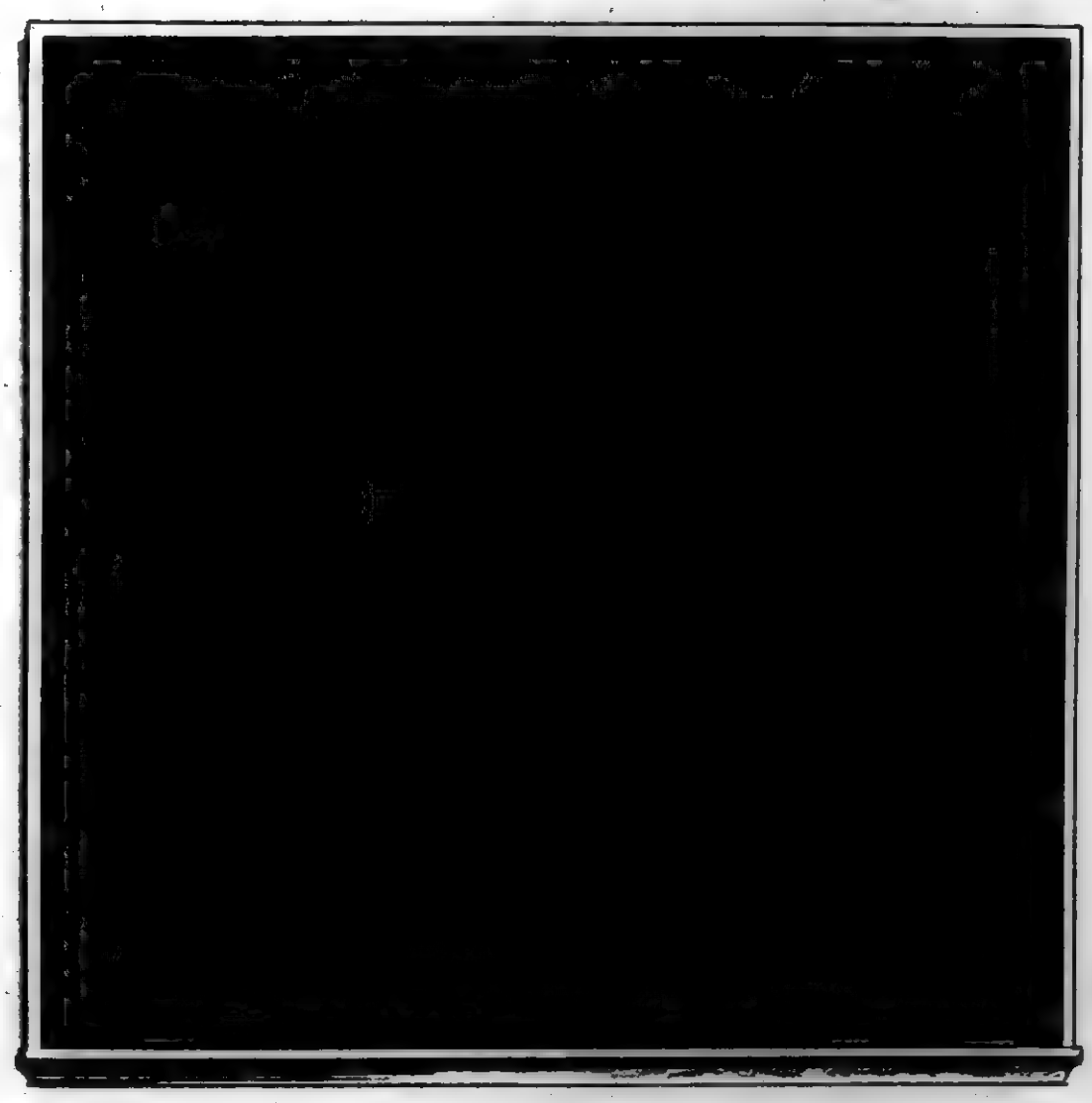
The third model is based on the premise that the concept of the enterprise is expanding to include not only the user company, but its suppliers, agents, customers and government. All of these groups may be found in a single image implementation.

Today, many vendors and users alike are stuck with the traditional model of enterprise-wide imaging. However, IDC/Avante sees a definite trend towards the second model, particularly in the insurance and healthcare industries. The third model is more applicable to truly innovative companies, mostly found in the financial sector.

VENDOR APPROACHES

Sigma Imaging Systems is one vendor that preaches the gospel of distributed processing and central records control. It strives to leverage its systems at all levels while offering the ability to expand systems incrementally without having to add gigabytes of storage or make other dramatic changes. Sigma has implemented a system at Empire Blue Cross/Blue Shield with these central concepts in mind. The system features 23 Kodak ImageLink 9000 scanners, processes 100,000 documents/day, includes six jukeboxes at three sites: Albany, N.Y., New York City and Yorkstown, N.Y.

The system automates multiple lines of business: medicare, a dedicated state service center and claims processing. The single catalog of images and the various jukeboxes communicate over an SNA network that links all sites. Work-



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1993—and already they're ahead of schedule.

They later added, "ImagePlus let us respond o our day-to-day customers—immediately."

In finance, take the example of Massachusetts Financial Services, which supervises $28 billion in assets for over one million investors.

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The IS Call to Arms — 11 Steps to Change

Unless there is a general call to arms, IS will become a simple maintenance function with some network caretaker services provided by specialists. It will have no opportunity to add value or make critical decisions. The call to arms should include several elements. In order to fulfill them, IS professionals must:

1. Understand the business environments of their companies and determine the appropriate mix of technologies to accommodate those environments.

2. Fully leverage existing IS infrastructures.

3. Recognize that IBM and Digital will be the network providers of choice, while imaging, workflow software and groupware will more than likely come from companies such as Lotus, Plexus, FileNet, Action Technologies, Wang and Computron.

4. Recognize that outmoded development environments must go. Hard coding imaging solutions simply recreate nightmarish support and maintenance scenarios. Instead, users should use automation efforts to ensure that the workflow process is isolated from the business application, and eventually from the data application. The goal is to change the workflow without negatively impacting other processes.

5. Beware of vendors offering a new lease on life through image-enabling legacy applications. This may be a suitable migration strategy for some, but it may leave others in a technology purgatory between the old and new worlds.

6. Break down the communication gap between IS professionals and business people.

7. Be aggressive with major computer suppliers. IS must demand that the system vendors alone, or in partnership, provide the appropriate products and services needed to get IS out of their legacy environments.

8. Implement imaging with an enterprise-wide view in mind while being mindful of the changes enterprises are experiencing.

9. Understand that imaging and the issues associated with imaging are typical of the organizational and technological issues that IS will be confronted with in the next ten years.

10. Shift IS expenditures away from processing transactions and toward automating people and the relationships between them.

11. Recognize that we are in a unique point in automation history. The competitive battleground is not simply quality or the time required to get to market. Instead, the competitive battleground is based on creating value, which, in the words of Russell Redenbaugh, Chairman of Action Technologies, is "the new coin of the realm." As such, we are not so much automating the flow of paper or data. What we are really talking about is an overall automation environment that allows systems to allocate resources dynamically.

in-progress is distributed on OS/2-based systems, but the image catalog — which contains 22 million documents — is on an IBM ES/9000.

FileNet Corp. considers its implementation at Chemical Bank in New York City to be an enterprise-wide system. According to FileNet, the system currently includes two cities, five systems and nine applications. Its users share data and images in a variety of different ways. Application processing, charge-backs and customer service applications reside in one city while the users are in two cities. FileNet says the system qualifies as an enterprise-wide system based upon its having data available to a distributed set of people or multiple applications that may be co-located or distributed.

Wang Laboratories believes there are few, if any, image systems that are truly enterprise-wide. In fact, Wang argues there may not even be a demand for enterprise-wide systems in which anyone working in an organization has access to all information. With the exception of small and focused enterprises such as resume access in a recruitment environment, Wang believes the need for everyone to have access to all data is simply not required. Since there is a division of labor between departments, the company maintains that it is unlikely that one form of information has to be accessed by all groups.

Despite this position, however, Wang also believes it is very important for prospective imaging customers to consider the enterprise-wide imaging implications in their up-front analyses because it leads them into considering the possible impact of standards and the implications they may hold for future expanded imaging systems.

CHANGE...

Document management is changing. The process can be
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MANAGED BY KODAK

Imaging by all means

Not surprisingly, IBM has done a lot of thinking about the issue of enterprise-wide systems. The company says enterprise-wide imaging has a lot more to do with the approach than with scale or scope of implementation. It cites a number of notable considerations, including the need for:

- Some element of work management
- An industrial-strength solution
- A conscious set of architectural elements.

THREE ENTERPRISE-WIDE SCENARIOS

IDC believes there are three possible scenarios for enterprise-wide imaging systems. While all three are different in definition they are certainly not mutually exclusive.

The first scenario includes hundreds of workstations as are found in implementations at USAA of Plano, Texas, and Putnam Investor Services of Quincy, Mass. These systems are absolute in scale, meaning the number of workstations they support can be expanded without limitation.

The second scenario is found in small companies where imaging is pervasive across the entire business. D.B. Kelly, which uses imaging to eliminate insurance fraud in the automobile inspection process, is an excellent example of this approach, which typically calls for fewer than 50 workstations. However, the ratio of workstations to employees is nearly one-to-one. D.B. Kelly is all the more remarkable because imaging allowed it to create a business that was not feasible without imaging.

A third scenario of enterprise-wide imaging comes into play when companies redefine their definition of the enterprise. IBM implemented an internal imaging system to handle customs documentation (IBM was the first company allowed by U.S. customs to destroy the original paper documents). Subsequently, the system is being expanded to include the customs brokers that handle IBM shipments at the different ports of entry.

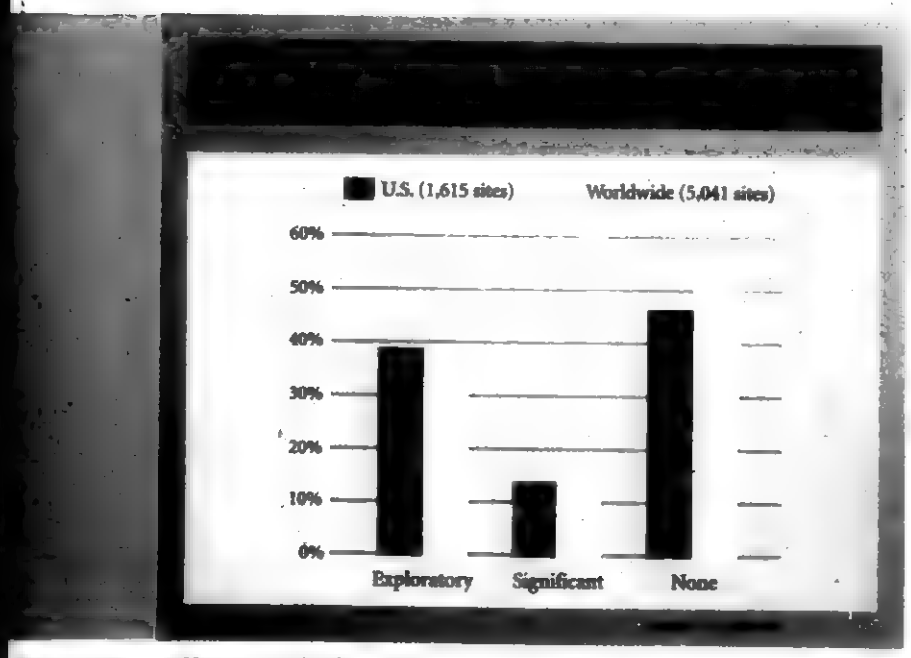
GLOBAL IMAGING IMPLICATIONS

IS managers in the U.S. are not alone in the struggle to place imaging, workflow software and groupware in perspective. As Europe marches toward a monetary union, many United Kingdom and European IS managers are also coming under intense pressure to provide a more seamless IS environment on an intercountry as well as an intracountry basis.

Despite the European unification efforts, however, it is a great mistake to perceive Europe as one market. The use and sophistication of imaging in various European countries is as varied as the business problems imaging solves in the U.S. For instance, Spain and Italy frequently implement file and retrieval applications, while Germany uses more workflow technology.

Far from being one market, Europe will remain a series of relatively unique markets well into the next century. Certainly the European Community (EC) simplifies many of the legal issues that U.S. companies must comply with in order to do business in Europe, but the driving factors behind the acquisition of new technology will still be different in each country.

As one European explained it, "We are all part of the EC but that does not mean we are similar or that we necessarily even like each other."



Users are cautiously committing themselves to imaging systems.

APPLICATION BRIEF

The State of Missouri, Employment Securities

This agency's job is to collect quarterly employment taxes. This means that once a quarter Employment Securities is literally deluged with thousands of checks. The result is that its processing cycle has huge peaks that last for 10 days.

Before implementing imaging, it took 10 days to pull the checks and get them to the bank. Anyone that was available from another department was requisitioned to pull checks because the state wanted to reduce float and make sure it could tell people that their payments had been received. It took approximately six weeks to get the information off the reports and get the basic

data into the agency's system. It then took another week to place the reports in numerical order. Eventually the reports were microfilmed, which took two more weeks.

The state's customer service representatives charged with replying to taxpayer inquiries did not have the necessary information until the end of the next quarter. Now, as soon as the check is pulled, the accompanying documents can be scanned and indexed. As a result, customer service has the information it needs within 48 hours of the check being pulled, and nine-to-ten weeks of waiting time is eliminated.

Industry	1992	1993	1994	1995
Banking	14%	17%	18%	20%
Insurance	7%	9%	11%	12%
Financial Services	6%	8%	9%	10%
Manufacturing	24%	25%	24%	24%
Transportation	5%	5%	6%	6%
Utilities	3%	3%	4%	4%
Government	21%	21%	20%	18%
Other	20%	12%	8%	6%

Leading Japanese imaging users in the manufacturing and government sectors frequently rely on electronic filing cabinet applications.

APPLICATION BRIEF
State Retirement Fund, Illinois

The State Retirement Fund was being forced out of its location, which was a problem because it had several million paper documents stored in cardboard boxes and on shelves. The fund had a finite number of dollars to spend, and had to decide whether to build special storage space into its next building or change its paper process. It opted for the latter, acquiring an image system in advance of the move to the new building. It used the system solely for converting paper to images. As a result, on moving day, everything moved but the paper records.

APPLICATION BRIEF
State of Louisiana,
Department of Public Safety

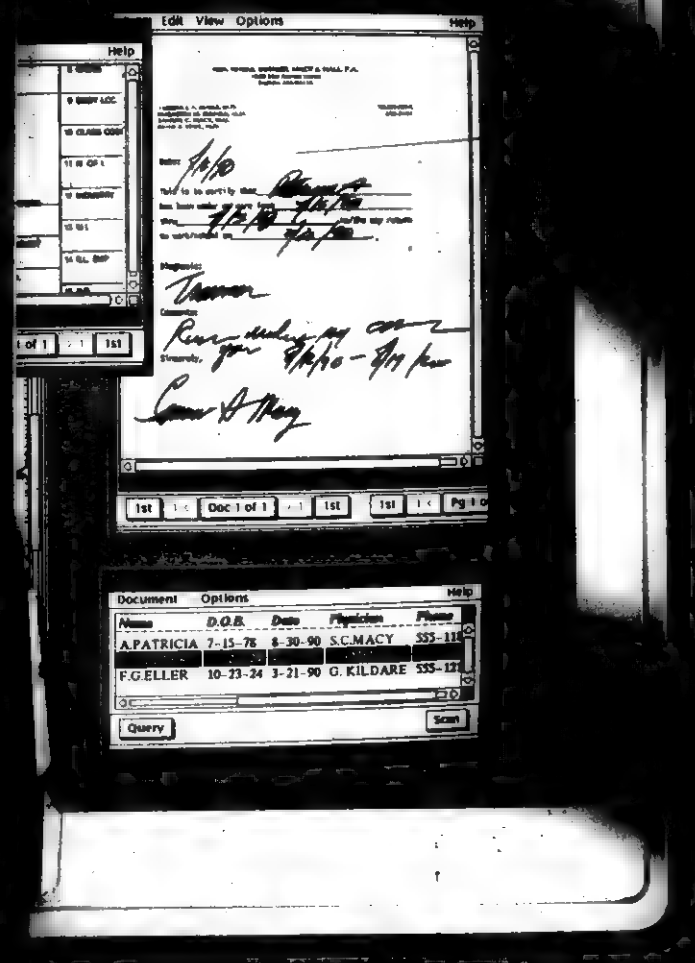
The State of Louisiana Department of Public Safety needed to supply information on drivers to many other agencies and departments. Problem drivers are a large part of that information, and tend to remain that way over time as they go in and out of the court system, amass police driving records and have their licenses revoked. Insurance company requests further compounded the state's information retrieval demands. In this environment, the state typically provides information to six outside organizations. Since placing this information on an imaging system, all files are readily available, and can be easily shipped across communication lines. The state's goal is to leverage imaging to the point where it no longer needs paper and microfilm, but can maintain information in an electronic folder. It also wants to include arrest histories — which are maintained separately from driving records — and mug shots in these electronic folders.

The state eventually wants this information to be accessible not only by the Department of Public Safety but by the court system and mobile units of the fire and police departments. The agency receives 12,000 pieces of documentation weekly, and has a 12-million-document backlog. So far, 2,000 terminals have been installed to fight the imaging battle.

APPLICATION BRIEF
American Republic
Insurance Company

American Republic has $386 million in assets, $150 million in health premium income, $1.4 billion in current life insurance business and 200,000 policy holders. It installed an imaging system in order to bring a higher level of automation to its claims adjustment department in the health claims area. Currently this area handles 1,300 claims per day, which is a 25% increase in volume over last year.

American Republic estimates that its image system will save $1.25 million over the next five years on reduced staffing costs. An additional $48,000 is expected be saved in microfilm equipment and services.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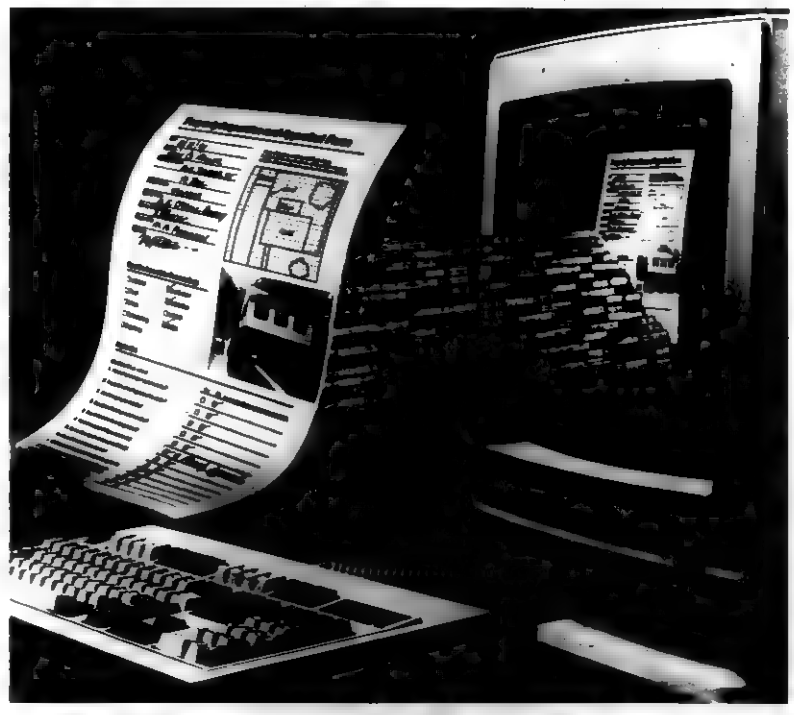

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Harvest month reaps crop of 21 viruses

BY JAMES DALY
CW STAFF

The summer may be waning, but things on the virus front continue to be hot. Besides the usual rogues gallery, a couple of new faces have appeared, including one that takes its inspiration from J. R. R. Tolkien's *Lord of the Rings* fantasy trilogy.

The **4096**, or **Frodo**, virus is destructive to both data files and executable files as it very slowly cross-links files on the system's disk, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La.-based developer of data security software. The cross-linking generated by the nearly invisible virus occurs so slowly that it appears there is a hardware problem.

The virus derives its name from two sources. First, the length of the infected file is increased by 4,096 bytes, although the increased length will not show up when a DOS DIR or CHKDSK command is executed.

In some cases, the virus will also display the message "Frodo Lives" on or after Sept. 22, that date being the birthday of Frodo and Bilbo Baggins, two fictional characters in Tolkien's series.

Another September virus is **AirCop B**, a memory-resident nuisance strain that infects only floppy disk boot sectors. Booting from an infected disk results in the message, "This is AirCop."

Also new on the agenda is the relatively rare **Plastique** (also known as Plastic Bomb, Plastique 3012 and AntiCAD3). Once loaded into memory through an infected .COM or .EXE file, it infects all executed .COM and .EXE files except COMMAND.COM.

The virus becomes active after Sept. 20. It may either progressively slow a system down — with some strains halting the system after 30 minutes — or intermittently emit a bomb noise from the speaker.

The ubiquitous **Cascade** virus causes individual letters to appear to fall, or cascade, from their position on the screen to the bottom. It infects only .COM files on personal computer systems with IBM Color Graphics Adapter or Video Graphics Array-based monitors.

These dates are not guaranteed. They are presented here more for general awareness.

Experts advise scanning any new disk before it is used as well as following the three basic rules of virus protection: backup, backup, backup. Among the vendors offering scanning applications are Symantec Corp., Central Point Software, Inc., McAfee Associates and Fifth Generation Systems.

> THE 4096, or Frodo, virus is destructive to data and executable files as it very slowly cross-links files on the system's disk. It gives the appearance of a hardware problem.

New kids on the block

New nasties set to go off this month include the following:

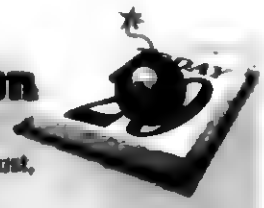
- **Plip** — Modifies .COM, .EXE and overlay files, as well as the boot sector and partition tables. When activated, the virus flips the screen 90 degrees. May damage file allocation tables and corrupt some data files.
- **Violater B1** — Infects all .COM files when an infected .COM file is executed. It can damage data on a system by reformatting Track 0 on all system drives on its trigger date.
- **Form** — Resides on boot sector of floppies or the partition table of hard disks. It seems to do no intentional damage.

Making September reappearances are the following:

- **Day 10** — .COM file growth, file date and time change and hard disk corruption.
- **Monxla** — Infected .COM programs increase in length by 535 bytes.
- **Skism** — May affect computer performance or functions and corrupt programs.
- **Pay Day** — Systems may slow down. Files may be deleted on any Friday except Friday the 13th.
- **Frog's Alley** — Host files are COMMAND.COM and .COM files. Corrupts programs.
- **Taiwan** — On the 8th day of any month will perform an absolute disk write for 160 sectors, destroying what it overwrites.
- **Alabama** — Affects runtime operation, corrupts program or overlay files and file linkage.
- **Frere Jacques** — Available memory may decrease. Systems may crash.
- **Crew 2480** — Changes the file date and hangs up the system, which then reboots.
- **Mendoza** — Deletes the infected file and all files in the directory with the infected file. Can crop up at any time during the last half of the year.
- **AH!** — May cause crashes and a decrease in available memory.
- **Bad Guy2, Exterminator, Demon** — Overwrite the beginning of infected programs with viral code.

Change of season

Coming into autumn, watch out for a few viruses that didn't appear in August, in addition to the monthly regulars



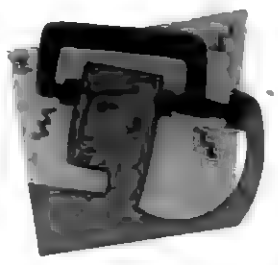
Source: Fifth Generation Systems, Inc.

The best and brightest: Prone to high stress

BY JAMES DALY
CW STAFF

Feeling tense and nervous? Can't relax? If you are a microcomputer support professional, you are not alone.

A recent study by a pair of university professors has found that high stress and gnawing job dissatisfaction are as common as ringing phones and befuddled users in the offices of many support staffs. The chief cause: ambiguous job expectations and confusion over roles, which especially eats at employees who are young, inexperienced and highly educated.



"Managers are unclear about what they expect of support, or if they tell [support people] what to do, they don't ever tell them how to do it," said Magid Igbaria, a Drexel University professor of management who conducted the study with Tor Guimaraes, a professor of information systems management at Tennessee Technological University.

Although many jobs have ambiguous directives and arduous schedules, Igbaria noted that the incredibly rapid pace of technological change at the microcomputer level — and the demands in keeping up with those changes to remain at the top of your game — exacerbate the typical job burden and make support positions especially stressful.

That lack of direction may create support professionals who seem unresponsive to user needs. Unlike those who work with the big iron in IS or mainframe applications, microcomputer support staffers have a continual need to train and explain and hence must communicate well.

"They must have a blend of business skills and communications skills," Igbaria said. "We sometimes found that the best support people — the least stressed — were those that had some training in humanities."

Igbaria and Guimaraes analyzed a survey of 76 support personnel employed in the banking, manufacturing and utility industries in the Cleveland area. Igbaria acknowledges that the sampling has some limitations and that additional research needs to draw on a wider sample of employees.

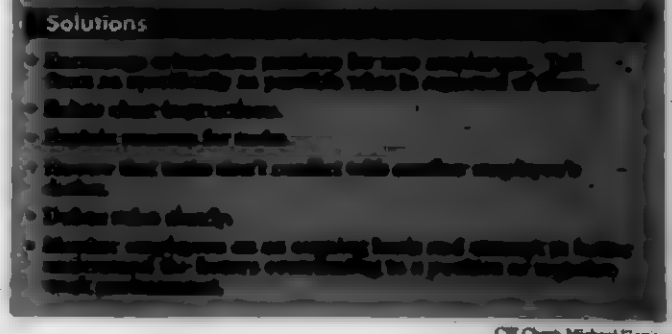
Survey respondents averaged 32 years of age; more than two-thirds had college degrees. Unlike IS professionals at the highest levels, about half of the support professionals surveyed were women. That made sense to Igbaria.

"The women we spoke to said they felt much more comfortable dealing with people in a support role than hunkering down in something like applications development," Igbaria said.

The survey also showed that employees who had more education and had been at companies longer were generally more able to handle stress than younger counterparts with less education and work experience.

Ultimately, the study reveals the dark side of stressful environments: Companies may lose their best employees. The study found that job satisfaction greatly affected company loyalty and was the most important factor in an employee's decision to leave.

"In some instances we're talking about losing the best and the brightest because we don't know how to lighten the stress load," Igbaria said.



CW Chart: Michael Siggins

NEW PRODUCTS

Software application packages

Mountain Network Solutions, Inc. has announced the FileSafe Plus Librarian.

FileSafe Plus Librarian was designed to enhance the company's FileSafe tape backup software. Dormant files can be groomed from Novell, Inc. NetWare servers, and files can be groomed from a DOS hard disk.

Microsoft Corp. Windows and DOS interfaces are offered, and the product is compatible with all versions of Mountain tape drives, according to the company. Features include pop-up dialog boxes, drop-down menus and mouse support.

Prices range from $99 to $129.

Mountain Network Solutions
240 E. Hacienda Ave.
Campbell, Calif. 95008
(408) 379-4300

National A. I. Lab, Inc. has introduced You/2, a personal computer-based decision support software program.

You/2 combines knowledge base, decision-making process, learning curve and organizational needs into a format that can be managed and transferred. The product was designed for applications such as technical support, equipment diagnostics and human resource management. Mouse and touch-screen support is provided. You/2 can be customized based on user needs.

You/2 runs on all IBM PC compatibles and is suitable for most networks and multiuser installations, the company reported.

The developer's version of You/2 costs $795; the runtime version costs $495.

National A. I. Lab
2161 Newmarket Pkwy.
Marietta, Ga. 30067
(404) 988-0909

Precision Visuals, Inc. has announced Version 2.0 of PV-Wave Point and Click visual data analysis software.

According to the company, the most significant new feature is a set of interactive tools called the Database Visualizer. Users can subset and display tabular data either visually or with an icon interface to SQL commands. The Database Visualizer has a probing analyst capability that searches for hidden trends by exploring large or complex data sets.

Other features include date/time data management and display, Encapsulated PostScript interchange output, a data import previewer and support for Silicon Graphics, Inc.'s series of four-dimensional workstations.

The product costs $2,495.

Precision Visuals
6230 Lookout Road
Boulder, Colo. 80301
(303) 530-9000

Autodesk Retail Products has introduced Office Layout, a personal computer software package.

The product was designed to help users simplify space planning and inventory management. Office Layout includes an on-line Help utility, self-guiding menus and a 25-step undo/redo feature for experimenting with the plans or correcting mistakes, the company reported.

More than 200 predrawn symbols are included in the program, and users can create custom symbols for future use.

Office Layout costs $149.95.

Autodesk Retail Products
11911 N. Creek Pkwy. S.
Bothell, Wash. 98011
(206) 487-2233

Macintosh products

Radius, Inc. has announced SCSI-2-Booster, a daughtercard for the Radius Rocket series of Apple Computer, Inc. Macintosh system accelerators.

According to the company, the product was designed to increase throughput to high-performance Small Computer Systems Interface (SCSI)-2 based peripherals. Data transfer rates of up to 7M byte/sec., with sustained data transfer rates of up to 4.5M bytes, can be achieved using the most current SCSI-2 specifications and a high-speed, 40-MHz SCSI-2 controller chip.

The product does not require a Nubus slot, and it features compatibility with Rocket-equipped Macintosh II and Quadra computers.

The SCSI-2 Booster costs $299.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
(408) 434-1010

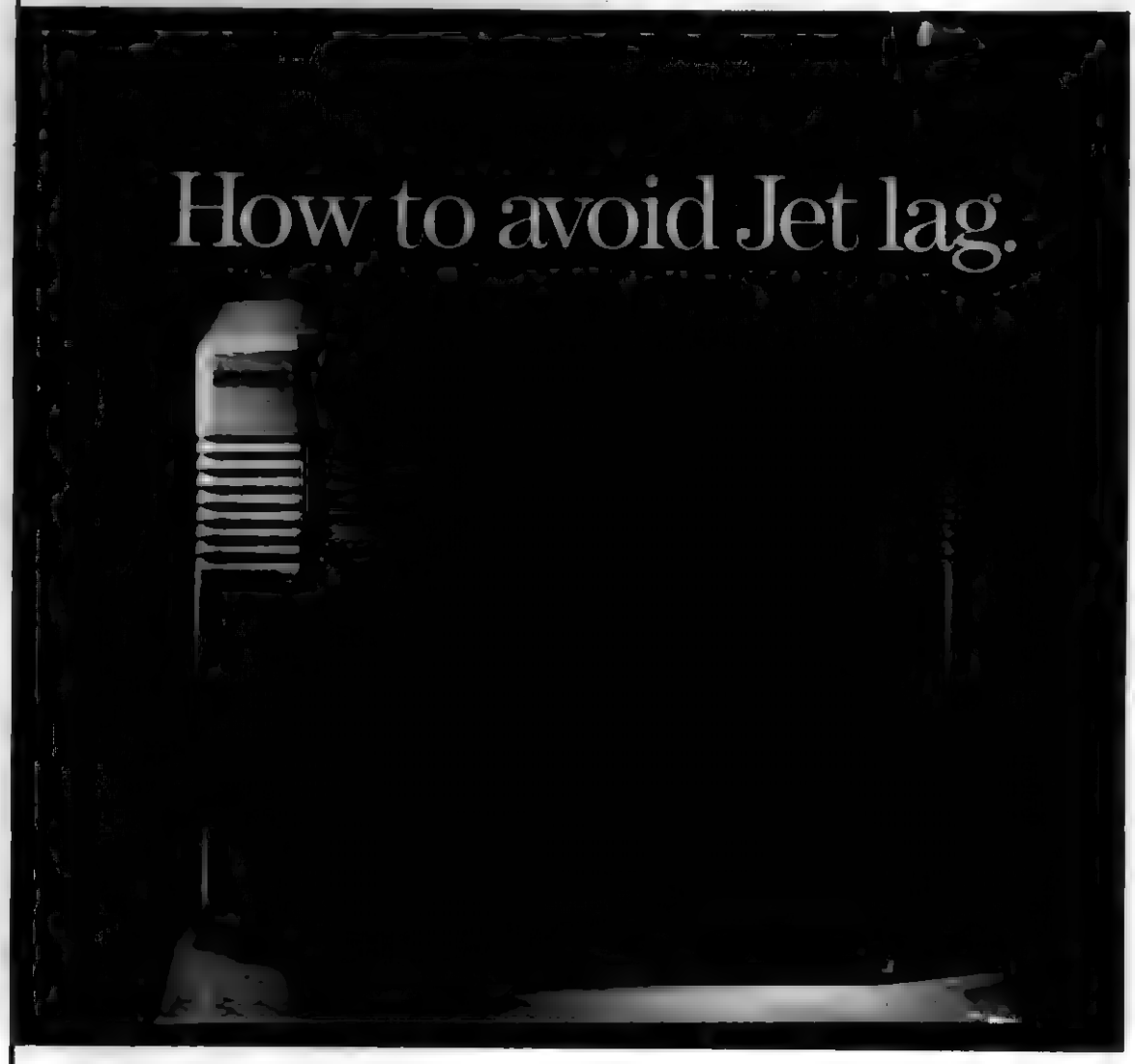
WordPerfect Corp. has started shipping LetterPerfect 2.1 for the Apple Computer, Inc. Macintosh.

An intuitive ruler allows users to change justification and set margin tabs and paragraph indents. Ruler settings can be copied to the clipboard and applied to other paragraphs. Users can design columns with irregular widths directly from the ruler.

Graphics features permit images to be sized, moved or cropped from the editing screen with the text automatically reformatting around them. Users can create template documents including memos, letterhead and envelopes with a stationery feature.

LetterPerfect 2.1 costs $149.

WordPerfect
1555 N. Technology Way
Orem, Utah 84057
(801) 225-5000



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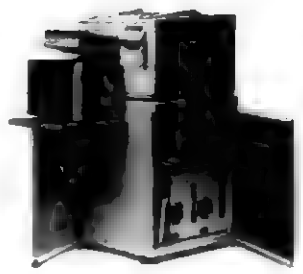
Your company will save even more time by keeping paper, toner cartridges, and other supplies in one convenient location—underneath the printer. The *HP LaserJet printer cabinet* is roomy on the inside, compact on the outside. It was custom designed to match the footprint of the HP LaserJet III Si printer with an HP paper feeder. Exactly.

Get your company's high-capacity printing solution off to a flying start. See your authorized HP reseller or contact your HP sales representative about the HP LaserJet III Si printer and custom accessories. For more information call 1-800-752-0900, ext. 7009.



Enhance the high-capacity HP LaserJet III Si printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

Reports of low-end LAN death greatly exaggerated

BY MICHELE DOSTERT
CW STAFF

Peer-to-peer, DOS-based personal computer LANs are one of those technologies that just refuses to die.

Most analysts expected peer-to-peer local-area network operating systems to obligingly fade away when powerful client/server operating systems such as Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager came on the scene. But although new peer-to-peer installations may be declining, a fairly healthy market for these simple, low-end LAN products still exists.

Peer-to-peer LANs provide basic network services such as file- and print-sharing but do not support more complex file server functions.

"There are a lot of people who don't want to be bothered with setting up a server," said Bob Gill, who tracks LANs at market research firm Gartner Group, Inc. "There are still many offices that don't even have PCs, much less network engineers to link them up. Client/server LAN operating systems are pretty daunting to these people; peer-to-peer LANs are simple."

One indication of the strength of the low-end market: Novell, which already claims more than 60% of all client/server installations, launched a peer-to-peer product, called NetWare Lite, in 1991. "NetWare Lite was a strategic product for Novell," said Brad Baldwin, a Gartner Group analyst.

Peer-to-peer LANs are usually installed in small shops that simply do not need the power of client/server LAN operating systems. Rock Grecious, who manages a seven-user NetWare Lite LAN at Provo, Utah-based U.S. Synthetic Corp., said, "I've worked with client/server before, but we just didn't need a full-blown LAN here."

Life price tag

In these tough economic times, peer-to-peer LAN operating systems have another big advantage: They are inexpensive. Novell is selling its NetWare Lite peer-to peer LAN operating system for $99 per node. By comparison, a 10-user package of Novell NetWare costs $1,995.

Artisoft, Inc. will bundle its LANtastic LAN operating system with its Ethernet cards for $99 per network — not per node. Sitka Corp., a Sun Microsystems, Inc. subsidiary, will give away a two-user version of its LAN operating system to anyone who can prove they own two network adapter cards.

But low prices for the user translate into low profit margins for the vendor. Artisoft, for example, makes only about 10% of its revenue from unbundled LANtastic sales, according to Baldwin. The rest comes from network adapters.

Although users like the low cost of peer-to-peer network operating systems, they overwhelmingly list ease of use and administration as the main reason they buy the technology.

"The LAN came with only one manual. You can read it overnight and set it up the next morning, instead of spending days on it," said Jim Garrison, who manages a 45-node Artisoft LANtastic LAN at a Georgia consulting firm. "I used to budget eight hours a week to helping users with LAN problems, but that's dropped down to two or three hours now."

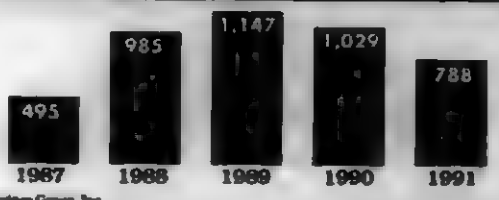
Peer-to-peer LANs are also popular among sophisticated users who want to control their own desktop computing environments. Susan Petrone, who manages a 28-node Tiara Computer Systems 10Net LAN at the Hipple Cancer Research Center in Dayton, Ohio, said 10Net LAN lets her scientific users "have control of their own system but still share files, printers and electronic mail. The users have more freedom than they would in a client/server LAN."

Peer-to-peer LANs are even capable of supporting client/server applications in some cases. "We've set up a 386 server, which stores Microsoft Excel and Word, Lotus 1-2-3 and Freelance, WordPerfect and Harvard Graphics," said Charlie Craig, who manages a 45-node LANtastic LAN at Memphis-based home improvements manufacturer Thompson-Formby.

Low-end shrinkage

The DOS-based LAN market is in decline . . .

Peer-to-peer license shipments (in thousands)



Source: Gartner Group, Inc.

. . . but has a healthy installed base of nearly 3 million nodes

1991 worldwide installed stations in DOS-based LANs

Manufacturer	Model	Stations	Percent of market
Artisoft	LANtastic	503,055	16.9%
IBM	PCLAN-Prg	996,800	33.4%
3Com	3+Share	210,000	7.0%
Tiara Computer Systems	10NET	650,000	21.8%
Other		624,500	20.9%

Source: Computer Intelligence/Infocorp

Notes: Novell only started selling NetWare in late Q4 1991, so this chart does not reflect Novell's presence

CW Chart: Michael Siegler

OS attack looming

Peer-to-peer network operating system vendors may not be threatened by client/server technology, but they will soon be under attack from a new direction — the desktop operating system itself. Microsoft plans to include a peer-to-peer networking capability in its forthcoming Windows for Workgroups product; Apple Computer, Inc. has bundled networking capability into its System 7.0 operating system.

When peer-to-peer networking goes from inexpensive to free, many analysts expect the current peer-to-peer network operating system vendors to lose some customers, although not right away. "There's been a lot of smoke and hype about what Windows for Workgroups is, but we haven't see it yet," said Lee Doyle, director of LAN research at International Data Corp.

Stan Schatt, LAN analyst at Computer Intelligence/Infocorp, a Santa Clara, Calif.-based research firm, agreed. "There will always be a market for peer-to-peer NOS. Even after the arrival of peer-to-peer capabilities on the desktop, the fittest peer-to-peer NOS vendors will survive."

$54 $54 $59 $23 $10 $92 $0

By the end of this week Computerworld readers will have spent over $54.5 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

DEC releases FullSail Ultrix manager

BY MARYFRAN JOHNSON
CW STAFF

With an eye toward easing the burden on Unix systems managers, Digital Equipment Corp. recently launched its FullSail application for managing distributed DEC Ultrix systems.

FullSail is intended for use in managing workgroups of up to 100 workstations and will be expanded later to handle larger networks. While FullSail manages only Ultrix workstations now, DEC is planning to release a client version for Sun Microsystems, Inc. machines in several months.

Comprehensive systems management is a "crying need" in the Unix arena, and FullSail is a reasonable beginning for Ultrix users, said Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "The product is immature," he added, "but as a basic product for Ultrix, it's not bad."

FullSail is divided into four areas: navigation tools, performance managers, user account managers and file system managers. System administrators can use the file system module, for example, to check the status of all files on the network, monitor disk space or tweak performance problems. "It's really a nuts-and-bolts application, written by engineers for engineers," Sines said.

Better features

DEC could expand FullSail's appeal to chief information officers and information systems directors, he noted, by broadening the performance manager features to include comparisons with best-case scenarios on other company networks, including DEC's own internal network.

"That would begin to address CIO issues about whether they're really getting top performance utilization from their networks," Sines said.

With its Motif-based graphical user interface and navigation tool, the product is "like a video game for system managers," quipped one DEC spokesman.

FullSail is part of DEC's overall Polycenter strategy, which encompasses a number of DEC and third-party products for network and systems management. DEC officials said FullSail will eventually be compliant with the Open Software Foundation's Distributed Management Environment.

The application requires the Ultrix operating system Version 4.2 or later. It is scheduled to ship next month. Pricing is $300 per client license, $6,000 per server for a database license and $2,000 per server for an application modules license.

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TCP/IP for DOS added to Desqview/X

BY MICHELE DOSTERT
CW STAFF

Quarterdeck Office Systems has licensed Novell, Inc.'s TCP/IP Transport for DOS for use in its Desqview/X Network Manager (to Other X Systems).

Quarterdeck also announced new support for users of Sun Microsystems, Inc.'s PC-NFS and Transmission Control Protocol/Internet Protocol (TCP/IP) products from The Wollongong Group, Inc. and Beame and Whiteside Software Ltd.

The Santa Monica, Calif.-based vendor's Desqview/X combines a graphical user interface with an implementation of the X Window System under DOS. It requires a third-party TCP/IP transport product, such as Novell's, to connect to TCP/IP networks. Network Manager (to Other X Systems) is the interface required to run Desqview/X on non-DOS networks.

With Desqview/X, the Desqview Network Manager and Novell's TCP/IP driver, DOS users can access programs running on remote Unix workstations, and X workstation users can access DOS and Microsoft Corp.'s Windows programs running on the Desqview/X personal computer.

Novell's TCP/IP Transport for DOS contains Novell's Open Datalink Interface driver set, which supports multiple protocols such as TCP/IP and IPX/SPX running simultaneously on the same board. The new TCP/IP drivers, along with the driver for Novell's TCP/IP for DOS product, will be provided free to Desqview/X Network Manager users.

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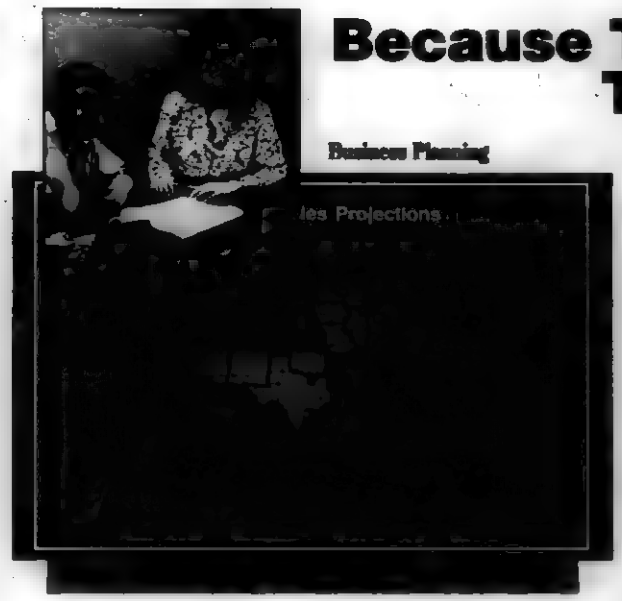

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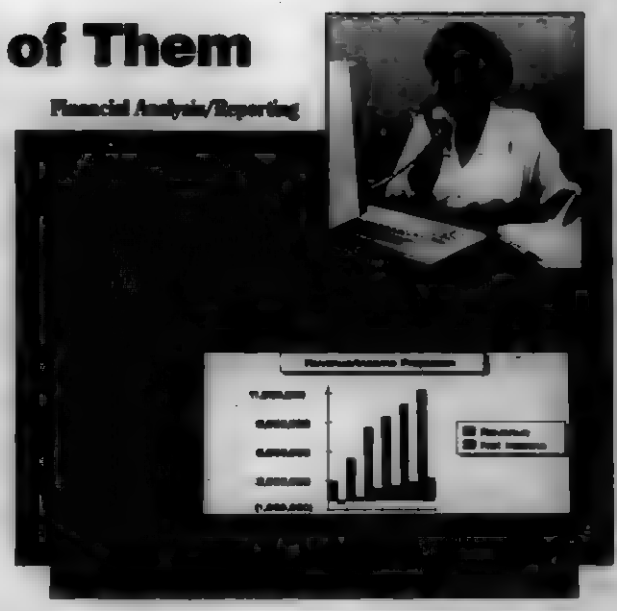

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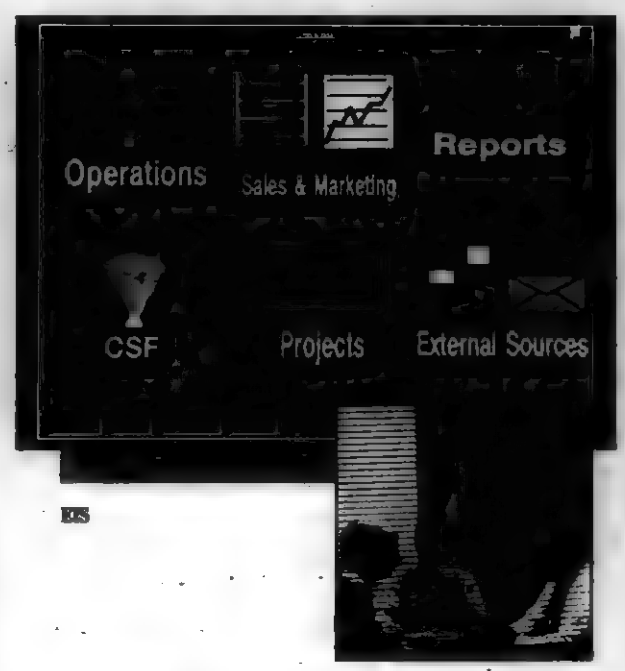

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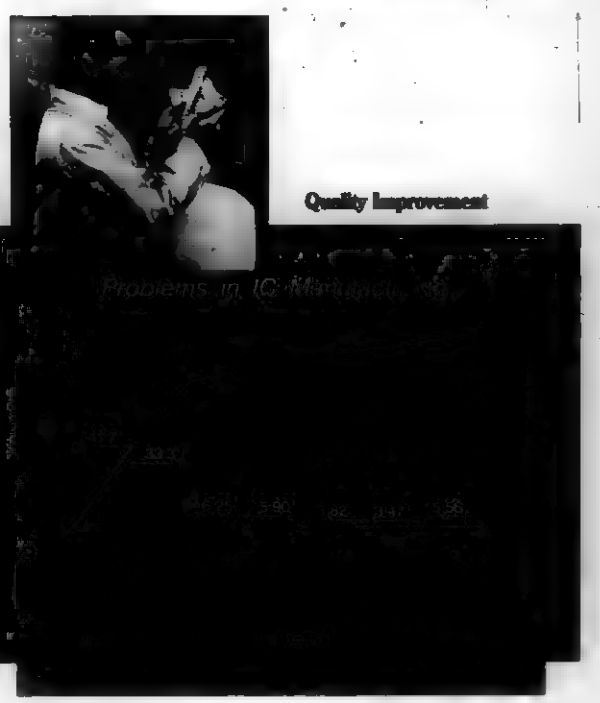

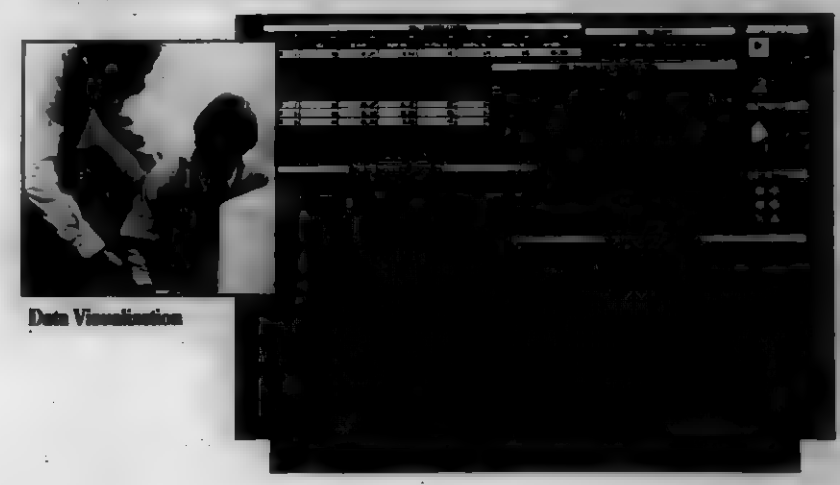

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Net-ready PCs spark user debate

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Personal computers with local-area network connections bundled right onto their motherboards are venturing into the marketplace. Yet while PCs and networks become more intertwined each day, opinions differ about the usefulness of integrated communications links.

Some users are itching for PC procurements that shield them from having to install network cards. For example, the city of Milwaukee has already decided that as of next year, all new PCs will come network-ready to allow end users to handle installation and support themselves.

"It is likely that PC purchases will no longer go through our information services group" and will become departmental responsibilities, said Joe Giljohann, senior microcomputer specialist for the city. "So we're seeking some way to cut down on users having to fiddle with boards. Users just answer a couple of questions on the screen" to configure their PCs for a network, he said.

Milwaukee tested Zenith Data Systems PCs with integrated 10Base-T connections, and it took just "four minutes to put the PC on the network after taking it out of the box," Giljohann said.

Zenith Data in Buffalo Grove, Ill., leads the network-ready PC pack with Ethernet connections bundled into nearly all of its laptop and desktop PCs. The chips contain drivers for Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Vines LAN operating systems. The chip comes bundled with the PCs for free; users buy a $100 physical connection to interface to cabling.

Is it worth it?

With an average of one in three corporate PCs connected to a LAN, users are unwilling to pay much for an integrated network connection

Source: CIMI Corp. CW Chart: Michael Siggins

Another PC vendor is soon expected to announce an optional $120 10Base-T or coax-based Ethernet connection on its desktops, according to analysts. In addition, Artisoft, Inc. said last month it has created an Ethernet chip to market to PC vendors for inclusion on their motherboards.

"I'm amazed it has taken this long" for PCs to ship with integral connections, said Jim Queen, LAN manager at Enron Gas Services Corp. in Houston. "I buy a network card for every PC; we have no more standalone machines," he said. "A PC with an interface means we don't have to open it, install a card and worry about software switch settings and conflicts with hardware."

Queen said he is a bit frustrated because most bundled network connections are limited to 10Base-T connections, and he runs a large Token Ring shop.

Zenith Data is focused on Ethernet today because "our studies indicate that about 80% of companies use some form of Ethernet, and it is a simpler chip set to install," a company spokesman said. However, Bruce Fryer, a product strategy manager at the firm, said, "We're very aware of the Token Ring market and are watching it closely."

Dan Snyder, vice president of information systems at Tyson Foods, Inc. in Springdale, Ark., has not been evaluating network-ready PCs because he said he perceives a limited availability of products. "We wouldn't be willing to pay much of a premium for the connection because only about 30% of our PCs are networked," he added.

"Under $50" was the price point where Snyder said he would become interested.

Analysts have long anticipated the migration of network connections off modular adapter cards onto chips to provide negligible PC premiums. Yet PC vendors shipping integrated network connections are scarce, in part because users are not sure to what network type they want to be connected, one analyst said.

"It is doubtful in the 1990s whether there will be a [network] period of stability long enough to get these products launched. There is always the next network hanging tantalizingly over the horizon," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consulting firm.

Bill Sheehan, a project leader at Stone & Webster Engineering Corp. in Boston, agreed. "With an adapter, if I'm running a 4M bit/sec. Token Ring and upgrade to 16M bit/sec., I toss out the card. I'd hate to toss out the whole motherboard," he said.

Sheehan evaluated Ethernet-ready Zenith Data laptops last month and found they constrained his ability to manage memory within the PC. "With cards, you can move memory and put it where it's convenient. Where Zenith has blocked out ROM is in high memory, and you can't move it," he said.

IN BRIEF

Tricord beefs up server line

■ **Tricord Systems, Inc.** bumped up its PowerFrame superserver line, releasing four new models built around Intel Corp.'s 33/66-MHz I486DX2 processor. The PowerFrame Models 30/66CB and 40/66CB for the Banyan Systems, Inc. Vines market cost $26,490 and $32,490, respectively. Models 30/66C and 40/66C for Novell, Inc.'s NetWare, IBM's OS/2 and Microsoft Corp.'s LAN Manager cost $26,990 and $32,990.

■ **QMS, Inc.** began shipping its fastest PostScript printer yet. Dubbed the QMS-PS 3200 and based on LSI Logic Corp.'s RPM3310 processor, it will print 32 page/min. in a networked environment. QMS has added 11- by 17-in. output and duplexing to its features. It has 16M bytes of random-access memory, and a 40M- or 120M-byte internal hard disk can be added. It will also support up to six external Small Computer Systems Interface disks. The base price is $19,995.

■ It will be a marriage made in storage heaven, or so hopes **Exabyte Corp.**, which is bidding to acquire **R-Byte, Inc.** for $12 million. Exabyte, a Boulder, Colo.-based maker of backup tapes, wants to leverage San Jose, Calif.-based R-Byte's expertise in 4mm digital audio tape storage.

■ **GigaTrend, Inc.** in Carlsbad, Calif., is now shipping the company's MasterSafe tape backup software. MasterSafe backs up and restores multiple local- and wide-area networks using communications technology that complies with Novell's Storage Management Service. It backs up data over several topologies. MasterSafe's network backups or restores are performed at a tape station on the network rather than on the file server or workstation. MasterSafe is priced at $2,995.

Task force agrees on PC management plan

Proposed Desktop Management Interface takes aim at controlling hardware and software on PCs

BY MICHELE DOSTERT
CW STAFF

Members of the Desktop Management Task Force (DMTF) have announced convergence on an application programming interface (API) architecture for desktop management.

Although standards consortia — and the standards they promote — often fade into the sunset, analysts said they think the DMTF has enough critical mass to endure and that the standards it is promoting are desperately needed.

Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based market research and consulting firm, said, "As things stand today, you can manage LANs, mainframes, minis and workstations, but managing PCs is almost impossible. This proposal gets us closer to being able to manage the hardware, the software and the whole shebang on the PC. I think we'll see applications developed to use this standard very soon."

The DMTF comprises Digital Equipment Corp., Hewlett-Packard Co., IBM, Intel Corp., Microsoft Corp., Novell, Inc., SunConnect (a Sun Microsystems, Inc. business) and Synoptics Communications, Inc. The group is focused on providing a common set of APIs and component interfaces to simplify the management of desktop computers.

> "AS THINGS STAND today, you can manage LANs, mainframes, minis and workstations, but managing PCs is almost impossible."
>
> MICHAEL HOWARD
> INFONETICS RESEARCH

The new API architecture, called the Desktop Management Interface (DMI), has two parts: a common Management Interface for network management applications and a Component Interface for component management.

The Management Interface provides a common access method for management applications, regardless of protocol, to process management requests and commands. The Component Interface is a simple method that hardware and software vendors can use to enable management of their products.

The DMTF will create test implementations at the Management Interface level for Simple Network Management Protocol (SNMP) and Common Management Over LLC standards; other standards will be supported as they gain industry acceptance.

The test implementation for the Component Interface will consist of managed objects, including hardware, software, operating systems and add-in components. DMTF members are considering using the Internet Engineering Task Force's Host Resources Management Information Base draft and other standards as the basis for their Component Interface object definitions.

The SNMP test implementation will be demonstrated in October at Interop '92 Fall in San Francisco. After validating the test implementations, the DMTF will publish a reference document, including Management Interface and Component Interface specifications, sample DMI code and an application for DMI validation. This document will be available free of charge from DMTF members by the end of 1992.

NEW PRODUCTS

Unix

Cyber Software International, Inc. has announced Btrv-Unix, Btrieve functions for the Unix environment.

Btrv-Unix features include compatibility with Novell, Inc.'s return code, auto error log tracking and the capability for an existing Btrieve/DOS application to run in the Unix environment without altering the Btrieve calls. The product also accommodates an unlimited amount of alternate indices and is Btrieve-compatible for error return codes.

The license fee for Btrv-Unix costs $399.

Cyber Software International
1593 Locust Ave.
Bohemia, N.Y. 11716
(516) 563-1336

LAN hardware

Cabletron Systems, Inc. has introduced the F6069 Desktop Network Interface (DNI) card.

The product is a Fiber Distributed Data Interface (FDDI) adapter for Apple Computer, Inc.'s Macintosh II and Quadra (Nubus) computers. According to the company, the F6069 enhances the Macintosh's performance on applications requiring high bandwidth, such as computer-aided design and manufacturing, digital video and multimedia platforms.

Support for FDDI Station Management Version 6.2 is included, offering compatibility with other FDDI products.

The F6069 DNI card costs $2,995.

Cabletron Systems
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400

Workgroup software applications

Aion Corp. has introduced the Aion Logic Management System (LMS).

The product is an end-user application tool that permits users to modify business process rules within Aion knowledge-based applications. The graphical user interface programming facility and the complete object-oriented programming system are implementation facilities that are maintained by Aion LMS.

Users can customize application logic and control, and changes are incorporated into the production application, according to the company.

Prices range between $2,000 and $5,000.

Aion
101 University Ave.
Palo Alto, Calif. 94301
(415) 328-9595

Unix

SCH, Inc. has announced Release 3.1 of Qbatch, a Unix job scheduling utility.

Qbatch can use the company's SCH:SAM (Systems Administration Manager) interface. It features additional flexibility to queue management and a sophisticated set of pre- and postjob scheduling variables, the company reported. Users submit jobs by entering the command name and job title via a Quick Entry feature.

Release 3.1 can be accessed directly from SCH:SAM's main menu and operates in character and X Window System modes.

Prices range from $395 to $8,500.

SCH
3 Centennial Plaza
895 Central Ave.
Cincinnati, Ohio 45202
(513) 579-0455

Micro-to-micro

Moses Computers, Inc. has started shipping MosesAll, a peer-to-peer network kit designed for entry-level users who want to build a computer network one personal computer at a time.

MosesAll consists of a network card with a data transmission rate of 1.79M bit/sec., a copy of MosesNOS 3.0 network operating software and standard telephone wire.

All modes of Microsoft Corp.'s Windows can be supported, including the 386 enhanced mode, the company reported.

MosesAll is priced at $99 per computer.

Moses Computers
Suite 201
15466 Los Gatos Blvd.
Los Gatos, Calif. 95032
(408) 358-1550

Workstations

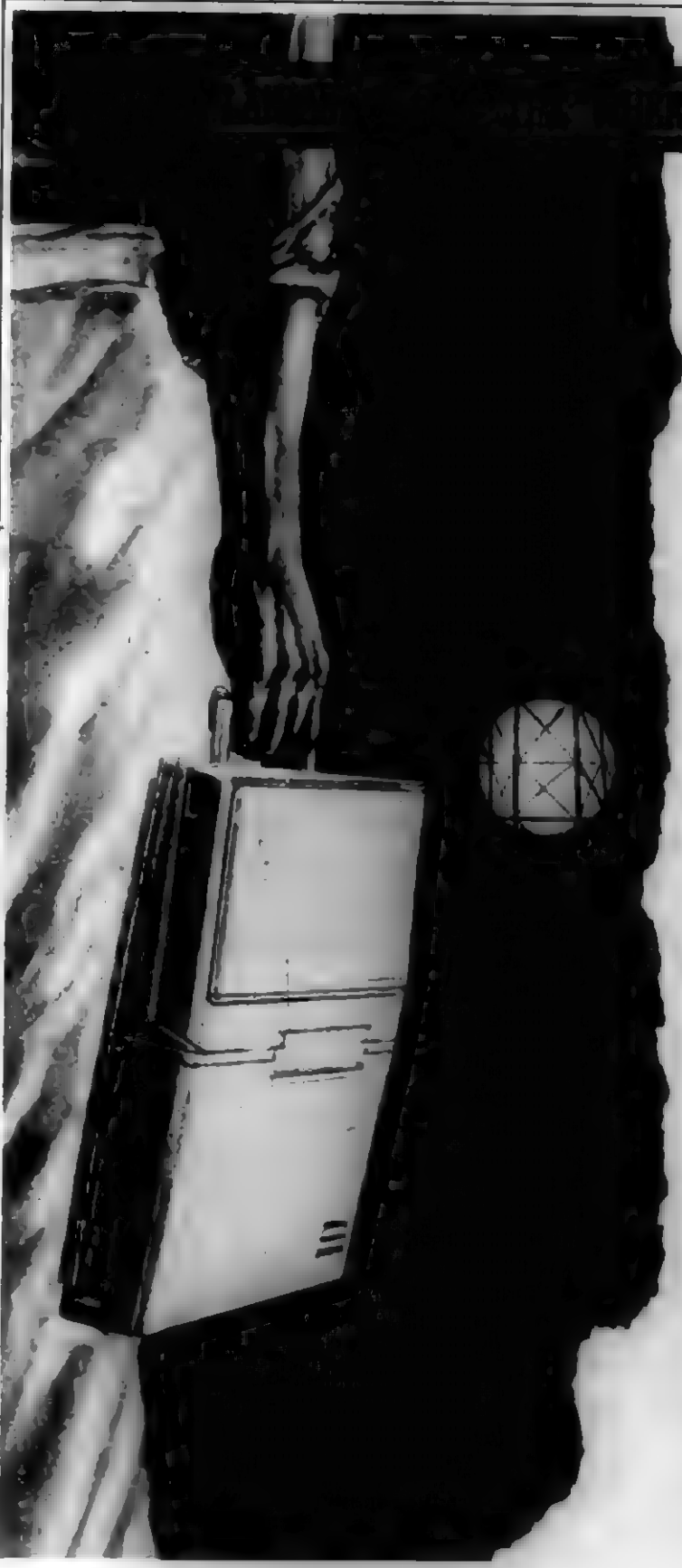
The Network Connection, Inc. has introduced the Triumph Local Bus 486/50-MHz workstation. The system features local bus operation and was designed as a Microsoft Corp. Windows or computer-aided design workstation.

An I/O data transfer rate of 50M byte/sec. can be achieved, according to the company, and the product includes 64M bytes of system memory.

The Triumph Local Bus workstation has a 256/512K direct mapped cache with posted write and 486 burst-mode support. It includes three local bus slots and five XT/AT bus slots.

The Triumph Local Bus 486/50-MHz workstation costs $3,493.

The Network Connection
1324 Union Hill Road
Alpharetta, Ga. 30201
(404) 751-0889



"NETWORK"

3:15 P.M. in Bahrain. We need an updated bid, and Arthur's 9000 miles from the resources he needs to revise our quotation. Fortunately, he has access to the home office LAN, where there's a UDS LanFast™ network modem in residence. As soon as he can get to a phone, Arthur will use his regular modem to dial into the LanFast. The Novell LAN will see Arthur as just another node, with access to files, applications, peripherals—every LAN resource he needs.

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LanFast is shipped with all necessary hardware and software. It supports standard modems at speeds to 57.6 kbps and popular communications programs such as Procomm Plus Network and Crosstalk Mk. IV.

Take care of your LAN "orphans" by adding LanFast to your network now. For full details, contact UDS at:

800/451-2369

UDS

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Client/server computing is a good example. It's often billed as the mainframe's replacement, but

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power, new speed, new purpose.

think about that. Client/server systems invite expansion, and as they expand so does the need to manage them.

With thousands of users, in hundreds of locations, on platforms from dozens of vendors, it *takes* a big system to keep it all going, and systems management is what mainframes do better than anything.

Also, with so many people digging through so much information, it's usually smarter to store it in fewer places than to scatter it all over, and large-scale storage is another mainframe forte. So is mission-critical, 24-hour systems availability.

So instead of replacing mainframes, big client/server systems will demand more of them, which is why IBM Systems/390™ architecture was invented: for openness, connectivity, management, cooperation.

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Enthusiasm high over NMS

Users attending tutorial like what they see but voice storage concerns

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Users who congregated here earlier this month to learn the ins and outs of Novell, Inc.'s fledgling NetWare Management System (NMS) were enthusiastic about the price, scope and architecture of the product, although several voiced concerns that it might max out their NetWare servers.

Many of the approximately 60 users attending an NMS tutorial at Novell dealership NetLAN, Inc. said they were embarking on searches for a product that will let them centrally manage scattered, mixed-vendor local-area networks.

That quest is fueling their interest in DOS Windows-based NMS, a Novell-created software platform that accepts third-party "plug-in" applications to allow users to piece together a customized, umbrella management product. NMS reportedly runs at all five levels of the "full" network management system specified by the Internet Engineering Task Force: network fault, performance, configuration, security and accounting management.

The NMS platform

The 'software bus' concept of Novell's management system appeals to users

Source: Novell, Inc. CW Chart: Stephanie Faucher

"Most of us are running a large variety of LANs, and finding a standard management platform at a reasonable cost is paramount in our minds," said attendee John Posephney, vice president of systems integration at Lockheed Information Management Systems in Tarrytown, N.Y.

Posephney said his attraction to the product is NMS' $4,995 price tag and its "open" software platform, which will accommodate applications written by Novell for NetWare environments and by third parties for managing non-NetWare equipment.

Novell likened NMS to Sun Microsystems, Inc.'s SunNet Manager platform for the Unix world, which Posephney tagged at three to four times the price.

Posephney's experience with the server performance impact of other monitoring tools, however, makes him cautious about how the 600K bytes of random-access memory required for monitoring NetWare servers every seven seconds — which Novell said causes server utilization to spike to 40% — will affect the performance of his mission-critical Oracle Corp. NetWare Loadable Module (NLM).

"I suspect I'm going to have a problem," he said.

Ed McVeigh, a Novell management products division sales manager who led the conference, recommended that users add a megabyte of RAM to accommodate the NLMs. He also explained that users can assign NLMs priority so business-critical applications can be handled ahead of NMS.

However, Alan Novick, an investment banking associate at UBS Securities, Inc. in New York, said he wanted to know that if he were to give other ap-

Continued on page 73

Core upgrade

Novell is enhancing its core management platform, although users still await applications from other vendors. Next month's planned NMS 1.1 arrival is expected to do the following:

- Add management of IP devices to Novell's IPX.
- Give users more choices of ways to display networks.
- Plot real-time server CPU usage in graphical form.

Getting the most out of distributed systems

BY ELLIS BOOKER
CW STAFF

After decades of experience with hosts and terminals, users have become comfortable with how that architecture should work.

Unfortunately, not much of that experience applies to distributed computing environments. Even worse, software-based automated modeling tools for this kind of computing are still in their infancy.

As a result, the job of implementing distributed systems today is still largely a seat-of-the-pants affair.

"With distributed computing, there are intrinsically an infinite number of distribution options. At the same time, there are an infinite number of information processing locations," said Tom Nolle, president of CIMI Corp., a networking consultancy that is based in Voorhees, N.J.

Figuring out how to optimize a distributed system — taking into account how an application and its data are spread across one or more networks and processors — "might involve 10,000 options," Nolle added. Most network simulation tools don't fit the bill, analysts said.

Hewlett-Packard Co.'s Software Technology Division in Roseville, Calif., hopes to address the need for distributed computing simulation with PerfView, a management tool for multivendor, client/server Unix networks that includes real-time monitoring. PerfView, which was expected this summer, is now scheduled for commercial release in early October, an HP official said. PerfView's second release will add a capacity planning feature.

Rather than being paralyzed by all these choices, many users are forging ahead, building systems and "waiting to see what happens," according to an analyst. But extrapolating from even a successful distributed pilot to a full-blown, enterprisewide system with hundreds of users is risky.

"I tell customers who want to do this kind of thing to prototype, prototype and prototype," said Tom Bell, president of Rivendel Consultants, Inc., a capacity planning consultancy in Palos Verdes Estates, Calif. But in the next breath Bell warned, "You just can't assume you can scale your prototype."

But Kerry Stover, executive director of product management for Andersen Consulting's Foundation computer-aided software engineering (CASE) product, argued that at least some concepts from the mainframe world are applicable to distributed systems.

In June, Andersen announced an updated version of its 9-year-old Method/1 application development methodology that provides both an analysis framework for systems developers working on distributed environments and a project management tool. A part of Andersen's client/server CASE product, Foundation for Cooperative Processing, Method/1 Version 9.0, can also be used with other CASE tools.

According to Stover, one of the most important planning concepts for distributed systems is the so-called queuing theory.

The queuing theory takes into account the response time and throughput of the processors and I/O devices, as well as the number of jobs that are expected to arrive at these potential bottlenecks. The more distributed the application, the more complex the model.

Right now, there are more performance monitors and systems managers than performance simulators on the market.

"Customers are simply having enough problems bringing servers and users on-line on these systems," explained Frank Moss, president of Tivoli Systems, Inc. in Austin, Texas.

Tivoli is supplying its Wisdom Environment, an object-oriented, distributed systems management product, as the systems manager component in the Open Software Foundation's Distributed Management Environment (DME).

The Tivoli tool will manage items such as network-resident services, peripherals and user-access tables in the DME. The first full release of the DME is due in the second half of 1993.

Bell said the proportionally greater emphasis on performance monitors and systems managers may reflect the fact that vendors and users are still busy gathering data on the distinctive requirements and characteristics of distributed computing applications.

A sampling

Vendors with distributed computing modeling products

Internetix, Inc., Upper Marlboro, Md.
Product: Lanalm

Network Design & Analysis Corp., Markham, Ontario
Product: Autonet/Designer

Comdisco, Inc., Foster City, Calif.
Product: Bones PlanNet

Caci Products Co., La Jolla, Calif.
Product: Comnet II.5, Lannet II.5 and Network II.5

CW Chart: Janell Genovese

Modeling complexity

All planning tools, whether for mainframes or distributed, open systems, were designed to predict performance based on changes in work load, hardware, communications infrastructure and the number of users on the system.

Distributed computing is more complex to model than host-to-terminal environments because processing takes place in many locations, with transactions typically traversing local-area networks that have performance characteristics of their own.

Analysts said companies that have traditionally provided modeling tools for mainframes — firms such as Systems Center, Inc. in Reston, Va., and Candle Corp. in Los Angeles — are destined to enter this key market.

For instance, in a few weeks, another mainframe player, BGS Systems, Inc. in Waltham, Mass., is scheduled to release Best/1-AIX, its initial performance-modeling product for Unix. BGS' 17-year history has up until now been in modeling and capacity planning for a variety of proprietary environments, including MVS, Systems Network Architecture, VM and VAX.

NetLabs unveils applications set for nontechies

BY ELISABETH HORWITT
CW STAFF

LOS ALTOS, Calif. — NetLabs, Inc. has introduced a set of applications that are said to make its sophisticated network management system more accessible to nontechnical users.

The company's original NetLabs/Manager, sold primarily to vendors and huge, technically savvy corporations, was "very high on the functional side but low on usability," company spokeswoman Roselie Buonauro said.

The product was designed to manage a variety of networks via either the Open Systems Interconnect Common Management Information Protocol or the Simple Network Management Protocol (SNMP), using a graphical user interface.

"Users had to put in quite a bit of work to make it productive in their environment," Buonauro said. In contrast, NetLabs' new NetLabs/Assist applications let users get the system up and running in a week, she added.

> THE PAGE DIVISION chose the product about two years ago because it was the best SNMP system available at the time that ran on an IBM RISC System/6000.

The applications consist of the following:

- **MetaView** — generates reports and graphs of network data.
- **Action Router** — automatically sends notification of a problem to a designated user or to a printer.
- **Alarm Starter Kit** — provides predeveloped software for setting thresholds and managing problems on several popular local-area network devices. These include hubs from Synoptics Communications, Inc., Chipcom Corp. and Cabletron Systems, Inc., and Novell, Inc.'s Lantern, a LAN monitoring device.

The easier the better

In addition, NetLabs enhanced the discovery utility, which automatically finds all network nodes and represents them on a topological map. The enhancement puts in the connections between the nodes automatically, Buonauro said.

NetLabs also put together software that automatically brings the basic NetLabs/Manager system up and guides the user through configuring the system by asking questions such as "What do you have on your network?" and "What type of system is it on?" Buonauro said.

Martin Marietta's Programmable Aerospace Ground Equipment (PAGE) Division has been using the original NetLabs/Manager for about two years to manage the links that support Titan missile launching systems, according to John Zwiebel, a PAGE network manager.

PAGE uses NetLabs/Manager to "look at communications resources managed by SNMP, like Fiber Distributed Data Interface, and whether the host is up and communicating or not and traffic levels to and from the host," Zwiebel said.

PAGE chose the product about two years ago because it was the best SNMP system available at the time that ran on an IBM RISC System/6000, he added.

However, Zwiebel agreed that "someone who doesn't know much about SNMP can certainly use [NetLabs/] Manager, but someone who understands SNMP can really take a lot of advantage of it."

Available now, NetLabs/Assist is priced at $4,000. NetLabs/ Manager is priced at $12,500. The discovery utility is priced at $3,000, according to the company.

Product finds bottlenecks in connections

BY ELISABETH HORWITT
CW STAFF

AGOURA HILLS, Calif. — A product just introduced by Network Telesis, Inc. is said to let users pinpoint bottlenecks in hundreds or even thousands of local-area network-based personal computer-to-mainframe and PC-to-server connections.

While tools for measuring response time across IBM mainframe networks abound, Net-F/X(A-LAN) is the first product that measures response time across networks that include hosts, servers and PC LANs, according to Roger Mahnke, Network Telesis spokesman.

The initial version of Net-F/X was designed to measure response time for PC-to-server and PC-to-host connections that involve OS/2-based PCs. DOS and Microsoft Corp. Windows versions of the product are due out by year's end, Mahnke said.

Network General Corp.'s Sniffer is said to pinpoint response-time problems across LAN-to-host as well as LAN-to-server connections by generating traffic across such links and analyzing the packets.

However, Net-F/X(A-LAN) may be the first tool of its kind to measure response time by causing traffic to be generated from both the host and PC end.

The product can be used to establish baselines for typical response time on a given configuration and then measure how response times change when the configuration changes, as when a new server or group of PCs is added to a LAN, Mahnke said. The product consists of IBM mainframe VTAM host software that coordinates the tests on remote LAN nodes and software that sits on each PC on the LANs, Mahnke said.

The VTAM host component provides the power to coordinate response-time testing across multiple PC-to-server and PC-to-host connections concurrently, he added. This means it can be used to collect baseline response-time information across a network of hundreds or thousands of nodes overnight, Mahnke said.

The initial version of the product, due in September, is priced at $15,000 for the host/VTAM application and master console and $1,250 for each LAN workstation. Volume discounts are available.

In theory, it's possible. But in practice, both propositions are a little scary. At ABT, we are project managers. So we've had the same deadlines that you have. We've responded to the same last minute changes. We've had to deal with the same constraints. And when you have a realistic view of the problems, it's a lot easier to design realistic solutions.

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[redacted]

APPLIED BUSINESS TECHNOLOGY

Project Bridge
Project Workbench
Project Graphics

Enthusiasm over NMS

CONTINUED FROM PAGE 71

plications priority, "would I ever be monitoring my servers?"

Novick was intrigued by the "software bus" concept of NMS, which Novell described as analogous to the computer bus in the hardware world, where users plug bus-compliant modems and network interface cards into the bus.

Novick said that his interest in NMS is to "not be confined" to the wiring hub strategy of UBS' central IS department.

Yousuf Nasir, network administrator at Cuisenaire Company of America, Inc., a New York maker of educational products for children, was heartened by the fact that "NMS allows you to manage down to the adapter card level." This appeals to him, he explained, for determining which of his myriad networked workstations are sending bad packets to the file server.

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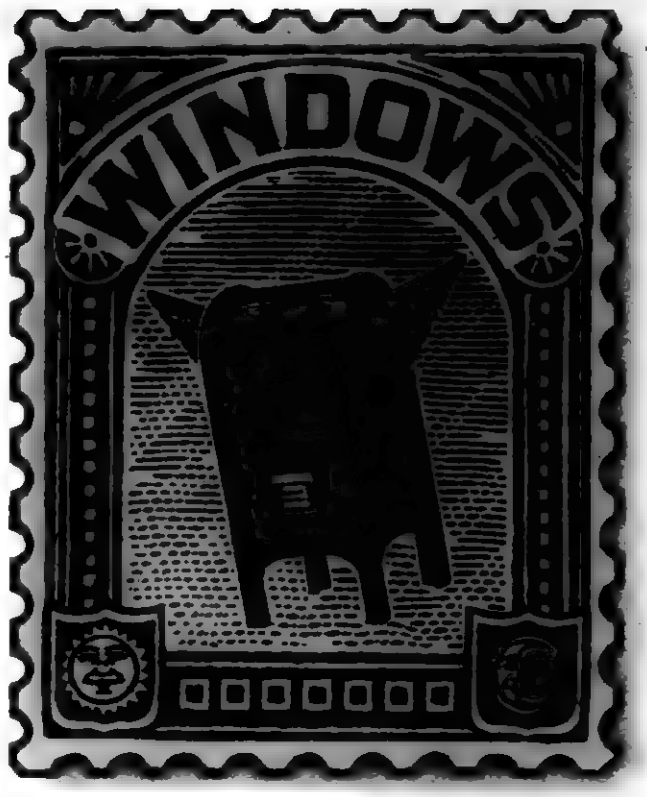

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LAN TIMES READERS CHOICE 1992

cc:Mail offers an impressive set of administration tools. Such as Automatic Directory Exchange, a product which automatically collects any changes made to the directory and updates the entire network. It's also the

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NEW PRODUCTS

Gateways, bridges, routers

Madge Networks, Inc. has introduced Smart Ringbridge, a stand-alone, IBM-compatible, local Token Ring bridge.

The Smart Ringbridge allows users to forward network traffic at up to 12,500 frame/sec. and transfer data at 16M bit/sec. between two Token Rings. Support for Novell, Inc. NetWare environments is provided, which allows users to forward nonsource router NetWare IPX traffic using standard IPX routing protocols.

Network management software gives users the ability to manage bridges remotely from a personal computer connected to the Token Ring network.

Smart Ringbridge costs $6,995.

Madge Networks
42 Airport Pkwy.
San Jose, Calif. 95110
(408) 441-1300

Dayna Communications, Inc. has introduced PathFinder, a hardware router designed for Apple Computer, Inc.'s AppleTalk.

The product is a single-protocol, LocalTalk-to-Ethernet router that offers three modes of operation. When PathFinder is the only router being used, the Run Mode provides a plug-and-play solution for connecting a LocalTalk network to an Ethernet network. An Automatic Mode devises a single logical zone of the Ethernet and LocalTalk segments, and a Configuration Mode configures PathFinder as a seed router on an existing internet.

PathFinder features auto-sensing technology and is compatible with 10Base-T, thick, thin and fiber-optic Ethernet wiring schemes.

The product costs $899.

Dayna Communications
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

Microcom, Inc. has introduced Microcom Bridge/Router (MBR) Release 6.0.

Two versions of the MBR 6.0 are offered: The MBR/6000 and the MBR 6500. According to the company, the MBR/6000 interconnects Token Ring or Ethernet local-area networks to leased-line wide-area networks at speeds of up to 2M bit/sec. The product also supports V.25 bis remote dialing. The MBR/6500 has four ports and can support up to 15 virtual circuits. Under maximum configuration, 60 virtual connections to X.25 networks and frame relay can be supported.

Prices range from $3,999 to $6,499, depending on configuration.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

Luxcom, Inc. has announced the Series 500 LAN Hub, a local-area network-based connectivity solution designed for IBM environments.

According to the company, the Series 500 connects up to 128 Token Ring or 96 Ethernet stations per hub. Distances of up to 100 meters can be supported on unshielded twisted-pair wiring. The Series 500 LAN can be configured for three different applications: as a LAN-based backbone, a stand-alone concentrator and a satellite hub.

Prices for the Series 500 LAN Hub systems range from $3,000 to $16,950 or $132 per port for a 128-port Token Ring configuration.

Luxcom
3249 Laurelview Court
Fremont, Calif. 94538
(510) 770-3300

Systems Network Architecture

Brixton Systems, Inc. has introduced the BrxLU6.2 Application Programmatic Interface.

The product was designed to allow IBM Systems Network Architecture users to communicate with IBM mainframe applications. Control of conversation-level data transfers is provided via the product's flexible interface. The BrxLU6.2 operates in local- and wide-area networks through Synchronous Data Link Control, Token Ring, X.25 or dial-up lines.

The BrxLU6.2 costs $3,950.

Brixton
185 Alewife Brook Pkwy.
Cambridge, Mass. 02138
(617) 661-6262

Network management

Intel Corp. has enhanced its version of LANProtect software with additional features and safeguards to protect Novell, Inc. NetWare networks against computer viruses.

LANProtect 1.5 software has improved capabilities for updating virus pattern libraries, technological enhancements for detecting stealth and polymorphic viruses and virus removal functionality for servers and workstations, the company reported. This version offers an optional terminate-and-stay-resident program that provides continuous scanning of DOS and Microsoft Corp. Windows-based workstations that are connected to the network.

The LANProtect 1.5 software costs $995.

Intel
3065 Bowers Ave.
Santa Clara, Calif. 95052
(408) 765-8080

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Then there's the ability to print in sizes up to 11" by 17". Which can really make your day if it's filled with everything ranging from envelopes to double-page layouts to CAD plots to spreadsheets.

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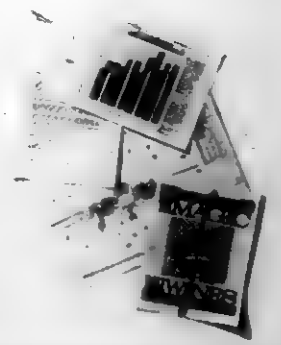
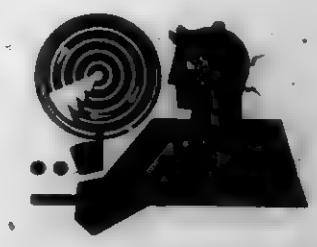
For more on COMPAQ PAGEMARQ printers, just turn to the next page.



They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple Twin-Trays hold up to 1,500 sheets. Impressed?



Our Intelligent Emulation Sensing feature continually monitors, then automatically adjusts to either PostScript Level 2 or PCL 5 depending upon which language you're using. You needn't lift a finger.

COMPAQ

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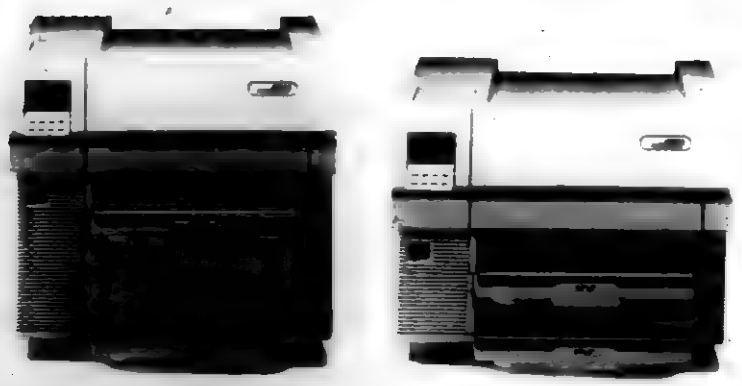

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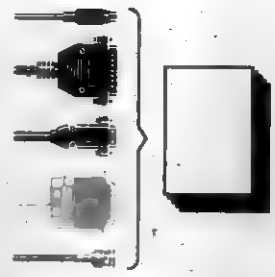

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Performance tools learning new tricks — applications

BY JOHANNA AMBROSIO
CW STAFF

You tune your car for performance, so why not tune your mainframe applications?

Increasingly, users are doing just that. Performance tuning has been around for some time, but the concept is now moving beyond systems software and into applications.

Mellon Bank Corp. in Pittsburgh has had a four-person performance unit for several years and recently began focusing more on applications. All told, Mellon saves "a couple of hundred thousand dollars" each year with its tuning efforts, said Donald Greb, technical support division manager at Mellon.

Performance tuning is the process of looking at a piece of software — like a transaction processing monitor or database management system — and figuring out how efficiently the code is running and where the bottlenecks are. Sometimes these performance issues are hardware-related, like storage or memory, and sometimes the code has to be rewritten or tweaked (see story below).

Traditionally, performance tuning has been applied to the area of systems software by a specialized unit within the information systems department.

New uses for old tools

Performance monitors have long been available from mainframe software vendors including Candle Corp., Legent Corp., Boole & Babbage, Inc. and Landmark Systems Corp.

But there have been few tools to fine-tune an application's performance. Although a couple of packages have been available for some time — including those from Programart Corp. in Cambridge, Mass., and WindTunnel Software, Inc. in Chicago — they have only recently started to be used by more than a handful of forward-thinking IS shops.

"As applications software becomes a larger monetary portion of the IS budget, people will begin to think to make sure it utilizes resources effectively," said Stephen Hendrick, an analyst at International Data Corp. in Framingham, Mass.

Programart's mainframe-based tuning package, called Strobe, runs on IBM mainframes and is used by more than 750 customers.

WindTunnel's Performance Architek line also runs on mainframes and is geared to tuning applications while they are being developed instead of after the applications are already in production.

Programart is getting ready to announce a package next month for this emerging market. Called APMpower, the OS/2-based package is geared to help applications developers build in peak performance as the application is being written.

This more holistic approach to performance is being touted by Programart as "applications performance management" and by WindTunnel as "proactive performance engineering." In any case, both companies pitch it as a way to improve software quality.

Tony DelDuca, senior director of mainframe development at Automatic Data Processing, Inc. (ADP) in Roseland, N.J., agreed. ADP is building a new payroll system, due to be finished next year, that will run in all 40 of its data processing centers.

The company is using Programart's Strobe "to show the incremental performance increase or decrease every step along the way," DelDuca said.

Most importantly, he said, "some of the results have caused us to change things in the system — internal vs. external sort, some Cobol II verbs. We don't want to wait until production to find out what's wrong."

Loosening the ties

As more tools are becoming available to help make applications hum, the roadblock within the IS organization itself is also starting to be, well, tuned.

"Applications programmers are more willing to include tuning items in the project," Greb said. Tuning "can help reduce the cost of the product" by making it run more efficiently.

"When I first came here, I was looked at as the spy from the CIA," said John Fair, technical specialist at US Air in Winston-Salem, N.C. "But one of the things we're getting good at is letting the applications people know we're here to help."

Still, performance-prediction tools are no panacea. "When you're in test, some things don't show up until you have the full load," Greb said.

For example, Fair said, DB2 may not choose the same path to data with the test database as with the production database. "It's really hard to rely totally on diagnostic tolls. A lot of it is gut."

Eye for detail

Applications tuning packages essentially analyze how much of a computer's horsepower a particular applications module uses. For example, Programart's Strobe generates reports that show how applications are running. Strobe takes snapshots of resource utilization at defined intervals while the application is running.

The following is some of what applications tuning packages look for:

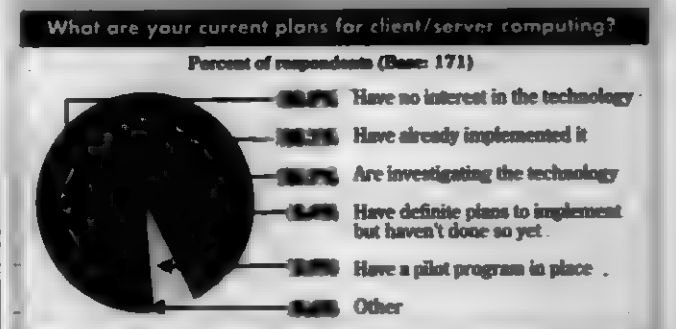
- How much CPU horsepower is consumed by specific SQL statements or series of statements.
- Direct-access storage device requirements for the data that the application requires and how quickly that data is accessed.
- How much code is needed to perform a specific function or series of functions.
- The number of I/Os needed by the application.

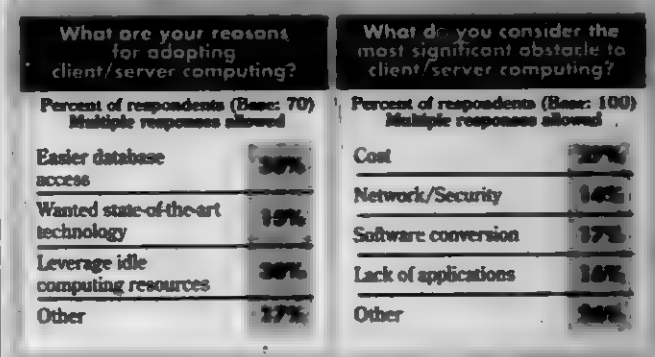
JOHANNA AMBROSIO

Survey: Client/server computing

Early stages

Less than one-third of respondents have already implemented client/server projects, but most are interested





Source: CW Database Division

CW Chart: Stephanie Faucher

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DEC's Ingres unbundling draws yawns

MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp.'s decision to discontinue its bundling of the Ingres relational database management system with its Ultrix operating system will have little impact on the majority of Ultrix users. Many users did not take advantage of the runtime RDBMS license anyway.

For instance, out of 32 Ultrix users questioned last week, only one had attempted to use Ultrix SQL. Many said they needed a development version of the Ingres RDBMS or else the product was of little use to them.

Ingres Products Division, a division of The Ask Cos., will offer a migration kit to move the Ultrix SQL user base — estimated by industry sources at nearly 10,000 out of 75,000 Ultrix licensees — to the development version of the RDBMS, Version 6.4. DEC officials refused to confirm that installed base figure, saying they had no way of knowing how many Ultrix SQL users exist.

DEC is required by law to inform users about the termination of the licensing program, and it is sending out a mailing to all customers who have valid Ultrix service contracts to let them know, officials said.

Oracle Corp. and Informix Corp. are also offering a migration program for Ultrix SQL users that will enable them to move their data and applications across to the Oracle and Informix RDBMSs.

Other options

DEC will explore a variety of alternatives for DEC products, such as DECmcc Director, that work in conjunction with Ultrix SQL, sources said.

Meanwhile, users interviewed last week said they had found little opportunity to use the runtime license.

"It's one of those things that was kind of neat, but we were busy with other things and never got around to using it," said Bill Brown, a systems manager at Occidental Fire & Casualty, an insurance company based in Scottsdale, Ariz.

The termination of the agreement with Ingres leaves DEC without an RDBMS of its own for the Unix market until it ships Rdb for OSF/1 sometime next year, according to DEC officials.

Industry analysts said this strategy underscores DEC's commitment to both Rdb and OSF/1 on its upcoming Alpha platforms. In a comparable move, DEC recently unbundled runtime Rdb from Open VMS.

Users plan for life after Wang bankruptcy

KIM S. NASH
and THOMAS HOFFMAN
CW STAFF

LOWELL, Mass. — Just hours after filing for bankruptcy protection, Wang Laboratories, Inc. was ejected from Standard & Poor's Corp.'s 500 index of public companies and replaced by Unix systems maker Sun Microsystems, Inc. This change is a microcosm of a larger shift in the industry from proprietary systems to open systems with better price/performance ratios.

And Wang users know it.

Wang's new status as the biggest computer maker ever to file Chapter 11 scared some on-the-edge users into making plans to vacate the VS minicomputer.

For others, the handwriting on the wall was bold enough to spur managers to draw up and execute contingency plans months or even years ago.

A recent survey of 256 Wang users by the CW Database Division confirmed this discomfort. Thirty-eight percent of VS shops surveyed said they would stick with existing hardware for the short term and another 43% said they are looking for another hardware vendor.

Migrations can be made wholesale or piecemeal, gradually or immediately. Changeovers can be guided by in-house information systems expertise or that of third-party firms that specialize in VS conversions, such as Financial Technologies, Inc. in Cedarhurst, N.Y., or Magna Computer Corp. in Salem, N.H. Competing vendors such as Digital Equipment Corp., Data General Corp. and IBM also tout strategies to lure VS users.

The following is a sampling of typical VS migration plans and their projected benefits:

Company:
American Express Co.

Wang setup:
Two VS minicomputers

Replacement:
Mix of Unix workstations and PC LANs

Status:
Will be done end of 1992

Benefits:
Projected savings of two-thirds the cost of annual VS maintenance; more functionality

American Express' corporate headquarters in New York has not bought a new VS in four years. In fact, the company will replace its Model 7310 and Model 300 by December.

The Wang minicomputers currently handle office applications and a 17,000-name electronic-mail system that links American Express with related companies Shearson Lehman Brothers, Inc. and the American Express Bank. But not for long.

Unix workstations from Hewlett-Packard Co. are already in place in some departments, along with an ever-growing local-area network of IBM-compatible personal computers linked to each other, IBM mainframes and outside news wire services.

Better features

The new system provides more processing power and cheaper memory compared to Wang machines, according to Joseph Caruso, director of corporate systems and technology.

In-house programmers are doing required software rewriting. In many cases, however, American Express is buying PC packages to replace former VS tasks such as word processing and financial reporting software.

Economics and enhanced functionality drove American Express to make the change, but so did the relative ease of backup of the desktop boxes, Caruso said. Although he acknowledged that the VS models failed "infrequently," when they did, hundreds of users were affected.

"But now processing doesn't have to stop because it's distributed over a large number of workstations," Caruso explained.

Company:
Hurt, Richardson, Garner, Todd and Cadenhead

Wang setup:
One high-end VS

Replacement:
Possibly PC LANs

Status:
Planning for new hardware, maintenance provider

Benefits:
Projected annual savings of $50,000 on VS maintenance

A Wang user for nearly 10 years, Atlanta-based Hurt, Richardson is now studying alternatives to a 3-year-old VS 10000, which is the hub of the law firm's $750,000 Wang installation.

The high-end VS processor controls billing and legal document processing systems and could be replaced with PC-based networks, according to Chris Drumm, MIS director.

"We already have more than 40 desktops linked, so that seems to be a good direction for us," Drumm said.

In the meantime, the law firm is looking closely at shifting its $100,000 VS maintenance contracts from Wang to third-party players, such as ICA, Inc. in Atlanta or Intelogic Trace, Inc. in San Antonio.

Drumm said he worries that Wang's impending 5,000-employee layoff will affect service. "Where are those [laid-off] people coming from? Maintenance is our biggest concern," he said.

Going to an independent service provider will reassure company management as well as save money.

For example, ICA has offered a 50% discount on fees currently charged by Wang. Wang is willing to match some aspects, but "won't budge on systems software prices," Drumm said.

He said he will make a final decision after LawNet, Inc.'s annual conference, scheduled for early September. LawNet, which was formerly a VS-only user group, recently changed its charter to include legal firms running equipment from vendors other than Wang.

Company:
YMS Management Associates, Inc.

Wang setup:
One VS minicomputer

Replacement:
IBM Application System/400

Status:
Done

Benefits:
Similar look and feel to applications

YMS, a financial management company based in New York, contracted with nearby Financial Technologies to migrate more than 1,000 VS-based programs to an IBM Application System/400 Model B45 late last year.

"Management here was nervous about Wang's money problems," said Kevin Saal, director of MIS.

The $70,000 conversion was done inside of three months, which included testing of the revamped programs.

The biggest benefit of the new configuration is nothing — that is, the 10 users who have used Wang's VS interface for several years see no difference in the look and feel of the AS/400 applications, Saal said. "Financial Technologies was able to convert everything, but it doesn't look fiddled with," he said.

Saal also reported quicker response time to user requests.

Company:
GTE Services Corp.

Wang setup:
10 VS minicomputers

Replacement:
Novell, Inc. NetWare LANs

Status:
Done

Benefits:
Projected savings of $1.5 million per year in hardware upgrade costs and fees for maintenance and operating system licenses

The Stamford, Conn.-based financial services and human resources arm of telecommunications giant GTE Corp. unplugged the last of its 10 VS minicomputers in April.

GTE Services replaced the Wang machines with a Novell, Inc. LAN linking IBM PCs and Apple Computer, Inc. Macintoshes. All conversion work was done in-house.

The LAN is more flexible than the VS-centric network because it supports hardware from multiple vendors.

"We didn't see [Wang] bringing about the technical innovation we needed," said Joseph Rasmussen, director of IS technologies.

For example, minicomputer development suffered when Wang entered the image processing market in 1987, according to Rasmussen. Wang built fewer operating system extensions when it began concentrating on imaging, he said.

Poor prognosis

GTE Services said it decided to ditch Wang 18 months ago because it does not give the now-bankrupt company good odds for survival. Besides contending with an increasingly poor financial condition, Wang caused customer ill will by jacking up license fees for VS operating system software, Rasmussen said.

Wang charges between $1,000 and $100,000 per license for VS operating system software, a practice approved by a federal judge in California who ruled on a September 1991 antitrust suit brought against the vendor by TSJ, Inc., a reseller in Southern California. Five other resellers later joined the suit.

According to a Wang spokesman, these fees "provide Wang fair return on the investment we make in developing and upgrading the operating system."

He added that one uniform policy ensures that Wang users pay the same price for VS operating system software.

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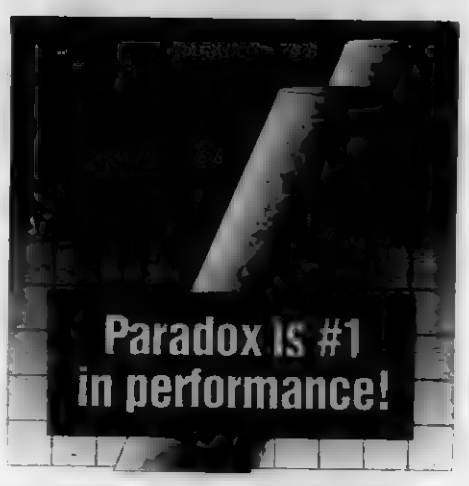

Software Digest's NSTL May 1992 report rates Paradox highest of all databases tested in Overall Power and Performance.

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• *Software Digest* Rating Report, Multiuser Database Programs, May 1992, Vol. 9, No. 2. BI 1573

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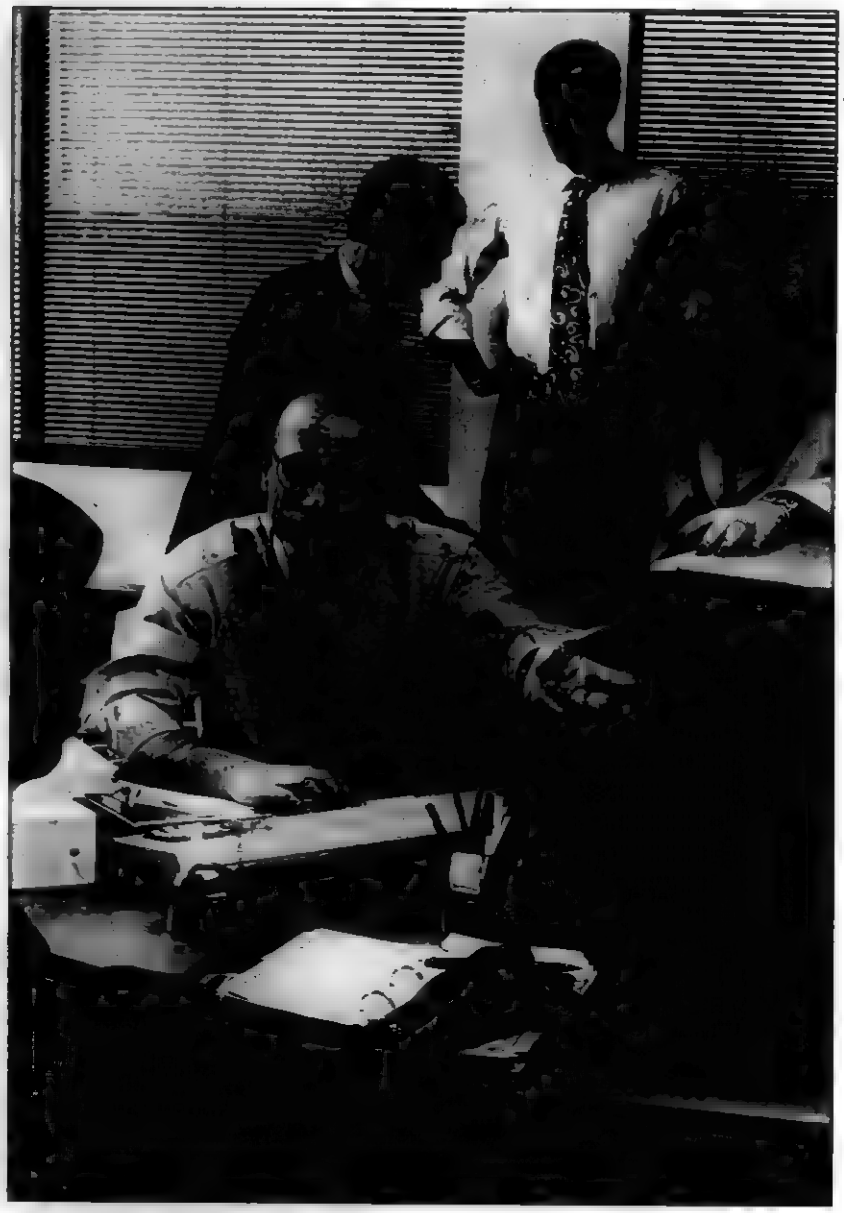

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NEW PRODUCTS

Software application packages

NewGeneration Software, Inc. has started shipping Release 4.0 of the company's Interactive Query data retrieval and report writing software.

The software was designed to help users retrieve time-critical information from the IBM Application System/400 or System/38 database without programming, the company said.

Improvements in this release have cut the query execution time by up to 50%. Files can be joined on new or derived fields, and the product can generate files that can be accessed by PC Support/400 users from their personal computer applications.

Pricing for Release 4.0 of Interactive Query ranges from $590 to $22,500.

NewGeneration Software
Suite 195
1010 Hurley Way
Sacramento, Calif. 95825
(916) 920-2200

Database management

BMC Software, Inc. has announced three administrative products for DB2: Release 3.1 of Catalog Manager, Alter and DASD Manager.

Catalog Manager has a single interface that allows users to execute most DB2 administrative functions such as automating utility generation and creating ad hoc queries and reports.

A security enhancement in Alter grants public or private access to a Work identification, and the product has improved object support and a number of ease-of-use features, the company reported.

Prices start at $8,000.

BMC Software
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Revelation Technologies, Inc. has announced OpenEngine 1.5, a database and data access engine.

The product consists of a full-featured relational database, ANSI-standard SQL and intelligent gateway access to multiple data sources.

A database fourth-generation language called Real is used for application logic construction. OpenEngine 1.5 has new features in the application programming interface layer and now has the capability to call for Microsoft Corp.'s Windows Dynamic Link Library routines from within the Real programming language.

OpenEngine 1.5 costs $595.

Revelation Technologies
181 Harbor Drive
Stamford, Conn. 06902
(203) 973-1000

BGS Systems, Inc. has announced the DB2 Support Facility (DSF).

The product was designed to help users understand hardware resources needed to achieve good performance in DB2 applications. According to the company, DSF highlights occasions when the DB2 application performance could be improved via short-term tuning functions.

A picture of DB2 application resource consumption and performance is created when the DSF combines multiple DB2 measurement sources. DSF is used in conjunction with BEST/1, the company's modeling tool for capacity planning and performance management.

The base price for DSF is $24,500.

BGS Systems
128 Technology Center
Waltham, Mass. 02254
(617) 891-0000

System software

Legent Corp. has announced Astex 1.5, an Automated Storage Expert product designed for managing data storage.

According to the company, Astex 1.5 features an Allocation Director that anticipates and prevents response-time conflicts by automatically placing data. Astex 1.5 automates the cache tuning process and can suggest solutions to response-time problems.

Prices for Astex 1.5 range from $17,600 to $62,100.

Legent
8615 Westwood Center Drive
Vienna, Va. 22182
(703) 734-9494

Turnkey systems

Diamond Micro Solutions, Inc. has introduced a turnkey document imaging application for processing and managing large amounts of paperwork.

The DMS Document Imaging Solution uses Sun Microsystems, Inc.'s SPARCstation and incorporates Oracle Corp.'s database and optical storage technology. Documents can be pulled up for review or transmission via fax or modem to other sites, where they can be searched by subject, scaled for viewing size and viewed in multiple windows. The product is capable of handling paper and graphic images, microfilm, microfiche and aperture cards.

Prices range from $70,000 to $85,000.

Diamond Micro Solutions
1615 Alvarado St.
San Leandro, Calif. 94577
(510) 351-4700

Processors

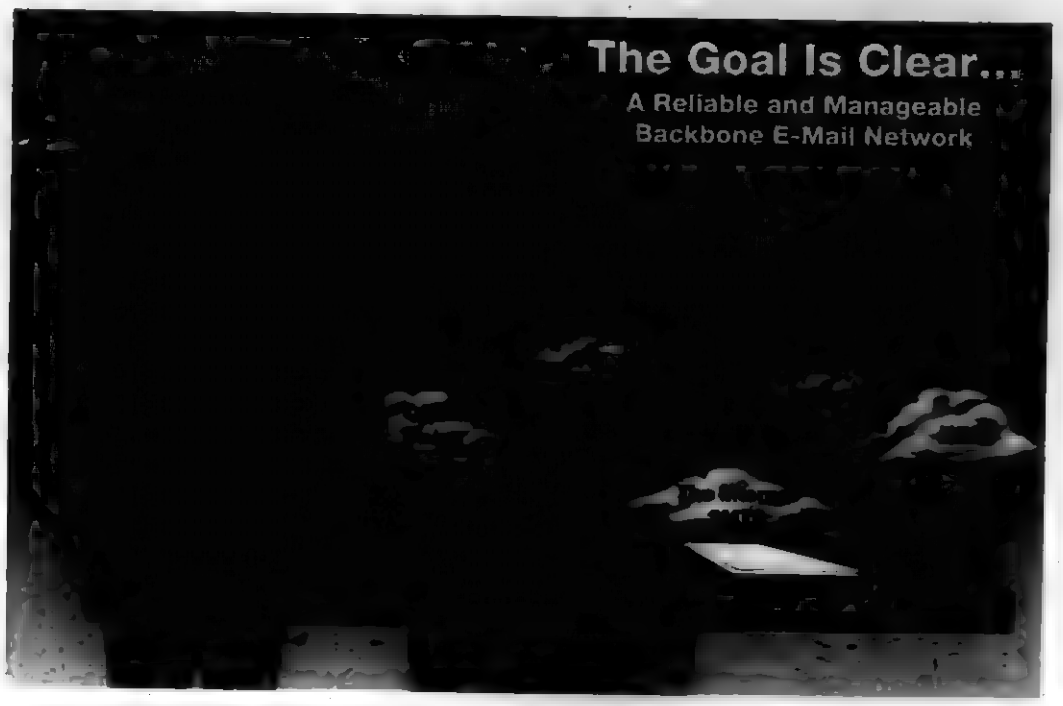
Electronic Associates, Inc. has introduced Starlight, a simulation computer.

The product was designed for advanced real-time hardware-in-loop simulation computing. According to the company, the system is capable of solving different equations 10 to 100 times faster than conventional simulation computers.

A data flow processor and a parallel compiler are included, which optimize the simulation processing.

Starlight prices range from $100,000 to $200,000.

Electronic Associates
185 Monmouth Park Highway
West Long Branch, N.J. 07764
(908) 229-1100



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Atlanta Marriott Marquis
Tuesday, October 6

Boston, MA
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Chicago Marriott Downtown
Thursday, September 17

Cincinnati, OH
Marriott
Tuesday, December 1

Cleveland, OH
Airport Marriott
Thursday, December 3

Dallas, TX
Marriott Park Central
Tuesday, October 13

Denver, CO
Denver Marriott West
Thursday, September 24

Detroit, MI
Hyatt Regency
Wednesday, November 4

Houston, TX
Hyatt Regency
Wednesday, October 14

Indianapolis, IN
Marriott Courtyard
Wednesday, October 14

Los Angeles, CA
Westin Bonaventure
Tuesday, September 22

Minneapolis, MN
Minneapolis Airport Marriott
Thursday, October 22

New York, NY
Helmsley Palace
Wednesday, September 30

Orange County, CA
Irvine Hyatt Regency
Thursday, October 8

Pittsburgh, PA
Hilton Hotel & Towers
Thursday, October 22

Princeton, NJ
Hyatt Regency
Tuesday, October 13

San Francisco, CA
Sheraton Palace
Thursday, September 24

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Tuesday, September 29

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Andersen's Foundation For Cooperative Processing CASE product does what other CASE vendors only promise: designs and generates code for client/server applications.

DATAMATION—SEPTEMBER 1, 1991

Considering how much has been written about CASE tools for cooperative processing, we thought you would appreciate an executive summary.

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BUYERS' SCORECARD

Microcom's Virex nets highest user satisfaction

BY DEREK SLATER
CW STAFF

Antivirus software users can be a difficult group to please. Industry analysts note that users have historically been very suspicious of antivirus vendors and typically are only as satisfied with their software as the results of their last unsuccessful computer virus battle.

There is still the occasional horror story. One user responding to the *Computerworld* Buyers' Scorecard on antivirus software reported that his package zapped a major system function after mistaking it for an infection. Many others operating under Microsoft Corp.'s Windows or other graphical user interfaces noted a variety of crashes and mishaps.

Overall, however, users surveyed indicated a reasonable level of satisfaction with their installed antivirus software. Microcom, Inc.'s Virex topped the poll with a final score of 84, followed by Central Point Software, Inc.'s Anti-Virus at 80 and Symantec Corp.'s Norton Anti-Virus at 79. (The highest possible score was 100.) Of the 132 users surveyed, only 10 said they do not trust antivirus software vendors.

The three products surveyed garner the lion's share of the market among large user companies in the U.S., according to the International Computer Security Association. A shareware program, McAfee Scan, has a very large installed base as well.

A number of other products, including Certus International, Inc.'s Novi, Dr. Solomon's Toolkit (marketed by Ontack Computer Systems, Inc.) and Virus Buster from Leprechaun Software Ltd., divide the remainder of the market.

Microcom's Virex ($99.95) runs on Apple Computer, Inc. Macintosh systems as well as personal computers. Virex stays resident in the computer's random-access memory (requiring about 1K byte of RAM, according to Microcom). The product scans for known virus strains and uses checksums to watch for new types of viruses.

Virex scored well in system resource requirements, indicating that users approve of its terminate-and-stay-resident method. It also placed highest in the category of overall ability to protect information.

However, Virex earned a relatively low grade in local-area networking capability (it supports only Novell, Inc.'s NetWare) and placed behind its competitors in ease of use.

Central Point's Anti-Virus is an expanded version of the program included in the company's PC Tools utility package. The PC Tools version detects viruses but does not provide a way to cleanse infected files.

Users rated Central Point Anti-Virus highly in accurate detection and identification of viruses. According to the company, the product scans for more than 1,200 known viruses. It is capable of detecting new types of viruses, including stealth varieties, which elude normal detection methods such as file-size checks. (Files infected with a stealth virus appear to remain their original size by feeding incorrect information to the operating system.)

Central Point Anti-Virus is offered for the DOS and Windows platforms at $129 each.

Symantec's Norton Anti-Virus ($129) makes its way into the market through inclusion with the Norton Desktop for Windows package as well as through individual sales. Norton Anti-Virus runs under DOS and Windows and supports a variety of networks, including Banyan Systems, Inc.'s Vines, NetWare and IBM's OS/2 LAN Manager; however, it earned a low rating in the area of local-area networking (6.8). Some users indicated that the product is too slow and lacks centralized control in networked environments.

Norton Anti-Virus uses a common technique for removing viruses. It automatically makes backup copies of boot sector data and critical files; if one of these areas becomes infected, the altered version is erased and the backup copy restored in its place.

Version 2.0, the most recent release, places this information in a single file, rather than consuming additional resources by creating individual backup files.

Overall, users gave Norton Anti-Virus good scores in the most important categories, including ability to protect data and effective removal of viruses.

Users rated only their own products in 15 specific areas. They also rated the relative importance of each evaluation area. (See the methodology on the following page for a description of the rating process.) •

Antivirus software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Virex, 32; Central Point Anti-Virus, 50; Norton Anti-Virus, 50.

Total possible score **100** Mean score **81**

Product	Highest ratings	Lowest ratings
Microcom's Virex SCORE 84	Virus detection and identification Effective removal of viruses Overall ability to protect data	Local-area networking capability Ease of use Report generation capabilities
Central Point Software's Anti-Virus SCORE 80	Effective removal of viruses Virus detection and identification Overall ability to protect data	Local-area networking capability Interoperability with other applications Frequency and distribution of updates
Symantec's Norton Anti-Virus SCORE 79	Effective removal of viruses Ease of use Overall ability to protect data	Local-area networking capability Frequency and distribution of updates Speed

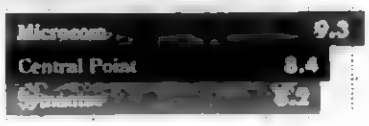
RATINGS IN ORDER OF IMPORTANCE

Microcom's Virex tops five of the six most important categories, but drops to third in ease of use.

(Additional ratings on next page)

User importance rating:

9.6 Accurate detection and identification of viruses



9.4 Overall ability to protect data

9.4 Effective removal of viruses

8.6 Ease of use

8.5 Quality of vendor support

8.4 Interoperability with other installed applications

RATINGS IN ORDER OF IMPORTANCE

Central Point's Anti-Virus earns first place in local-area networking capability, while Virex dominates the remaining ratings.

(Antivirus software, continued from previous page)

8.4 Value for the dollar

8.3 Limited number of false alarms

8.3 Frequency and easy distribution of updates

8.1 Documentation

8.1 Responsiveness of vendor service

7.8 Speed

7.7 System resource requirements

7.6 Local-area networking capability

6.6 Report generation capability

Verbatim

What do you like best/least about this product?

(Based on the most frequently stated answer. Quotes are selected from users' responses.)

Virex

Likes

Ease of use
"It is easy to use — very customizable."

Dislikes

Limited features
"It doesn't automatically examine files from bulletin boards or E-mail."

Anti-Virus

Likes

Ease of use
"We like the clarity of operation. You can see what it's doing at all times."

Dislikes

Poor detection
"It doesn't catch a large percentage of viruses."

Norton Anti-Virus

Likes

Ease of use
"It's easy to use and has a common user interface with other Symantec products."

Dislikes

Incompatibility
"We've experienced some application incompatibility."

Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

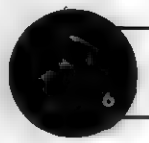
Virex

Response base: 32

Number of respondents

Anti-Virus

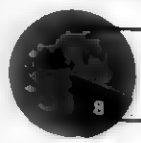
Response base: 50



Number of respondents

Norton Anti-Virus

Response base: 50



Number of respondents

Vital statistics

Total number of respondents: 132

What is your position?

IS director	5
IS manager	6
PC manager	16
PC technical support staff	40
Network/LAN administrator	11
Data security manager/other	54

How long have you been involved with anti-virus software?

Five years or more	21
3-4 years	36
1-2 years	54
Less than one year	21

What is your responsibility for anti-virus software?

Evaluate or recommend vendors	121
Determine need	115
Select vendors	108
Set standards for your organization	107
Approve or authorize purchase	72

In what industry does your company do the majority of its business?

Manufacturing	29
Government agencies	16
Utilities	10
Financial services	8
Health care	7
Retail	7
Other	55

METHODOLOGY

Products included in *Computerworld*'s Buyers' Scorecard are installed base leaders in North America among commercial antivirus software packages.

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results. The response base was 50 users each for Symantec Corp.'s Norton Anti-Virus and Central Point Software, Inc.'s Anti-Virus and 32 users for Microcom, Inc.'s Virex.

Users rated their satisfaction with their installed products but were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

A large majority of the respondents (76%) indicated that they have been using their current antivirus package for one year or less. One-third of the users reported that their company has lost data within the last year because of a virus infection.

The most frequently requested improvement users said they would like to see in antivirus software is more reliable virus detection and removal. Users also requested more options and capabilities such as automatic bulletin board service downloads, the ability to quickly install and uninstall antivirus software and event-triggered alarms in networked environments. Improved networking, improved software compatibility and better speed were other commonly mentioned improvements.

In response to a separate question about overall satisfaction, users rated the products as follows: Virex: 8.3, Anti-Virus: 7.9 and Norton Anti-Virus: 7.8.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and organizations for their assistance in preparing this Buyers' Scorecard: CW Database Division; David Stang, International Computer Security Association; and Robert Bales, National Computer Security Association.

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

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Windows builders eye promise of C generators

Programmer performance may be four times greater with developer aids

BY GARRY RAY
CW STAFF

In the face of downsizing and budget crunches, many programmers are turning to a new generation of C code generators that dramatically speed applications development for Microsoft Corp.'s Windows.

The tools, which lack the capabilities of a full-blown computer-aided software engineering (CASE) environment, allow programmers to design and test applications visually and to then generate C program code in as little as one-tenth the time required to hand-code Windows applications. In effect, application generators combine prototyping, designing and coding into a single step of the development life cycle.

"My performance increase [in generating Windows applications] is four times greater, and much more for program revisions," said Jim DeLong, president of Database Administrators, Inc. in Waukesha, Wis.

DeLong, whose company recently completed a salary compensation system for employee-benefits consulting firm William B. Mercer, Inc., in Louisville, Ky., has been beta-testing Knowledgepro for Windows++ from Knowledge Garden, Inc. in Setauket, N.Y.

The tool allows programmers to visually develop user interfaces for Windows applications and to write internal program functions using a proprietary development language. Once completed, the tool generates ANSI standard C++ code and supporting files that are compatible with Microsoft's C/C++ 7.0 compiler, according to Knowledge Garden President John Slade.

Unlike traditional CASE tools, most of which include facilities to generate higher level, "upper-CASE" functions such as entity relationship diagrams and data-flow diagrams, application generators go directly from design to coding. Moreover, they generally do not support other CASE facilities such as standardized repositories for program elements. Therefore, they are less useful for large programming projects that require ongoing maintenance and revision. However, users are quick to note that their strength is rapid prototyping and turnaround of applications.

"You see the application backlog and the ongoing set of requirements from customers who can't wait two years or longer" to complete a project, said David Holliday, a principal at Lifecycle Systems, a Bellevue, Wash., software engineering consultancy. Holliday said he has been "getting the customer involved" using Knowledgepro. By using it interactively to design screens and program functions with users of the final application, Holliday said, he can shorten the development cycle. "Getting prototypes is the best way" to increase application turnaround, he said. And, since application generators create code directly from these prototypes, there is no need for programmers to re-create screens through hand-coding.

Other developers have explicitly chosen application generators after studying the available CASE alternatives. CASE workbench solutions make it "fairly easy to get boxed in," said Steven Cooper, a consultant at Atlantic Information Management, Inc. in Bridgewater, N.J. They are "expensive, and you become dependent upon a single vendor," he noted. "I prefer to be a little bit more mobile."

APPLICATION generators combine prototyping, designing, and coding into a single step of the development life cycle.

The new generators

Code generators for Microsoft Windows

CASE: W
Caseworks
Atlanta, Ga.
Interface design tool for C and C++. Works with Microsoft's Foundation Classes and Borland's ObjectWindows class libraries.

KnowledgePro for Windows++
Knowledge Garden
Setauket, N.Y.
Interactive visual design tools and prototyping language generate C++ code. Optional tool kits for expert systems and math functions.

Windowsmaker Professional 4.0
Blue Sky Software
La Jolla, Calif.
Visual interface builder with C and C++ code generation. Custom code is preserved during code regeneration. Help authoring tool included.

Protogen 3.0
Protoview Development
Dayton, N.J.
Interface builder generates C code for Microsoft's Foundation Classes and Borland's Object Windows Library.

CW Chart: Michael Siggins

4GLs expected to ride client/server wave

Capabilities of 4GL prototyping tools will make it future choice for developers, researcher says

BY GARY H. ANTHES
CW STAFF

Developers of client/server applications are foresaking third-generation languages (3GL) such as Cobol and C in favor of supertools, according to a report from Forrester Research, Inc. in Cambridge, Mass. This new breed of fourth-generation languages (4GL) generates application code, builds graphical user interfaces (GUI) and connects to the major database management systems.

But users are befuddled by the fast-changing marketplace. "The tools share a common structure, but over three dozen variations were found . . . [and] pricing is chaotic: from $300 to $50,000," Forrester Research said.

According to Forrester Research, client/server power tools fall into three categories:

- Assisted 3GLs, which work with standard programming languages but provide special tools for things such as building GUIs.
- 4GL prototyping tools, which allow rapid development of application shells to get early user feedback. Examples include PowerBuilder from Powersoft Corp. in Burlington, Mass., and SQLWindows from Gupta Technologies, Inc. in Menlo Park, Calif.
- High-level modeling tools, which apply the top-down approach of traditional computer-aided software engineering (CASE) to client/server development.

Forrester Research said most current offerings take the 4GL prototyping approach because 3GLs do not offer enough productivity and most users are not yet willing to make the investment needed for client/server modeling.

Codman & Shurtleff, Inc., a Randolph, Mass.-based maker of medical devices, is downsizing from a Wang Laboratories, Inc. VS environment to a Banyan Systems, Inc.-based local-area network with Oracle Corp. databases. The company, a division of Johnson & Johnson, is using PowerBuilder to develop applications for inventory control, product compliance, repair and credit returns.

According to Alan Harrington, senior systems analyst, PowerBuilder has reshaped the jobs of former Cobol programmers and boosted application development productivity two to three times.

"We used to follow the data processing tradition — talk to users and find out what they want, go off and write all sorts of code and then send the results back," Harrington explained. "Now we do quick prototypes of screens and tables with the user sitting right there. The developer does everything from design to documentation."

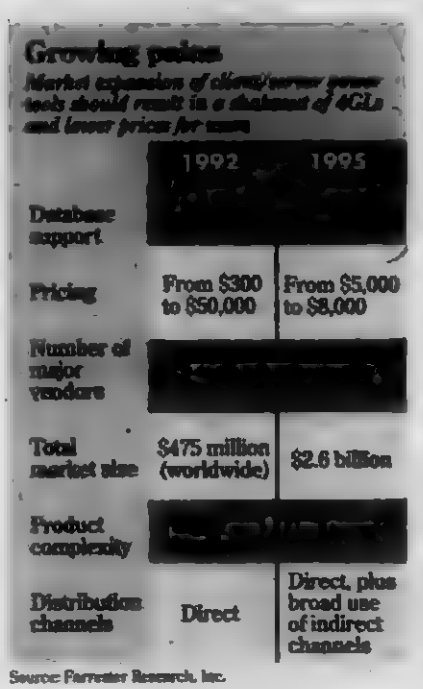
Forrester Research said the following trends are shaping the market for client/server application development tools:

- Client/server development projects, typically for decision-support applications, are showing good results in many large companies, leading them to consider the more demanding transaction-processing applications. Vendors are beefing up their tools to handle those.
- Users are demanding GUIs, causing vendors to upgrade the older, character-based tools.
- Recognizing that users will scatter their data over different database and hardware environments but will balk at learning a new tool for each configuration, the major vendors of database software are enhancing their tools to support competitors' databases.
- A market shakeout and user resistance to today's hefty price tags will bring peak prices for the development tools to between $5,000 and $8,000 for a single-person development license.

As products evolve, prices will fall while ease of use improves, the research firm said.

Donald Weimann, a PowerBuilder user and staff systems analyst at Chevron Information Technology Co. in San Ramon, Calif., agreed with a Forrester Research prediction that the 4GL prototyping and modeling classes of development tools will merge, or at least become better integrated. For example, he suggested that CASE models should pass information to a 4GL tool, with results of prototypes then passed back to update the model.

Weimann said he did some early work with assisted 3GL tools but was not pleased, particularly when building applications with complex GUIs.



Source: Forrester Research, Inc.

Graphical tools roll out at conference

New development tools to aid editing, graphics

BY PAUL GILLIN
CW STAFF

Two application development products were announced at the recent Windows & OS/2 Conference in Boston:

• The Stirling Group in Schaumburg, Ill., has figured out a way to in effect reverse-engineer compiled applications and lift out the graphical elements.

ResourceShield for IBM's OS/2 and Microsoft Corp.'s Windows works directly with the .EXE files on a personal computer, allowing developers to pull out items such as buttons, scroll bars, dialog boxes and menus, modify them and relink them to the application without ever working with source code.

It does that by using the resource table within each .EXE file, according to Vinesh Bhatia, a Stirling Group co-founder. That table lists the location and content of visual resources within a program.

Users select an element by clicking on it, edit its contents and reinsert it in the file or cut and paste to another program. The product is especially useful for translating applications into other languages, Bhatia said.

The Windows version of ResourceShield costs $149; the OS/2 version is $295.

• Lifeboat Software in Shrewsbury, N.J., said it will publish ED, The Programmer's Editor. ED is a developer's editor for the MS-DOS and Windows environments. It supports most popular programming languages.

ED provides programmer-friendly features such as automatic code indenting, hypertext lookups, keyboard remapping, versioning and journaling. It has an unlimited Undo feature, which allows the user to specify how many previous editing steps may be undone.

The editor can accommodate very large files and keeps extensive historical information so that programmers can recall files and commands through a mouse click.

ED is priced at $269.

Windows viewing a free choice

Symantec tool allows Windows users to view code in any environment

BY GARRY RAY
CW STAFF

CUPERTINO, Calif. — With this week's scheduled release of Symantec Corp.'s Multiscope Debuggers for Windows 2.0, Windows mavens can now view program code in Microsoft Corp.'s Windows graphical operating environment.

The debuggers, which Symantec said are the first to fully exploit the Windows environment, work with code created by Borland International, Inc.'s Borland C++, Microsoft's C/C++ 7.0 and a variety of other C and Pascal compilers. Support is also provided for assembly language programs.

According to company officials, the debuggers have been upgraded to work with C++ programs.

New features

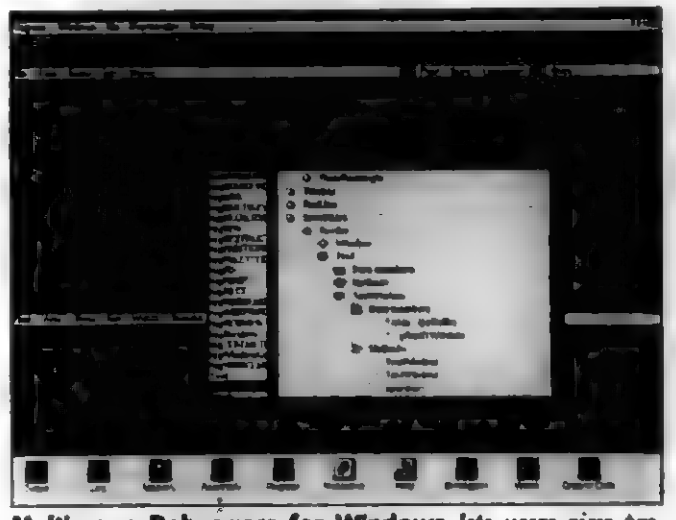
Among the features added to support C++ code are expandable and collapsible class hierarchy browsers, object browsing, automatic object mapping, object-oriented breakpoints, C++ expression evaluation and browsing of member pointers.

Multiscope's Crash Analyzer System, also included with the package, has two components: a monitor and execution dump utility (MED) and the crash analyzer debugger.

When a program bug causes a protection error, the MED utility captures the internal state of the machine to a disk-based dump file. Programmers can then use the crash analyzer debugger to examine the dump file and determine the state of the application prior to the crash.

Symantec officials said the utility is available for licensing and distribution to beta-test sites and other preliminary users of a program.

Available immediately, the $379 Multiscope Debuggers package will be offered for $99 until Sept. 30.



Multiscope Debuggers for Windows *lets users view program code in the environment of their choice*

NEW PRODUCTS

Application development tools

American InterFace Computer, Inc. has created Plasma, a knowledge-based tool for Cobol re-engineering.

Plasma recognizes code; the product first scans the code, creating a knowledge base that consists of program information. Next, users explore the application in a variety of ways as cross-reference lists, data and control flow are analyzed. Plasma is typically configured on a Unix workstation linked to mainframes through Transmission Control Protocol/Internet Protocol.

Plasma license fees start at $15,000.

American InterFace Computer
Suite 200
1 Westlake Plaza
1705 Capital of Texas Highway South
Austin, Texas 78746
(512) 327-5344

Microstar Laboratories has introduced a tool kit that allows Microsoft Corp.'s Windows applications to communicate with a Data Acquisition Processor. The Microstar Laboratories Windows Toolkit has a Dynamic Link Library (DLL) of functions that are used for communicating with the processor.

Any Windows programming language or Windows application that has the capability to call DLL can be used with the functions. The product produces a real-time data acquisition application when it is combined with Microsoft's Visual Basic.

Microstar Laboratories' Windows Toolkit costs $95.

Microstar Laboratories
2265 116th Ave. N.E.
Bellevue, Wash. 98004
(206) 453-2345

Business Computer Design has announced Release 3.30 of ProGen Plus, a middle-CASE application generator for the IBM Application System/400 or System/38.

Enhancements in Release 3.30 include dynamically generated program contexts for flat panels and a new creation command that provides compatibility with other software products.

The product can work with the user's new or existing database files. It can create pop-up windows and has a flexible screen painter.

Prices start at $4,500.

Business Computer Design
950 York Road
Hinsdale, Ill. 60521
(708) 986-0800

Lenel Systems International, Inc. has introduced MediaDeveloper, a universal multimedia engine designed for Microsoft Corp.'s Windows application development.

The product is a library of multimedia programming objects that permit users to add multimedia capabilities to existing applications or develop stand-alone or networked multimedia applications.

MediaDeveloper prices start at $595.

Lenel Systems International
19 Tobey Village Office Park
Pittsford, N.Y. 14534
(716) 248-9720

Compuware Corp. has released CICS Abend-Aid 5.2 and CICS Radar 4.0.

CICS Abend-Aid is an abend analyzer. The product was designed to provide analysis of CICS transaction abends and recommend corrective action. Release 5.2 offers support for DB2 Version 2.3 and for viewing any source-code program listing that has fast-path navigational capabilities.

CICS Radar 4.0 assists users in identifying the reasons for CICS region failures. The product has a diagnostic summary, provides program change information and executes storage error analysis.

Both products operate under MVS/XA and MVS/ESA and are available for a total cost of $30,000.

Compuware
31440 Northwestern Highway
Farmington Hills, Mich. 48333
(313) 737-7300

Virtual Technologies, Inc. has introduced Sentinel.

The product is a debugging environment for Unix. With the use of dynamic memory, Sentinel helps users locate and resolve hidden bugs. It also traps memory errors.

The product determines the cause of memory leaks by offering users the tools needed to track down and figure out hard-to-detect memory leaks. Sentinel supports a variety of environments, including some from Sun Microsystems, Inc., Hewlett-Packard Co. and Intel Corp.

Prices range from $195 to $495.

Virtual Technologies
Suite 160
46030 Manekin Plaza
Sterling, Va. 22170
(703) 430-9247

Code libraries

Pocket Soft, Inc. has introduced VMData, a suite of memory management libraries.

According to the company, the product provides a uniform, cross-platform method of managing a program's dynamically allocated data. It eliminates DOS memory restrictions and allows one operating system to port applications to another system.

VMData libraries are for C and C++ languages and cost $495 for the first platform and $295 for each subsequent platform.

Pocket Soft
Suite 195
7676 Hillmont St.
Houston, Texas 77040
(713) 460-5600

Compilers

EuroSoft, Inc. has released two DOS compilers from Salford Software Ltd. (UK).

The products are the Salford C/386, an ANSI C compiler, and the Pascal/386, an extended mode compiler.

The products reduce development time by compiling and linking at up to twice the speed of the nearest competitor. Address space is available for up to 2G bytes of extended memory with the DBOS DOS extender.

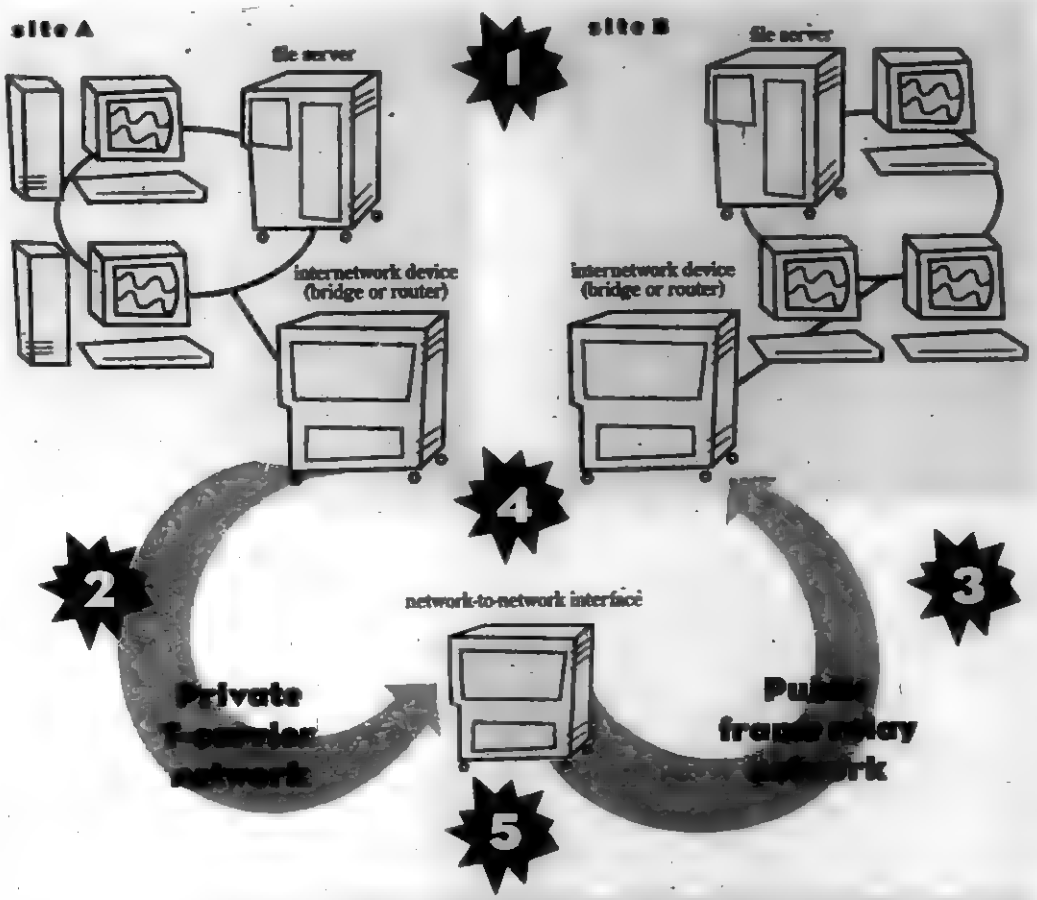
Salford C/386 programs can call subprograms written in Pascal and Fortran and vice versa, and both compilers offer application libraries with more than 200 routines.

The C/386 compiler costs $1,195; the Pascal/386 compiler costs $795.

EuroSoft
8312 La Plata Loop
Austin, Texas 78737
(512) 288-3444

The latest in frame relay

Most implementors are experimenting with frame relay or are planning to use it in combination with faster methods in the future



Hot spots

1. Do you have end-to-end protocol compatibility with frame relay service characteristics?
2. Which private equipment will you choose?
3. Which carrier is best for you?
4. Do you go private or public?
5. What are the issues involved in hybrid networking and internetworking?

The typical frame relay network connects LANs to one another or to a central data processing system. Most people will combine existing T1 networks (augmented with a frame relay interface) with carrier-provided services. Properly planned, installed and tuned, frame relay promises to cut costs by 50% or more and increase performance. But without proper support, frame relay networks can cause significant internal traffic delays and even discard data, resulting in even longer delays for error recovery. A little attention to the "hot spots" of frame relay can pay a big dividend later, when the network is operating

(see story next page).

BY JILL HUNTINGTON-LEE

Frame relay is the answer. Frame relay will never fly. Generalizations like these really have people wondering just what the future holds for cost-effective, fast transmission of local-area network data over wide-area networks.

Frame relay was never intended to be a miracle technology. It is simply an interface to the first fast-packet switching service tailored for the up and down volumes and variable lengths inherent in LAN transmissions. It doesn't stop for unnecessary error-checking pit-stops, so it's faster than its cousin technology, X.25. And it gives you full-time access to maximum bandwidth without making you pay for what you don't use, so it's cheaper than T1.

In theory, it's a good way to connect five or more geographically dispersed LANs running midspeed applications such as file transfer, electronic mail and terminal connections.

In reality, there are some imperfections, which explains the low number of implementors (there are only about 40) so far. As it turns out, this technology involves a lot more than just passing packets of data (or frames). There are unsolved problems with managing network congestion, and there aren't enough access points, especially overseas.

You also can't run high-end applications such as graphics, teleconferencing, full-motion video, document imaging, Fiber Distributed Data Interface LANs or database-intensive client/server software.

Users have discovered that it's not easy to re-engineer private networks to support frame relay, as this could require investments in training or changing the network infrastructure, not to mention that faster options are just over the horizon in the form of Asynchronous Transfer Mode (ATM) and Switched Multimegabit Data Service (SMDS). Although frame relay can be used as a stepping-stone to those technologies, the structure is not entirely in place to do that either.

But because of what frame relay does offer, there are people getting their feet wet by keeping their private T1 lines intact and experimenting with public frame relay services as they bring new LANs onto the network. That way, they avoid large capital outlays for switches and other equipment required to build a private frame relay network (see story page 91), not to mention some of the network management headaches and training

Continued on page 91

Huntington-Lee is an analyst at consulting firm Brandywine Network Associates in Delran, N.J.

Which carrier? 3

The most important technological difference among the carriers is the switching technology used: cell switching or frame switching.

Cell-switched networks break frames into fragments before transporting them. This helps avoid a major component of network delay, called either serialization or assembly delay, which occurs when messages must be assembled character by character within each node before being transported to the next. Breaking a frame into fragments lets a node forward each piece faster because it takes less time to assemble the short fragment.

The problem with cell switching is that a critical portion of the standard, called the DE (Discard Eligible) bit, may be difficult to implement. The network sets the DE bit on incoming frames that exceed the throughput rate negotiated with the network. If congestion occurs, the network is supposed to discard these frames first, penalizing users who exceed their negotiated rate rather than those who are obeying the rules. If the DE bit is not set, a network might just as easily discard a frame associated with a well-behaved user. This is sometimes called the "fairness issue."

Only full frame switches can really discard frames based on DE (see chart page 91).

A second big concern is cost. Service costs are normally based on the average throughput required for each virtual connection between user locations — called the committed information rate, or CIR. You're charged a premium for virtual circuits that are over a given maximum mileage and local access charges.

Local access charges account for as much as half of your total service costs. You might want to review the locations of each frame relay carrier node with respect to your site locations to minimize access costs, especially if you're in a more remote location.

CIR charges can also make a major difference in network costs, not so much because of major rate differences but because carriers vary in the increments in which they offer it. A carrier that assesses CIR charges in units of 64K bit/sec. might force a user to buy considerably more capacity than needed for an application, particularly a modest one. One that sells capacity in smaller increments may be a better buy because the capacity can be matched more exactly to application need.

Virtual circuit distance premiums are not normally a major problem. Most carriers assess a surcharge on circuits more than 1,500 to 1,800 miles in length, but the charge can sometimes be avoided by routing traffic to distant sites through an intermediary location. A few sites with a surcharge will not usually make a major impact on network costs in any case, so most users have elected to simply pay the surcharge when needed.

Public? Private? 2

This debate should sound familiar to anyone who's even dabbled in communications services. In frame relay, the decision is generally based on cost.

If you have large concentrations of traffic, private networking is generally less expensive. If you have already been able to justify private T1 and T3, you should probably at least consider private frame relay.

If you don't have a backbone network in place, you may still be able to justify private frame relay if you have large traffic flows between sites.

Most users probably overlook a major private frame relay application: Two locations with two or more data connections with unlike protocols can often save money by using frame relay to combine these onto a single channel. The use of a computer-to-computer trunk is usually low enough that two data connections of a given speed can be combined on a single circuit of the same capacity, cutting costs by 50%.

Public frame relay services are usually best where there are no major concentrations of traffic and where total site-to-site traffic volumes are well below T1 levels. Public is also best, generally, when there are more than just two or three sites.

A final factor to consider is support and management. A user with no network management experience whatsoever may find frame relay's traffic management demands too much to handle and might be better off dealing with a public carrier.

Protocol compatibility 1

A big problem on frame relay networks is that — because they don't assign a fixed amount of resources to network conversations — they can easily become congested. At best, this slows message travel time. At worst, it increases the risk that information will be discarded to relieve serious congestion.

There's no way to avoid the problem of data loss if the network is seriously overloaded. The trick is to avoid congestion altogether, which, ironically, the frame relay protocol was designed, in part, to do. In fact, it is the first congestion-avoidance protocol.

Frame relay generates explicit congestion notifications in both the forward direction (FECN) of data flow and the reverse direction (backward, or BECN). These notifications, which take the form of bit settings in the frame relay header, are presented to the device that directly attaches to the frame relay network. They ask that device to "throttle back" on data flow before the network begins to accumulate excess information.

The trouble is, the device is normally a bridge or router, not the user who is actually the source of the traffic. That user is connected to a LAN, possibly several internetwork "hops" away from the interface. So the indicators basically get ignored; there's nothing else that can be done with them for the present.

Because today's LAN protocols don't directly use frame relay congestion notifications, users must "trick" them, either by adjusting their flow control limits or by selecting products or carriers that will forgive traffic overloads more than the standards require. In either case, performance is slowed in exchange for safe arrival of data.

Some protocols have better flow control than others. Transmission Control Protocol/Internet Protocol and Open Systems Interconnect can provide efficient transmission even when network delays rise. Additionally, Novell, Inc.'s recent enhancements to SPX/IPX improve its performance in typical frame relay internets. IBM's Systems Network Architecture is probably the strongest protocol for use with frame relay.

If you can't control information flows satisfactorily, you may have to do some form of in-network buffering to absorb congestion or overload without dropping data. Equipment vendors and carriers vary in their ability to do this; you should ask about buffer size and whether cell- or frame-based switching is employed (see # 3).

Most people who consider frame relay won't have a private network linking all of their potential frame relay sites. You'll likely need to extend that network through public carrier facilities so that "fringe" locations can be connected as well.

In some cases, you might also want to link private frame relay networks from different vendors or even link two public frame relay carriers. The most trouble-free way to create a hybrid frame relay network is to use an internetworking device such as a router to connect the networks.

Hybrid concerns 5

If a public and a private network are both connected to ports on a bridge or router, the device can direct traffic between the two networks without involving the user in any special internetworking issues. This same strategy can be used to "hybridize" frame relay with another type of data service.

If a public network is used to extend the coverage of a private frame relay network to reach a few remote locations, there may be no need to place a router or bridge at the public/private boundary. In this case, the user may want to simply link the two frame relay networks together. This can be done either by connecting the user/network interfaces (UNI) offered by the public and private networks or through another type of frame relay interface called a network/network interface.

The value of the network/network interface is its support for the management of the whole connection. With the UNI strategy, each network believes the other to be an end user. A user on one network would have management visibility in his own network but not through it to the other user. This might result in a "half-connection," where one connection is broken but the fault is invisible to users on the other.

The network/network interface will ultimately be the standard for interconnecting frame relay networks, public or private, with each other, but the standard has only recently been submitted for voting to members of the ATM Forum; implementations will probably not be available before the end of 1992 or early 1993. In the interim, direct frame relay network interconnection, without an intermediate router or other internetworking device, should be avoided.

Articles written by Thomas Nolle, president of CIMI Corp. in Voorhees, N.J.

Which equipment? 4

Most private frame relay users will base their networks on high-capacity digital services such as T1. In many cases, they will already have T1 backbone networks or circuits in place and will be hoping to exploit this low-cost bandwidth further with frame relay.

Private frame relay switches are available in two forms: T1 multiplexers supplemented with a frame relay interface and stand-alone frame relay multiplexers.

Integrated T1 multiplexers reduce the number of hardware elements and thus network complexity. Some can move capacity back and forth between traffic types as demand changes.

T1 multiplexers can also support more traditional voice and data interfaces. They are best for applications for which the user has either no existing private network commitment or where the existing network is based on T1 products that offer a frame relay interface option.

Alternatively, stand-alone frame relay multiplexers can be used with an existing private T1 network. They are best used when the application is going to use an existing backbone network, particularly if that backbone is supported on a variety of equipment. A stand-alone device can be attached to a V.35 or RS-449 data port on any T1 multiplexer and can be assigned any portion of the T1 trunk capacity.

Like public services, private frame relay equipment can use either cell- or frame-based switching. Some products switch complete user frames within the network, while others fragment the frames into smaller cells for transmission. When the private network has many nodes, cell-based is likely preferable. That's because fragmenting frames reduces delay more when more nodes must be negotiated between source and destination. Frame-based may be preferable when the application is more point to point.

Combining frame- and cell-based products on a single network may be more difficult because of differences in the way the networks manage congestion and discarding. Special care should be taken where a carrier service based on one strategy is matched with a private network based on the other.

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Glossary

Underlying technologies:
Cell relay: A general term for any switching technology that uses fixed-length cells, such as IEEE 802.6/SMDS or ATM and B-ISDN (see below).

Fast-packet switching: Describes the new generation of post-X.25 packet switching technologies. There are three types: frame relay, cell relay and vendor-proprietary fast-packet switching.

Standards:
ATM: Asynchronous Transfer Mode, one of two transfer modes defined under Sonet (see glossary entry). Specifies fixed-length cells as opposed to the variable-length frames of frame relay. Supports 45M bit/sec. and up, as opposed to 56K/64K to 1.544K bytes with frame relay. Will be the basis for future B-ISDN services. Unlike SMDS (see entry), ATM is considered a wide-area network technology and is promoted by the interexchange carriers and international switch vendors. It is not yet available.

DQDB: Distributed Queue Dual Bus is a cell-relay technology for metropolitan-area networks and is the basis for IEEE 802.6. SMDS and DQDB/IEEE 802.6 are promoted by the regional Bell operating companies (RBOC), whereas WAN switch vendors and interexchange carriers promote ATM.

Sonet: Synchronous Optical Network is an international standard for carriers' fiber networks and the foundation for B-ISDN. Supports speeds from 45M bit/sec. to somewhere in the gigabit range. Defines two transfer modes: synchronous, or STM (for circuit switching), and asynchronous, or ATM (for cell relay).

IEEE 802.6: A standard addressing cell relay transmission in MANs and the basis for SMDS. Supported by the RBOCs.

Services:
B-ISDN: Broadband Integrated Services Digital Network. An ATM-based service with international support. Not yet available.

SMDS: Switched Multimegabit Data Service. A service based on the IEEE 802.6 cell relay standard. Faster than frame relay. Uses fixed-length cells, but as it targets MANs, it is not identical to ATM-based services such as B-ISDN for WANs. Now in beta testing.

Frame relay services

Vendor	Start date	Switch	Access points	Service range	Access speed (bit/sec)	CIRs (bit/sec)	Over-subscription	Network design	Network management	CPE
AT&T (800) 247-1212, Ext. 621 AT&T InterSpan Frame Relay Service	June 1992	Stratacom IPX	150+ U.S.	National, Europe	In the US: 56K, 64K, 128K, 256K, 384K, 512K, 768K, 1.024M, 1.544M; in Europe: 64K, 128K, 256K, 2.045M	32K, 48K, 64K, 128K, 256K, 384K, 512K, 768K, 1.024M	Burst only	AT&T InterSpan sales support specialists, Bell Labs technical support	AT&T InterSpan Frame Relay Customer Network Management Services	Customer premises router, DCE, dial-up modem through AT&T InterSpan Frame Relay Extended Connectivity Option
BT North America, Inc. (800) 872-7654 Enpremi.ace	September 1991	Stratacom IPX, BT's Turbo Engine	22 U.S., 5 UK, Europe	National, Europe, Japan/Far East	56K/64K	56K/64K	NP	Yes	Concert	ACC, Cisco, Wellfleet
CompuServe, Inc. (614) 451-8600 Frame-Net	October 1991	Stratacom IPX	38 LATAs	National	56K-1.024K at 128K increments	4K-512K in 4K increments	Up to 200%	Sales support, product marketing and technical engineering support staffs	Based on Stratacom's Strataview network management platform	Routers (optional), CSUs, DSUs
Infonet Services Corp. (310) 335-2600 InfoLAN Frame Relay	In beta testing	NET	11 U.S., Europe	National, Canada, Europe	64K, T1/E1	64K	Burst only	Enterprise Defined Network Services	INMC client workstation	Routers, DSUs
MCI Communications Corp. (703) 506-6060 VPDS Frame Relay	June 1992	Siemens	300+ U.S.	National	56K/64K, 112K/128K, 224K/256K, 336K/384K, 512K/728K, 768K/1.024M, 1.344M, 1.536M	16K, 32K, 48K, up to 1.024M at increments of 56K and 64K	200% of access	MCI provided capability	MCI provided capability (SNMP-based)	Routers, CSUs, DSUs
Nynex New York & New England Telephone (914) 644-5470 New York Frame Relay New England Frame Relay	April 1992 (New York) Planned October 1992 (New England)	Northern Telecom, Link Peripheral Processor (LPP) Data Span	16 New York, 15 New England	National, Canada/Mexico, Europe	56K, T1 (1.344M or 1.536M)	56K, T1	56K, T1	By the respective account team	SNMP planned for 1993	None planned for 1993
Pacific Bell Contact local rep. Pacific Bell Frame Relay Service	First half 1993	To be announced	4 U.S.	Regional only (IntraLATA)	56K/64K 128K, 384K., 51.544M	To be announced	To be announced	Assigned systems design consultants	To be announced	To be announced
Sprint Corp. (800) 736-1130 Sprint Frame Relay Service	December 1991	Sprint TP4900	300+ U.S.	National	50K/64K, fractional T1, T1	56K/64K, fractional T1 up to 1.024M	Yes (ingress) No (egress)	Yes	Yes	Yes
US West (303) 965-8973 Frame Relay Service	March 1992 Full installation across region Q1 1993	AT&T Network Services BNS 2000 Datakit II	Metrowide	IntraLATA in US West's 14-state region	56K, 1.5M	First-quarter 1991 support	NP	Via data application consultants	None	Bridges/Routers CSUs, DSUs
WilTel (918) 588-3210 WilPak	March 1991	Stratacom IPX	16 U.S.	National	56K/64K, 256K, 384K, 512K, 768K, 1.024M, 1.536M	Nx64	200%	None	None	Routers, CSUs, DSUs

Do-it-yourself guide to frame relay

Building your own frame relay network is much more complicated than signing on with a carrier. But it may be the only way to obtain the access, performance and control over your network that your company seeks. Here's a quick guide to implementation alternatives.

Access equipment
The access device turns LAN data into frames by attaching all the necessary headers and trailers. Routers are the most common. Virtually all router vendors now provide frame relay support.

There are several alternatives to routers, such as PC-based software and plug-in cards. These packages depend on the power of the platform PC and typically don't provide the throughput or added features of a conventional router.

Another form of access equipment, called stand-alone frame relay access devices, typically encapsulate synchronous protocols such as **IBM**'s SNA into frames for transport.

Finally, there are frame relay concentrators that support more than one port-to-network connection. **Sync Research, Inc.** in Irvine, Calif., is a leading supplier of these SNA-capable concentrators.

Switching equipment
Switches accept frames from a number of access devices and forward the data to the destination. They differ according to their technological ancestry.

- **Upgraded X.25 switches.** These have the benefit of added flow-control mechanisms. Two frame relay switches with an X.25 heritage include BT/Tymnet Turbo Engine from San Jose, Calif.-based **BT North America, Inc.** and TP4900 from Reston, Va.-based **Sprint Corp.**
- **Cell-relay switches.** Vendors of cell-relay switches claim they'll be able to convert easily to ATM when the time comes. These products include IPX from **Stratacom, Inc.** in Campbell, Calif., and FRSU from **Siemens/Stromberg-Carlson** in Boca Raton, Fla.
- **Upgraded multiplexers.** Multiplexer vendors hope to ease the customer's transition from private lines by overlaying frame relay on top of the multiplexer-based network. Multiplexer-based products include the Frame Relay Exchange from **Network Equipment Technologies, Inc.** in Redwood City, Calif.
- **Frame relay-only switches.** Manufacturers that have built their equipment from the ground up to support frame relay can obviously boast that their designs are the most frame relay-specific. Costa Mesa, Calif.-based **Frame Relay Technologies, Inc.**'s FrameMux 1200 and the #1ISS from **Netrix Corp.** in Herndon, Va., fall into this category.

JILL HUNTINGTON-LEE

Cell vs. frame

The cell vs. frame debate is also called 'the fairness issue'

Cell-based switches and service providers:

- AT&T BNS-2000
- CompuServe, Inc.
- Stratacom, Inc.'s IPX
- Siemens/Nixdorf Information Systems, Inc.'s QPSX
- WilTel

Evolving to cell:

- BT North America, Inc.
- MCI Communications Corp.

Frame-based switches and service providers:

- Sprint Corp.
- Network Equipment Technologies, Inc.
- Smaller regional providers

Source: CIMI Corp.

Now

Public frame relay fits like a glove on Byer California, a nationwide women's clothing manufacturer. The San Francisco-based firm uses **BT North America, Inc.**'s ExpressLane service to tie together its remote Ethernet LANs at regional showrooms scattered across the country.

Byer California uses frame relay to transmit reports and connect terminals providing immediate information on new garment lines to major retail customers, including JC Penney Co.

In 1988, the company began using BT's X-link, an X.25 service, to link its remote LANs. Last year, the company began searching for a way to upgrade service to its showrooms without installing a private network. BT's ability to provide a turnkey frame relay solution was a big drawing card for Byer.

"Our business is shipping garments, not programming routers," explains Michael Higgins, technical support manager. BT provides routers, data service units/channel service units, the telecommunications interface and "everything up to my Ethernet cable," he says. BT's standard package includes equipment and support.

Not yet

At Evangelical Health Systems in Oak Brook, Ill., the sports car is in the garage, waiting until it can really fly. The company owns five frame relay-capable switches but is waiting to use them.

The reason, explains Leonard Nielsen, lead network consultant at the company, is that current technology does not allow LAN transmissions to travel at peak speeds at all times. Early frame relay enthusiasts expected to be able to send LAN data on unused bandwidth anytime it was available. In reality, congestion control mechanisms now on some frame relay switches allow only momentary bursts of data at T1 speeds before quickly throttling back to prevent congestion and possible data loss.

Vendors are now developing new algorithms for congestion control that may overcome this limitation. New switches are expected this fall that use a look-ahead algorithm that analyzes network congestion and passes on as much traffic as possible rather than arbitrarily throttling back after each momentary burst.

"If that works, frame relay will make a lot of sense," Nielsen says.

Unlikely, unless . . .

Sam Shuler, communications strategy manager at Texas Instruments, Inc., has researched frame relay from top to bottom and has decided to wait. "On the surface, it appears to satisfy the demand for" reducing costs, Shuler says. But in his view, reducing monthly line costs is not always the true bottom line. "Let's say I save $12,000 a month by going with frame relay. I can easily lose $12,000 worth of business during 15 minutes of downtime — or spend $12,000 on training costs to educate technical staff on frame relay."

Additionally, access is not yet ubiquitous. "If you're already a global operation, obtaining only point applicability within the total global network environment creates additional cost," he says.

Frame relay also can't increase the upper bounds of performance for private T1 users. "Frame relay doesn't scale exponentially," Shuler says. Because he knows he'd eventually have to move onto something faster, "my inclination is, why not go through one training mode instead of two?" he asks.

Yes, and . . .

For some people, frame relay is a stepping-stone. "We're going into frame relay expecting ATM to be the ultimate answer," says Terry Lowder, vice president of the Advanced Technology Group at Banc One Services Corp. in Columbus, Ohio.

Banc One is currently moving from a Systems Network Architecture network to a client/server environment based on IBM's Advanced Peer-to-Peer Networking. The shift will entail interconnecting LANs in an any-to-any configuration. "Today we have a Timeplex-based switched backbone tying together our T1 networks around the country," Lowder says. "By building in frame relay [to the multiplexers], we'll see better use of bandwidth and better performance for the permanent virtual circuits." ATM will kick in when the company gets into document imaging. "Serious deployment [of imaging] drives our bandwidth requirement," Lowder says.

In general, Lowder warns against investing in frame relay without considering the future. "If you're going into frame relay, you need to talk to the same vendor about ATM," he says.

Latest in frame relay

CONTINUED FROM PAGE 87

costs. Frame relay services can also help users migrate to router-based LANs and establish an infrastructure that will sustain higher speed cell relay-based networks such as ATM.

Even for experimenters, there is a catch: Many LANs today are departmental creations that have grown spontaneously, without centralized information systems supervision. Before including LANs in an experimental frame relay subnet, a corporation must have an effective, internal central point of contact for ordering and implementing that service.

Naysayers and enthusiasts aside, it's impossible to ignore the recent equipment enhancements as well as the new value-added service features that indicate a maturing market. **Stratacom, Inc.**'s IPX Version 6.0 includes new software for tracking use, throughput, congestion and errors, including customizable reports. Carriers such as CompuServe, Inc. and WilTel that use the IPX will undoubtedly pass on the benefits of these capabilities to their subscribers.

The appearance of frame relay network design software also indicates that the market is shoring up. One such product from **Network Management, Inc.**'s Network Analysis Center in Syosset, N.Y., is Mind Frame-Relay, which can help users prepare to cost out different network configurations.

Also, the recent introductions of public frame relay services by the nation's two largest carriers — **MCI Communications Corp.** and **AT&T** — have put more muscle into the market and dramatically increased the availability and viability of the technology.

The tangled web of frame relay pricing

Frame relay's biggest plus is better connectivity at reduced cost. But when you attempt to spell out those costs in black and white, the "big plus" turns into a big nightmare.

With the exception of **AT&T, MCI Communications Corp.** and **WilTel**, all major vendors have made their fees public. Not that this helps much: Variations in pricing structures are so numerous and convoluted that users can spend days trying to price out a single network configuration for three or four vendor scenarios.

All pricing structures have two distance portions: access charges and circuit costs. But the similarities stop there. For both access and circuits, some schemes are distance-sensitive and others are not. Services may be fixed-rate or usage-based. All services carry onetime fees and monthly charges, but some include unique surcharges, while others have discounts. All services have options, which may include customer access to network management features, reports, network design services and comprehensive equipment leasing arrangements.

Faced with all of these variations, the user's best bet is to simply approach a carrier and ask for a price on a specific network configuration and then compare this to prices of other carriers.

Don't underestimate the power of bargaining. Vendors are definitely responsive if they know you're willing to move on to someone else if your demands aren't met, says Terry Lowder, vice president of the Advanced Technology Group at Banc One Services Corp. in Columbus, Ohio.

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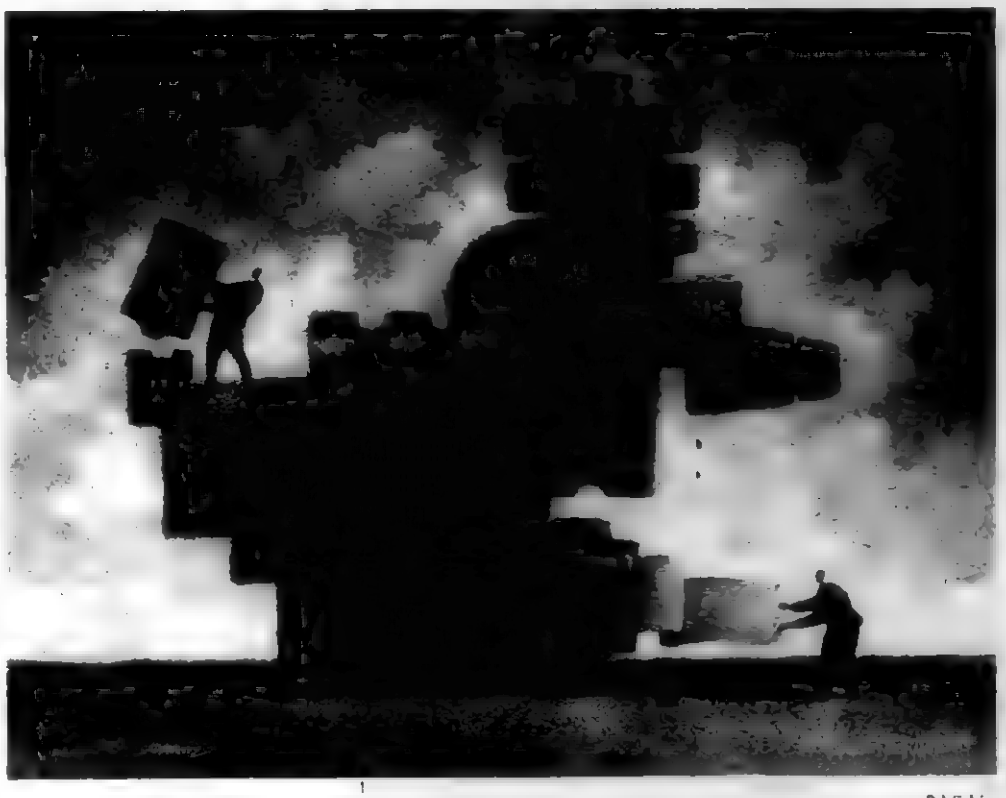
OS/2: Quirks & fixes

Version 2.0 has much to recommend it, but there are some things you need to know before you try to install it in a mixed-vendor environment



Bob Calvin

BY FABIAN PASCAL

OS/2 2.0 has some great attributes and may, given its ability to multitask DOS Windows applications, be the most logical successor to DOS. At this point, however, getting OS/2 2.0 to work smoothly, particularly in a mixed-vendor environment, requires time, resources and more than rudimentary technical expertise.

While OS/2 should run on any IBM-compatible system and does run on many, it may balk at some configurations.

For example, I've been working with OS/2 2.0 in a stand-alone mode multitasking OS/2 and DOS sessions on non-IBM hardware (see related story page 95).

During a period of about eight days, the OS/2 installation program failed at least 24 times, at different stages and with intermittently variable error messages, sometimes occurring in combination. Problems are still popping up after installation that have yet to be resolved.

That there are compatibility problems at this point is not surprising, given the difficulty of introducing a new, sophisticated operating system into a diversified and no longer standardized PC market.

What is important is that both IBM and third-party hardware suppliers work fast to resolve problems and that early adopters not be blindsided by complications.

After several months of working with my particular configuration, I've developed some knowledge of where problems can crop up, whether they can be avoided and — if they can — how to do it.

Advice: If you decide to use Extended Industry Standard Architecture (EISA), watch out for compatibility and support problems. Hard disk and video performance over a 32-bit data path is significantly faster than that of an AT compatible's 16-bit XT/AT bus, also known as Industry Standard Architecture.

If you want to ensure IBM compatibility and support, the 32-bit option is IBM's Micro Channel Architecture (MCA)-based Personal System/2. But some users, like myself, already have or prefer generic hardware. The 32-bit non-IBM alternative to MCA is the EISA bus.

I assembled my system from components, which was a risky option because many EISA system board makers (such as Micronics Computers, Inc., the maker of my 486/33 board) do not license OS/2. I'm also dependent on components vendors and IBM working together to solve any issues that crop up.

EISA's primary advantage is its backward compatibility with older AT cards such as memory extension, hard disk, video and Bernoulli box adapters, which IBM's MCA does not support.

While such XT/AT cards do not take advantage of the full EISA bus potential, such compatibility is important because EISA-specific equivalents have been slow to emerge and tend to be expensive.

But with OS/2, preserving old XT/AT cards may not always be possible. Even when it is, performance might not be acceptable. For example, OS/2 does not like some older, slower memory extension cards.

When my installation program kept crashing, it took me a lot of trial and error to identify the 8M-byte random-access memory card as one of the culprits. I had to replace the card (which cost $1,000 about four years ago and costs about $250 today) with faster system board memory, which cost about $700.

Continued on page 94

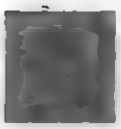
Pascal is a Washington, D.C.-based independent consultant, teacher and writer specializing in relational databases and SQL technology.

- **Compatibility problems using EISA**
- **Device drivers are not all equal**
- **DOS sessions can produce surprises**

Continued from page 93

One way to avoid compatibility and support troubles is to consider buying an assembled EISA system.

The choice of components may be somewhat restricted, but some of them may come with a licensed, supported copy of OS/2 preinstalled.



Advice: Small Computer Systems Interface (SCSI) drivers distributed with OS/2 support only specific adapters. There are alternatives, but proceed with caution. Given the size of OS/2 system and application files, disks are not a viable option for handling the frequent recommended backups. While a large hard disk with a dedicated backup partition will work, it is safer to use a different physical drive. Either tape drives or faster cartridge drives, such as a Bernoulli box, offer the advantage of "infinite" storage for multiple backups (particularly useful for database management).

For that reason, SCSI adapters can handle up to seven storage devices and are a good option for OS/2.

In theory, SCSI was devised to standardize the interface to storage devices. This should mean that through SCSI, OS/2's built-in support will work with any compliant adapter.

In reality, vendor implementations vary, and consequently, the SCSI drivers currently distributed with OS/2 officially support only IBM, Adaptec, Inc. and Future Domain Corp. adapters. If you have or want another adapter (particularly one that takes specific advantage of the EISA bus), you will need to depend on its manufacturer for OS/2 support.

A generic driver that also comes with OS/2 allows certain other SCSI adapters to work, but it does not take advantage of any of the special features they may provide, such as EISA-specific performance.

If you intend to use removable drives and select a SCSI adapter, not only make sure it supports such drives under OS/2 but also find out which of two available options the adapter-maker has chosen to implement its support: exploiting IBM's built-in OS/2 support for SCSI or developing add-on drivers.

Companies exploit the SCSI support built into OS/2 with a base device driver written to IBM specifications. However, because OS/2 recognizes removable media such as Bernoulli cartridges as large floppies, this approach yields slow performance and causes data compatibility problems between DOS and OS/2.

For example, I have an EISA SmartCache Plus SCSI adapter from Distributed Processing Technology in Maitland, Fla., and a 44M-byte dual drive Bernoulli box from Iomega Corp. in Roy, Utah, for backups. Distributed Processing has recently released an OS/2-based device driver that recognizes Bernoulli cartridges as floppies. Because floppies are not partitioned, OS/2-written data is not visible to DOS and vice versa. This means I can't read OS/2 data in DOS or DOS-written cartridges in a DOS session under OS/2.

Certain vendors' alternative to base device drivers is to develop add-on drivers that in essence recognize removable drives as "removable hard disks." Iomega, for example, has released a driver for the Bernoulli box that supports cartridge partitioning and compatibility between DOS and OS/2 data. However, it works only with Iomega's own proprietary adapter, which is XT/AT, and occupies an additional system slot.

At this point, neither of the two options allows bootability from removable media. The next version of OS/2 may allow it by locking the drive, but this option defeats the idea of removable media. Add-on drivers will continue to offer removable drivers and data compatibility without bootability.

The best solution would be for OS/2 to support bootability as well as removable media and compatibility. However, because that's not how OS/2 was designed, you will have to compromise based on your needs and preferences.

Advice: There are limited options for optimal resolution on non-IBM platforms. The larger the monitor screen and the higher the resolution of the video adapter, the more you will appreciate OS/2's graphical features. You can place more icons and windows on the screen, overlapping them for better viewing.

OS/2 comes with built-in standard Video Graphics Array (VGA) video mode that most video adapters support automatically. But the VGA resolution of 640 by 480 pixels limits the number of icons and windows you can display simultaneously and handle effectively on a 14-in. monitor.

Unfortunately, there is no equivalent to the VGA standard at higher resolutions. Most vendors have their own proprietary modes, collectively called Super VGA, but few have made OS/2 drivers available. OS/2 comes with built-in support for IBM's Extended Graphics Array mode, with resolutions up to 1,280 by 1,024 pixels, and 8514/A mode, with resolutions up to 1,024 by 764 pixels. (The latter is recommended for 16-in. monitors.)

Extended Graphics Array mode is legally restricted to IBM adapters for PS/2 systems, while only one vendor, ATI Technologies, Inc., currently supports 8514/A mode. Therefore, the only options for non-IBM platforms are a VGA or an ATI 8514/A adapter.

Advice: Setting up a DOS primary partition on a hard disk may be necessary to avoid behavior problems. True DOS multitasking is seen as one of the prime advantages of OS/2, which is made possible by a built-in version of DOS customized and optimized for OS/2.

But I found that in my setup, windowed DOS sessions were sometimes quirky. For example, my DOS windows, set to start as minimized desktop icons, behaved erratically; they were only partially painted and

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displayed garbage when I typed commands in them. (IBM has acknowledged a bug.)

Moreover, some older software may not run under the OS/2 version of DOS. It might be possible to work around this problem by setting up windowed sessions of regular DOS that OS/2 can multitask as well, but this setup can be temperamental.

For example, my DOS 5.0 windowed session would not load OS/2's Expanded Memory Manager driver.

Therefore, I couldn't load software drivers and resident programs into high memory to make more conventional memory available to programs. OS/2 issued an error message that warned of a conflict with an adapter, but the message did not specify which adapter or memory address was involved.

Other programs cannot run in windowed sessions because they "misbehave," (i.e., they access resources in a way that does not allow OS/2 to protect the system from crashes). This is true of programs such as Symantec/Peter Norton Computing Group's Speed Disk defragmentation utility, for instance.

My recommendation is to set up a DOS primary partition on the hard disk, from which you can boot DOS and perform tasks that are not possible otherwise. In this context, it is safer to stick with the old (but improved) File Allocation Table, or FAT, format for the OS/2 partition rather than going with OS/2's High Performance File System (HPFS).

Even though HPFS has the advantages of longer file names and better performance, it does not allow DOS and DOS applications to recognize and access the OS/2 partition.

My system components

Besides a 16-in. monitor, my system consisted of the following components:

- **EISA 486/33 system board with 8M bytes of RAM from Micronics Computers in Fremont, Calif.**
- **Ultra Graphics 8514/A video adapter from ATI Technologies in Ontario, Canada.**
- **SmartCache Plus EISA SCSI adapter with 4M-byte cache on board from Distributed Processing Technology.**
- **Dual 44M-byte drive Bernoulli box from Iomega in Roy, Utah.**

Solving the problem

When I came across the various problems with my configuration, I went through the usual support channels to get them resolved. I made at least 10 calls to IBM, involving six people at several levels within the OS/2 support structure. The staff was very prompt in responding to problem reports and was eager to resolve any glitches. I also placed calls to my SCSI adapter vendor, Distributed Processing Technology, and exchanged information on CompuServe, Inc.'s CompuServe IBMOS2 support forum.

Unfortunately, in many instances they could not figure out what was wrong. This was exacerbated by the lack of identical hardware configurations on which IBM can replicate problems. IBM's OEM laboratory tests numerous systems that may include my same components but not my exact configuration.

There was only sparse information in IBM's database of reported problems and IBM manuals, and OS/2 2.0 error messages weren't any help either.

In the end, I used trial and error to get to the bottom of things. For example, I figured out that my installation program was crashing because of my old memory board and SCSI adapter caching.

The fact remains that OS/2 2.0 may not be ripe enough yet for users with low technical expertise or ones who do not have the time and resources to dedicate to problem resolution.

What would it take to make OS/2 2.0 viable for a broader range of experience levels and environments? I have a few suggestions:

- **Add some finishing touches.** IBM must beef up basic diagnostics, such as memory testing, to identify unacceptable memory prior to installation. It must also move to user-friendly memory mapping and management to identify and help resolve conflicts as well as optimize operation and performance.

It should also make its error messages more informative, indicating possible sources of problems and potential avenues for resolving them.

- **Improve generic hardware support.** There should be more drivers available for non-IBM components, particularly SCSI and high-resolution video adapters. There is no reason, for example, why Extended Graphics Array should not be available for non-IBM hardware, especially because it could make OS/2 more attractive to more users. The company should improve removable media support.
- **Personalize customer support.** Each caller should have one support person as a point of contact per problem. In this way, the user doesn't have to repeatedly describe his configuration and his problem.

The contact person should also act as a liaison between IBM and non-IBM technical personnel.

- **Revamp IBM's support database.** IBM invented relational technology. It should bring this knowledge to bear on its support database. There should be one record for each customer, one record for each problematic system reported and one record for each problem reported per system.

The company should standardize the basic configuration details needed for problem resolution, and it should record these details once for each system. This will save time on reporting and recording information for each problem. With solutions and fixes properly recorded in the same database, it should be easier to match them to problems using an appropriate database management system.•

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1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigfa receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

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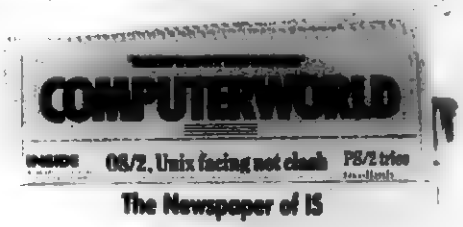

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Atlantic Container Line has promoted 18-year veteran **Jim Levis** to the position of terminal systems manager. Levis, whose previous posts include marine terminal and equipment control supervisor and systems integration manager, is now accountable for development and enhancement of information systems in the South Plainfield, N.J.-based company's terminal area.

As part of several late July management appointments, **Montgomery Ward & Co.** filled a 2-year-old vacancy in its IS department, naming **Joe Collins** vice president of operational planning and chief information officer. Collins, 42, had been a consultant in private practice; before that, he served as executive vice president and chief operating officer at New Jersey-based **Herman's Sporting Goods, Inc.** One of Collins' first duties will be to manage the Chicago-based retailer's recently announced development outsourcing contract with **Electronic Data Systems Corp.**

Late last month **Mortesa A. Rahimi**, formerly vice president at Wayne State University in Detroit, was named vice president of IS and technology at **Northwestern University** in Evanston, Ill. Rahimi, 53, joined Wayne State in 1983 as its IS director.

Martin Bieber has joined **St. Francis Hospital Heart Center** in Roslyn, N.Y., as vice president and CIO. He comes to St. Francis from Beth Israel Medical Center in New York, where he served as vice president of IS.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Nell Margolis, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

What is re-engineering, anyway?

Companies define term as they redefine the way they do business

BY WILLIE SCHATZ
SPECIAL TO CW

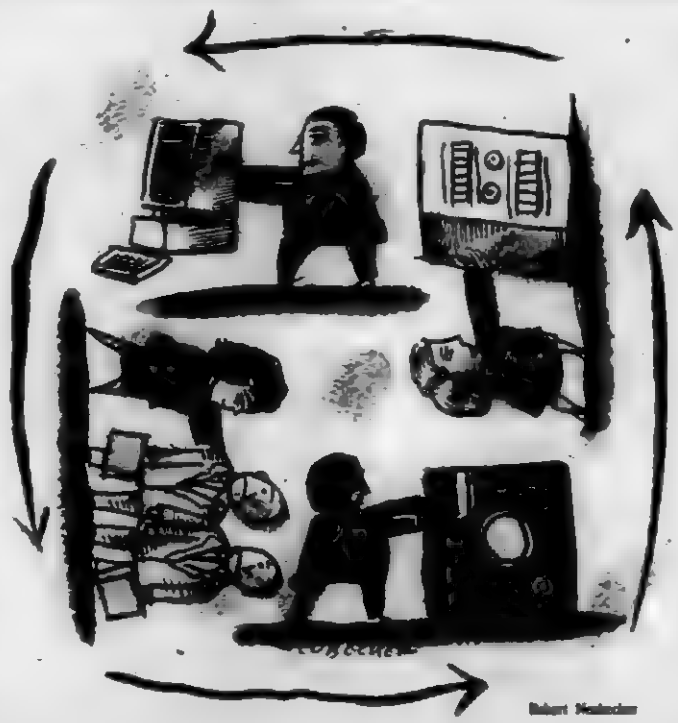
GTE Telephone Operations knew it was not going to be business as usual.

Under a new regulatory scheme, the telephone industry was about to take on the task of dealing with 50 separate state public utility commissions, each with its own price cap to impose.

For GTE — which, as a regulated monopoly, had become accustomed to profit expectations that made scrimping a low priority, the prospect meant a radical reversal. "We knew if we didn't get our costs under control we wouldn't make money," said Blaine Maring, assistant vice president of information systems architecture at the Irving, Texas-based company.

And when GTE went to analyze its business process information, it found that it first had to create a way for such information to be tracked and assembled.

"We had to re-engineer our processes and get to the core of our business," Maring explained. That meant examining every aspect of the company's telephone ordering process, from how it billed customers for service to whether its network could handle the increased traffic created by new customers.



The self-test also required analyzing the company's IS techniques and inventory.

But was GTE Telephone in fact re-engineering? The answer depends on who you ask. Whether it's called re-engineering, total quality management or business process restructuring, firms across the U.S. are reevaluating how they do business — and how information technology can help them do it better — as they respond to increasing competitive pressures.

According to Michael Hammer, the IS consultant credited with putting "re-engineering" into the IS/business lexicon, that makes GTE Telephone the exception rather than the rule. Hammer, who is president of Cambridge, Mass.-based Hammer & Co., contended that most companies re-engineer under extreme circumstances — for example, when their competitors fill orders five times faster than they do.

So when a semiconductor firm, the name of which Hammer declined to reveal, found itself filling orders five times slower than its archrival and heard about the delays from its angry customers, it did a womb-to-tomb number on its order ful-

Continued on page 98

Humana cuts staff, rolls out IS services firm

BY NELL MARGOLIS
CW STAFF

LOUISVILLE, Ky. — Information systems staff members at Humana, Inc. got a firsthand glimpse of both the burdens and the benefits of corporate cost-cutting earlier this month when the health care giant took two different tacks to right its listing finances.

A 400-person administrative staff layoff, sparked by a drop in hospital and health plan revenue, will likely affect the IS work force, Humana spokesman Tom Noland said. Overall, the work force reduction will eliminate some 4% of Humana's Louisville-based positions, Noland said, garnering the company about $11 million in savings. How hard a hit IS will take is as yet undetermined, he added.

At the same time, however — and toward the same overhead-cutting goal — Humana created three new service companies, one of which is an IS spin-off, according to the company.

Effective Oct. 1, F. David Rollo, Humana's senior vice president of medical affairs, will head up an as-yet-unnamed company that will target hospitals with quality assurance, technology assessment and management of clinical IS.

Rollo and fellow executives William Jessee and Paul Shoemaker will start with a staff of approximately 90 people, Noland said. Initial contracts will be with Humana, he added, but the arrangement is nonexclusive; like its two sister subsidiaries, the technology assessment company is free to seek contracts beyond Humana.

Todd Richter, an analyst at Dean Witter Reynolds, Inc., said he expects many small to midsize hospitals to welcome the service, despite the fact that in some sense they will be buying IS expertise from a competitor.

"Competition isn't really a factor here," he noted. "The point is that for years Humana has been the clear leader in evaluating medical technology in terms of cost-effectiveness. This isn't a product they're selling; it's an expertise." If you own 80 hospitals, Richter added, "you can afford to develop it. If you own three, you can't." Those hospitals that increasingly need to benefit from well-honed assessment skills but are in the can't-afford category, he said, may look favorably on the opportunity to cash in on Humana's research at an affordable price.

Randall Huyser, an analyst at Furman Selz, Inc., agreed. However, he pointed out, even though its expectations of success outside the Humana fold are reasonable, the new IS spin-off is a minor element of Humana's overall reorganization strategy.

The "inherent conflict between Humana's two major businesses," Huyser said, is at the heart of the company's financial problems. "The existence of the health plan side has alienated some of the doctors at [Humana-owned] hospitals," he said, triggering a sharp falloff in so-called "private-pay" — nongovernment subsidized — patients.

USX diversifies into information services arena

BY THOMAS HOFFMAN
CW STAFF

PITTSBURGH — Once an icon for U.S. manufacturing, the nation's rust belt has eroded during the past 20 years into a mere handful of manufacturing sites across western Pennsylvania and the Ohio Valley. Its decline has been hastened as foreign nations have ramped up their steel output at lower costs.

However, the savviest U.S. steelmakers have diversified into other industries to supplement their diminishing revenue: Witness, for instance, USX Corp., which recently formed a separate information technology subsidiary.

The yet-unnamed information technology subsidiary, a unit of USX Engineers and Consultants, Inc., will be overseen by Norbert J. Connors Jr., a 32-year USX veteran who has served as the company's general manager of the computer technology group since 1987.

Connors said the new unit's primary focus will be on delivering information services such as systems integration to other process industry members.

A developing group

The unit has evolved during the past five years, according to Connors. In 1991, USX entered a joint venture with Kobe Steel Co. in Japan to form USX-Kobe, a galvanized steel manufacturer. Connors said USX's computer technology unit won a competitive bid to supply the joint venture with a relational database management system-based order-entry tracking system.

Connors declined to reveal which other systems integrators bid on the project. However, he said the new unit will compete against Andersen Consulting, IBM and Digital Equipment Corp. The unit is currently bidding to supply Kobe of America's sales office with an order-entry system similar to the one it is building for USX-Kobe.

So far, the unit has 100 employees working on four projects, including information systems consultation for another major steelmaker.

Connors said he believes the new unit is well-positioned to provide systems integration, application development, consultation and other services to other process industries.

He defined the latter niche as including manufacturers of steel, aluminum, copper, brass and even forest products.

Connors would not divulge the new unit's projected revenue. However, he said, careful analysis led USX to view systems integration as a substantial growth market.

"I don't kid myself. The business, in the early years, is not going to make or break USX Corp.," Connors said.

Given the underwhelming track record of commercial and industrial firms' IS spin-offs of late, so conservative an outlook may be the better part of valor. During the past several weeks alone, Dallas-based paper products player Kimberly-Clark Corp. has effectively folded its once-promising IS spin-off, and retail giant Sears, Roebuck and Co. has tacitly acknowledged its IS subsidiary's lack of viability by merging the company into a new network outsourcing joint venture to be majority-owned by IBM subsidiary Integrated Systems Solutions Corp. [CW, Aug. 24].

THE SAVVIEST U.S. steelmakers have diversified into other industries to supplement their diminishing revenue.

Nothing in stone

Connors said that although the USX unit hadn't planned to offer disaster recovery or outsourcing services to customers, he isn't ruling out either possibility. "We have talked to a few [telecommunications] providers to set up a telecom site at our facility to allow people in this geographic region to set up connections here," Connors said.

He added that the unit has already received several inquiries regarding outsourcing services. Connors said the unit will provide those services "when it makes sense."

Although it operates independently of USX's computer technology group, the unit will draw on USX's data center capabilities, Connors said.

Connors said his former responsibilities will be split between Raymond Rezac, who will oversee USX's data center operations, and Brian Jones, who is responsible for systems development.

CALENDAR

SEPT. 13-19

Software Development Conference and Seminar '92. Boston, Sept. 13-18 — Contact: Miller Freeman Publications, San Francisco, Calif. (415) 905-2741.

Bascon '92/East. Boston, Sept. 15-17 — Contact: Bascon '92, Norwalk, Conn. (203) 852-0500.

DOD-STD Conference. Washington, D.C., Sept. 15-17 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

Crystal Ball '92. San Diego, Sept. 17-19 — Contact: Acumbel, San Diego, Calif. (619) 689-7220.

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Image World. New York, Sept. 21-25 — Contact: Benita Baumann, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

The Fifth Annual New England Computer Operations Conference. South Portland, Maine, Sept. 24-25 — Contact: Jerome Lonsin, Portsmouth Naval Shipyard, Portsmouth, N.H. (207) 438-2815.

SEPT. 27-OCT. 3

Sensors Expo's Seventh Conference. Chicago, Sept. 29-Oct. 1 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 988-4300.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository AD/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

What is re-engineering, anyway?

CONTINUED FROM PAGE 97

fillment cycle. It compressed the chain of steps along the entire production line, making it shorter and faster. It avoided layoffs by having fewer but different people in the mix. And it is now revamping its IS structure.

However, Hammer warned, revamping your systems is not tantamount to re-engineering.

"Business process re-engineering means a radical redesign of the way you work," he said. "IS is the mechanism that allows us to do the processes differently. Too many organizations fall into the cop-out of building new computer systems and saying it's re-engineering."

That message came through loud and clear at Equitable Resources, Inc. (ERI), a Pittsburgh-based gas and oil exploration company. As ERI executed its strategic business plan to grow through acquisitions, it discovered that it was often dancing in the dark.

"We had a lot of data, but we weren't sure we had a lot of information," said Al DeVito, ERI's director of strategic planning. "We were looking at where we wanted to be as a company and what our competition would be doing the next five to 10 years."

In the books

ERI had good accounting information concerning what happened the previous month, the previous quarter or the previous year. But it couldn't determine whether investing in a major company or buying an oil field was a wise economic decision.

The islands of data exploded when ERI began aggressively acquiring gas and oil properties as part of its strategic business plan. The acquisitions were designed to gain instant entry to pieces of the business in which ERI was not engaged but in which it wanted to be established before its competitors. Handling the additional data about the acquisitions' returns on ERI's investments stretched the IS staff to the max.

To cope with the demand, more personal computers started sprouting at employees' desks. So ERI called Alexandria, Va.-based Information Engineering Systems Corp. (IESC) to help with the sudden migration from the mainframe to the desktop. With IESC's assistance, ERI is migrating from an IBM System/36 to a distributed system based on PCs and laptops.

Maring said re-engineering is the correct term for the changes going on at his company — technological redesigns that, like those at ERI, were drafted to facilitate new business blueprints.

"We had to set up new paths into systems and develop shared databases," Maring said. GTE also had to integrate its own query tools so it could access the legacy systems that remained from its original IS setup. That "encircling," as Maring called it, allowed GTE to continue using those systems, some of which are 20 years old, rather than rewriting them or trashing them. GTE Telephone went inside as well as outside for its new IS. It turned to a third party to build a terminal emulator and used its in-house talent to create an LU6.2 peer-to-peer network.

It's been quite a metamorphosis for an "all-Blue" shop that lived and died by the mainframe. Business processes were done manually — and very slowly — on 3270 terminals. Now the company is implementing the processes as applications on its Hewlett-Packard Co. workstations via its Ethernet-based client/server network.

The company made the move because it calculated that a million instructions per second (MIPS) on the desktop costs $100 while a MIPS on the mainframe goes for $100,000.

Who cares?

At the end of the day, does anybody really care which came first, the new IS or the new way of doing business? Terry Smith, IS vice president at St. Louis-based Moog Automotive, Inc., said no. His firm's systems change came first, he said, but was nonetheless intended to drive business change.

"We knew by changing our systems that we would change the way we did business, but we didn't expect nearly the payback we got," Smith said.

Moving from a mainframe-based environment to a client/server system running San Jose, Calif.-based Cooperative Solutions, Inc.'s Ellipse software enabled the company to write the code for its air-tune warranty tracking system in a master installer in 2½ days, he said, rather than the anticipated 130 days.

But does business improvement, which does not make for re-engineering as defined by Hammer, amount to business change, which does? Smith said the distinction may be compelling only to semantic purists.

"The term 're-engineering' has been thoroughly marketized," he said. "But the only thing that matters is that it's real world and it works."

Schatz is a free-lance writer based in Washington, D.C.

IBM staffers get 'SMART' in the UK

Unique concept was designed to push employees away from desks into field to work with customers

BY RON CONDON
IDG NEWS SERVICE

LONDON — IBM's UK-based marketing staffers each have a computer, but they are going to have to get to the office early to be sure they get a desk.

The company has introduced a new office space allotment scheme under which employees carry a portable computer and spend their office time at whatever desk is available.

The introduction of the concept, which is called Space Morale and Required Technology (SMART), coincides with a major relocation of staff members in the south of England. IBM's British subsidiary has moved 1,000 marketing staff members into a new office complex in Feltham near London's Heathrow Airport.

THE STAFF CAN use any desk at their home location on a drop-in basis to access electronic mail and work on the company's internal computer network. Many will be provided with portable computers.

The new location, called Bedfont Lakes, houses marketing staff members who were moved from IBM offices in Richmond, Brentford and Chiswick. Those offices will be closed.

This is the first time the company has used SMART, and according to officials, the concept was designed to ensure that "territoriality" does not become an issue.

The staff can use any desk at their home location on a drop-in basis to access electronic mail and work on the company's internal computer network. Many will be provided with portable computers.

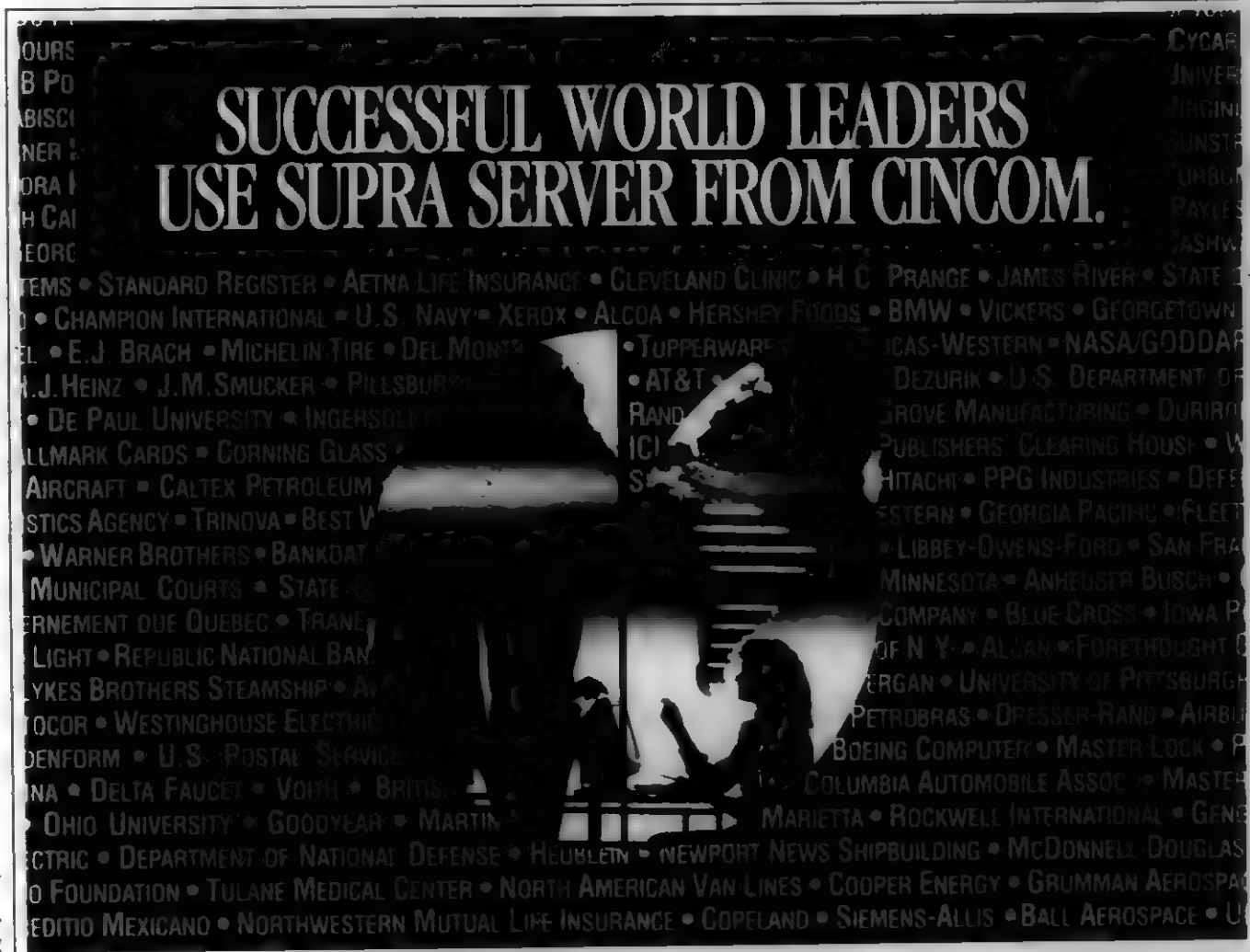
The move is in line with recent comments by Nick Temple, the new chief executive of IBM UK. Temple said he had to take "a chainsaw to the organization" and that he wanted to get most employees out of the office and interacting more closely with the customers.

The new offices, which will become the company's National Marketing Centre, give IBM 185,000 sq ft of space.

The buildings form part of a square that IBM developed in conjunction with MEPC, its first joint venture property development company outside North America. The total development area is 343,000 sq ft, and the remaining offices will be leased to third parties.

Keeping all the work in the family, IBM gave the job of outfitting the offices and preparing them for occupation to Procord, a property and facilities management company spun off by IBM last year.

In its previous corporate incarnation, Procord was IBM's internal property department.



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Two routes to the top: MBA or technical degree . . .

Which is the surest route to the CIO suite, a technical degree or an advanced business degree? This week free-lance writer Sally Cusack compares the career paths of two chief information officers, one of whom earned an MBA and another who obtained a master's degree in computer science.

Richard M. Nydick thanks his master's in computer science for getting his foot in the door for several high-level information systems jobs.

But to stay inside, he's also had to depend on interpersonal and business skills gained in the many IS jobs he's held since college.

As an undergraduate at City University of New York and later as a graduate student, Nydick worked as a senior programmer at American Express Corp.

But Nydick, who wanted to stay in the New York area while completing his master's degree, left Amex to accept a senior programmer/analyst job at Johnson & Johnson in 1978.

During graduate school, Nydick customized his curriculum to include courses in business, economics and manufacturing. The goal, he explains, was to round out his education, better preparing him for the business world.

The rest reads like a classic 1980's recipe for success.

After a two-year stint at Johnson & Johnson, Nydick moved on to management positions at several large corporations, including Knickerbocker Toy Co., Revlon, Inc. and AGS Information Systems.

Nydick: *Lacking an MBA has never been an issue*

Tough times followed. Knickerbocker went out of business, AGS was absorbed by Nynex-Information Solutions Group and Revlon decided to outsource. Still, Nydick applied his experience to his current position at The Hibbert Group, which he joined last year. Today, as vice president of MIS, he has responsibility for telemarketing, inquiry and program administration.

While the IS road hasn't always been smooth for Nydick, he says moving from company to company has had its benefits. He adds that technical know-how gained in his master's program has served him well throughout his career.

"There aren't many systems I haven't worked on," he says, listing IBM mainframes, minicomputers from Digital Equipment Corp. and Hewlett-Packard Co. and IBM Personal Computers and compatible systems.

This broad exposure has proved valuable recently, he says, as companies move toward more networked, heterogeneous environments.

Skills without MBA

Interestingly, Nydick has looked into getting an MBA to supplement his technical degree. But in researching degree requirements, he found his work experience had already provided most of the business skills needed.

"It was a matter of practical payback," he explains. "It would have been a lot of time and energy to get formally accredited for skills I already had."

Lacking an MBA has never been an issue, he adds, though he has beat out many MBA holders for jobs. He says that although 90% of his competitors had MBAs, once he got past the first interview, it didn't matter.

M.S. background

RICHARD M. NYDICK

EXPERIENCE

1991-Present
Vice President, Management Information Systems and Data Services, The Hibbert Group
Direct programming, computer operations, laser printing, data entry, telemarketing, inquiry and program administration functions for the company. Develop a hardware, software and data communications strategy and architecture to support the future of the organization and meet the needs of the customer base. Integrate the business and technical aspects of the organization

1987-1991
Project Development Director, Nynex Information Solutions Group (AGS Information Systems)
Developed project and systems integration business. Also responsible for management consulting, technology assessment, proposal development, sales, sales support and large-scale project management for a wide variety of distribution, manufacturing, insurance and financial companies.

1982-1987
Director of MIS, Professional Products Group, Revlon, Inc.
Direct responsibility for all function activities of business analysis, systems and programming, database administration, data center operations, technical support, computer user services and training.

1980-1982
Manager of Systems Development, Warner Communications, Inc. (Knickerbocker Toy Co.)
Managed all financial and manufacturing systems. Responsible for business analysis, system development, programming and related hardware, software and communications.

1978-1980
Senior Programmer/Analyst, Johnson & Johnson, Inc.

1975-1978
Senior Programmer, American Express Co.

EDUCATION

M.S. Computer Science, Polytechnic University of New York, 1981
B.A. Mathematics, H. H. Lehman College, City University of New York, 1975

He also noted that he would not have been considered seriously for several jobs, including the one at Revlon, without a master's in computer science.

He's confident that a strong technical background is essential for a CIO. Thanks to his degree, Nydick says, "evaluation, selection and implementation of hardware, software, communications, development and integration became a natural process as opposed to difficult or vague tasks."

His advice to students contemplating a master's program: Be sure to integrate solid business and good technical courses.

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. . . Neither is a sure bet, but both can get you there

When Nicholas Rudd graduated from Columbia University with an MBA in 1967, he never envisioned himself as a chief information officer of a major international advertising agency.

In fact, the title "CIO" had not yet been coined. Rudd's experience with computing was limited to a not-for-credit course called "Intro to Computing."

"I went all the way through my graduate degree without ever seeing a computer," Rudd recalls.

But in June 1968, he entered Young & Rubicam, Inc.'s account representative training program. There, he got his first look at the "glass house" run by the electronic data processing department. The raised floors, powerful air-conditioning and "reams of paper everywhere" impressed the trainees, Rudd says, though "no one understood it."

Rudd's first up-close experience with data processing came a year later, when he was assigned to oversee the automation of a manual billing system.

While he preferred pitching clients to following clerical workers preparing data for conversion, Rudd admits he found the automation process "interesting."

Rudd: *Trained to take long-term view*

Rudd encountered computers again in the mid-1970s in a staff position assisting the agency's new business development executive.

Rudd says he realized computers could be a great boon to organizing information. He went on to oversee several data processing initiatives for the new business development group. One evolved into the company's first business database — a project that continues today.

Down the road

As an MBA holder, Rudd says, he was trained to take a long-term view of any situation.

For example, when developing an in-house training program, Rudd came up with the idea of creating a central resource center that would save money and improve use in the long haul.

In the 1970s and 1980s, Rudd became more involved in personnel and human relations projects. He built a corporate staff, linked human resources with strategic planning and business units and conducted training sessions on the importance of managing corporate information. For five years, Rudd pitched corporate officers each year on the need for a single person to plan and oversee technology.

"I kept saying, 'We aren't paying enough attention to computers,' " he recalls. "Corporate execs kept saying 'Yeah, yeah, yeah.' Finally in 1990 they said, 'OK, if this is so important, YOU do it,' " and they appointed him the company's first CIO.

Initially, Rudd says, he had mixed feelings about the role. But thanks to his excellent relationship with an experienced information systems director hired several years earlier, the transition went smoothly.

Today, Rudd, who is also a senior vice president at the firm, presides over a highly decentralized global technology empire than spans 279 offices in 53 countries with a wide variety of equipment and approaches. He guides 150 IS professionals worldwide and oversees outsourcing.

Rudd's business sense seems to have paid off: In six years he has shrunk corporate IS staff from 75 to 22. Many have gone to business units, he explains, whose IS heads report to him.

Rudd says he's also thankful for his MBA for another reason. "Increasingly, the demands on a CIO are not technological," he says. "They are business needs that have to be met."

Business skills pay

As a result, Rudd says, he spends a great deal of time supporting and trying to understand the business activities of the ad agency. It's here that his skills in marketing, customer management, strategic planning, organization design and development really pay off, he says.

Rudd credits his future focus and broad view to his MBA. "If you look at what there is to do in business terms, you can see there are solutions other than writing new code and developing custom applications," he says.

He warns, however, that a traditional MBA curriculum might not be the adequate preparation for business today.

Programs don't always reflect changes now sweeping industry, he says, noting radical changes in manufacturing and marketplace economics that have taken place during the past few years.

"Ultimately, your academic preparation is just a place to start. In the long run it's up to you to understand needs, take advantage of circumstances and be useful to your organization," Rudd says.

Cusack is a free-lance writer based in Marstons Mills, Mass.

MBA background

NICHOLAS RUDD

EXPERIENCE

1990-Present
Chief Information Officer, Young & Rubicam, Inc.
Provide leadership in linking business strategies with information systems, seeking practical uses for technology and treating information as a strategic resource. Ensure strategies across the firm worldwide.

1986-1990
Senior Vice President and Director of Management Services, Y&R
Implemented the corporate function for strategic planning, organizational development and human resource management. Oversaw the development of programs and activities across the company worldwide.

1979-1986
Vice President of Management Services, Y&R
Began to build a corporate function for strategic planning, organizational development and human resource management.

1975-1979
Vice President and Management Supervisor, Y&R
Progressively responsible positions in managing client relationships.

1973-1975
Account Supervisor — advertising, Y&R

1968-1969
Account Executive — advertising, Y&R

1968-1969
Staff Assistant in Y&R's training program.
Training period in advertising for new-hire MBAs.

EDUCATION

MBA, Columbia University Graduate School of Business, 1967
B.A. Liberal Arts, Columbia College, 1964

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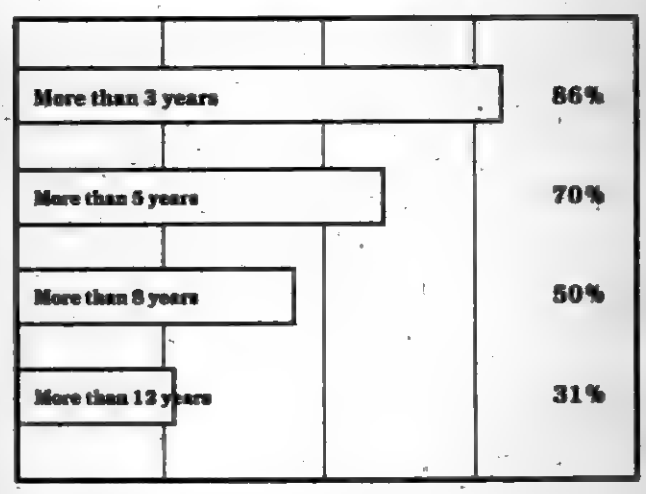

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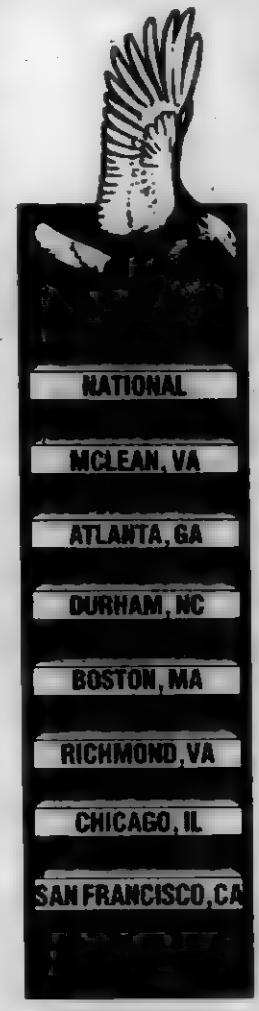

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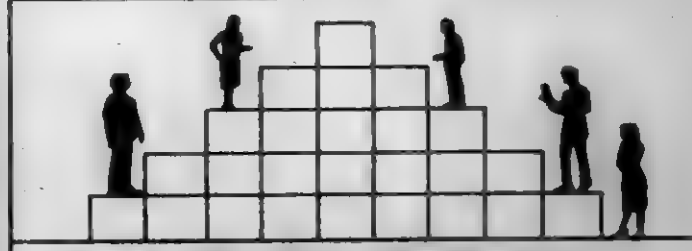

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small-scale computers	46,945
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technical workstations	30,943
Software Vendor	160,264
for large-scale systems	71,152
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SOURCE: Shill Survey of Computerworld's Audience, June 1991.

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Computerworld/Corptech Career Index

IN THE CELLAR – Technology manufacturers lost 1.3% of their work force during the past year.

Percent change in number of employees from April 1991 to April 1992

*Source: U.S. Department of Labor, Bureau of Labor Statistics

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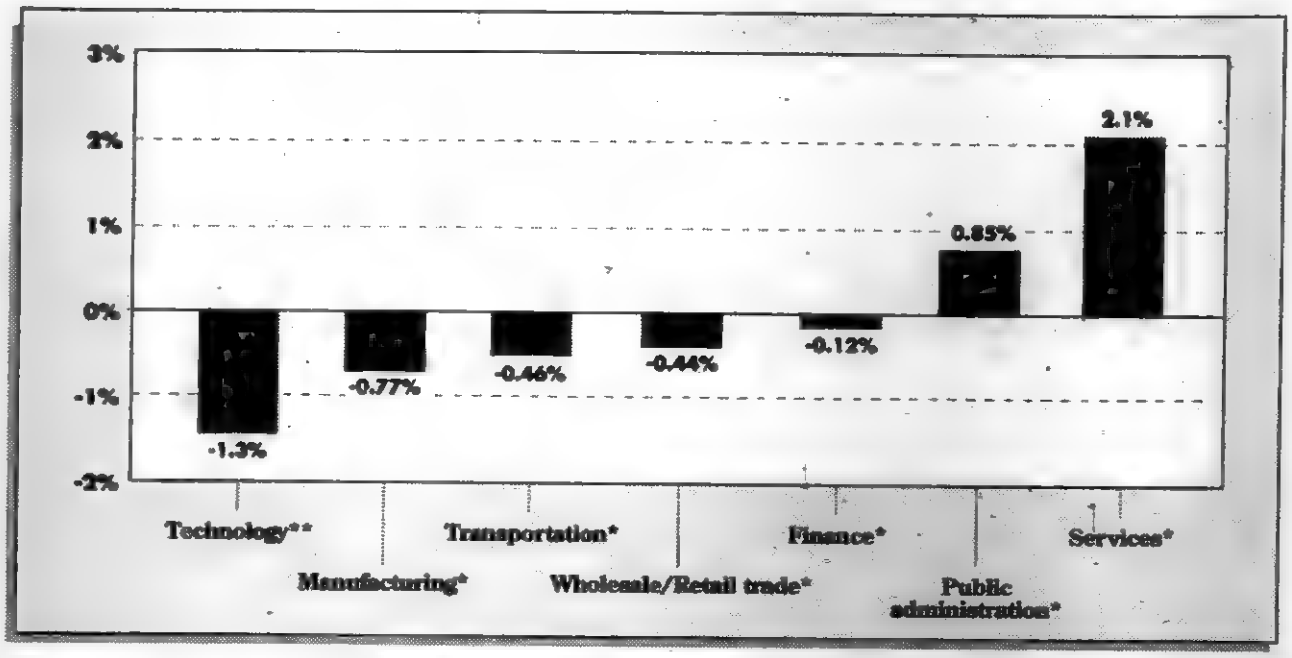

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Issue Date: October 31, 1992
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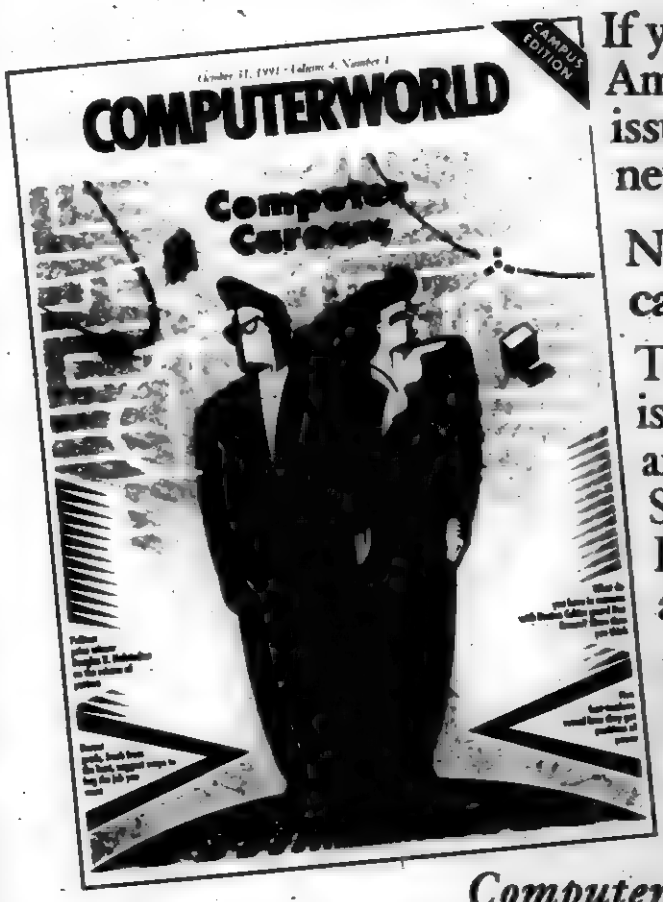

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.
- And much more!

Keeping up with product cycles

BY KARLYN GALE
SPECIAL TO CW

You bought into 486-based personal computers nine months ago. You got a great deal and you think the technology will be around for a while. You're really happy, except for one thing: The machine you bought has already undergone three price cuts, and 586 technology will be available in early 1993.

Anytime you invest in new technology, you play a game of "guess the product life cycle." Vendors continually narrow the window between a new product and the arrival of its technological replacement in order to stay competitive. And that wreaks havoc on your purchase decision.

Once you understand how life cycles work, you will be better prepared to time your purchases.

Generally, PCs and workstations have more compressed life cycles than big-iron machines, although both are shortening. PC vendors take about two years to come out with a new machine, compared with their previous three- to four-year span.

Large-system vendors are in the five-year range compared with their former six-year cycle, while midrange systems take two to four years compared with six to 10 years in the past.

Waiting game

The No. 1 rule of thumb: Don't buy a PC or workstation the day it's announced. If you can afford to wait six months, chances are you can get that same PC for at least half off the starting price.

But don't wait too long. Another vendor is bound to leapfrog that announcement with its own, and the previously "new" product stands a good chance of being made obsolete, which would place you back at square one.

For example, Compaq Computer Corp. just finished revamping its entire PC line and cutting prices on existing products when Dell Computer Corp. came along and cut its PC prices even further. Several clone makers did the same. It's only inevitable that Compaq will cut prices on its newly announced products during the next few months.

In the midrange

Even more radical have been the life cycle changes in medium systems, which have dramatically changed the way buyers should plan their purchases.

Take Digital Equipment Corp.'s recent replacement of the VAX 6000 Series 600 with the VAX 7000 Series 600.

Users looking to buy a VAX system in the performance range of the VAX 6000 Series 610 or the VAX 7000 Series 610 are better off buying the VAX 7000 because it is board-upgradable to the follow-on systems or to future technology such as RISC-Alpha.

In addition, the VAX 7000 Series 600 is a safe bet because DEC is expected to enhance it in 12 to 15 months.

If you don't plan to purchase until the summer of 1993, another strategy is in order: Wait for the new systems to be announced that offer better price/performance. Or you can purchase a VAX 7000 Series 610 because its list price will most likely be cut at that point.

Unlike PCs, whose prices are almost guaranteed to drop within six months of introduction, midrange products need to be out for about a year before their prices fall. Even bigger savings come when the vendor is about to replace the system.

Residual values

Short product life cycles dramatically change computer equipment's resale value. You can no longer get back half of what you paid when you try to sell a system two years after you bought it.

The faster products are announced, with more aggressive price/performance improvements, the faster the equipment's value will decline after purchase.

Compressed life cycles have brought residual values to an all-time low today. So even if you hear vendors tout high residuals because of an easy board or chip upgrade, don't believe them.

Even though upgradable equipment may seem to retain value — because it won't appear on the secondary market as fast as equipment that consists of full box-swaps — the used value of the original system must still drop to account for the price/performance improvements of the new system, less discounting.

Gale is a senior research analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Purchase highs and lows

The following are the four major phases through which all computer equipment passes:

➤ **Introduction:** Begins when the equipment is first actively marketed by the vendor. Lasts approximately three months for PCs and midrange systems.

➤ **Growth:** Occurs once the product has been accepted by the market and sales increase substantially. Competition from vendors is strong during this stage. As a result, pricing, features and other marketing issues start to become important. However, demand is strong enough that original pricing remains relatively unchanged. Lasts three months for PCs, four months for midrange systems.

➤ **Maturity:** Has traditionally been the longest stage in the product's life cycle. Demand begins to ebb, and sales growth slows down. Price cuts occur or discounts increase for the product as sales of the replacement product increase. Lasts three months for PCs, five months for midrange systems.

➤ **Decline:** Sales decline, and the product is no longer marketed. The residual value of the product is low and largely dependent on the reputation of the equipment, the installed base and the vendor's maintenance and support policies. Lasts three months for PCs and midrange systems.

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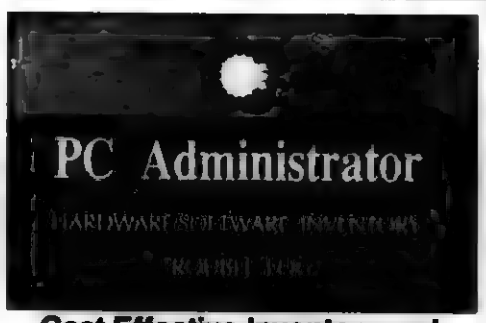

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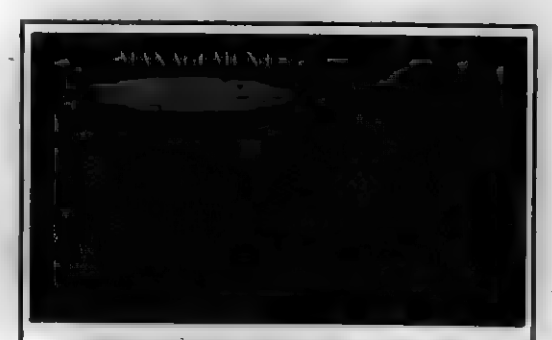

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ADVERTISERS INDEX

Andersen Consulting	62
Applied Business Technology	72-73
Association for Information and Image Management	49
AT&T Business Communications Services	30-31
B I Moyle Associates, Inc.	77
Bachman	C3
Borland International	79
Cincom Systems	99
ComNet	76
Compaq Computer	76/77
CW Recruitment	96
CW Marketing	63
CW Recruitment	24, 64, 73, 90
Digital Equipment Corp	58-59
EDS	94-95
Emerging Technology Application	64
Hewlett-Packard	18-19, 29, 62
IBM	22-23, 50-51, 68-69
IMC	52
Inference Corp	20
Information Builders	17
Informix	89
Intel	26-27
Knowledgeware	25
Kodak	54-55
Lexmark	40
Lotus Development Corp	74-75
Micro Focus	11
Microsoft	38-39, 70
Multi-Tech Systems	15
Okidata	24
Oracle Corp	7, 9
Ross Systems	10
SAP America	80
SAS Institute	21, 36, 66
Soft-Switch	81
Software Engineering of America	C4
Sun Microsystems	92
Sybase, Inc.	13
Syncsort	3
Systems Center	5
Unisys	34-35, 60
Universal Data Systems	67
Wang Laboratories, Inc.	42
WHITE PAPER	41-60
XDB	37

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COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

STOCK TRADING INDEX

Industry Almanac

ANALYSIS IN BRIEF: PCs AND SEMICONDUCTORS

Andrew Neff and John Ford
Bear, Stearns & Co.
Aug. 14, 1992

Unit volumes of personal computers continue to jockey upward, in part because of the ongoing price wars. As pressure builds in the PC industry, new products and price cuts from the front-runners have stunted many second-tier players, forcing layoffs, losses and cutbacks. September appears to be the month for price cuts, as vendors such as **IBM (IBM), AST Research, Inc. (ASTA), Dell Computer Corp. (DELL) and Compaq Computer Corp. (COMPAQ)** are slated to introduce new products in the low-price category.

Despite all of the unrest, demand for **Apple Computer, Inc. (AAPL)** products remains solid. On the PC side, the shift to 1486-based products will likely benefit **Intel Corp. (INTC).**

LISA DAVIDSON

Chips and dip

Selected microcomputer and semiconductor stocks trading near year highs	52-week high	Closing price 8/25	Rating*
Dallas Semiconductor Corp.	$10.88	$10.00	
Motorola, Inc.	$88.13	$85.13	●
Texas Instruments, Inc.	$42.38	$38.00	●
Stocks trading close to year lows	**52-week low**	**Closing price 8/25**	**Rating***
Advanced Micro Devices, Inc.	$7.38	$9.13	●
Apple Computer, Inc.	$41.50	$44.38	
Chips and Technologies, Inc.	$4.13	$4.25	●
Everex Systems, Inc.	$2.13	$2.25	●
Micron Technology, Inc.	$12.13	$15.00	●
Tandy Corp.	$22.25	$23.38	●
VLSI Technology, Inc.	$6.00	$6.50	
Xilinx, Inc.	$17.25	$20.63	●

*Shearson Lehman Brothers, Inc. rating

Not rated ● Neutral Outperform
● Buy ● Underperform ● Hold

Source: Shearson Lehman Brothers, Inc., *Wall Street Journal*

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 28, 1992

TOP PERCENT GAINERS

Wang Labs Inc. (b)* (L)	83.47
Software Publishing Corp.	25.00
Rasterops (L)	17.65
Gateway Communications	17.39
Sierra Semiconductor (L)	14.29
Archive Corp.	13.21
Artel Communication Corp. (L)	12.50
Chipcom Corp.	10.34

TOP PERCENT LOSERS

Picturetel Corp. (L)	-27.56
Chips and Technologies (L)	-25.00
Computervision Corp. (L)	-17.71
Ross Systems	-16.67
Data Switch Corp.	-14.81
Comshare Inc.	-14.10
Compression Labs Inc.	-12.50
Bolt, Beranek & Newman	-11.76

TOP DOLLAR GAINERS

Microsoft Corp.*	4.63
Matsushita Electronics	4.13
SMC Software Inc.	3.50
Parametric Technology	2.88
Novell Inc.*	2.75
Chipcom Corp.	2.25
Software Publishing Corp.	2.00
Compaq Computer Corp.*	1.88

TOP DOLLAR LOSERS

Picturetel Corp. (L)	-4.38
Adobe Systems Inc.	-3.75
Octel Communications Corp.	-2.50
Nynex Corp.*	-2.25
Computervision Corp. (L)	-2.13
Southwestern Bell Corp. (H)	-2.00
Computer Sciences*	-1.38
Harris Corp.	-1.38

Exch	52-Week High	52-Week Low		Aug. 28 Close	Wk Net Change	Wk Pct Change
Communications and Network Services					Off 1.01%	
OTC	15.00	8.00	3 COM Corp.*	11.63	0.75	6.90
NYS	70.63	56.25	American Info Techs Corp.*	68.63	-1.13	-1.61
NYS	44.38	32.88	AT&T*	42.25	-0.50	-1.17
OTC	4.25	0.88	Artel Communication Corp. (L)	1.13	0.13	12.50
NYS	50.63	40.25	Bell Atlantic Corp.	48.63	-0.63	-1.27
NYS	56.50	43.38	Bellsouth Corp. (H)	53.50	-0.88	-1.61
NYS	6.88	3.75	Bolt, Beranek & Newman	3.75	-0.50	-11.76
NYS	66.88	36.63	Cabletron Systems	66.63	1.13	2.03
OTC	31.00	17.50	Chipcom Corp.	24.00	2.25	10.34
OTC	53.75	18.63	Cisco Systems Inc.	46.38	-0.88	-1.85
OTC	35.25	6.00	Compression Labs Inc.	6.13	-0.88	-12.50
OTC	3.38	0.88	Data Switch Corp.	1.44	-0.25	-14.81
NYS	23.63	12.63	Digital Comm. Assoc.*	18.63	0.25	1.36
OTC	16.75	8.00	Digital Systems Int'l Inc.	9.25	0.25	2.78
OTC	7.00	3.63	DSC Communications	6.50	0.38	6.12
OTC	10.88	4.75	Fibronix Int'l Inc.	5.38	0.00	0.00
OTC	37.50	10.50	Fiserv Corp.	13.75	0.00	0.00
OTC	3.38	1.13	Gandalf Technologies Inc.	2.13	0.13	6.25
OTC	2.25	0.88	Gateway Communications	1.69	0.25	17.39
NYS	5.50	2.13	General Datacomm Inds.	3.00	-0.38	-11.11
ASE	5.88	0.50	Go Video	2.63	-0.13	-4.65
NYS	35.63	28.63	GTE Corp.*	34.75	-0.25	-0.71
NYS	70.63	50.00	ITT Corp.	66.13	-0.50	-0.75
OTC	38.13	25.25	MCI Communications Corp.	32.63	0.25	0.77
OTC	14.50	2.25	Microcom Inc.	3.75	-0.13	-3.23
NYS	18.25	9.50	Network Equipment Tech.*	11.25	0.25	2.27
OTC	25.50	8.00	Network General	9.38	-0.88	-8.54
OTC	20.00	8.50	Network Systems Corp.	11.13	0.38	3.49
OTC	17.88	5.63	Newbridge Networks Corp.	15.88	-0.63	-3.79
NYS	49.25	33.75	Northern Telecom Ltd.*	34.25	-0.38	-1.08
OTC	65.00	31.75	Novell Inc.*	50.25	2.75	5.79
NYS	88.38	69.13	Nynex Corp.*	83.25	-2.25	-2.63
OTC	37.50	16.50	Octel Communications Corp.	22.25	-2.50	-10.10
OTC	9.88	4.00	Parrit Data Comm. Newks.	5.13	-0.13	-2.38
OTC	53.00	10.50	Picturetel Corp. (L)	11.50	-4.38	-27.56
OTC	16.75	9.75	Proteon Inc.	12.75	-0.25	-1.92
NYS	27.38	11.63	Scientific Atlanta Inc. (H)	26.75	-0.50	-1.83
NYS	99.00	53.75	Southwestern Bell Corp. (H)	98.63	-2.00	-2.91
NYS	26.63	20.75	Sprint Corp.	23.13	-0.25	-1.07
OTC	13.75	4.00	Standard Microsystems Corp.	12.88	0.88	7.29
OTC	35.75	14.25	Synoptics Communications	34.88	0.88	2.57
NYS	40.00	32.88	US West Inc.	38.00	-0.75	-1.94
OTC	41.50	24.00	Wellfleet Communications	38.25	0.50	1.32
PC and Workstations					Up 1.33%	
OTC	14.50	4.50	Advanced Logic Research	4.50	-0.25	-5.26
OTC	70.00	41.50	Apple Computer Inc.*	45.00	0.25	0.56
OTC	32.25	11.25	AST Research Inc.* (L)	12.25	-0.25	-2.00
NYS	19.25	6.75	Commodore Int'l (L)	7.50	0.38	5.26
NYS	36.75	22.13	Compaq Computer Corp.*	30.63	1.88	6.52
OTC	29.00	13.91	Dell Computer Corp.	24.88	0.00	0.00
OTC	7.75	2.13	Everex Systems Inc.	2.25	-0.25	-10.00
NYS	34.00	21.25	Harris Corp.	29.38	-1.38	-4.47
NYS	86.00	44.63	Hewlett-Packard Co.*	55.75	-1.00	-1.76
NYS	29.75	14.13	Silicon Graphics	21.88	0.63	2.94
OTC	35.88	20.76	Sun Microsystems Inc.*	28.63	0.75	2.90
NYS	31.25	22.25	Tandy Corp.* (L)	23.88	1.38	6.11
NYS	11.13	6.13	Zenith Electronics	6.88	0.25	3.77
OTC	25.50	3.13	Zeos International Ltd.	3.13	0.00	0.00
Large Systems					Up 5.99%	
ASE	20.63	11.63	Amdahl Corp.*	13.50	0.38	2.86
NYS	16.13	7.50	Cerdian Corp.	15.38	0.38	2.50
NYS	16.38	5.75	Convex Computer	5.88	0.00	0.00
OTC	19.63	1.88	Cray Computer	3.25	-0.13	-3.70
NYS	52.25	22.75	Cray Research Inc.* (L)	23.63	0.25	1.07
NYS	22.50	7.13	Data General Corp.	7.75	0.00	0.00
NYS	65.50	33.25	Digital Equipment Corp.*	36.63	1.50	4.27
NYS	105.38	81.63	IBM*	87.38	1.63	1.90
OTC	13.25	7.50	Kendall Square Research	9.00	0.50	5.88
NYS	121.25	88.25	Matsushita Electronics	100.50	4.13	4.29
OTC	19.75	7.50	Pyramid Technology (L)	8.50	0.38	4.62
OTC	17.88	8.13	Sequent Computer Sys.	15.50	0.00	0.00
OTC	19.38	5.00	Sequoia Systems Inc.	6.75	-0.25	-3.57
NYS	54.25	36.75	Stratus Computer Inc.*	42.38	-0.25	-0.58
NYS	15.13	9.50	Tandem Computers Inc.*	10.38	-0.13	-1.19
NYS	11.75	3.63	Unisys Corp.*	9.13	0.00	0.00
ASE	7.50	0.25	Wang Labs Inc. (b)* (L)	0.69	0.31	83.47
Software					Off 0.67%	
OTC	68.50	33.00	Adobe Systems Inc.	33.00	-3.75	-10.20
OTC	13.25	2.50	Ai Corp.	4.00	-0.25	-5.88
OTC	45.00	11.50	Aldus Corp.	12.00	-1.00	-7.69
OTC	19.75	6.50	American Software Inc.	8.88	-0.25	-2.74
OTC	20.00	9.63	Ask Computer Systems	13.25	-0.25	-1.85
OTC	52.00	23.25	Autodesk Inc.	45.50	0.38	0.83
OTC	37.75	7.63	Blackman Info. Systems (L)	7.63	-0.63	-7.58
OTC	42.50	30.50	BGS Systems Inc.	38.50	0.50	1.32
OTC	79.00	37.25	BMC Software Inc.	49.75	3.50	7.57
OTC	20.50	9.00	Boole & Babbage	18.25	0.00	0.00
OTC	86.75	35.00	Borland Int'l Inc.*	40.25	0.13	0.31
OTC	11.25	3.63	CE Software	4.13	-0.13	-2.94
ASE	14.63	6.50	Cheyenne Software Inc. (H)	14.63	0.38	2.63
OTC	29.38	7.25	Cognos Inc.	7.75	-0.50	-6.06
NYS	17.00	7.50	Computer Associates*	13.88	0.13	0.91
OTC	21.25	8.38	Computervision Corp. (L)	9.88	-2.13	-17.71
OTC	47.88	6.50	Comshare Inc.	8.38	-1.38	-14.10
OTC	25.50	11.50	Easel Corp.	8.38	0.00	0.00
OTC	6.63	3.50	Group I Software	15.00	0.00	0.00
OTC	38.25	18.50	Magen Systems Inc.	4.50	0.25	5.88
OTC	39.75	6.00	Information Resources	23.00	0.00	0.00
OTC	22.38	12.50	Informix Corp. (H)	37.50	-0.25	-0.66
OTC	15.00	6.25	Intergraph Corp.	13.75	0.25	1.85
OTC	20.25	9.75	Interleaf Inc.	8.75	0.25	2.94
OTC	30.00	10.50	Intersolv Inc.	15.13	1.13	8.04
OTC	45.25	24.50	Knowledgeware Inc.	11.63	-0.38	-3.13
OTC	39.75	15.50	Legent Corp.*	41.50	0.50	1.22
OTC	7.38	1.88	Lotus Development*	16.25	-1.00	-5.80
OTC	22.25	8.50	Mace Software	2.00	-0.25	-11.11
OTC	37.25	27.25	Mentor Graphics	8.00	0.00	0.00
OTC	30.50	6.50	Micro Focus	32.13	1.13	3.63
OTC	68.84	53.34	Microgrph Inc.	8.00	-0.25	-3.03
OTC	21.13	10.25	Microsoft Corp.*	74.38	4.63	6.63
OTC	43.00	15.50	Oracle Corp. *	17.38	-0.13	-0.71
OTC	11.00	3.50	Parametric Technology	40.75	2.88	7.59
OTC	25.25	12.13	Phoenix Technologies	4.13	-0.50	-10.81
OTC	48.50	29.00	Platinum Technology	16.38	0.25	1.55
OTC	28.63	4.00	Progress Software Corp.	40.00	-0.13	-0.31
OTC	32.75	11.75	Quarterdeck Office Sys.	4.38	-0.25	-5.41
OTC	28.25	7.50	Rainbow Technologies Inc.	16.25	0.00	0.00
OTC	17.25	5.38	Rasterops (L)	10.00	1.50	17.65
OTC	12.13	8.50	Ross Systems	8.88	-1.38	-16.67
OTC	28.25	7.50	Saperia USA Inc.	10.75	-0.13	-1.15
OTC	8.50	2.00	Software Publishing Corp.	10.00	2.00	25.00
OTC	7.25	1.75	Software Toolworks Inc.	3.25	0.25	8.33
OTC	16.50	8.25	Spinnaker Software	2.38	0.13	5.56
OTC	13.50	7.75	State of the Art.	6.50	-0.25	-3.70
NYS	25.25	13.75	Sterling Software Inc.	16.25	-0.38	-2.01
OTC	30.00	12.50	Struct. Dynamics Research (L)	13.25	0.25	1.92
OTC	31.75	15.25	Sybase Inc.	29.25	0.75	2.63
OTC	51.00	15.50	Symantec Corp. (L)	17.00	-0.25	-1.45
NYS	15.50	5.25	Systems Center Inc.*	5.75	-0.63	-9.80
OTC	34.25	12.34	System Software Assoc.	26.00	-0.50	-1.89
OTC	23.75	14.50	Wallser Interactive Systems	15.75	0.50	3.28
OTC	6.63	2.13	Wordstar	2.25	0.00	0.00
Semiconductors					Off 0.12%	
NYS	21.50	7.38	Advanced Micro Devices	9.50	0.88	10.14
NYS	11.13	7.00	Analog Devices Inc.	8.50	-0.25	-2.86
OTC	13.88	8.75	Atmel Corp.	8.25	0.13	1.54
OTC	14.13	3.38	Chips and Technologies (L)	3.38	-1.13	-25.00
NYS	21.75	7.38	Cypress Semiconductor Corp	8.63	-0.13	-1.43
NYS	10.88	6.25	Dallas Semiconductor	10.00	0.00	0.00
OTC	66.75	38.50	Intel Corp.*	57.75	1.25	2.21
NYS	9.88	5.38	LSI Logic Corp. (L)	5.38	-0.13	-2.27
NYS	22.38	12.13	Micron Technology	15.25	-0.38	-2.40
NYS	88.13	54.00	Motorola Inc.*	85.88	0.75	0.88
NYS	11.75	3.88	National Semiconductor*	10.00	-0.13	-1.23
OTC	27.00	8.25	Sierra Semiconductor (L)	10.00	1.25	14.29
NYS	42.38	26.00	Texas Instruments*	38.88	0.63	1.63
OTC	10.50	6.00	VLSI Technology	7.00	0.13	1.82
OTC	9.88	2.13	Weitek	3.13	0.00	0.00
ASE	5.63	2.00	Western Digital Corp.	4.25	-0.25	-5.56
OTC	32.50	17.25	Xilinx	21.25	1.50	7.59
OTC	11.50	5.63	Zilog Inc.	6.63	-0.13	-1.85
Peripherals and Subsystems					Up 0.36%	
OTC	10.00	2.75	Archive Corp.	7.50	0.88	13.21
OTC	26.50	12.25	Barefoot Inc. (H)	25.38	0.13	0.50
OTC	23.50	8.63	Cambex Corp.	11.50	-0.25	-2.13
ASE	12.25	4.91	Cognitronics Corp.	10.13	-0.63	-5.81
NYS	23.88	12.50	Conner Peripherals*	19.38	0.25	1.31
ASE	19.88	4.38	Datatrain Corp.	7.25	0.25	3.57
NYS	19.25	5.88	EMC Corp.	16.75	0.25	1.52
OTC	9.88	4.75	Emulex Corp.	6.13	0.00	0.00
OTC	23.00	14.25	Evans & Sutherland	15.75	-0.25	-1.56
OTC	40.63	19.88	Exabyte	23.63	-0.25	-1.05
OTC	27.25	15.75	Intelligent Info. Systems	22.00	-0.25	-1.12
OTC	11.25	4.75	Iomega Corp.	7.13	0.00	0.00
OTC	34.75	11.00	IPL Systems Inc. (L)	11.00	-1.00	-8.33
OTC	24.50	10.75	Komag Inc.	15.75	0.50	3.28
OTC	14.00	3.44	Maxtor Corp.*	13.75	0.38	2.80
OTC	12.63	5.75	Micropolis Corp.	8.75	-0.38	-4.11
NYS	101.25	85.25	3M Co.	98.50	0.25	0.25
OTC	7.25	3.50	Printronix Inc.	6.25	-0.25	-3.85
NYS	28.75	7.00	QMS Inc.	8.50	-0.25	-2.86
OTC	16.00	8.88	Quantum Corp.	13.75	0.00	0.00
OTC	12.75	6.00	Radius Inc.	8.75	0.13	1.89
NYS	12.88	5.88	Recognition Equipment	9.38	0.00	0.00
OTC	13.13	5.38	Xerox Inc.	9.50	0.25	2.70
OTC	17.63	7.25	Seagate Technology*	13.38	0.50	3.88
NYS	78.00	28.75	Storage Technology* (L)	29.50	0.63	2.24
NYS	29.88	16.00	Tektronix Inc.	19.50	0.25	1.30
NYS	82.25	56.88	Xerox Corp.	75.63	1.50	2.02
Services					Off 0.86%	
OTC	18.88	11.88	American Mgmt. Systems* (H)	18.75	0.13	0.67
NYS	5.38	2.88	Anacomp Inc.	3.13	-0.25	-7.41
OTC	19.00	12.50	Analysts Int'l	17.50	0.75	4.48
NYS	49.00	32.38	Auto Data Processing*	43.13	-0.75	-1.71
NYS	24.16	12.50	Comdisco Inc.*	16.50	0.00	0.00
OTC	13.50	7.75	Computer Horizons	8.50	-0.88	-9.33
NYS	84.88	67.00	Computer Sciences*	84.13	-1.38	-2.10
OTC	10.13	7.00	Computer Task Group	8.13	0.00	0.00
OTC	40.50	16.00	CompUSA Inc.	26.00	0.75	2.97
OTC	19.25	7.00	Corporate Software	7.13	-0.63	-8.06
OTC	30.75	9.75	Egghead Discount Software	10.25	0.25	2.50
NYS	33.06	23.19	General Motors E (EDS)*	28.75	0.75	2.68
OTC	30.38	6.25	Intelligent Electronics	9.63	0.63	6.94
OTC	14.88	3.00	Mentel	7.00	-0.50	-6.67
OTC	15.75	7.00	Microage Inc.	8.50	-0.38	-4.23
OTC	27.50	15.34	Paychex	27.25	1.75	6.86
NYS	73.00	48.50	Policy Management Sys.	69.50	-0.38	-0.54
NYS	44.50	22.63	Reynolds and Reynolds	41.75	0.00	0.00
OTC	32.00	21.25	SEI Corp.	23.09	-0.13	-0.54
OTC	24.38	16.88	Shared Medical Systems	20.00	0.13	0.63
OTC	26.25	13.50	Sungard Data Systems	25.75	0.25	0.98
NYS	4.00	1.13	Ultimate Corp.	1.88	-0.13	-7.14

KEY: (H) = New annual high (L) = New annual low
* Companies tracked in Computerworld Stock Index

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IN BRIEF

Novell up 53% in Q3

■ Continuing its juggernaut, **Novell, Inc.** last week posted third-quarter net earnings of $66 million, an increase of 53% from the comparable period last year. Revenue in the period was up 43% to $243 million. The Provo, Utah-based firm attributed its strong results to continued demand for network software products and its acquisition of Digital Research, Inc.

■ **Ross Systems, Inc.** reported fourth-quarter net earnings of $2.3 million, up 228% from the corresponding period last year. Revenue for the period rose 24% to $23.3 million. For the year, revenue and profit rose 23% and 311% to $75.9 million and $4.2 million, respectively. The Redwood City, Calif.-based developer cited initiatives into the Hewlett- Packard Co. market and Unix, fourth-generation language and client/server software markets for its strong financial showing.

■ **System Software Associates, Inc.** reported a 53% jump in profits to $5.8 million for 1992's fiscal third quarter compared to $3.8 million a year ago. The Chicago-based software maker, which caters to the IBM Application System/400 market, booked sales of $55.6 million, up 49% from 1991's third-quarter tally of $37.2 million. Sales of AS/SET, the company's application development product, grew for the period, compared with last year, according to a spokesman.

■ **Bachman Information Systems, Inc.** credited brisk sales of an enhanced version of its flagship application development tool for contributing to a 45% fiscal fourth-quarter revenue growth to $15.1 million this year. Profits more than doubled for the quarter to $1.3 million. Year-end profits totaled $2.8 million, up 6% from 1991; revenue increased 52% to $48 million.

Imaging remains key to Wang's future

BY ELLIS BOOKER
CW STAFF

LOWELL, Mass. —The shadow cast by Wang Laboratories, Inc.'s Chapter 11 filing two weeks ago also covers its often-praised electronic document imaging products, including a promising suite of open systems-based offerings that had become a key aspect of Wang's Office 2000 strategy.

"The imaging software they have now as part of Office 2000 is very good, very functional and covers virtually all the platforms one would want to do business on," said Walter Novinger, a senior partner at the Berkeley, Calif.-based consulting firm of Shaw, Novinger & Odell.

In the next breath, however, Novinger said that Wang's imaging business is not enough to pull the firm out of its current financial crisis. By some estimates, Wang's imaging sales have declined sharply from a high of $90 million in 1990 (see chart).

Wary customers

Given that even healthy vendors, such as FileNet Corp. and Recognition Equipment, Inc., are having difficulty selling skittish customers on imaging, does Wang honestly think it can attract users now?

"We grew [the imaging business] 25% last year, better than the overall market, which fell into single digits," said Dave Goulden, Wang's vice president of marketing. While not willing to provide actual numbers, Goulden labeled industry estimates that these revenues would be under $35 million this year as "grossly inaccurate. To my knowledge, none of our existing orders for WISS or Open/image have been canceled since the Chapter 11 filing," Goulden said. "Basically, we remain open for business, and we continue to do business."

Treading water

Analysts count only about 200 of Wang's estimated 750 user sites actually using its Integrated Image System and Open/image products for serious production applications

Source: IDC/Avante Technology CW Chart: Michael Siggins

Wang boldly entered the electronic-document market in 1987 with a proprietary offering, the Wang Integrated Image System (WISS), on its VS platform. But the crown jewel in Wang's strategy, Wang Open/image, is a month away from commercial release. Wang Open/image will enable stand-alone personal computers and local-area networks to access images from an IBM RISC System/6000 server.

Scott McCready, a principal at IDC/Avante Technology, a market research and consulting firm in Framingham, Mass., said he does not think Goulden's bullishness is unwarranted.

"They could reasonably generate $300 [million], $400 [million] or $500 million in sales over the next two or three years," he said.

But McCready said he believes Wang must act "within the next 30 days" to ink joint licensing agreements for core Wang technology with other providers of imaging systems. "They need this credibility fast," he said.

Deals in the works

In fact, during the past several months, Wang had quietly begun exploring such relationships. The most prominent of the deals was signed late last year with Computer Associates International, Inc., which plans a series of image-enabled versions of its most popular database.

"Part of our reorganization plan is licensing, and we'll be aggressively licensing Open/image through alternative distribution channels, as well as our own sales channel," Goulden said.

But McCready, who was briefed by Wang recently, is not sure the troubled firm comprehends the urgency of this strategy. "I'm not sure they realize this is a survival issue," he said.

DEC flexes micro muscle with new PCs

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Last week's introduction of a line of low-cost, Industry Standard Architecture-based personal computers from Digital Equipment Corp. evinces just how seriously the company is pushing to expand its presence in the highly competitive microcomputer market.

The financially strained company is betting that users — both inside and outside its VAX/VMS base — will be attracted to the LP series' relatively low price points, ease of upgradability and technological advances [CW, Aug. 24].

Although DEC only has approximately 1% of the $25.6 billion PC market, according to International Data Corp., analysts have said making headway in this cutthroat business could potentially boost the firm's financial turnaround.

"They're still not out of the woods — a 1% share says you've only got your toe in the water — but a lot of people had not considered them as being in the market at all before," said Dan Ness, senior analyst at Computer Intelligence, a La Jolla, Calif., research firm.

Computer Intelligence lists DEC among the Top 5 fastest growing vendors in the PC market for the past five months.

Key to DEC's strategy is low-cost manufacturing and assembly. Components for the LP series PCs will be manufactured in DEC's Taiwan facility and will then be shipped by boat to integration centers located on five continents. Motherboards will be flown in to the facilities, and the systems will then be assembled locally, avoiding higher customs charges associated with fully assembled boxes.

"It's clever. They get around duties and tariffs, and they make use of worldwide distribution centers," said Chris Christiansen, a research director at International Data Corp., a market research firm in Framingham, Mass. "They're cutting their costs by going to a more efficient distribution system [while also making] enhancements which clearly add value to the boxes overall."

Packaged to move

DEC hopes its new low-profile PC line expands its penetration beyond VAX accounts. Three examples include:

Model*	Price	RAM	Hard Drive	Cache
DECpc 333SX LP	$899	2M bytes	52M bytes	64K bytes
DECpc 433DX LP	$1,849	4M bytes	122M bytes	128K bytes
DECpc 466D2 LP	$2,199	4M bytes	122M bytes	128K bytes

* All models include MS-DOS 5.0 and Windows 3.1 preinstalled, three XT/AT bus slots, two serial ports, one parallel port, keyboard, mouse, video ports and support for up to four disk drives (two floppies and two integrated drive electronics hard drives).

CW Chart: Janell Genovese

The pressures in this market are steep and margins are thin, however. Targeting non-DEC installed bases while turning a profit will be challenging, analysts said.

One large banking firm — a large IBM and DEC site that has IBM and Compaq Computer Corp. PCs in-house — did not go for the new LP series. "Every time we had anyone evaluate them, DEC's PCs came out as good as anyone else's, but we had a commitment to [other PC] technology that we were already using," said a large banking user who requested anonymity. "There wasn't anything in their offering to make us jump."

Christiansen added, "They also will have to sell a lot of $899-priced PCs before there's a substantial margin or profit coming out of those boxes."

Still, analysts are convinced DEC's strategy differs from earlier failed attempts.

"One advantage to the new line is the total commonality of components outside the daughtercard so that there will be less inventory of component parts, and the other is their stockpiling and two-stage pipeline distribution of products," said Steve Widen, an analyst at WorkGroup Technologies, Inc., a research firm in Hampton, N.H.

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Back in the caveman days . . .

"Seldom is there a company ... with experience dating back to man's first LAN ..." (From an MCCommunications press release) — *Wonder if we can use carbon dating to prove that?*

OS/2's Domino Effect

IBM recently set up a huge domino display at the Windows & OS/2 Conference in Boston, celebrating the millionth copy of OS/2 sold. A representative from IBM's millionth customer, Caterpillar, toppled the display, which took three men and 20 hours to complete.

QUIPS & QUOTES

"Careful market research results in one sure thing: You will be late to market."
Stan Cornyn, *president of Warner New Media, a Burbank, Calif.-based developer of CD-ROM audiovisual products.*

You can't keep a good scanner down

The first UPC-reading scanner was installed at Marsh's Supermarket in Troy, Ohio, in 1974. The first item scanned was a 10-pack of Wrigley's gum marked "69 cents." Marsh's price was actually 67 cents, a fact the scanner noted correctly.

Source: Warner-Lambert Co.'s "New[illegible]" (January 1992); *ID* magazine; *Boston Herald*, Aug. 21.

Diskettes For Democracy

The East West Education Development Foundation is making disk copies of the Constitution, Declaration of Independence, Bill of Rights, Magna Carta and other historical documents for communist countries interested in learning about democracy. It also places donated computers into schools.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Have you heard the one about . . .

Q: How many computer programmers does it take to change a lightbulb?

A: None. That's a hardware problem.

or

A: One. The world revolves around them.

or

A: Three, if you're dealing with Dbase III programmers. One to write a bulb insertion routine, one to write a bulb extraction routine, and one to act as a system administrator to ensure that the job doesn't suffer from system lockout.

WYSIWYG design: Michael Siggins

INSIDE LINES

User orientation

▶ A shift is under way in the pricing of Hewlett-Packard's minicomputer software. The company told attendees at an annual user conference in New Orleans last week that it plans to move pricing off a processor-based formula and will instead charge based on the number of users tied into a particular system. Under the processor model, an IS shopkeeper pays more for software after upgrading the CPU, even if the number of users remains constant. This news, which HP disclosed in response to criticism at an open mike session, was well-received by the many users who came to air their grievances. HP said it could implement the user-based pricing within a few months and that it plans to use its own Network License Server software to monitor the number of users on a system.

Window dressing

▶ Meanwhile, HP, which counts its HP/UX Unix and its proprietary MPE among the operating systems it runs on the PA-RISC chip that drives its minicomputers and workstations, may be adding another operating system to the PA-RISC fold. Rich Sevcik, general manager of HP's Commercial Systems Division, told users at roundtable sessions last week that HP is considering porting Windows NT to PA-RISC. Sevcik described the project as "exploratory."

Picture this sale

▶ Atex, Eastman Kodak's publishing software arm, is a company in search of a new owner, according to reports that are filtering back from a user group meeting last week. A spokesman from the company confirmed that the company is indeed on the block and that there are several buyers interested. The sale of the Bedford, Mass.-based firm could go through in the next few weeks, although an early 1993 time frame was also cited.

It's always something

▶ Users in the know have pegged most of Compaq's product backlog on a dearth of disk drives, chiefly from Connor Peripherals. One user said the Prolinea manufacturing line is running at 60% capacity because of this shortage, and another said that for want of a drive, a 50-MHz machine was not to be had.

Taking the high ground

▶ Dell, on the other hand, looks like it is planning to keep away from the competitive sandbox a little more this fall, when IBM is scheduled to make its tardy entry into the low-cost PC arena. Sources say that although Compaq will lower prices again, Dell will probably not be as aggressive in matching the cuts. Of course, Dell has all the business it can handle right now — so much so that the Austin, Texas-based vendor is planning on cutting back on marketing and advertising during the next few quarters.

Equity means business

▶ While Intersolv broke U.S. sales shackles with IBM last week, Synon — a newer AD/Cycle partner — was busy preparing for an announcement planned for today. Synon, a $50 million CASE company in Larkspur, Calif., is expected to unveil an equity deal with IBM. Big Blue owns a piece of other AD/Cycle partners such as Bachman and KnowledgeWare. The move looks like an initial step toward redefining AD/Cycle to focus more closely on Unix and client/server development.

Industry consultant John Logan, executive vice president of the Aberdeen Group, offered some unique interpretations of downsizing and customer relations while delivering a closing presentation at last week's Interex HP user conference. Recalling that IBM had declared 1987 the year of the customer, Logan mused, "They figured out what the customer would pay more for, and they charged him for it." Fast-forwarding to 1992, he advised IS practitioners that "the sneaky way to do downsizing is to delay the mainframe upgrade." And in an observation on the evolving psychology of the often difficult and disruptive downsizing process, Logan noted, "Three years ago, people were 'retrained.' Now they're 'flexible.'" News editor Alan Alper is very flexible — as long as he gets news tips. Phone, fax or CompuServe him at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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COMPUTERWORLD

Cisco offers open APPN option

APPI pitched as alternative for blending SNA with distributed nets

BY JOANIE M. WEXLER
CW STAFF

MENLO PARK, Calif. — Cisco Systems, Inc. stunned the industry last week with a gutsy challenge to IBM's Advanced Peer-to-Peer Networking scheme for migrating its hierarchical Systems Network Architecture to distributed internetworks.

The router market leader announced that it is developing an "open" APPN alternative, dubbed Advanced Peer-to-Peer Internetworking, due out in the third quarter of next year.

APPI is aimed at the plethora of commercial customers who run both large SNA networks and local-area network internetworks, according to Michael H. Zadikian, Cisco's SNA product manager.

IBM warning

The move follows an IBM briefing on APPN that angered some developers because IBM issued a strong warning that APPN developers had better first license IBM's patented technology [CW, Aug. 17].

General user and analyst reaction was that the Cisco offer will ease user architecture migration headaches, force IBM to own up to its APPN Network Node licensing and deployment timetables and get the APPN ball rolling. IBM has already published APPN End Node specifications that give any vendor's device access to APPN network resources.

However, IBM has dragged its feet on letting competitors get their hands on APPN Network Node's sophisticated directory and routing functions for coordinating resource-sharing across peer-to-peer networks, sources said.

Continued on page 15

Users want action from IBM PC unit

Service, prices, delivery cited as key concerns

BY CAROL HILDEBRAND
and MICHAEL FITZGERALD
CW STAFF

SOMERS, N.Y. — After weeks of boisterous speculation, IBM quietly spun off its personal computer hardware organization into a separate unit last week, saying it is now able to play for keeps in an arena where it has increasingly seemed unable to compete.

The new IBM Personal Computer Co., headed by Robert Corrigan, former president of the Entry Systems Division, effectively blends Entry Systems with IBM's National Distribution Division.

An approximately $7 billion company, it will feature PC marketing, vastly slimmed-down distribution, product development and manufacturing all under one roof, which Corrigan said will allow it to get better products to the right markets faster.

Demanding results

Skeptical users and analysts said they are more interested in tangible results than in yet another reorganization by the stumbling computer giant.

"What [IBM does] in terms of organizational structure is not the key issue," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. He said IBM needed to better target its products as well as lower its prices. "I'll wait and see — this could just be smoke and mirrors."

Nelson added that there were no IBM products on New York Life's list of approved products

Continued on page 14

NetWare, host integration still elusive

BY MICHELE DOSTERT
CW STAFF

Eighteen months after Novell, Inc. and IBM announced a new partnership designed to ease integration of NetWare into traditional IBM environments, users said the strategic alliance has so far failed to fill in some gaping holes in the blueprint for NetWare-to-IBM coexistence.

Novell has introduced its NetWare for SAA product, added NetView reporting to its management products and released a NetWare OS/2 requester. Although it now supports NetWare's SPX/IPX protocol, IBM has mostly concentrated on helping Novell connect to and be manageable from the IBM mainframe. IBM has yet to release products that would simplify NetWare connectivity from the IBM side.

Meanwhile, many users are addressing the problem by connecting their NetWare local-area

Continued on page 16

Comparison of annual salaries

	♂	♀	%	$
[illegible]	$61,240	$50,466	21%	$10,774
	$59,896	$50,716	18%	$9,180
	$51,651	$45,174	14%	$6,477
	$51,704	$48,769	6%	$2,935
	$55,687	$54,580	2%	$1,107

Source: *Computerworld* 1992 Salary Survey

CW Chart: Stephanie Faucher

IS pay dips; women still lag

Monetarily speaking, the only thing harder than being an IS manager this year is being a female IS manager. *Computerworld*'s 1992 Salary Survey found that top management posts took some of the biggest salary hits. This news is particularly bad for women, who earn less than their male colleagues in all positions and significantly less in top jobs. Network managers sustained heavy losses, with salaries declining by almost 9%. See Executive Report, page 85.

IS staffers consider the union label

Advocates say increased job security, technical training are key benefits

BY JEAN S. BOZMAN
CW STAFF

The work environment of an information systems professional is notorious for quirky hours, overnight shifts and constant change. Yet a small slice of the IS work force in the U.S. has found a unique way to combine skills with guaranteed technical training and protection from sudden layoffs: Those workers spent Labor Day as card-carrying union members.

In a recessionary economy, with automation of computer operations, downsizing, outsourcing and offshore programming threatening many high-tech jobs, some see unions as providing a higher level of job security, which is typically based on seniority.

IS employees noted that stability is the chief benefit of union membership. "It does afford an amount of protection from management mood swings," said a Boston-based Massachusetts Department of Employment Training programmer who asked not to be identified. "You have to do something substantially wrong to be dismissed."

Still, the union contract that covers the agency's 2,000 workers has lapsed, and state workers — who pay $5 a week for union dues — have not had a pay raise in four years, noted Joseph Garbino, the agency's assistant IS director.

Continued on page 20

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INSIDE

Bob Sacha

Anchor Bank CEO James M. Large Jr. is braving the uncharted depths of re-engineering. See CEO View, page 93.

IN THIS ISSUE

NEWS

4 **Microsoft** to add some antivirus features from **Central Point Software** to the upcoming DOS 6.0.

4 **IBM** discusses its plans for blending AIX and OS/2.

6 Relief agencies use technology to coordinate efforts in the aftermath of Hurricane Andrew.

7 Poor communication has cost **Computer Associates** its affiliation with the city of Boston.

8 **Tivoli Systems** will introduce two products for users of distributed Unix systems.

10 **Borland** updates its **InterBase** relational database server and Paradox SQL Link.

12 AS/400 users say they will likely wait for **IBM**'s upcoming F series before upgrading, despite other new products released last week.

12 **Apple** announces a link between the Macintosh and **IBM**'s AS/400.

14 **New Jersey Bell Telephone**'s purchase of 300 notepad computers is thought to be a test case for parent **Bell Atlantic**.

20 **EDS** wins a 10-year outsourcing contract from insurance company Fremont General.

Quotable

"It does afford an amount of protection from management mood swings. You have to do something substantially wrong to be dismissed."

PROGRAMMER
MASSACHUSETTS
DEPARTMENT OF
EMPLOYMENT TRAINING

On the advantages of being unionized. See story page 1.

DESKTOP COMPUTING

31 PC makers plan pocket-size, task-specific systems.

WORKGROUP COMPUTING

59 Burlington Northern Railroad moves down from big iron to an **IBM** RS/6000.

ENTERPRISE NETWORKING

69 **Network Equipment Technologies** adds frame-relay capabilities to its WAN equipment.

LARGE SYSTEMS

77 **Hitachi Data Systems** plans new user services.

APPLICATION DEVELOPMENT

81 **KnowledgeWare**'s Application Development Workbench 2.7 offers enhancements to all phases of life-cycle development.

MANAGER'S JOURNAL

93 CEO View: **Anchor Bancorp**'s James Large Jr.

EXECUTIVE REPORT

85 CW's 1992 Salary Survey finds that IS staffers are working harder for their paychecks as companies tighten their purse strings.

IN DEPTH

91 Staff integrators can go external integrators one better because of their familiarity with a company's systems and people. By Frances M. Bruce.

DEPARTMENTS

6, 16 News Shorts
24 Advanced Technology
28 Editorial
94 Calendar
95 Intelligence Files
96 Computer Careers
108 Marketplace
112 Stocks
113 Computer Industry
114 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **Users say IBM's PC spin-off must become more price and service conscious if it is to succeed.** But a moment of truth lies ahead for IBM: the user jury's verdict on whether a spate of upcoming product lines pass price/performance criteria. **Page 1.**

■ **IS professionals' salaries are down this year, and that's not all: IS staffers will have to do more for their money,** according to CW's 1992 Salary Survey of information systems managers and professionals shows. The money drop is top-down: The survey logs a 4% to 9% salary slide for CIOs, IS directors and network managers. **Page 85.**

■ **Unions represent only a small percentage of all IS shops nationwide, but they have a steady hold** on shops in some sectors, including state and local government, telecommunications, transportation and hospitals. Members laud increased job security and technical training; some IS managers, however, shudder at the thought of unionization. **Page 1.**

■ **Make way for 'internal information integrators.'** These technically and socially skilled staffers put together a plan for getting at data wherever it resides and mustering the resources needed to put the plan in action. **Page 91.**

■ **Stung by allegedly broken support and development promises from CA,** the city of Boston's IS department is giving the boot to both CA's software and its IBM mainframe platform. It is accelerating plans to move to client/server, Boston information systems chief Allan Stern says. **Page 7.**

■ **Cisco Systems boldly serves up an 'open' alternative** to IBM's slow-to-show APPN for blending SNA environments with distributed internetworks. **Page 1.**

■ **Eighteen months into a Novell/IBM pact aimed at easing NetWare into traditional IBM environments,** users are spotting yawning gaps in the blueprint for NetWare-to-IBM coexistence. **Page 1.**

■ **A new generation of handheld portable computing devices** will challenge IS efforts to oversee distributed technology. **Page 31.**

■ **Plans to put a global network in your pocket** with the help of a satellite system could bear fruit by 1998. **Page 24.** Scientists are eyeing the sky in search of a way to harness solar power for all those fiber-optic telecommunications lines that have become so popular. **Page 24.**

■ **IBM's 4381 family of small mainframes** may often be replaced by downsizing efforts, but it also serves as a primary stepping stone into new mainframe purchases. **Page 78.**

■ **The Federal Communications Commission finally finds merit** in the idea of leveraging the U.S. communications infrastructure as a step toward a massive nationwide network. **Page 69.**

■ **DEC attempts to glue together** disparate massively parallel architectures with new software releases. **Page 78.**

■ **KnowledgeWare users expect to see most of their concerns about module integration addressed** in the newest release of the company's CASE workbench, due out by year's end. **Page 81.**

■ **WordPerfect's renamed and revamped presentation graphics** package, Presentations Version 2.0, takes aim at the Big Three graphics packages. **Page 32.**

■ **On site this week:** EDI is the information-intensive way to move cargo for San Francisco's The Harper Group. **Page 69.** Burlington Northern Railroad pleases train schedulers with a move from mainframe to client/server computing. **Page 59.** Groupware is breaking the barriers of time, geography and group size at Texaco. **Page 59.**

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DOS to add antivirus features

Microsoft uses parts of Central Point's Anti-Virus tool for Version 6.0

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. will provide users with a first line of defense against computer viruses when it includes rudimentary virus protection features in the upcoming DOS Version 6.0, sources close to the company said.

DOS 6.0 is expected to include antivirus software licensed from Central Point Software, Inc., which produces both DOS and Microsoft Windows protection packages. The upgraded operating system, which entered beta testing last week, is expected to ship in early 1993.

A Central Point spokeswoman would acknowledge only that "a technology agreement is in place" between the two companies. But the firms are not strangers. Microsoft included Central Point's Undelete utility feature in DOS 5.0, which was released in June 1991.

Beta-test users of DOS 6.0 said they would be surprised if the entire Central Point Anti-Virus product would be included. It is more likely that the update will include a Central Point-derived checksumming routine that would tell the user when something virus-like was happening, such as unauthorized code replication or substitution.

"It would be nice to have some sort of basic checksum, but to have a full search-and-destroy program would be useless, considering how often viruses mutate," said Rich Eisenman, information systems officer at Chemical Banking Corp. in New York.

Once a virus was detected, users could instead bring in the big guns of a full-featured antivirus program to eliminate the offending code.

Observers said the checksum feature could easily be part of a disk-compression device driver because disk compression routines generally use "checksumming" to verify integrity and operate at the file level.

Negative response

Some analysts were dissatisfied with Microsoft's choice of software from Beaverton, Ore.-based Central Point.

Critic Mark Hamilton wrote in a recent product review in the British magazine, *Virus Bulletin*, that Anti-Virus for DOS Version 1.2 missed several infections, particularly among encrypted viruses, and gave false positives for others.

Eli Shapiro, antivirus product development manager at Central Point, downplayed the review, claiming it assessed an old copy of Anti-Virus. He added that a newer version addresses the problem of polymorphic viruses.

Shapiro also pointed out that the publishers of *Virus Bulletin* are owners of a company called Sophos that produces the Sweep antivirus program. "So how can you expect their reviews to be objective?" he asked.

Indeed, several virus researchers gave an unequivocal thumbs-up to Central Point. When the Research Center of the National Computer Security Association in Washington, D.C., conducted a review of competing virus scanners earlier this year, Central Point's products were among the highest performers.

Preventing infections

Central Point's virus protection software gets strong ratings from analysts

Ontrack/Dr. Solomon's Anti-Virus Toolkit	Quality scanning, good performance, average features
Symantec/Norton Anti-Virus	Quality scanning, lacks protective features
Central Point/ Central Point Anti-Virus	Excellent performance, scanning and usability
Microcom/Virex for the PC	Weak scanning, slow performance, unfriendly
Xtree/ ViruSafe	Excellent scanning, usability, good speed
McAfee/ ViruScan	Slow performance, unfriendly, ASCII manuals
PC Guardian/ Virus Prevention Plus	Slow performance, no Help, not intuitive
Certus International/Novi	Excellent performance, scanning, usability
Certus International/ Certus 2.1	Slow performance, validation check, poor manuals

Source: Technology Investment Strategies Corp. CW Chart: Michael Siggins

Borland exec accused of giving Symantec secrets

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — The battle for development tool market share got dirtier last week when Borland International, Inc. claimed that a former employee may have been working for competitor Symantec Corp. before he left his post at Borland. Symantec denied the charges and accused Borland of using the case "to create publicity and to harass."

Borland has charged that Gene Wang, former languages unit vice president and general manager who left Borland last Tuesday, illegally transmitted information via electronic mail about Borland's marketing, product and business relations plans to Symantec and possibly to its president and chief executive officer, Gordon Eubanks. The transmissions allegedly occurred while Wang was still employed at Borland.

Symantec claimed Borland's charges are without merit and called the investigation "an attempt to inhibit others from hiring Borland employees."

Borland and Symantec compete primarily in the development tools arena, particularly in the C++ market. At Borland, Wang was in charge of all C++ development products.

Borland also filed a civil suit against Wang, charging him with "willfull and malicious" misappropriation of company information. According to the suit, Borland seeks damages "in excess of $25,000." The suit also charges that Eubanks and Symantec "wrongfully induced Wang to breach his contract with Borland" and seeks damages against them.

Covering all the bases

The suit also sought several injunctions against Wang, Eubanks and Symantec to prevent them from disclosing or using Borland's trade secrets, to stop Symantec from employing Wang and requesting the return of all Borland trade secrets. Wang never signed a noncompete agreement.

Superior Court Judge Thomas A. Black granted a temporary restraining order, enjoining the defendants from obtaining, using or disclosing Borland trade secrets and from destroying any materials that originated at Borland. It also orders the defendants to return such materials to Borland.

The defendants were ordered to appear before the court on Sept. 17 to state any opposition to the order.

The next day, Borland claims, it found records of at least 10 MCI Mail messages that Wang had transmitted to Eubanks. Borland also stated that at a Sept. 2 exit interview, Wang refused to sign a statement indicating that he "had returned all Borland confidential information and that he had not disclosed Borland confidential information to others."

IBM advances plan to merge OS/2, AIX operating systems

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — IBM last week sketched out more details of its plan to meld the OS/2 and AIX operating systems, saying the goal is to have a single, micro-kernel-based operating environment within two years.

While OS/2 users said that sounds like a reasonable goal, they also said they have some more immediate concerns with OS/2 2.0. Two information systems managers said they are still hesitant to deploy the operating system until some bugs are fixed (see story at right).

IBM is charting a course to bring OS/2 and AIX development in line to "eliminate all the redundant, inconsistent [features] and replace that with a single set of [components]," said Lee Reiswig, assistant general manager of programming at IBM's Personal Systems Division.

The goal is to allow users to run Unix or OS/2 applications in either environment. In a broader sense, the idea is to build a portable and scalable operating system that users could take across various platforms, noted Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

"I will approve of anything, as long as it doesn't sacrifice speed," said Jeff Newman, an assistant vice president at Barclays Bank PLC in New York. "Otherwise, I'm not that interested in superior portability or running other apps on my operating system."

Reliance on Mach 3

The future operating environment will be based on the Mach 3 micro kernel from Carnegie Mellon University. While OS/2 and AIX will use the same kernel, they will function as separate operating systems, although their primary difference will be their front ends, or "personality," as IBM calls it.

The two will share the basic system components such as memory management. "They can share these common services, so [for example] they would all get memory in the same way," Reiswig said.

In addition, higher level services will be shared as well. OS/2 database manager development was moved to Toronto and will be completed for both the personal computer operating system as well as AIX, Reiswig said.

The plan to provide Lotus Development Corp.'s Notes technology as an Extended Services component of OS/2 will also be transferred to AIX, Reiswig added. And, he said, the company will continue to improve the existing AIX and OS/2s.

At the same time, the company is also working toward providing compatibility with the object-oriented operating system at Taligent Corp., the joint effort between IBM and Apple Computer, Inc. Reiswig said IBM hopes Taligent will use the Mach 3 kernel as well, but it has not signed off on this decision yet.

Bugging out

For now, some committed IBM OS/2 2.0 users are still working through some lingering operating system glitches.

"We think that when the [fix release] comes out, all our concerns will be resolved," said Robert Hecht, vice president of investment systems at Prudential Investment Corp. "Without it, we aren't going to roll it out onto our network."

IBM has committed to shipping a point release later this year that will include bug fixes and other promised features, such as a full-blown 32-bit graphics engine. The Microsoft Corp. Windows 3.1 support will also ship in that time frame but will not be part of the fix release, an IBM spokesman said.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

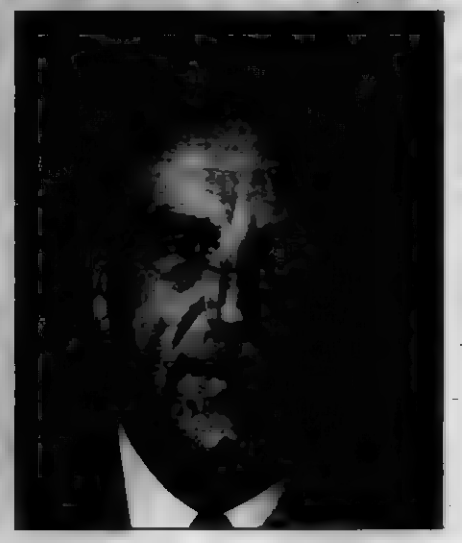
Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation



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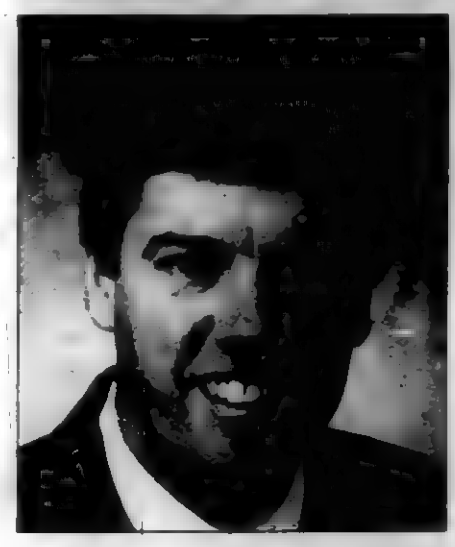
John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.



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NEWS SHORTS

Mellon, Shah settle suit

Mellon Bank Corp.'s week-old lawsuit against former top-ranking information systems executive Bipin C. Shah skidded to a halt last week as the parties settled out of court. Terms of the agreement were not disclosed. But, Shah said, the accords allay Mellon's fears that his newly minted banking services firm, Transaction Processing, Inc., and its employees — four of whom jumped ship from Mellon to sign on with Shah — "could take unfair advantage of Mellon's operations and customers."

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HP shifts OpenView/Unix

Hewlett-Packard Co. is slated to announce this week the creation of a network and system management division, headed by former HP System Management Division head Robert Hoog. The division will have responsibility for the Unix version of HP's OpenView, which HP will continue selling directly to customers as an enterprise management system. HP's PC Software Division will assume responsibility for the Microsoft Corp. Windows version of HP OpenView, which will be sold primarily through value-added resellers, the vendor said. The reorganization addresses the very different markets each product targets.

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Multivendor net standards set

The Network Management Forum announced the release of Omnipoint 1, an organized set of standards, specifications and technologies for achieving interoperability across multivendor network management systems. Omnipoint is a joint effort involving a number of user and vendor companies and major standards bodies such as the Corporation for Open Systems and the Open Software Foundation.

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Reversal on reverse-engineering?

A U.S. appeals court lifted an injunction barring Accolade, Inc. in San Jose, Calif., from developing and selling video games compatible with products from Tokyo-based Sega Enterprises Ltd. In April, a lower court ruled that Accolade had violated Sega software copyrights by "reverse-engineering," or studying how Sega games work. Supporters of that common practice hope the appeals court's written decision, not yet issued, will vindicate reverse-engineering, which they say is vital for innovation.

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Light damage in New York break

A 30-inch water main break in the financial district of lower Manhattan last week had little impact on the computer operations of firms housed in the two towers affected, according to company officials. At 55 Water St., the Securities Industry Automation Corp. (SIAC), a subsidiary of the New York Stock Exchange and the American Stock Exchange, switched to emergency backup generators. Chemical Banking Corp. and The Depository Trust Co., located in the same building as SIAC, reported no major disruptions. At 125 Broad St., telecommunications were disrupted for several hours after the building's communications systems were flooded in the basement.

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Short takes

Share, an **IBM** user group, has elected a new president, **John A. Chapman**, a senior technology consultant at **Amoco Corp.** in Chicago. . . . **Mark F. Morin**, who became the first vice president of IBM's **Image Solutions** unit in 1986, has moved to the post of general manager of software marketing at **IBM U.S. James J. Gant** takes over Morin's old title. . . . Last week, IBM began shipping Network Services/DOS Version 1.0 for DOS and Windows, which is said to implement IBM's Advanced Program-to-Program Communications peer-to-peer protocol using significantly less memory than former products. . . . **Motorola, Inc.** last week enhanced one portion of its 68000 family of chips. Three of its 68300 series chips, which integrate peripheral components around a 68000 or 68020 core, had their speed increased.

More news shorts on page 16

IS helps rebuild after Andrew

BY GARY H. ANTHES
CW STAFF

HOMESTEAD, Fla. — Lights flashing, Florida Highway Patrol cars escorted the 48-ft trailer onto the grounds of what remained of Homestead Air Force Base late last Monday night. Within hours, the van's multimillion-dollar cargo — an AT&T telecommunications switch trucked 1,500 miles from Chicago — had restored service to 1,400 telephones on the base.

The 5ESS switch in AT&T's "portable central office" was just one of many computers that have been wheeled or flown into South Florida to help with recovery efforts following Hurricane Andrew, which devastated the region two weeks ago.

Because the hurricane's eye moved over areas where there were few major businesses, most regional computer facilities escaped with minor damage [CW, Aug. 31]. According to a spokesman for Chicago-based Comdisco Disaster Recovery Services, seven companies moved their processing to a Comdisco backup facility prior to the storm, but by the weekend, all had returned home.

That weekend, some data center managers said they were still operating their facilities off diesel generators and had no idea when power would be restored. Others said they had power but that it was not reliable.

The Federal Emergency Management Agency (FEMA) set up a computer network spanning four disaster assistance centers in South Florida. The network can support 200 users, who process requests for disaster relief. A FEMA spokeswoman said the centers are handling some 7,000 applications a day.

The FEMA network — actually several local-area networks connected by T1 (1.5M bit/sec.) lines — uses a server from NetFrame Systems, Inc. in Milpitas, Calif. The server, which runs the Novell, Inc. NetWare operating system, is a fault-tolerant box

with redundant components designed for mission-critical applications, the company said. Connected to the server is a fault-tolerant storage management system from Vortex Systems, Inc. in Pittsburgh that provides continuous backup of data files.

Ken Tarone, a hardware/software engineer at Vortex, said FEMA got the disaster claims processing system up last Monday, a week after the storm hit. "They couldn't get in touch with their vendors. But they had my phone number, so I helped them all weekend."

Indeed, Tarone said most of the equipment for the FEMA system had been procured during the five-day period after Andrew struck. "They were dealing with multiple vendors, and the funny thing is, I was getting calls from vendors that I didn't even know, asking me how to connect things," Tarone said.

FEMA has been widely criticized for slow response to emergencies, including Hurricane Andrew. Computer officials at FEMA could not be reached for comment, but a FEMA vendor said the federal agency had been preparing to test a new, quick-deployment computer system at the time the disaster struck.

The American Red Cross was better prepared with its information systems. Its Disaster Relief Operation Management Information System software is prepositioned at 300 locations across the country, including Orlando, Fla., and Baton Rouge, La. Within four days of Andrew's passage, the Red Cross had set up a NetWare-based Token Ring LAN in its temporary disaster headquarters in Miami.

"We deploy this whenever there's a large enough disaster to warrant automation," said Maribeth Luftglass, the Red Cross' manager of disaster systems development. She said it has been used hundreds of times in recent years.

The Red Cross uses the 12-node LAN and software it developed to perform damage assessment and keep track of staff, staff assignments, supplies, vehicles and expenses. Luftglass said the system shares data with other relief groups such as FEMA.

The U.S. Army established a "Humanitarian Depot" at the Miami airport and is supporting its operations with Intel Corp. 80386-based personal computers flown in last Wednesday.

Microsoft says hidden APIs don't provide unfair edge

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp. is busily trying to defuse the tension created over published reports last week that said its Windows-based applications use undocumented calls to Windows.

The reports were based on claims in the book *Undocumented Windows*, by Andrew Shulman, David Maxey and Matt Pietrek, that some Microsoft products, including Excel and Visual Basic, use undocumented functions of the Windows application programming interface (API) to perform certain tasks. Such calls appear in most operating systems and are used to leave "hooks" for future features.

While the reports indicated that several application vendors were angry about the finding — even claiming that Microsoft's application group was using its knowledge of Windows to unfair advantage — Microsoft Vice President Brad Silverberg claimed that company policy prohibits the use of undocumented calls in applications.

However, any such use by Microsoft is bound to raise the specter of unfair business practices. The Federal Trade Commission has an ongoing investigation into whether Microsoft holds an unfair advantage in the software industry stemming from its involvement in both the operating system and the applications market.

Silverberg did acknowledge that several undocumented calls do appear in some Microsoft applications, but he added that their use violated the policy. He also said Microsoft has produced a technical note explaining the use of each of the calls.

According to the paper, four of the 16 calls mentioned in the book are documented, six are obsolete and the remainder either have documented equivalents or are useless.

"There's no appreciable advantage that Microsoft develops from [its applications using] these calls," Silverberg said.

Indeed, later in the section dealing with Microsoft's use of undocumented functions, the authors conclude, "In fact, the use of undocumented Windows functions by Microsoft applications is probably no more nefarious than the use of undocumented Windows functions by [Symantec/Peter Norton Computing Group], Borland or any other company whose software must make Windows jump through hoops."

Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash., agreed. "I don't think that the Windows APIs mentioned gave any major competitive advantage" to Microsoft, he said.

City of Boston dumps CA-Universe

BY THOMAS HOFFMAN
CW STAFF

BOSTON — The city of Boston is planning to replace several major applications based on software from Computer Associates International, Inc. after the Islandia, N.Y.-based software vendor failed to help the municipality migrate its software to an alternate platform as promised.

In fact, according to Allan Stern, director of MIS for the city, the decision to replace the software is forcing the city to convert to a yet-to-be-determined client/server configuration two years ahead of schedule from its current IBM 3090 200S MVS/ESA mainframe environment.

The city is planning to downsize nine applications written under CA's CA-Universe mainframe relational database management system to a client/server configuration during the next two years, Stern said. He added that repeated attempts to enlist CA's aid to ease migration from CA's Universe SQL database environment to CA's Datacom/DB RDBMS have gone unanswered.

Stern said the nine applications include three fire-department management systems, an abandoned-car tracking system and a voter registration system, which support several hundred users.

> "THEY WERE unwilling to accommodate us with a new purchase price or a training option, so basically we got stuck by a company that doesn't stand by its word."
>
> ALLAN STERN
> CITY OF BOSTON

Stern said he first became anxious in October 1988 when the $1.5 billion software firm acquired Applied Data Research, Inc., a Princeton, N.J., software firm. He said Applied Data Research's flagship product, Datacom/DB, a competitive database management system, had a larger user base than CA-Universe, the mainframe RDBMS tool set that CA acquired in its 1983 purchase of Stuart P. Orr & Associates, Inc., a Pasadena, Calif., software firm.

Stern said he wrote several letters to CA executives expressing his concern that users of CA-Universe would receive secondary support after CA-Datacom/DB users. He added that he received a phone call from CA Chairman and Chief Executive Officer Charles Wang in March 1990 assuring Stern that CA would continue to support and develop CA-Universe.

In March 1991, Stern said he received a "form letter" from CA stating the company's intention to abandon future development of CA-Universe in favor of CA-Datacom/DB. Stern, upset after receiving the letter, called CA to find out how the city could possibly migrate its applications off CA-Universe to CA-Datacom/DB. Stern said he met once with a migration support team from CA. Stern said CA has not contacted him on the subject since last summer.

"They were unwilling to accommodate us with a new purchase price or a training option, so basically we got stuck by a company that doesn't stand by its word," Stern fumed.

"We dropped the ball in communicating with him, there's no question about that," said Mark A. Combs, CA's senior vice president of research and development. Combs has contacted Stern and set up a meeting between Stern and CA technical representatives for this week.

Combs said CA has continued to support its Universe product set since the company announced in April 1991 that it would no longer make enhancements to the product. Since then, CA has offered licensed Universe users a free trade for its CA-Datacom/DB database product.

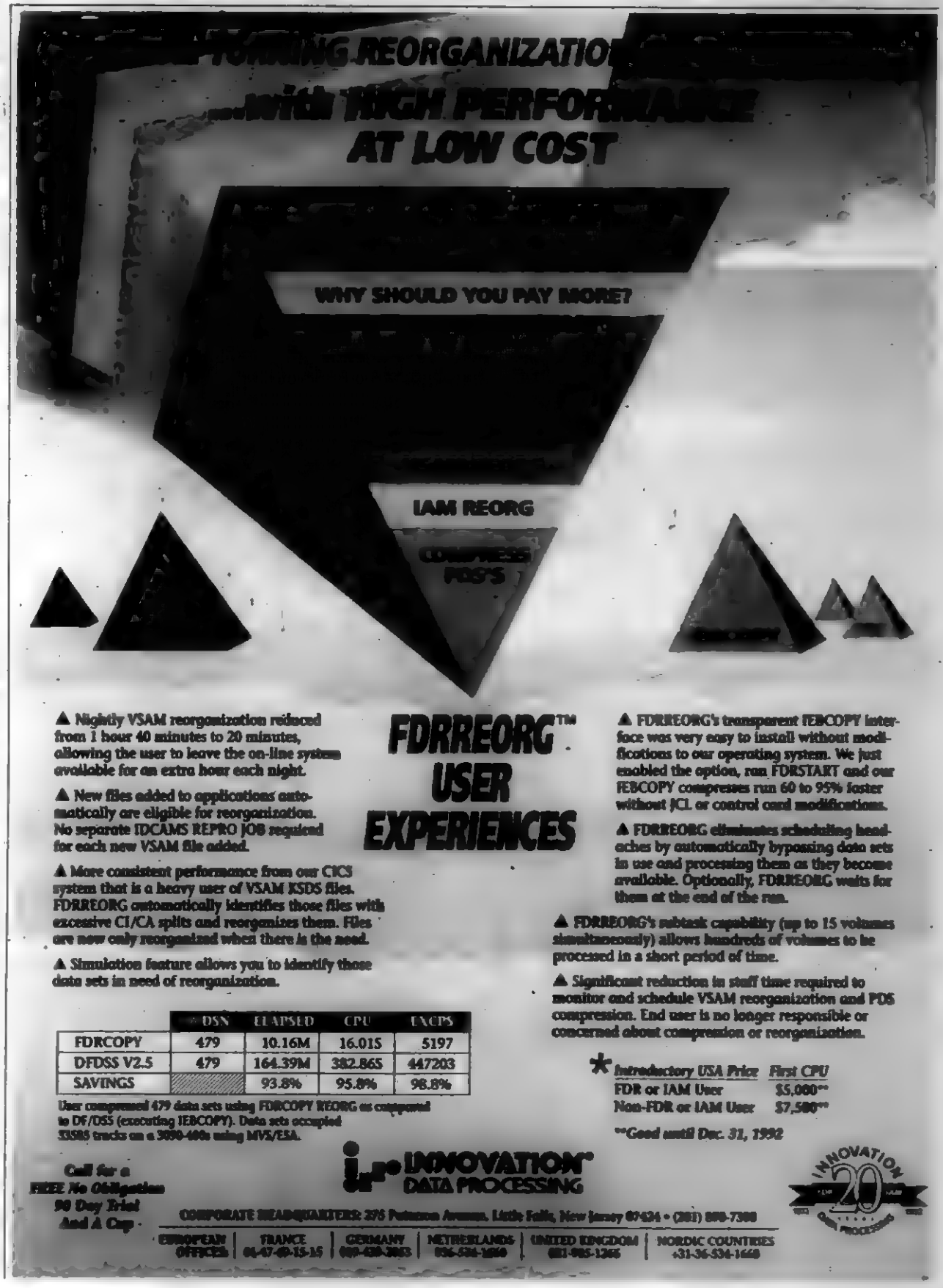
Stern was not able to disclose the cost of the conversion to the client/server environment, but he said the move would be "extremely costly."

Stern said the city will continue to use its IBM 3090 Model 200S mainframe as a data repository during the migration.

Stern's trouble with CA over CA-Universe has led him to replace his CA-Clipper application development environment with a competitive replacement, though Stern has not yet chosen a vendor. He said he is considering Borland International, Inc.'s Paradox tool set and Microsoft Corp.'s FoxPro, among others.

CA-Universe customers attempting to migrate to CA-Datacom said they are experiencing different levels of success and frustration. "We haven't run into any problems we haven't been able to overcome," said Ann Stone, systems analyst at Scott Community College in Bettendorf, Iowa. The college, which began converting more than 300 Universe applications to Datacom/DB, is slated to complete the project by next summer.

Tom Kruse, a database administrator at Purdue University in Fort Wayne, Ind., has been less fortunate. Kruse said CA has yet to deliver on migration tools promised to him almost a year ago.



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INNOVATION 20 YEARS

Tivoli to add apps for Unix nets

Products offer software distribution, problem monitoring functionality

BY ELISABETH HORWITT
CW STAFF

AUSTIN, Texas — Tivoli Systems, Inc. is expected this week to introduce two applications that target users who want to start implementing distributed Unix systems management and still be able to migrate to industry standards, such as the Open Software Foundation's (OSF) Distributed Management Environment (DME), when they become available.

Tivoli will announce Tivoli/Courier, which is said to automatically distribute software to multiple Unix systems, and Tivoli/Sentry, which is said to remotely monitor problems, performance and usage levels on distributed Unix systems. Both products are based on the Tivoli Management Framework, an object-oriented architecture that the OSF has adopted as part of its DME standard.

Hewlett-Packard Co. and IBM will shortly be bringing out DME-based network management products (see story at right). However, as developer of the object-oriented framework for the OSF's DME systems management standard, Tivoli is currently the only vendor that can promise future DME compliance for its systems management products, according to John Morrell, senior Unix analyst at International Data Corp. in Framingham, Mass. Tivoli has promised to migrate its products to the full OSF DME standard when it becomes available sometime in late 1993.

This makes Tivoli's applications of great interest to a small but growing band of companies that are committed to migrating their systems to the OSF's Distributed Computing Environment and DME standards.

Northwest Natural Gas Co., for example, chose Tivoli's management framework primarily because the company is "100% committed to DME compliance, plus we liked [Tivoli's] object-oriented approach," said Casey Canby, data center manager at the Portland, Ore.-based utility. The company is now looking to install both of the new applications, he added.

Tivoli/Courier allows users to create templates that describe a particular group of systems, such as brokerage trader workstations, so that software updates for the entire group can be initiated with one operation instead of on a case-by-case basis, Tivoli President Frank Moss said.

Tivoli/Sentry monitors printer, file and electronic-mail services, as well as other network services, Moss said. "The user designates what needs to be monitored," such as the status of the printer queue or how much free disk space is left on a server, he added. The network manager's console displays an alert when a preset threshold is exceeded (e.g., when too many Unix processes are running on one node).

The new applications will initially run on Sun Microsystems, Inc. SPARCstations, priced beginning at $375 a node for a 500-node license.

Ground breaker

The announcements further Tivoli's strategy of becoming "not just a technology supplier" but also an applications supplier, Morrell said. While Tivoli did announce some "general distributed Unix administration" applications earlier this year, this is the first time the company has come up with "new applications that haven't been done before," he added.

"The only systems management package I'm aware of that rivals [Tivoli's] is CA's Unicenter, which is very proprietary," said William D. Connor, vice president of information systems at Motorola, Inc.'s General Systems Sector.

General Systems is evaluating Tivoli's applications for "some major networks that we've been managing by brute force and awkwardness," Connor said, adding that he was particularly impressed with Tivoli/Sentry's ability to "snoop and see if things are degrading."

Connor also praised Tivoli's announcement this week of a Tivoli development tool kit for building distributed systems management applications for the Tivoli Management Environment.

DME conformity

IBM and HP are expected to turn up the volume shortly on user interest in the OSF's DME by announcing network management products that conform to the DME Consolidated Management Application Programming Interface (CM-API).

CM-API, which was co-developed for the OSF by IBM, HP and Groupe Bull, enables applications to initiate management tasks via either the Open Systems Interconnect (OSI) Common Management Information Protocol (CMIP) or the Simple Network Management Protocol (SNMP).

HP is expected to announce the shipment of OpenView Unix Release 3.1 with support for CM-API-based access to SNMP and CMIP over Transmission Control Protocol/Internet Protocol. HP will also announce that Release 3.2, which will include full CMIP-over-OSI support, will ship in the fourth quarter.

IBM is expected in the next few weeks to announce Distributed Systems Management, an OS/2-based local-area network management system that will comply with IBM's SystemView architecture and also support CM-API.

While compliance with CM-API is only an initial step toward full DME compliance, it is an important one, according to David Passmore, a program director at Gartner Group, Inc. "Managing CMIP and SNMP via common semantics is a nice trick," he said.

ELISABETH HORWITT

Organization, not tools, key to LAN management

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Technology may well be the last thing a company needs to look at as it struggles to put a local-area network management strategy together, according to a recent survey by Deloitte & Touche.

While many of the survey's 789 respondents complained of the lack of good network management products, particularly for LANs, they also cited their companies' organizational structures as impediments to effective enterprise network management, the consulting firm found.

And, information systems managers attested, it makes little sense to implement a network management system without resolving basic organizational issues, such as which department will take responsibility for which aspects of LAN operations and which procedures should be in place to ensure that the help desk finds out about a LAN problem before the users. Too often, procedures for timely identification and resolution of LAN problems are either sloppy or nonexistent, according to the study (see chart).

"Many organizations have not yet clearly defined an organizational structure with a clear delineation of responsibilities: this [LAN management task] is yours; this one is mine," said Glenn James, a Deloitte & Touche senior manager who co-authored the study performed by the firm's Telecommunications Consulting Service. As a result, "you have a situation where each group thinks the other is responsible, and things fall through the cracks."

LAN load

The rapid proliferation of LANs during the past year is making it increasingly difficult for organizations to get away with laissez-faire LAN management. More than 90% of organizations surveyed have multiple LANs installed, compared with approximately 60% last year, Deloitte & Touche said.

However, implementing a network management system without first ironing out procedures just "automates problems, which then become fire-eating dragons," said John Mahoney, manager of data processing at American Centennial Insurance Co. "I'm more interested in a combination of software and procedures, implemented in unison with the user community."

As a result, organizations ranging from General Electric Co. to the U.S. Air Force Materiel Command have been going through protracted and sometimes painful internal evaluations of their computer network support organizations, even before they start sending out requests for proposals for network management products.

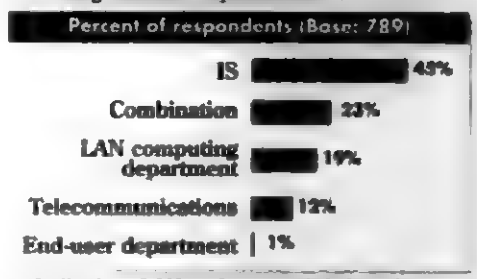
Materiel Command, for example, is in the middle of a multimonth project to develop consistent procedures for troubleshooting and supporting computer networks across the command. The aim is to replace "postmortem network management" with active management that identifies a problem before it adversely affects the users, said Maj. Hal Ellis, who heads the project. Once the procedures are set, the command will take a look at which products make sense, he added.

More often than not, companies are dividing responsibility between a central information systems or telecommunications department and departmental LAN managers, the study found (see chart).

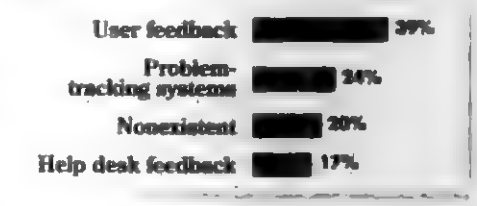
"You can't just turn it all over to DP; that defeats the LAN's purpose of putting computing power into the hands of the user," Mahoney said. "You have to have guidelines for what is IS-[maintained] and what is user-maintained."

Who's the boss?

While responsibility for LAN operations is spread out among numerous departments . . .



. . . feedback on LAN performance is informal to nonexistent



Source: Deloitte & Touche

Distributed the choice

William D. Connor, vice president of IS at Motorola, Inc.'s General Systems Sector, said, "We definitely intend to manage LANs on a distributed basis, in line with the decentralized way that Motorola runs its businesses." On the other hand, IS wants to be able to "administer software centrally," as well as do centralized backup, Connor said.

American Centennial is "just starting to put some things in place, more to identify issues than to stop anyone from doing anything," Mahoney said.

A challenge is "creating guidelines that don't restrict the user's ability to do business" in key areas such as applications development, file creation and maintenance and access control, he added.

For instance, Mahoney said, "You can say 'no user can create more than 10M bytes of disk,' but what do you do when the user has to create that next byte?"

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InterBase, Paradox link will extend Borland's LAN plans

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. plans to unveil tomorrow its first link between InterBase and Paradox databases, as well as the first piece in the developer's InterBase-centric server strategy.

Specifically, Borland will introduce the latest versions of its InterBase relational database server and Paradox SQL Link, according to the company.

Borland's goal for InterBase, which it acquired as part of its purchase of Ashton-Tate Corp. last year, is twofold. First, Borland wants to increase its rather small (about 10,000 units) presence in the Unix server arena. InterBase is already there, though primarily in technical environments. The company is also pursuing fresh ground in the burgeoning personal computer local-area network market.

The upgrades, Version 3.3 of InterBase and Paradox SQL Link for InterBase, will provide the recently released Paradox 4.0 with an avenue for connecting with the relational, server-based system.

InterBase 3.3 has an updated client interface for PCs as well as DOS and Microsoft Corp. Windows requesters supporting Transmission Control Protocol/Internet Protocol networks. Cobol and Fortran precompilers and drivers supporting multiple languages, including English, French and German, are included.

Paradox SQL Link for InterBase provides an interface for Paradox 4.0 to InterBase, including support for Query By Example and manipulation of binary large objects, such as images.

Borland is "really going after the server market for people on PCs who want to grow up," said consultant Judith R. Davis.

> "YOU CAN'T WAVE a magic wand and make the problems of learning about [both] SQL and server databases go away."
>
> DAVID MCGOVERAN
> ALTERNATIVE TECHNOLOGIES

Integral to that pursuit is the idea of bringing more PC-like database interaction to the world of relational, server-based databases, including managing such things as file locking so that users can perform long queries without denying data access to other users. Such issues are complex, however, and Borland will have its hands full, according to analysts.

"You can't wave a magic wand and make the problems of learning about [both] SQL and server databases go away," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif. "Borland will have to face the fact that users will have to be told there are certain things they can't do," he said.

If Borland can accomplish its goal of an easy-to-operate client/server relational database, however, at least one user will be waiting eagerly. Rock Blanco, vice president of information systems at Garber Travel in Boston, said he has been looking to build a distributed database network and would love to have one ready to run out of the box. "If that's the case," he said, "I would go for it."

InterBase 3.3 and Paradox SQL Link for InterBase are both expected in the fourth quarter of 1992. SQL Link for InterBase has a list price of $395. Upgrades to InterBase 3.3 are free for existing customers.

Senior West Coast editor Jean S. Bozman contributed to this report.

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CORRECTIONS

The story "CA's lineup" in the Desktop Computing section [CW, Aug. 17] should have indicated that the listed products are only a sampling of Computer Associates International, Inc.'s key personal computer products.

.....

The interoffice connection charges listed for MCI Communications Corp. in the Aug. 3 Marketplace section were incorrect.

The correct mileage charges for distances from Boston to New York (185 miles) and New York to San Jose, Calif., (2,549 miles) are 56K bit/sec.: $285.50 to $994.70; 256K bit/sec.: $1,004.05 to $3,675.37; 768K bit/sec.: $2,401.10 to $9,162.14; and T1: $3,147.00 to $15,912.60.

.....

A chart containing information about Frame Relay Service [CW, Aug. 31] inaccurately reported that Nynex would provide this service nationally, in Canada, Mexico and Europe.

Consistent with its legal obligation, Nynex provides intraLATA frame-relay service only within its region. Nynex does not have any plans to provide interLATA frame-relay service inside or outside of its region.

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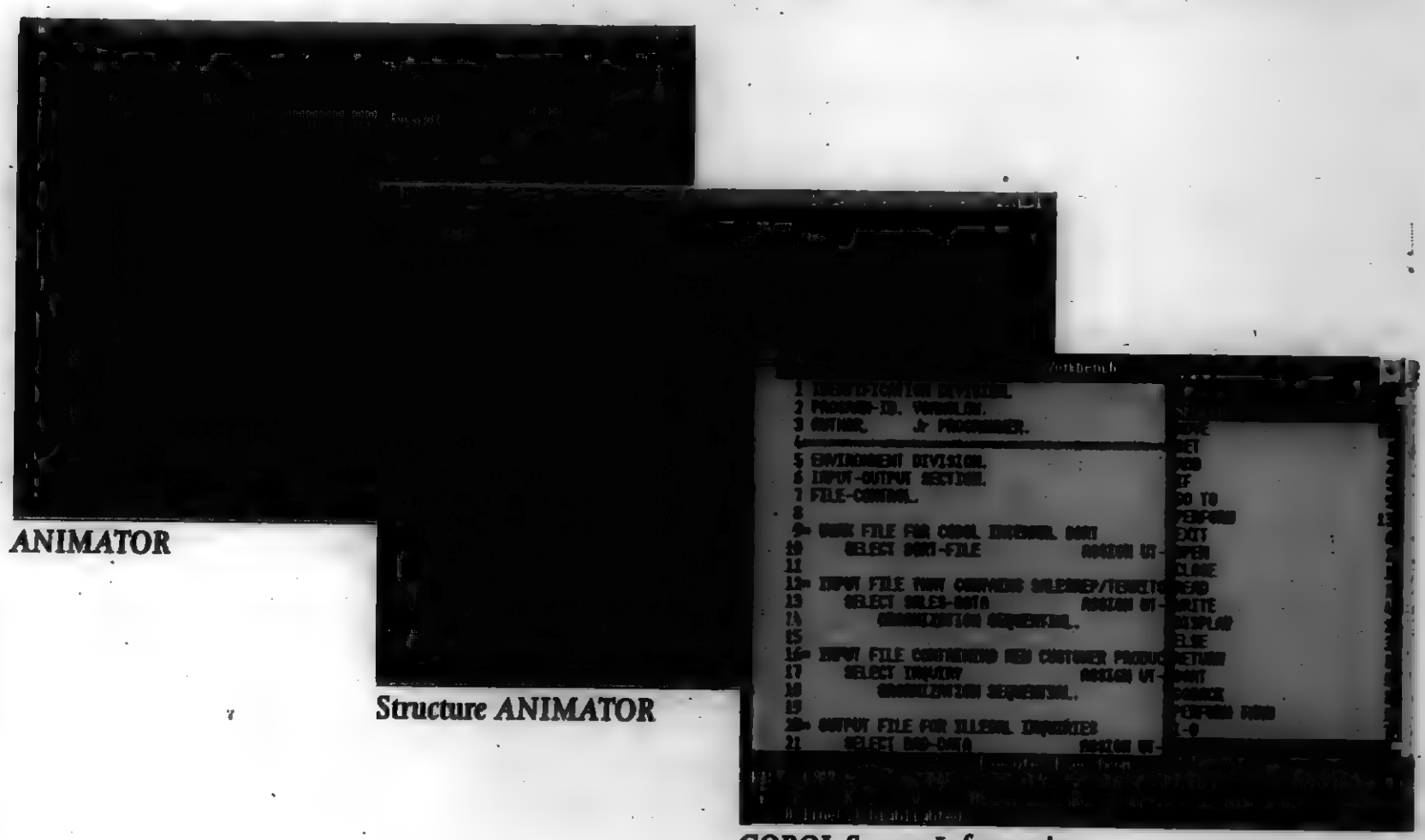

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AS/400 users zero in on pricing

BY KIM S. NASH
CW STAFF

NEW YORK — Application System/400 users greeted IBM's new four-way processor and redundant arrays of inexpensive disks (RAID) subsystem last week with a ho-hum attitude. Although the new products piqued interest, most shops said processor and storage upgrades will wait until after the expected first-quarter 1993 debut of a new F series AS/400 line.

What really drew cheers was IBM's foray into user-based software pricing.

The reaction of Massachusetts Financial Service Center, Inc. to the new hardware was typical. Running a Model E70, the Boston-based financial firm has no immediate need for the new products, according to James Bailey, senior vice president. "But it's encouraging to see IBM expand the line. As our business grows, it won't outpace the platform," Bailey said.

Hurrah for prices

By giving customers the option to pay per-user fees for some applications rather than traditional tiered pricing, IBM "is definitely onto something good," said Peggy Payne, information systems manager at Westinghouse Security Electronics in Santa Clara, Calif.

Promising more to come, IBM will experiment with the new price plan on two applications: ImagePlus, an imaging application; and PC Support, a program for linking AS/400s to personal computers. License management tools will be made available to third-party software makers in the hopes of spreading the user-based initiative.

A few vendors, such as Computer Associates International, Inc., have already gone this route. "If IBM's experiment goes well, the floodgates will open," said David Andrews, president of ADM Consulting, Inc. in Cheshire, Conn.

Sybron Chemical, Inc., an AS/400 Model D45 shop and maker of specialty chemicals in Birmingham, N.J., priced imaging software from IBM a couple of years ago but decided the cost was prohibitive.

The 150-user company went with PC-based imaging instead, said Jerry Goldman, director of MIS. "Pricing like this, though, would be easier to cost-justify," Goldman said.

Server option

Per-user pricing could also better position the AS/400 as a server, which John Thompson, general manager of IBM's Application Business Systems unit, said is a key new target market for the line as it expands. Thompson said high-end AS/400s, including next year's F series machines, are aimed at large users and those looking to "rightsize" by moving applications off mainframes.

However, the price/performance of the line troubles some users. Pace Foods, Inc., for example, would rather buy two smaller systems than one expensive high-end model, said Charles Greene, member of the MIS division of the San Antonio-based food distributor.

Pace Foods bought a D10 last year for software development and a bar-code system and also runs a B70 for mainstream applications. The company is evaluating whether to replace the D10. "It's cheaper to buy two 40s than one 70," Greene said.

New arrivals in IBM's midrange family

IBM's additions to its AS/400 line include the following:

- **E95 four-way processor.**
  Performance: Boost of 20% over former top-end, three-way E90 model.
  Availability: January 1993.
  Price: $973,000, plus $190,000 for upgraded operating system.
- **9337 Disk Array Subsystems for 9406 D and E models** (two RAID-5 systems with up to 5.8G bytes of storage).
  Availability: Nov. 13.
  Price: $42,900 and $60,000, respectively.
- **Two low-end subsystems with up to 6.8G bytes storage.**
  Availability: Sept. 25.
  Price: $38,900 and $56,000, respectively.
- **InfoWindow II display terminals** (four models sporting dual-screen sessions, mouse support).
  Availability: Sept. 25.
  Price: $640 to $1,265, with one-year warranty.
- **AS/400 Support Family** (seven separate services).
  Examples:

  AS/400 Associate, a technical advocate assigned to learn customer shop; $250/machine per month.

  Forum, bulletin board via Electronic Customer Support line; $25/machine per user per month.

  PM400, performance tuning reports done by IBM; $165/shift coverage per month for monthly reports or $210/shift coverage per year for one set of reports.

Apple announces DAL server to link AS/400, Macintosh

BY MICHELE DOSTERT
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week announced a new Application System/400 Data Access Language (DAL) Server that will allow Macintoshes to transparently access SQL-standard data stored on IBM's AS/400.

The AS/400 link is the latest network-related announcement to come from the IBM/Apple alliance announced in July 1991. Earlier products tied the Macintosh into Systems Network Architecture, Token Ring and Transmission Control Protocol/Internet Protocol networks.

Apple's DAL is an SQL-standard-based connectivity language that allows Macintosh users to use the drag-and-drop Macintosh interface to import SQL data. The DAL programs translate Macintosh commands into SQL commands to access data stored on non-Macintosh platforms.

"The AS/400 product completes Apple's DAL product line," said Randy Hietter, data access product manager at Apple. He said Apple now has DAL servers for 14 midrange and mainframe operating systems and 14 different databases.

Some users who have mixed Macintosh and AS/400 environments are eager to try the new DAL Server when it ships. Gary Garver, the head of information systems at the American Legion in Indianapolis, has about 50 Macintoshes connected to AS/400s at various sites. He said, "Right now, we use PC support from IBM to connect the Macintoshes to the AS/400s." Typically, the AS/400 is used as a database machine; right now, there are not many Macintoshes connected to them. The DAL Server will help the Macintoshes link up in a palatable way.

"The trouble is, the Macintosh user then has to give up his beloved interface and emulate AS/400 commands — and he hates it. We will definitely look at this product when it comes out if it can shield our users from the AS/400 database interface," Garver said.

The DAL Server for the AS/400 is scheduled to ship in December. Apple said it is developing other Macintosh-to-AS/400 products, including 5250 terminal emulation software and a "Shared Folders" utility. Shared Folders will allow Macintosh users to mount the AS/400 file system as a Macintosh file system, thus letting Macintosh users easily store and retrieve data on the AS/400.

Mac users to get tighter E-mail ties

BY MICHELE DOSTERT
CW STAFF

OLYMPIA, Wash. — Apple Computer, Inc. Macintosh users are not the only desktops getting IBM Application System/400 connectivity. Developer Patrick Townsend and Associates has enhanced its T/Mail MHS product to provide AS/400 mail connectivity with Banyan Systems, Inc.'s Vines and with Novell, Inc.'s NetWare network operating system.

T/Mail MHS runs on the AS/400; it can provide either mail services to AS/400 users or a gateway into IBM's OfficeVision/400 mail services.

From the AS/400, T/Mail MHS then connects to a bridge personal computer running MHS, which connects to any NetWare electronic-mail package that supports Novell's MHS message handling software.

T/Mail MHS can now offer AS/400 mail access to Vines users and vice versa by making the Vines and AS/400 E-mail systems speak a common language — MHS.

T/Mail bridges from the AS/400 side to the MHS-running PC.

A product called V-Bridge/MHS from Computer Mail Services, Inc. in Southfield, Mich., then bridges from Vines' mail service into the MHS-running PC.

T/Mail MHS also provides Banyan StreetTalk directory support on the AS/400.

Ameritech agrees to install local-loop fiber-optic cables

BY ELLIS BOOKER
CW STAFF

CHICAGO — Ameritech Corp. last week said it had negotiated two contracts that make up the largest committed purchase of local-loop, fiber-optic cables and related electronics in telecommunications history.

Ameritech's investment under the two contracts, including installation of fiber lines and support electronics, will total just under $1 billion. The deployment will also triple the amount of local-loop fiber in Ameritech's five-state region.

Ameritech will buy Fiber to the Curb equipment from DSC Communications Corp. in Plano, Texas, and Raynet Corp. in Menlo Park, Calif. DSC will also supply Next Generation Digital Loop Carrier systems, and Raynet will provide its multivendor operation support system, Rides.

The value of the individual deals was not disclosed, but company sources said DSC won the lion's share of the contract. DSC and Raynet won out over seven other firms responding to a request for proposals issued in July.

"These [purchases] are part of our planned network upgrade, built into our existing and future capital budget plans," a company spokesman said. Buying the fiber and electronics in bulk, he added, brought the cost of the fiber down to that of copper cable.

Within the next two years, fiber in the local loop, or the "last mile" portion of the phone network, will be a "routine" deployment, said Beacher Pearce, manager of network programs at ElectroniCast Corp., a market research firm in San Mateo, Calif, specializing in electronic and optoelectronic industries.

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New Jersey Bell dials up pen systems

BY MICHAEL FITZGERALD
CW STAFF

NEWARK, N.J. — Potentially providing a shot in the arm for the fledgling pen-based industry, New Jersey Bell Telephone Co. last week bought 300 NCR Corp. 3125 notepads as part of a $3.3 million client/server project.

The potential impact could be much larger, as New Jersey Bell is "acting as a test bed for all of [parent company] Bell Atlantic Corp.," said David Young, assistant manager of distribution services systems at New Jersey Bell. He said the notepad and Unix server project was approved "at the highest level of Bell Atlantic."

New Jersey Bell is implementing an entirely new data processing infrastructure in its operations offices. Besides the 3125s, it bought 12 StarServer E multiprocessor servers and 76 Model 3345 servers from NCR. The StarServer ES servers will be used as Unix servers for local-area networks in New Jersey Bell administrative offices, linkingstand-alone personal computers. Meanwhile, the 33-MHz 486-based Model 3345s will serve the same purpose in New Jersey Bell's garages, with X Window System terminals connected to them. Each StarServer will also be linked remotely to four or five 3345s.

New Jersey Bell is moving to client/server computing to decrease paperwork and gain operational efficiencies. Under its old, paper-intensive system, data compiled by New Jersey Bell's supervisors would be typed into spreadsheets and sent to the corporate staff for further review.

Now it will be uploaded via modem to the 3345s, then automatically sent into an Informix Corp. SQL database on the StarServers. Information for the supervisors will be sent to them transparently as they log on.

Young said the workers previously dedicated to typing in data will now work in customer service. "Those people are much more productive if they're serving customers directly," he noted.

Anton Kurelja, manager of distribution services systems at New Jersey Bell, cited efficiency as the driving force behind buying the 3125s. Because the company lost roughly 570 field managers last year to an early retirement program, the remaining managers have had to handle more work.

Staff "downsizing takes place, and we have to figure out how to accommodate what we did before with fewer people," Kurelja said. He said managers who were responsible for seven employees now have to handle up to 15. "The economies are obvious."

New Jersey Bell worked with Windsoft, Inc., a Denville, N.J.-based value-added reseller, to design 12 electronic forms, condensed down from perhaps triple that number of paper forms. Windsoft also designed a blank form for note-taking and several personal productivity tools.

The development work was done under Grid Systems Corp.'s PenRight operating environment, which runs over DOS and is licensed by NCR.

Young said the move to pen-based systems started two years ago. New Jersey Bell spent two years experimenting with Intel Corp. 8088-class pen systems from Grid Systems, then decided to wait for the performance boost offered by the 80386SL-based 3125.

After many product delays because of Federal Communications Commission clearance issues and NCR's slow ramp-up, the products are in-house.

Young said he would have liked to wait for NCR's 3130 notepad, which corrects the 3125's main flaws, "but we had to deploy; we couldn't wait anymore. We see this as a beginning, and as new hardware becomes available we'll evaluate it."

IBM, Canon build notebook with printer

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — IBM and Canon, Inc. said last week they will develop a notebook PC with a built-in bubble-jet printer as part of a joint venture to develop what the two called "next-generation personal computers."

The project will combine IBM's notebook efforts with Canon's microhead, bubble-jet technology in an integrated unit that will be the size of a conventional notebook PC, a Canon official in Japan said. U.S. sources said the prototypes are closer in size to a laptop, with the printer integrated onto its back.

The IBM/Canon notebooks are expected to be introduced first in Japan. The companies said the new notebooks will appear sometime next year. Some observers pegged a release date of as early as next spring.

"I think it's a good idea because a certain percentage of notebook [users] are totally field-based, and sometimes you just need to print something out," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. He said Wang Laboratories, Inc. unsuccessfully marketed a similar concept several years ago.

Lighter is better

Information systems managers with field users said the idea might prove to be a good one.

"We haven't typically been interested in IBM notebooks, but anything that decreases the amount of equipment our salespeople have to carry is an interesting concept," said Robert Peterson, director of sales and marketing ISat Coors Brewing Co. in Golden, Colo.

Officials at IBM Japan and Canon declined to provide details of their product plans, but a Canon official said the venture will cover various areas of notebook technology. Both firms will sell the product under their respective brand names, he said.

One U.S. source said the product announcement has been delayed in the U.S. as IBM prepared its new IBM Personal Computer Co. (see story page 1).

IBM's agreement with Canon is the latest in a series of cooperative ventures. An IBM Japan spokesman said the company continues to "pursue joint development in areas where other companies have superior technology in order to better meet user needs."

Senior writer Michael Fitzgerald contributed to this report.

Users want action from IBM personal computer unit

CONTINUED FROM PAGE 1

for its agents for the first time since the company formulated the list because the last two such products — IBM's Personal System/2 Model 70 and L40SX laptop — were no longer competitive in price/performance.

"In some ways, their [upcoming] product announcements are more important. This reorganization just shows all the trouble they're in," agreed William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass., referring to an expected revamp of IBM's entire PC product line.

Several users said a break from the mainframe-dominated mind-set at IBM would improve PC service and support and make pricing concessions easier to gain. Tom Martin, director of computer services at Conyers, Ga.-based Lithonia Lighting, said he thought it would make concessions granted faster.

Before, it was difficult "because too many people had to say yes. Now, if they so choose, they can be more immediate. It gives them a better handle on cost benefits," he said.

Corrigan said that in IBM's upcoming product announcements, expected on Sept. 9 and 21, the hardware unit will follow OS/2's lead by branching into new distribution channels.

The company will initially sell through various channels, including its traditional dealer network, and will contract with IBM's sales force to sell its wares, too. IBM retains the Personal Systems Programming Division (OS/2) and Advanced Workstations Division (RISC System/6000), as well as its Technology Products Group. Corrigan reports to IBM Vice President James A. Cannavino, general manager of the Personal Systems Division.

Corrigan will have profit-and-loss responsibility, but the company's results will not be reported separately from IBM's. Corrigan claimed that creating a separate PC company would allow the unit to better control its pricing, features and components sourcing.

Checkered past

IBM has a mixed history in efforts to revitalize business units by seceding them from the Big Blue union. While its Lexmark International, Inc. printer and Integrated Systems Solutions Corp. subsidiaries thrive, its Desktop Software Unit was dismantled before it had a chance to get off the ground.

Some observers wondered how a supposedly separate organization populated by people steeped in IBM culture could succeed. "With all the same people in place, can we really expect an entrepreneurial spirit to surface from thin air?" asked Richard Zwetchkenbaum, an analyst at Framingham, Mass.-based International Data Corp.

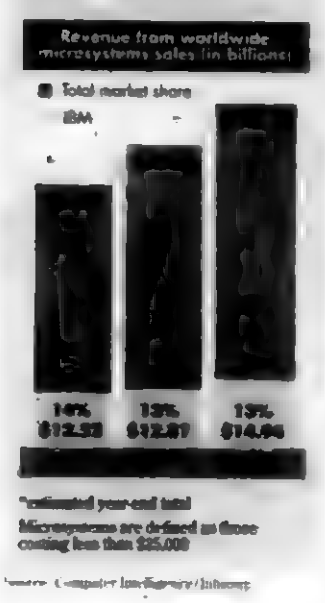
Many users interviewed by *Computerworld* said that while IBM was taking necessary steps to be more flexible and competitive by spinning off the company, they would not be convinced until they saw tangible evidence.

"We need to wait and see how it is implemented," said Lynne Baron, director of systems and technology at Standard & Poor's, Inc. Baron has shifted from IBM largely because of price, but she said proper service and support are also vital. "If IBM can lower prices to be competitive and still achieve the level of service and support of a Dell, that might be something we would revisit," she said.

Sources close to IBM said pricing on the new lines of PCs will be very aggressive, although it is unclear whether they will undercut clones.

Deep blue yonder

IBM hopes its new PC unit can boost flat market share



Industry sound bites

William Tauscher, *chairman and chief executive officer at ComputerLand Corp.:*

"It's been a long time coming, and I think it's wonderful. Basically, you had a structure that had two product organizations [ESD and NDD]. It was potentially ripe both for slow decision-making and . . . incorrect decision-making."

Scott McNealy, *chairman of Sun Microsystems, Inc.:*

"If IBM is successful in creating a more competitive Intel product line, the big winners will not be IBM but will be Intel and Microsoft. So to me, it's a totally wasted effort on IBM's part, unless it's a strategy to jettison a limb that works entirely for Bill Gates."

Cisco offers APPN option

CONTINUED FROM PAGE 1

"APPI is essentially a way to do peer-to-peer SNA networking without solely relying on APPN products from IBM and the friends they choose to license the software to," noted Nick Lippis, president of Strategic Networks, Inc., a consultancy in Rockland, Mass.

APPI allows users to interconnect APPN End Nodes over their existing Transmission Control Protocol/Internet Protocol (TCP/IP) backbones without having to implement the complexities of APPN Network Node on their routers. APPI combines IP routing and addressing with directory protocols and software that can intelligently handle SNA packets.

APPI IS AIMED at the plethora of commercial customers running both Systems Network Architecture and LAN internetworks.

A systems manager at a large New York financial services firm, who asked not to be identified, was bullish on the concept. "To the extent that we'll be doing APPN, we'll be doing it this way," he said. His firm runs a large IP backbone. "The fewer protocols in the backbone, the better," he said.

Robin Layland, engineering consultant at The Travelers Corp. in Hartford, Conn., added: "Using IP routing instead of native APPN is positive in that it reduces the number of protocols on the network. This has the benefit of less network overhead and of letting users of different protocols receive the same levels of service."

The public interest

APPI is billed as a public-domain specification available free of charge to vendors that want to implement it on their internetworking gear. Among the vendors that have endorsed APPI are BT, Infonet Computer Sciences Corp., Cabletron Systems, Inc. and McData Corp.

Not all vendors are jumping on the APPI bandwagon. APPI "is just another proprietary announcement," said Lynn Nye, a spokesman for LAN gateway vendor Sync Research, Inc. "Like the SNA product Cisco started to announce last year, this will be another attempt to implement their version of APPN when they don't have a grasp of what they're getting into."

Digital Equipment Corp. said it would consider APPI as one way to implement SNA support on its high-end router, the DECnetwork Integration Server.

"Cisco is making a big bid here to cut IBM off at the pass with its own approach," said Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consultancy in Cambridge, Mass., that "isn't crazy about APPI."

Cisco's offering presumes an IP backbone, she pointed out, and that "users will view APPN wrapped inside of TCP/IP as better than native APPN."

Rick Villars, an analyst at International Data Corp. (IDC), said, "Directly challenging a strategic technology for IBM is an audacious move." However, he said, when IBM announced its APPN strategy in March 1992, IDC believed that many IBM customers would have preferred APPN to be built on top of TCP/IP "instead of being positioned as a direct alternative."

That is because an IDC survey of 200 mainframe sites revealed that more than 20% stated TCP/IP would be critical to their network plans, while slightly less than 5% said APPN would be.

Cisco gear will support APPN — a routable protocol — as well, but not until the first quarter of 1994.

Whether IBM will support APPI on its still-to-ship 6611 multiprotocol router is a question mark; IBM said it just learned of APPI this week.

"We're looking at it and trying to understand what it is," an IBM spokeswoman said. "It looks interesting, but we don't know enough yet to comment."

Cisco's main competitor, Wellfleet Communications, Inc., declined to comment.

Senior editor Elisabeth Horwitt contributed to this report.

Open SNA

Cisco's open APPN announcement adds another option to these alternatives for melding IBM networks with LAN internetworks:

- **Running separate SNA and LAN networks while either building a routable APPN backbone out of SNA or letting the SNA network die off.**
- **Using existing source-route bridging or routing SNA packets encapsulated in other protocols.**
- **Running IP over SNA backbone.**
- **Running IBM peer-to-peer networking over existing IP backbone with Cisco APPI or using some combination of APPI/APPN.***

*Announced this week

CW Chart: Michael Siggins

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NEWS SHORTS

SNA gets flatter

Two router vendors last week alleviated barriers to carrying IBM Systems Network Architecture (SNA) traffic over local-area networks. Alongside its industry-rattling announcement that it has developed an alternative to IBM's Advanced Peer-to-Peer Networking approach (see story page 1), Cisco Systems, Inc. followed through on Phase IV of its five-phase IBM internetworking plan, initiated in 1989. Phase IV emphasizes prioritizing SNA traffic over LAN internetworks to increase response time. CrossComm Corp. last week delivered a similar capability.

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Wang talks Chapter 11 with users

Eighteen members of the U.S. Society of Wang Users recently met with officials from Wang Laboratories, Inc. to discuss the effects of its recent Chapter 11 filing on the user base. Joe Tucci, newly promoted executive vice president of operations, promised customers continued service from trained customer engineers. Wang's proposed plan to lay off 5,000 of its 13,000 workers was detailed to the group.

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Let your keyboard do the walking

Electric Bookshelf, Inc. in Norcross, Ga., is giving away the Employers on Disk database of 10,000 employers. The package, normally priced at about $149, has the addresses of employers in 12 major U.S. cities, as well as a program that lets a user browse through the database, add contact names and print mailing labels.

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Navy buys Intergraph gear

Intergraph Corp. in Huntsville, Ala., won a $422 million contract to supply interactive computer graphics systems and services to the U.S. Navy. Part of the Navy's $1.5 billion CAD-2 program, the procurement includes up to 4,200 workstations, 1,082 servers and 500,000 hours of support services. Intergraph beat teams led by Centel Federal Systems and Federal Computer Corp. for the job, the largest federal procurement ever of computer-aided design technology.

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AT&T picks up encryption tools

AT&T's Secure Communications Systems Division last week acquired public-key cryptography licenses from Public Key Partners through which it will develop devices for secure voice, data, fax, cellular and video communications. The licenses will give AT&T access to all forms of public-key. Greensboro, N.C.-based Public Key Partners holds the exclusive licensing rights to the Stanford University and MIT patents covering public-key cryptography. Neither the terms nor the financial value of the deal were discussed.

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Short takes

Peter B. Sheridan, a 40-year **IBM** research veteran and a member of the IBM team that developed the Fortran language during the mid-1950s, died on Aug. 25 of pancreatic cancer. . . . **Computer Sciences Corp.** (CSC) will receive a small slice estimated at $3 million annually of a $39.7 million asset management contract awarded last week by the **Resolution Trust Corp.** to **Texas Data Control.** CSC's CSC Logic subsidiary will provide data processing through a Resolution Trust data center and will also provide project management, report distribution and training. . . . The **Communications Managers Association** (CMA) and the **Association of Data Communications Users** will merge under the CMA banner. . . . **Next, Inc.** shipped NextStep 3.0, which features client support for **Novell, Inc.** NetWare and **Apple Computer, Inc.** AppleShare, object programming tools, a database development tool and Integrated Services Digital Network. . . . The **Petrotechnical Open Software Corp.**, a consortium of oil companies that works to define software standards, will study two object-oriented database packages — **Hewlett-Packard Co.**'s OpenODB and **UniSQL, Inc.**'s UniSQL/X — as elements of a unified method to manage data from multiple computer systems. **Microsoft Corp.** has extended the reach of its Visual Basic development language to MS-DOS.

NetWare, host integration elusive

CONTINUED FROM PAGE 1

networks to their IBM mainframes via third-party gateways; however, implementing these gateways can be tricky because both must be configured correctly, and problems are hard to troubleshoot.

Gateway user Jeff Cagel, a systems programmer at Ryan Aeronautical Division of Teledyne, Inc. in San Diego, explained, "SNA and NetWare are both two closed, proprietary systems." And engineers who really understand both NetWare and Systems Network Architecture are rare, so one side of the connection usually poses problems.

Gateways and terminal emulation are a long way from what is usually defined as interoperability — allowing host and LAN-based applications to use either platform and share data. First, common communications application programming interfaces (APIs) must be implemented on both platforms.

One step at a time

Some progress has been made. Both Novell and IBM will support the vendor-independent messaging standard. And, according to IBM, both companies are committed to supporting IBM's Common Programming Interface for Communications on NetWare servers. But applications written for an IBM platform still do not commonly run on NetWare LANs.

A good starting point, according to Craig Burton, president of the Salt Lake City-based research firm Burton Group, would be for IBM to build a NetWare Loadable Module that could translate its Server Message Block calls for NetWare. "We haven't heard anything about such a product from either IBM or Novell," he said.

Once a link is made, users want to monitor and manage both mainframes and LANs from one centralized location. Rod Peterson, operations specialist manager at Raychem Corp., a manufacturing company in Menlo Park, Calif., said, "I want to be able to monitor those remote LANs via the mainframe and provide LAN backup and recovery services from our central mainframe shop."

Some said they think IBM could do more to ease NetWare connectivity issues. "IBM seems to pass on a lot of decision-making to the customer rather than building more intelligence into the software," said Thomas Rianhard, a systems officer at Centerbank in Waterbury, Conn.

"You have to make the same parameter choices in about 20 different places. If you enter one wrong, the stuff won't work. The puzzle doesn't need to be that intricate," he said.

Several users said they were solving integration problems by throwing away their mainframes. Ken Stickney, LAN and communications manager for the city of Glendale, Calif., said, "Now we use gateways between our Novell LANs and our mainframe, but within a year and a half, we'll be completely off the mainframe. We're replacing it with Unix workstations."

An information systems manager at a Connecticut manufacturer said, "As soon as we can find a LAN payroll system we like, we're turning the mainframe off."

To avoid such moves, IBM is working to get its integration products out the door.

Bob Roth, who manages the Novell/IBM relationship for IBM's Networking Systems Division, claimed IBM has worked closely with Novell on the remote management of NetWare environments from IBM hosts. IBM is also working with Novell to enable NetView to remotely control NetWare servers.

"Secondly, in terms of applications developments, we are working with Novell to ensure that we both support the same APIs. Thirdly, IBM is now developing the NetWare drivers for our Token Ring, Media Access Unit and bridge products. Of course, there's no magic wand that so totally integrates them that there are no seams between the products, but the customers we've talked to have been appreciative," Roth said.

Confusion in LAN Server land

The fact that IBM has been selling an IBM-labeled version of Novell's NetWare since February 1991, combined with Microsoft Corp.'s plans to move LAN Manager to its New Technology (NT) platform, has left users confused about IBM's plans for its LAN Manager-based OS/2 LAN Server.

"LAN Server is an integral part of IBM's distributed computing strategy. We have plans in place for follow-on releases of LAN Server," said Joe Demassa, IBM's manager of LAN Systems Marketing in the Personal Systems Group.

"I think people expected that IBM would give up on LAN Server and go with NetWare, and they haven't, so the LAN Server users I talk to are confused," said Cheryl Currid at Currid and Co., a consultancy in Houston.

And while IBM has been preoccupied with the desktop wars, Novell's development of NetWare on IBM platforms has proceeded full speed.

According to Bob Young, director of marketing at Novell's NetWare Products Division, the vendor will have versions of NetWare for the RISC System/6000 and NetWare for OS/2 out shortly after the late 1992 release of NetWare 4.0. "Most of the actual development is being done by Novell; IBM's contribution is support for us on their platform," he said.

Despite user confusion and Novell's aggressive drive, IBM is making it clear that LAN Server is its LAN platform of choice. Demassa defined IBM's LAN operating system strategy thusly:

"What we're telling our customers is that for the traditional workgroup, where you just want file and print services or you need an application that runs on NetWare, Novell is a fine solution. For the customers that are looking to build custom corporate applications on the LAN, we think OS/2 and OS/2-based LAN Server is the right platform."

NetWare for OS/2, expected in early 1993, will not be a viable approach, according to IBM, because it runs as a process on top of OS/2 rather than being integrated with OS/2 like LAN Server.

Demassa also addressed Microsoft's announcement that NT will be its primary development platform for future LAN Manager versions. "LAN Server and LAN Manager have diverged and will continue to diverge. We will be adding features to LAN Server similar to those found in LAN Manager 2.1, plus some extra features of our own, but we will do the development ourselves."

Although OS/2 Extended Edition provides some connectivity, IBM said that for a true client/server LAN, users should buy LAN Server for the administration, management, file and security services that are found only in a LAN operating system.

MICHELE DOSTERT

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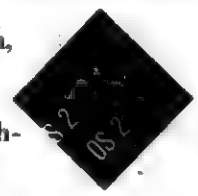

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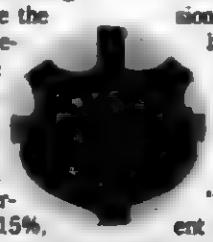
IBM

IS staff members consider the union label

CONTINUED FROM PAGE 1

In most cases, the percentage of IS staff members who are union members varies from 4% to 10%. But some labor experts said that is a historical low-water mark that should increase through the late 1990s.

"Our research shows a resurgence of unionism, following a period of decline since the 1970s," said Gerald Celente, director of the Trends Research Institute in Rhinebeck, N.Y.



In the U.S. work force, union membership stands at about 15%, said Daniel Cornfield, associate professor of sociology at Vanderbilt University in Nashville.

But in some parts of the economy, union membership runs as high as 40% — and often spills over into IS shops.

Burlington Northern Railroad in St. Paul, Minn., has 50 IS employees in the Transportation Communications Union, while hundreds in the 2,000-employee Massachusetts job agency belong to a government workers' union.

Traditionally, programmers and systems analysts styled themselves as technical warriors who were immune to automation, labor experts said.

"A lot of computer professionals always thought they had unique skills that would protect them," said Elaine Bernard, executive director of Harvard University's trade union program. "But they are no different than any other set of skilled workers."

Now that the work force is being squeezed in the middle, the skill set required to retain many IS jobs is changing, she said. For example, there is a surplus of mainframe jockeys in the market, in part because of IS layoffs that have followed data center consolidations, corporate mergers and bankruptcies [CW, Aug. 24.]

Union plants IS seed corn

Two years ago, a new union shop for IS was born at Nebraska's Central Data Center when employees elected a Nebraska Association of Public Employees (NAPE) bargaining unit.

The Central Data Center houses an IBM Enterprise System/9000 Model 720 and has about 300 IS staff members, half of whom are union members. Membership is not mandatory, but those who defer membership are lobbied.

"If they're turned off by the idea of the union, I back off," said Jeff Duhaime, a computer operator who is Local 61's union steward. The dues run to 1% of an employee's wages.

Some members of Local 61 feel they have benefited from standardized work rules and collective bargaining for wages, formal job postings and grievance procedures.

The union advocates employees' concerns, but it cannot veto changes in working conditions.

Union members can request a meeting with management, as some did recently when their hours were changed. "As long as the union is standing behind them, employees will not be left behind in technical training," Duhaime said. "If layoffs ever come, there are bumping rights so that the most senior people will be the last ones to go." However, the state-endorsed union does not support the right to strike.

State legislation allowed Nebraska employees to become unionized in 1969 and to bargain collectively for the wages of administrative workers in 1987, said Bill Arfmann, executive director of NAPE/AFSCME Local 61. The union covers 2,000 state employees.

JEAN S. BOZMAN

The formation of unions cannot stop technological change, but it can alter the way rapid change is handled within an organization, users said.

Unions "encourage dialog between management and the employees," said Jorge Quintero, assistant director of computer systems for the city of Miami, who directs centralized computer operations.

Miami had just 10 unionized computer operators until 1991, when union negotiators from the American Federation of State, County and Municipal Employees traded 4% salary increases for the right to organize more city workers. Now, 45 IS staffers belong to the union.

Despite the growth of some unions in IS shops, unionism has not been widely accepted since the Reagan administration downplayed its importance in the 1980s, experts said.

Resistance from some IS employees is one reason union membership is voluntary at sites such as Nebraska's state data center (see story above). "Many workers are scared to unionize because they don't have the full backing of the law," Cornfield said.

"A lot of shops have fought the union situation by reclassifying their staff as full-time workers not covered by the union contract, rather than as hourly workers," said Arnold Farber, president of Farber/LaChance, Inc. in Richmond, Va.

Some IS managers wince at the thought that unionization could ever come to their data center. It nearly happened at Crittendon Hospital, a highly unionized 300-bed medical facility in Rochester, Mich., in the mid-1980s. "There was a drive to unionize, and the organizers got enough signatures to have an election," said Robert Dinges, IS director of a staff of 13. "We had an active campaign against it."

The union lost the vote at Crittendon, but management changes were quickly made.

Dinges said he was relieved that unionization did not take hold: "Unions tend to be regimented, and IS tends to be free-flowing," he noted. "In the computer business, you never know when there's going to be overtime or when someone's going to have to come in to work."

Insurer taps EDS in switch back to centralized processing

BY MARK HALPER
CW STAFF

SANTA MONICA, Calif. — Fremont General Corp., a large insurance company that had intended just to sample an appetizer from Electronic Data System Corp.'s services menu, has instead selected a 10-year outsourcing entree.

The insurance company has tapped EDS to take over all data processing for its main subsidiary, Fremont Pacific Insurance Group, a $425 million workers' compensation operation.

The contract grew from a distributed computing job for which Fremont hired EDS last January, according to Fremont's chief financial officer, Wayne Bailey.

Under the original plan, EDS was combining the computer operations of Fremont Pacific's three units — Fremont Compensation Insurance Co., Pacific Compensation Insurance Co. and Beaver Insurance Co. — into one distributed system based on a Sun Microsystems, Inc. platform, Bailey said. The units were operating on a hodgepodge of systems, including an IBM mainframe and a Sun server.

But Fremont determined that the project would take too long — 2½ years — and cost too much, Bailey said.

The outsourcing job entails a mainframe-based hierarchical system, Bailey noted. "We reversed field. We're going to a mainframe now," he said.

Neither Fremont nor EDS would reveal the size of the contract, but Bailey estimated Fremont will save about $5 million in the first two years.

"The big thing will be the next couple of years," he said.

Although EDS offered jobs to Fremont's information systems staff, Bailey said he was not sure how many of the approximately 60 staff members took EDS' offer.

Riding the waves

Besides cost savings, Fremont's outsourcing decision was motivated by a desire to concentrate on the company's core business, which in California is riding a sea of changes related to changing workers' compensation regulations.

"We wanted our management to focus on workers' compensation issues, not on computer systems," Bailey said. Proposed changes in the workers' compensation business include switching to competitive premium pricing from a minimum premium pricing system.

Bailey noted that offloading data processing onto EDS will also give Fremont greater flexibility to absorb the computer operations of companies it acquires.

Ask Unix manufacturing suite debuts

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — The Ask Cos. is slated to introduce its Manman/X manufacturing applications for Unix client/server systems this week and ship them to users by November.

But the firm said last week that Manman/X, a package developed by a Dutch firm and adapted for Ask's Ingres relational database management system, will be ported to other vendors' databases by 1994. Ask acquired the Ingres relational technology when it purchased Ingres Corp. in 1990.

The introduction underlines the failure of $432 million Ask to port its own Manman manufacturing suite to the Ingres RDBMS in time to field a Unix client/server product by the fall. Ask decided last summer to license a 27-module program suite from the Dutch firm Baan International NV to compete at global sites that favor Unix [CW, July 20].

Ask said last week that versions for other SQL-based RDBMSs would be available in 12 to 18 months for customers who do not wish to use Ingres.

Gaining an edge

"We did change our plans as we went along," Peter West, Ask's vice president of marketing, told *Computerworld* last week. "But by taking the steps we took, we think we will have 12 to 24 months' advantage over our competitors," he said, referring to Oracle Corp. and SAP AG.

Analysts noted that Oracle's manufacturing applications for Unix database servers are starting to ship in volume and that SAP's real-time manufacturing resource planning systems will start to ship in the U.S. this fall.

West said Ask's Advance, a two-year project to port Manman to Ingres, is still alive, at least for the initial general-ledger accounting package. The Advance package was pulled back from field testing for rework last spring. "Ask's ideals [for Advance] were so high they never got there," said Ted Rybeck, director of research at Advanced Manufacturing Research, Inc. in Boston.

Some beta-test users of Manman/X seemed not to mind Ask's change in plans. "If I had seen Advance coming in the near future, it would have been a viable option," said Steve Greiner, manager of information systems at Industrial Dynamics Co. in Torrance, Calif. "But we were outgrowing our system and felt we couldn't go into the new year without buying new hardware."

The 325-employee firm is replacing an aging 5 million instructions per second (MIPS) Hewlett-Packard Co. HP 3000 that ran Manman with a Unix-based 75-MIPS HP 9000 that will run Ingres-based Manman/X by December.

The initial release of Manman/X will support Unix systems from Digital Equipment Corp., HP and IBM. It has a built-in tool set that can be used to customize applications. Pricing will be based on the number of users, ranging from $25,000 for an eight-user system to more than $250,000 for a 128-user system.

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Apple announces a between Windo

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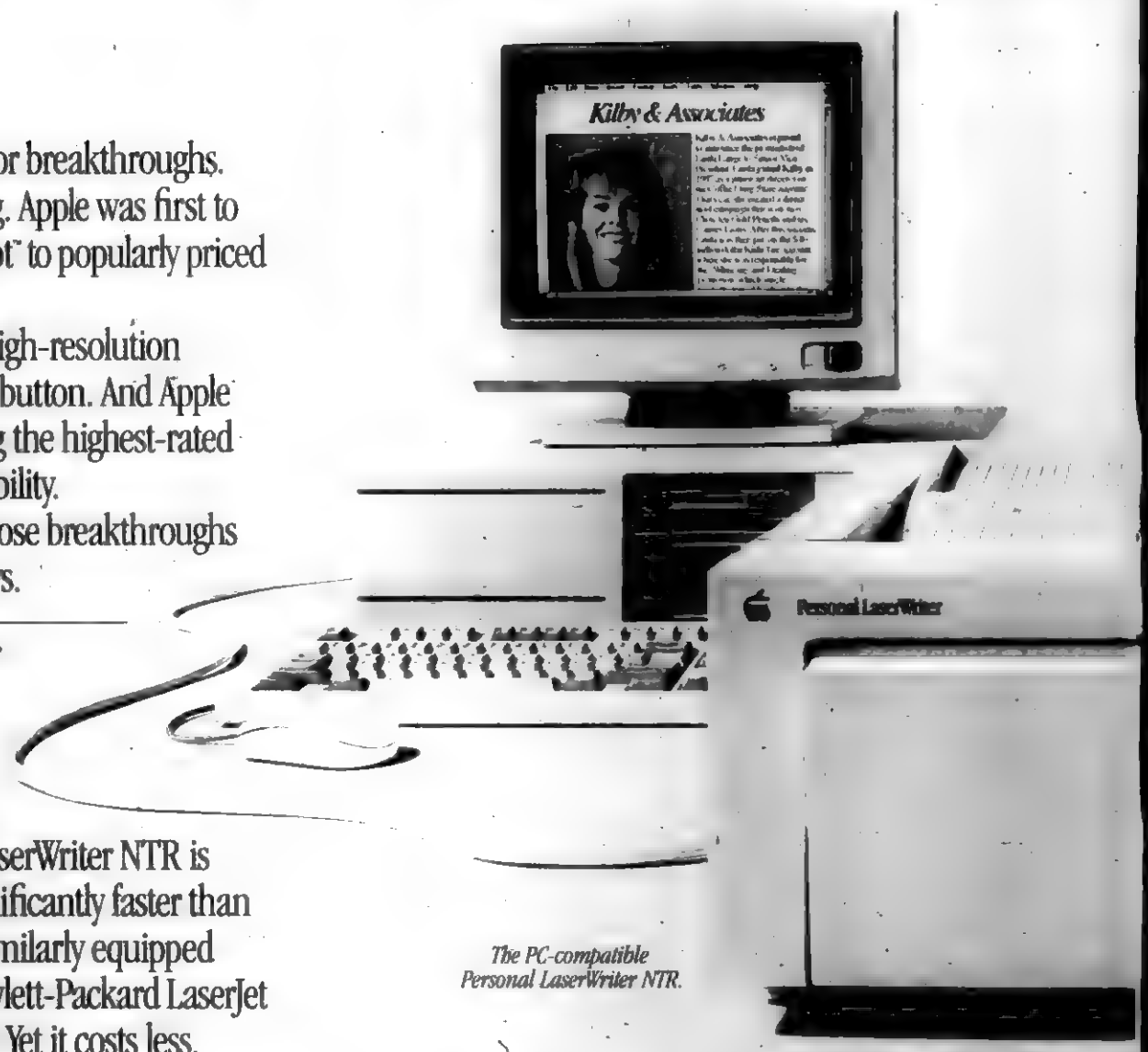
Apple was the first to make high-resolution scanning as easy as one touch of a button. And Apple® LaserWriter® printers remain among the highest-rated printers for image quality and durability.

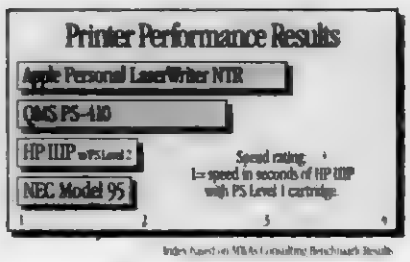
Now, Apple is extending all those breakthroughs to people who use PCs and Windows.



The PC-compatible Personal LaserWriter NTR.

The fastest printer in its class for PCs.

With a RISC controller that assembles pages at incredibly high speeds, the Apple Personal LaserWriter NTR is significantly faster than a similarly equipped Hewlett-Packard LaserJet IIIP. Yet it costs less.



The RISC-based Personal LaserWriter NTR dramatically outperforms the HP LaserJet IIIP, the QMS PS-410 and NEC Model 95.

The LaserWriter NTR comes standard with Adobe PostScript Level 2 and LaserJet II PCL compatibility, a parallel port to connect to your Windows PCs and an AppleTalk® port to connect to your Macintosh computers. And since both of these ports are simultaneously active, it can receive documents from both Macintosh and PC users without flipping any switches.

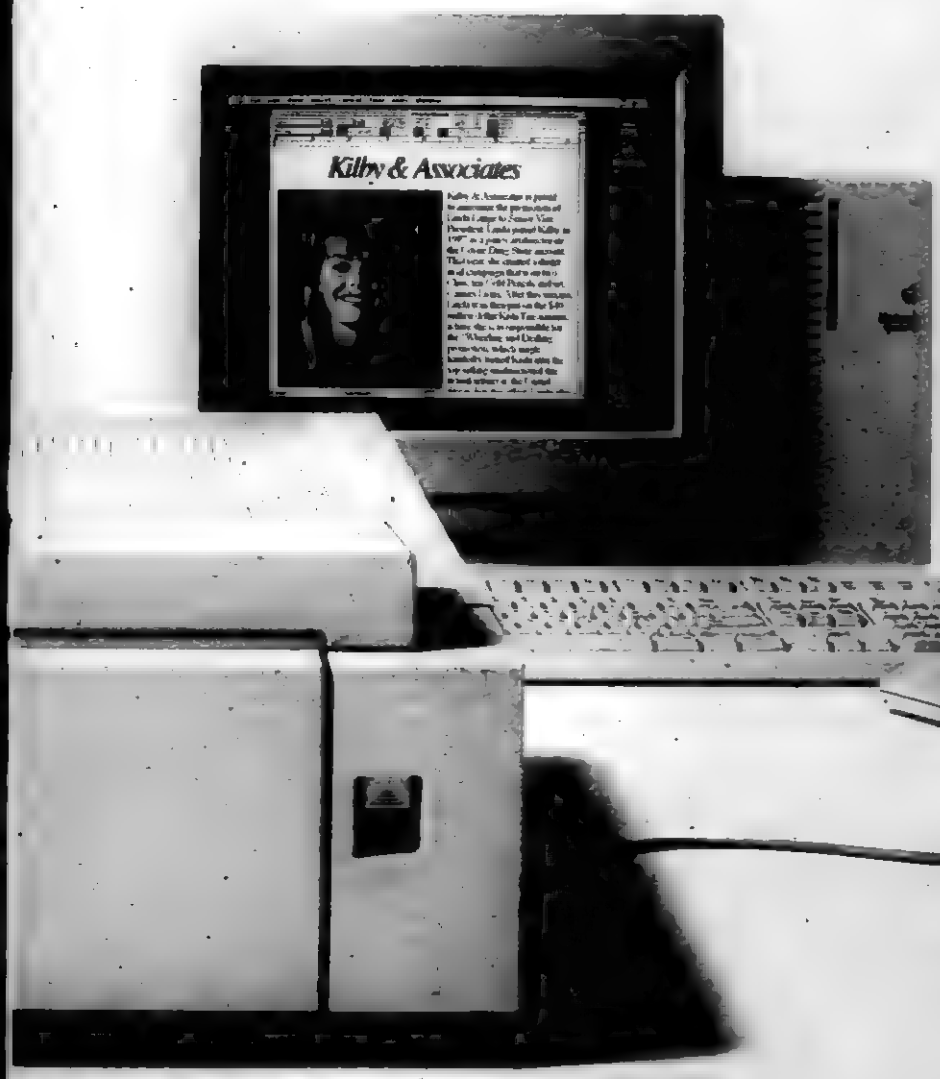
So the LaserWriter NTR is not just faster. It's also more flexible.

The first PhotoGrade printer for PCs.

On the left, conventional laser printing. On the right, Apple PhotoGrade printing. Which will do more for your image?

Like the LaserWriter NTR, the Apple LaserWriter IIg works equally well with both Macintosh and PCs. But it adds an innovative Apple gray-scale technology called PhotoGrade™

major breakthrough ws and Macintosh.



For high-performance networks, Ethernet is built in. And you can expand the memory to 32 megabytes for processing extremely complex documents. At Apple, we make your best work look even better.

The first one-touch scanner for Windows.

If you've ever used a scanner, you know it's an exasperating process of fiddling, futzing and adjusting. Not so with the Apple OneScanner™ for Windows. You simply pop your photograph or other artwork onto the scanner and click your mouse once. The OneScanner takes it from there. It automatically analyzes your image, sets the dpi and bit depths, adjusts brightness and contrast, and even straightens and crops. Before you know it, you've got yourself a perfect 256-level gray-scale scan.

One click. It's really that easy.

Your authorized Apple reseller will be glad to demonstrate just how much these breakthroughs can do for all your Windows PCs. For the location of a reseller in your neighborhood, call 800-538-9696, extension 145. And discover the power to make your work look better than ever. The power to be your best.

that delivers pages with image clarity comparable to 800 dpi.

The PC-compatible LaserWriter IIg.

The OneScanner for Windows.

Documents that incorporate photographs look nothing short of amazing. And with Apple's exclusive FinePrint™ technology, even text and line art have sharper edges and smoother curves than ever before.

ADVANCED TECHNOLOGY

TECH TALK

End of school?

■ The current school year will go ahead as usual. But many scientists, educators and science fiction writers think the classroom of the future will be inside computer networks. About 100 scientists and writers made their best-guess predictions on the future of the classroom as part of the eighth annual L. Ron Hubbard Awards for winners of the 1991 International Writers and Illustrators of the Future Contest. Among the predictions were the following: Students in the future will experience subjects as part of "virtual reality" field trips to such places as Ancient Greece and World War II-era Europe. The forecasts were sealed in a time capsule and will be opened on Aug. 24, 2042.

Thinking vectors

■ Thinking Machines Corp. in Cambridge, Mass., has begun receiving vector chips from Texas Instruments, Inc. for its CM-5 massively parallel supercomputer. Thinking Machines said the vector chips increase performance in the 1,024-node Connection Machine CM-5 seven times over its predecessor, the CM-2.

Going for a test spin

■ Ncube Corp. in Foster City, Calif., has sold its massively parallel computing platform, the Ncube 2, to Michelin America's Research and Development Corp. The company's Greenville, S.C., unit will use the 64-processor system on computational fluid dynamics and other complex calculations related to the mechanics of a spinning car tire.

Cray lands at Ames

■ NASA tapped Cray Research, Inc. to provide a Y-MP C-90 supercomputer for the Ames Research Center in Mountain View, Calif. Cray bested NEC Corp. in Japan, which had hoped to establish a toehold in the federal government. The deal has been watched as both the U.S. and Japan charge that their supercomputers are barred in the others' government markets.

The whole world in your pocket

Low-orbit satellites could allow you to make moble calls from anywhere to anywhere

BY ELLIS BOOKER
CW STAFF

It is safari season and you find yourself deep inside the Serengeti, 650 miles from the nearest pay phone, and you need to touch base with the home office.

Fortunately, in the pocket of your khakis you have a device about the size and weight of a portable cellular phone from which you can place or receive a call to any other spot on the planet.

Still a few years off, this is one scenario for Iridium, Inc., which plans a network of dozens of low-earth orbit (LEO) satellites that will finally provide a seamless, global communications network for mobile subscribers.

A wholly owned subsidiary of Motorola, Inc., Washington, D.C.-based Iridium's global satellite network will become a reality in early 1998, when all 66 of its LEO satellites are deployed. Iridium recently revised its original plan, which had called for a constellation of 77 satellites. That earlier number gave Iridium its name: 77 electrons fly around the nucleus of an iridium atom.

While safari hunters in out-of-the-way places may use Iridium, the network will have its greatest impact on business customers who could use the satellite network to bypass the difficulties of dealing with communication infrastructures of developing nations.

CW Chart: Janell Genovese

Along with voice services, Iridium will be able to carry low-speed (2.4K bit/sec.) data transmissions. In addition, one inherent aspect of the Iridium scheme is radio determination, a means of locating the position of the mobile subscriber on the map.

While Iridium will start with global voice services, it might develop applications for the global positioning feature at a later date, company spokesman John M. Windolph said.

Windolph estimated the cost for an Iridium call will be in the neighborhood of $3 per minute; the dual-mode Iridium handset — the phone will be able to use the satellite network as well as the local terrestrial cellular system — will cost approximately $3,000.

Satellites for communications are nothing new, of course. Even today, provided with the right hardware — a luggable transmitter/receiver and a parabolic dish — a hunter might set up a phone call from the safari trail.

But because Motorola and Iridium envision a far smaller, more portable phone — something about the size of today's 4 to 5 ounce cellular phone — that can communicate directly with the satellite, this means lower-orbit satellites that require substantially less powerful portable units on the ground.

Conventional communications satellites fly at 23,300 nautical miles above the earth. Iridium's "birds" will fly at an altitude of just 420 nautical miles.

Last month, Iridium moved a step closer to having the Federal Communications Commission grant it an experimental license to launch and test five satellites in polar orbits.

Iridium anticipates the contract for the total system, including the satellite constellation and assorted control facilities, will be about $3.37 billion.

To raise the capital for the project, Motorola plans to divest all but 15% of its interest in Iridium. It plans to sell the remaining shares to a consortium of domestic and international carriers.

Big LEO, little LEO

Data services via satellite systems will grow in the coming years, predicted Insight Research Corp. in Livingston, N.J. Revenue from global data network services on satellites will shoot up 67%, while revenue from voice services on satellites will actually decline about 4% between 1990 and 1996. Data services on satellites will grow from $1.33 billion today to $8.4 billion in 1996, Insight said.

Insight President Robert Rosenberg explained the two classes of LEO satellites now in development: those like Iridium that transmit and receive at frequencies above 1 GHz (big LEO) and handle voice, text and data; and those that transmit and receive at frequencies below 1 GHz (little LEO), which are suitable for text and data messaging only.

"There are a host of companies that have staked out positions in both LEOs, and there's a race on now to design and deploy them," Rosenberg said. Both types of LEOs got an important boost earlier this year at the World Administrative Radio Conference-92 meeting in Malaga, Spain.

ELLIS BOOKER

Looking for power in the sky

BY ELLIS BOOKER
CW STAFF

Say what you will about the telephones of yesteryear. They had one distinct advantage over newfangled handsets: They did not require AC or battery power.

Even powering terminals (for example, phones and other electronic systems) in optical-fiber networks is troublesome. That is because optical fiber, unlike copper cable, cannot carry electrical energy to devices in the field.

But researchers at Bellcore in Chester, N.J., have begun looking skyward for an answer. Bellcore scientists are exploring the use of solar power for optical components in the field, with an eye toward putting the solar collectors as close to the customer as possible.

Bellcore found it could use a solar power system — composed of two side-by-side photovoltaic solar panels mounted on a 14-foot poll — to collect enough energy to satisfy the telephone needs of four average U.S. households.

Solar energy is converted to low-voltage DC and transferred over a cable to commercial lead acid batteries. Batteries are attached to conventional electronics for use on cloudy days.

Along with obvious environmental benefits, Bellcore researchers said, their system could provide areas with abundant sunlight, such as the South and the Southwest, pollution-free power at costs comparable with other methods for powering optical electronics.

Bellcore said its prototype will be tested as part of a "fiber-in-the-loop" study later this year with US West.

Meanwhile, other telecommunications engineers are preparing for the day when optical lines extend to subscribers' homes and business. Power solutions being discussed include sending high-energy light pulses to photoelectric cells inside the optical subscriber's site.

The Life of Brian

"We're so confident in our network storage technology, that if you'll send us your network systems administrator for 4 hours, we'll pay that person's salary for a full day," invites Brian Swafford, founder and president of QStar Technologies, Inc.

I Was Just A Kid.

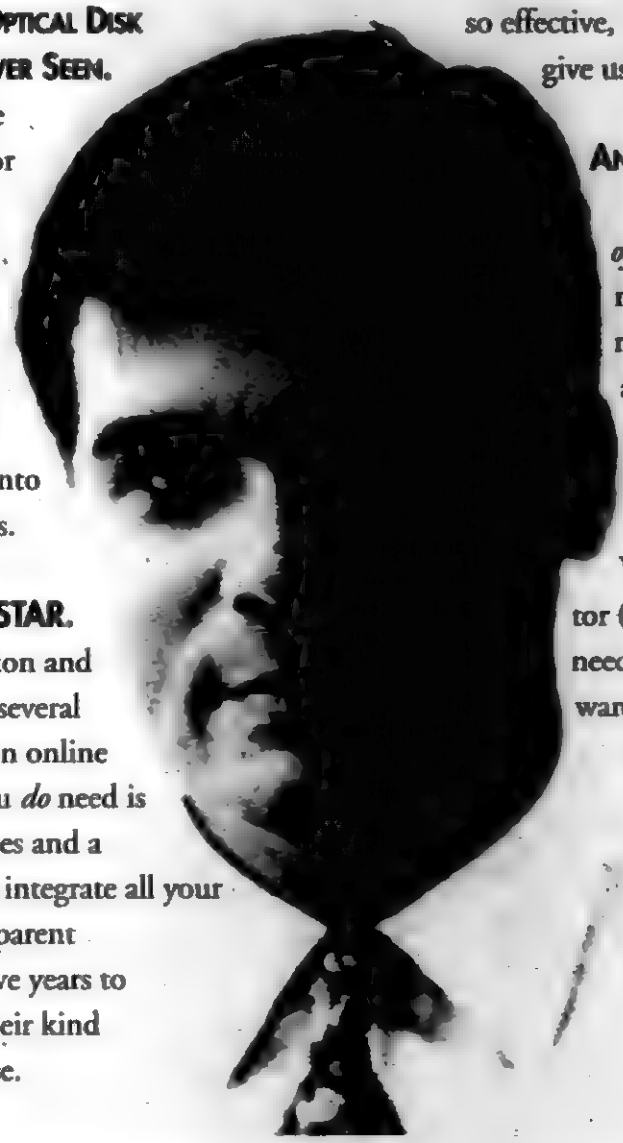
Even when I was young, I wanted to do world-changing kinds of things. I remember wanting to build the ultimate library, where anyone could access every book ever written at the touch of a button. My library would reside on a giant space station.

So I Majored In Math, And Joined NASA.

Actually it was a double major: math and physics. Math for the massively complex file management algorithms, and physics because … well, getting that much stuff into orbit seemed like a non-trivial physics problem. Is it any wonder I found myself at NASA's National Space Science Data Center heading up Networking and Mass Storage R&D?

I Got To Build The Neatest Optical Disk Networks This Planet Has Ever Seen.

If you've heard of the Space Physics Analysis Network — or SPAN — I worked on it. And on many massive optical storage systems as well. I never did get to build my space station library of every book ever written, but it's amazing just how much information I got into orbit on revolving optical disks.



Five Years Ago I Founded QSTAR.

You don't need a space station and NASA-scale resources to have several hundred GBytes of information online and at your disposal. What you *do* need is commodity mass storage devices and a group of software engineers to integrate all your media into a single, user-transparent storage network. And about five years to craft the only capabilities of their kind available anywhere, at any price.

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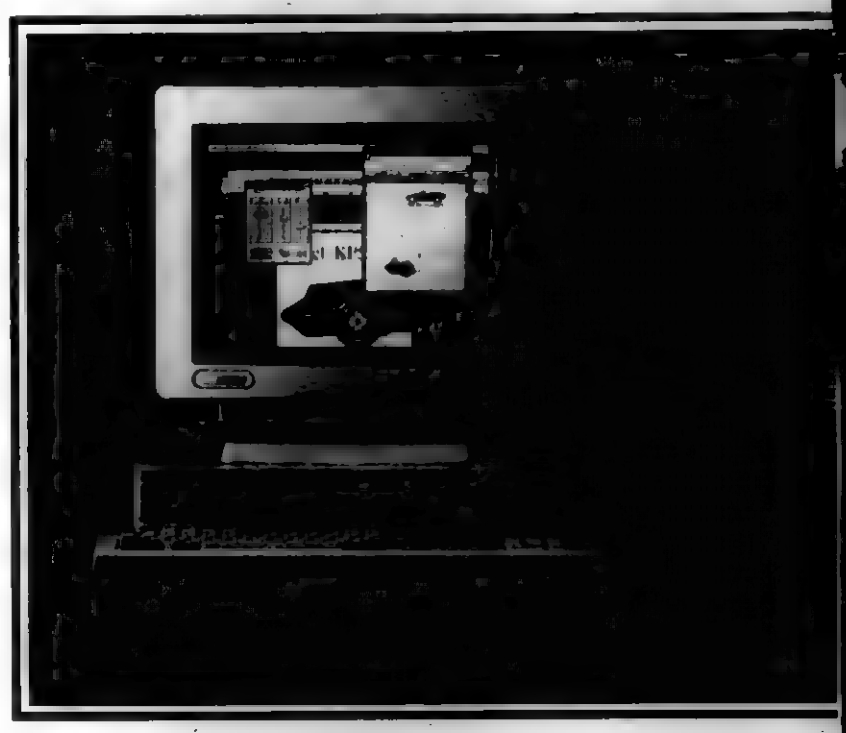
THE COMPAQ DESKPRO/i. SO A LIMITED PRICE LEADS

The company most qualified to advance the state of the desktop computer announces four systems that represent a breakthrough in R&D. At prices that won't ruin your P&L. Reflecting the level of thinking and quality that you've come to expect from Compaq.

At Compaq, there's a fundamental belief held by all of us that when you set an extraordinary goal, extraordinary people will meet it.

Recently, for example, you made it clear to us that you wanted computers with everything from advanced graphics to audio capability to affordable prices. Our response: the COMPAQ DESKPRO/i Family of PCs. Four new systems loaded with features to enhance productivity.

The built-in COMPAQ QVision 1024 Graphics Controller, for example, allows you to scroll, resize windows and pull down menus up to ten times faster than most popular video graphic subsystems. So quickly, as a matter of fact, you may find your computer waiting for you. Instead of the other way around.



Its unique VersaChip Upgrade Architecture ensures your PC won't be swept into obsolescence.

Simple chip upgradability and a 64-KB cache

†This service is provided by contracted Service Providers and may not be available in certain geographic locations. Contact the Compaq Customer Support Center for further details. *Suggested retail price; reseller price will vary; monitor not included; price indicated is for COMPAQ DESKPRO/i Model 86, not pictured here. © 1992 Compaq Computer Corporation. All Rights Reserved.

MUCH FOR THE IDEA THAT TO LIMITED THINKING.

memory module option provide quantum leaps in performance. Without similar outlays of cash.

Intel 386/25, 386/33, 486SX/25, 486/33, 486DX2/66 ◆ *QVision accelerated graphics* ◆ *VersaChip Upgrade Architecture* ◆ *Integrated business audio* ◆ *4 MB RAM (up to 32 MB)* ◆ *Cache memory standard* ◆ *3 ISA expansion slots* ◆ *3 drive bays* ◆ *84-MB to 510-MB hard drive options* ◆ *Multi-level security features* ◆ *Microsoft MS-DOS 5.0 as published by Compaq*

The integrated audio system provides for an unprecedented, yet not unfamiliar dimension in mainstream business computing: your voice.

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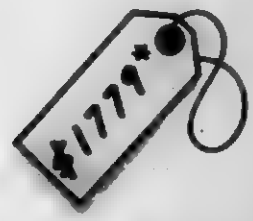
For more detailed information, just call us at 1-800-345-1518, ext. 210 in the U.S., or call us at 1-800-263-5868, ext. 210 in Canada.

We bet you'll be as excited about the COMPAQ DESKPRO/i as we are.

intel inside

Our exclusive VersaChip Upgrade Architecture allows you to expand the COMPAQ DESKPRO/i PC from 386/25 through 486DX2/66.

You can paste voice messages into MS Windows 3.1 documents with our integrated business audio system.



The COMPAQ DESKPRO/i PCs start at just $1779. Our integrated QVision graphics offer "incredible performance—among the fastest we've seen for any system." —PC Magazine*

COMPAQ

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EDITORIAL

It ain't over yet

"Dewey defeats Truman."

I sometimes think of that 1948 headline from the *Chicago Daily Tribune* whenever I read about another columnist or stock-picker who's decided to declare Microsoft the winner in the desktop operating system derby. Is it really possible for a race to be over before it even starts?

Not by a long shot. There won't be a hands-down winner in this marathon, and it's sad to see corporate IS under pressure to choose sides when there are so many miles left to go.

I'll give you the view from my own desktop. As a closet techie, I had Windows installed on my 386/33 clone about two weeks after 3.0 came out. I upgraded to 3.1 two months ago. Great product. Fast, colorful and (finally) reasonably bulletproof.

Then I installed IBM's OS/2. And lately I've been zipping around the desktop, popping up windows, multitasking and mixing character and graphics applications as if they were meant for each other. Great product.

The problem is, neither environment does exactly what I want it to. Windows has wide third-party support, a more intuitive look and feel, a slick installation and excellent overall performance.

OS/2 is comparatively clunky, and I had to ask my IS department to install it. But it has one big thing Windows doesn't: real-live multitasking. For a 10-year MS-DOS user like myself, the idea of working on a document while simultaneously formatting a disk and dialing up MCI Mail is enough to make you salivate.

Why make a choice? Pick what's best for your needs right now, and put the squeeze on your vendor to fill in the gaps. Windows and OS/2 do have something in common: They're a darned sight better than what we had before, and they both have the support of powerful vendors that are committed to fighting this one out.

Remember how long it's taken to get here. Windows was announced in 1983; the first really usable product shipped in 1990. OS/2 was announced in 1987 and hit its stride about six months ago. So by my watch, OS/2 isn't too far off schedule.

Both companies acknowledge the shortcomings of their current products and say they'll fix them. We'll see. I hope someday we'll have a product that combines the youthful energy of Windows with the maturity and wisdom of OS/2. Maybe we'll have two products that do that.

So why make a choice? The operating system battle is being stirred up by marketing departments that have everything in the world to gain by making this an either/or decision. But for corporate users, the view is pretty good from up on the fence.

You might wonder what is running on my desktop right now. It's OS/2. But tomorrow is another day.

Paul Gillin, *Executive editor*

LETTERS TO THE EDITOR

One CA product is lauded, another is not

I was disappointed in the Buyers' Scorecard that reviewed mainframe relational database management systems [CW, Aug. 17]. Computer Associates' CA-IDMS 12.0 was omitted from your product list.

While CA-IDMS is most often associated with its traditional Conference of Data Systems Languages (navigational) heritage, the newest release has an architecture that provides other navigational and relational technologies in a single DBMS engine.

This new engine provides the ability to access navigational data with SQL, as well as provide access to newly defined SQL tables.

Application code can also access navigational and relational data at the same time. In this respect, the CA-IDMS 12.0 engine is somewhat analogous to that of CA-Datacom 8.0.

As an early participant in CA-IDMS 12.0's beta-test cycle, my site has had the opportunity to exercise the new DBMS engine. CA has delivered on its promise of relational technology in an evolutionary rather than revolutionary manner.

Our investment in IDMS application software has been protected, but most importantly, our investment has been significantly enhanced.

James F. Bradshaw
Clemson University
Clemson, S.C.

If Computer Associates hopes to "break its mainframe shackles" [CW, Aug. 17], it is going to have to do more than change public perceptions of its role in the PC software market. It will have to ship decent products as well.

CA-dBFast is the buggiest piece of PC software I have come across in more than a decade of consulting.

The software hangs the machine in countless ways, sending the mouse cursor into blinking/beeping fits. And the program won't even read a large (but simple) database file that ran fine on Foxbase.

My calls to CA's technical support line were equally maddening. I spoke to a tech support rep who sounded more like a fast-talking salesman and gave me workarounds (such as using keyboard commands instead of the mouse — how's that for a Windows product?) without even acknowledging the program's many inexcusable defects.

Steven Salemi
SouthWest Systems, Inc.
Santa Fe, N.M.

Enticements

Assuming that the "Downsizing enticements" you cite are correct [CW, Aug. 24], you have either discovered why Digital Equipment Corp. lost more than $1 billion last year or why insurance costs have gone through the ceiling. To wit:

- A DEC RA91 disk drive is 1.2G bytes and can be obtained at this time for less than $7,000.
- Swapping motherboards should be the least of concerns for a corporate systems manager.
- A company that has programmers activating batch jobs from home must have some truly interesting job descriptions for its IS staff.

Ray Davis
Sheffield Steel Corp.
Sand Springs, Okla.

With IBM shift, what about VM?

Regarding "IBM repository shift suits users, for now" [CW, July 27], announcements concerning IBM's change in plans for Repository Manager have been met with approval but some concern.

Large corporations have a big investment in mainframe technology used to support applications that may not be easily moved to a LAN-only environment. Since IBM is reconsidering its position on the placement of Repository Manager, has anyone at the company considered VM?

VM has been the stepchild of IBM's offerings. While it appears to be fully blessed with its own ESA release, many feel IBM could do more to promote this platform.

VM is one of the most heavily used office automation platforms. Many companies rely on it to serve large numbers of users in an efficient and relatively friendly manner.

VM is a natural file server — the ultimate LAN platform. Can IBM afford to overlook VM's potential as a repository manager and not help large companies leverage their mainframes for all they're worth?

Stephen O'Malley
Nynex Corp.
White Plains, N.Y.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Sabotage of the airline systems

MAX HOPPER

While many inefficient U.S. enterprises have fallen prey to aggressive global competition, the U.S.' world-class companies may have only Congress to fear.

The House of Representatives has passed a bill that, if approved by the Senate, would severely cripple airline computerized reservation systems (CRS), one of our country's most advanced and efficient electronic distribution networks.

Over time, these systems have created a perfect marketplace within the airline industry, enhancing competition worldwide. The day a new airline begins flying it can display its fare and schedules on the industry "shelf" and compete head to head with even the largest airlines, without paying a dime to the CRS unless its products are sold.

For years, some less successful airlines and CRS vendors have broadcast false claims of monopolies, architectural system bias and anticompetitiveness. These myths persist, despite years of court actions ruling the claims invalid. Having failed to sway the courts and to compete successfully in a deregulated airline market, the critics of prosperous CRSs now seek the antithesis of competition and the last refuge of inefficient producers — regulation.

This CRS legislation, grossly mislabeled the "Airline Competition Enhancement Act," is nothing more than special-interest legislation. It proposes to "enhance" competition by restricting contractual rights between CRS vendors and their travel agency customers. It would impose strict technical standards on systems operations, and it would restrict the CRS industry's freedom to set its own prices.

Such a convoluted "cure" could be endorsed only by those same keen strategists who attempt to spend their way out of debt by taxing us into prosperity.

In how many industries are contract lengths between two business parties limited by legislation? Should legislation void a five-year contract that a company fairly awards to a CRS vendor in order to give a competing vendor who lost the contract (and promoted the legislation) a second chance at the business?

Does Congress really have the credentials to decide how major systems should be technologically developed? Does it have the wisdom or moral authority to dictate the price businesses should charge for their products? Should a company that invested in the development of proprietary technology be compelled by the U.S. government to turn it over, free of charge, for use by a competitor?

Michael Siggins

Already neutral

Clearly these proposals are absurd. Even the portion of the bill that calls for system neutrality is unnecessary. All four U.S. CRSs sell flights for all participating U.S. airlines and many international carriers. It only makes sense that all CRS-owning airlines would demand nonbiased systems of each other.

The proposed regulations are the worst form of meddling in a free marketplace. They are promoted under the lofty-sounding premise of a "level playing field." But the political process of leveling the playing field in the name of equality can only tilt the top end down and standardize the market alternatives at the lowest common denominator.

Deliberately damaging CSRs Sabre and Apollo will do nothing to help consumers, travel agents or the airline industry. It will, however, lower the quality of information available to airline customers, discourage development of CRS technology and demonstrate to businesses of every stripe that the U.S. Congress is willing to punish our economy's winners.

Hopper is senior vice president of information systems at AMR Corp.

Learn the lingo and become an 'insider'

MICHAEL COHN

Buzzwords are the key to professional success. Lawyers use them to keep one step ahead of clients. Doctors use them to keep one step ahead of lawyers. And we computer folks use them to confuse management, confound users, dazzle the opposite sex at parties and recognize our real peers.

In addition to the buzzwords that we use in public — the ones that the media and users are always trying to co-opt — there are some real insider terms that function a little like a secret handshake.

These are the words used by a handful of old timers — the folks who have been around the block a few times, read dumps in their sleep and have calculators that are more expensive than their cars. If you want to mix with this fraternity, pay attention and I'll clue you in to a few of their favorites.

Doubtsourcing: High-tech insiders use this term when they don't trust the company that runs their systems off-site. You'll occasionally hear about doubtsourcing, unless the relationship has gotten so bad that it's turned into "shoutsourcing."

Downsqueezing: Trying to get a 7 ft 3 in. mainframe out through a 7 ft computer room door.

Printegration: Occasionally, users buy lots of different types of systems and then want IS to do something about it. When the manuals say the systems are all supposed to work together but no one has a clue as to what's going on, that's printegration.

Printegration eventually deteriorates into local-area networks, where nothing can talk to anything and eventually IS managers just give up and adopt a standard of "open anarchitecture."

Prayned floor: This is where companies keep the million-dollar mainframe that everyone prays will stay up until month's end.

Then again, some shops trash the mainframe and get smaller distributed systems. These usually work for about six minutes, until the network crashes and communications get cut. These are called the "client severs."

And some shops go in the other direction and buy large mega-expensive systems that are guaranteed never to go down. So when they do, people really lose their tempers. That's why these are called "fault hollerant."

DUSD: Dud DASD. Of course, not all DASD is DUSD. But if you want density and high tech, move up to leading-edge, image-oriented storage systems: "obstacle disk."

Yousability: If users would let us handle their software, the world would be a better place. But instead they sneak off and buy all kinds of disparate applications, most of which are "IBM-combatible."

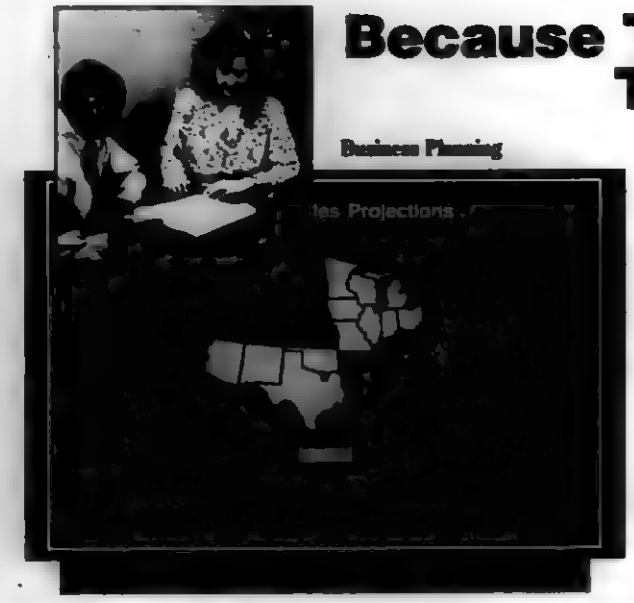
That's when IS has to put its foot down. That's when you tell your users, "From now on, all software will be 'yousable.' . . . You figure out the stuff and leave us alone."

If end users followed standards, none of this would happen. But they don't, and they always wind up with software that is "user-fiendly."

Delational waitabase: Most IS managers put off implementing 4GLs and centralized data. The folks who don't have the time and decide to wait will eventually build a "repausitory." But the folks who don't have the skill or knowledge will eventually build an "Information Wherehows" . . . either that, or a resume.

Discover resistory: That's what the chief information officer finds when he looks for a volunteer to write the IS contingency plan.

Cohn works for a very large computer company in Atlanta.



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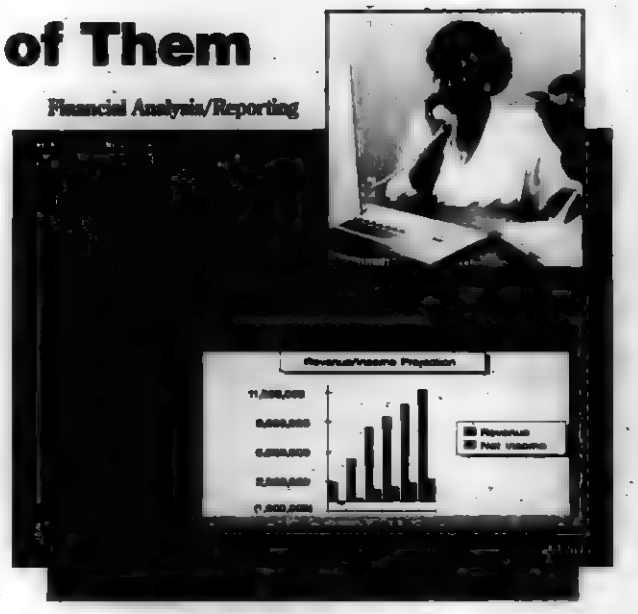

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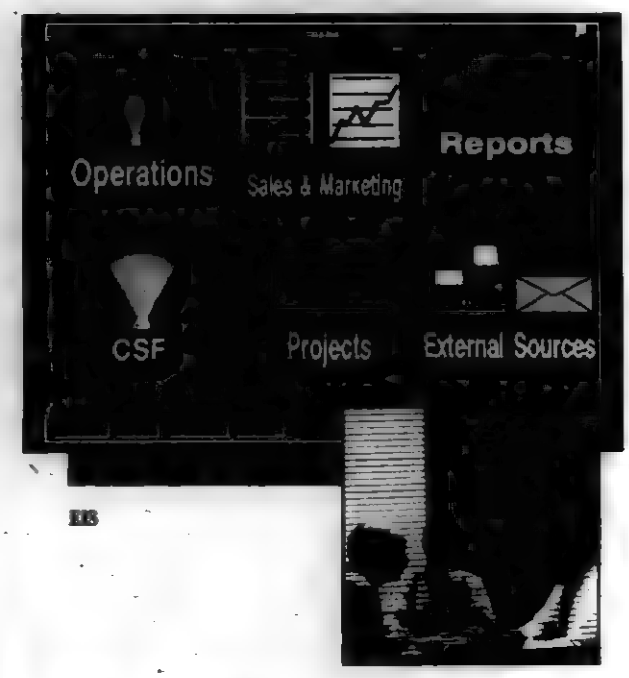

The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

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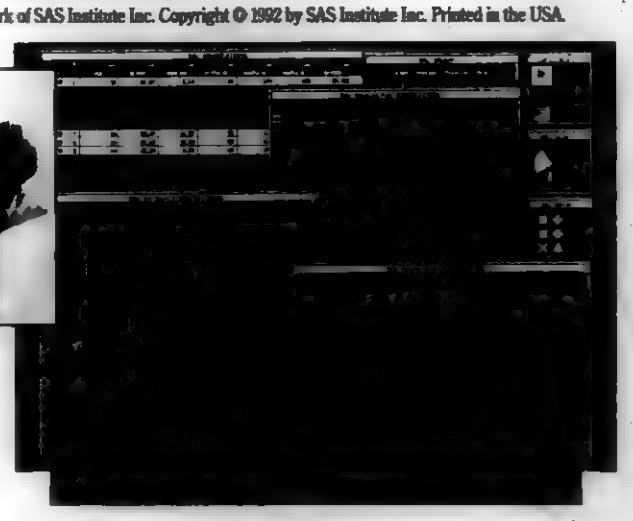

Flow, quality tracker is repackaged

BY MICHELE DOSTERT
CW STAFF

Recently repackaged personal computer software promises to help information systems groups track the flow and quality of their projects by analyzing progress on key function points.

Applied Business Technology Corp. (ABT) introduced a quality measurement package, called Metrics Manager, to help IS groups measure, track and improve their quality, productivity and customer satisfaction.

According to Danek Bienkowski, executive vice president and co-founder of New York-based ABT, the product lets managers establish a baseline for their current quality and productivity, identify variables that affect these areas and more accurately forecast the requirements of future projects.

At a price of $14,950 for the basic package and one year of support, plus optional industry-example databases and training, Metrics Manager is not inexpensive. However, one software quality measurement expert said she thinks users will save far more than they spend on the product. Nancy Spencer, a Downers Grove, Ill.-based consultant at Framingham, Mass.-based venture-capital firm NorthPoint Software, is the author of a report on metrics and measurement in software development who consult-

Continued on page 32

New generation of portables challenges IS

BY JAMES DALY
CW STAFF

Rocked by cutthroat pricing battles and shrinking margins, many captains of the personal computer industry — including Apple Computer, Inc. and IBM — are hoping to revitalize the sluggish desktop market early next year with the introduction of lightweight, task-specific, pocket-size systems.

As these machines ferret their way into every conceivable market — and many analysts are betting they will — they could present a bold new challenge to the efforts of information systems to effectively manage distributed technology.

"In two or three years, the rules regarding how we handle information on the desktop might be entirely different than they are today," said Jeffrey Henning, a senior analyst at BIS Strategic Decisions, a research firm in Norwell, Mass.

The impetus for this shift will be a device that today goes by several monikers: personal digital assistants (PDAs, which is the name we'll use here), personal communicators, information appliances — even picocomputers, or personal intelligent communicator.

These highly intelligent devices promise to ultimately weigh 1 pound or less; offer crisp readable displays, handwriting and voice recognition, wireless fax and modem communications and a pager; cost about $500; and offer software so intuitive that only seconds after you scribble "lunch with Pam" on its screen, Pam will have received a query fax, and the appointment will be entered in your appointment book.

These machines are not souped-up calculators or personal computers on a diet. "These machines are more than just small computers. They'll be consumer products and communications devices as well," said Richard Shaffer, publisher of the "ComputerLetter" newsletter in New York. "In fact, they could fundamentally change the way we do computing."

And that is why analysts are saying it is not too early to start drawing up a blueprint for integrating PDAs within your organization. William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said the little machines will have a big impact on IS.

"A new class of IS is needed," he said — one whose expertise will focus on the new hardware, software and applications development process required for the new designs' software development. Bluestein called this specialization "field MIS."

Unlike general-purpose notepad pen systems such as NCR Corp.'s 3125, PDAs will be special-purpose devices. For example, a tablet-size PDA for sales personnel will feature product information and contracts; another for dock workers will be outfitted with data collection accessories such as bar code readers and scanners.

That's an exciting prospect for users. Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle, said he would like to outfit grocery clerks with PDAs in order to stay current on the tens of thousands of items typically for sale at an average supermarket. "We're not necessarily talking

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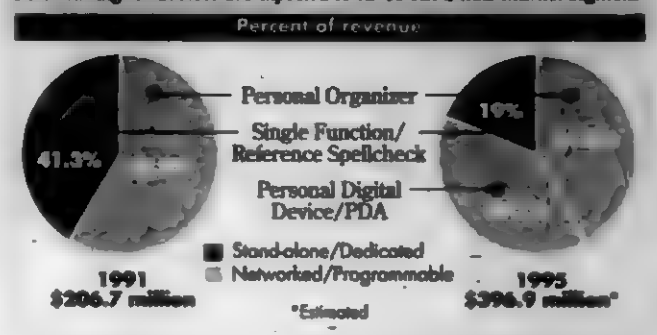
New niche

Personal digital devices are expected to carve out a new market segment



Source: BIS Strategic Decisions — CW Chart: Michael Siggins

Who's involved?

If all highfalutin PDA claims sound like something out of an old Dick Tracy comic strip, "ComputerLetter" publisher Richard Shaffer noted, this type of machine could be cobbled together today with existing technology. The first models, however, will not be available until early next year when Apple releases Newton.

IBM is another firm eyeballing the market, and it plans to make a splash in November at Comdex/Fall '92 when it demonstrates its first prototype PDA — a handheld device with 1.8-in. drives that can accommodate up to 40M bytes of flash memory and weighs about 2 pounds.

In addition, a Mountain View, Calif.-based start-up called Eo, Inc. is working on a handheld device that uses a pen to organize and manipulate data and has built-in wireless communications capabilities. Other vendors planning PDAs include Sharp Corp., Tandy Corp., Toshiba America Information Systems, Inc. and Casio Computer Co.

Although product plans are just emerging, the U.S. market for PDAs will likely top $500 million by the end of the 1990s, according to researchers at BIS Strategic Decisions.

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Updated package ups WordPerfect profile

BY CAROL J. HILDEBRAND
CW STAFF

WordPerfect Corp. is beefing up its graphics offering — and giving it a name change in the bargain.

The product, formerly known as DrawPerfect, will now be known as WordPerfect Presentations to better reflect its positioning as a presentation graphics package, said Todd Titensor, director of product marketing at the company.

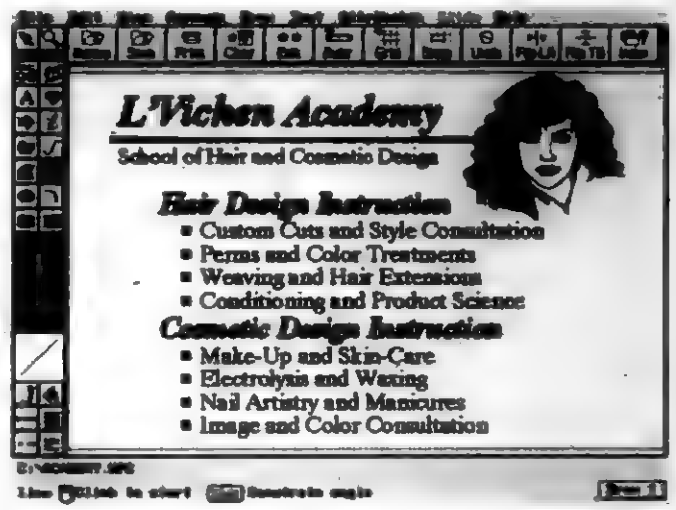
Version 2.0 for DOS, currently in beta testing, is due out this month, while the Microsoft Corp. Windows version is expected in December, Titensor said.

The version features a vastly different user interface that is a hybrid DOS/Windows interface, with button bars, mouse support and drawing tools represented by icons. The drawing and charting capabilities have also been greatly enhanced, with users allowed to create slides in the outline format through templates and move them around using a slide sorter. Clip art has been extended to 1,000 images, and audio clips are also being included.

Read Gilgen, director of learning support services at the University of Wisconsin in Madison, found that the improvements, such as the addition of bezier curves in the drawing tools and enhanced charting options, cut down on the time it takes to create a show. "It took me about an hour to do eight or nine different charts," he said. Gilgen also liked the new interface, saying that "it's about as 'Windowsy' as you can get without being Windows."

Analysts said that a higher profile from WordPerfect in this market is a plus, as the field has opened up somewhat. With Aldus Corp. in financial straits, Micrografx, Inc.'s Charisma needing an upgrade and Hollywood lost in the Claris Corp. shuffle, "the race seems to be Powerpoint, Freelance and Harvard," said Bill Coggshall, president of New Media Research, Inc. in Los Altos, Calif. "That's not trivial competition, but frankly, it makes good sense to have a product in this category and push it heavily."

However, WordPerfect is a little late to the Windows party. Software Publishing Corp. in Santa Clara, Calif., shipped market leader Harvard Graphics for Windows about eight months ago.



The newly named *WordPerfect Presentations has a hybrid DOS/Windows interface*

New generation of portables challenges IS

CONTINUED FROM PAGE 31

about putting huge databases on them — just a category's worth of information, like how items are priced and where they are placed on the shelves," Lester said.

As PDAs grow in popularity, a dial-in help desk will be required for mobile users. Since both hardware and software will be highly task-specific, the help desk staff members will need broad-based application knowledge.

"Building the expertise for a broad-based help desk could be our toughest challenge," said George Tabback, director of corporate information systems at Ingersoll-Rand Co. in Woodcliff Lake, N.J.

Changed focus

IS will also write fewer applications like payroll and accounting. More focus will be on order entry and on-line product information.

IS will also become an electronic publisher. With corporate electronic manuals, it will deliver catalogs, data and applications to workers in the field. This will require expertise in multimedia programming and compact disc/read-only memory technologies.

"There won't be the traditional porting of applications we see with new platforms," Henning said. "Instead, we'll see the creation of more applications driven by their connectivity abilities."

A typical application, he said, might be one that would allow a user whose travel plans have suddenly changed to wirelessly dial into a central server and call up maps, hotels or restaurant guides for the new destination.

While major obstacles still need to be cleared, users seem ready to take the leap.

"We're very excited about what PDAs offer," Lester said. "It will take some work to integrate them, but they could also have a very positive and stimulating effect on the organization."

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On the network side

PDA applications will put new pressure on network administrators, who will play a major role in their success. Excellent communications will be the key. Andrew Seybold editor of "The Outlook on Professional Computing," based in Brookdale, Calif., wrote in his newsletter, "without an umbilical cord of some kind, [Apple's] Newton is at best a much improved Sharp Wizard or Casio Boss."

Another key will be central host services for mobile computers. Companies will increasingly purchase wide-area services to support and connect the new machines, said William Bluestein, a senior analyst at Forrester Research. The role of the networking group will change from that of general contractor building the private network to that of manager of these purchased services. The growing use of wireless data transmission will also create new security concerns.

"Easy to use often means easy to lose, and an emphasis on wireless makes me very wary about confidentiality of data," said George Tabback, director of corporate information systems at Ingersoll-Rand. "Security is going to be absolutely critical."

A dial-in help desk will be required for mobile users. Since both hardware and software will be highly task-specific, the help desk staffers will need broad-based application knowledge.

Flow, quality tracker

CONTINUED FROM PAGE 31

ed on the development of Metrics Manager.

She noted: "A database project that is six months late because you didn't have the tools to accurately plan it is going to cost a lot more than $14,950. It could also cost you your job."

Metrics Manager is based on two fundamental IS management principles. First, the program uses "function points" to determine the size of a project.

Proponents claim that functionality is a more accurate measurement of scale than simply counting lines of code. Once a project has been measured in function points, measurements of variables can be added to the database.

Development measures

Variables can include such things as time estimated, time to completion, programmer expertise, man-months needed, projected costs, actual costs, tools used, defects reported and customer satisfaction.

"You might, for example, discover that one type of application progressed at the rate of 13 function points per man-month, while another type can be developed at 20 function points per man-month," Bienkowski said.

"You could find out that a project that had 400 function points as designed grew to 750 function points during the review process. You could set a goal of fewer than X errors per X number of function points. You can analyze your system as a whole for reliability and functionality. The point is, it lets you measure and quantify your current quality and then plan how to improve it."

Metrics Manager was originally developed in 1990 by Computer Power Group, a New York-based consulting firm, and marketed as MARS, or Metric Analysis and Reporting System. Computer Power Group will continue to support the development of Metric Manager.

The program, which is shipping now, uses the Microsoft Corp. FoxPro database and runs on Intel Corp. 80386-based PCs. ABT added data import and export features for links with ABT's other project management products, Product Bridge for planning and estimating and Project Workbench for scheduling, tracking and reporting.

"I think there's a massive market for products like this in the long term," Spencer said.

"Just as auditors and financial people verify the financial health of your company, products of this type let systems people verify the performance of the systems arena in terms of productivity and quality," Spencer added.

White Paper

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Introduction

Electronic Data Interchange (EDI) is not just another IS tool, another step up the technology ladder. With its ability to expedite business transactions between trading partners, EDI can promote commerce at a time when the sluggish global economy is dragging commerce down. It is also a boon to companies operating within more vibrant economic conditions, as it allows them to compete even more effectively.

As a result of its unique user-driven nature, EDI has evolved in strict accordance with the needs of a variety of vertical industries, each of which has tailored its technology to meet proprietary needs. While this freedom is arguably the purest expression of technology put to productive use, it has also led to a melange of EDI "standards".

Although efforts are in progress to unify users under one banner, a host of domestic and international obstacles — many not related to standards — must be overcome.

One of the most pressing and longest-running of those obstacles is the disparity of benefits EDI offers its varied constituents. In what has developed as a "haves" versus "have-nots" scenario, major retail and manufacturing companies that have implemented EDI are seen as forcing it on their suppliers, many of whom lack the resources to establish profitable EDI frameworks.

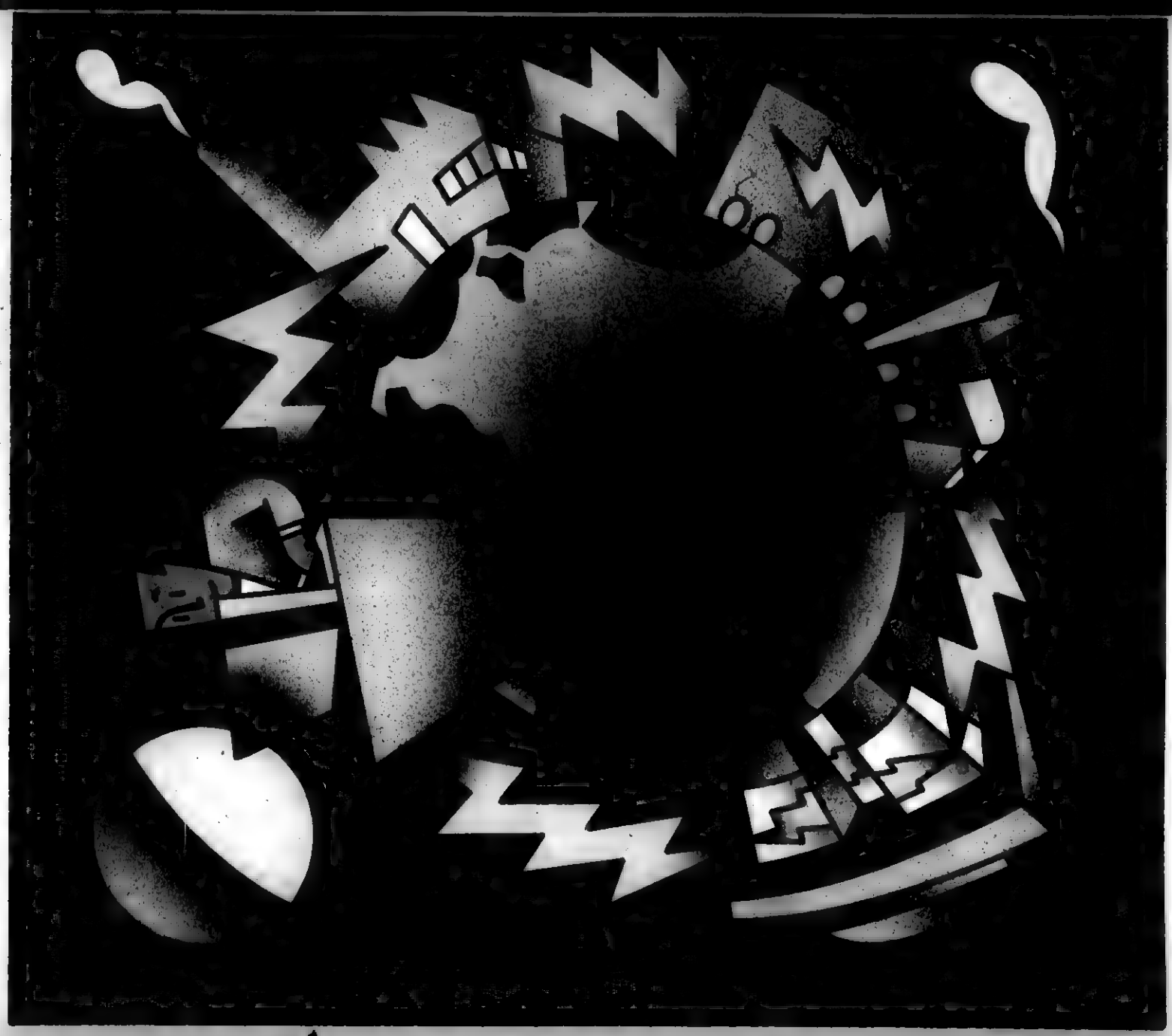
Although it is easy and appropriate to laud EDI for its potential as an economic catalyst, it does require attention on a technical level. Compared to other currently prominent technologies such as facsimile and imaging, EDI has a major advantage in that it is readily accessible for other applications.

As with other user-driven technologies such as personal computers, EDI has grown faster than IS' ability to obtain its full benefit. Now, IS is trying to provide broader and more integrated solutions that will allow users to get the most out of EDI while staying within the corporate IS structure.

Perhaps it is a good sign that so much attention is being paid to eliminating EDI's obstacles. That seems a sure indication that its ultimate success will be far-reaching.

This White Paper was written independently of the Computerworld editorial department by Paul Zorfass and Caroline Michel of International Data Corp. Zorfass is a consultant director at IDC. Michel is a senior analyst in communications.

For more information on the White Paper Program, please call 508-879-0700.



EDI (Electronic Data Interchange) is as much an evolutionary catalyst for continuous business improvement as it is an IS technology. EDI is unique in that it combines critical elements of data processing, business processes and communications.

EDI is a worldwide phenomenon that provides the infrastructure necessary for mission-critical transactions. It is being aggressively implemented and backed by national governments in the U.S., Canada, Europe, Asia and the Pacific Rim (Asia/Pacific). EDI has the potential to spur economic development by facilitating commercial transactions.

EDI is defined as the computer-to-computer interchange of business transactions that conforms with specified standards over a communications network that includes at least two trading partners. These transactions include the interchange of common commercial informa-

tion typically consisting of purchase orders, invoices, shipping notices and related acknowledgements. There are some special EDI characteristics that differentiate it from other processes and business solutions.

Most notably, EDI has been more user-driven than any other automated business solution. This has been advantageous for users because they have not been constrained by IS. They realize that characterizing EDI as a file transfer utility or as document-to-document interchange creates the wrong impression, one that does not portray the significant business benefits of EDI. Conversely, the user-driven nature of EDI has been disadvantageous to users because they lack the architectural and implementation coherence required by complex IS systems.

EDI growth has been bolstered by its appeal to some 30 vertical industry markets, each of which has become involved in specifying EDI standards for special interest organizations within that vertical industry. However, this vertical market appeal has undermined efforts to create a unified EDI standard. This situation has only recently been addressed by X12-Data Interchange Standards Association (X12/DISA). X12/DISA is the umbrella group for U.S. EDI standards, as chartered by the American National Standards Institute (ANSI).

The business and technology issues associated with EDI require special attention to project management, intra-enterprise cooperation and relationships between customers and suppliers. Companies that focus on these areas will realize competitive advantages.

The interchange of business information creates an extended enterprise environment. If the enterprise is viewed as a hub of activities, its trading partners can be viewed as spokes. Hubs represent the accumulation point for transactions from multiple trading partners. An example is a 350-store supermarket chain receiving direct store deliveries from its suppliers at all locations.

Typically, a larger spoke organization, such as a General Electric, RJR or Kodak, will be the hub for its own supplier network. Hubs have more specification power than spokes, which can lead to tension between the two trading partners.

MARKET SIZE AND MEASURES

Although the EDI market is worldwide, it originated in the U.S. and continues to enjoy most of its popularity here. The EDI market is comprised of three components:

- EDI software
- Data transport/network services
- Professional services.

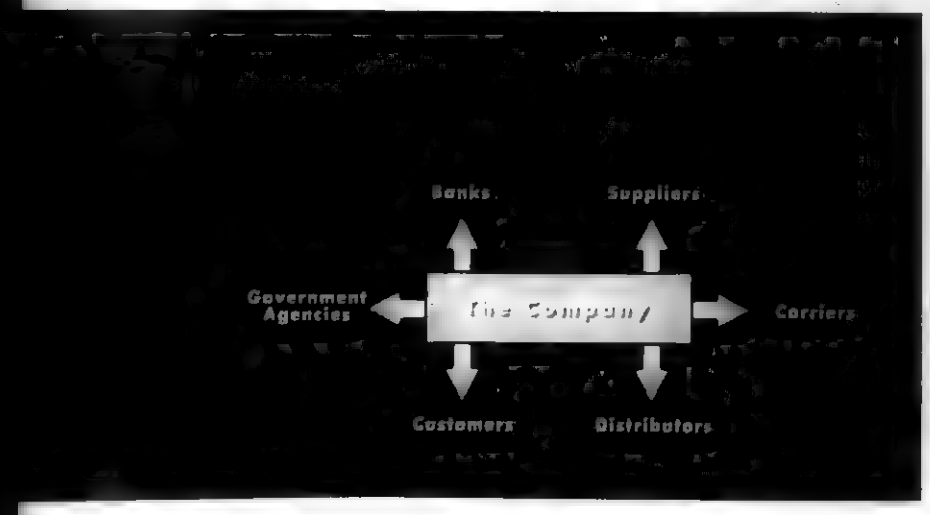
IDC estimates that the EDI revenues for these three components in the U.S., Europe and Asia/Pacific was $368 million in 1991. This figure is expected to reach $1.8 billion in 1996. This represents a compound annual growth rate of 37%. The projected growth by geographic trading area is 35% for the U.S., 36% for Europe and 48% for Asia/Pacific.

There are other parameters for measuring EDI's impact. For example, the banking community tracks the processing of EFT (Electronic Fund Transfers) transactions by the National Automated Clearing House. This is an excellent measure of how EDI is performing in the banking community. The best measure is the Corporate Trade Exchange (CTX) EFT transaction since it is compatible with the X12 ANSI EDI standard for remittance advice.

CTX transactions can automatically be processed from the automatic clearing house into a business's own EDI system. It is used for more than one invoice/payment. While the total number of transactions is modest, from the fourth quarter of 1990 to the fourth quarter of 1991, the number of CTX transactions processed went from 37,000 to 79,000, a growth of 114%.

The organization, "EDI, Spread the Word!", publishes the EDI Yellow Pages, listing EDI users. In July 1991, there were 21,000 registered users in this directory, and in July 1992, there were over 31,000.

The number of draft standards that X12/DISA has released for trial use over the last five years (excluding redundant transition standards) is steadily increasing. Maintenance activities continue at an active pace, showing interest and desire by users to make the standards more congruent with business practices.



EVOLVING BUSINESS AND IS PARTNERSHIPS IN THE '90s

Information technology trends such as downsizing and rightsizing are dynamics in the ever-changing relationship between IS and its business partners. As a result of such trends and economic imperatives, IS is being attached more securely to lines of business. Through all of these changes, IS must continue managing its high value-

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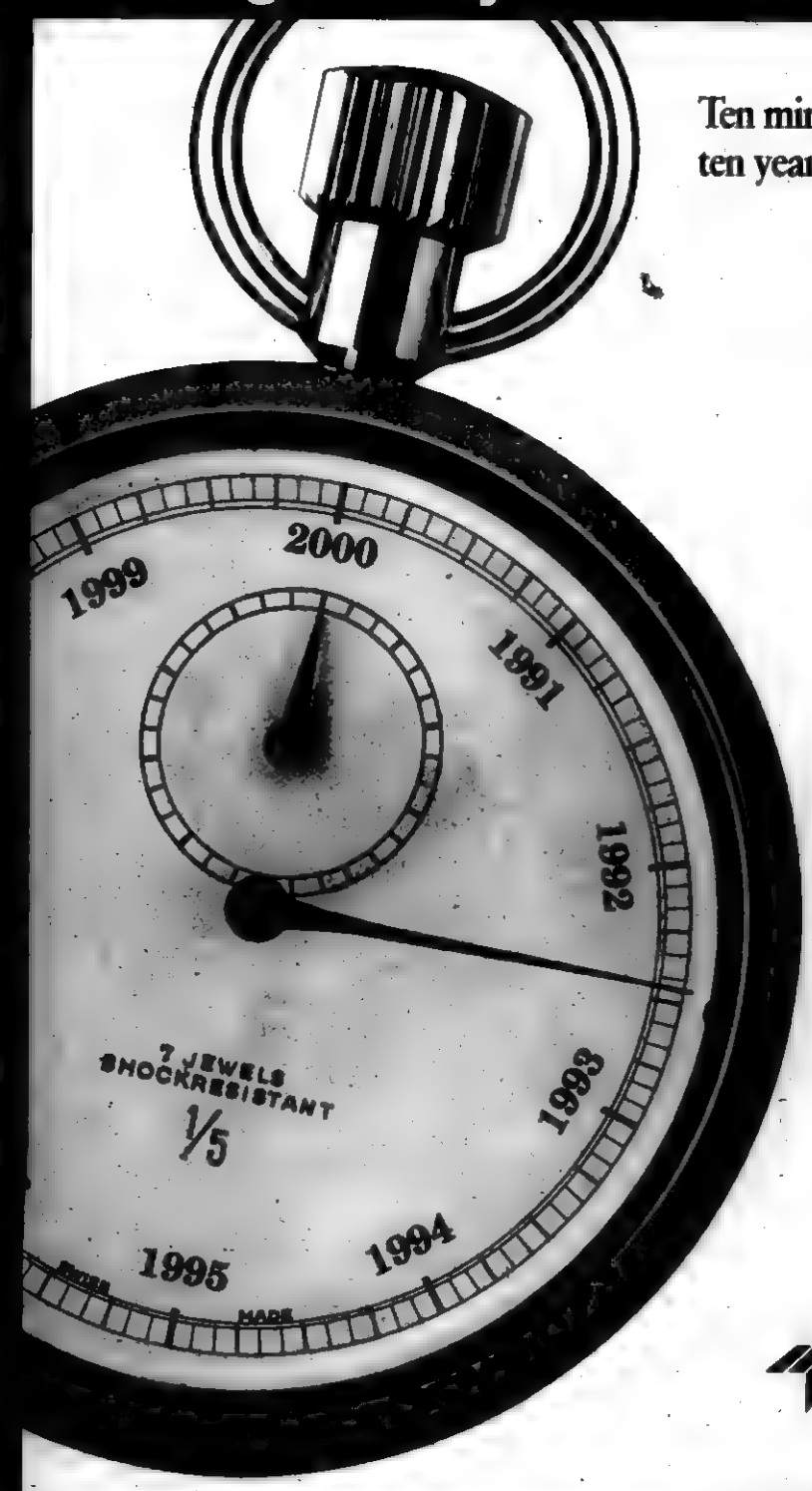

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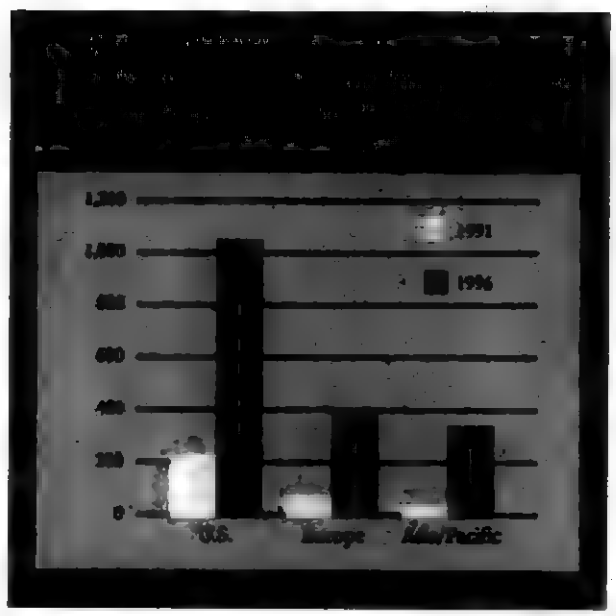
added, legacy systems (typically IBM and plug-compatible mainframes). This must be done in the face of new computing architectures, alternative software solutions, workgroup solutions and flexible infrastructures. At the same time, business management and IS are managing the ever-changing hierarchy of trading partner needs.

Senior IS executives need to keep in mind that there is a wide diversity of technology experience and planned technology funding for EDI. Smaller spoke organizations typically underfund EDI and put EDI solutions on dedicated PC platforms. While this approach meets the hub requirements, it does not allow the spoke/supplier organizations to realize the full range of EDI benefits.

Some advanced technologies such as fax and imaging which contribute to expanding electronic commerce are not yet ready for interoperating with current systems at all levels. If any data from a fax or image transmission needs changing, the entire fax or image must be retransmitted. With EDI, changes can be made on a transaction basis. While fax and image systems are sometimes simpler to utilize, their data is not readily accessible for other applications. By comparison, EDI's business transaction set opens EDI data to a wide variety of uses.

Enabling application software that allows EDI systems to operate in a variety of trading environments is critical. IS has prior experience with DBMSs, as a requirement for flexible data management: CASE, as a requirement for quality application development; electronic mail, as a precursor for continuous office communications; and 4GLs, as a requirement for responsive decision support systems. Similarly, EDI is a requirement for managing the business



organization for business process flexibility. As IS implementors understand, the challenge to building responsive systems is often directly related to the interfacing and interoperability functions.

TWO UNDERLYING EDI THEMES

EDI is a response to two underlying business themes, time-based business solutions and stakeholder-responsive solutions. This is the implicit motivator shared by such diverse EDI organizations as the Big 3 automakers, Sears, McDonalds, UPS, transportation port authorities and the Department of Defense. When it comes to time-based business solutions, the Japanese have shown that companies can control markets if they can first control their own companies, squeezing down the cycle times to complete tasks, while still not losing quality or accuracy. This means reducing paper, handling, filing and storage. Perhaps most importantly, it means reducing barriers to moving information and physical goods.

Currently, there are two noteworthy business practices in the U.S. that are particularly productive corollaries of time-based management solutions. EDI is conducive to both of them. The first, Just-in-Time (JIT), is a manufacturing strategy designed to reduce physical inventory and its associated costs, while managing a smoother interface between manufacturers and suppliers. This has spurred increasingly productive approaches to factory layout and design, production lines, transportation, bar coding and distribution.

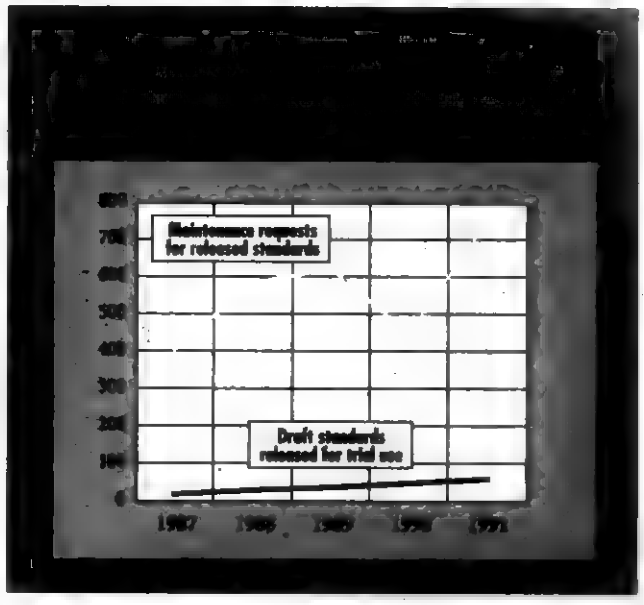
The second, Quick Response (QR), is a retail strategy, prominent in grocery/supermarket chains, designed to rapidly respond to customer buying patterns that are captured through point-of-sale (POS) checkouts. QR has led to such improvements as direct store deliveries, turnover management and earlier staging through advanced ship notices.

The ability to achieve best-in-class status, or even be recognized in an individual trading area as a company that other companies want to do business with, is a function of how well each company manages its separate audiences. These audiences consist of customers, suppliers, and employees. Since EDI establishes the infrastructure for electronic commerce by managing interfaces between companies, it improves stakeholder relations with customers and suppliers.

Managing the employee stakeholder is complex. Since EDI is almost always a change agent in the company, and since change is usually not comfortable for organizations, the scope, schedule and areas for application all require careful attention. Within many organizations, it is often the sales people who are the most concerned with the impact of EDI, since EDI forces them to become better business planners.

CONCEPTUAL MODEL ARCHITECTURE

While EDI use is growing rapidly within a diverse community of private and public users, architectures and universally accepted and understood models have lagged. While this may not have



hindered the rate of growth of EDI, it is becoming a more important issue as organizations work to achieve more critical paybacks from EDI.

It is also becoming more important for several other reasons.

- EDI is being deployed in a global environment marked by extreme differences in culture, business practices and approaches to problem solving
- More interactions are taking place outside an organization's primary trading group, with new partners, new practices and new language syntax
- The use of EDI as it relates to EFT and invoiceless payments is becoming more complex. This will force EDI hubs and spokes to communicate more precisely about critical points
- There is accelerating penetration of current EDI user organizations such as transportation companies, governmental agencies and banks. This means that education and training will grow in importance.

The initial development work for a conceptual model containing EDI standards and services was completed in mid-1991 by the Special Working Group on EDI under the auspices of the International Standards Organization. The objective of the group was not only to develop a conceptual model to identify and coordinate present and future standards and services, but to make it internationally acceptable.

FOUR SUCCESS FACTORS

The four overarching critical success factors for EDI are business process reengineering; standardization and infrastructure; automation and flexible computing; and integration and interoperability.

Business Process Engineering

The critical factor of business process reengineering, or redesign, was popularized by companies such as CSC/Index, Andersen Consulting, Ernst & Young and Nolan Norton. The approach is a methodical, often structured, approach to initiating fundamental organizational change by means of critically evaluating business activities. There is a discarding or reworking of ineffective or unessential processes. New approaches are built that utilize new technology, where appropriate, to achieve major breakthroughs in improved business performance.

Often the problems are larger than initially anticipated, since business problems do not usually fit into neat slots. For a computer systems manufacturer there may be multiple manufacturing systems, each having a different set of requirements, that need to be interfased at different locations. For a large manufacturing plant there may be multiple power plants each with railroad sidings for coal delivery, and the need to differentiate and cost differently since they use different grades of coal.

In the drive to become more efficient and reduce expenses through EDI, inventory reduction is often a target. This example can be the cause of significant concern, especially for the plant manager who has the ultimate responsibility for operations at the plant level, and who may see himself and his safety stock as both a beneficiary of, and a captive to, JIT solutions.

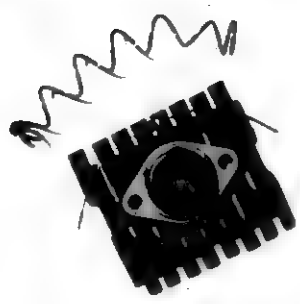
Standardization and Infrastructure

The first major area for standards involves messaging for the transaction transport and interchange over the communications network. The EDI roots for these are X.400 standards that were originally designed for electronic mail. The majority of current X.400 products is based on the version adopted in 1984. At that time, there was no explicit addressing of EDI requirements. Interim solutions have since been introduced by the National Institute of Standards and Technology (NIST) and the Consultative Committee for Telephone and Telegraph (CCITT).

The most critical EDI standards-related activity currently revolves around development of the X.435 standard, which facilitates EDI transactions over X.400 networks. X.435, which is still at least two years from implementation, defines a new EDI content type that uses the feature-laden services that are part of X.400. Additionally, as X.500-based directory services are better defined, the function of software translation and connectivity products for the deployment of EDI across networks will improve.

"Enabling application software that allows EDI systems to operate in a variety of trading environments is critical."

As an interim measure toward achieving improved network interconnection, the ANSI X.12.56 Interconnect Mailbag structure is being implemented by value added networks (VANs). All major U.S. VANs are committed to a rapid implementation of the Mailbag



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conversations.

standard with the goal of implementation by the end of 1992. This will improve transaction handling and message management. This is true even though Mailbag provides only one interconnection acknowledgement for multiple transmission steps, does not have full audit trail capabilities, and does not provide for real-time, event-driven EDI as does X.435.

The second major area for EDI standards is the content of the transaction or document itself. This is application oriented. Industry trade groups started by establishing their own standards to address their special needs. In the U.S. these standards now fall under the ANSI X12 umbrella. While over two-thirds of EDI users in the U.S. utilize the more generic X12 standard, many also still have unique requirements for subordinate special interest standards. Some of the established trading standards are: WINS for warehousing, UCS for supermarkets, TDCC for transportation, VICS for department stores/mass merchandisers and AIAG for automotive manufacturing.

"VANs must offer a high level of service, including effective help desks and rapid problem resolution."

"Industry trade groups started by establishing their own standards to address their special needs."

DISA has established uniform procedures for the adoption and distribution of standards, especially for groups of interested parties with structurally different business organizations. It is not likely that these diverse standards will ever be totally homogenized since trading groups always have unique business needs.

In addition to X12, there are primarily European standards that are being developed under the auspices of the United Nations and known as UN/EDIFACT (EDI for Administration, Commerce, and Trade), an upgrade to EDIFACT. The usage of the X12 and UN/EDIFACT standards are determined by the needs of trading partners. Although many EDI users do not have any current need for EDIFACT, it is nonetheless required for specific national agencies such as customs.

The UN/EDIFACT standards are not complete, and sometimes documentation is difficult to obtain. Because it is designed to meet generic global needs, it will evolve more slowly than X12 and may be more cumbersome.

It is important to note the U.S. federal government's EDI approach, Federal Information Processing Standard 161 (FIPS 161), was developed under the auspices of NIST. FIPS allows the use of either X12 or UN/EDIFACT. Both U.S. and European groups are working to get these two standards to align with each other within the next five years.

The open, conceptual model discussed earlier will be consistent with X12 and EDIFACT, since it does not plan to use specific syntax of either of these groups. This model could start EDI down a path toward a broad, unified methodology that will favor less sophisticated spoke users.

When discussing standards, be advised that trading sector standards may change as frequently as once or twice per year depending on each committee's actions and on the balloting by DISA membership.

The communication network is a very significant portion of the EDI infrastructure. As the most common EDI carriers, the VANs play a critical role in electronic data transport and interchange. Like standards, VANs often have a trading group heritage, although they have subsequently broadened considerably. For example, BT North America (the acquirer of Tymnet) has a background in the grocery area; TranSettlements has a transportation history.

Overall there are some dozen or so VANs active in providing both generic and specialized EDI services in the U.S. and Canada. They include GE Information Services (GEIS), IBM Information Network (IBM.IN), AT&T, CANAC Telecom, Harbinger EDI Services, Infonet, Kleinschmidt, MCI, RAILINC, Sprint, Sears Communications, and Sterling ORDERNET.

The European and the Asia/Pacific markets are actually multiple country markets. The U.K. has the most well developed EDI infrastructure in Europe. In the U.K., International Network Services (INS), which is partly owned by GEIS, and AT&T/ISTEL are the leaders; in France, GSI, a leading European professional services company, and GEIS dominate. The German market is controlled by GEIS. EDI is moving at a slower pace in the other European countries.

In Asia/Pacific there is a two-tier market. Australia, New Zealand, Singapore and Hong Kong have well-developed EDI infrastructures. Japan, Taiwan, and South Korea have been late starters in EDI.

VANs are often the most practical, rapid and secure solution to communication network needs. There are three important areas for users to consider when evaluating networks for EDI use. The first is secure data transmission. It is necessary to know if data packets reach the trading partner quickly enough. Users also need to know what sort of functional acknowledgement capability has been established to provide an audit trail for the transactions. Beyond that, it is important to find out what backup and restart mechanisms are available when links or central offices are impaired.

It is also important to check out what type of archiving is provided and for how long. Are transactions just lost after one week? How well does the VAN plan and execute disaster recovery? When was the last time that disaster recovery was tested?

The second networking area to consider is interoperability. Since many trading partners will not be on the same VAN, interoperability between VANs and managing the security of the transactions over the multiple VANs is critical. These are the issues that the Mailbag protocol and X.435 are designed to solve.

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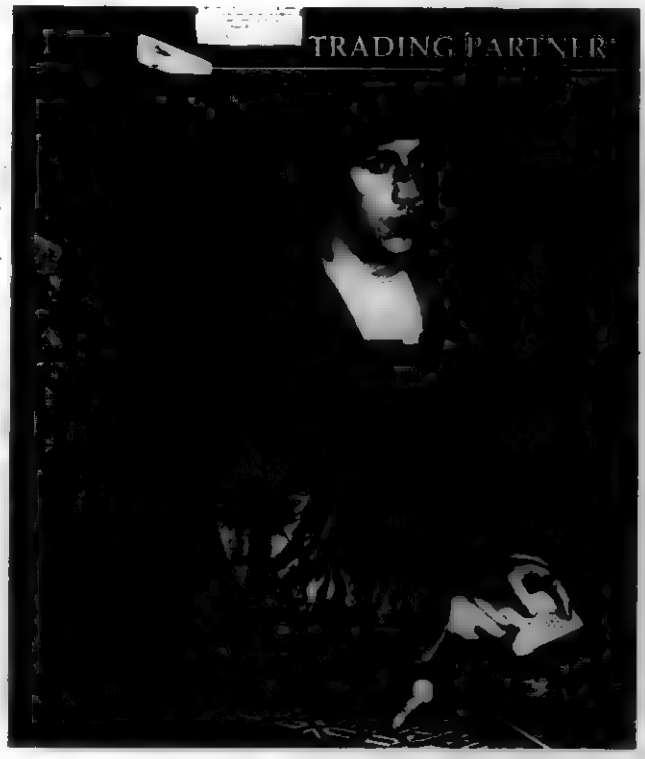

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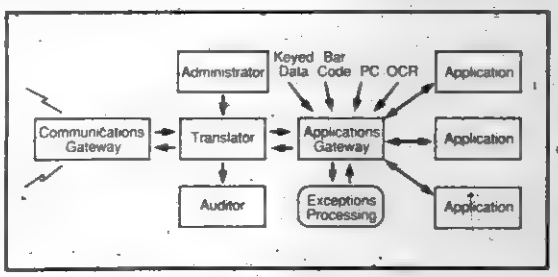

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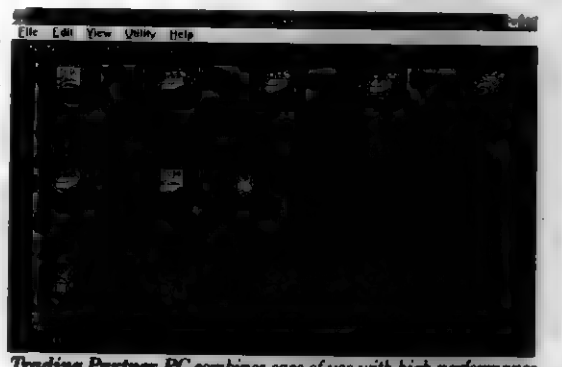

***Trading Partner PC** combines ease of use with high-performance EDI processing under Windows.*

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For more information on **Trading Partner PC** or customized Kits for your EDI program, **call 800-334-2120.**

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The third area is customer service. Some VANs still do not realize that there are usually no effective replacement and backup systems available for heavy EDI user companies. VANs must offer a high level of service, including effective help desks and rapid problem resolution. VANs need programs that rapidly profile trading partners for installation and modifications.

Automation and Flexible Computing

The broad family of EDI software fits comfortably with a range of computer platform architectures, operating on mainframes, minicomputers and desktop (primarily DOS) machines. It can be used with both proprietary and UNIX environments. UNIX solutions have been emerging during the last two years. EDI translation software for standardized transaction sets is critically important. As the mission-critical nature of EDI evolves, organizations are making platform decisions that also include fault-tolerant machines. Both large and small organizations are purchasing EDI software.

Present computing platform usage is distinctly polarized. The larger Fortune 500 hub firms are operating in a mainframe environment often with software purchased from independent software vendors like Sterling, TSI, GEIS and IBM.

The spoke firms are typically operating on PCs or minicomputers. They may have only standalone PCs. EDI standards usually have been dictated by the larger hub firms and are predominantly based on X12. Small firms that use EDI only for the communications benefits will often translate and reassemble transactions for paper output delivery to departments such as purchasing, order entry, customer service, manufacturing or transportation/traffic.

Spoke software usually is chosen to be as compatible as possible with the requirements of hubs. Software suppliers focusing on the midrange and the desktop area include Supply Tech, ACS/Premenos, Digital Equipment, EDI Inc., EDS and Harbinger.

The larger hubs typically require rich product sets that accommodate scalability and address risk and reliability areas. The software needs to be table-driven. These tables must also address the evolving nature of X12, UN/EDIFACT and additional services such as bar coding that utilize online Universal Product Code tables.

The VANs also have complex software requirements for message and transaction management services. These services are required to maintain the integrity of the envelope and the transaction set. This integrity may have to be maintained across more than one VAN.

Integration and Interoperability

Managing application integration and interoperability are also critical to EDI success. The term EDI II is used for systems that successfully realize this goal. The integration and interoperability areas have organizational, platform and software components associated with them. The organizational issues are very complex and largely applicable to business process reengineering. Hardware, standards and communications issues are primarily software issues.

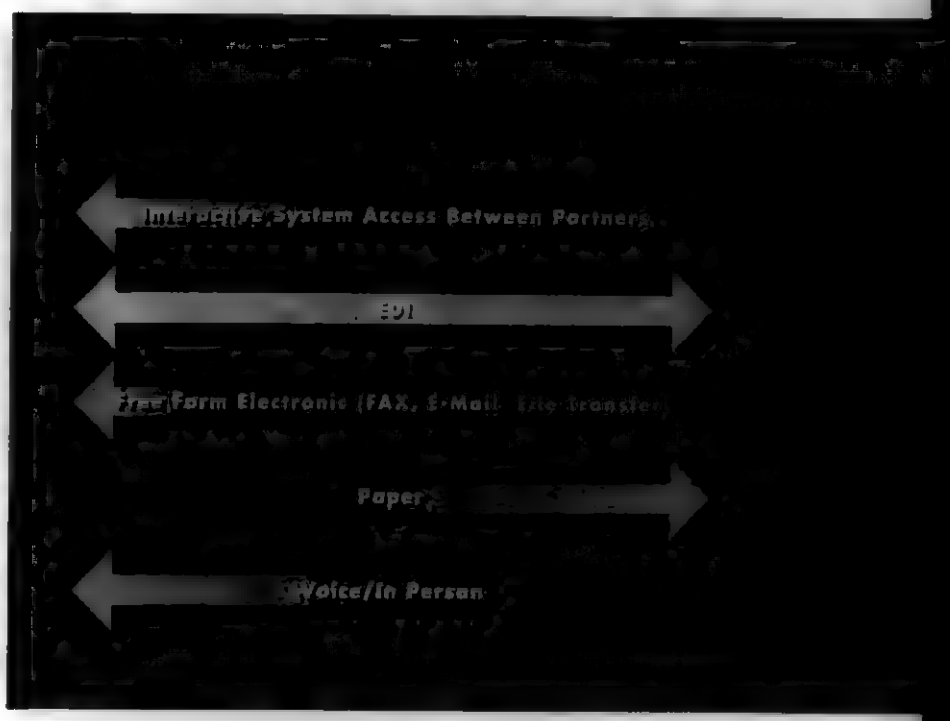
The more seamless and transparent EDI software is to other software, the easier it is to manage accompanying issues such as business reengineering. Software is improving in this area, but is not yet standardized. There are several areas that require special attention, including advanced software function, interoperability, network computing, convenient GUIs and time responsive solutions.

THREE LEVELS OF EDI

There are three basic levels of EDI use: end-to-end communications, intraintegration and interexploitation.

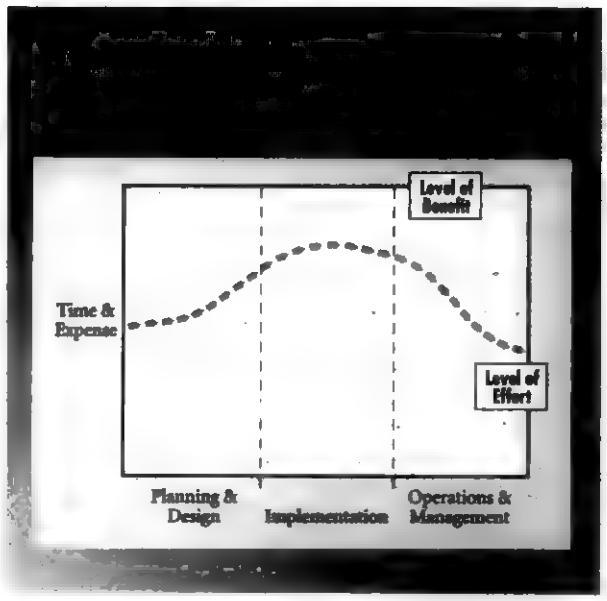
Level 1 — End-to-end communications. This is the foundation installation of EDI. It is comprised of computing platform, translation software and communications links.

Usually PC-based, Level 1 includes an end-to-end transaction delivery system. This is the least expensive approach and accordingly offers the fewest benefits. Transactions received at this level may be keyed into other systems or



turned into paper to be delivered to functional groups. There is no business process reengineering considered here.

The system is viewed by the organization as more of a communications link system than an IS system. Emphasis is on the trading partner-initiated aspects of the system. Usually it has been implemented to respond to a small number of trading partners and a limited number of business applications. Most EDI implementations are of a Level 1 type. Level 1 generally applies to smaller spoke companies as well as low end networks.



Level 2 — Intraintegration. This represents a Level 1 system that interoperates and is integrated with other IS systems. The Level 2 system affects business operations and has a high likelihood to change business practices. Business process reengineering is likely to have occurred at this level. Application integration and interoperability with other systems are the primary characteristics of this EDI level. It is a moderately expensive solution and has the potential for significant benefits when business processes are considered.

The Level 2 system impacts intracompany activities most heavily. Usually a larger number — perhaps hundreds — of trading partners is involved. Level 2 systems have the potential to be mission-critical. Level 2 approaches may extend JIT or QR across the business organization. These implementations are mostly being performed by hub organizations on mainframe systems.

Level 3 — Interexploitation. This is a Level 2 system that is more thoroughly integrated with business practices on both ends of the communication link. Level 3 systems are expensive and need to be implemented carefully over time. Their benefits can be very significant. The trading partners are providing information to each other that was formerly classified as internal information only. For example, a supermarket is sharing its anticipated shelf withdrawals and special promotions with manufacturers who will use the information for their manufacturing production planning schedules.

This level allows trading partners to plan ahead for materials, machine time, capacity and people needed in the future. Level 3 systems are mission-critical systems. Only a few trading operations have achieved Level 3. This group includes a number of transportation companies that have integrated systems with their customers' needs. These systems require trust between partners.

FUTURE EDI DIRECTIONS

While EDI will be more successful if integrated with present application software solutions as Level 2 EDI applications, the most lucrative EDI payoffs will come from finding new ways of doing business. Examples may include tieing EDI directly to scanners to take advantage of bar code inputs, or reducing complexity of purchasing systems by building advanced shipment solutions that require only P.O. release numbers. Another example may be simplifying payments to trading partners with advanced receipt and settlement systems. These systems will maintain tight audit trails but, let workers focus on system effectiveness rather than system efficiency.

Currently it is common to schedule batch EDI applications at various times. In some industries this batch orientation will change to real-time and event-driven transmissions that require the time-critical capabilities of EDI.

Although communication carriers such as AT&T, MCI, Sprint and the regional Bell-operating companies are in their early startup stages for EDI, VANs may expect greater competition here once the carriers better understand the requirements of EDI. There is a challenge to carriers to become more than just a voice or data communications network offering customers wide area connections. Carriers have the opportunity to become more deeply associated with customers and their business activities by managing EDI transaction sets. They also have the opportunity to provide enhanced services that extend present voice and data communications infrastructures and offerings significantly.

T D C C

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GREGORY B. HARTER
President and Chief Executive Officer

Dear Reader:

You, personally, can make a critical investment to remove limitations on your company's success. Walk, don't run, through this white paper on the use of EDI as a vital catalyst in the strategy to ensure your company's success.

You will see clear, logical connections between the use of EDI and your company's major business objectives such as leadtime and inventory reductions, new found ability to compete, and significant overhead cost reductions. Extensive research was done to compile the information and to arrive at conclusions about the application, benefits, and expansion of EDI in the U.S. business community. I urge you to capitalize on that research and compare and contrast it to your organization's position.

The number of companies in the U.S. now using EDI has almost doubled in the space of only two years. However, over 50 percent of the firms have done so reactively, attempting to minimize expenses which, even at low levels are not totally offset by resultant benefits because of the mindset in which it was done.

One of the key determinants in whether a company approaches EDI proactively or reactively is the position of a corporation's MIS management. Of course you know the opposite of the reactive mode is a proactive mode. That proactive mode also gives you broader, more positive results.

MIS staffs understandably advocate using standard business PROCESSES since that means less complex and more streamlined business SYSTEMS. I would suggest MIS staffers pay close attention to the information in this piece and give serious thought as to how you can proactively lead efforts in your company to get an EDI strategy and program started, or expanded across ALL functional levels of your organization.

The Electronic Data Interchange Association is pleased to be a part of this excellent white paper. Our number one priority is taking your company's EDI success seriously; we do so via a full range of educational resources available for companies which recognize the benefits of and are committed to seamless links between systems applications and those of their customers and suppliers.

I am sure you will have questions after studying this white paper. Please don't hesitate to call us for assistance. Our information network of EDI users who have successfully implemented EDI as a business strategy is second to none in the U. S.

On behalf of EDIA and our members, I would like to thank IDC for their effort in preparing this white paper and COMPUTERWORLD for the opportunity to expand the level of EDI awareness in such a prestigious publication.

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8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigfa receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

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Factory ferrets out inadequacies

Says increase of viruses warrants new generation of scanners

BY JAMES DALY
CW STAFF

A Thailand security company has produced a self-described "virus factory" that may force computer owners to rethink the way they detect and eliminate viruses.

A spokesman for Bangkok Security Associates said the company's Project XVIR can double the number of known computer virus variants in one two-hour stretch — faster than any standard antivirus program that scans for known viruses can possibly keep up.

Bangkok Security chief programmer John DeHaven said the purpose of the demonstration was not to scare the wits out of those in charge of information systems security but to show that the primary passive inspection methods of looking for strings of known virus code are seriously flawed.

No gimmick

"This is not a trick, and it is not superprogramming," said DeHaven, who demonstrated Project XVIR at the recent International Virus Prevention Conference in Arlington, Va. "It is something that we would fully expect a virus writer or malicious individual to do."

Although antivirus experts have claimed the existence of about 1,200 known viruses and variants prior to the experiment, Project XVIR can produce up to 600 viruses per hour. Each one possesses a 1-byte modification of the prevalent Jerusalem-B virus and is distinct from every other one produced, DeHaven said.

The traditional method used by scanners to ferret out malicious code is to look for strings of code inherent in particular viruses. But the increasing prevalence of mutated viruses has precipitated a new generation of scanners that look for both suspicious code and irregular code behavior.

Raising alarms

These detection methods typically involve simple internal self-consistency checks. When the application is launched, these checks are made as part of the start-up procedure. If the checks fail, it means the application has been modified, perhaps by a virus, and an alarm is raised.

Some applications of this type include Untouchable, Microcom, Inc.'s Virex and F-PROT, which is available for a small fee on many bulletin boards.

DeHaven said Project XVIR's goal is "to help return the battle against computer viruses to its proper track. The nonexpert . . . has been led down a wrong road by stop-gap measures to determine the presence of viruses."

DeHaven added that when experts claim that virus scanning for specific viruses is the wave of the future, "then something is desperately and depressingly wrong in the antivirus community."

Bangkok Security's message has not fallen on deaf ears. Several creators of virus detection packages already integrate features that look for virus-like behavior rather than strings of virus code.

"The days of checking for virus signatures are over," said Vicky Gore, senior product marketing manager at Baton Rouge, La.-based Fifth Generation Systems, Inc., which produces the Untouchable package.

HELP LINE

IBM OS/2

Part of a series of user tips provided by personal computer software vendors, based on questions commonly asked of their customer support personnel. This week's focus is on IBM's OS/2 2.0.

Q Should I use the High Performance File System (HPFS) or should I stick with file allocation tables (FAT)?

A There are two things to consider with HPFS. First, if you plan on using the feature of OS/2 that allows you to boot DOS by itself, not within a DOS session under OS/2, then you should stick with FAT on the boot drive and any drives you want to access within DOS applications.

The other consideration is memory. If you have less than 8M bytes of memory in your computer, you should seriously consider staying with FAT, as HPFS uses 500K bytes of memory. If you have 8M bytes of memory or more and your disk is larger than 60M bytes, you will be better off with HPFS.

Q I want to install something similar to HPFS support, which I did not choose when I installed OS/2. Do I have to start my installation over?

A No. Simply open the OS/2 System Folder by double clicking on it, then open the System Setup object. You can then choose Selective Install, which will allow you to install any feature you did not choose initially.

Q My printer worked fine under DOS but now will not work under OS/2. What should I do?

A There are several things that OS/2 does with printing that DOS did not. You will need to ensure that your system is configured so that your printer port is on IRQ7 and your second printer port is on IRQ5. You will also need to ensure that the address on LPT1 is either 3BC or 378 and LPT2 is address 278.

Q I have heard about BIOS dates and how some older machines will not run OS/2 unless I have an up-to-date BIOS. What are the right levels?

A There are several manufacturers of BIOS chips that require certain levels to run OS/2. Any IBM Personal System/2 with an Intel Corp. 80386SX chip or higher will run OS/2 with no problems. The information below describes the BIOS makers and BIOS levels we know about:

American Megatrends, Inc. (AMI) BIOS — For AMI BIOS machines, the revision number will be displayed while the memory is counting and will look like this:

aaaa-bbbb-mmddyy-Kc for AMI BIOS and AMI BIOS Plus.

ee-ffff-bbbbbb-gggggggg-mmddyy-hhhhhhhh-c for AMI Hi-Flex BIOS.

If the ID looks any different, then you need to contact the system board manufacturer.

If you have an IDE-type hard disk, the "mmddyy" above should be 040990 or later. With any other type of hard drive, the "mmddyy" above must be 092588 or later, along with the keyboard controller at revision level (the "c" in the codes above) F. This is necessary for OS/2 2.0 to function correctly.

The ID codes above may indicate you should contact your system board manufacturer for upgrade information for running OS/2 2.0. If the ID codes on your system conform to the above and you need a BIOS update to run OS/2 2.0, you can contact Washburn & Co. at (716) 248-3627 for upgrade information.

Phoenix Technologies, Inc. BIOS — If your system has a Phoenix BIOS, it must be at Revision level 1.02.05D or later for OS/2 2.0 to operate properly.

NEW PRODUCTS

Software application packages

The Aldridge Co. has introduced Version 4.0 of its Tree86 file management program.

According to the company, the product is Microsoft Corp. Windows-compatible and offers support for large drives of up to 16,000 files and 2,000 directories. Version 4.0 has a variety of new features, including the ability to execute operations across drives as if they were one unit and a configuration option for compact disc/read-only memory.

Tree86 costs $89.95

Aldridge
Suite 575
2500 CityWest Blvd.
Houston, Texas 77042
(713) 953-1940

Bullseye Systems has announced Info-Cady, a document organizing system. The product was designed for personal computer users who need to organize the abundance of documents and information that they receive on a daily basis.

User-defined pop-up menus, keyed fields and default autogenerated fields enable the user to input the information. Several search parameters such as title, subject, author or location can identify the information.

Info-Cady costs $99 for a single user and $149 when it is networked.

Bullseye Systems
2268 Westmoreland Drive
San Jose, Calif. 95124
(408) 266-9226

Molecular Arts Corp. has introduced ChemExhibit, Microsoft Corp. Windows-based software.

Version 1.1 of ChemExhibit is a desktop tool designed for users in chemical research. Users can manipulate, display and render three-dimensional molecular structures, create 2-D chemical diagrams and publication-quality graphic illustrations.

The product can also import graphic images from third-party applications and record the results. Several features have been added to this release, including Chemgram, advanced 2-D chemical diagram drawing tools and Zoomin, a 3-D molecular structure magnification and higlighting tool.

A single-user industrial license costs $595.

Molecular Arts
1532 E. Katella Ave.
Anaheim, Calif. 92805
(714) 634-8100

Utilities

Visual Software, Inc. has announced Version 2.0 of Renderise for Windows.

The product is a photo-realistic, three-dimensional, image-rendering utility designed for Microsoft Corp.'s Windows. The company's graphical user interface allows users to create 3-D wireframe models, producing full-color, photo-realistic designs that are ready for hard-copy output. Version 2.0 offers directed environment mapping and features enhanced image-processing capabilities, transparency mapping and improvements in object/camera view positioning.

Version 2.0 of Renderize for Windows costs $895.

Visual Software
Suite 310
21731 Ventura Blvd.
Woodland Hills, Calif.
91364
(818) 883-7900

Macintosh products

Envisio, Inc. has introduced ColorFrame, a flat-panel color display for the Apple Computer, Inc. Macintosh.

According to the company, the active-matrix display in ColorFrame refreshes faster than ordinary LCD panels. Problems such as ghosting and submarining are eliminated by the quicker response time. A portable presentation system can be created when the product is combined with the Macintosh Powerbook and Envisio's Notebook Display Adapter/030.

ColorFrame costs $5,495.

Envisio
Suite 303
510 First Ave. N.
Minneapolis, Minn. 55403
(612) 339-1008

Helix Technologies has announced Helix Tracker Version 1.0, a work-flow and document management product for the Apple Computer, Inc. Macintosh.

The product enables users to facilitate document routing, assign tasks and priorities and track and schedule projects and deadlines. Helix Tracker also allows users to control document versions and store and retrieve documents in a nonproprietary client/server environment. Support for a server and four client workstations is provided by client/server software included in the product.

Helix Tracker costs $739.

Helix Technologies
4100 Commercial Ave.
Northbrook, Ill. 60062
(708) 205-1669

Santos Technology, Inc. has announced Mira 35.

The Mira 35 is a slide scanner that was designed for the Apple Computer, Inc. Macintosh LC and II series computers running System 6.05 or higher.

According to the company, the Mira 35 offers single-pass 2,700 dot/in. resolution and can

Continued on page 57

When you spend ten years designing spreadsheets, you get pretty good at filling in the rows and columns.

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Lotus 1-2-3

*Based on Software Publishers Association share data, May 1992, for North America. **In Canada, call 1-800-GO-LOTUS. ***While supplies last. Demo disk not available for palmtop version of 1-2-3. ©1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Incorporated. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a trademark of UNIX Systems Laboratories, Inc.

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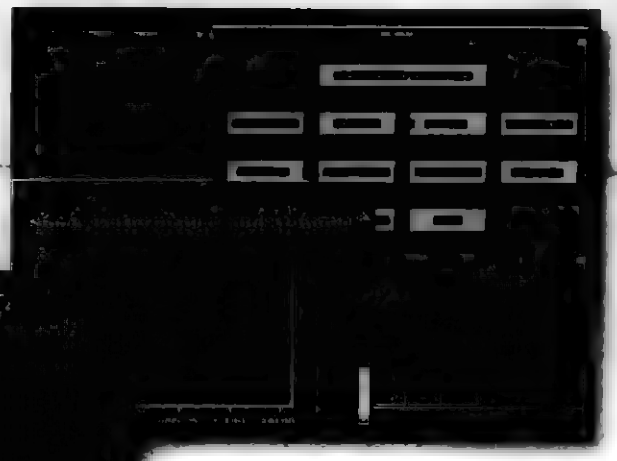
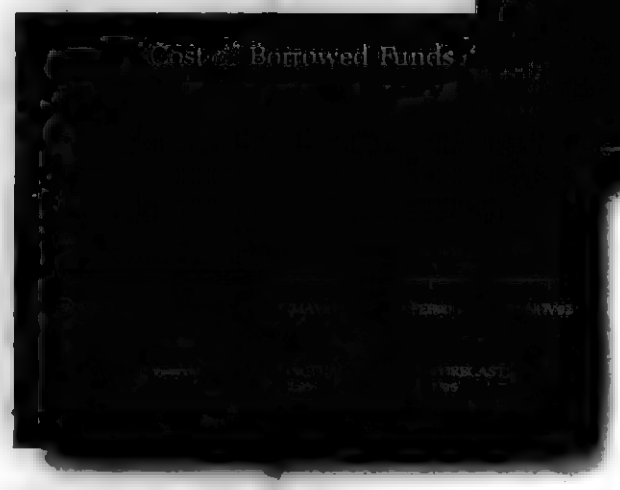


Finance



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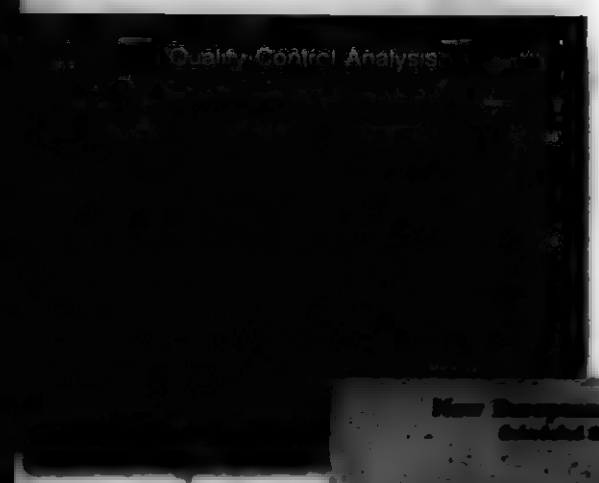

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Phone 919-677-8200 ☐ Fax 919-677-8123

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Continued from page 52

capture color or monochrome images from any positive or negative 35mm slide or film. The product is bundled with Santos Technology's Mira 35 plug-in module software.

Mira 35 costs $2,695.

Santos Technology
Suite 1604
383 Van Ness Ave.
Torrance, Calif. 90501
(310) 320-8888

Peripherals

Altra has introduced Felix for Windows, a compact desktop pointing device.

Felix is an alternative to the typical computer mouse. It can be used across a range of applications such as desktop publishing, word processing, graphics and spreadsheets. An on-board microprocessor controls Felix's optical pointing technology.

Felix was ergonomically designed and can help prevent injuries such as carpal tunnel syndrome, the company reported.

Felix for Windows costs $129.

Altra
520 W. Cedar St.
Rawlins, Wyo. 82301
(307) 328-1342

Visionetics International Corp. has introduced VIGA+, a real-time image-capture board for IBM Personal Computers and compatibles.

VIGA+ was designed for Extended Industry Standard Architecture and PC XT/AT bus systems. The product occupies a single slot and has new Video Graphics Array and Extended Graphics Array overlay and pass-through features. VIGA+ performs digital special effects processing. With this process, users can do cross-fading and linear blending between different images and video sources.

Prices for VIGA+ range from $1,395 to $1,895.

Visionetics International
Suite 300
21311 Hawthorne Blvd.
Torrance, Calif. 90503
(310) 316-7940

Microfield Graphics, Inc. has introduced the X8 Color Graphics controller.

The X8 Color Graphics controller was designed for the X Window System and Microsoft Corp. Windows environments. According to the company, the product turns PC XT/AT and Extended Industry Standard Architecture bus-compatible personal computers into high-performance, high-resolution color workstations.

The X8 Color Graphics controller can transfer a 1,280- by 1,024-pixel image in a quarter of a second to the display on the XT/AT bus. The product performs block logical transfer operations at 23 pixel/sec. for moving picture elements such as icons and windows across the screen.

The graphics controller costs $2,995.

Microfield Graphics
9825 SW Sunshine Court
Beaverton, Ore. 97005
(503) 626-9393

Database management

Ace Software Corp. has introduced AceFile 2.0, a nontechnical database manager for the Microsoft Corp. Windows environment.

Version 2.0 has a new tool bar that lets users invoke functions that are used most often by clicking on an icon. The product can include bit-mapped graphics on every form, report or label that it generates and allows the images to be scanned in or imported from another program.

The product costs $199.

Ace Software
Suite 680
1740 Technology Drive
San Jose, Calif. 95110
(408) 451-0100

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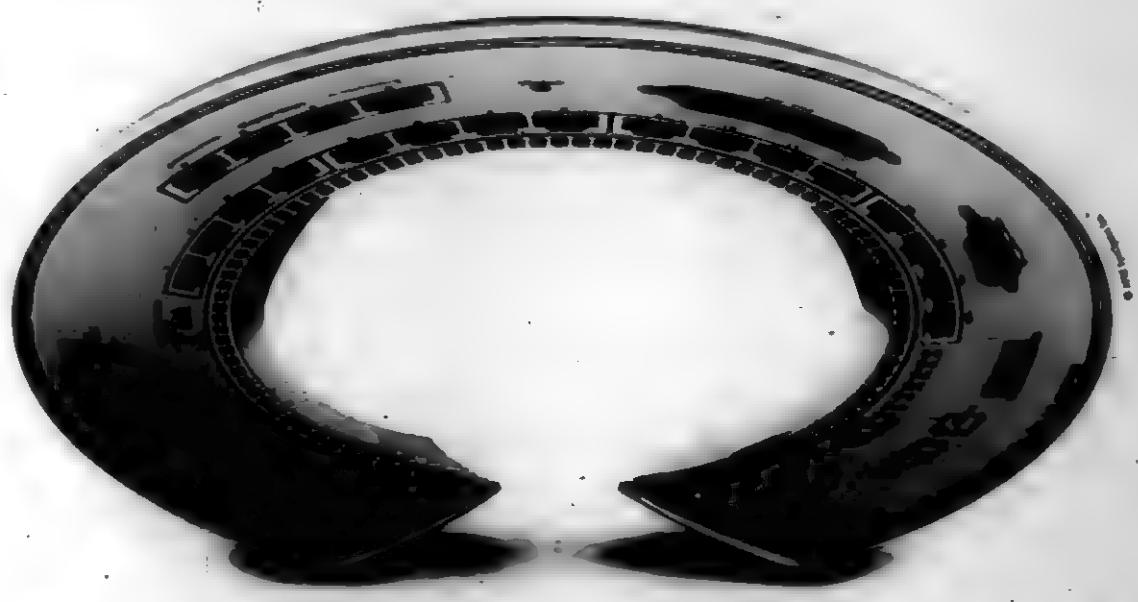

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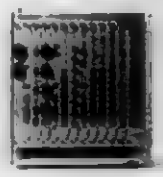

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GARTNER GROUP REPORT

Client/server on track at railroad

BY GARY H. ANTHES
CW STAFF

FORT WORTH, Texas — "You'd have to see our mainframe to believe it," said James L. Shefelbine, a planning specialist at Burlington Northern Railroad. "It's to the point where you can submit a screen change and go and get a cup of coffee, and when you come back it still might not be done."

But now some of the interactive requests that took five to 10 minutes on the mainframe are being cranked out on an IBM RISC System/6000 server and delivered to users' desktops in 15 to 30 seconds.

The railroad has just put into production its first application for the Unix-based client/server environment, which seems likely to steal a number of mission-critical applications from the sluggish, glass-house machines — an Amdahl Corp. 1400A and an 1100A. The applications allow 40 to 50 railroad operations specialists to schedule trains and optimize their movement over 25,000 miles of track and through 8,000 terminals and stations across the country.

"We'd do number-crunching [on the mainframe] for days and weeks on end," Shefelbine explained. "But for writing interactive applications, for doing graphics and for being user-friendly, the mainframe was a terrible environment for us."

He said the more friendly client/server environment has boosted development productivity by 85% to 100%.

On a local-area network here, Microsoft Corp. Windows-based personal computers talk to the Unix (IBM AIX) box using Sun Microsystems, Inc.'s PC-Network File System for communication and Xvision, an X Window System-based tool from Visionware Ltd. in Leeds, England. Operations research models can be initiated on the RS/6000 from the PCs and the results brought back for inclusion in a document or spreadsheet window.

Burlington Northern is working with operations research experts at IBM to develop new models that will, for example, allow train schedulers to perform what-if analyses to predict the effects of alternate train movements. Those models, which will be very complex and highly optimized for efficiency, will be written in C and will take five to 10 years to perfect, Shefelbine said.

In the meantime, the railroad is writing new applications — and porting or rewriting old mainframe ones — in software from SAS Institute, Inc. in Cary, N.C. "We use SAS because it has the graphics, the statistical analyses and the operations research under one umbrella. We can throw code together very quickly and very inexpensively," Shefelbine said.

He said the use of PCs — let alone client/server computing — is a relative novelty at Burlington Northern, having really caught on just this year. "It's very political. The [data processing] department is very, very powerful, and they like owning the computer you work on," he said.

But the end-user computing dam has apparently burst at last. "So much of our analysis is now leaning toward the PC side, with enormous amounts of spreadsheets, presentations, graphics. PCs were rare, but now we'll take any PC we can get," he said.

In the current setup, Shefelbine's group runs a monthly

Continued on page 64

ON SITE

Burlington Northern Railroad
Fort Worth, Texas

- **Challenge:** To improve poor graphics and excruciatingly slow turnaround on mainframe-based railroad modeling and scheduling applications.
- **Solution:** Port compute-intensive applications to IBM RS/6000s running AIX; give users PCs and access to the applications, written with tools from SAS Institute, Inc.
- **Results:** Development productivity boosted 85% to 100%; runtimes reduced; users enjoy all the functionality of modern PC software.

Texaco finds rewards, challenges in groupware

Uses workgroup approach to tackle integration

BY ROSEMARY HAMILTON
CW STAFF

When it comes to groupware, Texaco, Inc. could be considered an old-timer. It has a good six years of research and implementation behind it.

And, as is often the case, the years of experience point out how much more there is to learn.

"I believe it is enabling us to do things that we couldn't do before," said Brad Jackson, assistant to the general manager in the corporate information technology department. "It's breaking the barriers of time, geography and group size."

Yet he is also quick to point out that there is more to groupware than the products. It is a far cry from populating a user base with such productivity tools as spreadsheets. To Texaco, groupware is more an approach to computing, and it raises as many organization and human behavior challenges as it does technology issues.

STRUCTURE ALONE DOES not resolve the human issues of workgroup computing.

Currently, Texaco uses Lotus Development Corp.'s Notes as well as other products, including Software Aided Meeting Management (SAMM), a tool from the University of Minnesota that is not commercially available. In addition, Texaco works with other products under development, although Jackson declined to name the software companies.

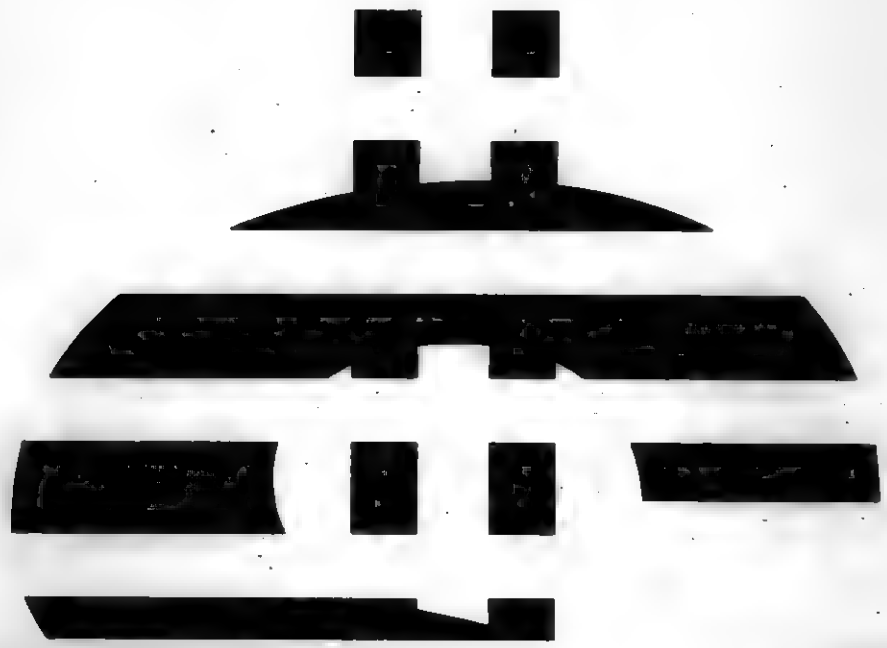
Jackson said Texaco is still studying the effects the technology has on teams. Initial implementations are now behind it, so the biggest groupware challenge facing Texaco is integration, he said. While this includes integrating groupware products, it also means integrating the workgroup approach to Texaco.

As part of a total quality initiative, which began in the mid-1980s, each division of the corporation adopted quality programs; in some cases, that included team management. But that structure alone does not resolve the human issues of workgroup computing. For example, Jackson said, some end users adapt quickly to Lotus' Notes. "They see it and they click

Continued on page 61

By the end of this week Computerworld readers will have spent over **$56.1 Billion** on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD



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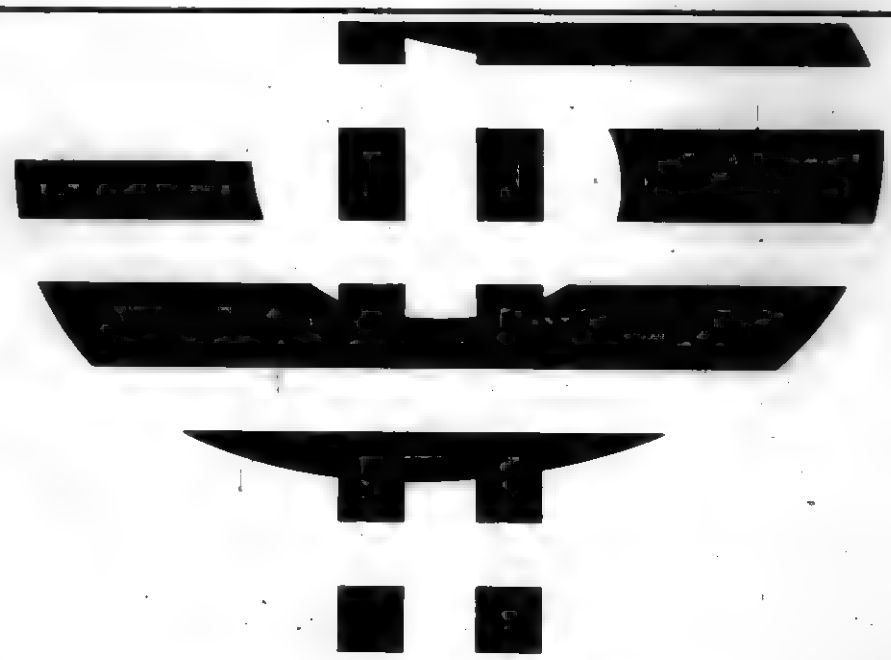

Inevitably, IBM says the only way to get increased AS/400 performance is to upgrade your CPU. And every time you upgrade, it means you're looking at new hardware, new software, additional memory, additional disk space, and greater service costs on an annual basis. (Ouch.)

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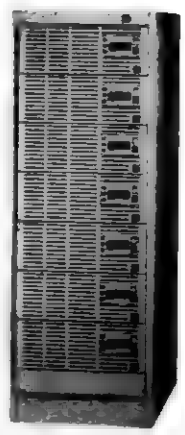

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Texaco finds challenges

CONTINUED FROM PAGE 59

with it," while others "struggle with it and see it only as electronic mail."

To better understand these differences, the company is continuing its research on group dynamics and the human element of workgroup computing. In conjunction with the University of Minnesota, Texaco recently received a grant from the National Science Foundation to further research group-related issues.

"This is about trying to learn," Jackson said. "What are teams' needs? How do they interact? What do teams do? They are very complex organisms."

Electronic staff meeting

While research continues, Texaco is gaining productivity boosts as well. The company recently conducted a "virtual town meeting" in which 800 Texaco employees in various locations were able to assemble electronically and "discuss" corporate issues.

Jackson would not reveal the groupware product used for the meeting because it is not yet commercially available, but he said it was a mainframe-based system that allowed Texaco "to do something we could not do otherwise."

While Jackson also did not give a dollar figure, he said the company realized significant savings from the meeting. "We didn't have [to buy] all those plane tickets" to bring the employees to one location. "Plus, they would have had to leave work for a day or so" to attend, he said.

The virtual town meeting helps illustrate Texaco's overall approach to groupware technology.

"Our strategy is to explore it and apply it as it makes sense," Jackson said.

Technology dealer

The company lends technology to fairly straightforward processes and is not interested in the cutting edge. Also, it tends to work closely with software providers, often before products are commercially released, with the goal of swapping research as the product develops.

For example, while it is only within the last year that Lotus began winning recognition as the premier workgroup software provider with its Notes platform, Texaco began working with Lotus in 1986.

"For us it was [initially] research," Jackson said. Texaco asked, "How can we think of things differently? What input can we give to Lotus?"

Texaco also worked with the University of Minnesota long before the two received a research grant; it now uses the university's SAMM, a software tool that is not sold commercially. The product helps Texaco automate meetings and allows participants to electronically input ideas, as well as rank issues by priority.

The key now is to help blend these systems. Jackson said one recent step was to transfer files from a SAMM meeting to a Notes database.

"There's a need to document meeting action items," Jackson said. "Meetings are not a single event. You want to develop a group memory."

Once the files are transferred to Notes, users can use them for reference or discussion purposes before the next meeting takes place.

IN BRIEF

Data General ships AV Object Office 2.0

■ Data General Corp. is shipping AV Object Office 2.0, an office automation product for its Unix-based Aviion line. Priced between $3,495 and $65,495, the software lets Microsoft Corp. Windows applications run with Unix servers on a Novell, Inc. NetWare network.

It provides integrated fax functions and enhanced support for X.400 Message Handling System and Simple Mail Transfer Protocol electronic mail and other features.

■ Document imaging vendor Alacrity Systems, Inc. this month will add optical character recognition from Calera Recognition Systems in Sunnyvale, Calif., to its standalone and networked products.

■ NCR Corp. and Independence Technologies, Inc. have ported NCR's Top End Unix transaction monitor to the Hewlett-Packard Co. HP 9000 system.

The two companies also plan ports to Sun Microsystems, Inc. SPARCservers, IBM RISC System/6000s and Pyramid Technology Corp. MIServer platforms in early 1993.

■ The Open Software Foundation has chosen Systems Center, Inc. to provide the Distributed Print Services part of the OSF's Distributed Management Environment.

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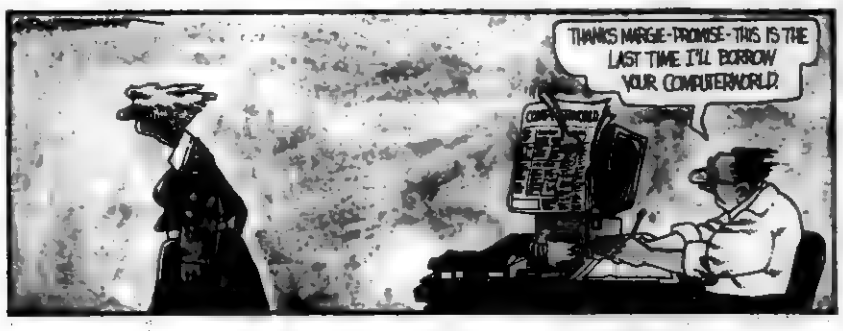

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If people would simply agree on a single computer platform, hooking everyone up with an e-mail system would be no trick. But since *that* shows no signs of happening, WordPerfect Office is available for all of the most popular platforms, including DOS, Windows, Mac, UNIX, VAX and Data General.

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Far-flung empires will find WordPerfect Office equally accommodating, with gateways to messaging systems that include Novell MHS, IBM OfficeVision, DEC, X.400, SMTP, MCI Mail and AT&T EasyLink, among others.

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(Until you have a more effective means of business communication up and running, the telephone will have to do.)

WordPerfect

Sun search/retrieval package helps locate business data

BY MARYFRAN JOHNSON
CW STAFF

Making an information mountain into a manageable molehill is the basic goal of SearchIt, a full-text search and retrieval application recently introduced by SunSoft, Inc. for the Solaris 1.0 software environment.

The Sun Microsystems, Inc. subsidiary likens this $295 shrink-wrapped Unix application to having one's own personal reference librarian — someone to swiftly locate on-line business data such as reports, proposals and correspondence stored on the corporate network.

The desire for database searching help is spurring more companies to dabble in this market, which is still an elusive one to judge in dollar size, said Ronni Marshak, editor of the Patricia Seybold Group's "Office Computing Report."

"This kind of technology is becoming much more visible," Marshak said. "There is a trend, with the problems of workgroups working together, of needing to not just find your own stuff but other stuff people have created."

The base technology in SearchIt hails from Fulcrum Technologies, Inc. in Ottawa, Ontario. Fulcrum's Ful/Text search and retrieval software engine gives SearchIt an intuitive searching or indexing capability that allows a user to pull up one document and then direct SearchIt to scan the network for other documents containing similar words or phrases.

Sun's AnswerBook on-line documentation and Help system also use Fulcrum's software engine. "SearchIt can use information stored on any NFS [Network File System] server or system on your network, so the information could be on an IBM mainframe, a Novell Netserver or a Hewlett-Packard machine," said Larry Kluger, senior product manager at SunSoft.

One U.S. government agency is using SearchIt to keep track of its own officials' testimony before Congress. Another user is Salomon Brothers, Inc. in New York, which uses the product to search its on-line information about companies and clients.

"SunSoft is the first company to implement content-based retrieval within the workstation client/server environment," said Peter Addison, vice president of marketing at Fulcrum.

In the legal industry, Marshak noted, there are three companies selling search and retrieval products for documents created in WordPerfect Corp.'s WordPerfect. Last month alone, two other document management software systems appeared — although on a somewhat grander scale than the SearchIt product.

Cimage Corp. in Ann Arbor, Mich., introduced an integrated document text-retrieval system geared to handle any document type from text to engineering drawing to computer-aided design data. Pricing for the Cimage system begins at $5,000.

Alliance Technologies, Inc. in Austin, Texas, came out with its TextMachine, a Unix full-text distributed textual database product designed for client/server environments. TextMachine is a suite of tools and utilities that enable developers to build systems for collecting, monitoring and managing very large distributed databases. Its price ranges from $50,000 to $300,000.

There is also full-text searching software available free on the internatonal Internet network. The best known example is the Wide Area Information Server (WAIS), developed by Thinking Machines Corp. in Cambridge, Mass.

A WAIS search, which can be launched from more than 200 servers on the Internet, uses the frequency of key words to score relevance of documents.

It can take one of the chosen documents and use it to hunt down text with similar concepts but different key words. Therefore, users can find the documents they are searching for without having to know the key words.

"Document management is basically technology everyone should have," Marshak said. "The $295 [for SunSoft's SearchIt] does sound like a reasonable price, but it's not a stand-alone application."

SearchIt, which is available now at $295 per user, is built to interoperate with Solaris DeskSet productivity tools. It runs under Solaris 1.0 and requires OpenWindows 3.0. A Solaris 2.0 version will be available early next year.

NCR software brings RAID to StarServer

BY MICHAEL FITZGERALD
CW STAFF

WICHITA, Kan. — NCR Corp. recently released software that allows users to configure their hard disks like redundant arrays of inexpensive disks (RAID), without the need for RAID hardware.

While the Disk Array Plus, as the product is known, will work only on NCR's StarServer E line of multiprocessing servers right now, NCR is in the process of porting it to the System 3000 line and will look closely at the possibilities of porting it to other hardware platforms, as well as operating systems besides Unix.

One analyst said the concept is solid. "It's one of the necessary pieces for commercial applications which are not compute-intensive," said Michael Casey, director of storage industry research at Computer Intelligence/Infocorp in Santa Clara, Calif. "It's appropriate to do disk array management by running software on the main CPU, and I think you'll see a number of people doing disk array implementations as software."

Casey said there are other software RAID products on the market, but these are aimed more at personal computer servers than the more powerful mid-range Unix market.

Disk Array Plus will give users who have servers with at least three hard drives the ability to do disk-mirroring, hot swapping, hot sparing and RAID levels 0, 1, 4 and 5 on their current systems. They will not need to reconfigure current systems to run the software.

Disk Array Plus also gives users the ability to move to an array without having to first run backup and raster procedures.

Ed Coleman, product manager for Disk Array Plus at NCR, said NCR parent company AT&T was developing the software array for the StarServer E when it took over NCR.

The product costs $3,495.

Client/server on track

CONTINUED FROM PAGE 59

batch job on the mainframe to preprocess and extract train-movement data and download it to the RS/6000. He said a process is now being developed to enable users on the LAN to seamleasly access via a Transmission Control Protocol/Internet Protocol link the huge mainframe files of historical data, which grow at the rate of 1.7G bytes per month.

Shefelbine said the new models may be too demanding for a single RS/6000, but he said he hopes to avoid a return to the mainframe by linking multiple RS/6000s. He said IBM researchers are helping devise ways that a single program can be distributed across multiple machines for parallel processing.

The move out of the glass house has gone smoothly so far, but Shefelbine said it is not without risks as mission-critical applications migrate to an environment without all the backup and recovery capabilities of mainframe systems. "It's probably one of the weaknesses we have. But we have a small group, so the opportunity for failure hasn't really been there yet," he said.

Shefelbine said the small size of the RS/6000 earns it no respect, and users mistakenly believe they can be their own system administrators.

NEW PRODUCTS

Workgroup application software

Legato Systems
260 Sheridan Ave.
Palo Alto, Calif. 94306
(415) 329-7880

Legato Systems, Inc. has announced new client/server software packages for Legato Networker, backup and recovery software for Nowell, Inc.'s NetWare and Unix networks.

According to the company, the ClientPak works in conjunction with the Networker server software running on a NetWare 3.11 local-area network, IBM RISC System/6000 or Sun Microsystems, Inc. SPARCstation. Data is transferred from the client to the server via a Transmission Control Protocol/Internet Protocol network.

The product is priced at $1,500.

AimTech
20 Trafalgar Square
Nashua, N.H. 03063
(603) 883-0220

AimTech Corp. has announced IconAuthor, an interactive multimedia authoring tool.

IconAuthor runs under the OSF/Motif X Window System interface and now offers support for Hewlett-Packard Co.'s 9000 Series 700 workstations. The visual programming environment for the product is icon-based, enabling users to develop interactive multimedia applications that join graphics, text and animation, audio and full-motion video.

IconAuthor costs $7,500 for one user, $15,000 for four users, $25,000 for 10 users and $75,000 for unlimited use at one site.

Island Graphics Corp. has introduced IslandPresents, a multimedia presentation and business graphics package.

The product was designed for Unix and is available for Sun Microsystems, Inc. SPARCstations and compatibles using SunSoft, Inc.'s Solaris software environment. Users can create full-color presentations and illustrate the presentations with clip art from IslandPresents' library of over 1,100 images, the company reported.

The tool has multimedia features to display full-screen presentations on SPARCstations and includes three views of a presentation: an Outliner, a Slide Editor and a Slide Organizer.

A single-user network license for IslandPresents costs $995.

Island Graphics
4000 Civic Center Drive
San Rafael, Calif. 94903
(415) 491-1000

Diagnostic equipment

Mercury Interactive Corp. has announced automating testing support of X Window System-based software applications for Hewlett-Packard Co.'s 9000/700 series Unix workstations.

XRunner is a software testing tool that automates quality assurance procedures. Through a grahical user interface, the product mimics the way a user would manually test software, according to the company.

Keystrokes and mouse movements are put into an application, and output is monitored for results. Prices start at $50,000.

Mercury Interactive
3333 Octavius Drive
Santa Clara, Calif. 95054
(408) 987-0100

Micro-to-micro

AnswerSet Corp. has released Clientele Standard Edition, a support automation system.

Clientele Standard Edition maintains and tracks customer information, product data, call records and service agreements. Users can customize the product's screen and field names to fit specific needs, and common customer data can be shared with other departments, the company reported.

Prices start at $795.

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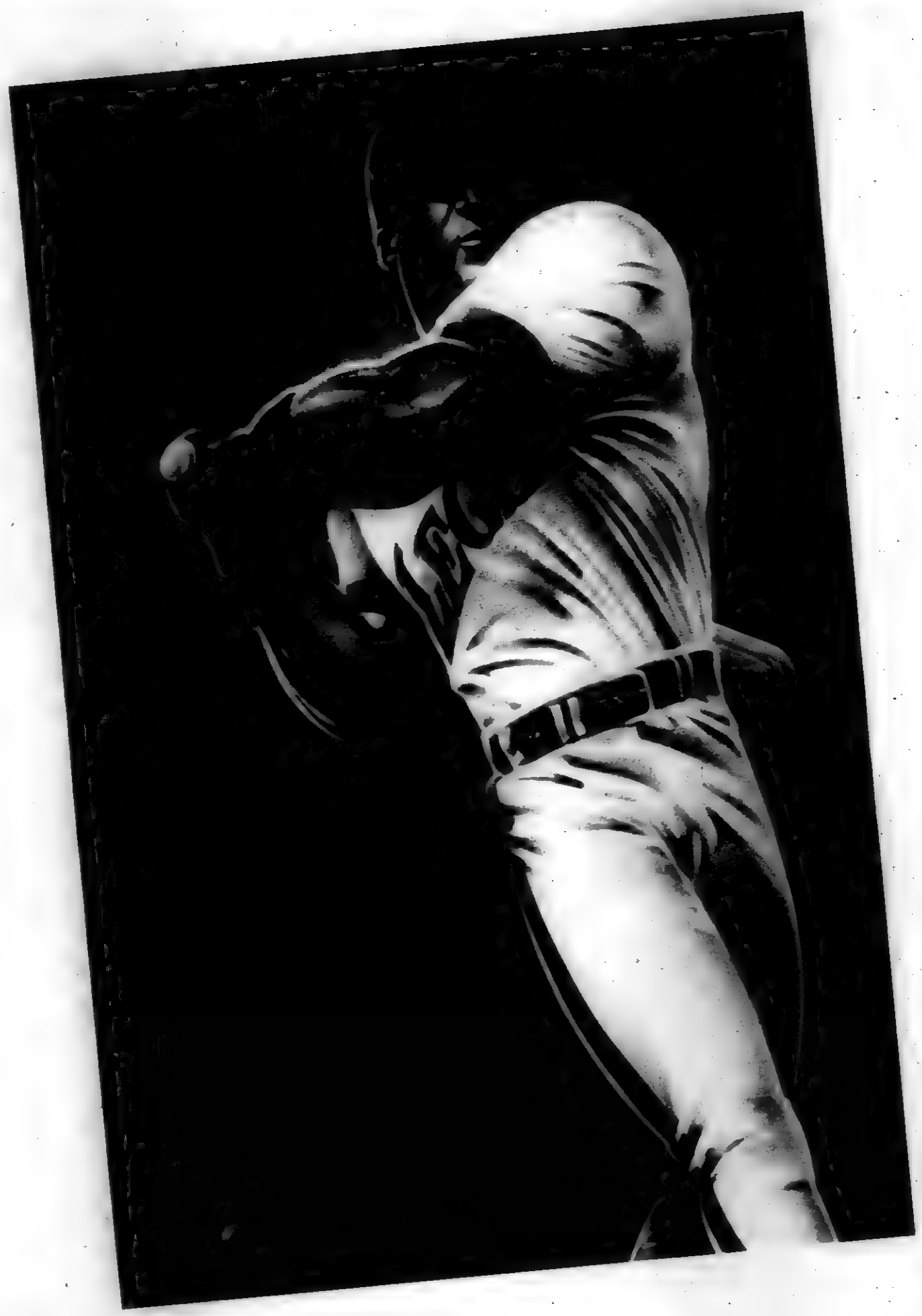

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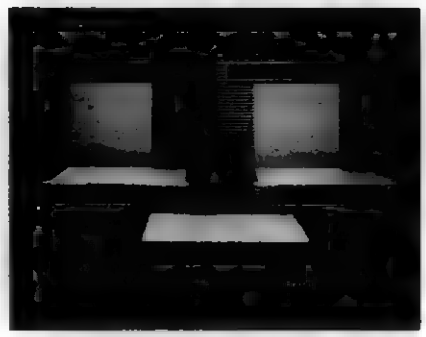

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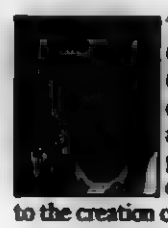
COMMENTARY

Joanie M. Wexler

The FCC makes history



The Federal Communications Commission recently left about a size 14D footprint in the sands of time en route to the creation of one humongous, thriving network with tentacles stretching from sea to shining sea.

Its mid-July decision to grant the local telephone companies permission to play in the dial-up video service biz could revolutionize life as we know it. Dial-up movies, educational seminars and simulated real-estate tours could be merely tame precursors to Star Trekkian Holodeck parties or Jane Jetson-style push-button dinners.

With its ruling, the FCC has put a feather in the cap of Mitch Kaporian efforts to leverage existing network infrastructures for consistent nationwide services. This must have been a tough decision for an agency historically saddled with the task of balancing the merits of entrepreneurship with appropriate monopoly control. However, the sprawling network that was built up by AT&T and its regionals in the 100 years before

Continued on page 72

StrataCom adds IPX flexibility

Management feature gives T1 switch dynamic allocation capability

BY ELISABETH HORWITT
CW STAFF

SAN JOSE, Calif. — A congestion management capability recently introduced by StrataCom, Inc. will give its T1 IPX FastPacket frame-relay switches the ability to allocate extra bandwidth to users as needed and better fulfill user expectations about frame relay's touted "bursting" capability.

The IPX switch traditionally divides up a 1.5M bit/sec. T1 trunk into individual user circuits and concentrates on ensuring that users get the most out of those circuits, said Bryan Long, a StrataCom product manager.

Until now, the IPX could not allocate extra bandwidth to any user beyond the user's committed information rate — or contracted bandwidth "ceiling" — even when unused bandwidth existed on the T1 trunk, Long said.

This was because of the danger that too many temporarily expanded user circuits would feed into the same switch and cause congestion that would impair other users' network performance.

This limitation has been a concern of some companies, such as Industrial Design Corp., that have tested StrataCom-based services and have been disappointed enough with the lack of bursting capability to discontinue the service [CW, April 6].

Competing platforms do provide users with temporarily expanded bandwidth allocations, or bursts, because the vendors simply disregard the danger of switch congestion, Long said.

UNTIL NOW, THE IPX could not allocate extra bandwidth to any user beyond the user's committed information rate.

Frame-relay delays

When congestion does occur, the switches respond by dropping frames and then retransmitting them, which causes delays, he added. This is a danger with the frame-relay services offered by carriers such as Sprint Corp., which do not use StrataCom switches, according to observers.

StrataCom's ForeSight, announced last month, enables IPX nodes to communicate with one another about how much excess bandwidth exists throughout the network and to lift the bandwidth ceiling of a given circuit depending on what bandwidth is available, explained Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

Meanwhile, ForeSight monitors all circuits for incipient congestion problems, StrataCom said.

StrataCom's announcement will provide end users with the dynamic bandwidth allocation services that "were frame relay's original intent," said Ginny Mellinger, a senior analyst at International Data Corp. in Framingham, Mass.

For example, Long said, a user could request enough extra bandwidth to distribute a catalog to customers overnight. The user would pay only for the time during which the bandwidth was needed and would save money because the transmission took place during off-peak hours, he added.

AT&T, WilTel, CompuServe, Inc. and Canadian carrier National Telecom Corp. are among the carriers that offer IPX-based frame-relay services. Telecom New Zealand recently began offering IPX-based services in the Pacific.

Foresight is scheduled to ship in the first quarter of next year, priced at $1,000 per frame-relay processor. Each processor supports four ports, StrataCom said.

Senior editor Joanie M. Wexler contributed to this report.

NET readies frame-relay interfaces

BY JOANIE M. WEXLER
CW STAFF

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc.'s (NET) recent addition of frame-relay capabilities to its wide-area network equipment served more to placate forward-looking users than to scratch any immediate user itches, NET customers said.

NET plans to have frame-relay interfaces available for its high-end T1 multiplexer and statistical multiplexer wide-area transmission equipment come October. However, the user community is still largely in the studying stages of frame relay, a technology that has been highly publicized but sparingly deployed as users preoccupy themselves with getting their router internetworks in place and evaluating other emerging high-speed WAN technologies.

"We're going to want to take advantage of [NET's frame-relay capabilities] in a year or two," said Mark Lillie, manager of client computing services at Community Health Care Plan, an NET customer in New Haven, Conn. Lillie said he anticipates that an electronic medical records application that is under evaluation will force the high-performance connections afforded by frame relay.

Larry Calabro, a network engineer at Kirkland and Ellis, a Chicago-based law firm, said the NET announcement "adds flexibility to the decisions we can make for tying outside connections to our backbone." He said his interest in NET's frame-relay interface would be for linking temporary offices, such as client sites that have high bandwidth requirements, to his private NET backbone via public frame-relay services.

However, the firm would not be implementing frame relay "for a year or so," he said.

Like frame-relay pioneer StrataCom, Inc.'s recent switch upgrade (see story above left), NET's architecture addresses user concerns about sustaining prolonged data bursts. A frame-relay card, dubbed the Frame Relay Exchange, creates a virtual packet network that can be overlaid onto a high-end T1 or statistical multiplexer network. The subnetwork can expand and contract to use all network resources, analysts said.

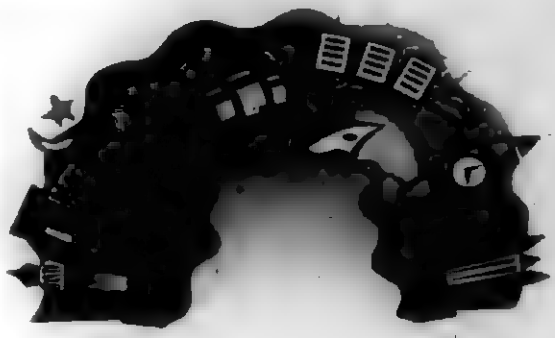
EDI: The information-intensive way to move cargo

BY HAL GLATZER
SPECIAL TO CW

Cargo in transit is information in motion. With electronic data interchange (EDI), freight forwarders such as The Harper Group in San Francisco have become "information-intensive," according to Steven J. Olson, Harper's vice president of information services and chief information officer.

"Logistics is a major component of a delivered product's price," he said. "By the year 2000, more money will be spent on logistics information systems than on inventory carrying costs."

The Harper Group is a holding company that owns 12 specialized transportation businesses that employ more than 3,500 people in more than 300 branches in 43 countries. They can now track the two-way movement of orders and inventories electronically and monitor the status of shipments.



Stephanie Fowler

"It was not difficult to sell top management on the idea of electronic mail and EDI," Olson said. "It was clear that we would make better use of networks we had already built for ourselves. Telex is very expensive. Electronic mail is cheaper. That's a straight-off cost justification. It's easy to point to sending paper and rekeying data as places to cut costs."

EDI also enabled Harper to make changes in its human resources, refocusing staff to take on new types of jobs. "The company has doubled in revenue over the last three years, but our people now are spending more time servicing customers and less on internal management," Olson said.

For example, the company has cut its accounting staff: Two people in San Francisco can now do what 15 used to do in a remote office. "That's saving $400,000 a year, but it represents an initial investment of just $40,000 in systems development and $100,000 in capital equipment — equipment that's depreciated over five years. That's a 10-to-1 return," Olson said.

However, he warned, "EDI is not — by itself — a solution." It has to be integrated with the other application programs in the partners' computers: finance, manufacturing, purchasing, inventory and so on. "It's in that integration where the bene-

Continued on page 73

Everybody talks a in corporate America. some of th

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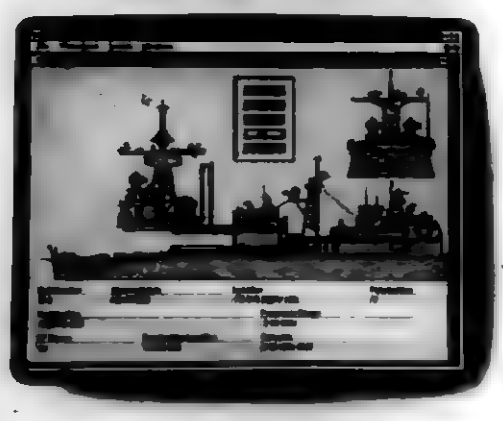
CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,® MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Raima Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

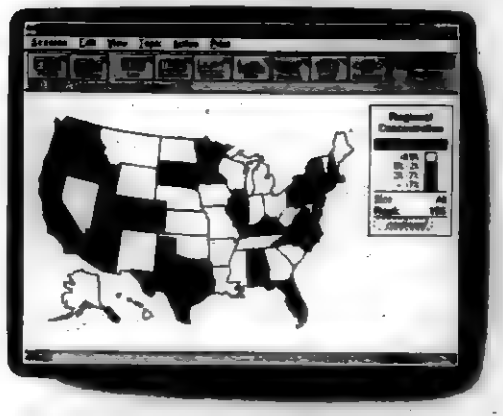
Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, and Raima Data Manager, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

© 1992 Microsoft Corporation. All rights reserved. The Windows World Open competition was sponsored by ComputerWorld, Windows Watcher, Windows World and Microsoft. Winners were selected by five independent Windows experts. Choice of development tool was not a criterion for entrance in the contest. Microsoft is a registered trademark of Microsoft, Inc. Bridge Tool Kit is a trademark of SoftBridge Microsystems Corporation. Q+E is a trademark of Pioneer Software Systems Incorporated. Superbase is a registered trademark of Precision Incorporated.

bout the problems We'd like to talk about e solutions.

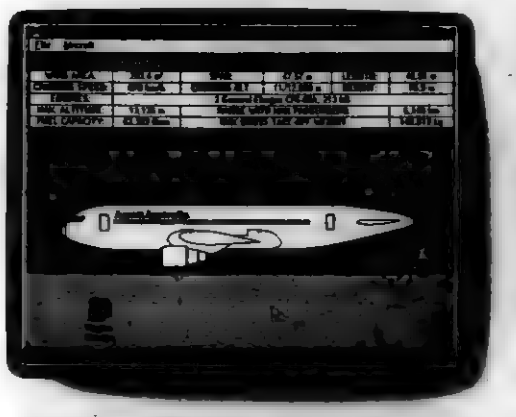
Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



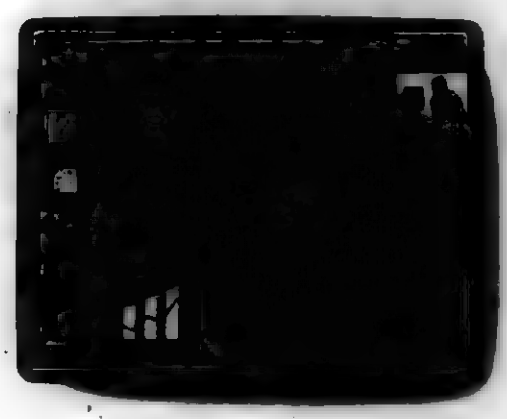
PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and Raima Data Manager (formerly db VISTAIII) to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.



Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.



Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

Microsoft
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Wexler

CONTINUED FROM PAGE 69

divestiture has of late been a bit underleveraged on principle.

The FCC seems to be realizing now that barring the RBOCs from participating in information services that society demands *because* of their size and reach is like carving a new cross-country trail with a machete when you could just hop on Interstate Route 80. Bypass carriers have long reiterated the valid point that overbuilding the telecommunications infrastructure with redundant networks is a waste of time, effort and customers' money.

We need to use what is here as a building block for getting as many services to as many places as possible, and the FCC's July decision was pivotal. The state public utility commissions have been long validating this attitude through their decisions to allow alternative access providers to hook into regional networks and proliferate access.

Admittedly, the FCC has it tough, having to continually review how much regulatory rope to feed the monopoly-status utilities. But signs are emerging that enough years have passed to begin snapping the local phone companies out of their sluggish stereotypes and into competitive mode.

For instance, Bell Atlantic is in the throes of a $2 million infrastructure revamp project specifically aimed at ensuring the RBOCs' survival among telecommunications competitors. Joseph T. Ambrozy, CIO, recently acknowledged that breaking down regulatory barriers to the RBOCs in the cable television business would be integral to the survival of all RBOCs.

The interesting question is what tactics the RBOCs and cable TV companies will use to duke it out. Will the phone and cable TV companies grudgingly link arms, much as the alternative access carriers and RBOCs have done, and somehow hook their networks together? Or will they go head to head, fostering the "network island" problem?

The phone companies are more far-reaching but will likely continue to be confined by regulatory straitjackets, according to Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J.

The FCC decision to allow the local phone companies to offer as well as distribute information services reminds me a little of my liberating seventh grade school year. That was when the school board finally decreed that girls could wear pants to school. But the firm rule was that no jeans were allowed; we could only wear "nice slacks."

A month later, we were clad in Levi's, work shirts and desert boots. Makes you kind of relish what's around the corner for the phone companies.

Wexler is a Computerworld senior editor, networking.

IN BRIEF

Cabletron/SAS unveil gateway

■ **Cabletron Systems, Inc. and SAS Institute, Inc. have jointly developed a gateway that enables Cabletron Systems' Spectrum to send information to applications based on SAS database and analysis software, according to the companies.**

The gateway will enable users to integrate Spectrum information with third-party applications that perform device utilization analysis, network inventory management, trend analysis and capacity planning, Cabletron said. The gateway is priced at $1,000.

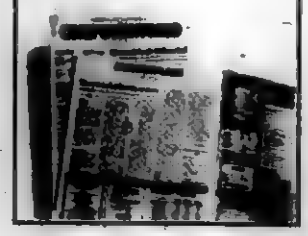
Cabletron said it plans to introduce a data server that will enable Spectrum to port information to a wide range of database and analysis systems.

■ **OSInet has now successfully tested 62 Open Systems Interconnect (OSI) products from 17 vendors for interoperability, the McClean, Va., company announced.**

Vendors included AT&T, Amdahl Corp., Bull HN Information Systems, Inc., Control Data Corp., Hewlett-Packard Co., Novell, Inc., Digital Equipment Corp. and Unisys Corp. The products were based on either the OSI Message Handling System or File Transfer, Access and Management protocol.

OSInet is an independent test bed facility for testing multivendor OSI interoperability.

Check out the Marketplace Pages on Page 108.



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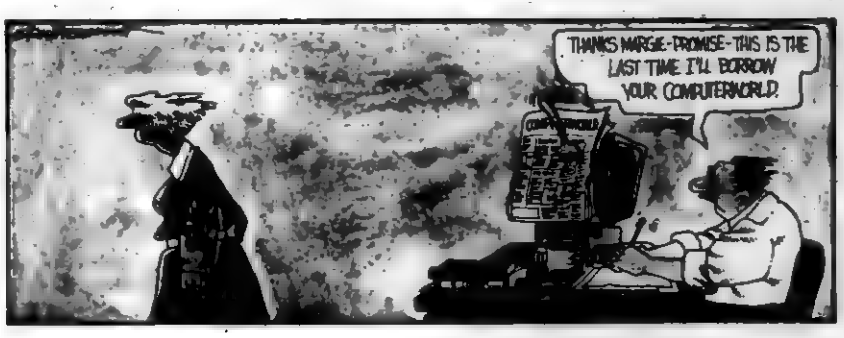

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60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Remote database access assists crime fighters

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Two telecommunications providers have formed an alliance to deliver wireless data communication capabilities to public safety organizations.

The alliance between Ram Mobile Data and RF Data will combine RF Data's computerized state and national crime database access system, RF/Switch, with Ram's national wireless data communications service, which is based on Mobitex network technology supplied by Ericsson GE.

Company officials said the combined technologies will enable public safety officers to access federal, state and local law enforcement databases directly from their vehicles, using portable computers and radio modems, thereby bypassing dispatchers and avoiding information bottlenecks.

Suspect profiles

Once they have accessed the appropriate database, law officers will be able to receive information on suspects within seconds, according to the vendors.

RF Data officials said they expect the service to be cost-effective for smaller communities if they share the service. By dedicating a single RF/Switch gateway to a number of municipalities, communities that band their fiscal resources can rely on a single gateway and reduce their monthly costs.

A spokesman for RF Data, based in Hinsdale, Ill., said the alliance expects to ship a combined product by year's end. He added that the firms have not yet decided on a pricing model.

Faster modems on the way

Vendors promise product fidelity, upgradability to new standard

BY CAROL HILDEBRAND
CW STAFF

Modem vendors are jumping the standards gun by announcing products they say will conform or upgrade to the so-called V.Fast standard, which is more than a year away from fruition.

The standard, which is currently under development by standards developer Consultative Committee for International Telephony and Telegraphy (CCITT), will cover 28.8K bit/sec. dial-up communications, the fastest speeds yet for modems.

However, CCITT representatives have said that the earliest the committee would approve a standard is September 1993, but the first quarter of 1994 is a much stronger possibility.

Until the standard has been approved, any "V.Fast modem" that is announced is really a proprietary two-wire duplex unit that runs at speeds faster than the current high-speed standard, V.32 bis standard.

That has not stopped vendors from announcing such products. Racal-Datacom, Inc. announced a series of small-footprint modems, including units that the company said will be compatible to the new standard. US Robotica, Inc. also joined in, unveiling an upgrade path from its current Courier V.32 bis.

THE COMMITTEE MAY approve a standard by September 1993, but the first quarter of 1994 is more likely.

Users can upgrade for $299 as soon as the standard is settled, the company said.

The new standard allows vendors to fatten up their margins in a very lean market, according to Judy Parani, an analyst at BIS Strategic Decisions in Norwell, Mass. "Data modems are a real commodity item," she said. "When you have something new with a faster speed, you can charge a little more and keep the margins up a little longer."

However, even when the standard is approved, a lot of data will not achieve top speeds. Dale Walsh, vice president of advanced development at U.S. Robotics, said the public switch telephone network will be the bottleneck.

Walsh estimated that by the time the standard is approved, true 28.8K bit/sec. speeds will be achievable on only about 20% of the phone lines, with the majority supporting 19.2K bit/sec. transmissions.

NEW PRODUCTS

Network management

Bolt Beranek and Newman, Inc. has released its Network Management System (NMS).

The product is an open, standards-based network management system that uses an architecture based on Digital Equipment Corp.'s Enterprise Management Architecture. Users can monitor and control the company's routers, packet switches and access devices, according to the company.

NMS was designed to improve network performance by supporting network analysis, configuration, monitor and control and troubleshooting.

Prices start at $25,000.

Bolt Beranek and Newman
70 Fawcett St.
Cambridge, Mass. 02138
(617) 873-4000

Local-area networking software

FortuNet, Inc. has introduced Nsure 1.1 Archive Library.

The product is a DOS-based backup-and-restore application. Support for a variety of digital audio tape and 8mm helical scan jukeboxes is provided. Nsure 1.1 Archive Library includes a menu user interface and a script language.

Nsure 1.1 Archive Library costs $1,895.

FortuNet
Suite 435
2180 South 1300 East
Salt Lake City, Utah 84106
(801) 467-6887

Gateways, bridges, routers

Digital Equipment Corp. has introduced the DEC WANcontroller 720, designed for the reduced instruction set computing-based workstation and server market.

Users can transmit high-speed, network-intensive graphics and accelerate normal wide-area network functions, such as transferring files to other users, at very high speeds on WANs.

The DEC WANcontroller costs $2,500.

DEC
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

Penril DataComm Networks has introduced two Ethernet bridges: the Series 1210 Local Ethernet Bridge and the Series 1220 Remote Ethernet bridge.

The Series 1210 bridges two local Ethernet segments and supports 10Base5, 10Base2 and 10Base-T networks and handles media conversion between different networks.

One Ethernet segment and up to two remote wide-area networks can be bridged with the Series 1220. Support for various WAN capabilities are included in the Series 1220.

The Series 1210 Local Ethernet bridge costs $2,895 and the Series 1220 Remote Ethernet Bridge costs between $3,195 and $5,395.

Penril DataComm Networks
1300 Quince Orchard Blvd.
Gaithersburg, Md. 20878
(301) 921-8600

Information-rich EDI moves cargo

CONTINUED FROM PAGE 69

fits of EDI are found. A company shouldn't start by thinking about sending transactions back and forth; they should go back and think about the whole process, end to end. They often underestimate the amount of money it takes to implement EDI."

Moving products from country to country requires that forms be filled out for customs clearance and delivery of each shipment, but in many countries, EDI can actually move the information in advance of the goods — completing the paperwork before a plane lands.

Cummins Engine Co. in Columbus, Ind., is typical of The Harper Group's EDI partners. Whether it receives supplies or ships products, Cummins is "not interested in materials without information." The goal, according to Fran Warren, manager of EDI, is a "synchronous flow of materials and information."

The company used to do everything with paper, which employees had to "translate" into various formats. "But with EDI, it's pretty routine by now," Warren said. The last obstacle it overcame was the difference between "transaction sets," mainly that European messaging standards differed from those in North America, such as ANSI. Now there is agreement on a common, international messaging standard, called EDIfact.

The Harper Group handles worldwide, on-line EDI transactions with a mix of computers: an IBM mainframe at its San Francisco headquarters; 10 IBM Application System/400 midrange computers in various European and Far Eastern cities; and approximately 800 personal computers (mostly purchased from NEC Corp.) in the U.S. In addition, there are still "hundreds" of dumb terminals — IBM 3270s — on an IBM Systems Network Architecture network, although Olson noted that the company is gradually replacing them with PCs that act as workstations.

Data communications are handled by value-added networks — mostly over ground links.

With all its international traffic, The Harper Group spent more than $3 million on data communications this year, which is actually slightly less than it spent in 1988. Olson noted that he's gotten "more bang for the buck" since then.

Glutser has reported on the information technologies for 15 years.

EDI speeds processes

"Behind the scenes, EDI and E-mail are integrating all of a business' information in a single system," said Tim Wilson, executive editor of DataTrends Publications, Inc. in Vienna, Va., which publishes the biweekly newsletter "Advanced Office Technologies Report."

The transportation industry is one of the largest users of what Wilson calls "electronic commerce" because it operates in many places at once and must deal with many companies that may use different technologies and computing systems. By agreeing on standards for messaging, those differences are minimized. "From our perspective," Wilson said, "EDI and E-mail lend themselves to that type of environment."

Wilson also sees increasing interest in "the development of information as an asset: using EDI and E-mail not just to move products around but to improve the overall business process." He said the traditional way of handling day-to-day business through paperwork and separate departmental computers requires "relaying and retooling to make the information fit."

EDI is not only faster ("no more two-day waits at each step"). With it, information is part of a single set of computer systems and a single electronic process that takes it from supply through manufacturing, from warehouse through shipping, from invoicing through electronic funds transfer. In short, Wilson said, "Rather than technology adapting to the business process, the business process is adapting to the technology."

AS/400

The leader in contact lenses realized its vision with AS/400s.

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Vistakon's vision was clear. With their Acuvue® disposable contact lenses, this division of Johnson & Johnson Vision Products, Inc. already offered a superior product. But they also wanted to offer superior customer service. An advanced AS/400® application helped them do just that.

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Of course, you don't have to be a contact lens maker to see things so clearly. All kinds of companies are looking to advanced AS/400 applications. Companies like Porsche Cars North Amerida Inc. are also using CallPath/400 to improve customer service. And companies like Purity Wholesale Grocers, Inc. and Omak Wood Products are using our advanced applications to fax invoices and information directly from their AS/400s, so they can serve their customers better and reduce costs.

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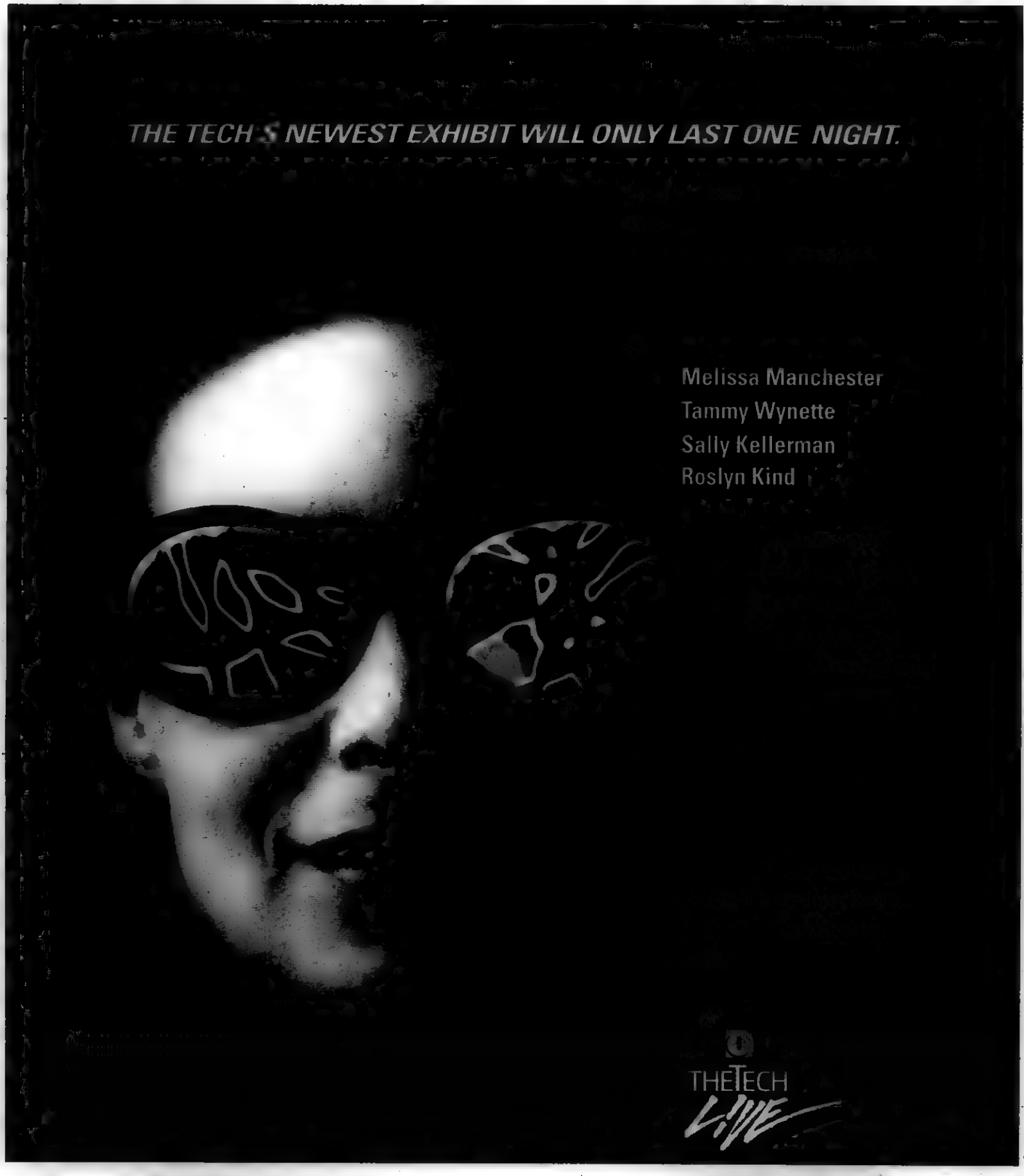

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AP braces for campaign finale

News service faces election coverage pressures with VAXs and Sun 470s

MELINDA-CAROL BALLOU
CW STAFF

While Governor Bill Clinton and President George Bush spar with one another, the Associated Press news service is beefing up its computer systems to handle data flow and news coverage more effectively.

For instance, the AP's information systems department recently completed the process of bringing its U.S. bureaus to Digital Equipment Corp. VAXclusters from aged DEC PDP-8s.

Even though other businesses have been focusing on distributed processing and have been spreading out resources to remote sites, the AP replaced distributed PDP-8s with centrally located VAXclusters and distributed access.

"The AP wire service has constant deadlines, and we also have a broadcast service for nonprint media which every hour is trying to get stuff out, so we must have high availability," said Robert Friedman, manager of news systems development at the AP.

The AP chose to replace the 25-year-old PDP technology in hopes of gaining more reliable and quicker access to material.

ON SITE

The Associated Press
New York

- **Challenge:** To provide greater reliability in news service systems; prepare vote-capture system before presidential election.
- **Strategy:** Replace obsolete PDP-8 news bureau system with VAXclusters; upgrade Motorola system to Sun 470s, 670s and SuperSPARC platforms for vote-capture systems.
- **Expectations:** Increased availability, cost-efficiency and new applications made possible; ability to handle high volumes of votes coming in for elections.

"Our new architecture goes against the trend which is currently toward distributed computing. With the PDPs, we had 40 computers based in 40 different locations," Friedman said. "We've moved to a large, extended LAN-based network with a lot of bridging and a small number of data centers."

A typical AP bureau now has about 16 personal computers hooked up to two terminal servers on an Ethernet network, and the servers are attached to VitaLink bridges that communicate via dedicated lines or dial-up backup to VAXclusters in New York or Kansas City. Before, the AP relied on 40 PDPs; now, each of the two VAXclusters include three nodes of VAX 6000-class machines.

"In the old days, it was possible for a system to go down for a couple of hours or even days because we

Continued on page 78

Bank of America tests downsizing

Moves host apps to PC LANs across 11 states

BY JEAN BOZMAN
CW STAFF

SAN FRANCISCO — The Bank of America is banking on two things to stay ahead of processing requirements of the 1990s: dozens of mainframes in its three data centers and a downsizing program that has moved many host applications to personal computer local-area networks in bank offices throughout 11 states.

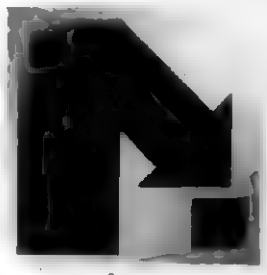
Large-scale IBM and Tandem Computers, Inc. machines collectively use 2,000 million instructions per second to handle 10% of the nation's checks, bank officials said. But downsizing host applications has been taking place here for six years in a bank-wide program designed to move data and software closer to the user.

The road to downsizing was somewhat bumpy at first, said Mark Bowler, systems director at the bank's Advanced Technology Group in Concord, Calif. In 1986, as PCs were shipped out to hundreds of bank branches, a six-month "hold" was placed on the project to deal with logistical problems.

Some of the problems were physical. "The power consumption of that many PCs caused a brownout at one of our locations," Bowler told attendees of a Downsizing Expo seminar held here late last month. "If the voltage in the building went down, the PCs would go into a state and then hang." That problem was solved with the purchase of a $500,000 power supply.

Downtime utilized

The bank used the delay to find new ways to support thousands of PC LAN users and distribute software to hundreds of remote sites electronically.



The bank wrote special IBM NetView alerts to signal PC failures, such as hard disk failures, prompting field support personnel to repair the problem. Software had to be distributed electronically because of the bank's size, which made disk software updates unreliable.

Today, the $7 billion bank — the nation's second largest — has 1,000 Token Ring LANs and roughly $250 million invested in PC technology in the 900 California branches it had before its 1992 merger with Security Pacific Bank.

Most PCs run Microsoft Corp.'s Windows instead of the OS/2 operating system envisioned by former Chief Information Officer Michael Simmons in the late 1980s. "We couldn't get OS/2 stable enough at the time," Bowler commented.

The bank will gain even more IBM-compatible PCs from Security Pacific; its Seafirst unit in Seattle has a cache of 1,000 Apple Computer, Inc. Macintoshes.

By 1995, Bowler plans to test some Unix parallel processors as potential replacements for some IBM mainframes.

Despite its use of cheap hardware, downsizing did not reduce total information systems costs for staff and support, he said: "The budget has stayed the same, but the mix of what people are doing is different."

Now, IS staff members spend more time talking to end users, training branch personnel to use the PC LAN applications and keeping software updates flowing smoothly to the remote sites.

HDS beefs up service offerings to hold onto IS shops

BY JEAN BOZMAN
CW STAFF

SANTA CLARA, Calif. — In a move to hold onto the 3,000 information systems shops that have its IBM-compatible gear, Hitachi Data Systems Corp. is beefing up its service offerings.

The $1.4 billion firm recently told industry analysts that it will soon field new software tools to help IS managers plan for IBM's Escon fiber-optic channel system. It also plans to tap several more third-party vendors to broaden its service offerings.

But HDS, a 1989 joint venture of Hitachi Ltd. and Electronic Data Systems Corp. that sells IBM-compatible mainframes and peripherals, is moving cautiously — perhaps too cautiously, according to some analysts. It does not plan to build up its internal consulting staff any faster than business permits. For the past 18 months, a core staff of fewer than 10 consultants has managed HDS' relationships with outside consultants. Among these are database experts from Software AG of North America, Inc. and Oracle Corp., HDS said.

"We could hire 300 people, but we probably won't do that," said Supriyo Sen, an HDS marketing vice president responsible for competitive analysis. "Our objective is to make it very clear that we are not competing with service consultants." In effect, Sen said, HDS will act as the prime contractor that lines up multiple service providers for a customer account.

The HDS service program includes feasibility studies, configuration management, capacity planning, maintenance planning and change management. HDS also sells software tools that can be used by IS managers to do their own planning. The tools range in price from $25,000 to $200,000, HDS said.

Some HDS users have used the IS planning tools but have not yet signed up for consulting services. "Typically, we tend to do things in-house," said Glenn Rudyanski, a software specialist at Prudential Service Cos. in Roseland, N.J. "We have HDS as a sounding board, and if we run into a problem, they'll help us out."

The IS arm of The Prudential Insurance Company of America started using HDS' Technical Assistance Program/System Managed Software (TAP/SMS) software tool in October 1991. Now the shop, with 2T bytes of disk capacity, is about 50% converted to IBM's SMS, Rudyanski said. Prudential has one HDS mainframe — and dozens of HDS disk drives. "The TAP/SMS tool goes out and scans the entire DASD farm," he said. "It builds a database on data sets and volumes, so you can look for any exceptions." Rudyanski said the conversion of all data sets to SMS at the Roseland site is expected by the end of 1993.

> "OUR OBJECTIVE is to make it very clear that we are not competing with service consultants."
>
> SUPRIYO SEN
> HDS

Industry analysts lauded the goals of HDS' new-and-improved consulting but questioned the level of commitment. "HDS has a long way to go to compete in the consulting big leagues," said Frank Gens, vice president of technology assessment at Technology Investment Strategies Corp. in Framingham, Mass. "They are making incremental moves to grow beyond the mainframe business, but the question is what level of investment these new ventures get."

But HDS' consulting move is an outward sign of a deeper cultural change at HDS. In the 1980s, the company had been National Advanced Systems, a firm that distributed Hitachi gear. "As it becomes a major systems vendor, the focus is on growing the field sales and support organization and on providing value-added services," said Mark Hess, vice president at Gartner Group, Inc.'s large computer strategies service.

HDS is gaining 200 new sites each year, growing at 15% annually, a faster rate than its larger competitor, Amdahl Corp., according to Hess.

Study disproves 4381 myth

IBM's midrange mainframe group, the 4381, is usually cited as among the most vulnerable to the downsizing trend. But recent research shows that this processor family is in fact most often replaced with other mainframes.

Computer Intelligence in San Diego tracked the replacement patterns of 4381s between January 1991 and May 1992 and found that some 90% were replaced with other mainframes, usually from IBM.

About 30% of 4381 users opted for a larger 43XX box; another 8% installed an IBM 308X or 309X; and some 47% opted for an IBM Enterprise System/9000. Still, only 12% of the ES/9000s installed represented new business for IBM, the market research firm said.

Ten percent of the 4381s were replaced by multiple personal computers, high-performance workstations or minicomputers.

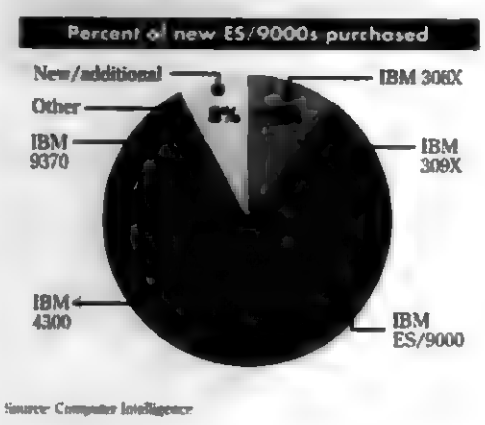
During 1991, the population of IBM mainframes and compatible machines dropped 11% in the U.S.

For every ES/9000 installed between January 1991 and May 1992, approximately 1.3 mainframes were displaced by outsourcing, data consolidation or other moves, the survey said.

The survey said users' intentions for future mainframe purchases also reflect a decline, dropping to a little more than half the number of planned systems from a year ago.

Stepping up

More IBM ES/9000 users are migrating from IBM 4300 machines than from any other platform



Source: Computer Intelligence

AP braces for election finale

CONTINUED FROM PAGE 77

didn't have hot spares of everything," Friedman said. "With the increased power of VAXs over PDPs we could afford to put multiple bureaus on a single system, and with clusters it became fairly easy."

Now if a machine goes down, extra processors are available to take over, and additional ones can act as backups. Instead of leaving the extra VAXs to idle when they are not required as backups, the processing load is distributed across the cluster.

"The cluster architecture has been very helpful in giving us a reasonably cost-effective, high-availability solution," Friedman said. "There are worlds of difference in what we are now capable of doing — in real time, the PDPs would take forever to get a response back. Now we have all kinds of searching capabilities and real-time access to around 13,000 news items."

The AP began its transition to VAXclusters four years ago, and the organization's Boston bureau was the last to make the move this spring.

> THE AP CHOSE to replace the 25-year-old PDP technology in hopes of gaining more reliable and quicker access to material.

"The system we had before was in pretty bad shape by the end — it was pretty slow and would crash a lot," said Eve Epstein, statehouse reporter at the AP in Boston. "There were times when we lost stories."

"The major changes have been increased reliability because we have a VAX that has in effect two backup VAXs," said Dan Beegan, statehouse bureau chief for the AP in Boston.

"That solved the old problem when each bureau only had its own. By the time they were replaced, those machines were very antiquated, and though it didn't happen frequently, there would be times when we'd be down for several hours," Beegan said.

The new system lets users work on-line without loss of material a minute or so after the operation moves to another VAX on the cluster.

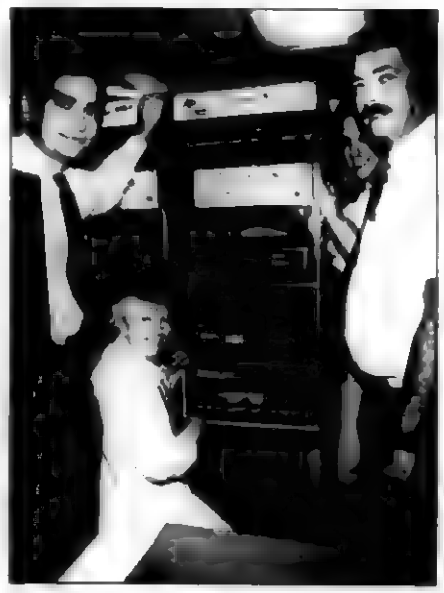
The news system is now running APedit, a PC editor that the AP customized itself. The AP also added electronic mail with the VAXcluster upgrade via A1, a stand-alone E-mail package from DEC.

While the news bureaus run their operations off the VAXclusters, the AP also has an election vote-tabulation system that is based on a network of Sun Microsystems, Inc. 470s. It was originally based on Motorola, Inc. 68020- and 68030-class multiuser systems.

When the AP made its decision to move from the Motorola platforms, the company chose Sun with a Sybase, Inc. relational database management system for the vote-tabulation system, based on price/performance issues and DEC's lack of commitment to Unix at the time of the decision.

"We ultimately chose to go with Unix over VMS to hedge our bets and to gain expertise in Unix so that we would have flexibility in terms of future directions," Friedman said. "The message at DEC about Unix was very confused and it still hasn't settled down now."

The AP's information systems department will upgrade the Sun 470 workstations to 670s before November's presidential election in preparation for the "big bang" on election night, when it must handle more than 400,000 transactions.



Staffers mark *the departure of the last VAX PDP-8E running in news production at the AP*

DEC releases tools for DECmpp

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced that it has enhanced a range of software tools for the company's massively parallel DECmpp 12000 series of computers. It has also provided higher-density parallel disk array systems and a new high-speed console.

Products that were part of the announcement include DECmpp Fortran V1.1; DECmpp Vast-2, which translates conventional Fortran 77 programs into DECmpp Fortran; DECmpp Math Library; DECmpp Image Processing Library and DECmpp Parallel Programing Environment.

DECmpp Fortran V1.1 is a new release of DEC's parallel Fortran compiler, which features automatic scalarization allowing massively parallel programs to be developed and tested on conventional workstations, officials said. DECmpp Vast-2 is new software that can translate portions of conventional Fortran 77 programs into DECmpp Fortran, optimizing it for massively parallel systems.

The DECmpp Math Library is a store of frequently used mathematical routines that can be invoked during program development. The DECmpp Image Processing Library includes new data types for use in a range of image processing applications. DEC's DECmpp Parallel Programming Environment now offers support for the Open Software Foundation's Motif graphical user interface, links to AVS graphical visualization software and performance improvements, officials said.

DEC, which is currently reselling Single Instruction Multiple Data (SIMD) computers from Masspar Computer Corp. and Multiple Instructions Multiple Data (MIMD) systems from Intel Corp., seeks to offer a unified software environment across architectures.

"We are headed toward a unified software environment across SIMD and MIMD machines. This compiler is a big step forward toward our goal of a high-performance Fortran compiler across environments, and we're looking to do that with our development tools as well," said Bob Nilsson, marketing manager for DEC's massively parallel systems group.

In the works

DEC is working on its own massively parallel systems in-house, according to industry analysts, although DEC officials refused to comment. Other vendors, such as Cray Research, Inc., are licensing DEC's Alpha chip to develop massively parallel systems, Nilsson said, noting that it is "quite conceivable" that DEC might do the same.

Analysts were positive in their assessments of DEC's massively parallel software.

"DEC is trying to provide the software across their panoply of vendors that will make it all work. This will be how they glue it all together," said George Lindamood, vice president of high-performance computing at Gartner Group, Inc. in Stamford, Conn. "They have quite correctly judged that the world out there can use some better software, and they will be able to use it later on for whatever they do in-house. Their plate is very full in the short term, since they are trying to get Alpha out."

Neon unveils Shadow for IMS

BY TOM HOFFMAN
CW STAFF

HOUSTON — Neon Systems, Inc. has rolled out two software products designed to provide client systems with access to mainframe databases.

Shadow for IMS allows client programs on Unix-based personal computers or workstations to access databases under IBM's IMS mainframe database management system. Using Shadow for IMS, users can access and update IMS message queues and execute IMS application programs using Unix workstations.

Shadow for IMS can be used on any platform that supports the C programming language, according to the company.

Shadow Gateway for DB2 allows Sybase, Inc.'s Open Client applications to communicate with IBM's DB2 database.

Each of the products offers monitoring and diagnostic facilities for controlling large-scale client/server applications. Connections between client systems and the mainframe are established through either Transmission Control Protocol/Internet Protocol or the LU6.2 networking protocol. The products run on any IBM or plug-compatible mainframe running IBM's MVS/XA or later release.

Pricing for both products ranges from $9,950 to $55,000, depending on configuration.

NEW PRODUCTS

System software

Diversified Software Systems, Inc. has announced Release 5.6 of Docu/Text, an MVS JCL documentation and analysis productivity tool.

Performance improvements have been made in this release, which responds to new functions in the IBM MVS/ESA environment. New DB2 functionality has also been added.

By reading JCL as input, the product automatically provides a variety of reports and flow charts. On-line job information for operations is provided by an On-line Info feature, and Online XREF offers enterprisewide, cross-reference information that is contained in a central repository.

Pricing for Docu/Text ranges from $17,600 to $55,000.

Diversified Software Systems
18630 Sutter Blvd.
Morgan Hill, Calif. 95037
(408) 778-9914

Software application packages

NCR Corp. has released recognition capabilities for its image-based Document Management System.

The imaging system can now recognize handwritten numbers, machine-printed characters and numbers and multiple fonts on a single document, the company reported. Paper documents can be converted to electronic form. The product can recognize omnifront machine print, optical character recognition, bar codes and adding machine tape.

Prices start at $800,000 for a 20-workstation system.

NCR
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

CHI/COR Information Management, Inc. has announced a new demonstration disk for the Deduction Management System (DMS).

The disk introduces financial implications of the deduction problem and also describes the productivity benefits that can be achieved by using DMS to resolve customer deductions.

The disk also demonstrates the capabilities of DMS, which is a mainframe-, Application System/400- or personal computer-based tool designed to help users monitor, control and track customer deductions, according to the company. DMS automates and formalizes an organization's deductions resolution process.

Pricing ranges from $9,500 to $95,000, depending on system configuration.

CHI/COR Information Management
300 Wacker Drive
Chicago, Ill. 60606
(312) 322-0150

Datathon, Inc. has announced a starter pack for TrainEase, a computer-based training software package.

Version 3.0 of TrainEase is a personal computer-based multimedia training program for designing presentations, tutorials and instant simulations, the company reported. The product can be used with the IBM Application System/400, and it offers support for sound and graphic file formats that are compatible with Microsoft Corp. Windows 3.0 or later.

TrainEase features instant recording of all screens and keystrokes plus authoring and design capabilities to guide users through the training session.

Prices start at $1,492.

Datathon
19360 Rinaldi St.
Northridge, Calif. 91326
(818) 701-9642

Database management

BMC Software, Inc. has released Version 4.2 of Delta IMS.

The product now supports Fast Path Data Entry Databases and several new terminal types. Delta IMS is available in three product levels: Delta IMS DC, Delta IMS DB/DC and Delta IMS Virtual Terminal. The ability to add, delete or modify the database and data communications elements of IMS on-line is achieved with Delta IMS.

According to the company, by reducing the number of IMS generations needed, the Delta IMS DC and Delta IS DB/DC increase system availability and improve responsiveness to users. Delta IMS Virtual Terminal permits devices such as automated teller machines and teller printers to be added to the IMS system.

Perpetual licenses for all three of the products start at $11,000.

BMC Software
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

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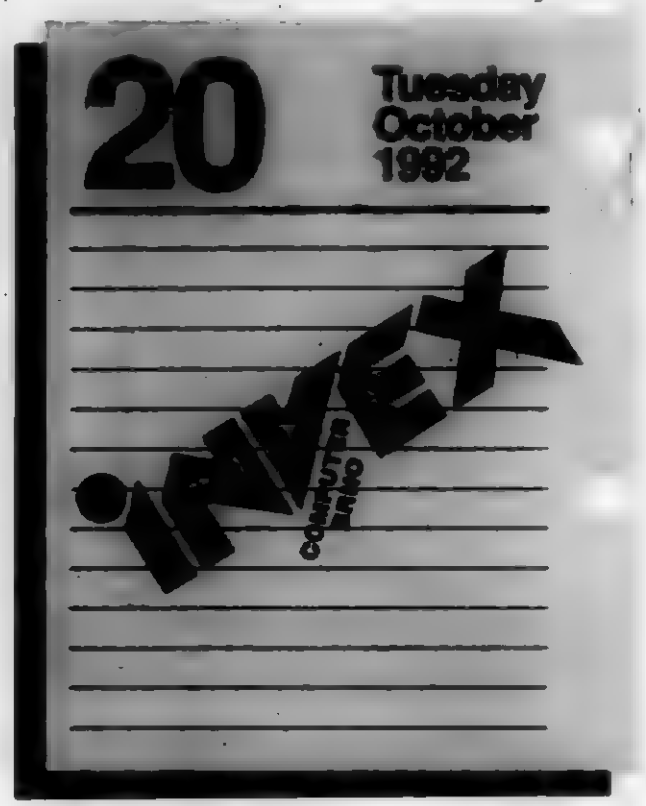

October 20th marks the beginning of INVEX Computer 1992, the international exhibition of software, hardware, office equipment and telecommunications. INVEX Computer will be one of the largest information technology events ever held in Eastern Europe. Covering over 550,000 sq. ft. of space, with projected attendance in excess of 50,000 and featuring more than 650 major exhibitors like IBM, NCR, Sharp, Audodesk, 3M, Hewlett Packard, Software AG, Bull and DEC.

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THIS IS WHAT A MASSACRE LOOKS LIKE IN THE WORLD OF APPLICATION DEVELOPMENT.

DATAPRO
DBMS USER SURVEY

	PROGRESS SOFTWARE	SYBASE	INFORMIX	INGRES	FOCUS	ORACLE
ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	8.8
Ease of Use	9.1	8.2	8.2	7.9	7.9	7.4
Ease of Install/Upgrade	8.9	8.0	8.6	7.1	8.1	7.6
Price/Performance Pattern	9.1	8.3	8.5	7.5	8.1	7.1
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	9.0	8.4	8.6
Interface Capabilities	8.9	8.9	8.4	8.7	8.7	8.0
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	8.7
User Friendliness	8.9	7.7	8.3	7.9	7.5	7.3
OS Compatibility	8.6	8.4	8.9	9.1	8.6	9.0
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	5.7	6.2	7.3
Vendor Training	8.7	7.9	8.0	7.2	7.6	8.0
Problem Response Time	8.8	7.5	7.2	6.1	6.4	6.7
Quality of Vendor Support	9.0	7.8	7.5	6.4	6.9	7.0
Frequency of Releases	8.5	7.5	6.7	7.2	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.0	7.0	7.3
Overall Satisfaction	9.3	8.7	8.5	8.3	8.0	7.9

Compiled from the 1991 Datapro Reports on Software/Computer System Series Software, available for each product listed. (Systems from 10/93). The results are those of actual users of the products as surveyed by Datapro.

VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	INFORMIX	ORACLE	Ingres/Ingres 6/6	Sybase
PRODUCT FEATURES					
Ease of use	9.02	7.07	6.00	6.19	5.80
Memory requirement	7.37	6.16	4.25	6.19	5.22
Ease of programming	9.03	7.09	6.06	6.20	5.90
Ability to manipulate data	9.19	7.41	7.44	6.81	5.67
Sorting capabilities	9.02	7.44	7.69	6.85	5.78
Provision for software security	8.56	6.93	7.28	5.07	5.76
Report writing capabilities	8.39	6.72	6.59	5.71	4.11
Ease of use of interface	8.51	7.05	6.15	6.10	6.10
Software integration capabilities	8.34	7.26	7.24	6.27	6.10
Ease of data retrieval	9.06	7.66	7.66	6.61	6.11
Satisfaction with product profitability	8.26	7.04	6.22	5.56	5.13
Overall quality of product	8.84	7.37	6.69	6.32	5.44
Product Features Average	8.84	7.10	6.61	6.14	5.60
SUPPORT FEATURES					
Provision for customer support	7.74	5.98	5.76	5.77	5.50
Charges for training time	8.88	4.49	4.59	5.64	4.56
Provision for technical support	7.81	5.76	5.72	5.87	5.22
Provision for marketing support	8.86	5.88	6.09	6.13	3.60
Documentation & product information	8.74	6.73	6.56	6.45	5.56
Frequency of updates & revisions	8.36	5.88	6.34	5.57	5.00
Support Features Average	7.73	5.79	5.84	5.90	4.94
Overall Average	8.34	6.66	6.36	6.06	5.38

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PROGRESS
SOFTWARE

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CPWADV0907

KnowledgeWare promises better module integration

BY KIM S. NASH
CW STAFF

ATLANTA — The latest release of Application Development Workbench (ADW), the integrated computer-aided software engineering system from KnowledgeWare, Inc., should appease users seeking smoother interaction between modules and more sophisticated diagrammers.

Like many KnowledgeWare users, the *Minneapolis Star Tribune* wanted to see better integration between ADW's design and construction stations. Kim Albee, a member of the newspaper's research and integration team, said that under ADW 1.6, the current version, some of that link has to be built manually by the programming staff.

"You have to copy your spec diagram files and paste them into the [generator] module. That kind of thing should be automated," Albee explained. "We have a lot of expectations for 2.7 and hope KnowledgeWare delivers," she said.

Albee is not alone, acknowledged Brett Roeder, a KnowledgeWare product manager. "We realized the need to get the front-end tools working better with the back end and have taken care of that," Roeder said.

ADW 2.7, which is due out before year's end, is currently in beta testing at 80 U.S. customer sites. As revealed in a recent product demonstration, the tool set sports enhancements to all phases of full life cycle development.

That is good news for businesses such as Vons Cos., a Los Angeles-based chain of food stores. Vons attempted a pilot project using ADW 1.6 and got through analysis and design. However, time pressures forced the company to abandon efforts to generate code with ADW and revert to Computer Associates International, Inc.'s CA-IDMS programming.

The pilot grew too large for Vons' programmers to handle, explained Barry Boone, director of corporate systems. "And when the heat got on, we went back to what we knew, what was easy," Boone said.

With 1993's schedule of information systems projects laid out, Vons expects to allocate at least one system to a team equipped with ADW 2.7 next year. "We don't doubt that 2.7 will be much improved," Boone said.

A key difference between Release 1.6 and the new version is how Construction Workstation relates to Design Workstation. "The generator is nothing but an engine now. All the construction specifications are defined in the design phase," Roeder said. Version 1.6 depended on the code generation module to lay down at least some of the program specifications.

Improved translation

The product preview highlighted improvements in translating business requirements into application code. For example, ADW/RAD, a facility for doing rapid application development, now lets programmer/analysts use data and process models formed during the analysis phase serve as the basis for workable application prototypes.

The information used to create test programs can later be used to build actual applications, said Pam Johnston, director of product management.

For the North Carolina Department of Administration, that enhancement comes too late to be of use on a 1,000-program computerized judicial tracking system. Based in Raleigh, N.C., the state agency is one year into what is expected to be a three-year project. The department is finished with the analysis portion of the task and plans to start building prototypes during the design phase, according to Ray Speight, application development manager.

However, functionality of the RAD and Documentation modules in ADW 1.6 is not up to snuff, Speight said. "I think they released them too early," he said.

Speight asked KnowledgeWare whether he should wait for 2.7 to come out and use the new construction tools or complete the current project with 1.6. "They are encouraging us to start a fresh project with 2.7 when we get it. I guess it's not easy to make the transition from one release to another," he explained.

Meanwhile, the department will build pseudo-prototypes by tacking ADW-generated interfaces and screens onto interim code programmed manually by in-house staff. "It's not prototyping in the true sense of the word, but it'll do," Speight said.

Key enhancements to KnowledgeWare's CASE Workbench

■ **Planning and analysis phases:**
Diagrams and reports to cover entire life cycle.
Translation of business process models into working data models.

■ **Rapid Application Development Module:**
Automated prototype design that can be translated to Design Workstation tool.

■ **Design and construction phases:**
Enhanced screen painter, syntax checking functions.
Expanded support for IBM's DB2 and Cross System Product.

■ **Documentation and maintenance phases:**
Documentation built via templates; can include graphic elements.
LAN administrator functions, license control.

CW Chart: Janell Genovese

Change managers speed re-engineering

BY GARRY RAY
CW STAFF

In today's business lexicon, "change management" does not have quite the weighty clout of "re-engineering" or "downsizing." But according to analysts and users, the change management tools used by application developers might play a central role in any corporate re-engineering or downsizing effort.

"These tools are absolutely critical to client/server development and deployment," said Steven Bradley, program director at market research firm Gartner Group, Inc. in Stamford, Conn.

Represented by tools such as CCC/Manager from Softool Corp. in Goleta, Calif., and Endevor from Legent Corp. in Alexandria, Va., change and configuration management tools allow developers to maintain rigid control over different versions of application code, documentation, change authorizations and other elements of the software development process.

By storing these elements in "libraries" and providing tools for tracking, updating and merging them with other elements, change and configuration management products can assure developers that they are working with the most recent version of any application element.

In addition, change and configuration management tools generally provide clear audit trails showing who made changes to a particular module and why those changes were made.

Those auditing features were crucially important to Susan Kuwana, an information management technologist at User Technology Associates, Inc., an Arlington, Va., services contractor to the U.S. government.

Kuwana explained that a contract protest involving a previous employer required that "we go back to justify and explain why paragraphs and sentences had changed in a 1,000-page contract" that included development specifications.

Because the contract had been tracked using Softool's CCC/Manager, "we were able to do it in 20 or 30 minutes," she said.

Kuwana is currently implementing CCC/Manager at User Technology Associates because "how we control changes internally is inherently part of our contract," she said.

Software librarian

To do this tracking of code and documentation, most change and configuration management software operates in a manner analogous to a library: The development staff "checks out" and "checks in" the program elements they intend to review, modify or test.

To reduce the amount of disk space used by these multiple versions of program elements, only the changes, or "deltas," made to an existing element are stored in the change and configuration management system. At various points in the process, deltas and original program elements are merged to build updated versions of the application.

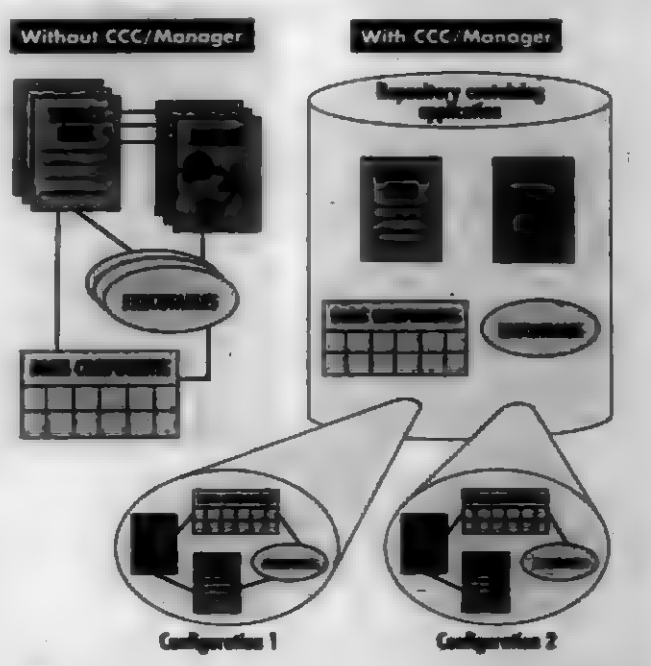
While these extra steps may seem like onerous additions to the coding cycle, development staffs have taken kindly to the process. A Chicago-area administrator of Legent's Endevor change and configuration management software said programmers had embraced the tool in order to improve software quality.

Few of these capabilities were important in the days of the lone coder working on a single application. But that's changing quickly. "We're seeing multiplatform development becoming an issue today," said John Treacy, product director at Rockville, Md.-based Intersolv, Inc., which sells the

Continued on page 82

User views

Configuration managers such as Softool's CCC/Manager let users define multiple versions of an application



Source: Softool Corp.

CW Chart: Stephanie Faucher

Passport aids fast applications generation

BY MELINDA-CAROL BALLOU
CW STAFF

RONKONKOMA, N.Y. — InSynch Software Corp. last week announced the release of Passport6, which combines the firm's Passport development environment with a rapid application generator and a GUI customizer for quick generation of applications across operating systems and relational database management systems.

This version of InSynch's development tool integrates an easy-to-use graphical user interface (GUI) with the Passport fourth-generation language and automates RDBMS access across Oracle, Sybase, Ingres, Rdb, Unify and Sequoia Systems, Inc.'s FT/SQL RDBMSs.

"Someone who has never used Passport can now build a five- to 10-screen application in a day, and someone with two months' experience can build an advanced abstract widget such as a spreadsheet with a GUI format in three to four days," said Keith Sturges, vice president of sales at InSynch. "And you can now deploy a Passport application on VMS or Unix machines using either character mode or a GUI with the same application. The majority of the code remains the same."

Passport is an object-based, SQL application development environment designed to create portable, high-performance GUI and/or character-based applications. Passport's objects (including Menus, Menu Items, Forms, Screens, Blocks, Fields, Scrolls, Text, Overlays, Reports and SQL-Object) are implemented as abstract data types and possess dynamically queriable and modifiable attributes.

Menu styles can be modified at runtime under user control because the application menu hierarchies are abstract models that are independent of user interface representation and navigation style.

Since Passport's objects are separate from programming logic, it is possible for developers to separately reuse Passport object and logic modules. The advantages of this are that the amount of logic needed to manage Passport objects is minimized and that programmers can build their own generic Passport utilities if they so choose.

Passport is fully structured and procedural but supports nonprocedural SQL by storing SQL statement blocks as callable, named objects. Those SQL objects are then modular and can be reused.

"Passport is like a universal translator that lets us draw information from different databases and pull it together into a single screen," said John Keeran, a database administrator at Peterson Air Force Base in Colorado Springs. "This is especially important for me because in the military we have different installations with different levels of hardware and software."

With the new version of Passport, Keeran said, he can simply relink the old application to make it a GUI application. He said he looks forward to a Microsoft Corp. Windows version of Passport6 on DOS, which InSynch officials said they expect to ship by the end of the year.

Other advantages to Passport include its flexibility and ease of use, Keeran said.

"I've programmed with both Oracle and Unify tools, and those have a set of instructions for screens and another for report generation. Just having to learn one set simplified the process for me."

VMS and Unix versions are available now, priced from $1,500 to $45,000.

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Speeding re-engineering

CONTINUED FROM PAGE 81

PVCS version control software for DOS, OS/2 and AIX. The company also provides a gateway to IBM's SCLM mainframe change and configuration management software.

Add to multiplatform development the desire for programs that can run on multiple operating systems and have different user interfaces, such as Microsoft Corp.'s Windows and OSF/Motif, and development complexities grow rapidly. The Endevor administrator in Chicago said the tool had significantly reduced that complexity.

Paradoxically, as development efforts become more ambitious in their scope and size — multiplatform client/server applications being the best example — change and configuration management products might become more crucial to the success or failure of a project.

According to Bradley, "Software change management will be the gating factor" in future software projects.

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NEW PRODUCTS

Application development tools

Kansmen Corp. has announced upgrades on six modules in the ToolsKan Development Toolkit Version 2.0.

The six modules are 3Dchart, Status Bar, Toolbox, Table, Ribbon/Icon Bar and Field Validation. The 3Dchart module can produce pie charts and supports printing and scrolling and features a clipboard for long series of data.

ToolsKan's Toolbox can create buttons from bitmaps or text and supports scrolling for a large number of buttons, the company reported.

All of the modules are written in Microsoft Corp.'s C Version 6.0 and are compatible with Version 7.0, Borland International, Inc.'s C/C++, Turbo Pascal and Quick C.

Version 2.0 costs $1,299. An upgrade from the previous version costs $299.

Kansmen
2080-C1 Walsh Ave.
Santa Clara, Calif. 95050
(408) 988-0634

Integrated Systems, Inc. has introduced Xmath Version 1.1, a numerical analysis tool.

According to the company, Xmath is the first mathematical analysis tool designed for X Window System workstations. A programmable graphical user interface allows users to create and run interactive design tools from the Xmath environment. The product also has a high-level scripting language and interactive color graphics.

New features include a callable interface and the capability to link C, C++ and Fortran functions.

The product is available for Sun Microsystems, Inc. SPARCstation-compatible workstations and Digital Equipment Corp.'s DECstations.

Prices start at $2,500.

Integrated Systems
3260 Jay St.
Santa Clara, Calif. 95054
(408) 980-1500

Language Systems Corp. has released SoftPolish, a quality assurance tool.

According to the company, SoftPolish tests the dialogues, windows and controls of an application for compliance with Apple Computer, Inc.'s Human Interface guidelines.

For resource validity, the product applies numerous tests and can identify potential incompatibilities. All of the string objects in application resources are spell-checked, and SoftPolish automates file cleaning for master disks.

SoftPolish costs $295.

Language Systems
441 Carlisle Drive
Herndon, Va. 22070
(703) 478-0181

Step Engineering has announced RightStep, an OSF/Motif graphical user interface for GDB, a debugger from Free Software Foundation, Inc.

The product was designed to accelerate development of complex C and C++ applications.

RightStep has the ability to set or clear breakpoints by source line number, function name or exact address and examine stack frames with their function call arguments, executing location and local variables.

A variety of features are included, such as control processing of asynchronous signals to the program and a change execution path to simulate difficult-to-trigger errors. C and C++ users on a Sun Microsystems Inc. SPARC workstation network can access the tool.

RightStep costs $850 for a network license with two tokens. A four-token license costs $1,450.

Step Engineering
661 E. Arques Ave.
Sunnyvale, Calif. 94088
(408) 733-7837

Languages

Apple Computer, Inc. has introduced Version 2.0 of the Macintosh Common LISP, a LISP programming environment.

The product is fully integrated with the Macintosh personal computing platform. Common LISP is an object-oriented dynamic language that provides automatic management, simplifying the creation of complex applications, the company reported.

Macintosh Common LISP 2.0 costs $495.

Apple Computer
20525 Mariani Ave.
Cupertino, Calif. 95014
(408) 996-1010

Code libraries

Data Access Corp. has released two products designed to provide users with the ability to read and write data in DataFlex databases.

The Data Access Database C-Library enables users to write stand-alone C and C++ programs that manipulate data located in the existing database system.

Any Microsoft Corp. Windows-based program that can use Dynamic Link Libraries (DLL) can access data stored in DataFlex data files with the Data Access Database Windows DLL.

Prices start at $195.

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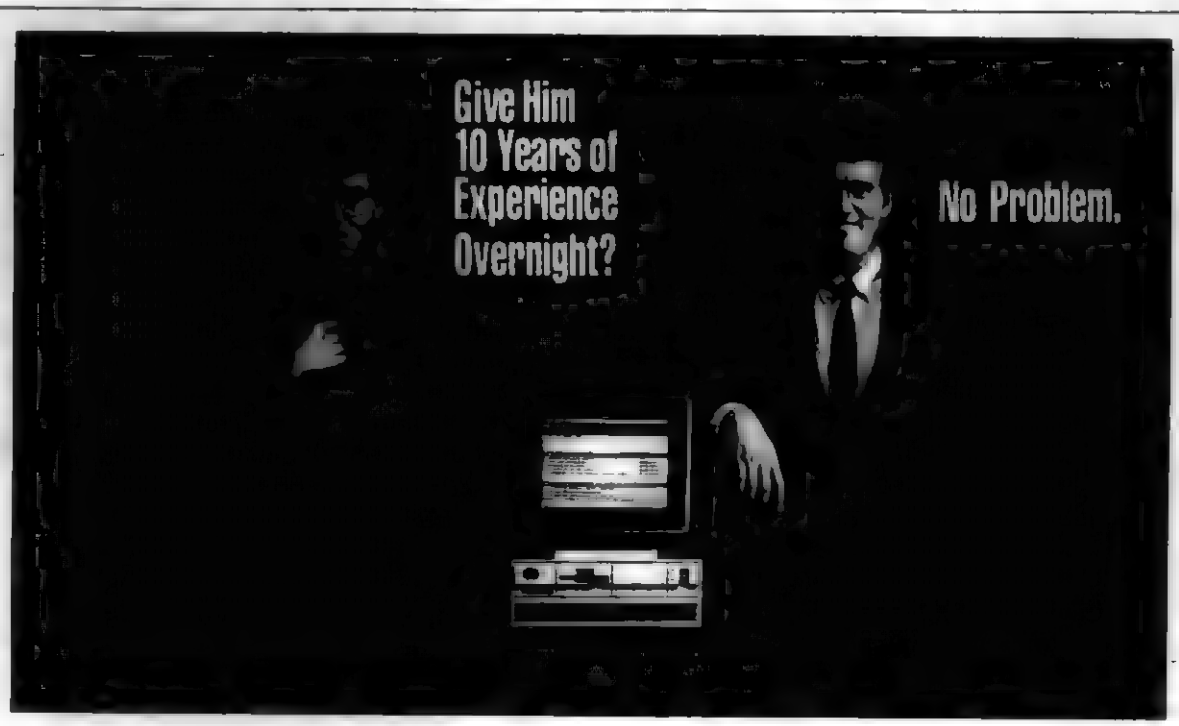
14000 S.W. 119th Ave.
Miami, Fla. 33186
(305) 238-0012



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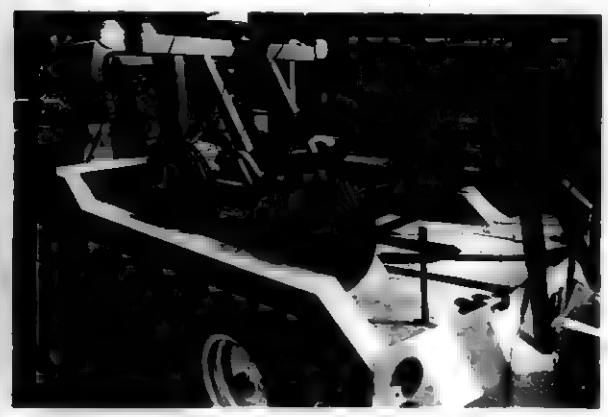

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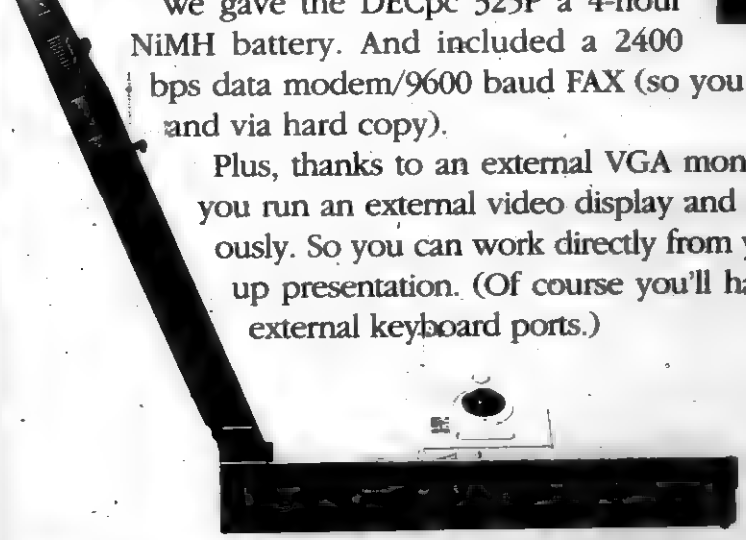

Like all Digital Notebooks, the DECpc 325P also comes with "one of the most important hardware power saving capabilities found in SL systems — Resume®, which allows the notebook to power down to the exact point where it left off" (INFOWORLD, June 8, 1992). In other words, it keeps your place in an application when you power down, and lets you pick right up without rebooting.

To make the DECpc 325P Notebook even easier to use in the toughest environments (at night on airplanes, in direct sunlight, etc.) we added a big 10-inch Triple Super Twist (TST), high-definition VGA Display. For working in close quarters, there's a trackball built right in. And, yes, we also included the popular Logitech™ TrackMan® Portable.

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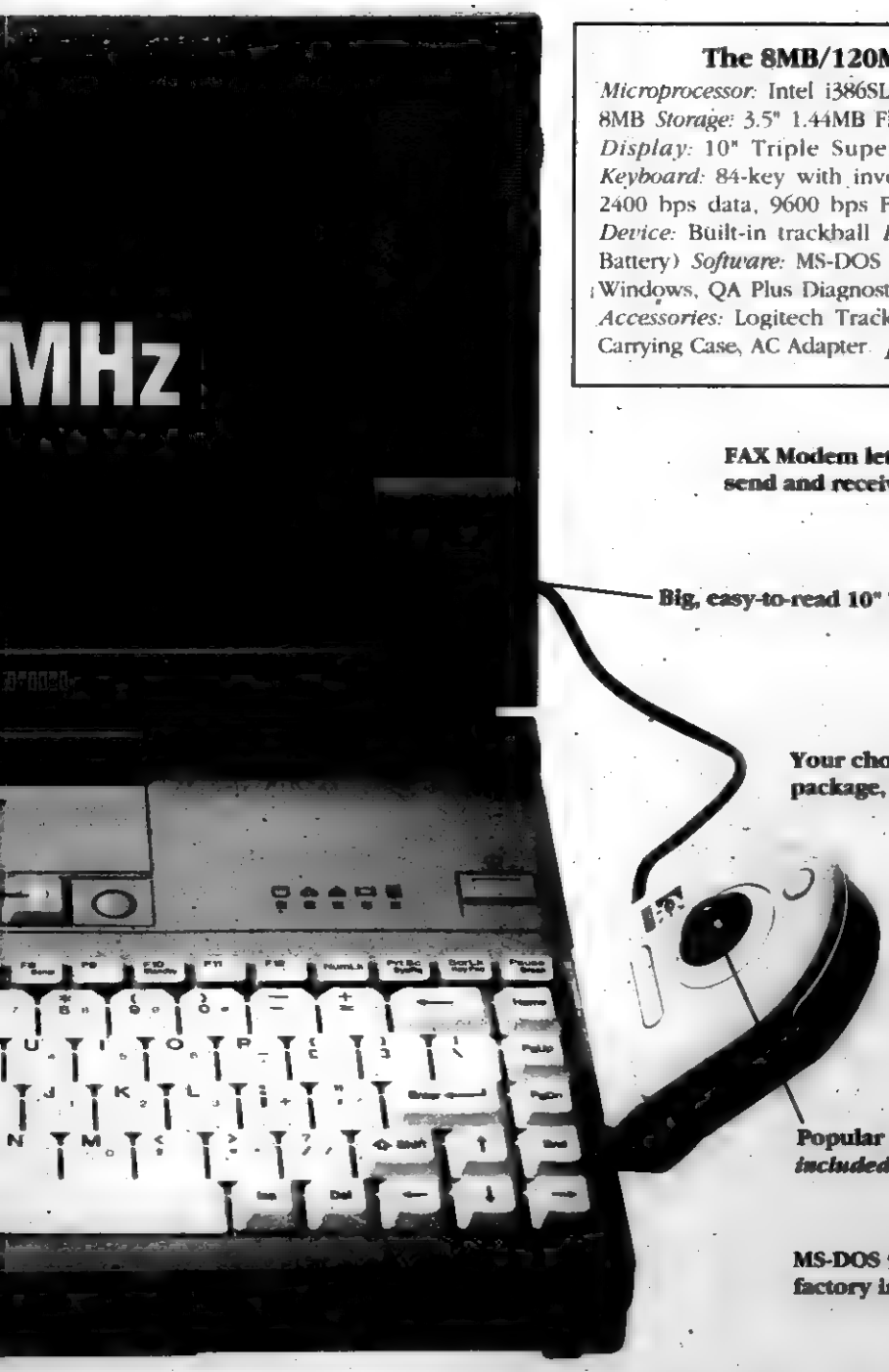

The 8MB/120MB DECpc 325P

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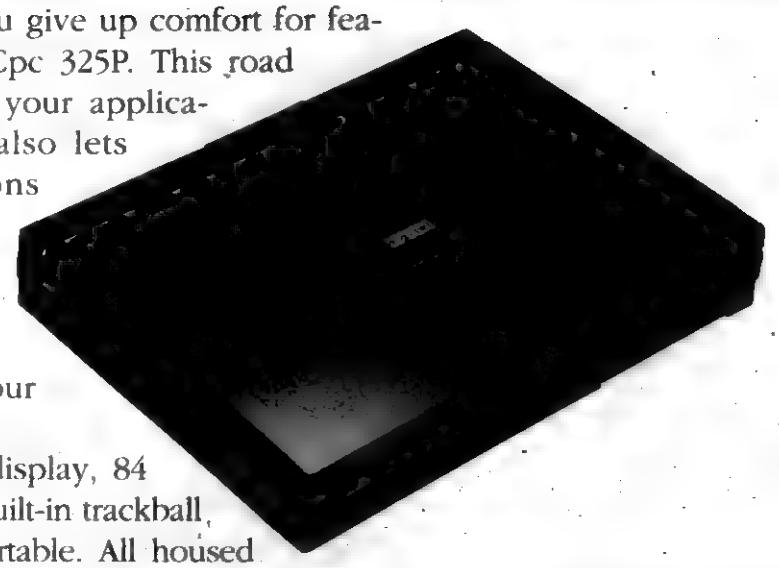

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DECpc 325P

	COLUMN A **Base system**	COLUMN B **OPTIONS (circle your choices)**
Microprocessor:	Intel 25MHz i386SL	25MHz 80387SL 25MHz Coprocessor
Memory:	2MB	Upgrade to: 4MB, 6MB, 8MB
Storage:	3.5" 1.44MB Floppy; 80MB IDE Hard Disk	Upgrade to: 120MB IDE Hard Disk
Display:	10" Triple Super Twist Backlit VGA LCD	External 14" VGA Color Monitor
Keyboard:	84-key with inverted T cursor keys	Extended 101-key Industry Standard
Pointing Device:	Built-in Trackball Logitech TrackMan Portable	
Communication:	Serial, parallel port	9600 baud FAX/Modem Pocket Ethernet
Battery:	4-hour NiMH	Extra Battery Pack
Software:	MS-DOS 5.0, Windows 3.1, QA Plus Diagnostics, Choice of Lotus Software	
Carrying Case:	Black Nylon	Black Leather
Adapter:	AC	Car Adapter ALSO: Expansion Chassis, Portable Printer, FAX Modem, External 14", VGA, Color Monitor, External 101-key Industry Standard

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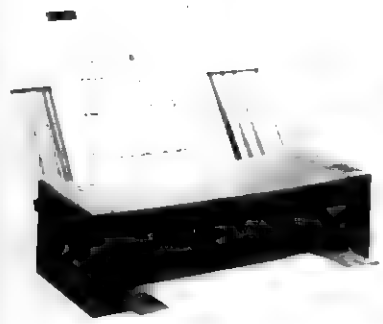
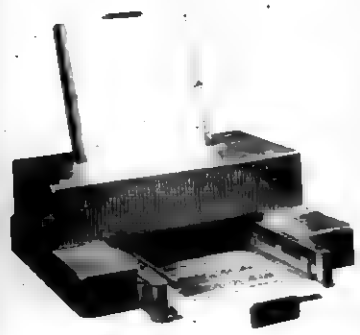
DECjet 1000: Laser quality printing at a less than laser price.



Print Technology:	Bubble ink-jet with 50-nozzle printhead
Printer Speed:	Up to 160 characters per second
Print Resolution:	300 x 300 dots per inch
Paper Handling Sizes:	8.5" x 11"; 8.5" x 10.5"; 8.5" x 14"
Envelope Handling Sizes:	Standard office envelopes Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2) Up to 36 lbs. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman) Proportional spacing, Letter Gothic
Cartridge Slots:	One (for font or emulation cartridges or RAM cards)

DECjet 1000 Order No.: FR-LJ16P-AA Price: $329

DECjet 2000: Handles larger print runs with speed and reliability.



Print Technology:	Bubble ink-jet with 50-nozzle printhead
Printer Speed:	Up to 360 characters per second
Print Resolution:	300 x 300 dots per inch
Paper Handling Sizes:	8.5" x 11"; 8.5" x 10.5"; 8.5" x 14"
Envelope Handling Sizes:	Standard office envelopes Maximum width: 9.5", Maximum length: 4.3"
Paper Thickness:	19-24 lbs. (70-90 g/m2) Up to 36 lb. manual feed
Print Modes:	Portrait and landscape
Optional Memory Upgrade Cards:	256KB
Resident Fonts:	Courier, Courier Landscape, Times Nordic (Times Roman) Proportional spacing, Letter Gothic
Cartridge Slots:	Two (for font or emulation cartridges or RAM cards)

DECjet 2000 Order No.: FR-LJ36P-AA Price: $539

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COMPUTERWORLD 1992

THE BUCK STOPS HERE

As recession grinds on, IS pros lucky enough to have jobs are working harder for slimmer paychecks, especially managers and women

BY KELLY E. DWYER

If you want to bring home more bacon this year, you're going to have to work twice as hard. If you're a woman, you'll probably have to work twice as hard as that.

In other words, the salad days are over, replaced by a few small carrots.

Computerworld's annual salary survey of 1,478 information systems managers and professionals found that, with a few exceptions, total compensation has generally dipped slightly from last year, ending five years of declining growth.

Management- and networking-related titles, including chief information officer, IS director and network manager, suffered the worst declines — up to 9%. Most of the modest hikes, all less than 5%, were given to programmers and other nonmanagement professionals (see chart page 86).

The dreary results were blamed on the recession and rising unemployment, according to IS managers, recruiters and compensation consultants.

"In the '80s, money was being tossed around like crazy," notes David Raciti, vice president at Corico Recruiters in Salem, N.H. "Now, in the '90s, everybody's watching their bottom lines — not just salaries, but on the cost of everything: cost of benefits, cost of hiring, cost of agency fees."

Typical of companies trying to rein in IS personnel costs is Phillips Petroleum Co. The Bartlesville, Okla., firm had companywide layoffs after a restructuring during the first quarter.

One result, says Jim Gottardi, manager of application services at Phillips, was that "people didn't get bonuses and the pay increase they may have been accustomed to receiving."

To make things tougher, the IS department was also shrunk about 20% as part of a corporate downsizing, Gottardi adds.

Observers agree that many companies are playing it safe by putting a bit more money into IS bonuses and less into base salaries. That way, explains Jay Gaines, placement specialist at Jay Gaines & Co. in New York, fixed costs can be more easily managed.

Indeed, modest bonuses are emerging as a favored bonbon for hard-working survivors in downsized, rightsized, restructured and generally slimmed-down organizations.

"The people left in many of these positions are the people who are the real producers, the achievers," notes Norm Sanders, managing director at Norm Sanders Associates, Inc. in Hazlet, N.J. "These people are working very hard, and they deserve to be compensated for doing more with less."

Still small bonuses

The bonus increases over last year, however, are still below 1990 levels and are hardly spectacular. The biggest boost, for operating systems programmers, was less than $650. And only about one-third of the respondents received any bonus at all.

CIOs managed an average of $7,242 in bonus, a drop of $450 from 1991 and $1,350 from 1990. Average bonuses for IS managers also declined, from $4,639 to $3,903.

One group apparently doing the same or more for less pay is women.

On average, women's IS salaries, which *Computerworld* surveyed as a separate category for the first time this year, were lower than men's in every category.

The pay gap, about 2% for programmers, worsens higher up the hierarchy, swelling to 21% for top IS directors, the survey found (see chart

Continued on page 86

1992 SALARY SURVEY

Main points

- Thanks to the recession, total compensation is down 1% to 9% for most titles.
- Women polled earn up to 21% less than men.
- Benefits have become more important.
- Modest performance bonuses are more common for some jobs.

David Strick

IS manager Jackson: *'Once again, it's a matter of [women] proving ourselves'*

Dwyer is a *Computerworld* assistant editor, features.

The buck stops here

CONTINUED FROM PAGE 85

page 1). Such differences clearly anger some women.

"Performance is performance," according to Suellen Jackson, MIS manager at a community bank in California.

"If the person is performing, I don't care who, what gender, color, or whatever — let's identify the job description, let's identify the performance, and pay based on that," she continues. "It's such an old story; you'd think by now we would've gotten a clue."

Ideas about reasons for the disparity vary. Some blame women themselves for the gap.

James Hackett, director of legislative data systems at the Rhode Island General Assembly in Providence, says he believes that women tend to assume traditional, lower-level IS roles and lack aggressiveness.

"I'm critical of [women] that work for me that don't demand more and that haven't sought management positions," he says. "A 10- to 12-year [female] employee with full knowledge of the system should be banging on my door every quarter saying 'When am I going to become the assistant director?' "

Terry W. Mattix, MIS director at Delta Consolidated Industries, Inc. in Jonesboro, Ark., speculates that some women might be less inclined to move around because of family obligations. But he adds that many women now seem more comfortable with jumping to another company for higher pay.

"They're saying: 'If I stay with this company, I'll get the standard 3% raise a year. But if I take my same skills to another company, they'll pay me 10% more right now,' " Mattix says.

Still a minority

Jackson notes that women remain a minority in IS, especially in management positions. (In our survey, men outnumbered women approximately 4 to 1 overall.) As a result, she says, it's harder for women in IS than those in other fields to get equal pay.

Joseph Biskner, director of MIS at Stevens Van Lines, Inc. in Saginaw, Mich., points to an even more basic problem. "It's still a pretty chauvinistic world, unfortunately," he says. "But that's true in the world in general, not just the IS world."

Further complicating the matter is that the issue of gender pay is emotional, delicate and discussed so quietly it almost seems taboo. Several consultants and recruiters, for instance, declined to comment on the topic.

Moreover, not everyone agrees that a problem exists. Cynthia McFarland, MIS manager at The Philanthropic Mutual Life Insurance Co. in Norristown, Pa., acknowledges that male executives at her firm earn more than she does.

But she notes they have been at the company longer, so she presumes the difference in salary reflects their greater experience. "At least I would hope so," she says.

Some recruiters even argue that women in IS can earn *more* than male colleagues. "If you have a man and a woman negotiating for the same opportunity, the woman tends to get certainly equal but maybe more," Sanders says, "because firms are interested in women, and there aren't enough to fill the demand."

Earn your pay

But regardless of sex, the new, recessionary reality is clear: If you want more, you're going to have to earn it. The hard way.

Surprisingly, people at the lower levels of the IS pecking order are in slightly better shape than their loftier peers. True, no job category is getting spectacular raises. But when raises do come, they are going to programmers and analysts, not honchos.

"Companies are putting their smart money where it belongs — at the professional ranks. They must go for longer-term retention of professionals rather than managers," says Roger O'Connor, a senior consultant at Edward Perlin Associates, Inc. in New York. "You have to keep those folks satisfied."

And because higher-ups make more, Mattix adds, it's tougher to get their raises signed off by penny-pinching corporate budgeters.

"It costs more to give me a 10% raise than it does to give a computer operator a 10% raise," Mattix explains. "So it's easier to get those types of salaries approved."

Enjoying modest rises were operating systems programmers, data center supervisors, programmers and database analysts (see chart).

In contrast, network and local-area network managers suffered the biggest declines, followed by IS and microcomputer managers and CIOs, vice presidents and directors of IS (see chart).

To keep employees happy and productive in stingy times, IS managers are trying a range of tactics.

Many are doing what they can to beef up corporate benefits (see story at right).

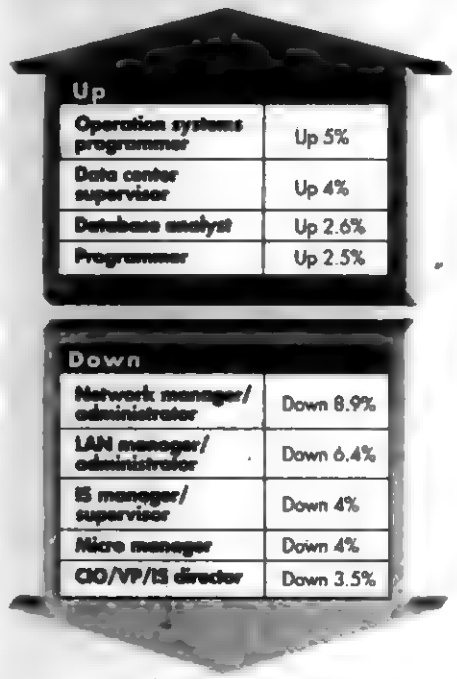
Some managers, such as Mattix, are willing to sacrifice their own raises for their staff. "I'm willing as a manager to take a lesser increase for

Continued on page 89

1992 SALARY SURVEY

Ups and downs

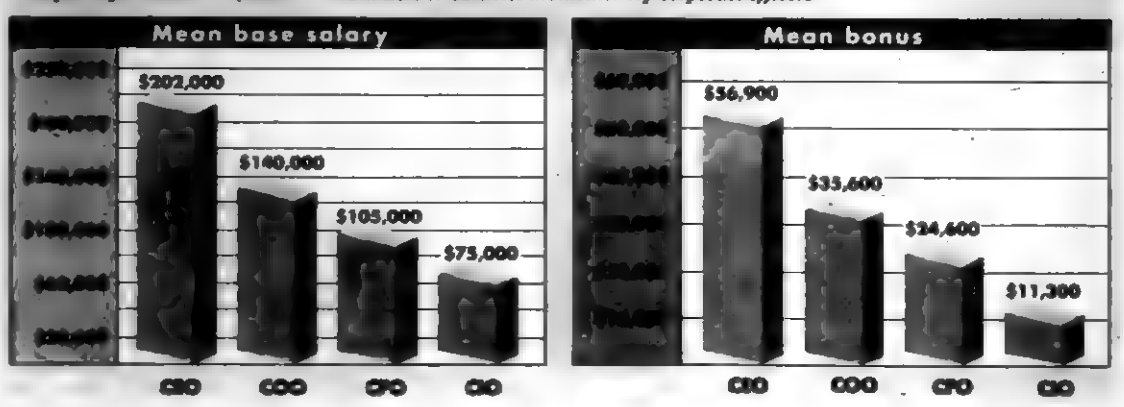
Surprisingly, traditional IS jobs fared better than more network-oriented and top management positions in this year's salary survey



1992 SALARY SURVEY

Pecking order

Well-paid by IS standards, CIOs still earn 25% to 65% less than other top corporate officers



Source: CFO magazine

Not so fringe benefits

During times when money is so tight it can't talk, employers are trying to use benefits to sweeten IS compensation packages.

Nonfinancial incentives, says Roger O'Connor, a senior consultant at Edward Perlin Associates, "probably only came about as a result of the economy. Companies are saying, 'What else can we do other than compensation?' "

Overall, about 48% of IS workers surveyed by *Computerworld* now have the option of working flexible hours. Employee assistance and wellness programs are also popular.

Consultants also say that more senior IS executives are asking for a bridging or quicker vesting of pension and retirement funds.

While benefits in many large organizations may not be negotiable, placement specialists say they can still help decide whether a person takes an IS job.

David Raciti, vice president at Corico Recruiters in Salem, N.H., tells of a senior programmer/analyst who turned down a job offer because he would have had to pay $2,000 more in health insurance premiums.

Interestingly, IS professionals in different parts of the country want different perks.

In Atlanta, child care is much desired among IS workers surveyed. In the Pacific Northwest and San Francisco area, paid sabbaticals are hot. Bostonians like stock options.

Expectations can run pretty high. In New York, O'Connor says, IS executives often expect extras such as car phones, health club memberships, supplemental retirement and health plans, personal expense accounts and company cars or chauffeurs.

Following is a summary of benefits that IS professionals surveyed now have:

- *Vacation (98.8%).*
- *Health insurance (98.5%).*
- *Life insurance (92.9%).*
- *Dental insurance (82.6%).*
- *Retirement/Pensions (82.1%).*
- *Education (66.4%).*
- *Extended leave (41.4%).*
- *Profit-sharing/Stock options (37.4%).*
- *Expense account (34.1%).*
- *Bonus incentives (32.9%).*
- *Telecommuting (13.9%).*
- *Sabbaticals (10.2%).*
- *Child care (8.2%).*

KELLY E. DWYER

COMPUTERWORLD 1982

How are YOU DOING?

Average annual salaries for 15 jobs

MANAGEMENT		END-USER SUPPORT			COMMUNICATIONS				SYSTEMS AND PROGRAMMING	
CIO/VP/ IS Manager	IS Mgr./ Supervisor	Micro Mgr.	Help Desk/ Operator	PC Specialist	Network Mgr./Admin.	LAN Mgr./Admin.	Telecom. Mgr.	Comm. Specialist		
Avg.: $89,373 Bonus: $7,242 Total: $76,615 Down: 3.5%	Avg.: $56,024 Bonus: $3,903 Total: $59,927 Down: 4%	Avg.: $44,337 Bonus: $2,074 Total: $46,411 Down: 4%	Avg.: $29,824 Bonus: $1,049 Total: $30,873 New	Avg.: $31,945 Bonus: $1,050 Total: $32,995 Down: 1.7%	Avg.: $44,663 Bonus: $2,174 Total: $46,837 Down: 8.9%	Avg.: $38,957 Bonus: $1,561 Total: $40,518 Down: 6.4%	Avg.: $48,088 Bonus: $2,285 Total: $50,353 Down: 0.8%	Avg.: $37,458 Bonus: $1,223 Total: $38,681 Down: 2.3%	Avg.: $54,407 Bonus: $3,050 Total: $57,555 Down: 1.5%	Avg.: $50,794 Bonus: $2,142 Total: $52,936 Down: 1.6%

INDUSTRY

Utils.	$86,229	Finance	$71,469	Utils.	$54,000	Consult.	$38,167	Utils.	$36,708	Finance	$53,077	Utils.	$48,625	Consult.	$55,333	Consult.	$46,500	Consult.	$64,250	Consult.	$60,490
Computer	$85,583	Computer	$68,000	Finance	$51,727	Govt.	$32,228	Consult.	$34,722	Utils.	$52,050	Finance	$43,083	Banking	$52,864	Utils.	$43,143	Finance	$61,800	Media	$59,333
Consult.	$83,278	Utils.	$67,417	Insur.	$46,500	Finance	$32,167	Insur.	$34,500	Govt.	$47,441	Consult.	$42,750	Retail	$51,667	Banking	$39,472	Banking	$61,200	Nonprft.	$56,500
Finance	$82,222	Constr.	$59,706	Govt.	$46,371	Other	$31,771	Banking	$34,244	Banking	$46,850	Constr.	$42,300	Mfg.	$49,919	Govt.	$39,348	Utils.	$59,844	Utils.	$54,864
Banking	$79,419	Consult.	$58,500	Mfg.	$45,507	Utils.	$30,833	Govt.	$33,230	Retail	$45,348	Govt.	$40,192	Utils.	$49,500	Retail	$38,438	Media	$59,000	Banking	$52,950
Insur.	$75,162	Banking	$58,242	Banking	$45,072	Constr.	$30,778	Mfg.	$32,995	Mfg.	$44,945	Banking	$39,950	Computer	$48,625	Finance	$38,000	Insur.	$57,017	Mfg.	$52,467
Health	$72,100	Mfg.	$56,991	Consult.	$44,500	Banking	$29,405	Constr.	$32,167	Constr.	$43,958	Insur.	$38,769	Health	$48,105	Health	$37,059	Mfg.	$55,948	Constr.	$51,333
Constr.	$72,000	Govt.	$56,533	Other	$43,409	Mfg.	$29,404	Finance	$31,556	Health	$43,146	Other	$38,200	Other	$48,100	Media	$37,000	Constr.	$55,536	Insur.	$49,975
Mfg.	$69,820	Health	$55,375	Constr.	$42,969	Insur.	$29,109	Health	$30,794	Consult.	$42,250	Health	$38,033	Govt.	$47,549	Mfg.	$36,722	Govt.	$53,444	Health	$49,867
Retail	$66,459	Insur.	$55,250	Retail	$42,452	Computer	$28,962	Retail	$30,537	Insur.	$41,500	Media	$38,000	Constr.	$46,214	Computer	$36,667	Health	$53,371	Retail	$49,707
Media	$65,000	Retail	$52,286	Health	$42,364	Educ.	$28,526	Other	$30,058	Computer	$40,667	Retail	$37,346	Nonprft.	$46,000	Insur.	$36,500	Retail	$52,639	Computer	$49,571
Other	$64,658	Other	$51,102	Media	$42,167	Retail	$28,485	Computer	$29,333	Media	$40,500	Mfg.	$37,238	Finance	$44,333	Constr.	$33,600	Computer	$51,500	Govt.	$49,378
Govt.	$64,637	Media	$50,400	Computer	$40,167	Health	$28,128	Educ.	$28,769	Other	$39,231	Computer	$37,100	Insur.	$41,929	Other	$32,700	Other	$50,174	Other	$48,679
Educ.	$61,183	Educ.	$48,881	Educ.	$38,798	Media	$25,833	Nonprft.	$26,563	Educ.	$38,800	Educ.	$35,556	Educ.	$40,765	Educ.	$30,000	Educ.	$48,273	Finance	$45,167
Nonprft.	$60,958	Nonprft.	$44,500	Nonprft.	$34,400	Nonprft.	$22,167	Media	$24,250	Nonprft.	$37,200	Nonprft.	$14,000	Media	NA	Nonprft.	NA	Nonprft.	$46,250	Educ.	$43,773

REGION

N. Calif.	$81,227	N. Calif.	$66,037	N. Calif.	$49,926	N. Calif.	$35,370	S. Calif.	$37,527	N. Calif.	$52,568	Balt./D.C.	$45,575	Balt./D.C.	$55,132	Balt./D.C.	$43,375	Chicago	$61,103	S. Calif.	$59,600
S. Calif.	$78,986	Balt./D.C.	$63,022	S. Calif.	$49,752	Boston	$34,773	N. Calif.	$36,217	Other	$51,000	N. Calif.	$41,068	N. Calif.	$53,464	N.Y.	$41,611	N. Calif.	$59,654	Balt./D.C.	$54,386
N.Y.	$75,570	N.Y.	$59,706	Chicago	$49,500	N.Y.	$33,853	Boston	$35,333	Chicago	$50,862	Texas	$40,533	S. Calif.	$52,125	N. Calif.	$41,190	S. Calif.	$59,500	N.Y.	$53,722
Balt./D.C.	$75,508	S. Calif.	$58,026	Balt./D.C.	$48,917	S. Calif.	$33,278	N.Y.	$33,370	S. Calif.	$50,462	Atlanta	$40,333	N.Y.	$51,100	Chicago	$41,179	N.Y.	$56,720	Boston	$52,899
Boston	$72,837	Detroit	$57,872	N.Y.	$48,125	Detroit	$31,425	Detroit	$33,167	Atlanta	$48,357	S. Calif.	$40,292	Chicago	$50,500	S. Calif.	$40,500	Boston	$56,804	Chicago	$52,682
Chicago	$72,486	Texas	$56,366	Boston	$45,824	Chicago	$30,413	Balt./D.C.	$32,764	Balt./D.C.	$46,897	Chicago	$39,893	Ariz.	$48,571	Atlanta	$40,143	Balt./D.C.	$56,037	Texas	$51,821
Texas	$69,296	Boston	$56,243	Detroit	$44,534	Balt./D.C.	$29,922	Texas	$31,970	Texas	$44,158	N.Y.	$39,222	Fla.	$48,067	Detroit	$39,923	Minn.	$54,456	Fla.	$51,118
Minn.	$68,385	Chicago	$56,128	Texas	$44,173	Denver	$29,542	Minn.	$31,071	Boston	$43,967	Pacif. NW	$38,375	Detroit	$47,857	Minn.	$38,333	Atlanta	$53,458	N. Calif.	$50,967
Detroit	$68,143	Minn.	$54,950	Minn.	$43,760	Minn.	$29,333	Chicago	$30,714	Minn.	$43,741	Denver	$37,806	Boston	$46,333	Denver	$36,324	Detroit	$52,868	Atlanta	$50,219
Other	$67,875	Denver	$54,327	Atlanta	$42,458	Atlanta	$29,288	Ariz.	$30,700	Denver	$42,182	Boston	$37,071	Atlanta	$46,222	Boston	$34,643	Texas	$52,529	Detroit	$48,882
Atlanta	$65,730	Ariz.	$52,305	Pacif. NW	$40,794	Texas	$28,926	Denver	$30,650	Pacif. NW	$41,312	Detroit	$37,000	Minn.	$46,118	Pacif. NW	$33,379	Denver	$52,167	Denver	$48,857
Denver	$63,660	Atlanta	$52,100	Ariz.	$40,104	Pacif. NW	$28,054	Pacif. NW	$30,264	Ariz.	$40,775	Ariz.	$35,929	Denver	$44,563	Ariz.	$32,925	Ariz.	$50,809	Minn.	$47,978
Ariz.	$62,980	Pacif. NW	$49,282	Denver	$39,978	Ariz.	$26,733	Atlanta	$30,125	Detroit	$40,324	Minn.	$35,735	Texas	$43,000	Fla.	$31,952	Pacif. NW	$49,488	Ariz.	$46,840
Fla.	$62,706	Fla.	$48,635	Fla.	$36,235	Fla.	$25,472	Fla.	$26,560	N.Y.	$39,778	Fla.	$33,656	Pacif. NW	$42,500	Texas	$30,800	Fla.	$49,387	Pacif. NW	$45,879
Pacif. NW	$59,214	Other	$47,500	Other	$37,000	Other	$24,500	Other	$25,883	Fla.	$39,740	Other	$25,000	Other	$34,500	Other	$30,333	Other	$41,500	Other	$35,667

COMPANY SIZE

Under $50M: $58,023 $50M - $499M: $72,238 $500M and up: $84,138		Under $50M: $48,881 $50M - $499M: $55,948 $500M and up: $68,196		Under $50M: $38,025 $50M - $499M: $43,476 $500M and up: $52,494		Under $50M: $27,121 $50M - $499M: $29,437 $500M and up: $32,455		Under $50M: $28,258 $50M - $499M: $32,100 $500M and up: $36,205		Under $50M: $39,433 $50M - $499M: $44,427 $500M and up: $50,579		Under $50M: $34,927 $50M - $499M: $38,413 $500M and up: $42,948		Under $50M: $42,587 $50M - $499M: $46,833 $500M and up: $52,948		Under $50M: $30,894 $50M - $499M: $36,368 $500M and up: $41,880		Under $50M: $48,859 $50M - $499M: $54,512 $500M and up: $61,116		Under $50M: $40,000 $50M - $499M: $48,704 $500M and up: $54,859	

NOTES

Survey size: Charts based on 1,478 responses.
Industries: Banking category includes securities and investment banking. Retail includes wholesale. Construction includes mining, petroleum, refining and agriculture. Computer includes related hardware, software and service fields. Nonprofit includes amusement firms.

Locations: Texas includes Dallas, Fort Worth and Houston. Florida includes Miami, Tampa and Orlando. Southern California includes Los Angeles and San Diego. Minnesota includes Minneapolis and St. Paul. Northern California includes San Francisco and the Oakland Bay area. Arizona includes Phoenix and Tucson. Pacific Northwest includes Seattle; Portsmouth, Wash.; and Spokane, Wash.
NA: Not available.

SYSTEMS AND PROGRAMMING

SERVICES AND OPERATIONS

Avg.: $45,913 Bonus: $1,600 Total: $47,513 Ups: 0.8%	Avg.: $40,196 Bonus: $1,282 Total: $41,478 Ups: 2%	Avg.: $41,613 Bonus: $1,335 Total: $42,948 Bonus: 1.5%	Avg.: $34,942 Bonus: $1,199 Total: $36,141 Ups: 1.1%	Avg.: $37,372 Bonus: $875 Total: $38,247 Ups: 2.6%	Avg.: $29,474 Bonus: $890 Total: $30,364 Ups: 2.5%	Avg.: $39,964 Bonus: $1,411 Total: $41,375 New	Avg.: $54,549 Bonus: $1,224 Total: $57,782 No change	Avg.: $49,278 Bonus: $1,824 Total: $51,102 Bonus: 0.8%	Avg.: $41,891 Bonus: $1,345 Total: $43,236 Ups: 2%	Avg.: $42,911 Bonus: $2,000 Total: $45,910 Bonus: 1.1%
INDUSTRY										
Consult. $50,214	Consult. $45,800	Utils. $44,958	Utils. $40,029	Nonprft. $48,000	Utils. $33,708	Constr. $45,667	Banking $65,700	Consult. $63,000	Consult. $53,000	Utils. $54,962
Finance $49,500	Banking $44,773	Finance $44,727	Computer $37,700	Utils. $41,083	Consult. $32,667	Govt. $44,207	Utils. $63,778	Other $60,333	Other $48,333	Banking $48,540
Banking $48,821	Utils. $43,300	Computer $43,944	Consult. $37,600	Govt. $39,750	Computer $32,083	Insur. $42,250	Consult. $61,167	Computer $53,857	Utils. $46,750	Finance $45,591
Utils. $48,143	Constr. $42,727	Mfg. $42,848	Constr. $36,200	Other $39,083	Govt. $30,895	Finance $42,250	Computer $60,833	Finance $52,600	Govt. $45,115	Mfg. $45,247
Constr. $47,133	Retail $40,800	Govt. $42,103	Mfg. $35,777	Retail $39,067	Constr. $30,792	Retail $41,100	Finance $56,500	Utils. $51,611	Retail $42,441	Consult. $44,333
Computer $46,125	Finance $40,650	Banking $41,981	Banking $35,771	Mfg. $38,109	Finance $30,333	Utils. $40,583	Insur. $56,107	Retail $49,929	Computer $42,167	Govt. $43,973
Govt. $45,971	Govt. $40,134	Constr. $41,971	Govt. $35,455	Health $36,313	Other $30,077	Consult. $38,000	Health $55,521	Insur. $49,778	Finance $41,750	Insur. $42,932
Mfg. $45,931	Educ. $39,955	Retail $41,684	Health $34,666	Computer $36,000	Retail $29,189	Mfg. $37,058	Retail $54,810	Banking $49,286	Mfg. $41,703	Health $42,597
Health $45,417	Mfg. $39,893	Other $41,229	Insur. $34,367	Consult. $36,000	Health $29,174	Computer $37,000	Mfg. $54,370	Mfg. $49,112	Banking $41,312	Computer $42,038
Other $44,727	Nonprft. $39,500	Insur. $40,833	Retail $34,309	Constr. $34,714	Mfg. $28,856	Health $36,750	Govt. $52,731	Govt. $49,011	Health $41,278	Educ. $41,943
Retail $44,615	Media $39,000	Consult. $40,000	Educ. $32,898	Finance $34,000	Banking $28,600	Banking $36,083	Constr. $50,429	Health $48,200	Insur. $41,222	Retail $41,538
Insur. $44,059	Health $38,283	Health $39,937	Media $32,875	Banking $33,958	Nonprft. $27,500	Other $33,000	Other $49,455	Educ. $44,133	Nonprft. $39,000	Constr. $40,731
Educ. $43,886	Computer $37,200	Educ. $36,889	Finance $32,567	Educ. $33,143	Insur. $27,250	Educ. $29,875	Educ. $48,825	Nonprft. $40,000	Educ. $35,500	Other $39,969
Media $43,417	Insur. $37,143	Nonprft. $35,571	Other $32,543	Insur. $30,800	Educ. $26,200	Nonprft. NA	Media $37,000	Constr. $34,500	Media $35,000	Nonprft. $39,500
Nonprft. $42,500	Other $36,667	Media $34,937	Nonprft. $31,179	Media $28,000	Media $19,000	Media NA	Nonprft. $30,000	Media NA	Constr. $27,667	Media $39,100
REGION										
S. Calif. $51,320	N. Calif. $45,306	N. Calif. $47,484	N. Calif. $41,172	N. Calif. $46,714	N. Calif. $36,233	N. Calif. $47,375	Boston $62,818	N. Calif. $55,889	N. Calif. $45,722	N.Y. $48,722
N. Calif. $49,370	S. Calif. $43,810	S. Calif. $45,682	S. Calif. $38,393	S. Calif. $41,900	S. Calif. $34,579	S. Calif. $46,333	Chicago $60,711	Balt./D.C. $55,184	Boston $45,643	Chicago $47,611
N.Y. $49,036	Balt./D.C. $43,735	Balt./D.C. $43,446	N.Y. $38,263	N.Y. $41,000	Boston $31,625	Detroit $45,800	N. Calif. $60,636	S. Calif. $54,000	Balt./D.C. $45,633	N. Calif. $46,845
Balt./D.C. $48,684	N.Y. $43,563	Chicago $42,194	Chicago $36,154	Balt./D.C. $40,719	Balt./D.C. $30,571	Minn. $44,545	S. Calif. $58,912	Boston $50,600	Chicago $44,222	Balt./D.C. $46,469
Texas $47,429	Chicago $42,861	Denver $42,061	Balt./D.C. $36,128	Chicago $38,375	N.Y. $30,542	Balt./D.C. $44,071	N.Y. $58,857	Detroit $49,679	Detroit $43,083	Boston $46,275
Boston $45,568	Atlanta $42,125	N.Y. $42,043	Texas $34,756	Minn. $37,385	Texas $30,326	Atlanta $42,000	Balt./D.C. $56,907	Atlanta $48,417	S. Calif. $42,125	S. Calif. $46,232
Chicago $45,479	Fla. $40,750	Texas $41,909	Boston $34,704	Boston $36,125	Chicago $29,795	N.Y. $41,100	Minn. $53,857	Minn. $48,385	Pacif. NW $42,107	Minn. $42,776
Atlanta $45,370	Texas $40,500	Atlanta $41,040	Atlanta $34,589	Ariz. $36,000	Minn. $29,191	Denver $40,313	Texas $52,667	Fla. $48,321	Minn. $41,531	Denver $42,773
Detroit $44,786	Detroit $39,583	Pacif. NW $40,243	Detroit $33,957	Detroit $35,679	Pacif. NW $28,829	Texas $39,875	Ariz. $52,441	N.Y. $47,625	N.Y. $41,500	Detroit $42,286
Minn. $44,773	Boston $39,219	Minn. $39,705	Denver $33,741	Denver $35,562	Detroit $28,571	Boston $37,750	Fla. $52,113	Chicago $47,400	Texas $40,458	Texas $41,990
Denver $44,469	Minn. $38,121	Boston $39,620	Pacif. NW $33,647	Pacif. NW $35,036	Atlanta $28,222	Chicago $37,143	Denver $51,974	Denver $47,250	Denver $40,250	Ariz. $41,906
Fla. $44,429	Pacif. NW $37,909	Detroit $39,479	Minn. $33,245	Texas $34,250	Denver $28,043	Fla. $35,938	Detroit $51,714	Texas $46,556	Ariz. $40,150	Pacif. NW $41,681
Pacif. NW $42,897	Denver $37,900	Ariz. $39,455	Ariz. $33,096	Fla. $33,682	Fla. $26,560	Pacif. NW $32,800	Atlanta $50,794	Pacif. NW $46,167	Atlanta $40,038	Atlanta $41,593
Ariz. $42,385	Ariz. $37,625	Fla. $37,973	Fla. $32,583	Atlanta $31,455	Ariz. $25,980	Ariz. $31,950	Pacif. NW $48,796	Ariz. $46,059	Fla. $39,300	Fla. $41,172
Other $32,000	Other $25,333	Other $18,500	Other $22,000	Other $17,000	Other $16,000	Other $23,667	Other $39,667	Other $41,000	Other $25,500	Other $33,667
COMPANY SIZE										
Under $500M: $43,100 $500M - $499M: $45,462 $500M and up: $48,510	Under $500M: $37,309 $500M - $499M: $39,600 $500M and up: $43,352	Under $500M: $39,535 $500M - $499M: $41,333 $500M and up: $44,596	Under $500M: $32,713 $500M - $499M: $35,090 $500M and up: $37,902	Under $500M: $33,971 $500M - $499M: $36,118 $500M and up: $39,436	Under $500M: $27,678 $500M - $499M: $29,508 $500M and up: $32,118	Under $500M: $29,714 $500M - $499M: $37,379 $500M and up: $43,991	Under $500M: $49,571 $500M - $499M: $53,291 $500M and up: $61,014	Under $500M: $43,150 $500M - $499M: $50,156 $500M and up: $50,786	Under $500M: $35,550 $500M - $499M: $42,611 $500M and up: $42,709	Under $500M: $38,993 $500M - $499M: $42,794 $500M and up: $50,676

'I should be making WHAT?'

You've just learned that you're making $5,000 less than a friend with essentially the same job.

Do you a) Quit and go to work at his company? b) Ask for a $5,000 raise? c) Look for work at a company that will pay you what you're worth? or d) Keep quiet and be thankful you've got a job?

None of these is the right answer, according to IS recruiters.

Instead, they say, do some homework and look beyond a simple comparison of salaries before making a move.

Jim Parker, a senior MIS recruiter at Technical Connections, Inc. in Los Angeles, suggests a strategy of six steps:

1) Prepare your case. A good first step is to gather performance reviews and list your major accomplishments.

2) Meet with the boss. Next, arrange an informal session with your supervisor and ask for feedback.

3) Reconsider if necessary. If that feedback is negative, Parker says, you'll need to reassess whether you're truly underpaid.

4) Make the pitch. If the feedback is positive, tell the boss: "Here's a concern that I have." (Make it your problem, not the boss'.) "In talking to people both internally and externally, I've learned that I'm probably underpaid by about $3,000 or $4,000. What do you think?" This puts the ball in your boss' court.

5) Form a plan. The two of you should then figure out what's needed to raise your pay to the desired level.

6) If that fails, look around. "If there's no meeting of the minds, then you've got to start looking outside," Parker advises.

SERVICES AND OPERATIONS		DATABASE GROUP			
			Avg.: $48,985 Bonus: $1,925 Totals: $51,890 Bonus: 1.8%		Avg.: $43,473 Bonus: $1,523 Totals: $44,996 Ups: 2.0%
INDUSTRY					
Utils.	$43,222	Consult.	$28,667	Consult.	$62,500	Computer	$60,000
Consult.	$40,000	Utils.	$28,600	Utils.	$58,400	Consult.	$50,500
Other	$36,000	Govt.	$28,045	Finance	$54,667	Constr.	$50,333
Finance	$35,143	Finance	$25,263	Constr.	$53,167	Finance	$50,000
Mfg.	$34,944	Computer	$24,154	Retail	$51,310	Utils.	$49,600
Govt.	$33,445	Mfg.	$24,105	Banking	$50,200	Banking	$47,625
Computer	$32,500	Insur.	$23,782	Mfg.	$50,020	Other	$45,550
Banking	$32,405	Educ.	$23,517	Health	$49,083	Govt.	$44,267
Educ.	$32,147	Other	$23,457	Insur.	$48,773	Mfg.	$43,739
Insur.	$32,125	Media	$23,346	Govt.	$48,590	Insur.	$41,429
Retail	$30,161	Constr.	$22,913	Other	$48,571	Educ.	$40,250
Health	$28,433	Retail	$22,792	Educ.	$48,471	Retail	$39,050
Constr.	$25,833	Banking	$22,512	Computer	$46,937	Health	$35,789
Media	$24,000	Health	$21,680	Nonprft.	$38,000	Nonprft.	NA
Nonprft.	NA	Nonprft.	$21,433	Media	$31,333	Media	NA
REGION					
N. Calif.	$38,962	Boston	$33,833	Boston	$57,750	S. Calif.	$50,900
S. Calif.	$35,625	N. Calif.	$28,030	Texas	$56,682	Boston	$50,250
N.Y.	$35,250	N.Y.	$27,012	Chicago	$54,000	Balt./D.C.	$48,923
Balt./D.C.	$34,120	S. Calif.	$26,613	N.Y.	$52,938	Texas	$47,500
Texas	$33,625	Detroit	$25,136	N. Calif.	$52,341	N. Calif.	$45,071
Chicago	$33,469	Balt./D.C.	$24,865	Balt./D.C.	$52,000	Minn.	$44,091
Ariz.	$33,219	Chicago	$23,698	Ariz.	$50,737	Ariz.	$43,750
Detroit	$32,654	Minn.	$23,269	Minn.	$50,594	Fla.	$43,500
Boston	$32,571	Pacif. NW	$23,038	Atlanta	$50,038	Pacif. NW	$42,964
Denver	$31,955	Atlanta	$22,649	S. Calif.	$49,545	Atlanta	$42,045
Pacif. NW	$31,381	Texas	$22,509	Detroit	$46,592	Chicago	$40,292
Atlanta	$31,233	Denver	$22,145	Denver	$45,750	Detroit	$40,071
Minn.	$29,937	Ariz.	$21,968	Fla.	$45,125	Denver	$37,538
Fla.	$28,050	Fla.	$20,654	Pacif. NW	$44,273	N.Y.	$33,333
Other	$18,667	Other	$16,000	Other	$25,000	Other	$30,500
COMPANY SIZE					
Under $500M: $29,531 $500M - $499M: $31,121 $500M and up: $36,801		Under $500M: $21,773 $500M - $499M: $25,041 $500M and up: $25,999		Under $500M: $41,220 $500M - $499M: $49,823 $500M and up: $56,419		Under $500M: $38,412 $500M - $499M: $43,043 $500M and up: $44,911	

The buck stops here

CONTINUED FROM PAGE 86

Nolan Alexander

Rhode Island General Assembly's Hackett: *'I'm critical of [women] that work for me that don't demand more and that haven't sought management positions'*

myself and, if I can, pass that on to some of the people underneath me and allow them to get a little more," he says.

In some cases, though, stronger measures are needed. Some companies are simply cutting out raises altogether. The number of companies reporting "no salary increases" in the 1992 survey jumped from 8.1% to 11.1% this year.

A few organizations are even taking deep, if temporary, salary reductions. State workers across Rhode Island, including IS, took a 14% pay cut in 1991, according to Hackett.

The cut in salary was restored in 1992, Hackett says, meaning that employees will receive deferred compensation when they retire or leave the government. But he says the short-term effect clearly was painful.

Big firms, big pay

Predictably, IS personnel in large companies and big metropolitan areas earned more than their cousins in smaller settings.

For example, CIOs at companies with annual revenues exceeding $500 million earned an average of $106,825. In contrast, the top technology officer at firms with sales of less than $50 million averaged $61,000.

Geographically, pay in high-priced areas such as Northern and Southern California, New York and Boston outpaced locales where the cost of living is cheaper.

But pay in all regions slumped in 1992. Florida was especially hard hit: Averages for IS managers in the Sunshine State plummeted from $60,170 last year to $48,635 in this year's survey.

No doubt, many IS people would have hoped for more upbeat salary news, even in a recession. Yet not everyone appears upset. Some are thankful just to have jobs.

Others, like Glenn Shubert, a systems programmer at Our Lady of the Lake Regional Medical Center in Baton Rouge, La., say money isn't a top priority. "I'm happy doing what I'm doing and happy with what I'm making," he says.

Another possible reason for satisfaction, Stevens Van Lines' Biskner says, is that many IS people simply don't know what their peers make.

"I've found the people who work for me are very out of touch with how much other people in their same job classifications are making," Biskner says. "They have a tendency to say what they think they'd like to make but have nothing to justify that. And I think that's sad — people should know what they're worth. They don't even attempt to find out."

If there's an upside, it's that stubborn, recession-rising unemployment has made it a bit easier to fill IS middle-management jobs.

Consider: Last year it took 56 days to fill a midlevel IS slot. In 1991, it took 51 days. Time needed to fill top posts actually increased from 72 to 78 days, however. Entry-level searches remained at 32 days.

Cloudy future

As for the future, nobody is making upbeat predictions.

True, traditional IS jobs, such as operating systems programmer and data center shift supervisor, are enjoying a minor upturn in pay. But that's most likely due to the new interest in recentralizing some technology functions, and it probably won't last. So long-term optimism is hardly rampant.

"The revolution in distributed technology is still relatively young," placement specialist Gaines says. "There's a tremendous risk that rank-and-file IS professionals who have come of age in the mainframe environment may find themselves obsolete, with relatively little prospects for compensation growth."

Current changes in industry and technology, he adds foreboddingly, "put the conventional IS person at serious risk."

On a brighter note, some are hopeful that the male/female salary gap in IS can be closed, or at least narrowed.

"It's a slow growth," Jackson sighs. "Once again, it's a matter of us proving ourselves in an industry that's male-dominated and showing our worth."

If and when that occurs, women will discover that, for the foreseeable future, the pickings will still seem slim. ●

Senior editor Joseph Maglitta contributed to this report.

METHODOLOGY

Computerworld's sixth annual salary survey includes responses from 1,478 information systems professionals polled by IDG Research Services in Framingham, Mass.

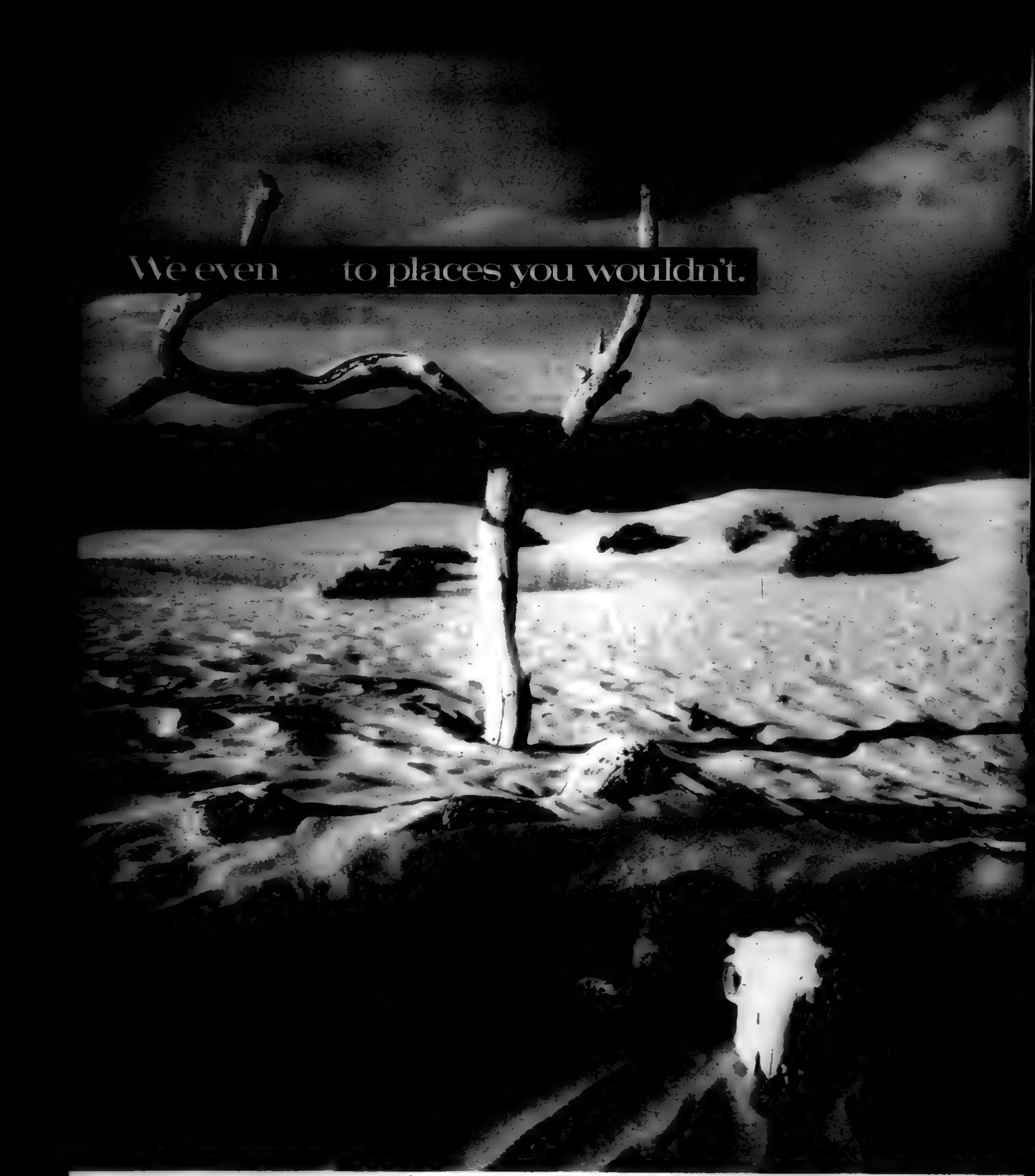
Surveys were mailed on June 10 to approximately 9,000 people. Unduplicated names were culled from lists provided by The Association for Systems Management, The Applied Computer Research directory, *Computerworld*'s circulation department, *Computerworld*'s Buyers' Database and the 1991 *Computerworld Premier 100*.

Twenty-three job titles in 15 industries and 14 geographic regions were included.

Sex: Male: 1,197; Female: 281.

Age: Under 25: 0.9%; 25-34: 20.1%; 35-44: 38.9%; 45-54: 31.4%; 55-64: 8.25%; 65 or older: 0.2%.

Company size: Annual revenue under $1M: 2.7%; $1M-$9.9M: 10.6%; $10M-$49M: 23.7%; $50M-$99M: 16.4%; $100M-$249M: 12.5%; $250M-$499M: 8.3%; $500M-$999M: 5.3%; $1B-$4.9B: 7.1%; $5B-$10B: 1.9%; more than $10B: $2.8%; Other: 8.8%.



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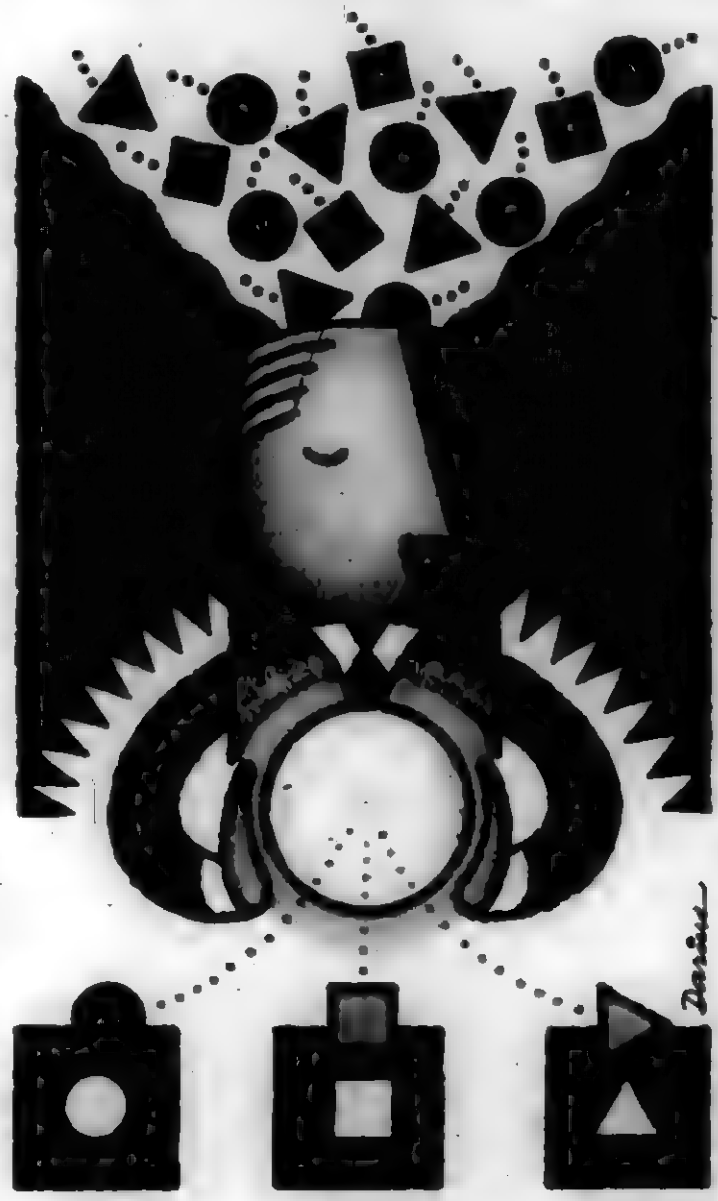
The information integrator

BP Australasia has one. So does PacifiCare. Internal integration staff go external people one better — they know a company's culture and systems

BY FRANCES M. BRUCE



Darius Dziwulski

There's a powerful allure to the idea of hiring an outsider to tie together the mishmash of systems that have grown up in your organization over time. But there are some good reasons why a company might want to resist the urge and cultivate its own information integration specialists.

We've done this at British Petroleum Australasia Ltd., establishing the internal function of information integrator. In fact, that's my own job title.

Key responsibilities of this position, which is part of the information systems department, include figuring where and how systems can best be deployed to optimize business processes and get data to the people who need it. This involves targeting technologies that can ease communication across organizational boundaries and provide access to data held in several different databases. It also involves coordinating in-house and external experts to turn the plan for integrated systems into reality.

Of course, external integrators can do these things, too, but the difference is that internal integrators have an insider's knowledge of the organization, its culture and its existing resources. To gather the appropriate information, external integrators must rely on extensive interviews, which take time and might not give an accurate view of the company's technology palette.

A person working from the inside knows who the real "influencers" are in an organization and where to go to get speedy cooperation for a project or buy-in from users. He also knows where information resides and which other systems the company has developed that could be reused and integrated into the new scheme.

At British Petroleum, for example, a business unit wanted an information report management system. Instead of buying new software, I extended an existing report management system, using existing communications software, at a cost of $3,500. A new package would have cost $23,000.

This is not to say that there is no role for third parties. Outside experts can be a great help in implementing integration plans, and one of the internal integrator's tasks is to coordinate this kind of assistance with internal resources. The idea is to buy help but cultivate strategic integrators.

What you gain with an information integrator is a strong and well-rooted leader to give users quick and accurate access to the full range of the organization's information resources. Typically, someone in this position reports to the chief information officer and acts as a consultant on all projects related to making systems work together.

An information integrator reviews existing processes and work practices and suggests changes to them, if necessary. He places emphasis on binding separate organizational processes and practices more closely together and always takes into account the human impact of change.

This is no lightweight post. It takes considerable expertise in both technology and personal dynamics. While an internal integrator acts as an overseer, rather than a hands-on technician, someone in this job still needs to be well-versed in data analysis, applications development and networking in the context of international open systems standards.

The information integrator must also play the part of facilitator on projects, using knowledge of organizational dynamics and human relations to overcome political barriers, break down resistance to change and devise integration strategies that will improve, rather

Continued on page 92

Bruce is an information integrator at British Petroleum Australasia Ltd. She has degrees in sociology, education and computing.

- **Buy help but cultivate internal integrators**
- **A blend of technologist, sociologist**
- **PacifiCare's Leo Collins tells it like it is**

PacifiCare's integrator in residence

BY LORY ZOTTOLA DIX

What's a research psychologist doing in a place like PacifiCare Health Systems, Inc., a $1.2 billion health maintenance organization? If you guessed practicing medicine, try again. Leo Collins is applying his psychology and technical training to manage a 20-person team of senior technologists assigned to assist systems integration efforts.

"We're acting as consultants and integrators" for internal development groups, says Collins, whose title is director of computer and communications technology. He reports to PacifiCare's CIO.

PacifiCare's December 1991 merger with Health Plan of America, Inc. created a combined Digital Equipment Corp. and Hewlett-Packard Co. shop. The 40-year-old Collins and his team deal with the systems development staff, diagnosing requirements and then finding the appropriate technologies to answer particular needs.

Recently, for example, Collins met with the developer working on an integrated voice response system. The task was to figure out how to provide direct transparent access to a central database for geographically scattered physicians seeking information on how much to charge patients based on their particular plan.

These physicians had been obtaining the data by using one of roughly a dozen 800 numbers to call customer service representatives. Collins and the developer wanted to ensure that far-flung doctors had to dial only one number to get that information from a central database, using customer service reps only if needed.

"We sat down and worked out a plan to configure and integrate the voice response box with the customer service system and phone system," Collins says. The developer went back with plan in hand; the system should be live now.

Collins' team of technologists includes experts in networks, systems programming, databases, transaction processing and desktop integration. Narrow specialization is not encouraged, however. Collins uses job rotation to ensure that members of the group are well-versed in a variety of technical areas. For example, the person in charge of systems programming was previously development manager.

For his part, Collins claims to be a "generalist" with a background in networks, systems and databases. "I've got my fingers in every pie," he says. And what of the time he spent as a research psychologist at an institution for family development? "I know a lot about negative and positive reinforcement from my days of watching rats press levers. Psychological theories have given me great insight into dealing with people," he says.

Collins prides himself on the fact that he's a bit hard to reach by phone. "I'm always walking around the campus talking to people," he says. That's how he came across the situation that prompted one of his group's most recent projects: networking stand-alone PC telemarketing data with demographic data residing on a DEC VAX.

Collins doesn't just look internally for information. He's constantly on the watch for information about other companies with similar systems requirements. He also works with outside consultants, overseeing external service providers in the information systems area.

Dix is *Computerworld*'s senior editor, in depth.

Continued from page 91

than impede, communications flows and process productivity.

I'd recommend at least eight years of relevant experience in both technical and people-related posts as a requisite for this job. I have 16 years of experience and a sociology background, which I've found is every bit as important as my technical training.

Variety key

Diversity is the watchword of the information integrator's skill set because he is dealing with a hodgepodge of information and business groups. It's best, in fact, for a candidate to have worked in both other fields and other companies.

An ideal candidate is someone who has a humanities background (I have degrees in both sociology and teaching), has worked in the services field, has moved into computing and has gained expertise by working at several companies and on several projects.

Once that person has joined a company and worked there for a minimum of four years in IS, rotating jobs and marinating in company culture, he would move into his integrator role, consulting with various project teams to get things rolling.

It is essential that the information integrator has credibility — an essence created by significant achievements in other organizations — combined with acceptance and influence at his current company.

His specific "soft" skills and technical prowess should include the following:

• **Creativity and vision, with the ability to help develop a systems strategy.** The CIO charged with cultivating an integrator among his staffers must ask himself, "Who operates at a strategic, conceptual level?"

• **Strong project management and leadership ability.** These skills will enable the internal integrator to coordinate the diverse range of multidisciplinary resources needed for achieving integrated systems.

• **Political skills.** He should be knowledgeable about the organization, its culture and its processes, either from his own experience or from the experiences of other key people. He needs to know who the "influencers" of company policy are and who can help get commitment on a project.

• **The ability to gain the confidence of a diverse set of users.** The integrator's work spans business units. In fact, he may often have to pacify and educate users who are jealously hoarding data. This kind of territorial resistance can stymie efforts to provide ready access to information from different databases and to integrate data, systems and computer processing/network levels.

I've found that the best way to nip user problems in the bud is to involve users and managers in the integration process. This way the integrator fosters a broad level of ownership and support for the strategy. These feelings may even contribute to better organizational cohesion.

• **Ability to understand user requirements.** The information integrator bridges the gap between a user's information needs and an organization's sources of information and its delivery frameworks. Therefore, before he integrates anything, he must first establish what users' needs are — what data they must access to do their jobs and with what business functions they want to interact.

That involves talking to users and business managers not only about the information they need and where it resides but also about how processes help or hinder their work.

• **Ability to work with those business colleagues who are setting business process redesign goals.** An internal integrator cannot be expected to be highly expert in all areas of the business as well as the technology. Rather, he should be good at working closely with those business managers who want to change the way they do business.

An information integration function harnesses technology to support business changes.

The idea here is to couple the technologist/sociologist with the businessman (or business integrator, if you will) who has a sound understanding of the various business streams within the company.

• **Applications development experience, including strong expertise in data analysis.** At the level at which the information integrator works, there is no hands-on data analysis.

However, a good understanding of data's timeliness and integrity and its importance as a corporate resource enriches his ability to make the right integration moves for a company.

For example, I am versed in data management and information warehouse concepts, which helped when I needed a plan for combining and storing some British Petroleum data that came from physically separate personal computers.

• **Strong information architecture skills.** The integrator needs to think in terms of frameworks — how a change in one part of the company could affect what happens to systems and business in another. He must have some grand plan for information.

Because the integrator is a trailblazer, he provides input to the corporate architecture group to create new standards for the rest of the company.

• **Computer communications, with practical network experience covering both data and voice communications and implementation of Open Systems Interconnect standards.** Without sufficient depth of knowledge in networking, the integrator cannot effectively envision a plan to link information in the best way for the business.

Knowledge of open standards is also important so that the company will be able to integrate its different areas without fussing too long over specific vendor equipment.

The integrator should ask questions such as: What will we gain in flexibility and what kind of return on investment can we expect from Transmission Control Protocol/Internet Protocol? Which standard should the company use for external electronic data interchange?

Not all of the above are easy skills to assess, but there's one requirement that, while fuzzy, is even more essential than those just listed: the ability to have a sense of the future in dealing with the present.

This is critical because the goal of this job is to develop a strategy that anticipates needs, drawing together relevant sections of the company's current application, data and technology resources to produce a sustaining answer to business needs. •

Hidden talents

Internal information integrators already exist in a number of U.S. companies, but they are not always easy to find or count, says M. Victor Janulaitis, president of Santa Monica, Calif.-based Positive Support Review, Inc. and publisher of the *Hands-Guide for Information Systems Position Descriptions*. In the U.S., Janulaitis says, the stress is on function, not title, and in many instances, the function of integrator is performed as part of a larger job or several people's jobs.

The official titles for these jobs will vary from company to company, with perhaps the most frequently used tag being vice president of consulting services. At PacifiCare Health Systems, Inc., Leo Collins performs the integration function under the title of director of computer and communications technology (see story above).

Whether a single, full-time integrator is really the best answer for a particular company depends on a number of factors, according to Janulaitis. In smaller companies, it might be difficult to justify a full-time position only to handle this integration, whereas in very large, complex organizations, a single person probably couldn't handle everything that needs to be done.

THE CEO VIEW

Anchors aweigh!

CEO sets company sails for re-engineering shores after rescuing it from fiscal storm

BY NELL MARGOLIS
CW STAFF

One day in 1989, only months after James M. Large Jr. was brought into Anchor Bancorp, Inc. to apply his noted turnaround talents to the bank's bleeding balance sheet, an accounting requirement contained in the newly passed Financial Institutions Reform, Recovery and Enforcement Act hurled Anchor into insolvency between breakfast and dinner.

Industry observers expected Anchor to bite the dust; instead, Large bit the bullet. Within two years, he reduced the bank's work force of about 3,260 by some 30%, sold off a string of noncore subsidiaries, consolidated branches and tightened procedures, slashing overall expenses by an estimated 25%.

This past April, Anchor signed an extensive outsourcing/technology co-development pact with Systematics Information Services, Inc. (see story page 95). On June 30, after reversing prior losses, returning the corporation to profitability and adding $300 million to capital, the bank was released from the regulatory restrictions under which it had been operating since April 1990.

Historically, this would be Large's cue to light out for the territories — but this time, the "Turnaround Man" says he's planning to stay.

Now heading beyond reconstruction into the early stages of a largely uncharted re-engineering initiative, "Anchor is a unique opportunity for all of us," Large says. Even as regulators loomed and colleagues lost their jobs, he says, "It's incredible how much enthusiasm there is here; everyone pitched in to make this [turnaround] happen. We didn't work this hard to win this place back just to walk away."

In a recent interview with Nell Margolis, *Computerworld*'s senior editor, management, Large expanded on where and how he plans to cast Anchor and on information technology's role in the effort.

■ On the re-engineering initiative under way at Anchor:
We're not a long way into re-engineering yet — and that's appropriate because we see it as a continuing process rather than a project with a beginning, middle and end.

Back in '89, we were hit so hard, so fast, that we went to work in all the usual ways — and some otherwise — to get our earnings up. Interestingly, we were able to do this while improving the quality of our service — although we've certainly still got room for improvement.

We've been whacking away at these problems steadily over the past three years, and we've gone further than most people thought we ever could.

But the good news stops right there: We've done all we can without seriously altering the way in which we perceive ourselves and go about our everyday business. Now we're running out of steam; to get a second wind, we're going to have to figure out what we should be doing, and can do, differently. Whether we can make this next transition as smoothly as we've made our last one remains to be seen.

■ On the role of information technology:
We have a wonderful reputation as a customer-friendly bank, and we talk a very good game. During the next year, our major thrust is putting into our employees' hands whatever tools are necessary to make sure that in every last detail, we're playing as good a game as we talk. Right now, we're turning our technology folks loose to try to figure out how.

Since information is the backbone of everything that goes on at a bank, it's a sure bet that information technology will play a major role. But we have to be careful about what role. At this early stage, we're taking a couple of steps to help ensure that the [technology] tail doesn't wag the dog.

First, we're going to slice the [banking] organization along functional lines: Job definitions will be pegged to the kind of results that ought to be accomplished and the various tasks people really do to accomplish those ends, rather than geared to titles and established procedures.

Then we're going to add some systems improvement people to our IS forces — not to enhance the computer systems themselves, but to reconfigure the way we're working and target places where technology can be a valuable tool. And in doing this, one important idea we'll be bearing in mind is that, in a given instance, less or older or even no technology might be the answer.

■ On outsourcing:
When we thought about outsourcing, a couple of things were important to us. First, cost structure: What we had gotten on our own was an ability to freeze cost over time, but that wasn't the home run we were looking for. We wanted to roll cost back.

Second, an IS boost — a chance to co-develop with a partner who's way ahead of us.

Some folks assume you outsource to divorce your organization from IS: That's nonsense — we don't want to get out of these things; we want to get further into them. They're the core of what we do as bankers. Data processing, IS, the whole area of [banking] product development — this is what drives and produces the capabilities we deliver to end users.

Anchor doesn't feel that it's appropriate for us to spend our resources on being state of the art; our responsibility is to be aware of the state of the art and to cherry-pick it for the things that will benefit us.

■ On the meaning of customer service in banking:
Expense reduction and service improvement are inextricably related. I'm a total believer that no matter what you're good at in banking — and this includes information technology — you'd better be a whale of a low-cost operation.

You'd also better be ready to back up the warm, friendly personal feeling people like to get at the bank with the ability to actually do what the customer wants and needs to have done.

The moment of truth comes when the customer comes face-to-face with the bank. When a customer is walking up to Mrs. Jones, the teller, that's the

Continued on page 95

Bob Smith

The CEO: *James M. Large Jr., 60; graduate of Princeton University and the Stonier School of Banking at Rutgers University.*

The career: *Came to Anchor in 1989 from First Interstate Bancorp, where he served as executive vice president and assistant to the president of the $56 billion bank holding company (1986-89). Prior to that, held executive positions at First National Bank of Allentown (1981-86), Central National Bank of Cleveland and Central Pennsylvania National Bank.*

INSIDE

- Intelligence files — items of interest from publications, speeches, research projects. Page 95.
- Calendar. Page 94.

CALENDAR

SEPT. 20-26

Sapphire '92. Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

Pen-Based Expo. Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Virtual Reality '92. Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

Business & Computer Solutions '92. Seattle, Sept. 24-25 — Contact: Vikki Sanata-Thomas, Data Processing Management Association, Bothell, Wash. (206) 485-0794.

SEPT. 27-OCT. 3

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository AD/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Sam-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

OCT. 11-17

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

OCT. 18-24

Info/Tech Management '92. Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Bacon '92 Conference and Exhibition. New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

Society of Information Management (SIM) 1992 Annual Conference. Universal City, Calif., Oct. 18-21 — Contact: SIM, Chicago, Ill. (800) 477-4561.

APICS Conference and Exhibition. Montreal, Oct. 18-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

International Society for Hybrid Microelectronics '92. San Francisco, Oct. 19-22 — Contact: Terry Ritter, San Jose, Calif. (408) 945-9992.

OCT. 25-31

The 13th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

ASIS Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

Total Quality Management '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Expo Comm China. Beijing, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause Associates, Hong Kong. (911) 5-773-343.

NOV. 8-14

U.S. Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 852-3888.

12th Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalen, Tinius Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

Synergy '92. Anaheim, Calif. Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146

NOV. 15-21

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7900.

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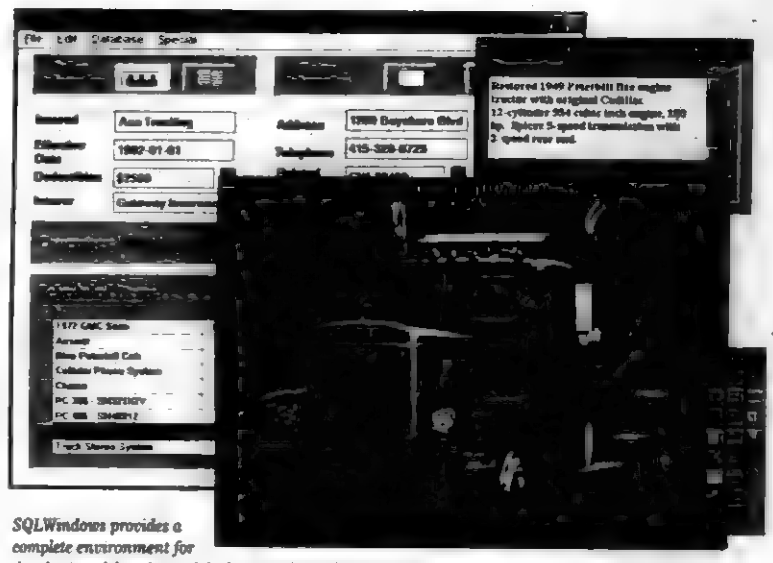

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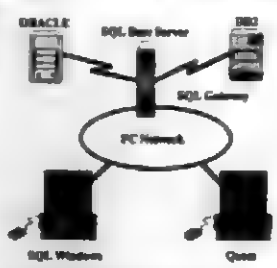

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Items of interest from publications, speeches, surveys and research projects

Assembly of integrators

■ ParaTechnology, Inc. in Bellevue, Wash., has published a guide to more than 200 systems and network integrators to help information systems managers in their searches for service providers. The guide offers detailed information on each company and can be used to cross-reference a range of technical skills and services, vendor relationships, vertical market expertise, company revenue and major contracts.

The 450-page directory is available in print for $495 and on disk for $995.

Source: *A systematic guide to systems integrators*, BusinessWeek, *Sept. 7, 1992.*

Thrifts spend for PCs

■ Banks and thrifts are rapidly replacing their branch offices' dumb terminals with personal computers, and the thrift industry is leading the way. In 1992, 55% of banks and 64% of thrifts are expected to install PCs at teller stations.

Meanwhile, merger fever in the banking industry has produced huge multibank holding companies that are technology-buying powerhouses. The top 1% of the banking industry will spend $1.7 billion on information technology in 1992 — more than 60% of the information technology budget for the whole industry.

Source: *"Annual Financial Industry Systems and Technology Survey," Mentis Corp., Salisbury, Md., July 28, 1992.*

Poll fax?

■ Some federal and state election administrators are pushing legislation that would allow U.S. citizens overseas to submit their voter registrations and absentee ballots electronically.

Supporters say voting by fax or electronic mail would boost absentee voting so much that it could make a difference in the outcome of some close elections.

Source: *"Election officials back fax balloting proposal," by Richard G. Smolka, "Election Administration Reports," Aug. 3, 1992.*

Boosting worker performance

■ Chief information officers may soon be hearing about an emerging scientific discipline called human performance technology (HPT), which finds ways to make people more productive in the workplace.

HPT's roots are in the field of instructional technology, but HPT also draws on research in management science, IS and human factors engineering.

Generally, work performance can be improved by the application of training, job aids and feedback systems. Information technologies such as Help systems, computer-aided instruction and expert systems can play important, performance-enhancing roles.

Source: Handbook of Human Performance Technology, *edited by Harold D. Stolovitch and Erica J. Keeps; published by Jossey-Bass, Inc., 1992.*

Getting out of outsourcing deals

■ An outsourcing contract is like a marriage — easy to get into and a nightmare when it comes to divorce. Consequently, it is crucial for the contract to include termination procedures that provide a smooth transition from the outsourcing vendor to another vendor or back to the customer.

For example, the customer or new vendor must have the right to continue using existing software and documentation and perhaps even the right to hire some key personnel — the people who know the customer's systems.

One of the trickiest parts of the outsourcing divorce is dividing the hardware, especially if the vendor is using it to service multiple customers. On the other hand, if the hardware was acquired solely for one customer, the vendor may try to force that customer to buy it or share in the financial loss from selling it to a third party.

Source: Scott on Computer Law (Second Edition), *by Michael D. Scott; published by Prentice Hall, 1992.*

Compiled by Kelly E. Dwyer, assistant editor, features, with contributions from Mitch Betts, national correspondent.

CEO backs re-engineering

CONTINUED FROM PAGE 93

second at which whatever the IS department, or human resources, or legal or accounting or what have you done to empower Mrs. Jones to help that customer either succeed or fail. And if Mrs. Jones is standing there with a software program she doesn't know how to use, or doesn't like to use, or that takes a long time to work, or that would have been working except that there's a glitch somewhere on the network, then she's falling down on the job the minute she opens her mouth.

And it doesn't matter one iota that this is the swiftest, latest cutting-edge technology; it's failing.

■ On the barriers to creating a service-oriented bank:
There's no question about it: Culture is the hardest part. People build little boxes around themselves, defined by their jobs as they saw them when they first took them on, and it can be extremely hard to get them to see outside the box.

If a job is seen as "I push X button" or "I do Y on Mainframe Z" rather than "I push this button or use this mainframe because at this point in time, that's the best way for me to give customers what they want and need," it's a pretty difficult thing to get the [jobholder] to switch gears and work back from the result to the process: "My job is to help the bank help the customer; is pushing the button or using the mainframe the most effective way to do that?"

■ On surmounting those habit barriers:
One of the things we're doing to try to break down these cultural roadblocks is, simply, talking a lot. It's an important part of my job that I'm going to spend a specific amount of time just walking the place, telling the story — not just among managers, but in the mailroom, with the gardeners: Customer service is also whether the lawn is cut. . . .

Much more fun and effective than sitting around a conference table at yet another meeting is going out into the departments and the branches, talking to people, getting their ideas as well as telling them some of mine.

By 1989, for instance, this bank had become pretty encrusted with policies: X gets done Y way. We enlisted branch people to make suggestions about which policies to kill — and then we implemented a lot of the better suggestions.

Of course, we had our law department look to make sure we hadn't just thrown out [regulatory] compliance! But why should a teller have to go to an assistant teller to get a signed authorization to access a piece of information which used to be in a locked file somewhere but now is readily accessible on-line?

Something else a little bit unusual that we're doing to communicate: The bank's corporate strategy is mailed to each of our tellers.

They may be dismayed rather than delighted to get 20 pages of print to go through — but they are included in the loop and don't have to pick up a newspaper or even a company bulletin to find out what their own bank is doing and why.

■ On the CEO's duty to understand technology:
I don't believe the widely held view that a generalist can run a business is valid. It's a popular philosophy, I know, but company after company makes this miraculous discovery: If you understand the details of the business and what it entails, you're better at running it.

So no, from that point of view, I'm not a technologist and don't think it would be in the bank's best interests if I were. To be ignorant of it or scornful or afraid would be just as bad. I'd say "well-informed" and "wide open to the possibilities. . . ."

■ On the changing role of the CIO:
One of our strengths is that Joel [Talka, Anchor's executive vice president and head of IS] has been here for so many years and is ideally able to take the lead in making a lot of people who are not technologically literate into completely comfortable users of technology. It's another plus to have so experienced a [CIO] to head up the outsourcing partnership.

Does that mean that when these efforts succeed, he'll have worked himself out of a job? If you're looking at a job as a box — the rigid, process-oriented rather than results-oriented kind of thinking that we all have to break out of — I can see where that could be a concern for a CIO. Otherwise, not.

Joel starts from a base of technology, but that's not the whole ballgame. He's a member of our management committee. He could easily step in and run branches. He can't work himself out of his job — he's a banker."

Anchored in reality

When Anchor Bank outsourced to Systematics last April, Joel Talka, executive vice president and effective CIO, was not crowded out; to the contrary, he was bumped up. "We're very lucky that Joel is first a banker, then a businessman, and then knows everything there is to know about information systems," says Anchor Chairman/CEO James M. Large Jr.

Talka's "total job here at Anchor is perhaps an odd combination," says Large, who describes his relationship with his CIO as open, frank and symbiotic. "He's in charge of managing the outsourcing partnership. He's also in charge of leveraging that partnership and Systematics' technology to make us a more effective, better bank."

Large says he is relying on Talka to be a major spearhead and technological guide as the bank, which has already moved from recovery to restructuring, now attempts to step beyond both into re-engineering.

There are three general earmarks of a healthy IS environment, Talka says. "First, there is function: Whatever you provide to users has to be operating smoothly. Then, there's position: We never want to be six months behind what some business person wants." Third, he adds, is research depth. "We've been good on the first two, but not so good on three," he admits. Making up the research deficit, he says, "is a big part of what we want out of the outsourcing relationship."

Exactly how to harness technology to take the bank where it needs to go is being thrashed out, Talka says. Too many conclusions up front, he adds, would be a a warning sign of technology in the driver's seat, with business practices chugging along in its wake. That is the situation Anchor is trying to avoid.

Bob Sacha

Anchor's Talka *wasn't pushed aside when the outsourcers moved in*

IS pros know what they want

Fantasies abound, but when reality hits, goals are set on management

BY LESLIE GOFF
SPECIAL TO CW

What kinds of jobs do you fantasize about? If you are anything like the information systems professionals questioned by *Computerworld* about career aspirations, you're likely dreaming of careers that range from corporate fitness director to college professor.

But when those we interviewed come off the dream cloud, many reveal that what they'd really like to do is become managers — even vice presidents — someday.

Many IS professionals say they'll stick with IS for the technical challenge and to become more involved in technology leadership and decision-making.

"I'd like to be evaluating new technologies relative to computers — multimedia, open systems, tools that allow systems to talk across multiple platforms, connectivity," says 15-year IS veteran Sidney Haggins, an information services analyst at Consolidated Diesel Co., a manufacturer of diesel engines based in Whitakers, N.C.

Keenan *seeks database administration*

Haggins' ideal title 10 years from now would be vice president of networking, but he'd settle for a consulting position. He got involved in end-user computing about three years ago, after a six-year stint as an operations support analyst in Consolidated's data processing department. He now supports its personal computer networks.

Like Haggins, most want variety in their jobs but would like to obtain master's degrees and find opportunities at their current firms.

Fred Humphrey, an MVS systems programmer at Northrop Corp. in Los Angeles with 10 years of IS experience, takes classes at the University of California at Los Angeles (UCLA) to help him keep up to date on changes in the MVS world. He may also augment his bachelor's degree in computer technology with a UCLA certificate in programming by completing 10 three-hour courses.

Humphrey *hopes to get into AI*

Humphrey says he is ultimately interested in getting a master's degree and entering the field of artificial intelligence, but in the meantime, he'd like to become a project manager in a technical services or MVS programming group.

"I like the aspect of the technical part — data processing — better than applications," he says. "Originally, I came from applications development. I like systems programming better because of the technical aspects of how things work and why."

The target for Larry Keenan is database administration. Keenan, a systems analyst in the IS group at Southwestern Bell in St. Louis, is interested in DB2. He's keeping an eye open for strategic opportunities in his company and would like to get into system design rather than actual coding.

"It's a matter of requesting job assignments that would give me the technical skills I need," he says. "There's a certain amount of negotiating to get those appointments, but I could do it quite feasibly. Southwestern Bell is fairly good at moving people around, but you still have to do a certain amount of politicking — finding the right openings and the right people to invite you into them and getting high enough performance ratings."

Keenan, who says he is happy in telecommunications, echoed many IS professionals in saying he is satisfied working in his current industry segment. "The same things would apply across the board, regardless of the industry," Haggins notes.

All of these IS professionals hope that their earning power will increase during the next decade. Most hope for increases of $10,000 to $15,000 from salary levels that now range from $40,000 to $50,000.

Satisfaction #1

More important to their long-range goals, however, was job satisfaction. It ranked as the IS professional's first priority in determining career goals from among the other categories of lifestyle, geography, money and title.

Take Kristi Kilpatrick. While she's currently on a solid career track as a systems analyst at Alexander Hamilton Life Insurance Company of America in Farmington Hills, Mich., she says her dream job would be in the consumer products industry. That's because of the satisfaction she'd get from participating in the creation of a tangible product.

"When you physically manufacture a product for the consumer, the whole process from operations to marketing is very intensive," she says.

Goff is a New York-based free-lance writer.

Land of promise

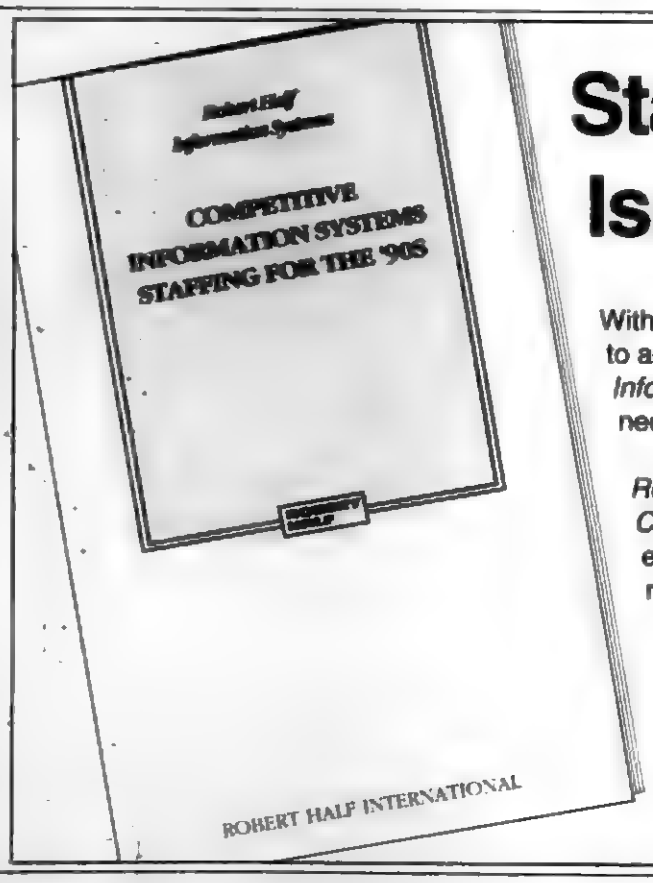
Matt Gambill, a software engineer at Woodbridge, Va.-based Universal Dynamics Corp., a maker of auxiliary equipment for the plastics industry, has worked here and in England. He says prospects for job satisfaction and job advancement are better on this side of the pond.

Ideally, he'd like the title of project manager and would love to get into the aerospace industry because of his affinity for space and mathematics. His primary concern is job satisfaction and feeling that he is making a contribution.

He says he was dissatisfied working in England, for instance, because "education wasn't important for IS positions — I had replaced a bricklayer who had had a modicum of experience.

"They see IS as more vocational than mission critical," he adds. "I want to feel that what I'm doing is important."

LESLIE GOFF



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INDUSTRY CURRENTS

Demand steady for IS jobs in discounting

BY SUZANNE WEIXEL
SPECIAL TO CW

Discount operations are the brightest lights in retailing right now, and these companies, locked in fierce competition, are investing heavily in information systems improvements and advanced technology to squeeze more profit out of smaller margins.

So far this hasn't produced a boom in IS jobs, but demand in this sector has held steady, and available jobs are by and large richer and more challenging.

"Scanning, mark-down processing, inventory replenishment and employee scheduling are all applications that can improve employee productivity. Improved employee productivity leads to an improved bottom line," says George Gillen, executive vice president at Management Horizons, a consulting division of Price Waterhouse that specializes in the retail industry.

When companies hire, they look for a certain amount of experience.

"If they can't hit the ground running, we can't afford the time for training," says Christopher Gay, vice president of information services at One-Price Clothing, Inc., based in Duncan, S.C.

Information technologies are abundant at every level, from the in-store systems used to manage inventory to the central systems used for buyer support.

Consistently, discount retailers look for a minimum of three years of IS experience and a four-year college degree.

Required experience seems to vary: Kmart Corp. used to run numerous training sessions for recent college graduates, according to Ronald L. Griffin, a senior systems manager responsible for store systems development at the Troy, Mich-based firm. Now, most hiring is done from within.

Wal-Mart Stores, Inc. considers seven to eight years of IS experience to be about right, according to Bobby Martin, executive vice president of information services at the Bentonville, Ark.-based chain.

Gay looks for four years of programming experience, but he also looks for "'creative-type" undergraduate degrees. "Art majors bring something extra to the job," he says. An MBA doesn't hurt, he adds, but it's not enough on its own.

"It's the technology that you bring to the table that gets you the job," says Elizabeth Roney, senior director of IS at Kmart's Fashion Division in North Bergen, N.J., who oversees mainframe-based central systems.

Roney says she sees a need for individuals who can combine an understanding of the business requirements with a creative approach to current technologies. Programming is giving way to computer-aided software engineering (CASE) tools and data manipulation, she explains.

Gay also looks for creativity and flexibility as well as an understanding of the job processes.

More important than the ability to read a technical specification and write an application is the ability to control the accuracy and efficiency of the data. Relational database management, specifically experience with DB2, is an important skill to hone, she says.

New breed

"The batch programmer is dead," Roney says. "Now we need information engineers." In addition to experience with CASE and DB2, Roney looks for candidates who know fourth-generation programming languages (4GL) and understand how to implement automated development cycles.

Griffin says his programmers play a more traditional role. When good CASE tools are available on personal computers, there will be less need for technical language skills and more emphasis on analytical abilities, he says. But for now, what he's looking for is hands-on acquaintance with DOS and Unix and the ability to program in C or Informix Corp.'s 4GL.

Rapid growth, which some discounters are experiencing, also leads to somewhat different skill requirements. One-Price Clothing has grown from 150 stores to more than 400 stores in two years. Gay estimates that the company upgrades its IBM Application System/400-based systems every six months.

From the store level up, the systems people need to understand how everything from bar-code scanners to inventory control systems simplifies and speeds up the job processes, he says. They need skills in systems analysis, capacity planning and distribution processing. "PC literacy is vital," he adds, because PCs are proliferating in both the stores and in operations.

Gay also looks for experience with nonstandard programming tools such as CASE. "We don't have time to wait for a programmer to write a program," he says. "We need to be able to manipulate a database."

Martin agrees that the rapid development of systems and applications is the key to remaining competitive in the discount arena. He also says upper level management expects more from IS personnel than ever before.

"There's no room for people with a strictly technical viewpoint anymore," Martin says.

Weixel is a free-lance writer based in Marlboro, Mass.

Outlook: Discount retail

WHERE THE JOBS ARE: Opportunities exist throughout the country, although the Midwest seems to be the strongest.

SALARIES: Systems analysts with three to five years' experience can earn anywhere from $35,000 to $45,000. A special skill base can up that ante by another $10,000.

HOTTEST JOB TITLES: The hottest job titles now include business analysts and data managers. And as the industry emphasis shifts from programming to data management, some companies are coining new job titles. Kmart's Fashion Division recently retitled all of its programmer/analysts "information engineers."

HOT TECHNICAL SKILLS: The future is brightest for those who have experience with CASE tools, DB2, 4GLs, client/server technologies, electronic data interchange, PC-to-mainframe communications, expert systems and artificial intelligence.

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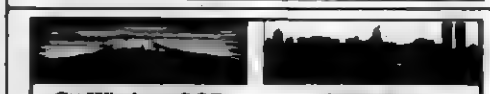

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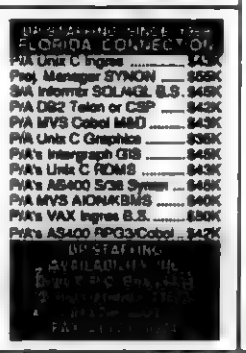

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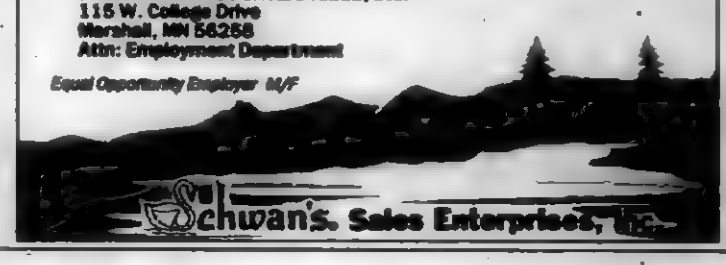

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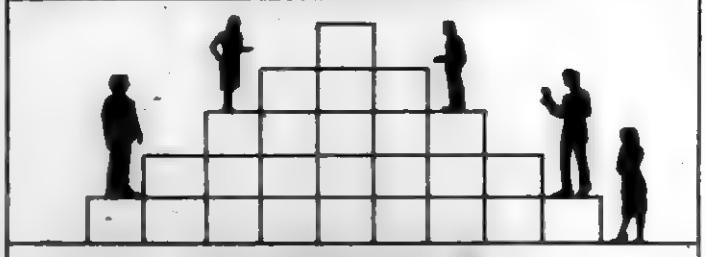

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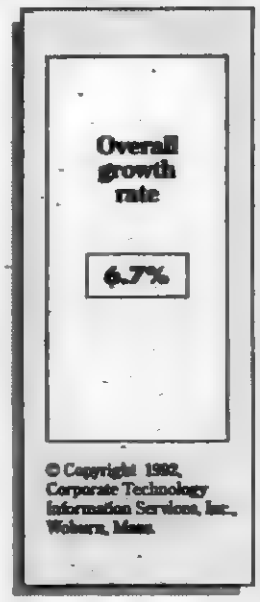

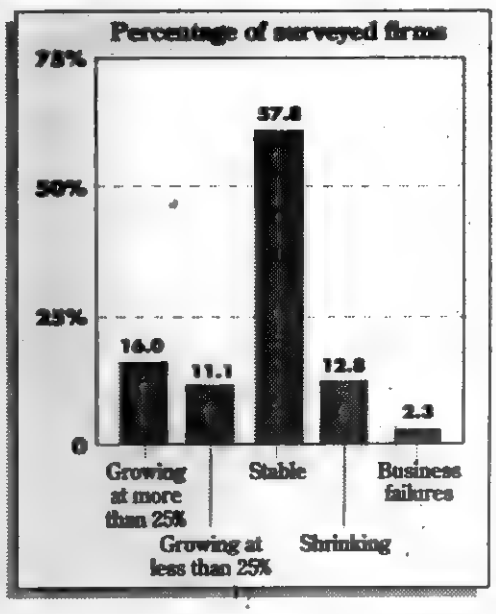

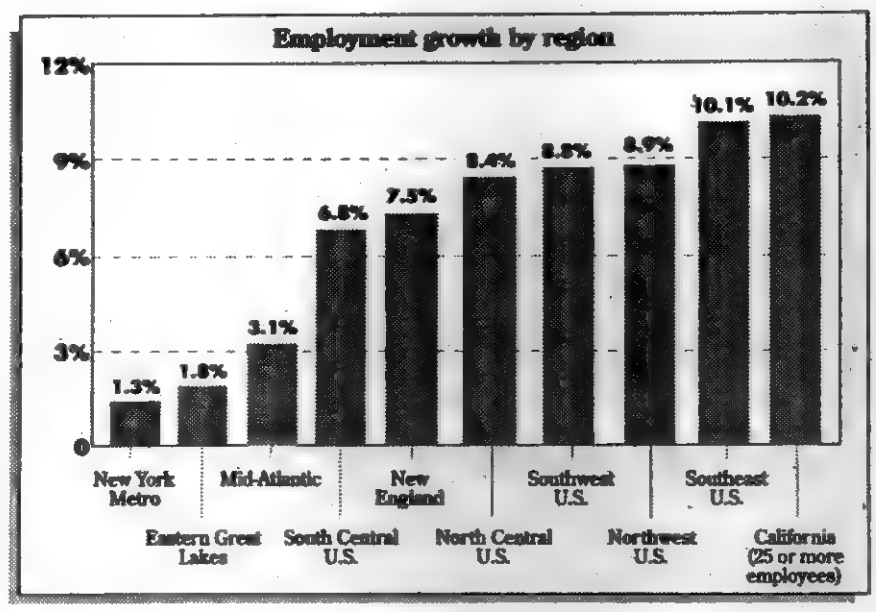

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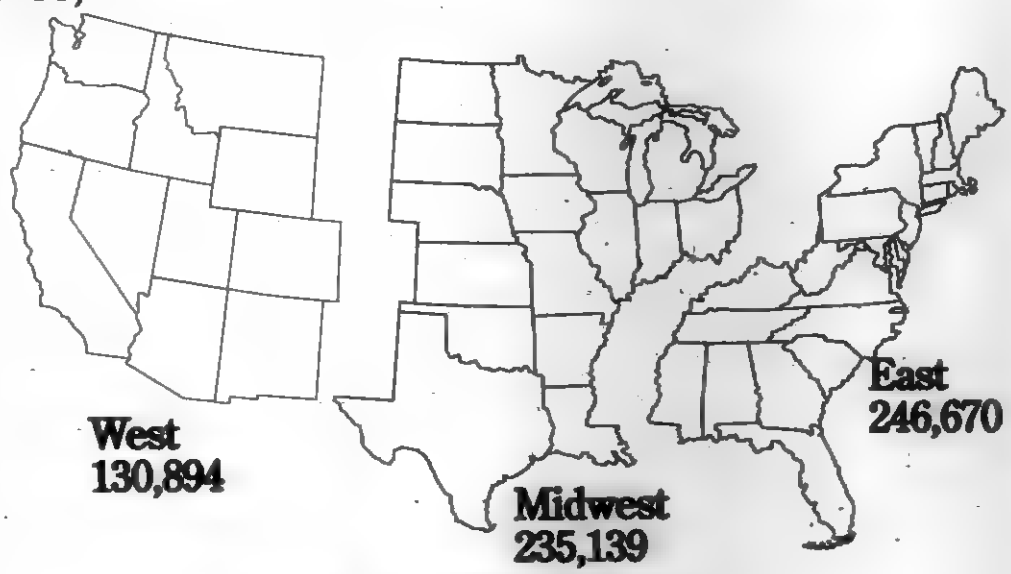

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There is something magical about opening a package. Even when you know what's inside, there's always the possibility of surprise. Unfortunately, the surprise isn't always pleasant. Like a shiny, new battery-powered toy without the batteries, the new purchase may lack something essential.

For instance, the package may lack cables. "All printers come without cables, but with monitors you get one," says Cindy Gabriel, senior end-user computing analyst at DeKalb Genetics Corp. in DeKalb, Ill. "You just have to know what comes with the product and what doesn't."

It's not that vendors are always out to deceive; more often, it's a case of inconsistent packaging. But regardless of the reason, it is annoying and sometimes embarrassing, too.

In one instance, after recommending a certain modem for a client, Sandra Eichler, a partner at Long Island-based New York Computer Consulting, discovered it couldn't be hooked up because it didn't come with cables — not a disaster, but an inconvenience. "It comes down to my mistake, but I would have assumed cables were included," she said.

Where's the cable?

Palmtops also often come without the cables necessary for transferring data to and from personal computers, says Judy Brown, president of the Association of PC User Groups (APCUG) in Washington, D.C. "With the Hewlett-Packard 95LX, for example, you can communicate with your PC, but you need a cable," she says.

Many vendors leave out the cables because they don't know what type will be needed, says Frank Medina, network sales manager at Atlantic Computers Corp., a retail operation based in Waltham, Mass. Older PCs, for instance, usually require 25-pin RS-232 cables, but more recent models may require 9-pin cables, he says.

When cords and cables are included, buyers may find they aren't long enough. In particular, notebook buyers will most likely need more than the typical 6-foot cord provided by vendors to connect their notebooks to a power source, says Mark Leaser, principal at Executive PC Institute, a San Diego-based PC consulting firm specializing in sales automation.

In some cases, even replacement hard disk drives lack the metal rails needed to install them in the PC. One reason: different PC models require different types of rails. "But you would think [vendors] would say 'OK, specify which rails you want,'" says Georgia Pinis, senior information center specialist at Akron, Ohio-based Aircraft Braking Systems Corp.

To the consumer, providing drives without rails is like selling a car without tires, adds Linda Dienberg, administrative coordinator at Fujisawa Pharmaceuticals Co. in Deerfield, Ill.

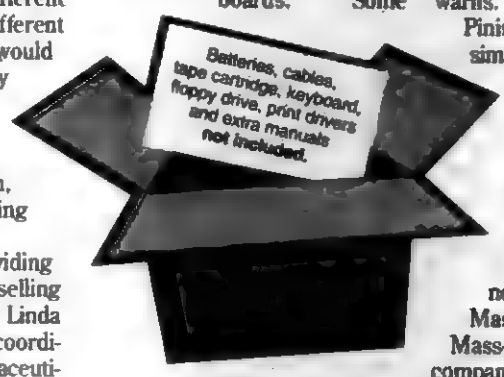
Vendor industries

There can also be inconsistencies in the way a single vendor packages products in a given product line. Colorado Memory Systems, Inc.'s 120M-byte tape backup unit comes with a tape cartridge but its 250M-byte backup unit doesn't, Medina says.

In addition, the most basic item of all — the battery — is never a "sure thing," especially for portable modems. Many vendors don't include them because they have a limited shelf life. Conveniently, the lack of batteries also makes the product look less expensive.

Although experienced buyers have learned to avoid surprises by asking questions, even veterans can be confused when venturing into new product areas.

Several users were taken by surprise the first time they purchased Apple Computer, Inc. Macintoshes. Unlike IBM PC compatibles, Macintoshes come with monitors but not with keyboards. "Some [people] might be surprised if they're migrating from an IBM environment to an Apple one," Dienberg says.



Many buyers rely on their vendor's and favorite reseller's guidance to avoid purchasing pitfalls. But even users who have been buying from the same vendors for years have to be on guard.

"Our standard vendor changed [PC] configurations and we weren't aware of it," said Doug Jackson, associate director of academic computing at the University of North Carolina in Wilmington. When he received a new order of PCs, Jackson discovered the new configuration included a hard drive but not a floppy drive. The cost for the floppy drives was negligible, but there was a brief delay in getting the PCs up and running.

Check the facts

One rule to live by, experienced buyers say, is to take nothing for granted. "Verify everything. Otherwise, you get burned," Gabriel warns.

Pinis experienced something similiar when purchasing laser printers for her site. She discovered that she needed to purchase laser printer drivers for the Mass-11 word processing software running on her PCs.

Microsystems Engineering Corp., which offers Mass-11, makes a special Mass-11 printer manual to accompany the printer drivers, but it didn't come with the drivers, she says. "Not only do you have to pay for [the manual]; they don't even tell you [that one exists] until you call with a problem," she says.

Another annoyance Pinis has noticed is more universal. "One of the things we find very odd is that when you buy multiuser software [for the VAX], you get [only] one manual," she says. Users of other systems, including PCs, have the same complaint.

Juneau is a free-lance writer and editor based in Salem, Mass.

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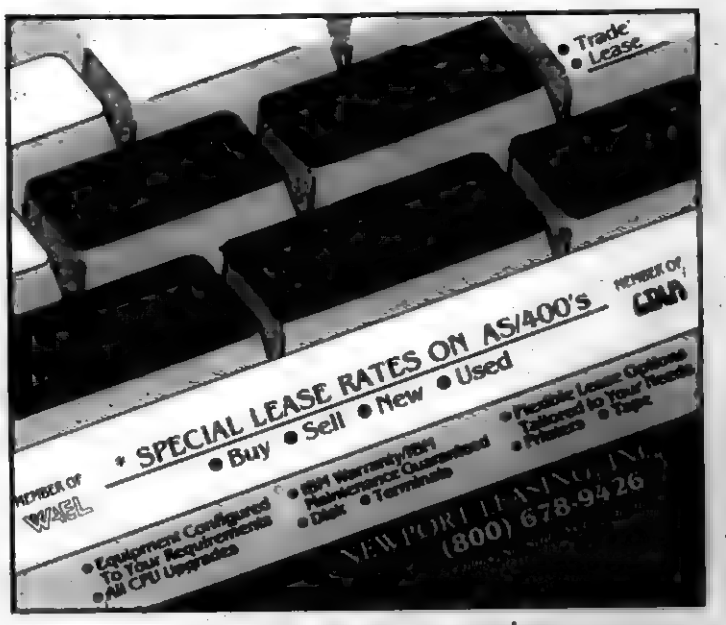

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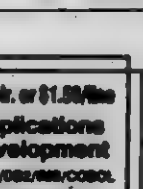

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ADVERTISERS INDEX

Apple Computer	22-23
AT&T Business Communications Services	42-43
Borland International	C4
CANAC Telecom	34
Chipcom	C3
Command Technology	31
Compaq Computer Corp	26-27
Computer Associates	3
CW Circulation	49
CW Marketing	59
CW Recruitment	57, 72, 79, 82
Digital Equipment Corp	84/85
Digitalk	83
EDIA	47
Effective Marketing	15
EMC Corp	60
Emerging Technology Applications	82
Fischer International	58
Gupta Technology	94
Hewlett-Packard	13
IBM	18-19, 50-51, 74-75
Inference Corp	84
Information Builders	17
Innovation Data Processing	7
Knowledgeware	21
Legent Corp	66-67
Lotus Development Corp	53
Micro Focus	11
Microsoft	70-71
Motorola Codex	65
NETEC International	32
Oracle Corp	5
PC Expo	72
Progress Software	90
Q-Star Technologies	25
Ross Systems	10
SAS Institute	30, 56
Software Engineering of America	9
Sprint	90
Sterling Software	48
Synoptics	57
Tandem	39
Tech Museum	76
Wellfleet Communications	68
WHITE PAPER	33-48
Word Perfect	62-63
World Expo Corp	79
Wyse Technology	54-55
X/Open	61

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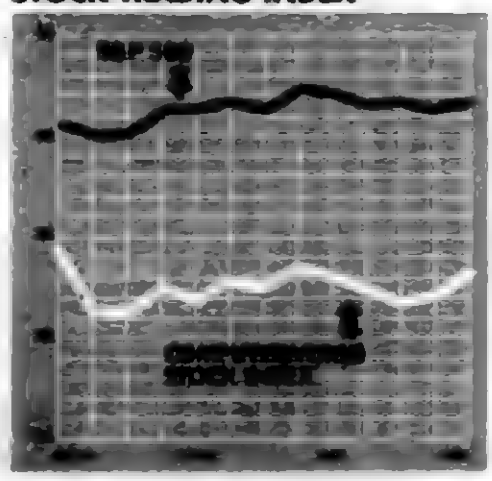

Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO BUY: **Dallas Semiconductor Corp.** (Alex. Brown & Sons, Inc.). Dallas (DS) vaulted over historically soft seasonal trends, boasting very strong sales momentum in July and August. Upward sales momentum stems from the firm's broad collection of proprietary products.

While Dallas' two biggest product lines, timekeeping (32% year-to-date sales) and nonvolatile memories (21%), seem to be on the flat side, proprietary products should be bulging to more than 60% of overall sales by the end of 1993, compared with 42% in 1991. Domestic distributors find Dallas' proprietary products appealing because they are less likely to be subject to order theft by other distributors that could provide alternative products from the competition. Rapid growth is expected to continue for the company through the first six months of 1993.

SECTOR FOCUS: MINICOMPUTERS

Laura Conigliaro, Lisa Cummings and Barbara Van De Wall

Aug. 20, 1992

In order to jump-start revenues, top-line growth will need to depend on well-postured product cycles that will not require a company to fight against more than the normal drop in average selling prices. **Silicon Graphics, Inc.** (SGI), **Sun Microsystems, Inc.** (SUNW) and **Stratus Computer, Inc.** (SRA) fit this mold, with product cycles just beginning. However, revenue growth will probably not pick up until the December quarter provides a seasonal boost. **Cadence Design Systems, Inc.** (CDN), Silicon Graphics and **Sequent Computer Systems, Inc.** (SQNT) are companies that appear to have plenty of room to draw in expenses.

It is possible that Silicon Graphics' June quarter orders were up by as much as 40%. Sparking the orders were low-end Indigo workstations and the company's new midrange Crimson series. During the September quarter, Silicon Graphics plans to add to its revenue pool with shipments of the R4000-based Indigo and the Reality Engine, a high-end graphics system.

Parametric Technology Corp. (PMTC) consistently posts impressive earnings gains without the benefit of a giant new contract. A sharp increase in new customers — up 85% during the June quarter — benefited the company.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 4, 1992

TOP PERCENT GAINERS

Maxis Software	37.50
DSC Communications (H)	34.62
Chips and Technologies (L)	25.93
Sequoia Systems Inc.	20.37
Sierra Semiconductor	20.00
Ask Computer Systems	19.81
Compression Labs Inc. (L)	18.37
Advanced Micro Devices	17.11

TOP PERCENT LOSERS

Wang Labs Inc. (b)*	-18.17
Xilinx	-17.08
Ariel Communication Corp.	-16.82
Digital Comm. Assoc.*	-15.44
Printronix Inc.	-12.00
Software Toolworks Inc.	-9.60
AI Corp.	-9.38
Cordian Corp.	-8.94

TOP DOLLAR GAINERS

Policy Management Sys.	5.63
BMC Software Inc.	4.63
Cisco Systems Inc.	3.88
Legent Corp.*	3.63
Parametric Technology	3.63
Intel Corp.*	3.50
Synoptics Communications (H)	3.50
CompUSA Inc.	3.38

TOP DOLLAR LOSERS

Xilinx	-3.63
Digital Comm. Assoc.*	-2.88
Information Resources	-1.50
Cordian Corp.	-1.38
IBM*	-1.38
Exabyte	-1.38
System Software Assoc.	-1.25
GTE Corp.* (H)	-1.25

Exch	52-Week High	52-Week Low		Sept. 4 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 2.88%**			
OTC	15.00	8.00	3 COM Corp.*	12.00	0.38	3.23
NYS	70.63	56.25	American Info Techs Corp.*	66.75	0.13	0.19
NYS	44.88	32.88	AT&T*	42.38	0.13	0.30
OTC	4.25	0.88	Ariel Communication Corp.	0.94	-0.19	-16.82
NYS	50.63	40.25	Bell Atlantic Corp.	49.13	0.50	1.03
NYS	55.50	43.38	Bellsouth Corp.	53.50	0.00	0.00
NYS	6.88	3.75	Bolt, Beranek & Newman (L)	4.38	0.63	16.67
NYS	66.88	38.63	Cabletron Systems	59.25	2.88	4.84
OTC	31.00	17.50	Chipcom Corp.	25.00	1.00	4.17
OTC	53.75	18.63	Cisco Systems Inc.	50.25	3.88	8.38
OTC	35.25	5.75	Compression Labs Inc. (L)	7.25	1.13	18.37
OTC	3.38	0.88	Data Switch Corp.	1.63	0.19	13.00
NYS	23.63	12.75	Digital Comm. Assoc.*	15.75	-2.88	-15.44
OTC	16.75	8.00	Digital Systems Int'l Inc.	9.25	0.00	0.00
OTC	8.75	3.63	DSC Communications (H)	8.75	2.25	34.62
OTC	10.88	4.75	Fibronics Int'l Inc.	5.63	0.25	4.65
OTC	37.50	16.50	Fluke Corp.	13.75	0.00	0.00
OTC	3.38	1.13	Gandalf Technologies Inc.	2.00	-0.13	-6.88
OTC	2.25	0.88	Gateway Communications	1.56	-0.13	-7.41
NYS	6.50	2.13	General Datacomm Inds.	3.13	0.13	4.17
ASE	5.88	0.50	Go Video	2.88	0.25	9.52
NYS	35.75	28.63	GTE Corp.* (H)	33.50	-1.25	-3.60
NYS	70.63	50.00	ITT Corp.	65.88	-0.25	-0.38
OTC	36.13	25.25	MCI Communications Corp.	34.00	1.38	4.21
OTC	14.50	2.25	Microcom Inc.	3.63	-0.13	-3.33
NYS	18.25	9.50	Network Equipment Tech.*	11.00	-0.25	-2.22
OTC	25.50	8.00	Network General	10.00	0.63	6.67
OTC	20.00	8.50	Network Systems Corp.	11.25	0.13	1.12
OTC	17.88	5.63	Newbridge Networks Corp.	16.63	0.75	4.72
NYS	49.25	33.75	Northern Telecom Ltd.*	35.00	0.75	2.19
OTC	65.00	31.75	Novell Inc.*	51.25	1.00	1.99
NYS	88.38	69.13	Nynex Corp.*	84.38	1.13	1.35
OTC	37.50	16.50	Octel Communications Corp.	21.75	-0.50	-2.25
OTC	6.88	4.00	Penril Data Comm. Ntwks.	4.88	-0.25	-4.88
OTC	53.00	10.25	Picturetel Corp. (L)	12.38	0.88	7.61
OTC	18.75	9.75	Proteon Inc.	14.00	1.25	9.80
NYS	38.00	11.63	Scientific Atlanta Inc. (H)	27.25	0.50	1.87
NYS	99.00	53.75	Southwestern Bell Corp.	67.38	0.75	1.13
NYS	26.38	20.75	Sprint Corp.	22.88	-0.25	-1.08
OTC	13.75	4.00	Standard Microsystems Corp.	13.50	0.63	4.85
OTC	38.38	14.25	Synoptics Communications (H)	38.38	3.50	10.04
NYS	40.00	32.88	US West Inc.	39.50	1.50	3.95
OTC	41.50	24.00	Wellfleet Communications	39.25	1.00	2.61
PC and Workstations			**Up 2.13%**			
OTC	14.50	4.50	Advanced Logic Research	4.75	0.25	5.56
OTC	70.00	42.75	Apple Computer Inc.*	47.25	2.25	5.00
OTC	32.25	11.25	AST Research Inc.*	13.00	0.75	6.12
NYS	19.25	6.75	Commodore Int'l	8.50	1.00	13.33
NYS	35.75	22.13	Compaq Computer Corp.*	32.50	1.88	6.12
OTC	29.00	13.91	Dell Computer Corp.	25.00	0.13	0.50
OTC	7.75	2.00	Everex Systems Inc. (L)	2.13	-0.13	-5.56
NYS	34.00	21.25	Harris Corp.	29.75	0.38	1.28
NYS	85.00	44.63	Hewlett-Packard Co.*	55.88	0.13	0.22
NYS	29.75	14.13	Silicon Graphics	22.63	0.75	3.43
OTC	35.88	20.75	Sun Microsystems Inc.*	27.88	1.25	4.69
NYS	31.25	22.25	Tandy Corp.*	23.63	-0.25	-1.05
NYS	11.13	5.13	Zenith Electronics	6.75	-0.13	-1.82
OTC	25.50	2.88	Zeos International Ltd.	2.88	-0.25	-8.00
Large Systems			**Up 0.07%**			
ASE	20.63	11.63	Amdahl Corp.*	13.75	0.25	1.85
NYS	15.50	6.41	Cordian Corp.	14.00	-1.38	-8.94
NYS	16.38	5.38	Convex Computer (L)	5.38	-0.50	-8.51
OTC	19.63	1.88	Cray Computer	3.63	0.38	11.54
NYS	52.25	22.75	Cray Research Inc.*	25.00	1.38	5.82
NYS	22.50	7.13	Data General Corp.	8.38	0.63	8.08
NYS	65.50	33.25	Digital Equipment Corp.*	35.88	-0.75	-2.05
NYS	106.38	61.63	IBM*	88.00	-1.38	-1.57
OTC	13.25	7.50	Kendall Square Research	8.75	-0.25	-2.78
NYS	121.25	88.25	Matsushita Electronics	101.50	1.00	1.00
OTC	19.75	7.50	Pyramid Technology	8.13	-0.38	-4.41
OTC	17.88	8.13	Sequent Computer Sys.	14.63	-0.88	-5.65
OTC	16.38	5.00	Sequoia Systems Inc.	8.13	1.38	20.37
NYS	54.25	38.75	Stratus Computer Inc.*	44.00	1.63	3.83
NYS	15.13	9.50	Tandem Computers Inc.*	10.75	0.38	3.61
NYS	11.75	3.63	Unisys Corp.*	8.88	-0.25	-2.74
ASE	7.50	0.25	Wang Labs Inc. (b)*	0.56	-0.13	-18.17
Software			**Up 3.99%**			
OTC	88.50	34.75	Adobe Systems Inc.	34.75	1.75	5.30
OTC	13.25	2.50	AI Corp.	3.63	-0.38	-9.38
OTC	45.00	11.50	Aldus Corp.	12.25	0.25	2.08
OTC	19.75	8.50	American Software Inc.	9.63	0.75	8.45
OTC	20.00	9.75	Ask Computer Systems	15.88	2.63	19.81
OTC	52.00	23.25	Autodesk Inc.	48.75	3.25	7.14
OTC	37.75	7.50	Bachman Info. Systems (L)	8.75	1.13	14.75
OTC	42.50	30.50	BGS Systems Inc.	37.50	-1.00	-2.60
OTC	79.00	37.25	BMC Software Inc.	54.38	4.63	9.30
OTC	20.50	9.00	Boole & Babbage	18.75	0.50	2.74
OTC	88.75	35.00	Borland Int'l Inc.*	42.50	2.25	5.59
OTC	11.25	3.63	CE Software	4.00	-0.13	-3.03
ASE	16.13	8.50	Cheyenne Software Inc. (H)	16.13	1.50	10.26
OTC	20.38	7.25	Cognos Inc.	7.25	-0.50	-6.45
NYS	17.00	7.50	Computer Associates*	14.50	0.63	4.50
Exch	52-Week High	52-Week Low		Sept. 4 Close	Wk Net Change	Wk Pct Change
NYS	12.38	9.75	Computervision Corp. (L)	10.38	0.50	5.06
OTC	21.25	8.00	Domain Inc. (L)	8.38	0.00	0.00
OTC	47.88	8.88	Easel Corp.	8.25	-0.13	-1.49
OTC	25.50	11.50	Group I Software	16.25	1.25	8.33
OTC	6.63	3.50	Hogan Systems Inc.	4.50	0.00	0.00
OTC	35.25	18.50	Information Resources	21.50	-1.50	-6.52
OTC	39.75	6.00	Informix Corp.	38.00	0.50	1.33
OTC	22.38	12.50	Intergraph Corp.	14.50	0.75	5.45
OTC	15.00	6.25	Interleaf Inc.	9.88	1.13	12.88
OTC	20.25	8.75	Interlink Inc.	14.38	-0.75	-4.96
OTC	24.00	10.50	Knowledgeware Inc.	11.75	0.13	1.08
OTC	46.25	24.50	Legent Corp.*	44.63	3.63	8.84
OTC	38.75	15.50	Lotus Development*	17.50	1.25	7.69
OTC	7.38	1.88	Maxis Software	2.75	0.75	37.50
OTC	22.25	6.50	Mentor Graphics	7.75	-0.25	-3.13
OTC	37.25	27.25	Micro Focus	34.50	2.38	7.39
OTC	20.50	6.50	Micrognatix Inc.	8.63	0.63	7.81
OTC	58.84	53.34	Microsoft Corp.*	76.00	1.63	2.18
OTC	21.13	10.25	Oracle Corp.*	18.50	1.13	6.47
OTC	44.38	15.50	Parametric Technology	44.38	3.63	8.90
OTC	11.00	3.50	Phoenix Technologies	4.25	0.13	3.03
OTC	25.25	12.13	Platinum Technology	16.75	0.38	2.29
OTC	46.50	29.00	Progress Software Corp.	39.75	-0.25	-0.63
OTC	28.63	4.00	Quarterdeck Office Sys.	4.50	0.13	2.86
OTC	32.75	11.75	Rainbow Technologies Inc.	18.88	0.63	3.85
OTC	25.25	7.50	Resterops	9.50	-0.50	-5.00
OTC	17.25	5.38	Ross Systems	7.38	0.50	7.27
OTC	12.13	8.50	Sapiens USA Inc.	11.75	1.00	9.30
OTC	35.25	7.50	Software Publishing Corp.	10.00	0.00	0.00
OTC	8.50	2.00	Software Toolworks Inc.	2.94	-0.31	-9.60
OTC	7.25	1.75	Spinnaker Software	2.25	-0.13	-5.26
OTC	16.50	6.25	State of the Art	6.63	0.13	1.92
NYS	25.25	13.75	Sterling Software Inc.	16.63	0.38	2.05
OTC	30.00	12.50	Struct. Dynamics Research	15.00	1.75	13.21
OTC	31.75	15.25	Sybase Inc.	30.50	1.25	4.27
OTC	51.00	16.50	Symantec Corp.	16.50	-0.50	-2.94
NYS	15.50	5.25	Systems Center Inc.*	6.25	0.50	8.70
OTC	34.25	12.50	System Software Assoc.	24.75	-1.25	-4.81
OTC	23.75	14.50	Walker Interactive Systems	18.25	2.50	15.87
OTC	6.63	2.13	Wordstar	2.25	0.00	0.00
Semiconductors			**Up 7.59%**			
NYS	21.50	7.38	Advanced Micro Devices	11.13	1.63	17.11
NYS	11.13	7.00	Analog Devices Inc.	9.88	0.38	3.95
OTC	13.38	6.75	Atmel Corp.	9.50	1.25	15.15
OTC	14.13	3.25	Chips and Technologies (L)	4.25	0.88	25.93
NYS	21.50	7.38	Cypress Semiconductor Corp.	9.63	1.00	11.59
NYS	11.13	6.25	Dallas Semiconductor	11.13	1.13	11.25
OTC	68.75	38.50	Intel Corp.*	61.25	3.50	6.06
NYS	9.88	4.88	LSI Logic Corp. (L)	5.75	0.38	6.96
NYS	22.38	12.13	Micron Technology	14.75	-0.50	-3.28
NYS	88.13	54.00	Motorola Inc.*	88.00	2.13	2.47
NYS	11.75	3.88	National Semiconductor*	10.88	0.88	8.75
OTC	27.00	8.25	Sierra Semiconductor	12.00	2.00	20.00
NYS	42.38	26.00	Texas Instruments*	40.75	1.88	4.82
OTC	10.50	6.00	VLSI Technology	7.75	0.75	10.71
OTC	8.75	2.13	Weitek	2.88	-0.25	-4.00
ASE	5.63	2.00	Western Digital Corp.	4.63	0.38	8.82
OTC	32.50	17.25	Xilinx	17.63	-3.63	-17.08
OTC	11.50	4.63	Zilog Inc. (L)	7.38	0.75	11.32
Peripherals and Subsystems			**Up 2.58%**			
OTC	10.00	2.75	Archive Corp.	7.63	0.13	1.67
OTC	26.50	12.50	Banctec Inc.	25.75	0.38	1.48
OTC	23.50	8.63	Cambex Corp.	11.50	0.00	0.00
ASE	12.25	4.91	Cognitronics Corp.	11.38	1.25	12.35
NYS	23.88	12.50	Conner Peripherals*	21.00	1.63	8.39
ASE	19.66	4.38	Dataram Corp.	7.25	0.00	0.00
NYS	19.25	5.88	EMC Corp.	18.63	-0.13	-0.75
OTC	8.38	4.75	Emulex Corp.	6.13	0.00	0.00
OTC	23.00	14.25	Evans & Sutherland	15.75	0.00	0.00
OTC	40.63	19.88	Exabyte	22.25	-1.38	-5.82
OTC	27.25	15.75	Intelligent Info. Systems	23.50	1.50	6.82
OTC	11.25	4.75	Iomega Corp.	6.88	-0.25	-3.51
OTC	34.75	10.25	IPL Systems Inc. (L)	10.75	-0.25	-2.27
OTC	24.50	10.75	Komag Inc.	17.25	1.50	9.52
OTC	14.63	3.44	Maxtor Corp.* (H)	14.38	0.63	4.55
OTC	12.63	5.75	Micropolis Corp.	9.25	0.50	5.71
NYS	101.25	85.25	3M Co.	99.50	1.00	1.02
OTC	7.00	3.50	Printronix Inc.	5.50	-0.75	-12.00
NYS	26.75	7.00	QMS Inc.	9.00	0.50	5.88
OTC	18.00	8.88	Quantum Corp.	14.63	0.88	6.36
OTC	12.75	6.00	Radius Inc.	7.25	0.50	7.41
NYS	12.88	5.88	Recognition Equipment	9.88	0.50	5.33
OTC	13.13	5.38	Rexon Inc.	9.63	0.13	1.32
OTC	17.63	7.25	Seagate Technology*	14.50	1.13	8.41
NYS	78.00	28.75	Storage Technology*	29.00	0.50	1.75
NYS	29.63	16.00	Tektronix Inc.	20.50	1.00	5.13
NYS	82.25	56.88	Xerox Corp.	78.25	0.63	0.83
Services			**Up 3.70%**			
OTC	19.25	11.88	American Mgmt. Systems*	19.25	0.50	2.67
NYS	5.38	2.88	Anacomp Inc.	3.13	0.00	0.00
OTC	19.00	12.50	Analysts Int'l	18.50	1.00	5.71
NYS	49.00	32.38	Auto Data Processing*	45.13	2.00	4.64
NYS	24.16	12.50	Comdisco Inc.*	15.00	-0.50	-3.09
OTC	13.50	7.75	Computer Horizons	8.25	-0.25	-2.94
NYS	84.88	57.00	Computer Sciences*	65.88	1.75	2.73
NYS	10.13	7.00	Computer Task Group	8.25	0.13	1.54
OTC	40.50	15.00	CompUSA Inc.	29.38	3.38	12.99
OTC	19.25	8.00	Corporate Software (L)	8.00	0.88	12.28
OTC	30.75	9.25	Egghead Discount Software (L)	10.50	0.25	2.44
NYS	33.00	23.13	General Motors E (EDS)*	29.13	0.38	1.30
OTC	30.38	8.25	Intelligent Electronics	9.50	-0.13	-1.30
OTC	14.88	3.13	Mentel	8.00	1.00	14.29
OTC	15.75	7.00	Microage Inc.	9.38	0.88	10.29
OTC	29.00	15.50	Paychex (H)	27.00	-0.25	-0.92
NYS	75.13	48.50	Policy Management Sys.	75.13	5.63	8.09
NYS	44.50	22.63	Reynolds and Reynolds	42.13	0.38	0.90
OTC	32.00	21.25	SEI Corp.	24.75	1.75	7.61
OTC	24.38	16.88	Shared Medical Systems	19.63	-0.38	-1.88
OTC	27.38	13.50	Sungard Data Systems (H)	26.75	1.00	3.88
NYS	3.75	1.13	Ultimate Corp.	1.88	0.00	0.00

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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ABP

IN BRIEF

IBM buys into Synon

■ As expected, **IBM** [CW, Aug. 31] announced that it plans to buy a 10% stake in **Synon Corp.** for an undisclosed sum. IBM expects to make the application development tool maker's CSG software the sole code generator for building Application System/400 programs under AD/Cycle. IBM will continue to target its own generator, Cross System Product, at mainframe and small systems applications.

■ **The Software Publishers Association** said second-quarter personal computer application software sales reached $1.49 billion, an increase of 20% from the corresponding period last year. Windows applications hit $526 million, up 181% from 1991's second quarter. Spreadsheets displaced word processors as the largest application area, with sales of $236 million in the quarter, the Washington D.C.-based organization said.

■ U.S. marshals, at the behest of **Microsoft Corp.**, last week seized 2,000 counterfeit copies of Microsoft software at **Number One International, Inc.**, a South El Monte, Calif., distributor. The Redmond, Wash., software giant also slapped Number One and its president, Randy Wang, with a trademark and copyright infringement suit.

Short takes

The **Microelectronics & Computer Technology Corp.** consortium last week formed a venture capital company to invest in projects spun off from the Austin, Texas, research and development firm. The consortium hopes to use capital supplied by outside investors and member companies to keep scientists within its fold.... Underwriters of **Banyan Systems, Inc.**'s initial public offering have used their overallotment option to purchase an additional 400,000 shares of Banyan stock.

SPARC seeds sown in Russian soil

Sun signs up 33 more computer scientists to advance SPARC compiler technology in Moscow

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. staked a second claim in Russian territory last week through a novel software development contract with a group of computer scientists in the former Soviet Union.

The move could reserve an important place for Sun on the ground floor of Russia's computer industry, which is struggling to recast itself for the economic realities of East/West business competition, analysts said.

Sun's SunPro subsidiary unveiled an agreement with 33 Russian computer scientists who will work under a six-month, renewable contract to advance Scalable Processor Architecture (SPARC) compiler technology. They will expand the mission of the 50 Russian computer scientists already working for Sun in the recently formed Moscow Center for SPARC Technology.

The center is led by Boris Babaian, the preeminent supercomputer expert in the former Soviet Union.

"This cooperation makes it possible for us to continue our work in this industry," said Babaian, whose Elbrus supercomputer became obsolete once the Iron Curtain collapsed and competing Western vendors entered with faster, cheaper technology.

Established five months ago, the Moscow SPARC center is a Russian/American joint venture, funded by Sun through contract research. Evidence of this latest collaboration should show up in early 1994 in the form of improved compilers and tools for the Fortran and Pascal languages, plus optimized performance for SunPro's SPARCompiler products.

Moscow's Babaian: *The alliance will 'resurrect' high-tech in his country*

"What Sun is doing is a kind of affirmative action for Russia," said Esther Dyson, publisher of "Rel-East," an East/West high-tech business information newsletter based in New York. "They have first crack at a resource most people ignore."

Multiprocessing techniques and parallel processing technology are key specialties of Babaian's researchers, who make up an elite core among the 1,000 employees at the Russian Academy of Science's Institute of Precise Mechanics and Computer Equipment in Moscow.

"This isn't a bunch of PC hackers learning Windows," Dyson added. "This is serious computer science."

The design of Sun's SuperSPARC Viking chip, with its highly parallel reduced instruction set computing architecture, is similar to the work Babaian and his engineers did on the Elbrus supercomputer. Collaboration with the Russians during the past year has already altered Sun's future implementation of a 64-bit SPARC architecture, said David Ditzel, director of advanced development at Sun.

Yet while the concept sounds grand, the reality of working together across thousands of miles with unreliable phone lines and a 12-hour time difference is still largely untested. The Sun engineering teams will communicate mainly via electronic mail — in English — with Russian software designers at sites in Moscow, St. Petersburg and Novosibirsk in Siberia.

Gaining a foothold in the research community and among software developers is Sun's tried-and-true method of breaking into new markets, said Eric Schmidt, president of Sun Technology Enterprises, one of Sun's six subsidiaries.

Babaian and nine of his researchers were in California last week to meet their Sun colleagues and soak up some business education seminars at Stanford University along with the sunshine. An avuncular, good-humored man who takes care to avoid making predictions about Russia's future, Babaian said the Sun alliance will help "resurrect" his own country's floundering technology industry.

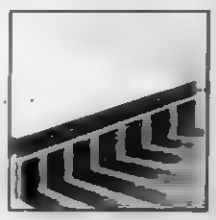
Yet the Russian alliance means far more than goodwill for Sun. Company officials spoke frankly about the business opportunities to be had selling workstations into Russian industries such as banking, telecommunications and oil exploration.

Cyrix seeks route into Intel 386 market

Upgrade path to 486 PCs could go down to $300

BY MICHAEL FITZGERALD
CW STAFF

RICHARDSON, Texas — Like a gnat looking for weak spots in a hippo's hide, Cyrix Corp. continues to search for markets that Intel Corp. has failed to find.



Its latest approach is not so much technical as marketing-driven: Cyrix officials are looking to sell their CX486DLC processor upgrade directly to corporate users.

The 486DLC has three versions that range from slightly less powerful than an Intel 25-MHz I486DX to slightly more powerful than a 33-MHz 486DX; all fit into the smaller 386DX socket.

James Chapman, Cyrix's vice president of marketing, said Cyrix has established a corporate beta-test program in which 10 to 12 major corporations are testing Cyrix's 486DLC, with a bent toward installing it directly in 386-based systems.

While upgrades to date have not been common, Cyrix said the ability to pop a 486-class chip into a 386DX socket could spark a market. The company said it came up with the idea when its current beta-test users called for it.

One beta-test user at a major West Coast company, who spoke on the condition of anonymity, said his company is testing the Cyrix upgrade chip because "as we move into an area with graphical interfaces, the 386 processor seems to be interminably slow" because it lacks on-board cache.

Accelerator cards do not improve performance enough to make a major investment in the technology worthwhile, the user said.

He said new 486-based machines cost at least $5,000 each, and with the potential to replace 20,000 386-based systems, using the Cyrix upgrade chip could save the company $1 million.

Cyrix said its program is targeted only at large companies with internal information systems staffs that do their own maintenance and upgrade work.

If the strategy works, Cyrix said, more corporations will buy Cyrix-based personal computers in the future, rather than strictly Intel-based PCs. No PC vendor with a major corporate presence has announced a Cyrix-based product.

"This is a Trojan horse for Cyrix into the Fortune 1,000," Chapman said.

Legal battles ahead

Of course, Cyrix still has to survive legal hurdles with Intel. While Cyrix won a recent decision against Intel, the court simply gave Cyrix the ability to continue manufacturing its chips.

The court will not decide the real question of whether Cyrix has infringed on an Intel patent with its processor until sometime next year.

Meanwhile, Cyrix's upgrade would give users a significant break on costs. If users like what they see in their tests, Cyrix will sell a special upgrade-ready version of the chip for a target price of $300 each.

"I would say it makes a lot of sense, considering how lucrative [the upgrade] market can be," said Dean McCarron, an analyst at In-Stat, Inc. in Phoenix. McCarron said the potential market was the entire universe of 386DX-based systems. He also said Cyrix may benefit from its experience in the math coprocessor market, where corporations often buy directly from the maker.

Cyrix, which hopes to begin selling the chip directly to corporations in the first quarter of 1993, said it intends to sell its upgrade chip through retail channels starting late this year or early in 1993.

Chapman also said Cyrix is working on its version of Intel's P5, the 486 follow-on. He said Intel's need to stay compatible with existing software gives Cyrix a target to shoot for, despite the lack of a physical chip to benchmark against.

TRENDS

Mainframe acquisitions

For many organizations, the largest single capital investment ever made is a mainframe. According to a survey of 1,000 mainframe sites, IS managers are still more apt to purchase and hold onto a mainframe rather than lease one.

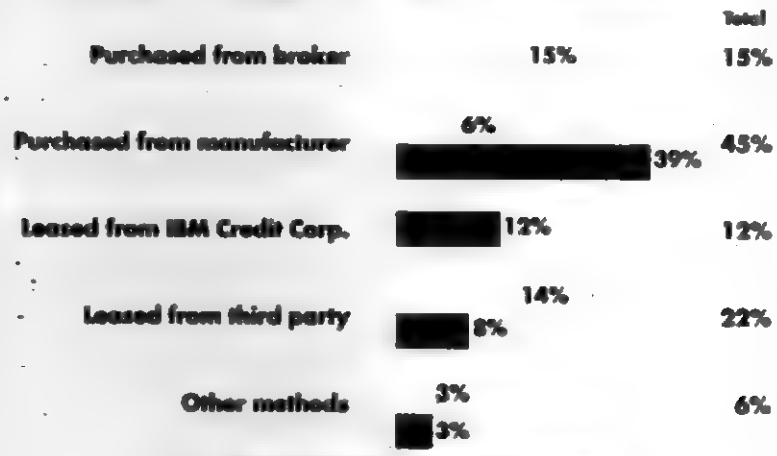
Procurement

The preferred method of obtaining mainframes is buying them outright. In the respondent base, 60% were purchased and only 34% were leased.

Hold the upgrade (for now)

Out of 900 installed CPUs, IS managers plan to upgrade or replace only 23% of them in the next six months.

Where do IS managers get their mainframes?



Lease commitment

Leases on second-hand systems tend to be shorter than for new ones:

***New systems** 45 months

***Used systems** 37 months

***Average initial duration of leases**

Big guns

IBM Credit Corp. accounts for almost 40% of all leases in the sample, including 56% of the leases for new systems. Next largest is Comdisco, with 15% of the responding market.

Source: Xephon/WPWS, Orlando, Fla.

CW Chart: Michael Siggins

INSIDE LINES

The unkindest cut

▶ One aspect of IBM's new PC company that is not being discussed much is the number of employees who won't be transferred. Naturally, IBM, being what it is, is not using the "L" word, but sources said approximately 30%, or 6,000 NDD employees, have reportedly already taken advantage of such offers as early retirement programs. Some of the parachutes glint golden: pen and tablet guru Kathy Veith is reportedly spending her newfound free time in a new home in Vail, Colo.

Polyglutonous networking

▶ Tomorrow, DEC is expected to make its long-awaited announcement of a link between DECmcc Director and IBM's NetView, which DEC co-developed with Systems Center, Inc. The software is expected to let DECmcc manage IBM SNA systems and provide DEC network management capabilities to NetView and Systems Center's NetView/Master.

Sparks will fly

▶ At a product splash slated for early December, Sun plans to unveil a 20-processor SPARCserver and new low-end systems and multiprocessor desktop machines. Sun President Scott McNealy said prices for Sun servers will remain below the $200,000 mark, however. The new systems will run Solaris 2.0 and its subsequent versions only, as Sun migrates users from SunOS and Solaris 1.0 to the newer operating system based on Unix System V, Release 4.

Allies no more

▶ Effectively slamming the door after its exit from the AD/Cycle alliance, Intersolv plans to roll out a new version of APS, a code generator that went head-to-head with IBM's Cross System Product (CSP). Expected late this month, APS 2.2 will target client/server applications for OS/2-based clients. IBM, meanwhile, intends to revamp CSP to produce both mainframe and OS/2 code. The delivery date is undefined.

OTC burglary tools?

▶ HP recently unveiled an accessory to its popular LaserJet printers that may be very popular with an unforeseen customer — check forgers. The package reproduces the little numbers on checks that are scanned and read in bank clearinghouses, reducing the cost of payroll checks to about 10 cents each, instead of the $1 apiece that a check-printing service charges. Also, a $3,000 laser printer compares favorably with $10,000 and up for a special-purpose check printer. Observers such as ANSI's Roy Van Denburgh fear the package — which includes a $169 toner cartridge containing special ink and a $249 font program needed to make the magnetic-ink character recognition code — will reduce the cost of forgery.

Down, but not out (yet)?

▶ Sources close to Momenta say the company has finally filed for Chapter 11 bankruptcy protection, after a few months of struggling to find a buyer. Word is the company could now be had so cheaply that someone may buy it, and sources say more than one investor is sniffing. The sources said John Rizzo, former vice president of marketing at Momenta, might be tapped to run a reincarnated company that would market several products Momenta was close to completing.

While PCs are the usual target of viruses, Unix-based workstations could be next. Unix machines have so far been protected by the variety of operating system variants, including I/O media that typically harbor PC viruses, but they are far from immune. From an internal Intergraph paper on this issue: "The potential threat . . . is greater than what has actually been observed. . . . Viruses can spread anywhere that programs are shared. . . . A very good culture medium, therefore, is a LAN with many PCs and one or a few file servers. . . . A non-PC file server could be carrying programmed threats to which it is itself immune and passing them on to PCs which execute programs from the file server." Experts suggest that a good checksum program would be a nice addition to any network. So would some news tips. Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

NEXT WEEK

Bill Knobles doesn't have time to sit by the pool lately. As MIS manager at Baltimore's Omni Inner Harbor Hotel, he is trying to make the best of tight times — and he's got plenty of company. Yet despite pressures to do more with less, many IS professionals are *more* satisfied with their jobs. Find out more in our annual Job Satisfaction report.

Katherine Lambert

The hot spot in forms automation is what is happening on personal computer platforms, particularly the distributing of forms to remote terminals on disk and via network electronic mail. The author of In Depth reveals what the hubbub is all about as well as what factors could hold back forms automation in an organization.

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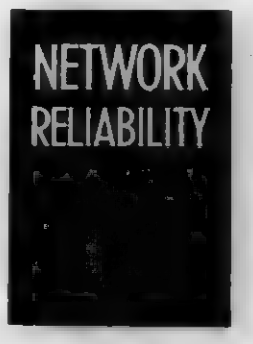

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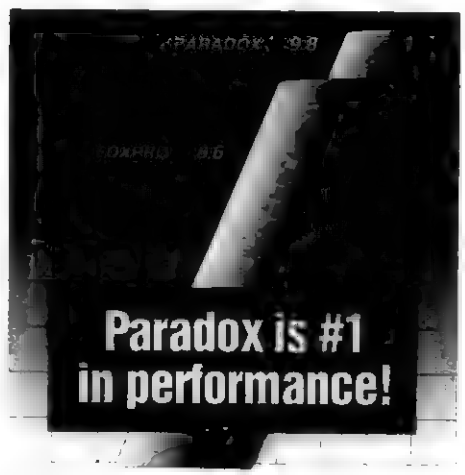

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Software Digest Rating Report, Multiuser Database Programs, May 1992, Vol. 9, No. 2. BI 1573

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IT'S THE MOST EFFECTIVE IS'ERS OF IS
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COMPUTERWORLD

Spreadsheet war moves to Windows

Borland, Lotus act to loosen Microsoft's hold

BY CHRISTOPHER LINDQUIST
CW STAFF

LONDON — Users who had been holding their breath waiting for Borland International, Inc. to release a Windows application can finally get some air following last week's debut of Quattro Pro for Windows.

The long-awaited and much-discussed spreadsheet will compete with Lotus Development Corp. and Microsoft Corp. in what has become a bloody struggle for the hearts and wallets of graphically inclined users.

"I think we're finally going to see the real battle take place," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash. Borland will have its work cut out for it as it tries to convince users that it will be able to upgrade the product on schedule after the long delay in delivery, he said.

Lotus will not be resting on its laurels, either. "Lotus has said

Continued on page 20

NEW PRODUCT IN-SITE — PRODUCT EVALUATION

Oracle 7

Beta-test users rate the latest release of Oracle's RDBMS high on quality but short on affordability and simplicity. See New Product In-Site, page 96.

Enhancements/ New features	4.7
Ease of installation	4.0
Ease of use	3.7
Purchase/ Maintenance cost	2.8

Ratings are based on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations

High-tech movie highlights realistic security concerns

BY JAMES DALY
CW STAFF

It is a rare — or perhaps daydreaming — information systems director who would compare himself with Robert Redford. But a new high-tech crime movie in which Redford stars may have computer executives debating not only the worth of a government-sanctioned encrypting standard but also the extent to which any data can be considered truly safe or trusted.

In *Sneakers*, a brilliant mathematician invents a small, black-box code breaker that allows its users to decrypt the most sophisticated encoded information instantly and gain access to any computer system.

In the movie's gee-whiz sequence, Redford's pals test the gizmo and drop their jaws in wonder as the Federal Reserve's computers, the air traffic control system and a "national power grid" all lie open for them to study — or modify.

Sneakers relies on a vintage Hollywood formula of supersleuths covertly deciphering encoded messages. If taken to an extreme, it is liable to add fuel to the arguments already roaring about the depth of safety provided by the Data Encryption Standard, a government-approved algorithm for encrypting digital information. The algorithm is up for recertification next year.

"The basic premise of [*Sneakers*] is very, very far-fetched, but it does remind us

Continued on page 16

IBM to users: 'It'll cost you'

Free on-site support is now shared or billed

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM, the company that built its business on excellent technical support, is changing the rules of the game. More customers must make do with telephone support instead of the free on-site technicians who used to be part of most big-iron deals.

There are still technicians available for on-site service. But where there had been service people dedicated to a particular large account, some customers now share technicians among multiple sites. And some users must pay an hourly rate of up to $200 for an expert's time, although an IBM executive acknowledged that some freebies are still being offered in certain circumstances.

Many customers are philosophical about this change, saying they have been expecting it for some time. "We [users] have been very successful at getting IBM to reduce the cost of hardware and still get the benefit of bundled services," said William Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y.

Continued on page 14

Retailer nears end of huge IS overhaul

JC Penney restructuring may save $11M yearly

BY ELISABETH HORWITT
CW STAFF

DALLAS — It will be "lights-out" at JC Penney Co.'s four data centers next year. The nationwide retailer last week announced plans to control and manage its operations from a single production control center here.

Headed by JC Penney's director of information systems, David Evans, the move has a bottom-line expected savings of $11 million annually in computer operations, coming in part from the elimination of 300 IS positions, the retail giant said.

The restructuring is the final, "cost-reduction and optimization phase" of a multiyear data center consolidation that has brought the company down from approximately 20 centers in the late 1970s to four today, Evans said.

The consolidation, which has been paralleled by recent corporate cost-cutting, furthers JC Penney's commitment to being a "low-cost producer in our industry," Evans said.

JC Penney is "effecting a logical [IS] operation rather than a physical operation, leaving hardware in its existing locations. Operating activities will be relocated to a centralized production control center" that will be the company's "computing model for the 90s," said John Dratch, manager of data processing and technical support.

Sam Walcutt

Evans *leads JC Penney's consolidation*

Scheduled for completion by the end of next year, the new

Continued on page 12

Pleasure and pain

More work. More stress. And — surprise — more satisfaction.

COMPUTERWORLD 1992 JOB SATISFACTION SURVEY

Nearly 70% of the respondents in *Computerworld*'s Sixth Annual Job Satisfaction Survey say they are doing more work this year compared with last.

Yet despite rising work pressures, especially among nonmanagers, the number of people who say they are more satisfied than last year with their jobs actually rose 8%. Greater challenges and growth opportunities were often cited as reasons for satisfaction.

But trouble might be looming: Rank-and-file information systems workers voice growing criticism about their work and departments.

And the number of IS managers and professionals who say they are less satisfied with their jobs climbed about 6%.

Complete survey results and profiles begin on page 99.

INSIDE

Tools previews and the delivery date of Oracle's next-generation database await attendees of this week's Oracle user meeting. Page 4.

Two utilities tap systems integrators to automate, innovate and lower costs. Page 6.

Price-sensitive PC users assess new entries from IBM and Apple. Page 8.

Is the threat of computer viruses exaggerated? Page 16.

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IN THIS ISSUE

NEWS

4 Naturally, **Oracle** users are interested in Oracle 7, but they are even more concerned about whether it will be delivered on time.

6 **Microsoft**'s release of Windows for Workgroups could give network computing a big boost.

8 First-time home users are the target of **Apple**'s Performa line of PCs.

10 An early user of **Lotus**' Notes imaging companion finds it both capable and inexpensive.

12 A slew of products from **IBM** will make it easier for LAN users to integrate with existing products.

14 Five corporations file complaints with the FCC accusing **AT&T** of charging exorbitant network fees.

15 **PI Systems** introduces the least expensive entry to date in the notepad-size pen-based market.

16 An IBM virus researcher addresses such issues as how widespread are viruses, and are they controllable?

24 **Zenith Data** wins a huge contract to supply 300,000 PCs and peripherals to defense and civilian agencies.

Quotable

"If a man made the DES, a man can break it."

IAN MURPHY
IAM/SECURE DATA SYSTEMS

On the worth and security of a government encryption standard. See story page 1.

DESKTOP COMPUTING

35 Powerful notebook computers will be ripe for the picking this fall.

WORKGROUP COMPUTING

59 How to follow up a successful downsizing project.

ENTERPRISE NETWORKING

67 A group of users and vendors creates a blueprint for networking products and standards.

LARGE SYSTEMS

79 **UPS**' package-tracking system enables quick replies to customer queries.

APPLICATION DEVELOPMENT

87 Visix hopes users will find its **Galaxy** environment out of this world.

96 **New Product In-Site:** Oracle 7 beta-test users praise its quality but struggle with its complexity.

MANAGER'S JOURNAL

109 Meeting-support software can cut meeting time by one-tenth.

EXECUTIVE REPORT

99 The pain and the pleasure of life in IS: Our Sixth Annual Job Satisfaction Survey.

IN DEPTH

105 Electronic forms shine when linked to database and data collection technologies.

DEPARTMENTS

6, 16 News Shorts
28 Advanced Technology
32 Editorial
111 Calendar
115 Computer Careers
117 Fast Track
123 Marketplace
128 Stocks
129 Computer Industry
130 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **IBM is tweaking its tradition of intensive technical support for big-iron customers,** many of which must make do with fewer on-site IBM technicians, more telephone support and hourly charges of $200 for expert advice. While some customers view the changes as inevitable, others are upset at having to hire more technical staffers. **Page 1.**

■ **IS managers and professionals are working more and stressing out more.** Still, overall job satisfaction rose modestly among those surveyed for *Computerworld*'s Sixth Annual Job Satisfaction Survey. 'Increased challenges' were cited as a big factor. **Page 99.**

■ **JC Penney's four data centers** will go into remote operations mode next year and are expected to save the company $11 million annually. **Page 1.**

■ **Washington Water Power outsources** its information systems power to Electronic Data Systems, and Connecticut Natural Gas signs Andersen Consulting as systems integrator — two more chapters in the ongoing saga of price-squeezed utilities in search of innovative technology partnerships. **Page 6.**

■ **Gray areas in network service contracts** surfacing in a Federal Communications Commission complaint against AT&T could cause network managers to reexamine where their responsibilities end and their service provider's begin. **Page 14.**

■ **A consortium of users, vendors and standards organizations** offers a treatise on how today's morass of network management products and standards can peacefully coexist and interoperate. **Page 67.**

■ **Going from paper to electronic forms can save companies about 73% in costs.** But saving money isn't the real benefit of forms automation. Through use of workgroup automation and client/server connectivity, companies such as KFC Corp. are improving the quality and efficiency of their operations because users get a palatable interface to enterprise data. **Page 105.**

■ **Oracle users are looking for signs of a re-energized vendor in this week's** previews of enhanced products and concrete shipping dates for the Oracle 7 relational database management system. **Page 4.**

■ **Open tools that can generate** vendor-independent application code can simplify matters for sites with multiple databases. **Page 87.**

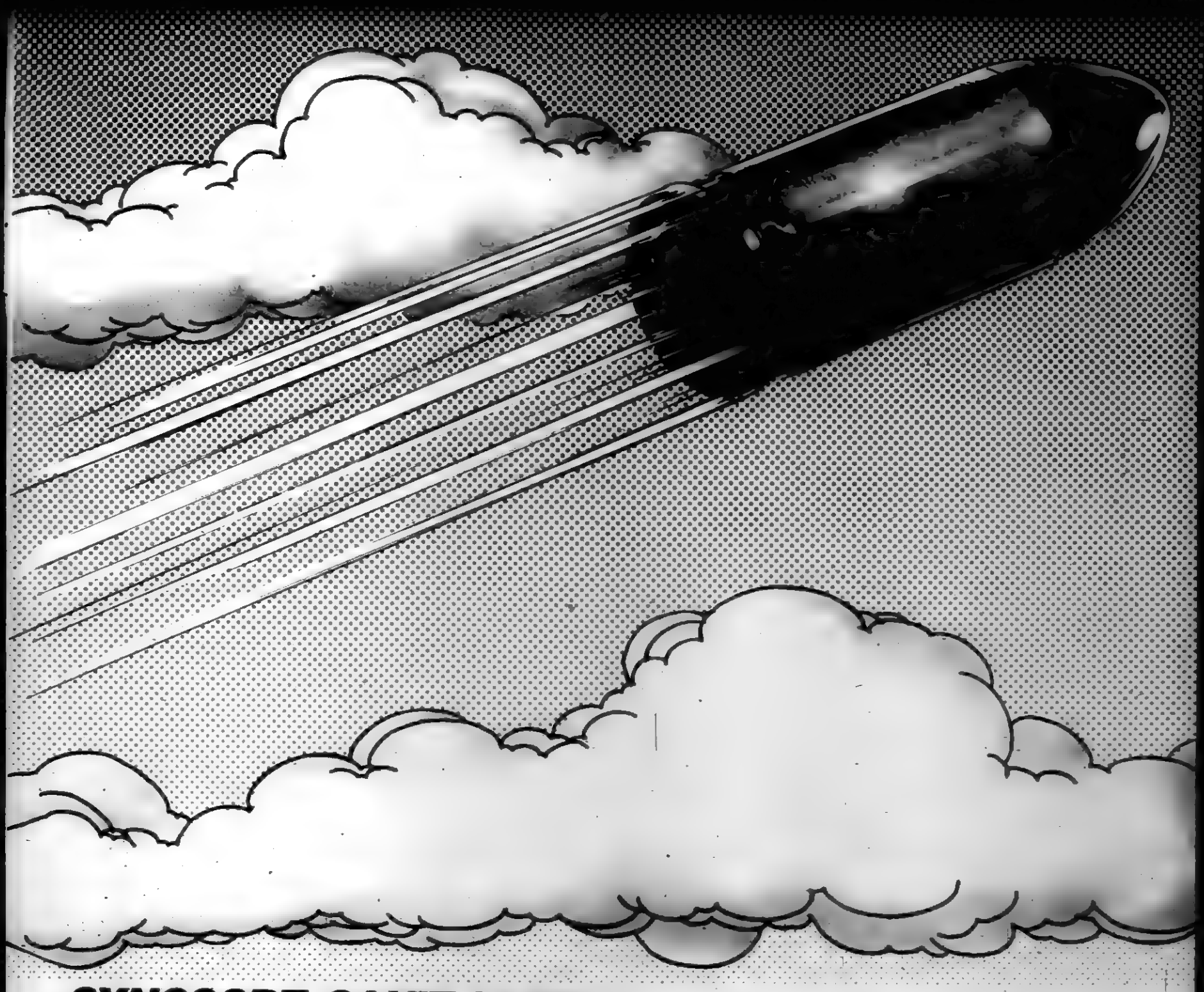
■ **Apple is unveiling four entry-level models** for the home market in the company's first large-scale attempt to sell through the IBM-dominated mass market retail channel. IBM, meanwhile, is rolling out a revamped line of Personal System/1 PCs. **Page 8.**

■ **Hewlett-Packard takes a divide-and-conquer strategy** for marketing the Microsoft Windows and Unix versions of OpenView to different network management niches. **Page 67.** Another division of HP is using gentler methods to convince its 100,000-plus base of Apollo/Domain workstation users to stay inside the fold. **Page 62.**

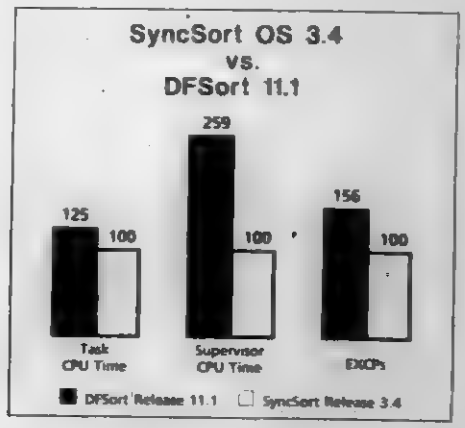
■ **Modeling the behavior of a fire could lead to safer data centers** and improvements in other buildings. **Page 28.**

■ **Legent extends its mainframe offerings** to the desktop. Users follow but not all in a rush. **Page 79.**

■ **On site this week:** Ben & Jerry's supports Deming management processes using videoconferencing technology. **Page 67.** UPS installs one of the largest DB2 databases in the country to confirm delivery of more than 13 million packages each day. **Page 79.** An automated program trading system has enabled market maker Rockrimmon Securities to double its trading volume within the past year. **Page 38**



SYNCSORT CAN'T LEAP TALL BUILDINGS, BUT IT IS FASTER THAN A SPEEDING YOU-KNOW-WHAT.



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CC:Mail yanks Unix desktops onto the net

BY JOANIE M. WEXLER
CW STAFF

MOUNTAIN VIEW, Calif. — User enthusiasm for a Unix version of Lotus Development Corp.'s CC:Mail electronic-mail package, which is slated to roll out today, is in step with industry reports that Unix systems sales are largely outpacing overall hardware growth.

The Unix-based CC:Mail runs on a Sun Microsystems, Inc. Scalable Processor Architecture/Solaris platform with an Open Look interface. Additional versions for Hewlett-Packard Co. and IBM workstations with Motif interfaces should arrive during the first half of 1993, said Atta Rasekhi, product manager of CC:Mail Unix products.

The foray into Unix for traditional personal computer local-area network-based mail packages addresses two trends, said users and analysts: the proliferation of Unix on corporate desktops and corporate efforts to fuse mail packages on all their computing platforms into one interactive messaging backbone.

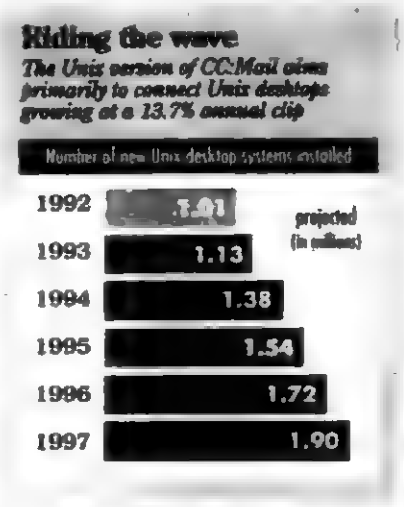
International Data Corp. in Framingham, Mass., has reported that the worldwide Unix systems market grew nearly 19% in 1991 in an overall hardware market that grew just 2%. The firm said Unix desktops made up 79% of the 900,000 Unix-based system shipments last year.

CC:Mail for Unix beta-test site Raychem Corp. in Menlo Park, Calif., for example, is about one year into a project to create a corporatewide "data bus," which will allow users anywhere in the multinational company to access data anywhere, regardless of platform.

Part of the initiative includes E-mail exchange, said Frank Pleshe, network engineer at the conglomerate.

Pleshe and others said the main attraction of the package is that Unix populations gain entry into the messaging network while retaining the look and feel of the operating system in which users are versed.

For example, prior to the Unix beta test, Raychem was able to exchange multiplatform CC:Mail messages through Novell, Inc. NetWare file servers running NetWare NFS software. But SPARCstation users were faced with a DOS interface.



Source: Computer Intelligence/InfoCorp
CW Chart: Janell Genovese

"They were frustrated; they lost a lot of the point-and-click functionality they had with the Sun operating system," Pleshe said.

"You want to keep the interface consistent with the platform" so users can leverage the operating system they are skilled in, agreed Nina Burns, president of market development services at Creative Networks, Inc. in Menlo Park, Calif.

She explained that this ability of CC:Mail is a result of the vendor writing applications specifically for each platform rather than porting DOS-based software to other environments.

CC:Mail shop Southern California Edison in San Clemente, Calif., however, has avoided putting much Unix on its desktops "because they couldn't play in our E-mail environment," said Bill Lawrence, network engineer. But the utility does run myriad Unix server processes that "would run a lot better if errors could be detected and E-mailed to somebody," Lawrence said. "Unix is architected to allow most processes, such as overnight tape backup systems, to communicate via its mail systems."

Rasekhi said CC:Mail will provide this capability in the second half of 1993.

CC:Mail's Unix client will allow Unix communities to exchange mail and mail-enabled documents with CC:Mail users on DOS, Microsoft Corp.'s Windows, Apple Computer, Inc. Macintosh and OS/2 platforms.

"This is a savvy move because when you integrate two [different] mail systems, you lose robust functionality," said Walter Uhrich, a director in the Los Angeles office of Arthur D. Little. Observers said they are not aware of any other LAN mail vendors with Unix clients today.

Oracle conference goers look for proof of change

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Users attending the International Oracle Users Group (IOUG) meeting this week expect to see tangible proof of a reenergized Oracle Corp. through previews of enhanced products and delivery of a concrete shipment schedule for the Oracle 7 relational database.

For all the hoopla that preceded Oracle 7's introduction on June 15, its exact shipment date — expected this fall — may not be as important as Oracle's sticking to any date it promises, analysts said. That is because the 1989 introduction of Oracle 6.0 took a year to play out to more than 80 hardware platforms.

"It will take a while to migrate from Oracle Version 6.0 to Oracle 7, even if users got it today," said Charles Phillips, a vice president at SoundView Financial/Gartner Group, Inc. in Stamford, Conn. "They're going to have to shake it down themselves to make sure it's robust and reliable before putting it into production."

Oracle's financial problems stemmed from 1990, when expenses outstripped revenue at the firm. Oracle reorganized its sales divisions and laid off 500 employees but sustained a $12.4 million loss for the year ending in May 1991. A month later, Oracle won $200 million in new financing from Nippon Steel Corp. and was profitable for the year ending in May 1992.

Oracle also patched up frayed user confidence by addressing quality and support issues in 1991. The fruits of this labor seem to be borne out by users' initial reaction to Version 7 (see story page 96).

New division unveiled

Also at the conference, an estimated 4,000 users will learn of a new North American division of the IOUG. IOUG will be transformed into an umbrella organization for European, North American and Pacific Rim user groups.

"It will reduce the need for the IOUG president to deal with 26 regions throughout the world and with hundreds of local groups," explained Jim Raper, IOUG board member from the Southeast Region.

Many users questioned last week said their major reason for attending IOUG this year was to see previews of a new generation of graphically oriented Oracle tools: SQLForms 4.0, which is reportedly not yet ready for testing; and SQLReportWriter 2.0, a report-creation tool that sources said entered beta testing last month.

The enhanced Oracle tools depend on Toolkit 2.0, a new software layer that supports multimedia applications due for introduction in late 1992 or early 1993. But users are concerned about the amount of memory and system overhead the feature-rich Toolkit 2.0 will require.

Oracle "is extremely proud of its designer interface," said Michael Abbey, chairman of the Affinity group, an advisory group of top Oracle users. "It's like having a Chevrolet that has solid gold doors. You can start it, it's very, very pretty, but if you put it in production, everybody may start twiddling their thumbs while they wait."

Other IOUG show highlights, analysts said, might include information about additions to Oracle's team of top executives, exhibits of massively parallel relational database management systems and a showing of Microsoft Corp.'s Excel spreadsheet acting as a front end to Oracle databases running under Microsoft's Windows New Technology operating platform.

Industry analysts speculated that Oracle founder and Chief Executive Officer Lawrence Ellison may be ready to shed one of his three titles — chairman, president and CEO — to an experienced outsider or to one of his top lieutenants by year's end. Oracle recently hired a number of notable industry executives.

If Ellison takes a half-step back from the helm of the RDBMS market leader he founded 13 years ago, it may be a delayed response to 1990's troubles, analysts said. "He's just going to give these [top] guys more leeway in running the store," said Rick Sherlund, vice president of investment research at Goldman, Sachs & Co., a New York investment house.

Sybase reaffirms SQR support

Attendees at this week's IOUG meeting will learn they can count on continued support for the popular SQR report writer product from an unlikely source — Oracle competitor Sybase, Inc.

Users were upset this summer by rumors claiming that Sybase would halt SQR support for the Oracle database.

But in a letter to more than 700 SQR sites, Sybase promised to continue support for SQR, an independent fourth-generation language product used by Oracle sites worldwide as an alternative to Oracle's SQLReportWriter 1.0. Future SQR support will be discussed at Oracle user meetings this week, said Matt Reagan, president of the SQR user group at IOUG.

Sybase's letter, dated Aug. 17, was obtained by *Computerworld* last week. It reads, in part: "In keeping with its open systems approach, Sybase will continue to sell and support the SQL Solutions [Division] products that interface to non-Sybase databases such as Oracle, Informix, Ingres, [DEC's] Rdb and [Gupta Technology, Inc.'s] SQLBase." It stopped short of promising to enhance SQR for Oracle 7.

Some users said they were told by Sybase personnel last summer that modules for the non-Sybase databases would be downplayed in favor of support for the Sybase relational database management system. The rumors spread among Oracle users shortly after Sybase acquired Cleveland-based SQ Software, Inc., which created SQR.

"The seed may have been a misunderstanding, but it built its own critical mass," Sybase product manager Steve Hershberg confirmed.

Greg Olson, vice president of strategic planning, who wrote the Sybase letter to SQR users, said he plans to enhance SQR for Oracle 7. But he alleged that Oracle canceled the Oracle 6.0 license of Sybase's SQL Solutions Division when the unit was absorbed by Sybase last spring. "That has thrown a monkey wrench into our plans," he said. "We negotiated with Oracle to keep our license until the end of this year."

Sybase executives declined to point fingers at the source of the rumors. Some users claimed that Sybase sales personnel were to blame for informally indicating a bias. "I think there has been a fair amount of concern," said M. J. Kahn, SQR product manager based at Sybase's Burlington, Mass., office. "People felt this black cloud hanging over them."

JEAN S. BOZMAN

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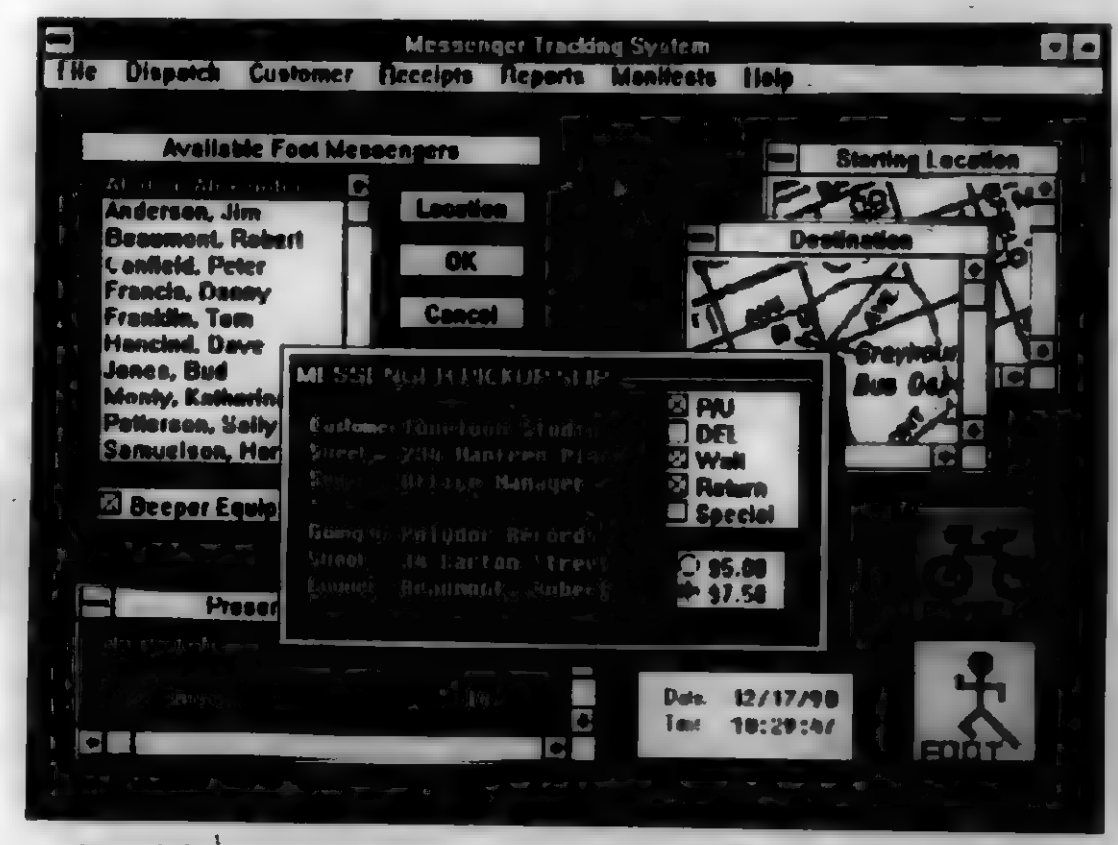

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NEWS SHORTS

Roadway Express nabs SIM award

A series of information systems initiatives that bucked Akron, Ohio-based Roadway Express up to what it claims is the top spot among the nation's less-than-truckload motor carriers has also earned the firm a Society for Information Management (SIM) 1992 Partners in Leadership award. Roadway Express President Michael Wickham and IS Vice President Gerald Long will share honors at SIM's annual conference next month for the likes of E-Z Bill, a personal computer-based shipment data management system given to customers so they can build databases, print shipping documents, transmit bills of lading and calculate freight rates.

Bellcore branches into auditing

Bellcore, the research and development arm of the regional telephone holding companies, last week said it has begun offering technical auditing services directly to network equipment suppliers for Switched Multimegabit Data Service and frame-relay offerings. Previously, Bellcore provided the services for one of its seven phone company owners. Bellcore tests vendor products for compliance with industry standards or Bellcore generic requirements.

DEC expands Polycenter suite

Following two years' development effort, Digital Equipment Corp. and System Center, Inc. brought out products that are said to enable users to manage DEC and IBM networks from either vendor's network management system [CW, Sept. 7]. Announced at last week's European DEC Users Society, DEC's Polycenter SNA Manager Version 1.0 and System Center Solve:Connect for EMA are said to provide peer-to-peer links between DECmcc Director and either IBM's Netview or System Center's Net/Master SNA management system. The products are scheduled for availability by December, DEC said. Polycenter SNA Manager will be priced at around $15,000; Solve:Connect will cost $50,000 for IBM MVS-type systems.

EDS buys stake in software vendor

Electronic Data Systems Corp. has wielded the equity weapon in its campaign to replace Computer Associates International, Inc. mainframe software with other brands [CW, Aug. 3]. The Dallas-based outsourcer has invested $2 million in a small Israeli mainframe firm, 4th Dimension Software Ltd. in Tel Aviv.

Sun wins CBOT bid

The Chicago Board of Trade (CBOT), known for the public auction, "open outcry" market system conducted in its trading pits, settled last week on Sun Microsystems, Inc. SPARCstations and servers as the base for a new technology installation dubbed "Project A." The project will expand trading opportunities for CBOT's 3,600 members by offering new niche trading, such as scrap steel futures contracts, via high-resolution graphical windows opened on the SPARCstation screen.

Fujitsu supercomputer aimed at U.S.

San Jose, Calif.-based Fujitsu America, Inc. said last week that it would market a brand-new Fujitsu Ltd. supercomputer. The VPP500 offers 11.2 billion floating-point operations per second (GFLOPS) to 355 GFLOPS of performance for prices ranging from $9.5 million to $120 million. It will be available in September 1993.

Short takes

Texas Instruments, Inc. plans to unveil today Business Design Facility, a business re-engineering workbench. . . . **Visa U.S.A., Intuit** in Menlo Park, Calif., and Primerica Corp.'s **Primerica Bank** announced IntelliCharge, a service that gives consumers PC-based tracking of their credit card spending. . . . **Dell Computer Corp.** has taken up the pruning shears yet again, snipping $100 off the prices of its 486D/25 and 486P/25 systems. Pricing now ranges from $1,899 to $2,499 for the models.

More news shorts on page 16

Utilities partner way to IS power

BY NELL MARGOLIS
CW STAFF

HARTFORD, Conn. — Two regional power suppliers last week added their names to the growing list of utilities relying on information technology to stay their bottom lines while spreading their customer services.

Nine months into a sweeping migration to a client/server-based automated customer information system, Connecticut Natural Gas Corp. paused to formally confirm Chicago-based Andersen Consulting as its software vendor and systems integrator of choice.

Neither company was willing to divulge the contract price, but a Connecticut Natural Gas executive estimated the overall project cost at $10 million to $15 million.

Meanwhile, in Spokane, Washington Water Power Co. outsourced its 45-person IS operations to Dallas-based Electronic Data Systems Corp. The utility signed on for 10 years' worth of data processing, application development, system maintenance and system center support from the outsourcer.

Washington Water provides water, gas and electricity to an aggregate 418,000 customers in Washington, Oregon and Idaho.

Terms of the deal were not disclosed. However, Merrill Lynch & Co. analyst Stephen T. McClellan placed the contract among several that EDS will announce in the next few days, "all in the $50 million to $100 million ballpark."

All 45 members of the Washington Water IS crew were offered jobs at EDS, according to Washington Water spokesman Patrick Lynch; all but one, he added, have accepted. Former Washington Water IS manager Tony Broyles will remain at the utility, where he will head up a new seven-person IS oversight department and "will manage the EDS relationship," Lynch added.

Technology catch-22

Utility companies are struggling under common — and crippling — constraints, noted both Lynch and Connecticut Natural Gas information services director Russell Leavitt Jr. Since information technology lies at the heart of their ability to serve customers, the utilities were early to automate. That means that today, most are stuck with albatross-like "legacy" systems that cost the moon to keep up and more to replace.

Washington Water opted for outsourcing when the prospect of "upgrading and the replacement cost of our mainframe — a basically obsolete IBM model — sent shivers down our spine," Lynch said.

The same bind that sent Washington Water's IS group in search of an outside contractor turned Connecticut Natural Gas' sights inward, triggering a several-year trek from a Unisys Corp. mainframe-based customer information system to a split mainframe/client/server approach featuring customized host-based Andersen software and IBM workstations, Leavitt said.

The project is expected to go live in stages between February and October 1993. Andersen will install, integrate and customize to Connecticut Natural Gas' particular demands the powers of two utility-specific Andersen applications.

These include Customer/1, a customer information system that supports all customer contact and billing jobs and is being tailored to incorporate new marketing and meter/equipment inventory subsystems for Connecticut Natural Gas; and Work/1, a project management package that automates tasks such as standards-based estimating, field reporting, capacity-based scheduling and leak management.

Part of Andersen's challenge as systems integrator for the ambitious project will be a first: tightly integrating the two packages to share a DB2 database and provide users throughout Connecticut Natural Gas with common views of all information. The plum contract was won over bids from contenders, including IBM and Price Waterhouse.

The gas company is expecting to mine rich rewards from its investment by way of tightened financial controls and expanded service offerings, Leavitt said.

Windows for Workgroups in use at beta-test sites

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp. has announced that Windows for Workgroups, its peer-to-peer network-enabled version of the Windows environment, has entered beta testing at 8,000 sites.

Windows for Workgroups reportedly enables users to connect Windows workstations into a peer-to-peer network that allows file and printer sharing without the need for a separate network operating system. The product will also ship with versions of Microsoft Mail electronic mail and Schedule+ group scheduling software.

One beta-test user, who asked to remain anonymous, said the product could greatly increase the acceptance of network and workgroup computing.

He indicated two examples of where the product fit easily, one being a department that needed networking but was waiting for security clearance to join the corporate network. The other was an office with a few personal computers but even fewer printers. Windows for Workgroups would be an answer in both situations, he said.

The user also indicated that Microsoft may sweeten the deal for users new to networking by bundling a network card with the software. He said the transition to Windows for Workgroups is "almost completely transparent," requiring only knowledge of network versions of the File Manager, Dynamic Data Exchange and the Clipboard.

He noted a small network of three nodes could easily be set up in a of couple hours, including installing the cards and running cable.

However, the product is not groupware per se. The user indicated that Windows for Workgroups is not going to compete with such products as Lotus Development Corp.'s Notes. Instead, he compared its use with an Apple Computer, Inc. Macintosh's peer networking capabilities but said it was better. "They're doing everything that Apple did wrong, right."

Windows for Workgroups is scheduled to ship by the first quarter of next year.

CORRECTIONS

Because of a reporting error, the ship date for the IBM Application System/400 Model E95 four-way processor was listed incorrectly in "AS/400 users zero in on pricing" [CW, Sept. 7]. IBM plans to ship the machine this month.

The article "DEC covers client/server bases," [CW, June 15] quoted a customer stating that Interconnections, Inc.'s NetWare for VMS does not allow VAX users to access printers on the personal computer local-area network. NetWare for VMS is part of a family called Leverage for NetWare. It can be integrated with another member of the family, Network Print Services, which allows VAX users to print files on NetWare printers, Interconnections said.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

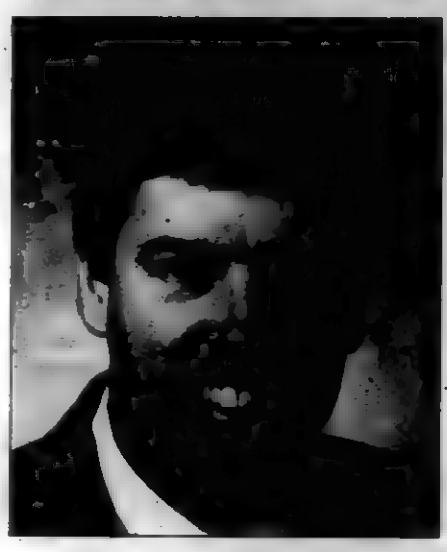
Larry Ellison
President and CEO
Oracle Corporation

"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.



The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision making by making access to information easier. . . much easier.

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IBM muscles PC pricing down

But new PS/1s, impending ValuePoint line could eat into PS/2 sales

BY CAROL HILDEBRAND
CW STAFF

NEW YORK — IBM Personal Computer Co.'s unleashing of a fully revamped Personal System/1 line has some analysts predicting that the PS/2 line will lose sales to its mass market sibling, but most forecast that the real product line overlap will come with the advent of the ValuePoint line.

The new PS/1s are divided into three different lines, each targeted at a particular segment of mass merchandisers and each containing different bundled software that IBM said targeted the type of customer that frequents each kind of store.

There were no suggested retail prices, although IBM said pricing would probably range from $1,100 to $2,800 and that retailing competition could drive prices lower.

Robert Corrigan, president of IBM Personal Computer, said some cannibalization between IBM's new and existing products was possible, but he would rather see it staying among IBM families than moving toward a competitor.

"It would have happened anyway, but before, they would have moved to somebody else's product," he said. "Now we'll have an offering in all places."

Analysts called the PS/1 pricing very competitive, particularly in light of its standard configuration (see chart). "I didn't expect anything close to this," said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

Corporate appeal

Some analysts said there could be corporate interest in the lines, which are expandable and sport Intel Corp. 486DX-based models, if they follow the example of Compaq Computer Corp.'s ProLinea series. But, most said the true cannibalization of the PS/2 line will come at the end of next month, when IBM said it will announce its low-cost ValuePoint line, the midrange line in IBM's three-family strategy.

"When you're really going to see cannibalization is [during delivery of the ValuePoint line] coming in October," Forrester Research, Inc. analyst William Bluestein said. "Obviously, the most critical market is the corporate market, and it remains to be seen whether they can get their prices down for that."

However, Karlyn Gale, an analyst at Technology Investment Strategies Corp., said she could see this line appealing to midsize corporations as well as to its planned targets, the small businesses and home users.

According to Corrigan, it is a matter of time before the company starts a direct response, or direct mail, campaign, reportedly for its forthcoming ValuePoint line.

Jerry Jobin, an analyst at Loyola University in Chicago, is one PC buyer who sometimes frequents superstores. But, he said, the PS/1 is not on the university's accepted list of standards, so he doubted he would purchase one.

"I haven't looked at PS/1s at all. But I'm sure if I see it in Sears, etc., I'll stop by and fiddle with it."

IBM's PS/1 onslaught is divided into these lines:

- **PS/1 Essential.** Targeted at small-business owners who typically shop at office supply stores, the Essential is available at Office Depot, Inc., Office Max and Staples, Inc. The bonus software includes accounting package QuickBooks and Express Publisher.
- **PS/1 Expert.** Sold through superstores such as Computer City, ElecTek and BizMart, Inc., the Expert line is aimed at a fairly computer-savvy user. Added software includes Address Book Plus and Calendar Creator Plus.
- **PS/1 Consultant.** For the home user who shops at stores such as Sears, Roebuck and Co., Montgomery Ward & Co. and Circuit City Stores, Inc., the Consultant line is sold with financial management package Quicken for Windows and the New Print Shop.

Analysts differed on the question of whether IBM has segmented the market too severely.

"I believe IBM is correct on the segmenting. They may have a crossover, but you do not have the same kind of customer shopping at those kinds of stores," said JoeAnn Stahel, president of Stahel & Co. in Plano, Texas.

But Sy Merrin, editor of "The Channelmarker Letter" newsletter in Palo Alto, Calif., disagreed. "One of the things IBM is trying to do which will not be successful is trying to force segmentation on dealers that doesn't work," he said.

Head to head

IBM and Compaq are both looking to appeal to small businesses and home users

	Compaq ProLinea	IBM PS/1
CPU	25 MHz 386SX	25 MHz 386SX
RAM	2M bytes	2M bytes
Drive	40M bytes	85M bytes
Mouse	Yes	Yes
Modem	No	Internal 2,400 bit/sec.
Software	DOS 5.0 Windows 3.1 PFS: Windowsworks	DOS 5.0 Windows 3.1 Works for Windows Prodigy Prodenade Address book
Monitor	No	No
Price:	$899	Set by retailer

CW Chart: Janell Genovese

Apple fights clones with low-end Macintoshes

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will launch the first shot in a two-punch fall Macintosh product introduction cycle today when it unveils four entry-level models that it hopes will sell briskly to the home market.

The four-member Performa series includes the first Macintosh with a preinstalled compact disc/read-only memory (CD-ROM) drive as well as the company's first large-scale attempt to sell through the mass market retail channel now ruled by IBM-compatible personal computers.

The Performa 200, 400, 600 and 600 CD will be sold at 1,800 outlets, such as Sears, Roebuck and Co., Office Max, Silo, Inc. and Office Depot, Inc., although the two high-end models will not be on the shelves until next month.

Close to home

Apple Vice President Keith Fox said the machines will generally not be available in the business-oriented computer stores such as Businessland, Inc. and Computerland Corp. because they are targeted at home buyers.

Given the target audience, Apple is including a year's worth of service and support as well as preinstalling integrated applications such as Claris Corp.'s Clarisworks or Symantec Corp.'s Greatworks.

An enhanced System 7 operating system that will be offered with the series includes additions that make the launching, navigation and backup of applications easier. Even window dressing such as making the machines boot up in color will be included. "Usually when people see the machine boot up in black and white, that's the first call to the support lines," Fox said.

Although the machines are specifically targeted at first-time buyers for the home, their low price might make them attractive to corporate IS buyers as well. But their lack of expandability in comparison to higher end Macintoshes may make the price issue relatively unimportant.

"Besides, we already get massive discounts when we buy directly from Apple, so we don't need to jump in the car and drive down to Sears to get a good price," said Rob McPhee, development engineer at the DuPont Imaging Systems Department of Du Pont Co. in Wilmington, Del.

Analysts said they thought Apple had a good chance of succeeding in the same lucrative mass market chains where IBM-compatible machines are now thriving.

"The key to these machines is the channels they will be sold through," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

The Performa models are essentially redesigned versions of the Macintosh Classic II, the LC II and the Macintosh IISI. On Oct. 19, the vintage IICI and IISI will be replaced, respectively, with the 16-MHz 68030-based Macintosh IIVI, which is expected to sell for about $2,300, and the 33-MHz Macintosh IIVX, which will offer an optional internal CD-ROM drive and sell for about $2,800.

Apple will also release two new PowerBooks on that date: the high-end 33-MHz Model 180 and the 25-MHz Model 160. Both are expected to sell for between $2,100 and $2,600.

Apple estimates the machines could pique the interest of as many as 7 million potential new buyers.

Sliced apple

The Macintosh Performa line is aimed at price-sensitive users

	200	400	600
Processor	68030	68030	68030
Memory	4M bytes	4M bytes	4M/5M* bytes
Slots	None	1 PDS	3 Nubus
Mass storage	3 1/2-inch, 1.44M-byte floppy, 80M-byte hard drive	3 1/2-inch, 1.44M-byte floppy, 80M-byte hard drive	3 1/2-inch, 1.44M-byte floppy, 160M-byte hard drive, optional CD-ROM
Expected list price	$1,250	$1,450	$2,000 ($500 optional CD)
Availability	Now	Now	October

*For use with CD-ROM

CW Chart: Michael Siggins

Apple trims fighting weight

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week closed an assembly plant in Fremont, Calif., and said it will eliminate roughly 345 jobs — or 2.5% of the 14,000-member work force — as part of a broad-based consolidation of its worldwide manufacturing and distribution activities.

The realignments are a by-product of a highly competitive IBM-compatible clone market that has seen the price of personal computers plummet dramatically during the past 18 months.

Apple Chairman John Sculley has continually vowed commitment to a cost structure that will allow the company's products to stay competitive and affordable.

During the past 18 months, he has changed the company's business strategy from one of selling expensive machines with high-profit margins to one of pushing high volumes of low-cost Macintoshes.

Company officials said they are closing the 700-employee Fremont plant to consolidate final assembly, testing, customization and distribution at a new distribution center in Sacramento, Calif.

Additional jobs will be lost at Apple's Cork, Ireland, manufacturing site.

An Apple spokeswoman said there are no final estimates on how much the consolidations will save the company. However, Apple will record a charge against earnings of about $20 million before taxes in its current fiscal quarter for expenses related to the realignment.

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("", "",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code != FAIL)
  {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
          remove_xact(dbproc_commit, commid, 1);
      }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL)
  {
      remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.O. McGoveran and C.J. Date: *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 498, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE  SAVINGS
SET     S_BALANCE = S_BALANCE - 250.00
WHERE   S_DEPOSITOR = 'JONES'
UPDATE  CHECKING
SET     C_BALANCE = C_BALANCE + 250.00
WHERE   C_DEPOSITOR = 'JONES'

COMMIT  WORK;
```

Early Client/Server RDBMS products, like Sybase, don't automatically assure the consistency of distributed transactions. When related data on multiple servers must be updated by one transaction, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications.

ORACLE7™, the Cooperative Server RDBMS, automatically processes distributed transactions, with NO SPECIAL CODE. With ORACLE7, all it takes to update multiple servers is the same simple SQL you would use for a single-server update. ORACLE7 lets applications programmers concentrate on solving business problems rather than computer problems.

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House damns Justice in Inslaw affair

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A congressional report capping a three-year investigation last week said the U.S. Department of Justice stole software from Inslaw, Inc. and attempted to drive the firm into bankruptcy.

The report also charged former Attorneys General Edwin Meese III and Richard Thornburgh with blocking inquiries into the matter and ignoring the findings of two courts that had ruled in the tiny company's favor.

The report from the House Judiciary Committee said Meese has consistently denied any knowledge of Inslaw or of its contract to provide law enforcement case-tracking software to the department. However, the committee report revealed sworn testimony from former Deputy Attorney General Lowell Jensen that he had "briefed Mr. Meese regularly on the issue and that Mr. Meese was very interested in the details of the contract and negotiations."

The committee also said former Deputy Attorney General Arnold Burns testified under oath that he had been advised in 1986 by Justice Department attorneys that Inslaw's claims were valid and that they would be upheld in court.

'An abuse of power'

"It is incredible that the department, having made this determination, would continue to pursue its litigation of these matters," the committee wrote. "This clearly raises the specter that the department's actions taken against Inslaw ... represent an abuse of power of shameful proportions."

The former Justice Department officials could not be reached for comment.

Besides recommending appointment of an independent counsel, the committee also said the Justice Department should immediately compensate Inslaw for the agency's "continued unauthorized use" of Inslaw's software and for legal fees.

Inslaw President William Hamilton said he doubted whether the investigator will be appointed.

Among the matters the committee said the counsel should probe is the mysterious death of free-lance writer Danny Casolaro, who was found in a West Virginia hotel room last year with his wrists slit. He had been gathering material for a book about alleged corruption in the Justice Department. The report listed a number of flaws in the investigation by local authorities, who ruled the death a suicide.

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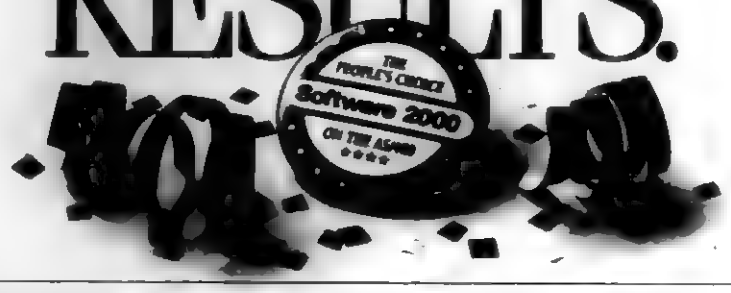

SOFTWARE 2000 TOPS POLLING FOR POPULARITY, QUALITY, AND GROWTH

The people have spoken. In the 1992 AS/400 Software Market Survey by Sentry Market Research, Software 2000's Accounting and Human Resources/Payroll systems took the winning position in the "installed" category.

1992 SENTRY SURVEY
#1 Choice for Accounting:
SOFTWARE 2000

But this isn't just a popularity contest. There's a solid reason why businesses choose Software 2000 — they deliver. In addition, Software 2000 was awarded the software industry's highest award, the ITAA Quality Award, establishing the company as an industry leader in quality.

That helps to explain why Software 2000 has been at the forefront in helping more than 150 mainframe sites rightsize their operations: implementing mainframe-power applications on efficient, new AS/400's. This growing customer commitment has resulted in four consecutive annual appearances for Software 2000 on the Inc. 500 list of the fastest growing private American companies. It also has resulted in Software 2000's expanded product portfolio, now serving customers in the distribution, process manufacturing, and multinational marketplace.

ITAA Quality Award

1992 SENTRY SURVEY
#1 Choice for Human Resources/Payroll:
SOFTWARE 2000

Popularity, quality, and growth: that's what you expect of a leader, and that's what you get with Software 2000.

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Lotus ships Notes imager

BY ELLIS BOOKER
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. will begin shipping its long-awaited document imaging companion product for Notes today.

Lotus Notes: Document Imaging (LNDI) is the result of a joint development agreement signed last April by Lotus and Eastman Kodak Co. Originally slated for June shipment, the product is the first of three complementary products for the Notes groupware platform due out this year.

The product, pronounced "lindy," allows users to capture, manipulate, store and display documents and other images as part of their Notes databases.

LNDI offers two ways to store and access images. Image files can be stored on a dedicated server — called a mass storage system — and linked to Notes databases using the Dynamic Data Exchange feature of Windows. Or images can be "embedded" directly into a Notes database. A dedicated server is recommended for Notes applications dealing with larger volumes of images.

New features

The next two Notes companion products will offer an optical character recognition server and inbound facsimile services. These companion products will be provided, respectively, by Calera Recognition Systems, Inc. and GammaLink, both in Sunnyvale, Calif., and are expected within a month.

At least one early user is pleased with the price, if not the results, of the offering. "Our experience with the imaging part has been very positive," said Sally Jennings, a Texaco, Inc. staff engineer who has been working with a test version of the product since April.

Texaco hopes to use LNDI to provide plantwide access to material safety documents. However, the LNDI purchase has not been approved yet, Jennings said.

For Jennings, one of the most attractive features of the system is its price — approximately $295 per seat. "We've done our shopping with other imaging vendors ... and this is considerably cheaper," Jennings said.

For now, LNDI runs off an OS/2 server and supports Microsoft Corp. Windows clients.

The Solution Series:

September 17
Parsippany, NJ
New York, NY
Quebec City, PQ

September 22
Sacramento, CA
Little Rock, AR

September 23
Syracuse, NY
Roanoake, VA
Grand Rapids, MI

October 2
Piscataway, NY

October 6
Philadelphia, PA

October 8
Houston, TX
Milwaukee, WI

October 13
Long Island, NY
Bethesda, MD
Portland, OR

October 14
Costa Mesa, CA
Atlanta, GA
Denver, CO

October 15
Hartford, CT

October 20
Lansing, MI
San Ramon, CA

October 21
St. Louis, MO

October 22
Greenville, SC

October 27
New York, NY

November 5
Dayton, OH
Bedford, NH
Baltimore, MD

November 10
Washington, D.C.
Ottawa, ON

November 11
West Orange, NJ

November 12
Coral Gables, FL

November 18
Pittsburgh, PA
Chicago, IL

November 24
Buffalo, NY

Cross Platform Seminars

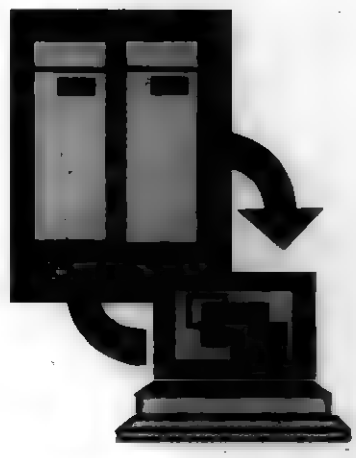
September 18
New York, NY

September 29
Providence, RI

October 15
Atlanta, GA

October 16
Hartford, CT

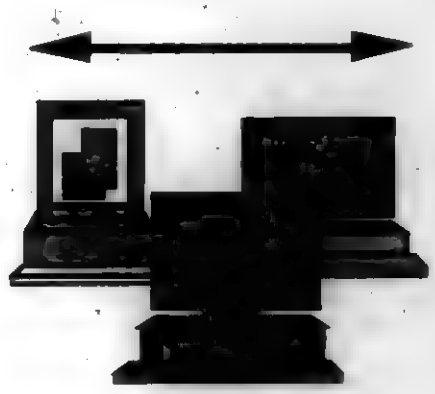
November 12
West Orange, NJ



Offloading Mainframe Development and Maintenance

PC Programming

Client/Server Computing



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IBM to unveil slew of PC LAN products

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM is expected to shore up its position in the personal computer local-area network market this week with a barrage of LAN management, internetworking, frame-relay and client/server introductions, several sources said.

The introductions are expected to be the first in a series of announcements that will greatly improve the ability of IBM customers to integrate their disparate LAN installations with existing IBM equipment.

Of particular interest to users will be new LAN and frame-relay capabilities for the IBM 3745, which will finally let users support high-speed LAN traffic over their existing Systems Network Architecture backbones, analysts said.

IBM is expected to meet the above user needs this week by announcing frame-relay switching capabilities for the 3745, as well as an add-on frame for high-end 3745 models that will support Escon and up to eight Token Ring attachments.

Complementing the above will be a frame-relay card for Personal System/2 workstations running OS/2. Priced at less than $1,000, it is said to enable users to send data from a LAN out over a frame-relay link.

IBM is also expected to play catch-up with seasoned players in the LAN hardware arena with the following announcements, according to analysts briefed by the vendor last week:

- An agreement under which IBM will private-label Chipcom Corp.'s intelligent LAN hubs and a statement of direction to merge IBM's Token Ring card with Chipcom's per-port switching capability.
- 4/16M bit/sec. Token Ring cards supporting at least 30% better throughput than IBM's current offerings and aimed directly at Madge Networks, Inc.
- The first IBM-manufactured Ethernet cards, expected to be priced at less than $300. The cards will support IBM PC ATs and PS/2s.

Other products expected:

- A new AIX Netview/6000 version that supports the Open Software Foundation's Consolidated Management Application Programming Interface.
- A Netview/6000 application featuring built-in intelligence to automate system management tasks such as correlating alerts from multiple devices.
- A new version of IBM's CICS OS/2 client/server program that will enable an OS/2 workstation to send out a single request for data from multiple CICS hosts.
- An open framework that is said to facilitate the integration of different vendors' SNMP Management Information Bases on the same SNMP network management system.
- Netview applications, including an upgraded Netview Distribution Manager.

Retailer nears end of huge IS overhaul

CONTINUED FROM PAGE 1

facility will be "primarily an office," rather than a data center environment, Dratch said.

Some 140 operations personnel garnered from the four data centers will manage and monitor the centers remotely on personal computers linked by a Token Ring local-area network and IBM Systems Network Architecture backbone, according to Dratch.

JC Penney expects to get "most of the economies of scale of a large data center, and at the same time, the backup and disaster-recovery characteristics of multiple data centers," through lights-out operations, Evans said. "A lot of good technology in hardware, [drive] robotics, data communications and automation software is permitting us to enter into this phase."

The move is expected to eliminate 300 management and non-management positions from JC Penney's IS staff, which currently numbers 1,500. The company said it expects to make some of the cuts through attrition and to find work for some displaced staff members in other parts of the organization.

The restructuring will not result in any cutbacks of data processing facilities, Evans emphasized. Indeed, JC Penney increased its total million instructions per second capacity by 25% in the last few months, by trading up a group of IBM 3090 and Amdahl Corp. 1400 mainframes for higher end models, he said.

Healthy growth

Indeed, aggressive fat-trimming and cost-containment have helped JC Penney recover from a grim fiscal 1991, according to David Poneman, a research analyst at New York investment company Sanford C. Bernstein (see chart). Profits were up 70% in first quarter 1992 and 200% in second quarter 1992 compared with last year's figures, Poneman added. One big factor was "a very effective marketing program this year;" another was tight controls that have kept cost growth at JC Penney close to zero this year, excluding advertising, Poneman said.

The data center restructuring comes on the heels of a corporate restructuring, "with some job losses," announced late last year, Poneman said.

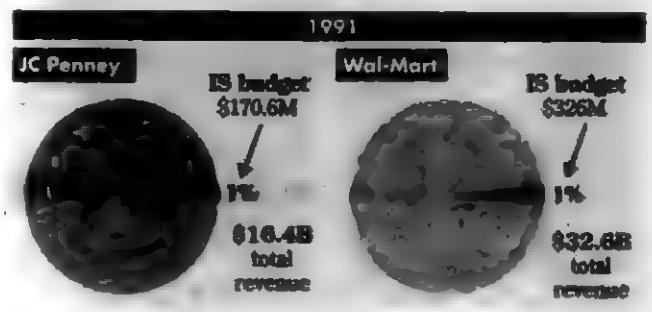
Most of the routine work of maintaining and managing systems operations at the center will be handled by Legent Corp. systems automation software, such as the company's Automate product line, Dratch said. "They have a product that is rules-based and permits automation to be put under the covers — so you can operate the computers with them managing themselves," he added.

The software was chosen after almost a year of testing partly because it supports JC Penney's IBM MVS, VM and Application System/400 computers, as well as Amdahl Corp. and Tandem Computers, Inc. computers, Dratch said.

A related initiative, which IS embarked on at the beginning of this year, aims at implementing a "quality management process in our organization," Dratch said. The process targets issues such as time management and involves "re-engineering how we do our jobs to improve effectiveness and efficiencies in delivering quality output."

More bang for the buck

JC Penney and Wal-Mart spend the same percentage of revenues on IS, but Wal-Mart has made better use of computers to boost its sales, analysts say



CW Chart: Stephanie Faucher

Retailer revamps

JC Penney's push toward lights-out data center operations is just the latest in a series of downsizing, cost-cutting and budget-trimming maneuvers that retailers are practicing to survive in the '90s.

Indeed, JC Penney's restructuring follows close on the heels of Sears, Roebuck and Co.'s decision to outsource its information systems and networking operations to Advantis, the recently formed outsourcing company that Sears will hold jointly with IBM [CW, Aug. 24].

"It's not a sign of weakness; it's just the way the industry is," said David Poneman, a research analyst at Sanford C. Bernstein in New York.

Both Sears and JC Penney have had their profits chomped by feisty mark-down merchants such as Wal-Mart Stores, Inc. and Kmart Corp. And a major competitive edge the latter two firms enjoy is their ability to "tie technology to turnover" through applications such as just-in-time inventory and retail networking, said Howard Anderson, president of The Yankee Group, a Boston-based research firm.

Both Sears and JC Penney wield powerful corporatewide data networks and heavy-metal IBM data centers. But "a mainframe is a $14 million or $22 million liability. It's not an asset until I figure how to use it to run my firm better or increase inventory turns from 12 [turns] to 15 per year," Anderson said.

ELISABETH HORWITT

Southwestern Bell nets JC Penney HQ

BY ELISABETH HORWITT
CW STAFF

DALLAS — JC Penney Co. troweled in yet another crucial piece of its computing strategy for the 1990s last week when it announced its choice of Southwestern Bell to implement the networking infrastructure for its brand-new headquarters here.

Competing against the likes of AT&T, GTE Corp. and IBM, Southwestern Bell won an $11.2 million contract to install the wiring, routers, hubs and switches that will support JC Penney's voice, data and video needs "well into the next millennium," said Marty Holder, an information systems project manager at the retail firm. "Southwestern Bell's was the most comprehensive, the most technically compliant and cost-effective solution. Their being local to the community was attractive also."

A key component of the installation will be cabling that brings unshielded twisted-pair, shielded twisted-pair and fiber to every office in the building, Holder said. "We required a single information outlet so that each office, workplace and conference room" has access to the same networking resources, he added. The custom-spun cabling was manufactured by Siecor Corp.

Currently, videoconferencing is one of the few applications at JC Penney that requires the high bandwidth of fiber, Holder said. However, the company expects to need the bandwidth as time goes on, he added.

The company specified Cisco Systems, Inc. routers to support a mixture of IBM Systems Network Architecture traffic and local-area network traffic such as Transmission Control Protocol/Internet Protocol, Holder said.

Headquarters is in the unusual position of straddling the turf of Southwestern Bell and independent telephone company GTE, Holder said. JC Penney took advantage of the situation by using Southwestern Bell facilities to back up GTE, he said.

GTE, the primary local carrier, will provide Integrated Services Digital Network (ISDN) Primary Rate Interface voice lines from headquarters out to long-distance carriers, Holder said.

While JC Penney has been a test site for ISDN, this is its first commercial implementation. Again, JC Penney expects the technology to take it well into the next millennium — as soon as carriers begin deploying it more widely, Holder said.

In addition, the firm has set up two master communication rooms, both on-line and hot, so at least half of the building will remain on-line even in the case of a massive network or computer failure, Holder said.

"THE TASK IS TO INTEGRATE THE OLD AND THE NEW"
To a great extent, the day of the bulldozer is over.
Buildings, like the historic St. Louis Union Station, are saved. And made even more valuable by putting them to new uses. Architects call it "adaptive re-use."
There are parallels in computing. Mainframes are saved. And made even more valuable by becoming part of the on-line enterprise. Software architects call it "mainframe integration."
There is one software architecture that is designed to integrate the old and the new: Sybase.
Sybase integrates any CICS application and data source—IMS, VSAM, DB2 and more—into an advanced client/server computing environment. The mainframe becomes a high performance server in a network of PCs, workstations and minicomputers.
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Telco inertia can imperil network use

BY JOANIE M. WEXLER
CW STAFF

OXFORD, N.C. — Companies taking responsibility for their own network destinies should be careful when changing carriers not to disconnect one network service before another is turned on. Otherwise, they could wind up with dead networks while multiple carriers dredge through the paperwork and hookups needed to coordinate service.

Carolina Steel Corp.'s Concrete Division learned this the hard way last week when its efforts to shift a dedicated 56K bit/sec. service off of MCI Communications Co. lines and onto Advanced Telecommunications Corp.'s (ATC) network ran amok, leaving the firm with no network while a new service order is being implemented.

"We haven't figured out what it will cost, but we're losing a lot of time having to hand-carry information, call other sites to find out what's going on and wait to key in purchasing and receiving information" to remote computers, said Victor Wong, MIS manager. For pricing reasons, Carolina Steel decided to switch from MCI to ATC for the long-haul portion of its 56K bit/sec. service between headquarters here and a Colfax, N.C., manufacturing and sales estimating site about 100 miles away, Wong said.

New order

The new scenario involved disconnecting the MCI service and ATC contracting with two local carriers at each end of the trip: regulated Southern Bell and independent Carolina Telephone. The original order didn't account for Carolina Telephone's involvement — a customer error — and the service orders had to be reissued.

This resulted in MCI service being turned off with the new service not yet up. MCI was willing to reconnect in a couple of hours, Wong said, but Southern Bell could not commit to service sooner than two to three weeks, saying it needed to start processing the order all over again, Wong said.

While Wong acknowledged that the problems were in part self-inflicted, he expressed frustration with the regulated local phone companies' seeming inability to respond quickly.

"There is too much red tape and a lot of union influence in the telecommunications industry, and the local exchange carriers are inflexible because of this," Wong said. "Without competition in the local loop, they don't have to provide good service."

Carolina Telephone, as an independent, was able to work quickly with MCI to get the circuit back up, but Southern Bell was bound to an official procedure. However, a Southern Bell spokesman said the company is working feverishly to expedite the service.

Wong made the original decision to switch long-distance carriers because MCI's monthly quote of $900 for the circuit showed up as $1,500 on Carolina Steel's telecommunications bill. When Wong discovered the discrepancy on its first bill after four months of service, MCI explained that "the local phone companies had increased their tariffs, and MCI had to pass those costs on to us. But they never told us before the fact," Wong said.

ATC quoted the same service at under $800, Wong said.

IBM to users: 'It'll cost you'

CONTINUED FROM PAGE 1

"Sooner or later, it had to stop, and it's stopping."

He said that although he still has access to the full range of technical support services, the process is now "more reactionary; they respond to problems instead of coming on-site and constantly looking at things and monitoring to make sure nothing happens." Still, Dean said, "I haven't had or heard of any major problems."

Others are more upset. David Brantingham, director of computer operations and technical services at Western Publishing Co. in Racine, Wis., said he has had to change his in-house hiring plans. "Where I had originally intended to be supported by IBM, now I have to look for more technical staff than before."

He added that the telephone support line is sometimes not sufficient. "Occasionally, with very technical problems, you need to have someone come in and show you how to work through it."

Another customer at a large bank in New York said, "There has been a noticeable change in the level of support. Our DB2 and VM experts were taken away, and we're fighting to get them back because we don't have the in-house people to support these systems."

The change in IBM support has become increasingly evident to customers within the past year — largely because of IBM's downsizing. By year's end, IBM will have about 300,000 employees, in contrast to last year's 344,400 [CW, Aug. 3].

The right direction

Marty Clague, general manager of consulting, software and services at IBM U.S., said the move from permanent, not-for-charge support technicians at major customer sites has been under way for roughly three years. He maintained that telephone support and pooled experts are actually better for customers.

"Rather than having someone show up and wait for something to happen, customers are able to pick and choose what services they want," Clague said. Users can also specify exactly what kind of technical support they want and in which areas. This also allows IBM to keep hardware prices low, he added.

Telephone help lines have been set up so that the experts who answer customers' calls on a particular question are the ones who did the development work. DB2 experts are in California, and OS/2 and AIX specialists are in Boca Raton, Fla. When customers call in, the experts check a database to see if the problem has already been called in and solved. If not, the expert recreates the problem and then attempts to fix it over the phone.

"It's just a better arrangement all around," Clague said. IBM trading-area managers have the authority to decide which technicians work "for free or for fee," he said. "We will sometimes provide free talent for a specific thing."

Some customers, even those who have had their on-site IBM technicians redeployed, agreed it will be better for both customers and IBM in the long term. James Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va., said, "I lost an RS/6000 expert because someone else was willing to pay the hourly rate. Sure, it bothers me, but if this is what it takes for IBM to get their costs down and allow them to succeed, I'm for it."

John Wood, vice president of computers and network services at the Royal Bank of Canada in Toronto, said that although the number of free IBM technicians at his site has shrunk from 36 to 10, "it has had no impact on service. We still have access to whoever we need, and it's better for us because we pay for only those services we choose."

Another reason it may be beneficial for customers, users said, is because it frees them to select non-IBM hardware to a greater degree than before. Without the on-site technicians, Matsey said, "I'm less tied to IBM. It's not really a problem."

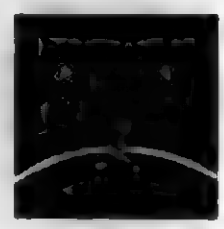
Clague added, "Some customers like it, others don't. But they all want the lowest price, and we're willing to do that — but we're not willing to include 10 people in that price."

Buyer beware rules network services

AT&T accused of $1.4 million overcharge

BY JOANIE M. WEXLER
CW STAFF

A complaint filed recently with the Federal Communications Commission on behalf of five large corporations allegedly overcharged for AT&T network services may prompt users to reexamine the lines of demarcation between the responsibilities of corporate telecommunications managers and network carriers.



Auditing firm Telecom Services Limited West, Inc. in San Francisco filed an FCC complaint earlier this month for clients it says have for years been unknowingly receiving a portion of their tariffed network services in a more expensive manner than necessary.

The collective overcharges allegedly total $1.4 million.

The complaint addresses AT&T's provisioning of local private lines that it acquires from local telephone companies and resells under Tariff 11 contracts.

Some industry observers, though, pointed out that in today's market, where companies are trying to leverage competition among long-distance carriers for business advantage, it is incumbent on corporate telecommunications managers to know what they are getting and how much they are paying for it.

"It strikes me that in all cases caveat emptor [let the buyer beware] applies," commented Robert Rosenberg, president of Insight Research Corp., a consultancy in Livingston, N.J. "Quite often, network managers will turn to a dominant player [in the telecommunications market] to obviate the more difficult questions they must face as part of their job descriptions."

If they end up with an imbalance between meeting their needs and the price they're willing to pay, they must ask if they were doing due diligence to their jobs, he said.

Resource hurdle

The problem users have, though, is that tariffs and telecommunications bills are so lengthy and complex, it is the exceptional firm that has the human and financial resources to examine every service provisioned and billed with a fine-tooth comb, observed Phillip Evans, former senior adviser to the International Communications Association, a telecommunications user group.

"It behooves you to hire an experienced firm to go over the initial contract because the responsibility does lie on the part of the company being served by the tariff," Evans said.

For example, a spokesman from one complainant, Japan Airlines, American Region, said the firm is on the fence as to who, if anyone, is at fault but does "not mind Telecom Services pursuing the issue as long as it doesn't cost us anything."

Other FCC complainants include Quotron Systems, Inc.; Charles Schwab & Co.; Texaco, Inc.; and TRW Information Systems Group Credit Data Division. Most of the companies have reverted to the cheaper local service option and are still AT&T customers.

Routing compensation

The auditing firm said it has been negotiating with AT&T for nearly two years to get the companies reimbursed for "extra" charges levied for routing local private lines through its own equipment, one of two tariffed options.

AT&T allegedly defaulted to a scenario in which traffic passed through AT&T equipment if the user did not specify it wanted cheaper, direct connections from its premises to the local exchange office.

However, "The two options are clearly stated in the tariff, and customers are being charged accordingly," an AT&T spokesman said. In addition, he said, "When traffic goes through an AT&T central office, it allows better provisioning and testing capabilities of those channels" by AT&T.

Steven A. Taylor, president of Distributed Networking Associates, Inc. in Greensboro, N.C., said, "Companies buying service from AT&T are probably doing it because they want AT&T to be their sole provider, which implies network diagnostics and maintenance. There is value added by going through an AT&T switch. How much that value is worth is what the market will determine," he said.

According to Telecom Services President Scott Maltz, by using more equipment in provisioning the circuits, "AT&T doubled the equipment failure potential" and charged on average 250% more than the direct routes cost.

Toshiba to take pen market plunge

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — Toshiba Corp. said last week that it will stick its toes in the pen-based market by introducing its first pen-based system here in December.

The Dynanote, a 386SX-class computer, weighs three pounds and accepts input from a cordless pen. The 10.6- by 8.27-in. machine has a 9.6-in. monochrome LCD screen with side lighting and supports 4M bytes of random-access memory (expandable to 20M bytes).

It also features a U.S.-made 1.8-in., 40M-byte hard drive. A 3½-in. floppy drive is optional. A nickel-metal hydride battery provides eight hours of battery life when the LCD side light is turned off and three hours when it is turned on. Side lighting can make it difficult to read the screen in bright light.

Shigenori Matsushita, general manager at Toshiba's Information Processing and Control Systems Group's Planning and Coordinating Office, said the company intends to market the Dynanote in the U.S. and other countries, perhaps six months after its debut in Japan.

"Most of those products are designed to be used in Japan," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. in Santa Clara, Calif. "You [have to] approach the two markets differently; the form and function in Japan vs. here is completely different."

The Dynanote will be bundled initially only with Toshiba's Japanese-language MS-DOS Version 3.1, but Toshiba said it will also support Microsoft Corp.'s Windows for Pen Computing and Go Corp.'s PenPoint operating systems when Japanese-language versions are ready.

Toshiba was one of six Japanese vendors that recently licensed PenPoint for use with unspecified pen-based computers.

Microsoft plans to ship the Japanese version of its Windows product to computer makers next month. Go delivered the alpha version of its Japanese-language PenPoint 2.0J operating system last week and is on schedule to deliver a final product starting in late December.

Senior writer Michael Fitzgerald contributed to this report.

PI puts pen to notepad

BY MICHAEL FITZGERALD
CW STAFF

PORTLAND, Ore. — PI Systems Corp. has begun shipping the Infolio, a 3.4-pound, notepad-size pen-based system that is far cheaper than the other notepad-size pen-based systems on the market.

Based on Motorola, Inc.'s MC68331 processor, which uses a 68020 chip as its core, the Infolio costs $1,895. It runs its own operating system, Picos, which communicates in binary language with other environments.

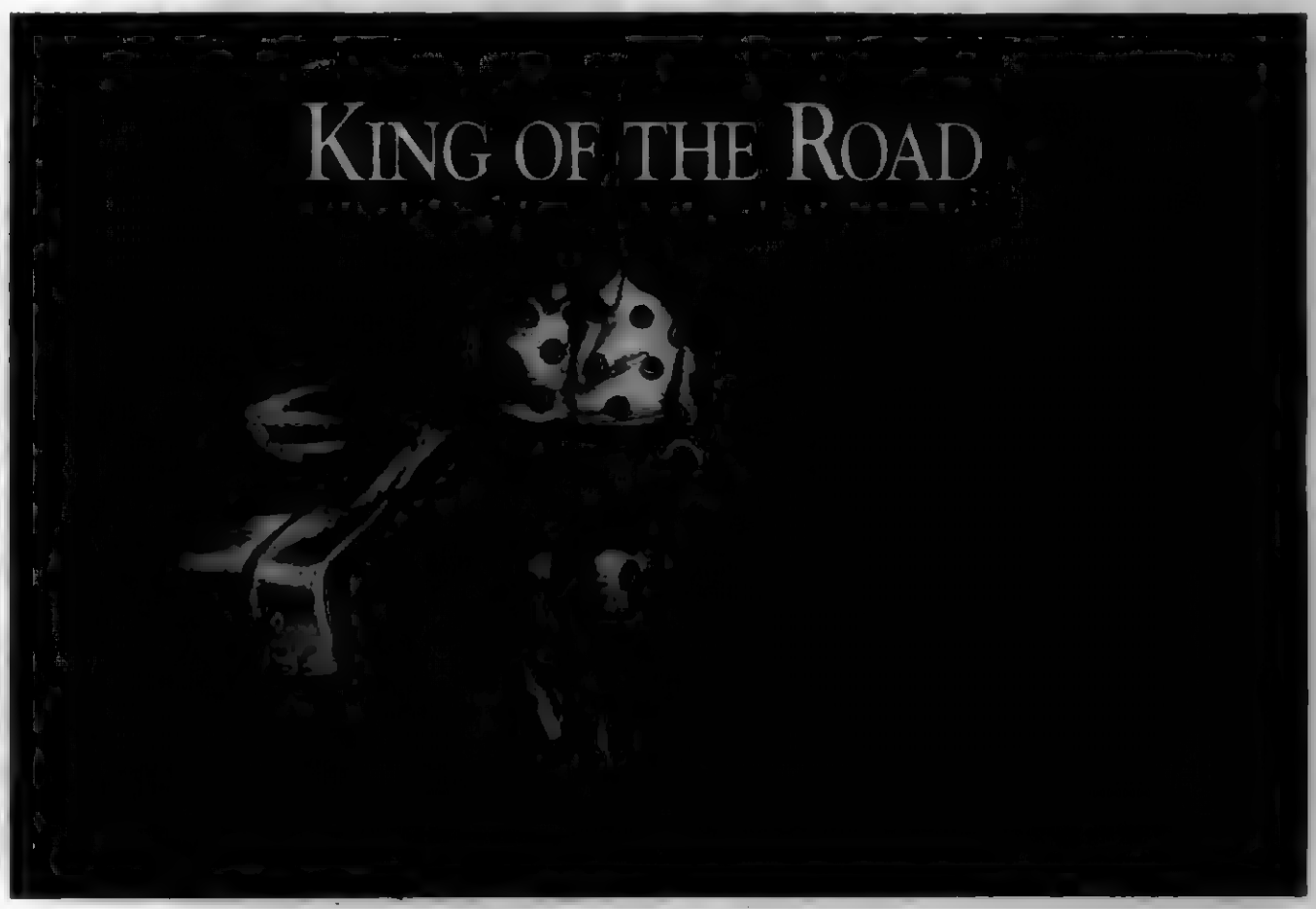
PI, which stands for Portable Information, uses three Personal Computer Memory Card Interface Association slots: one for the operating system and the other two for additional electronic forms and data.

Its first announced user is the Stanford University Clinic in Palo Alto, Calif.

Hospital care "is becoming information-intensive, and we end up moving carloads of paper around so we can look at it and decide what to do," said Raymond Pedden, the clinic's director of operations. The clinic has 1,600 physicians and sees more than 250,000 patients a year.

Pedden said the clinic is at the very beginning of an effort to automate its medical records and create a sophisticated series of seamless databases running from accounting and diagnostics to ordering.

Initially, the clinic expects to buy between 50 and 200 Infolio systems.



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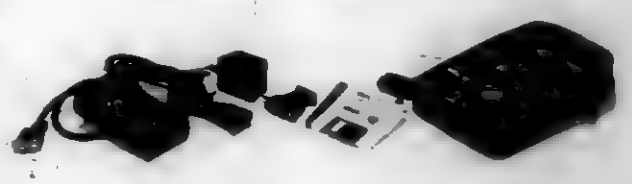

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NEWS SHORTS

Study cites magnetic field danger

Researchers in Finland reported that women who use VDTs that emit strong magnetic fields may have a greater risk of having miscarriages than women who use low-emission VDTs. The study of 191 clerks seems to confirm the validity of Sweden's guidelines for low-emission VDTs, according to Robert Dieterich, managing editor of "VDT News" in New York. However, the Finnish study found no difference in miscarriage rates between women who had used VDTs and those who had not.

Amdahl disk drive ready

Amdahl Corp. announced last week that it had moved up the shipment schedule for its 6390 Model 3 disk drive by a few weeks. Volume shipments are now scheduled to be available Sept. 21. Announced in January, the 6390 Model 3 holds 45G bytes of data and is priced from $148,000 to $457,950. Amdahl also announced a $20,000 Open Systems Expansion Feature that allows an Amdahl mainframe running UTS Unix to use 20% more of the disk space available in a 6390 Model 3.

HP/Samsung deal grows

Hewlett-Packard Co. and Samsung Electronics Co. last week extended their business alliance to include a $50 million purchase by Samsung of HP's Unix-based 9000 Series 700 workstations during the next two years. The $7 billion Korean electronics giant will now be reselling HP workstations under both the Samsung and the HP label, as well as using them internally to run computer-aided design and engineering applications and to develop software.

Prices, speeds hiked on Prodigy

The Prodigy service made several announcements last week, most notably that it would increase the monthly base subscription price for its on-line information network from $12.95 to $14.95 starting Nov. 1. Prodigy, which is owned by Sears, Roebuck and Co. and IBM, also said it would triple the number of bulletin board topics carried by the service to more than 400 and enable subscribers to edit messages off-line. Finally, Prodigy said it would support access from 9.6K bit/sec. V.32-compatible modems from major cities later this year.

Phone directory goes on-line

On the heels of the regulated local phone companies' recent admittance into the information services business, a dial-up, electronic version of the greater Minneapolis telephone directory was announced last week by US West and worldwide telecommunications company France Telecom. The electronic directory offers published residence, business and government listings that will be continually updated by the service providers. Users can use their own words to search for products and services; for example, a consumer typing "fix my car" will receive a display of car repair and service categories to choose from, according to the companies.

Short takes

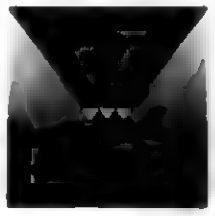
Leading Edge, Inc. bumped up its multimedia offerings by adding a 486DX and 486SX model to the line. . . . **Redwood City, Calif.-based Next, Inc.** last week announced the shipment of Next 3.0, the third generation of the company's object-oriented operating system. The update comes integrated with Novell, Inc. NetWare client software. . . . **Lawson Associates, Inc.** said Unix machines from Hewlett-Packard Co. are the hardware of choice for its financial, human resources and other packages, over IBM's RISC System/6000. . . . The Federal Trade Commission recently announced an antitrust settlement with Realty Computer Associates, Inc., a multiple listing service in Kansas City that had been charged with refusing to publish listings from part-time brokers, out-of-town brokers and property owners who want to sell without using a broker. . . . **Alisa Systems, Inc.** in Pasadena, Calif., said it will provide site licenses for AlisaTalk, its file and print services sharing software for Apple Computer, Inc. Macintosh and Digital Equipment Corp. VAX environments.

Virus threat could be overstated

IBM researcher suggests sparse connectivity reduces virus contagion

BY JAMES DALY
CW STAFF

YORKTOWN HEIGHTS, N.Y. — The mere mention of a computer virus may still put ice water in the veins of many information systems managers, but an IBM computer scientist claimed that rogue programs are less pervasive and spread more slowly than is generally believed. The reason: The world's computers are not connected to as great an extent as some may believe.



"Since most projections about viral spread are based upon the assumption of a fully connected world, the growth and dissemination of most viruses is comparatively slow," said Jeffrey O. Kephart at IBM's High Integrity Computing Laboratory. Kephart based his ideas on years of studying virus outbreaks, at both IBM and its customers' sites.

This does not mean that the virus threat is over and users can let down their guard. "In a fully connected homogeneous environment, a virus could spread explosively," Kephart said. "And I expect the virus problem to worsen until we see widespread use of effective countermeasures."

Kephart added that "obviously, as we continue to have more and more connectivity, there is the potential for more virus problems. But meanwhile, we are working hard to keep them under control." He added that it should be possible to control the spread of infection in local topologies by intervening locally when the problem has been detected.

Scare worked

Some researchers are seeing widespread deterrence. "People have taken the virus threat seriously — installing antiviral packages, telling their employees what to do if a virus pops up — and I suspect that is what is going to keep the spread down," said Charles Rutstein, a Bethesda, Md.-based virus researcher and author of *Executive's Guide to Computer Viruses.*

Although Kephart's research suggests that the spread of viruses may have slowed, the creation of them has not. Experts estimate that from 1,500 to 3,000 DOS viruses now exist.

Rutstein said more than 100 new DOS viruses were discovered this summer. "But not every virus is a huge threat to the planet," he said. Only about 20 viruses comprise 90% of today's infestations, with venerable favorites such as Stoned and Jerusalem-B continuing to crop up.

Edward Wilding, editor of the UK's "Virus Bulletin," added: "What many antivirus software developers are loath to admit is that most of these virus specimens are research or laboratory examples and have never been seen in the wild. Worldwide, only 70 or 80 viruses have ever disrupted real computers in real organizations.

"So it is very important to keep the problem in perspective. Doom merchants who purvey messages of the end of computing and universal contagion should be ignored."

Movie points to security concerns

CONTINUED FROM PAGE 1

that there is no such word as 'impossible' when it comes to cryptosystems," said Philip Chapnick, director of the Computer Security Institute based in San Francisco.

Last year, two Israeli mathematicians said they discovered a crack in the encryption scheme [CW, Nov. 4, 1991] that would allow them to decipher messages under certain conditions. The discovery of an Achilles' heel in DES, if verified, could have "a very significant impact" on whether DES is recommended as a standard.

DES has been followed by controversy since it was accepted by the National Bureau of Standards in July 1977. Invented by IBM in the early 1970s, the DES algorithm uses substitution and transposition processes and a key consisting of 56 bits, plus eight parity bits, to present more than 72 quadrillion possible key combinations to a would-be intruder. With frequent key changes, the algorithm satisfactorily renders confidential information inaccessible, many proponents feel.

But not everyone believes in its invincibility. "If a man made the DES, a man can break it," said Ian Murphy, a former hacker and now president of IAM/Secure Data Systems, Inc., a security consultancy in Gladwyne, Pa.

Some experts said the DES 56-bit key should be much longer (such as 128 bits), thus adding to the code's complexity. These scientists claimed that advances in technology now make it possible to break the DES by brute force; i.e., a computer can be programmed to attempt every possible combination until the correct key is discovered.

"With the machines we have, [DES is] on the margin of insecurity right now," said Martin Hellman, a professor of electrical engineering at Stanford University in Palo Alto, Calif.

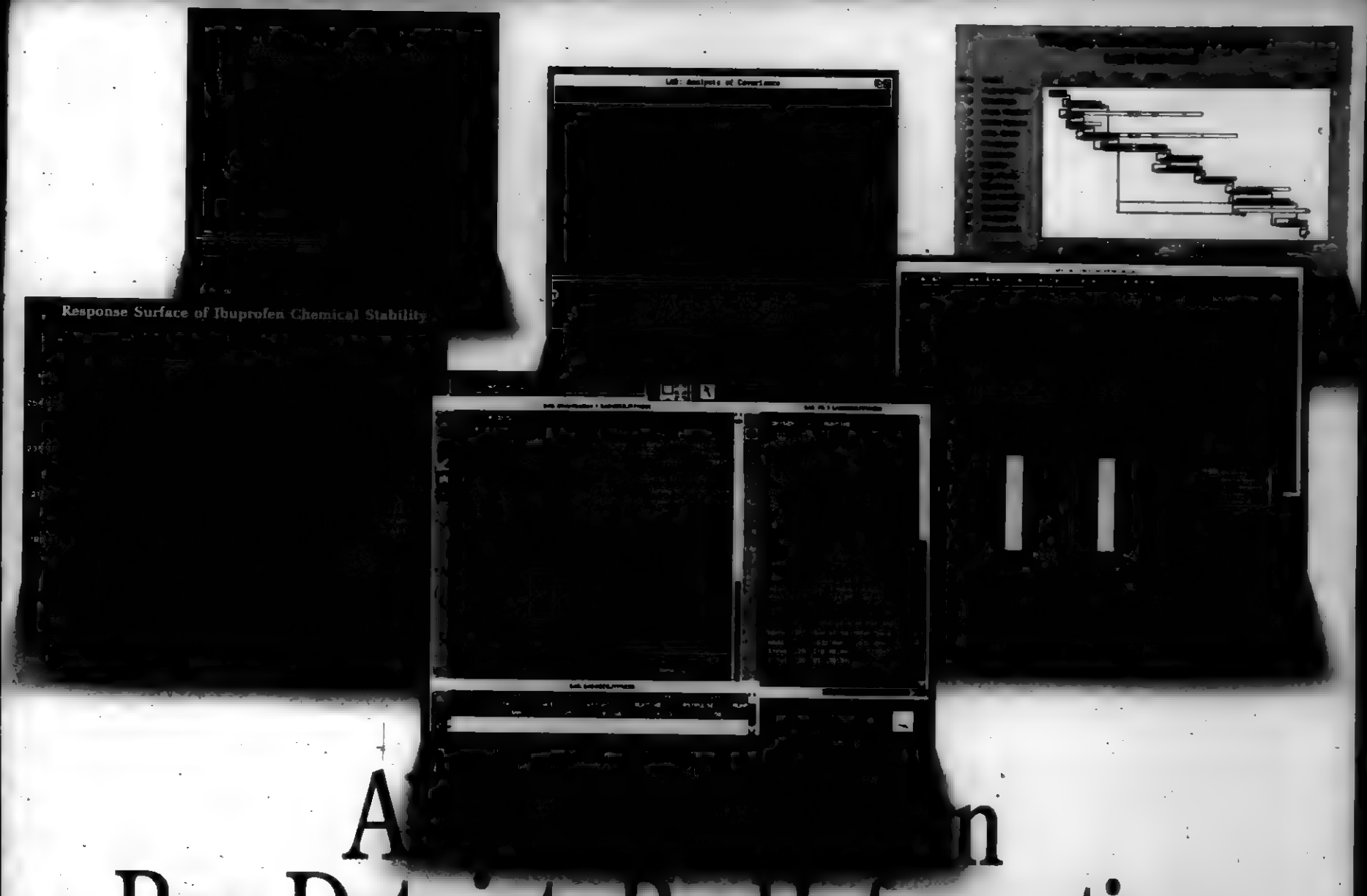
That could present a frightening scenario. Although different organizations often tweak the DES to suit their needs, the basic engine remains the same. And with DES in use by everyone from banks to air traffic controllers, the possibility that an intruder could scramble such sensitive data would present an immediate life-or-death crisis.

Supporters of DES, however, claim cracking the government-sanctioned code is a much more complex matter. The latest generation of vector computers, operating at one try per microsecond, would take more than 2,000 years to break the DES code, said Kenny Weilerstein, an analyst at research house Datapro Research Corp.

Changing keys regularly, as often as once a day or week, and double- or triple-encrypting the DES code could make it even more bulletproof, he added.

Real-world horrors

Mid-1970s — Teen computer whiz Kevin Mitnik breaks into the North American Defense Command in Colorado Springs.
July 1981 — Captain Zap — 23-year-old Ian Murphy — breaks into systems at the White House, Pentagon and Bell South.
Mid-1980s — Researcher Clifford Stoll tracks West German hackers who had been rummaging through a DOD network.
November 1988 — Robert Morris Jr., son of the NSA's chief computer scientist, creates the Internet worm, resulting in an estimated $40 million to $90 million in damage.
July 1992 — Five men are charged with breaking into computer systems, including several credit reporting databases, and stealing account information.



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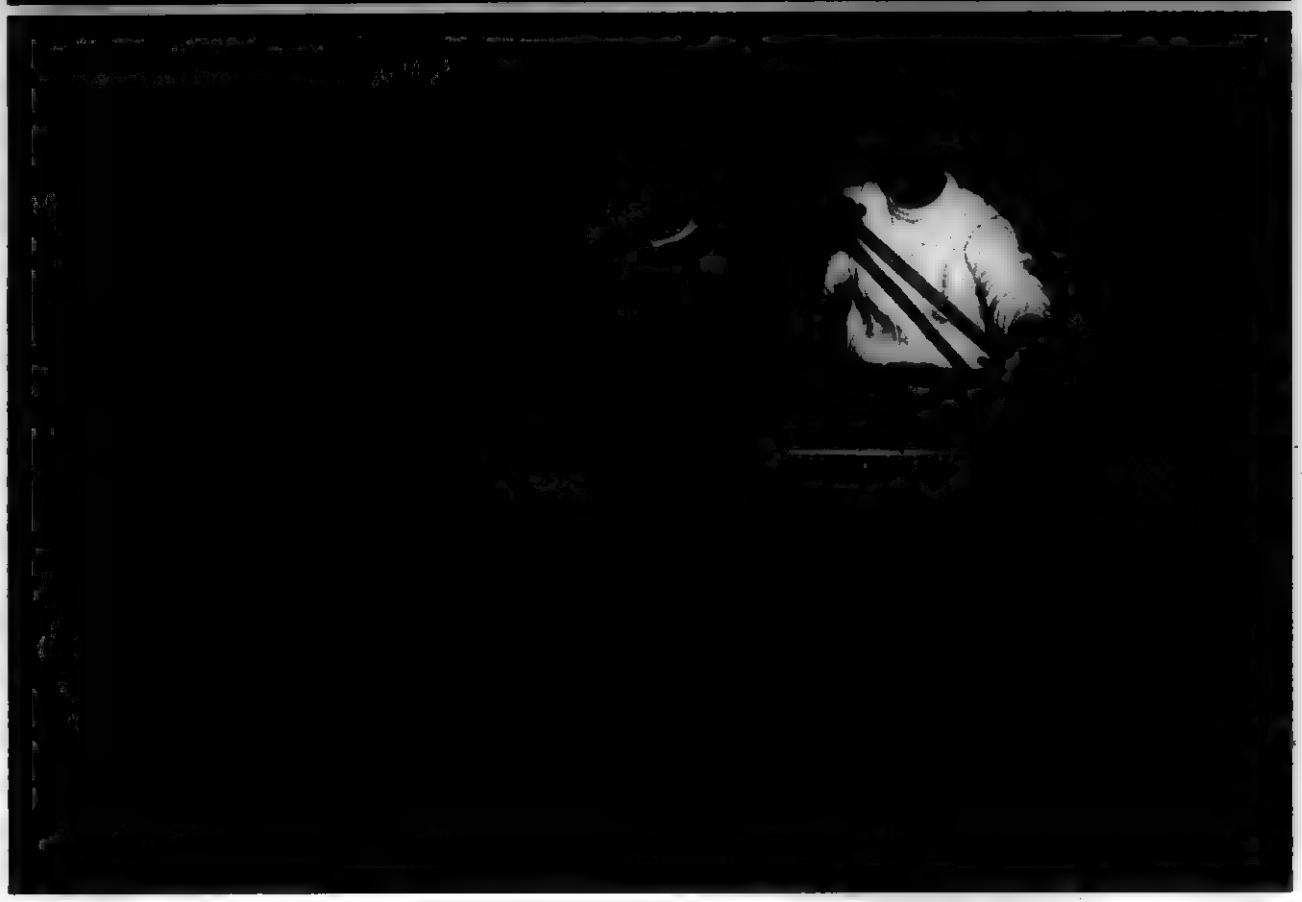

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The LaserJet IIISi avoids bottlenecks by pulling data through the interface card 30 times faster than the standard parallel rate. It is therefore able to print 18 times faster than ordinary printers. And, since your file server is relieved of some print server functions, you'll enjoy faster transaction times and increased speed across your entire system.

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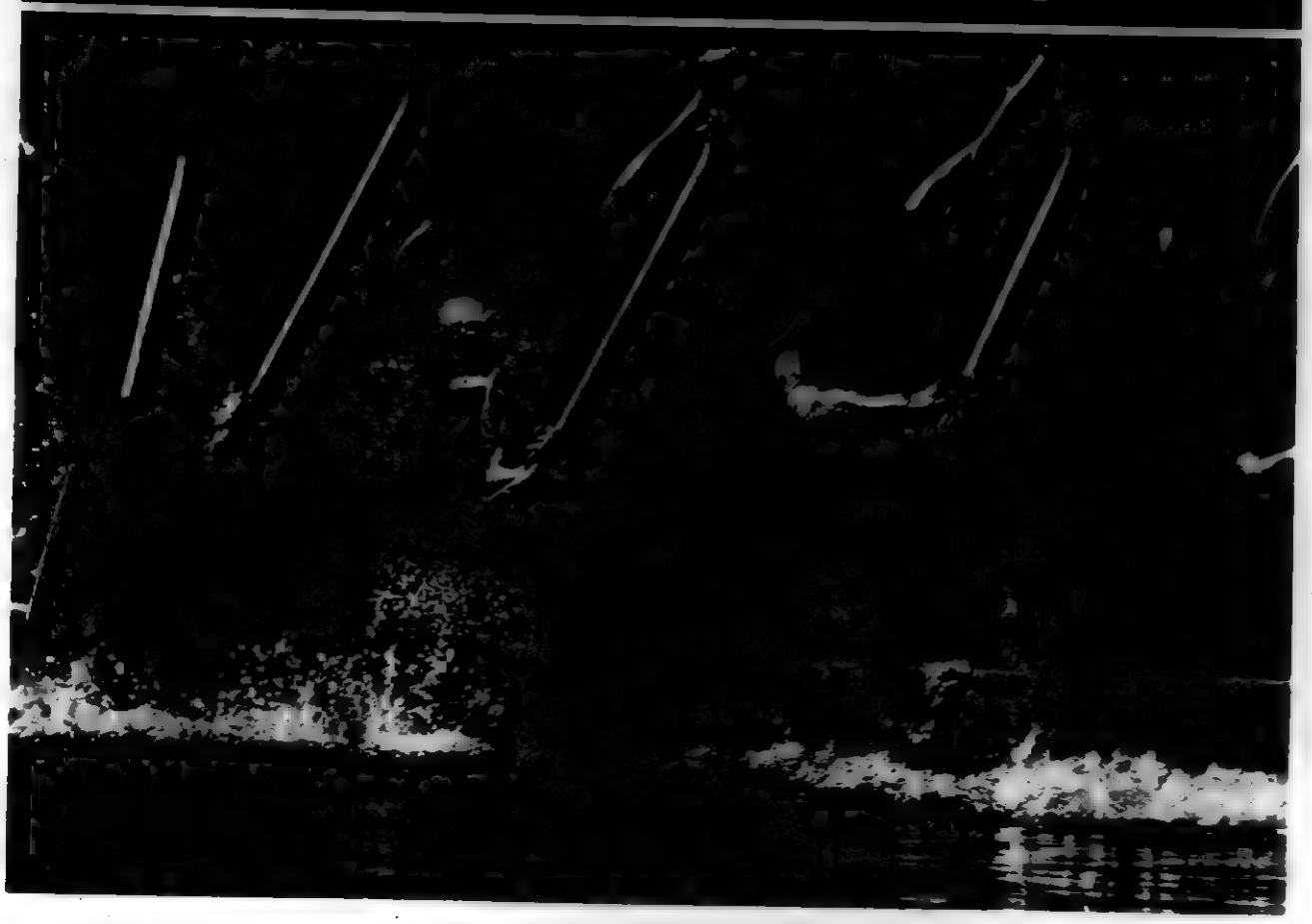

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IBM LAN Server	*Token Ring (4/16 Mbps)*
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Spreadsheet war moves to Windows

CONTINUED FROM PAGE 1

they're going to use every weapon," Berst said.

Indeed, Lotus last week reduced the price of 1-2-3 for Windows by $100 to $495, making it more competitive with the Borland product. Borland's offering will also list for $495 but will include both Quattro Pro Version 4.0 for DOS and Quattro Pro for Windows in one package. However, Microsoft remains the king of the Windows spreadsheet market (see chart).

"We have to be more directly responsive to the kinds of things that [our competitors] are saying about us," said Paul McNulty, Lotus' director of spreadsheet marketing. "We know that we have to do business aggressively."

More than cost

Lotus may need more than a lower price to outdo Borland, however. "I don't want them dropping their price; I want a good product," said Joel Diamond, technical director of the Windows Users Group Network in Media, Pa., and a former spreadsheet consultant. "Lotus has their work cut out for them." Diamond claimed that both Excel and Quattro Pro outstrip Lotus in a feature-by-feature and ease-of-use comparison.

Some users echoed his sentiment. Rock Blanco, vice president of information systems at Garber Travel in Boston, said he was particularly impressed with Quattro Pro for Windows' Database Desktop approach to data connectivity.

"It completely blows Lotus away," he said.

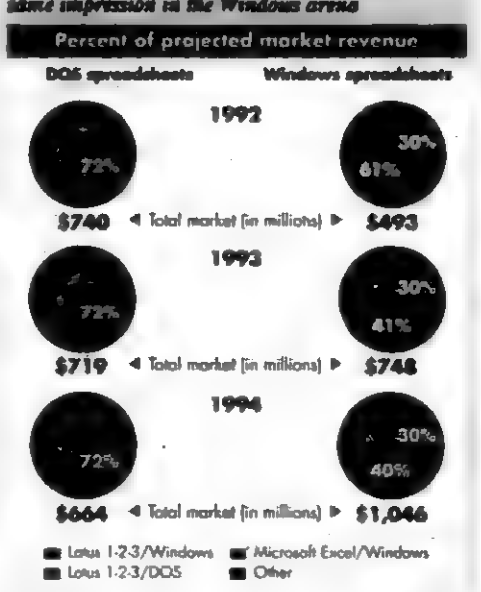
Early demonstrations of Quattro Pro for Windows detailed many features that differentiate it from Lotus, including a notebook metaphor, an "Object Inspector" capability that allows users to click on an object with the right mouse button to call up options, highly customizable graphing capabilities and an Interface Builder for creating custom applications.

But while Borland may have the technical advantage at this point, Lotus has what could be a more vital advantage in its knowledge of selling to corporate customers and its ability to provide a complete suite of software. Lotus recently announced the addition of Lotus Organizer, a personal information manager for Windows, to its SmartSuite package that includes 1-2-3 for Windows, Freelance Graphics, Ami Pro and CC:Mail — all for a list price of $595.

While Microsoft competes on this level with its popular Office suite, Borland lacks several key pieces, including electronic mail and a word processor.

Windows pain

Although still dominating the DOS spreadsheet market, Lotus is having problems making the same impression in the Windows arena



Source: BIS Strategic Decisions — CW Chart: Michael Siggins

The suites may not sell to everyone, however.

Berst said he sees the software arena divided into a commodity market for spreadsheets, word processors and databases that is interested in suites and "the rest of the world, which buys in ones and twos." Among the commodity buyers, however, the suites are "becoming more and more important." Yet while some large organizations may find the suites appealing, others see them as a waste.

"I would go for the best of any one item instead of going for any kind of suite," said Gene Ackerman, a consultant at Kaiser Foundation Health Plan. "Unless you're out in the woods, you don't need a Swiss army knife," he added, indicating that most of the several thousand users at Kaiser are interested in a single application and have little or no use for others.

Whatever the case, Lotus and Borland may have an opportunity to steal some of Excel's market share during the next year. Microsoft has revealed plans to include its ObjectBasic language in the next release.

SPC revamps hierarchy for suite battle

BY CHRISTOPHER LINDQUIST
CW STAFF

SANTA CLARA, Calif. — One company that fully anticipates the impending onslaught of suite selling is Software Publishing Corp. (SPC). To battle more effectively, SPC has elevated Irfan Salim, its international division vice president, to president and chief operating officer, and has bumped Chief Executive Officer Fred Gibbons up to chairman.

SPC is also implementing a new strategy focused on selling users on a presentation graphics-centered desktop, where they will access data and execute other functions from within a presentation graphics package — namely, Harvard Graphics.

Gibbons said the change in titles will allow him to "hit the bricks to develop and maintain key technology partnerships" and enhance relationships with customers while Salim concentrates on the company's day-to-day operations.

"The fight's getting tougher, and you need more help at the top," Gibbons said. Salim, 39, brings many years of experience in international marketing to the position, including stints as a vice president at Lotus Development Corp. and experience at Texas Instruments, Inc. in the UK and France.

Tough competition

SPC lacks a spreadsheet and does not have a word processor with a large market share — key pieces found in rivals' application suites. Also, SPC's core products, Harvard Graphics and SuperBase, are facing severe competition as the flow of applications development moves to graphical environments such as Microsoft Corp.'s Windows.

SPC recently announced SuperBase Version 2.0, an upgrade to its Windows database, and is planning to include data access capabilities in Harvard Graphics to allow a presentation-centered environment to be created.

"We believe presentation graphics, particularly when it's coupled with data, is a fundamental tool for viewing data in the corporation," Gibbons said.

Jesse Berst, publisher of "Windows Watcher" in Redmond, Wash., said that what SPC needs is alliances with other vendors, not a presentation graphics-centered product line.

"I just don't think very many people are going to live in a presentation program," he said. "I think [Gibbons] sees the big trouble he is in, but I don't think he's found the right solution."

Solbourne preps servers to run Oracle financials

BY MARYFRAN JOHNSON
CW STAFF

LONGMONT, Colo. — In an unusual move that may foreshadow a tilt toward greater specialization in the Scalable Processor Architecture (SPARC) market, Solbourne Computer, Inc. this week will announce two high-end Unix servers optimized specifically to run Oracle Corp. financial applications.

Solbourne is tying the fate of its new Series 6/700 and 6/900 servers to Oracle Financials as it tries to carve out a more lucrative piece of the SPARC market. The vendor's "Application Optimized Architecture" product strategy is counting on finding a middle ground between general-purpose Unix servers and highly specialized servers tuned to one vertical industry.

"In open systems these days, companies have to get specialized and focused," said Carl Herrmann, Solbourne's recently appointed president and chief executive officer. He cited the financial applications as one of the fastest growing areas at Oracle, adding, "We think we can grow even faster with our products tuned to theirs."

Oracle had a lock on more than 30% of the 1991 wordwide Unix-based financial software market, according to International Data Corp (IDC).

A year ago, 6-year-old Solbourne jettisoned its unprofitable line of SPARC clone workstations and restructured the company around its high-end, symmetrical multiprocessing servers. The machines are particularly well-suited to handling compute-intensive database applications, according to analysts.

Under the sun

Solbourne is overshadowed by Sun in the U.S.' SPARC-compatible systems market

Total SPARC shipments: 201,740

Source: International Data Corp

"I think the strategy is a very obvious move. It's the way technology is going," said Chris Peterson, director of image processing at Earth Satellite Corp. in Rockville, Md.

The private company, which specializes in satellite data and image processing for clients such as the World Bank and the United Nations, is planning to upgrade a Solbourne Series 5 to the Series 6.

The Series 6 servers, scheduled to ship in December, are based on Texas Instruments, Inc.'s Viking SuperSPARC chip.

"We think it's great. We've enjoyed some of the enhancements in software and firmware already," said Marlen Roepke, director of information management services at Tampella Power, Inc., a $200 million boiler manufacturer in Williamsport, Pa. The company runs its entire business operation on a Unix-based network with several Sun Microsystems, Inc. workstations anchored by a Solbourne server.

As a beta-test user for the Series 6 server running Oracle Financials, Roepke said data throughput had "increased dramatically" once the company upgraded from the Series 5.

With revenue of roughly $70 million, Solbourne is the second-largest SPARC vendor in a market heavily overshadowed by Sun (see chart).

"Solbourne needed to really focus on providing a particular, differentiated product," said John Morrell, an analyst at IDC in Framingham, Mass. "They've got a very good, high-performance server product that is relatively unique in the SPARC market. They easily blow away Sun servers in database performance."

Solbourne officials said they expect to compete for Oracle applications mainly with Hewlett-Packard Co., Sequent Computer Systems, Inc. and Pyramid Technologies, Inc.

For the Series 6, Solbourne's OS/MP Unix operating system was enhanced with several Oracle-specific optimizations, such as improved context-switching code for typical Oracle environments with dozens of on-line users.

Analysts also noted that Solbourne's new servers — priced from roughly $75,000 to $250,000 — land within the budgetary reach of smaller companies that cannot afford systems in the $400,000 and higher strata.

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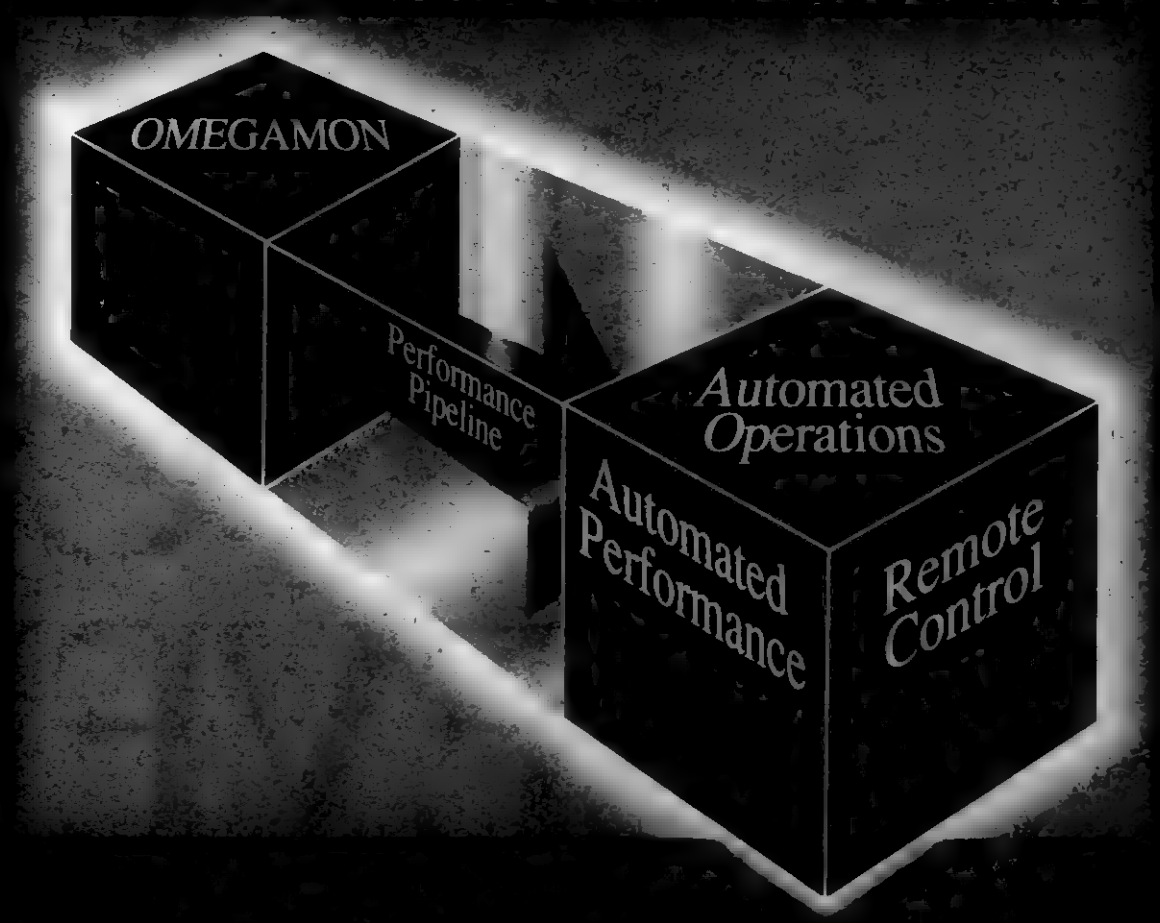

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Zenith wins mega micro DOD contract

BY GARY H. ANTHES
CW STAFF

GUNTER AIR FORCE BASE, Ala. — In the second but perhaps not final round of a controversial computer buy, the U.S. Department of Defense last week tapped Zenith Data Systems to supply defense and civilian agencies with 300,000 personal computers, related equipment and office automation software. The contract, one of the largest small-computer acquisitions ever, is estimated to bring the U.S. unit of the French computer maker Groupe Bull $740 million over three years.

The Desktop IV contract was first awarded jointly last November to CompuAdd Corp. in Austin, Texas, and Sysorex Information Systems, Inc. in Falls Church, Va., but it was pulled by the Pentagon when a number of the 22 companies bidding on the deal complained that their proposals were unfairly rejected because of minor flaws.

The split award was intended to encourage competition after the contract was signed, with each vendor guaranteed a small minimum in the first year. The U.S. Air Force said that would stimulate better service and eliminate the procurement bottlenecks that plagued Desktop III, which was won by Unisys Corp.

Last week, a spokesman for the Air Force, which manages the procurement, said the selection of Zenith was made "as an integrated assessment of all proposals for the best value."

James F. Kerrigan, federal program manager at G2 Research, Inc. in Mountain View, Calif., said Zenith most likely won the deal on price. "This means it's still a commodity business in the federal market because the higher priced, better-capability vendors like IBM and Apple did not win."

A PC on every desk

Desktop IV procurement at a glance

Estimated value	$740 million over one year with two one-year options
Hardware	Up to 300,000 laptop, notebook and desktop computers and file servers (plus peripherals)
Software	Microsoft Windows and Office; network operating systems from Microsoft, Novell and Banyan; development and runtime tools from Enable Software
Users	U.S. defense and civilian agencies around the world

Gerald Mixon, public sector general manager at CompuAdd, said the award to Zenith raised "troubling issues" but that CompuAdd had not yet decided whether to file a protest. "The Air Force has done a total about-face," he said. "The No. 1 evaluation criterion [in the government's request for proposals] was management and also financial strength."

Mixon said Zenith's non-U.S. parentage will strike a resonant chord in this election year. "The fact that they are a French company is ludicrous. Here's the Defense Department strengthening a French firm with obvious financial problems."

Mum's the word

A spokesman for Zenith, based in Buffalo Grove, Ill., said Zenith contributed $1.24 billion in revenue to its French parent last year but would not disclose further financial details. "Groupe Bull is very much committed to our success. We are the company's desktop strategy, and they've been increasing our research and development budget 25% a year since the acquisition" in 1990, he said.

Of the charge that Zenith is not a U.S. company, the spokesman said, "Our major manufacturing facilities are all in the U.S. We are a U.S.-based company."

"Zenith has certainly shown it knows how to get the maximum benefit from these contracts," said Robert Dornan, senior vice president at Federal Sources, Inc. in McLean, Va. "They got Desktop II for 90,000 units initially, and they milked it for 400,000 units, and they did a very good job. But it remains to be seen what their unit prices are and whether they can make any money."

It has been reported that Unisys "mispriced" its winning bid for Desktop III, lost money on every unit it sold and consequently limited sales as much as possible.

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T3300SL/120MB

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T6400SXC

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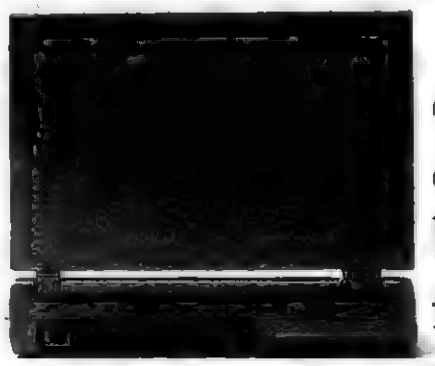

T4400SXC

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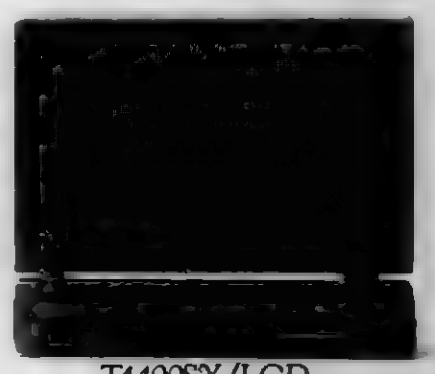

T4400SX/LCD

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intel inside

Which, after everything we've told you, does seem like the logical next step.

In Touch with Tomorrow

TOSHIBA

3

ADVANCED TECHNOLOGY

Fire: Predicting the unpredictable

Insurance researchers use modeling, expert systems to understand fire's behavior

BY JAMES CONNOLLY
CW STAFF

"Yessirree, this is a darn nice data center you've got planned. Let me just see one thing," said the engineer, clicking away on the notebook computer.

"Ya know, if you put in a fire wall over there, you'd cut the risk of a major fire by, oh, 20%."

This kind of advice, plus a detailed understanding of how a fire will travel through a given building, may be possible in the future if Ronald L. Alpert and his associates at Factory Mutual Research Corp. have their way.

The researchers are applying modeling software and expert systems to that horrendously complex phenomenon known as a "fire."

Full-scale modeling of a fire makes airplane designing seem easy because fires have so many physical and chemical reactions, according to Alpert, manager of the fire and explosion research department at Factory Mutual. The company is part of Norwood, Mass.-based Factory Mutual System, a nonprofit company owned by three insurance carriers.

A fire may send a billow of smoke along a ceiling and into another room, or its plume of gases may travel upward at 60 miles per hour only to be hit by a spray of water from a sprinkler system. Meanwhile, radiation and convective heat transfer and the rate at which fuel is consumed are other variables to consider.

The first type of building targeted under the Factory Mutual project is the phone company switching office, such as the Illinois Bell facility in Hinsdale, Ill., that burned and left businesses paralyzed for months without communications in 1988.

But the models and expert systems being developed can be applied to other structures as well.

One early beneficiary could be the data center, which is similar to a switching office in many ways.

Factory Mutual's work involves breaking a fire into "modules" and ranges from burning small material samples in test chambers equipped with sensors that monitor the flow of gases and heat to burning buildings to test sprinkler systems.

The results are collected on Concurrent Computer Corp. real-time computers and analyzed on Sun Microsystems, Inc. and Hewlett-Packard Co. workstations.

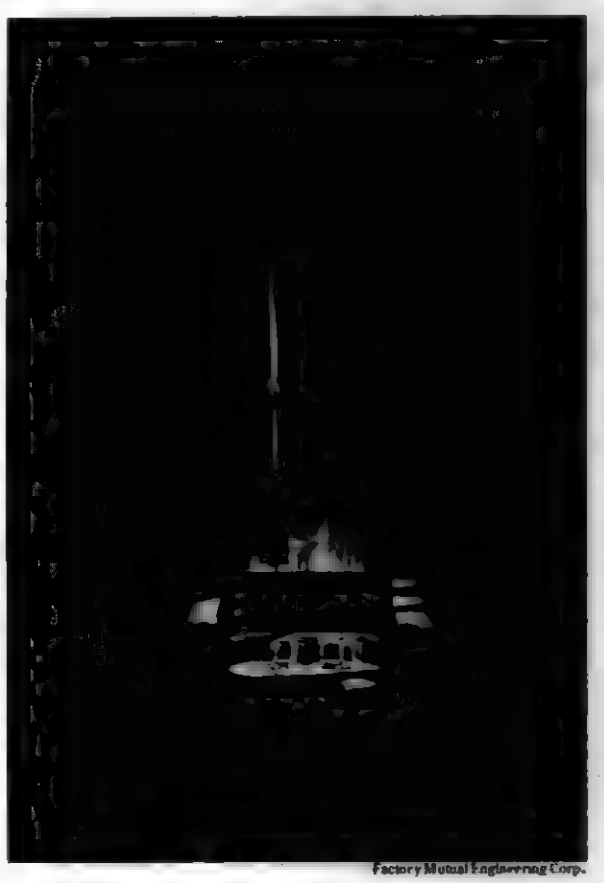
Because the readings show ranges of temperature and gas flow, they are analyzed on a graphical spreadsheet called Dadisp from DSP Development Corp. in Cambridge, Mass. Dadisp deals with curves instead of individual numbers.

While several organizations have done limited models of fires in the past 20 years, those models tended to focus on single rooms within a residence and needed a well-defined starting point. Alpert noted that the models typically did not relate to commercial properties such as warehouses and their varied contents.

Factory Mutual is trying to put all of the pieces together in such a way that many variables, each analyzed as its own module, can be substituted in to or out of a model. This tool would give a Factory Mutual field expert insight into how a fire would progress and the type of damage it would cause.

Variables might include the sprinkler system capacity, the products stored in a warehouse or even the stacking of those products.

Paul A. Croce, manager of the protection and risk analysis research department at Factory Mutual, is overseeing the development of several such expert systems, the first being one for telephone central offices. "Even a small fire, if it generates a lot of smoke, is a problem because it's the corrosive action of the combustive agent that causes much of the damage," he said.



Factory Mutual Engineering Corp.

Data collection *behind fire modeling starts with test-burning of material samples*

Among the "knowledge modules" Croce can draw on are models that look at how smoke ages and how its particles settle on surfaces. Another module looks at what type of damage is done to electronics over time. The field engineer can use the model to show different outcomes. Each model has associated with it a probability of occurrence and level of damage.

"The field engineer can then look at it and look at the probabilities and come up with a scheme for protecting the customer," Croce said.

Preliminary models have been verified in real-world experiments, and the central office system is scheduled for rollout in about 18 months. The system, being built with Nexpert from Neuron Data in Palo Alto, Calif., will be delivered on Intel Corp. 1486-based notebook computers with 200M bytes of storage.

Expert systems dealing with data center fires are a logical next step, Croce said. In a data center, like the central office, wire insulation is a primary fuel, damage to electronics is a major concern, and the entire business is at risk because corporations have become so reliant on computers.

Bellcore council to explore future needs

BY ELLIS BOOKER
CW STAFF

What advanced network technologies are racing our way? Bellcore, a research and development organization owned by the nation's seven regional Bell holding companies, has been preoccupied with answering this broad question since it was formed out of the breakup of the Bell System in 1984.

Bellcore scientists have explored technologies ranging from superconductivity to video phones and have provided crucial network interconnection standards to both its owners and the industry.

According to its critics, however, Bellcore has been less successful at hearing what users need or explaining its own blueprint for the network. Enter the Bellcore Advisory Council. Composed of 15 academic, scientific and educational leaders, the council will hold its first meeting this month.

Along with investigating a panoply of advanced networking technologies, the group will, inevitably, "explore public policy questions in light of technological issues," said Bob Meese, Bellcore's vice president of human resources and external affairs.

Significantly, the advisory panel will include top representatives from the National Association of Regulatory Commissioners, which proposed the council idea in 1991 and participates on similar gas and electric industry councils.

Over the years, state regulatory commissions have been at odds with efforts by local phone companies to initiate new kinds of network technologies and new pricing structures.

Meanwhile, representatives from user companies on the Bellcore panel said they were looking forward to taking their wish lists directly to an entity responsible for setting network research priorities.

Future considerations

Panel member Colin Crook, chairman of the Corporate Technology Committee at Citibank NA, praised the creation of the panel as "a superb thing."

He said he planned to underscore Citibank's belief that "data traffic will grow at a hell of a rate in the coming years" and that the public network must be ready to handle this load.

The panel will consider the following public network technologies:

- "Nomadic" devices that will enable users to conduct voice or data calls over wireless networks.
- Fiber-optic-based broadband applications, including broadcast video and videoteleconferencing.
- Self-healing and self-configuring networks.

Introducing a note of caution, Crook observed that network planning cycles of yesteryear may no longer apply, given the rapid pace of technological innovation.

For instance, Integrated Services Digital Network was originally conceived by predivestiture AT&T as a 20-year project, he said. At the same time, Crook said, customer requirements for network services have stopped being slow and predictable.

On the other hand, Crook said he is confident businesspeople "don't yet grasp that, if these guys do what they plan, there will be an extremely exciting [network] infrastructure."

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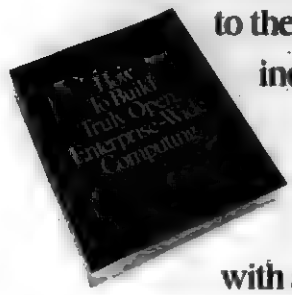

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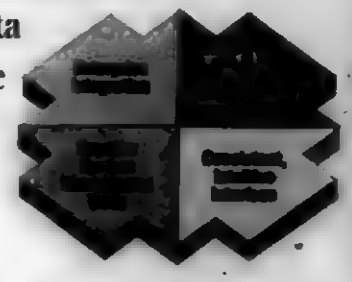

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EDITORIAL

Gender gap

By most counts, the recession began about three years ago. And, by most reasonable counts, it persists today.

Historically, information systems had always weathered recessions in fine fashion and seemed to be doing fine even when the current recession hit the trough about 18 months ago.

But as shown clearly and demonstrably by our salary survey last week and the job satisfaction survey this week, the doo-doo has hit the fan. Recession-provoked downsizing has ravaged salaries, ending a decade-long unbroken streak of salary increases across the majority of the 26 job categories that we have sampled. People are toiling harder, longer and for less while new opportunities are scarce. It ain't pretty.

Given what's going on in the economy at large, it might seem that the only really unusual thing about our survey findings is that it took so long for the recession to hit IS. However, there was a far more disturbing finding that revealed a consistent gender salary gap — one that starts out at a modest few percentage points in entry-level management positions but balloons to more than 20% at senior IS management levels.

You can search hard to establish explanations for the pay gap and find few, if any, satisfying answers. Some say women aren't as aggressive as men when it comes to pushing for equal pay, absent any significant collective bargaining or unionization at the IS level to assure pay equity.

Others say working mothers are less inclined to make the same sacrifices as men on their way up the ladder, giving up visibility along the way. Still others say the gender gap reflects the same chauvinistic biases evident in the business world in general.

I'm not a woman, so it's pretty easy for me to sit back and academically speculate on why women appear to be getting the short end of the pay stick. But I can reflect on the wisdom of three women we interviewed [CW, May 18], who parlayed fast-track IS careers into high-level corporate management positions.

Essentially what they advised their sisters to do is seize control of their destiny. Women comprise maybe 3% or 4% of the senior-most IS positions, so they can't wait around for a man to promote their cause. As one of the executives said, "Men are not comfortable with women, period." The executives said to set your goals clearly, pursue them aggressively, and don't let any artificial barriers, such as the "men's club," block your way. And most of all, take control, take control, take control.

In other words, to steal and then tweak a few lines from Shakespeare:

Women at some time are
masters of their fates:
The fault is not in the stars,
But in ourselves...

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Don't pull your mainframe's plug

Regarding "Dirty downsizing" [CW, Aug. 10], the concept of distributed computing is something that vendors have been espousing since the 1970s.

Certainly as more power makes it to the desktops and the cost of these systems declines, we'll continue to see the investment focused on the worker's desk rather than in the "fishbowl."

Even so, I wouldn't pull the plug on my mainframe quite yet.

The article alludes to a few of the invisible costs involved in downsizing. By the time you've completed new equipment purchases and conversions of systems, applications and networks, your anticipated cost savings can easily evaporate.

After further costs of retraining and bearing the burden of "integration snafus" that occur, anything less than a flawless execution may have serious repercussions on the organization's business.

Another concern is that if you distribute the processing, you also distribute the cost, work load and effort required to sustain the systems.

I'm sure the company's engineering department is quite capable of doing daily backups of their workstations and servers. But, will they?

And, more importantly, do you really want them to?

Bottom line: What works well today can be less expensive than embarking on a crusade to reinvent the wheel.

I'm sure I have overheard more than one data center manager say, "If it's not broken, don't fix it." Good advice!

Lynne Gregg
Seattle, Wash.

Be skeptical when downsizing

After reading the article "Insurer cancels host policy" [CW, Aug. 24], I realize that I need to be somewhat skeptical about the claims of great savings that can be realized when downsizing to personal computer networks.

The article states that "a 622M-byte VAX RA91 disk drive costs about $40,000." I'm forced to conclude that someone didn't do their homework.

There is no such thing as an RA91, but if we assume they were speaking of the 1.2G-byte RA90 introduced four years ago (an eternity in the computer business), it retailed for about $25,000. If I were comparing storage alternatives at today's prices, even the most naive shopper can acquire an RA90 for about $4,000 — twice the storage capacity at one-tenth the quoted figure!

I concede that there are many other downsizing issues that may in fact "slash costs," but if one assumes that Jerry Whetnall's boss trusts his comparative analysis, its no wonder that he "can cost-justify this stuff real easy."

Tim Killinger
Richmond, Va.

Sympathizes with OS/2 frustrations

Regarding "OS/2: Quirks & fixes" by Fabian Pascal [CW, Aug. 31], I found the article interesting, honest and, therefore, refreshing. Your paper has published what would appear to be the first unbiased review of OS/2 2.0 that I've seen this year.

I have experienced many of the same "difficulties" as Pascal. I have a Bernoulli box on my clone. OS/2 will not acknowledge its existence.

IBM's help desk advised me that I would have to get the driver software from Iomega. I have a ViewSonic-4 Super VGA monitor. Although ATI's video driver for OS/2 (not IBM's) supports Super VGA mode for the OS/2 desktop, I could not get the same results with OS/2 Windows. IBM's response? Get the driver software from the vendor. And while we're on the topic, where is the Windows 3.1 compatibility? IBM: We don't know.

As a professional programmer/developer, I am not usually daunted by new software packages.

OS/2 has proved to be the exception. (My personal favorite was when OS/2 refused to boot after I installed OS/2's EGA driver. Gee, let me look up the problem in the manual.)

My last complaint with OS/2 is that it took twice as long to deinstall as it did to install. But, hey, the box looks great on my shelf.

Micheal Shallop
Houston, Texas

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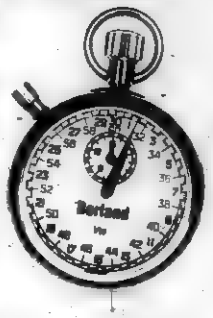

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Installed in company	**#1 dBASE** **#2 Paradox**	**#1 dBASE** **#2 Paradox**	**#1 Borland C++**	**#1 ObjectVision**
Best technology	**#1 dBASE**	**#1 dBASE**	**#1 Borland C++**	**#1 ObjectVision**
Best price performance	**#1 Paradox**	**#1 dBASE** **#2 Paradox**	**#1 Borland C++**	**#1 ObjectVision**
Best service/support	**#1 Paradox** **#2 dBASE**	**#1 dBASE** **#2 Paradox**	**#1 Borland C++**	**#1 ObjectVision**
Best documentation	**#1 Paradox** **#2 dBASE**	**#1 dBASE** **#2 Paradox**	**#1 Borland C++**	**#1 ObjectVision**
Prefer to do business with	**#1 Borland**	**#1 Borland**	**#1 Borland**	**#1 Borland**
Plan to buy	**#1 dBASE** **#2 Paradox**	**#1 dBASE** **#2 Paradox**	**#1 Borland C++**	**#1 ObjectVision**

ComputerWorld *readers rank Borland software best in categories important to IS.*

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*J.D. Power and Associates 1991 Computer End User Satisfaction Study for Application Software Publisher. Phase IV: Business End User Summary. Responses from Business End Users at 4,396 business sites.

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Can U.S. be content with morsels?

RICHARD KRAFT

As an American executive in a U.S. subsidiary of a Japanese company, I have long shared my colleagues' profound admiration for American technology, which is still the best in the world in many areas such as computer and communications innovations.

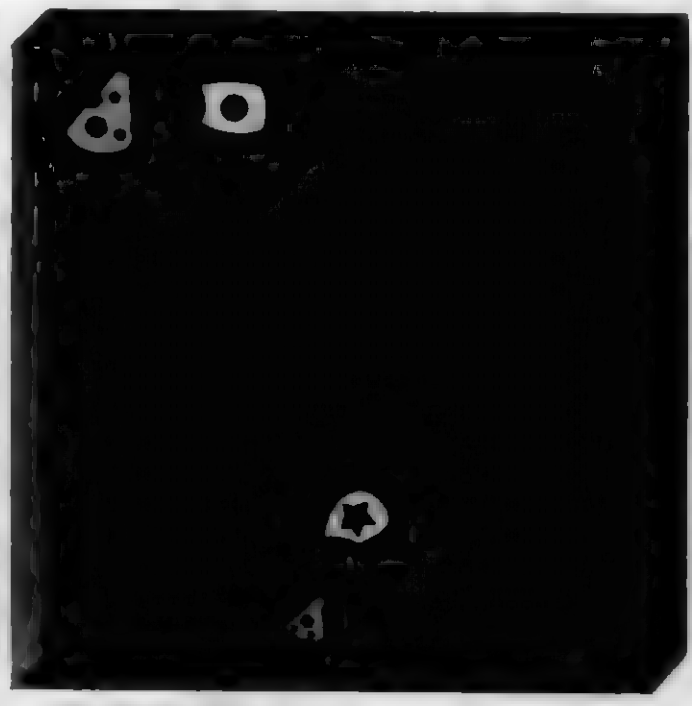
Unfortunately, somewhere along the line we, as a society, lost interest in bringing our best ideas to market efficiently and competitively. In sharp contrast, Japan, the newly industrialized countries of Asia and the technology leaders of the European community have gained strength, based on their ability to rapidly turn ideas into products.

Our trading partners understand that to raise their standard of living they must not only work harder and smarter but also develop their technological strengths to make products that can succeed in a global economy. The sad truth is that their management of technology now reflects this priority and ours, with few exceptions, does not.

Change of home

As an electrical engineer with more than 40 years' experience in the electronics industry, I am distressed by the implications of this trend. We fool ourselves and shortchange our successors if we think that companies can somehow afford to continue technology policies that are short-term oriented, largely risk-averse and often misdirected. All too often, it seems that technology management decisions are based on figures generated by accounting or finance departments whose first priority is short-term returns.

Attaining industry leadership requires decisions that transcend the numbers. In my company, technology investment decisions are based not only on evaluation of available financial data but also on a strong corporate conviction about intangible benefits. The automation of factory processes, for example, is justified not only by cost reduction, but by the fact that it frees workers for more productive tasks by eliminating heavy or hazardous jobs and reducing repetitive or monotonous work.



Janell Genovese

I also believe that the time has come for our society to channel investment into research and technology that will benefit endeavors that are our true sources of wealth — industries such as manufacturing, agriculture and mining.

Deep contribution

Information technologies in particular have much to contribute in helping to improve the efficiency and productivity of such industries and the lives of the people who work in them. Enormous technical and human resources were expended in recent years in the pursuit of paper profits, without making any substantial contribution to the improvement of society.

The closing of the 1980s did not signal an end to our national bad habits, but there are encouraging signs that companies are trying to come to terms with some of these problems. We now see more innovative, cost-saving international R&D alliances and technology-sharing arrangements. Investors, once again, are beginning favor the producers of products. Business school graduates say they find the manufacturing world more attractive.

Perhaps the right conditions are slowly developing for a technology renaissance in America. I hope so. But even under the best of conditions, it will take much effort and a strong commitment to undo the damage that flawed technology management policies have already caused.

Kraft is president and chief operating officer of Matsushita Electric Corporation of America.

What's a bug? Whatever the customer says it is

CURTIS E. A. KARNOW

What is a bug? Is it an incompatibility, a performance degeneration, a sign of bad design, a flow or just a misunderstanding between programmer and consumer?

Coming up with a common definition isn't easy because performance deterioration ignored by one user may be irritating to another and fatal to a third. It depends on the user's expectations and the specific mix of hardware and software.

The issue is increasingly serious, however, because users are multiplying their concurrent use of systems, including add-on software and hardware, and because contracts and litigation can depend on a commonly accepted treatment of software defects.

There's no question that performance expectations are becoming more stringent. Users upgrade hardware and demand that the software perform as well or better on the new platform, without regard to the fact that increased clock speed, caches, new video drivers, new fonts, memory managers and the like can all seriously interfere with a program's operation.

Users have also come to expect and rely on a wider range of features. It isn't good enough anymore for a spreadsheet to simply crunch numbers. The program must also communicate with a variety of printers, soundboards, VGA cards and drivers, *and* it must be compatible with its own older versions and competing programs.

These are all complications that make it increasingly likely that users will be disappointed by software's performance, and increasingly likely that contracts and litigation will be resolved in unpredictable ways.

Defining a software bug is not assisted by breaking down the severity of bugs into 3, 5 or 10 types. For example, there is no advantage to defining bugs as mild, moderate, annoying and so on, or as level 1, 2, 3, etc. These systems simply add further ambiguity to an already confusing situation.

And the fact is that software will continue to disappoint and fail in various degrees, no matter how stringent the standards we endorse, regardless of the extent to which we require object-oriented design or insist on common user interfaces and drivers or, indeed, agree on the general meaning of words.

> There is no advantage to defining bugs as mild, moderate, annoying and so on, or as level 1, 2, 3, etc.

Satisfaction guaranteed

However, if we cannot legislate industry standards or perfection, there is something else that we can do. We can insist that there be user satisfaction.

Those who hold the key to the code should provide no questions asked, money-back guarantees. They should also offer bug fixes at cost (no more than $1 per disk) and without disguise (no more slipstreaming fixes under the semblance of an update). Users are owed speedy public confessions of problems and announcements of workarounds, new drivers and the like.

Any other standard encourages deceptive practices, sours customer relations and risks the loss of irreplaceable data and business opportunities as users struggle with tools that don't live up to expectations.

These concepts can be applied to information services contracts for custom software and systems as well as mass market purchases. To be sure, these transactions are the subject of negotiations and (one hopes) tailored contracts, but the principle remains. The customer should be able to expect that he is buying an effective solution. Anything else is a breach of contract.

Karnow chairs the Competitive Practices Group at the San Francisco law firm of Landels, Ripley & Diamond.

When you spend ten years designing spreadsheets, you get pretty good at filling in the rows and columns.

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Crop of notebooks ripe for fall harvest

BY MICHAEL FITZGERALD
CW STAFF

Forests of notebooks are growing in preparation for the fall. Many vendors are shipping notebooks with Intel Corp. I486SX or even more powerful processors, and several have introduced machines with innovative features such as detachable screens.

Leading the way is Advanced Logic Research, Inc.'s (ALR) Ranger MC4SX/20, a passive-matrix, color notebook based on Intel's 20-MHz 486SX chip. Irvine, Calif.-based ALR's Ranger series features chip upgradability, and ALR said the color product will run for five hours, then recharge in two hours while running. The 7½-pound box is priced at $2,949 with 4M bytes of random-access memory and an 80M-byte hard drive or at $3,249 for a 120M-byte hard drive. Both versions are shipping now.

Epson America, Inc. in Torrance, Calif., joined fellow notebook vendors in the price-cutting parade, dropping prices 20% on its NB-SL/20 and NB-SL/25 notebooks. The NB-SL series now starts at $1,800 with no hard drive or $2,199 with a 40M-byte hard drive. Epson offers systems without hard drives because its hard drives are removable.

Epson also cut prices on its external hard drive adapter, which was designed to let the removable hard drives work with a desktop machine.

Data General Corp., a Westboro, Mass.-based minicomputer and workstation vendor, also stepped up its efforts in the portable realm, announcing a new notebook. The Walkabout/386SL, a 5½-pound machine based on Intel's 25-MHz 80386SL, has a four-hour battery life. It has six I/O ports, a backlit triple supertwist LCD and either a 60M-, 80M- or 120M-byte hard drive. DG said the base model, with 2M bytes of RAM, will sell for $2,445.

While the larger vendors were trumpeting their fall lineups, several smaller vendors released portables with innovative features.

Rochester, N.Y.-based NovaCorp International, Inc. began shipping its Cruiser 325 Presentation Notebook PC. Built by Rever Computer, Inc., a Taiwan company, the 25-MHz 386SL-based Cruiser 325 features a detachable screen that can be used as a projection LCD panel. Users can also upgrade to an active-matrix, thin-film transistor color screen by year's end. The Cruiser 325 has a built-in track ball and interchangeable 60M- or 80M-byte hard drive and weighs 5.7 pounds. Prices start at $3,395.

NovaCorp said it will soon begin marketing a multimedia expansion station that will include audio capabilities and a Small Computer Systems Interface adapter for compact disc/read-only memory drives.

Noteable Computers, Inc. (NBI) in Fountain Valley, Calif., said it would add a Cyrix Corp. 486SLC-based system to its N400 line of notebooks. NBI offers 60M-, 80M-, 130M- and 180M-byte hard drive options, with prices starting at $1,999.

Beaverton, Ore., notebook maker Quantitative Technology Corp. announced the QTC3500, which uses a 33-MHz 486DX in a 7-pound package. With 4M bytes of RAM and a 120M-byte hard drive, the system is priced under $2,600. A 486SX-based notebook starts at less than $1,800.

Aurum Computer Corp. in Hingham, Mass., released the GoldnoteSX, a 6.4-pound notebook that uses the 486SX chip. Designed so the hard drive can be removed, the GoldnoteSX comes standard with an 80M-byte hard drive and 4M bytes of RAM, which is expandable to 16M bytes. Base price is $1,995.

Bitwise Designs, Inc., a Schenectady, N.Y.-based maker of heavy-duty portables, released its ScreenStar, a 39-pound computer with a 23-in. gas plasma monochrome screen. The ScreenStar comes with its own composite carrying case.

In addition to sporting the largest screen and heaviest weight of any portable shipping today, the machine offers what may be the best resolution of any portable, capable of supporting 1,280- by 1,024-pixel resolution. It includes three full expansion slots and a 50-MHz 486DX processor and will support up to 32M bytes of RAM.

The Bitwise ScreenStar comes with a 180M-byte hard drive and can support up to 1.2G bytes of storage.

ALR's Ranger series *features upgradability and can run continuously for five hours*

IN BRIEF

Firm inks pen pacts

■ **Communication Intelligence Corp.** signed its third licensing agreement in less than a week, as Montreal-based **MicroSlate, Inc.** and Tewksbury, Mass.-based **Arthur Dent Associates, Inc.** licensed Communication Intelligence's PenDOS operating environment and Handwriter Recognition Systems.

■ High-security workstation manufacturer **Datawatch Corp.** announced that it is negotiating a purchase agreement for the utility products division of **Microcom, Inc.**, which publishes virus detection and correction products for the Apple Computer, Inc. Macintosh and DOS environments. Thomas R. Foley, Datawatch's chief executive officer, said he hopes his firm would complete the buy "in the near future."

Snooper makes Mac house calls

BY JAMES DALY
CW STAFF

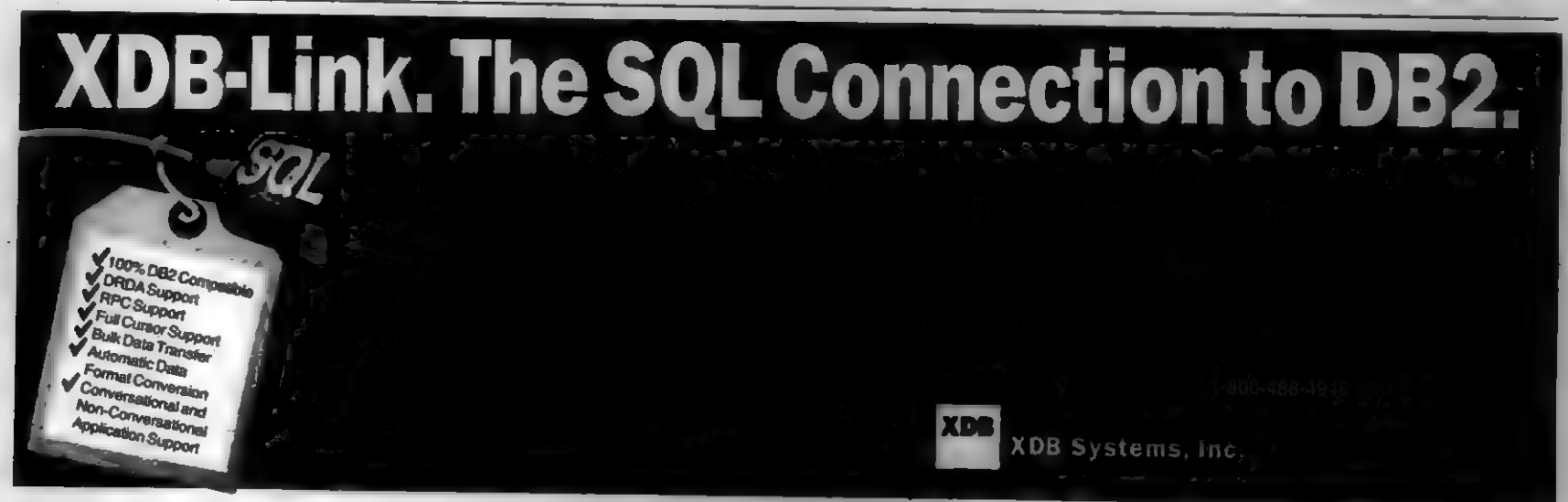
GLENDALE, Calif. — Is your Apple Computer, Inc. Macintosh feeling a bit woozy and under the weather? Is major surgery required? With Maxa Corp.'s updated Snooper diagnostic tool, it's easy to tell the difference.

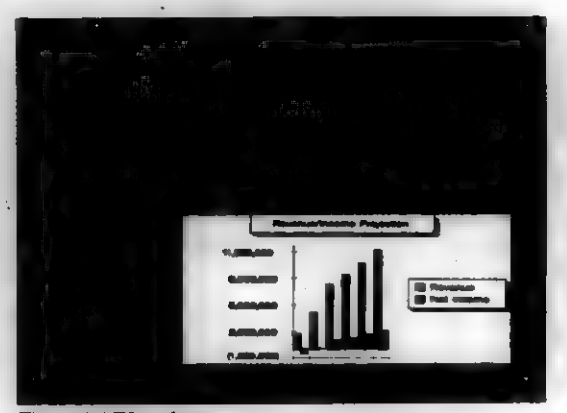
The icon-driven Snooper 2.0 update helps users determine when a Macintosh doctor is needed by performing more than 200 component tests. Snooper 2.0 is not a magic wand for replacing service representatives, but it can detect and give hints for handling hidden problems and let users know what they are up against if they decide to take their Macintosh to a shop. Test results can also be printed.

Snooper 2.0 identifies system configuration, runs benchmark tests, analyzes Small Computer Systems Interface drives and boards, evaluates random-access memory and checks video accuracy, among other things. A splashy new SIMM Finder also identifies defective single in-line memory modules (SIMM) by blinking their status in green or red.

Maxa has also increased the video tests Snooper performs. Enhancements include on-screen testing of video RAM, the ability to burn-in multiple monitors at once and the testing of certain accelerator cards.

The $349 Snooper 2.0 kit includes software and a diagnostic Nubus board, which detects problems in hardware configuration when a Macintosh will not boot up. Software alone is $249. Free upgrades are available.





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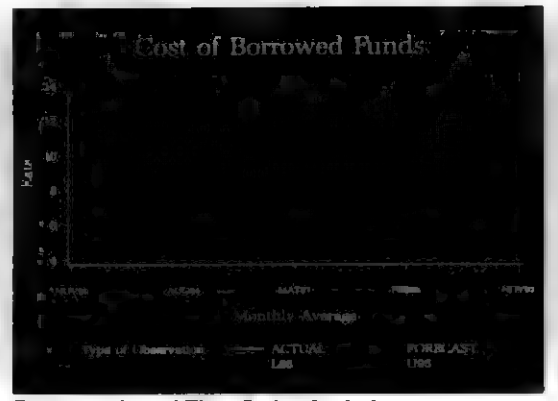

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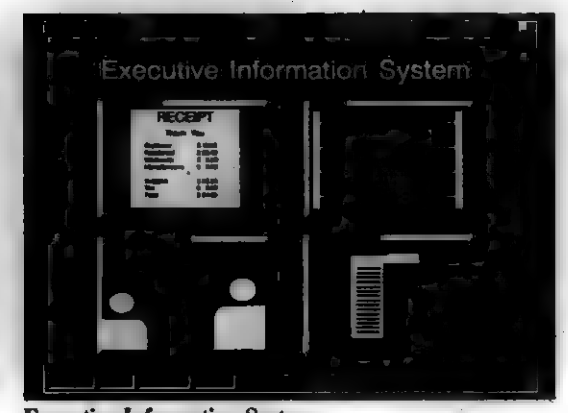
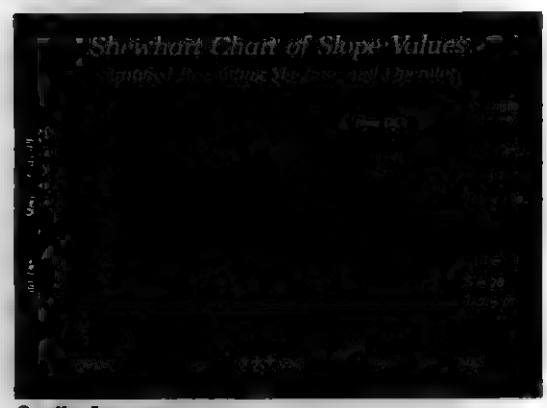


Executive Information Systems



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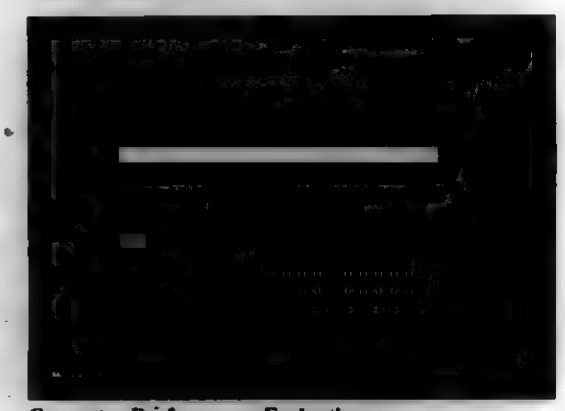

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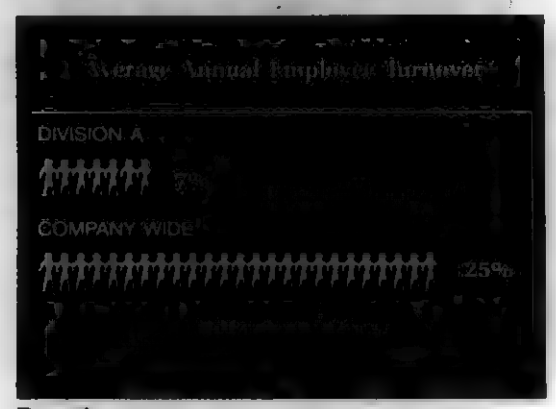

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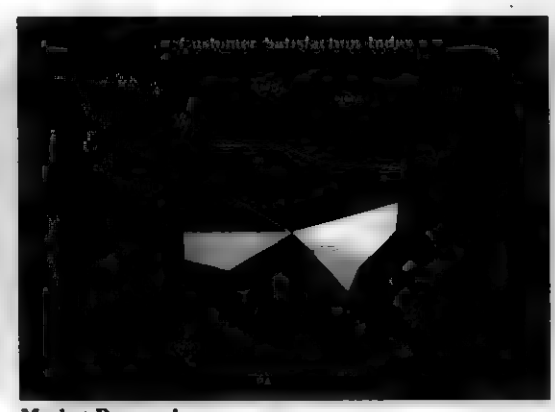

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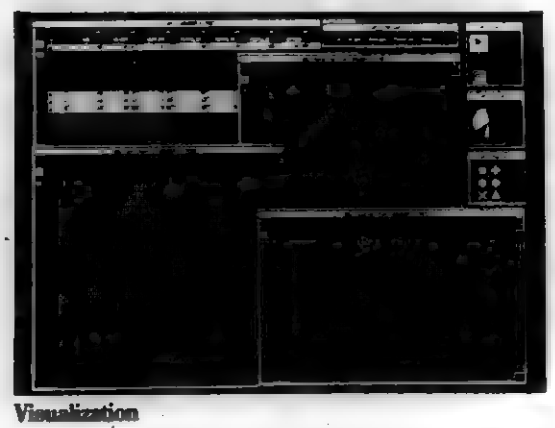

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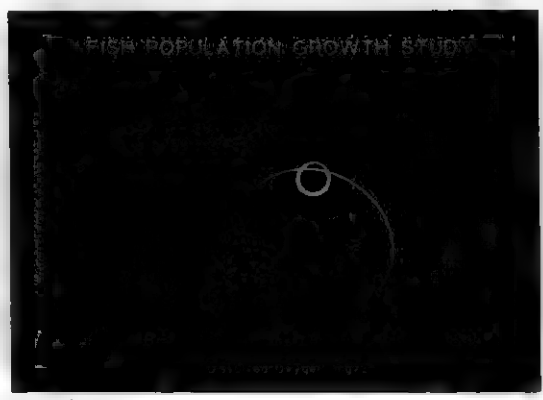

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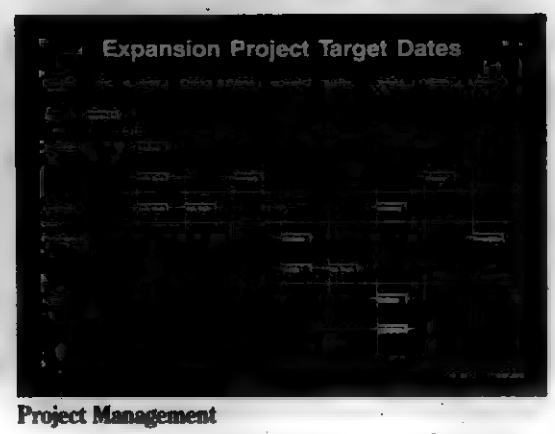


Project Management

WINDOWS VIEW

Jesse Berst

Out of the mainstream

Thanks to the recent advertising and public relations wars, you could be forgiven for thinking that spreadsheets, word processors and databases are the only things that exist in the Microsoft Windows universe.

The last two years have brought forth an amazingly diverse collection of shrink-wrapped software — nearly 6,000 packages. If you already have Windows workstations, you may want to leverage that investment by seeking out other productivity-boosting Windows packages. Here are a few examples:

• **People management:** Remember that management seminar you attended a few years back? The one where you learned all those great ideas for setting goals and "empowering employees"? Remember how you got tired of the paperwork and went back to the old way after a month or three?

The problem with many management schemes is the paperwork. Now there's a Windows software package called ManagePro from Avantos in Emeryville, Calif., to help you plan, delegate and track business goals. Included are modules for monitoring milestones and appraising an employee's work. There is also built-in "expert advice" from leading management experts. There's even a People Status Board that prompts managers to give periodic feedback, coaching and recognition.

When you delegate a task to someone else, it automatically appears on that person's list of goals. Alarms and reminders prompt you when to follow up. And here's something everyone will love — ManagePro has tools to speed you through those dreaded performance appraisals. Randy Dugger, who supervises nine people as manager of the workstation/LAN support group at Tandem Computers, says "I can take an objective and break it down into subgoals that I delegate to my staff. Every goal is documented, which saves me the drudgery of writing it all down, filing it and then looking for it again."

• **Asset management:** Some companies say the administrative costs of software distribution and licensing can cost as much as the software. Why not use Windows software to help with the task?

PC Galaxy from Apsylog SA in Palo Alto, Calif., is an English-language version of a Windows program from France. Due to be released next month, it lets systems administrators keep track of computer hardware and software. Extensive menus reduce data entry by letting users pick from lists. Once you've added equipment to the database, it can be sorted by user, brand and so on. PC Galaxy can monitor stock levels and generate orders when inventory slips below predefined levels.

If you want an automatic inventory of all your software, you might try CheckList by Touchstone Software in Huntington Beach, Calif., which performs a variety of auditing and inventory tasks. Thanks to a database of more than 4,000 programs and software publishers, CheckList can identify all the programs on the network (or on local machines), complete with version numbers and the publishers' name and address.

And if you want to combine asset management with a full-scale help desk, you might take a look at the new Windows version of Support Magic from Magic Solutions in Mahwah, N.J.

In addition to providing a centralized help desk database, Support Magic supports inventory tracking using bar codes. The product has optional modules for rentals, leasing, reporting, service contracts, purchasing and more.

■ **Desktop mapping.** Windows' GUI has led to a surge in mapping products for PCs. For instance, MapExpert from DeLorme Mapping in Freeport, Maine, is a CD-ROM product that contains a detailed map database of the entire U.S. Users can instantly call up a map of any location, searching by name, ZIP code or area code. Maps can be printed in any of 16 different scales.

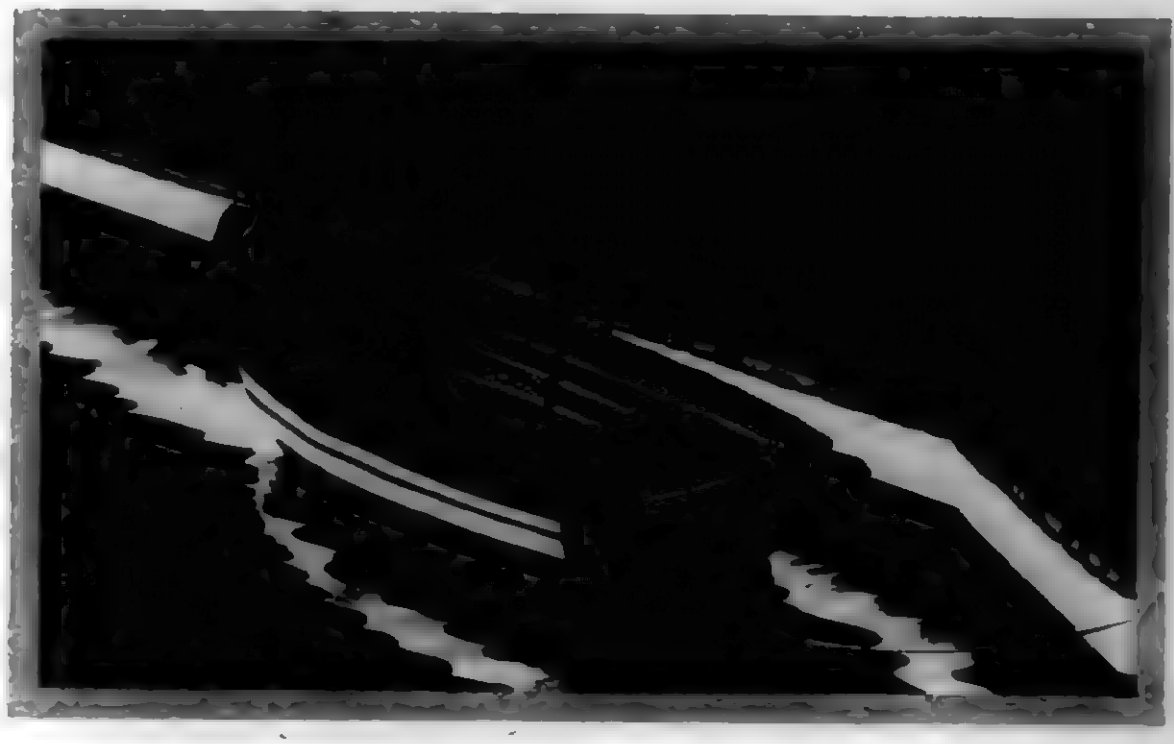
Meanwhile, MapInfo 2.0 from Mapping Information Systems in Troy, N.Y., is a tool for visually organizing data from databases and spreadsheets. You might, for instance, use the product in conjunction with your customer database to search for all sales prospects within 10 miles of an interstate highway.

• **Engineering applications.** Windows has already spawned a wide range of scientific and engineering applications, from statistical analysis to data collection. For instance, the Notebook package from Laboratory Technologies in Wilmington, Mass., collects data from test products or measuring instruments and displays it as a graph or chart.

How do you find these out-of-the-mainstream products? One resource is the "Windows Shopper's Guide," which comes out roughly twice each year and costs $24.95 from Whitefox Communications in Beaverton, Ore.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Document image management. If it seems like a logistical nightmare, look at the picture. Close your eyes. Take a deep breath. This is about as complicated as we get.



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Automation speeds firm's trading program

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Rockrimmon Securities, a privately held securities trader on the New York and American Stock Exchanges (NYSE and AMEX), is one of the first companies to take advantage of fully automated program trading, and the firm is seeing immediate results. Since the company began using customized software to facilitate its trading nine months ago, its trading volume soared 100%.

"It makes us much more competitive than we were," said Jeff Wilson, a general partner at Rockrimmon, which trades more than 1 million shares per day. By converting from a manual execution order system to an automated trading system based in large part on personal computers, Wilson said, the firm is often the first to place orders at the exchanges.

Last December, Rockrimmon began installing a program trading software system developed by The Davidsohn Group, a New York-based facilities management and outsourcing service bureau for the banking and financial services industries. The system, called the Davidsohn Order Execution System, runs on Rockrimmon's PCs, which emulate Stratus Computer, Inc. terminals.

Once traders have logged on to the system, they can "hot key" between a simultaneous display of updated market data and analytics. The system also produces on-line reports, including average prices of shares traded, Securities and Exchange Commission fee calculation, trade details and net proceeds.

Trading through terminals

Rockrimmon traders using PCs are connected by leased lines to Davidsohn's Stratus XA 2000 Model 120 fault-tolerant host. Rockrimmon traders are then able to place single or multiple orders through their terminals. Trade data is routed by the Stratus minicomputer through an IBM 3270 connection via leased lines to the Securities Industry Automation Corp., which houses computer operations for the NYSE and AMEX.

Before installing the software, Wilson said, Rockrimmon would have to phone one of its clerks on the floor of the exchange in order to page a nearby stock broker, a function that usually took at least two minutes, Wilson said. Using the Davidsohn system, Rockrimmon has eliminated the need for a "middleman" or stockbroker. Orders are now executed within seconds, which Wilson said helps make his firm more competitive. "Whoever is fastest in placing an order with the New York Stock Exchange sells the stock first," Wilson said.

Wilson said he realizes that other firms will soon be moving to program trading. "It's definitely the wave of the future. Eventually, everyone's going to have one of these [electronic trading systems]," Wilson said.

Davidsohn's DDX system is available immediately. Pricing is determined by order volume and terminal installations.

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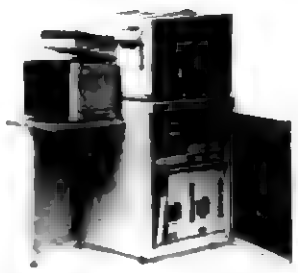

Enhance the high-capacity HP LaserJet III Si printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

Windows report writer debuts

BY CHRISTOPHER LINDQUIST
CW STAFF

An area where graphical user interfaces have an advantage over text-based interfaces is in those pursuits that are graphical to begin with, One such endeavor is report writing. Now the largest dBase-compatible report writer has entered the graphical fray with a Microsoft Corp. Windows-based version of its product.

R&R Report Writer for Windows from Westboro, Mass.-based Concentric Data Systems, Inc., allows users to query a database and graphically create and preview a report that can then be printed. Multiple database tables can be linked, and reports can be saved and reused. A variety of spreadsheet-like functions, such as subtotals and totals, can also be applied to the data before the report is printed. A royalty-free runtime verisen of the product is also available for developers.

"Users expect things to look professional, and database reports should also," said Michael Davis, network administrator at Robert Mondavi Winery in Napa, Calif. R&R Report Writer for Windows makes that easier, he added. However, graphical report writers are becoming more commonplace. Pioneer Software has a Windows version of Q+E, and several Windows database managers, such as Software Publishing Corp.'s SuperBase, have report writers built in.

"I think it stacks up quite favorably to the competition," said Chris Le Tocq, senior analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. Plus, "they have the name and the developer base so they have some momentum," he added.

Concentric also announced Version 5.0 of its DOS-based R&R Report Writer for Xbase.

R&R Report Writer for Windows is scheduled for availability next month for a list price of $249. Version 5.0 of the DOS product is available immediately for $249. Current users of R&R Report Writer can upgrade for $99.

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Deborah Bragg
Manager PC and Network Services
Raymond James & Associates

"We had some questions about our network, so I called our Cabletron salesman. A moment later, I was amazed to hear Bob Levine, the president of Cabletron, on the line asking me for details on the situation. Bob promised, *and delivered*, a complete solution to the problem within 24-hours.

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HELP LINE

Part of a series of user tips provided by personal computer software vendors and based on questions commonly asked of their customer support personnel. This week's focus is on Lotus Development Corp.'s 1-2-3 for Windows.

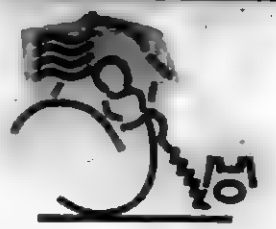
Q When I print from 1-2-3 for Windows to my color PostScript printer, it prints shades of gray instead of colors. Can 1-2-3 for Windows print in color to my printer?

A 1-2-3 for Windows uses its own internal PostScript driver as a default. This driver does not support color printing. To print in color, install the Windows PostScript printer driver under Printers in the Windows Control Panel and edit the 123W.INI file so that the line "postscript=" reads "postscript=system." Changing this line in the 123W.INI file will tell 1-2-3 for Windows to use the Windows PostScript driver.

Q Where do I select how many copies of my worksheet are to be printed from 1-2-3 for Windows?

A 1-2-3 for Windows determines the number of copies to print by the Copies setting in File, Printer Setup, Setup. This setting configures the printer driver for the number of copies. The printer driver contains the Copies setting. However, not all of the Microsoft Corp. Windows 3.1 printer drivers have a Copies setting. Typically, the Windows Laser and PostScript printer drivers include this capability.

1-2-3 for Windows



Q I don't see any of the Windows 3.1 TrueType fonts when I look in the "Available Fonts" section of the Style Fonts Replace dialog box of 1-2-3 for Windows. Can I use TrueType fonts?

A 1-2-3 for Windows 1.0 and 1.0a will not show TrueType fonts as being available if the current printer selection in 1-2-3 is not a laser printer. You can use TrueType fonts with the latest version of 1-2-3 for Windows. The 1-2-3 for Windows 1.1 Update is available free of charge by calling Lotus at (800) 872-3387, Ext. 6616.

Q How can I underline a word in a cell in 1-2-3 for Windows with a double line?

A Click on the cell with the mouse and select Style, Border. Then click on the box next to Bottom, click on the down arrow, choose the double underline and click OK.

Q How can I print a graph in 1-2-3 for Windows?

A To print a graph in 1-2-3 for Windows, it must first be added to the worksheet. Select Graph, Add to Sheet, select a range in the worksheet where you want the graph to be placed and click OK. Specify the range by highlighting it with the mouse, and click on the Printer SmartIcon to print the graph.

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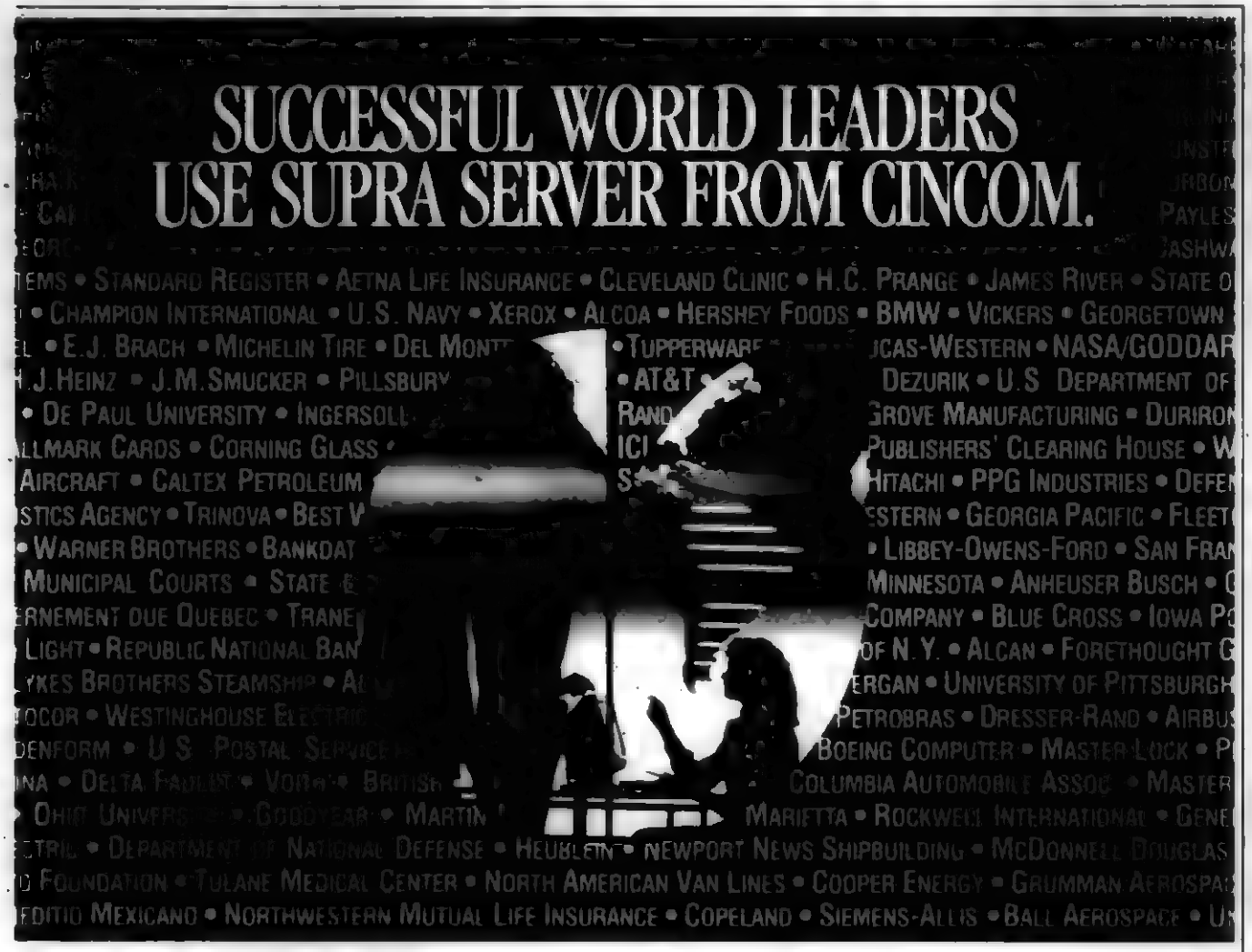

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Macintosh products

Agfa, the imaging division of Miles, Inc., has announced Version 3.1 of AgfaType CD-ROM, a type collection for Apple Computer, Inc. Macintosh users.

Version 3.1 offers more than 200 new typefaces, bringing the number of Adobe Systems, Inc. PostScript fonts that the product provides to more than 2,000. Two new Agfa type applications are included. KernEdit is a professional kerning editor, and TypeChart is a type speciman generation software package.

AgfaType CD-ROM Version 3.1 costs $99.

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White Paper

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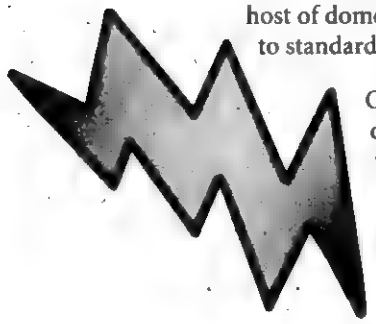
Introduction

Electronic Data Interchange (EDI) is not just another IS tool, another step up the technology ladder. With its ability to expedite business transactions between trading partners, EDI can promote commerce at a time when the sluggish global economy is dragging commerce down. It is also a boon to companies operating within more vibrant economic conditions, as it allows them to compete even more effectively.

As a result of its unique user-driven nature, EDI has evolved in strict accordance with the needs of a variety of vertical industries, each of which has tailored its technology to meet proprietary needs. While this freedom is arguably the purest expression of technology put to productive use, it has also led to a melange of EDI "standards".

Although efforts are in progress to unify users under one banner, a host of domestic and international obstacles — many not related to standards — must be overcome.



One of the most pressing and longest-running of those obstacles is the disparity of benefits EDI offers its varied constituents. In what has developed as a "haves" versus "have-nots" scenario, major retail and manufacturing companies that have implemented EDI are seen as forcing it on their suppliers, many of whom lack the resources to establish profitable EDI frameworks.

Although it is easy and appropriate to laud EDI for its potential as an economic catalyst, it does require attention on a technical level. Compared to other currently prominent technologies such as facsimile and imaging, EDI has a major advantage in that it is readily accessible for other applications.

As with other user-driven technologies such as personal computers, EDI has grown faster than IS' ability to obtain its full benefit. Now, IS is trying to provide broader and more integrated solutions that will allow users to get the most out of EDI while staying within the corporate IS structure.

Perhaps it is a good sign that so much attention is being paid to eliminating EDI's obstacles. That seems a sure indication that its ultimate success will be far-reaching.

This White Paper was written independently of the Computerworld editorial department by Paul Zorfass and Caroline Michel of International Data Corp. Zorfass is a consultant director at IDC. Michel is a senior analyst in communications.

For more information on the White Paper Program, please call 508-879-0700.

EDI (Electronic Data Interchange) is as much an evolutionary catalyst for continuous business improvement as it is an IS technology. EDI is unique in that it combines critical elements of data processing, business processes and communications.

EDI is a worldwide phenomenon that provides the infrastructure necessary for mission-critical transactions. It is being aggressively implemented and backed by national governments in the U.S., Canada, Europe, Asia and the Pacific Rim (Asia/Pacific). EDI has the potential to spur economic development by facilitating commercial transactions.

EDI is defined as the computer-to-computer interchange of business transactions that conforms with specified standards over a communications network that includes at least two trading partners. These transactions include the interchange of common commercial informa-

tion typically consisting of purchase orders, invoices, shipping notices and related acknowledgements. There are some special EDI characteristics that differentiate it from other processes and business solutions.

Most notably, EDI has been more user-driven than any other automated business solution. This has been advantageous for users because they have not been constrained by IS. They realize that characterizing EDI as a file transfer utility or as document-to-document interchange creates the wrong impression, one that does not portray the significant business benefits of EDI. Conversely, the user-driven nature of EDI has been disadvantageous to users because they lack the architectural and implementation coherence required by complex IS systems.

EDI growth has been bolstered by its appeal to some 30 vertical industry markets, each of which has become involved in specifying EDI standards for special interest organizations within that vertical industry. However, this vertical market appeal has undermined efforts to create a unified EDI standard. This situation has only recently been addressed by X12-Data Interchange Standards Association (X12/DISA). X12/DISA is the umbrella group for U.S. EDI standards, as chartered by the American National Standards Institute (ANSI).

The business and technology issues associated with EDI require special attention to project management, intra-enterprise cooperation and relationships between customers and suppliers. Companies that focus on these areas will realize competitive advantages.

The interchange of business information creates an extended enterprise environment. If the enterprise is viewed as a hub of activities, its trading partners can be viewed as spokes. Hubs represent the accumulation point for transactions from multiple trading partners. An example is a 350-store supermarket chain receiving direct store deliveries from its suppliers at all locations.

Typically, a larger spoke organization, such as a General Electric, RJR or Kodak, will be the hub for its own supplier network. Hubs have more specification power than spokes, which can lead to tension between the two trading partners.

MARKET SIZE AND MEASURES

Although the EDI market is worldwide, it originated in the U.S. and continues to enjoy most of its popularity here. The EDI market is comprised of three components:

- EDI software
- Data transport/network services
- Professional services.

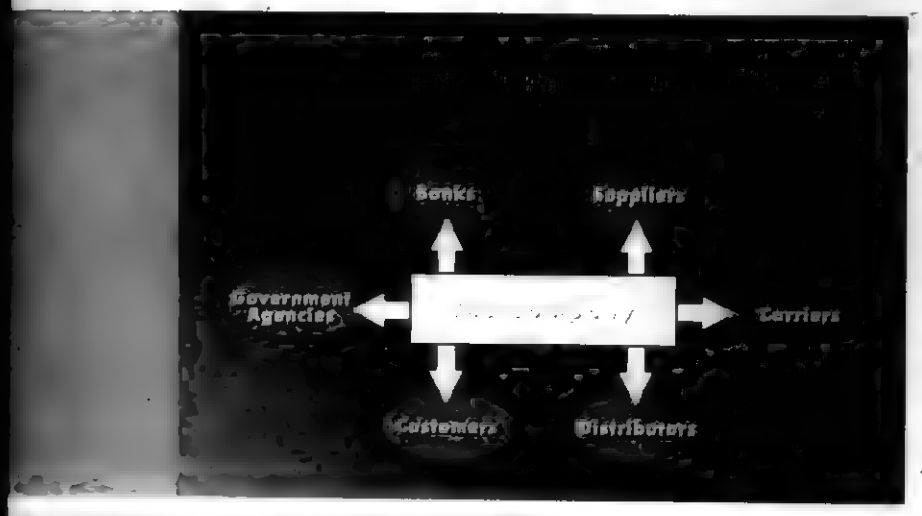
IDC estimates that the EDI revenues for these three components in the U.S., Europe and Asia/Pacific was $368 million in 1991. This figure is expected to reach $1.8 billion in 1996. This represents a compound annual growth rate of 37%. The projected growth by geographic trading area is 35% for the U.S., 36% for Europe and 48% for Asia/Pacific.

There are other parameters for measuring EDI's impact. For example, the banking community tracks the processing of EFT (Electronic Fund Transfers) transactions by the National Automated Clearing House. This is an excellent measure of how EDI is performing in the banking community. The best measure is the Corporate Trade Exchange (CTX) EFT transaction since it is compatible with the X12 ANSI EDI standard for remittance advice.

CTX transactions can automatically be processed from the automatic clearing house into a business's own EDI system. It is used for more than one invoice/payment. While the total number of transactions is modest, from the fourth quarter of 1990 to the fourth quarter of 1991, the number of CTX transactions processed went from 37,000 to 79,000, a growth of 114%.

The organization, "EDI, Spread the Word!", publishes the EDI Yellow Pages, listing EDI users. In July 1991, there were 21,000 registered users in this directory, and in July 1992, there were over 31,000.

The number of draft standards that X12/DISA has released for trial use over the last five years (excluding redundant transition standards) is steadily increasing. Maintenance activities continue at an active pace, showing interest and desire by users to make the standards more congruent with business practices.



EVOLVING BUSINESS AND IS PARTNERSHIPS IN THE '90s

Information technology trends such as downsizing and rightsizing are dynamics in the ever-changing relationship between IS and its business partners. As a result of such trends and economic imperatives, IS is being attached more securely to lines of business. Through all of these changes, IS must continue managing its high value-

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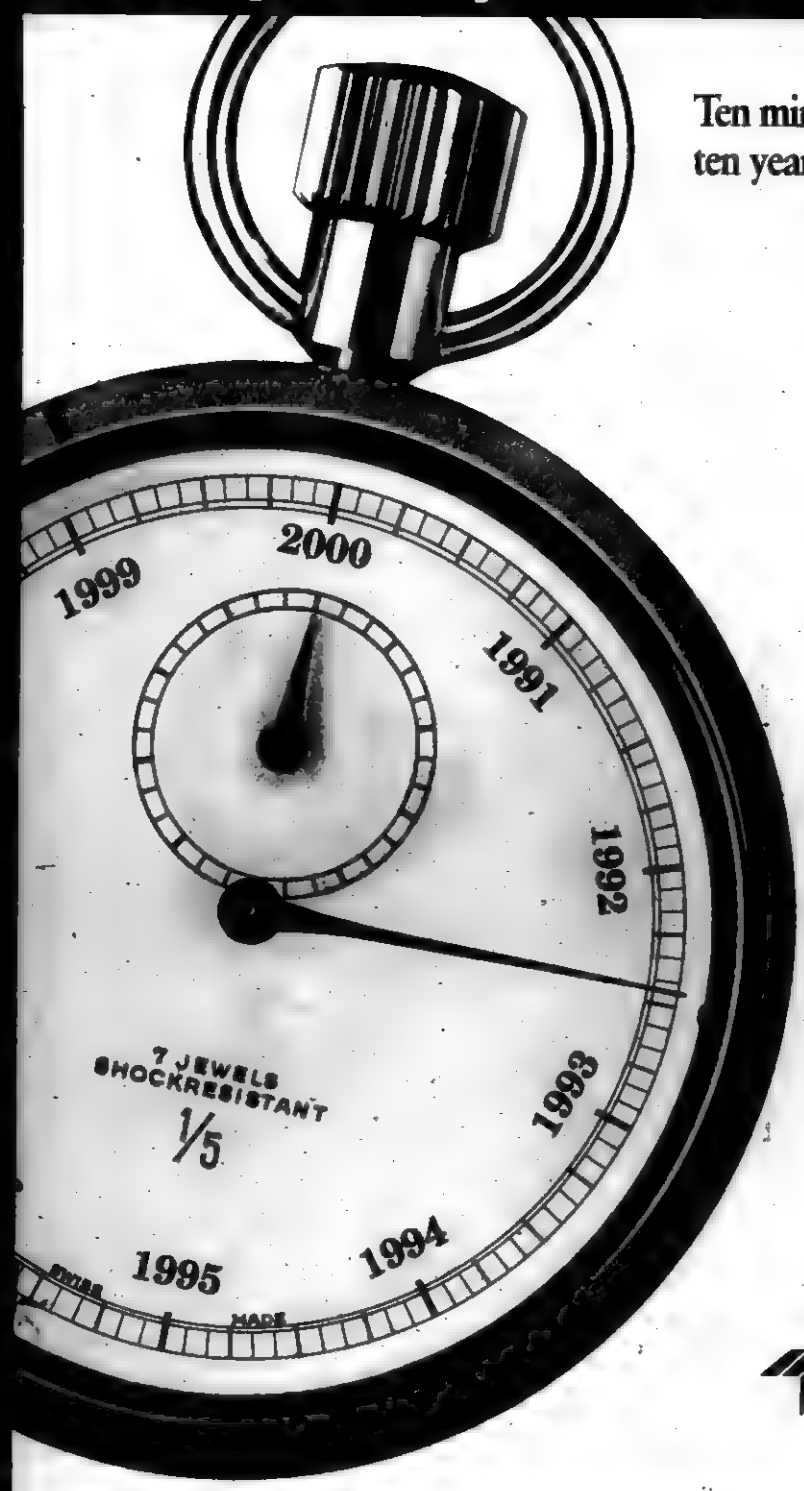

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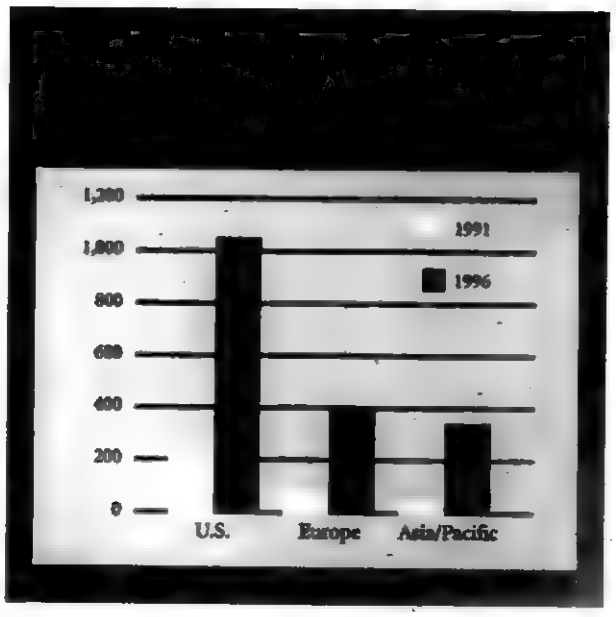
added, legacy systems (typically IBM and plug-compatible mainframes). This must be done in the face of new computing architectures, alternative software solutions, workgroup solutions and flexible infrastructures. At the same time, business management and IS are managing the ever-changing hierarchy of trading partner needs.

Senior IS executives need to keep in mind that there is a wide diversity of technology experience and planned technology funding for EDI. Smaller spoke organizations typically underfund EDI and put EDI solutions on dedicated PC platforms. While this approach meets the hub requirements, it does not allow the spoke/supplier organizations to realize the full range of EDI benefits.

Some advanced technologies such as fax and imaging which contribute to expanding electronic commerce are not yet ready for interoperating with current systems at all levels. If any data from a fax or image transmission needs changing, the entire fax or image must be retransmitted. With EDI, changes can be made on a transaction basis. While fax and image systems are sometimes simpler to utilize, their data is not readily accessible for other applications. By comparison, EDI's business transaction set opens EDI data to a wide variety of uses.

Enabling application software that allows EDI systems to operate in a variety of trading environments is critical. IS has prior experience with DBMSs, as a requirement for flexible data management: CASE, as a requirement for quality application development; electronic mail, as a precursor for continuous office communications; and 4GLs, as a requirement for responsive decision support systems. Similarly, EDI is a requirement for managing the business



organization for business process flexibility. As IS implementors understand, the challenge to building responsive systems is often directly related to the interfacing and interoperability functions.

TWO UNDERLYING EDI THEMES

EDI is a response to two underlying business themes, time-based business solutions and stakeholder-responsive solutions. This is the implicit motivator shared by such diverse EDI organizations as the Big 3 automakers, Sears, McDonalds, UPS, transportation port authorities and the Department of Defense. When it comes to time-based business solutions, the Japanese have shown that companies can control markets if they can first control their own companies, squeezing down the cycle times to complete tasks, while still not losing quality or accuracy. This means reducing paper, handling, filing and storage. Perhaps most importantly, it means reducing barriers to moving information and physical goods.

Currently, there are two noteworthy business practices in the U.S. that are particularly productive corollaries of time-based management solutions. EDI is conducive to both of them. The first, Just-in-Time (JIT), is a manufacturing strategy designed to reduce physical inventory and its associated costs, while managing a smoother interface between manufacturers and suppliers. This has spurred increasingly productive approaches to factory layout and design, production lines, transportation, bar coding and distribution.

The second, Quick Response (QR), is a retail strategy, prominent in grocery/supermarket chains, designed to rapidly respond to customer buying patterns that are captured through point-of-sale (POS) checkouts. QR has led to such improvements as direct store deliveries, turnover management and earlier staging through advanced ship notices.

The ability to achieve best-in-class status, or even be recognized in an individual trading area as a company that other companies want to do business with, is a function of how well each company manages its separate audiences. These audiences consist of customers, suppliers, and employees. Since EDI establishes the infrastructure for electronic commerce by managing interfaces between companies, it improves stakeholder relations with customers and suppliers.

Managing the employee stakeholder is complex. Since EDI is almost always a change agent in the company, and since change is usually not comfortable for organizations, the scope, schedule and areas for application all require careful attention. Within many organizations, it is often the sales people who are the most concerned with the impact of EDI, since EDI forces them to become better business planners.

CONCEPTUAL MODEL ARCHITECTURE

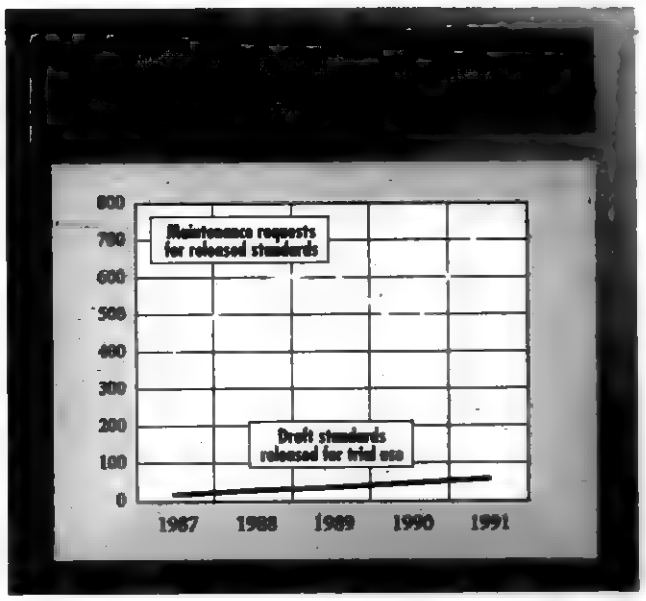
While EDI use is growing rapidly within a diverse community of private and public users, architectures and universally accepted and understood models have lagged. While this may not have

hindered the rate of growth of EDI, it is becoming a more important issue as organizations work to achieve more critical paybacks from EDI.

It is also becoming more important for several other reasons.

- EDI is being deployed in a global environment marked by extreme differences in culture, business practices and approaches to problem solving
- More interactions are taking place outside an organization's primary trading group, with new partners, new practices and new language syntax
- The use of EDI as it relates to EFT and invoiceless payments is becoming more complex. This will force EDI hubs and spokes to communicate more precisely about critical points
- There is accelerating penetration of current EDI user organizations such as transportation companies, governmental agencies and banks. This means that education and training will grow in importance.

The initial development work for a conceptual model containing EDI standards and services was completed in mid-1991 by the Special Working Group on EDI under the auspices of the International Standards Organization. The objective of the group was not only to develop a conceptual model to identify and coordinate present and future standards and services, but to make it internationally acceptable.



FOUR SUCCESS FACTORS

The four overarching critical success factors for EDI are business process reengineering; standardization and infrastructure; automation and flexible computing; and integration and interoperability.

Business Process Engineering

The critical factor of business process reengineering, or redesign, was popularized by companies such as CSC/Index, Andersen Consulting, Ernst & Young and Nolan Norton. The approach is a methodical, often structured, approach to initiating fundamental organizational change by means of critically evaluating business activities. There is a discarding or reworking of ineffective or unessential processes. New approaches are built that utilize new technology, where appropriate, to achieve major breakthroughs in improved business performance.

Often the problems are larger than initially anticipated, since business problems do not usually fit into neat slots. For a computer systems manufacturer there may be multiple manufacturing systems, each having a different set of requirements, that need to be interfaced at different locations. For a large manufacturing plant there may be multiple power plants each with railroad sidings for coal delivery, and the need to differentiate and cost differently since they use different grades of coal.

In the drive to become more efficient and reduce expenses through EDI, inventory reduction is often a target. This example can be the cause of significant concern, especially for the plant manager who has the ultimate responsibility for operations at the plant level, and who may see himself and his safety stock as both a beneficiary of, and a captive to, JIT solutions.

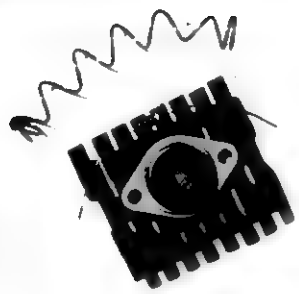
Standardization and Infrastructure

The first major area for standards involves messaging for the transaction transport and interchange over the communications network. The EDI roots for these are X.400 standards that were originally designed for electronic mail. The majority of current X.400 products is based on the version adopted in 1984. At that time, there was no explicit addressing of EDI requirements. Interim solutions have since been introduced by the National Institute of Standards and Technology (NIST) and the Consultative Committee for Telephone and Telegraph (CCITT).

The most critical EDI standards-related activity currently revolves around development of the X.435 standard, which facilitates EDI transactions over X.400 networks. X.435, which is still at least two years from implementation, defines a new EDI content type that uses the feature-laden services that are part of X.400. Additionally, as X.500-based directory services are better defined, the function of software translation and connectivity products for the deployment of EDI across networks will improve.

"Enabling application software that allows EDI systems to operate in a variety of trading environments is critical."

As an interim measure toward achieving improved network interconnection, the ANSI X.12.56 Interconnect Mailbag structure is being implemented by value added networks (VANs). All major U.S. VANs are committed to a rapid implementation of the Mailbag



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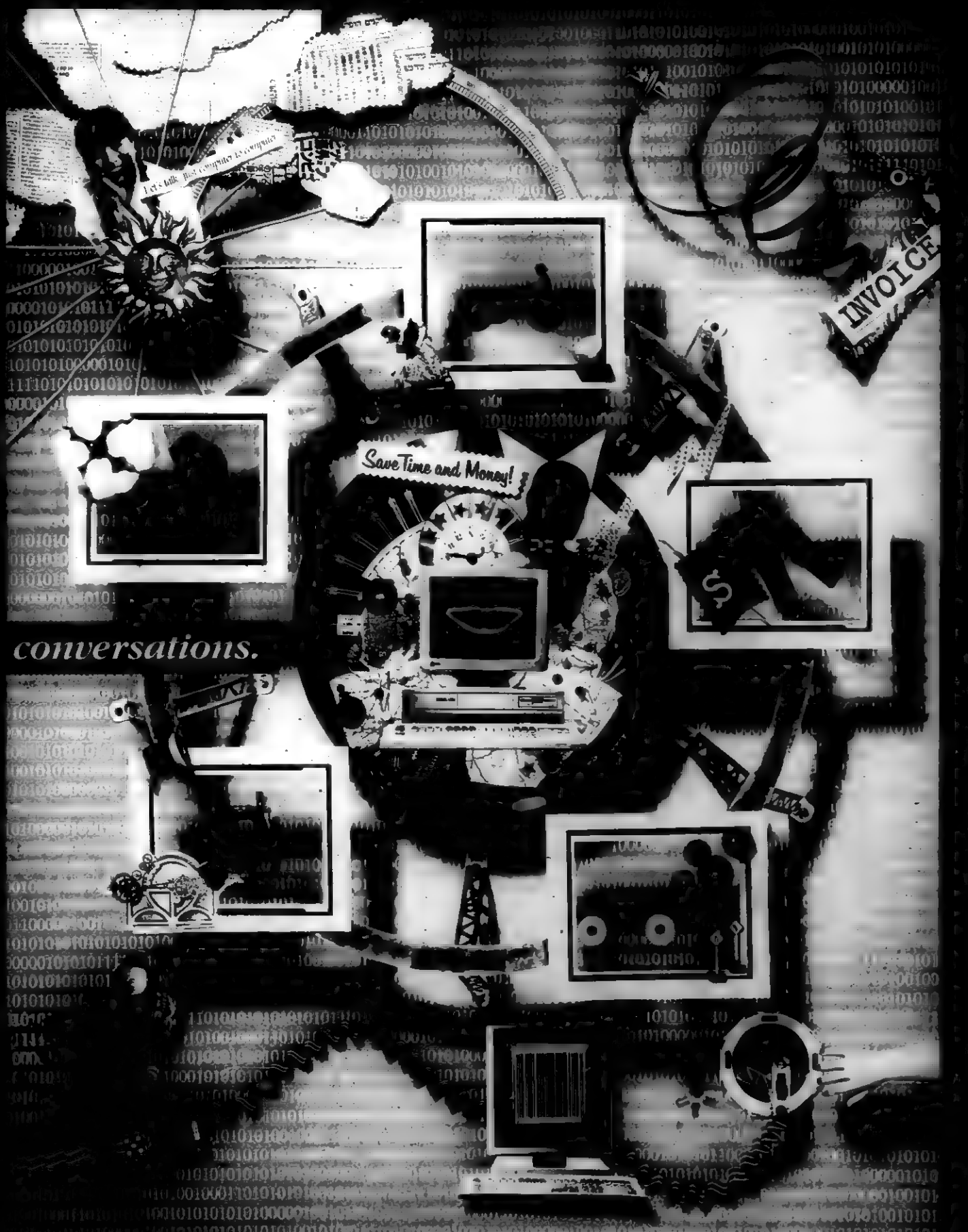
AT&T
EasyLink Services



conversations.

standard with the goal of implementation by the end of 1992. This will improve transaction handling and message management. This is true even though Mailbag provides only one interconnection acknowledgement for multiple transmission steps, does not have full audit trail capabilities, and does not provide for real-time, event-driven EDI as does X.435.

The second major area for EDI standards is the content of the transaction or document itself. This is application oriented. Industry trade groups started by establishing their own standards to address their special needs. In the U.S. these standards now fall under the ANSI X12 umbrella. While over two-thirds of EDI users in the U.S. utilize the more generic X12 standard, many also still have unique requirements for subordinate special interest standards. Some of the established trading standards are: WINS for warehousing, UCS for supermarkets, TDCC for transportation, VICS for department stores/mass merchandisers and AIAG for automotive manufacturing.

"VANs must offer a high level of service, including effective help desks and rapid problem resolution."

"Industry trade groups started by establishing their own standards to address their special needs."

DISA has established uniform procedures for the adoption and distribution of standards, especially for groups of interested parties with structurally different business organizations. It is not likely that these diverse standards will ever be totally homogenized since trading groups always have unique business needs.

In addition to X12, there are primarily European standards that are being developed under the auspices of the United Nations and known as UN/EDIFACT (EDI for Administration, Commerce, and Trade), an upgrade to EDIFACT. The usage of the X12 and UN/EDIFACT standards are determined by the needs of trading partners. Although many EDI users do not have any current need for EDIFACT, it is nonetheless required for specific national agencies such as customs.

The UN/EDIFACT standards are not complete, and sometimes documentation is difficult to obtain. Because it is designed to meet generic global needs, it will evolve more slowly than X12 and may be more cumbersome.

It is important to note the U.S. federal government's EDI approach, Federal Information Processing Standard 161 (FIPS 161), was developed under the auspices of NIST. FIPS allows the use of either X12 or UN/EDIFACT. Both U.S. and European groups are working to get these two standards to align with each other within the next five years.

The open, conceptual model discussed earlier will be consistent with X12 and EDIFACT, since it does not plan to use specific syntax of either of these groups. This model could start EDI down a path toward a broad, unified methodology that will favor less sophisticated spoke users.

When discussing standards, be advised that trading sector standards may change as frequently as once or twice per year depending on each committee's actions and on the balloting by DISA membership.

The communication network is a very significant portion of the EDI infrastructure. As the most common EDI carriers, the VANs play a critical role in electronic data transport and interchange. Like standards, VANs often have a trading group heritage, although they have subsequently broadened considerably. For example, BT North America (the acquirer of Tymnet) has a background in the grocery area; TranSettlements has a transportation history.

Overall there are some dozen or so VANs active in providing both generic and specialized EDI services in the U.S. and Canada. They include GE Information Services (GEIS), IBM Information Network (IBM IN), AT&T, CANAC Telecom, Harbinger EDI Services, I fonet, Kleinschmidt, MCI, RAILIN Sprint, Sears Communications, a Sterling ORDERNET.

The European and the Asia/Pacif markets are actually multiple countr markets. The U.K. has the most well d veloped EDI infrastructure in Europe. the U.K., International Network Servic (INS), which is partly owned by GEI and AT&T/ISTEL are the leaders; France, GSI, a leading European profe sional services company, and GEIS dom inate. The German market is controlle by GEIS. EDI is moving at a slower pac in the other European countries.

In Asia/Pacific there is a two-tier mar ket. Australia, New Zealand, Singapor and Hong Kong have well-develope EDI infrastructures. Japan, Taiwan, an South Korea have been late starters i EDI.

VANs are often the most practical rapid and secure solution to communi cation network needs. There are thre important areas for users to consider when evaluating networks for EDI use The first is secure data transmission. It i necessary to know if data packets reach the trading partner quickly enough. Users also need to know what sort o functional acknowledgement capability has been established to provide an audit trail for the transactions. Beyond that, it is important to find out what backup and restart mechanisms are available when links or central offices are impaired.

It is also important to check out what type of archiving is provided and for how long. Are transactions just lost after one week? How well does the VAN plan and execute disaster recovery? When was the last time that disaster recovery was tested?

The second networking area to consider is interoperability. Since many trading partners will not be on the same VAN, interoperability between VANs and managing the security of the transactions over the multiple VANs is critical. These are the issues that the Mailbag protocol and X.435 are designed to solve.

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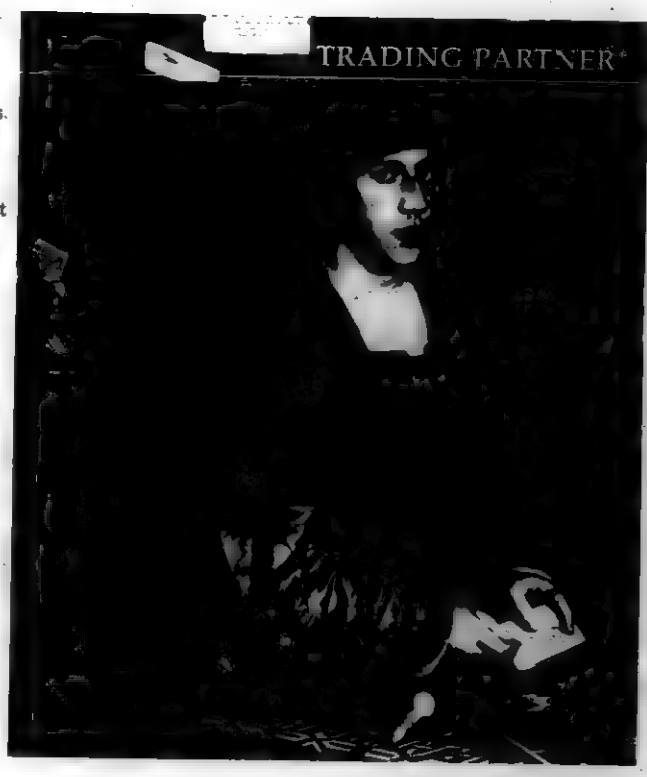

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- JIT/Continuous Replenishment
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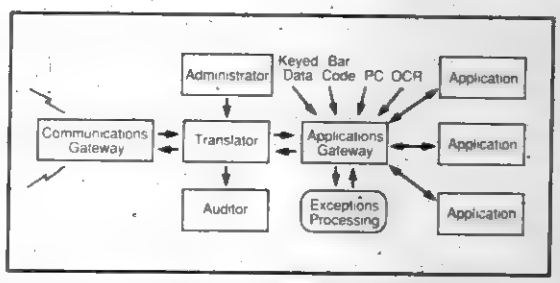

Trading Partner is the next generation EDI software for IBM mainframes.

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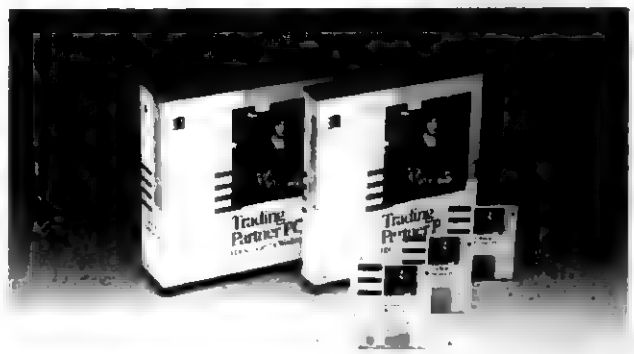

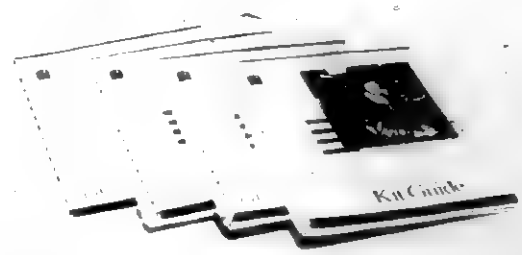

Each Kit comes with all of the software and documentation your partners need for reliable, consistent trading. The benefits are clear — reduced effort for you and happy EDI partners at both ends.

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The third area is customer service. Some VANs still do not realize that there are usually no effective replacement and backup systems available for heavy EDI user companies. VANs must offer a high level of service, including effective help desks and rapid problem resolution. VANs need programs that rapidly profile trading partners for installation and modifications.

Automation and Flexible Computing

The broad family of EDI software fits comfortably with a range of computer platform architectures, operating on mainframes, minicomputers and desktop (primarily DOS) machines. It can be used with both proprietary and UNIX environments. UNIX solutions have been emerging during the last two years. EDI translation software for standardized transaction sets is critically important. As the mission-critical nature of EDI evolves, organizations are making platform decisions that also include fault-tolerant machines. Both large and small organizations are purchasing EDI software.

Present computing platform usage is distinctly polarized. The larger Fortune 500 hub firms are operating in a mainframe environment often with software purchased from independent software vendors like Sterling, TSI, GEIS and IBM.

The spoke firms are typically operating on PCs or minicomputers. They may have only standalone PCs. EDI standards usually have been dictated by the larger hub firms and are predominantly based on X12. Small firms that use EDI only for the communications benefits will often translate and reassemble transactions for paper output delivery to departments such as purchasing, order entry, customer service, manufacturing or transportation/traffic.

Spoke software usually is chosen to be as compatible as possible with the requirements of hubs. Software suppliers focusing on the midrange and the desktop area include Supply Tech, ACS/Premenos, Digital Equipment, EDI Inc., EDS and Harbinger.

The larger hubs typically require rich product sets that accommodate scalability and address risk and reliability areas. The software needs to be table-driven. These tables must also address the evolving nature of X12, UN/EDIFACT and additional services such as bar coding that utilize online Universal Product Code tables.

The VANs also have complex software requirements for message and transaction management services. These services are required to maintain the integrity of the envelope and the transaction set. This integrity may have to be maintained across more than one VAN.

Integration and Interoperability

Managing application integration and interoperability are also critical to EDI success. The term EDI II is used for systems that successfully realize this goal. The integration and interoperability areas have organizational, platform and software components associated with them. The organizational issues are very complex and largely applicable to business process reengineering. Hardware, standards and communications issues are primarily software issues.

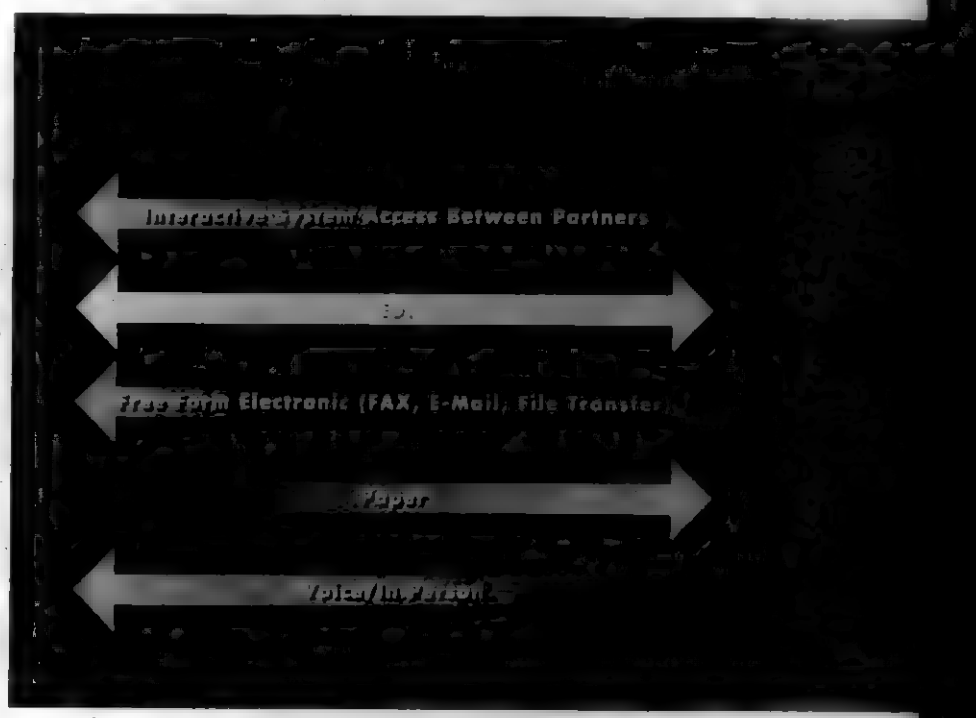
The more seamless and transparent EDI software is to other software, the easier it is to manage accompanying issues such as business reengineering. Software is improving in this area, but is not yet standardized. There are several areas that require special attention, including advanced software function, interoperability, network computing, convenient GUIs and time responsive solutions.

THREE LEVELS OF EDI

There are three basic levels of EDI use: end-to-end communications, intraintegration and interexploitation.

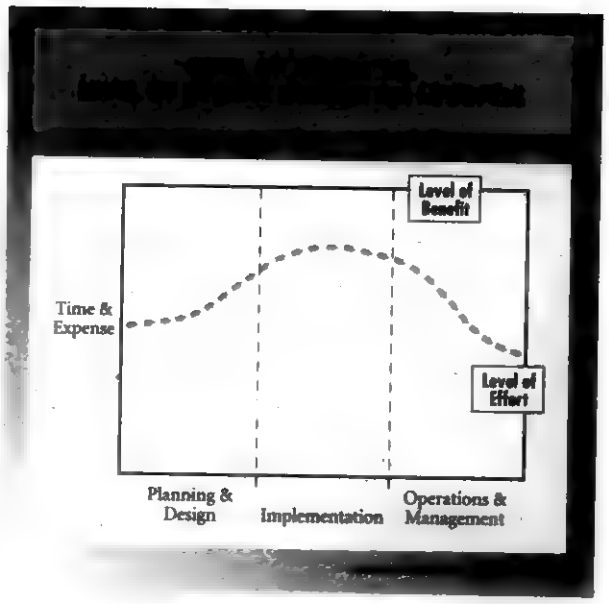
Level 1 — End-to-end communications. This is the foundation installation of EDI. It is comprised of computing platform, translation software and communications links.

Usually PC-based, Level 1 includes an end-to-end transaction delivery system. This is the least expensive approach and accordingly offers the fewest benefits. Transactions received at this level may be keyed into other systems or



turned into paper to be delivered to functional groups. There is no business process reengineering considered here.

The system is viewed by the organization as more of a communications link system than an IS system. Emphasis is on the trading partner-initiated aspects of the system. Usually it has been implemented to respond to a small number of trading partners and a limited number of business applications. Most EDI implementations are of a Level 1 type. Level 1 generally applies to smaller spoke companies as well as low end networks.



Level 2 — Intraintegration. This represents a Level 1 system that interoperates and is integrated with other IS systems. The Level 2 system affects business operations and has a high likelihood to change business practices. Business process reengineering is likely to have occurred at this level. Application integration and interoperability with other systems are the primary characteristics of this EDI level. It is a moderately expensive solution and has the potential for significant benefits when business processes are considered.

The Level 2 system impacts intracompany activities most heavily. Usually a larger number — perhaps hundreds — of trading partners is involved. Level 2 systems have the potential to be mission-critical. Level 2 approaches may extend JIT or QR across the business organization. These implementations are mostly being performed by hub organizations on mainframe systems.

Level 3 — Interexploitation. This is a Level 2 system that is more thoroughly integrated with business practices on both ends of the communication link. Level 3 systems are expensive and need to be implemented carefully over time. Their benefits can be very significant. The trading partners are providing information to each other that was formerly classified as internal information only. For example, a supermarket is sharing its anticipated shelf withdrawals and special promotions with manufacturers who will use the information for their manufacturing production planning schedules.

This level allows trading partners to plan ahead for materials, machine time, capacity and people needed in the future. Level 3 systems are mission-critical systems. Only a few trading operations have achieved Level 3. This group includes a number of transportation companies that have integrated systems with their customers' needs. These systems require trust between partners.

FUTURE EDI DIRECTIONS

While EDI will be more successful if integrated with present application software solutions as Level 2 EDI applications, the most lucrative EDI payoffs will come from finding new ways of doing business. Examples may include tieing EDI directly to scanners to take advantage of bar code inputs, or reducing complexity of purchasing systems by building advanced shipment solutions that require only P.O. release numbers. Another example may be simplifying payments to trading partners with advanced receipt and settlement systems. These systems will maintain tight audit trails but, let workers focus on system effectiveness rather than system efficiency.

Currently it is common to schedule batch EDI applications at various times. In some industries this batch orientation will change to real-time and event-driven transmissions that require the time-critical capabilities of EDI.

Although communication carriers such as AT&T, MCI, Sprint and the regional Bell operating companies are in their early startup stages for EDI, VANs may expect greater competition here once the carriers better understand the requirements of EDI. There is a challenge to carriers to become more than just a voice or data communications network offering customers wide area connections. Carriers have the opportunity to become more deeply associated with customers and their business activities by managing EDI transaction sets. They also have the opportunity to provide enhanced services that extend present voice and data communications infrastructures and offerings significantly.

T.D.C.C

EDIA

20 years of leadership

GREGORY B. HARTER
President and Chief Executive Officer

Dear Reader:

You, personally, can make a critical investment to remove limitations on your company's success. Walk, don't run, through this white paper on the use of EDI as a vital catalyst in the strategy to ensure your company's success.

You will see clear, logical connections between the use of EDI and your company's major business objectives such as leadtime and inventory reductions, new found ability to compete, and significant overhead cost reductions. Extensive research was done to compile the information and to arrive at conclusions about the application, benefits, and expansion of EDI in the U.S. business community. I urge you to capitalize on that research and compare and contrast it to your organization's position.

The number of companies in the U.S. now using EDI has almost doubled in the space of only two years. However, over 50 percent of the firms have done so reactively, attempting to minimize expenses which, even at low levels are not totally offset by resultant benefits because of the mindset in which it was done.

One of the key determinants in whether a company approaches EDI proactively or reactively is the position of a corporation's MIS management. Of course you know the opposite of the reactive mode is a proactive mode. That proactive mode also gives you broader, more positive results.

MIS staffs understandably advocate using standard business PROCESSES since that means less complex and more streamlined business SYSTEMS. I would suggest MIS staffers pay close attention to the information in this piece and give serious thought as to how you can proactively lead efforts in your company to get an EDI strategy and program started, or expanded across ALL functional levels of your organization.

The Electronic Data Interchange Association is pleased to be a part of this excellent white paper. Our number one priority is taking your company's EDI success seriously; we do so via a full range of educational resources available for companies which recognize the benefits of and are committed to seamless links between systems applications and those of their customers and suppliers.

I am sure you will have questions after studying this white paper. Please don't hesitate to call us for assistance. Our information network of EDI users who have successfully implemented EDI as a business strategy is second to none in the U. S.

On behalf of EDIA and our members, I would like to thank IDC for their effort in preparing this white paper and COMPUTERWORLD for the opportunity to expand the level of EDI awareness in such a prestigious publication.

Greg Harter

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NEW PRODUCTS

Systems

Presenta Technologies Corp. has released PC-Video VGA Model VN-01.

PC-Video VGA is an expansion card designed for IBM-compatible personal computers. The product enables a standard IBM-compatible PC to utilize any NTSC-standard device for display or recording, the company reported.

The product is a multimedia tool that supports simultaneous output via Super VGA, Super VHS, RBG analog and NTSC/PAL. Features include a proprietary firmware-based flicker reduction algorithm, overscan and underscan correction and flicker-free and real-time scan conversion.

PC-Video VGA costs $599.

Presenta Technologies
Unit F
12806 Schabarum Ave.
Irwindale, Calif. 91706
(818) 960-0420

Software application packages

MicroCal Software, Inc. has introduced Version 2.5 of its Origin Technical Graphics and Data Analysis software, adding three-dimensional and contour support.

Version 2.5 has 3-D graphs that include surface, scatter and ribbon charts. According to the company, a contour or surface chart can plot a grid of up to 256 by 255 points in size; users can plot random XYZ points as a surface with gridding specifications.

Built-in buttons on the chart permit the 3-D charts to rotate on the screen. The product has a "skip points" option that can increase the speed of the drawing so that the chart is continuously rotating in real time.

The 3-D contour features are available in two modules selling for $95 and $50.

MicroCal Software
22 Industrial Drive East
Northampton, Mass. 01060
(413) 586-2013

NovaStor Corp. has released Version 2.0 of NovaBack.

The product is a tape backup and restore software solution that offers support for Version 2.0 of IBM's OS/2, earlier versions of OS/2, OS/2's high-performance file system and DOS/Microsoft Corp. Windows files, the company reported.

Scheduled unattended backup, complete macro language for customized backup and a verify option are some of NovaBack's features. The product can support more than 100 Small Computer Systems Interface (SCSI) peripherals and more than 20 SCSI host adapters.

NovaBack Version 2.0 costs $295.

NovaStor
Suite 109
30961 Agoura Road
Westlake Village, Calif. 91361
(818) 707-9900

Avalan Technology, Inc. has announced Version 2.0 of Remotely Possible/Dial.

According to the company, Remotely Possible/Dial is a Microsoft Corp. Windows-based remote control and file-transfer package. Users can remotely control a Windows-based personal computer with keyboard and mouse operation.

Using a file-transfer utility that uses standard dial-up modems, Remotely Possible/Dial can convert files among PCs. The product can support high-resolution Super VGA and Windows accelerator display adapters. Support is provided for more than 75 modems.

Remotely Possible/Dial costs $199.

Avalan Technology
116 Hopping Brook Park
Holliston, Mass. 01746
(508) 429-6482

Peripherals

Tektronix Inc. has introduced Phaser IISD, a dye sublimation color printer.

Phaser IISD implements Adobe Systems, Inc. PostScript Level 2 software and TekColor Photofine technology. Because Phaser IISD offers continuous tone images, it is suitable for applications that require photorealistic output.

Apple Computer, Inc.'s AppleTalk serial and parallel ports are included, and Unix Transmission Control Protocol/Internet Protocol connectivity is available with the company's 4511A modem-size network interface.

Phaser IISD costs $9,995.

Tektronix
26600 Southwest Pkwy.
Wilsonville, Ore. 97070
(503) 685-3150

GoldStar Technology, Inc. has started shipping noninterlaced, flicker-free 14-, 15- and 17-in. personal computer monitors.

The monitors feature Enhanced Video Graphics Array and offer a high resolution of 1,024 by 768 pixels. According to the company, the products were designed for Microsoft Corp. Windows users who want to upgrade their computer systems with high-resolution monitors and desire a less expensive noninterlaced solution.

A Model 1465 14-in. monitor costs $699. A Model 1510 Flat Square Tube monitor costs $799; Model 1710 costs $1,299.

GoldStar Technology
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San Jose, Calif. 95134
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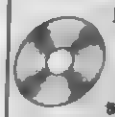

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Is LAN server market ready for RISC platform?

BY MICHELE DOSTERT
CW STAFF

RISC vendors, trying to move their machines into the business world, have been trying to sell local-area network managers on the idea that reduced instruction set computing (RISC)-based machines are the logical LAN server of choice; but industry watchers don't see any compelling reason for users to abandon Intel Corp. servers just yet.

No one denies that RISC machines have gotten very powerful and very cheap in the last two years. Steve Widen, senior analyst at WorkGroup Technologies, Inc., a research firm in Hampton, N.H., said, "On average, I think we've seen 50% to 100% improvements in price/performance each year for the last few years, driven by tooth-and-nail competition between such vendors as Sun Microsystems, IBM, Hewlett-Packard and DEC."

No one denies, either, that RISC vendors have been aggressive in porting LAN operating systems to their platforms. However, most of these ports will not be available until 1993.

Novell, Inc.'s NetWare for Unix is currently available on Sun Microsystems, Inc.'s Scalable Processor Architecture/Solaris platform and will be available on IBM's RISC System/6000 in early 1993.

Hewlett-Packard Co., meanwhile, is adapting NetWare to run natively on its Precision Architecture-RISC platform. This will be the first native NetWare implementation on a non-Intel chip; it is scheduled for release sometime in 1993.

Microsoft Corp. LAN Manager, as interpreted in the NCR Corp. LAN Manager for Unix product, is being ported to a wide array of RISC platforms.

Continued on page 60

In the works

Four key Unix server vendors have projects aimed at improving their links to PC networks

■ HP's PA-RISC chip

Developing the first native NetWare for platforms other than Intel. Scheduled for release in early 1993.

■ IBM's RS/6000

Novell is developing a port of its NetWare for Unix product that will run on the RS/6000. Scheduled for delivery in early 1993.

■ Sun's SPARC chip

Currently runs NetWare connectivity — developing port of NetWare for Unix to SPARC chip. Due in 1993.

■ DEC's Alpha

Will run Microsoft's NT operating system, which includes LAN Manager functionality. Scheduled to be out by the end of 1992.

CW Chart: Michael Siggins

Innovation follows downsizing

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — OK, so you've dumped your mainframe for a local-area network, and not only didn't the business die, it got bigger.

Now what?

The question of how to grow your system after a successful downsizing project faces Turner Corp., a $3 billion construction company with 70 offices worldwide.

Turner migrated from its IBM 4341 host in June 1991, bringing in a Banyan Systems, Inc. network.

"Our real focus now is, based on the fact that we have the [LAN] in place, we can take on business re-engineering tasks more easily," said Richard A. Schell, Turner's director of information systems.

For instance, Turner is working to integrate its proprietary computer-aided design tools with commercial systems, such as Autodesk, Inc.'s AutoCAD, so that it can combine efforts with architectural firms to compete more effectively for joint design/build projects.

Many users develop applications locally that could be used more broadly throughout Turner, and the IS department is working on improving this as well.

"Something that worked in Cleveland could be used in Washington, D.C., for a different client," Schell said. He cited a logo library developed in Florida that was broadly applicable to other presentation preparations.

Accordingly, Turner is building a Revelation Technologies, Inc. Advanced Revelation database that will give users around the world better access to all of Turner's projects.

Turner is working on a separate database that will capture and consolidate contract information so various business units can look at past projects and see cost estimates vs. real costs when making bids.

In addition, Turner wants to capture the knowledge of its "gurus" for various specialties — the company has built a huge variety of buildings. The concept would allow a Turner unit in Atlanta to gain knowledge from, say, a sports stadium guru in London without having to fly in the expert from London.

Projects of these kind led John Good, Turner's manager of information technology, to crack, "We are an information management company that just happens to build buildings."

Turner's move to a LAN brought more users in contact with technology and has the IS staff scrambling to build up its users' skill sets so they can fully exploit the technology they now have.

"We need to for-

To page 60

ON SITE

Claudio Edinger

Richard A. Schell, Director of IS

Turner Corp.
New York

- **Challenge:** Help decentralized construction company make better use of database and other application programs after downsizing from a mainframe to a LAN.
- **Strategy:** Reorganize support functions, work to more effectively communicate with users to learn their needs and help them contribute.
- **Results:** Implemented innovative user training program; developed consent for new approach to support.

$57 634 615 544

By the end of this week Computerworld readers will have spent over $57.6 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

Innovation follows downsizing

CONTINUED FROM PAGE 59

tify the decentralized organization," Schell said. He said that because Turner is so decentralized and has such diverse users — ranging from executives at corporate headquarters to construction workers at building sites — supporting them has required it to rethink training and support for users.

For example, Turner has created a traveling road show for its users. Rather than bring them in for specific training, three separate "training kits" of five personal computers and a trainer spend two weeks in each Turner office, training employees on the hows and whys of systems.

"We've accomplished one objective: to get rid of the old iron. But we're just on the front end of exploiting our new systems," Schell said.

Varying needs

Again, the variable nature of the construction industry poses a big challenge.

"The main office has business needs, and the end users are down on construction sites, so we're constantly trying to balance our customer focus," said Bill Lodge, a project leader at Turner.

Turner already does what some observers may consider implausible — supporting a 2,800-person company with only 28 IS employees.

Carrying that support a step further has meant recasting the support structure and has translated into more travel for Richard S. Enderle, Turner's project leader in charge of information and technology training.

Enderle has been sent down to a regional office in Nashville and spends a good deal of his time in the field, handling support tasks for the various Turner offices and sites in the South. He serves as a one-man pilot program for the new Turner approach to service.

As an area manager for Turner's IS department, Enderle gets called on to coordinate technology implementation with various Turner sites. He also comes in to do troubleshooting and is currently a key part of Turner's efforts to support its Miami sites in the wake of Hurricane Andrew.

Downsizing definitely makes a difference at Turner, despite the increased demands on its IS staff.

"The only thing I'd change is the schedule — I'd accelerate it," Schell said. Turner moved gradually toward shutting off the mainframe, beginning its research in 1986.

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Xircom

RISC vendors eye LAN gear

CONTINUED FROM PAGE 59

NCR currently offers it on its Mips Computer Systems, Inc. System 7000. Data General Corp. and Dansk Data Electronic are porting LAN Manager for Unix to their RISC systems based on the Motorola, Inc. RISC chip; it is also being used in numerous OEM deals.

Banyan Systems, Inc. said it plans to port its Vines network operating system to various RISC platforms but has not yet selected which platforms will be first.

RISC proponents cite two features of RISC that seem to make it a natural for LAN servers: a multibus design optimizes server I/O, and powerful processors running at speeds up to 100 MHz optimize server data processing. This power seems to make RISC a natural for large LANs or processing-heavy applications.

John Dubiel, manager of planning and technology at Boston Edison Co., plans to investigate NetWare for the IBM RS/6000 when it comes out.

"If you look at Novell's pricing structure, the way applications are priced for concurrent use and the cost of support, everything is forcing us to fewer, larger servers. We're looking for price/performance, so we will definitely investigate RISC as a server platform," Dubiel said.

Bob Buchanan, vice president of LANQuest, a benchmarking laboratory in San Jose, Calif., said he thinks that while most applications do not yet need the processing power of RISC, such compute-heavy programs are definitely coming.

However, advances in Intel-based superservers may have eliminated RISC's advantages. For example, several of the superserver companies have added intelligent processors to their buses to speed LAN I/O.

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Domain users OK latest HP support plan

BY MARYFRAN JOHNSON
CW STAFF

More ardently than ever before, Hewlett-Packard Co. is courting its Apollo/Domain users, this time with a better coordinated support program that creates a kind of one-stop shopping for their needs.

HP is determined to hang onto the business of those 100,000-plus users still running the 4-year-old, proprietary Domain operating system on workstations from the former Apollo Computer, Inc., which HP acquired in 1989.

After three years of fits, starts and complaints from disgruntled users, the vendor has finally settled on a plan that pulls the scattered pieces of Domain support together under one roof.

"HP has been very aggressive in seeking information from people with large [Apollo] accounts and in working with our user group," said Doug Eltoft, president of the 4,500-member IWorks HP/Apollo workstation user group.

"They really should have done this earlier," added Eltoft, who directs the Iowa Computer Aided Engineering Network at the University of Iowa, which has more than 300 HP and Apollo workstations. "Things have never been this well-coordinated before."

HP has promised to sustain Domain's life until the year 2000, although the last major release of Domain 10.4 will receive only incremental improvements, bug fixes and updated peripheral connections.

Gift of life

"Our charter is to provide extended life support for Domain so customers can choose when they migrate," said Jim Stroh, product line manager at HP's Software Technology Division in Fort Collins, Colo. "We want users to know we have a team of people keeping Domain active and viable."

A separate division of HP focuses on upgrading and migrating Apollo workstation users to HP 9000 Series 700 workstations.

Stroh's group has a distinctly different charter: to provide "mature software support" for Domain, MPE 5 and RTE, an older real-time operating system for HP 1000 systems.

The most visible change for Domain users will be more timely and accurate information about bug fixes, Stroh said. "We don't want anyone to see a major shift," he said. "We don't want disruption in the user base."

In recent customer surveys, Stroh said, HP discovered that once users vented their frustration at Domain's eventual disappearance, they acknowledged being "reasonably satisfied" with service levels.

"We found that what customers want from us is better communication. Many were not aware of when we issued patches [to the operating system]," he explained.

At a recent HP/Apollo user conference in New Orleans, Eltoft said a survey of 280 workstation users showed that some 30% are only running the HP/UX Unix operating system, 20% only Domain, and the remaining 50% are running both.

"Most people [at the conference] were very happy to hear what HP is doing, such as focusing on specific bug fixes for Domain," Eltoft said.

"HP still wants everybody to migrate, of course, but I heard a lot of users saying they're very pleased that HP is doing this," Eltoft noted.

Staying with its own

Along with the problems of tending to a dying operating system, many Apollo/Domain users have been annoyed with HP for deciding not to adopt the Open Software Foundation's (OSF) OSF/1 kernel and keeping its HP/UX kernel instead.

With its more advanced functionality and multithreading capabilities, the OSF/1 kernel was considered a better bridge to the future by Apollo users.

"There have been some hurt feelings that HP lied to them or at least misrepresented things," Eltoft said. "But if you sit down and talk to HP [executives], the decisions they've made do make sense."

He was referring to HP's plan to make the existing HP/UX kernel compliant with the OSF's Application Environment Specification in the upcoming release of HP/UX 9.0.

Two heads are . . .

The HP/Apollo workstation user group, which recently changed its name from InterWorks to IWorks, is now offering a $75 compact disc/read only memory (CD-ROM) that includes more than 500 public domain applications, games, utilities and tools for both the Domain and HP/UX operating systems.

Created through a joint project by HP and IWorks, the CD-ROM includes 360 Domain packages and 150 HP/UX packages for Series 700 workstations. It is intended as the first in a series of similar releases covering "the whole gambit of public domain software," said Doug Eltoft, president of IWorks.

Copies can be ordered by contacting Carol Relph at HP's Workstation Business Unit in Chelmsford, Mass., at (508) 436-5046.

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NetWare tools, equipment promise better automation in LAN backup

BY MICHELE DOSTERT
CW STAFF

Backing up and restoring data has traditionally been the Achilles' heel of local-area networks in corporate computing. Recently, vendors have begun introducing hardware and software products to facilitate — and automate — LAN backup.

"Frankly, a lot of people's network backup is just awful, and they don't find that out until they need to restore some data," said Cheryl Currid, a LAN analyst who runs Currid and Co. in Houston. "LAN backup should be automated, it should be centralized, and it should be idiot-proof."

Aiming for idiot-proof data protection, Intel Corp. in Santa Clara, Calif., has introduced an integrated hardware/software backup server designed to provide automated, centrally managed, unattended backup of Novell, Inc. NetWare-based LANs.

Currid said she thinks the new Intel system could be just what the doctor ordered for large NetWare LANs.

Intel's new StorageExpress system is unique in providing a complete, hardware/software, plug-and-play backup solution. It can back up not only multiple servers on a LAN, but also data stored on DOS, Microsoft Corp.'s Windows and OS/2-based LAN clients. Built-in scalability lets a LAN administrator continue to manage one single backup process from one central console, no matter how many StorageExpress systems are employed.

The StorageExpress system hardware consists of an intelligent controller with an Intel I486 CPU, an integrated 32-bit Ethernet interface, and a Small Computer Systems Interface-2 controller for fast data throughput. The system can be ordered with either 200M- or 500M-byte hard drives and either 2.2G- or 5G-byte tape drives; an additional 5G-byte tape drive can also be added. Peripheral ports are preconfigured to support label printers and an uninterruptible power supply.

The control unit is preconfigured with NetWare RunTime from Novell and has NetWare Loadable Modules and backup software, co-developed by Intel and Cheyenne Software, Inc., preinstalled, configured and tested.

> "LAN BACKUP SHOULD be automated, it should be centralized, and it should be idiot-proof."
>
> CHERYL CURRID
> CURRID AND CO.

On the software side, StorageExpress's user interface is a Windows application that allows backup-and-restore operations to be custom-tailored. It automatically prompts for tape rotation and routine maintenance and includes system-level diagnostics and on-line help.

For users who already have the hardware but are looking for automated backup software to protect their data, FortuNet, Inc. in Salt Lake City and Gigatrend, Inc. in Carlsbad, Calif., have both announced products.

FortuNet's new Nsure V1.2 suite of backup software products includes NetWare and DOS server backup managers, as well as client backup software for NetWare, DOS, OS/2 and Unix clients.

Nsure supports a multiple-protocol environment that supports IPX, NetBIOS and Transmission Control Protocol/Internet Protocol LAN transport protocols. This allows Nsure to provide backup for popular LAN operating systems, such as NetWare and Microsoft's LAN Manager, as well as for DOS, OS/2 and Unix. "We operate in parallel with LAN [operating systems] but we're not dependent on them; all we need to back up is compatible transport protocols between any two points," FortuNet President Richard Watson said.

Gigatrend, a leading manufacturer of 4mm digital audio tape storage systems, is now shipping MasterSafe Enterprise, tape backup software that backs up and restores multiple LANs and wide-area networks to a tape station on the network.

Support options

MasterSafe Enterprise was designed for enterprisewide backup, supporting ArcNet, Ethernet, Token Ring and fiber-optic topologies, as well as wide-area technologies such as T1. It works on any LAN running NetWare 2.x, 3.x or NetWare for Unix.

MasterSafe Enterprise permits multiple network file-servers and workstations to be backed up simultaneously. This parallel processing of backup tasks was designed to improve backup performance.

Wayne Roberts, LAN administrator at St. Agnes Medical Center in Fresno, Calif., is impressed with the Gigatrend software. "Using MasterSafe Enterprise, we are backing up two servers to a tape station at speeds up to 41M byte/min.," he said. "We plan to do global backups on a nightly basis and incremental backups every two hours using this new system-based backup software."

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TAKE ADVANTAGE OF CHANGE™

Record company gets down to downsizing on low budget

BY CAROL HILDEBRAND
CW STAFF

The Rolling Stones and the Grateful Dead aside, making a living in the music business is difficult at best for most artists. But for Rounder Records, a shoestring budget did not mean that information technology was left dangling.

Bob Mitchell, manager of the studio's MIS department, has managed to assemble a system that fulfills his aim of decentralizing the computer system while still recycling as much incumbent equipment as possible, thus saving the company precious dollars.

Based in Cambridge, Mass., Rounder was formed in 1970 by three Boston-area college students who sold their wares out of an old Volkswagen bus at folk festivals. Since then, the company has grown to an $18 million concern with a staff of more than 70. However, with its main labels specializing in niche musical genres such as reggae, Cajun, zydeco and the blues, mainstream acceptance is not likely, Mitchell said.

Thus, when the company outgrew its old system, Mitchell decided he would see how much he could expand while keeping costs to a minimum.

"The whole thing was driven by cost and coincidence," he said.

Rounder has been running on an Altos Computer Systems 1000 machine for several years and wanted to stay in that niche for cost reasons. Mitchell said it came to that decision after evaluating whether to continue in its current direction or start from scratch.

Personal computer networks were out of target range for the budget, as was getting all new software.

Mitchell ended up with another Altos — a 486 box with 36M bytes of random-access memory and 1.4G bytes of storage — running The Santa Cruz Operation's SCO Unix. Attached to the server are cluster unit controllers supporting up to eight dumb terminals each. He has about 70 devices attached, with about 55 users running at peak times. The server runs customized accounting software from RealWorld Corp. in Concord, N.H., which the company had previously used, and WordPerfect Corp.'s word processing package.

Although Mitchell said he knows his shop is not cutting-edge, what is important is that he was able to get technology out across the company and help streamline operations.

For example, orders are placed on-line by a salesman, and the credit is automatically verified on-line by the software, thus saving the accounting department about an hour a day by eliminating manual credit checks. In the warehouse, orders are pulled from the computer, which then compiles a complete shipping manifest for United Parcel Service, Inc. to check.

Receiving, which the company automated last month, has cut down on the number of human errors caused by the old handwritten forms, he said, particularly since the orders now can be compared with the on-line versions entered by the buyer.

Mitchell said keeping things simple is essential, considering the nature of most of his clients. Many of the people who work for Rounder are musicians who, he said, tend to distrust machines. "Which is cool," he said, "because it makes them better consumers" and gives him a strong mandate to simplify.

He said the initial distrust has turned into excitement over what the system can do, and users are doing their own exploring.

Royal Bank taps Notes for help

BY ROSEMARY HAMILTON
CW STAFF

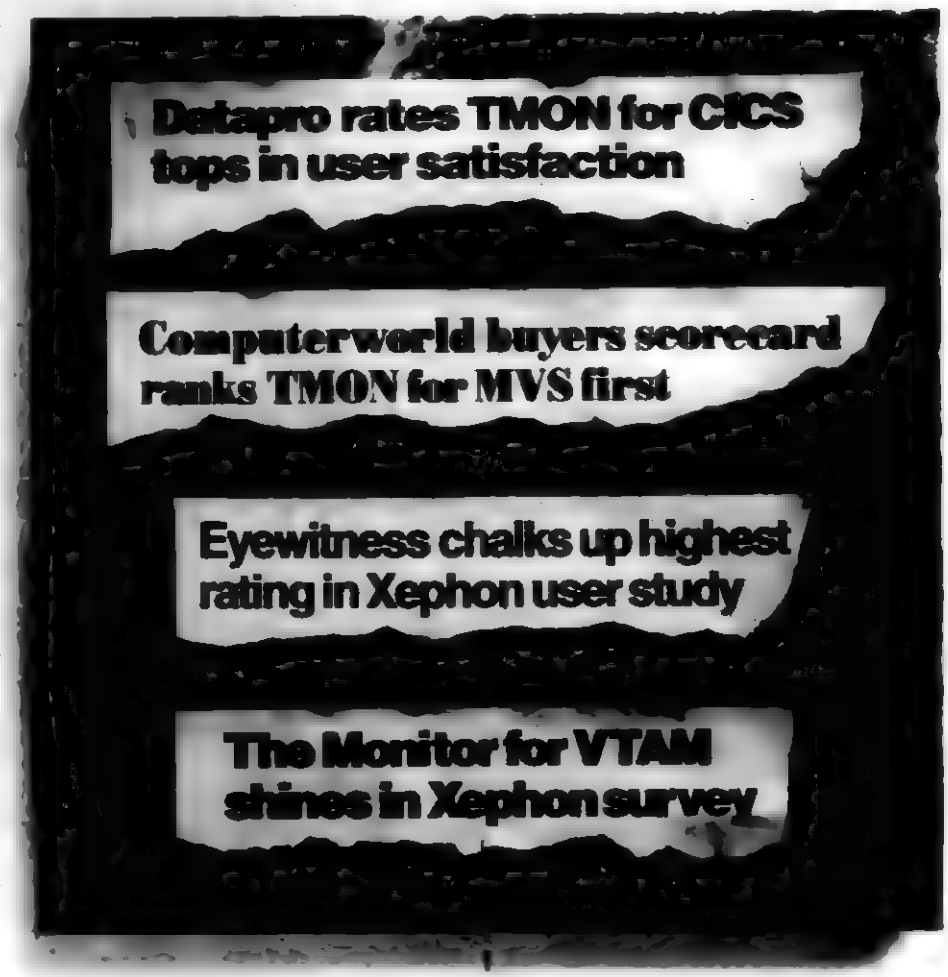
The Royal Bank of Canada in Toronto had not been in pursuit of a groupware product. But when its New York office asked for help in sharing information among account managers, the bank decided to take a look at Lotus Development Corp.'s Notes.

"They pushed it, so we accelerated our look [at Notes]," said George Oliver, manager of information delivery technology. Now "we are seeding it throughout the organization."

Oliver said initial reaction to Notes is positive, but the bank is not yet certain what kinds of productivity boosts it will deliver. "How it shows up on the bottom line still has to be proven."

But he has seen some initial results within the technology group, which is using Notes to share data among project teams. Before Notes, the teams relied on "paper and people's memories and lots of meetings," Oliver said. "We are hoping to cut down on all of those things."

When Royal Bank evaluated Notes, it determined "that there isn't another product like it. . . . It has significantly rich function."



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NEW PRODUCTS

Workgroup software applications

Business Objects, Inc. has introduced BusinessObjects, a data access solution for relational databases.

According to the company, the product's Microsoft Corp. Windows- and DOS-based front ends give users access to relational databases from desktop personal computers and workstations. Several new technologies have been added, including data representation and a query technique.

Prices start at $9,360.

Business Objects
Suite 240
2500 Sand Hill Road
Menlo Park, Calif. 94025
(415) 854-1500

Database Publishing Software, Inc. has released SmartLeaf Batch Processor.

The product is a queue-based version of the company's SmartLeaf product line. Users can design Interleaf documents from information stored in databases, the company reported. SmartLeaf Batch Processor is suitable for generating financial statements, invoices and reports.

Prices begin at $7,000.

Database Publishing Software
Suite 6800
800 Cummings Park
Woburn, Mass. 01801
(617) 938-0018

Workstations

Commodore Business Machines, Inc. has introduced the Amiga 3000T-040/200, a multimedia workstation.

Powered by a Motorola, Inc. 68040 processor with an integrated math coprocessor, the Amiga 3000T-040/200 includes AmigaDOS 2.0 and has a 200M-byte hard disk drive. A 32-bit bus architecture and 5M bytes (expandable to 18M bytes) of random-access memory are provided. Commodore's service program, CommodoreExpress Gold Service Options, is included with the product.

The price is $5,998.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

Unix

Tektronix, Inc. has introduced Phaser Print, a printing solution.

According to the company, the product enables Unix workstation users to print Adobe Systems, Inc's PostScript files and raster screen dumps on any of Tektronix's color printers with PostScript Level 2 software.

Color matching, image positioning and scaling are some of the control printer features included in Phaser Print. The product is available on 8- and 24-bit Sun Microsystems, Inc. and Silicon Graphics, Inc. workstations that run the X Window System, Open View or Sun View.

Phaser Print costs $995.

Tektronix
26600 Southwest Pkwy.
Wilsonville, Ore. 97070
(503) 685-3150

Structured Software Solutions, Inc. has released FacetTerm for AlphaWindows.

The product was designed to offer window management support for Alpha Window terminals, a generation of character terminals that use a window-style user interface, the company reported. Multiple windows running various Unix applications can be opened, moved, resized, stacked and closed.

FacetTerm costs $495.

Structured Software Solutions
Suite 205
4031 W. Plano Pkwy.
Plano, Texas 75093
(214) 985-9901

Maxa Corp. has introduced Reveal, a Unix diagnostic and system monitor for the RISC System/6000.

Reveal can be used as a foreground utility, giving users three screens of information that indicate system load levels with numeric and light bar scales, the company reported.

General information regarding the system total CPU use, disk activity and total memory use is shown on the main screen. The process screen reveals which users or processors are using the most system resources.

Reveal for the RS/6000 costs $999.

Maxa
Suite 100
116 Maryland Ave.
Glendale, Calif. 91206
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Pacific Genesys Development, Inc. has released ReForm, a Unix software tool.

According to the company, ReForm reduces or eliminates the use of preprinted business forms by enabling Unix software applications to generate forms with data output to a plain paper laser printer or a fax system.

ReForm can support most accounting and database software. The product prints to any Adobe Systems, Inc. PostScript- or Hewlett-Packard Co.-compatible laser printers.

Prices range from $595 to $1,295.

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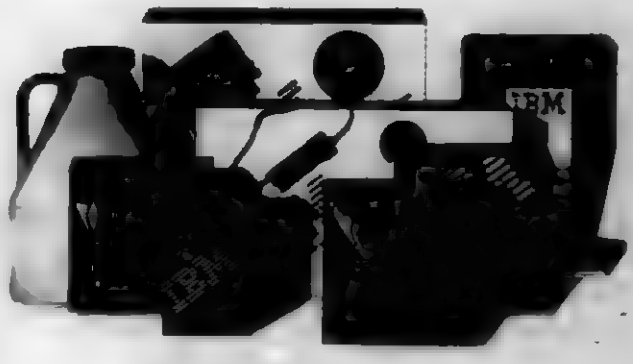

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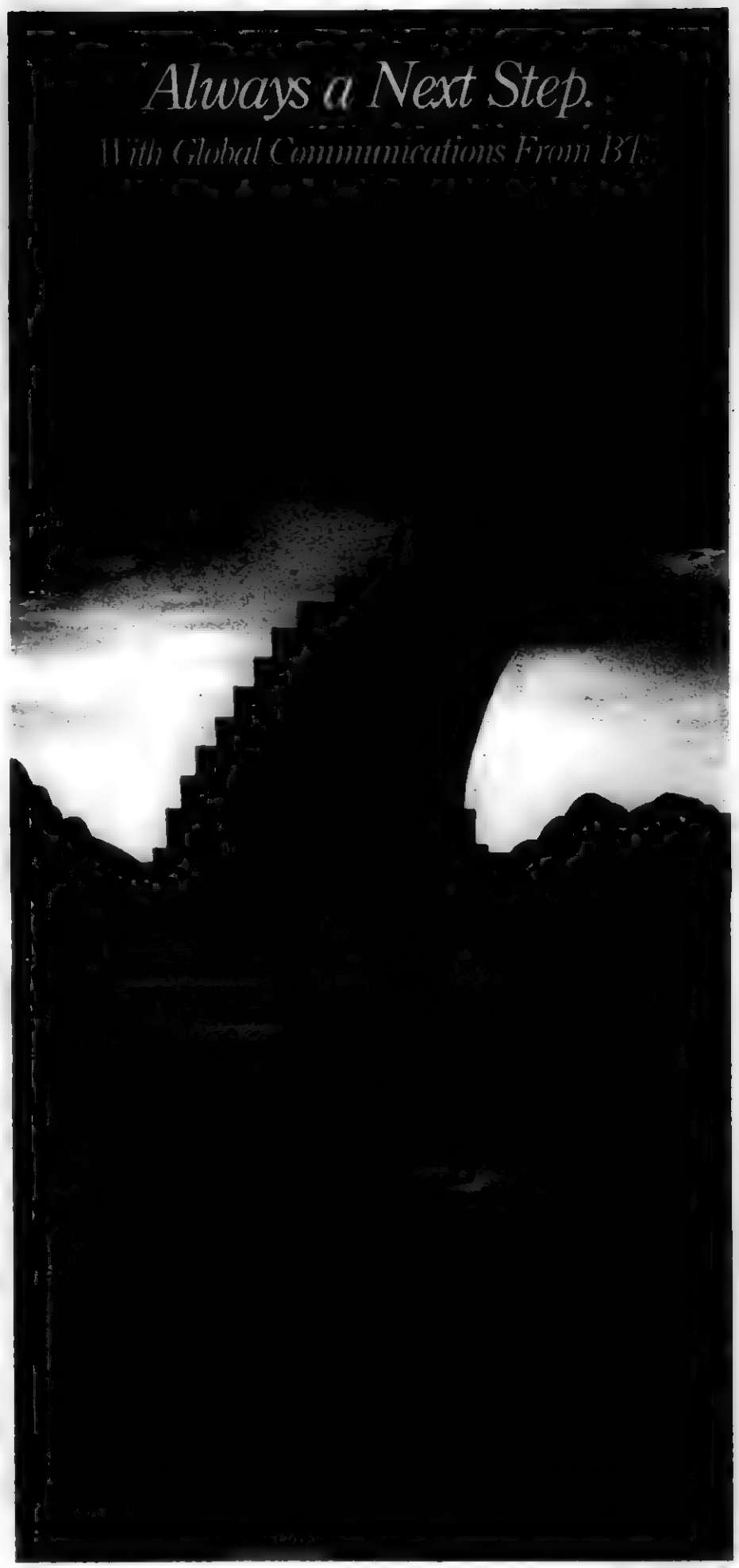

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Diverse standards take step in unison

BY ELISABETH HORWITT
CW STAFF

A consortium of users, vendors and standards organizations has released what it claims is the definitive treatise on how today's free-for-all of conflicting and competing network management products and standards can lie down together in peaceful coexistence and interoperability.

Leading network management vendors and standards groups such as the Network Management Forum, X/Open, the Open Software Foundation (OSF), the Object Management Group and Unix International achieved "an unprecedented degree of cooperation" to bring out Omnipoint 1 on schedule, said Hewlett-Packard Co. spokesman Bob Emerson.

"We have never had a single blueprint or vision of how all those [different standards] can be pulled together in practical, real terms that can be used by vendors and customers," said Gary Francis, IBM's director of network management products.

"One advantage of Omnipoint is the avoidance of major conflicts and overlaps between different standards; you get a package of standards that hangs together," Emerson said. Major standards in Omnipoint include Simple Network Management Protocol (SNMP), the Open Systems Interconnect (OSI) Common Management Information Protocol (CMIP) and the OSF's Distributed Management Environment (DME).

NETWORK MANAGEMENT

Omnipoint's "second benefit is stability," Emerson said. A major obstacle to widespread vendor implementation of standards such as CMIP is the tendency of standards bodies to change the protocols every year or so. "So you get different vendors implementing different versions, and you quickly reach the point where no two systems interoperate," Emerson said. Omnipoint is guaranteed to remain in its current form for two years.

The drawback to this stability, however, is that certain gaps in the first Omnipoint release cannot be addressed until the next version comes out. Omnipoint has only begun to tackle the crucial question of how SNMP- and CMIP-based systems can interoperate. The consortium is now working on mapping guidelines between the two standards' object definitions, which enable different network management systems to talk the same language when they are describing a managed device or a management function.

The consortium is also working to achieve some degree of commonality between the models used by Object Management Group's Common Object Request Broker Architecture and those used by OSI.

Omnipoint 2, due out in two years, will address both of these issues, Emerson said.

Meanwhile, the big question in users' minds is whether vendors will really implement the full Omnipoint 1 plan to the point where their systems can interoperate. The danger is that vendors will be content with the level of commitment that IBM delineated in its formal statement of support for Omnipoint: the promise of "implementing one or more of the Omnipoint elements such as SNMP and CMIP protocol support" in its products. Because virtually every major network management vendor now supports either SNMP or CMIP, this is not a significant statement.

The Network Management Forum User Group recently issued scorecards for vendors to fill out, outlining a schedule for bringing out Omnipoint-conformant products [CW, June 29]. The scorecards, which are due back to the user group next week, put the vendors in a quandary. Emerson said, "We have to respond without preannouncing our 1993 and 1994 product plans," Emerson said.

Meanwhile, users may turn to DME, which is due to become an implementable standard by the end of next year. Unlike Omnipoint 1, which is "about 97 documents that users can't do anything with directly, DME is an implementation; it's code that users can get direct value from," Emerson said.

HP targets OpenView to new markets

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — OpenView is hot, and Hewlett-Packard Co. plans to make it hotter, the company said, by dividing up the DOS and Unix sides of its network management product and allocating more marketing and development personnel to both versions.

HP announced last week that its PC Software Division will assume responsibility for the HP OpenView Microsoft Corp. Windows platform, which HP sells primarily through value-added resellers as a local-area network management system, the company said.

In addition, HP has created a new Network and System Management Division to take over Unix-based OpenView.

OpenView is billed as a multivendor enterprise network and systems management platform and is sold directly by HP, company spokesmen said.

All the right moves

HP is making the "right move" by sharpening its thrust into the fast-moving, increasingly cutthroat integrated network management market, said David Passmore, a program director at Gartner Group, Inc.

OpenView is a leader in this arena right now, with an installed base of 11,000 user sites, HP said. The product family took 24.5% of the LAN management market last year, according to International Data Corp. (IDC) in Framingham, Mass.

However, OpenView is hotly contested by Sun Microsystems, Inc.'s SunNet Manager, which had 22.6% of the market last year, according to IDC.

The new HP unit will be led by Robert Hoog, former head of the company's Systems Management Division. Hoog will take over the job of Peter Hamilton, the former HP general manager of network management who recently became president and chief operating officer at Banyan Systems, Inc.

The reorganization reflects the very different markets that the two products target, HP spokesmen said.

Unix-based Openview targets users who want to manage multivendor networking equipment across the enterprise in an integrated way; the Microsoft Windows product has been used pri-

Continued on page 68

Videoconferences give life to team approach

BY JOANIE M. WEXLER
CW STAFF

WATERBURY, Vt. — Ben and Jerry's Homemade, Inc. is one company practicing the Japanese style of management that requires close teamwork among employees who might be geographically scattered. Videoconferencing is one way the ice cream maker is trying to foster tighter-than-ever interaction while continuing to distribute its corporate sites.

Ben & Jerry's is about a year into a team quality management process that is long espoused by the likes of W. E. Deming and other management strategists, who point to its success in Japan, explained Maureen Martin, Ben & Jerry's communications coordinator.

The idea is to define, for example, measurable manufacturing process parameters so firms can identify what goes awry or is wasteful in factory output. Many strategists have said that cross-departmental involvement at all job levels is integral to the success of that process.

At Ben & Jerry's, the philosophy translates into nine teams of 10 to 15 employees from various Vermont sites focusing on corporate quality in areas such as manufacturing excellence, customer feedback and service and employee orientation, Martin explained.

The company turned to videoconferencing technology in March. Ben & Jerry's has linked its two most distant sites — offices here and a manufacturing plant in Springfield, Vt. — and is considering further deployment throughout its three manufacturing plants, three of its ice cream stores, a distribution center and a smattering of nationwide sales offices.

On the manufacturing side, for example, a team member could leverage an electronic conference to demonstrate a current process for packing ice cream into containers, then demonstrate to viewers suggested ways to improve on the process.

Users need only about a five-minute training session to learn to set up an electronic meeting with the high-end PictureTel Corp. System 4000 equipment, Martin said, although many of the 500 employees in Ben & Jerry's renowned casual corporate culture are going through a mental adjustment period with the technology.

"We're still ramping up and getting used to cameras and seeing our own faces" on the monitor, Martin said. She described, for example, one videoconference member who kept forgetting she could be seen and continually whispered into a local colleague's ear.

"This isn't the be-all, end-all for communications, but it beats a speakerphone," Martin said.

Aside from these employee adjustment hurdles, she said, for a month after Boston-based systems integrator USTeleCenters installed the equipment, the two participating public telephone carriers at each end of the link could not get the videoconferencing equipment to work at full fractional T1 speeds.

Ben & Jerry's is currently using 728K bit/sec. of a dedicated T1 line between sites for video "because we have no switched data services in Vermont," Martin explained.

Continued on page 73

ON SITE

Ben & Jerry's Homemade
Waterbury, Vt.

- **Challenge:** To follow through on a new interdepartmental team management philosophy despite team members being scattered across geographically dispersed sites.
- **Technology:** PictureTel System 4000 high-end videoconferencing equipment.
- **Results:** Videoconferences allow team members to regularly brainstorm, demonstrate manufacturing techniques and otherwise interact.

HP targets OpenView to new markets

CONTINUED FROM PAGE 67

marily to manage one type of HP or third-party network device.

HP said it hopes to reposition Microsoft Windows OpenView as an integrated LAN management system. Although the Microsoft Windows product accounts for about 80% of OpenView units shipped, it has been sold primarily to OEMs, which then package it as the network management piece of their network products, according to Passmore.

"Now HP is repositioning the product as an integrated management platform in its own right," designed to manage LANs at small workgroups and individual sites, Passmore said. The product will be distributed primarily through the retail channel and will ultimately be shrink-wrapped, HP indicated.

Looks familiar

HP has noted that the Microsoft Windows version will "take on a lot of the capabilities now provided by big brother Unix," Passmore said.

"They intend to provide some degree of commonality in terms of the graphical user interface and eventually the application programming interfaces," so the same applications could ultimately run on both products, Passmore added.

Still in question is how HP plans to coordinate sales of the two products for users who want the Windows OpenView to manage individual LANs and sites, and feed information up to the Unix-based OpenView that oversees the enterprise. Hoog will be coordinating marketing across the two organizations.

In addition, users can call a toll-free customer service number to learn more about both products, HP said.

Soon to be released

Although HP introduced the Microsoft Windows version of OpenView first, the Unix product is more standards-oriented and feature-rich, as befits a multivendor, enterprise network management system.

New versions of the products, which HP announced last week, will move the Windows version closer to the Unix version's functionality and will move both versions closer to standards-compliant "openness," HP said.

The announcements included the following:

Openview for Windows introductions:

- Version 6.0 has started shipping with new features such as dynamic map updates and an enhanced menu system.
- Version 7.0, due out in the first quarter of 1993, will include auto discovery, which allows the system to determine automatically what devices are where on the network and to use the collected information to create a topological map. Another new feature is a Simple Network Management Protocol (SNMP) Management Information "Browser" and application builder, a current OpenView-Unix feature.

The browser and builder are said to enable an SNMP-based network management system such as OpenView to automatically figure out how to take advantage of special management features that vendors frequently add to the SNMP agents that manage their devices.

OpenView for Unix introductions:

- Release 3.1, now shipping, supports a distributed management infrastructure, in which multiple network management nodes can send alerts and data to one another or to a central system. Also supported is the Consolidated Management application programming interface, an Open Software Foundation Distributed Management Environment protocol that is said to enable applications to manage devices via either SNMP or Common Management Information Protocol.

ELISABETH HORWITT

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8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigra receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

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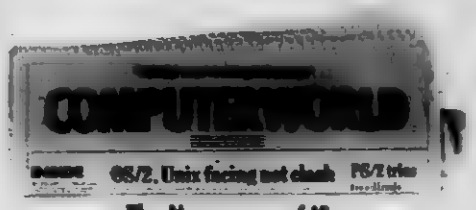

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LAN TIMES READERS CHOICE 1992

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Muzak offers new tune for data flow

Retailers are increasingly using satellite data transmission to distribute corporate information

BY THOMAS HOFFMAN
CW STAFF

Broadcasters that provide retailers with background music programming via satellite have recently been leveraging their telecommunications capabilities by piggybacking data transfers with mellow music transmissions.

The approach is intended to provide customers with satellite-delivered data services for a fraction of the cost of terrestrial communications.

Witness Muzak Ltd. Partnership in Seattle, known as the world's largest provider of business music to 200,000 subscribers in 15 countries. One of its customers, Taco Bell Corp., the Irvine, Calif.-based Mexican/American fast-food chain, recently began using Muzak's Direct Broadcast Satellite (DBS) service in Raleigh, N.C., to transmit corporate data to more than 2,000 Taco Bell outlets in the U.S.

SATELLITE DATA transmission services are faster and less expensive than leased lines or dial-up modems.

Taco Bell had previously relied on land-based modem communications between its headquarters and stores for routing store sales information.

In October 1990, Taco Bell contracted Muzak to provide its DBS service to the fast-food giant, and the installation of data demodulators throughout Taco Bell is nearly complete, according to a Muzak spokesman.

The service allows Taco Bell to transmit large amounts of data from its headquarters to each of its outlets over the same satellite system that broadcasts Muzak's business music to each Taco Bell store. Muzak leases transponder bandwidth from General Electric Co.'s K-2 satellite and from Microspace, a division of Capitol Broadcasting, which uses a Hughes Aircraft Co. SBS-6 Ku band satellite.

Taco Bell integrated the satellite network with its terrestrial-based communications systems using a software package developed by CMI Software in Waltham, Mass. The terrestrial systems are used by the stores to route smaller amounts of data back to headquarters.

Faster and less expensive than leased lines or dial-up modems, satellite data transmission services are starting to catch on among retailers and other firms, according to Bill Frerich, vice president of research at Black & Co., a Portland, Ore., brokerage firm. Aside from providing business music and data transfer, Frerich said, firms such as Muzak and Broadcast International, Inc. in Midvale, Utah, also provide users with satellite-based check verification, credit-card transaction, electronic mail and teleconferencing services as well.

Several user companies have recently been taking advantage of these services. Wilsonville, Ore.-based Payless Drug Stores, Inc. recently contracted Broadcast International to provide satellite services to 92 additional sites in Washington and Idaho, increasing the number of Payless stores on the satellite network to more than 500.

Frerich said British Petroleum Co. PLC uses satellite services in Europe to transmit every transaction its gas stations process on the continent to its headquarters in London each night.

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21 MEGABYTE*

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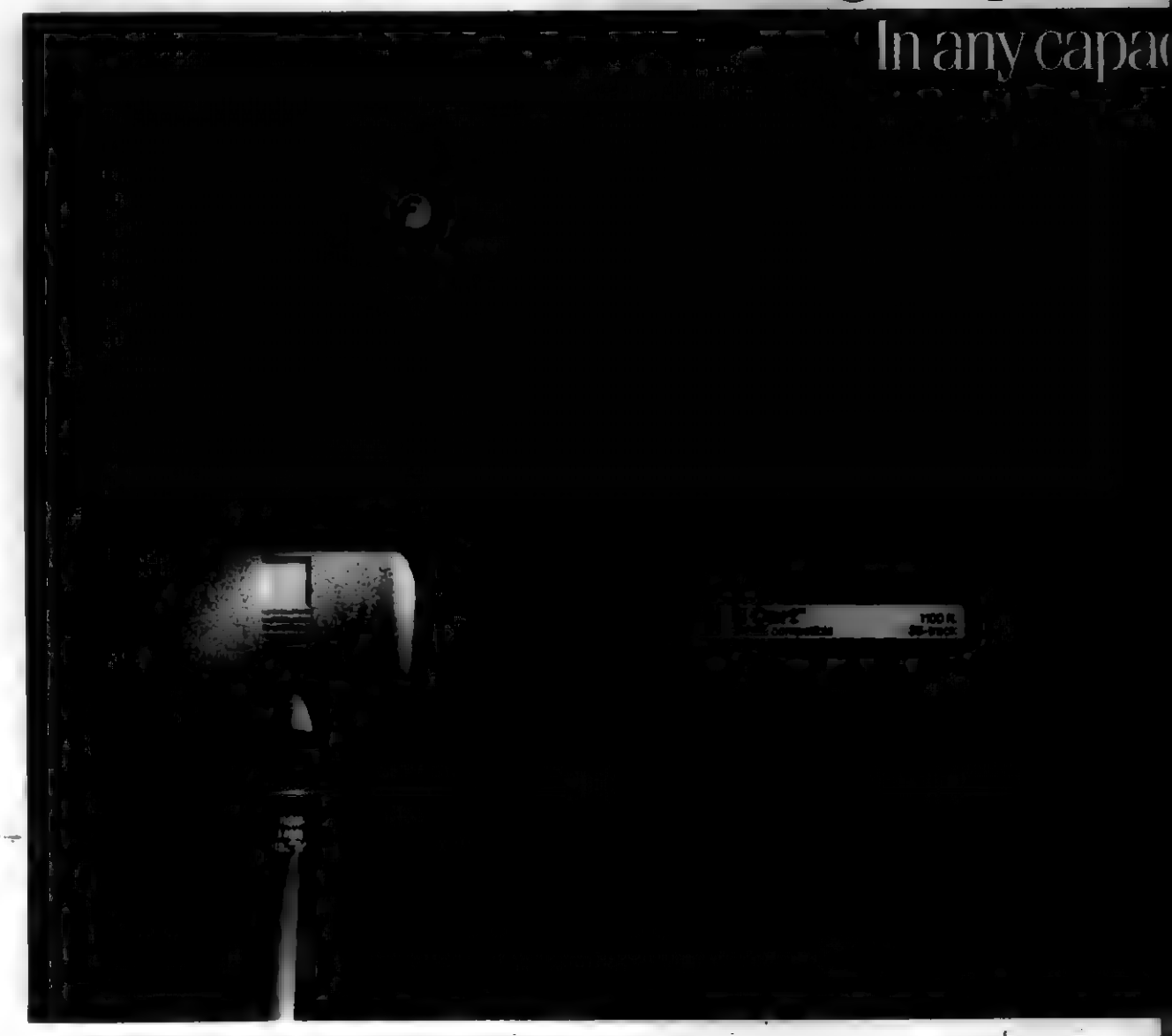

Videoconferences build teams

CONTINUED FROM PAGE 67

"We were watching Max Headroom in slow motion," and there was "a lot of finger-pointing" between carriers New England Telephone Co. and GTE Corp. "You can't ask phone companies to be nice to each other," Martin commented. She noted that now that the issue is resolved, Ben & Jerry's is looking to piggyback other data and voice traffic on the T1 link and maybe cut back on the video bandwith to optimize use of the link.

Videoconferences are held on alternate weeks to support the team communications concept and to help Ben & Jerry's, reputed for its social conscience, cut down on automobile contaminants. Prior to March, team members made regular two-hour road trips between the Waterbury and Springfield sites.

"The price justified itself with travel alone, not counting employee salaries while traveling," Martin said.

While there is a trend for large companies to cost-justify videoconferencing based on travel expenses alone, surprisingly, both PictureTel and its main competitor, Compression Labs, Inc., have recently reported sales downturns, which analysts blame largely on the still-high cost of equipment for midsize corporate budgets.

Ben & Jerry's invested about $140,000 for the two end systems and spends about $2,000 a month for T1 services, Martin said.

To enhance its electronic meetings, the ice cream maker has setup auxiliary cameras to focus on white boards and is considering a document camera to allow users to revise documents together.

The company deferred going to a videoconferencing service, such as those offered by public carriers, or a state-sponsored educational network that allows companies to buy time because "going to another facility defeated the whole purpose," Martin said.

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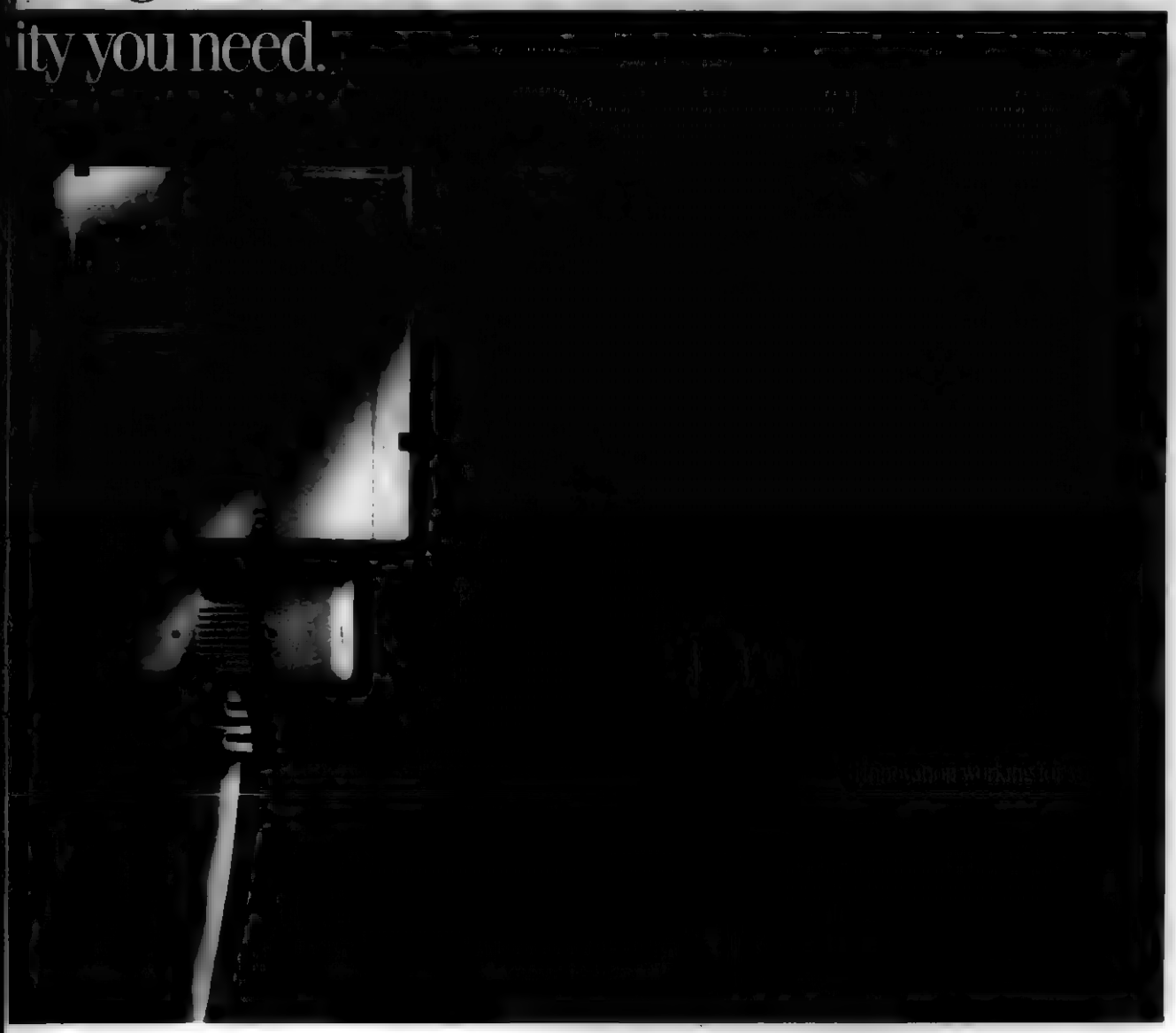

NEW PRODUCTS

Host-to-host

Systems Center, Inc. has released NDM for Tandem Release 3.0.

The product was designed for Tandem Computers, Inc. computers and enables users to transfer data and integrate production applications with non-Tandem and Tandem computers, the company reported.

NDM for Tandem Release 3.0 connects directly with a variety of platforms, including MVS, VM, VMS, VSE, IBM's Application System/400 and OS/2.

Release 3.0 also connects to PC-DOS running the NDM product and features new connectivity options.

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IWI, Inc. has introduced Communique, remote access and bulletin board system servers.

Communique was designed for Novell, Inc. networks and includes Microsoft Corp.'s Windows 3.1 in its remote access server solutions.

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Continued on page 77

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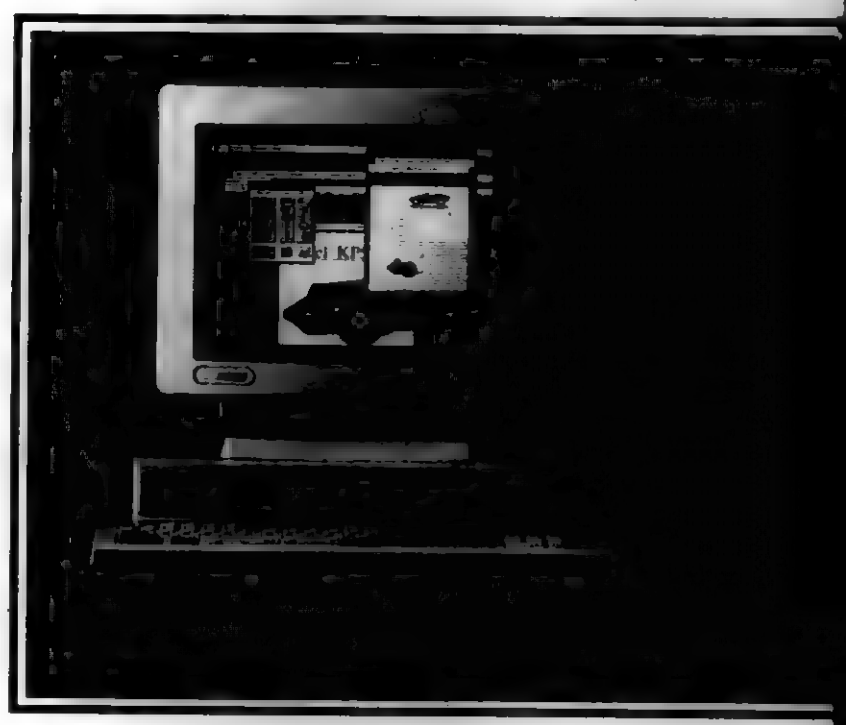

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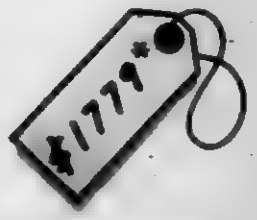

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The Life of Brian

"We're so confident in our network storage technology, that if you'll send us your network systems administrator for 4 hours, we'll pay that person's salary for a full day," invites Brian Swafford, founder and president of QStar Technologies, Inc.

I Was Just A Kid.

Even when I was young, I wanted to do world-changing kinds of things. I remember wanting to build the ultimate library, where anyone could access every book ever written at the touch of a button. My library would reside on a giant space station.

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Actually it was a double major: math and physics. Math for the massively complex file management algorithms, and physics because … well, getting that much stuff into orbit seemed like a non-trivial physics problem. Is it any wonder I found myself at NASA's National Space Science Data Center heading up Networking and Mass Storage R&D?

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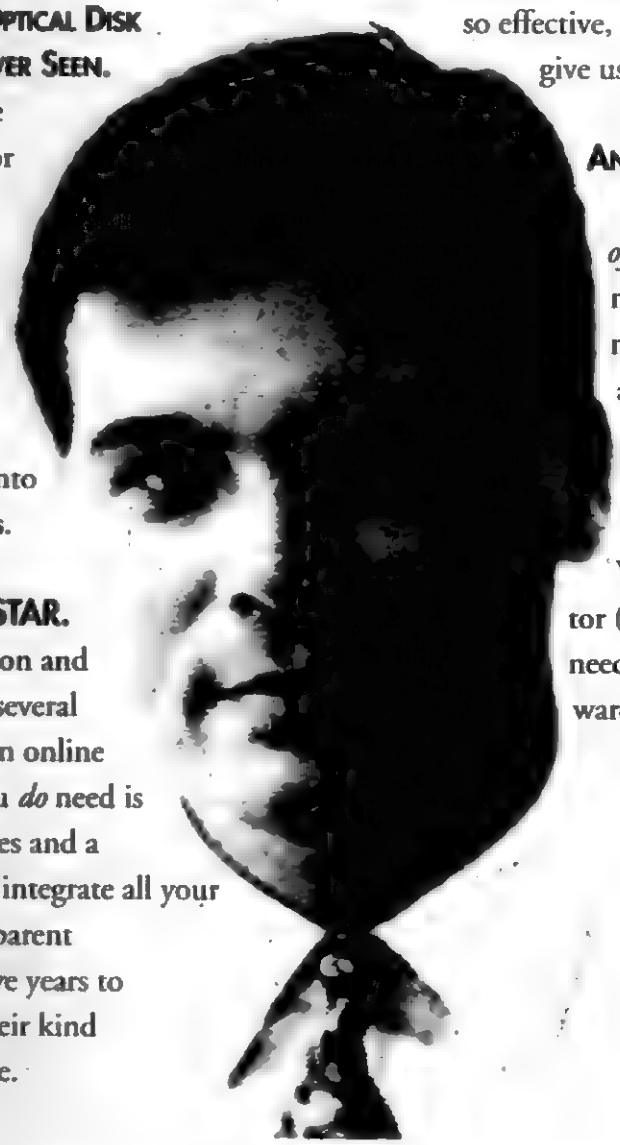
If you've heard of the Space Physics Analysis Network — or SPAN — I worked on it. And on many massive optical storage systems as well. I never did get to build my space station library of every book ever written, but it's amazing just how much information I got into orbit on revolving optical disks.



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Continued from page 73

(V.32 bis) high-speed modem.

According to the company, Communique is reconfigurable from 4 lines to 63 lines because of its modular systems.

Communique costs $8,995.

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Gateways, bridges, routers

Netronix, Inc. has introduced the TokenMaster series of bridge/routers.

The series includes the new TokenMaster 1000, a low-end remote router, and the TokenMaster 5000, a multiport, multiprotocol device. Routing capabilities have been added to the company's TokenMaster 4000 remote and 2000 local bridges.

The products offer data compression on remote links, 4M/16M byte/sec. Token Ring speeds and complete IBM compatibility.

TokenMaster 1000 costs $2,990. The 2000 costs $4,690, and the 4000 costs $4,990. The TokenMaster 5000 costs $5,990, and the 5-port version costs $7,500.

Netronix
1372 N. McDowell Blvd.
Petaluma, Calif. 94954
(707) 769-3300

Dayna Communications, Inc. has introduced PathFinder.

PathFinder was designed for any size Apple Computer, Inc. AppleTalk network and for users with smaller networks who want to attach LocalTalk to Ethernet. PathFinder offers three modes of operation: RunMode creates an Ethernet and LocalTalk zone on the Internet; a single zone for both Ethernet and LocalTalk is made with the Automatic Mode; and the Configuration Mode provides full configuration while it is connected anywhere on the network.

PathFinder costs $899.

Dayna Communications
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

X Window Systems

UniPress Software, Inc. has started shipping AutoPlan, a graphical project management system designed for X Window System environments.

AutoPlan can manage projects of up to 10,000 activities and 1,000 resources per project. Its reports can be formatted in Program Evaluation and Review Technique, Gantt and histogram charts, and custom formats can be made using AutoPlan's report writer.

AutoPlan costs $1,495 for a fixed license and $2,995 per floating license.

UniPress Software
2025 Lincoln Highway
Edison, N.J. 08817
(908) 287-2100

Links

Proteon, Inc. has developed a new implementation of the DECnet Phase IV protocol that enables integration of Digital Equipment Corp. and IBM environments.

The new implementation is incorporated into Proteon's router software and has capabilities that enable the DECnet Phase IV protocol to operate over the source routing bridge found in IBM Token Ring internetworks.

DECnet Phase IV end nodes and Proteon routers can cooperate in discovery procedures, which allows the protocol to find the destination of all of the end notes on the network and the route.

Prices for the product start at under $1,000.

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UPS 'Dials' up fast data on deliveries

BY JOHANNA AMBROSIO
CW STAFF

United Parcel Service, Inc. uses a 1.1T-byte DB2 database to confirm delivery of more than 13 million packages each day.

The Delivery Information Automated Lookup System (Dials), one of the largest DB2 implementations in the U.S., provides proof of delivery for customers within one hour of their inquiry.

This is an enhancement to the complete Package Tracking System that allows UPS operators to monitor a package en route and answer customers' inquiries immediately.

Prior to Dials, which was installed in November 1991, delivery information was stored manually, said Robert Omerza, data resource administrator. "This automates the process of getting information to customers," he said. "Customer service is our primary goal."

Dials incorporates a number of elements, ranging from electronic clipboards to personal computers and two IBM mainframe database management systems: IMS and DB2.

The system tracks more than 5 million delivery stops and some 4 million customer signatures each day.

Preventive measures

A modular architecture was chosen so each portion of Dials can continue to run if another breaks down, Omerza said. "If IMS crashes, we can still do inquiries against DB2. If DB2 crashes, we can still upload data into IMS."

Although the database has been stable for a while, Omerza said, the company did have some problems with one of the IMS portions. The architecture worked, he added, because all of the other IMS regions were able to continue uploading data, and the DB2 portion was not affected at all.

The process begins when UPS drivers return from their daily routes. They plug their electronic clipboards — which contain information about when and where deliveries were made — into a giant rack, which charges up the clipboard and moves the data into a PC.

From there, the PC encodes the data and transfers it to the mainframe-based IMS. The data — about 6G bytes' worth each day — is decoded, checked to make sure no duplicate information exists and then sent into DB2.

The firm uses homegrown batch routines to move the information from 20 IMS areas to 20 sets of related DB2 tables. Each of UPS' 20 geographical locations has a corresponding DB2 table.

In total, the DB2 database consists of 148 tables and more than 4,500 physical data sets that require at least 1.1T bytes of magnetic storage. The company purchased 393 IBM 3390 Model 3 disk drives. "That made IBM very happy," Omerza said. Approximately nine months' worth of data is stored on the disk drives.

Optical vs. magnetic

The original plan was to move data after nine months onto optical drives, but that may change, Omerza said. "Optical is slower,

Continued on page 80

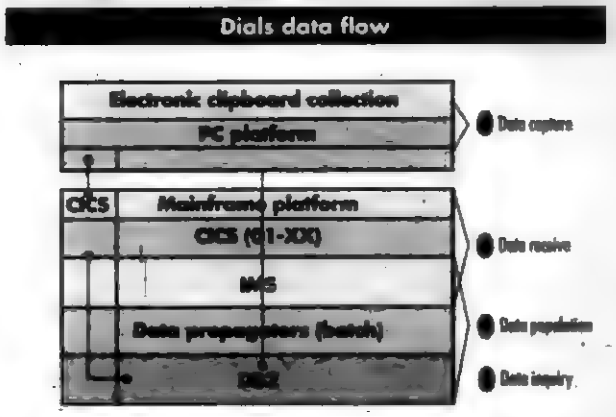
ON SITE

United Parcel Service
Mahwah, N.J.

- **Challenge:** To automate the proof-of-delivery process for 13 million shipments per day.
- **Technology:** Combination of electronic clipboards, PCs and two mainframe databases under IBM IMS and DB2.
- **Results:** More than 1,800 UPS field centers can query the system around the clock to find out when a package was delivered.

Data flow

UPS' electronic clipboards feed data up through a PC and an IMS database for access by users under DB2



CW Chart: Janell Genovese

Legent users like workstation move

Say data center tasks much simpler on PCs

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp.'s move out of the glass house, under way for a year or so, has been generally well-received by customers, who say new workstation-based products have enabled them to boost productivity in their programming shops and data centers.

One such user is TransAmerica Insurance Group in Sacramento, Calif. The company develops Cobol applications for an IBM mainframe using personal computers, development tools from Micro Focus, Inc. in Palo Alto, Calif., and Legent's Endevor products for cross-platform distributed development.

"It's a lot easier to do developing and testing on the PC because tools that are available in Micro Focus Workbench are not available on the mainframe or are available at large cost," said Brian Dehn, senior systems analyst. "Also, it gets people off the mainframe so they are not limited by system availability."

PC possibilities

Dehn said TransAmerica also may buy Legent's Bundl PCView for viewing and capturing mainframe output on a PC. He said this could save the company $100,000 to $200,000 after five years. "That will allow users to download only the data they need, not entire reports taking up massive space on a file server."

Last year, Legent introduced six products that gave users desktop access to mainframe resources (see chart page 85). Although not the first steps in that direction — Legent introduced Automate/XC for DOS-based PCs in 1988 — it marked the first major push in Legent's strategy of moving beyond its traditional mainframe roots.

Users are following suit, although they are not in a rush. "The typical scenario is that organizations are not buying any new [IBM mainframe-based]

> "IT'S A LOT easier to do developing and testing on the PC."
>
> BRIAN DEHN
> LEGENT

3270 terminals," said Jim Snediker, product development vice president. "They are replacing old 3270s with PCs, and initially the PCs are doing 80% 3270 emulation. But once the PCs are in place, they can go and get [PC-based products] so they can do more intelligent interaction with the mainframe."

A systems analyst at a large telecommunications firm who asked not to be named said his company had for years used Legent's MICS family of 3270-based products for collection, analysis and reporting of operations data. Now the company is using MICS EasyReach, which funnels various types of operations data from the mainframe into a PC.

"I've automated the entire reporting process," the analyst said. "It used to be if we did something wrong, we had to start over and reuse mainframe MIPS. Now

Continued on page 85

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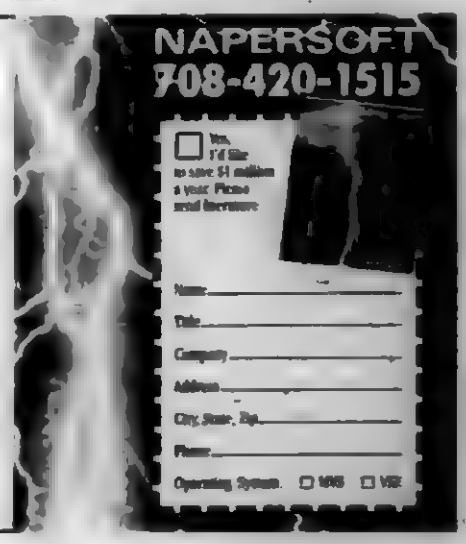


Toronto library heeds users; downsizes to mini

BY MARK HALPER
CW STAFF

TORONTO — At the Metropolitan Toronto Reference Library, a decision made last year to downsize its card catalog platform from an IBM 4381 to a Hewlett-Packard Co. minicomputer was a foregone conclusion determined by the library's choice of new software.

The Virginia Tech Library System that Canada's largest reference library selected ran on only one piece of hardware: the HP 3000.

Furthermore, the decision was not one driven by the information systems department. Rather, it was one made by a group of the system's most regular users, according to Olav Vanderzon, manager of the computer operations department.

"The librarians were the ones who made the choice. There were four or five others they looked at," Vanderzon recalled, noting that one option they rejected entailed upgrading the Western Library Network (WLN) program running on the 4381.

So a system that once comprised a 4381 tied to 120 IBM 3178 dumb terminals has given way to an HP 3000 Model 960 linked to about 200 386 personal computers.

Vanderzon says *librarians chose the system themselves*

Good choice

While the librarians may have evaluated systems from a functionality and ease-of-use perspective, their choice yielded some classic downsizing benefits for IS.

Specifically, Vanderzon noted, moving from the 4381 to the HP 3000 Model 960 slashed operating costs from $460,000 per year to $124,000.

Functionally, the HP-based system with its networked PCs introduced a number of advantages over the relatively clunky and terminal-oriented 4381 platform running WLN, Vanderzon said.

Although the 4381 was running at maximum capacity, the library's users were complaining of slow response time and a shortage of on-line information regarding the library's 1.6 million books and 778,000 publications, Vanderzon said.

The transfer from the 4381 to the HP 3000 entailed a conversion of data from Adabase to HP's TurboImage. The library handed that job to Virginia Tech Library System, Inc. in Blacksburg, Va., a Virginia Tech spin-off that took "several months" to complete the task, Vanderzon said.

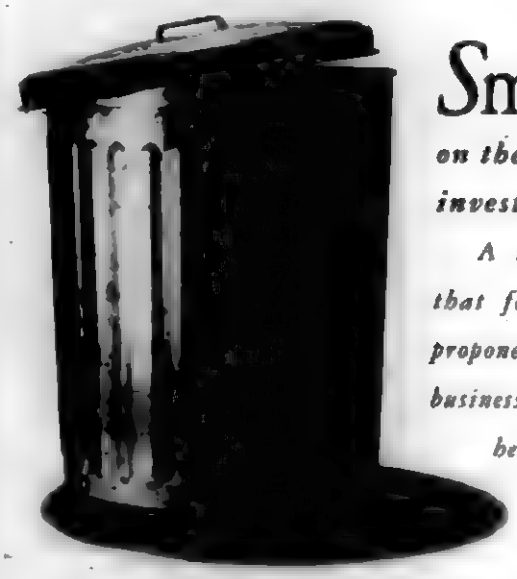
The purchase and implementation cost the library roughly $2 million, he added. The library received a $3 million grant from the Ontario government, leaving it about $1 million, which Vanderzon said the library will use to upgrade the 960 — perhaps to a more powerful Model 980.

It also plans to spend some of the money buying and installing additional PCs, he said.

Meanwhile, the library has had no luck finding a taker for its 4381, which Vanderzon said has been relegated to "boat anchor" status.

"We're going to have to pay someone to take it away," he noted.

Other downsizing solutions will probably transfer your existing applications to a new environment.



SmartSize with UniKix software, on the other hand, and you can preserve your investment.

A not-so-funny thing is happening to companies that follow the advice of overzealous downsizing proponents. Applications they've used to run their businesses for years are being consigned to the scrap heap. And in the name of progress, no less.

But is it progress to abandon applications of proven value? If this is downsizing, then all the more reason to consider a far more sensible alternative: SmartSizing. Moving to distributed computing environments that integrate new technologies – relational databases, for example – with the existing systems a company already owns and uses.

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To find out how organizations such as yours are already benefiting from SmartSizing, phone our toll-free number. And by the way, if a downsizing vendor says you ought to scrap your applications, tell him to can it.

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UPS 'Dials' up speedy data on delivery

CONTINUED FROM PAGE 79

so response time is slower. We may wind up just putting more data onto magnetic media."

More than 1,800 UPS field centers can query the DB2 database around the clock to find out when a package was delivered. A printed report is then sent to the customer. Up to 188,000 inquiries can be processed each day.

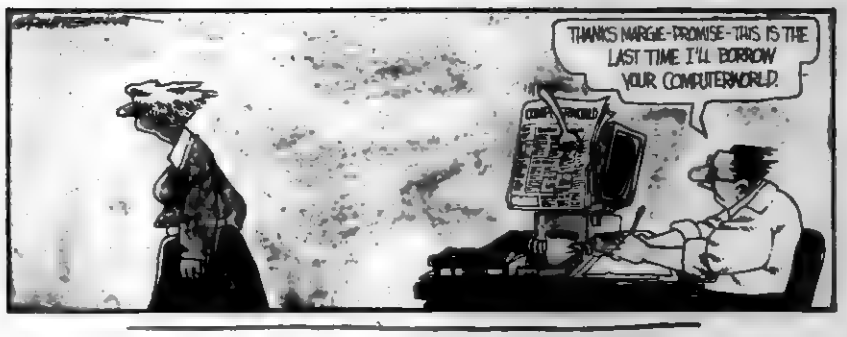
The IMS and the most recent portions of the DB2 database are backed up daily using the DB2 Image Copy Facility. Two sets of backups are made: one for on-site storage and another that is located off-site. The off-site backups run for three hours and use about 300 cartridges each day.

So far so good

So far, Omerza said, "We've had no problems." The biggest challenge has been "learning how to deal with large volumes of data. We have to be very careful because what we do and how we do it can impact the whole business."

Although there are no concrete plans yet, the next step may be to create a separate decision support database — based on summarized information from Dials — that can be accessed by marketing and other departments.

"At this point, our plans are just to continue to populate Dials and let it continue rolling," Omerza said.



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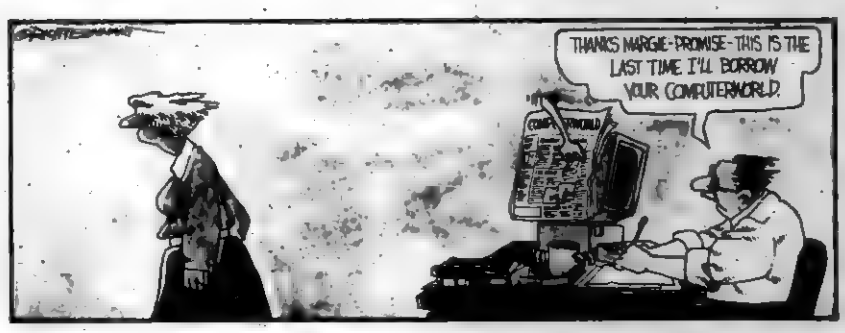

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What's in store for future AS/400s?

IBM plans to build on AS/400 success by adding RISC, more network links, other features

BY KIM S. NASH
CW STAFF

Today's IBM Application System/400 is both a mirror reflecting current computing trends and a crystal ball looking into the future.

Some progressive IBM shops are betting that New Age AS/400s will look like a cross between a mainframe and a server. Such companies have configured their shops that way already, banking on IBM to further expand the midrange line's functionality in communications and high-end processing.

Other firms, especially the small and midsize businesses that are bread-and-butter markets for the AS/400, are content to let IBM lead the technological way.

IBM claims an 18% share of the midrange market, up from 10% five years ago. But beyond first-quarter 1993's planned announcement of a new performance-boosting F series line, what does the future hold for the AS/400?

Susan Whitney, midrange systems director at IBM U.S., sees the AS/400 cultivating a "point and shoot" approach to computing. Like an automatic camera that comes packaged with lens, flash and film, AS/400s come with database, systems management and security tools.

"You just plug it in and start," Whitney said.

Users will tell you it may not be that simple, but relative ease of use is frequently cited as a motivation for buyers. IBM's Plug-n-Go and Migrate-n-Grow programs focus on delivering preconfigured, preloaded machines to small businesses. The base price for a low-end model is $11,995.

Here is a glimpse of other developments on the horizon:

RISC: Analysts briefed by IBM expect the AS/400 operating system to get a hefty injection of reduced instruction set computing (RISC) features in 1994. However, rudimentary RISC hooks are expected before then, according to Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. When the F series debuts early next year, it will likely contain RISC hooks in areas such as the input/output controller.

Plus, the recently unveiled 9337 storage subsystem, which marks the entry of Big Blue into redundant arrays of inexpensive disk, or RAID, technology, runs on a RISC processor, said David Andrews, president of ADM Consulting, Inc., in Cheshire, Conn.

Multiprocessors: The E95 four-way processor introduced earlier this month is not the end of the line in terms of number of CPUs, admitted John Thompson, vice president and general manager of Applications Business Systems (ABS), the IBM division responsible for the AS/400 line.

Other sources briefed by IBM confirmed that additional multiway processors are in the works for both the E and the impending F lines.

Thompson has promised a 30% price/performance improvement per year. He added that "developments are coming so fast, you may see us more than one time per year."

Host for downsizers: IBM will continue to grow high-end AS/400s to cultivate mainframe downsizing business, Thompson said.

Companies such as publishing house John Wiley & Sons, Inc. in New York and Access America, a large financial firm in Richmond, Va., have moved the lion's share of applications off IBM mainframes and onto AS/400s.

Sixty percent of all AS/400s installed in the U.S. are located in companies with four or more AS/400s, IBM said.

Frigidaire Co. fits that bill. The Dublin, Ohio-based appliance maker launched a revamped product distribution scheme two weeks ago controlled by a network of AS/400s. Previously, some distribution locations had no computers; other functions were handled by an IBM mainframe.

A more unified approach to shipping management has helped Frigidaire boost warehouse throughput by 30% in pilot projects before the recent formal launch, according to Jack Plieninger, vice president of physical distribution.

What Plieningers said he really liked was modularity in the AS/400. He installed five different sizes of machine, which let him tailor processing power to processing needs.

Communications: Still, not all so-called downsizers are completely ditching mainframes. Many shops plan to keep the big iron to act as communications or database servers [CW, Aug. 17]. That means AS/400s will have to talk to and work with mainframes, tasks that some users and analysts say could use improvement.

Plans are under way with Candle Corp. to build mainframelike Systems Automated Operations utilities to get AS/400s to better communicate with mainframes in networks.

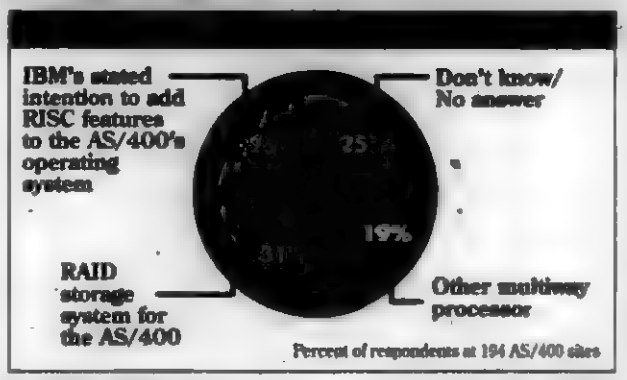
ABS has signed more than 60 development pacts to improve AS/400 interoperability. Although it gave no time frame for actual products, the division promised to meet Posix and Distributed Computing Environment standards.

Image server: The imaging market is not a huge one for IBM. However, ABS is clearly bucking for a piece of the pie. New per-user pricing on ImagePlus should spur sales if initial user reaction is any indication.

Sybron Chemical, Inc., a specialty chemicals maker in Birmingham, N.J., passed over ImagePlus for a personal computer-based alternative two years ago because pricing on the IBM product was "prohibitive," according to Jerry Goldman, director of MIS. However, the idea of using his Model D45 as a server for imaging applications is more attractive now, Goldman said.

Future think

One poll of AS/400 users shows them looking at RAID and RISC technology for the long term



Source: CW Database Division

CW Chart: Janell Genovese

IN BRIEF

CA adds on-line resource center

■ **Computer Associates International, Inc.** has announced a CompuServe-based resource center that is intended to provide further support for users of its personal computer, Digital Equipment Corp. VAX, application development and Unix software. The 24-hour-a-day resource center, referred to as GO CAI in CompuServe, is expected to serve 25,000 users in its first year.

■ **Computer Associates** also began shipping CA-Visa, a Motif-based systems management tool for DEC's DEC Windows. The software provides centralized account management for VAXclusters and DECnet networks. The cost of a base license, including software for both client and server, is $2,690. Server-only software is priced at $1,590.

■ **The American Red Cross** said it will spend $3.7 million to install two Unisys Corp. A 16 mainframes at its Northeast region branch in Dedham, Mass. The move is part of a nationwide program to revamp the Red Cross' blood-tracking computer systems [CW, June 8]. Once the A 16 mainframes start running the Blood Center Management System software, the Dedham site will start to support Southern U.S.-based blood centers.

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SECURITY CHECK

James Daly

Virus shots

Take two hard disks and call me in the morning. There's been some discussion lately about mainframe viruses — mainly, "Do they exist?" Well, the answer is yes — but don't go scurrying for the aspirin just yet.

Although mainframe viruses are rare, they can certainly be created, and some have even become widespread. Witness the famous CHRISTMA EXEC file that flashed a Christmas message to VM users on IBM's corporate network in 1987. But in general, we do not see viruses become endemic on mainframes the way we have on PCs.

There are several reasons for this, some technical and some cultural. Viruses don't become widespread unless they can spread faster than they are caught.

David M. Chess, a research staff member at the Hawthorne, N.Y., offices of IBM's Thomas J. Watson Research Center, notes: "There are many fewer people walking around with tape reels in their back pockets than there are people with diskettes. The micro world is just a more tightly connected graph and has many more nodes than the mainframe world." Access controls on mainframes would also slow spreading to a crawl.

In other words, someone *could* write a mainframe virus, but it'd be unlikely to get anywhere before becoming extinct.

Get me an Orange Whip and a seat on the aisle. If you haven't done so over the weekend, check out *Sneakers*, a new film from Universal Pictures that features an endless parade of cryptologists, wiretappers, FBI men, cyberpunks and the National Security Agency.

The plot involves a tiger team hired to break into places to test their security as well as a mysterious "black box" that can potentially decode any computer data in the world.

A hacker friend (well, ex-hacker, or so he claims) who sat through a screening gave it one binary digit up.

The movie — which stars such silver screen luminaries as Robert Redford, Dan Ackroyd, Ben Kingsley, Sidney Poitier and River Phoenix — raises some interesting questions, such as how can you trust the information you receive from a computer if it's transmitted over such insecure media?

The title? Oh, it's an old IBM nickname for flashy kid programmers.

Is the Unix password Mitzy or Rover? In these days of multiplatform activity, it's easy to drive users bonkers by making them memorise a dozen or more passwords in order to move around electronically.

Multiple passwords can also present a higher security risk because end users are more likely to write those varied passwords down than commit them to memory.

One possible solution was introduced at the recent Downsizing Expo in San Francisco: Single Sign-On from Rocky Hill, Conn.-based Pyramid Development Corp. Single Sign-On enables authorized users to access any number of computing platforms via a single password. Single Sign-On is a companion product to Pyramid's PC/DACS workstation security software package.

You say tomayto and I say tomahto. Think you've uncovered a new virus? Not so fast. The Antivirus Methods Congress (AMC) wants people who think they've stumbled on some as-yet-undiscovered rogue code to consult the AMC's international directory of viruses before they give it a name. Software publishers should also consult the directory before they create antivirus programs.

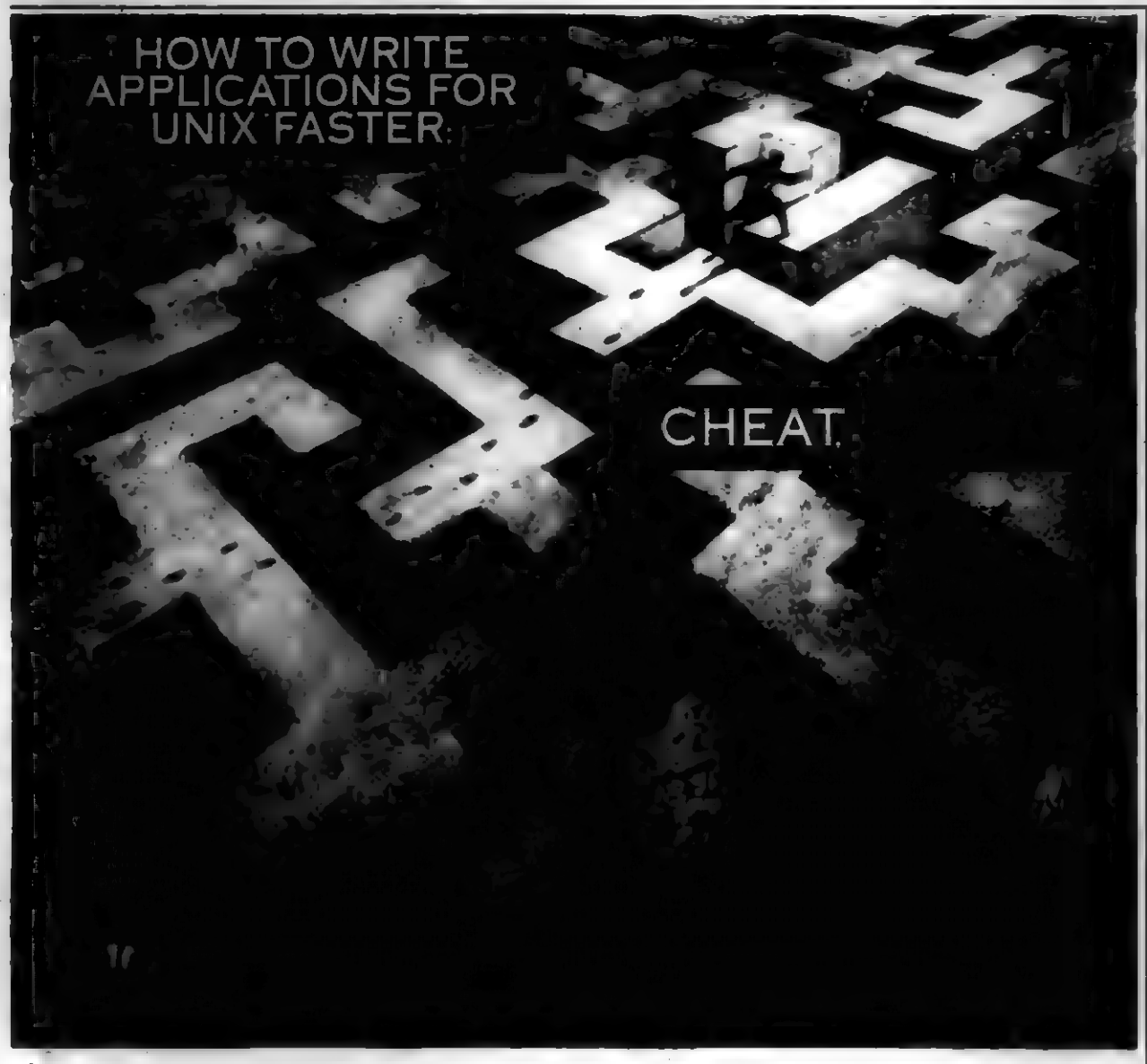
Not only will standard naming "minimize the wasteful rediscovering of old viruses but it will also avoid confusion over what commercial virus scanners can and cannot detect," AMC President Richard Lefkon said.

For more information about the directory, contact Lefkon at 609 West 114th St., New York, N.Y. 10025 or call (212) 663-2315.

And this one fills your mind with empty promises until election day. Heard about the spate of new viruses named after the big political blowhards? Probably not, but their descriptors are having fun and keeping folks chuckling on the bulletin boards.

A small sample: George Bush Virus (doesn't do anything, but you can't get rid of it until November); Bill Clinton Virus (mutates from region to region; won't let PC inhale data); H. Ross Perot Virus (produces a blank screen, but it appears to have had a lot of money put into its development); Pat Buchanan Virus (shifts all output to the extreme right of the screen); David Duke Virus (makes your screen go completely white); Congress Virus (overdraws your disk space); Richard Nixon Virus (you can wipe it out, but it always makes a comeback); and the Warren Commission Virus (won't allow you to open your files for 75 years).

Daly is a *Computerworld* West Coast senior correspondent.



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Legent users like workstation move

CONTINUED FROM PAGE 79

we just get the data off the mainframe and manipulate it on the PC to our heart's content." He said new performance reports that required a day or more to develop on the mainframe can now be done in an hour or so.

To make its mainframe offerings reach out to the desktop, Legent turns the mainframe product into a file server component, then develops an "outbound" component based on object-oriented designs and graphical user interfaces, said Paul Johnson, product development vice president. For example, Endevor Workstation is essentially a rewrite of Endevor/MVS as a single C kernel with separate C++ shells for DOS, Windows and OS/2.

Vague promises

Many of Legent's 130 products do not yet allow workstation access, but Johnson promised further announcements of the type made last year. "Our direction is to do more of the same," he said, declining to be more specific.

"Legent's strategy is going quite well, and over the next 12 months, you'll see even more workstation-based management tools for distributed systems and for mainframes," said Dale Kutnick, president and research director at Meta Group, Inc. in Westport, Conn.

Kutnick estimated that workstation-based tools account for less than 5% of the $3 billion-plus systems management market at present, but he said that would increase to 40% or so of a $6 billion market by 1997.

Some users said the pairing of the mainframe and PC components is a step forward but not necessarily the ultimate solution.

For example, Mitsubishi Electronics America, Inc. in Cypress, Calif., is beginning to use SAR/PC to download mainframe report data to a PC for manipulation in Lotus Development Corp.'s 1-2-3. Danny Rhyan, manager of data center operations and telecommunications at Mitsubishi, said, "We see this as a good bridge — at least for the near future — between the glass house and the client/server environment we are all moving toward."

Bethlehem Steel Corp. is using AutoMate/XC at its Bethlehem, Pa., headquarters to automate initial program load (IPL) on its mainframes, which used to require tedious and error-prone keying of responses to system prompts at the hardware console. Now, automated scripts on PCs re-IPL multiple logical partitions on the mainframes.

Greg Thomas, senior technical analyst at Bethlehem Steel, said AutoMate/XC is being used with Carbon Copy Plus from Microcom, Inc. in Norwood, Mass., to do remote IPLs and monitor two mainframes at a satellite data center in Burns Harbor, Ind.

Carbon Copy allows systems personnel using a PC at headquarters to "acquire the keyboard and screen image" of a Burns Harbor PC running AutoMate/XC to control the remote mainframes.

"That allowed us to consolidate that complete operation into here, so people out there were displaced," Thomas said.

Legent's lineup

Endevor workstation	Software management (version control)	150
AutoMate/XC for OS/2	IBM, DEC, Tandem console automation and remote operations	120
Bundl PCView	PC access to mainframe reports	25
OptiModel	IBM mainframe capacity prediction and management	99
MICS EasyReach	Access to mainframe system management information via Microsoft's Windows	61
SAR/PC (with Express)	On-line viewing of computer output	110

Source: Legent Corp. CW Chart: Janell Genovese

NEW PRODUCTS

System software

Empact Software has introduced a new release of Budget-DASD.

Budget-DASD provides a storage component with facilities to monitor and control direct-access storage device (DASD) space consumption.

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CPU licenses for Budget-DASD begin at $8,000.

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Software application packages

Nova Systems, Inc. has introduced Version 3.0 of Reveal for DB2.

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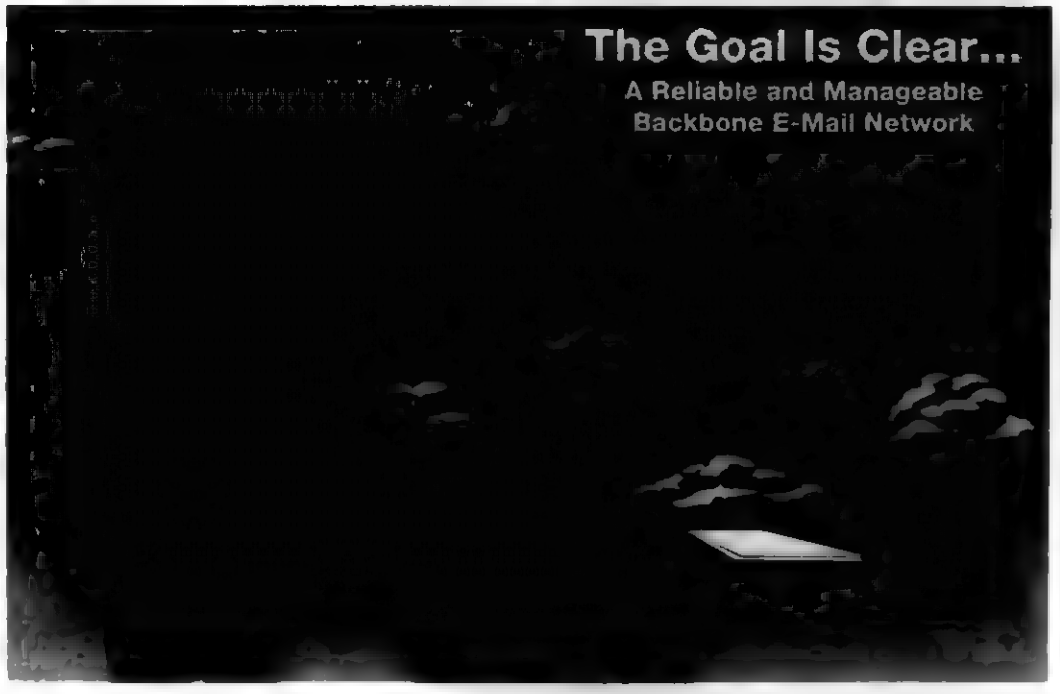

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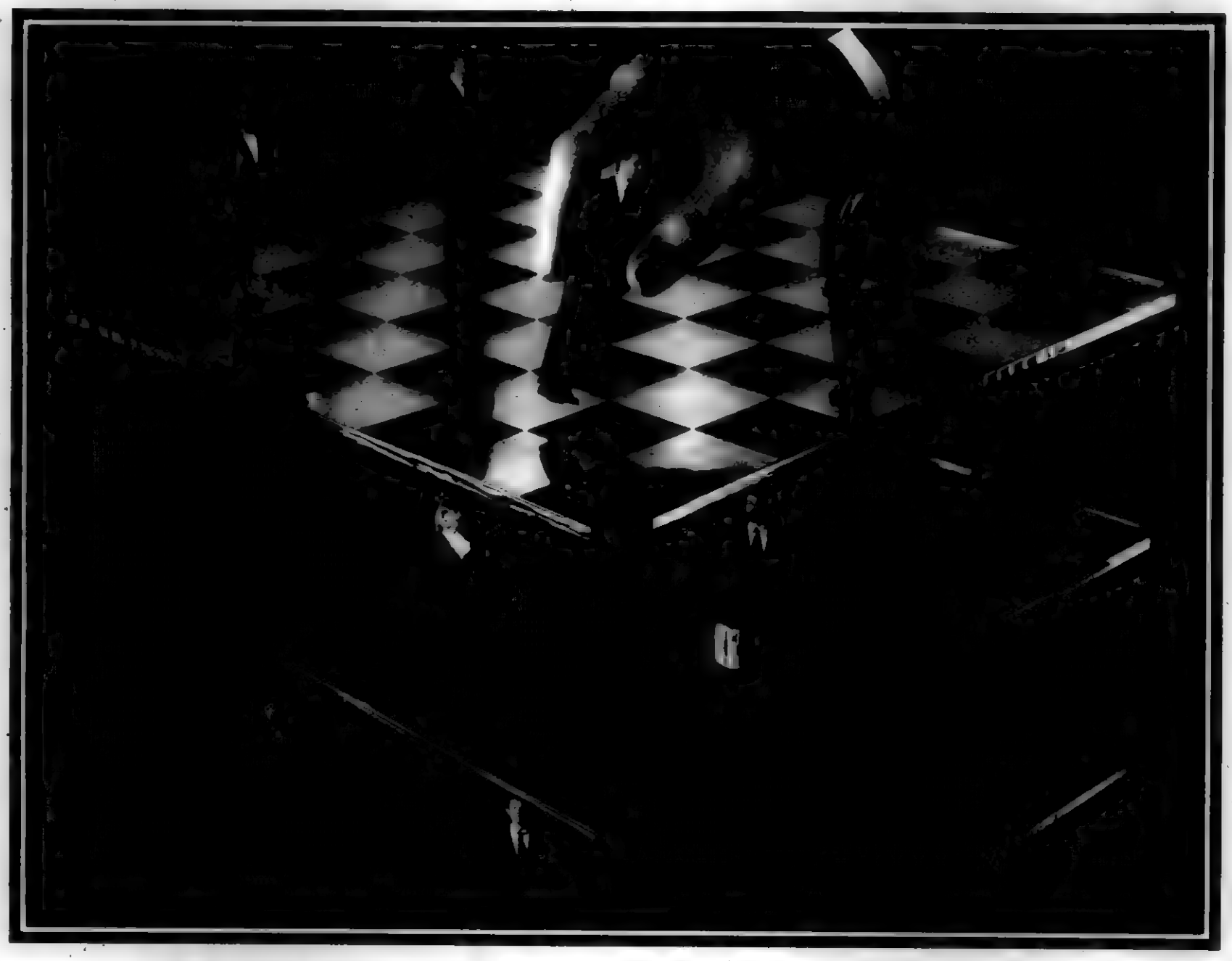

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IN BRIEF

Tiburon adds tests

■ The test products group of San Jose, Calif.-based **Tiburon Systems, Inc.** has added software testing and quality assurance training to its line of services. The company, which released its platform- and operating system-independent Ferret System software testing program earlier this year, said it will now offer independent software testing to commerical and corporate software developers. Tiburon recently signed testing contracts with Borland International, Inc. in Scotts Valley, Calif., and Atlanta-based Peachtree Software, Inc.

■ European expenditures on computer-aided software engineering (CASE) tools grew by 28% in 1991, according to a recent report by London-based market research firm **Ovum Ltd.** CASE expenditures grew by 39% in 1990, the firm said. Ovum noted that CASE investments in Germany are expected to increase by 32% during 1992.

Visix's Galaxy explores new territory

BY GARRY RAY
CW STAFF

Patriot Partners folded and lost millions trying to do it. Lotus Development Corp. founder Mitch Kapor tried it too, but backed off after more than a year of effort. Only time will tell whether Taligent, Inc., a Cupertino, Calif.-based alliance of IBM and Apple Computer, Inc., will succeed where others have failed.

But Reston, Va.-based Visix, Inc., developer of the Looking Glass desktop manager for Unix workstations, is on the verge of announcing a platform- and operating system-independent development environment.

The Galaxy environment was designed for five major platforms: Microsoft Corp.'s Windows and Windows New Technology (NT); SunSoft, Inc.'s Open Look; the Open Software Foundation's Motif environments for Unix; and the Apple Macintosh.

Galaxy, which is scheduled to be announced and partially shipped in November, will allow users to create multiplatform, client/server applications using a single set of identical development tools, application programming interfaces (API) and other services.

Ultimately, it will allow developers to write a single application on any platform and easily recompile it for use on another, according to developers, analysts and observers who have seen early versions of the environment.

"This is the first product that is a true client/server application builder," said Judith Hurwitz, editor of Newton, Mass.-based "Client/Server Toolwatch," an industry newsletter. "You could do your development once and migrate [the application] to any other platform."

Various functions

Galaxy is roughly divided into three major layers of functionality, according to other observers. Comprising a user interface layer; a compiler, library and services layer; and an application and runtime layer, it will be delivered with six development tools.

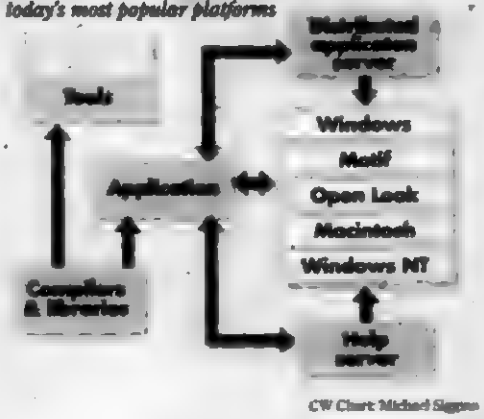
These will include a graphical user interface builder; a Help system authoring tool; a Help system server; a color image editor for animation and multimedia applications; a project browser to be used for version control; and a programmable text editor.

"Their [tool] support is incomparable to anything that currently exists in Unix," said Nik Ivancic, senior staff engineer at Metaphor, Inc. in Mountain View, Calif., and a former software project director for Patriot Partners, the now-defunct IBM and Metaphor partnership that attempted to design a similar environment.

"You can do serious things in one afternoon," using the Galaxy tools and services, he said.

Galaxy

Visix's Galaxy development environment promises portable tool sets and applications for some of today's most popular platforms



CW Chart: Michael Siggins

As for its client/server elements, Ivancic said Galaxy's distributed application services (DAS) server duplicates a number of communication functions that are expected to be implemented in Windows NT, such as named pipes, remote procedure calls and shared memory, that are currently available in most Unix implementations.

However, he said DAS implements these services in a manner that makes them accessible to any application running on any supported platform through the Galaxy API.

That ensures portability of applications and a reduction of programmer effort in writing client/server programs, he added. "There are lots of little communication details that are unorganized [in operating systems]. Structuring and organizing those is what DAS will give you."

What it supports

Other sources said Galaxy DAS will support a variety of networking, communication and file-sharing protocols, such as SunSoft's ToolTalk, Apple's Publish and Subscribe, Microsoft's Object Linking and Embedding and Dynamic Data Exchange and the Object Management Group's Object Request Broker. Hurwitz added the DAS "attaches to whatever network is there."

Visix officials were reluctant to comment on Galaxy.

"The product will be announced and in general release by November," according to Visix director of product marketing Tom Axbey.

Independent tool sets catching on

BY JEAN S. BOZMAN
CW STAFF

Open systems should have open tools. That's what users say, as they map out client/server applications that draw on multiple databases scattered throughout their companies.

But industry analysts said they believe that a relative handful of users are using open — or independent — tool sets to integrate data across an enterprise (see chart at right). More often, users are picking the independent tool set they like most, but they are taking on only one database application at a time.

"In the past, people have typically used tools that were well-integrated with their primary database," like Sybase's APT Workbench or Oracle Corp.'s SQL Forms, said John Morrell, a senior analyst at International Data Corp. in Framingham, Mass. "But the people who buy an independent tool set are looking for a top-to-bottom solution, with a fourth-generation language (4GL), a relational database and more robust features."

A wide variety of independent tool sets are available, including well-established systems from Uniface Corp., Unify Corp., JYACC, Inc., PowerSoft Corp., Information Builders, Inc. and Gupta Technologies Corp. Others are available from a new crop of start-up vendors, including Trifox Corp. and Cooperative Solutions, Inc.

With all of those choices, users are ready to go shopping. And they have a laundry list of reasons for going to open tools for database applications development. "You may want to have one look and feel for the tool set your developers use, or you may want to insulate yourself from changes among vendor companies," suggested Michael Corey, a vice president at Database Technologies, Inc., a Boston consulting firm. Large multinational firms have reason to do both because most have multiple databases, Corey said.

Many sites need to combine data from legacy databases with data stored in new relational database management systems. Clayton Environmental Consulting, a 500-employee firm in Novi, Mich., uses Progress Corp.'s 4GL to write applications that access both a Progress RDBMS and a large legacy database of Digital Equipment Corp. RMS flat files. "We can treat the RMS files exactly as we would a Progress file, and we don't have to do any SQL coding," said Dave Drummond, a senior systems analyst. Clayton has written more than 10 Progress applications in

Continued on page 90

Open tools

Some open systems DBMS development tools and samples of the DBMSs they support

Uniface Corp. Product: **Uniface**
DBMS support includes: Oracle, Sybase, Informix, Ingres, DEC's Rdb, Microsoft/Sybase SQL Server for OS/2

Unify Corp. Product: **Accell/SQL**
DBMS support includes: Oracle, Sybase, Informix, Unify 2000 database

Gupta Technologies, Inc.
Product: **SQLWindows**
DBMS support includes: IBM's DB2, Oracle, Ingres, Novell's NetWare/SQL, Gupta SQLBase

Progress Corp. Product: **Progress 4GL**
DBMS support includes: Oracle, Rdb, IBM's OS/400

PowerSoft Corp. Product: **PowerBuilder**
DBMS support includes: Oracle, Microsoft/Sybase SQL Server for OS/2, DB2, Informix, HP's Allbase/SQL

JYACC, Inc. Product: **JAM**
DBMS support includes: Oracle, SQL Server for OS/2, Sybase, Informix, Ingres, Borland's InterBase, NetWare/SQL

Information Builders, Inc. Product: **Focus**
DBMS support includes: Oracle, Sybase, Informix, IBM's DB2, Allbase/SQL

Cooperative Solutions, Inc. Product: **Ellipse**
Supports Sybase

Source: Companies

CW Chart: Janell Genovese

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Independent tool sets catching on

CONTINUED FROM PAGE 87

the past two years, Drummond said.

While users gain freedom from their database vendors by buying independent tool sets, they may give up some performance. Each database has specific features, such as Sybase, Inc.'s remote procedure calls or Oracle Corp.'s triggers and stored procedures, that cannot be fully leveraged by some third-party tool sets.

"The problem is that they restrict the functionality that comes with each database," said Donald Feinberg, a software analyst at Gartner Group, Inc. in Stamford, Conn. Feinberg said such differences mean that the relational databases are not yet interchangeable commodity products.

But a new generation of toolset products is coming, analysts said. Some vendors, such as Trifox, are embedding database-specific code generators to take advantage of proprietary RDBMS features.

Some are including C++ extensions that allow users to "glue" tool set applications to custom code. Users will then be able to fine-tune applications for better performance.

Hospital Corporation of America in Nashville would like to use such features to move toward distributed databases in its three-tier network of personal computers, NCR Corp. Towers and mainframes. The firm uses Information Builders, Inc.'s PC-Focus to write PC programs that extract data from IBM's DB2. "The promise of a distributed database is having intelligent applications knowing when and how to access databases on PCs and mainframes," said John Pair, development manager. "For us, at least, that's the future."

Some analysts said the independent tools are forcing a separation between the application development software layer and the underlying database engine.

American migration

OAKLAND, Calif. — American President Lines is a $2.3 billion global shipping company that has invested tens of millions of dollars in mainframe applications. Now, the firm is migrating to a distributed processing environment that pushes more of the computer work load into business units.

APL chose JYACC's JAM to develop client/server applications that run against IBM's DB2, Oracle 7 from Oracle and an NCR/Teradata database machine.

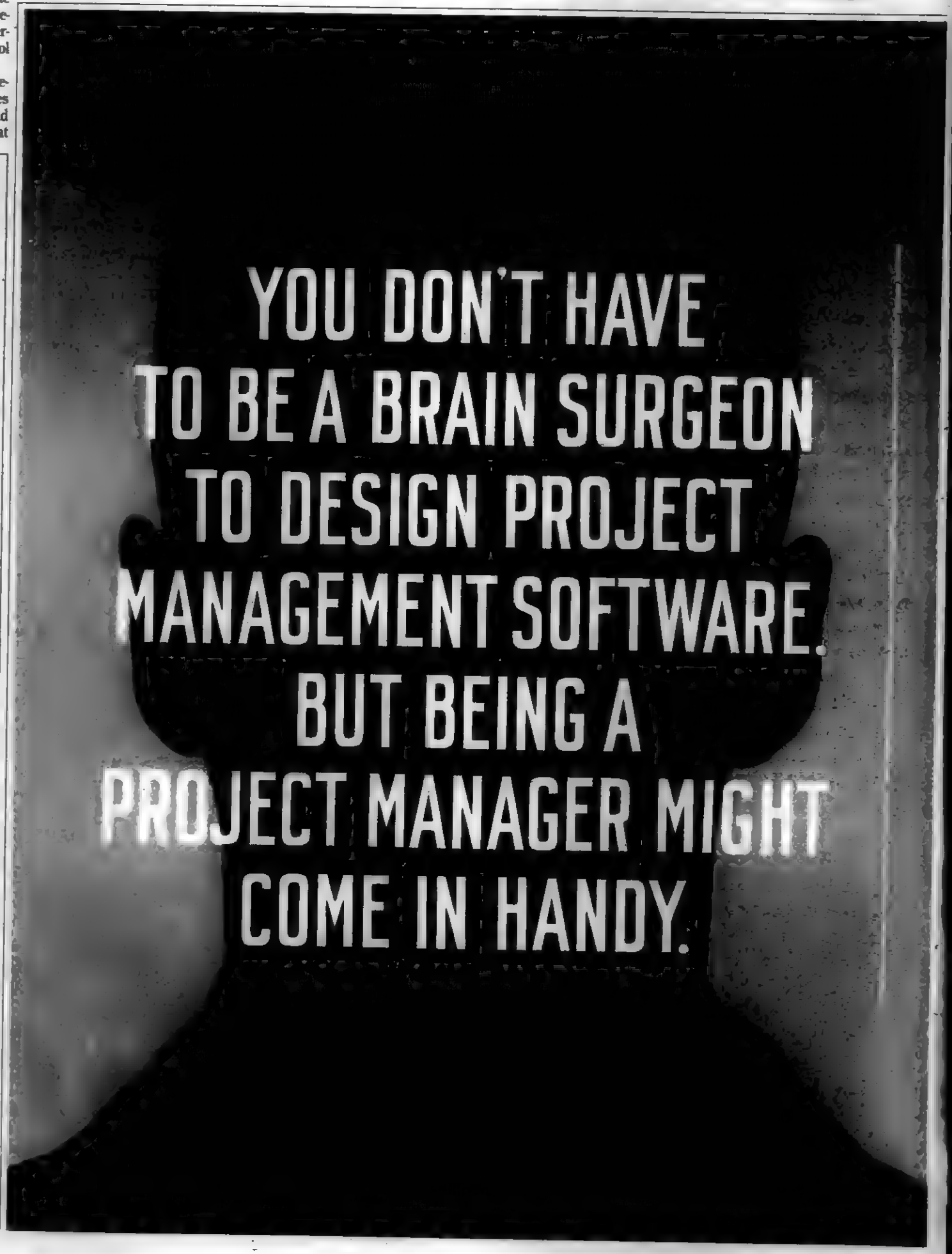
The 5,000-employee firm has 7,000 computers, including IBM PCs and Apple Computer, Inc. Macintoshes.

One client/server project, APL's transportation costing application, will access both DB2 and Oracle in 1993. "We had very few tools in our PC LAN environment and were using some CASE tools and Cobol to develop our mainframe applications," said Alex Gray, director of systems planning. "We wanted a tool that supported rapid application development and joint application development."

APL placed its own stamp on the tool set by plugging JAM and Information Builders, Inc.'s EDA/SQL "data warehouse" software into a homegrown "middleware" software layer.

"The middleware allows you to map your JAM variables to DB2," Gray explained.

The bond between the tools and the middleware, he said, will keep APL's client/server environment afloat.



ComputerVision to sell off Unix tools

VMark Software plans to buy rights to PI/Open for undisclosed sum

BY KIM S. NASH
CW STAFF

FRAMINGHAM, Mass. — ComputerVision Corp., the reincarnated version of Prime Computer, Inc., has agreed to sell rights to the Unix version of its database/application development system to a small Unix tools maker here.

VMark Software, Inc. plans to pay an undisclosed sum for PI/Open, which was designed to help users convert proprietary Prime minicomputer applications to a Unix environment.

ComputerVision recently completed an initial public offering (IPO) of 25 million shares for $12 each on the New York Stock Exchange. Prime disclosed plans to spin off ComputerVision in June, hoping to raise $600 million to pay off some of its $1.29 billion debt.

Under the plan, Shearson Lehman Brothers, Inc. would receive $300 million in cash and $300 million in stock [CW, June 8]. However, the share price has dropped since the IPO, closing recently at $10.38.

PI/Open customers will be able to buy support contracts from ComputerVision, which will also resell the product for the length of the five-year agreement, a spokeswoman for the Bedford, Mass.-based company said. ComputerVision also plans to service VMark's UniVerse products. UniVerse is a similar proprietary-to-Unix conversion product.

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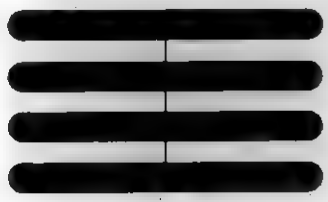

Unix porting made easier

BY GARRY RAY
CW STAFF

Porting Unix applications across five versions of the operating system will be made easier with the Micro Focus Operating System Extensions Version 3.0.

The extensions work with Micro Focus, Inc.'s updated Micro Focus Cobol Version 3.0 for Unix, officials at the Palo Alto, Calif.-based company said. The updated compilers, tools and extensions support The Santa Cruz Operation's SCO Unix V3.2, Unix System V, Release 3 and 4, IBM's AIX V3 and OSF/1.

Designed to support client/server applications programming, the operating system extensions comprise two primary modules: the common communications interface (CCI) and a set of display routines that are portable across different hardware platforms and operating systems.

The CCI provides communication functions that allow programmers to use a single programming interface to develop network applications. CCI supports Transmission Control Protocol/Internet Protocol on Unix and other protocols including NetBIOS and Novell, Inc.'s IPX on DOS and OS/2.

CCI also works with Fileshare V2, a server-based file-handler that provides a number of the transaction-processing facilities needed by client/server applications, including data caching.

Besides the new CCI, Micro Focus has updated Cobol 3.0 for Unix with faster compilation speeds, enhancements to its editing and debugging tools and a preliminary release of its portable graphical user interface builder technology.

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NEW PRODUCTS

Application development tools

Folger Development Corp. has introduced Cobol Navigator 1.1, a Microsoft Corp. Windows-based tool.

The product was designed for Cobol source-code comprehension porting and maintenance, the company said. The ability to find program constructs such as program entry points, variable declarations, paragraph names and section names in multiple Cobol programs is enhanced with the product.

A Cobol parser is included, which screens the source code and makes hypertext links to program, variable paragraph and section name declarations.

Cobol Navigator runs on IBM-compatible personal computers and Windows 3.0 and above. The product costs $349.

Folger Development
Suite 262
801 W. El Camino Real
Mountain View, Calif. 94040
(415) 969-3191

Image Connection has released the Image Connection tool kit.

The product enables users with unmodified DOS programs to retrieve and display images from an image-processing system, the company reported.

The tool kit links complex host and DOS applications with a variety of document imaging systems. Image Connection runs on 640K-byte personal computers and requires the Microsoft Corp. C compiler.

The tool kit costs $995 for the bundled version and $895 for unbundled versions.

Image Connection
24241 Briones Drive
Laguna Niguel, Calif. 92656
(714) 831-8892

Computer-aided software engineering

Popkin Software & Systems, Inc. has released System Architect 2.4, a personal computer-based computer-aided software engineering tool.

According to the company, System Architect 2.4 features 14 enhancements including major data dictionary/encyclopedia improvements. A re-index feature increases the product's report generation speed and enhances response time on the networks.

System Architect 2.4 runs under both Microsoft Corp.'s Windows and IBM's OS/2 Presentation Manager.

The product costs $1,395 for a Windows stand-alone merger version and $2,940 for a Windows network version for two users.

Popkin Software & Systems
15th Floor
11 Park Place
New York, N.Y. 10007
(212) 571-3434

Code libraries

Innovative Data Solutions, Inc. has upgraded its Paragen code-generation system for the Paradox engine.

The product generates native language code with embedded calls to the Paradox engine, the company said. Standard Pascal, object-oriented Pascal, Pascal for Windows code and C and C++ can be created for accessing Paradox database applications.

Paragen code generator has an assortment of features including the ability to reduce hundreds of lines of hand-coded, low-level engine calls to a single function and session support for frequently used options.

The Paragen code-generation system is available in DOS and native Windows versions. The product costs $179.

Innovative Data Solutions
Suite 9
1757 Eastwood Court
Schaumburg, Ill. 60195
(708) 882-3713

Unix tool set removes Lint

BY GARRY RAY
CW STAFF

Unix programmers can remove Lint from their tool kits using a new coding aid by Procase Corp. in Santa Clara, Calif.

Called C/Spot/Run, the tool set includes a variety of graphical utilities that replace Unix programs such as Lint, Grep, Find and C Scope, company officials said. Those Unix programs provide syntax checking, text searches through one or more source-code files, file selection and cross-referencing. In addition, C/Spot/Run provides development utilities such as editing, filing and window management.

Because the programming tool kit is graphical, it provides separate windows for editing, syntax and semantics checking, error exceptions lists and function call graphs. The output and results from one window are available to other windows as needed. For example, errors found in a syntax-checking operation originating in the edit window are automatically sent to the exceptions window. By switching among these windows, programmers will be able to locate and repair errors more easily than with standard Unix utilities.

Designed to run on Sun Microsystems, Inc. SPARCstations with SunOS 4.0+, the tool kit is priced at $995.

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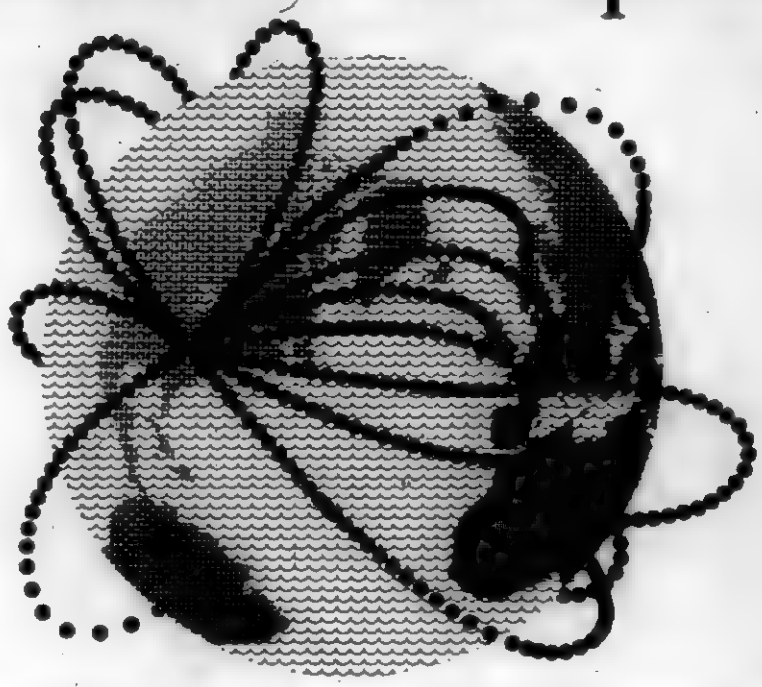

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APPLICATION DEVELOPMENT

Oracle 7: Stability and quality

Users may be excited about slew of new features, but its complexity may be somewhat daunting

NEW PRODUCT IN-SITE

Computerworld's New Product In-Site is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used with live application environments.

ORACLE CORP.'S ORACLE 7

- **Beta-test users say Oracle has made great strides in improving the quality of its product, minimizing the reliability and installation problems that plagued prior versions. At the same time, Version 6 applications require minimal adjustments under Version 7.**
- **The users also report that the additional security and administrative functions are useful but could have been made much easier to use. They are also unhappy with the pricing, which requires additional purchases to receive distributed features.**

Veterans of nightmarish Oracle upgrades rejoice! The vendor has licked its quality problems with the introduction of a beta-test version of its relational database management system that is more stable than the production version of previous releases, according to four corporate sites that evaluated the product for *Computerworld*'s New Product In-Site.

Oracle 7 brings a slew of new features and functions to users — making it competitive with longtime leading-edge companies such as Sybase — in a package that retains the form and fit of Oracle 6 but avoids the reliability hassles.

Currently in its final beta stages, the system is expected to be released in a production version within the next few months. Oracle has taken pains to improve the quality of its production release, its first major upgrade since 1989.

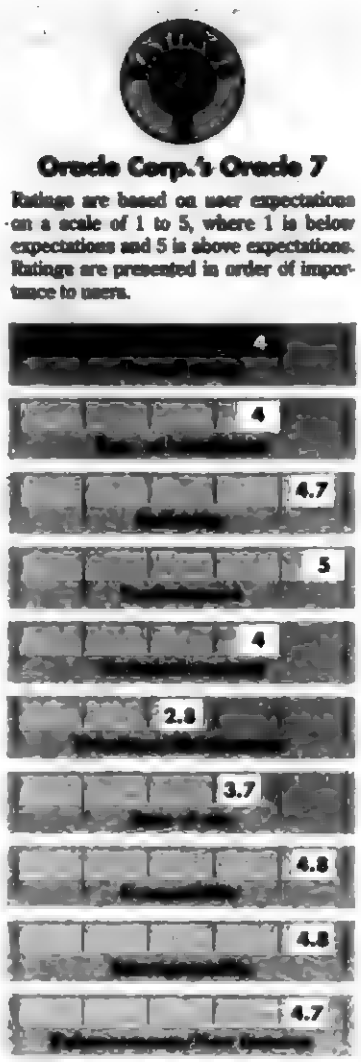
But these accomplishments come with a price: Version 7 is much more complex from the database administrator's point of view. There is also a significant learning curve for information systems staff members used to a simpler Oracle product, the evaluators said.

"Oracle users haven't had this kind of complexity and flexibility before," said analyst David McGoveran at Alternative Technologies.

"The additional tool functionality and stored procedures may be a boon, but previous Oracle users should move cautiously. They may be both excited and overwhelmed," he said.

The evaluators said they were taking advantage of the following new features of Oracle 7:

- Parallel server capability.
- Stored procedures — programs stored directly in the database that can perform repetitive functions for all applications that access the server.
- Triggers — program routines that alert users when special conditions exist.
- Declarative referential integrity — functions that allow developers to set data management and business rules when they create database tables.



Oracle Corp.'s Oracle 7

Ratings are based on user expectations on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.

EASE OF INSTALLATION

According to evaluators, installation ranged from comparable with Version 6 to much easier. One of the main reasons for the difference was that two of the companies had Oracle technical consultants on site as part of an "alliance program" with the Redwood Shores, Calif., software vendor.

The program involves 14 beta-test sites that agreed to share evaluation and implementation information with Oracle in exchange for technical support and quick access to Oracle 7 developers, technicians and support staff.

Three of the four companies installed their systems on Digital Equipment Corp. VAX platforms under VMS, which is the first priority platform for Oracle.

The utility company installed the product on an NCR Corp. NCR 3550 under Unix V, Release 4.

The petroleum company installed the product on an IBM RISC System/6000, Model 550, as well as a VAX 6420.

Utility evaluator: "The 'make file' command wouldn't work, so we had to install each part of the product separately. It took several calls to the vendor and about 20 hours to figure out what was going on."

Insurance evaluator: "It was much easier than anticipated to load both the alpha and beta copies. We saved it all on disks first and loaded it off the disk because it goes much faster. It took about two hours."

Petroleum evaluator: "Installation was a breeze. It was no different than what I'd done before. Oracle made sure we had the help we needed to get the installation done." He also said the installation could take under three hours if users off-load the program tapes to disk and install from the disk.

RELIABILITY

The evaluators found the system to be more reliable than they expected. No serious failures were reported.

"They have apparently taken the time to go through modular testing and integration testing a little more carefully," McGoveran said.

"With Version 6, the developers were under a lot of pressure just to get the product delivered in whatever shape. That's not true anymore. Oracle made a pretty tough decision to slow things down a little bit," he added.

Manufacturing evaluator: "We haven't found anything that was serious enough to bring [Oracle 7] down."

Insurance evaluator: "The initial version didn't have all of the features in it. But as they were delivered, they were very high in quality."

Petroleum evaluator: "I was prepared to have the same kind of [installation] problems I had years ago, and I didn't have any of them.

"One reason for that is that going

SITE PROFILES

Installation descriptions for companies that evaluated Oracle 7

	Manufacturer	Utility	Insurance	Petroleum
Hardware platform	VAX 8800	NCR 3550	Range of VAXs	VAX 6420; RS/6000-550
Version in use now	7.0.9	7.0.9	7.0.10	7.0.10
Time installed	3 months	1 month	1 year	1 year
Using previous version	Yes	Yes	Yes	Yes
Applications type	OLTP	OLTP/test	OLTP	OLTP
Number of applications	3	1	1	1
Number of users	2-20	3-5	10	5
Transaction rate	Low	Low	High	High
Update or read intensity	Record inserting	Good mix	50/50	Record inserting

METHODOLOGY: Product ratings are based on evaluations from four user sites (profiled above). These are beta-test users of Oracle 7, which is due to be released in a final production version within the next few months. The users are members of Computerworld's Product Evaluation Council.

from Version 5 to Version 6 meant recreating the database. Going from Version 6 to Version 7, you don't have to do that."

PERFORMANCE

The insurance evaluator found his online transaction processing application ran 25% faster than it did with Version 6. The application is accessed by 10 users with a high transaction rate and a fifty-fifty mix of update and read activity. The platforms are made up of a variety of VAXs, including a VAX 3800 and 4200.

According to the Transaction Processing Performance Council (TPC), Version 7 has achieved TPC-B benchmarks ranging from 107 to 618 transactions per second at a cost of $11,006 to $12,604 per transaction per second.

The evaluators expect significant performance increases once the production version of the product is in their hands. New features such as triggers will allow performance boosts because they cut down on the number of transactions.

Insurance evaluator: "Oracle conversions usually have been functionality first, and then performance comes near the end, when they get closer to production."

TECHNICAL SUPPORT

Support responsiveness ranged from a three-week delay in pinning down an answer to Oracle support personnel calling the alliance members to ask if they had problems.

In all cases the evaluators felt Oracle was responsive, but the manufacturer found there were things he already knew about the product that came as news to the technicians.

The utility evaluator and manufacturer found a greater need for support because they were working with Version 7.0.9 rather than 7.0.10, which fixed some of their concerns.

PURCHASE/MAINTENANCE

Oracle's new pay-as-you-use pricing scheme, which was designed to match competitors' offerings, made the acquisition of Version 7 more expensive for the evaluators. Users must pay separate fees for the parallel server, procedural database and distributed database options.

Insurance evaluator: "We have over 40 licenses now, and it's going to be more expensive than I thought to go from Version 6 to 7. I thought more would be included. I was a little surprised at the pricing."

The evaluators said maintenance costs are higher on the database administration side than for Version 6 because of the wealth of tuning parameters and options added to Oracle 7. Costs are generally lower on the application development side.

Manufacturer: "The number of parameters associated with tuning has gone up, so maintenance and new releases will take more time. There will be less application development work because they have made the environment a little better integrated."

Petroleum evaluator: "I was not surprised that it was going to cost more. I don't view it as a problem. Our contract covers all the functionality."

EASE OF USE

Beware of the learning curve, the evaluators said. Database staff members can expect more difficulty in administering Version 7 than previous versions, largely because of the many added features. However, the evaluators said not all of these options will be needed for every application, and some of the learning curve involves knowing what options *not* to use.

Manufacturer: "There's a lot more for the [database administrator] to know. There's a learning curve that you've got to get up and get over."

Utility evaluator: "It's going to be harder to administer. I'm still running into problems with the security and ID administration aspects. It was much simpler in the prior version."

Petroleum evaluator: "From a database administration standpoint, it's much, much better. Although it is enormously more complex, at the same time [Oracle] has left all of the simplicity from Version 6 in there. You don't need to use a lot of the features if you don't want to."

COMPATIBILITY

Conversions of applications from Version 6 to Version 7 have been very smooth, the evaluators said. Most are running Version 6 applications unaltered under Oracle 7. None had yet updated these older applications to use any significant number of the new Oracle 7 features.

Insurance evaluator: "We can run Version 6 applications against Version 7 databases without changing them. The only work is making changes to accommodate the new features in Version 7."

Petroleum evaluator: "I've imported data into it and haven't seen any problems, nor do I expect to."

INTEROPERABILITY

The evaluators reported smooth interoperability. The manufacturer found no problems communicating between a VAX running Version 7 and a Sun Microsystems, Inc. system running Version 6.

The petroleum evaluator reported no problems using a VAX and an IBM RISC System/6000 as servers with clients on a number of different platforms.

Petroleum evaluator: "It did what I wanted it to."

The manufacturer said applications developed on Sun workstations using Oracle's Forms 3.0, Menu 5.0 and Report Writer 1.1 ran without difficulty on Oracle 7.

ENHANCEMENTS/NEW FEATURES

The evaluators also said the new features are providing the benefits they expected. They look for more features and functions in the production release of the product, including faster performance.

The most popular features are improved security, referential integrity, stored procedures and triggers.

The utility evaluator found the security enhancements were not as easy to use as expected.

The petroleum evaluator found the alliance process enabled him to get the enhancements that he needed added to early versions of the product.

Manufacturer: "The features that we were expecting — parallel server technology and stored procedures — are present."

Utility evaluator: "Triggers and declarative integrity might be the most popular here. We're kind of big in total integrity."

Insurance evaluator: "It had many more features than we were expecting."

Petroleum evaluator: During our testing, "we found that there were little things that we needed, such as information from other databases. We asked for enhancements to the product, which were made. They added things at our request.

"Version 7, to my way of thinking, you could really call Version 6.3. It's a lot on new features, but a lot of what's underneath is still the same."

Reported by Michael L. Sullivan-Trainor and Garry Ray.

Transaction Processing Performance Council Ratings

	TPC-B throughput	Price/ Performance	Platform
Oracle 7	618.9	$11,006	Sequent S2000
Oracle 7	578	$11,606	HP 9000-890
Oracle 7	107.28	$12,604	Sun SPARCserver
Informix On-Line 5	110.42	$9,866	HP 9000-877S
Oracle 6	48	$20,928	IBM RS/6000-950

ORACLE RESPONDS

Oracle's Tim Negris, senior director of corporate strategy, responded to the issues raised in this report.

Improvements in the quality of Oracle 7: We have done rigorous testing of the product, including an alliance partner program of 14 very large users; a developer's release, which has been flowing out during the past five months; and a formal beta-testing program with 100 customers on a variety of platforms. Customers are exercising different parts of the product with different kinds of applications and have been reporting on their progress, both positive and negative.

Complexity of Oracle 7: In reality Oracle 7 is simpler to use rather than more complicated. But because of the scale and scope of enterprise computing, it's necessary to provide choice. When users get experience, they discover that the number of options they need to tune is actually quite limited. Different people use different subsets of functionality in service of their applications.

Pricing changes: We've divided the modules of Oracle 7 to allow customers to buy and maintain only the portions of the product that they need. Customers can get more functionality for less money than they would have spent on Oracle 6 on comparable platforms. Because of product improvements, users can downsize their hardware platforms and move to a lower priced licensing category.

Platform support: We recognize that our customers live in a heterogeneous world, and it is harder to use the new features on one platform if they don't have the same features on every platform. So we have worked hard with Oracle 7 to compress the porting cycle to as minimal a time frame as is possible.

Future upgrades: This release will take users very far into the future because of the expanded base functionality of the product. We are in the process of parallelizing our query processing and optimization facilities for loosely coupled systems for an intermediate release. With regard to Oracle 8, we are focusing on large database support and incorporating objects into our implementation of the relational model. We're making good progress. We'll be able to turn things around much more quickly.

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PAIN & Pleasure

COMPUTERWORLD 1992 JOB SATISFACTION SURVEY

The hours are longer, the work load is growing and stress runs rampant. Yet many like their jobs more than ever. Are IS people crazy?

BY ALAN RADDING

Not that you need to be reminded . . . but these are trying times for information systems professionals. A stubborn, nasty recession continues to take big bites from technology budgets, forcing IS shops to struggle through a second or third year of doing more work with fewer resources.

"We have to take our fair share of across-the-board reductions," says Hal Eckel, director of information services at Haworth, Inc., a Holland, Mich., maker of office furnishings. "Other departments are rushing to us for support to help them cope with their cutbacks. We're seeing geometric increases in the demand."

These days, more work and less money is the rule, according to *Computerworld*'s Sixth Annual Job Satisfaction Survey. Some 60% of the 770 IS senior- and midlevel managers and IS professionals in large organizations say their work loads (and stress) have risen during the past year, especially at the lower levels (see chart page 101).

Given that backdrop, it's hardly a surprise that the number of respondents who considered their jobs "very unsatisfying" or "somewhat unsatisfying" rose 6% this year.

But wait a moment. Beyond the long hours, shrinking (or vanished) bonuses, training cutbacks and meager hopes for advancement, there's also growing satisfaction.

It's true: Despite the double-whammy of downsizing resources while upsizing expectations, the number of IS people who say they are "very satisfied" or "somewhat satisfied" with their jobs climbed 8% this year.

In addition, more than one-third of all polled and nearly half of senior executives report increased satisfaction in comparison with the 1991 survey.

Does this prove once and for all that you have to be crazy to pursue a career in IS? Maybe, but not necessarily. Some people seem to thrive under difficult conditions and heavier burdens.

"There's a lot more stress and pressure, for sure," says the senior IS manager at a major insurance company in the Midwest. "But that's what I find challenging, and I like it."

Despite edicts to cut spending and freeze hiring, this IS chief has embraced the challenge of boosting productivity and motivation. For example, in a switch of conventional practice, he hired consultants to temporarily take over routine maintenance. In-house staff members were thus freed up to tackle an exciting new development project.

"It gave our people a big boost," the executive reports.

Indeed, many IS pros report feeling energized by adversity (see profiles page 100). In the current do-more-with-less times, IS pros are managing to find other strong motivators, too.

Predictably, pay raises remain a favorite incentive and path to satisfaction. But a hearty pat on the back and an enthusiastic "well done" are much appreciated, too, especially by senior managers.

All told, a surprising 85% of respondents say that happiness in one's job matters more than career advancement. Things such as sense of accomplishment, enjoyment of work, sense of worth and yes, money, are more important, they say, than simply getting ahead.

Nearly half of IS professionals held this view, compared to 35% of middle managers and 22% of senior managers.

All's not rosy, however. Several ominous signs indicate there's reason to fear that things might be corroding deeper in the IS organization. Consider the following:

- **Heavier work loads and higher stress levels are reported by nearly two-thirds of respondents.**
- **Satisfaction tends to drop lower in the ranks.**
- **Three out of every four say they would welcome a job change.**

• **Departmental satisfaction is down.** In contrast to their own rosy personal assessments, 30% of all the respondents said they believed satisfaction in their department as a whole was eroding, compared to 26% last year. Nearly 35% of the nonmanagers noted a decline — twice the rate cited by management.

Continued on page 100

Michael Abramson

Haworth's Eckel: *'We're seeing geometric increases in the demand' for IS*

Radding is a free-lance writer based in Newton, Mass.

Grins, grimaces and grit

Numbers alone don't tell the entire job satisfaction story. Experiences of information systems professionals vary as much as different positions, companies and people themselves. *Computerworld* recently spoke with a cross-section of IS managers and staff members to get a close-up look at life in today's IS trenches. Some are struggling; some are coping. Others are even thriving. Free-lance writer Alan Radding reports.

▸Yearning for change

"IS is interesting when it is changing," says Bill Knobles, MIS manager at the Omni Inner Harbor Hotel in Baltimore. In past years, new technology and development have fueled that change.

Unfortunately, new initiatives were an early casualty of the recession. Today, many organizations are sticking with older systems and applications, especially in the hard-hit hospitality industry.

"We've been cutting back for two years," Knobles says. "We have less people, and we're not updating the equipment.

"Pay raises are modest. And there is little room for advancement in a shrinking shop," he adds.

To keep himself and his two-person staff motivated, Knobles has tried several tactics, including rotating staff assignments. He's also fought and won funding so that he and his staff can learn new skills.

"We just finished a three-day program," he says.

Without opportunities like these, he says, IS staff members get bored, morale drops and productivity suffers. He is eager for new and interesting challenges.

"I've been on the same minicomputers now for five years, counting a previous hotel IS job," Knobles says. "I really want to learn new things."

IS managers take note: Growing pressure on technical staff members suggests an ominous drop in morale

	Overall average	Senior executive	Middle manager	Nonmanager
Improving	18.8%	28.3%	21.0%	10.2%
Stable	51.8%	52.2%	49.8%	55.3%
Declining	29.7%	19.5%	29.2%	34.5%

Satisfaction tends to diminish further down into the ranks but is growing for some

	Overall average	Senior executive	Middle manager	Nonmanager
Very satisfied	29.2%	39.4%	27.5%	24.0%
Somewhat satisfied	46.1%	45.7%	48.8%	46.3%
Neutral	4.3%	2.1%	6.3%	6.6%
Somewhat dissatisfied	9.6%	8.5%	10.8%	16.6%
Very dissatisfied	10.8%	4.3%	6.6%	6.5%

Increased satisfaction	Decreased satisfaction	Same as last year
37.2%	29.4%	33.4%

▸Double time, double trouble

Mike Graeber has been working flat-out, and he's getting tired.

Although officially the systems administrator at Staco Energy Products Co., a manufacturer based in Dayton, Ohio, he is also de facto IS manager at both Staco and a struggling sister company. "I'm trying to do two full-time jobs without having to put in 100-hour weeks," Graeber says.

Much of the crunch stems from work involved in consolidating the sister company onto Staco's minicomputer as part of a company drive to slash costs. Though Graeber says he has enough staff support, he still must spend nearly one-third of his time traveling.

He accepts that the weak economy has decimated Staco's profit-based bonus plan and that he'll probably have to work nonstop until the minicomputer consolidation is completed this fall.

But what really bothers him? Graeber says it's the pressure that has kept him from exploring other, possibly more satisfying, career challenges.

"I'd like to start playing with PCs again and looking at new technology," he says. Sadly, that's not likely right now.

No wonder that at times like this Graeber says he sometimes questions his long-term commitment to IS.

"I don't see myself becoming the vice president of MIS at some large manufacturing company," he says. He muses about returning to graduate school.

However, there's little time to weigh options. "My boss has another project waiting when we finish this. I don't know what it is, but at least it will be different."

▸Wanted: Grace under pressure

Pressure can bring out the best in some people. So believes Charles Bedekovich, data processing manager at Pittsburgh-based Employee Benefit Claims, Inc.

Pain & pleasure

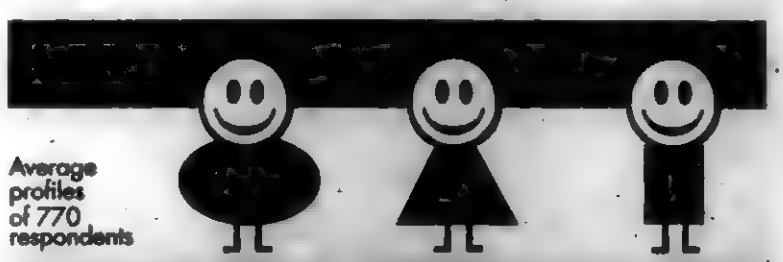
CONTINUED FROM PAGE 99

- **Few believe that IS is being used to its fullest potential.** Some 68% of all the respondents say they believe that they are not "working up to their fullest potential." The feeling is even stronger among nonmanagers (72%).
- **IS performance is seen as declining.** Some 15% of those polled described IS performance as "declining" vs. 12% the previous year. Again, criticism was harsher at the lower levels, with 21% of nonmanagers reporting a drop. In contrast, 53% of senior managers saw an *increase* in their job performance.
- **Many are looking for new jobs.** Although the hiring market is pretty dismal in most places and many respondents say they are satisfied, more than 75% of those polled say they would welcome a job change. Twenty percent are actively looking for new work. Among nonmanagers, those who said they would switch jobs rises to nearly 83%.

Unhappy at the bottom

Overall, the responses suggest that satisfaction is lower and criticism stronger at the middle management and professional levels. This is probably because of staffing cutbacks and work load pressures, the brunt of which has been borne by lower level workers.

What to do? According to respondents, flexible job scheduling, more bonuses, better training, more opportunities for advancement, better salaries, the opportunity to telecommute and more feedback from supervisors could all help improve satisfaction. •



Average profiles of 770 respondents

	CIO, VP/manager of IS services	Director of IS, technical manager	Programmer/Analyst, systems developer
Direct reports	24	11	2
Years at current job	9.7	10	6.6
Years in IS	17.9	16.4	11
Age	45	42	36
Department size	189	226	379
Sex	96.8% male 3.2% female	85.1% male 14.9% female	75.5% male 24.5% female

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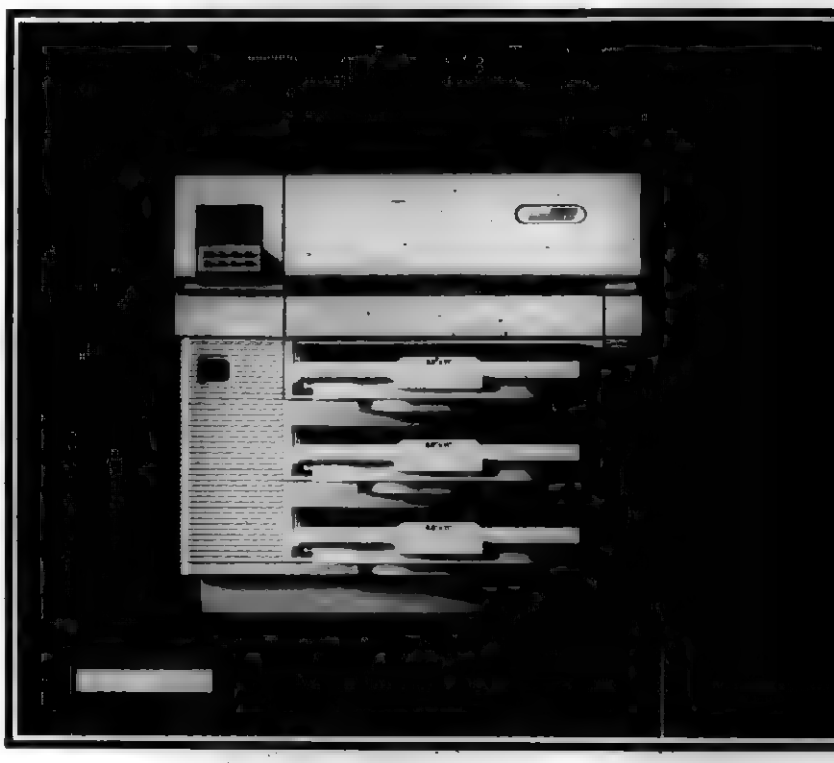

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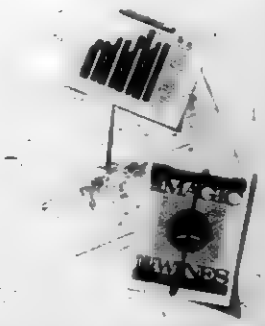

They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple Twin-Trays hold up to 1,500 sheets. Impressed?

Our Intelligent Emulation Sensing feature continually monitors, then automatically adjusts to either PostScript Level 2 or PCL 5 depending upon which language you're using. You needn't lift a finger.

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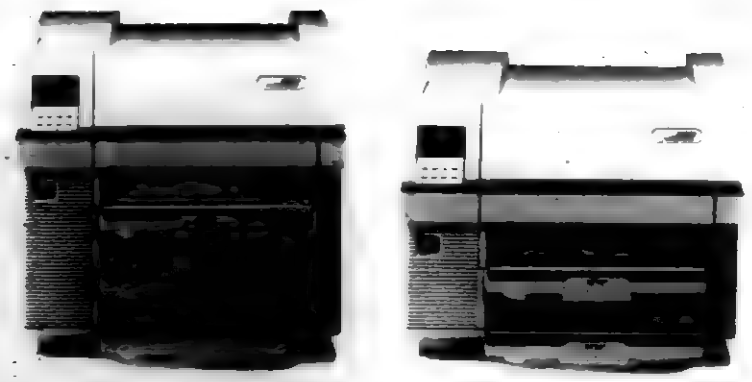

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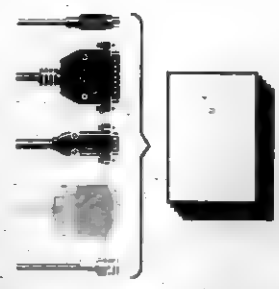

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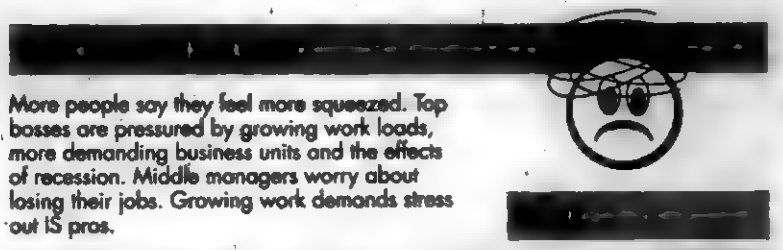


More people say they feel more squeezed. Top bosses are pressured by growing work loads, more demanding business units and the effects of recession. Middle managers worry about losing their jobs. Growing work demands stress out IS pros.

	Senior executive	Middle manager	Nonmanager
More	51.1%	57.8%	65.9%
Same	33.7%	31.8%	29.3%
Less	15.2%	10.4%	10.3%

Increased work load	[illegible]
Increased demands from business	[illegible]
Concern about job loss	[illegible]
Budgetary constraints	37.5%
Overall economy/recession	20.1%

"Top people seem to prefer to work under pressure. They like to be challenged," he says.

The company is doing well, and Bedekovich is on the prowl for top people to strengthen his IS team. "We're improving the quality of our people and weeding out nonperformers," he explains.

A realist, Bedekovich tries to keep his IS organization focused on attainable goals and objectives. "You're always going to have people who have bad days," he says.

To motivate his staff, Bedekovich draws from a bag of motivational techniques, none of which involve money. Some employees he pressures; others are challenged by new problems. Still others receive a little tender loving care. Bedekovich explains: "They want some attention. They want to know that I'm interested."

True, the pressure is intense, but Bedekovich believes it's still fun to work in a growing, profitable business. "Most of the people here," he reports, "are very enthusiastic."

Senior managers tend to like a word of praise and increased duties. Everyone likes cash.

Salary increase	35.6%
Promotion	14.5%
Personal congratulations	13.8%
Bonuses	11.3%
Public recognition	11.3%
Increased responsibilities	11.3%
Other	2.2%

▶Washington's Santa Claus

"Sure, there is quite a bit of stress," says Larry Barker, director of computer services for the county of Klickitat in Glendale, Wash. "But people in IS don't know what stress is."

Barker isn't just macho posturing.

Before switching careers into computers, Barker worked as a juvenile probation officer. "Now that's a stressful job!" he exclaims.

Sure, the rotten economy has created extra pressures for technology professionals, he says. But compared with some other fields, things could be a lot worse, he says.

For example, despite the major, widespread problems of local and county governments, Barker has the full financial backing of his Pacific Northwest county.

County officials "recognized that they have to get on the IS bandwagon and spend some money," Barker says.

True, Barker puts in long hours, as users pile on demands. But he says the reward is high.

"This is more enjoyable every day because of the feelings of accomplishment," he says, noting that many county departments have never had a computer. "People call me Santa Claus. That makes me feel great."

Rich Frishman

'This is more enjoyable every day,' *county of Klickitat's Barker says, pictured by a local re-creation of Stonehenge dedicated to World War II veterans. 'People call me Santa Claus'*

▶On track (with smaller boots)

Downsizing computer systems, staff and a dramatic corporate overhaul are giant pebbles in the boot of Nocona Boot Co., a Western footwear manufacturer. In a staff-cutting move, the Nocona, Texas, company recently moved from a proprietary NCR Corp. mainframe system to an IBM Unix system.

"Morale is high for the moment because we've got new technology to play with," says John Wicker, director of IS.

But darker times loom ahead for IS and the rest of the company. More staff cuts are likely.

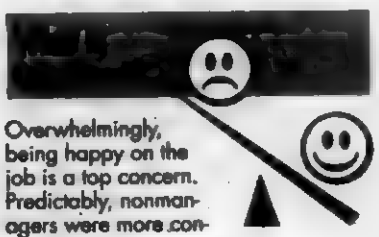
And Nocona management expects other problems to arise, as workers struggle with dramatic changes wrought by streamlining the 65-year-old company.

To ease the pain, all 450 employees are participating in a special training program designed to ease the shift from a traditionally structured manufacturing company to a modular, more open structure. Despite some initial suspicion, Wicker says that many people are now getting excited. Still, he concedes that IS productivity has suffered from the many organizational and technical changes.

Take downsizing, for example. "When you leave the mainframe," Wicker notes, "you don't find the same productivity tools."

At the same time, the IS department

Continued on page 104



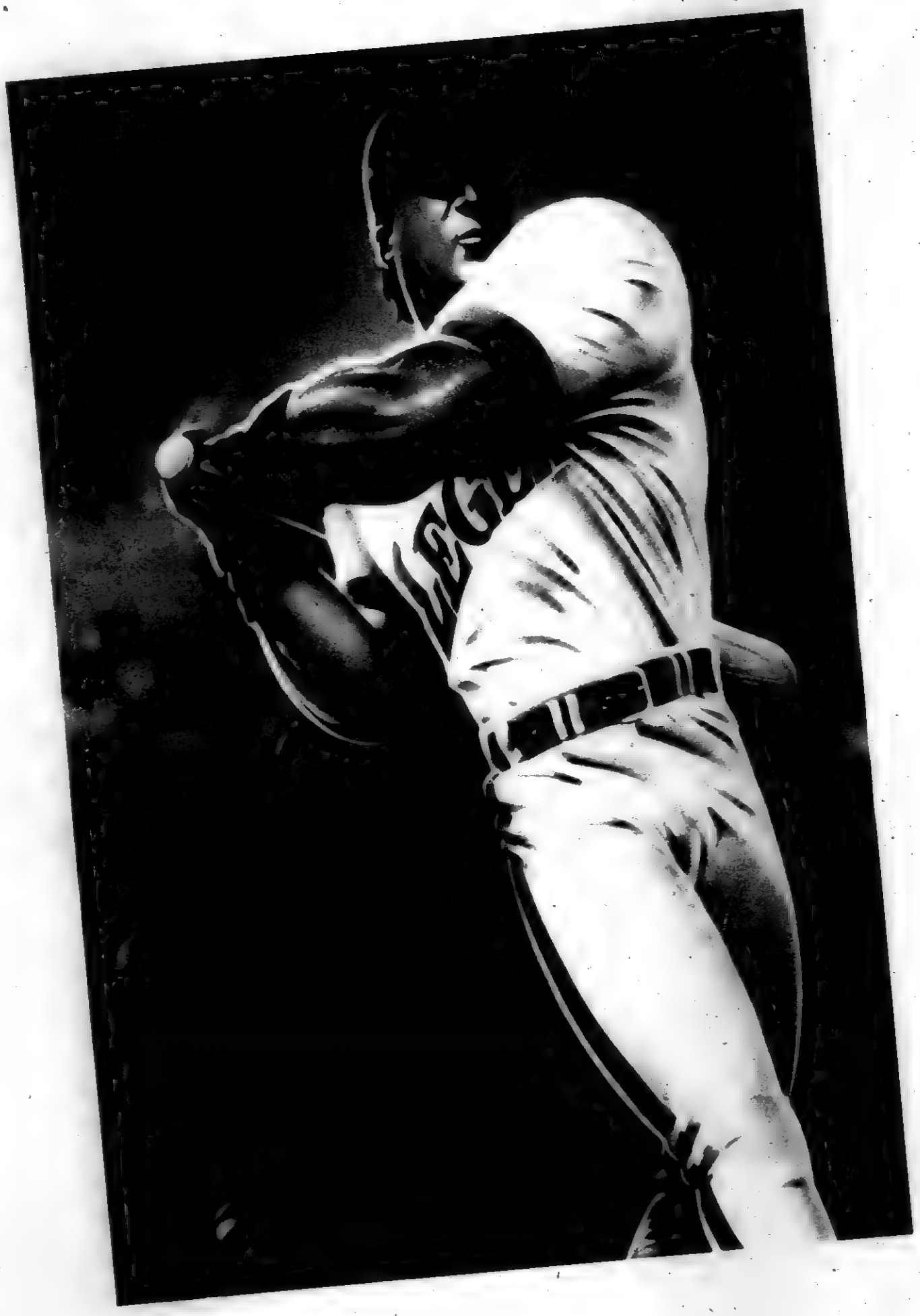
Overwhelmingly, being happy on the job is a top concern. Predictably, nonmanagers were more concerned with advancement.

Job satisfaction	[illegible]	
Career advancement	14.5%	
Both	1.3%	

Enjoy work, money, accomplishments	[illegible]
Helps company, others	13.3%
Leads to career advancement	10.7%
Close to retirement	8.1%
Better family life/ quality of life	4.5%

Katherine Lambert

Omni Inner Harbor Hotel's Knobles *rotates staff assignments and encourages new training to boost morale and keep staff members from getting bored*



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The recent joining together of Legent and Goal has done more than create a new, larger company.

It's changed the entire playing field of systems management.

Not because the new Legent is a bigger company than before.

But because we're going to be the one that's best to do business with.

Both Legent and Goal have always been responsive to our customers' needs, with business practices recognized as the fairest in the industry. We intend to continue that tradition.

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Find out how the game has changed. From the players who are changing it.

LEGENT

Grins, grimaces and grit

CONTINUED FROM PAGE 101

is also upgrading its skills with client/server, programming tool kits, design aids, relational databases and Unix training.

With so much going for the IS staff — a profitable, stable company, new hardware, new software and new training — keeping up is still difficult, Wicker says.

▶Future looks bright

For David Berkley, programmer/analyst at the Industrial Commission of Ohio in Columbus, IS couldn't look brighter.

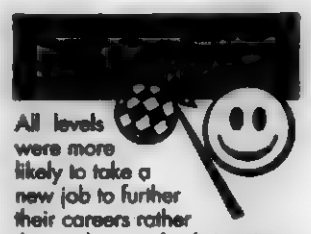
In his first job out of college, Berkley found himself at a state agency that was just starting to automate. "We don't have a lot of constraints," he says. "We are not under budget pressure. It's almost like we have a blank check."

When pressure mounts, IS gets rewarded. During one sticky job, for instance, Berkley found himself working nights and weekends to meet a deadline. But he says the extra effort paid off.

"We have a choice of time-and-a-half or time off. I took the money," he says.

His small IS unit runs an Application System/400 Model B-60 that supports 450 users and the claims tracking application Berkley works on.

He's thrilled with the growing duties he enjoys. "My boss lets me do things that aren't really part of my job description. It gives me a lot of experience."



All levels were more likely to take a new job to further their careers rather than to leave a bad situation

Career advancement	57.7%
Better pay	42.0%
Escape stress	28.7%
Layoffs	19.3%
Poor communication with superiors	15.2%

Multiple responses allowed

▶'A very trying time'

After eight years of meteoric growth, Haworth, Inc. has fallen back to earth. The morale of the company's IS department has plummeted in the face of staff and budget cutbacks.

"We're in an industry that just matured," says Hal Eckel, director of information services at the Holland, Mich., maker of office furnishings.

Now that the days of high-flying growth are over, the company is battening down, Eckel says. "This is a very trying time," he laments. "There is a lot of pressure, and morale is low."

Still, Eckel doesn't like to dwell on the negatives. "It just pulls you into a downward spiral," he says. The department's productivity, though below peak, is still acceptable, he adds.

To boost sagging spirits, Eckel looks for special ways to reward accomplishment, such as giving out awards for exceptional work. He has also managed to keep salaries above average and continues merit increases. Training and development are also key: IS staffers occasionally get time to pursue an independent research project of their choice.

Still, Eckel says, there are no quick fixes, short of a major economic upturn. "When you are dealing with attitudes and emotions," Eckel says, "things take a long time." ●

METHODOLOGY

***Computerworld*'s Sixth Annual Job Satisfaction Survey includes responses from 770 information systems managers and professionals. A total of 2,000 unduplicated names were culled from *Computerworld*'s paid subscriber list. Surveys were mailed on June 24, 1992, and tabulated by IDG Research Services in Framingham, Mass.**

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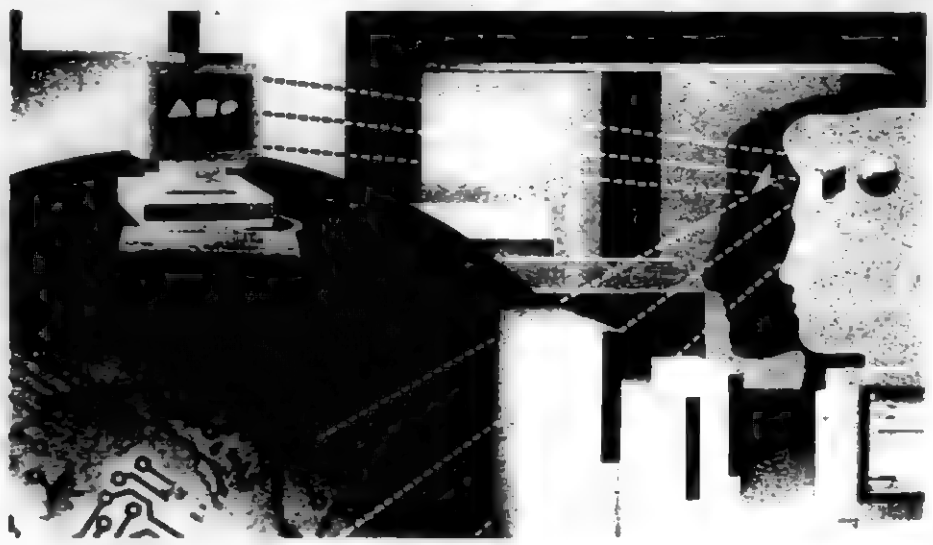

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We ask you to envision the world of computing that you will inherit. The quality of your ideas will influence the changing world of IT — the dawn of a new era of computing. What is the destiny of the information-intensive workplace?

The Challenge

We believe in listening to the next generation of leaders who will shape business, education, and society. That's why we're asking all full-time undergraduate and graduate college or university students to explore the topic, "New Ways of Computing."

The student chosen as the first place winner will be awarded $10,000 in cash and an NCR notebook computer. The second place winner will receive $5,000 in cash and a notebook computer, and the third place winner will receive $3,000 in cash and a notebook computer.

In addition, the professors of the top three entrants will also receive NCR notebook computers.

The Rules

1. The $60,000 Student Essay Competition is open to any full-time undergraduate or graduate student attending an accredited college or university.

2. Entries must be original, unpublished work on the topic, "New Ways of Computing." Essays must not exceed 3,000 words. Discussions should be about the near future of computing and how the field will evolve in the next three to five years.

3. Areas of discussion may include, but are not limited to, open systems, the role of technology in a corporation, the globalization of computers and communications, information distribution or privacy issues, and trends in computer architecture as they relate to multimedia, wireless systems, telecommunications, or other such innovations.

4. Entries must be typed, double-spaced on 8 1/2 by 11 bond paper, one side only. A separate cover sheet should list the entrant's name, school, home address, whether undergraduate or graduate, and title of the essay. Subsequent pages should be numbered sequentially and include the essay title in the upper right margin. Winners will be required to produce proof of current full-time college or university enrollment.

5. All entries must be postmarked by December 15, 1992 to be eligible for consideration. Please submit entries to: Manning, Selvage & Lee Public Relations, New Ways of Computing, 79 Madison Avenue, New York, NY 10016. The sponsors are not responsible for, and will not consider, late, lost or misdirected entries.

6. In the event any prize winner is a minor, the cash award will be made to his/her parent or guardian.

7. Awards to individuals will be reported as income on IRS Form 1099. All taxes are the responsibility of the recipients.

8. Award winners will be required to sign publicity releases and affidavits of eligibility and compliance with all rules governing the competition. Failure to return executed affidavits and releases within 15 days of receipt will cause the award to be null and void.

9. All entries become the property of the sponsoring organizations and will not be returned.

10. By participating in this competition, entrants agree to these rules and the decisions of the judges which shall be final in all respects, and further agree to the use of their names, likenesses and entries for *Computerworld*, the Computer Society of IEEE and/or NCR advertising and publicity purposes without further compensation.

State, territorial and country judges will consist of panels that include NCR stakeholders. Final selections will be made from state, territory and country winners by a national panel of judges.

If clarification is necessary, call (513) 445-1667, 8am-5 pm EST.

Award winners will be notified on or about May 16, 1993. To obtain a list of finalists, send a self-addressed, stamped envelope to:

1992 Student Essay Competition
NCR Corporation
Stakeholder Relations Division
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Form fitting

Going from paper to electronic forms can save companies more than 70% and give users a palatable interface to enterprise data

Mark Fisher

BY MICHAEL A. BRAGEN

A form is the universal medium for communicating business data. By managing paper, companies guide the flow of operational work. Documents travel among departments, collecting the data required for decision-making and leaving a paper trail of transactions.

But paper use is costly. U.S. firms spend nearly $7 billion annually to purchase paper forms — and nearly $100 billion to process, file, store and destroy them.

Enter forms automation software (electronic forms), brought on the scene to cut costs. By bringing design and production of forms in-house, companies can save more than 70% (see chart page 107). The drive to get electronic forms off of large systems and onto personal computer platforms may shrink costs even more.

But saving money isn't the real benefit of forms automation. Through the use of workgroup automation and client/server, enterprisewide connectivity, firms are improving the quality and efficiency of their operations because users get a palatable interface to enterprise data. In the same way that graphical user interfaces such as Microsoft Corp.'s Windows enable better access to systems functions, PC electronic forms act as graphical data interfaces.

The technology of forms automation is not extraordinary; its value is in the linkage of database, data collection and data retrieval/presentation technologies.

Steven Weissman, associate director of publications at BIS Strategic Decisions in Norwell, Mass., refers to the "technology soup" of forms automation, citing the convergence of hardware, software and environments as an enabling factor in the process of collecting and disseminating information.

The high end of PC electronic forms technology is where all the action is for corporations. At the high end, electronic forms packages from firms such as Delrina Technology, Inc. (PerForm Pro) and Jetform Corp. (Jetform) not only enable the design of a form but also provide separate "fill" modules that can be distributed to remote terminals.

Fill modules operate as what-you-see-is-what-you-get data entry screens that look the same as their paper counterparts. The packages act as sophisticated information filters, with automatically calculated fields, table lookups and electronic signature security.

The creator of an electronic form can associate rules and algorithms with each field on the form to guide and constrain users.

For example, on an expenses worksheet, the number of work hours for a given day can be limited to a range of 0 to 18. Also, additional forms can be linked to fields. Answering "yes" on an insurance application to the question of whether a customer smokes can force the completion of a more detailed health form.

KFC Corp. in Louisville, Ky., for one, has set up a pilot project to integrate forms processing through its enterprise electronic-mail systems using Delrina's PerForm Pro, says David Sierra, project manager for the forms management area. The project focuses on automating in-store administrative forms at the company's Canadian subsidiary.

KFC's electronic forms are oriented toward human resources and administrative functions, including performance appraisals, customer complaint forms, supply tracking forms, property loss forms, job descriptions and employee information requests.

Whenever a new store employee begins working at KFC, his manager fills out an on-screen information form containing personnel information. The form and data are then

Continued on page 107

Good form

The market for electronic forms software packages, which range in price from $100 to $495, will beat up by '95

Projected sales (in millions)

1992	$48
1993	$60
1994	$86
1995	$106

Source: Frost & Sullivan, Inc. CW Chart: Janell Genovese

Bragen is a software market analyst and management consultant based in Lexington, Mass. A close watcher of the forms automation industry, he has prepared extensive reports on the market, users and technology.

Where are you headed with your applications development?

BACHMAN

Continued from page 105

routed through the network to the human resources department, where data about employees is stored on a mainframe database. Data from the form is then electronically transmitted to the payroll department, activating the individual's account.

Advanced forms software can also work within peer-to-peer and interconnected client/server networks, enabling users to enter information via electronic forms to remote, distributed databases. Databases can be populated from users entering data simultaneously to on-screen forms.

These more sophisticated electronic forms are crossing the boundary into the realm of database front ends. Forms designers can structure complex SQL queries that can transparently retrieve information from corporate databases and present it to novice users.

At the mortgage department of a large bank in the Southeast, loan clerks fill in on-screen loan application forms for potential customers. Credit history, account balances, outstanding loans and prevailing mortgage rates are instantly accessed from databases connected on the client/server network. The clerk gets a senior loan officer's approval for the loan via electronic signature. Before the customer can walk away — and check out a competitor's rates — he gets the hard copy of the commitment letter, ready for signature.

For its part, Northrop Corp.'s Electronics Division has a department using forms linked via a backbone network to a dBase database for access and entry of human resources data, says Raymond Hernandez, a graphics coordinator in the management systems and procedures department.

Right now, the finance, procurement and engineering departments, each on different workgroup local-area networks, all have access to the company's backbone. Department staffers can call up electronic versions of corporate forms that can be filled in on-screen.

"The second phase will be to connect each department's forms and data over the network using electronic mail," Hernandez says. In the future, all departments will be able to fill and transmit forms and mainframe-based data via Lotus Development Corp.'s CC:Mail E-mail system.

Quick & easy

How do you implement forms automation in the most expedient and least stressful way possible?

The best kinds of forms systems are ones based on careful collaboration by information systems groups and users to find out how many forms are in use and how those forms support tasks employees perform. What information is required to issue a policy for a customer? Which actuarial tables should be used in determining premium rates? How is information on an approved application conveyed to the billing department? Analyze work flow: what happens, in what order, which business units are involved and where the information goes.

Needs must then be matched to available technologies and products ranging from stand-alone PCs to LAN-resident multiple design and fill workstations connected to databases. These products should be tested in an organizational context.

In doing an environmental and work-flow analysis, you may find that your processes or systems set-up need rethinking or that certain sections of the company are more prepared than others to take on the new software.

Having forms software in place doesn't mean you should stop your analysis. One major aerospace manufacturer that has been concentrating on forms automation and scrutinizing its processes since 1986 recently encountered architectural problems. The company has a base of nearly 3,000 centrally managed forms it currently uses. However, the number of "bootleg forms" — forms created and used by departments but not officially cataloged and sanctioned — is estimated to be twice that number.

The firm stands to gain significantly from a coordinated automation effort, but in studying its environment, the company found that it has a complicated mixture of systems, which run the gamut from stand-alone desktop forms software (DOS- and Apple Computer, Inc. Macintosh-compatible) to mainframe host-based systems.

The company is currently undergoing a substantial effort to build a consolidated, integrated library of electronic forms.

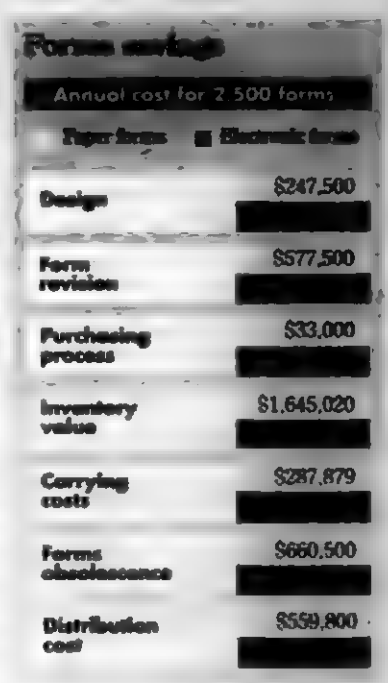
Cost accounting

The question always comes up when implementing a new technology: How much is this going to save us?

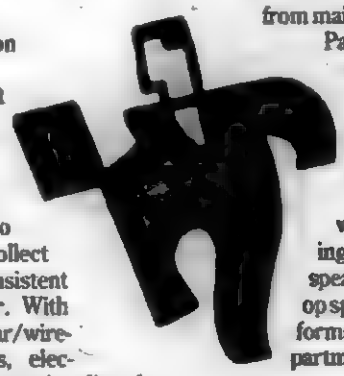
There is a series of statistics (see chart) on cost benefits of the use of electronic forms. These statistics are based on studies of forms usage conducted by Ryerson College and Corporate Electronic Imaging, a division of IDS Financial Services, in 1989 for Delrina Technology, Inc., a forms software vendor in Toronto.

For companies with 2,500 forms to automate, annual costs of existing paper forms are broken into seven "hard dollar measures" totaling an average of $4 million. Using electronic forms, the costs are estimated to total $1.1 million, a savings of nearly 73%.

A company with 2,500 paper forms that uses electronic forms, the study indicates, should save more than $18 million per year.



CW Chart: Stephanie Faucher



Extends to field

The kind of information delivery/retrieval forms enable doesn't stop within a company's walls. With electronic forms distributed on notebooks, pen-based PCs and so on, field forces can collect information in a consistent and efficient manner. With the new crop of cellular/wireless communications, electronic forms place automation directly in the hands of the remote user.

Associated Aid for Lutherans (AAL), an insurance provider with $7.3 billion in assets and $1.5 million members, has given its 2,000 sales agents laptops and mobile communications equipment. The agents can call up 40 of the most common forms related to insurance applications while at the customer's location, fill them in on-screen and transmit the collected data to the home office in Appleton, Wis.

The company has reduced the time it takes to process applications because sales agents no longer send completed forms via the mail. While a signed paper application must be on file by law, "between 50% and 60% of applications are processed, and policies are ready to be issued by the time the signed copy is received by mail," says Kay Jacobson, an AAL field automation specialist. Furthermore, she says, electronic forms have virtually eliminated the problem of incomplete or incorrectly filled in forms.

Despite the promise of forms automation, some companies aren't taking advantage of the technology as an information flow enabler. These companies tend to view forms automation in light of its most narrow description: as a design tool that lets users remake a paper form into a computer one. Part of the problem may be a political struggle for control of (and access to) enterprise data, and part may be a misunderstanding of the strategic role forms automation can play in a company.

"We could be doing a lot more with automation," says Kim Miller, senior forms analyst at State Farm Life Insurance Co. in Bloomington, Ill. The firm is using advanced function printing, which enables formatted output of policy data from mainframe databases.

Part of the solution is getting senior and systems management to recognize the value to the firm of providing users with a window on corporate information.

Connie Magers, who works in nonresale purchasing at JC Penney Co. in Dallas, is spearheading an effort to develop specifications for an enterprise forms automation system. Her department, which is responsible for forms procurement and administration, is now completing a series of nearly 50 presentations to senior management and the information systems group on the benefits and workings of forms automation.

The forms and systems professionals in the company have coordinated on requirements for the bidding process. "It's a team thing," says Magers, who first garnered the attention of the chief executive officer by pointing out the potential cost savings (50% expected) and environmental benefits of paperwork reduction.

KFC's use of E-mail as a transmission medium for forms-based information hinges on collaboration between the IS, telecommunications and forms management groups to integrate the flow of electronic forms among users. Because of the "uncommon level of coordination" among groups, "we're doing a lot of things right now that I don't think any other company has done," Sierra says.•

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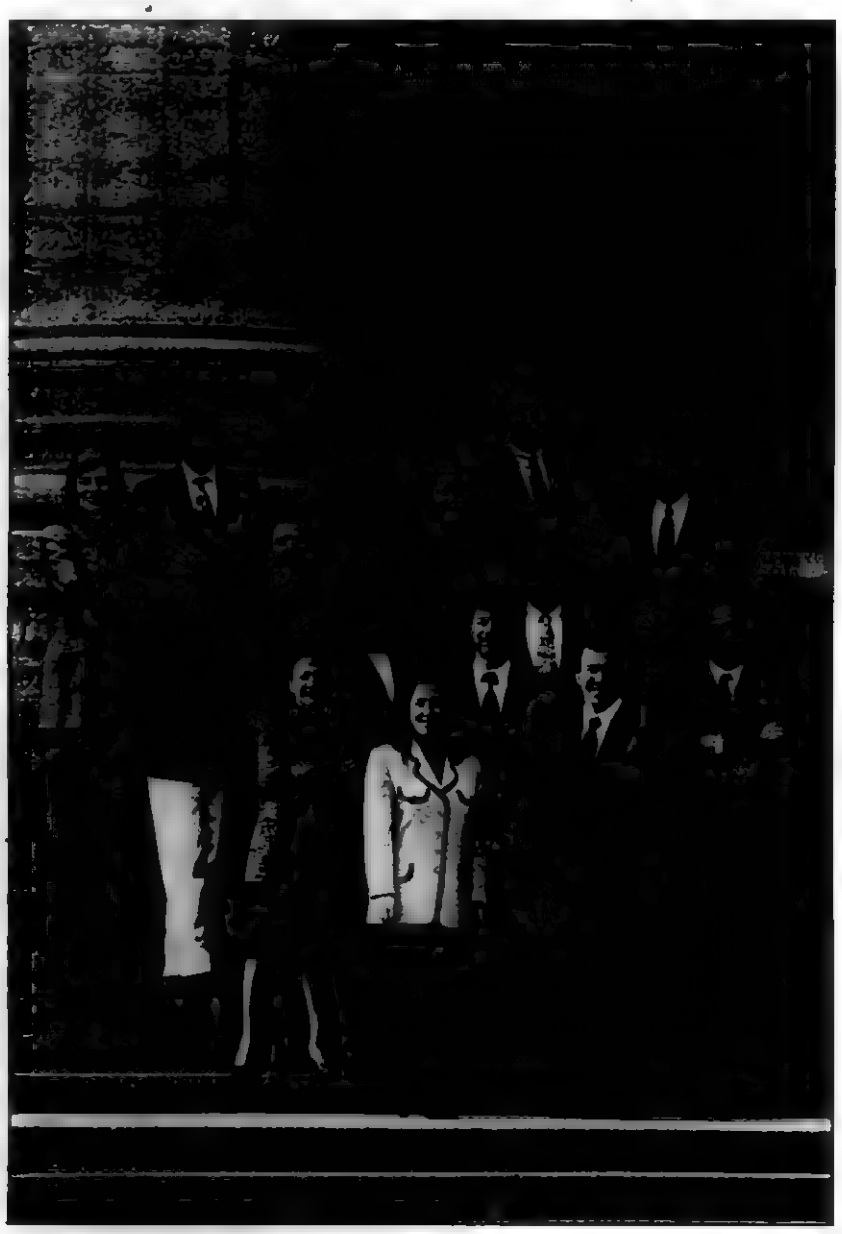

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MANAGER'S JOURNAL

EXECUTIVE TRACK

U.S. Intelco Networks has a new director of information services: **Ken Hughes.** The 20-year information systems veteran arrived at the Olympia, Wash.-based independent telephone company consortium after 10 years as MIS director at Westin Hotels & Resorts. In his new post, he will manage the development, application and maintenance of U.S. Intelco's in-house systems, support of data center operations and maintenance of the consortium's data communications and networks.

Sheldon L. Azine, a 23-year veteran of **The Federal Reserve Bank of Minneapolis**, has been named senior vice president of the bank. Azine, who now assumes senior responsibility for the personnel, automation/communication and administrative services departments, most recently served as vice president and deputy general counsel. Also on his way up at the bank is **Thomas E. Kleinschmit**, who moves from assistant vice president to vice president. Kleinschmit became managing officer of the securities, cash, network services and electronic payments departments of the bank he has served for 21 years.

As of last month, **John J. Lane** is the chief information officer of the **Securities and Exchange Commission** (SEC). The CIO comes to the SEC from Shearson Lehman Brothers, Inc., where he served as executive vice president and director of communications. In prior jobs, Lane — an attorney as well as an IS executive — was vice president of an IS services division of Computer Sciences Corp.

Tandycrafts, Inc. President and Chief Executive Officer **John Sandlin** said he would step down from the spot he held for eight months to return to his former job as Tandycrafts' vice president and IS director.

Electronic meetings: No more zzz's

Software helps managers save time, money while conducting more effective meetings

BY ROSEMARY HAMILTON
CW STAFF

We have all been to meetings from hell, those seemingly endless sessions with questionable cause and less effect. Some of our best doodles and daydreams have resulted from them.

And we could shrug them off as another quirky part of business life if they were not consuming such huge amounts of time. According to the New York-based American Management Association, executives spend at least 50% of their time in meetings.

"Managers need to look at the kind of money they are spending to put people in a room to make some decisions," says Virginia Johnson, manager of the 3M Co. Meeting Management Institute, a meeting information clearinghouse based in Austin, Texas. What's more, many organizations are moving toward more team-oriented management as well as reorganizing the rank and file along team lines. That could mean more meetings than ever before.

"The biggest factor is we are increasingly working in teams that form and do tasks and then disband," says Hudi Cantrel, a program manager in information systems services and technology at Palo Alto, Calif.-based Hewlett-Packard Co. "We feel these teams need all the help they can get."

Trends like these are making managers look at meetings as very serious business these days. For many, meeting management is becoming a core aspect of ongoing total quality initiatives or teamwork research. Managers and consultants contacted recently said two key elements promise a meeting productivity boost.

First is a recent batch of personal computer-based meeting support software tools. Second is a meeting manager or facilitator who can guide the meeting process with the help of these tools (see chart page 113).

The tools are being used in so-called decision rooms, which are actually conventional meeting rooms equipped with personal computers and software that allow people to present ideas, rank action items and document the meeting electronically. Some also provide for a "virtual meeting," enabling people to tap in from various locations and attend electronically. In both cases, the tools allow for anonymous input, which is a critical factor in getting more honesty and more ideas from the meeting, many observers say.

Formal and informal research currently afoot at user companies is showing the potential benefits of this approach. The Boeing Co. based in Seattle, for instance, conducted a nine-month study in which 64 groups used meeting software. In a paper submitted to the Institute of Electrical and Electronics Engineers, Inc. last year, the company reported 1,773 calendar days saved during the period, a figure established based on estimates of what the group time would have been had conventional meetings been conducted.

More recently, a technical support group at Pittsburgh-based Westinghouse Electric Corp. met to establish

Continued on page 113

Bonnie Parrott

Decision rooms *equipped with PCs and software allow managers and staff to present ideas and document meetings electronically*

Feds seek EDI contracting solution

BY MITCH BETTS
CW STAFF

Give them credit. Some federal agencies really are trying to become more efficient and slash paperwork.

But when they try to adopt paperless business practices such as electronic data interchange (EDI), they run up against their own outdated regulations.

The "paper culture" is so embedded in the federal bureaucracy that many of the government's internal regulations require the use of handwritten signatures on paper forms, experts said. The U.S. Food and Drug Administration (FDA), for example, found that its regulations call for signatures in no fewer than 132 different sections.

Consequently, the FDA has launched a proceeding asking for public comment on how to revise its regulations to accommodate electronic records and alternative forms of "human endorsement."

The agency said it will evaluate the legal acceptability, integrity and security features of all sorts of alternative signature schemes, including smart cards, biometric devices, passwords, encrypted digital signatures and pen-based computers.

"Although the FDA recognizes that virtually any system can be corrupted . . . substitutes for handwritten signatures should nonetheless be at least as secure as conventional handwritten signatures," the FDA stressed.

Agencies such as the U.S. Department of Defense could make greater use of EDI for purchasing supplies from the private sector if federal acquisition regulations were updated to permit electronic records, said Daniel J. Drake, a research fellow at the government-funded Logistics Management Institute in Bethesda, Md.

Some government administrators resist electronic contracting out of fear that paperless records will not hold up in court, Drake said in a recent report. However, the U.S. General Accounting Office has ruled that computerized records with electronic signatures are as legally valid as paper forms, as long as there are adequate security controls.

In some cases, high-level government directives supporting electronic commerce have been issued, Drake said. However, they have not proven sufficient to expunge the bureaucracy's pro-paper bias.

Low-level officials are either "overly cautious" about the legality issues or simply have not incorporated EDI into their day-to-day business procedures, he said.

COMMENTARY

Les Gilliam

The check's in the mail

Disaster recovery is a checklist item these days — assuming you've got a mainframe shop. But at the decentralized or downsized IS operations that are increasingly dotting the corporate landscape, it's more like a case of "the check is in the mail."

As they take on more autonomy over their own work, PC and workstation users are also inheriting a bunch of responsibilities they don't necessarily want and often aren't up to. I just completed a consulting project for a huge Fortune 1,000 company division that had moved to client/server. When it came to disaster recovery, they didn't have a clue.

And this firm is far from exceptional. In the downsized, decentralized world, disaster recovery is spending a lot of time on the back burner — a lapse in protection that no information-reliant firm can afford.

Is there anything the IS chief and whatever remains of the centralized IS organization can do to head off the trouble that's brewing? You bet:

- **The economy package:** There are tools available for providing centralized backup and restoration service. Get them and offer this partial disaster recovery to the decentralized, often downsized users on a service bureau basis.
- **The whole hog:** Offer to set up and provide complete disaster recovery for the IS paladins. Sooner or later, somebody is going to — and the internal IS shop can do a quality job more economically than a costly outside systems integrator.
- **Spread the good word:** Central IS is ideally positioned to share its knowledge of what the various departments at its own firm and at others it might be observing are doing to put industrial-strength disaster recovery at the service of user-dominated computer operations.

At worst, any of these alternatives stands to win centralized IS a few new friends and move the firm further into the zone of protection it is now wandering away from. At best, they stave off disaster while showcasing IS as a potential profit center.

Whichever tack you take, however, remember that among the downsized, disaster recovery isn't a burning problem waiting to be solved; it's more likely a nonissue. The place to start is scratch. Users need to define the term "disaster." Are they concerned only about acts of God such as Hurricane Andrew, or does a major server failure qualify? Shouldn't there be a plan for recovering from any type of system failure?

Constructing a list of scenarios can help get users involved in the forging of the definition and disaster recovery blueprint that will serve them best. These scenarios basically cover the territory:

- **Emergency response:** What should employees actually do if disaster strikes? Emergency phone numbers, escape routes, fire extinguishers, utility cutoff valves, switches and handy flashlights are among the items to acquire.
- **Alternate site required:** If so much damage occurs that an alternate site is needed, prior planning will have analyzed alternatives and selected the most feasible plan for moving people and machines. Often, user departments can establish mutual backup arrangements and configure accordingly in advance.
- **Hardware replacement required:** If hardware has been destroyed or damaged beyond immediate repair, the user should be able to turn to prepared documentation for quick replacement action. Letters of commitment from vendors may help get priority response. Up-to-date inventory records will provide configuration details for placing orders. Prearranged purchase order numbers can also help shorten the time frame.
- **Repair required:** Day and night numbers for vendor reps and their alternates — beepers and car phones included — are a must. Fine-line attention to maintenance contract details can help, too.
- **Power loss:** Beyond the acquisition of an uninterruptible power supply facility, your key to rapid recovery lies, once more, in knowing the name and 24-hour access number of your firm's person in charge of electrical power, as well as the appropriate contacts at the power company and their alternates.
- **Loss of telecommunication facilities:** Whether for local-area cabling, building wiring or WANs, analysis and documentation are often slighted. Therefore, backup units for routers, bridges and the like are a smart investment.
- **Outage of unknown origin:** Arm yourself with the names and 24-hour phone numbers of various experts both inside and outside the company.
- **Above all, publicize:** From little tips to 12-step plans, make sure that every bit of information that can help users recover quickly after any computer setback is widely known, easily accessed and clearly communicated.

And one more suggestion: Don't keep the only copy of the recovery plan on-line.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

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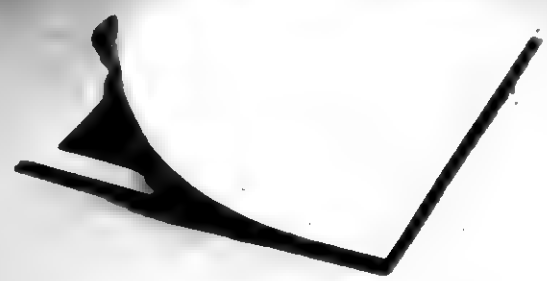

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CALENDAR

SEPT. 27-OCT. 3

Downsizing and Rightsizing Conference and Exposition. New York, Sept. 28-Oct.2 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731, Ext. 294.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

CASE World: The National Application Developers Exposition. Boston, Sept 30-Oct. 1 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

IONET Power Breakfast. San Diego, Oct. 1 — Contact: S.S. Smith Associates, Waynesville, Ohio. (513) 897-0655.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository AD/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Multivendor and Third Party Computer Maintenance Conference. San Francisco, Oct. 5-6 — Contact: Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Semi-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

REXSYS Users Conference. Boston, Oct. 6-9 — Contact: Recovery Management, Inc., Littleton, Mass. (508) 486-8866.

OCT. 11-17

The Third Annual East/West High-tech Forum. Prague, Oct. 11-14 —Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

USE, Inc.'s Fall Conference. Atlanta, Oct. 12-16 — Contact: USE, Inc., Lanham, Md. (301) 577-1881.

Europa Telecom '92. Budapest, Oct. 12-17 — Contact: International Telecommunication Union, Switzerland (011-41) 22-730-5926.

Enterprise Network Management Seminar. Elmsford, N.Y., Oct. 13-15 — Contact: Hart Rasmussen, Polytechnic University's Center for Advanced Technology in Telecommunications, Westchester, N.Y. (914) 347-6940.

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

Multimedia World, Inc. Conference. Chicago, Oct. 13-16 — Contact: Jim Prude, Multimedia World, Alexandria, Va. (703) 684-5401.

OCT. 18-24

Info/Tech Management '92. Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Elecon '92 Conference and Exhibition. New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

Society of Information Management (SIM) 1992 Annual Conference. Universal City, Calif., Oct. 18-21 — Contact: SIM, Chicago, Ill. (800) 477-4561.

APICS Conference and Exhibition. Montreal, Oct. 18-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Directions '92. Dallas, Oct. 19-22 — Contact: Cognos, Burlington, Mass. (617) 229-6600.

International Society for Hybrid Microelectronics '92. San Francisco, Oct. 19-22 — Contact: Terry Ritter, San Jose, Calif. (408) 945-9992.

OCT. 25-31

The 13th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

ASIS Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

Total Quality Management '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Expo Comm China. Beijing, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause Associates, Hong Kong. (011) 5-773-343.

NOV. 8-14

U.S. Society of Wang Users (USOWU). Boston, Nov. 9-13 — Contact: USOWU, Chicago, Ill. (708) 832-3660.

12th Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whelan, Taken Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

Synergy '92. Anaheim, Calif. Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

NOV. 15-21

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.

NOV. 29-DEC. 5

CAUSE '92. Dallas, Dec. 1-4 — Contact: CAUSE, Boulder, Colo. (303) 449-4430.

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Electronic meetings save time and money

CONTINUED FROM PAGE 109

key issues it would need to address in the upcoming year. This annual process typically takes about two months as the team holds meetings large and small, summarizes the data and then reconvenes for a round of follow-up meetings, says Jeff Jury, a senior consultant at the Westinghouse Productivity and Quality Center.

This time, however, the team armed itself with meeting support software from Collaborative Technologies, Inc. in Austin, Texas, and got to work in a former PC training center that is now converted into a decision room. "We were able to cut about three weeks off what was their normal cycle time on actually deciding what the issues would be that they would address," Jury says.

Jury stresses there's no magic here. Visionquest, the Collaborative Technologies software, along with competing products such as TeamFocus from IBM and GroupSystemsV from Ventana Corp. in Tucson, Ariz., are pretty straightforward, he says.

Specifically, the software allows teams to construct meeting agendas, brainstorm, submit ideas for discussions, build a decision list and then vote on prioritizing the items on that list. Each meeting member sits at a PC and enters ideas — and can do so anonymously. The collective ideas are displayed in real time on the PC monitors — or in a decision room setting, shown on an overhead screen.

"It helps to lessen the influence of power," says Brad Jackson, assistant to the general manager of information technology at Houston-based Texaco, Inc., which has used a decision room for nearly two years. "You want to hear from everyone in a team meeting . . . and people tend to agree with the manager or not speak up. With these kinds of tools, everyone contributes. Ideas become the focus, not the people who [raised] them."

Jackson and other users say at least three key benefits result from the software: shorter meetings, better meetings and documented meetings.

First, meetings tend to run much more quickly. With established agendas and a meeting facilitator guiding the process, people are less likely to stray from the appointed issues. During a nine-month period last year, Marriott Corp. ran 300 meetings in a decision room. The average meeting was completed in one-tenth the time it would normally take, says Carl DiPietro, a former vice president of human resources at Marriott who started his own consulting firm in June.

In addition, because ideas are submitted simultaneously, brainstorming sessions move more rapidly than the conventional one-speaker-at-a-time format.

At Metropolitan Life Insurance Co. in New York, a recent brainstorming session ran for 14 minutes "before we cut it off, and we got 287 ideas," says Barbara Myers, director of strategic technology resources in IS. "You would never get that [from a conventional meeting] in 14 minutes."

The third benefit comes from documentation, which can be distributed upon adjournment. This in turn becomes a resource for the staff and cuts back on the need to review the previous meeting's activities at the next gathering.

However, managers and consultants note that the tools have downside potential as well. The key is to avoid overusing the technology and letting it become the primary form of communication among meeting members. For instance, the group should use the software to input ideas and vote; then, once the priority list is established, it should have traditional discussions.

"When the technology becomes more important than the content of the meeting, then you've got a problem," 3M's Johnson says.

Source: Executive Strategies, National Institute of Business Management, Inc.

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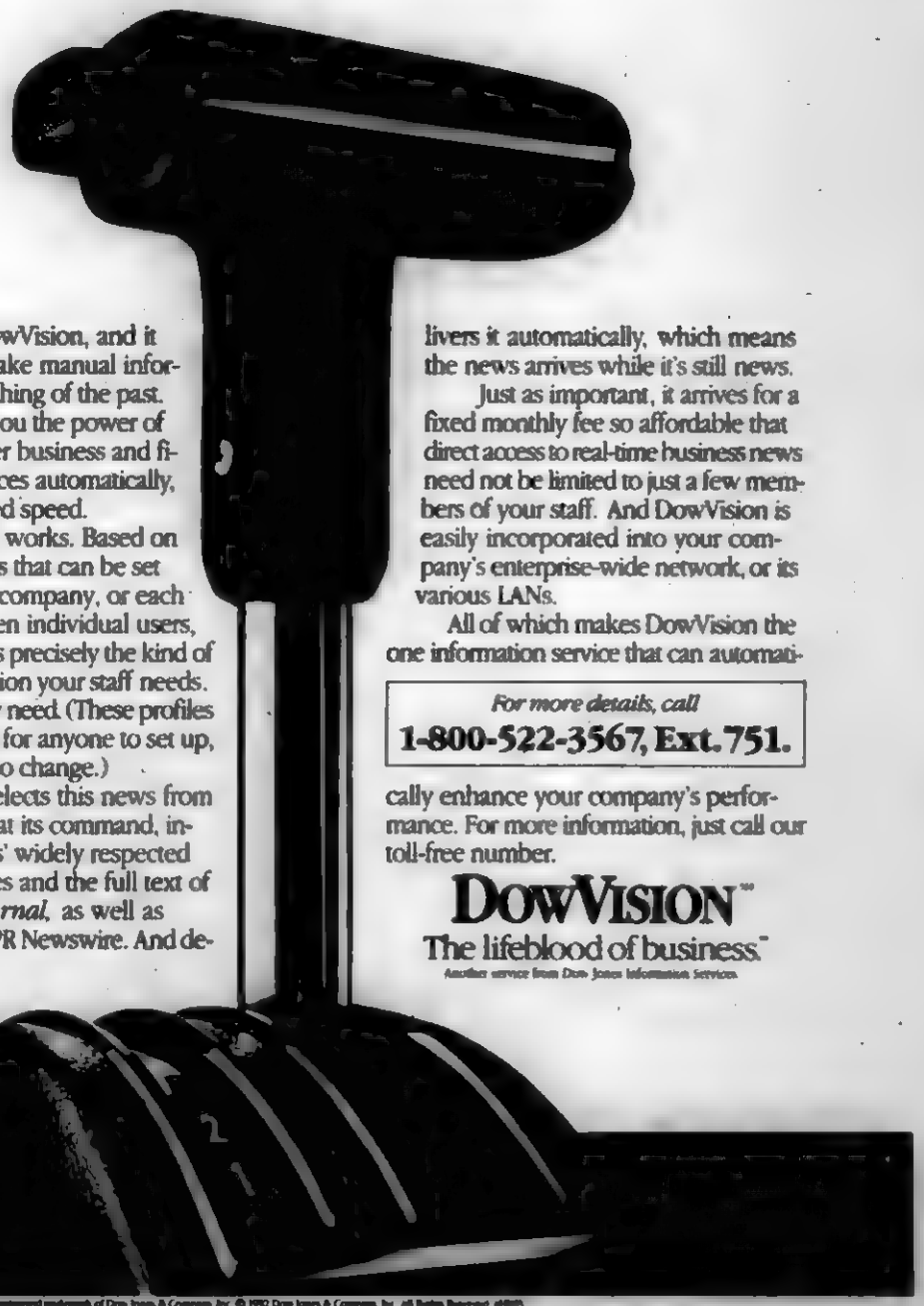

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What does it take to get a job these days?

BY LESLIE GOFF
SPECIAL TO CW

You're ready for a career change, but the classifieds seem thinner every Sunday, competition is getting stiffer, and the couple of interviews you managed to snag have made you start biting your nails again.

Job hunting can be frustrating, but securing a new position is not impossible. In fact, *Computerworld* tracked down three of this quarter's new hires to find out how they landed jobs in such tough economic times. The keys to their success were diligence, patience, sharp interviewing skills and knowing what they wanted.

Kevin Coleman, a senior Oracle Corp. programmer/analyst at Bolt, Beranek and Newman (BBN), a diversified high-technology firm in Cambridge, Mass., found his current job after an eight-month search he began when layoff rumors started flying around at his former company.

Coleman launched a selective, deliberate strategy of scanning the Sunday classifieds. "If I didn't think I hit all the ingredients in an ad, I didn't respond," he says. "I didn't want to waste my time going to interviews just to be told I wasn't qualified for the job."

This strategy highlights a common complaint among information systems managers: "Don't send in a resume when you don't have those skills listed in the ad," says Coleman's new boss, Stuart Markowitz, MIS applications manager at BBN.

Although Coleman's strategy landed him several interviews, he still didn't receive any offers. He finally contacted an IS recruiter, through which he snared the BBN position. Markowitz says Coleman's skills and job experience gave him a foot in the door, but it was his attitude of confidence and honesty during the interviews that set him apart.

"Very few people come into an interview with all the skills we need, and we know that," Markowitz says. But he says he likes applicants who demonstrate the ability to "absorb new information quickly and jump on."

Coleman says he feels he clinched the interview because he followed the advice of an article he read. The article told interviewees to stay focused, to be energetic but not overbearing, to be upbeat and not to rake their employer over the coals.

Fran Moss had better luck in the classifieds. In May, she began scanning the Sunday newspaper and sent out five resumes a week. By the end of July, she had interviewed with three companies and landed her present position as a systems analyst working with end users on financial applications at the Memorial Medical Center in Jacksonville, Fla.

Perseverance *key to Coleman's search*

"I was very limited on the amount of time I could spend because I didn't want my employer to know I was looking," she says. She looked for ads only from large companies and never responded to ads that listed only post office boxes. Moss says she did not limit herself to particular industries. "With the economy the way it is, you can't be choosy."

On her first two interviews, she found herself either over- or underqualified. But her financial skills were just what Memorial Medical was looking for.

"After my third interview with them, they brought me back to the area where I would be working, and I got to talk to other systems analysts," Moss says. "I got to ask about the longevity of the staff, technical questions — I got a much better feel for the position that way."

Bob Rittler didn't take the classified route but landed a job anyway — and he wasn't even looking for one.

Although he had been unhappy in his job as a software engineering supervisor, he didn't try to make a move until his wife launched a job search through a local IS recruiter.

"She came home with a bunch of different job descriptions, and I glanced through them because there were some positions dealing with geographic information systems (GIS)," a technology he was interested in, Rittler says.

He called the recruiter and was sent to interview for a GIS-related position at TV Answer, Inc., a company involved in the interactive television industry.

Although TV Answer interviewed Rittler for a GIS project, the company decided to reorganize the IS department to leverage Rittler's management and technical experience. He was named manager of business applications, and another interviewee landed the GIS position.

"It's a start-up, and a year from now who knows what will happen," he says, "but I knew I would learn a lot, and the job has incredible upside potential."

Goff is a New York-based free-lance writer.

Grass may be greener

If you're sick of your job and haven't had any luck finding a new one, your background and skills may be of more value in another area of the country. Joan Savaree, director of recruiting and staffing at Computerpeople in St. Petersburg, Fla., warns that IS professionals considering relocation should research the area they've chosen before making a move. She suggests turning to the following sources for information:

- The American Chamber of Commerce in Washington, D.C., or the local chamber of commerce in the city you are considering for information on an area's largest employers.
- The local board of realtors for rental rates, average housing costs and the average square footage of apartments and houses. This will help you compare what you have with what you get.
- Local newspapers to get a flavor of the city. Newspapers also can help you determine average salaries and job availability.
- Local chapters of national industry associations for information on potential employers.
- User groups for the software or hardware platforms that you use for an opportunity to work with that technology.

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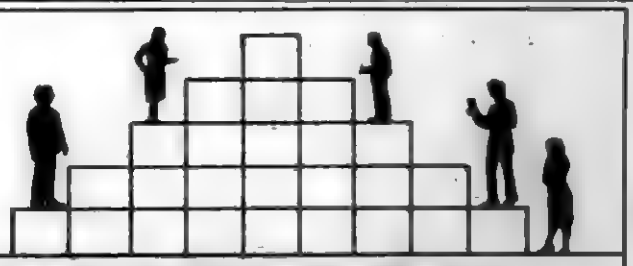

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Heavy travel has future payoff

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Steven B. Fogle, a managing director at The Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q I have just taken a job as an electronic data processing (EDP) auditor at a major worldwide consumer products company. I was told before taking the job that there would be travel, but I've been on the road at least 80% to 90% of the time. Is this common?

A Yes. If you can endure at least two years of this pace, it will pay off. You will gain much more exposure to line management, which helps for future career growth. Additionally, I know numerous EDP auditors who have been able to achieve international positions.

Q I am a programmer/analyst. I've always wanted to get into networking, so I got certified as a Novell Enterprise Certified NetWare Engineer (ECNE). I haven't had any luck finding a job as an ECNE, and I can't find a transitional post where I can use my programming or Novell skills. What do I have to do to get into networking?

A Several companies are currently recruiting Novell-certified individuals. There are regional Novell networking groups that should be very helpful to you.

Usually, the most successful way to move into a networking role is to join a company that is active in cross-training and supports employees who would like to develop additional skills.

I recommend that you contact every Novell user in your area to gain a better understanding of the job market and increase your visibility.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q A colleague told me it was a good idea to find an area that complements my regular programmer/analyst-type skills.

What could I tie from my information systems background — that is, the programmer/analyst-type things that I've been doing over the years — with telecommunications?

A Clearly, in large IS organizations, there are programmer/analysts who are part of the telecom departments. Additionally, there are numerous prosperous telecom manufacturers and services companies that are recruiting at all levels in their IS groups.

Recently, I have been aware of an increase in the need for analysts in long-distance aggregation companies (long-distance brokers).

Q I am currently a financial analyst/systems analyst at a large medical center. I am a certified public accountant, but I have recently been involved in major software development and systems projects.

Should I try to move over to the IS department or stay in finance?

A Depending on the organization, your skills would be valuable in either department. I would think that you would have the most opportunity by demonstrating a strong background in both finance and IS. Stay close to the department that is the greater decision maker for the organization.

We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

How to handle a co-worker who isn't pulling his weight

Find out if the problem is because the person won't or can't do the work. If he won't do it, find out why, and if you think he's being inconsiderate and irresponsible, speak to someone higher up. If he can't do it, teach the person what he doesn't know so he can do it. If that doesn't work, call a meeting with the manager and the individual and explore solutions.

Jerry Weinberger, systems analyst
New York Department of Transportation, New York

Everyone is overworked as it is, and everyone is expected to pull their weight. If someone isn't, tell the manager that it isn't fair to the others and that the employee should be talked to.

Dawn Quitschau, systems analyst
Grand Valley State University, Allendale, Mich.

If a person had pulled his weight in the past, I would see if something was wrong. If he was new, I would show him by example what was expected of him. If there was no improvement, then I would go to the manager.

Joseph Flint, programmer/analyst II
Safeco Insurance, Seattle

I had a case like that and I went to the fellow, offered my help, and advised him to get training. When he wasn't responsive, I went to the supervisor and said I thought the employee could do the work with more training and support. He agreed and asked me to tell the employee. I said, 'I recognized you could use more training, and I mentioned it to the supervisor, who said he would support you.'

Nancy Walpole, analyst III
Portland General Electric, Portland, Ore.

How you handle it really depends on your relationship with the person. Ultimately, if there's no improvement, I would have to write it up and send it to the next level of management.

Mark Albin, project manager
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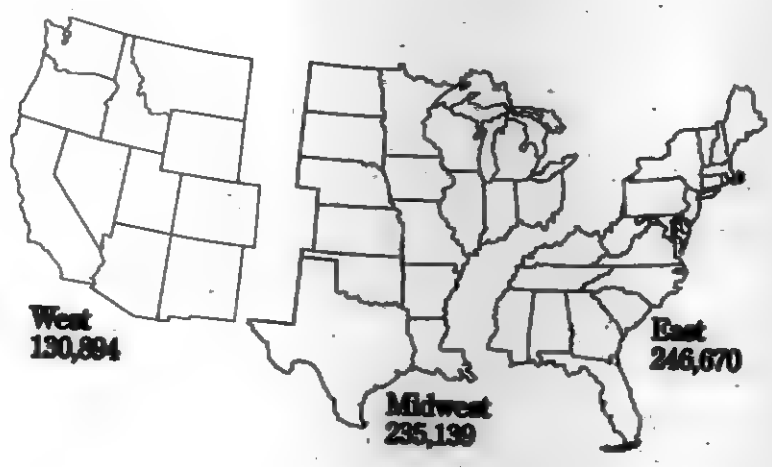

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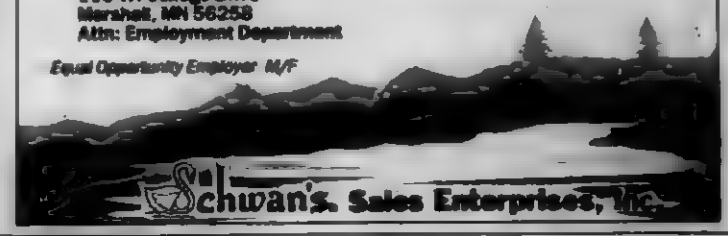

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Computerworld/Corptech Career Index

THE BIG PICTURE — Employment changes have been increasing but not at the same rate as last year

Employment change in technology companies by type of ownership

- Change from January 1991 through December 1991
- Change from April 1991 through March 1992
- Change from July 1991 through June 1992

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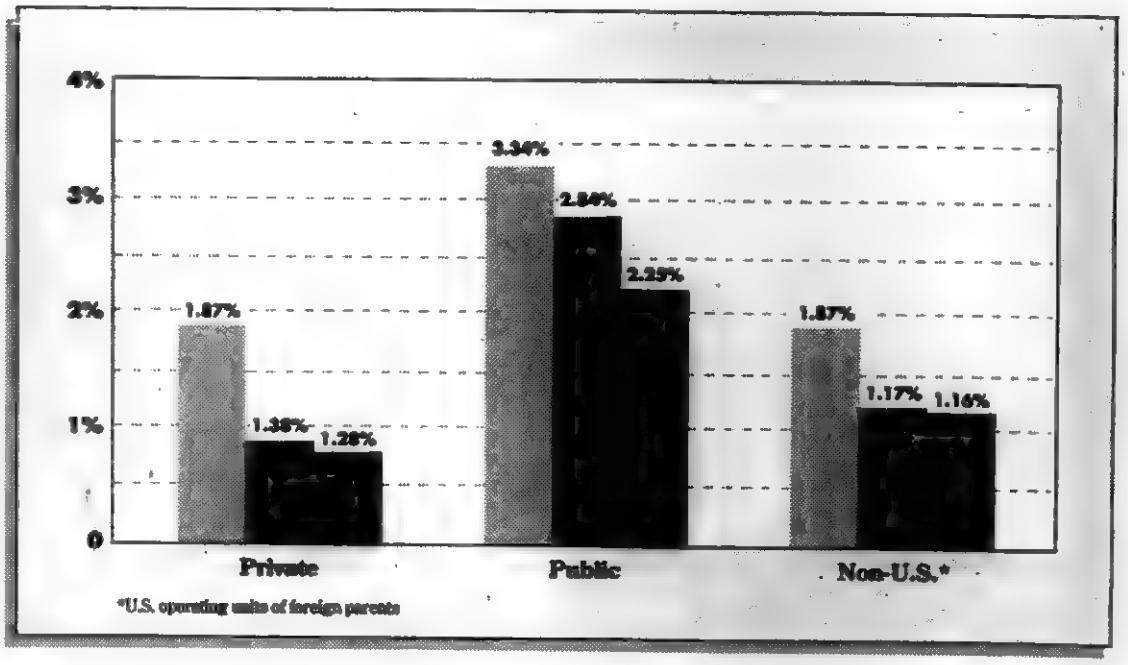

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COMPUTERPEOPLE

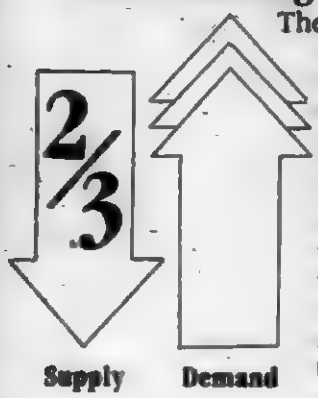
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

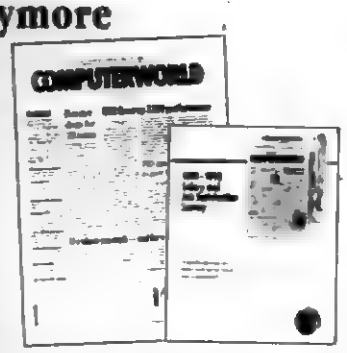
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

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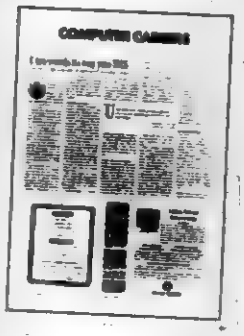

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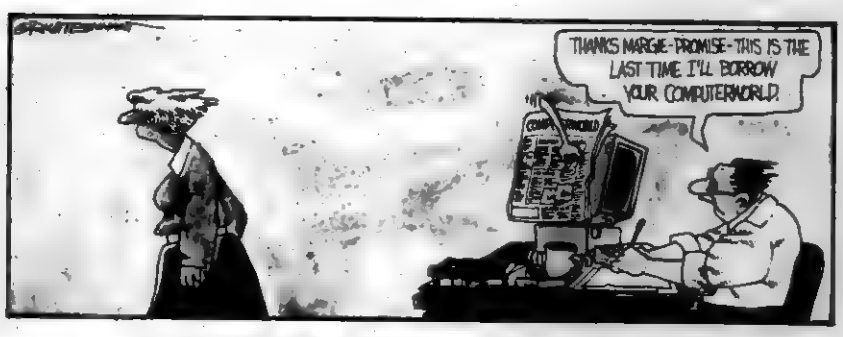

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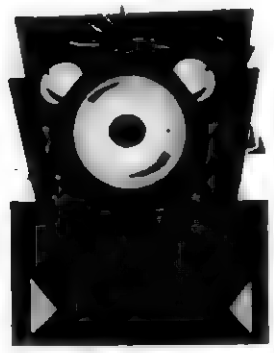
MARKETPLACE

The economics of leasing



BY ALICE BREDIN
SPECIAL TO CW

If you're like many people, money is tight for you, and you're reluctant to commit to a technology platform that may prove outdated in the long term. The conditions seem ripe for leasing rather than buying. Especially with lower-than-ever percentages, you may be tempted to take this route. But before you do, be sure you understand the factors that can influence your decision.

Will you keep the equipment for less than five years?

The economic viability of leasing is tied into how quickly technology will be turned over within a company. If it is critical to keep moving with an architectural change, it makes sense to lease. "It also makes sense for people who are in a large rollout phase like point-of-sale," explains Scott Stein, director of desktop computers at Technology Investment Strategies Corp. (TISC) in Framingham, Mass. "Many of our clients will lease for a two- or three-year project that has an end in sight for which they need specific technology for a short term."

If you plan on keeping the equipment for five years or less, it makes economic sense to lease, says Greg Carroll, president of Washington, D.C.-based Computer Leasing and Remarketing Association.

"Making payments for five years or less will save you money. After five years you might pay the same or more as you would to purchase," Carroll says.

Will you need to upgrade?

It is important to negotiate for upgrades when drawing up a lease. Although the cost of upgrading is roughly the same whether you're leasing or buying, terms are negotiated between lessors and users.

The first tip is to know the meaning of the term "upgrade" in your lease. Some lessors will try to substitute enhancements for true upgrades. Some will upgrade by swapping out a group of processors, which is very time-consuming for the user. Still others will consider a new frame on a system an upgrade, says Susan Gannon, a senior analyst at TISC.

If your company is committing to a specific product upgrade, negotiate it into the price up front. "Some vendors will offer a low leasing price, hoping to make it up on the upgrade later on," explains Tom Martin, owner of Computer Financial, Inc., a Hackensack, N.J.-based computer lessor.

You will get a better deal if you negotiate a price in the beginning. "It may be more expensive once upgrading is included, but you will be getting a good deal overall," Martin says.

There are several choices for upgrade fees: a cap arrangement in which a lessee pays only a certain percent of the upgrade or a right to go out for bids at upgrade time, with the lessor given a chance to bid.

"We recommend that customers look at all the competition. If you bring in alternatives, you will keep every vendor honest," Gannon says.

How will you negotiate maintenance?

As a user, you are responsible for maintenance fees. One way to get around paying a big lump-sum maintenance fee is to roll it into the lease so you're making payments on it.

Maintenance runs about 1% to 3% of the purchase price each year. For example, a water-cooled 9021 Model 340, which costs $2.5 million, would cost $4,000 per month to maintain..

Personal computer lessees may skip the maintenance agreement altogether if the machine is under 5 years old. "In the PC area, it is safe not to have [a maintenance agreement] if the machine is new," said Bob Tate, a product manager at ATT Capital, a Dallas-based rental and leasing firm.

From whom will you lease?

Third parties always offer a good price because they have to compete with vendors. "Good price" means beating the manufacturer's rate. "Third parties have to slice a percentage off the vendor's price," Gannon explains.

Third parties may appear to have better prices at first, but that doesn't mean they offer the better deal. Vendors tend to offer more market-basket items that add to the value of a deal in soft-dollar items. These can cut 10% to 15% off the lease price in the form of software, warranties, education allowances and deferred payments.

In addition, they offer financing for weak credit because in general, they have more financial strength than third parties.

Bredin is a free-lance writer based in New York.

Lease or buy?

PC

Product: A new Apple Macintosh II CI

Cost of 12-month lease (at $168 per month): $2,016

Purchase cost: $2,800 - $2,900

You would have to lease the machine about 1½ years before hitting the purchase cost.

Mainframe

Product: A used IBM 3090 600J

Cost of 24-month lease (at $95,000-$100,000 per month): $2.28 million - $2.4 million

Purchase cost: $2.7 million - $2.8 million

You would have to lease the machine for just over two years before hitting the purchase cost.

*Numbers are averages

Source: ATT Capital, Technology Investment Strategies Corp. CW Chart: Janell Genovese

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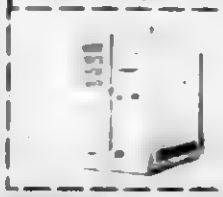

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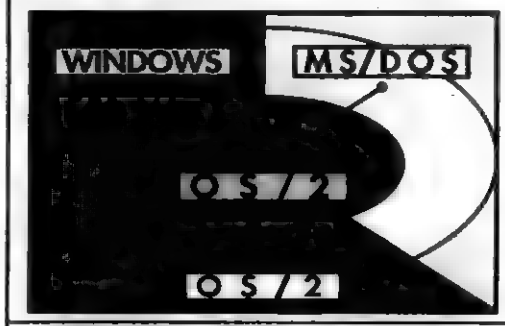

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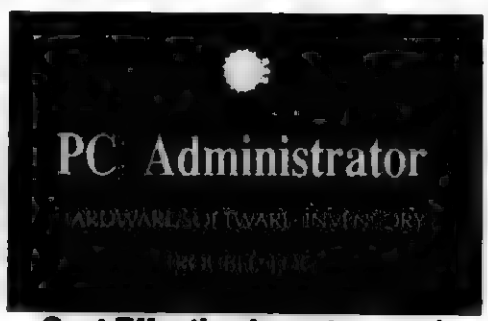

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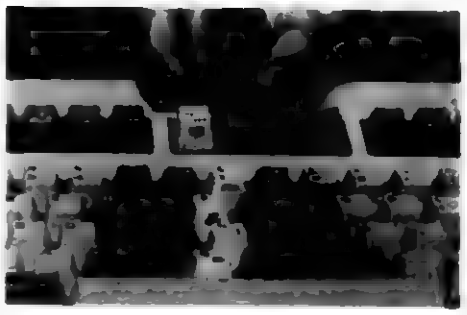

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ADVERTISERS INDEX

Anderson Consulting	84-85
Applied Business Technology	90-91
AT&T	61
AT&T Business Communications Services	22-23, 80-81
Bachman	108
Borland International	32/33
British Telecom North America	95
Cabletron Systems	39
CANAC Telecom	42
Candle Corp	21
Chipcom	38
Cincom Systems	40
Cisco Systems	C3
Cognos	58
Compaq Computer Corp	74-75, 100/101
Compusery	53
Computer Associates	6, 83
CW Circulation	89
CW Marketing	89
CW Recruitment	36, 60, 66, 73, 77, 91, 113
Data General	84
DCA	112
Dataq	110
Dow Jones Services	113
EDA	96
EDS	62-63
Emerging Technology Applications	57
Genicom	77
Hewlett-Packard	18-19, 38
Information Builders	86
Informix	C4
Integris	80
Interface Group	114
Intersolv	82
Landmark Systems	64
Laser Data	37
Legent Corp	102-103
Lexmark	65
Lotus Development Corp	34, 70-71
Micro Focus	11
Microsoft	28
Multi-Tech Systems	15
Napersoft	79
NCR	30-31,104
Oracle Corp	7, 9
Platinum Technology	78
Q-Star Technologies	76
SAP America	108
SAS Institute	17, 35
Soft-Switch	96
Software 2000	10
Software AG	25
Sterling Software	96, 98
Sybase, Inc.	13
Symplex	34
Syncsort	9
3M	72-73
Tandem	47
Texas Instruments	88-89
Toshiba America	26-27
TSI International	82/83
Unisys	61
Universal Data Systems	111
VMark Software	82
WHITE PAPER	41-66
Workstation Group	107
XDB Systems	35
Xircom	80

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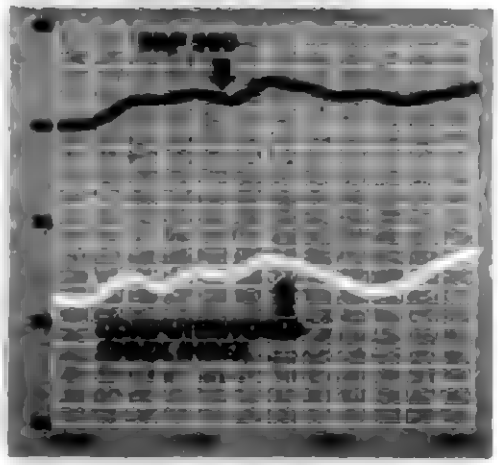

Industry Almanac

NEW COVERAGE

INITIAL RATING OF BUY: **Autodesk, Inc.** (Salomon Brothers, Inc.). Autodesk (ACAD) roars in with the lion's share — nearly 70% — of the personal computer-based, computer-aided design software market, led by AutoCAD, its flagship offering. Earlier this year, the company rejuvenated its management team with three new top-level officers. Autodesk said it will concentrate on research and development across a breadth of products.

INITIAL RATING OF BUY: **Banyan Systems, Inc.** (Alex. Brown & Sons, Inc.). Banyan (BNYN) completed an initial public offering last month of 2.67 million shares at $10.50 per share. Since then, Banyan has kicked off an "open" Unix version of Vines, the company's network operating system, with a version for **The Santa Cruz Operation**'s SCO Unix. Previously, Vines operated solely with a proprietary version of Unix created by Banyan. The company plans to announce a new product tomorrow that is expected to enable other vendors network operating systems to work with Banyan's Enterprise Network Services.

INITIAL RATING OF BUY: **ChipSoft, Inc.** (The Chicago Corp.). ChipSoft (CSFT) is a major player in the professional tax preparation software market. Strong annual growth is expected in the long term because. ChipSoft sells both Microsoft Corp. (MSFT) Windows and Apple Computer, Inc. (AAPL) Macintosh versions of its software.

RECOMMENDATION CHANGES

UPGRADED FROM SELL TO HOLD: **Compaq Computer Corp.** (Mabon Securities Corp.). Compaq's (CPQ) supply problems appear to be subsiding. Specifically, the company miscalculated demand for its ProLinea line and was forced to add more manufacturing sites to accelerate delivery of disk drives, power supplies and flat-panel displays. Also, a PC industry shakeout that could erupt during the next six months should benefit Compaq. Companies such as **Advanced Logic Research, Inc.** (AALR), **Everex Systems, Inc.** (EVRX), **Zeos International Ltd.** (ZEOS) and other clone vendors may be completely pushed out of the business. If Compaq can attractively position its brand-name image for price-sensitive segments of the market, it should be able to pick up some of the residual business left by the clone makers.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 11, 1992

TOP PERCENT GAINERS

Meca Software	22.73
IPL Systems Inc.	20.93
Network General	20.00
Picturetel Corp.	19.19
Convex Computer (L)	18.60
Information Resources	17.44
AST Research Inc.*	17.31
Xilinx	16.31

TOP PERCENT LOSERS

Radius Inc.	-34.48
Struct. Dynamics Research (L)	-30.00
Cray Computer	-17.24
Go Video	-13.04
Pyramid Technology	-12.31
Ross Systems	-11.86
Wang Labs Inc. (b)*	-11.19
Computer Task Group	-9.09

TOP DOLLAR GAINERS

Progress Software Corp.	4.38
Borland Int'l Inc.*	3.88
Information Resources	3.75
Sybase Inc.	3.75
Cabletron Systems	3.75
Parametric Technology (H)	3.38
CompUSA Inc.	3.38
Sun Microsystems Inc.*	3.25

TOP DOLLAR LOSERS

Matsushita Electronics	-5.50
Struct. Dynamics Research (L)	-4.50
Radius Inc.	-2.50
Adobe Systems Inc. (L)	-2.38
Southwestern Bell Corp.	-1.63
Nynex Corp.*	-1.63
US West Inc.	-1.38
Bellsouth Corp.	-1.25

Exch	52-Week High	52-Week Low		Sept.11 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 3.50%**			
OTC	15.00	8.00	3 COM Corp.*	13.63	1.63	13.54
NYS	70.63	56.25	American Info Techs Corp.*	67.63	-1.13	-1.64
NYS	44.88	32.88	AT&T*	43.75	1.38	3.24
OTC	4.25	0.88	Antel Communication Corp.	0.88	-0.08	-8.72
NYS	48.75	40.25	Bell Atlantic Corp	48.63	-0.50	-1.02
NYS	55.50	43.38	Bellsouth Corp.	52.25	-1.25	-2.34
NYS	8.75	3.75	Bolt, Beranek & Newman	4.50	0.13	2.86
NYS	65.38	38.63	Cabletron Systems	63.00	3.75	6.33
OTC	31.00	17.50	Chipcom Corp	25.50	0.50	2.00
OTC	53.75	18.63	Cisco Systems Inc.	53.38	3.13	6.22
OTC	35.25	5.75	Compression Labs Inc.	7.50	0.25	3.45
OTC	3.38	0.88	Data Switch Corp	1.63	0.00	0.00
NYS	23.63	13.38	Digital Comm. Assoc.*	14.88	-0.88	-5.56
OTC	15.25	8.00	Digital Systems Int'l Inc.	9.63	0.38	4.05
OTC	9.25	3.63	DSC Communications (H)	8.75	0.00	0.00
OTC	10.88	4.75	Fibronics Int'l Inc.	5.63	0.00	0.00
OTC	37.50	10.50	Fibronics Int'l Inc.	13.50	-0.25	-1.82
OTC	3.38	1.13	Gandalf Technologies Inc.	2.13	0.13	6.25
OTC	2.25	0.88	Gateway Communications	1.88	0.13	8.00
NYS	5.50	2.25	General Datacomm Inds.	3.63	0.50	16.00
ASE	5.88	0.50	Go Video	2.50	-0.38	-13.04
NYS	35.75	28.75	GTE Corp.*	33.13	-0.38	-1.12
NYS	70.63	50.00	ITT Corp.	64.63	-1.25	-1.90
OTC	36.13	25.25	MCI Communications Corp.	35.25	1.25	3.68
OTC	14.50	2.25	Microcom Inc.	3.63	0.00	0.00
NYS	18.25	9.50	Network Equipment Tech.*	11.88	0.88	7.95
OTC	25.50	6.00	Network General	12.00	2.00	20.00
OTC	20.00	8.50	Network Systems Corp.	12.38	1.13	10.00
OTC	17.88	5.63	Newbridge Networks Corp.	16.38	-0.25	-1.50
NYS	49.25	33.75	Northern Telecom Ltd.*	35.00	0.00	0.00
OTC	65.00	32.50	Novell Inc.*	54.13	2.88	5.61
NYS	88.38	69.13	Nynex Corp.*	82.75	-1.63	-1.93
OTC	37.50	16.50	Octel Communications Corp.	22.75	1.00	4.60
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.50	0.63	12.82
OTC	53.00	10.25	Picturetel Corp.	14.75	2.38	19.19
OTC	18.75	9.75	Proteon Inc.	15.00	1.00	7.14
NYS	29.13	11.63	Scientific Atlanta Inc. (H)	29.13	1.88	6.90
NYS	69.50	53.75	Southwestern Bell Corp.	65.75	-1.63	-2.41
NYS	26.38	20.75	Sprint Corp.	23.00	0.13	0.55
OTC	15.13	4.00	Standard Microsystems Corp.(H)	15.13	1.63	12.04
OTC	40.63	14.25	Synoptics Communications (H)	40.63	2.25	5.86
NYS	40.00	32.88	U S West Inc.	38.13	-1.38	-3.49
OTC	41.88	24.00	Wellfleet Communications	41.88	2.63	6.69
PC and Workstations			**Up 3.13%**			
OTC	14.50	4.50	Advanced Logic Research	4.50	-0.25	-5.26
OTC	70.00	42.75	Apple Computer Inc.*	47.63	0.38	0.79
OTC	32.25	11.25	AST Research Inc.*	15.25	2.25	17.31
NYS	19.25	6.75	Commodore Int'l	8.00	-0.50	-5.88
NYS	35.75	22.13	Compaq Computer Corp.*	32.88	0.38	1.15
OTC	29.00	13.91	Dell Computer Corp.	26.50	1.50	6.00
OTC	7.75	2.00	Everex Systems Inc.	2.00	-0.13	-5.88
NYS	34.00	21.25	Harris Corp.	31.38	1.63	5.48
NYS	65.00	44.63	Hewlett-Packard Co.*	57.38	1.50	2.68
NYS	29.75	14.13	Silicon Graphics	22.88	0.25	1.10
OTC	35.88	20.75	Sun Microsystems Inc.*	31.13	3.25	11.66
NYS	31.25	22.25	Tandy Corp.*	24.00	0.38	1.59
NYS	11.13	5.13	Zenith Electronics	6.75	0.00	0.00
OTC	25.50	3.25	Zeos International Ltd.	3.25	0.38	13.04
Large Systems			**Up 1.68%**			
ASE	20.63	11.63	Amdahl Corp.*	14.50	0.75	5.45
NYS	15.50	8.41	Cerdian Corp.	14.13	0.13	0.89
NYS	16.38	5.25	Convex Computer (L)	6.38	1.00	18.60
OTC	19.63	1.88	Cray Computer	3.00	-0.63	-17.24
NYS	52.25	22.75	Cray Research Inc.*	25.88	0.88	3.50
NYS	22.50	7.13	Data General Corp.	9.63	1.25	14.83
NYS	65.50	33.25	Digital Equipment Corp.*	36.00	2.13	5.92
NYS	106.38	81.63	IBM*	88.00	2.00	2.33
OTC	13.25	7.50	Kendall Square Research	9.00	0.25	2.86
NYS	121.25	88.25	Matsushita Electronics	98.00	-5.50	-5.42
OTC	19.75	7.13	Pyramid Technology	7.13	-1.00	-12.31
OTC	17.88	8.13	Sequent Computer Sys.	16.63	2.00	13.88
OTC	16.38	5.00	Sequoia Systems Inc.	8.00	-0.13	-1.54
NYS	54.25	36.75	Stratus Computer Inc.*	48.00	2.00	4.55
NYS	15.13	9.50	Tandem Computers Inc.*	11.13	0.38	3.49
NYS	11.75	3.63	Unisys Corp.*	8.88	0.00	0.00
ASE	7.50	0.25	Wang Labs Inc. (b)*	0.50	-0.06	-11.19
Software			**Up 1.03%**			
OTC	68.50	31.75	Adobe Systems Inc. (L)	32.38	-2.38	-6.83
OTC	13.25	2.50	Ai Corp.	3.38	-0.25	-6.90
OTC	45.00	11.50	Altus Corp.	12.75	0.50	4.08
OTC	19.75	8.50	American Software Inc.	10.13	0.50	5.19
OTC	20.00	9.75	Ask Computer Systems	16.25	0.38	2.36
OTC	52.00	23.25	Autodesk Inc.	49.50	0.75	1.54
OTC	37.75	7.50	Bachman Info. Systems	8.00	-0.75	-8.57
OTC	42.50	30.50	BGS Systems Inc.	36.50	-1.00	-2.67
OTC	79.00	37.25	BMC Software Inc.	57.00	2.63	4.83
OTC	20.50	9.00	Boole & Babbage	18.50	-0.25	-1.33
OTC	66.75	35.00	Borland Int'l Inc.*	46.38	3.88	9.12
OTC	11.25	3.63	CE Software	4.13	0.13	3.13
ASE	16.88	6.88	Cheyenne Software Inc. (H)	16.88	0.75	4.65
OTC	20.38	6.88	Cognos Inc. (L)	6.88	-0.38	-5.17
NYS	17.00	7.50	Computer Associates*	16.00	1.50	10.34
NYS	12.38	9.75	Computervision Corp.	10.75	0.38	3.61
OTC	20.50	8.00	Cornerstone Inc.	8.00	-0.38	-4.48
OTC	47.88	6.50	Easel Corp.	8.00	-0.25	-3.03
OTC	25.50	11.50	Group I Software	15.00	-1.25	-7.69
OTC	6.63	3.50	Hogan Systems Inc.	4.88	0.38	8.33
OTC	36.25	18.50	Information Resources	25.25	3.75	17.44
OTC	40.88	6.00	Informix Corp. (H)	40.88	2.88	7.57
OTC	22.38	12.50	Intergraph Corp.	14.25	-0.25	-1.72
OTC	15.00	6.25	Interleaf Inc.	9.38	-0.50	-5.06
OTC	20.25	9.75	Intersolv Inc.	18.00	1.63	11.30
OTC	22.75	10.50	Knowledgeware Inc.	12.00	0.25	2.13
OTC	46.00	24.50	Legent Corp.*	46.00	1.38	3.08
OTC	38.75	15.50	Lotus Development*	17.75	0.25	1.43
OTC	7.38	1.88	Meca Software	3.38	0.63	22.73
OTC	22.25	6.50	Mentor Graphics	7.50	-0.25	-3.23
OTC	37.25	27.25	Micro Focus	34.38	-0.13	-0.36
OTC	20.50	6.50	Micrografx Inc.	8.50	-0.13	-1.45
OTC	88.84	54.88	Microsoft Corp.*	78.75	2.75	3.62
OTC	21.13	10.25	Oracle Corp.*	19.75	1.25	6.76
OTC	47.75	15.50	Parametric Technology (H)	47.75	3.38	7.61
OTC	11.00	3.50	Phoenix Technologies	3.88	-0.38	-8.82
OTC	25.25	12.13	Platinum Technology	17.00	0.25	1.49
OTC	46.50	29.00	Progress Software Corp.	44.13	4.38	11.01
OTC	26.63	4.00	Quarterdeck Office Sys.	4.38	-0.13	-2.78
OTC	32.75	11.75	Rainbow Technologies Inc.	17.00	0.13	0.74
OTC	24.50	7.50	Rasterops	8.25	-0.25	-2.93
OTC	17.25	5.38	Ross Systems	6.50	-0.88	-11.86
OTC	12.13	8.00	Sapiens USA Inc.	12.00	0.25	2.13
OTC	26.25	7.50	Software Publishing Corp.	10.50	0.50	5.00
OTC	8.50	2.00	Software Toolworks Inc.	3.13	0.19	6.38
OTC	7.25	1.75	Spinnaker Software	2.38	0.13	5.56
OTC	16.50	6.25	State of the Art	6.25	-0.38	-5.66
NYS	25.25	13.75	Sterling Software Inc.	17.88	-0.75	-4.03
OTC	30.00	10.50	Struct. Dynamics Research (L)	10.50	-4.50	-30.00
OTC	34.25	15.50	Sybase Inc.	34.25	3.75	12.30
OTC	51.00	15.50	Symantec Corp.	15.50	-1.00	-6.06
NYS	15.50	5.25	Systems Center Inc.*	8.25	0.00	0.00
OTC	34.25	13.00	System Software Assoc.	23.50	-1.25	-5.05
OTC	23.75	14.50	Walker Interactive Systems	19.50	1.25	6.85
OTC	6.63	2.00	Wordstar (L)	2.25	0.00	0.00
Semiconductors			**Up 5.84%**			
NYS	21.50	7.38	Advanced Micro Devices	12.38	1.25	11.24
NYS	11.13	7.00	Analog Devices Inc.	10.75	0.88	8.86
OTC	12.00	6.75	Atmel Corp.	11.00	1.50	15.79
OTC	14.13	3.25	Chips and Technologies	4.00	-0.25	-5.88
NYS	21.50	7.38	Cypress Semiconductor Corp	10.00	0.38	3.90
NYS	11.63	6.25	Dallas Semiconductor (H)	11.25	0.13	1.12
OTC	68.75	38.50	Intel Corp.*	64.00	2.75	4.49
NYS	9.88	4.88	LSI Logic Corp.	8.50	0.75	13.04
NYS	22.38	12.13	Micron Technology	15.25	0.50	3.39
NYS	90.00	54.00	Motorola Inc.* (H)	90.00	2.00	2.27
NYS	11.88	3.88	National Semiconductor*	11.88	1.00	9.20
OTC	27.00	8.25	Sierra Semiconductor	12.00	0.00	0.00
NYS	43.50	26.00	Texas Instruments*	43.50	2.75	6.75
OTC	10.50	6.00	VLSI Technology	8.50	0.75	9.68
OTC	8.75	2.13	Weitek	3.00	0.13	4.35
ASE	5.63	2.00	Western Digital Corp.	4.50	-0.13	-2.70
OTC	32.50	17.25	Xilinx	20.50	2.88	16.31
OTC	11.50	4.63	Zilog Inc.	7.63	0.25	3.39
Peripherals and Subsystems			**Up 1.93%**			
OTC	10.00	2.75	Archive Corp.	7.63	0.00	0.00
OTC	26.50	13.00	Banctec Inc.	26.25	0.50	1.94
OTC	23.50	8.63	Cambex Corp.	12.00	0.50	4.35
ASE	12.25	4.91	Cognitronics Corp.	11.38	0.00	0.00
NYS	23.88	12.50	Conner Peripherals*	21.63	0.63	2.98
ASE	19.88	4.41	Dataram Corp.	7.13	-0.13	-1.72
NYS	19.25	5.88	EMC Corp.	17.75	1.13	6.77
OTC	8.38	4.75	Emulex Corp.	5.75	-0.26	-6.12
OTC	23.00	14.25	Evans & Sutherland	16.25	0.50	3.17
OTC	40.63	21.00	Exabyte	23.75	1.50	6.74
OTC	27.25	15.75	Intelligent Info. Systems	25.50	2.00	8.51
OTC	11.25	4.75	Iomega Corp.	8.25	-0.63	-9.09
OTC	34.75	10.25	IPL Systems Inc.	13.00	2.25	20.93
OTC	24.50	10.75	Komag Inc.	18.38	1.13	6.52
OTC	18.00	3.44	Maxtor Corp.* (H)	13.88	-0.50	-3.48
OTC	12.63	5.78	Micropolis Corp.	9.63	0.38	4.05
NYS	101.25	85.38	3M Co.	88.38	-0.13	-0.13
OTC	7.00	3.50	Printronix Inc.	5.63	0.13	2.27
NYS	26.75	7.00	QMS Inc.	9.38	0.38	4.17
OTC	18.00	8.88	Quantum Corp.	15.50	0.88	5.98
OTC	12.75	4.75	Racius Inc.	4.75	-2.50	-34.48
NYS	12.88	5.88	Recognition Equipment	11.13	1.25	12.68
OTC	13.13	5.38	Rexon Inc.	10.13	0.50	5.19
OTC	17.63	7.25	Seagate Technology*	15.00	0.50	3.45
NYS	78.00	26.75	Storage Technology*	31.00	2.00	6.90
NYS	25.63	16.00	Tektronix Inc.	20.50	0.00	0.00
NYS	82.25	56.88	Xerox Corp.	78.75	0.50	0.66
Services			**Up 2.13%**			
OTC	19.38	11.88	American Mgmt. Systems* (H)	19.13	-0.13	-0.65
NYS	5.38	2.88	Anacomp Inc.	3.25	0.13	4.00
OTC	19.00	12.50	Analysts Int'l	17.75	-0.75	-4.05
NYS	49.00	32.38	Auto Data Processing*	46.88	1.75	3.88
NYS	24.18	12.50	Comdisco Inc.*	16.25	0.25	1.56
OTC	13.50	7.75	Computer Horizons	9.00	0.75	9.09
NYS	84.88	57.00	Computer Sciences*	65.88	0.00	0.00
NYS	10.13	7.00	Computer Task Group	7.50	-0.75	-9.09
OTC	40.50	15.00	CompUSA Inc.	32.75	3.38	11.49
OTC	19.25	8.00	Corporate Software	7.50	-0.50	-6.25
OTC	30.75	9.25	Egghead Discount Software	10.00	-0.50	-4.76
NYS	33.08	23.19	General Motors E (EDS)*	29.88	0.75	2.58
OTC	30.38	8.25	Intelligent Electronics	10.63	1.13	11.84
OTC	14.88	3.13	Merisel	9.13	1.13	14.08
OTC	15.75	7.00	Microage Inc.	10.13	0.75	8.00
OTC	29.00	15.50	Paychex	27.25	0.25	0.93
NYS	76.13	48.50	Policy Management Sys. (H)	74.50	-0.63	-0.83
NYS	44.50	32.63	Reynolds and Reynolds	42.13	0.00	0.00
OTC	32.00	21.25	SEI Corp.	25.50	0.75	3.03
OTC	24.38	16.88	Shared Medical Systems	20.25	0.63	3.19
OTC	28.50	13.50	Sungard Data Systems (H)	28.50	1.75	6.54
NYS	3.88	1.13	Ultimate Corp.	1.50	-0.13	-7.69

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Radius' sales drop

■ **Radius, Inc.**, a San Jose, Calif., maker of personal computer and **Apple Computer, Inc.** Macintosh enhancement products, last week said sales in the quarter ending Sept. 30 will be lower than anticipated. Revenue for the period is expected to be comparable with the $35.5 million in the corresponding quarter last year and below the $44.2 million posted in the previous quarter. Radius blamed the shortfall on lower demand for its core products and trouble getting a supplier to fill orders for its 15-in. monochrome displays.

■ **National Semiconductor Corp.** reported fiscal first-quarter earnings of $21.9 million compared with a $168 million loss — including a $149.3 million restructuring charge — in the same period last year. Revenue in the period was up 15% to $472.4 million.

■ Swiss telecommunications firm **Ascom Holding AG** said fiscal 1992 profits could be lower than the 54.3 million Swiss francs ($43.4 million U.S.) it made in 1991. The owner of T1 multiplexer maker **Timeplex, Inc.** in Woodcliff, N.J., said revenue for the first half of 1992 rose 18% to 1.66 billion francs ($1.33 billion U.S.), and orders received climbed 25% to 1.78 billion francs ($1.42 billion U.S.).

■ Frame-relay switch start-up **Cascade Communications Corp.**, which is headed by former Timeplex President Victoria Brown, has received nearly $7 million in a second round of financing.

■ A federal bankruptcy court in Boston ordered **Expeditors International of Washington, Inc.**, a Wang Laboratories, Inc. equipment shipper, to deliver eight of 14 containers of PCs to Wal-Mart Stores, Inc. outlets. Expeditors had delayed dropoff of the goods, saying that Wang owes it $100,000.

Discounters to sell Compaq's low-end line

Circuit City, CompUSA, Office Depot to offer ProLinea, Contura; Can company meet demand?

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Despite a protracted inability to meet demand, Compaq Computer Corp. further expanded its distribution options last week by signing mass retailers Circuit City, CompUSA and Office Depot, Inc. to sell its low-end ProLinea desktop and Contura notebook personal computers.

Compaq's Cooley *is ready to fill mass retailers' shelves*

Both analysts and Compaq's more traditional resellers warned that the PC giant risks putting off even more sales if it gets caught with its warehouse empty. Compaq has been fighting a backlog of demand for its low-cost ProLineas and Conturas, models that were introduced in June.

The families have proved so popular that Compaq cannot keep up with demand, according to users and resellers. Expanding the distribution channel by 300 new outlets could well exacerbate the problem.

"They're walking a fine line between dropping prices and goosing demand and not being able to supply the dealers," said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

However, Brown said moving into mass retailing is important if the company is to remain competitive, particularly in light of IBM's announcement last week of an aggressively priced Personal System/1 line aimed specifically at the mass merchandising channel. (see story page 8.)

William Tauscher, chief executive officer at Computerland Corp., said he had spoken to Compaq CEO Eckhard Pfeiffer about trying to resolve the delivery problems. "I told him he should make more," he said. On a more serious note, Tauscher said Computerland would have no problem selling what Compaq could send. "He wanted to know how many units we would like from him for next month. I told him as many as he can make; that's what we want," he said.

Ross Cooley, president of Compaq USA, said the company is still working on filling the backlog of orders. He predicted Compaq would be ramped up enough to fill mass retailers' shelves in time for the busy December selling season and will hopefully ship the product to retailers in late September, thus filling that channel by mid-October.

VAR experimentation

Cooley also said Compaq was experimenting with mail order through several of its value-added resellers; the fourth quarter might see an expansion in that direction, he added.

The company has brought in Michael Norris as vice president of consumer products to watch over this new channel.

"This is quite a departure for Compaq. We don't have a history of going out and hiring a lot of vice presidents, and we needed someone who will understand the market," Cooley said.

Senior writer Michael Fitzgerald contributed to this report.

Extended family

HOUSTON — Compaq will expand its hot-selling Contura and ProLinea product lines today, while adding features to the entire ProLinea line.

Compaq will introduce the 6.7-pound Contura 3/25C, a passive-matrix, color notebook with an 84M-byte hard drive that is expected to start at $2,799. A nickel-metal hydride battery generates three hours of battery life. Based on Intel Corp.'s 25-MHz 80386SL, Compaq has targeted its pricing at passive-matrix notebooks from Dell Computer Corp. and AST Research, Inc. These products are available now.

The ProLinea line got a power boost with the 25-MHz 1486SX and the 50-MHz 486DX appearing inside systems. Compaq expects to see pricing on the ProLinea 4/50 start at $2,049 and the ProLinea 4/25s at $1,349.

Andrew Watson, Compaq's director of North American portables marketing, said Compaq delayed announcing these products to ensure it can meet demand, something that has plagued the firm since the introducution of new lines in June.

The ProLinea line as a whole gained several features: a variety of security features, an option of interlaced or noninterlaced video output, up to 32M bytes of random-access memory and 240M-byte hard drives.

MICHAEL FITZGERALD

Commission-based sales to begin at DEC

Move suggests influence of CEO-elect Palmer

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. sales representatives will have even more incentive beyond just keeping their jobs beginning in January, when the beleaguered minicomputer maker adopts a commission-based sales plan.

"We are going to undertake a modest evolution of our incentive compensation program for U.S. salespeople, which will offer a more direct linkage of pay for performance," a DEC spokesman said.

He refused to confirm details of the plan, saying the company must inform its internal sales force before going public. One published report said the company is considering giving its salespeople 20% of their annual salaries in commission.

Some skepticism

However, skeptical analysts said that layoffs already well under way offer a much stronger incentive than anything DEC could do in terms of compensation.

"Providing the DEC sales force with a commission structure is a step in the right direction, but it's a day late and a dollar short," said John Logan, vice president at Aberdeen Group, a market research firm based in Boston.

"A few years ago, DEC started giving out bonuses via an incentive plan, but at this point, the typical DEC sales reps are fighting for something more than a commission — and that's their jobs," he said.

Departing longtime chief executive officer Kenneth Olsen vehemently opposed commission-based sales and blocked the adoption of earlier, similar moves.

This shift in policy is the harbinger of a companywide restructuring resulting from the transfer of leadership to CEO-elect Robert Palmer, who will take over from Olsen on Oct. 1.

Switching channels

Recent cutbacks in DEC's direct sales force areleading to a greater reliance on non-DEC marketing channels, such as value-added resellers, distributors, systems integrators and other third parties.

Twenty-six percent of DEC's U.S. sales came through such channels during fiscal 1992, DEC officials said.

> "PROVIDING THE DEC sales force with a commission structure is a step in the right direction, but it's a day late and a dollar short."
>
> JOHN LOGAN
> ABERDEEN GROUP

A program instituted last year emphasized channels marketing for account reps and began to measure them on a "profit-and loss statement, making them entrepreneurs rather than just hardware salesmen," according to a second DEC spokesman. "If the total business generated was not enough so that the manager could say 'I'm profitable,' then there were cuts."

By Rick Blum

Hello, sir. Welcome to Lotta Computers and our one-day, 50% off everything sale. I'm Mr. Rum. How can I help you?

Hi. I'm the purchasing agent for Costello Community College. Can you tell me what your most popular word processing software is?

WriteNow.

I'd appreciate it.

You'd appreciate what?

I'd appreciate if you'd tell me the name of your most popular word processing package.

WriteNow.

I don't understand you. I ask a simple question, and you keep putting me off. Tell me your most popular word processing software.

WriteNow.

There you go again. Listen, maybe we should skip the software and decide on hardware, instead. Can you recommend something that's designed for an educational setting?

Next.

If you don't know the answer, why don't you just say so instead of trying to get rid of me?

I'm not trying to get rid of you. I'm just recommending a good workstation that's designed specifically for colleges and universities.

Then what is it?

I told you. Next.

Fine. Have it your way. I'll just go across the street to Notmenny Computers and do my business there.

Please don't go. Educational institutions are very important to Lotta Computers. Let's try again. What exactly is it you need to decide?

I need to decide on our next computer and right now.

I'm sorry, but they don't work together.

What doesn't?

The hardware and software you just named.

How could I name them? I hardly know a thing about computers! I have an idea. Why don't we forget all this hardware/software stuff for a minute and instead just pick an established company with a wide range of products. What do you say?

I'd say Bull.

Excuse me! I admit I don't know much about computers, but you don't have to insult me.

I would never do such a thing. Let's pick another company if you don't want Bull.

I certainly don't.

OK, no Bull.

Good. Would it be a good place to start by asking what the best PC is that you carry?

Sure. I'd say that's Wyse.

Well, thanks. I take pride in choosing only prime products for our students.

I'm sorry, but you can't get a Prime PC anymore. You really should get Wyse.

I'm getting pretty wise to you, buddy. Look, all I want is a good PC.

Well, that's easy. The choice is Wyse.

Great. Half an hour and all we've decided is to make a wise choice. I can't wait to find out what's next.

It's a workstation specifically designed for colleges and universities.

How did we get back to workstations?

You mentioned a brand. Next.

I'll move on, but this is your last chance — put together a system with the works and, if the price is right, I'll make out a check today.

I'd be happy to. But if you want the Works, there's no reason to buy WriteNow.

But you said the sale is for one day only. I'd like to buy right now.

I'll sell you anything you want. But I warn you, WriteNow won't work on Wyse PCs, if that matters.

The only thing that matters is to get out of here so fast you'll think I had wings.

Well, if you want Wingz, forget about the Works. We'll put everything on a Mac rather than Wyse and I'll give you Word, instead.

Oh yeah? Well, here's my word — Good-bye!

• • • •

— Blum is a free-lance writer and principal at Aquiline Associates in Carlisle, Mass.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

INSIDE LINES

Face-lift for LANs?

▶ 3Com and IBM are reportedly working feverishly to bring higher transmission speeds to Token Ring and Ethernet LANs. 3Com will likely debut a 100M bit/sec. Ethernet LAN as soon as the end of the year, according to an analyst who has been briefed, and IBM is allegedly working on a 32M bit/sec. Token Ring LAN that it plans to continue enhancing in increments of 32M bit/sec. Interesting moves, given user enthusiasm over the much-touted and pending Asynchronous Transfer Mode next-generation LAN that does not require attached nodes to share bandwidth. The higher speed Ethernet, though cheaper than 100M bit/sec. FDDI, one analyst said, will require users to purchase new adapter cards and wiring hubs.

Alpha, beta

▶ DEC is expected to officially unveil its next generation Alpha systems next month. Included will be "Flamingo," a desktop workstation for upgrading from the VAX 4000 60 series; "Cobra," a departmental machine with 2G bytes of memory for upgrading from the 4000 series; and "Ruby," a machine with up to four CPUs and 12G bytes of memory.

Tick, tick, tick . . .

▶ IBM has always said it would never resell a clone PC in the U.S. But IBM Personal Computer Co. management may have different ideas. Sources said the PS/1 line has only about 30 days to start proving itself a winner. If it fails, antsy Blue bigwigs will reportedly start considering the charms of the Ambra. Ambra is a non-IBM brand currently sold, at arm's length, by IBM in Canada, Europe and Latin America.

Eluding the cannibals?

▶ There's been some juggling of the dates in IBM Personal Computer Co.'s September product announcements. Sept. 21 was to have been the date for both the revamped PS/2 debut and the great ValuePoint line extravaganza. Now, however, ValuePoint has been pushed back until the end of next month. IBM explained it wanted to give each brand team its own day in the sun, but skeptical minds say the company has to wait until reorganized support people have time to get into place. Still more cynical minds said the delay gives the PS/2 line a small time frame to sell in before the product cannibalization kicks in. IBM's new ThinkPad and a slew of new notebooks will debut Oct. 6.

Closed windows

▶ Microsoft is apparently angering a few software vendors who use the word "Windows" in their product names. According to sources, Microsoft has recently received trademark authorization on Windows and is sending cease-and-desist letters to some software vendors, requesting that they either change the product name or, in some cases, license the name (though reportedly for no fee). Microsoft confirmed it is "working with" some vendors to meet the company's trademark requirements. An attempt is being made to organize some purportedly infringing vendors to fight the trademark claim, the sources said.

CD a-go-go

▶ Sony will try to make multimedia portable when it officially introduces its oft-previewed Bookman, now named the Multimedia CD-ROM Player, on Wednesday. Sources said the player will weigh approximately 2 pounds and come in a 6- by 4-in. package. Eleven software vendors, including IBM and Microsoft, will announce their support for the device.

Democratic party insiders jumping the gun on the November presidential election are already discussing who will be in the Clinton cabinet. Some of the names being tossed around would definitely tilt a Clinton administration toward an activist U.S. technology policy. The candidates include Robert Reich for chairman of the Council of Economic Advisors, Roger Altman for Secretary of the Treasury, Henry Cisneros for Secretary of Commerce and — this is a big maybe — Paul Tsongas for director of the Office of Management and Budget. All of them are big fans of high-tech industries. So is News Editor Alan Alper. Phone, fax or CompuServe serve him with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld***'s 24-hour voice-mail tip line at (508) 820-8555.***

September 14, 1992 Section 2 of 2

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   - 66. Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/ Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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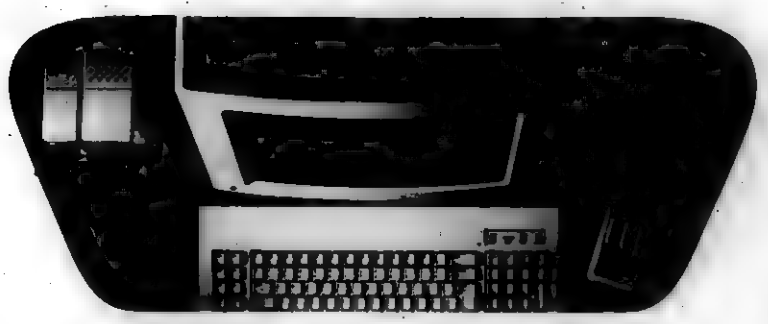

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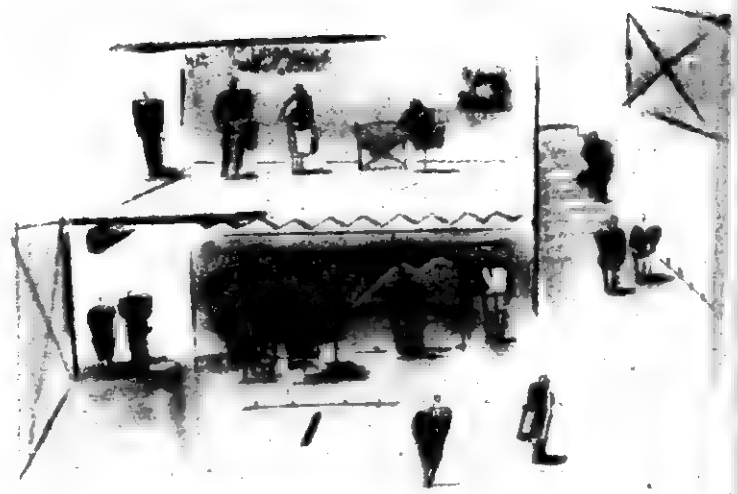


ABOUT THIS ISSUE

4
RISING ABOVE THE CHALLENGES
In a tough year, IS executives balance strategic necessities with cost constraints and learn how to take measured risks.

WINNERS BY INDUSTRY

10
AEROSPACE
Do it smart and do it once: Beleaguered industry emphasizes streamlining and waste reduction.
By Kathleen Gow

13
CONSUMER PRODUCTS AND SERVICES
Catering to the customer: Well-stocked store shelves keep retailers happy.
By Barbara Francett

18
FINANCIAL SERVICES
Growth is relative: Budgets are bigger, but so are expectations.
By Amy Bernstein

DRESSER INDUSTRIES' *Henry Paulsen, page 21*

21
INDUSTRIAL AND AUTOMOTIVE PRODUCTS
New spirit of conservatism: This is not the time for experimentation.
By Mark Mehler

26
MANUFACTURING
Breaking the mold: Companies concentrate on strengthening the customer link.
By Emily Leinfuss

PHOTOGRAPHY: HENRY PAULSEN BY DAN BRYANT; ILLUSTRATION BY JEFF JACKSON

Editors' Note

No more easy wins

Excellence comes easier in the midst of prosperity. So IS executives whose companies are among the *Computerworld Premier 100* industry groups this year deserve a special round of applause. They have not only adjusted to the realities of a sustained recession in terms of their own operations but have helped their companies to stay on course and in the race.

The challenges that confront IS executives these days are unique. They are being asked to help produce radical and rapid change in a setting of financial austerity. In many cases, that means devising systems that will cut costs and help to distinguish their company in the marketplace. The performance bar has been raised several notches, and there are no more easy wins.

Premier 100 IS executives have a number of things in common. One is a feel for corporate priorities; another is a sense of when technological risk-taking is appropriate. Still another is the admiration of their industry peers. We feel strongly that no one is better equipped to judge a company's IS effectiveness than another IS executive in the same industry. For that reason, we have doubled the weight given to peer ratings in this year's selection of the *Premier 100*.

Our congratulations to the winning companies – the most effective corporate users of information systems in the U.S. – and to the executives who guided their use of technology. This designation has never been an easy one to earn, but this year it really took something extra. ■

PHILLIPS PETROLEUM'S *Jim Gottardi, page 29*

29
PETROLEUM AND CHEMICALS
Down to fighting weight: Less is more as users battle recession.
By Cheryl Goldberg

34
PHARMACEUTICALS AND FOOD
Spending for the future: Companies take advantage of a buyer's market.
By Daniel Lyons

37
RETAILING AND WHOLESALING
Luring consumers with conspicuous efficiency: Limited but well-targeted spending pays off.
By Lucie Juneau

42
TRANSPORTATION
The name of the game is revenue generation: Information can be a money maker.
By Julia King

47
UTILITIES
Betting the farm on technology: Stay ahead or be vulnerable.
By Amy Bernstein

MCI'S *Jim Zucco, page 47*

INSIDE THE 100

53
SELECTING THE TOP USERS
How we measure the effective use of IS in the *Computerworld Premier 100*.

54
THE PREMIER 100 TABLES
Detailed data on all 100 companies.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the following organizations for their assistance in creating this year's *Premier 100*: Andersen Consulting, Arthur D. Little, Inc., A. T. Kearney, CSC Index, Inc., Cleveland Consulting Associates, CW Database Division, Deloitte & Touche, Ernst & Young, First Market Research, International Data Corp., McKinsey & Co., Technology Investment Strategies Corp. and SRI Execution. We would also like to thank all the IS executives and their staffs for their time and patience in responding to our many inquiries.

LAST WORD

63
DO YOU HAVE WHAT IT TAKES?
Key factors in the successful use of information systems.
By DuWayne Peterson

PHOTOGRAPHY: JIM GOTTARDI BY ALAN LEVENSON; JIM ZUCCO BY KATHERINE LAMBERT

Rising to the challenge

Top IS executives use a variety of strategies to overcome the hurdles of economic pressure and rapid change

The year: 1992. The place: the boardroom of a large Fortune 500 company. A chief information officer stands before the executive committee preparing to argue for several million dollars of extra leeway in the IS budget for the coming year. The CIO faced this same group last year and had to walk away without an increase. As a result, he's spent the whole year shuffling resources and trying to figure out how to get all those new systems built without dropping service levels or letting older systems deteriorate. This time, the audience isn't any easier.

Each committee member is aware of the slow economy and extreme pressure from domestic and foreign competitors on the company's bottom line. The chief executive officer in particular is concerned about an upcoming stockholder's meeting where he will have to explain last quarter's disappointing results.

Reviewing his options, the CIO realizes his staff's excitement over performance ratings of the new technology will not impress the group. Neither will they be interested in a discussion of the elegant software interfaces that his programmers have created to link diverse applications and make the front ends easier to use. He'd better cut to the chase.

Pulling himself to his full height, the CIO launches into a presentation stressing the long-term resource savings and process improvements that the switch to local-area network-based client/server systems will make possible. Sure, it will cost money up front, but down the road, an open systems approach will place more power in the hands of users.

The CIO restrains an urge to wipe his brow as the corners of the CEO's mouth turn up in an almost imperceptible smile. "He's buying it," the CIO thinks, knowing the executives would rather hear about downsizing than a requisition for another $10 million mainframe. "Now all I have

THE WINNERS

AEROSPACE

1. The Boeing Co.
2. Grumman Corp.
3. McDonnell Douglas Corp.
4. Martin Marietta Corp.
5. Lockheed Corp.
6. Raytheon Co.
7. Rockwell International Corp.
8. Textron, Inc.
9. Northrop Corp.
10. General Dynamics Corp.

CONSUMER PRODUCTS AND SERVICES

1. Reader's Digest Association, Inc.
2. Procter & Gamble Co.
3. Levi Strauss Associates, Inc.
4. Gillette Co.
5. American Brands, Inc.
6. The Dun & Bradstreet Corp.
7. McGraw-Hill, Inc.
8. Helene Curtis Industries, Inc.
9. Humana, Inc.
10. Johnson Controls, Inc.

FINANCIAL SERVICES

1. J. P. Morgan & Co.
2. Primerica Corp.
3. Banc One Corp.
4. CoreStates Financial Corp.
5. KeyCorp
6. BankAmerica Corp.
7. Barnett Banks, Inc.
8. Unum Life Insurance Co.
9. Bankers Trust New York Corp.
10. Massachusetts Mutual Life Insurance Co.

INDUSTRIAL AND AUTOMOTIVE PRODUCTS

1. Dresser Industries, Inc.
2. Black & Decker Corp.
3. Caterpillar, Inc.
4. Harley-Davidson, Inc.
5. Eaton Corp.
6. Ford Motor Co.
7. Deere & Co.
8. Paccar, Inc.
9. Trinity Industries, Inc.
10. Ingersoll-Rand Co.

MANUFACTURING

1. Kimberly-Clark Corp.
2. Corning, Inc.
3. 3M Co.
4. Inland Steel Industries, Inc.
5. Cone Mills Corp.
6. Amoskeag Co.
7. Eastman Kodak Co.
8. Sonoco Products Co.
9. Polaroid Corp.
10. Bethlehem Steel Corp.

to do is make it work." Quietly, he permits himself the gesture of tapping his knuckles on the table.

■

This CIO is not any of the executives listed in the 1992 *Premier 100*. But in many ways he represents them all. Whatever their industry, IS chiefs at the leading companies are feeling more performance pressure than ever before. They are being asked to come up with new kinds of systems and system configurations that will give their companies that all-important edge in the market, often with the stipulation that expense be held to a minimum.

Money is on everyone's mind this year. It isn't always a matter of actual budget cuts: More *Premier 100* executives saw increases last year than decreases (44% increased, 33% decreased, and 22% stayed flat).

In many cases, the big challenge is figuring out how to spread about the same amount of money over a lot more territory and satisfy escalating expectations in terms of impact per dollar spent.

At AMR Corp., for example, approval for new projects depends on a guarantee of 100% return on investment. Previously, says Max Hopper, senior vice president of information services, the goal might have been as low as a 15% return.

IS executives on the *Premier 100* list tell us that the eyes of management and shareholders are on them. Seventy-three percent say this scrutiny increased last year (see chart at left).

"Our markets are still terrible," says R. D. Sonnenburg, newly named director of computer IS at Deere & Co. "In this environment, we have no choice but to keep our own costs in line."

But simple frugality isn't all that management and stockholders are interested in. They are also looking for information weaponry to use against increasingly aggressive competition.

Rodger Marticke, principal of the motor carrier practice at Mercer Management Consulting in Lexington, Mass., observed that "the cargo shipping wars are, in large part, being waged vis-a-vis IS." So, in fact, are the retailing wars, the automotive wars, the financial services wars and so on.

For better or worse, companies' awareness of IS has grown to the point that top executives expect their IS staffs to redesign processes and produce systems that offer a real competitive advantage. Eighty-five percent of the *Premier 100* leaders say they have redesigned some processes over the past year to take advantage of information technology; 80% say they have installed systems to provide competitive advantage.

Handling these critical tasks on top of the normal work load has stressed the resources of even the IS organizations

PETROLEUM AND CHEMICALS

1. Phillips Petroleum Co.
2. The Dow Chemical Co.
3. FMC Corp.
4. Unocal Corp.
5. Union Texas Petroleum Holdings, Inc.
6. Monsanto Co.
7. Ashland Oil, Inc.
8. Rohm and Haas Co.
9. NERCO, Inc.
10. Air Products and Chemicals, Inc.

PHARMACEUTICALS AND FOOD

1. Merck & Co.
2. Schering-Plough Corp.
3. Becton, Dickinson & Co.
4. Sara Lee Corp.
5. International Multifoods Corp.
6. Pepsico, Inc.
7. Bristol-Myers Squibb Co.
8. Upjohn Co.
9. Abbott Laboratories
10. Johnson & Johnson

RETAILING AND WHOLESALING

1. Wal-Mart Stores, Inc.
2. Sears, Roebuck and Co.
3. The Home Depot, Inc.
4. FoxMeyer Corp.
5. Dillard Department Stores, Inc.
6. Kmart Corp.
7. Bergen Brunswig Corp.
8. Winn-Dixie Stores, Inc.
9. Toys R Us, Inc.
10. Nordstrom, Inc.

TRANSPORTATION

1. AMR Corp.
2. Airborne Freight Corp.
3. Roadway Services, Inc.
4. Northwest Airlines
5. J. B. Hunt Transport Services, Inc.
6. International Shipholding Corp.
7. Federal Express Corp.
8. Hawaiian Airlines
9. Carolina Freight Corp.
10. Southwest Airlines

UTILITIES

1. MCI Communications Corp.
2. Bell Atlantic Corp.
3. Carolina Power & Light Co.
4. Southern Co.
5. Northeast Utilities
6. Ameritech Corp.
7. Duke Power
8. Baltimore Gas & Electric
9. GTE Corp.
10. AT&T

at these top companies. Among the chief challenges for *Premier 100* IS execs this year were reducing costs, managing more work with the same resources, educating business users, meeting strategic corporate objectives and downsizing.

The expectations for next year are very similar, except that implementing effective process improvement and networking strategies jumps to the middle of the list.

Unifying LANs and installing T1 lines are already high priorities at many of the *Premier 100* companies, which see tighter communications links with customers and suppliers as an absolute necessity.

STABLE BUT GUARDED

After experiencing a budget free-fall in 1991, *Premier 100* IS groups, particularly in Consumer Products and Financial Services, regained some ground in 1992

Premier 100 companies' cumulative IS budgets (in billions)

*Projected

At retailer Nordstrom, Inc., for example, data processing manager Charles T. Mitchell says that partnering with suppliers has become the key to success in retailing. He points to the company's new VIP Express E-mail system as an example of how Nordstrom is trying to strengthen its supplier relationships. VIP Express gives suppliers fast and easy access to Nordstrom's geographically scattered buyers.

Fully 70% of the companies surveyed have already downsized to smaller platforms; the most frequently cited reason for this move is cost-effectiveness. Hand-in-hand with platform reduction goes the desire to move to nonproprietary systems. Seventy-eight percent of the executives say they installed some nonproprietary systems last year, and 77% say they are planning to install such equipment during the coming year.

The most prevalent theme is the IS chief's great concern with concentrating energies in areas that will produce economies and offer some appreciable business advantage.

In most instances, this means focusing on applications that will increase value to customers — rapid response and fast fulfillment systems, information-on-demand systems, customer service systems and high-level sales and marketing automation systems that provide companies with information their customers need and want.

Client/server systems, electronic data interchange (EDI) technology and networks all play major parts in achieving those goals. None come cheap enough that new infrastructures and systems can be built without some sacrifice. Intelligent trade-offs have become very important — perhaps even the single most important item separating successful CIOs from unsuccessful ones.

Some examples of how *Premier 100* IS leaders are prioritizing and allocating resources include the following:

- Johnson Controls, Inc.'s James J. Kerwin, director of information technology services for the controls group, says he is reducing spending on maintenance of old systems to concentrate resources on "systems that touch the customer directly, such as order entry."
- At Caterpillar, Inc., Robert Roof, business manager of corporate information services, is hoping to eke out money for systems to support faster delivery by cutting back on support services, which now consume 60% of the central IS budget.
- At Airborne Freight Corp., minor or cosmetic changes to existing systems, such as alterations to report formats, are absent from the priority list. This year, the emphasis is on continued improvements to Airborne's EDI systems, which are the technological building blocks for all its customer service programs.
- In most financial services companies, McKinsey & Co. principal William M. Saubert says, the spending emphasis is now on "the desktops of traders and underwriters, property and casualty adjusters, customer service reps of mutual fund companies and branch personnel." Back-office operations are being consolidated, scaled back and moved out.

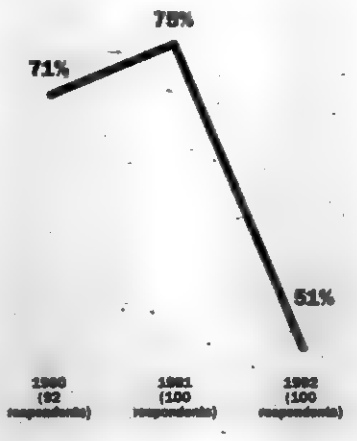
Outsourcing is an option that almost every firm has considered and a significant number have actually pursued, particularly in beleaguered industries such as financial services, petroleum and chemicals and aerospace.

Among *Premier 100* companies in aerospace alone, for example, General Dynamics Corp. outsourced its entire computing operation to Computer Sciences Corp.

BACKING OFF THE EDGE

The importance of leading-edge systems to organizations has dropped 24% since last year

Percent of respondents who said leading-edge technology is critical or important to their organizations



this year. And Martin Marietta Corp. outsourced maintenance of its dedicated telephone circuits to AT&T.

An even more popular option is data center consolidation. Forty-six percent of *Premier 100* companies have already combined some centers, and 59% say they expect to do so in the coming year.

However, neither of those cost-saving alternatives comes close to the appeal of downsizing, which not only permits more flexible access to information but also gives IS departments an opportunity to lower expenditures on central maintenance and support.

At Unum Life Insurance Co., for exam-

ple, CIO John Alexander describes retraining mainframe developers to handle PC development tools and educating users to function in "quasitechnical" roles. And at Union Texas Petroleum, some systems are being migrated to PC LANS, so that business departments can handle more of their own ad hoc report generation.

Right now, the technologies concerning most IS leaders are not artificial intelligence, pen-based computing, multimedia or any of the more glitzy day-after-tomorrow-type tools. In fact, the number of *Premier 100* companies rating leading-edge technology as a "critical" concern has declined precipitously in the last year (see chart page 6).

What top IS executives are more concerned about right now is figuring out what they need to do to make a bottom-line contribution to the business and locating the technologies that will help them solve today's problems.

Derek Mumford, vice president of information technologies at Eaton Corp., an OEM supplier of truck and automotive parts and appliances, gives voice to this sentiment. "We have to build on our core skills and stick to the things we do well," he says. "There are areas in which we will not be world-class."

Many *Premier 100* companies are concentrating on enhancing existing systems for EDI or, in paper-intensive industries, investing in imaging systems. The emphasis is on streamlining production and order fulfillment, improving communications with customers and distributing information more effectively.

What they'd really like more of right now, many say, are better data and systems management tools for distributed platforms.

In terms of the departments and applications receiving attention, traditional back-office areas such as finance or personnel take a back seat to sales and marketing, manufacturing and distribution. And of those, sales and marketing take the lion's share.

In most instances, the goals of these efforts range from cementing customer loyalties to finding new and improved ways to analyze information captured in the marketplace for better product planning.

At Gillette, improved analysis of point of sale data is a key target. Gillette is already using this data to anticipate customer replenishment needs and fine-tune merchandising strategies. However, Herbert Moller, director of systems operations, says he believes that better systems could produce much more actionable information. "We need to translate it [the information] into something we can act on," Moller says.

In the transportation sector, things have gone one step further. For example, companies are creating new information-based services that can be sold to existing customers interested in outsourcing some of their own high-overhead, low-return functions.

No matter what the exact strategy or whether budgets at their company increased or decreased, all *Premier 100* IS executives know two things: They are finally in the thick of the business, and the measure of success these days isn't how much iron you control, but how well you can answer the question, "What have you done for the bottom line lately?" ■

PEERLESS PERFORMERS

The following companies received the highest ratings among their industry peers. Four new companies made the ranks this year.

INDUSTRY	COMPANY
Aerospace	The Boeing Co.
Consumer Products and Services	Procter & Gamble Co.
Financial Services	Banc One Corp.
Industrial and Automotive Products	Ingersoll-Rand Co.
Manufacturing	Inland Steel Industries, Inc.
Petroleum and Chemicals	Air Products and Chemicals, Inc.
Pharmaceuticals and Food	Johnson & Johnson
Retailing and Wholesaling	Wal-Mart Stores, Inc.
Transportation	Federal Express Corp.
Utilities	Duke Power

There is perhaps no greater honor than to be called "the best" by your toughest competitors. The IS organizations named above were accorded that honor by other major players in their industries surveyed for the peer rating component of the *Premier 100* selection process.

The top reasons given by the IS executives who named these companies are as follows: The firms use information systems most effectively for competitive purposes; they are an outstanding example of how IS can be integrated into company strategy; they obtain the best bottom-line advantage from information systems; and they combine cost-effectiveness with savvy applications strategies. ■

CONSULTANTS RANK PREMIER 100 LEADERS

Leading IS consultants were asked to pick who they thought were the most effective users of information systems among the *Premier 100* target group of 600 companies. Their selections, which were not included in the *Premier 100* scoring system, agree with the peer selections of industry leaders in the cases of AMR Corp., Banc One, Boeing and Wal-Mart Stores. But they vary greatly after that, with AT&T, The Dow Chemical Co., Ford Motor Co., General Electric Co., Humana, Inc. and Merck & Co. rounding out the rest of the 10 industries. All but GE made the Top 10 within their industry in this year's *Premier 100*. ■

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Do it smart and do it *once*

Beleaguered industry emphasizes streamlining and waste reduction

BY KATHLEEN GOW

COLLINS *says applications are Boeing's future*

The last 12 months have been a rough ride for the aerospace industry. While the U.S. defense budget continued to shrink, the commercial airline industry posted one of its worst years in 1991. Despite a couple of bright spots — a $1.6 billion increase in spending for the Strategic Defense Initiative and expected increases in NASA outlays — contraction remains the primary mode in the more defense- and government-oriented sector.

Foreign competition is also a growing factor. U.S. share of the worldwide aerospace market has slipped considerably during the past few years, from 73% in 1985 to 58% in 1990, according to the Aerospace Industry Association of America.

In the commercial sector, The Boeing Co. still dominates, with about 60% of the world market for commercial aircraft. But McDonnell Douglas Corp. was displaced from its traditional No. 2 spot by Airbus Industries, the European consortium financed by the governments of France, Germany, Spain and the UK.

Information systems organizations are feeling the effect of business downsizing. Many have lost budget ground, and most are operating in cost-cutting mode. Data center consolidations are common, and a number of companies have outsourced some significant IS functions.

Despite these economies, *Prêmier 100* aerospace companies still see IS as the key to enhanced efficiency and profitability through diversification.

Heavy stress is being placed on distributed processing. According to Norm Collins, vice president and general manager of IS at Boeing, client/server platforms are seen as the future there. "For new applications, especially where we are making dramatic process changes, we almost always favor a distributed architecture because it brings more graphics functionality to the table."

KEY TECHNOLOGIES

NOW
- LAN applications
- MRP II
- Imaging applications
- Software development

NEXT FIVE YEARS
- Open systems
- CIM

1

The Boeing Co.

Seattle-based Boeing, the world's leading manufacturer of commercial aircraft, is also the leading manufacturing exporter in the U.S. With an order backlog of about $90 billion, the $29 billion company is in no danger of being edged out of the sky.

If cutbacks in Northrop Corp.'s B-2 bomber program — for which Boeing is a subcontractor — and drops in orders for 737s have caused a pinch, Boeing was not about to let IS feel it. In fact, the company bucked the industry trend in 1991 by increasing its IS budget 23% to $1.6 billion. IS staff grew 4% to top 14,000, while installations of personal computers and terminals grew 18% to 122,600. These IS investments were partially fueled by the ramp-up of Boeing's 777 passenger plane program, due for delivery in 1995.

The wide-body, two-engine 777 is being built with the help of three-dimensional computer-aided design (CAD), which Collins says means far

PHOTOGRAPHY BY RICH FRISHMAN

fewer mistakes and significant savings from reduced cycle time.

2 Grumman Corp.

Grumman, a $4 billion company in Bethpage, N.Y., is responding to defense cuts by using systems technologies to drive costs down and functionality up. The company's strategy is based on high-powered workstations in a distributed environment, extensive use of imaging and links between local- and wide-area networks to handle high-speed, high-volume transactions.

Like most of its competitors, Grumman trimmed its 1992 IS budget. A 4% cut brought the funding level to $153 million, and the IS staff was cut by 25% to 1,500. Grumman is currently examining how it delivers services to internal customers to ensure that its practices and procedures align directly with business needs.

The company has centralized many shared services during the last several years by consolidating data centers. Most application, workstation and PC areas have remained decentralized, but the company is looking at further consolidation to eliminate redundancies and streamline operations.

3 McDonnell Douglas Corp.

McDonnell Douglas, the top U.S. defense contractor and the world's third-largest maker of commercial aircraft, responded to declining industry revenue with major IS initiatives centered around cost. The $18.7 billion company has been examining architectural options for the last several months, including increased reliance on Unix-based workstations. It has also been weighing the possibilities of outsourcing data center or application development services.

Last fall, McDonnell began a year-long data center consolidation, which will fold seven operations into two.

McDonnell's IS budget slipped 2% in 1992 to $683 million, while IS staffing fell 5% to 3,500. Support for training stayed strong, however, as did the company's commitment to end-user computing.

INDUSTRY LEADERS

1. **Art Hitsman**
   President, Boeing Computer Services
   The Boeing Co.
2. **William D. Wizzell**
   Corporate V.P., Information Management
   Grumman Corp.
3. **Leonard J. Doney**
   V.P., Information Resource Management
   McDonnell Douglas Corp.
4. **Raymond J. Wiltshire**
   V.P., Computer-Aided Productivity
   Martin Marietta Corp.
5. **Dean O. Allen**
   V.P., IS
   Lockheed Corp.
6. **Robert Sexton**
   Corporate Director, IS
   Raytheon Co.
7. **J. F. Salter**
   V.P. and General Manager
   Rockwell International Corp.
8. **Cecil W. Lalbert**
   V.P., IS
   Textron, Inc.
9. **Herbert Anderson**
   V.P. and Center General Manager
   Northrop Corp.
10. **Joseph H. Hall**
    V.P. and General Manager
    General Dynamics Corp.

4 Martin Marietta Corp.

Revenue was flat and profits were down in 1991 at Martin Marietta in Bethesda, Md. With the anticipated cancellation of some of its defense contracts (the Peacekeeper missile and the Air Defense/Anti-Tank system), the diversified aerospace company's plans include aggressive expansion into nondefense markets.

CHALLENGES

- Managing increased user demands
- Customer satisfaction

The company's IS budget for 1992 dropped 6% from the previous year to $301.3 million, and the IS staff was cut 14% to 1,900. The company is moving from a two-tiered (host/workstation) architecture to a three-tiered setup, with many mainframe-based applications moving onto servers.

Martin Marietta is also exploring the use of fiber-optic networks, computer-aided software engineering and rapid application development tools.

5 Lockheed Corp.

Lockheed in Calabasas, Calif., is the leader of the team building the U.S. Air Force's new Advanced Tactical Fighter, the F-22. But the $9.8 billion company's long-term strategy is to decrease its dependence on defense and transfer internally developed IS skills and expertise into commercial endeavors.

The major challenges for IS are to reduce service delivery costs while using technologies such as imaging and expert systems to improve performance and cost-allocation processes.

In a major cost-cutting initiative, Lockheed established a company called Lockheed Information Technology to consolidate the company's large-scale and high-performance computing services in one world-class data center. By eliminating duplications of platforms, software and services, the company predicts an annual savings of 25% to 30%. The consolidation will take place during the next 18 to 24 months.

6 Raytheon Co.

Although most widely known as a missile and radar provider, Raytheon also produces commercial aircraft

(Beech), manufactures appliances, builds chemical and power plants and publishes books. This diversification into commercial markets has helped the $9.4 billion company insulate itself from the effects of defense cuts. Still, the downturn in defense business has brought changes.

Raytheon has steadily reduced its IS staff during the past several years, and the head count dropped another 7% this year to 1,150. This year the IS budget also fell sharply, dropping from $197 million in 1991 to $105 million in 1992.

Raytheon's strategies to stay lean and mean include standardization of systems, consolidation of resources (it is folding an IBM 3090-class computer center in Waltham, Mass., into another in nearby Andover), the purchase of remarketed systems and investment in "paperless" design and procurement systems. The company has also started scanning "legacy" engineering drawings into image-based systems with new drawings going directly to electronic media via CAD.

7
Rockwell International Corp.

Despite defense industry woes and the completion of its Endeavor space shuttle, top NASA contractor Rockwell International increased its IS budget 10% to $285 million for 1992. That increase helped to fund a number of important technology initiatives, such as enhancing systems for materials management and integrating engineering and manufacturing databases into a single large system called the Enterprise Product Data Management.

Rockwell is also replacing large-scale and midrange computers with reduced instruction set computing (RISC)-based workstation technology and increasing its use of imaging technology to facilitate cooperation with customers and partners in product design and manufacturing.

Despite the IS budget increase and Rockwell's unflagging commitment to training, IS is not exempt from the need to watch costs. Staff in that area was cut 10% in 1992 to 2,464, reflecting the consolidation of two data centers. Sales declined 3% in 1991 to just over $12 billion, and profits fell 4% to $601 million. Overall employee head count dropped 15% to 87,000.

DEFINING REALITIES

BUDGETS
Well over three quarters of the leading aerospace companies said their budgets decreased last year, and most expect further reductions.

PRESSURES
Shrinking defense dollars are causing companies to closely examine IS and cut back or outsource where they can. Process redesign and downsizing are also being considered.

ORGANIZATIONAL CHANGES
Well over three quarters of these companies have a mixture of centralized and decentralized IS operations. Most of these companies plan to consolidate or merge data centers in the coming year.

PLATFORM CHANGES
Aerospace leads the way in the move to smaller platforms.

8
Textron, Inc.

The economy was good to Providence, R.I.-based Textron in 1991: the company recorded a net income for the year of $300 million, up 6% from the year before, and the result for IS was a $169 million budget for 1992.

The company's 35 subsidiaries fall into three sectors: aerospace technology, commercial products and financial services, split evenly between defense and commercial markets. The company acquired Cessna Aircraft Co. in Wichita, Kan., this spring from General Dynamics for $600 million.

Textron Aerostructures, which manufactures wings and wing components, has shifted emphasis from mostly defense sales three years ago to about 80% commercial aerospace sales today. Through total quality management programs and an employee-supported asset management program, Textron hopes to reduce cycle time.

9
Northrop Corp.

In 1991, Los Angeles-based Northrop saw additional cuts to its flagship B-2 Stealth Bomber program and a lost bid to build the Air Force's Advanced Tactical Fighter in partnership with McDonnell Douglas.

The $5.7 billion company has been reshaping itself for leaner times and greater flexibility for some time, however. In 1991, it instituted a number of changes in its IS organization, which saved $25 million. These included consolidating and centralizing the responsibilities of the IS vice presidents who used to manage each of the company's Southern California locations, consolidating its applications, programming and telecommunications groups and reducing the number of large mainframes from 31 to eight.

Savings of another $25 million are projected for this year. Northrop is also putting together a five-year technology architecture plan to move toward a client/server environment.

10
General Dynamics Corp.

General Dynamics moved back into the Top 10 this year, after falling to No. 12 in 1991 and holding the No. 1 spot in 1990 and 1989. It was a busy year for the company, moving its headquarters from St. Louis to Falls Church, Va., last January. Chairman Stanley Pace retired in 1991 and was replaced by William A. Anders.

To counter the reduction in defense spending, $9.5 billion General Dynamics is withdrawing from noncore markets, reducing risk and, where possible, replacing fixed costs with variable ones. It sold its Cessna Aircraft subsidiary to Textron and its missile systems divisions to Hughes Aircraft Co. It also outsourced its computing operations to Computer Sciences Corp. (CSC) in November 1991 under a 10-year, $3 billion agreement.

CSC is providing General Dynamics' aerospace and defense units with systems development, data center management, network operations and other technical services. In an initial six-month review, users said the change has been totally transparent.

General Dynamics is pursuing improvements in cash flow and cost control through electronic data interchange and materials management. ■

Gow is a free-lance writer based in Medford, Mass.

Consumer Products and Services

Catering to the customer

Well-stocked store shelves keep retailers happy

BY BARBARA FRANCETT

READER'S DIGEST'S *Nelson leads IS globalization effort*

Always competitive, the consumer products industry is now downright predatory. Companies are trying everything to increase market share.

In most instances, the best way to wrest share away from the competition is by gaining the retailers' favor. Consumer products companies are attempting to do that by improving delivery efficiency and shouldering a number of tasks, including product ordering, inventory management and payment processing. Procter & Gamble Co., for instance, has taken over purchasing and inventory management for its products at Wal-Mart Stores, Inc. sites.

Collection and analysis of point-of-sale (POS) data contributes to another strategy that's gaining momentum in the consumer products industry: micro merchandising, or the ability to integrate fine-grained information from a number of sources to determine where a product is most likely to sell and what combination of products is best for specific locales.

1

Reader's Digest Association, Inc.

Global unity is the theme these days at Reader's Digest in Pleasantville, N.Y., which, with its range of direct marketing businesses, is actually its own best information customer. "Our businesses around the world have been operating independently. Now, a two-year program is under way to globalize the business," says Kenneth A. Nelson, vice president of MIS.

The $2.4 billion publisher and direct-mail marketer operates in more than 50 locations worldwide. It publishes its namesake magazine in local editions around the world rather than

Continued on page 16

INDUSTRY LEADERS

1. **Kenneth A. Nelson**
   V.P., MIS
   Reader's Digest Association, Inc.
2. **F. R. Cacciamo**
   Manager, Management Systems Division
   Procter & Gamble Co.
3. **R. William Eaton**
   CIO and Senior V.P.
   Levi Strauss Associates, Inc.
4. **Herbert Meller**
   Director, Systems Operations
   Gillette Co.
5. **Leonard L. Hendrickson**
   Director, IS
   American Brands, Inc.
6. **Michael S. Field**
   Executive V.P.
   The Dun & Bradstreet Corp.
7. **Edward J. Horowitz**
   Senior V.P., Computer Services
   McGraw-Hill, Inc.
8. **Thomas J. Gildea**
   V.P., Business IS
   Helene Curtis Industries, Inc.
9. **Fred Pirano**
   Senior V.P., IS
   Humana, Inc.
10. **James J. Kervin**
    Director, IS
    Johnson Controls, Inc.

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Salomon Brothers

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Global networking
Client driven
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Continued from page 13

translate a U.S. version. The local editions feature local advertising, and the reader responses to those ads are fed into databases for direct marketing of other products such as books and home video packages.

This year's $120 million information systems budget (up from $98 million last year) is earmarked for a five-part program that began last year, which includes an international communications network and the creation of a portfolio of common business applications.

CONSUMER PRODUCTS *companies use IS to compete for limited shelf space*

2 Procter & Gamble Co.

Procter & Gamble has forged strong partnership arrrangements with its retailers through swift responses in product replenishment and a variety of technology-supported value-added services.

For customer/partner Wal-Mart, Procter & Gamble handles inventory management and purchasing for some of its products. It also uses Wal-Mart's POS data to replenish stock automatically.

Long known for its outstanding brand management capability and market research, Procter & Gamble has shown interest in expanding its global presence by tapping developing markets in eastern Europe, Latin America and the Far East: The $27.4 billion company spends $237 million on IS.

CHALLENGES

- Moving more quickly to production
- Process improvement

3 Levi Strauss Associates, Inc.

Consumers can't buy apparel that isn't on the racks, so Levi Strauss emphasizes paring product delivery times to keep enough merchandise available to meet consumer demand without piling up excess inventory.

Order, inventory and delivery management are the goals of the LeviLink system, which connects Levi Strauss to its suppliers and trading partners.

Making sure that the information collected using LeviLink is then applied to turning out deliverable products is the job of another internal system, Levi's Advanced Business System.

KEY TECHNOLOGIES

NOW
- DBMSs
- LAN applications
- Networks

NEXT FIVE YEARS
- Sales force automation
- Client/server systems
- Open systems

On the manufacturing side, computer-integrated manufacturing, including computer-aided design and manufacturing systems, cuts production time and speeds merchandise out of the plant.

Bill Eaton, senior vice president and chief information officer at the San Francisco-based company, says the differentiator between Levi Strauss and some of its competitors is not that it uses information technology that is so much more advanced but that it applies IS to "the full array of business processes."

4 Gillette Co.

This $4.7 billion Boston-based maker of personal care products derives more than 65% of its sales income from overseas markets. Corporate IS sets strategic directions for its far-flung business units, each with its own IS operations support.

Gillette's IS budget — about $120 million this year — continues to grow. During the past year, developing business units in Latin America, Asia and the Pacific Rim have concentrated on establishing client/server computing systems and using off-the-shelf software packages wherever possible, according Herbert Moller, vice president of corporate MIS. Moller notes that it is easier to "start fresh" with newer units.

Business units in the more mature competitive markets of the North Atlantic region are focusing on technologies that support distribution and logistics, such as electronic data interchange and POS data collection and analysis.

5 American Brands, Inc.

The chief IS challenge at this highly diversified, $8.4 billion company is to formulate specific responses to the unique competitive conditions in each of its five core businesses: American Brands and Gallaher Ltd. tobacco products, Jim Beam Brands Co. distilled spirits, Master Brands Industries hardware, ACCO World Corp. office products and Franklin Life Insurance Co.

While each company functions autonomously with a distinct IS group and strategic business plan, all benefit from

PHOTOGRAPHY BY GERARD FRITZ/TONY STONE WORLDWIDE

volume purchase agreements for hardware, software and services, says Leonard Hendrickson, director of IS.

The Master Brands Industries hardware and ACCO office products companies concentrate their technology investments on efficient customer support systems, including inventory control, warehouse management and distribution systems. The American Brands and Gallaher tobacco products companies have focused on improving their manufacturing support systems with more sophisticated manufacturing resource planning systems as well as handheld computers.

6 The Dun & Bradstreet Corp.

If there's a word that characterizes Dun & Bradstreet this year, it's "transition." Following several years of double-digit growth, the $4.6 billion diversified financial information provider experienced a decline in earnings last year. It responded by reorganizing and pruning business units and by cutting costs. Nevertheless, Dun & Bradstreet is steadfast in its commitment to technology.

The company's business information group continues to aggressively pursue ways to leverage Dun & Bradstreet's vast information resources and to provide lower cost, real-time information services to its directory, marketing and financial information services customers.

7 McGraw-Hill, Inc.

Technology provides the underpinnings for the varied publishing and information services businesses of McGraw-Hill in New York.

"Our four corporate goals are to grow the business, use technology to leverage the business, expand globally and cut costs," says John Dobilas, senior vice president of IS and technology.

Two groups, the Technical Advisory Committee and the Applications Coalition, enable the company's businesses to share applications, design information and maintain compatibility so that solutions are transferable among businesses.

Despite a flat overall IS budget (an estimated $166 million), several important projects were launched in the past year. Financial services company Kenny S&P, for example, reduced its large-scale platforms to small, multivendor client/server systems with Unix processors and graphical user interfaces and, based on the results at that unit, client/server systems are being rolled out to other groups.

8 Helene Curtis Industries, Inc.

Since all growth at Helene Curtis is internally generated (no acquisitions of companies or brands), its market share in the hotly competitive personal care segment must be earned. Right now, the company is trying to earn its share by beating the competition at logistics management, particularly order processing and distribution.

"The goal is to squeeze as much time out of the order cycle as possible," says Thomas J. Gildea, vice president of business information services.

Recently named Vendor of the Year by Wal-Mart, the company isn't resting on its laurels. A hefty increase in the IS budget — up 10% to $30 million — is being directed toward technology investments that will improve service. For example, enhancements are being made to the sales information system, which will allow representatives to offer immediate competitive analyses.

DEFINING REALITIES

BUDGETS
Well over half the companies in this category increased IS budgets this year, and slightly over half of the IS managers expect another increase next year.

PRESSURES
Well over three quarters said they were under increased scrutiny from the top executives and shareholders this year. Application development backlog is a significant concern, with just under half of the companies surveyed reporting that it had worsened over the past year.

ORGANIZATIONAL CHANGES
Decentralization of IS is prevalent. In fact, this industry has the smallest reported incidence of IS centralization.

PLATFORM CHANGES
Downsizing to smaller platforms is a major trend. Well over three quarters made moves of this type this year, primarily for cost reduction and cost-effectiveness but also to allow greater user involvement.

9 Humana, Inc.

A flat business cycle has produced lean times at Humana, a Louisville, Ky.-based health care company. The company, which operates 78 hospitals, has declared a hiatus from acquisitions, which had been a primary source of growth. It is also trying to recover from the migration of some of its patients to lower cost facilities for some treatments.

The IS budget is down to $90 million, representing a reduction of 50% in capital expenditures and of 8% to 10% in operating funds, says Fred Pirman, senior vice president of IS. Several major productivity-oriented initiatives continue, such as an imaging system for insurance claims operations that was recently rolled out to three processing centers.

10 Johnson Controls, Inc.

At Johnson Controls, a Milwaukee-based manufacturer of temperature, lighting and energy controls, as well as automotive systems, plastic containers and automobile batteries, IS has focused on aligning its goals with business strategies.

"There was a bit of disconnect between IT's directions and priorities and those of the business," says James J. Kerwin, director of information technology services at the controls group. To address that problem, the company enlisted external consultants to help map its technical infrastructure and organized cross-functional project teams of business and IS staff members.

Future strategies will continue to emphasize responsiveness to customers, Kerwin says, and phasing out legacy systems is on the near-term agenda. ■

Prescott is a free-lance writer based in Bloomfield, N.J.

Financial Services

Growth is relative

Budgets are bigger, but so are expectations

▶ BY ALICE LAPLANTE

After four years of multimillion-dollar losses and bad loan write-offs, the financial services industry is at last showing signs of revival. Revenue — and more importantly, profits — is up at the leading financial institutions.

That sounds like good news for information systems managers, and it is . . . sort of. Although the strongest financial institutions have indeed increased budgets — and, to a lesser degree, head counts — many, especially banks, have also absorbed dozens of other institutions. In other words, slightly more money and personnel are being stretched over a lot more territory.

IS staffs at the top companies are being asked to develop systems and architectures that will allow efficient and cost-effective servicing of expanding customer populations and to provide products of a consistently high quality at a lower per-unit cost.

There's one story that all *Premier 100* financial services firms tell: how they are slashing costs in back-office operations to put money and personnel into all-important front-office development efforts.

Self-service technologies are also a major focus of systems efforts. Financial services firms, for example, are moving strongly into systems that allow customers to use telephone and home computers to access accounts.

1 J. P. Morgan & Co.

Earnings at the global holding company, which provides a wide range of banking, underwriting, trading and investing services to corporations, governments and individuals, rose an astonishing 44% in 1991, for a net income of $1.1 billion.

With its 1992 IS budget of $510 million, J. P. Morgan is pursuing a two-part goal: reduce costs wherever possible and funnel dollars into development of desktop systems. That was the impetus for the outsourcing arrangement with BT North America, Inc., which is expected to save more than $12 million over five years, and the decision to consolidate support for London and Paris operations into the data center in Delaware.

Savings from such moves are being used to develop sophisticated local-area network-based front-office applications around the world. Morgan just completed a major project connecting its international office LANs and is developing a Unix-based securities processing system that will allow dealers to input trades on the desktop and automatically reconcile host-based transaction processing systems.

Last year, J. P. Morgan established an advanced technology group. The major challenge now is training IS employees on Unix, LAN and emerging object-oriented technologies.

INDUSTRY LEADERS

1. **Peter L. Weicke**
   Managing Director
   J. P. Morgan & Co.
2. **Richard F. Morrison**
   Senior V.P. and CIO
   Primerica Corp.
3. **Robert L. Barrett**
   President, Banc One Services Corp.
   Banc One Corp.
4. **Robert H. Gilmore**
   Executive V.P., Technology
   CoreStates Financial Corp.
5. **F. J. Ward**
   Executive V.P., Operations
   KeyCorp
6. **Martin A. Stein**
   Executive V.P., CIO
   BankAmerica Corp.
7. **Jonathan Palmer**
   Chief Technology Executive
   Barnett Banks, Inc.
8. **John J. Alexander Jr.**
   CIO
   Unum Life Insurance Co.
9. **Caroline Voss**
   Executive V.P.
   Bankers Trust New York Corp.
10. **John J. Pajonk**
    Executive V.P.
    Massachusetts Mutual Life Insurance Co.

2 Primerica Corp.

The expressed goal of Primerica, a $21.5 billion consumer finance, investment and insurance services company, is to be a low-cost provider in realms that include consumer lending, investment banking, securities brokerage, asset management and personal and property insurance.

Achieving this means maintaining a low-cost corporate culture everywhere, including IS. In 1992, Greenwich, Conn.-based Primerica continued its consolidation of data centers by folding six corporate centers into four. It also moved a number of strategic host-based systems onto LANs. To control costs, business managers have bottom-line responsibility for application development projects.

A variety of client/server projects are under way, including a commercial credit system that will move intelligent processing out to branch offices. Funding continues for investigating emerging technologies such as imaging, which may help to further reduce costs.

3 Banc One Corp.

IS helped Columbus, Ohio-based Banc One make 1991 its most successful year ever. With profits up 25%, the retail banking giant continued rapid growth by acquiring new banks at an average rate of one per month, and it ended 1991 with assets exceeding $46 billion.

A SWAT team of 150 conversion experts from Banc One Services Corp., the IS arm of Banc One, descends on new acquisitions and converts them to standard Banc One hardware and software literally overnight. With an IS budget of $293 million and 1,650 employees, Banc One Services offers acquired banks IS services and support at 90% of market price, in addition to providing credit-card and check processing/settlement for credit unions, brokerage houses and nonaffiliated banks.

Last year, Banc One began implementing a suite of client/server applications called the Strategic Banking System. Co-developed with Electronic Data Systems Corp. at a reported cost of more than $100 million, this enhanced customer service system has so far resulted in 10% to 20% savings.

4 CoreStates Financial Corp.

CoreStates Financial Corp is using technology to help it expand in all of its main businesses: wholesale banking, retail banking, trust and investment banking and electronic payment services. Last year, Philadelphia-based CoreStates doubled business handled by its electronic payment services group by acquiring BuyPass the System, Inc., the largest third-party provider of processing services for point-of-sale transactions.

The company, which is growing its international business at a 30% annual rate, also redesigned its international processing systems by defining a distributed architecture for all off-shore operations.

CoreStates intends to put $103 million into IS spending in 1992 — a figure that is slightly up from the previous year — and hold IS staffing steady at 700 employees.

J. P. MORGAN'S WOICKE *balances cost reduction with strategic investment*

CHALLENGES

- Cost reductions
- Managing more work with same resources
- Remaining technologically effective

KEY TECHNOLOGIES

NOW
- Imaging applications
- Expert systems
- Telecommunications

NEXT FIVE YEARS
- Client/server systems
- EISs

5 KeyCorp

IS is literally part of the company's growth strategy at KeyCorp. When KeyCorp, one of the fastest rising financial holding companies in the country, is considering an acquisition, it sends in an advance analysis team that includes senior IS executives. Their job is to determine whether a smooth and cost-effective systems consolidation is possible.

IS hasn't been forgotten in terms of funding, either. Its budget will be a healthy $48.7 million in 1992, up $8 million from 1991. Staffing is up, too. When KeyCorp acquired Gold Dome Savings Bank in Buffalo, N.Y., last year, it retained the programming staff to help meet a growing backlog.

During the past year, roughly half of KeyCorp's systems and programming resources were spent on converting acquired banks to the KeyCorp systems architecture.

6 BankAmerica Corp.

Consolidating gains has been the emphasis at BankAmerica since its $4.4 billion acquisition of Security Pacific Corp. Absorbing, standardizing and

PHOTOGRAPHY BY JOYCE RAVID

streamlining are still big chores for IS. In 1992, BankAmerica sold its $125 million payroll processing unit to ADP Network Services, which cleared the decks for large-scale systems development projects made necessary by the merger.

Although BankAmerica's 1992 IS budget has not been finalized, the goal is to cut 25% from the combined spending of the two institutions. One major step was the consolidation of Hong Kong and Frankfurt data center operations into a center in Croyden, England, at an estimated savings of more than $1 million per month.

But thrift does not mean inactivity on the development front. Last year, the network systems management group developed a change management tool that simultaneously downloads software to more than 1,000 desktop workstations from the corporate data center in Concord, Calif.

7 Barnett Banks, Inc.

The IS arm of Jacksonville, Fla.-based Barnett Banks has set a goal of earning $1 for every 60 cents invested in systems.

All IS services for the $43.2 billion bank holding company and its 32 retail banks are provided by a wholly owned $220 million subsidiary, Barnett Technologies, Inc.

The IS group's main strategy is to gradually reduce the dependence of bank operations on expensive, centralized data centers by moving strategic applications to a distributed architecture. More than $50 million will go toward reorganizing all operations around a distributed system built on IBM Token Ring LAN technology. More than 10,000 IBM Personal System/2 machines are scheduled to be in place by the end of this year.

The IS department has also developed a state-of-the-art imaging system for check processing, which will be rolled out during the next five years.

Although the $75 million IS budget is up $20 million from 1991 and the capacity of the data center has been increased threefold in the last two years, Barnett Technologies has reduced its staff by 400 workers, to 3,200, to help meet the profitability goals set by its parent. The bank's profits rose 22% in 1991 to $123.8 million.

DEFINING REALITIES

BUDGETS
The number of companies reporting IS budget increases actually ran well ahead of the average for all industries surveyed, and more than three quarters anticipate increases next year.

PRESSURES
Resources are being claimed by systems deemed to offer competitive advantage. The vast majority of companies said they had installed systems of this type over the past year. At the same time, 100% said they had evaluated outsourcing.

ORGANIZATIONAL CHANGES
More than half of the companies report having consolidated some data centers this year. More than three quarters expect to do so next year.

PLATFORM CHANGES
More than half said they've done some downsizing over the past year, but this industry is far less active than most when it comes to downsizing.

8 Unum Life Insurance Co.

A specialty insurance company with assets totaling $10.3 billion, Portland, Maine-based Unum is a leader in two relatively underpenetrated markets: disability and long-term care. With relatively little competition, Unum continues to expand rapidly at a time when other insurance firms are struggling. Indeed, Unum's IS staff's biggest challenge is managing growth.

Unum is determined to place more power in the hands of business users. A new OS/2-based client/server claims processing application has been implemented on a Token Ring network, and other plans for cooperative processing projects are on the boards. Business users are receiving tools and training that will allow them to assume "quasi-technical" roles.

9 Bankers Trust New York Corp.

With net income at an all-time high of $667 million last year, Bankers Trust decided the time was right for major changes in systems architecture that would create consistent applications across its decentralized structure. In 1991, the company finished plans for a bankwide architecture that will move the company from a character-based 3270 computing mode to a client/server architecture using graphical user interface systems.

This is the year Bankers Trust will begin worldwide client/server implementation and will interconnect disparate LANs and wide-area networks into a global enterprisewide network.

10 Massachusetts Mutual Life Insurance Co.

Careful and conservative investment practices have helped Springfield, Mass.-based Mass Mutual escape most of the travails that have afflicted the financial services industry. The $5 billion company has the strongest capital base in the industry, as well as top bond ratings from Standard & Poor's Corp. and Moody's Investor Service, Inc. Throughout the organization, which is one of the largest insurance concerns in the country, the emphasis is on frugality and targeted investment.

Last year, Mass Mutual implemented the bulk of its new, multistage Horizon project, which involves overhauling most applications for distributed processing. Eventually, all field and home-office personnel will be tied into a new distributed environment, which includes an on-line link with medical providers, as well as client management and office automation facilities.

A distributed on-line transaction processing system that divides processing between the Springfield data center and a new facility in Ireland was also completed last year. The system has increased insurance claims processing productivity by 40%.

All of this has been accomplished in a year when the IS budget was reduced from $78 million to $71 million. Field maintenance of personal computers and LANs was outsourced at an estimated annual savings of $600,000, and a deal with AT&T is expected to provide volume discounts on voice and data transmissions. ■

LaPlante is a free-lance writer based in Palo Alto, Calif.

Industrial and Automotive Products

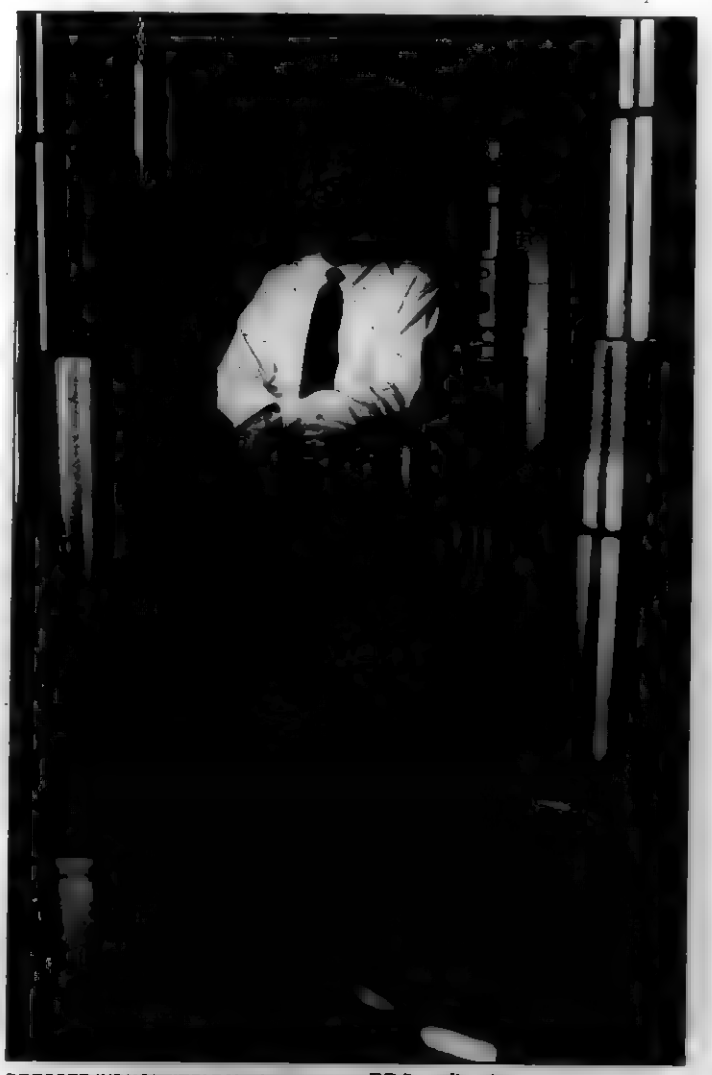
New spirit of conservatism

This is not the time for experimentation

▶BY MARK MEHLER

INDUSTRY LEADERS

1. **Henry Paulsen**
   Director, IS
   Dresser Industries, Inc.
2. **Donald Lee**
   Acting V.P., Worldwide IS
   Black & Decker Corp.
3. **Robert P. Hinds**
   Director, Corporate IS
   Caterpillar, Inc.
4. **Richard Kolbe**
   Director, MIS
   Harley-Davidson, Inc.
5. **Derek Mumford**
   V.P., Information Technology
   Eaton Corp.
6. **S. I. Ollman**
   Executive Director, IS
   Ford Motor Co.
7. **P. F. Ollman**
   V.P., Engineering, Information Technology
   Deere & Co.
8. **Bruce Carlson**
   General Manager, IS
   Paccar, Inc.
9. **John Sanfordj**
   Director,. Corporate DP
   Trinity Industries, Inc.
10. **George Tabback**
    Manager, Corporate DP
    Ingersoll-Rand Co.



DRESSER INDUSTRIES' PAULSEN *targets EDI applications*

When the going gets tough, the tough start thinking. At least that's the philosophy Ford Motor Co.'s Jim Cnossen follows.

This is a time to tap IS resourcefulness, not look for new resources, says Cnossen, manager of the company's North American systems. It is also a time for pursuing practical gains rather than making experimental leaps.

Cnossen's peers at companies in the top ranks of the industrial products and automotive industries all seem to agree. It's better to forgo leading-edge technologies, they say, in favor of more modest systems that reduce costs, improve customer service and shorten delivery cycles.

Most of the *Premier 100* companies in this category have launched extensive electronic data interchange (EDI) programs during the past two years. "In a period of tight money, [EDI] is a perfect fit with the goals of the organization: lower inventories, faster deliveries, just-in-time manufacturing," says Henry Paulsen, director of information services at Dresser Industries, Inc., a Dallas-based oil field equipment supplier that tops the category this year.

Continued on page 24

PHOTOGRAPHY BY DAN BRYANT

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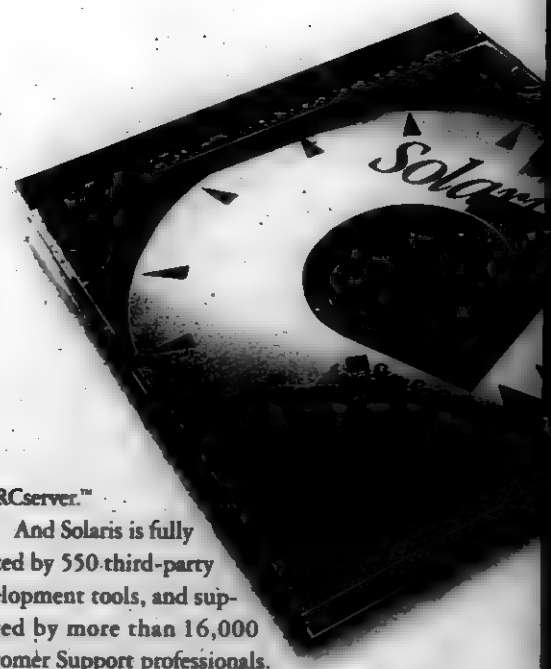

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Sun

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TOUGH TIMES *in the auto industry make IS groups more conservative*

CHALLENGES

- Platform integration
- Networking

KEY TECHNOLOGIES

NOW
- LAN applications
- Networks
- Order and supply-chain applications

NEXT FIVE YEARS
- Distributed RDBMSs
- CIM
- EDI

1 Dresser Industries, Inc.

Continued from page 21

The fourth-largest industrial and farm equipment supplier, Dresser saw its sales rise 4% in 1991, to $4.7 billion. The role of information systems is to provide tools that allow each of Dresser's 20 autonomous divisions to bring in money faster.

Toward this end, the IS group offers EDI as a mainframe service across the entire organization. Currently, departments use it for requests for proposals, customer purchase orders and acknowledgments, confirmed ship dates and purchase orders. "We've eliminated the two-week lead time while the paper was being moved," Paulsen says.

He adds that there is a generalized pressure from internal customers for better processing capability, and the biggest challenge is trying to meet those expectations at lower cost. In 1991, total IS spending was down 10% to $108 million, and he looks for another 10% decline in 1992.

2 Black & Decker Corp.

Rapid response is the magic phrase at Black & Decker. The power tool and appliance manufacturer, which offers 5,000 product lines, is investing in new just-in-time systems and software to speed deliveries.

EDI is a major piece of that plan, says Donald Lee, acting manager of worldwide information services. In the U.S., the firm is implementing EDI between Black & Decker and its customers, while in Europe, it focuses on computerized links between the manufacturer and supplier base.

The allocation of Black & Decker's $80 million 1991 IS budget reflects the new priorities. Although that figure was down 10% from the previous year, the company chose to buy quick response and MRP II applications and make up the difference by reducing expenditures on the operational side (maintenance and support).

3 Caterpillar, Inc.

Caterpillar's 1990 reorganization into 14 profit centers and declining sales and earnings (it lost $400 million in 1991 on sales of $10.1 billion) have resulted in an IS department rebuilt for speed.

Major systems programs now in the works include an effort to link the various engineering groups to shorten the product design cycle and widespread EDI implementation to hasten just-in-time delivery. The company expects to bring 80% of its supplier base onto the system within 11 months.

"Time is money, and in this economy it's critically important that IS find the cheapest ways to bring products to market faster," says Robert Roof, business manager of corporate information services.

IS is cutting back its support spending. "Support currently runs about 60%" of the centralized IS budget, Roof says. "I think our customers can get by with less handholding. We can crank down support spending 5% or 10%."

4 Harley-Davidson, Inc.

Don't talk recession to this manufacturer of motorcycles, recreational vehicles, parts and motorcycle fashion accessories. Demand began soaring late last year — fourth-quarter earnings rose 86% on a 22% jump in sales — and hasn't let up. IS director Richard Kolbe credits improvements in product quality, noting that the overall U.S. motorcycle market is relatively flat.

For Kolbe and his staff, this mini-boom presents an enviable problem: speeding up deliveries to satisfy the pent-up demand of dealers still on allocation.

To accomplish this, Harley has invested in tools such as a commercial inventory planning and forecasting system for use in the repair parts and accessories business.

5 Eaton Corp.

As an OEM component supplier to two recession-blasted industries — auto manufacturing and construction — Eaton is under increasing cost pressure from its customers.

These pressures have prompted the company to accelerate its expansion into

PHOTOGRAPHY BY ANDY SACKS/TONY STONE WORLDWIDE

overseas markets via a bevy of small acquisitions. And IS has come through with new cost accounting systems aimed at ensuring consistency of reporting among far-flung manufacturing enterprises. "We're now making the same product in two or three different countries, and it's critical that we get a handle on what it's costing us," says Derek Mumford, newly named vice president of information technologies.

Recent investments in manufacturing control systems such as IBM's Copics also support the goal of controlling costs on a worldwide basis, Mumford says.

6 Ford Motor Co.

Among the Big Three, Ford has experienced the biggest rebound. The company earned $337.9 million in the first quarter of this year — a major comeback after last year's $884 million loss.

But nobody at this $88 billion automaker is crowing about a recovery, least of all in the 5,000-member decentralized IS operation, where spending currently runs below 1.5% of revenue and advanced technology has been placed on the back burner.

Cnossen says IS remains in a period of relative "introspection," trying to pinpoint those areas where its strengths can be aligned with corporate goals.

Most recently, IS has turned its attention to the plant floor, developing a suite of applications that allows production people to monitor and control work in progress.

7 Deere & Co.

By the time the recession hit Deere's agricultural and construction equipment businesses full force, IS was already fortified against the impact. Major investments in manufacturing resource planning, engineering and commercial systems over a 10-year period had improved efficiency. And Deere had recently wrapped up a worldwide networking project to integrate its mainframe and engineering workstations via Ethernet. "Now all of our plants have access to the same data," says R. D. Sonnenburg, director of computer IS.

Thus, Deere, which forecasts $202 million in IS spending this year, felt comfortable last February in turning down a proposal to outsource its data processing and worldwide communications to IBM.

"We've done a lot of competitive benchmarking," Sonnenburg says, "and we believe we are doing it cheaper."

DEFINING REALITIES

BUDGETS
Roughly half of these companies experienced a decrease in IS budgets last year. This trend is expected to be repeated in the coming year.

PRESSURES
IS departments in these industries are being asked to trim their own costs and supply systems that will reduce operating time and costs to market.

ORGANIZATIONAL CHANGES
Three quarters of these companies plan to merge or consolidate their operations by 1993. About half of the companies already have centralized operations. The remaining companies have both centralized and decentralized operations.

PLATFORM CHANGES
Well over three quarters of these companies say they plan to install proprietary systems within the next year.

8 Paccar, Inc.

At Paccar, the recession drove home the need to diversify. More than 80% of the corporation's business hinges on diesel truck sales, which tend to be cyclical.

IS general manager Bruce Carlson says his 360-member department is doing its part to further the company's diversification efforts, which have brought it into new areas such as after-market truck parts retailing, financial and leasing services.

Carlson says the department's $10 million in capital spending on software focuses largely on automation of the retail operation. Paccar has invested in EDI to improve order processing in both the retail and the mainstream truck businesses, and investments are being made in retail point-of-sale systems and electronic catalogs. Efforts are also under way in the computer-aided design, manufacturing and engineering areas.

9 Trinity Industries, Inc.

What's the good news about being the manufacturer of a product that has had soft sales for two years? Well, if you make a really big-ticket item such as railcars and orders have been off for that long, about the best you can hope for is a unique selling advantage so that you can capture a healthy share of whatever business there is. That's what Trinity Industries has managed to achieve. With some help from IS, the company has made itself into the market's lowest cost producer, with 50% of the industry's productive capacity.

Analysts expect demand to begin rebounding in the coming months as older rail cars are scrapped at accelerating rates — but better times ahead are not likely to cause the IS group to start spending wildly on new systems. This department has long hewed to a "conservative" systems philosophy that emphasizes financial discipline over leading-edge technology. There is probably a lot more mileage in those IBM Application System/400s.

10 Ingersoll-Rand Co.

After two lean years, this $3.6 billion maker of ball bearings, air compressors and other heavy equipment is cutting back on just about everything, including its 600-member IS group. George Tabback, director of corporate IS, says spending, which equaled 1.7% of revenue last year, is expected to fall as a percentage of the top line.

But Tabback still has ambitious projects on his plate, such as installing virtual networks to support Ingersoll-Rand's European expansion and implementing Pansophic's BPCS to help integrate manufacturing, distribution and financial functions.

Tabback says moving from the mainframe to the AS/400 and more packaged software could bring a big savings. In the UK, he says, 50 people supporting a mainframe have been replaced by 24 people supporting three AS/400s. ■

Meister is a free-lance writer based in Jackson Heights, N.Y.

Breaking the mold

Companies concentrate on strengthening the customer link

BY EMILY LEINFUSS

Manufacturers in the U.S. can't afford to be complacent: Worldwide recession is causing many customers to sit on their hands, and fierce competition has made raising quality an imperative and raising prices a near impossibility.

In many cases, small, incremental changes just aren't enough to move buyers or hold off the competition. Whole processes have to be reworked to gain new efficiencies. The supply chain has to be shortened and streamlined. Inventories have to be lowered, rework reduced and costs brought under control. Basically, the whole production structure must be reshaped. All of this requires aggressive and innovative use of information systems.

This will not be an easy job because U.S. manufacturing's worst enemy is often its own internal rigidity, according to Martin Ressinger, an analyst at Duff & Phelps, Inc. in Chicago. "Internal struggles based on old lines of power keep these companies from making obvious structural and cooperative changes," Ressinger says.

At leading-edge manufacturing companies where changes are being made, IS organizations are providing not only technology expertise but also assistance with process reform.

The *Premier 100* companies are also asking their IS organizations for the means to forge strategic partnerships with key customers. At Cone Mills Corp., for example, IS works hand-in-hand with the retail apparel industry to develop standards for quick-response, real-time linkage.

Customer satisfaction has become almost a religion at all of these companies. Providing customers with links into their systems is a priority at most of the Top 10 manufacturing firms because it allows a faster, easier response to customer needs and stengthens the ties that bind them.

Profitability now depends heavily on operating margins. For that reason, much attention is being paid to linking operations with business systems to provide a consistent set of numbers for everything from marketing analysis to automated inventory control. A case in point is Eastman Kodak Co., which has made integration its No. 1 concern.

Now, management is demanding cost accountability and maximum investment effectiveness. IS is responding to this trend by benchmarking best practices within the industry and focusing on improving quality. Cost control measures include eliminating non-value-added expenses.

Globalization is also an area of concern for IS groups in manufacturing. For example, industry leader Kimberly-Clark Corp. is spending $5 million to $7 million to redesign its telecommunications infrastructure to enhance point-to-point communications among customers, manufacturing and distribution sites.

INDUSTRY LEADERS

1. **D. James Guzy**
   V.P., MIS
   Kimberly-Clark Corp.
2. **Harvey R. Stendahl**
   V.P., IS
   Corning, Inc.
3. **Carl A. Kalmoyer**
   V.P., Administration
   3M Co.
4. **H. William Howard**
   CIO
   Inland Steel Industries, Inc.
5. **Paul Vetter**
   Director, IS
   Cone Mills Corp.
6. **James A. Stutts**
   V.P. (Fieldcrest Cannon)
   Amoskeag Co.
7. **Candy Obourn**
   Director, IS
   Eastman Kodak Co.
8. **Bernie Campbell**
   V.P., IS
   Sonoco Products Co.
9. **A. L. Hyland**
   Director, Worldwide Systems
   Polaroid Corp.
10. **Walter N. Bangoon**
    V.P.
    Bethlehem Steel Corp.

1 Kimberly-Clark Corp.

Faced with maturing U.S. markets, fierce challenges in its major product lines and growing European competition, Kimberly-Clark is using technology to gain an edge. Key objectives include reducing order cycle time, improving customer service and generating customer-specific data for targeted marketing and merchandising. Working closely with Chief Executive Officer Wayne Sanders,

KIMBERLY-CLARK'S SANDERS *uses IS to cut order cycle time, improve customer service, guide marketing efforts*

former Chief Information Officer John T. Kohler used IS to speed electronic ordering across the board. His initiatives punched up domestic order processing and inventory control.

Kohler left the Neenah, Wis.-based paper and fiber products innovator in July to start a consultancy.

Next year, under the direction of new CIO D. James Dull, there will be a major emphasis on communications. The redesign of the firm's telecommunications infrastructure reflects the global nature of its business.

2 Corning, Inc.

Harvey Shrednick, Corning's vice president of IS, is charged with making quality improvement at the diversified manufacturer a reality. The company is banking on total quality management as its first and most powerful weapon against the competition. The Corning, N.Y.-based company, makes aggressive use of technology to track and analyze its quality programs.

Another initiative is revamping internal systems to boost office productivity and team effectiveness.

3 3M Co.

The IS strategy of 3M Co., a diverse global manufacturer, centers on the power of the personal computer at home, the economics of centralization abroad and electronic data interchange (EDI) worldwide. This year the St. Paul, Minn.-based office equipment and supplies company pursued distributed computing with a vengeance, configuring PCs and servers to connect directly to mainframes and cutting out the midrange processor.

This shift gives more capability to end users and brings computer power closer to the action. Improvements in telecommunications in Europe and the European Economic Community movement spurred 3M to plan consolidation of its 18 computer centers into five during the next few years.

CHALLENGES

- Process improvement
- Order management applications
- Retailing application development

KEY TECHNOLOGIES

NOW
- EDI
- On-line customer service
- Product scheduling

NEXT FIVE YEARS
- EDI
- CIM

4 Inland Steel Industries, Inc.

Competition from overseas manufacturers and domestic mini-mills has forced Inland Steel in East Chicago, Ind., to tighten its belt. For IS, this means emphasizing improved use of existing technology. Recently, IS staffers took a look at how departments actually used reports, eliminating some and tailoring the useful

PHOTOGRAPHY BY REID HORN

ones to the particular requirements of each set of users.

Inland Steel is also developing a long-term architecture based on smaller and more open systems, operating in a client/server mode. This puts more power in users' hands.

5
Cone Mills Corp.

Cone Mills, based in Greensboro, S.C., is on the verge of a public stock offering and in the middle of a market expansion. Because the textile supplier to the retail apparel industry is growing faster internationally than domestically, it is looking at videoteleconferencing techniques and high-speed networks that will connect it more effectively with Europe.

During the past year, Paul Vetter, director of information services, initiated a drive to move all key internal systems to real-time through re-engineering and the use of high-speed networks.

Heavily committed to EDI, the textile and apparel industries are working together to develop standards for nomenclature at a technical level.

6
Amoskeag Co.

Boston-based Amoskeag's major IS investment lies in its largest holding, Fieldcrest Cannon, Inc., the country's sixth largest textile manufacturer. Other holdings include real estate and a Maine railway, Bangor and Aroostook Railroad, which services paper companies.

Fieldcrest claims a 50% share of the U.S. towel market and 20% of the sheet market. The company's IS initiatives have included helping to incorporate a series of rapid expansions and acquisitions over the past decade, as well as embarking on major plant modernization programs.

Buffeted by the recession and overseas competition, Fieldcrest is trying to reduce debt and cut operating expenses, laying off 1,100 workers last year.

In 1988, the company formed three divisions with separate corporate managements and sales forces for faster response to customer needs, but they continued to share manufacturing facilities. Towel-making plants are being upgraded in a five-year, $250 million modernization project to increase efficiency. Analysts say that if Fieldcrest can slim down its debt and expenses, it will be well-positioned to be strong when the recession lifts, and efficient IS operations will be a key component of that strength.

DEFINING REALITIES

BUDGETS
Less than half of these companies expect their budgets to change by 5% or more in 1993.

PRESSURES
Producing a continuous stream of new products. Rapid technological growth.

ORGANIZATIONAL CHANGES
Most companies have a mix of both centralized and decentralized operations.

PLATFORM CHANGES
A large majority of companies plan to install nonproprietary systems in the next year.
Less than half plan to downsize from larger platforms to smaller ones.

7
Eastman Kodak Co.

New IS chief Candy Obourn's title says it all. As vice president of IS and business processes, Obourn has set out — with the help of Kodak's outsourcing partner, IBM's Integrated Systems Solutions Corp. — to transition the Rochester, N.Y.-based company's core businesses to client/server computing and re-engineer business processes along the way.

After two successful pilots, Kodak recently began full-scale implementation of a software system that integrates order processing with manufacturing, financial distribution and operations.

The main business objectives include reducing cycle time and errors in manufacturing and order processing and providing a more comprehesive view of current financial and operations conditions for decision-making and planning. Re-engineering the core businesses will take five to 10 years.

The company has also reduced its infrastructure cost and number of IS workers by about 10% during the past year through early retirement.

8
Sonoco Products Co.

As Sonoco shifts from a large, domestic paper packaging manufacturer to a global supplier, IS management at the Hartsville, S.C., firm is devising a consistent IS architecture that will not only cross cultures but also permit the merging of administrative, product, marketing and logistical data from many locations. The systems environment, which will have to cope with more product variety and shorter product lifetimes, will likely be based on a mixture of Digital Equipment Corp. VAXs and IBM Application System/400s and PCs.

Bernie Campbell, vice president of corporate information services, considers those changes just a starting point. "Once you have core systems, then you can look at creative ways of using the information."

9
Polaroid Corp.

Integration is the operative word at Polaroid. The photographics products company, based in Waltham, Mass., is beset by intense global and domestic competition. IS' response is to increase decision support capability while reducing overall costs.

Polaroid's director of worldwide systems, A. L. Hyland, is moving applications to common platforms and operating systems. Key technologies include relational database management systems, such as IBM's DB2 and The Ask Cos.' Ingres, local-area networks and Unix.

10
Bethlehem Steel Corp.

In an industry in which none of the major manufacturers are running at more than 75% to 85% capacity, you have to be efficient. Bethlehem Steel in Bethlehem, Pa., is determined to be efficient. It is using IS to manage inventory levels and production for maximum profitability.

This charge is led on four fronts: better data management, enhanced connectivity, more "user-friendly" software and better software integration. ■

Leinfuss is a free-lance writer based in Sarasota, Fla.

Down to fighting weight

Less is more as leading users battle recession

▶ BY CHERYL GOLDBERG

INDUSTRY LEADERS

1. **Charles Bowerman**
   Executive V.P. and CIO
   Phillips Petroleum Co.
2. **Donald S. Pfeile**
   V.P., Corporate IS
   The Dow Chemical Co.
3. **Dan Irvin**
   V.P., Technology, Manufacturing, IS
   FMC Corp.
4. **Paul R. Jones III**
   Director, Corporate IS
   Unocal Corp.
5. **George-Anne Bebo**
   Manager, Corporate Information Resources
   Union Texas Petroleum Holdings, Inc.
6. **Leonard A. Cohn**
   V.P., Corporate MIS
   Monsanto Co.
7. **Guigo R. Paulsen**
   CIO
   Ashland Oil, Inc.
8. **David A. Dilsaver**
   CIO
   Rohm and Haas Co.
9. **Ken Rohm**
   Vice President, IS
   NERCO, Inc.
10. **Peter W. C. Mather**
    V.P., IS
    Air Products and Chemicals, Inc.

KEY TECHNOLOGIES

NOW
- Seismic processing
- LAN operations

NEXT FIVE YEARS
- Client/server systems
- LANs
- RAID storage

PHILLIPS PETROLEUM'S *IS manager Jim Gottardi moves IS closer to users*

Rightsizing, recession and recovery are the main challenges to the petroleum and chemicals industries. Information systems teams face a daunting task: adapt technology to make their firms more cost-effective in the face of dismal business conditions. Although a gradual economic recovery is expected to help pull the chemicals industry out of the doldrums, petroleum companies have been pummeled by falling demand, high exploration costs and low prices, and they may not see a turnaround for some time.

Both industries see the strategic advantages of implementing information technologies. However, the petroleum industry cut IS budgets by an average of 2.2% in 1992, and chemical companies increased theirs by a scant 0.8%, according to a recent survey by CSC Index, Inc. in Cambridge, Mass.

IS efforts to make order fulfillment, manufacturing and distribution systems more effective are part of an overall plan in many companies to create a system that manages the flow of materials from the time an order is placed to when it is shipped to achieve 100% on-time delivery to customers. Refineries are also looking at ways to integrate manufacturing functions.

Where possible, companies are moving applications from mainframes to lower cost minicomputer- and personal computer-based local-area network platforms and are giving control of the systems to individual business units. This trend is allowing business units to explore decentralized decision-making. The decentralization trend is key for the No. 1 company in this category, Phillips Petroleum Co. The firm's mandate is to

PHOTOGRAPHY BY ALAN LEVENSON

DEFINING REALITIES

BUDGETS
Cutbacks have been common. In many instances, budget reductions exceeded 10%.

PRESSURES
Companies will make greater use of systems integrators to control costs. Fifty-six percent of the top companies surveyed said they would increase this service, more than any other industry category.

ORGANIZATIONAL CHANGES
Data center consolidation is rife in this industry. In fact, this industry had the highest percentage of consolidations last year.

PLATFORM CHANGES
Many companies are planning on downsizing, citing system effectiveness as a primary concern. More than half are sticking with proprietary systems.

CHALLENGES

- Integration of CASE technology
- Managing more work with same resources

decrease its budget and distribute part of its programming staff from a centralized mainframe environment to decentralized business unit teams. The move was designed to allow users greater control and access to system resources.

1
Phillips Petroleum Co.

Celebrating its 75th anniversary this year, Phillips Petroleum is the ninth-largest integrated petroleum company in the U.S. Hard hit by the recession and the fall of oil and gas prices, the Bartlesville, Okla., company has trimmed its 22,700-person work force by 1,200 and has reduced its overall capital budget by about 16% from 1991. IS has not been spared: Its budget took a 20% hit, dropping to $183 million.

Faced with these challenges, the IS organization is moving technology closer to users. Some of the IS work load and programming staff will be moved from IBM 3090 mainframes to IBM RISC System/6000s and Sun Microsystems, Inc. SPARCstations. The move, currently for software development and scientific applications, will save mainframe cycles and help the company defer future mainframe upgrades.

Because programmers won't have to wait for the mainframe and can use workstation-based development tools, Phillips expects the move to improve programmer productivity.

2
The Dow Chemical Co.

As a commodity chemical company, Dow in Midland, Mich., has been hit particularly hard by the recession. Cost cutting, therefore, is the order of the day in IS.

During the past five years, Dow has been working to make IS more efficient by integrating systems across the entire company. For example, it has linked all applications relating to the order life cycle — from the original order entry to production to distribution — into a companywide financial management system.

The system lets Dow provide real-time information to customers about the status of a product they have ordered or are thinking about ordering, no matter where it is in the process.

3
FMC Corp.

Mixing technology savvy with a business diversification strategy, Chicago-based FMC was one of the few chemical companies to post gains during the past year. Net income rose 18% between the first quarters of 1991 and 1992.

Nonetheless, FMC is continually looking at ways to reduce costs. The company has trimmed the number of IS workers by about 10% during the past few years by automating and consolidating operations.

To save utility costs and improve data accessibility, FMC is implementing a private telecommunications network in Europe, which is an extension of its U.S.-based wide-area network.

4
Unocal Corp.

Returning to its core businesses has caused Los Angeles-based Unocal's IS organization to downsize its systems to save $9 million this year and make applications more accessible.

A sell-off of divisions has prompted Unocal to consolidate three data centers into one by the spring of next year. Between 1990 and 1992, IS staff will be cut 20%, with many of the remaining workers organized into cross-functional teams. Such a team may include people on the help desk, who handle a variety of areas such as network management, mainframe operations and PCs.

To help geophysicists obtain better access to seismic information for exploration, Unocal is migrating the applications on its IBM Enterprise System/9000 Model 820 to a Convex Computer Corp. 3840 minicomputer connected to 100 Sun SPARCstations.

Other initiatives include consolidating the management of the company's WANs and using multimedia to develop just-in-time training systems to provide workers with timely, relevant information.

5
Union Texas Petroleum Holdings, Inc.

Union Texas Petroleum's IS organization has maintained a high level of effective service despite an earthshaking downsizing effort that has seen the company sell off three of its major U.S. operations to concentrate on international exploration.

The work force at the Houston-based company has been cut by a drastic 65%. Not surprisingly, IS saw its budget slashed from $12 million to $6 million between 1991 and 1992, with another $2 million in cuts expected next year. The IS staff has been cut by 60%.

The secret to maintaining strong IS services in this environment, says corporate IS manager George Anna Bobo, is a combination of outsourcing and placing more services under the control of users.

For example, payroll functions have been outsourced, and IS plans to replace its IBM 3090 with a Digital Equipment Corp. VAX 4000/500 early next year.

The company is also migrating some systems, such as human resources and international accounting, to PC LANs. Data access for ad hoc reporting has been

shifted from the IS group to individual departments, which cuts the need for IS support in half.

6 Monsanto Co.

Unlike many of its *Premier 100* peers, Monsanto's IS organization has the luxury of doing more with more. The chemical group at the St. Louis-based company saw its operating income increase 5% in the first quarter, which allowed the IS budget to swell by 10% this year.

Monsanto's technology investments are aimed at improving such global decisions as determining which plant is best for manufacturing a particular product or where in the world to obtain the most favorable interest rates.

Monsanto is also devising a list of corporatewide standards of preferred vendors, software packages and operating systems. Implementing these standards will help Monsanto get better pricing through volume purchases and minimize training costs.

7 Ashland Oil, Inc.

After selling a number of subsidiaries that didn't fit its mix, Ashland Oil in Russell, Ky., is beefing up its areas of strength — chemicals, Valvoline automotive products and SuperAmerica convenience store divisions. During the past year, Ashland acquired Unocal's chemical business, and Ashland's Scurlock crude oil division acquired Permian Corp.

Ashland's IS organization is charged with quickly integrating the new acquisitions into the fold. A major task of this effort is to incorporate them into the shared corporate data center that provides telecommunications and mainframe resources for all divisions.

In addition to this strong central approach, the divisions each pursue respective rightsizing efforts, moving as much software development as possible off the mainframe to a PC platform. Such rightsizing may involve moving to PC LANs as well or to IBM Application System/400s connected to the central mainframe for client/server computing.

CHEMICAL AND PETROLEUM FIRMS *focus on improving efficiency of production*

8 Rohm and Haas Co.

Philadelphia-based Rohm and Haas has responded to the lows in the chemical industry by getting down to basics: customer service.

Although the company's diversified specialty chemicals business — plastics, agricultural chemicals, polymers and resins — produced earnings of $59 million for the first quarter of 1992, up from $41 million for the same quarter last year, the company wants to do better by providing customers with 100% on-time delivery.

This is the goal of a $10 million materials management system that will integrate order processing, materials management and manufacturing for the company on a worldwide basis. The materials management program, STSC, Inc.'s Logistics Plus, will help Rohm and Haas forecast demand to determine the materials needed to meet production schedules.

9 NERCO, Inc.

NERCO suffered a first-quarter loss of $178 million because of an 18% nosedive of natural gas prices in February (the lowest level in 12 years) and wants to cut costs wherever possible.

That includes plans to replumb and consolidate its computer operations. The idea is to invest now to lower per-unit production costs for a leaner and meaner future. The company's new architecture is based on an open systems environment, with DOS and Microsoft Corp. Windows-based PCs linked via Novell, Inc. LANs, which are tied to Unix-based Sequent Computer Systems, Inc. S2000s and Sun SPARCstations and servers.

On this platform, NERCO is consolidating the accounting applications for its three divisions — oil, gas and minerals — under Oracle Corp.'s financial software running on a server.

10 Air Products and Chemicals, Inc.

Air Products and Chemicals' emphasis on specialty chemicals, which suffered less during the recession, combined with the company's gas contracts, which are longer term "take or pay" agreements unaffected by quarterly demand cycles, helped the company stay competitive and post a modest 2% first-quarter profit.

The Allentown, Pa., firm's widely respected IS organization is redistributing many of its centralized resources to three main business units. ■

Goldberg is a free-lance writer based in San Francisco.

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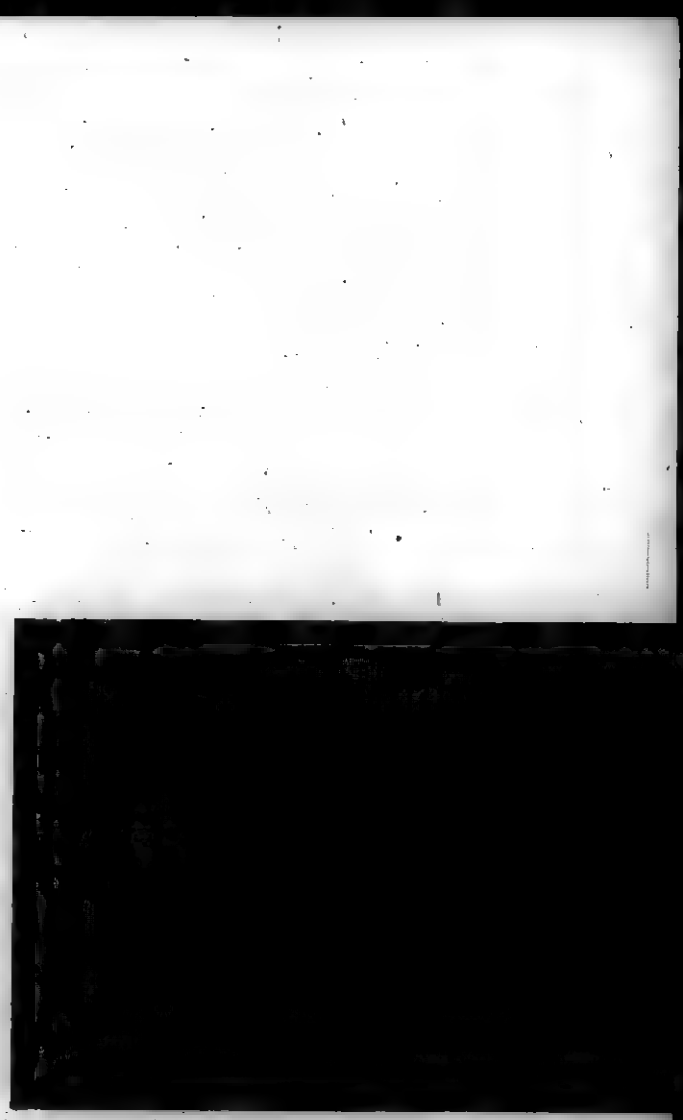

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Pharmaceuticals and Food

Spending for the future

Companies take advantage of a buyers' market

▸BY DANIEL LYONS

Recession or no, pharmaceuticals and food companies have continued to invest heavily in information technology in 1992. On average, drug companies will spend 7.3% more on technology this year than last — more than double the 3.5% average gain for all industries, according to CSC Index, Inc.

By increasing spending during the recession, drug companies have been buying technology and consulting services at lower costs, positioning themselves for a competitive advantage when the recession ends, says Michael Hawotte, a director at A. T. Kearney, Inc.

Drug companies are hot for technologies such as videoconferencing to save on travel and imaging to speed document processing time. There's one overriding goal behind almost all investments, however, and that is this: Compress the product cycle, says Peter Kirn, managing partner of the pharmaceuticals industry practice at Andersen Consulting in Chicago. "On average, it takes 12 years and $250 million to bring a drug to market," he says.

On the manufacturing side, pharmaceuticals companies are looking to improve yields by raising quality or volume — or both. "I had a client tell me once that if he could raise the yield on a product by 0.5% it was worth $10 million a year to him," Hawotte says. The ultimate, but still hypothetical, manufacturing environment is a "lights-out" operation.

As for marketing, pharmaceuticals companies are launching more joint ventures with one another, requiring better coordination of sales force automation programs and customer service streamlining.

Increased efficiency is also the name of the game in the food industry, chiefly on the marketing and distribution side of the business.

By developing tight electronic data interchange (EDI) links with grocery stores, for example, food manufacturers can provide just-in-time shipments to outlets, thereby reducing inventory and shipping costs. Still, storefronts have been slow to adopt EDI technology.

That's mostly because distributors and resellers still see EDI as a one-way street: It helps manufacturers, but the benefits to consumers and retailers have not been shown. "Technology can monitor what is actually happening in a store vs. what we think is happening. Down the road, it may even tell us what consumers want," says Glenn Terbeek, managing partner of the food and packaged goods industry program at Andersen Consulting.

1 Merck & Co.

Perhaps the biggest computer-related event at Merck in the past 12 months was the Nov. 1, 1991, appointment of Charles Popper, a former partner at Deloitte & Touche, to run Merck's worldwide computer operation.

The challenge, as Popper sees it, is to find ways to deliver products more efficiently. "We're facing fundamental changes in the marketplace in

INDUSTRY LEADERS

1. **Charles Popper**
   V.P., Computer Resources
   Merck & Co.
2. **Robert Lyons**
   V.P., Corporate IS
   Schering-Plough Corp.
3. **Roland Cyr**
   V.P., Information Technology
   Becton, Dickinson & Co.
4. **Vincent H. Sweyer**
   V.P., Corporate Systems
   Sara Lee Corp.
5. **Lyle T. Bosacker**
   Director, Corporate IS
   International Multifoods Corp.
6. **Allan B. Dooling**
   VP, MIS
   Pepsico, Inc.
7. **Alex Gibbons**
   Corporate Director, IS
   Bristol-Myers Squibb Co.
8. **Jack R. Loughran**
   V.P., Information Resource Management
   Upjohn Co.
9. **Kenneth Farmer**
   V.P., MIS and Administration
   Abbott Laboratories
10. **Ron Morris**
    CIO
    Johnson & Johnson

CHALLENGES

- Networking
- Decentralization
- Quality improvement

KEY TECHNOLOGIES

NOW
- EDI
- Telecommunications
- Shipment and tracking systems

NEXT FIVE YEARS
- Client/server systems
- RAID storage
- EDI
- Groupware

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CHARLES POPPER: *'We're facing fundamental changes in the marketplace'*

terms of price pressure, demands for better service and finding ways to deliver our products more efficiently," he says.

Merck, an $8.6 billion pharmaceuticals giant, placed No. 1 in last year's *Premier 100*, too. The company will spend $230 million on information technology this year. Major outlays include the recent acquisition of a Cray Research, Inc. YMP supercomputer to replace an IBM 3090 for computational chemistry.

The supercomputer will add "substantially more capacity to use molecular modeling techniques in support of research," Popper says.

Merck is redesigning its clinical research program and re-engineering its worldwide networks to reduce the time it takes to bring products to market. Merck continues to automate its manufacturing plants to improve yields. "We're moving toward computer-integrated manufacturing. We have automation in a number of plants," Popper says, "but it's a multiyear effort to get to a more complete level."

2 Schering-Plough Corp.

Schering-Plough jumped from eighth place in last year's *Premier 100* to second place this year. The Madison, N.J., company has increased its focus on developing applications for sales and marketing, including new local-area network-based systems and sales force automation programs that should improve its relations with customers.

In an effort to contain costs, the $3.6 billion company has not increased its IS staff this year. Schering-Plough's IS budget will be $67 million this year, a gain of about 10%. The company makes pharmaceutical and consumer health care products.

3 Becton, Dickinson & Co.

Globalization is the mobilizing trend at Becton, Dickinson this year. The $2.2 billion company is rolling out a set of common applications — such as order management, sales, financial reporting and accounting — on a worldwide basis, using frame-relay technology for data communication.

The idea is to improve the consistency of data across the organization. "Our key objective is to be able to communicate, consolidate and provide easy access to information on a worldwide basis," says Roland Cyr, vice president of information technology.

The Franklin Lakes, N.J., company is also expanding its global communications network, installing videoconferencing facilities at 13 sites, with plans to add five more. This is crucial technology because the company is flattening its structure and building teams to manage each of its 11 major product lines. Team members may be from sales, marketing and research staffs in centers all over the world.

Later this year, the company will roll out a worldwide human resources database. The IS budget is $58 million, up 16% from $50 million last year.

4 Sara Lee Corp.

Less is more, according to the IS recipe at Sara Lee, which is migrating from mainframes to microcomputers.

"Our intent is to exploit the capability of the micro," says Vincent Swoyer, vice president of corporate systems. "We're already using it in mission-critical applications."

Only one mainframe application survives in the corporate offices from five years ago. Everything else — all tax work and financial consolidation, for example — is done on personal computers.

Manufacturing work has already shifted from mainframes to Digital Equipment Corp. and IBM minicomputers; Swoyer says that eventually those applications will migrate to microcomputers again.

The Chicago-based company has more than 3,000 IS people worldwide. Many are being retrained in

PHOTOGRAPHY BY DAVID ZIOL

client/server technology.

The company's IS budget this year will be $138 million, of which 45% will be spent on the IS department's 1,400 staff members. About 4.5% of the budget will go toward training. The company has 108,000 employees and 30,000 PCs.

5 International Multifoods Corp.

Based in Minneapolis, International Multifoods is a $2.2 billion food processing company. This year's IS budget is $11 million, of which $4 million will be spent on the company's 140 IS staff members, and $100,000 will go toward training users.

International Multifoods has 1,500 PCs and $4 million worth of major processors.

6 Pepsico, Inc.

Ray Charles isn't the only one singing the praises of Pepsi. Ranked 10th in its industry in the *Premier 100* last year, Pepsico, based in Purchase, N.Y., leapt to the No. 6 spot in 1992. Uh-huh.

To improve productivity, Pepsico's top brass has emphasized "empowering" its employees this year. And though the company is pushing more responsibility out into the field, it is also pushing technology.

In March, the $5.9 billion company made a substantial minority investment in a Denver company, Carts of Colorado, Inc., which has developed a "smart" vending cart that can relay sales information via telecommunications and computing equipment to a central location.

Pepsico will deploy the carts at schools, ballparks and shopping malls, stocked with food from its Taco Bell restaurant chain. The company is also outfitting its Canadian truck drivers with handheld computers to relay sales data. The program began in the U.S. several years ago.

7 Bristol-Myers Squibb Co.

The beat goes on at Bristol-Myers Squibb, thanks in part to Pravachol, a drug that fights heart disease. Pravachol, which won FDA approval last fall, is expected to be a blockbuster that will buoy profits at Bristol-Myers Squibb for the next few years.

In response to pressure from customers, Bristol-Myers Squibb this year said it would cut the prices it charges federal health programs by at least 12.5%. The company will try to make up the differenee by raising consumer prices and increasing volume sales to federal agencies. Efficiency gains through technology will play a vital role in this plan, says Alex Gibbons, corporate director of information services.

The total IS budget in 1992 is $209 million. With sales of $11.3 billion, the New York-based firm is, after Merck, the second largest pharmaceuticals firm in the U.S.

DEFINING REALITIES

BUDGETS
Half of the IS departments in this group had more money to spend last year, and half expect an increase next year.

PRESSURES
More than two-thirds of the leading companies reported they will consider outsourcing all or part of their IS operations in the coming year.

ORGANIZATIONAL CHANGES
More than half of these companies plan to merge or consolidate a data center in the coming year.

PLATFORM CHANGES
Changes have been minimal. This industry remains a bastion of large systems.

8 Upjohn Co.

Upjohn, based in Kalamazoo, Mich., is trying an experimental marriage of marketing and IS. Last year, the company moved Ralph Feldt, an executive in worldwide marketing, into IS, with two goals: to teach IS staff members ways to market themselves internally and to help business managers learn to use IS services.

The move comes at a critical juncture for Upjohn. The $3.4 billion pharmaceuticals giant faces patent expirations on several key drugs, as well as problems with Halcion, its sleep medication.

Some say the drug has dangerous side effects; Upjohn insists that Halcion is safe. So far, the FDA agrees with Upjohn.

9 Abbott Laboratories

In June, six months after winning FDA approval for temafloxacin, a key new antibiotic, Abbott withdrew the product because of adverse reactions among patients.

But the Abbott Park, Ill., pharmaceuticals leader probably won't even break stride. The company posted record sales of $6.9 billion in 1991 and is considered strong because of the diversity of its product lineup, which includes Selsun Blue shampoo and Similac infant formula.

Ranked among the Top 10 in its industry for the past four years, Abbott's IS strategy includes investments in an automated purchasing network and the sale of its own health care planning and marketing software.

10 Johnson & Johnson

Decentralization is no mere technological Band-Aid at Johnson & Johnson. It is at the heart of the company's culture. As new products are created, a new operating unit is dedicated to producing and marketing them. The role of IS in this environment is to support the efforts of the business units and keep centralized functions to a minimum.

The pharmaceuticals and consumer products company, based in New Brunswick, N.J., posted sales of $12.4 billion in 1991. Approximately $231 million will go to IS this year. A major initiative is the installation of a worldwide videoconferencing network.

The network, based on Integrated Services Digital Network, will eventually link 36 locations. It will reduce travel time and expenses as well as keep information moving more smoothly throughout the organization. It will also help the company communicate better with its customers and suppliers, says Ronald Morris, vice president of information technology. ■

Lyons is an Ann Arbor, Mich.-based freelance writer.

Luring consumers with conspicuous efficiency

Limited but well-targeted spending pays off

BY LUCIE JUNEAU

BOB MARTIN *heads IS at Wal-Mart, a leader in inventory management*

The spend-what-you-earn Eighties have turned into the frugal Nineties, and retailers, as well as their suppliers, are feeling the chill. Even supermarkets are hurting. "You normally think of trading down as buying hamburger instead of sirloin, but this time we have seen the consumer go straight from sirloin to pasta," says Joseph C. Ronning, a retail analyst at Brown Brothers Harriman & Co., a New York investment research firm.

To survive, retailers are clinging to the tried and true: great service and lower prices. To offer the lower prices consumers demand, retailers must rein in expenses. That's where technology comes in. Many retailers are implementing inventory management systems, which cut overhead costs and prevent loss of customers because of low stocks of high-demand items. Nordstrom, Inc., for example, is rolling out an item inventory system that includes the use of radio frequency universal product code (UPC) scanning devices and touch-screen personal computers to help merchandisers make smarter buying decisions and allow them to monitor the unexplained loss of goods.

Continued on page 40

KEY TECHNOLOGIES

NOW
- EDI
- On-line customer service
- Inventory management systems
- Data management tools

NEXT FIVE YEARS
- Wireless data networks
- Order and supply-chain applications
- Open systems

INDUSTRY LEADERS

1. **Bob L. Martin**
   Executive V.P. and CIO
   Wal-Mart Stores, Inc.
2. **G. A. Carlson**
   President, Sears Technology Services
   Sears, Roebuck and Co.
3. **Andrew McKenna**
   Senior V.P., IS
   The Home Depot, Inc.
4. **Vincent Walker**
   V.P.
   FoxMeyer Corp.
5. **Malcolm Wilhite**
   V.P., IS
   Dillard Department Stores, Inc.
6. **David M. Carlson**
   Senior V.P., Corporate IS
   Kmart Corp.
7. **Denny Steele**
   Executive V.P.
   Bergen Brunswig Corp.
8. **C. Ray Rasbeary**
   V.P., IS
   Winn-Dixie Stores, Inc.
9. **Dennis Healey**
   V.P., MIS
   Toys R Us, Inc.
10. **Charles T. Mitchell**
    DP Manager
    Nordstrom, Inc.

PHOTOGRAPHY BY KENT HANSON

Of course,

your applications run on Sun.

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XDP	Wordperfect 5.0	Analog Design & Analysis System	GASYS	S-PROCES 2S	APT Workbench
Imageflow	Sun LATE	Sharps 5000	Fuzzy-C	FOCUS	
ATW	TT3	GDS	ANVIL	GDS CAD	
Interleaf 5	GHOSTSCRIPT	SCARAGON	STELAE III	PinDaro Plus	
EDDAS	Autor*x	GlasStation	FrameMaker 3.0	GDS DMF	
IES	20/20	ASPEN PLUS	SITE	SAS/IC Software	
Adobe	Cannon Bresee	Prophecy	Smalist 5	MultiValue	PICOSPOINTE
LOGISCOPE	Editor Vada	SAS	Spss Statesda	MOOG	AP*DSL
Quantum	Image Station	GOOSY	Gamap	PinDat	ProductSFX
TIBS	IBM PCSS	PS Partner for	SVDSL	Tapin	SAS Systems
II Word	PDD TRANSIT	UNIX	TimerTask	LANBOARD	PICONCEPT
ABAQUS	DASA	RealTime MPS	Image-Pro	Risk Manager	Windriver
BARRIER	TOMS	XTools	Visualization	HELIX I	EDDOS
BusterFlex 32	GLOS	OFFICE POWER	Workbench	SPSS Emulation	Sybase
FEAP	POLYBRAF	T.S.P.S.	VS-1501	SCICARDS	GA-Simplex
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TESCS	FU-WAVE	Caterbar	CGM-View	PHOSMA	Empress
Qwrte Tracker	Teamwork	TBA SUPERS-3	VLPS	Vanguard	GASIS
TMARK	Looking Glass	Ultratel	EMVel	ARIES	Desktop Power
TruFax	CDC	Arbortext	UNI Track	FIX Planning	Ingres
ActorPLAN	EDDOSA	Publisher	XVT	CHAMBERA	ACS
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CADDS	UNIGRAPHICS	ProcessSavy	ALEX	SAS/AF	Gupta
Innovision	SynaNet	Express/AIS II	MicroFocus	Software	SUVISION
Expro	FATRAN	EPIC	CGDDL	GDS CAM	GADKEY 4
Informix	GLOSS	Trader VIS	GS	GDS CAM	GDS CAD3D
Rosanic 2000	EPFIX FRAMER	Belvedere	INFORMIX-SET	Digital Photo	Personal Designer
Sulphur	VIBL System	Finance	Prolog	VERSANT	PRECHANDEE
Business Software	Shareliber	UNI Plus	AP*SQL	Cleverleaf	VersaCAD
RADS	EDDOSIT	Fit*SQL	MediaStation	SI-3000	TeamworkRT
APSC EXPER-DUCT II	Arts & Letters Composer	PowSon Accounting	GNTES C++	SAS/OR Software	ADAS
HVAC Sizing	ANALYST	Scale Then	EDDOSNET	Beta*Workbench	TeamworkSSA
GPSS	WordBASIC	SilverCASE	Amplify Control	G-MAN	GDS OUT
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FIMS	Express	II Word +	EDDOSNET	Oracle*Basi	ACCELAP
TRAM	SERVER	SEET ACCESS	Sigmax	SQL*Net	Plan
Lightwave	MathCAD	ASTOMSI	Silex	SWIFT 3000	Series 5000
		Synsis	Technology		GlobalView
					To-Solid

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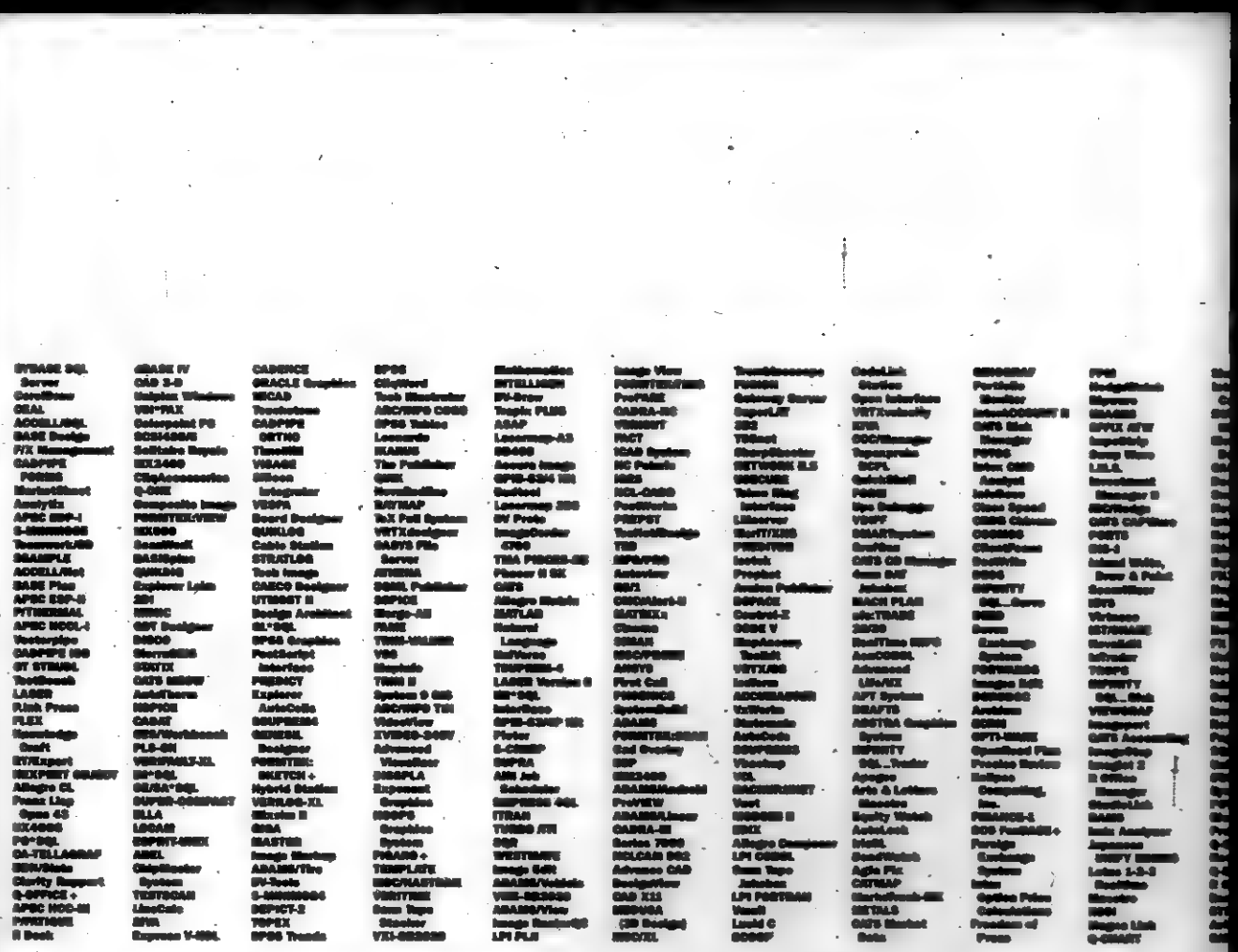

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There's software for word processing, databases, graphics, spreadsheets, accounting and payroll, drafting and drawing. More than 4500 applications in all. Including favorites like Lotus 1-2-3,® dBASE IV,® and WordPerfect.®

But we wouldn't leave it at that. A Sun SPARCstation not only runs your favorite software, it can run them all at the same time, thanks to true multitasking. That means while you're busy writing a business letter, your SPARCstation can be calculating spreadsheets and searching databases in the background.

And while you're running applications on your SPARCstation there's something else working in the background: software development to introduce even more applications for Sun.

In fact, programmers prefer Sun as a development platform for its power and ease of use. Which means that should you wish to develop your own corporate applications, you will find a robust, tried-and-true developer tool kit.

Either way, more and more businesses are choosing to run their applications on Sun. Not only for what they can run on Sun, but for how they can run it.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 37

Retailers are finding that improving the logistical side through technology is a way to ensure payoffs, says Tom Hennessy, a consultant at retail consulting firm Davidowitz & Associates, Inc. Wal-Mart Stores, Inc., No. 1 among this year's *Premier 100* retailers, has long been a leader in this area, making extensive use of electronic data interchange (EDI) to communicate with its vendors, which helps speed products through the pipeline.

Retailers also continue to invest in network infrastructures to enhance both in-house communications and the exchange of information with trading partners.

The Home Depot, Inc., for example, is designing a Transmission Control Protocol/Internet Protocol (TCP/IP) network to carry EDI transactions over its Scientific Atlanta satellite network. This will also support credit transactions and heavy transaction processing applications. And Toys R Us, Inc. is testing a new satellite network to link its U.S. stores in a first step toward multimedia, videoconferencing and other applications with high-bandwidth requirements.

RETAILERS FIND *electronic systems for inventory and check-out efficient, profitable*

1 Wal-Mart Stores, Inc.

Wal-Mart's information technology is second to none, competitors and analysts agree. And it's probably no coincidence that the $54 billion company, based in Bentonville, Ark., is also the nation's fastest growing and most profitable retailer.

Wal-Mart enjoys exceptionally low operating costs and passes the savings along to customers, typically underpricing competitors. Armed with automated quick-response systems, Wal-Mart can maintain remarkably low inventories: A Wal-Mart store devotes 10% of its square footage to inventory, compared with an industry average of 25%.

Last year, Wal-Mart moved to provide sales figures to suppliers directly, speeding the automated replenishment cycle.

2 Sears, Roebuck and Co.

Falling behind Wal-Mart and Kmart Corp. in the retail sweepstakes was a rude awakening for industry giant Sears. In 1991, Sears' retail revenue of $34 billion trailed Wal-Mart by $10 billion and Kmart by $1 billion.

Roused to attention, Sears has moved to make its retail division more competitive by cutting operating costs. Recent measures include adding 28,000 CompuAdd Corp. cash register terminals to 22,000 existing NCR Corp. point-of-sale terminals (to be upgraded with new software). This move will allow Sears to cut about 1,000 full-time nonsales positions and 5,900 part-time jobs at its 868 stores, reducing annual operating expenses by about $50 million.

CHALLENGES

- Moving more quickly to production
- User training

3 The Home Depot, Inc.

When money is tight, the do-it-yourself home improvement business is good. Business is particularly good at Home Depot, now the largest U.S. retailer in the category. Sales at the company's 180-plus stores were up 35% last year.

To handle the increased business and its ongoing expansion, Home Depot will increase mainframe capacity 50% this year, after doubling it only a year ago. All in-store systems are being replaced with Unix-based Hewlett-Packard Co. processors in the belief that a commitment to open systems will help keep its costs down while maintaining flexibility for growth.

Soon a new TCP/IP network will carry EDI transactions and other traffic via Home Depot's satellite. Home Depot is expanding its use of EDI to improve inventory replenishment, adding new vendors to the system daily.

4 FoxMeyer Corp.

The 1990s have also been kind to Carrollton, Texas-based FoxMeyer Corp., the third-largest drug wholesaler in the nation. While most competitors are being squeezed, FoxMeyer's profits are up.

At the close of FoxMeyer's '92 fiscal year in March (a year in which FoxMeyer lost its hefty Kmart account), sales were up to $3.1 billion, a 6.9% jump from 1991.

FoxMeyer is migrating from midsize Unisys Corp. systems to IBM mainframes and has outsourced its IBM Enterprise System/9000-based data center to IBM. To reduce operating costs, FoxMeyer uses robotic picking devices and conveyor systems for some warehousing operations. FoxMeyer also reportedly leads its industry in EDI use, doing business electronically with more than 300 trading partners.

PHOTOGRAPHY BY ROBERT E. DAEMMRICH/TONY STONE WORLDWIDE

DEFINING REALITIES

BUDGETS
Although not historically big technology spenders, retailers and wholesalers are spending aggressively right now. Almost three quarters of the companies reported an IS budget increase last year. More than half expect one next year.

PRESSURES
With more budget dollars, IS managers are under increased scrutiny. Targeted IS investments are the key to winning management's approval.

ORGANIZATIONAL CHANGES
This industry has had the smallest incidence of data center consolidation. However, almost three quarters have plans to consolidate in the coming year.

5
Dillard Department Stores, Inc.

Dillard Department Stores in Little Rock, Ark., began computerizing operations in the 1960s. With sales and earnings continuing in a strong upward direction, the company remains a firm advocate of the importance of information systems.

"We've got computers, EDI, data capture tools — all the latest and greatest technology," says Ray Heflin, Dillard's director of quick response. The company has already reaped many of the benefits that quick response systems can provide: the ability to replenish goods more quickly, greater turns on inventory, increased sales and fewer price markdowns.

Now Dillard is embarking on a campaign to persuade suppliers to adopt just-in-time manufacturing.

6
Kmart Corp.

Discount retailers can't afford to be cheap. Troy, Mich.-based Kmart, the nation's second-largest retailer, has spent more than $1 billion on information techology since 1985 and is spending nearly $3 billion to refurbish its stores. It has plenty to show for the investment: Profits grew 14% to $859 million last year.

In the IS arena, Kmart has adopted the latest in quick-response technology: UPC bar-code marking and scanning, shipping container marking and reading and an EDI program involving more than 2,000 vendors.

This year, Kmart is equipping its 2,300 stores with handheld spread-spectrum RF devices that will not only speed price checks but also automatically trigger reorders and inventory updates.

7
Bergen Brunswig Corp.

"We don't make products; we distribute others' products," Bergen Brunswig's Chief Information Officer Denny Steele says. "The more efficiently we do that, the more competitive pricing we can offer and the more business we get."

The $4.9 billion Orange, Calif., company operates 31 distribution centers with just 3,000 employees, 195 of whom are in IS, Steele says. In a major organizational shift during the past year, system developers were moved to the functional departments — marketing, warehouse operations, sales and finance.

The company's $20 million IS budget is about 5% higher than last year. The extra money is pegged to enhance efficiencies at the warehouse level, adding automated replenishment systems to the distributor's automated picking capabilities.

8
Winn-Dixie Stores, Inc.

Winn-Dixie Stores is making a comeback. After falling off the pace in the mid-1980s and losing market share to relative newcomers such as Albertson's, Inc., the Sun Belt's largest food chain is introducing bigger, brighter supermarkets and more efficient systems.

Still behind the technology curve relative to some of its competitors, the Jacksonville, Fla.-based company is quickly coming up to speed.

By late June, Winn-Dixie had installed new minicomputers in its 1,200 supermarkets in the U.S. and the Bahamas. The minicomputers will support computer-assisted ordering as well as time and attendance scheduling, according to Jack Russo, a retail food analyst at St. Louis-based A.G. Edwards.

9
Toys R Us, Inc.

Toys R Us has pretty much eliminated all the major competition in its own league. The Paramus, N.J.-based retailer, which controls more than 20% of the domestic toy market, will open 100 new stores around the world this year, while Child World and Lionel's Kiddie City are no longer competitive.

The real games may be just beginning, however. Some big mart kids — Wal-Mart, Kmart and Dayton Hudson Corp.'s Target stores — are moving into the neighborhood and challenging the $6.12 billion specialty chain.

Toys R Us won't be caught short in IS. To provide for growing bandwidth needs, it is upgrading networking capabilities and testing a new Hughes Aircraft Co. satellite — the first to carry an Ethernet wide-area network — that will link 200 of its more than 800 Toys R Us and Kids R Us stores by year's end. A new data center in New Jersey will house a variety of satellite earth stations.

10
Nordstrom, Inc.

California has been taking it on the chin in this recession, and Seattle-based Nordstrom, which does about half its business there, has felt the impact. But rather than simply waiting out the situation, Nordstrom is using IS to buttress its position.

With a budget of $25 million, its IS group set out to improve the quality of inventory information. The result was a prototype item inventory system — installed in Oregon in May — that uses handheld, remote RF scanning devices to help buyers determine which items are selling well.

In addition, a new VIP Express electronic-mail system allows suppliers to communicate with Nordstrom's geographically scattered buyers via MCI Mail.

The system will allow buyers and suppliers to exchange shipping data and check the payment of invoices. ■

Jansen is a free-lance writer and editor based in Salem, Mass.

The name of the game is revenue generation

With the right systems, information can be a money-maker

BY JULIA KING

Over the past few years, almost anything that could go wrong has gone wrong in the transportation industry. Airlines, already staggered by fuel cost increases and loss of business during and after the 1991 Persian Gulf war, are now bloodying one another in cutthroat fare wars. Trucking firms struggle to differentiate their services in a sector reeling with capacity overload.

Industrywide, all companies are up against brutal competitive pressures as old business boundaries disappear and previously distinct businesses move into one another's sectors.

In response, transportation firms are looking to information systems for fresh sources of revenue.

Airline, trucking and express package delivery companies have all created information-intensive businesses specializing in shipping logistics. These enterprises — based in large part on sophisticated electronic data interchange (EDI) networks — book air, land, sea and rail transport, handle shipment tracking and, in some cases, manage warehousing and inventory functions for corporate customers.

One major player is AMR Corp., the parent company of American Airlines, which partnered with rail giant CSX Corp. and the Postal Telephone and Telegraph authorities in the Netherlands to create what Max Hopper, senior vice president of information technology, calls "a Sabre system for the cargo world."

1 AMR Corp.

Fort Worth, Texas-based AMR is responding to the economic crisis facing all passenger carriers with a two-pronged strategy of continued large-scale investment in long-term technology projects and deep cost cuts affecting virtually every in-place system and service. Moreover, to help stem a 1991 loss of $241 million, all new IS projects — including this year's multimillion dollar sales force automation effort — have been placed under an immediate 100% return-on-investment mandate.

On the investment side, there is not only AMR's partnership stake in Encompass, the multibillion-dollar, EDI-based, multimodal cargo shipping logistics system but also its ambitious InterAAct office automation system. InterAAct will link 70,000 employees on personal computers and local-area networks over a single network, with access to all company databases and electronic services.

InterAAct is expected to reduce costs by eliminating redundancies, but AMR has also introduced more direct cost-cutting measures. Lower prices are being negotiated on all computer purchase and maintenance contracts. Applications are bought rather than built whenever possible. IS staffing has been reduced on some projects, and other projects have been eliminated altogether.

INDUSTRY LEADERS

1. **Max D. Hopper**
   Senior V.P., IS
   AMR Corp.
2. **David A. Billings**
   V.P., Information and Technology Systems
   Airborne Freight Corp.
3. **Jerry Lang**
   V.P., Summit IS
   Roadway Services, Inc.
4. **Barry Kotar**
   Senior V.P., IS
   Northwest Airlines
5. **Larry Davenport**
   V.P.
   J. B. Hunt Transport Services, Inc.
6. **Wayne Nixon**
   Director, IS
   International Shipholding Corp.
7. **Dennis Jones**
   Senior V.P.
   Federal Express Corp.
8. **Frank Quitt**
   Director, IS
   Hawaiian Airlines
9. **John Wm. Rudasill**
   President, Carrier Computer Services
   Carolina Freight Corp.
10. **Dan Hay**
    V.P., Systems
    Southwest Airlines

2 Airborne Freight Corp.

EDI-based shipping, invoicing and payment systems shaved 8 cents from Airborne's average cost per shipment in 1992, bringing it down to 36 cents. Meanwhile, total shipping volume for the company, more commonly known as Airborne Express, increased 24%, with 45% of all shipments tendered electronically via the company's Linkage and Libra systems.

Linkage connects the shipping systems of high-volume customers to Airborne's mainframe. Libra combines EDI with PCs, scales and printers so that customers can electronically weigh freight, calculate rates and print shipping labels. This year, Airborne introduced a PC-based software product that allows customers to generate their own invoices.

3 Roadway Services, Inc.

Akron, Ohio-based Summit Information Systems, the IS subsidiary of $3.1 billion Roadway Services, has concentrated most of its efforts this year on two systems that were designed to answer customer demand for up-to-the-minute shipping information.

One is an automated data collection system that uses 5,000 bar-code scanning terminals to track individual cartons. The other is the Roadway Advanced Planning for Inbound Dispatch system, a desktop shipment information management system that provides customers of the less-than-full truckload carrier with real-time data on all shipments.

Summit's next step is to equip drivers of the company's 37,000 trucks with handheld devices to record information at the time of pickup and therefore eliminate as much as an hour's delay in information availability.

CHALLENGES

- Personnel/Human resources
- Process improvement

KEY TECHNOLOGIES

NOW
- On-line customer service
- Shipping tracking systems
- Networks

NEXT FIVE YEARS
- Open systems
- Client/server systems
- Pen-based PCs

4 Northwest Airlines

Northwest Airlines grabbed headlines earlier this year when it introduced Worldlink, the first in-flight communication system providing passengers with video-based entertainment and shopping services. But the bulk of IS work at the privately held airline has been behind the scenes — platform downsizing and re-engineering for open systems.

So far this year, Northwest has invested in Unix-based applications to run on a Sybase, Inc. engine over LANs. New applications include systems for gate management, pilot and route scheduling and pricing.

Continued on page 46

AMR's **MAX HOPPER** *balances economics and strategic imperatives*

PHOTOGRAPHY BY DAN BRYANT

I own four toasters.

One for rye.
One for wheat.
One for grain.
One for pumpernickle.

I own five ovens.

One for ham.
One for turkey.
One for chicken.
One for lamb.
And one for roast beef.

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Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 43

Although the major impetus for architectural changes has been customer service, Northwest is also positioning itself for targeted expansion into international markets. This year's transfer of mainframe-based financial data to LANs was a key step, permitting faster and more accurate projection of demand for seats and routes.

5
J. B. Hunt Transport Services, Inc.

The main thrust of the 80-member IS team at J. B. Hunt has been supporting the less-than-full truckload carrier's diversification into shipping logistics, flatbed hauling and hazardous waste transport. This year, Hunt's IS department will rewrite 80% of existing application code to accommodate the requirements of these new businesses.

By year's end, the company's 6,000 trucks will also be outfitted with IBM Personal System/2 computers linked to an optimization system that integrates data needed by the carrier, its drivers and customers, and five new partners in the railroad industry. Among other things, says Lawrence G. Davenport, senior vice president of information services, the company hopes that the system's ability to track drivers' routing, refueling and scheduling requests will increase job satisfaction and reduce turnover.

6
International Shipholding Corp.

International Shipholding, or ISC, is the $309 million parent company of four waterborne freight shippers: Central Gulf Lines, Inc., Waterman Steamship Corp., Forest Lines, Inc. and LCI Shipholdings, Inc.

At the end of 1991, ISC had in place contracts that would employ the majority of its fleet for this entire year. But continued economic uncertainty here and abroad makes business forecasting a difficult exercise, according to ISC Chairman Niels W. Johnsen. Approaching the future cautiously, ISC's chief business goals in 1992 are controlling expenses and improving overall efficiency.

DEFINING REALITIES

BUDGETS
Despite poor business conditions, more companies in the transportation field received budget increases than did companies in any other industry.

PRESSURES
The IS focus is on producing revenue in the face of declining customer bases, higher logistics costs and brutal competition.

ORGANIZATIONAL CHANGES
Most of these companies consolidated their data centers in the last year.

PLATFORM CHANGES
Most of these companies plan on installing proprietary systems within the next 12 months.

7
Federal Express Corp.

The showpiece of recent IS efforts at Fedex is its Ramp Management Advisory System (RMAS), which uses Unix-based workstations and expert systems software to track more than 85 inbound and outbound flights daily at the company's major airport hub in Memphis. Fedex considers RMAS the launch point for its planned expansion into networked expert systems. In the meantime, although its IS spending remained flat at $360 million for 1992, the $7.7 billion express shipper has continued its march toward real-time distributed computing, replacing terminals with Unix-based workstations at 1,000 shipping stations. Full conversion will be completed by 1995, according to Jon Riker, vice president of corporate systems development.

8
Hawaiian Airlines

HAL, which operates Hawaiian Airlines, Hawaii's largest airline, and the West Maui Airport are using information systems to regain market share. The strategy — initiated by a group of investors led by Peter Ueberroth and his brother John, who is chief executive officer — calls for deep price cuts and a customer-service focus, backed by IBM mainframe applications.

So far, the company has managed to reverse a reputation for late arrival with 98% on-time performance and to build back market share from 33% to 45%.

9
Carolina Freight Corp.

Enhancement of a broad array of value-added shipping information services is the main systems goal at Carolina Freight, or CFC, in Cherryville, N.C.

CFC's IS subsidiary, Carrier Computer Services, Inc., processes more than 165,000 EDI transactions monthly, furnishing high-volume customers with online shipping, invoicing and payment information. Lower-volume customers can access rate and shipment status data via an automated voice-response system. A service dubbed "Caro-Fax" furnishes computer-generated manifests, shipment status reports and other messages directly to customers' fax machines.

These system innovations have given CFC the means to provide customers with more information without increasing customer service staffing.

10
Southwest Airlines

A lean and mean IS strategy is at the heart of $1.3 billion Southwest's sustained success in the regional air transport business. Working with a modest budget — $4.7 million — its 60-member IS team developed several new systems in 1992.

Heading the list is the Southwest Integrated Flight Tracking system, or Swift, which consists of two linked systems. One part is a client/server-based integrated flight operations system that combines data from various radar and weather services and allows Southwest to generate its own real-time flight plans. The other is a real-time aircraft situation display, which permits precision planning of ground service and connecting flight schedules.

Other important systems projects activated this year include a PC-based ticket-by-mail system and a network of Quick-It automated ticketing machines. ■

King is a free-lance technology writer based in Ridley Park, Pa.

Utilities

Betting the farm on technology

In this field, if you're not ahead, you're vulnerable

BY AMY BERNSTEIN

Nearly 10 years ago, when deregulation punctured AT&T's long-distance monopoly, twin challenges — increasing competition and changing consumer demands — loomed before staid Ma Bell. The rules of that game were changing from a world where, in place of unchallenged rate increases, one had to provide better service at the lowest possible cost. Deregulation accelerated those trends.

Today AT&T still retains a healthy 70% share of the long-distance carrier market. But fierce competition has transformed the entire industry into a technology-driven race in which each player must develop and deliver a constant slew of consumer-friendly products and services while relentlessly holding down costs.

Meanwhile, the nation's electric and gas utilities are just coming to grips with their tumultuous era of deregulation. New federal laws make it easier than ever for independent power producers and cogenerators to sell power and/or pipeline transmission capacity directly to consumers for less than the established utilities do.

MCI's ZUCCO *stays ahead of the ongoing rollout of new services*

INDUSTRY LEADERS

1. **James L. Zucco Jr.**
   Senior V.P.
   MCI Communications Corp.
2. **Joseph T. Ambrosy**
   V.P., Operations and IS
   Bell Atlantic Corp.
3. **R. Thomas Dwyer**
   V.P., IS
   Carolina Power & Light Co.
4. **M. Enel Wade Jr.**
   CIO
   Southern Co.
5. **Ted G. Dixon**
   V.P., Information Resources
   Northeast Utilities
6. **Mike Fridaus**
   V.P., Customer Service and Information Technology
   Ameritech Corp.
7. **George E. Stubblins**
   V.P., IS
   Duke Power
8. **J. E. Hunter**
   Manager, IS Department
   Baltimore Gas & Electric
9. **Dennis Murphy**
   Director, Corporate IS
   GTE Corp.
10. **W. F. Gal Jr.**
    V.P.
    AT&T

KEY TECHNOLOGIES

NOW
- LAN applications
- Telecommunications
- DBMSs

NEXT FIVE YEARS
- Open systems
- Client/server systems
- LANs

PHOTOGRAPHY BY KATHERINE LAMBERT

The Premier 100

Not surprisingly, change is triggering massive internal restructuring among utilities as they struggle to move to a market-driven culture and infrastructure. As with telecommunications, technology is the critical enabler for the utilities; it is the engine of corporate reinvention. The utilities are still exploring the mandate that telecommunications firms have been implementing for years: Use technology in every way possible to drive down costs unilaterally while continually improving quality and customer service.

For telecommunications companies, which are further along in the technology-driven restructuring process, the next big push is to develop a client/server architecture that streamlines the flow of information from mainframes to desktops. This allows employees in far-flung offices to more quickly and efficiently retrieve data, such as customer billing records, on demand.

MCI Communications Corp., the *Premier 100*'s No. 1 utility for the fourth consecutive year, has a strong grip on these complex initiatives. The company is committing its substantial information systems resources to everything from virtual private network services to lights-out data center operations.

1 MCI Communications Corp.

The nation's second-largest long-distance carrier performed impressively last year: MCI's earnings nearly doubled, to $522 million, on revenue of $2.16 billion — close to double the industry growth rate for 1991. One of the company's high-profile new products, the Friends & Family program, alone generated more than 5 million new long-distance customers.

No wonder, then, that MCI's IS organization is bucking the industry trend toward flat or downsized resources. In 1992, it had staff increase of 250, to 2,050 total, and a budget increase of 4.5%, to $460 million.

In the works is a move toward "800 portability," whereby toll-free 800 numbers would be owned by customers, not carriers. MCI won't detail strategies but admits to readying billing and reporting systems for an anticipated increase in volume. Rollout is scheduled for March 1993.

DEFINING REALITIES

BUDGETS
Deregulation has unleashed competition among utility companies, resulting in this year's flat budgets.

PRESSURES
New competitive threats range from large customers providing their own services to independent companies offering lower cost products.

ORGANIZATIONAL CHANGES
Almost three quarters of these companies plan to consolidate data center operations in the coming year. Most have a mixture of centralized and decentralized organizations.

PLATFORM CHANGES
Nonproprietary systems are on almost everyone's lists. Three quarters of these companies plan to downsize from larger platforms to smaller ones.

CHALLENGES

- Managing PC/LAN technology
- Delivery of corporate business applications
- Networking

Nearly completed is a new networked customer service system of 7,000 IBM OS/2 licenses and an equal number of Personal System/2 Model 90 workstations.

2 Bell Atlantic Corp.

Bell Atlantic, the third-largest provider of local telephone services, is caught up in an effort to essentially "rebuild everything" by the year 2000, according to Joseph T. Ambrozy, vice president of IS and chief information officer.

System 2000 — a $2 billion, 10-year commitment to boosting productivity and competitiveness — involves rebuilding virtually all front-end applications driving the company. One facet: a new Unix-based application for 6,000 customer service representatives.

3 Carolina Power & Light Co.

Carolina Power & Light's ongoing commitment to total quality management (TQM), now in its sixth year, has deeply affected the way the $2.6-billion utility formulates and implements IS strategy.

A new customer billing system — initiated in 1988 as a result of TQM studies — is slated to go on-line at the end of this year. The new system is expected to yield 25% to 30% improvements in productivity overall. And in the early stages is a new activity-based cost management system that breaks down costs by work effort and project. The DB2-based system should go on-line in late 1993.

4 Southern Co.

Southern, in its best year since 1989, posted a 35% gain in first-quarter earnings over '91. The firm serves 120,000 square miles in the Southeastern U.S. and excels at cutting costs while improving infrastructure.

Case in point: Under CIO M. Euel Wade Jr., Southern has laid 1,400 of 2,500 miles of fiber-optic cable. The completed backbone network will tie far-flung plants to the company's headquarters in Atlanta. By cutting deals with long-haul carriers that use Southern's transmission-line rights-of-way, the utility is saving $75 million in capital expenditures while strengthening vital voice and data systems.

Still in the prototyping stage is a massive geographic mapping and facilities management system that will provide precise information on where and when outages occur.

5 Northeast Utilities

Northeast Utilities (NU), the parent company of New England's largest electric utility system, is scrambling to compete in a deregulatory environment. NU's 378-person IS operation is responding, in part, by building innovative new alliances to improve customer service, tighten operations and achieve new economies of scale.

For example, an unusual agreement with IBM, Northern Telecom, Inc., AT&T and other providers will result in a Caller ID system that enables customer service representatives to capture critical information during a power emergency.

On another front, NU's just-completed

Natural Activity-based Accounting System helps IS track precise project expenditures using IBM's DB2 relational database. NU's partner in the $35 million project was Arthur Andersen & Co.

6 Ameritech Corp.

Ameritech Services, the technology arm of the nation's seventh-largest telephone holding company, is in the midst of an ambitious restructuring effort designed to help the company lower costs and become more market-driven.

The first order of business is linking each of 15 core "business processes" — customer billing, repair, marketing and so on — with the IS people and functions that support them. In this way, the various business units and their IS support teams strive together toward goals such as 24-hour, seven-day customer support.

To support this market-driven strategy, Ameritech has budgeted $150 million this year for new IBM Enterprise System/9000 mainframes, an Open Systems Interconnect data network, an NCR Corp.-based client/server network and four new data centers.

7 Duke Power

The mandate for IS at Duke Power — to help lower the cost of generating electricity — reflects difficult economic times at one of the nation's most efficient utilities.

One major IS initiative involves streamlining centralized telephone service to utility customers after hours. The IS department is developing a suite of applications that make it easier for service representatives to extract customer account data using the customer's phone number rather than a complex customer ID. The new system will enable fewer people to handle more calls.

8 Baltimore Gas & Electric

Despite a 7% cutback in its $65 million IS budget this year, Baltimore Gas & Electric (BG&E) is knee-deep in IS projects. The most important is a wide-area network, budgeted at $2.5 million, that will connect 11 BG&E business locations in Maryland. The data network's open systems architecture should improve local-office access to data and eliminate intraoffice paper trails.

During the next couple of years, the network will support many critical new applications running on multivendor platforms, such as a $7 million customer information analysis system that improves anticipation of emergencies such as residential power outages.

9 GTE Corp.

GTE is the nation's largest local phone company and the second-largest cellular telephone provider, thanks to last year's $6.6 billion merger with Contel Corp. It is also among the most profitable: Local phone traffic grew 8% last year, besting the 2% industry average.

Despite phenomenal growth, GTE's 1992 IS budget of $800 million is about even with last year's, and head count is flat. Roughly 60,000 PCs are in place now, compared with 20,000 three years ago.

Like its rivals, GTE is focusing on building a client/server architecture. A three-year, $150 million agreement with Hewlett-Packard Co. will result in hundreds of new servers and workstations. Once completed, the new architecture will allow GTE to internally publish more than 1,200 telephone directories, a job that is now outsourced. The directories contribute $1.2 billion yearly to GTE revenue.

10 AT&T

Even with 70% of the long-distance market in hand, AT&T isn't taking anything for granted. The company paid $7.4 billion for NCR last year as part of a long-term strategy to make AT&T a one-stop shop for worldwide voice-data networks and attendant equipment.

The acquisition is fueling a major IS push to incorporate NCR's local-area networks and processors into a new client/server architecture that will make it easier for 21 business units and as many supporting divisions to quickly access data locally. For example, individual customer records that once resided on a central mainframe can now be accessed locally.

AT&T views this re-engineering process as essential to speeding up customer service, improving accountability and eliminating the number of people involved in each business transaction.

Overall, AT&T expects savings of 65% to 75% over five years from re-engineering and ongoing data center consolidation efforts — with no planned cutbacks in IS staffing, which hovers around 20,000. ■

Bernstein is a free-lance writer based in Baltimore.

GOOD SERVICE, *supported by IS tracking systems, is a primary goal for utilities*

PHOTOGRAPHY BY DAVID JOEL/TONY STONE WORLDWIDE

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Improved decision making
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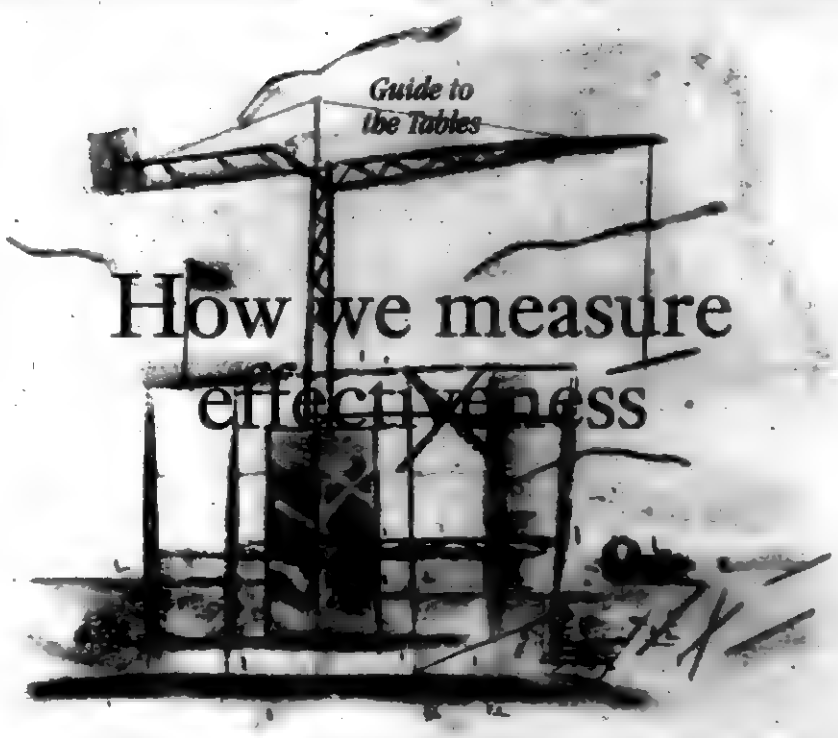


How we measure effectiveness

There is no single measure that defines the effective use of information systems by a large company. But it is possible to assess effectiveness based on a broad dimension of measures that balance both the qualitative and quantitative aspects of technology use. *Computerworld*'s *Premier 100* provides this analysis.

Each year since 1988, we have taken the top half of the Fortune 500 industrial and service companies and looked at how they invest in and deploy IS. By combining seven measures, we assess which companies lead their industries in the effective use of IS.

These measures include: 1) assessment of the company's effectiveness, according to its peers; 2) IS budget for that year; 3) company profitability over five years; 4) current market value of major hardware; 5) IS staff expenditures; 6) IS training investments; and 7) the number of personal computers and terminals installed in the company.

A total of 600 companies were included in this year's study. More than 40 specific industry breakdowns were used to calculate the ranking.

Aside from sales and profit information, the data was provided by IS executives at the highest level of each of the companies. In cases where companies did not supply data, *Computerworld* generated estimates by working with consulting and industry sources.

The total points used to rank the companies are the sum of all the points collected in all seven measures. The peer assessment has the highest value (a multiplier of 30). The other measures have an equal value (a multiplier of 15), except for staff (which has a multiplier of 10). Each measure is calculated and ranked separately for all the companies.

Among the best judges of IS effectiveness are the IS executives themselves. For this reason, we have a measure based on how IS executives rank their peers from a list of companies in their industry group. They are asked to select the Top 5 most effective users of information systems in their industry and rank them one to five. The total peer score is based on the combination of all the rankings a company achieves.

How committed is a company to IS? We use an industry comparison of a company's IS budget as a percentage of revenue to answer this question.

This measure takes into account the combined domestic IS spending of the corporation, including subsidiaries. The budget as a percentage of revenue is compared with an average for that company's industry. Above-average budget ratios receive higher points than do below-average ones.

IS staff and training spending are measured as a percentage of the combined corporation budget. Higher training investments receive more points than lower ones to account for the importance of a well-educated IS staff. Lower staff investments receive more points than higher ones to reflect the efficiencies gained from automation.

To reflect the IS contribution to business performance, profit growth is measured after taxes and extraordinary credits over a five-year period. Profits for mutual insurance companies are based on net income. This year's ranking is based on the average percentage for 1987 through 1991.

How current is a company's technology investment? The dollar value of mainframes, minicomputers and supercomputers on today's market is measured as a percentage of revenue to assess this aspect.

One of the IS organization's prime missions is to provide access to technology to employees throughout the corporation. We measure the total number of PCs and terminals as a percentage of total employees to gain a snapshot of how IS answers this mission. The companies with the most PCs and terminals per capita receive the most points. ■

ILLUSTRATION BY JEFF JACKSON

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
AEROSPACE						
1	The Boeing Co.	65,610	37.7%	$1,600	5.46%	$562.5
2	Grumman Corp.	64,555	30.3%	$153	3.78%	$75
3	McDonnell Douglas Corp.	62,695	13.0%	$683	3.65%	$256
4	Martin Marietta Corp.	62,680	9.3%	$301	4.93%	$94.6
5	Lockheed Corp.	61,595	10.1%	$320	3.26%	$324
6	Raytheon Co.	59,320	7.4%	$105	1.12%	$60
7	Rockwell International Corp.	59,100	(0.5)%	$285	2.37%	$145
8	Textron, Inc.	57,675	4.2%	$169	2.16%	$70
9	Northrop Corp.	57,150	(48.6)%	$248	4.35%	$1.4
10	General Dynamics Corp.*	53,340	(59)%	$350	3.67%	$200
	Industry average	60,372	.4%	$421	3.5%	$179
CONSUMER PRODUCTS AND SERVICES						
1	Reader's Digest Association, Inc.	64,220	22.8%	$120	5.01%	$19
2	Procter & Gamble Co.	62,255	37.7%	$236.6	.86%	$48
3	Levi Strauss Associates, Inc.*	61,200	17.0%	$125	2.5%	$15
4	Gillette Co.*	59,780	17.0%	$120	2.5%	$89
5	American Brands, Inc.	59,705	12.3%	$73.5	.88%	$17
6	The Dun & Bradstreet Corp.*	59,650	7.8%	$778	16.6%	$150
7	McGraw-Hill, Inc.*	59,345	6.1%	$166	8.54%	$100
8	Helene Curtis Industries, Inc.	59,000	(13)%	$30	3.36%	$12
9	Humana, Inc.	58,825	16.6%	$90	1.53%	$100
10	Johnson Controls, Inc.	58,675	2.6%	$60	1.31%	$7
	Industry average	60,266	12.6%	$180	4.3%	$56
FINANCIAL SERVICES						
1	J. P. Morgan & Co.	64,435	30.8%	$510	4.94%	$65
2	Primerica Corp.	63,890	59.0%	$293.1	4.43%	$58
3	Banc One Corp.	63,650	27.8%	$293	7.1%	$79
4	CoreStates Financial Corp.	63,475	23.0%	$103	4.32%	$24
5	KeyCorp	63,355	24.8%	$48.7	2.16%	$17.3

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
1.92%	53%	2%	122,600	77%	Bucks trend: 23% budget increase
1.86%	48%	3%	18,250	77%	Networking emphasis brings efficiency
1.37%	45.9%	2.5%	75,400	69%	Cut five data centers; added 5,400 PCs
1.55%	21%	1%	23,700	39%	Server strategy increases productivity
3.3%	41%	1%	45,000	62%	Up to 30% savings from recentralization
.64%	40%	1%	34,000	47%	Emphasis on imaging, paperless design
1.21%	52%	4%	59,000	68%	NASA contractor ups IS budget 10%
.89%	41%	6%	25,500	49%	Nets 6% profit rise; IS focus: TQM
.02%	49.6%	2%	23,900	66%	IS consolidations save $25 million
2.09%	53%	1%	7,600	9%	$3 billion CSC outsourcing contract
1.4%	44%	2%	43,500	56%	
.79%	45%	3%	4,589	62%	Global drive; $22 million budget rise
.18%	38.3%	2.2%	48,000	46%	Close customer links; brand focus
.31%	44%	3%	4,000	12%	IS links Levi value chain with EDI
1.89%	50%	5%	9,000	29%	Global strategy requires flexible IS
.2%	45%	2%	10,000	20%	Balances business unit; central IS
3.5%	45%	3%	50,000	86%	Emphasizing lower cost IS services
5.1%	42%	3%	5,000	37%	Client/server rollouts; 15 business units
1.35%	39.7%	3.1%	3,600	100%	Customer drive fuels 10% budget rise
1.69%	45%	1%	18,000	26%	1992 initiatives: imaging, LANs
.15%	42%	2%	11,000	26%	Even budget; IS focus: Customer service
1.5%	44%	2.7%	16,319	46%	
.63%	36%	1%	12,500	95%	Profits up 44%; IS focus: Desktop Unix
.88%	31%	4%	18,100	72%	Income up 28%; highly decentralized IS
1.9%	30.7%	4%	29,500	100%	IS effort aides most profitable year ever
1.01%	38%	1.6%	10,500	78%	Even spending; 30% business growth
.77%	38%	.5%	13,894	100%	IS keys acquisitions; budget up $8 million

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
FINANCIAL SERVICES						
6	BankAmerica Corp.*	63,205	1.9%	$700	5.71%	$93.7
7	Barnett Banks, Inc.	63,125	13.3%	$142	4.34%	$30
8	Unum Life Insurance Co.	61,685	21.9%	$92.5	3.82%	$9
9	Bankers Trust New York Corp.	61,580	(25)%	$435	6.36%	$70
10	Massachusetts Mutual Life Insurance Co.	61,420	20.3%	$70	1.04%	$9
	Industry average	62,982	19.8%	$269	4.4%	$45.5
INDUSTRIAL AND AUTOMOTIVE PRODUCTS						
1	Dresser Industries, Inc.	61,115	28.4%	$116	2.47%	$30
2	Black & Decker Corp.	60,390	22.7%	$80	1.73%	$40
3	Caterpillar, Inc.	59,235	(39.4)%	$346.1	3.4%	$191.5
4	Harley-Davidson, Inc.	58,910	21.3%	$7	.74%	$6
5	Eaton Corp.	58,595	(17.2)%	$76	2.1%	$30
6	Ford Motor Co.*	58,205	(44)%	$1,330	1.5%	$400
7	Deere & Co.	58,005	7.25%	$202.3	2.87%	$125
8	Paccar, Inc.*	57,890	1.75%	$40	1.7%	$28
9	Trinity Industries, Inc.*	57,365	51.1%	$15	1.2%	$6
10	Ingersoll-Rand Co.*	56,945	9.1%	$60	1.67%	$16
	Industry average	58,665	4.1%	$227	1.9%	$87.3
MANUFACTURING						
1	Kimberly-Clark Corp.	62,410	19.1%	$116	1.7%	$32
2	Corning, Inc.	61,910	12.4%	$80	2.43%	$30
3	3M Co.	61,275	6.8%	$310	2.32%	$251
4	Inland Steel Industries, Inc.	60,845	(32.8)%	$60	1.76%	$8.6
5	Cone Mills Corp.*	60,130	12.0%	$10	1.43%	$7
6	Armstrong Co.*	59,675	49.0%	$18	1.45%	$10
7	Eastman Kodak Co.*	59,430	(27.0)%	$518	2.64%	$50
8	Sonoco Products Co.	59,255	14.2%	$9	.53%	$.5
9	Polaroid Corp.	58,955	(24)%	$67	3.2%	$39
10	Bethlehem Steel Corp.	58,945	(34.0)%	$82.6	1.91%	$5.4
	Industry average	60,283	(0.4)%	$127	1.9%	$43.4

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.76%	29%	1.4%	81,000	100%	Swallows $400 million Security Pacific IS
.92%	35%	4%	14,000	79%	$50 million invested in PC/LAN project
.37%	46%	2.5%	5,900	100%	15% IS budget hike backs client/server
1.02%	29%	2.5%	13,000	100%	Strong profits; architecture rewrite
.13%	59%	2%	7,438	76%	OLTP system nets 40% productivity rise
.84%	37%	2.4%	20,583	90%	
.64%	46%	3%	4,000	13%	Uses EDI to shorten order process
.86%	35%	5%	10,000	26%	Focus: Quick response and MRP II systems
1.88%	53.7%	1.4%	30,000	56%	Systems rebuilt for speed/integration
.64%	35%	25%	600	11%	High demand met by new inventory systems
.82%	39%	2%	13,000	36%	Cost containment on a global scale
.45%	52%	5%	70,000	21%	Rebound under way; plant floor systems key
1.77%	42%	1%	18,500	51%	Streamlining yields low-cost production
1.2%	42%	2%	4,000	39%	Diversifying IS throughout truck business
.48%	40%	2%	3,500	36%	Lowest cost rail car producer
.45%	54%	7%	10,000	32%	Migrating from mainframe to AS/400s
.9%	44%	5%	16,360	32%	
.47%	36%	3%	16,400	40%	Major IS initiatives across the board
.91%	50%	4%	9,000	29%	Internal operations revamp with TQM
1.88%	55%	8%	47,000	53%	Replaced midrange with PCs/servers
.25%	47%	.8%	6,306	34%	Open systems, paper reduction emphasis
1%	42%	2%	6,000	43%	Internal systems shift to real time
.8%	45%	5%	3,000	17%	Fieldcrest Cannon plant modernization
.25%	40%	2.5%	75,000	56%	IBM outsourcing, integration reduce costs
.03%	42%	4%	1,200	9%	Shift to global supplier yields new systems
1.86%	58%	3.5%	6,000	50%	IS integrates applications
.13%	67%	1.3%	7,608	28%	Data mining, networks speed business
.76%	48%	3.4%	17,751	36%	

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
PETROLEUM AND CHEMICALS						
1	Phillips Petroleum Co.	62.965	16.8%	$183	1.45%	$21.7
2	The Dow Chemical Co.	61.590	5.3%	$400	2.07%	$122.7
3	FMC Corp.	61.350	(0.8)%	$118	3%	$40
4	Unocal Corp.	61.255	6.5%	$178	1.82%	$46
5	Union Texas Petroleum Holdings, Inc.*	60.360	55.2%	$6	.56%	$5
6	Monsanto Co.	60.115	(3.8)%	$185	2.07%	$140
7	Ashland Oil, Inc.	59.580	21.5%	$76	.82%	$4.5
8	Rohm and Haas Co.	59.080	(2.3)%	$98	3.53%	$21
9	NERCO, Inc.	59.040	8.75%	$10.3	1.12%	$4.8
10	Air Products and Chemicals, Inc.*	58.755	15.1%	$51	1.73%	$10
	Industry average	60.409	12.29%	$130.5	1.8%	$41.6
PHARMACEUTICALS AND FOOD						
1	Merck & Co.	63.135	23.8%	$160	1.86%	$120
2	Schering-Plough Corp.	61.820	19.5%	$67	1.82%	$20
3	Becton, Dickinson & Co.	61.685	6.4%	$57.7	2.66%	$25
4	Sara Lee Corp.	61.535	19.7%	$137.7	1.11%	$24.6
5	International Multifoods Corp.	61.275	(4.8)%	$11	.5%	$4
6	Pepsico, Inc.	60.920	16.5%	$350	1.77%	$50
7	Bristol-Myers Squibb Co.*	59.375	31.2%	$209	1.85%	$80
8	Upjohn Co.*	59.270	17.1%	$57	1.63%	$30
9	Abbott Laboratories*	59.175	14.6%	$170	2.46%	$28
10	Johnson & Johnson*	59.030	15.4%	$231	1.86%	$70
	Industry average	60.722	15.9%	$145	1.75%	$45.2
RETAILING AND WHOLESALING						
1	Wal-Mart Stores, Inc.*	62.640	17.5%	$335	.76%	$96
2	Sears, Roebuck and Co.	62.435	5.7%	$1,233	2.15%	$687
3	The Home Depot, Inc.	62.110	46.6%	$42	.82%	$15
4	FoxMeyer Corp.	60.425	7.8%	$44	1.46%	$4
5	Dillard Department Stores, Inc.*	60.325	22.8%	$29	.69%	$5.8

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.17%	43.5%	.93%	14,265	63%	Major shift: Mainframe to workstations
.64%	37%	10%	32,000	51%	Rebuilt integrated financial/order systems
1.02%	37%	7%	11,400	49%	Profit up 6%; WAN/workstation projects
.47%	34%	2.3%	9,860	57%	Multimedia training; major downsizing
.47%	37%	1%	300	29%	Half the size; twice the profit
1.57%	38%	4%	15,000	38%	10% budget hike; global decision support
.05%	32%	3%	8,300	25%	Single shared data center; divisional PCs
.76%	36%	1.2%	6,600	51%	$10 million project: On-time product delivery
.52%	29%	1%	650	38%	Profits up 4%; downsize to open systems
.34%	43%	3.7%	6,500	45%	8% profit rise; decentralizing IS duties
.60%	36.7%	3.4%	10,488	45%	
1.39%	50%	6%	15,000	40%	Profit up 19%; new CIO, supercomputer
.54%	31%	2.5%	5,000	25%	14% more profits; 10% more IS spending
1.15%	46.3%	5.9%	8,719	47%	16% budget hike; network rollout
.2%	45%	4.5%	30,000	27%	Mission-critical PCs replace mainframe
.18%	36%	1%	1,500	16%	39% profit jump; solid IS investments
.25%	35%	3%	32,000	9%	Empowering through IS; most revenue
.71%	48%	2%	24,000	45%	Profits up 18%; focus on IS efficiency
.86%	50%	4%	6,500	34%	IS aim: Internal marketing; 18% profit rise
.4%	52%	1%	15,000	33%	13% more income; automated purchasing
.56%	46%	5%	15,000	18%	Profits up 28%; IS planning global video
.62%	44%	3.5%	15,272	29%	
.22%	41%	1%	77,360	21%	24% profit rise; low-cost EDI leader
1.2%	40%	3%	350,000	78%	Profits up 42%; budget up 5%
.29%	44%	1%	3,000	10%	Growth boosts mainframe capacity 50%
.13%	50%	1%	3,000	29%	IBM outsourcing; warehouse robotics
.14%	43%	3%	4,000	12.4%	10% profit rise; focus on quick response

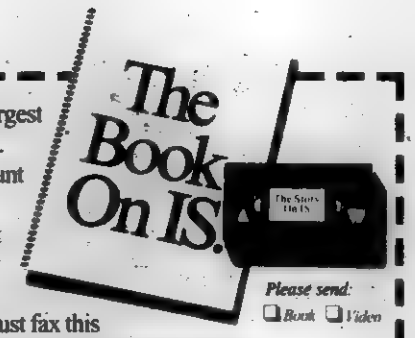
THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
RETAILING AND WHOLESALING						
6	Kmart Corp.	60,290	17.5%	$215.2	.62%	$57
7	Bergen Brunswig Corp.	59,335	38.6%	$20	.4%	$16
8	Wise-Obzie Stores, Inc.*	59,085	11.2%	$98	.97%	$50
9	Toys R Us, Inc.*	58,715	14.2%	$49	.80%	$12
10	Nordstrom, Inc.	58,705	10.9%	$25.2	.79%	$3.8
	Industry average	60,407	19.3%	$209	.95%	$94.7
TRANSPORTATION						
1	AMR Corp.	66,895	23.9%	$1,090.8	8.4%	$79
2	Airborne Freight Corp.	64,425	45.9%	$55	4.02%	$6
3	Roadway Services, Inc.	63,405	27.4%	$93.9	2.96%	$53.4
4	Northwest Airlines	61,645	32.8%	$205	2.7%	$47
5	J. B. Hunt Transport Services, Inc.*	61,170	2.7%	$15	2%	$6
6	International Shipholding Corp.*	60,415	(.2)%	$12	3.65%	$3
7	Federal Express Corp.	60,130	(28)%	$360	4.7%	$150
8	Hawaiian Airlines*	59,855	(70)%	$12	3.28%	$6
9	Carolina Freight Corp.	59,810	(1.5)%	$13.7	1.78%	$20
10	Southwest Airlines*	59,450	11.6%	$4.7	.36%	$3
	Industry average	62,020	4.5%	$186.2	3.4%	$37
UTILITIES						
1	MCI Communications Corp.	64,460	49.8%	$460	5.45%	$330
2	Bell Atlantic Corp.	63,975	2.9%	$750	6.11%	$553
3	Carolina Power & Light Co.	63,855	12.2%	$75	2.76%	$25
4	Southern Co.	62,345	17.3%	$200	2.48%	$16
5	Northeast Utilities	62,075	1.3%	$72.8	2.64%	$97
6	Ameritech Corp.	61,290	(0.4)%	$560.5	5.18%	$129
7	Duke Power	61,190	4.4%	$76.6	2.01%	$13
8	Baltimore Gas & Electric	59,730	(5.3)%	$62.9	2.56%	$75
9	GTE Corp.*	59,500	9.1%	$800	3.6%	$140
10	AT&T	59,480	(69.9)%	$2,900	4.5%	$900
	Industry average	61,790	2.1%	$595.8	3.8%	$227.8

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.16%	39.6%	.72%	108,348	31%	Profits up 14%; radio-frequency terminals
.33%	52%	5%	2,700	73%	5% budget hike; development decentralized
.49%	37%	5%	30,000	28%	1,200 new in-store minicomputers added
.20%	45%	5%	4,000	10%	4% profit rise; Ethernet satellite system
.12%	45%	2.96%	910	3%	17% more net income; supplier E-mail
.33%	44%	2.2%	58,332	29%	
.61%	27.6%	.3%	117,889	100%	100% ROI required for new IS projects
.44%	35%	.8%	8,700	6%	Even spending, more EDI services
1.68%	37%	1.7%	15,650	43%	17% budget rise; desktop/handheld PCs
.62%	32%	1%	3,000	79%	Focus: Unix applications; in-flight network
1%	42%	4%	2,000	21%	Rewriting 80% of its application code
.91%	41%	2%	600	77%	Goals: Improve efficiency, control expense
2%	48%	3%	60,000	73%	Even budget; innovative flight tracking
1.64%	42%	2%	1,000	37%	Focus: Cost reduction; efficiency
2.6%	34%	2%	1,400	13%	EDI customer applications save staff costs
.23%	44%	3%	1,100	10%	Budget up 15%; flight operations system
.97%	38%	2%	21,134	36%	
3.91%	46%	6%	34,000	100%	Nearly twice the earnings; 4.5% budget hike
4.5%	37%	5.1%	70,000	92%	Budget part of $2 billion, 10-year IS revamp
.92%	37%	4%	6,500	78%	25% productivity boost from TQM system
.2%	40%	1%	18,000	59%	Flat budget; extensive fiber-optic backbone
3.52%	46.5%	4.8%	6,253	77%	Profits up 12%; $35 million tracking system
1.19%	62%	1.5%	66,000	89%	Four new data centers worth $150 million
.34%	44%	3.5%	13,000	67%	Cost savings through internal IS investment
3.05%	59.2%	1.3%	5,000	52%	$2.5 million WAN; $7 million project
.64%	37%	5%	60,000	37%	Three-year $150 million client/server plan
1.4%	45%	6%	315,000	99%	65% savings projected NCR-based migration
1.97%	45.4%	3.8%	59,375	75%	

We left out everything in this ad except what was important to you.



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COMPUTERWORLD

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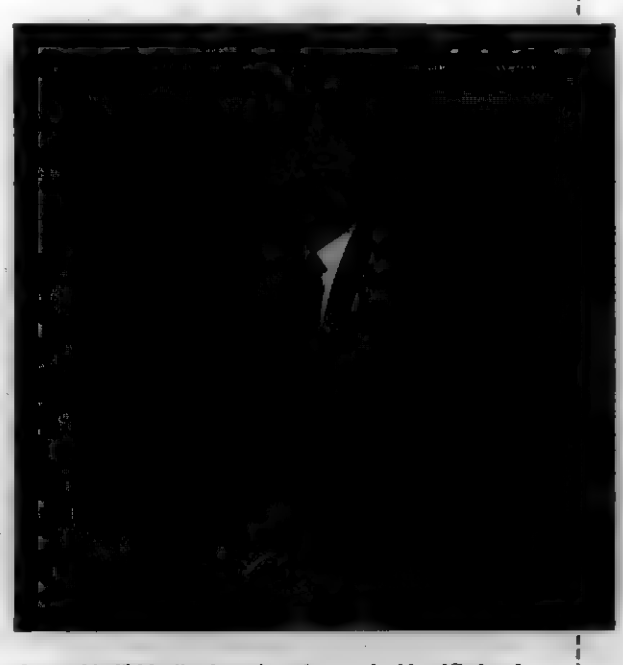
Do you have what it takes?

BY DUWAYNE PETERSON



I haven't met all the IS executives honored in *Computerworld*'s *Premier 100*, but I do know several things about them. I know that they work hard and that they aren't inclined to rest on their laurels.

It couldn't be otherwise: Using information systems effectively is a job that never ends. The first condition for effectiveness is credibility. Before an IS organization can even hope to make a real difference, it must earn the trust of everyone from top executives to business unit staffers.

Another condition for effectiveness, which is very close to credibility, is relevance to the business. This cannot be taken for granted. Business priorities are changing rapidly, and an IS organization that hopes to stay relevant has to be able to keep up a stiff pace, adapt easily and rise to fresh challenges as quickly as they appear.

That's not all it takes to be an effective user of information systems. Here are some of the other major requirements:

- Close coordination between strategic business planning and IS planning.
- Effective IS management processes and performance measurement.
- A well-conceived and well-constructed infrastructure.
- Process change that is more than automation.
- Effective human resource management.

Integration of strategic business planning and IS planning has been talked about for so long that many people take it for granted. But the reality is that it still does not happen in most organizations. Without this integration, there is no way for IS to be effective because it is a rudderless ship groping for direction.

For its part, the IS organization must have the management capability to operate within the planning process and provide value to the total business plan. IS must have a solid vision of its own role in achieving the plan's objectives.

Getting from wherever you are to wherever you need to be always demands some kind of infrastructure. In the case of IS, you need systems architecture, data management, system tools and standards. Your architecture must include not only how computing is accomplished — on a mainframe, in client/sever mode and so on — but how information is integrated across the organization and how the IS function is structured to support computing activities.

The major task is to figure out how to structure IS resources to best accommodate two ongoing requirements: low-cost, highly responsive services across the organization and individualized services that can be identified and directed by business units. There is no formula for how much of any organization's IS resources should be integrated or dedicated; the key is to address the issue and not be trapped by too narrow an approach such as one that is either all centralized or all decentralized.

Another major part of systems architecture is the network strategy. Organizations are providing increased interoperability among internal organizations, customers and suppliers. The IS groups that have established the proper infrastructure and are focusing on the network will be positioned to exploit these new capabilities.

A flexible and responsive infrastructure sets the stage for effective process change, which is where the real benefits are delivered. The concept of business process re-engineering may be an overworked term, but it is a major part of delivering maximum benefit. We simply can't afford to continue automating inefficient business processes.

The best way to achieve process improvement is through a strong partnership with the business organization. It is critical that key processes are examined, challenged, revised or eliminated.

The final, and possibly most important, issue is human resource management. Without a skilled, well-trained work force, none of these things is possible. ■

Peterson, former CIO of Merrill Lynch & Co., heads DuWayne Peterson Associates, an IS consultancy.

PHOTOGRAPHY BY ALAN LEVENSON

16,000 experts
500,000 clients
125 countries

A Fortune 500 company?

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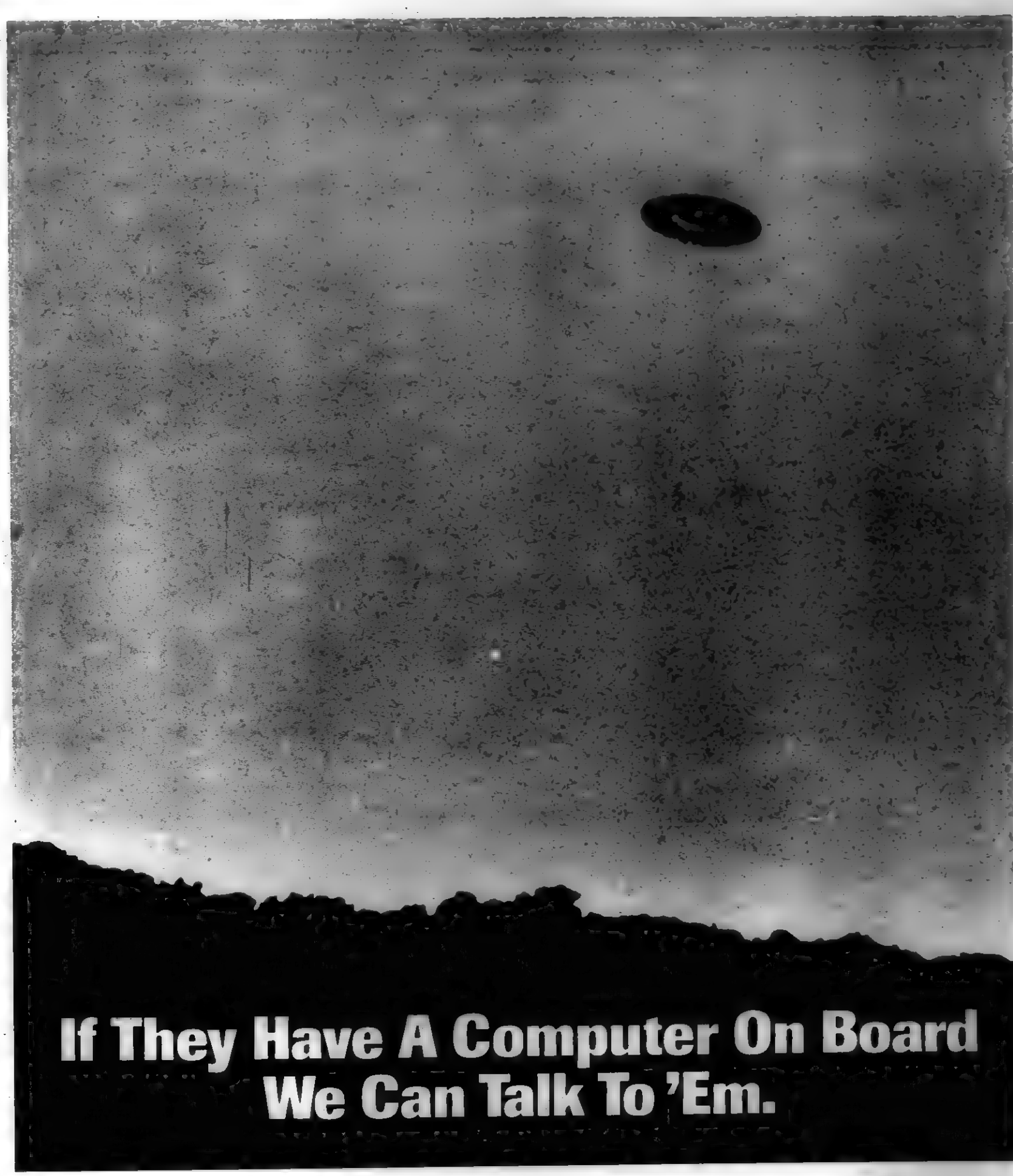

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COMPUTERWORLD

Oracle users frustrated by wait for DBMS, tools

1993 utilities to trail Oracle 7's October release

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Oracle Corp. users, eager to install the new Oracle 7 relational database management system, have learned that only a select group of sites will get delivery this fall. Worse, those lucky enough to get their hands on Oracle 7 will have to use the 3-year-old, character-based SQL Forms 3.0 tool to build new applications for the next three to six months.

A new tool set that supports graphical user interfaces and non-Oracle databases will not be announced until early next year, Oracle said last week.

Some users were clearly frustrated that the integrated tool set would be delayed from the fall until early next year — slowing development plans for Oracle 7. Until the new tool set arrives, users must write extra code to invoke Oracle 7's new features.

"Users who need these tools today are having to turn to [vendor] sources other than Oracle to get [similar] capabilities," said David Kreines, a project manager at the Educational Testing Service in Princeton, N.J., who chaired the International Oracle User Group conference.

Oracle executives confirmed that Oracle 7, announced June 15, would be delivered to selected customers starting Oct. 1, fol-

Continued on page 10

FCC ruling opens local loop

BY ELLIS BOOKER
and MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Federal regulators took their first historic steps last week toward opening the local-exchange network to the kind of price and service competition that has benefited business customers in the long-distance market.

Collectively, the watershed rulings permit "alternative access" carriers such as Metropolitan Fiber Systems, Inc. and Teleport Communications Group, as well as large end users, to physically collocate their networking gear inside local-exchange telephone company central offices and connect to long-distance dedicated network services.

Bypass carriers are currently limited to collocation granted on a state-by-state basis for local service interconnection only.

Strong support

Coalitions of business network managers, such as the International Communications Association and the Ad Hoc Telecommunications Users Committee, strongly supported the move.

Group representatives said they expected competition to produce lower prices, better service and network redundancy so they can reroute traffic around

Continued on page 8

Source: Federal Communications Commission, Association for Local Telecommunications Services

Forget the glitz: Unix Expo attendees seek remedies

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — The "Show Me" state of Missouri might be a more appropriate staging ground for Unix Expo, which opens here tomorrow to users who are in no mood for futures or fantasies.

"We need to define open systems in terms of the customer, not the technology itself," said Mark Factor, MIS director at Au Bon Pain, Inc. in Boston. "In the end, an open system is whatever gives your company president or end users the information they want."

Factor is one of the information systems executives featured in a conference session on the "payoffs and pitfalls" of moving to open systems. Another is Kevin Reilly, director of operations and technology at Hyatt Hotels Corp. in Chicago.

Steven Lewis

EG&G's Bob Curren: *'I think the interest in Unix is much stronger in the larger shops now'*

"What I can tell other users is that while it's not particularly easy, the move from proprietary to open systems is doable," Reilly said. "It makes your technology and administrative life much, much easier."

With an expected 28,000 attendees and more than 300 exhibitors, this Unix Expo will be the largest ever. The underlying theme focuses on real-world practicality — namely, what does this technology do for my company today?

"People want to see the steak, not the sizzle," said Gary Donnelly, one of the show committee members and director of membership at the National Information Technology Center in Rockville, Md.

"Users are a lot less interested in the latest bells and whistles. They want to see a so-

Continued on page 20

No time for downtime

Large-capacity mainframe systems get fairly high user satisfaction scores in the crucial area of reliability for the second straight year

See Buyers' Scorecard, page 48

Product	Score 1991	1992
HDS EX/GX	9.3	9.7
IBM ES/9000	9.4	9.4
Unisys 2200/A19	8.8	9.3
Amdahl 5990/5995	9.2	9.0
DEC VAX 9000	•	7.4

Maximum possible score: 10
*not included in 1991 survey

Micro giants duel at CAMP conference

Microsoft serves up product futures while IBM offers OS/2 assurances

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Executives from Microsoft Corp. and IBM offered glimpses of the future to attendees at last week's Corporate Association of Microcomputer Professionals meeting here, but Microsoft used its top billing to wow the crowd in the face of a defensive IBM.

Steve Ballmer, a Microsoft executive vice president and a featured speaker, treated CAMP to a presentation highlighting beta-test versions of numerous products. The presentation included peeks at Windows New Technology, DOS 6.0, the forthcoming Windows for Workgroups and FoxPro for Windows, as well as Microsoft's own Access relational database and many 32-bit applications, including Excel and Word.

The goal of these products, Ballmer said, is to produce a suite of enhanced applications that can dynamically exchange data.

Meanwhile, John Patrick, IBM's director of Personal Systems software marketing, focused his session on reassuring customers that OS/2 remains part of IBM's long-term strategy. IBM said it will officially adopt Carnegie Mellon University's Mach 3 as the kernel for both OS/2 and AIX.

Patrick said IBM continues to focus on allowing applications to

Continued on page 12

INSIDE

Former Frito-Lay IS chief Charles Feld leaves Perot Systems to restart his own consultancy after only two months on the job. Page 6.

Beginning this week, *Computerworld* is publishing a comprehensive index of companies mentioned in each issue's articles. The index includes vendors, users, trade associations, academic institutions and user groups and appears at the back of the issue, just before the Stocks page. Page 107.

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IN THIS ISSUE

NEWS

4 Apple increases its efforts in the mail-order channel.

6 Perot Vice President Charles Feld leaves his new employer to resume running his start-up consultancy.

6 The government has ordered airline reservation systems to allow customers to use third-party hardware.

7 And the winner is . . . electronic vote tabulation systems.

10 Sybase has made the mainframe a client in the client/server equation.

12 Dell is bundling OS/2 on its PCs.

12 IBM is set to make a PS/2 announcement but pushes back the debut of the corporate entry-level offering.

14 Products from **Make Systems** aim to give users the most bang for their networking buck.

15 NetView/6000 Version 2.1 is here.

16 DEC reveals its RDBMS strategy.

24 Lotus unveils a developer's kit for its messaging interface.

24 A Sun SPARCstation interface from **Network Peripherals** gives users more FDDI options.

Quotable

"I really like the idea of running to the post office to get the mail."

CHARLES FELD
FORMER FRITO-LAY EXEC

Explaining his decision to leave Perot after just two months. See story page 6.

DESKTOP COMPUTING

37 Despite a tough sell from **Compaq**, the corporate printer market still leans toward **HP**.

40 Technology Analysis: New color portables from **Dell** and **Toshiba**.

WORKGROUP COMPUTING

54 Axil Workstations introduces Sun SPARCstation 10 clones.

ENTERPRISE NETWORKING

63 FTS-2000 users feel stymied by vendors' legal and public relations battles.

LARGE SYSTEMS

67 Two firms use metrics to evaluate data centers.

BUYERS' SCORECARD

48 Hitachi Data Systems' GX series rates high among mainframes.

APPLICATION DEVELOPMENT

73 Fidelity Investments' IS division builds a new development methodology.

PRODUCT SPOTLIGHT

79 Mainframes will see a lot of action this decade.

IN DEPTH

85 A rundown of the hot industries for jobs. By Emily Leinfuss.

MANAGER'S JOURNAL

87 IS managers can help prevent repetitive strain injuries.

DEPARTMENTS

6, 16 News Shorts
28 Advanced Technology
32 Editorial
89 Calendar
92 Computer Careers
103 Marketplace
108 Stocks
109 Computer Industry
110 Inside Lines

Company index appears on page 107.

The 5th Wave

"WHY A 4GL TOASTER? I DON'T THINK YOU'D ASK THAT QUESTION IF YOU THOUGHT A MINUTE ABOUT HOW TO BALANCE THE MAXIMIZATION OF TOAST DEVELOPMENT PRODUCTIVITY AGAINST TOASTER RESOURCE UTILIZATION IN A MULTIDINER ENVIRONMENT."

EXECUTIVE BRIEFING

■ **The FCC begins to pry apart** the local telephone services monopoly enjoyed by telephone companies. The hope is that competition in the local loop will lead to lower prices and better services for business customers. **Page 1.**

■ **Average mainframe discounts are expected to average** 23% this year, according to Gartner Group, compared with an average 18% discount in past years. Others log the average discount at 30%. But don't let the size of the discount blind you to what you're really getting: Some of the "great deals" include freebies that purchasers never use. **Page 79.**

■ **Unix Expo, with attendance nearing 30,000,** will feature new IBM strategies for the RS/6000 and AIX, lots of new products and practical advice on implementing Unix in the commercial workplace. **Page 1.**

■ **Oracle users learn that an integrated tool set** for Oracle 7 will be pushed back from this fall to 1993. Some are frustrated by the news. **Page 1.** Sybase introduces four connectivity tools to complement its client/server database strategy. **Page 10.**

■ **Banyan will offer its network services** on arch-rival Novell's NetWare as part of a new strategy to compete on network operating systems but cooperate on service products. **Page 4. Make Systems** announces a simulator that takes the guesswork out of re-engineering LAN internetwork installations. **Page 14.**

■ **IBM PC Co. adds strength** at the high end with a beefed up PS/2 premium line, but the industry is more concerned about the upcoming ValuePoint announcement. **Page 12.** Dell tops a user survey in reliability, service and support. **Page 39.**

■ **Carnegie Mellon develops a multilingual speech recognition** and translation system, as years of industry research begin to yield limited applications. **Page 28.**

■ **The job market stinks these days, but don't despair.** We asked recruiters and hiring managers to pinpoint those industries in which prospects are good. Among their picks: health care, financial services and distribution. **Page 85.** Learn how you can increase your chances of employment with tips on improving your resume, your appearance and the things you might say in an interview. **Pages 92 and 93.**

■ **Users of the giant Federal Telecommunications System (FTS)-2000** say it's working well and is reasonably priced, but they are concerned about their ability to upgrade to newer technology. **Page 63.**

■ **Borland faces timing challenges** as it tries to establish itself in the Windows spreadsheet market with Quattro Pro for Windows. **Page 37.**

■ **Is the network printing town big enough** for the both of them? Compaq's new products have the features and the price, but Hewlett-Packard has the overwhelming mind-set. **Page 37.**

■ **DEC shows off** an Alpha-based PC prototype at a European user meeting, saying the first machines will deliver six times the price performance of a 486. **Page 44.**

■ **On site this week:** Fidelity Investments copes with its complex environment by fashioning a new standard for application software development. The $1.3 billion Boston firm has 10 projects under development that use the new methodology, which is expected to speed completion by boosting programmer productivity. **Page 73.** In an economy plagued with plummeting interest rates, Norwest Mortgage turns to wireless workgroups to hurriedly add networked personnel and clean up processing backlogs. **Page 51.** California-based Inno Designs uses graphical workstations to speed time-to-market for its product designs in consumer electronics and other retail areas. **Page 51.**

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BUSINE

INTERA COMPET INTENSI

One by one, world trac falling, leading to the r truly global marketplace.

Aided by the substan throughs in telecommunic computer technology, many are finding it easier than ever enter markets around the wo were previously unreachable.

Even the smallest firms are to compete on a global basis, an are finding that overseas marke greater growth potential than d markets,which may be flat or satu

However, this advent of incr global competition has had a bruta on price margins.

Local firms which had previousl protected by tariffs or governm port are now finding themselv pressed to compete with the ne of global competitors, who economies of scale are offerin quality at lower prices.

This new global marketplace created the demand for multi multicurrency financial softwa can consolidate a firm's global picture into one integrated bala or P&L in seconds.

Due to very confusing, com and ever-changing tax structur foreign currency exchange ru vary country-by-country—this new challenge to the new breed c CFOs. ■

PRESSURE HEATS UP ON FINANCIAL FORECASTING

The ability to accurately forecast bo financial trends in the marketplace well as the financial performance of t firm is becoming critically important today's fast-moving, highly competitiv marketplace.

With the introduction of new multi-dimensional modeling and financial analysis software, the quality of financial forecasting has risen substantially over the past few years.

New spreadsheet technology such as CA-Compete!, which allows the creation of a multi-dimensional cube of data as

GEN

werful and are wooing m traditional vironments.

NIX, AS/400, offer incredible breakthroughs and (graphical user interfaces).

hardware platforms are bers await proven, mission- are to run on these exciting ns.

WIN-SIZING REND CELERATES

ll be needed is a way to integrate novative, new, cost-effective plat- and technology with clients' exist- stems and investments.

one can afford to walk away from past investment and start over. ouring hundreds of millions of dol- IS systems for several decades, America is starting to demand ty from its MIS departments. Return On Investment) of IS difficult to measure and sible to project. But still, ngful way to assess it must be found.

ne aspect of it that is easy to nd that is the amount of n existing IS systems. g back and adding up the ment is systems, training, development, etc., it's easy to how much a corporation will ndoning its current systems. corporations who have under- s exercise, it can be quite a experience. It also puts in a w light proposals to scrap exist- ms. ■

INVESTMENT PROTECTION #1 PRIORITY

many hardware and software ven- e proponents of "starting over" for us self-serving reasons, it is rarely a efficient or rational move for clients. ntead, prudent clients focus on evolu- onary technological advances, as pposed to revolutionary ones. There's o reason to throw away existing sys- tems when there's always technology that integrate the old with the new.

Apple reaching out to touch corporate customers directly

Begins push to sell to large accounts through mail order, direct channel

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. made another bid to get closer to the corporate customer last week by increasing the number of large accounts to which it will sell directly.

The company also continued its efforts to get its products into the hands of the masses when it announced plans to start selling a limited number of its goods by mail order next month.

Apple USA President Robert Puette said he still expects the majority of the company's corporate sales to involve dealers, adding that Apple will still contract out to these traditional distributors. He said the new initiative will target corporate accounts with 1,000 employees or more.

Although some dealers may carp about Apple's new plan, direct sales are already a part of life at some large corporations. "Like a lot of companies, we already buy directly from Apple and get massive discounts," said Rob McPhee, a development engineer in the imaging systems department at Du Pont Co. in Wilmington, Del.

No real competition

Nervous dealers said they had assurances from Apple that its direct marketing program would not cut into their business. For instance, all products in the catalog will be listed at their suggested retail price. "Apple has assured us that the prices they offer corporate customers won't compete with what we can offer. So as long as it doesn't affect our allocation of products and helps Apple be a stronger player, we're all for it," said Steve Taylor, a spokesman for Computerland Corp. in Pleasanton, Calif.

Apple will limit its initial catalog sales to peripherals, with the recently introduced PowerBook 145 portable being the only computer available. Although an Apple spokeswoman said the company plans to "expand the hardware offerings" and include more Macintosh personal computers in future catalogs, analysts said Apple may miss the boat on generating large PC mail-order sales.

Vendor catalog sales are expected to grow from $3.8 billion this year to $4.4 billion in 1995, but their percentage of the total PC market is projected to drop from 8.1% today to about 6% during the same period, according to researchers at Merrin Information Services, Inc., a distribution-oriented research firm in Palo Alto, Calif.

"Given the choice, people would rather go down to a local store and take home a product today than mail away for it," said Marcia Kaplan, Merrin's director of research. "With the recent price-cutting battles, catalog sales lost a lot of the advantages they once had."

Rather, catalog sales might appeal to people in more sparsely populated areas who might not be able to get their hands on the Apple supplies the catalogs offer. "We'll be able to expand our reach," said Maureen Loeb, manager of catalog sales at Apple USA.

To sweeten the deal, Apple will provide a next-day turnaround for most orders and give customers one-year, toll-free telephone support.

Gaining an edge

The company's move follows a long-term effort to compete more effectively with producers of low-cost PCs. Dell Computer Corp., most notably, has emerged as a strong competitor in the PC market by selling low-cost, high-quality PCs almost exclusively through mail order. Its success has forced IBM, Compaq Computer Corp. and Digital Equipment Corp. into the PC mail-order waters as well.

Apple's first catalog will be mailed out in mid-October to about 1.1 million customers in the general business, consumer and education markets. Revised catalogs will be sent out quarterly. The first catalog will include peripherals such as printers and scanners, complementary third-party products from firms such as Claris Corp. and Aldus Corp. and products that are hard to find in computer stores.

The moves are a byproduct of a highly competitive IBM-compatible clone market that has seen the price of PCs plummet during the past 18 months. Apple Chairman John Sculley has continuously vowed commitment to a cost structure that will allow the company's products to stay competitive and affordable. In the past two years he has changed the company's business strategy from one of selling expensive machines with high profit margins to pushing high volumes of low-cost Macintoshes.

Last week, Apple announced the four-member Performa series, which marked the company's first large-scale attempt to sell through the mass market retail channel now ruled by IBM-compatibles.

Expanding options

Apple is extending its reseller strategy to include the mail-order channel, while increasing its emphasis on direct sales to large corporations

Which of the following sources do you typically go to?

Survey of 1,091 IS professionals at medium and large companies

Source: CW Database Division

CW Chart: Michael Siggins

PowerBook 100s recalled

Apple announced last week that some owners of its Macintosh PowerBook 100 portable computer should return their units for minor circuit board modification.

The concern emanates from an electrical short that can melt a small hole in the bottom of the machine. So far, the malfunction has occurred in only three of the nearly 60,000 PowerBook 100 units that could be affected by the problem, Apple officials said. No personal injury or property damage has resulted from the problem, and the short did not affect the performance of the machines, they added.

PowerBook 100 computers bearing serial numbers below SQ211xxxxxx and SS216xxxxxx require modification. Units with serial numbers equal to or greater than SQ211xxxxxx and SS216xxxxxx are not affected.

This problem marks the second time an alert has gone up about the PowerBook. Last April, the company confirmed that loose battery packs can short out and create a fire if a piece of metal comes into contact with the negative and positive poles simultaneously [CW, April 27]. The company subsequently offered users a free protective case.

The current short-circuit problem cannot occur in the PowerBook 140, 145 or 170 models because the component configuration is different. Model 100s made since March are also not affected.

Apple is asking PowerBook customers in the U.S. with the specified serial numbers to contact their dedicated PowerBook 100 Safety Helpline at (800) 572-1731 from 9 a.m. to 8 p.m. EDT, Monday through Friday, to schedule modification. Upon confirmation, Apple will provide express pickup of the unit, make the free adjustment and return the unit by express service. Turnaround time will be about three days, Apple said.

JAMES DALY

Banyan introduces network services for NetWare

BY MICHELE DOSTERT
CW STAFF

NEW YORK — Banyan Systems, Inc. in Westboro, Mass., last week made good on earlier promises by announcing a suite of network service products that will run on rival Novell, Inc.'s NetWare network operating system.

Banyan's Vines local-area network operating system has long featured distributed directory, messaging and security services tailored for large, multiserver LANs. These services have helped the company win a devoted following among large LAN users.

However, those customers provide only a 10% to 12% market share for Banyan, according to most analysts. That compares with an estimated 65% to 70% share for Novell.

Banyan has now adopted a new strategy: compete with Novell tooth and nail to sell LAN operating systems but cooperate with Novell to sell network service products on the NetWare platform.

"There are a lot of NetWare users who desperately want these distributed services, but they aren't going to throw away their NetWare to get them," said David Mahoney, chief executive officer at Banyan. "With Enterprise Network Services [ENS], they won't have to," Mahoney added.

Banyan's ENS for NetWare product consists of an ENS server running on an Intel platform, a NetWare Loadable Module for NetWare v3.11 or a Value-Added Process for NetWare 2.2 that runs on the NetWare server, as well as Banyan client software that allows NetWare clients to use ENS.

The first release of ENS for NetWare will include Banyan's StreetTalk directory, Intelligent Messaging, Network Management, System Administration and Security services, as well as a variety of wide-area and server-to-server communications options.

Novell itself has promised users that its forthcoming NetWare 4.0 product will contain a distributed, multiserver directory service similar to Banyan's StreetTalk. However, some analysts said they think that Banyan's ENS products may be enthusiastically embraced by NetWare users who want distributed directory service but do not want the expense and hassle of upgrading to NetWare 4.0.

"By stratifying their product line so much, Novell has really opened the door for Banyan services," said Jamie Lewis, a principal analyst at The Burton Group, a Salt Lake City-based LAN research firm. "Only 25% of Novell's customers are now using NetWare 3.11, and NetWare 4.0 is such a revolutionarily different product that I think it will be 12 to 18 months [following NetWare 4.0's] introduction before we see significant movement to the 4.0 platform.

"If Banyan can do a good job of explaining the benefits of their ENS products to users, I think they could be very successful with it," he added.

Rick Inatome, president of Inacom Corp., a large Omaha-based reseller, said, "I've seen a lot of customers who have tried to downsize but have gotten burnt by the lack of tools, such as directory and security, that they need. I think my customers will be very receptive to ENS."

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("","",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code != FAIL)
  {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
          remove_xact(dbproc_commit, commid, 1);
      }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL) .
  {
      remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.O. McGoveran and C.J. Date: *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 498, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE  SAVINGS
SET     S_BALANCE = S_BALANCE - 250.00
WHERE   S_DEPOSITOR = 'JONES'
UPDATE  CHECKING
SET     C_BALANCE = C_BALANCE + 250.00
WHERE   C_DEPOSITOR = 'JONES'

COMMIT  WORK;
```

Early Client/Server RDBMS products, like Sybase, don't automatically assure the consistency of distributed transactions. When related data on multiple servers must be updated by one transaction, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications.

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NEWS SHORTS

Olsen to leave DEC board Oct. 1

When Digital Equipment Corp. CEO-elect Robert Palmer takes over next week, current Chief Executive Officer and founder Ken Olsen will resign as a member of DEC's Board of Directors, effective Oct. 1. Olsen was slated to stay on the board until November 1993. Olsen, who will retain an office at DEC, did not comment on the change in plans.

486SX speeds up

Intel Corp. is scheduled to increase the speed of its I486SX microprocessor today, when it unveils a 33-MHz version of the chip. More than a dozen personal computer vendors, including IBM and AST Research, Inc., have announced systems based on the new chip. Meanwhile, Intel rival Advanced Micro Devices, Inc. last week boosted the speed of its Intel 80386SX clone, introducing 40-MHz versions of its AM386SX and AM386SXL microprocessors. According to AMD, the chip, when used with cache, will rival Intel's 20-MHz 486SX in performance.

Valley GOP leaders back Clinton

Some of Silicon Valley's leading Republican CEOs last week announced support for President Bush's Democratic rival, Bill Clinton. Endorsements came from Apple Computer, Inc.'s John Sculley, Hewlett-Packard Co.'s John Young, National Semiconductor Corp.'s Gil Amelio and Silicon Graphics, Inc.'s Ed McCracken. "Many of us are Republicans," Sculley said. "But as we look at the future of this country, we said we couldn't sit this one out."

Stratus study examines downtime

A new study has found out how much those annoying outages cost corporate America. According to research paid for by Stratus Computer, Inc., "unplanned computer downtime" costs U.S. businesses $4 billion a year. The losses come from lost productivity when employees are idle as well as the loss of potential future business by dissatisfied customers, the study said.

Solbourne sells object unit

ParcPlace Systems, Inc. in Sunnyvale, Calif., a provider of object-oriented developers' software, announced the acquisition last week of Solbourne Computer, Inc.'s Object Interface Software business unit. The Solbourne unit, formed only nine months ago, develops software for building X Window System-based C++ applications. Industry analysts said the acquisition effectively makes ParcPlace the leading developer for object-oriented tools in the C++ environment.

Short takes

Systems Center, Inc. in Reston, Va., has acquired **Tangram Systems Corp.**'s AM:PM package for centrally distributing software to NetWare and OS/2 local-area networks as well as DOS PCs and Apple Macintosh systems. . . . Pete Privateer, ex-strategic product planner at **KnowledgeWare, Inc.** in Atlanta, has resurfaced as vice president of North American marketing at **Interactive, Inc.**, a rival computer-aided software engineering company based in Rockville, Md. . . . **Wang Laboratories, Inc.** will ask a U.S. Bankruptcy Court for permission to terminate 118 real estate leases in various U.S. locations, which is expected to save $35 million. . . . **IBM Personal Computer Co.** has named David Saxby, formerly senior vice president at Parallan Computer, Inc., the new IBM spin-off's director of server business. . . . **Apple** moved to beef up the font selection of the mainstream user with the introduction of the Apple Font Pack, a selection of 25 new fonts for $99. . . . **Andersen Consulting** has signed a five-year extension to an outsourcing contract with Schuller International, Inc., a Denver-based subsidiary of Manville Corp. . . . **Tandy Corp.** opened a major electronic "Incredible Universe" superstore in a Portland, Ore., suburb last week.

More news shorts on page 16

Feld resigns from Perot post

BY MARK HALPER
CW STAFF

DALLAS — After just two months, former Frito-Lay, Inc. information systems chief Charles Feld has left Perot Systems Corp. to resume running his start-up consultancy.

Feld, who joined Perot July 10, resigned early this month, he said, because he missed the challenge of his own company. "I really like the idea of running to the post office to get the mail," said Feld, who founded the Feld Group earlier this year after leaving Dallas-based Frito-Lay as vice president of management information.

Perot had hired Feld as vice president of a business group charged with helping clients implement information technology strategically [CW, July 27]. Feld is widely credited with having overhauled information systems at Frito-Lay and was to have overseen similar projects for Perot clients.

Entrepreneurial bent

But Feld last week said he wanted to remain in a smaller, entrepreneurial environment that specializes in consulting rather than getting involved in running client operations, as Perot often does.

Feld described his parting as amicable and said he had ample latitude while at Perot. "I really had a pretty broad slate to operate within that environment," he said. "It just came down to working at a major corporation on a major growth path with 1,600 people as opposed to a smaller business consisting of a couple of dozen people."

Feld missed *challenge of start-up*

Feld is restarting the Feld Group and is bringing two Perot employees with him: Monte Jones, who joined Feld at Perot after leaving Chicago systems integrator Technology Solutions Corp. and who was formerly chief information officer at Kentucky Fried Chicken; and Pat Steele, a former Frito-Lay techical director who had joined the Feld Group before Perot absorbed it. Feld, Jones and Steele are all equity partners in the consultancy, which Feld hopes to expand to include about 30 employees.

Feld declined to elaborate on the financial details of his parting except to say that he is giving up the equity share in Perot that he received when he joined the company. "It was kind of a hazy deal" with Perot, Feld said, referring to the manner in which Perot bought out the Feld Group.

He said he had not begun any major client projects at Perot, which allowed him to walk away.

Neither Perot Chairman Mort Meyerson nor President Pat Horner returned calls last week to comment on Feld's departure. It is not known whether the firm will replace him.

Meanwhile, Feld said that as an IS consultant he will preach the virtues of client/server computing, though he sees a place for mainframes for a long time to come. "The mainframe will be the tallest, most robust server on the network," he said, noting that it should typically be used for accounting systems, large databases and network control, while smaller servers should be used for functions including order entry and inventory.

DOT sends CRS message to airlines: 'Loosen up'

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The federal government last week ordered the nation's airline reservation systems to loosen up and let users install third-party desktop systems to tap into multiple reservation and data networks.

The U.S. Department of Transportation (DOT) included the order for open systems in a new batch of regulations intended to curb some monopolistic practices of the airline-owned computerized reservation systems (CRS).

The DOT also decided against mandatory "dehosting," which would mean running the CRS service on a separate mainframe from the one used for the airline's internal CRS.

In the past, CRS vendors provided terminals or personal computers to travel agencies under contracts that forbade them to use third-party hardware or software. The new rules allow agencies to buy desktop computers on their own and access multiple CRSs.

The agency noted that this would make the CRS business more like an information service such as CompuServe or Prodigy: "CRS vendors should be able to conduct business without compelling subscribers to acquire their equipment and software," the DOT argued.

But if the user sticks with hardware supplied by the CRS vendor, that vendor has the right to keep the travel agency captive to its own CRS, the DOT added.

A recent survey by *Travel Weekly*, a trade newspaper based in Secaucus, N.J., found that 18% of travel agency locations are interested in buying their own hardware for CRS access and 25% are interested in buying third-party software.

Compatibility assurance

CRS vendors are required to publish technical specifications so that third-party hardware and software vendors can be sure their products are compatible with the reservation systems.

The long-delayed DOT rules also extend the 1984 ban on displays biased toward the host carrier and prohibit the use of certain contract clauses that have made it very difficult for travel agencies to switch CRS vendors.

Officials at the two biggest reservation systems, Sabre and Apollo, said the new regulations were overkill.

"It's rather unfortunate that DOT felt forced by political pressure to adopt these rules because they are generally unnecessary," said a spokesman for American Airlines' Sabre unit in Fort Worth, Texas. The political preasure came last month from a U.S. House of Representatives vote for tougher CRS rules [CW, Aug. 17].

Allan Z. Loren, president of the Covia Partnership in Rosemont, Ill., which owns the Apollo CRS, said the DOT's rules are unnecessary but "appear more reasoned than other proposals we have seen regarding our industry, including legislation in Congress."

The DOT did strengthen its requirement that CRS vendors eliminate system defaults that favor the host carrier and load data for other participating airlines in a timely fashion. But the DOT shied away from any stronger steps to eliminate the "architectural bias" that favors the airline operating the system.

"These rules will enhance the ability of carriers to compete on price and service without denying vendors the legitimate benefits of their investments and without requiring detailed management of CRS operations by the government," Secretary of Transportation Andrew H. Card Jr. said in a statement.

Electronic vote tabulation saves cash

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — When U.S. congressmen Chester Atkins (D-Mass.) and Stephen Solarz (D-N.Y.) lost their respective state primaries last week, it pushed the number of incumbent congressional ousters to 19 for the year, setting a post-World War II record. Based on early returns, the same trend appears to favor the replacement of incumbent, manual voting systems.

Early users of automated electronic voting systems are reaping big benefits. For example, the state of Oklahoma is saving $1 million in manpower that used to be spent counting paper ballots. In addition, automated voting systems can process information within minutes.

Last week, New York City and the states of Minnesota and Oklahoma successfully used automated systems to help process voter registration and tabulate votes for elections in their regions. The New York City Board of Elections last week made Staten Island (Richmond County) the third city borough to use a signature-verification imaging technology to automatically locate each voter's name in a computerized system.

Daniel DeFrancesco, executive director of the Board of Elections, said the system has dramatically shortened the long waiting lines voters have come to expect in the city.

SCRIBE, or Signature Capture, Reproduction and Imaging System for the Board of Elections, had already been used by the city in the Bronx and Brooklyn in March. Voters in Queens and Manhattan will register using the system beginning next year.

Developed by Andersen Consulting, the system uses Hewlett-Packard Co.'s Advanced Image Management software residing on an HP 9000 Model 825 server running HP/UX in a client/server configuration.

DeFrancesco said the city will probably add bar-code scanning to the system, which, based on preliminary research, could save the city a minimum of 25% in man-hours.

Based partly on SCRIBE's success, DeFrancesco is looking for additional high-tech voting opportunities. The city expects to install electronic tally systems and begin testing them by 1993. Full deployment is expected by 1994.

Success in Minnesota

Minnesota has been phasing in a vote tabulation system during the past two years. In last week's local and state primaries, an IBM Systems Network Architecture network was used to link the state's 87 counties using IBM 3270 terminals to a Unisys Corp. 2200 6011 mainframe to record the results from the state's 2.65 million registered voters. According to Tim Hanson, director of the information services division of the secretary of state's office, the system will be used in November to calculate Minnesota's presidential election results.

Last week, the state inaugurated a new election-night reporting system, written in Unisys' Mapper fourth-generation language. Hanson said the system replaces an older one that was less user-friendly and couldn't handle as much data as the Mapper system.

As each county manually enters voting results on IBM 3270 terminals, the data is uploaded by a front-end processor via modems to the mainframe, which crunches out the results.

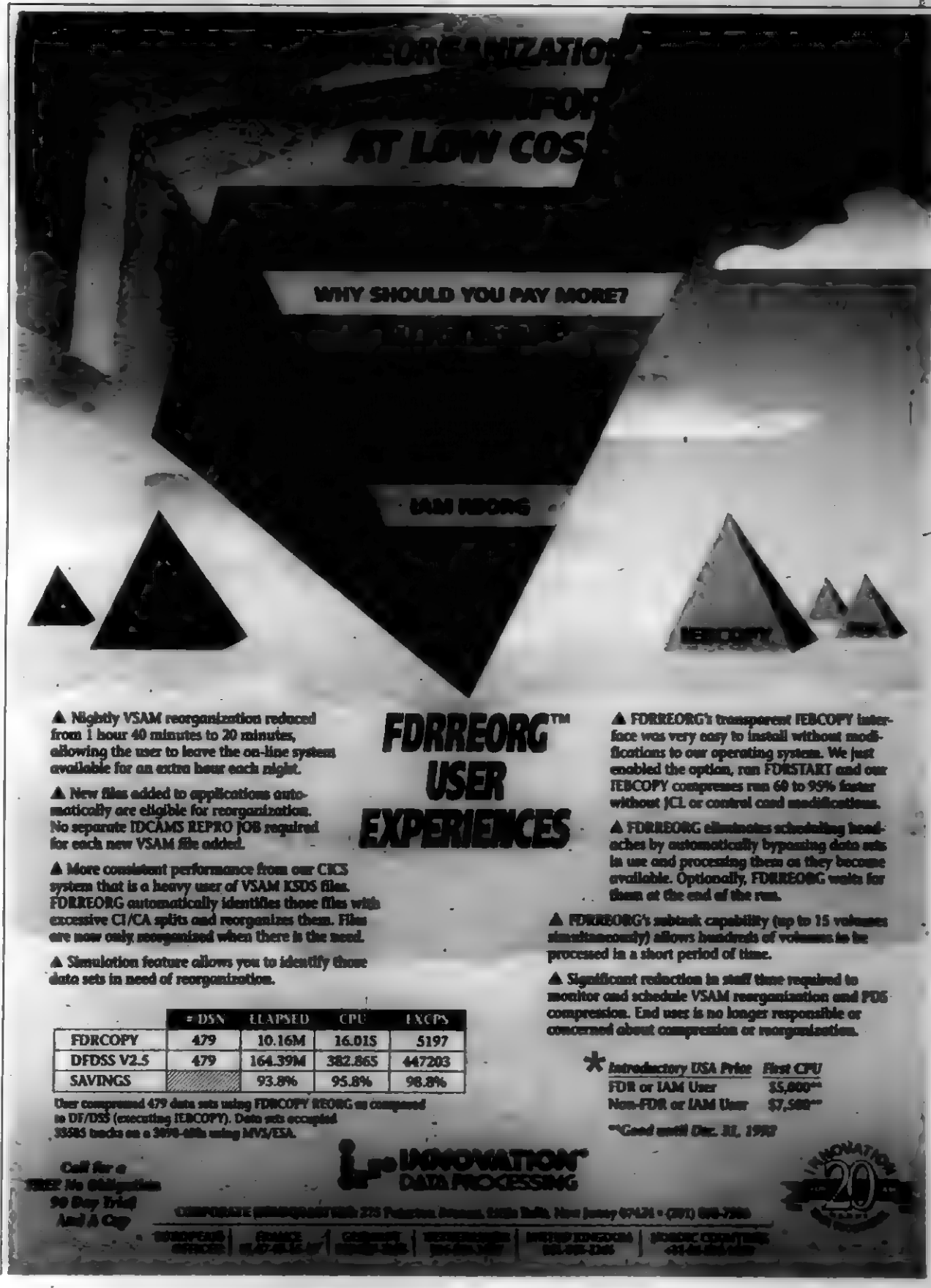
Heavy thunderstorms throughout Minnesota last Tuesday briefly delayed communications between a handful of rural county auditors' offices and the central data center until downed phone lines could be repaired. Though Hanson said he was delighted with the system's performance last week, he expressed concern that the state has no backup systems, such as uninterruptible power supplies, to prevent possible disasters on election night. Hanson said he hopes the state will allocate backup systems in its next budget.

The state of Oklahoma is using computerized systems for both voter registration and automated voting. The system replaced the use of paper ballots with devices that record and report votes electronically, saving $1 million.

According to Lance Ward, secretary of Oklahoma's State Election Board, each of Oklahoma's 77 counties uses Digital Equipment Corp. MicroVAX 3100 minicomputers to record the results from the state's 2 million registered voters.

The information is housed in databases custom-designed by Andersen Consulting and then routed over phone lines to a DEC VAX 4300 machine.

Ward said the system has paid off handsomely. After the polls closed Tuesday at 7 pm Central Standard Time, Oklahoma's voting board had results from 96% of the state's 250 precincts within two hours. Prior to using the system, Ward said it usually took two or three days to gather statewide results.



FCC ruling opens up local loop competition

CONTINUED FROM PAGE 1

faults in the public network.

"For customers, it means they get more competition, faster," said Henry D. Levine, a Washington, D.C.-based attorney who represents several large-business customers.

For their part, users said they were looking forward to the effect on prices and service levels in a competitive local loop, if not alternative kinds of voice and data networking services as well.

"I'm not sure that new services will be as significant as the ramifications on pricing and service that competition will bring," said Alan Phillips, president of Instant Information, Inc. in Boston, the country's largest fax-on-demand service bureau.

However, Levin suggested that a fight over interconnection rates is expected. Phone companies have 120 days to file their tariffs with the Federal Communications Commission.

Once pricing issues are ironed out, however, a quick expansion is expected in the number of businesses using alternative metropolitan-area networks. "The networks of all the [alternative carriers] combined maybe reach into 3,000 or 4,000 buildings nationwide," Levin said. "With this, they'll be able to reach 200,000 businesses within 12 months."

MFS, for example, operates fiber-optic backbone networks in 14 cities, and predicts revenue of $125 million, or about 55% of the competitive access market, according to MFS President Royce J. Holland (see chart page 1).

"The competitive access industry is in a similar position to that of long distance 15 years ago," Holland said.

Last week's FCC ruling quadruples the market that alternative local-access companies can address, according to Richard Tomlinson, president of Connecticut Research in Glastonbury, Conn.

"Up to now, they've been able to address around $500 million of the $4 billion to $5 billion pie for special access lines," Tomlinson said. "With this ruling, they can address half that market."

Tomlinson added that these carriers will be able to address about $4 billion worth of the $20 billion switched local-access market when the next FCC ruling opens local switched services to competition.

The opening of the local loop to competition would not necessarily end the need for private facilities. "We look at internal networking as competitive product," said Jeff Marshall, senior managing director of communications at Bear, Stearns & Co. in New York.

On the other hand, Marshall and other users said they look forward to competitive offerings for services such as Integrated Services Digital Network and switched video, which have been the sole province of local telephone companies.

> "FOR CUSTOMERS, it means they get more competition, faster."
>
> HENRY D. LEVINE
> ATTORNEY

MFS played a key role in last week's FCC ruling, which was a response to MFS' November 1989 Local Equal Access Initiative. That initiative asked the FCC and the U.S. Department of Justice to require Bell operating companies to interconnect with competitive access providers. A number of observers said the FCC interconnection plan, proposed in May, has already had a beneficial effect.

Instant Information uses MFS as a bridge to its long-distance carriers. But Phillips said MFS' ability, under last week's FCC decision, to bridge to local sites "is something we're very interested in."

Phone companies, seeing the writing on the wall, have been lowering prices for private lines and improving service responsiveness. In fact, the FCC — seemingly aware of this tactic and eager to encourage a new breed of alternative carriers into vigorous competition with local telephone monopolies — moved to keep users' choices open.

Cheryl A. Tritt, chief of the FCC's Common Carrier Bureau, said users will be able to break existing contracts with telephone companies and take a "fresh look" at competitive offerings without paying a penalty. Presumably, she said, the telephone companies will negotiate to keep those customers.

The FCC order last week dealt only with special access lines. But in a second step toward busting the local monopoly, the FCC proposed a regulation that would extend the interconnection plan to switched local transport, which affects virtually all business customers. That proceeding will take about 12 months to finish.

To ensure that the traditional telephone companies can respond to the new competitive threat, the FCC said it will give them new pricing flexibility within a price-cap system.

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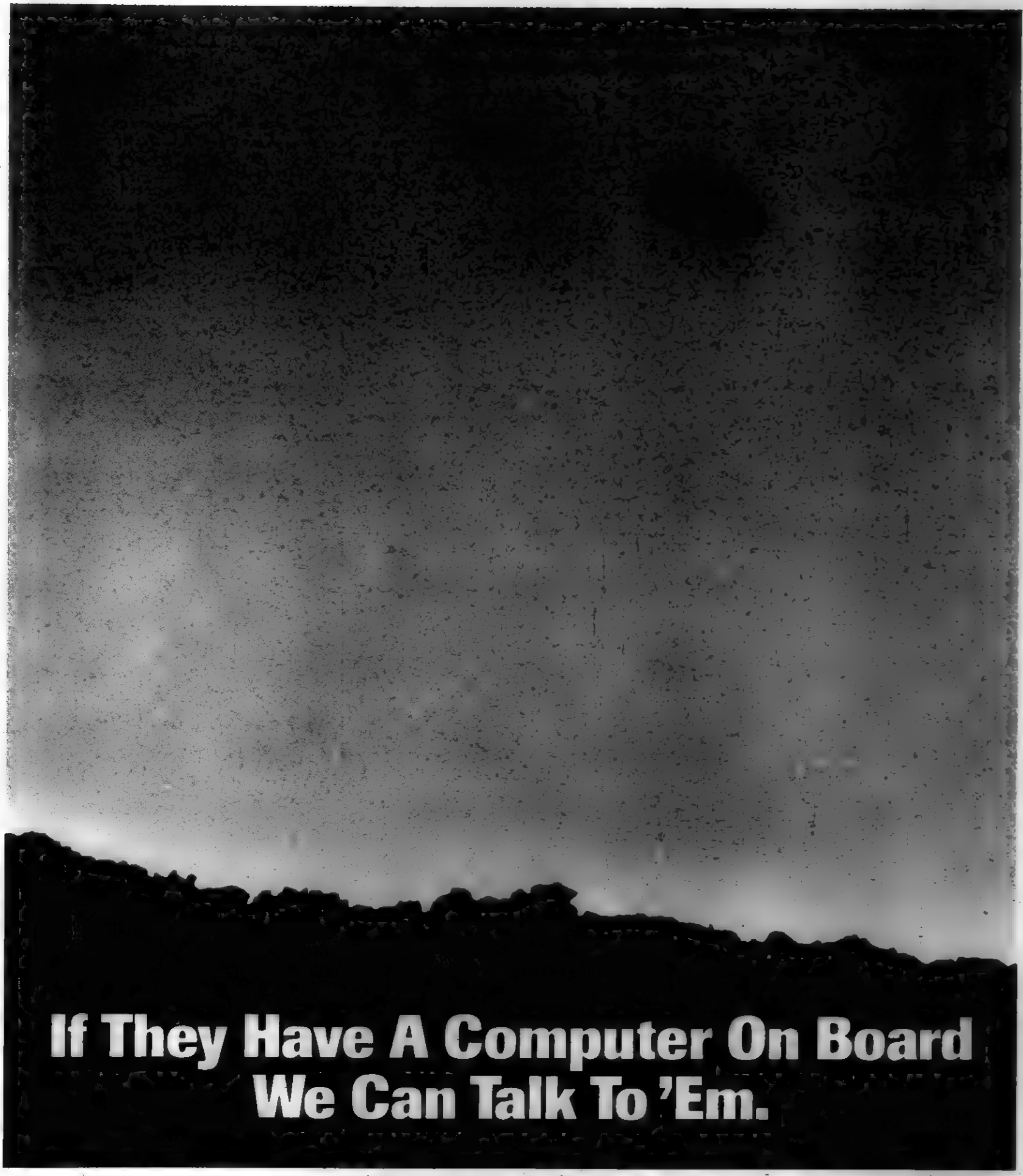

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Sybase: Server becomes client

But mainframe's 'transparent access' will cost users programming time

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. last week turned the client/server equation on its head, saying it has found a way to make the mainframe into a client to a Unix server and minicomputer, instead of the other way around. But it will cost users extra coding time.

Sybase's Open Client for CICS tool kit allows users of IBM mainframe applications to grab data from remote database servers on personal computer local-area networks or Unix networks. But this transparent access will come at the expense of extra programming, some analysts said.

"Sybase is providing the glue that will make client/server computing transparent and easy for the end user," said Neal Hill, a senior technology analyst at Forrester Research, Inc. in Cambridge, Mass. "But the price is that you're going to have to write code on top of the Sybase interfaces."

Some analysts said they believe Sybase innovated Open Client by translating the downsizing trend into a host-to-LAN connectivity tool. "They're probably the first ones to do a reverse-connect product so that a CICS application can get data from a Unix database," said Donald Feinberg, a software analyst at Gartner Group, Inc. in Stamford, Conn. The technique will become more important as downsizing becomes more widespread, he said.

At the same time, Sybase announced an enhanced Open Gateway product for IBM's DB2 relational database. Matesys Corp. in Larkspur, Calif., a developer of Microsoft Corp. Windows applications, said it plans to use the new gateway to develop "client" programs for DB2 that are identical to those for Sybase's SQL Server database.

Sybase also announced NetGateway for OS/2 and Open Server for OS/2. Open Client is priced from $32,040 to $64,040; Open Gateway is priced from $102,530 to $204,930. They are scheduled to ship in the fourth quarter.

Oracle users frustrated by wait for DBMS, tools

CONTINUED FROM PAGE 1

lowed by volume shipments sometime in early 1993. Oracle Chief Executive Officer Lawrence Ellison compared the phased rollout to one of IBM's early release programs under which new technology goes to experienced customers first.

Oracle has been cautious not to repeat the flawed rollout of Oracle Version 6.0 in 1989, which was caused by buggy software and poor quality control. Fourteen sites started using Oracle 7 in August 1991, followed by hundreds of sites that joined an expanded beta-test program this year.

"It's important to us to turn over Oracle 7 [to customers] in October," Ellison said, "but there aren't a lot of customers who want to flip it on [during] the first month it's available."

Migration from Oracle Version 6.0 to Oracle 7 will take some time because users must first develop applications that take advantage of Oracle 7's distributed database features, such as stored procedures, triggers and two-phase commit. This process could take six months to a year to complete, users said.

The next set of Oracle tools includes the SQL Forms 4.0 application development kit, the SQL ReportWriter 2.0 report generator, the Oracle Graphics 2.0 multimedia package and the BookViewer 1.0 documentation product. All were shown to industry analysts in January and again last week, but they were never formally announced. Oracle demonstrated the new tools on the exhibit floor.

Users said Oracle developers told them that SQL Forms 4.0 is taking longer to complete than expected but that selected users began beta tests of SQL ReportWriter 2.0 last month.

Oracle told users in March that they could begin to develop with SQL Forms 3.0, which is compatible with Oracle 7. Since then, Oracle has held training classes on how to use SQL Forms 3.0 to program for Oracle 7, including sessions at the user conference.

Many sites began developing for Oracle 7 features in June, when a developer's copy of Oracle 7 was widely distributed. But development with SQL Forms 4.0 is expected to be faster.

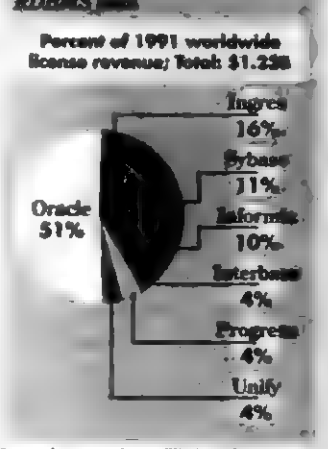
"With the new tools, many of the forms are already set up, and you don't have to write all the triggers," said Dali Gotay, a database administrator at the U.S. Army Corps of Engineers. "It makes a big difference to the users."

Users noted that the modules in Oracle's new tool set are linked, so code can be transferred from one tool to another. The new tools support GUIs and multimedia through a common Oracle Graphics 2.0 software layer. When the new tools are shipped, Oracle users will for the first time be able to write portable applications for other relational databases, such as IBM's DB2. Until now, Oracle tools have worked only with the Oracle database.

Another product set key to Oracle 7 distributed applications also waits in the wings: Oracle's connectivity tools. SQL Net 2.0, announced one year ago, will be shipped on the same program tapes as Oracle 7, said Kenneth Jacobs, vice president of RDBMS marketing. A new group of SQL Connect programs, which link Oracle databases to other databases such as IBM's DB2, will be announced in early 1993, sources said.

Riding high

Oracle remains the leader of the RDBMS pack



Source: Dataquest, Inc. CW Chart: Tom Monahan

Space exec lands at Oracle

After nearly two years of wearing all three top management hats at the company he founded in 1977, Lawrence J. Ellison tossed one of them to an experienced outsider. Hughes Aircraft Co. executive James Abrahamson, a former NASA administrator and director of the U.S. "Star Wars" Strategic Defense Initiative, has been named chairman of Oracle Corp.'s board.

Abrahamson, 59, will become a full-time chairman next month at $1.18 billion Oracle. He will help direct day-to-day operations from a newly created Office of the Chairman, which he will share with Ellison, according to the company.

Ellison, 48, will retain the titles of president and chief executive officer and will focus more closely on technology issues.

Oracle also formed a five-person executive committee, including Ellison and Abrahamson, to define strategic direction and oversee worldwide operations. "The operational executives will report to me," Ellison said. "In the case of disputes, I'll cast the deciding vote."

Ellison took on the role of chairman in early 1991, following Oracle's 1990 fiscal crisis but before Oracle announced its first-ever yearly loss in 1991. Since then, "I've been spending a good deal of my time making sure such an event never happens again," he told reporters and analysts last week. "The biggest mistake I made was not strengthening the management team." Since June, Oracle has hired several top executives from outside the company.

Ellison will *focus on technology issues*

Abrahamson said Ellison "is giving me the charge to work on developing the culture and the infrastructure for the multibillion-dollar future Oracle has ahead of it." His extensive contacts in the aircraft and automotive industries as well as in the federal government will help Oracle gain big contracts, Wall Street analysts said.

A retired U.S. Air Force lieutenant general, Abrahamson directed NASA's Space Shuttle program from 1981 to 1984 and directed the Strategic Defense Initiative nuclear-umbrella program from 1984 to 1989. However, he playfully asked reporters and analysts "not to call me General Star Wars."

The Oracle board will meet to formally approve Abrahamson's appointment later this month.

JEAN S. BOZMAN

More RAID subsystems for AS/400

WALTHAM, Mass. — Two weeks after IBM announced a RAID storage subsystem for the Application System/400 line, third-party firm IPL Systems, Inc. counterpunched with similar products.

IPL's 7936 Models 40 and 42 are based on low-level redundant arrays of inexpensive disks (RAID) technology and are targeted at users doing disk mirroring to build fault-tolerant-like data storage.

An early user of the products, the New England Memorial Hospital, cut six hours off monthly batch-processing time, from 18 to 12 hours, because of the quick seek time of the arrays, according to Phil Janus, assistant vice president of information services. Critical monthly reports are available a day earlier as a result, he said.

The hospital replaced 15.2G bytes of IBM-supplied storage with IPL's Model 40 disks "with no sacrifice of reliability, service or quality," he added.

Priced at $46,600, Model 40 offers up to 54G bytes of storage, while Model 42 holds up to 27G bytes and is priced at $34,200.

IPL, which specializes in storage products for IBM midrange and RISC System/6000 systems, promised more advanced RAID subsystems.

KIM S. NASH

CORRECTIONS

A story in the Sept. 14 issue of *Computerworld* on Apple Computer, Inc.'s new Performa systems should have said that the Macintosh IICI will be replaced with the IIVX and that a new model, the IIVI, will also be added.

.....

Oracle Corp. received $80 million in financing from Nippon Steel Corp., not $200 million as was reported in the Sept. 14 issue.

.....

A callout in a story in the Sept. 14 issue of *Computerworld* incorrectly identified Brian Dehn as a Legent Corp. employee. Dehn actually works at TransAmerican Insurance Group in Woodland Hills, Calif.

.....

A story in the Sept. 7 issue incorrectly identified a product acquired by Computer Associates International, Inc. from Stuart P. Orr & Associates. The product, Advanced Business Software, is a set of financial, distribution and manufacturing accounting packages.

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GSA Number GS00K90AGS5251-PS02.

IBM enhances PS/2; low-end line debated

BY CAROL HILDEBRAND
CW STAFF

NEW YORK — Today's anticipated announcement of an enhanced Personal System/2 line is making diehard IBM users happy, but analysts questioned whether IBM Personal Computer Co. missed the boat by delaying its long-awaited ValuePoint announcement until the end of next month.

The ValuePoint is IBM's entry-level offering for corporate buyers.

"It doesn't make any sense," said Jeffrey Henning, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass. "If they didn't want to bunch their announcements, they should have pushed back the PS/2 line, not the ValuePoint."

The company is following up on a strategy aimed at targeting three different PC families at separate customers by differentiating on distribution, price and service and support. With its PS/1 line — aimed at the home market via mass merchandisers [CW, Sept. 14] — already out the door, IBM had originally planned a massive announcement today for both its premium line, the PS/2, and the ValuePoint line. But the company is pushing back the delivery date of ValuePoint. Analysts said the decision came from a combination of a parts shortage and a desire by IBM to let each line and brand team have its own separate moment in the sun.

Analysts said that even though the ValuePoint line is bound to cannibalize PS/2 business, IBM should make tracks in getting it out the door. The company badly needs a revitalization of user support for its PC division. In fact, International Data Corp. recently estimated that for the first time, Apple Computer, Inc. shipped more units than IBM did last quarter because IBM has lost so many users to competitors such as Compaq Computer Corp. and Dell Computer Corp.

Joseph Trickey, PC coordinator at Stratton-Cheeseman Management Co. in East Lansing, Mich., is one customer who said he would like to see the ValuePoint line. Although he said he expects the Model 56 will stay a part of his purchasing plans, "I wouldn't be surprised if the ValuePoint line might be what we buy a majority of."

Others have less of a sense of urgency. Charles Darnell, chief executive officer of Lithonia Lighting in Conyers, Ga., said he is more interested in the ValuePoints. "I think that [IBM] needs it more than we do. I think the customer base has learned to wait a beat or two longer before reacting to change because prices keep going down, and function keeps going up."

The new PS/2s are aimed at the corporate high end. All of the new boxes will be Micro Channel Architecture-based, with Small Computer Systems Interface adapters and enhanced Extended Graphics Array. Also standard will be 8M bytes of random-access memory, as well as OS/2 preloaded (see story above).

Another new twist will be an unprecedented three-year warranty on the machines, which brought cheers from users.

"A three-year warranty would make us very happy and hopefully would reduce maintenance costs," said Bruce Linker, assistant vice president of group information technology at Dean Witter Reynolds.

However, many analysts said they were confused about how the two lines could be differentiated enough to keep the PS/2 viable. With the ValuePoint expected to be exclusively AT bus-based, "the bottom line is, I don't think the Micro Channel can be sustained," Forrester Research, Inc. analyst William Bluestein noted.

Family values

IBM's PS/2 extensions are expected to include the following:

- **Models 56 and 57:** New systems that feature IBM's clock-doubling 486SLC2/50 chip.
- **Models 85 and 95:** The 85 is a new low-end server designed around the 33-MHz 486DX chip. It will not have the power and upgradability of the Model 95, of which there should also be two new entries. The Model 85 will replace the Model 80.
- **Models 76 and 77:** The Model 76 will be a 33-MHz 486SX box with a 3- by 3-slot/bay configuration; the Model 77 will have a similar box, as well as a 486DX2 33/66 machine with a 5- by 4-slot/bay choice. They replace the Model 70.

Pricing was not available, but sources said the new systems would cost roughly the same as current products. All of the new models comply with the International Standards Organization's ergonomic health standards, as do the three new monitors that will also be announced.

Micro giants duel at CAMP conference

CONTINUED FROM PAGE 1

run on OS/2, AIX and Pink, the object-oriented operating system it is building with Apple Computer, Inc., and pointed toward plans to add multimedia extensions, support for Windows 3.1 applications and compact disc/read-only memory distribution.

CAMP members, drawn from large and medium-size corporations in the Great Lakes region, reacted favorably to the Microsoft demo, though many called it "glitz." Still, some were swayed.

"That blew us away — it really makes you change the way you think about the future," said Michael J. Henderson, personal computer coordinator at James River Corp.'s Neenah Technical Center in Neenah, Wis.

Henderson said Windows is on some 15% of James River's desktop machines and is making further inroads.

Windows, in fact, seemed to be the front-end choice of the future for a majority of the large users in attendance, but OS/2 enjoys a strong presence, particularly as a back end among CAMP membership.

And attendees kept the Microsoft product fireworks in perspective.

"It was glitzy and very impressive," said James R. Murdock, research and systems integration consultant at a major Midwestern insurer, "but we're going ahead with OS/2." Murdock said he expects to get similar multimedia and data transfer features from vendors that support OS/2.

In his demonstration, Ballmer freely swapped files among systems loaded with DOS, Windows and NT, using the ClipBook and network .DDE feature in Windows for Workgroup Computing. He automatically upgraded schedules through an electronic-mail function, and a file updated in FoxPro for Windows automatically updated a file in Excel, which in turn changed a chart being used in a presentation.

Also demonstrated were beta-test versions of Rumba NT, Microsoft Video for Windows, which captures full-motion video, and Sound System, a 16-bit sound card Microsoft introduced last week. Ballmer said everything he demonstrated would ship by the end of first-quarter 1993.

While users at CAMP said they liked the interoperability presented by Windows for Workgroup computing and NT, its multimedia aspects were met with some skepticism.

Ashvin D. Dave, director of database and technical services at Midas International, Inc. in Chicago, said, "We're a conservative company, and what he showed takes a different mindset than what we have."

IBM, Microsoft cross swords

BOSTON — If you were looking for an answer to the Windows New Technology (NT) vs. OS/2 question, you would have walked away frustrated from the World Trade Center, the scene of just such a debate between IBM's John Soyring and Microsoft Corp.'s Adam Walkes.

Panelists and attendees — the majority of whom were independent developers — seemed to prefer IBM's OS/2. But when pressed, four of the five panelists, who included technical journalist Will Zachman, acknowledged they would opt for Microsoft's Windows, mostly because they had mouths to feed and bills to pay.

Not that they seemed happy about the decision. In fact, anti-Microsoft sentiment was high. Secret application programming interfaces (API), buggy preliminary releases and 15-minute waits for telephone support — on the caller's dime — were only a few of the accusations voiced by outraged audience members.

Soyring looked a little stronger, announcing the improved phone support and the availability of documentation for any OS/2 API. He even leaked information about an unannounced $1,800 C++ compiler. But as one audience member put it, "We probably wouldn't even be having this debate if OS/2 cost $65 per copy" in its first release.

MARY BRANDEL

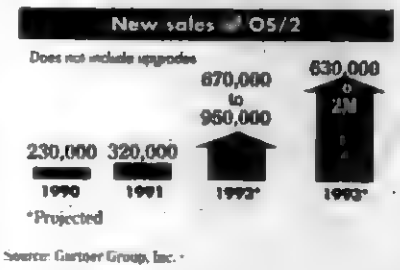
Dell to start bundling OS/2; analysts nix trend notion

BY CAROL HILDEBRAND
CW STAFF

AUSTIN, Texas — Dell Computer Corp. became the largest U.S.-based vendor besides IBM to raise the OS/2 standard, announcing last week that it will make the operating system available preloaded on its personal computers. However, the bundling deal is unlikely to spur OS/2 sales.

Hopeful signs

After a sluggish start, IBM's OS/2 appears to be picking up steam



Source: Gartner Group, Inc.

A Dell spokesman said the offer was prompted by user interest and Dell's desire to be a one-stop shopping mecca. "Clearly, we've been seeing some customer demand for it, but it's also a goal to have a good variety of options for customers to choose from," he said.

Dell now offers seven operating systems preinstalled on its PCs, including Microsoft Corp.'s Windows environment. The spokesman said that although he had no estimates on the number of OS/2 machines the firm expects to ship, he thought the bundling would be evenly weighted between servers and desktop units.

Currently, U.S.-based Reply Corp. and Europe-based ICL and Ing. C. Olivetti & Co. are the only firms other than IBM that bundle OS/2. AST Research, Inc. said it did not have any near-term plans to bundle the operating system. Likewise, Compaq Computer Corp. and Everex Systems, Inc. said they did not have any immediate plans.

Analysts said that although the move may indicate a trend, it is more a reflection of a general push toward software bundling by hardware companies than a signal that OS/2 is on the rise.

"We're seeing a demand to have more and more software bundled," said Matthew Cain, an analyst at Meta Group, Inc. in Westport, Conn. "I think what Dell is doing is that for a very little incremental investment, they can offer an option that will be attractive to large corporate buyers."

Christopher Lindquist and Michael Fitzgerald contributed to this story.

"THE TASK IS TO INTEGRATE THE OLD AND THE NEW."

To a great extent, the day of the bulldozer is over.

Buildings, like the historic St. Louis Union Station, are saved. And made even more valuable by putting them to new uses. Architects call it "adaptive re-use".

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

IBM LAN moves signal open approach

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — IBM's sweeping announcements in the distributed networking arena last week were interpreted as a thumbs-up sign that a reorganized IBM is evolving into a more open-minded and nimble industry player.

However, immediate gains for users accustomed to filling IBM product voids from third parties are limited, some IBM shops said.

IBM sanctioned Ethernet technology with homegrown desktop adapter cards and offered up a multiprotocol intelligent wiring hub through its partnership with Chipcom Corp. [CW, Sept. 14]. The hub has hooks to IBM Token Ring concentrators and IBM's NetView/6000 distributed management system (see story page 15).

The company also doubled the performance of its 16/4M bit/sec. Token Ring adapters in servers and tripled it in clients, said Donald A. Haile, IBM LAN Systems' network systems director.

An IBM spokesman estimated that this would bring IBM card performance within 15% of the fastest cards on the market. These are generally considered to be from Madge Networks, Inc.

More distributed moves are expected this week from IBM in the areas of laptops, Personal System/2s, Distributed Systems Management and mainframes and minicomputers used as servers, analysts said.

However, while "it's of interest that IBM recognizes they have to move to more open, distributed platforms, they're a little late," said Ronald W. Meyers, vice president of technical strategic planning at Bankers Trust Co. in New York. "We're already well into implementing wiring hubs and other technology providing interconnection from LANs and workstations to IBM hosts."

"Goodness no, we're not waiting for IBM to supply us with these things," said Butch Kemper, assistant director for networking and technical services at Texas A&M University in College Station, Texas, a combined IBM Systems Network Architecture/local-area network shop using Cabletron Systems, Inc. hubs.

"If IBM wants to get down and scrap with the prices for Ethernet cards, we'll be happy to consider them. But at $250 apiece, they're not going to sell any to me" (see pricing at right). Many vendors sell Ethernet cards in the $100 to $150 range.

"We'll have to wait and see how well they will compete with third parties who have been doing [distributed networking] for quite a while," added Jerry Noble, director of telecommunications and personal computer support at The American Cancer Society in Austin, Texas.

Particularly encouraging to analysts was IBM's ahead-of-the-pack rollout of industry-standard credit-card-size portable network adapter cards for the most thriving area of the PC market: portables (see story at left). IBM reportedly turned the adapters around in a six-month development cycle.

"We see concrete evidence of a more aggressive and agile IBM, particularly in the networking systems group," said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass. "IBM is usually late to market, but now they've turned around these adapters with lightning speed," she said.

IBM users, though, seemed most interested in a frame-relay access device announced by IBM for PS/2 servers in remote LAN sites.

This is because frame relay "is the technology of preference for interconnecting LANs and for having workstations gain access to central databases," Meyers said. "It would seem a natural fit to interconnect dispersed LANs via frame relay back to the mainframe."

Should The American Cancer Society turn to frame relay to fix some throughput problems it is having with Novell, Inc. IPX protocols across the satellite network it is testing, it would be important for IBM to offer the capability, said Kyle Cooper, a senior LAN analyst.

The society would need IBM support to supplement its eight-person nationwide network staff, Cooper said.

LAN land

IBM endorsements of LAN-oriented technologies it has not previously offered could indicate the vendor has caught the distributed computing wave:

- The 8250 multiprotocol intelligent wiring hub, $2,410 to $4,465. *Availability:* Now.
- Ethernet adapter cards for XT/AT ($250) and Micro Channel Architecture ($395) bus computers. *Availability:* January 1993.
- Low-end frame-relay network access device for PS/2 LAN servers in remote sites, about $1,600. *Availability:* December.
- Credit-card-size Token Ring, Ethernet and 3270 adapter cards for portable PCs conforming to emerging industry standards (see story at left).

Adapters abound!

IBM's rollout last week of three credit-card-size network interfaces compatible with emerging Personal Computer Memory Card International Association (PCMCIA) standards was hailed as a sign that a more flexible, decentralized IBM is leaping behind the technology eight ball.

"PCMCIA is a brand-new technology, and boom, there they are," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

A $795 Token Ring PCMCIA adapter and a $375 Ethernet adapter are due out at the end of next month; a 3270 PCMCIA card for linking mobile users into IBM's SNA networks is scheduled for delivery in mid-December.

And while longtime Token Ring bigot IBM was rolling out its first line of PC Ethernet adapters that support all Ethernet media types, Ethernet pioneer 3Com Corp. was rejoining the Token Ring side of the house. The firm introduced Token Ring support on its routers and three IBM-compatible adapters, which some analysts predict will prompt price wars.

Currently, prices are as follows:

- 16-bit XT/AT bus adapter: 3Com, $695; IBM, $845.
- 16-bit Micro Channel Architecture bus adapter: 3Com, $745; IBM, $895.
- 32-bit Extended Industry Standard Architecture bus adapter: 3Com, $1,095; IBM: no product.

IBM also re-engineered its home-designed Token Ring Tropic chip for improved card performance (see story above). This is important because "generally, IBM Token Ring performance was not comparing," said Todd Dagres, vice president of communications at The Yankee Group, a Boston-based consultancy.

JOANIE M. WEXLER

Internetwork-simulation software could cut costs

Make Systems' tool aids detection of bottleneck

BY ELISABETH HORWITT
CW STAFF

MOUNTAIN VIEW, Calif. — Network asset management system vendor Make Systems, Inc. made announcements last week that may finally put sophisticated network-simulation capabilities in the hands of network managers who can no longer rely on intuition to pinpoint the source of bottlenecks.

The product is said to help users make changes to internetworked local-area network installations in order to optimize response time and resolve bottlenecks. This, in turn, will allow cost-conscious managers to get the most bang for their networking budgets, the vendor claimed.

Make's NetMaker enables users to run what-if scenarios and failure analyses to simulate the impact of network changes and to optimize the network by testing alternate scenarios for upgrading or reconfiguring an installation, according to Make.

Network managers have traditionally made educated guesses to determine the cause of a response time problem or to find the most cost-effective way to boost network throughput, according to President Stephen Howard.

However, intuitive answers are often the wrong ones when networks reach a certain level of complexity, particularly where routers are concerned, he added.

For example, boosting the capacity of one inter-LAN link can actually hurt overall network throughput because routers may be programmed to automatically send traffic over the higher-speed link, when a more efficient path may be available elsewhere, Howard said.

Although companies such as CACI Products Co. in La Jolla, Calif., and Internetix, Inc. in Upper Marlboro, Md., offer products with similar capabilities, what differentiates NetMaker is its ability to make those capabilities accessible to a network manager with just a little network-simulation modeling, said Stu Gavrin, a senior manager at Ernst & Young.

NetMaker, for example, uses color coding and graphics to pinpoint exactly where problems crop up during a network simulation, he added.

Device, protocol tracking

Another key component of NetMaker is a set of predefined libraries that keep track of the proprietary architectures and features of different network devices and protocols so that the network manager need not bother with such complexities.

"All [the network manager] needs to do is key in: 'connect all unconnected nodes in the best way possible,' " and the simulator searches intelligently for the best solution, Howard said.

This type of simulation "would be useful to anyone" as a way to pinpoint network bottlenecks and fine-tune networks, said Greg Parcell, manager of floor support systems at the Chicago Board of Trade. "The question is how easy the product is to use; I'd have to see it first."

A network manager at a major Wall Street firm who has been beta-testing NetMaker testified to the product's capabilities and ease of use. "You can pick your scenarios and let it do its thing," said the manager, who requested anonymity. "There are so many different routing choices that affect the way a network reacts, and the longer NetMaker runs, the more it knows."

By the fourth quarter, NetMaker will have libraries for the leading T1 multiplexer and router vendors, with a frame-relay library slated for the first half of 1993, Howard said.

Also available is a library of Transmission Control Protocol/Internet Protocol, with Novell, Inc.'s IPX, Digital Equipment Corp.'s DECnet and probably Apple Computer, Inc.'s AppleTalk libraries to come out in the fourth quarter, he said.

Make also plans to bring out by the fourth quarter a financial simulator with a tariff database for figuring out the costs of wide-area links, as well as a configuration designer with vendor-specific information on what components are needed for a given device.

NetMaker prices start at $20,000 for a small network of about 20 nodes and range to $300,000 for a large network.

IBM ups Unix net management

BY ELISABETH HORWITT
CW STAFF

NEW YORK — The second version of IBM's NetView/6000 shows promise of being the first LAN management system aimed at commercial Unix network users, observers said.

Announced last week, IBM's NetView/6000 is an AIX, RISC System/6000-based network management system that is said to manage Simple Network Management Protocol (SNMP)-compliant local-area network and internetworking devices, as well as IBM products such as the 6611 Network Processor.

Slated for delivery next June, NetView/6000 Version 2.1 adds significant value to the original Hewlett-Packard Co. OpenView-based product in the area of ease of use, said Mary Johnston, a principal analyst at Northeast Consulting Resources, Inc., a Boston-based consulting firm.

Key new features include an Open Software Foundation Motif- and X Window System-based graphical user interface; autodiscovery, which automatically maps LAN configurations; remote diagnostics; and threshold-setting and alert-filtering features that should help users winnow out the important network events from incoming information, Johnston said.

In addition, the product lays the foundation for providing the future ability to identify devices and lines that carry crucial business applications so that those links can be given priority, sources said.

With NetView/6000 Version 2.1, IBM is beginning to provide network managers with the troubleshooting capabilities they need to support the growing number of commercial Unix networks running crucial business applications, said John Payne, a communications architect at DHL Worldwide Express who beta-tested the product.

While engineering users with their own Unix workstations can go on working during a network failure, LAN outages can be disastrous for corporations where X terminal users run crucial business applications on Unix servers, Payne said.

NetView/6000 Version 2.1 only begins to provide such capabilities. Still, it lays the groundwork for future products that will enable managers to rapidly pinpoint the source of a network problem — be it a physical network device, a transport protocol, a server or an application, Payne said.

Also important is the product's object orientation and new end-user application programming interface (API), which should make it easier for independent software vendors to deliver applications on the platform, Johnston said.

IBM announced five additional companies committed to implementing their network management applications on NetView/6000: Novell, Inc.; Cabletron Systems, Inc.; Ki Research, Inc. in Columbia, Md. (Digital Equipment Corp.'s DECnet network management); Elegant Communications, Inc. in Toronto (Unix systems management); and International TeleManagement Corp. in Vienna, Va. (management of non-SNMP network devices, such as T1 multiplexers).

Existing supporters include Chipcom Corp., Fibermux Corp., HP, Network Equipment Technologies, Inc., Proteon, Inc., Ungermann-Bass, Inc. and Wellfleet Communications, Inc.

IBM also announced AIX NetView Hub Management Program/6000, which is said to manage IBM 8250 Multiprotocol Intelligent Hubs announced last week; and AIX Systems Monitor/6000, which is said to enable managed Unix systems to automatically send crucial network management data to a NetView/6000 system.

In a statement of direction, IBM said it would provide a trouble-ticket application that would enable the system to track problems through to resolution.

IBM also said NetView/6000 will take on the LAN media management capabilities of IBM's OS/2-based LAN Network Manager product sometime next year. This is part of IBM's strategy to provide users with a choice of two LAN management platforms with similar capabilities, one for Unix and the other for OS/2, Johnston said.

NetView/6000 Version 2.1 is priced at $15,650.

SynOptics to replace LattisNet Manager

BY JOANIE M. WEXLER
CW STAFF

SANTA CLARA, Calif. — With competition continuing to heat up in the Unix-based distributed network management market, SynOptics Communications, Inc. said it intends to announce today a comprehensive replacement for its LattisNet Manager for Unix.

The more integrated, broad-reaching system, dubbed Optivity, reportedly leverages intelligence in SynOptics hubs to trace the path a data packet takes from one end station to another across local- and wide-area networks. The SunNet Manager-based core application allows users to plug in other SunNet Manager-based applications from both SynOptics and other vendors for more sophisticated management of a particular community of Simple Network Management Protocol (SNMP)-based devices, the vendor said.

For example, Cisco Systems, Inc.'s CiscoWorks, announced last week for close scrutiny of router networks, runs on SunNet Manager and could plug into Optivity.

Three applications from SynOptics, also set to be announced today, allow the enterprise network fabric to be managed at two levels: by network experts and by less-technical network operators, said Clive A. Hallatt, SynOptics' product marketing manager. These applications are aimed at closely managing bridges, routers and data paths between devices.

Info at hand

"This first trio of applications puts a lot of information visually on the screen," observed Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based consultancy.

He said SynOptics seems to be following a trend that he discovered in a recent network management study his firm conducted: "What people want are tools that reduce problem-resolution time and that less-experienced people can use."

The competition

Like competitor Cabletron Systems, Inc.'s Spectrum management tool, the system features a hierarchical polling approach to keep enterprise polling traffic to a minimum.

Unlike Spectrum, however, which manages any SNMP network regardless of whether Cabletron hubs are in it, Optivity is optimized for SynOptics hubs being in the network.

Optivity, slated to ship late next month, costs $4,995 plus the cost of the SunNet Manager platform. The three applications to be announced this week from the vendor range in price from $2,500 to $3,500 each.

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NEWS SHORTS

Microsoft releases sound system

Microsoft Corp. is once again dipping its toe into the hardware waters with the release of the Windows Sound System, a combination of sound card and software that adds sound reproduction, storage and voice-recognition capabilities to Windows workstations. The $289 product offers a synthesizer, sound chip, connectors for microphone-in, line-in, headphones-out and line-out as well as headphones and a microphone. Also included are utilities to browse sound libraries, record sounds, proofread Lotus Development Corp.'s 1-2-3 for Windows and Microsoft's Excel and perform voice-activated macros in Windows applications.

Frame relay hits milestone

Frame-relay technology took a big step forward last week when the Frame Relay Forum ratified the Network-to-Network Interface specification. The move provides the industry with a standard mechanism for allowing disparate frame-relay networks to interoperate. This means users can extend the reach of their networks among any combination of private networks and public frame-relay services.

Internetworking Sniffer on its way

Network General Corp. in Menlo Park, Calif., this week is expected to announce Expert Sniffer Internetwork Analyzer, which it claims is the first product to analyze internetworking traffic traveling between proprietary routers. It is said to monitor traffic in real time, identify network throughput or connectivity problems and perform protocol and traffic analysis to pinpoint problem sources. An optional expert system does the analysis and explains the results. Priced at $15,500, a version minus the expert system is slated to ship in the fourth quarter.

Andersen closes big CASE deal

Andersen Consulting recently closed a deal with the state of North Carolina for $1 million worth of Foundation Cooperative Processing (FCP) computer-aided software engineering tools. Grand plans for FCP include rewriting major mainframe applications to run in client/server mode. More than 2,500 users, linked via 200 local-area networks, will be blasted into the future with programs such as Microsoft's Word and Excel.

Informix adds NLM

Informix Software, Inc. said last week it will ship a NetWare Loadable Module (NLM) version of its Informix OnLine relational database for Novell, Inc.'s NetWare 3.1.1 network operating system. The NLM version, which is slated to ship by Oct. 1, will compete against other NLM databases from Oracle Corp., Sybase, Inc. and Gupta Technologies, Inc. Prices for the Informix NLM range from $4,995 for a 16-user version to $16,995 for an unlimited number of users.

Short takes

SunSelect, a business unit of Sun Microsystems, Inc., last week acquired the assets of Praxsys Technologies, Inc., a software development firm specializing in personal computer emulation technology. . . . Start-up **Cascade Communications Corp.** in Westford, Mass., last week announced that nationwide network services provider **Performance Systems International, Inc.** has signed a five-year, $10 million contract for Cascade frame-relay feeder switches. . . . **Everex Systems, Inc.** cut its prices by up to 59%, including cuts up to 47% on the Tempo series. . . . Robert W. Lucky, a top executive at AT&T Bell Laboratories, has been named vice president of applied research at **Bell Communications Research**, the regional operating companies' jointly held research and development arm. . . . The consolidation of six claims-processing systems into one at **Blue Cross/Blue Shield** of Massachusetts eliminated 68 of about 500 information systems jobs. . . . **The Object Management Group** announced that the Petrotechnical Open Software Corp. will include the Common Object Request Broker Architecture technology in its application programming interface specifications.

Global buffering beefs up Rdb

BY MELINDA-CAROL BALLOU
CW STAFF

ORLANDO, Fla. — Digital Equipment Corp. laid out a relational database management system strategy at the Rdb World Conference earlier this month that includes new versions of Rdb, migration support for the next-generation of 64-bit Alpha platforms and database-access products.

DEC began shipping Version 4.1 of Rdb in June. It features global buffering for improved data access, direct support of optical jukeboxes and capabilities that allow users to install a new version of the database while maintaining older versions elsewhere on a VAXcluster. DEC expects to release Version 4.2 before the end of this year. It will include MultiVendor Integration Architecture support and performance improvements for multimedia.

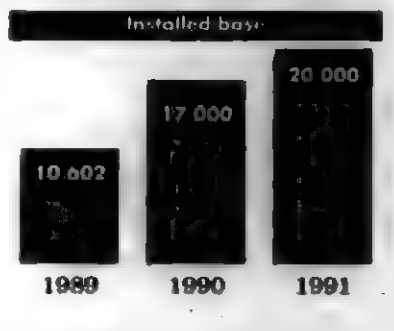
Users said they are content with the most recent Rdb release.

"Version 4.1 brought terrific performance improvements with the global buffering," said Tim Mueller, chairman of the Digital Equipment Computer Users Group Database Special Interest Group. "They also changed the way commits are assumed. Before, a transaction had to be written to the database first, but now it's committed once you've finished journaling and written to the database, which saves time."

"The global buffering is the biggest advantage to us," added Martin Keiser, a senior specialist at Du Pont Co., which is in the process of making the transition to 4.1. "We're able to curb back on the total memory that's used since users are able to share similar, buffered data."

Stacked DEC

Licensing of DEC's Rdb has grown briskly during the past few years



Source: International Data Corp. CW Chart: Michael Siggins

DEC will ultimately redesign Rdb to take better advantage of Alpha's 64-bit architecture, the officials added. And while DEC emphasized the advantages of Alpha, users expressed cautious interest.

"We would love to move to Alpha, but the layered software products aren't going to be out for a while, and we use ACMS," said Mark Leako, project leader of the computer repair business information systems group at Lockheed Missiles and Space Co., which is based in Sunnyvale, Calif. DEC plans to stagger the release of layered software on a quarterly basis. Full VAXcluster support for DEC's Application Control Management System (ACMS) transaction processing monitor is not scheduled to be available on Alpha Open VMS platforms until early 1994.

DEC officials said sites can use SQL Services to access Rdb from non-VMS platforms via DEC's Network Architecture Support (NAS). This opens up to VMS users the wider world of IBM's Systems Network Architecture, Transmission Control Protocol/Internet Protocol, Open Systems Interconnect and LAN Manager, with support for Novell, Inc. soon to follow. Rdb will be ported to OSF/1, Microsoft Corp.'s Windows New Technology and other unannounced platforms, they added.

DEC officials also spoke about the remnants of the earlier RdbStar distributed database technology, now referred to as the Information Network. They hope to release a version of the product by early 1993 that will act as a manager of heterogeneous RDBMSs so that users will be able to access and manage data located across a range of databases (CW, June 29).

Current DEC offerings in this area include Accessworks products, which offer read access to IBM's VSAM files, DB/2 and Oracle Corp. databases and read/write access to RMS files.

Artisoft adds TCP/IP, Macintosh support

BY MICHELE DOSTERT
CW STAFF

TUCSON, Ariz. — In a major expansion of its client support strategy, Artisoft, Inc., a peer-to-peer personal computer networking provider, said it is developing software for Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity. The company is also shipping its LANtastic for Macintosh Connectivity System.

"We now support DOS, Windows and Macintosh; our TCP/IP product will ship this fall, and we are working on a native OS/2 version of LANtastic," said Joe Waldego, marketing manager for LANtastic.

By expanding its client connectivity options, Artisoft may be trying a preemptive strike against Microsoft Corp.'s Windows for Workgroups product, which, when it appears, will have peer-to-peer connectivity.

Jodi Mardesich, a San Francisco-based analyst at local-area network research firm The Burton Group, said, "Expanded connectivity or not, most large corporations are choosing client/server, not peer-to-peer, LAN network operating systems. These announcements may help Artisoft defend its workgroup and small-office client base against Workgroup for Windows, but I don't think it's going to move them out of their small-site niche."

> ARTISOFT MAY BE trying a preemptive strike against Microsoft's Windows for Workgroups product.

Artisoft is working with The Wollongong Group, Inc., a Palo Alto, Calif.-based provider of Unix-based connectivity products, to develop its LANtastic for the TCP/IP Connectivity System package. It was designed to let a workstation on a LANtastic network access a wide range of systems throughout the network, including Digital Equipment Corp.'s VAX, workstations from Hewlett-Packard Co. and Sun Microsystems, Inc., IBM mainframes and AT&T/NCR Corp. minis.

LANtastic for TCP/IP will support TCP/IP applications such as Telnet terminal emulations and File Transfer Protocol.

Artisoft's LANtastic for Macintosh Connectivity system reportedly allows for transparent integration of Macintosh computers and PostScript printers into a LANtastic network. Using a dedicated PC as a gateway, it displays PC servers as logical drives on Macintoshes. PC users, meanwhile, can access Macintosh files that have been saved onto the gateway PC.

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IBM

HP gives Unix minis a power boost

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week upped the performance range on its line of Unix minicomputers, adding two models based on the latest and fastest version of its Precision Architecture-RISC microprocessor.

At the same time, HP released a new version of HP/UX, its Unix operating system, and said it is adding Fiber Distributed Data Interface (FDDI) connectivity to its entire family of Unix minicomputers.

The new HP 9000 Models 897S and 887S mark the second time HP has incorporated the 96-MHz 7100 PA-RISC chip into one of its products. Last month, HP added 7100-based models to its HP 3000 line of proprietary minicomputers.

Power surge

HP is billing the 897S as its top-of-the-line departmental business server, operating at up to 184 transactions per second based on the Transaction Processing Council's "A" benchmark. HP's departmental offerings previously topped out at 110.5 transactions per second based on the benchmark. The company claimed that, based on the council's "A" rating, the Model 897S performs up to three times faster than IBM's Application System/400 and 50% faster than Digital Equipment Corp.'s fastest single-processor VAXserver Model 610.

One analyst noted that while users may not have an immediate need for the leap in power, the addition of the 7100 PA-RISC-based machines gives them the ability to upgrade.

"Users always want to make sure there's a high end to grow into," noted John Logan, executive vice president of the Boston-based consulting firm Aberdeen Group. "This will make users feel safe; there's a growth path."

HP is not positioning the machine for enterprise computing but will instead continue to pitch its 4-month-old line of Corporate Business Systems.

Gary Lemke, product marketing manager at HP's General Systems Division, said HP will add the 7100 to the Corporate Business System line sometime next year.

Meanwhile, pricing starts at $112,000 for the 897S and at $92,000 for the 887S. The company is charging $35,000 to upgrade from an 867 to an 887 or from an 877 to an 897.

Both new models support up to 1,850 users and will be available next month. The 897S includes 12 I/O slots; the 887S has six. Maximum storage on the 897S is 144.5G bytes; on the 887S, it is 139.1G bytes. Both come standard with 64M bytes of random-access memory, expandable to 768M bytes.

HP/UX Version 9.0, introduced by HP last week, includes HP's Visual User Environment 3.0. HP is marketing Version 9.0 for use with its workstation line as well as its minis.

FDDI for the 9000 line of Unix servers will be available in December, with pricing from $4,495 to $15,995.

AST to offer highly upgradable notebook

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — AST Research, Inc. will today announce its next-generation notebook — possibly the most upgradable notebook computer ever to hit the market.

AST's 5.9-pound PowerExec will let users upgrade the processor, the screen and the hard drive. Other vendors offer notebooks with one or two such features, but AST appears to be the first to combine all three and allow an upgrade from the base Intel Corp. 80386SL chip to an I486-class processor.

The basic display is monochrome and can be upgraded to either a passive-matrix color screen or a thin-film transistor, active-matrix color screen.

One current AST notebook user was impressed by the new box. "That's a very hot product; we'd like to have it," said Ashvin D. Dave, director of database and technical services at Midas International Corp. in Chicago.

AST has also included both a floppy drive and two Personal Computer Memory Card International Association (PCMCIA) slots.

Dan Sheppard, director of marketing for portable systems, said the company thinks PCMCIA will "explode" in the next year and will offer Token Ring and Ethernet adapter cards as well as modem cards and 3270 emulation cards. "We believe in open architecture, and [PCMCIA] gives every hardware developer a platform to design for this," he said.

AST has also designed an optional SmartPoint cableless trackball, the ability to support alkaline batteries and an algorithm that adapts the machine's power-management features to the user's habits.

"They have put a lot of the bells and whistles in one box," said Christopher Vasko, an analyst at BIS Strategic Decisions in Norwell, Mass.

AST is shipping monochrome and color versions. The monochrome versions include the PowerExec 3/25SL Model 63 with a 60M-byte hard drive for $2,395 and the PowerExec 3/25SL Model 123/W, which has a 120M-byte hard drive bundled with Microsoft Corp.'s Windows 3.1 and a SmartPoint trackball, for $2,795.

The PowerExec 3/25SL-Color Model 83 with an 80M-byte hard drive will sell for $3,495, and the PowerExec 3/25SL-Color Model 163/W will retail for $3,895.

AST expects to ship an active-matrix color screen in the fourth quarter. The company also released its $449 PowerStation, a docking unit with two slots and three drive bays.

Unix Expo attendees seek remedies

CONTINUED FROM PAGE 1

lution to their particular problem," Donnelly said.

For users looking for significant announcements, all eyes will be on IBM's show-stealing splash built around its AIX Unix variant, a few new models of the RISC System/6000 and the broadening of its client/server strategy.

One IBM demo at the show, for example, will feature a Personal System/2 running both AIX and OS/2 over the Open Software Foundation (OSF)'s micro kernel technology.

Users familiar with IBM's plans said the RS/6000 is the next target platform for running multiple operating system "personalities."

"The ability to run multiple operating systems gives IBM a platform that fits into a lot more customers' migration needs," said Chuck Hemann, manager of engineering computer operations at Harnischfeger Corp. in Milwaukee. "If you're migrating from OS/2 PCs to another platform and that new platform also runs OS/2, life is that much easier."

Users and analysts also noted IBM's rapid turnaround in just two years of paying attention to the Unix market. "As recently as a year ago, IBM's suite of applications for commercial accounts was rather narrow on AIX. That is changing," said Tom Willmott, an analyst at Aberdeen Group in Boston.

A prime example will be the introduction this week of CICS for AIX, which will allow users to off-load mainframe-based transaction processing work to RS/6000 servers [CW, Aug. 31].

Putting CICS on AIX will help "make an easy transition of our mainframe applications over to a distributed environment," said Bob Denison, open systems development unit manager at Wausau Insurance Cos. in Wausau, Wis., which has a client/server network of 30 RS/6000s.

Still, Denison is frustrated with the pace of the RS/6000's growth on the high end. His firm recently turned to Sequent Computer Systems, Inc. for a machine powerful enough to run a large database application. "We need something with more scalability," he said. "I hope we hear more [this] week about where IBM is going with the high end."

Wide focus

Overall, IBM's direction with the RS/6000 is to "span the entire range of computing and support multiple operating environments, from DOS through mainframes," said one customer who asked to remain anonymous.

Integrating the mainframe into open systems environments is of particular interest to large corporate users. "Our chief information officer now calls the IBM machines the Big Blue servers," said Sam Malek, manager of technology support at New York-based Salomon, Inc. "The Big Blue server is now finding a place in the open systems environment."

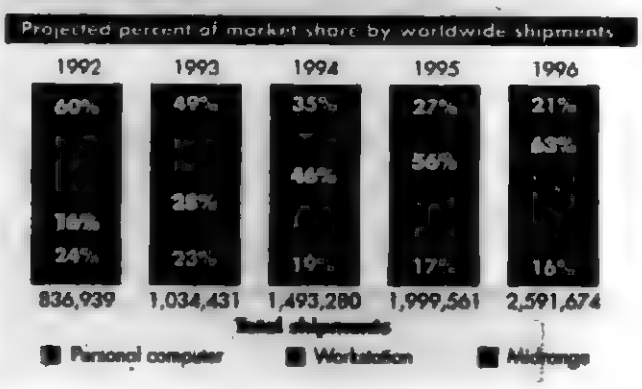
"I think the interest in Unix is much stronger in the larger shops now," agreed Bob Curran, corporate director of information systems at EG&G, Inc. in Wellesley, Mass., a $2.7 billion electronics and high-tech components company.

Curran is sending one of his managers to Unix Expo. "I thought the tutorial sessions looked excellent," he said.

Those tutorials will cover a range of topics, from Unix system administration basics to advanced networking, corporate transaction processing and integrating Microsoft Corp.'s Windows into Unix environments.

Commercial aspirations

Corporate use of Unix systems is projected to grow 27% annually during the next four years



Peaceful demonstrations

While IBM may dominate the news scene at Unix Expo this week, there will be quieter signs of life from other industry players as well.

The OSF will provide some glimpses of its technology in action by highlighting some 150 customer sites.

The OSF will also put some polite pressure on its key sponsors with its "Challenge '93" program. This brainchild of the OSF end-user steering committee calls on vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co. to set up and demonstrate heterogeneous environments using OSF technologies such as the Distributed Computing Environment.

Sun Microsystems, Inc. will demonstrate the multiprocessing features of Solaris 2.0 running on a Compaq Computer Corp. SystemPro. HP will show off its new Series 800 servers and several key software products.

DEC will highlight its commercial Unix products and stage a competitive demo running an Alpha workstation against Sun and HP boxes.

MARYFRAN JOHNSON

The Life of Brian

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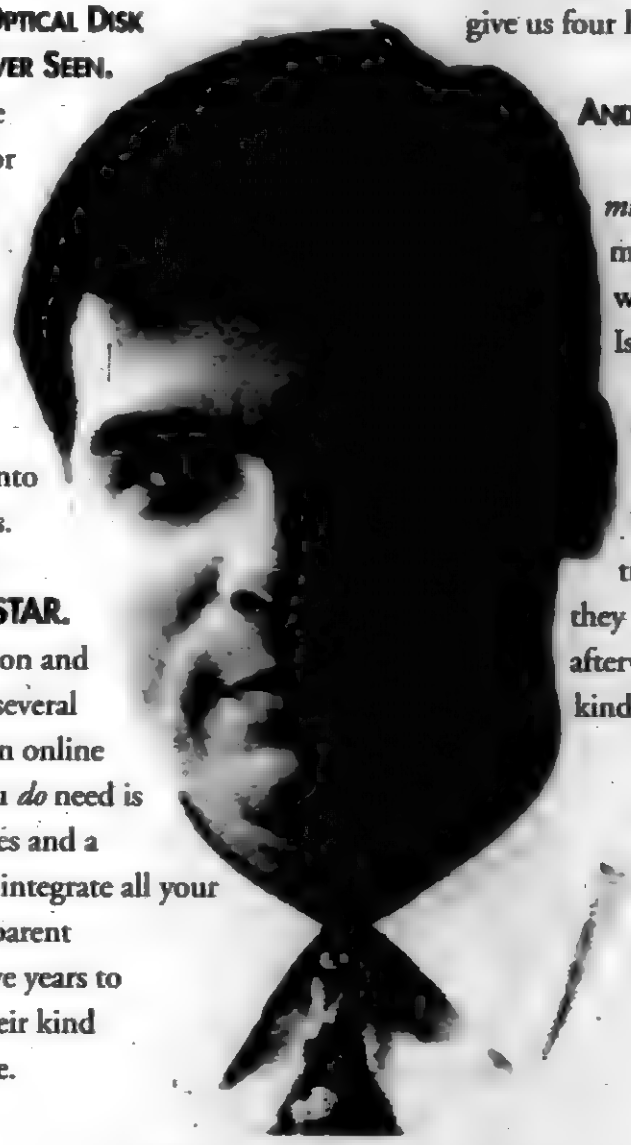

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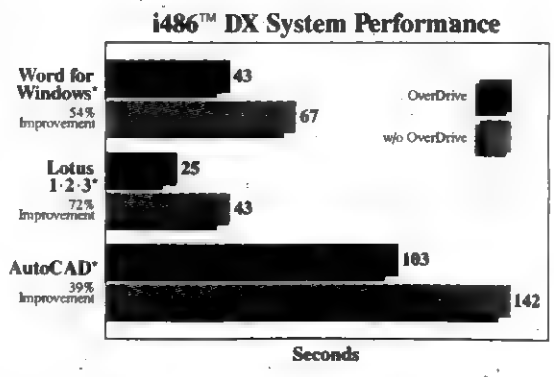

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Lotus unveils developer's kit for VIM

BY CHRISTOPHER LINDQUIST
CW STAFF

CAMBRIDGE, Mass. — In a bid to counter Microsoft Corp.'s momentum in the messaging application programming interface (API) arena, Lotus Development Corp. has unveiled a developer's kit for its own messaging interface.

The Vendor Independent Messaging (VIM) Developer's Toolkit allows software makers to build applications that conform to a single standard — VIM — for sending electronic messages.

A VIM-compliant application would theoretically be able to send messages across a diverse range of networks and operating environments without having to work through the complexity of each environment. For example, a message could be written under DOS in a mail-enabled word processor and sent directly from the word processor to another mail-enabled application on an Apple Computer, Inc. Macintosh.

Microsoft's Messaging API (MAPI), which was originally positioned as extremely Windows-centric, has recently been expanded to include some support for both DOS and the Macintosh.

The VIM steering committee consists of several of the largest software and hardware vendors in the world, including Borland International, Inc., Novell, Inc., WordPerfect Corp. and IBM.

Subject to scrutiny

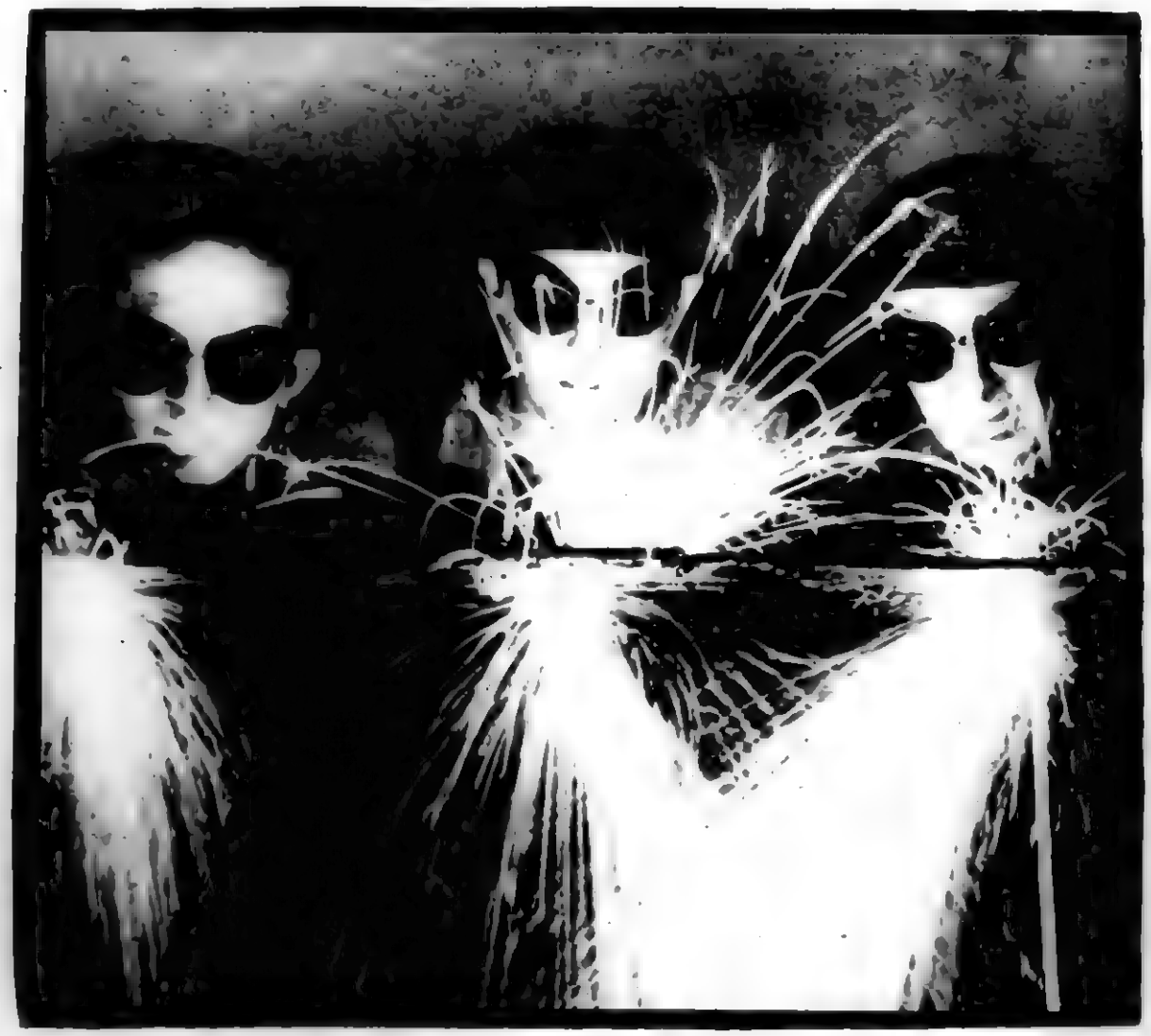
Microsoft has also placed its MAPI specification before the XAPI standards committee for review and adoption. The strength of the Windows environment's presence and Microsoft's intimate connection to the product will no doubt help Microsoft attract third-party developers.

"VIM has a little more momentum right now, but Microsoft has thrown [down] the gauntlet by aligning themselves with users and XAPI," said Mike Anderson, program director for office information systems at Gartner Group, Inc. in Stamford, Conn. "It's neck and neck."

For the moment, vendors may have to hedge their bets and work with both standards if they are not to be left out in the cold, should one become a de facto standard. "It would be nice if we could have just one interface," said Ajit Kapoor, vice president at Meta Group, Inc. in Westport, Conn. "That is not the case."

Developers shared the same attitude. "One API, wouldn't that be wonderful?" said Anik Ganguly, vice president of product development at Southfield, Mich.-based Campbell Services, Inc., a maker of scheduling programs. "That would certainly be wonderful, but it looks like industry politics won't let that happen."

The VIM Developer's Toolkit supports CC:Mail on Windows and OS/2, with support for CC:Mail on DOS, Macintosh, Unix and Lotus' Notes expected in future releases.



FDDI interface for Sbus debuts

BY JOANIE M. WEXLER
CW STAFF

MILPITAS, Calif. — Users looking to bulletproof Sun Microsystems, Inc. SPARCstations and other Sbus-based computers against failures on Fiber Distributed Data Interface (FDDI) networks now have the option of linking those devices directly to both of FDDI's 100M bit/sec. redundant rings for $2,995.

Last week, Network Peripherals, Inc. became the first vendor to offer the dual-attach capability for the Sbus platform, analysts said. Users are likely to double-link their network-critical computers, such as servers and concentrators, to FDDI to ensure their continued uptime. Multiple end-user stations then single-attach to the protected concentrator.

Top candidates

Small local-area networks of workstations running bandwidth-intensive modeling and scientific applications — such as the SPARCstation — often need optimum throughput, so they are also strong candidates for dual attachment.

Network Peripherals and other vendors already offer single-connection cards for the Sbus platform.

In the single-attach scenario, the total cost of an FDDI connection includes the price of the card (in Network Peripherals' case, $2,495, and in Sun's case, $2,995) plus the cost of a corresponding port on a concentrator.

Digital Equipment Corp. currently offers the lowest per-connection price for a concentrator at $1,625, according to Kari Shimada, vice president of market research at Rising Star Research, Inc., a consultancy in Van Nuys, Calif.

Notoriously hefty FDDI prices have been dropping by half each year for the last two years, and lower cost adapters for running 100M bit/sec. networking over copper, albeit with some distance limitations, are in the $1,500 range from 3Com Corp., IBM and others.

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Now people get personal, face-to-face service without going inside the bank.

AT&T ISTEL and NCR Europe announced a pan-European digital service to provide one-stop networking for multinational companies.

AT&T put its communications software into NCR's laptop computers so that people on the go can now send facsimiles and electronic mail over cellular networks.

Open systems based on AT&T Bell Laboratories' world-class research, AT&T's unsurpassed experience in communications, and NCR's leadership in computers can bring these kinds of benefits to you, too.

And we've only been working together for a year.

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Apple announces a between Windo

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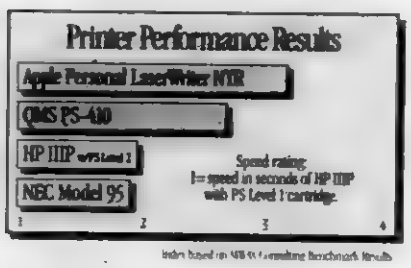

The RISC-based Personal LaserWriter NTR dramatically outperforms the HP LaserJet IIIP, the QMS PS-410 and NEC Model 95.

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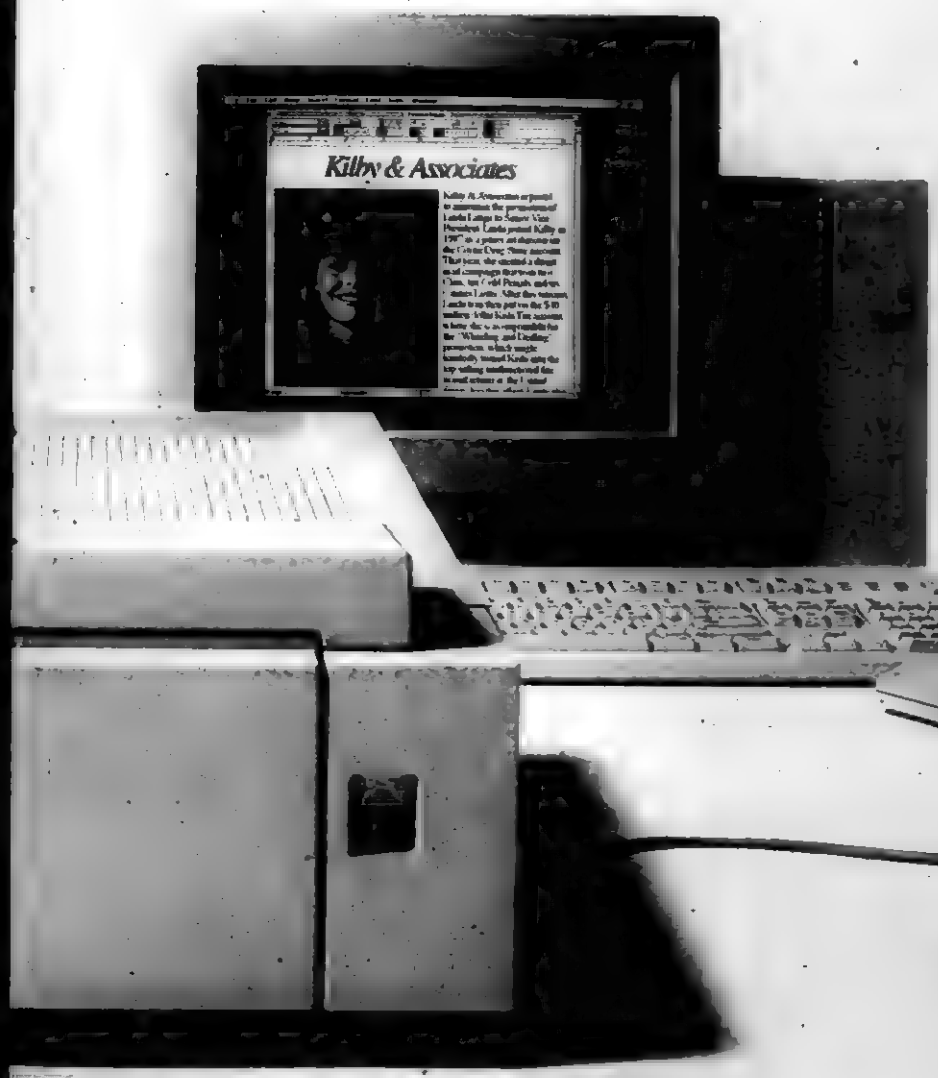

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ADVANCED TECHNOLOGY

TECH TALK

Holographic storage

■ Amoco Laser Co., an Austin, Texas-based firm, will provide a key laser device for a holographic storage system being developed under the sponsorship of Microelectronic and Computer Technology Corp. (MCC). MCC is developing the system as part of a 1991 award from the Advanced Technology Program of the U.S. Department of Commerce. In addition to Amoco's diode-pumped, solid-state laser, the MCC holographic storage project includes contributions from several other firms. A working prototype of the MCC system is expected by 1994. That device is targeted to have a 2G-byte memory and readout times of less than 100 microseconds.

Auto screening

■ Potential blood donors are more likely to reveal their risk factors for the HIV virus to a computer than to a human interviewer, according to a study by Boston's Beth Israel Hospital, published this month in the *Journal of the American Medical Association*. Researchers determined that the 294 donors who were asked to use the computerized system — in addition to standard questionnaires and personal interviews — felt the computer-based system was more private. "Since obtaining information about behavior is essential to preventing the spread of AIDS, the computer will have an important role in screening," one of the researchers said.

Data as sounds

■ Software for developing applications that present data as sounds was announced this month by Clarity Software, a Garrison, N.Y.-based firm. The Clarity Sonification Toolkit was demonstrated at the Virtual Reality '92 conference in San Jose, Calif. Sonification can display as many as five to 10 data streams without cluttering the visual field, said Clarity executives, noting that the human mind is good at recognizing auditory patterns.

Guten tag! Bonjour! Good day!

Carnegie Mellon to demo Janus speech recognition and translation system in January

BY MELINDA-CAROL BALLOU
CW STAFF

Imagine this: At your Boston office, you speak English into your workstation, and your Tokyo-based colleague hears the Japanese translation. She responds in Japanese, and you hear her answer in English.

As world economies become more integrated, the need for multilingual technologies is more acute than ever before.

Research into speech recognition and translation has been going on for more than 30 years. But the requirements for speech recognition have been so computationally intensive that even simple tasks, such as the recognition of single words, were laborious and time-consuming when computing power was less available.

The translation of text from one language to another has progressed more rapidly than speech recognition because the text translation is less consumptive of CPU power. The combination of both technologies is now beginning to yield results.

The birth of Janus

In January, members of Carnegie Mellon University's Center for Translation, Siemens Corp., the University of Karlsruhe in Karlsruhe, Germany, and Japan's Advanced Technology Research consortium are scheduled to conduct an intercontinental demonstration of Janus, a speech recognition and translation technology.

Janus will allow members of the group to speak with one another in English, Japanese and German but under more constrained conditions than the scenario described above.

Janus, which was designed as a conference registration system, has a vocabulary of only 400 words. The translations themselves will occur in almost real time, taking about one and a half times the actual speaking time in the best cases.

The current version of the system runs primarily on Hewlett-Packard Co.'s HP 9000 Series 720 Unix workstations, in conjunction with a massively parallel system from Maspar Computer Corp. in Sunnyvale, Calif., using Digital Equipment Corp.'s DECtalk as a speech output device.

Janus addresses several complex problems: receiving and translating speech into digitized text, translating that text into the speech of the target language and outputting it via a speech synthesizer.

"Translating broad-based speech into accurate, digitized text is a very hard problem, and translating text into a target language is also very difficult. Combining them compounds two very difficult problems," said Bill Meisel, president of TMA Associates, a market research firm specializing in speech technologies based in Encino, Calif.

One problem is that computerized recognition of spoken words can often introduce errors.

"There are challenges all along the way," said Arthur McNair, a research programmer at the Neural Network Speech group at Carnegie Mellon. "Someone might say 'Hello, how are you?' and our recognizer might come back with 'Hello, how is it?' "

To overcome these difficulties, Janus offers a language model built specifically for the task of conference registration. Hypotheses created by the recognizer are parsed and matched against that model. The text is then analyzed to find the most appropriate choice.

Neural exploration

Those involved with the Janus project have been exploring the use of neural networks to help discriminate among sound patterns.

"Our language model is written in such a way that it is expecting the sentences that we have and not very much more at the moment," McNair said.

"One of our current tasks is to try and extend our system to spontaneous speech. We want people to be able to express things differently, rather than being limited to the actual sentences that we have in the system. We're trying to write a more complicated grammar for the parser so that it will accept many more types of grammatical structures and sentences," he explained.

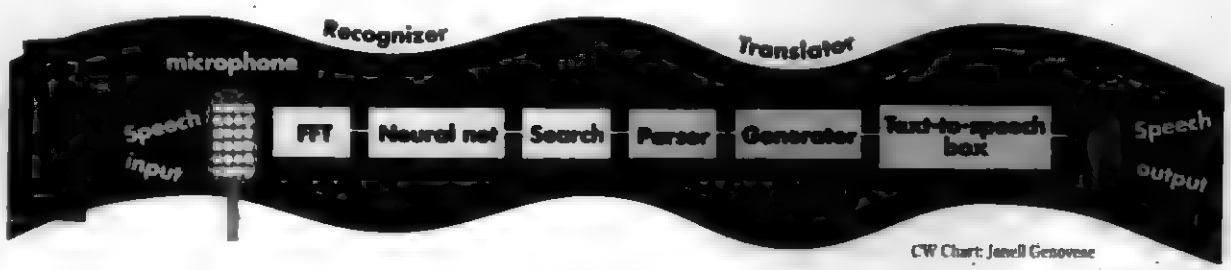
The researchers are also attempting to increase the speed of the recognition process and to support more people. They would also like to increase the vocabulary size beyond the 400 words and thus increase the range and scope of the content it addresses.

To allow for common speech, a system must have a vocabulary of at least 1,000 words; a more general discussion requires at least 10,000, according to McNair.

The largest market for speech recognition and speech synthesis systems will be for systems capable of translating spontaneous speech. But the complexity of addressing those translation issues is far beyond the capabilities of current technologies.

In order to make them nearly interactive, "almost all speech recognition and translation systems must limit themselves now to a specific set of words and tasks," McNair said.

"It is a hugely difficult technical problem to handle an unconstrained conversation like the one you and I are now having," Meisel agreed.



CW Chart: Janell Genovese

Janus mechanics

When a user speaks into Carnegie Mellon's Janus system, the workstation receives the input as wavelengths that are digitized by an analog-to-digital converter.

Then Janus uses Fast Fourier Transforms (FFT), an algorithm that was designed to take the waveform input to create a frame for each fragment of speech and convert this data into a spectagram. The FFTs also compact the data so that it is easier to feed through the system. These frames are then fed into Janus' speech recognizer. The recognizer arrives at a hypothesis of what was said, which is then sent to the translator. The translator parses the sentence to determine if it is a valid utterance according to the Janus language model.

The use of neural networks in this parsing process increases the accuracy of the Janus system as well as its efficiency because the system is able to learn parsing via examples, instead of requiring complicated grammatical structures for all possible linguistic alternatives.

If the sentence is valid, it is sent to the output language generator, which produces the translation, and the speech is output.

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Consider this a safe bet in the world of terminals. The Wyse WY-285 is plug-and-play compatible with your DEC VT420 or VT320 environment. And ours costs 21% less.

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w Wyse 285 as a smaller digits.

additional serial port, non-volatile function keys and an 85Hz refresh rate. Not to mention an EPROM access door for reprogramming ease. At this point, we're tempted to use a cliche like "more for less." Instead, we'll just ask that you consider the size of Digital's digits. And then call 1-800-GET WYSE. WYSE

EDITORIAL

Homespun

The landmark article "Who is us?" in the *Harvard Business Review* a couple years back defined the essence of the multinational company. It is a corporation that, while based in one specific country, is really a global citizen.

So although Honda is based in Japan, it manufactures its top-selling Accords in the U.S. and ships some abroad. The company uses American labor to build them, and it pays local American taxes. The Accord is assembled with many made-in-Japan parts, but the steel for those parts does not originate in that resources-starved nation. All things considered, the Accord is a sort of non-nation-specific product.

This is the way the world is going. And it is very important that our own policymakers fully understand this when it comes to formulating the competitive rules of the road.

With these dynamics in mind, it is hard to comprehend the flap that has followed the awarding of a $740 million Department of Defense contract for PCs to Zenith Data Systems. Zenith Data is owned by France-based Groupe Bull, which continues to have Zenith Data operate almost entirely out of the U.S.

The contract award wasn't a clean one. In fact, the DOD originally gave it to two U.S.-based vendors, but the bid-evaluation process had to be reopened when several of the 22 bidders griped about the original award.

Naturally, some of the rejected bidders started banging on the "buy-American" war drums. How can government money go to a subsidiary of a French company?

Why not? For one thing, let's assume the procurement people at the DOD determined that Zenith Data could best fit their requirements. Which means, by association, that any other accepted bid would have somehow fallen short of the mark set by Zenith Data.

More importantly, as it relates to public policy, shouldn't the federal government favor those suppliers that have the highest content of U.S. labor in their products, if they are going to favor anyone at all? I bang away on a laptop proudly carrying the logo of an all-American company, but there isn't a nickel's worth of U.S. labor that went into producing my machine. Is this vendor, for example, more certified in any nationalistic sense to fill that DOD contract than Zenith Data, which does 100% of its manufacturing here in the U.S.?

There are those who would claim that the billions of dollars in annual purchases the government makes ought to totally ignore domestic employment factors and just concentrate on getting the best product the most cheaply. Tell that to the swelled ranks of the unemployed.

But neither policymakers nor the public should be misled by the many faces of jingoism — faces that often disguise other intentions.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Job security is worker's responsibility

I wish I could say that your front-page article concerning the unionization of information systems professionals [CW, Sept. 7] shocked me, but it did not.

Many U.S. workers feel that they have a God-given right to work for a corporation of their choice until they retire.

Corporations have the right to maintain an appropriately sized work force that possesses the skills most valuable to the corporation.

Technology is, by nature, always changing, and it is a fact of life that IS professionals must keep abreast of the latest technology if they are to remain a valuable asset to a corporation.

When will workers in the U.S. realize that it is not corporations' responsibility to employ workers, but their choice?

Jill Blejwas
Underhill, Vt.

Disagrees with Scorecard's results

Your Buyer's Scorecard [CW, Aug. 31] on virus products was misleading.

You quoted a survey that claimed the three products reviewed held the "lion's share" of the market.

However, the industry's leading virus product, McAfee, which you only mentioned in passing, holds a 62% market share, according to a November 1991 independent survey conducted by Dataquest.

Our experience as a leading McAfee agent and supplier of local-area network-enabling interfaces for McAfee confirms this market share among our Fortune 1,000 clients, with few occurrences of the products you surveyed.

The fact that McAfee chooses a shareware approach to distribution should not exclude its products from any serious evaluation.

Randy Bradley
President
NetPro Computing, Inc.
Scottsdale, Ariz.

Speak now or forever hold your ...

"Users unite! Let's stand up for our basic rights" [CW, Aug. 24] led me to think about the users I have to deal with every day.

Some users are a joy to work with, but a good majority of them are not. I realize that IS-bashing is in fashion, but let's be a bit realistic.

When user comments and input are requested, it's "I'm really busy right now" or "Just create something and I'll let you know if it's what I want." If users refuse to take the time to help define the system they want, there should be no complaints about the final results.

There is no doubt that IS is responsible for helping new users get oriented. But there are too many users who are truly computer-phobic or just too unwilling to change.

Oops! Time for me to get out and help secure that IS empire. The sun never sets on our data center.

Michael Fanelli
Enka, N.C.

Big fan of Hewlett-Packard

This is regarding "Survey pegs computer downtime costs at $4 billion" [CW, Aug. 10].

At Intermountain Gas Co. in Boise, Idaho, we have had Hewlett-Packard hardware since 1980. We have upgraded accordingly as the need for more space/horsepower has become apparent.

Because user downtime is a key issue, I report to management all items that affect our users: power failures, hardware failures, software failures, etc. Our user downtime since 1984 averages out to be only 21.56 hours per year.

That equates to an average of 1.79 hours per month — with an average of seven incidents per year — that our users were affected by computer system downtime.

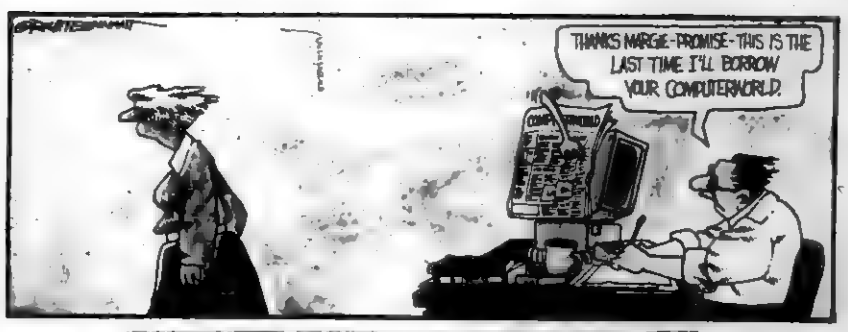
Of these, only a small percentage (an average of a half-hour per month) relates to the HP hardware.

I think that these figures say a great deal about HP and the reliability of its equipment.

I don't know what vendor's equipment is being used by those companies involved in your survey, but I can't say enough about the quality and reliability of HP hardware.

Dick Edwards
Boise, Idaho

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*



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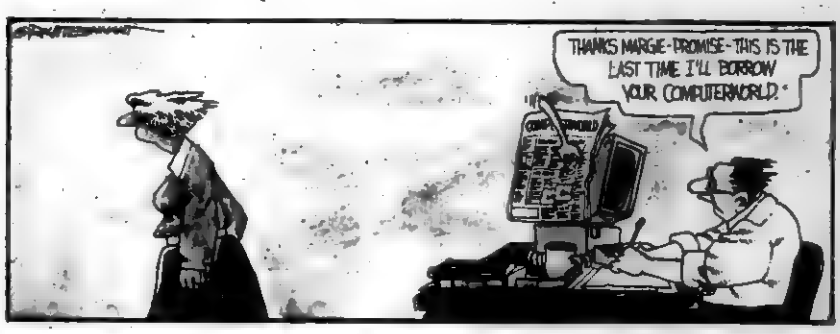

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From 'whose?' to 'how much?'

W. D. REILLY

In what we now think of as the good old days, I was a man devoted to labels. I figured we could all have class, as long as we were willing to pay for it. There were a lot of us who felt that way then, although it's almost hard to imagine because the pendulum has swung so far in the other direction. Too far, I'm afraid.

Yes, our deference to labels was occasionally foolish. I dumped a brand new Apple computer in favor of the newest rage, the IBM PC. It had 64K bytes of memory, a single low-density disk drive, a color monitor with pixels the size of peach pits and a price approaching infinity. It wasn't HAL from 2001, but it had one thing the Apple didn't have: an IBM label.

Now, price is the thing and the price of computers is falling through the floor.

Mystery parts

The other day I saw a 486 machine complete with Super VGA, a 120M-byte fixed disk, a tape backup unit and two floppies for less than 2,000 bucks. For the life of me, I can't figure out how they do it. My guess is that they spend a lot of time at computer swap meets, digging up cheap parts of dubious ancestry.

Even Compaq and the venerable IBM are dropping their prices to compete with the clone companies nipping at their heels. At some point, they will reach a price below which they cannot go, and I suspect it still won't be far enough. With costly R&D divisions to maintain, they will never be able to compete dollar for dollar with smaller and more maneuverable companies.

Where does that leave them?

I read an article the other day about a man who said he would like to own Compaq equipment because of its high quality, but he would not pay a penny more for the name. What?

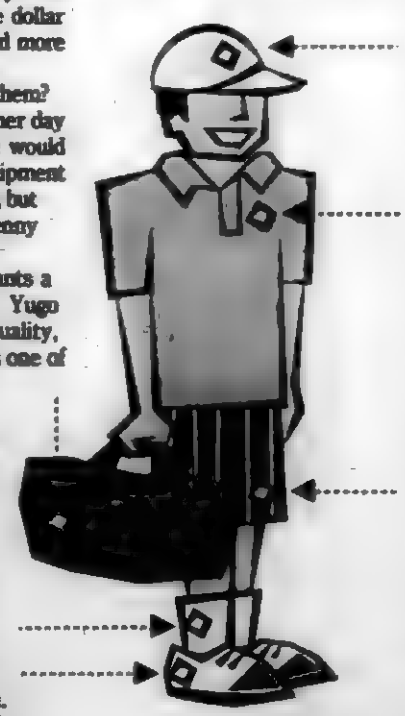
Does that mean he wants a BMW, but will only pay Yugo prices? When you want quality, you have to pay for it. It's one of life's little shortcomings.

The small clone vendors have been able to compete strongly in a market obsessed with price and one that views quality only within the narrow bounds of a single desktop. But, in the rapidly growing network market, it's the little things that get you. Networks, particularly large global systems, are complex enough. What you don't need is a workstation that fails because of improper design and testing.

I am probably one of the last people in the world who believes there is something wrong with a 486 PC that sells for $1,000. But my job depends on keeping the computers in operation, and I'd rather pay a small premium for quality equipment and after-sale support.

Don't get me wrong: I do agree that prices for some of the top name computers are high. I also think the big companies need to tighten their collective belts a notch or two.

But I like the idea that I can call these vendors if I have an unusual problem or need engineering support. Try doing that with most clone vendors and see what you get.



Stephanie Faucher

Big sizzle, small support

I'm acquainted with two lesser known clone makers. Both advertise in major publications. Both have nifty little 800 numbers. And both have staffs of less than five people.

I'm not suggesting that we have to buy expensive computers from companies without regard to cost. We can do what we've always done. We can shop around. We can pressure large companies to become more responsible and, if they don't come around, force them out of business by taking our dollars somewhere else.

What we cannot do is keep lowering our sights, accepting less and borrowing on our technological future. I figure if you want to dance, you should be willing to pay the band.

Reilly is the microcomputer support manager for the City of Hope Medical Center in Duarte, Calif.

Why Johnny can't get A's in C programming

EDWARD G. NILGES

THE PROGRAMMER'S DILEMMA

In recent months, the loss of American programming jobs has generated much attention and concern.

The redoubtable Edward Yourdon has published a book on the decline of the American programmer, and in a recent issue of *Computerworld* [CW, Aug. 3], John S. Morrison wrote about the cost savings to be had by hiring programmers from the Commonwealth of Independent States (CIS), the somewhat shadowy entity that replaced the Soviet Union.

Recently, I taught the C language to a number of classes of IBM assembler programmers and had an experience that proved some of Yourdon's and Morrison's points.

The emigres have it

In the C classes, there were two distinct groups. One was made up of "ordinary Americans," people from a variety of ethnic groups, most of whom had been born in the U.S. and educated in local schools. The second group consisted of recent emigres from the Soviet Union.

Although the American students were both capable and motivated, I found that the ex-Soviet students were significantly faster at learning C. The Soviet students enjoyed the course and demanded more advanced instruction, whereas a number of the American students complained about the "complexity" of C. The ex-Soviets also seemed far more willing to check code carefully for errors.

> IT WAS CLEAR to me that . . . the Soviet students represented the "better buy" and that Americans need to damp down their salary expectations and sharply increase their technical skills, if they expect to remain in the programming racket.

It was clear to me that, for the company in question, the Soviet students represented the "better buy" and that Americans need to damp down their salary expectations and sharply increase their technical skills if they expect to remain in the programming racket.

I took a pay cut to come to my current job and recently started learning C++, Visual Basic and Windows. I do this because programming is one of the few things I do that makes any money at all and because I think the idea of closing American borders to foreign skills and talent is both impossible and profoundly unfair. Why should I make 10 times what some hungry Russian or Mexican makes for coding C — unless, of course, I do it 10 times faster or 10 times better?

It is ironic, however, that after years of calling for American programmers to think like managers — to be less technically oriented and more attuned to the needs of business — U.S. companies now wish to export programming jobs to a population that, despite its high intelligence and education, has very little experience with business.

Even more ironic is the fact that the theoretical skills of CIS programmers are so highly valued when U.S. programmers have been taught that theory-based approaches don't meet the needs of business.

In spite of their grumblings about "complexity," which is merely protective coloration, U.S. programmers want to learn and improve. The problem is that they've been impeded for years by management's attachment to out-of-date technology.

Layoffs often come to the older programmer, who has been complaining for years about preservation of museum-piece equipment and who long ago ported Unix to his home 386. Adding insult to injury, this "ancient programmer" is told at his exit interview that the reason for his layoff is lack of familiarity with workstation technology.

U.S programmers do have work to do and lessons to learn. One of those lessons may be to pay less attention the next time management says it wants us to be "less technical."

Nilges is a programmer and Information Center consultant at Princeton University.

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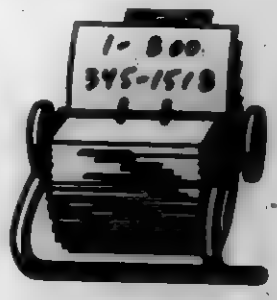

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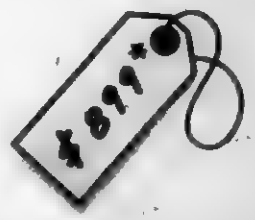

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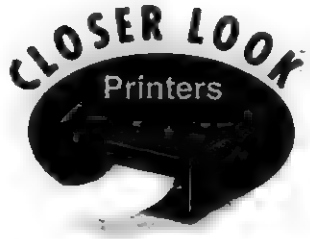
Compaq, HP draw lines for their printer showdown



BY CAROL HILDEBRAND
CW STAFF

The new boy in town looks good, there's no doubt about that. But although Compaq Computer Corp.'s printers are gaining praise both for price point and feature set, Hewlett-Packard Co. holds the mind-set of a vast majority of customers.

Compaq announced two network printers that are plainly targeted at the heavyweight in the network printing category, HP's IIISI. According to analysts at BIS Strategic Decisions in Norwell, Mass., the Compaq printer has scored a bull's-eye. "Its kinds of features are state-of-the-art. They've definitely done a good job at looking at what is weak in the IIISI," analyst Rob Auster said.

However, Compaq has a long way to go if it is to break into a corporate mind-set that is overwhelmingly fixed on HP printers.

"There's an awful lot of people brainwashed into thinking that HP is the place to buy printers," said C. J. Meiser, another analyst at BIS Strategic Decisions. Meiser cited a BIS Strategic Decisions survey that placed HP as the No. 2 vendor of choice for network printers — before the company even had a network product out.

Meiser said he sees the printers as almost even when it comes to features, but Compaq has the advantage on price. With the PageMarq 15 listing at $3,199 and the PageMarq 20 at $5,499 — and street prices significantly lower — analysts predicted that HP would answer with a price reduction on the IIISI, as well as an upgraded model before year's end. HP declined to comment.

Analysts said Compaq made a canny move in targeting one of its native strengths: expertise in networking. The network printing market is seen as one of the growth areas in the printing arena during the next four years. According to numbers from International Data Corp. (IDC), a market research firm in Framingham, Mass., 60% of personal computer users will be on a local-area network by year's end, with an estimated 69% on the LAN bandwagon by the end of 1996.

Aim for the top

Compaq will undoubtedly start by selling to its strengths: the big corporate sites that use a majority of Compaq servers and PCs. Indeed, Eckhard Pfeiffer, president and chief executive officer of Compaq, said that of the 10 printer beta-test sites, nine have decided to purchase a Compaq printer.

Another strength is Compaq's dealer channel. Slanted toward servers and PCs, many of the dealers have integration expertise, which will help in placing the printers in a networked environment. Conversely, Auster said HP had to struggle a little at first, moving the IIISI through a dealer channel that comes from the printer side.

The company also did its homework on the parameters of the printers. The PageMarq 15 and the PageMarq 20 print at 15 and 20 page/min., respectively. IDC research also found that of printers already installed on a LAN, 65% to 70% of 12 to 19 page/min. units shipped are destined for networks. IDC estimated that a 12 to 19 page/min. printer serves between five and 20 people comfortably.

Other places in which analysts said HP will be playing catch-up came in paper handling and font switching. PageMarq 15 and PageMarq 20 paper trays hold 1,000 and 1,500 sheets, respectively, with output trays holding 500 sheets. Compaq also uses a new technology, developed with Adobe Systems, Inc., that allows a printer to automatically sense which page description language is being sent to it and automatically switch between Adobe's PostScript Level 2 and HP's Page Control Language (PCL). On the IIISI, PostScript printing capabilities are an add-on that costs extra.

However, one of the things that the IIISI can do that Compaq's print engine cannot is duplex printing, or printing on both sides of a page.

One analyst said the issue could become important, particularly as environmental awareness rises. Joel Wechsell, an analyst at Gartner Group, Inc. in Stamford, Conn., said that in a networked environment, good sorting capabilities become important. "When a printer has a 20 [page/min.] output, you don't want to discover that your stuff is at the bottom of the pile," he said.

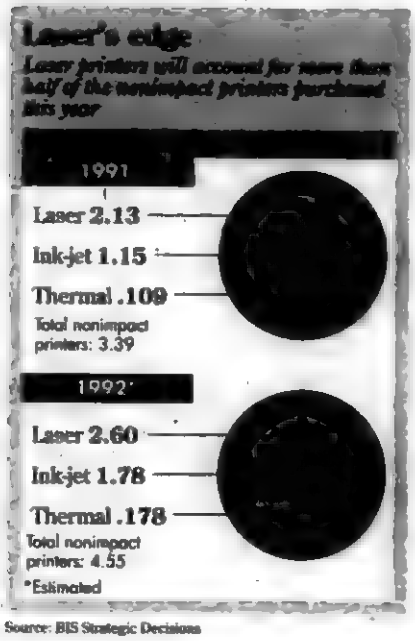
Challenge issued

Compaq is the first serious market share threat to entrenched HP, analysts say

	PPM	DPI	Price	PostScript	Duplex	Network interface
HP IIISI	17	300	$5,495	Optional	Yes	Token Ring, Ethernet, Unix
Compaq PageMarq 20	20	300 PCL 600 x 400 PostScript	$5,499	Built-in automatic switching between PCL, PS	No	Token Ring, Ethernet, AppleTalk

Laser's edge

Laser printers will account for more than half of the nonimpact printers purchased this year



Source: BIS Strategic Decisions

Network printer woes ease

BY KELLEY DAMORE
SPECIAL TO CW

While many information systems managers find LANs an attractive option, they have experienced many headaches with network printing. Printer vendors, however, have started to address the problems by producing network-ready printers, which have changed the landscape of printing by letting the printer be its own node on the network.

"Printing on the network has been a thorn in the side of IS managers. All the dissatisfaction in the past has been that the printer was too far away or was too slow. Printers hooked up to file servers offered limited capabilities because print jobs were spooled through the network," said Christine Rivera, a consultant at MicroDynamics Plus, Inc. The New York firm specializes in training managers in laser printing.

Don Davis, a manager of microcomputer support services at Boston University, noted, "The biggest advantage to network printing is that I can now print directly. I don't have to go into a queue in the file server. This has increased our productivity and performance."

Network printing doesn't come cheap, costing up to $7,000 when networking options are considered, but some managers said the productivity gains make the cost worthwhile.

At the College of Business at Oregon State University, Greg Scott, computer service manager, replaced 11 HP LaserJet Series II printers with five LaserJet IIISI networked devices. "Even though users were printing to half as many printers, the LaserJet IIISI increased printing throughput dramatically," Scott said.

One improvement users said they want is to have the network operating system and printer keep them posted on the status of print jobs, rather than forcing them to search for the status themselves.

Damore is a San Francisco-based writer.

Quattro Pro for Windows last but hoping to be best

ANALYSIS

BY CHRISTOPHER LINDQUIST
CW STAFF

Better late than never does not mean much to the man staring into a smoking cellar hole just as the fire trucks arrive. Borland International, Inc. is hoping it will still find a blaze to fight when it finally ships Quattro Pro for Windows after months of delays.

The much-ballyhooed product has been beset by delays that have caused Borland to be the last of the big spreadsheet players to enter the Microsoft Corp. Windows market. However, early users of the product said it is impressive enough, particularly in ease of use, to give competitors Lotus Development Corp. and Microsoft something to think about.

"In this first release, we really targeted ease of use and functionality," said Song Huang, product manager at Borland.

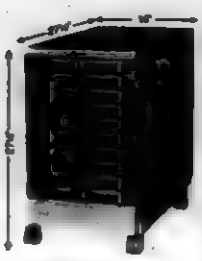
Huang noted that the product delays were caused by several factors, not the least of which was Microsoft's release of Excel 4.0. Indeed, one of Quattro Pro for Windows' core features, the Database Desktop, which allows spreadsheet users to easily access outside data, was not intended to be fully incorporated in the first version.

However, Huang said, it was decided that "we're last in the market, so we'd better be the best."

Whether that is the case remains to be seen, but beta-test user Peter Blair, a product manager at DHL Worldwide Express, said the product is impressive. In particular, he called attention to the Database Desktop. "It's a good way to look at database information while putting together a spreadsheet."

Continued on page 44

Data General trumpets the open storage system news to IBM, SUN, HP, UNISYS and ICL users!



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User survey says Dell PCs best the competition

BY JAMES DALY
CW STAFF

NEEDHAM, Mass. — Mirror, mirror on the wall, who's got the most functional, least expensive, reliable and upgradable personal computer of them all? Answer: Dell Computer Corp., at least according to a recent study of four major vendors by an independent research house.

The Austin, Texas-based Dell outgunned PCs from Apple Computer, Inc., Compaq Computer Corp. and IBM in every category of Reliability Ratings' survey of the 500 largest PC sites in the country. It was only the second time a vendor has scored best in every category.

The findings, published in a $124, 40-page document, collected a broad range of data on end-user experience with a total of 10,770 computers. Topics included reliability, service, technical support, functionality, upgradability, price, monitor and overall satisfaction.

The PCs had a total of 25 million run hours of history and were set up in more than 50 configurations, publisher Greg Strakosch said. Government and educational institutions were excluded, and the research firm surveyed only those PCs that were installed in the past year.

Mail-order vendor Dell got its highest customer satisfaction scores in reliability and price. Dell's PCs scored more than two points higher on a 10-point scale than any other vendor's PC in the aggregate for price. For the others, price was frequently listed as a major weakness.

Perhaps most important, nearly 81% of the users owning a specific Dell PC model said they would buy it a second time. The highest percentage of Dell users who said they would not buy the same model again said they would buy another Dell PC, but a newer model.

Compaq had the second-highest score in four categories, barely missing a tie with Dell in reliability and creeping close in functionality and overall performance.

In a strong indication of customer satisfaction, nearly 92% of Apple users said they would buy the same Macintosh again, more than any other vendor. Apple users described ease of use as the major strength of Apple's PCs.

IBM finished poorly in the survey, coming in last in seven of eight categories. This poor finish, however, might ironically be caused by IBM's stellar reputation. "People seem to hold IBM up to a higher standard," research director Kevin Beam said. "For many people, buying IBM was a default decision, so they have a tendency to gripe about it. And picking on IBM is like picking on the government — it's a big target with broad shoulders."

Beam also noted that the same customers who complain about IBM are, in most cases, likely to continue to purchase IBM hardware. "They complain, but they come back," he said.

One shocking discovery of the survey was the high rate of machines rated dead on arrival (DOA). The DOA rating was given for any instance in which the PC was inoperable when first installed. IBM scored the worst in this regard, with 2.33% of the 215 Personal System/2 Model 80s surveyed listed as DOA.

IN BRIEF

CA slashes Cricket price

■ To introduce its new Microsoft Corp. Windows-based image processing software, **Computer Associates International, Inc.** announced a promotional price reduction of $500 for Cricket Paint. The price cut lowers the cost of the personal computer-based imaging software from $595 to $95.

Pricing for CA-Cricket Image, an image processing system for raster-based PC graphics, was dropped from $295 to $92. The promotional prices will remain in effect until Jan. 31, 1993, the company said.

■ **Sytron Corp.** in Westboro, Mass., has announced the release of backup and archival software for OS/2 2.0. Sytos Plus Version 1.35 for OS/2 is reportedly the first backup-and-restore application with full support for OS/2 2.0, including backup of High Performance File System drives and use of long path names. It is available for a list price of $295.

Check out the Marketplace Pages on Page 103.

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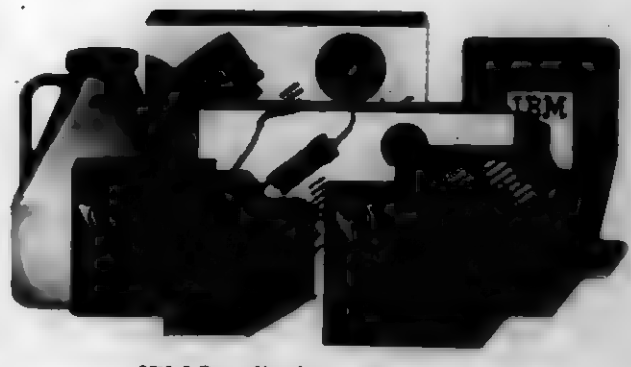

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Toshiba's T4400SXC: Power at a premium price

Technology Analysis — A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

Toshiba America, Inc.'s T4400SXC defines the current high end of the color notebook market. The portable offers active-matrix color display and a powerful processor. Naturally, it also carries a premium price tag.

Performance: The Intel Corp. I486SX processor gives the Toshiba model a performance edge over most available notebooks.

Ease of use: Reviewers said the T4400SXC's color display is excellent, with sharply defined colors and little glare or color washout. *Infoworld* quibbled only with the lack of brightness control. The 82-key keyboard has half-size function keys.

Power supply: Tests yielded an average battery life of approximately three hours.

Service and support: Toshiba offers a one-year warranty and toll-free phone support during business hours. *Infoworld* rated the technical support as "good."

Overall: Reviewers agreed the Toshiba unit is for power users who can afford the best combination of power and sharp color display. With an 80M-byte hard disk, the T4400SXC lists for $5,499.

Toshiba T4400SXC

Reviewer	Performance	Ease of use	Power supply	Design	Service and support	Overall value
Infoworld 7/27/92	Performance leader	Bright and clear active matrix	Very good	Satisfactory size and weight	Good support	Steep price
PC Magazine 8/92	Superior	Small screen	Decreased battery life	Small and light	Toll-free support	Pretty and fast
Windows Magazine 7/92	Quick	Top-notch keyboard	Three-watt boost	Convenient layout; needs improvement	NC	Best Windows notebook available
PC Week 4/6/92	A champ	Crisp images	Just over 2.5 hours	RAM expandable to 20M bytes	NC	High price
PC Computing 9/92	Most powerful	Perfect keyboard	Favorable battery scores	Hefty	NC	Could easily replace desktop PC
Users						
Wayne Yacco, Yacco Communications	■	■	▌	■	■	Power a problem with active matrix
User at a major engineering company	■	■	▙	▙	▪	Availability and quality problems
Analysts						
Margaret Jacobs, DataPro Information Services Group	■	■	▙	▙	▙	Good
Bart Blich, Faulkner Information Services	■	■	▙	■	■	Very good

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Toshiba America Information Systems (TAIS) is an independent operating company owned by Toshiba America, Inc., which in turn is a subsidiary of Toshiba Corp. TAIS reports annual revenue of approximately $1 billion. The company is headquartered in Irvine, Calif.

Toshiba responds

Grant Johnson, product marketing manager:

Ease of use: With the color, thin-film transistor screen, brightness control is superfluous. You don't have to optimize it like you need to with black-and-white LCD. Not a single customer has complained about the lack of a brightness control.

Overall: The street price is less than $5,000.

Dell's 325NC: A good deal for nonpower users

Dell 325NC

Reviewer	Performance	Ease of use	Power supply	Design	Service and support	Overall value
Infoworld 7/27/92	Good	Difficult to view from side	Excellent	Satisfactory size and weight	Excellent	Bargain-basement price
PC Magazine 8/92	Top quarter of its class	Generally good keyboard layout	Battery life exceeds competitors	NC	Toll-free support	A pleasure to work on
Windows Magazine 7/92	NC	Keyboard close to perfect	Extensive power-saving features	Exactly notebook-size	24-hour tech fax	Best all-around value
PC Sources 6/92	Excellent overall performance	Credible color	Better than some monochromes	Reliable	Usual high standards	Doesn't deliver no-compromise color
PC Computing 9/92	Blazing disk times	Problems with screens	Longer-lasting batteries	NC	NC	Easy to like
Users						
Celeste DeSalvo, J.A. Adams, Inc.	■	■	▌	▙	■	I'm very pleased with it
Stuart Swanson, A-tech Computer Services	▙	■	▙	■	NC	Lot of value for money
Analysts						
Margaret Jacobs, DataPro Information Services Group	▙	▙	▌	▙	■	Dependable
Bart Blich, Faulkner Information Services	▙	▙	▙	▙	■	Low resolution for 256 colors

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Dell, located in Austin, Texas, reported profits of $22 million on revenue of $458 million for the quarter ended Aug. 31. Profits and revenue were up 77% and 129%, respectively, from the same quarter last year.

Dell responds

John Biebelhausen, manager of portable systems:

Ease of use: In order to package the keyboard into an 8- by 11-in. form, you have to compromise somewhere. We do have seperate F11 and F12 keys, scroll and lock keys on the top row, so it's aligned similarly to the 101-key keyboard, which isn't true of most notebooks. The color emulates all standard Video Graphics Array modes.

Passive-matrix color displays — which refresh the screen row by row instead of supplying constant power to each pixel — are generally less impressive than active matrix. However, reviewers noted that the price differential can make competent passive-matrix machines such as Dell Computer Corp.'s System 325NC an attractive buy.

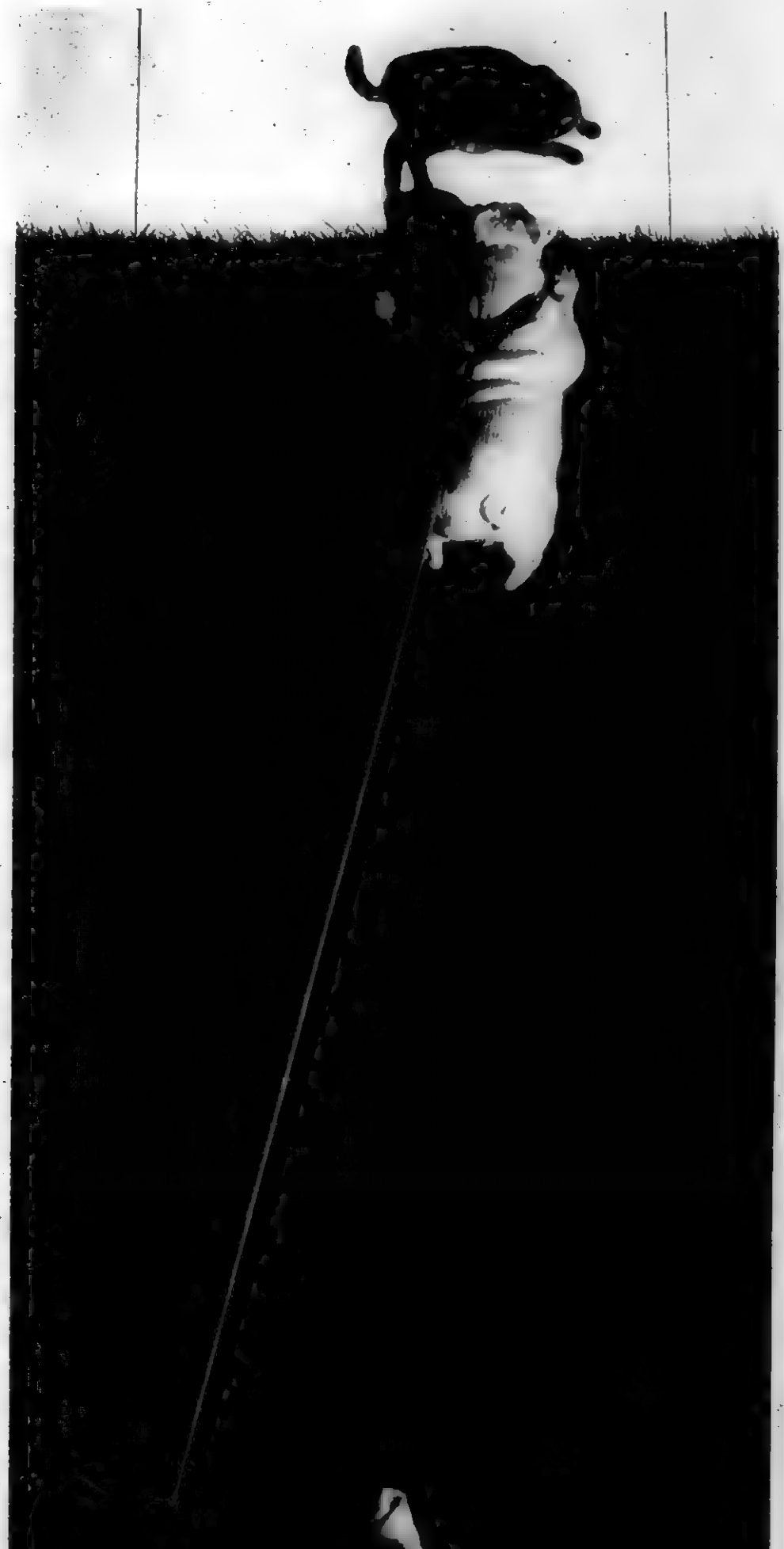
Performance: Based on the Intel Corp. 80386SL chip, Dell's notebook boasts good overall performance and excellent disk speed.

Ease of use: The keyboard sports a logical layout, with a few typical notebook compromises such as half-size function keys. The color display is fine, though it produces 256 colors at a slightly reduced dot resolution (640 by 400, instead of the standard 640 by 480), according to *Windows Magazine*.

Power supply: The 325NC fared well in battery life tests. Power-saving features can extend the charge to four or more hours. The system uses nickel hydride batteries.

Service and support: Dell's support features a one-year warranty and toll-free phone support during extended business hours.

Overall: The Dell 325NC is an excellent passive-matrix system, reviewers said. The $2,999 price tag will appeal to users who do not need the costly benefits of active-matrix color.



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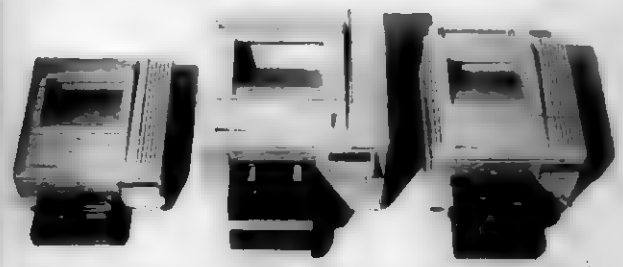

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CD-ROMs ready to break out

BY MICHAEL FITZGERALD
CW STAFF

Compact disc/read-only memory (CD-ROM) technology may have yet to invade the realm of computing the way it swept through the music industry, but some analysts said they think CD-ROM is about to become a major factor in the information systems arena.

In fact, Patty Chang, an analyst at San Jose, Calif.-based market research firm Dataquest, Inc., has dubbed 1992 the year of the CD-ROM. Dataquest forecasts that the installed base of CD-ROM drives will double this year, from 1.5 million to 3 million units, she said.

Chang said two factors are driving CD-ROM growth: Microsoft Corp. and falling prices. "Microsoft is shipping new multimedia titles every six months, and other software is coming to market. There are 3,000 available [CD-ROM] titles right now, and for multimedia we see 100 titles by the end of the year," Chang said.

As for prices, some CD-ROM drives now retail for less than $200, and with system prices falling, users may be more likely to stick peripherals on their systems, Chang said.

Of more use to IS managers may be the upcoming CD-Recordable technology, which allows a user to create write-once read-many (WORM) CDs. These drives cost more than $3,000 each now, but Chang said Dataquest research shows that creating six CDs would justify buying one.

Various applications

Analysts said they think corporations will use CD-ROMs for presentations and training, while CD-Recordable drives will take advantage of the 680M-byte capacity of a CD-ROM to distribute corporate databases to salespeople and other personnel worldwide.

"The key point to remember is that CD-ROM is a publishing business," said Richard A. Bowers, executive director of the Optical Publishing Association in Columbus, Ohio. "Publishers are creating information-oriented products people want to buy, which spurs other growth."

Dataquest projects 35% annual growth rates for the CD-ROM drive industry, with 4.9 million units selling in 1996. Bowers' organization projects growth rates similar to Dataquest's.

Multimedia demand low

BY MICHAEL FITZGERALD
CW STAFF

The onslaught of multimedia personal computers in search of a market continued recently, as consumer computer giants Tandy Corp. and Packard Bell Electronics, Inc. released multimedia machines.

One analyst said the new machines, while interesting, would not spark the multimedia PC market.

"The announcements are all there and the shipments are not and are not going to be for a couple of years yet," said Richard Zwetchkenbaum, an analyst at International Data Corp. (IDC) in Framingham, Mass. Zwetchkenbaum said IDC estimates a worldwide installed base of only 100,000 multimedia PCs.

A new Sensation

Tandy, located in Forth Worth, Texas, released Sensation, its third-generation multimedia PC, and said it will market multimedia PCs in its Radio Shack stores.

Sensation will include advanced telecommunications facilities that let the computer operate as a telephone answering machine and message center; and WinMate, a new software organizer that Tandy designed to help users better organize Microsoft Corp.'s Windows package. Besides DOS 5.0 and Windows 3.1, Sensation ships with Microsoft's Works for Windows, Bookshelf for Windows and three on-line networks.

It will also have clip art, font and sound libraries, a Tandy-designed Multimedia Palette chip that gives 16 million color displays and Super VGA graphics.

Sensation, with a 25-MHz Intel Corp. I486SX chip, 4M bytes of random-access memory, a 107M-byte hard drive and a compact disc/read-only memory (CD-ROM), costs $1,999.

Chatsworth, Calif.-based Packard Bell's 486SX/25 Multimedia Computer System has an internal CD-ROM player, a three-speaker stereo system and a Sound Blaster Pro II digital audio mixer from Creative Labs, Inc. The system, with a monitor, fax modem, 4M bytes of RAM, a 210M-byte hard drive and 1,024- by 768-pixel resolution, costs $2,599.

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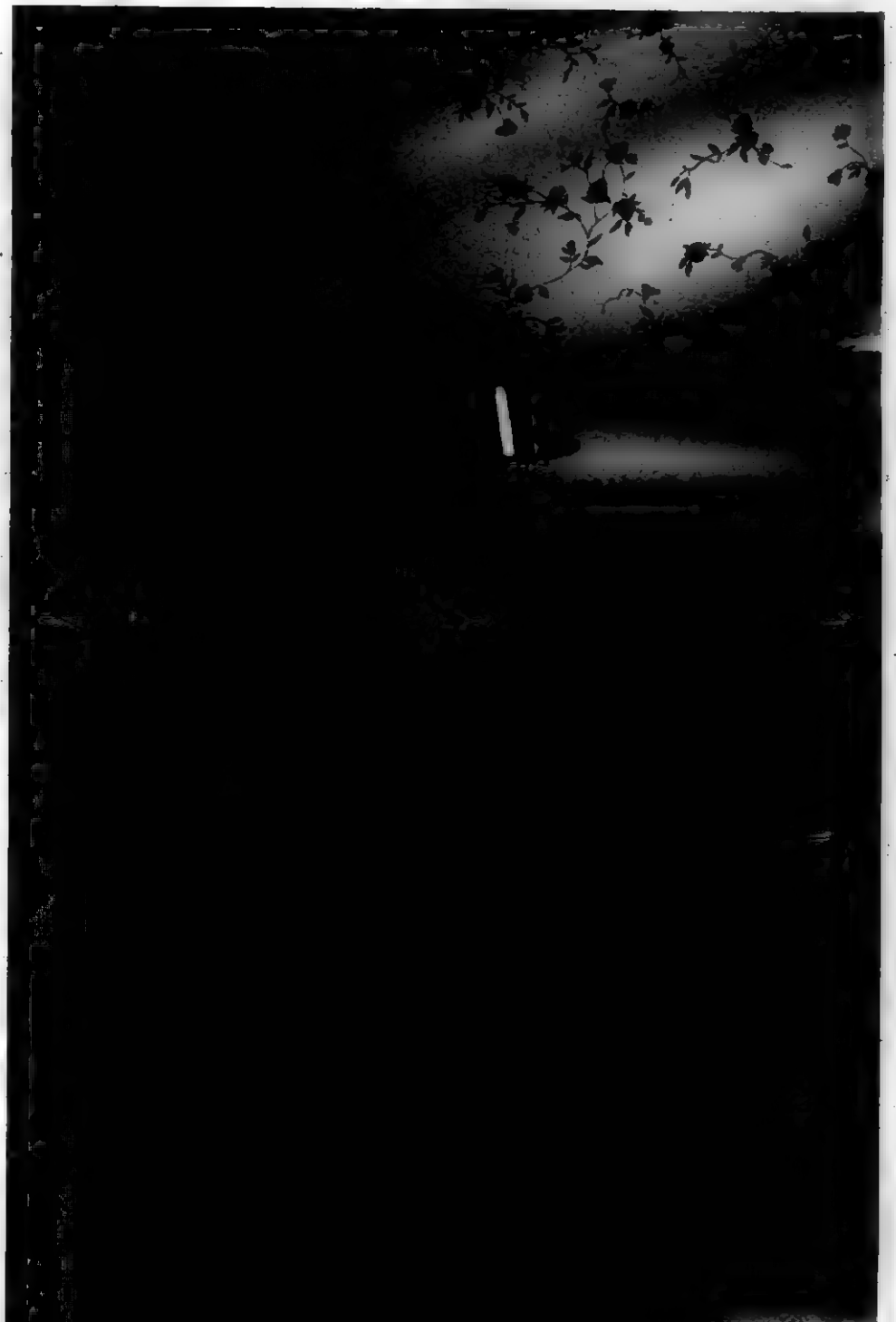

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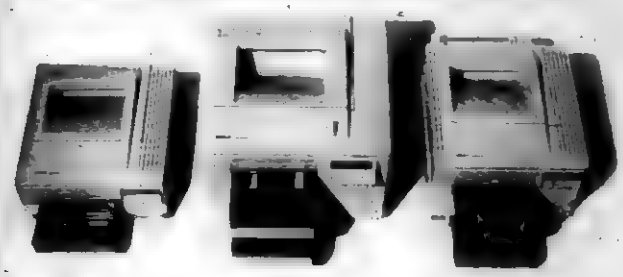

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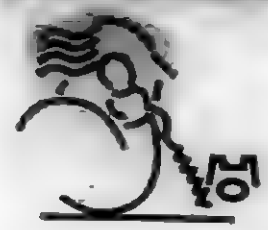
HELPLINE

WordPerfect for Windows



Part of a series of features dealing with questions commonly asked of personal computer software vendors' support groups. This week's article focuses on WordPerfect 5.1 for Windows.

Q Are there shortcuts for formatting?

A Using the Ruler is the easiest way to make quick formatting changes such as tabs, margins, fonts, line spacing, line justification, columns and tables. Double-clicking on the tab or margin markers or any button on the Ruler will automatically bring up the corresponding dialog box so you can fine-tune your formatting choices.

Q Can I use TrueType fonts with WordPerfect 5.1 for Windows?

A Select a Windows printer driver and you will be able to print all TrueType fonts.

Q Since I cannot use the Alt key to name macros in WordPerfect 5.1 for Windows, is there an option?

A You can use the Ctrl or Ctrl+Shift keys instead, with one of the 26 letters in the alphabet. You can add macros to a button bar for easy access, or you can assign up to nine macros to the Macros pull-down menu. You can also remap the alphanumeric keys to invoke a macro.

Q After certain third-party Windows font packages (e.g., Adobe Type Manager, TrueType or Facelift for Windows) are installed, why don't the additional fonts display in the font list when a WordPerfect printer driver is selected?

A Most Windows font packages (with the exception of Fonts On The Fly and Morefonts) will add fonts to the Windows printer drivers but not to the WordPerfect printer drivers.

Make sure to restart Windows after installing your font package and then follow these steps to use the fonts that have been added to your Windows printer driver: Select a Windows printer driver (File/Select Printer/Windows/Select), choose the Update option (File/Select Printer/Update), then select the fonts desired (Font/Font).

Non-Windows font packages that work in WordPerfect 5.1 for DOS, such as Bitstream Fontware, add fonts to WordPerfect printer drivers but do not add screen fonts to match the printer fonts. You can print the fonts accurately, but you may not get a true representation of them onscreen.

If you do not plan to use other WordPerfect Windows products and wish to install these files into one directory, you can use the Custom Install option when installing.

After using the Custom Install option, you can then delete the WPC directory and the files in it. (Please note: it is not recommended that network administrators install all files to one directory — the WPC directory is also used to store individual user files.)

Q Why didn't my interim release include a printer disk?

A The interim release (dated April 4, 1992) includes a full set of program disks but no printer disks. If you are installing the interim release on a machine where WordPerfect 5.1 for Windows already exists, you don't need to reinstall your printer. Each interim release disk was designed to totally replace the original corresponding disk.

If you need to reinstall the program, you can use your original printer disk to install your printer.

DEC shows Alpha-based PC at DECUS meet in Europe

Company official promises 'aggressive' pricing

BY ROBERT LINEBACK
IDG NEWS SERVICE

CANNES, France — Digital Equipment Corp. went public with a reduced instruction set computing-based personal computer, showing a working prototype system built using its Alpha chip for the first time at the European DEC Computer Users Society (DECUS) here.

DEC's head of Entry Systems Business promised to price the first Alpha-based PCs aggressively against systems using microprocessors from Intel Corp. "We believe the Alpha PC and our cost structure are very much in line with what will be 586-based PCs," said Jesse Lipcon, vice president of the Entry Systems Business operation. He said DEC has started its early support program, and it is sending "seed" units to key developers worldwide.

DEC managers claimed the first products will offer about six times the performance of an Intel 1486-based 50-MHz PC but at about the same price. But when pressed for a price and an introduction date, officials declined to give specific information and said that a launch will occur after Christmas.

"The plan is to make it available within the same time frame as [Microsoft Corp.'s Windows] NT," Paul Evans, desktop marketing manager for DEC in Europe, said after he showed the prototype at the DECUS managers meeting. "We want to bring these to the market simultaneously so there won't be a lot of hardware waiting for software."

DEC intends to make Microsoft's 32-bit Windows New Technology (NT) operating system a key part of its 64-bit Alpha-based PC strategy. DEC officials promised high performance and a ready supply of NT applications for Alpha.

First wave

The prototype systems shown at the DECUS meeting will be the basis of the first Alpha PCs, which will be deskside models, to be followed by desktop models. The prototype has a 150-MHz Alpha chip set and is capable of delivering maximum performance of 250 million instructions per second, or about six times that of a 50-MHz 486-based PC, DEC managers said.

For some customers at the meeting, DEC's aggressive attitude on price was a welcome change from previous product introductions.

"They are facing up to the fact that the Unix world is able to offer us four times the price/performance as they have been able to, and we have many suppliers to choose from," said one DEC computer user who works at a Dutch medical center. "I think DEC can succeed."

Quattro Pro for Windows

CONTINUED FROM PAGE 37

He also noted that the Interface Builder is useful for creating applications that do not look like spreadsheets. Such a feature could be beneficial to a bank that needs loan information filled in but wants to use a nonthreatening interface, he added.

Fun features

Rock Blanco, vice president of information systems at Garber Travel in Boston, said he likes the Database Desktop, adding that the spreadsheet's use of "notebooks" to store sheets as well as its use of the last sheet in the notebook for all graphics were very intuitive.

Quattro Pro for Windows can use graphics to create slide shows. As changes are made to graphics in individual sheets, the graphics are automatically updated, as are any previously created slide shows.

Borland is making a limited offer of Quattro Pro for DOS and Windows in one package for a list price of $495. Previous owners of Quattro Pro can move to the Windows version for $79.95 until Dec. 31, at which time the price will increase to $99.95.

NEW PRODUCTS

Systems

CAF Technology, Inc. has introduced AquaLite-I, a 386SXL/25-based notebook computer.

According to the company, AquaLite-I has the full features of both a mobile and a desktop computer. The product weighs 6.4 pounds and has a base unit equipped with 2M bytes of random-access memory. Via insertable memory modules, the 2M bytes of RAM are expandable to 4M, 6M or 8M bytes. One parallel and two serial ports are included, along with an external CRT port and an external keyboard port.

A 110-pin expansion port is also included for an optional Docking Station, which allows the user to expand the AquaLite-I into a desktop computer.

AquaLite-I costs $1,995.

CAF Technology
1315 Johnson Drive
City of Industry, Calif. 91745
(818) 369-3690

Software application packages

MicroLogic Software has released Version 1.0 of TrueType for DOS.

The product enables users with DOS versions of WordPerfect Corp.'s WordPerfect, Microsoft Corp.'s Word and Microsoft's Works to use the TrueType font format. The package includes 36 TrueType typefaces, which are accessed from the regular font-selection menu of WordPerfect, Word and Works and can be printed to any ink-jet, dot matrix or laser printer, the company reported.

Thousands of customized TrueType fonts can be created by merging a TrueType typeface and MicroLogic's collection of outlines, fill patterns, backgrounds and shadows.

TrueType for DOS costs $99.95.

MicroLogic Software
1351 Ocean Ave.
Emeryville, Calif. 94608
(510) 652-5464

Utilities

Software Quality Automation has released SQA:Replay.

According to the company, SQA:Replay is a utility that enables users to record every keystroke, mouse click and mouse movement for playback at a future time. SQA:Replay has a recording feature that allows for a point-and-click operation that does not require programming.

Replay features include automatic restoration of the desktop order before replay begins, the ability to selectively pause during playback and variable speed playback.

SQA:Replay works with IBM's OS/2 1.3 and 2.0 and on IBM AT, Personal System/2 or compatibles.

The product costs $99.

Software Quality Automation
1 Parker St.
Lawrence, Mass. 01843
(508) 689-0182

Macintosh products

Dantz Development Corp. has released Version 1.1 of DiskFit Pro.

The product was designed to make Apple Computer, Inc. Macintosh backup more efficient. According to the company, DiskFit Pro backs up files that are on the user's hard drive and puts them onto a SmartSet of disks that maintain an up-to-date version of the hard disk in Finder format. New or changed files are replaced with incremental backups, which keeps the SmartSet compact.

DiskFit Pro costs $125.

Dantz Development
Suite 1
1400 Shattuck Ave.
Berkeley, Calif. 94709
(510) 849-0293

Peripherals

Philips Consumer Electronics Co. has introduced FastRefresh/21, a two-page autocanning monitor.

FastRefresh/21 can be used in computer-aided design and manufacturing, workstation, Apple Computer, Inc. Macintosh, graphics developer and desktop publishing environments. FastRefresh/21 uses a very fine pitch 0.28mm CRT and has an Invar shadow mask. Full digital front panel controls are included, and the product's microprocessor can store up to 22 video modes.

FastRefresh/21 is priced at $3,495.

Philips Consumer Electronics
1 Philips Drive
Knoxville, Tenn. 37914
(615) 521-4316

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For a how-to source that provides information on hooking network-ready LaserJets into your system, call **1-800-752-0900, Ext. 3075** for the HP Connectivity Solutions Guide.

HEWLETT PACKARD

*For operating HP-UX, SunOS and SCO UNIX, $800 in additional software is required. All prices are suggested U.S. list prices. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. Microsoft is a U.S. registered trademark of Microsoft Corp. ©1992 Hewlett-Packard Company PE12250

OS/2

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IBM

BUYERS' SCORECARD

HDS mainframe users most satisfied

BY DEREK SLATER
CW STAFF

On the strength of its enhanced GX line, Hitachi Data Systems Corp. received the highest user satisfaction ratings in *Computerworld*'s annual mainframe Buyers' Scorecard.

Following HDS' rating of 89 were Amdahl Corp.'s 5990/5995 systems at 86 and IBM's Enterprise System/9000 line at 85. Digital Equipment Corp.'s VAX 9000 and Unisys Corp.'s 2200/A19 products received overall scores of 83 and 82, respectively.

The results closely mirror the findings of a similar survey conducted last year [CW, Nov. 18, 1991], with HDS' systems netting a higher rating than Amdahl this time around. Users indicated little change in their priorities since last year, with reliability still the foremost issue for high-capacity mainframe systems.

HDS' GX designation incorporates the older EX line as well as three new high-end models, offering users a more flexible upgrade path. The high-end GX 8000 series is roughly equivalent to IBM's ES/9000-class systems, offering up to 238 million instructions per second (MIPS) of processing power.

HDS has also announced new GX 6000 systems for users requiring somewhat less capacity.

GX systems earned the top scores in four of the six areas users considered most important, including reliability and overall performance.

Amdahl has announced an eight-way processor version of its 5995M high-end models, which could provide an advantage in the marketplace; IBM and HDS have not yet announced eight-way models.

However, Amdahl has not yet delivered the eight-way, and its current models failed to outshine its competitors in the capacity or performance areas of the Scorecard, placing in the middle of the pack in both categories.

IBM's ES/9000 models earned a solid score comparable to last year's showing. Users graded the ES/9000 as a reliable performer and gave it the highest score in availability of software and peripherals. However, it tied for third place in service and support. (See New Product In-Site [CW, May 11] for more user input on the ES/9000.)

The VAX 9000, DEC's first mainframe-class product, earned its best marks in vendor support and service and compatibility with installed systems, indicating that the VAX 9000 integrates smoothly with DEC's other systems.

Unisys has recently announced a number of new systems and enhancements in its mainframe product lines. The company has announced its new Extended Processing Architecture, which it says will expand users' ability to handle very large applications and combinations of applications.

Nevertheless, Unisys received the lowest user satisfaction rating for the second consecutive year. Users gave the Unisys products low satisfaction scores in both service and support and compatibility.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assign 1-to-10 ratings based on their satisfaction with their mainframe systems in 15 specific categories. (See the methodology on the following page for a complete description of the scoring process.) •

High-capacity mainframes

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users each for all products, except DEC's VAX 9000 (23 responses).

Total possible score **100** Mean score **85**

Product	Highest ratings	Lowest ratings
Hitachi Data Systems' GX series SCORE **89**	Reliability	Effective networking support
	Overall performance	Effective I/O channel control
	Compatibility with installed systems	Vendor service and support
Amdahl's 5990/5995 SCORE **86**	Compatibility with installed systems	Effective cache performance
	Reliability	Effective networking support
	Efficient memory access time	Reasonable acquisition and maintenance cost
IBM's ES/9000 SCORE **85**	Reliability	Reasonable cost per processing cycle
	Availability of software and peripherals	Effective networking support
	Compatibility with installed systems	Ease of operation
DEC's VAX 9000 SCORE **83**	Compatibility with installed systems	Reasonable cost per processing cycle
	Availability of software and peripherals	Reasonable acquisition and maintenance cost
	Ease of migration from previous systems	Efficient I/O channel control
Unisys' 2200/A19 SCORE **82**	Reliability	Availability of software and peripherals
	Efficient I/O performance	Reasonable acquisition and maintenance cost
	Sufficient capacity	Effective networking support

RATINGS IN ORDER OF IMPORTANCE

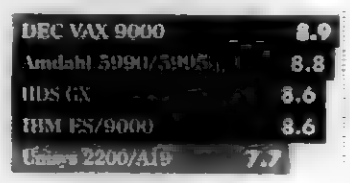
HDS' GX systems earn the highest satisfaction grades in four of the Top 6 categories. DEC's VAX 9000 gets the top marks in compatibility and service and support but suffers low scores in reliability and cost.

User importance rating:

9.6 Reliability

9.1 Compatibility with installed systems

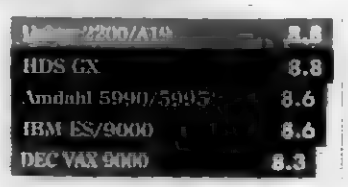
9.1 Vendor service and support

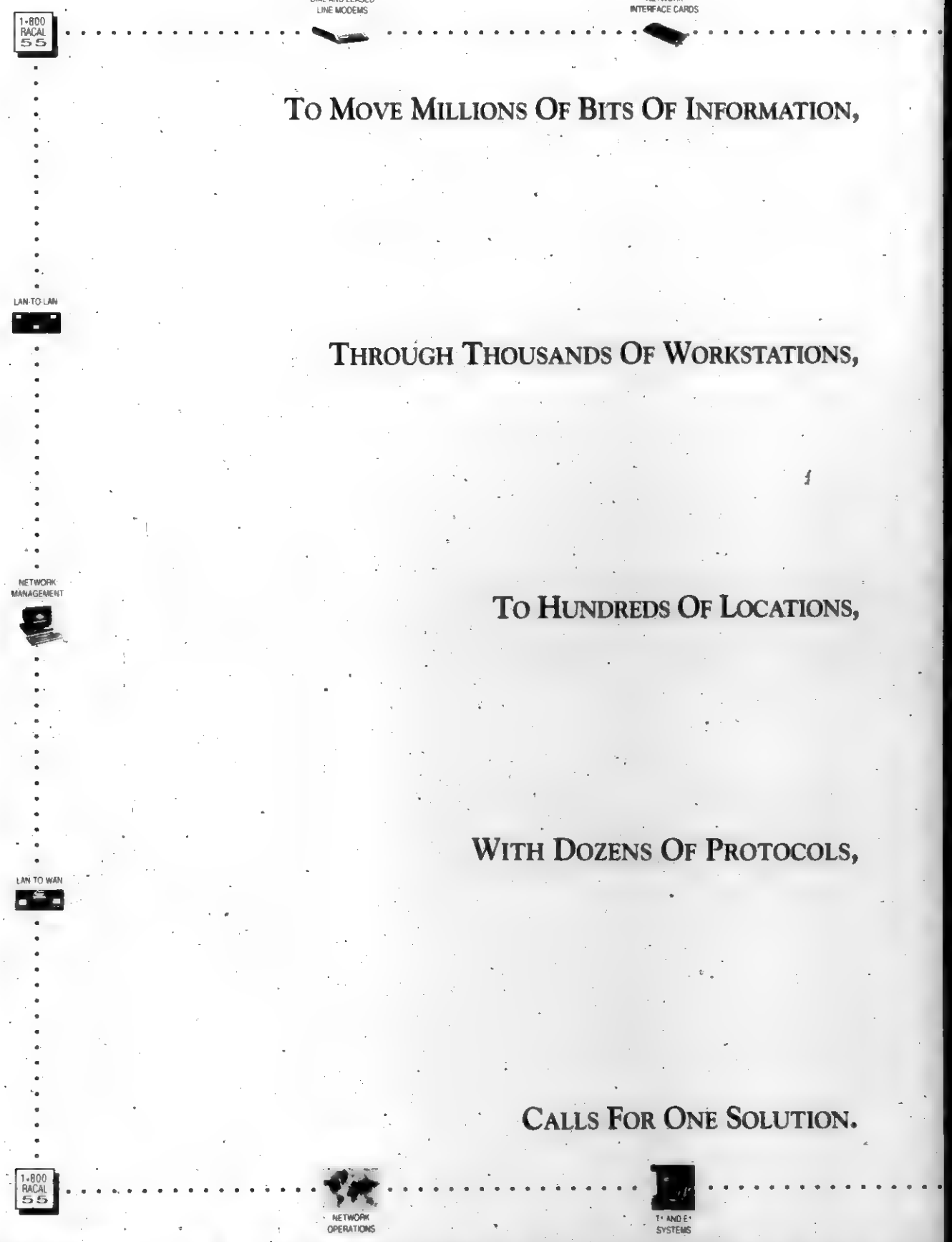


9.1 Overall performance

9.0 Reasonable cost per processing cycle

9.0 Sufficient capacity





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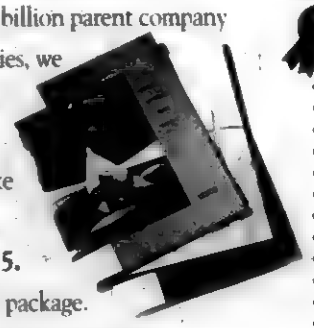

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RATINGS IN ORDER OF IMPORTANCE

(Mainframes, continued from previous page)

8.9 Reasonable acquisition and maintenance cost

HDS GX	8.8
Amdahl 5990/5995	8.2
IBM ES/9000	7.5
Unisys 2200/A19	7.2
DEC VAX 9000	6.4

8.7 Availability of software and peripherals

IBM ES/9000	9.1
DEC VAX 9000	9.1
HDS GX	9.0
Amdahl 5990/5995	8.7
Unisys 2200/A19	6.9

8.6 Ease of migration from previous systems

HDS GX	9.2
IBM ES/9000	8.9
Amdahl 5990/5995	8.8
Unisys 2200/A19	8.4

8.6 Efficient memory access time

DEC VAX 9000	8.9
HDS GX	8.9
Amdahl 5990/5995	8.8
IBM ES/9000	8.7
Unisys 2200/A19	8.6

8.6 Efficient I/O performance

Unisys 2200/A19	8.8
HDS GX	8.7
Amdahl 5990/5995	8.6
IBM ES/9000	8.5
DEC VAX 9000	8.4

8.5 Efficient I/O channel control

Unisys 2200/A19	8.6
Amdahl 5990/5995	8.6
IBM ES/9000	8.5
HDS GX	8.5
DEC VAX 9000	8.0

8.4 Effective networking support

DEC VAX 9000	9.3
Amdahl 5990/5995	8.2
HDS GX	8.0
IBM ES/9000	7.8
Unisys 2200/A19	7.4

8.3 Efficient cache performance

HDS GX	8.9
Unisys 2200/A19	8.5
IBM ES/9000	8.3
DEC VAX 9000	8.2
Amdahl 5990/5995	7.9

8.3 Ease of operation

HDS GX	8.9
DEC VAX 9000	8.7
Amdahl 5990/5995	8.5
Unisys 2200/A19	8.0
IBM ES/9000	7.9

Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer. Quotes are selected from user responses.)

HDS GX

Likes
Reliability
"The host system stays up – we haven't had any downtime."

Dislikes
Support
"Hitachi can't support it."

Amdahl 5990/5995

Likes
Reliability
"It gets the job done day in and day out."

Dislikes
Not state-of-the-art
"It lags behind in feature capability and lacks support for new products."

IBM ES/9000

Likes
Reliability
"It is reliable, and the vendor service is excellent."

Dislikes
Cost
"It's too slow and too expensive."

DEC VAX 9000

Likes
Performance
"We like its processing capability and the fact that you can cluster the boxes if you need to add onto it."

Dislikes
Cost
"The maintenance cost is high, and the initial purchase price was reasonable at the time, but isn't anymore."

Unisys 2200/A19

Likes
Reliability
"It performs well and doesn't go down."

Dislikes
Display quality
"Maintenance costs are too high."

Loyalties

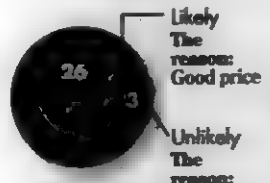
Would you buy the product again?
(Reasons are based on most frequently stated answer.)

HDS GX

Responses: 29

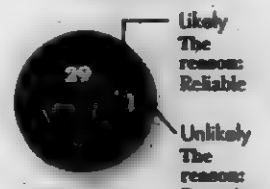
Amdahl 5990/5995

Responses: 29



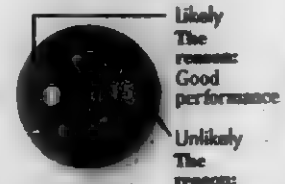
IBM ES/9000

Responses: 30



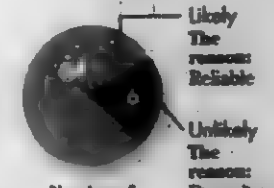
DEC VAX 9000

Responses: 23



Unisys 2200/A19

Responses: 30



Vital statistics

Total number of respondents: 143

What is your position?

CIO/Vice president	9
IS director	23
IS manager	15
Systems analyst	19
Data center or operations manager	32
Other	45

How long have you been involved with mainframe systems?

Five or more years	131
3-4 years	6
1-2 years	5
No response	1

What is your responsibility for mainframe systems?

Evaluate or recommend vendors	119
Determine need	117
Set standards for organization	103
Select vendors	101
Establish purchase agreements	76

In what industry does your company do the majority of its business?

Government agencies	33
Manufacturing	25
Education	23
Financial services	10
Transportation	9
Other	43

METHODOLOGY

First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results. User names were obtained from nonvendor sources. The response base was 30 users each for IBM's Enterprise System/9000, Hitachi Data Systems Corp.'s GX series, Unisys Corp.'s 2200/A19 products and Amdahl Corp.'s 5990/5995 systems; and 23 users for Digital Equipment Corp.'s VAX 9000.

Users rated their satisfaction with their installed products. They were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

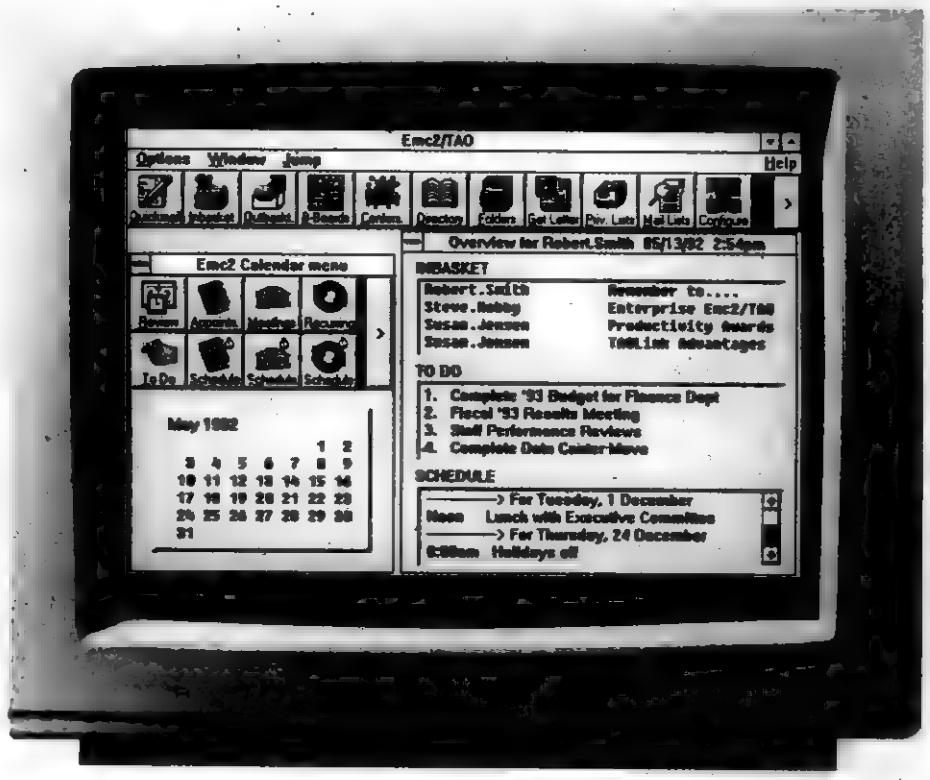
3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100. The ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and firms for their assistance: CW Database Division; Nancy Stewart, Dataquest, Inc.; and Susan Gennon, Technology Investment Strategies Corp.

E-Mail For Both Mainframe And LAN Is A Huge Headache...



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GARTNER GROUP REPORT

Wireless LANs rescue Norwest from mortgage rate turmoil

BY JOANIE M. WEXLER
CW STAFF

MINNEAPOLIS — In a volatile economy, the business volumes at financial services firms such as Norwest Mortgage, Inc. are subject to wide swings. Wireless local-area networks are one way for companies to react with catlike quickness to these sudden changes in the economic climate.

Corporate growth fueled by falling mortgage rates caused Norwest to triple the size of its enterprise network since January, convert from 2.5M bit/sec. Datapoint, Inc. Arcnet LANs to 16M bit/sec. Token Ring LANs and interconnect three formerly autonomous networks in the Twin Cities area, said Eric Nystrom, an information services middle manager at Norwest.

However, "unexpected interest rate drops trigger an influx in the number of users applying for mortgages, which generates tremendous backlogs in back-office processing," he explained. He said the backlog of work could double or triple in a matter of two weeks, "and it is challenging to get the work done in a responsive period of time."

So Norwest decided to pursue the wireless route for the flexibility of building up and tearing down workgroups at will without wasting cabling investments and with the goal of recycling the wireless LAN equipment for future uses such as other sudden work-load increases.

Users in the makeshift workgroup are postclosing analysts who review documents prior to selling mortgages to investors. On average, Norwest builds a 10- to 12-person analyst workgroup and melds it in with its enterprise 600-user network.

NCR Corp.'s WaveLAN leverages spread-spectrum technology, which, unlike infrared schemes, requires no line of site between transmitting nodes.

Norwest was concerned about potential interference because it is situated directly across the street from the IDS Tower — one of the tallest buildings in Minneapolis — from which radio and television signals are broadcast.

"But we haven't had a single interruption," Nystrom said. "With spread spectrum, there is not much chance of interference because broadcasts occur on many frequencies simultaneously," he explained.

The fairly rigorous process Norwest must go through prior to selling loans to investors requires hiring more employees,

Continued on page 54

ON SITE

Norwest Mortgage
Minneapolis

- **Business challenge:** To accommodate a rise in customer demand for new mortgages and mortgage refinancing because of plummeting interest rates.
- **Technology:** NCR WaveLAN wireless LANs, which quickly bring added human resource troops onto the corporate network.
- **Results:** Users can respond to unpredictable economic influence on the business; company can save money by renting additional floor space for short periods of time without losing cabling investment.

Workstations turn raw product ideas into reality

Inno Design smooths rocky path from conception of idea to production with computer technology

BY MARYFRAN JOHNSON
CW STAFF

Young S. Kim was heading home from the Comdex/Fall '90 show two years ago when the idea struck for a novel twist on notebook computer design. The president and founder of Inno Design, Inc. grabbed an American Airlines napkin and started sketching.

Today, Kim can still produce the worn paper napkin with the rough sketch that eventually became Leading Edge Products, Inc.'s sleek new laptop with the built-in trackball.

Yet while such creativity is the bedrock of this 10-year-old industrial design company in Sunnyvale, Calif., it was graphical workstation technology that turned Kim's quick sketch into a three-dimensional, highly realistic image of a product in the offing.

"You need a good idea, and you need to get it through quickly so the client can see it," Kim said. "Even trained designers are not always sure if something will look great. The computer is a great tool to generate various concepts."

Inno, which takes on about 30 projects annually, specializes in design work for clients that manufacture a range of goods from consumer electronics and kitchen appliances to laptop computers. The company is also preparing to launch another line of work by licensing its own product design ideas to interested manufacturers.

As its core business technology, Inno uses a pair of Silicon Graphics, Inc. Personal Iris workstations running industrial design software from Toronto-based Alias Research, Inc. A Sun Microsystems, Inc. workstation assists on the mechanical engineering end with ProEngineer software from Parametric Technology Corp., and a pair of Intel Corp. 1486-based personal computers provide CorelDraw software from Corel Systems Corp.

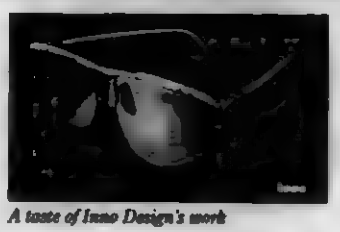
The trip from rough sketch to finished design ordinarily takes

Continued on page 52

ON SITE

Inno Design, Inc.
Sunnyvale, Calif.

- **Challenge:** To use advanced computer graphics and design tools to create realistic images of design concepts and products.
- **Technology:** Two Silicon Graphics, Inc. Personal Iris 25TG and 35TG turbographics workstations running Designer 2.0 software from Alias Research, Inc. and one Sun Microsystems, Inc. workstation running ProEngineer software from Parametric Technology Corp.
- **Results:** Ability to test-market various design concepts before prototyping, faster time to market for designs and greater client satisfaction.



A taste of Inno Design's work

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By the end of this week Computerworld readers will have spent over $59.2 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

The Newspaper of IS

Turning raw ideas into reality

CONTINUED FROM PAGE 51

several weeks when done by hand. Computer rendering, which Inno moved to three years ago, covers the same ground in a matter of hours.

The firm recently turned that speed to its advantage with a gas range design for a Korean manufacturer who wanted to "test drive" the concept with a focus group of consumers. "We did a slide show with pictures of the product that were created on the SGI workstations, and these customers liked it right away," Kim recalled. "Our clients really appreciate not only the design, but the assurance from potential users. It gives them a competitive edge."

Inno also capitalizes on its computer smarts in its advertising, which highlights "time to market" as the key benefit in using computer-aided industrial design in the creative process. Three-dimensional computer-aided industrial design modeling allows Inno designers to quickly and accurately visualize a concept, then refine and test their ideas.

So far, the only significant stumbling block with the technology has been the lack of compatibility between packages such as ProEngineer and Alias' Designer software, Kim said.

With about $2 million in annual revenue, Inno has invested at least $500,000 in its computer technology, the chief executive officer noted. His 12-member firm — whose name is short for innovative — employs nine designers, about half of whom are experts in computer-aided design.

Inno's work made it to the cover of the international *Design* magazine in November 1991, with a picture of "The Lobster," a striking black and red portable butane burner for campers. The company also designed the ProTech 2 golf travel bag, which won *Businessweek*'s best design of the year for 1991.

"Designers are not just stylists anymore," Kim said. "We're not engineers either, but we do track the trade shows so we have ideas that are practical and feasible."

IN BRIEF

NetWare adds host print tool

■ **Novell, Inc.** in Provo, Utah., is now shipping NetWare HostPrint Version 1.0, a product that was designed to make any printer on a local-area network available for host print jobs. HostPrint is a NetWare Loadable Module that runs on Novell's NetWare for SAA product. It moves the IBM print emulation sessions from the workstation to the server, thus reducing network traffic, eliminating the need for a dedicated workstation and increasing the number of print sessions available to network users, according to Novell.

NetWare HostPrint is available now and is priced from $595 to $4,995, depending on the number of print sessions supported.

Novell also announced that it is now providing a free utility to ease migration from the NetWare 2.x line to NetWare 3.11. The new NetWare Migration Utility 1.0 is available free of charge from Novell's NetWire and NetWare Express bulletin boards. It saves upgrade time by translating NetWare 2.x-based information to NetWare 3.11 bindery format and provides simple or customized migration options.

■ Unix systems vendor **Harris Corp.** in Fort Lauderdale, Fla., recently declared itself the first company to comply with the IEEE open systems standard for Posix 1003.5, which defines the interface between the Ada language and the operating system. System designers using Harris' Night Hawk line of computer and Ada can now build high-performance, multithreaded Ada applications that are readily portable to other systems running Posix-compliant Ada.

■ Milpitas, Calif.-based server maker **NetFrame Systems, Inc.** recently introduced a low-end superserver with what the vendor claims are high-availability features. The NF200ES is based on a single Intel Corp. 25-MHz I486DX microprocessor and can support up to three dedicated 80386 I/O processors. Among its high-availability features are parity checking, error-correcting random-access memory and hot-swappable hard disks. Pricing for the system starts at $14,950.

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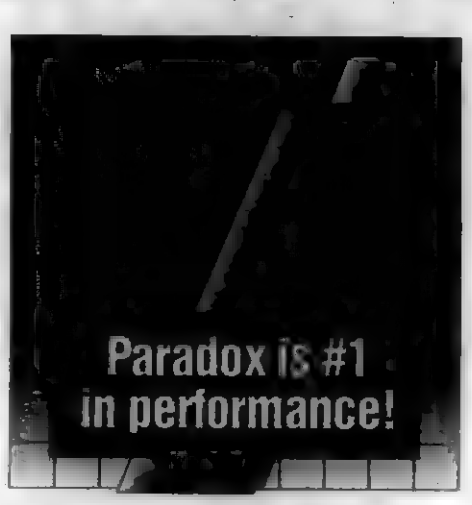

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Software Digest Rating Report, Multiuser Database Programs, May 1992, Vol. 9, No. 2. BI 1573

Social Security division awards LAN contract

BY MICHELE DOSTERT
CW STAFF

The Social Security Administration's Office of Hearing Appeals (OHA) will soon install local-area networks in 152 sites nationwide.

Hughes LAN Systems, Inc., a Mountain View, Calif.-based subsidiary of GM Hughes Electronics, has won the $7.4 million contract to install Token Ring LANs running Novell, Inc.'s NetWare.

Don Lovett, program manager at the General Services Administration's Federal Systems Integration and Management Center, said most OHA offices currently have systems from Wang Laboratories, Inc., but Wang's current bankruptcy court filing was not a factor in the move. "OHA has been planning to move to LANs for around two years," he said. "They expect to save a lot in both system costs and increased productivity."

According to Lovett, the OHA has already developed some of its own applications, using stand-alone personal computer-based databases. These applications will be modified to work on LANs and then replicated in all OHA offices.

The remote LANs will be bridged into the central headquarters LAN, which will then be bridged into the Social Security Administration's mainframes.

> "IT SAVES A lot of time if systems people have one standard configuration to manage."
>
> DON LOVETT
> GENERAL SERVICES

Like many government agencies, the Social Security Administration is trying to standardize its computing purchases. The agency chose Token Ring as one of its core technologies. "We tried to promote a configuration that would be standardized at most sites and could be centrally managed," Lovett said. "It saves a lot of time if systems people have one standard configuration to manage."

Under the terms of the contract, Hughes and its subcontractors will handle installations. Hughes will also provide documentation and training, with LAN maintenance as an optional part of the contract.

Hughes LAN Systems executives see the OHA contract as the first step in building their presence in government LANs.

"We won this contract because we researched the LAN market and used products from many different vendors to build the most cost-effective solution," said Ed Barrera, director of data network services at Hughes.

"We are now using what we learned to compete for several other government contracts," Barrera added.

James Kerrigan, manager of federal programs at G2 Research, Inc. in McLean, Va., said he thinks this contract may indeed help establish Hughes LAN Systems as a government player.

Wireless revamps at Norwest

CONTINUED FROM PAGE 51

including temporary help, and finding additional floor space and automation. "It is difficult for us to put in an economical LAN without being able to plan or knowing how long we're going to need it," Nystrom said.

To process mortgages, Norwest personnel need access to mortgage documents and applications such as file management, insurance and trust on distributed computers and the mainframe. The wireless network segment is bridged into the corporate backbone to provide this access.

To install a wireless network segment, the company runs one copper cabling connection to the WaveLAN-dedicated floor. A dedicated personal computer with both a WaveLAN adapter and a Token Ring adapter acts as a bridge between the WaveLAN network on that floor and the Token Ring networks.

On the "WaveLAN floor," a WaveLAN card attached to an antenna about 4 in. square and half an inch deep is attached to the wall with Velcro.

"The cost savings come from being able to reuse the cards and not be bound to the cabling," Nystrom said.

Cables unnecessary

The wireless LAN market is expected to exceed 100% annual growth during the next few years

*Estimated

Source: Computer Intelligence

Wireless gets unique standard

The Institute of Electrical and Electronics Engineers, Inc. 802.11 committee, charged with constructing a set of standards governing the operation of wireless LANs, was in session last week in Dayton, Ohio.

Running about a year behind schedule in defining a common set of physical-layer and media-access control specifications for both infrared- and radio-based LANs, the committee has broken into functional groups to speed up defining an interface between the two layers of the wireless topology, explained committee member Paul Nikolich.

Because of the peculiarities of wireless media, the 802.11 standards will comprise a unique topology and bridge to wired LANs such as Ethernets and Token Rings, Nikolich said.

"With wired LANs, you have a well-defined environment — you either have a good signal or you don't," Nikolich explained. "But with wireless, it's always changing."

Developing an infrastructure for tying wireless and wired LANs was one agenda item at last week's meeting.

Also on the agenda was a discussion on special problems with running time-bound services, such as delay-sensitive audio and video, across wireless media, said Donald C. Johnson, another committee member.

In addition, the committee collected comments to submit to the Federal Communications Commission regarding a proposed rule to set aside spectrum dedicated to personal communications systems, Johnson said.

JOANIE M. WEXLER

SPARCstation clone maker enters fray

Electronics unit targets commercial sector

BY MARYFRAN JOHNSON
CW STAFF

SAN JOSE, Calif. — Another player has joined in the Scalable Processor Architecture (SPARC) market, equipped with a strategy that could set it apart from the average clone vendor.

Axil Workstations, Inc., a division of $50 billion Hyundai Electronics America, last week introduced two lines of Sun Microsystems, Inc. SPARCstation 10 clones and compatibles.

Axil's Hyundai workstation line is pure clone, while its AxilStation line is "differentiated" with fax and modem capabilities built into the SPARC motherboard — rather than the Integrated Services Digital Network interface that Sun built into the original SPARCstation 10.

New pitch

Rather than competing head-to-head with Sun in technical workstation markets, Axil decided to pitch its differentiated SPARC line at new, expanding markets in commercial arenas such as manufacturing and health care. Along with the built-in fax and modem, the company said it will include voice-mail capability next January.

"The key to success in the commercial market will be our ability to hide Unix from the end user. That's where a lot of our efforts will be going in the future," said Mark Johnston, president of Axil.

To add value beyond a SPARC clone, Axil has its own research and development team working on Application Specific Integrated Circuits development and memory modules, Johnston said.

"Our vision is a computer you can pull out of the box, plug into the phone jack, and it automatically dials back to [Axil's corporate office] to download application software for a 90-day free trial," he said.

Looking into crystal ball

Analysts said that the futuristic vision of "plug-and-play workstations" is one that many vendors are pursuing these days, particularly on the low end.

"In general, people have realized there is not going to be such a thing as a PC revolution in the SPARC community," said John Morrell, an analyst at International Data Corp. in Framingham, Mass. "Targeted strategies are the way to go with small companies."

Johnston said there are many reasons a straightforward clone strategy will not work in the SPARC market, such as:

- IBM did not aggressively defend its personal computer turf, whereas Sun did so from the beginning.
- PC microprocessor development is controlled by Intel Corp., but SPARC chips fall under the broader purview of the SPARC International consortium.
- The PC market is mature and commodity-oriented while the SPARC market is still developing and leans toward value-added resellers.
- Workstation customers are more technically oriented and demanding than PC users, particularly in terms of service and support.

Winter activity

Shipment of Axil's SPARCstation 10 clones and compatibles is expected to begin in December, depending on the availability of Sun's Solaris 1.1 operating system and Texas Instruments, Inc.'s SuperSPARC chip set.

The Hyundai line of SPARCstation 2 clones began shipping this month, priced at $13,000, or about 20% cheaper than the Sun original.

One of Axil's new customers is Roger Watson, director of sales at Outsource, Inc., a Los Angeles-based business specializing in technical source-code documentation.

Outsource runs its business on three SPARCstations but turned to the clone market recently for an extra machine at lower cost.

Confidence earned

"I had to feel some confidence in these systems before I let them run my business. I can't afford to make a mistake," said Watson, who bought the Hyundai SPARCstation 2 clone.

"The design is better than Sun's, and when we had a potential problem their sales and support people were on it like vultures and dealt with it," Watson added.

WorkGroup Technologies, Inc., a market research firm in Hampton, N.H., projected that shipments of SPARC compatibles will grow by 47% annually through 1995, broadening the current installed base of 32,000 systems to 90,000 systems by the mid-decade mark.

Still, the vast share of the SPARC market still belongs to Sun. Dataquest, Inc. in San Jose, Calif., released figure showing that of 210,000 SPARC systems shipped in 1991, at least 187,000 were Sun machines.

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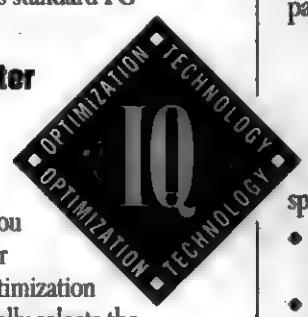

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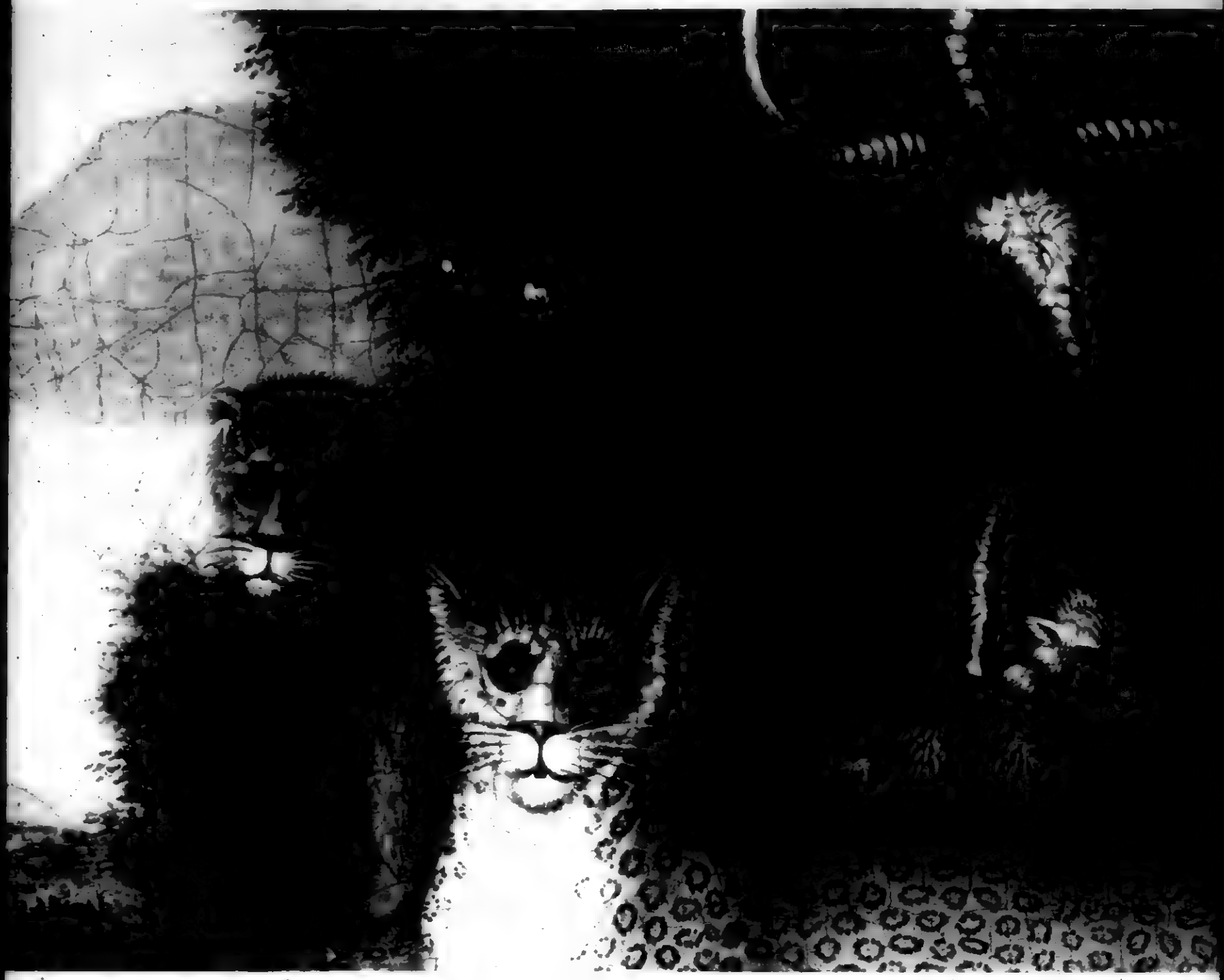
Multivendor networks.



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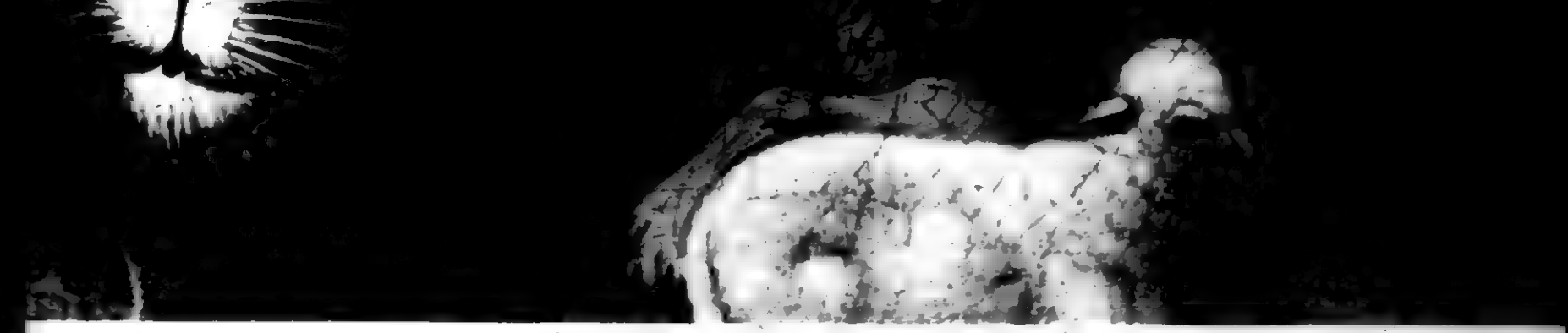

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NEW PRODUCTS

Unix

Tricord Systems, Inc. has announced Tricord Unix/FT, a shell for networks running The Santa Cruz Operation's SCO Unix Version 3.2 and above.

Unix/FT operates on a Tricord PowerFrame server, which enables the PowerFrame server to be used as a hardware platform for performance features and fault tolerance.

The product is a software implementation of redundant arrays of inexpensive disks Level 1 that allows SCO Unix users to configure drives into mirrored arrays for fault-tolerant operation, according to the company.

To automatically replace failed drives, users can assign one or more disk drives as hot spares.

The Unix/FT software shell costs $350.

Tricord Systems
3750 Annapolis Lane
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Spry, Inc. has introduced SprySoft NetWare Client for Unix.

The product enables a Unix workstation to become a Novell, Inc. NetWare-compatible client for file and print services from the NetWare server, the company reported. While using native Unix commands, users running Unix applications can share data with NetWare local-area networks, according to the company.

SprySoft works with NetWare servers on network topologies that support Novell IPX/SPX, including Ethernet, Token Ring and Arcnet.

A single-user version on The Santa Cruz Operation's SCO Unix platform costs $495, and a single-user version on Sun Microsystems, Inc. SunOS costs $995.

Spry
Suite 150
1319 Dexter Ave. North
Seattle, Wash. 98109
(206) 286-1412

Corel Systems Corp. has released CorelDraw Version 2.01.1 for Unix.

The product is a graphics program that now offers additional support for a variety of Unix platforms including Hewlett-Packard Co.'s Apollo Series 700 and Sun Microsystems, Inc. Open Look SPARCstation.

CorelDraw also runs with the Open Software Foundation's Motif and offers 46 new fonts and more than 2,500 new clip-art images. CorelDraw 2.01.1 can customize print commands and has expanded support for more X Window System terminals.

The product costs $895 for a single-user version and $745 for additional licenses.

Corel
1600 Carling Ave.
Ottawa, Ontario
K1Z 8R7
(613) 728-8200

Legato Systems, Inc. has introduced Legato NetWorker, a backup and recovery software package for Unix networks.

According to the company, Legato NetWorker is bundled with the NetWorker Jukebox Module and is fully integrated with the EXB-120 Cartridge Handling Subsystem (CHS) from Exabyte Corp.

Approximately 580G bytes of unattended backup and recovery services to a multiple 8mm tape are provided by the EXB-120 CHS. NetWorker backs up Unix file servers and workstations from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sony Corp., among others.

The NetWorker Jukebox Module with the EXB-120 CHS costs $100,000.

Legato Systems
260 Sheridan Ave.
Palo Alto, Calif. 94306
(415) 329-7880

Diagnostic equipment

Landmark Research International Corp. has upgraded PC Probe Version 3.0, a diagnostic software program.

The program enables users to run up to 150 tests on a system, such as benchmark tests, virus protection and system information. Features include Super VGA video mode tests, password protection and an AT Centrally Managed OSI Protocol for TCP/IP editor.

According to the company, because tests can be run in single-test or timed-batch mode, Version 3.0 has the capability to isolate intermittent errors overnight. Users also have the option of running tests from a distant system through a modem.

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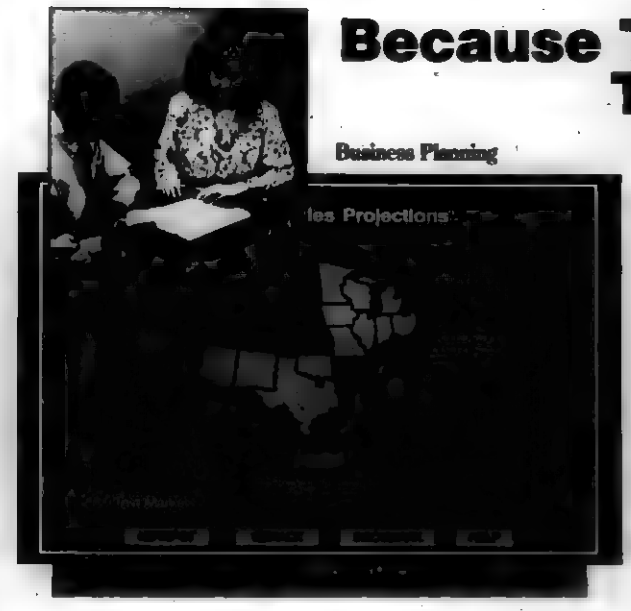

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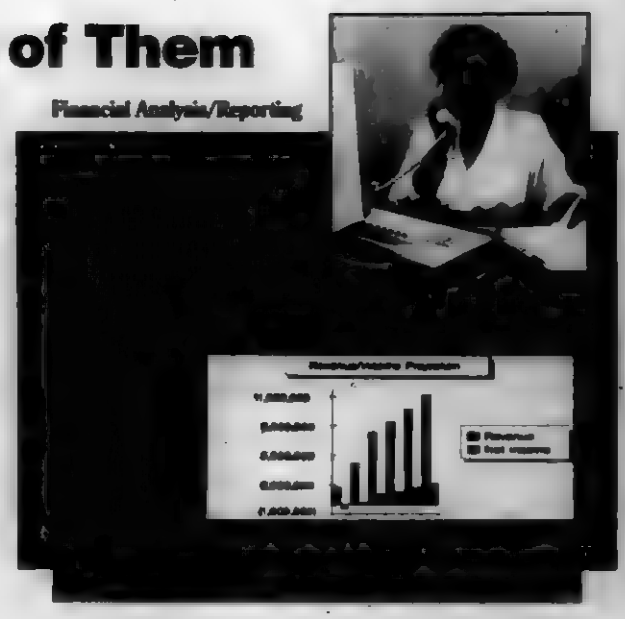

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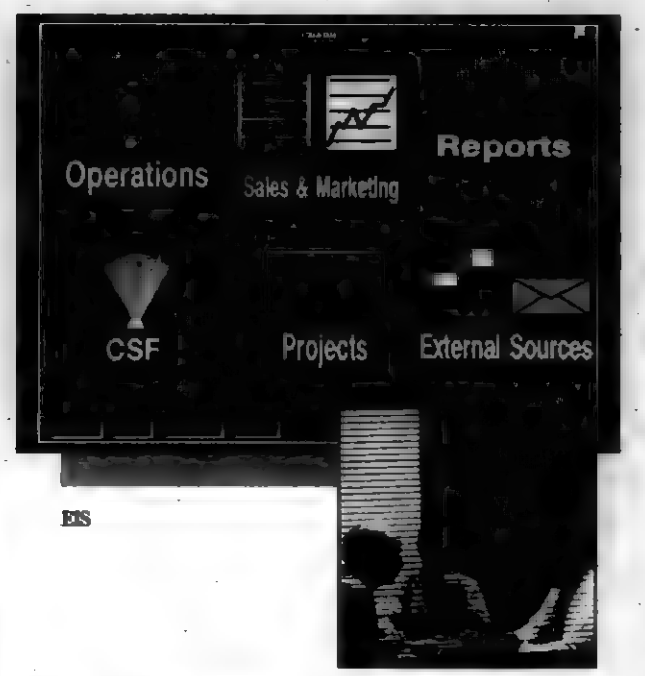

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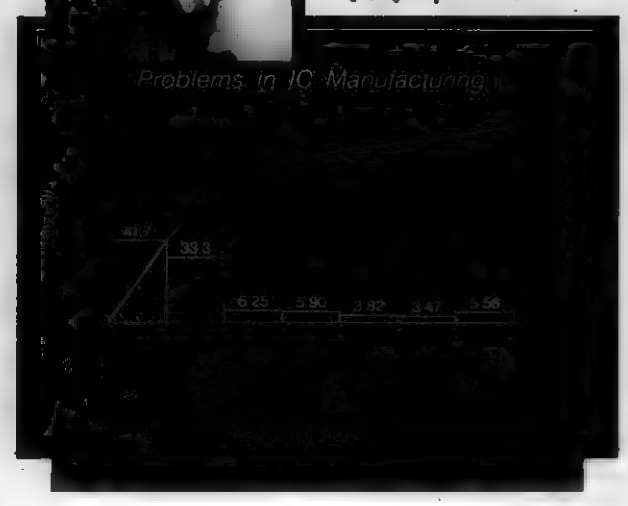

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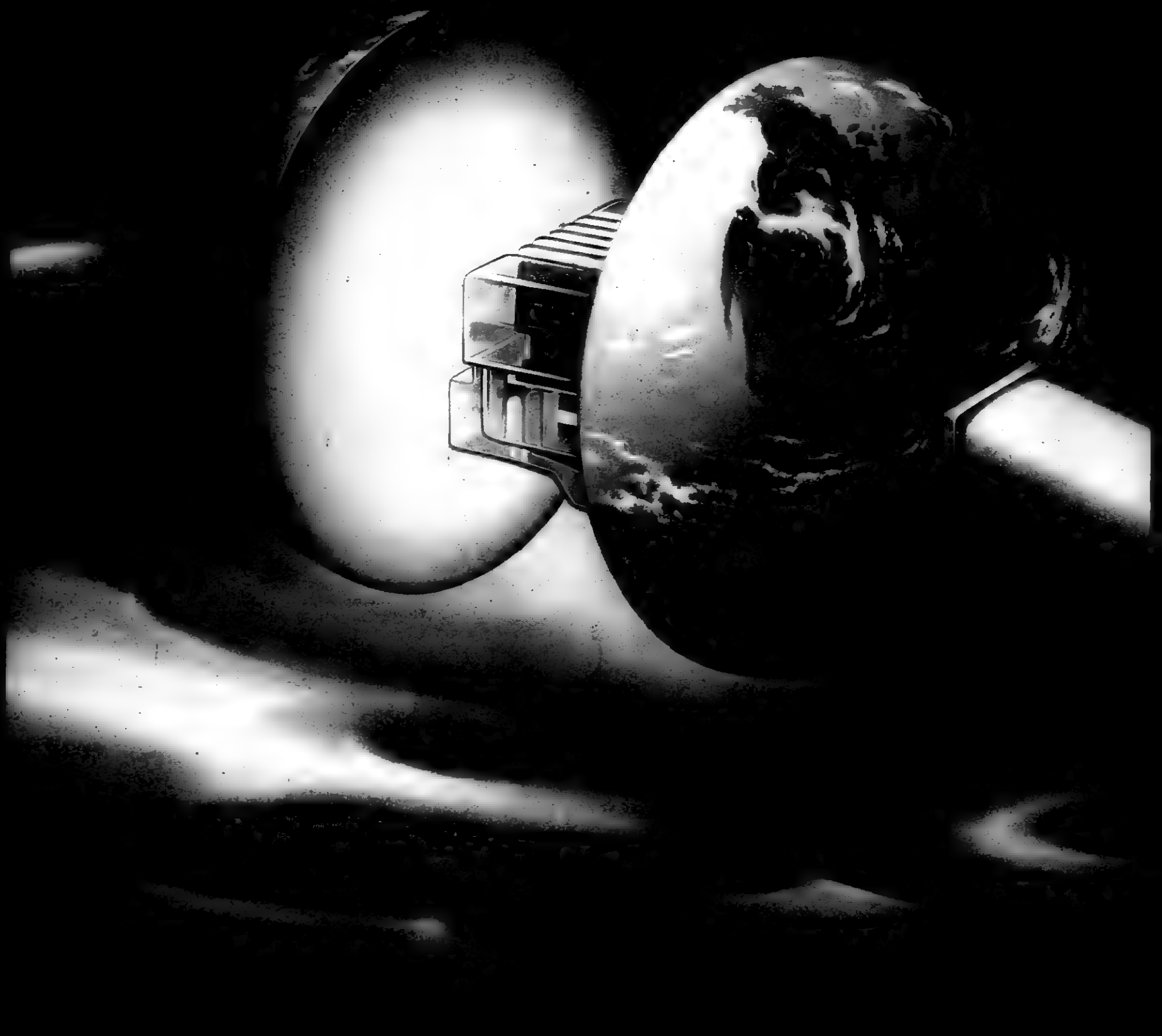

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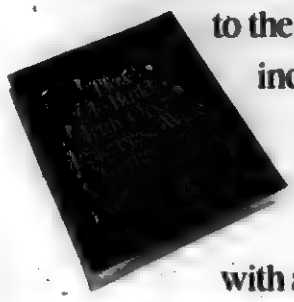

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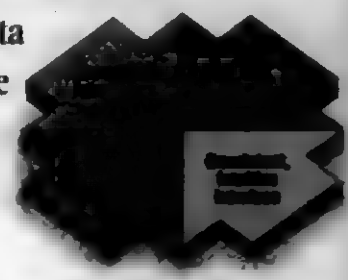

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COMMENTARY

Elisabeth Horwitt

APPN vs. TCP/IP

Early reports from the front indicate that IBM's APPN may well lose its battle against TCP/IP for control of corporate internetworking backbones.

"Maybe I underestimate how relentless SNA will be this decade, but we certainly see a push here for TCP/IP with the emergence of new applications in the Unix world," says Pat Mayer, a LAN administrator at Mortgage Guaranty Insurance Corp.

Initially a directory and routing architecture for peer-to-peer SNA networks, APPN is now being positioned by IBM as the industry standard for LAN-to-LAN communications. Toward this end, IBM is trying to get LAN hub, router and adapter vendors to implement APPN protocols on their own systems. IBM is also promising that APPN will be able to carry popular LAN protocols, such as TCP/IP.

Right now, users are definitely interested in meshing TCP/IP and SNA over the same communications backbone. And vendors such as router maker Cisco Systems are helping them do it. But not necessarily via APPN.

Wrong move

IBM did not help its own cause by recently telling an assembled room of LAN and SNA vendors they would have to pay a hefty license fee for APPN before developing any products — particularly products that make use of IBM's "crown jewels," the sophisticated routing and directory functions developed for the APPN Network Node protocol.

The problem is that IBM wants to have things all ways: make APPN a successful industry standard, recoup some of the money it invested in the protocol's development and retain some portion of the competitive advantage APPN's capabilities give its own products.

If IBM doesn't watch out, it will wind up with none of the above. Cisco recently took advantage of the confusion and resentment surrounding APPN to announce its own APPN alternative, Advanced Peer-to-Peer Internetworking. APPI is said to meld TCP/IP routing and transport

Continued on page 64

FTS-2000 users anxious to upgrade

ANALYSIS

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Users of the Federal Telecommunications System-2000 (FTS-2000) seem generally satisfied with price and service, but they say the ongoing legal and public relations brouhaha among vendors and would-be vendors is inhibiting their migration to higher bandwidth and more advanced network services.

FTS-2000 contracts were awarded to AT&T and Sprint Corp. nearly four years ago for a multibillion dollar overhaul of the government's expensive, unreliable and fragmented voice and data telecommunications system (see chart).

Almost from the beginning, the program was beset by criticism — from agencies that said its mandatory-use provisions blocked their ability to choose the best solutions; from Congress and government oversight bodies that said prices were too high; and from wanna-be FTS-2000 vendors that attacked the program on nearly every front.

The latest flare-up was sparked by MCI Communications Corp. and WilTel, which have challenged in court the government's attempts to move into areas that they said are not covered by the FTS-2000 contract. Instead, they said these "new services" should be put out for bid.

For example, WilTel protested AT&T's sale of T3 (45M bit/sec.) service, saying it is not legally available under FTS-2000 because it is a new technology — not an enhancement to an existing technology covered by FTS-2000, as AT&T claimed.

WilTel's protest to a government appeals board was upheld, and AT&T has sought relief in a federal court. In the meantime, the availability of T3 and the legal status of agencies already using T3 are in limbo.

Judges may ultimately side with MCI and WilTel in these disputes, but users are unsympathetic.

"It seems to me a T3 is just a bigger T1," said David Bittenbender, telecommunications chief at the Environmental Protection Agency (EPA). "What's the difference if I get the whole wire [T3] or just part of the wire [T1]? I'm buying a service."

Bittenbender said he hopes FTS-2000 will be able to provide the technology needed to move the huge amounts of data used by EPA laboratories. "I'd like to see them take full advantage of the technology-refreshment clauses of the contract and start doing things like higher bandwidth and services like cell relay and frame relay," he added.

GSA's Scott: *Moving to higher speeds*

Donald Scott, associate administrator for FTS-2000 at the General Services Administration (GSA), which oversees the federal program, said every request for a new or enhanced service must meet two tests if it is to be provided through FTS-2000.

Two requirements

First, it must represent a capability needed by multiple users. The second and apparently trickier question is whether a given requested capability can be provided under FTS-2000 without the need to solicit bids from all comers.

Although Scott acknowledged that the issue is subject to legal review and interpretation, his own views were clear: "We are going to move to higher and higher speeds. T3 is just one along the way, and it's not the last one. For example, when Sonet comes along, you're going to be in the gigabit range, and I fully expect that it ought to be offered on this contract or any successor."

The GSA and users argued that movement away from the concept of an agency having just one telecommunications vendor would delay their migration to new services because new federal procurements can take months or years to complete. They also said it would be difficult.

"You want to add another vendor for T3, one for Sonet, one for this and one for that? It becomes awfully expensive to manage," Scott said.

Herb Kuehne, acting director of the Telecommunication Policy Division at the U.S. Department of Agriculture, said the agency needs things such as Asynchronous Transfer Mode and broadband Integrated Services Digital Network services now, but he said he is reluctant to go after them via the GSA's FTS-2000 exception process.

"That would put part of the department on FTS-2000 and part on other facilities. We want one architecture," he said.

Nevertheless, companies such as MCI argue that greater competition would lower the government's communications costs, and various studies support that contention (see story at left).

If the GSA proves unable to satisfy the needs of FTS-2000 users through existing contracts, it is partly to blame, said Joseph J. Leo, deputy administrator for management at the Food and Nutrition Service of the Agriculture Department.

According to Leo, the 1988 contracts were put together primarily for voice communications. "They never did a real good analysis of what the data side of the house needed. They'll have to do that next time. In the meantime, FTS-2000 is going to continue to fragment and fall apart."

FTS-2000 At a Glance

Service providers: AT&T and Sprint

Users: 1.5 million in 135 federal agencies

Annual revenues: $500 million; 60% to AT&T, 40% to Sprint

Minutes of usage, switched voice and data: 300 million per month

Services: Switched voice (78%), dedicated (private-line) analog voice and digital data service (12%), compressed or wide-band videotransmission service, packet-switched service for data including electronic mail, switched data service and switched digital integrated service for voice, data and video

Reliability: Approximate percentage of calls blocked (busy): 2.5%

Trouble reports/100,000 calls: Five

Source: General Services Administration — CW Chart: Michael Siggins

Economical or not?

"We do not believe that FTS-2000 has been a good deal for the government," asserted the General Accounting Office (GAO) in a report a year ago. The GAO said the government paid $148 million above commercial rates for switched-voice service during a two-year period.

But the GSA, Sprint and AT&T said the GAO report and others reaching similar conclusions are flawed in various ways and, in any case, are not valid in the face of subsequent price reductions by the carriers. They also argued that they offer unique services, such as special invoicing and security guarantees, the cost of which are legitimately passed to customers.

Many users agreed. "The feeling is we're getting good prices," said James J. Flyzik, director of the Office of Telecommunications Management at the U.S. Department of the Treasury, the largest agency on the Sprint network. "It's very easy to say from point A to point B you could get a better price elsewhere. But you need to look at prices in the aggregate."

"We are actually adding services but spending less money because AT&T has lowered prices twice," said David Bittenbender, telecommunications chief at the EPA. Donald Scott, associate administrator for FTS-2000 at the GSA, said the program has saved the government $500 million during three years. "FTS-2000 prices are comparable now to commercial rates, and in many cases, they're lower. With the new prices, they'll be substantially lower."

New prices, to be announced in about two weeks, will be based on those submitted recently by AT&T and Sprint in a process called "price redetermination/service reallocation," mandated for years four and seven of the 10-year contract.

While the contract originally said that 60% of the revenue must go to AT&T and 40% to Sprint, the GSA may now adjust that split by shifting 40% of one carrier's traffic to the other if it is cost-effective to do so.

Protests from MCI, WilTel and others "create a lot of uncertainty and a lot of problems for us," Flyzik said. But they come with a silver lining, he added: "They do put pressure on AT&T and Sprint to keep prices down."

GARY H. ANTHES

Imaging system to help insurers capture faxed claims

BY ELLIS BOOKER
CW STAFF

BALTIMORE — Physicians and other medical service providers may soon be able to submit Medicare claims electronically even if they do not own a computer.

At the recent Medicare National Electronic Environment Conference here, Teknekron Communications Systems, Inc. announced a proprietary system called FaxEMC. The product is an imaging system that allows insurers to capture and translate standard health care claims transmitted by fax.

"Our system is designed specifically for the HCFA 1500 [Medicare] claim," said Floyd Williams III, Teknekron's director of insurance technologies. He said the system uses off-the-shelf optical character recognition and other components. But some proprietary pre- and postprocessing elements are geared for increasing overall system accuracy, he said.

"We believe it takes one quarter the number of man-hours to process a claim this way compared with a paper system," Williams said. He estimated that insurers will save about 50 cents per processed claim with the system.

The first test of FaxEMC will be at Blue Cross/Blue Shield of Texas next month. Blue Cross/Blue Shield of Arkansas also plans to test the system this fall.

For several years, many hospitals and other large providers of medical services have been able to use a computer-to-computer format, the Electronic Media Claim, for transmitting claims to the insurer. Both Electronic Media Claim and a companion computer records standard were developed by the U.S. government's Health Care Financing Administration.

Teknekron's FaxEMC system differs by converting incoming fax images to computer-readable records in the government's format. A little over half of all Medicare Part B claims are submitted electronically. But only one-third of all Medicare providers are automated, leaving about 350,000 providers filing claims manually.

For instance, about half of the 25 million doctor bills Blue Cross/Blue Shield of California processes each year arrive electronically. The insurer said it hopes the fax-based system will make a 10% dent in the 45,000 to 50,000 paper documents it receives every day.

"If we can exceed that [target], we'll be thrilled," said Rick Lytle, Medicare operations manager at Blue Cross/Blue Shield of California.

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And it shows by what industry analysts are saying. A recent *Yankee Group* report lauded AT&T Tridom's shared hub service capability, technical superiority, and facility for combining VSAT technology with terrestrial data services.

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AT&T Tridom

Horwitt

CONTINUED FROM PAGE 63

protocols with Cisco's own directory and SNA routing functions, enabling users to interconnect both TCP/IP and SNA devices over the same backbone.

The attraction for users is that they can use their existing TCP/IP links and don't have to implement a new, complex protocol — APPN; the attraction for vendors is that, unlike IBM, Cisco is making APPI available free of charge.

IBM is also hurting its own cause by making the 3745 front end a keystone of its APPN architecture. The idea is that IBM shops already have their LANs linked to their IBM hosts via 3745s, so why not use a 3745-based APPN backbone to link the LANs to one another?

The problem, as users have found, is that the 3745 was never designed as a LAN interconnectivity device. IBM is putting a lot of effort and R&D money into solving that problem: Last week, it announced frame-relay switching and more efficient LAN connections for the 3745.

However, users may see this as Band-Aid stuff; the real question is whether they will want to continue to route their LAN connections through centralized front ends when they can just as easily interconnect LAN routers directly, according to Doug Underhill, an assistant vice president at CSX Corp.

IBM's 3745 push has more behind it than just keeping an expensive piece of hardware on the market. Behind it is IBM's central strategy of how to keep its customers as they move increasingly down to LANs and Unix systems.

IBM's dilemma is that it would like customers to stay on its mainframes as long as possible; yet if IBM does not serve their LAN needs, it will lose them entirely when they finally do move off mainframes.

One wild card is APPN+, the next generation of APPN, which promises to allow TCP/IP, IPX and OSI — as well as SNA — to realize the full bandwidth of fast-packet connections.

In addition, other wild cards are the so-called Paris and Planet switches, IBM's next generation of communications processors.

The big question is whether IBM can modernize its enterprise connectivity blueprint to meet users' peer-to-peer networking needs. Right now, it seems likely that leading-edge companies will not wait that long.

Horwitt is a *Computerworld* senior editor, networking.

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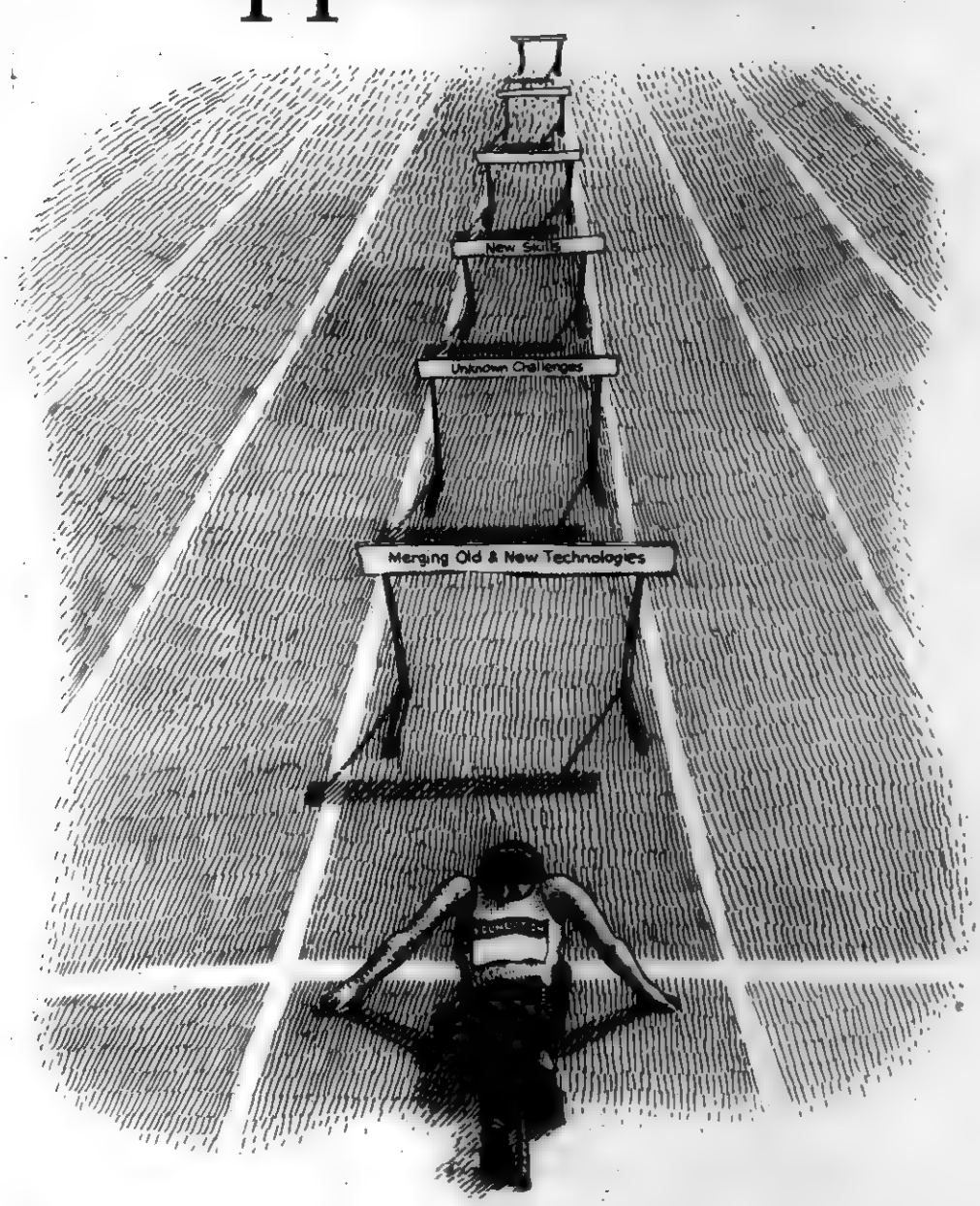

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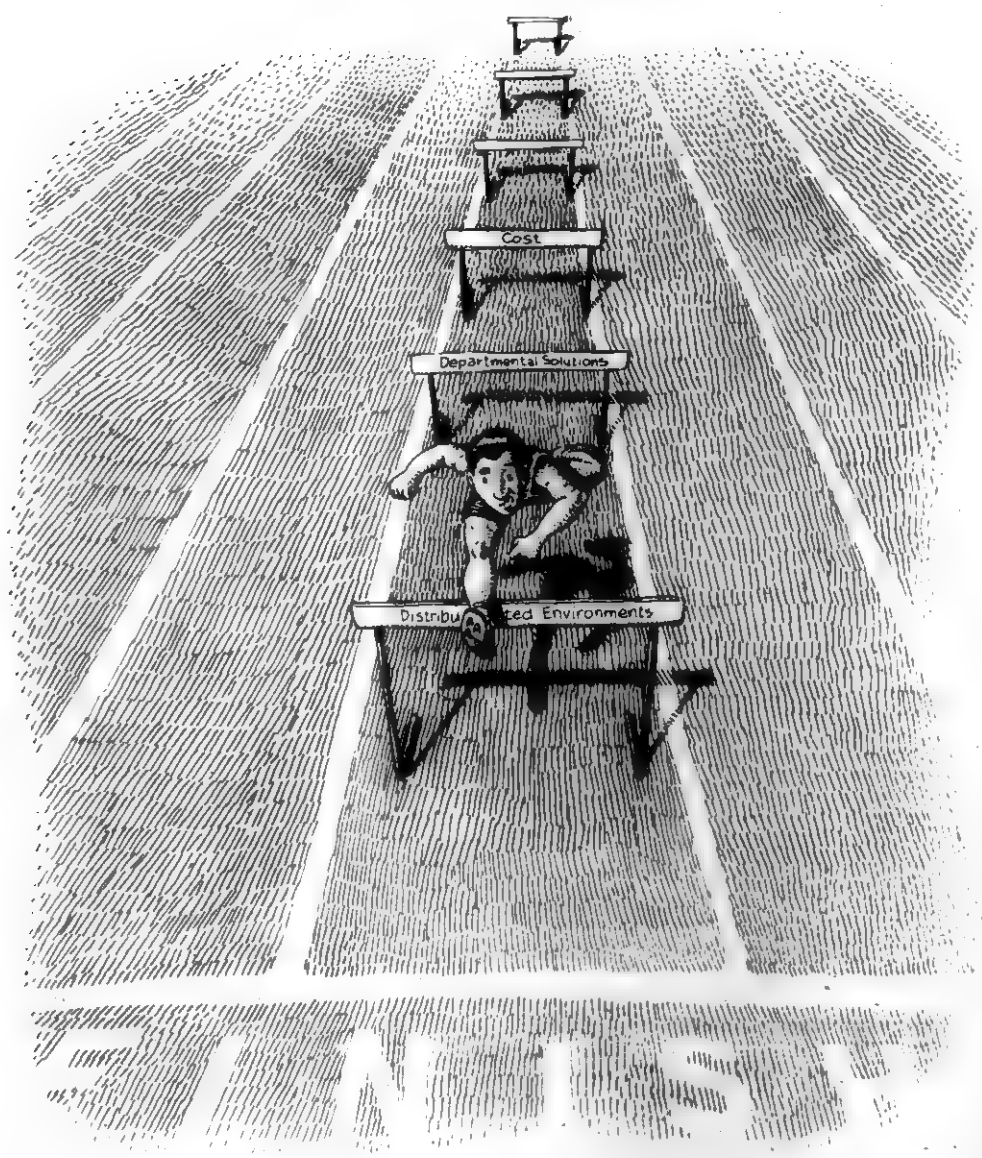

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X Window simplifies net management

BY JOANIE M. WEXLER
CW STAFF

Eliminating the common "swivel chair" syndrome of network management is an emerging use of X Window System technology. The X protocol allows users to tap into multiple networked hosts from one terminal and establish simultaneous windowed sessions.

US West NewVector Group, Inc. in Bellevue, Wash., for example, is using about 60 Applied Digital Data Systems, Inc. X terminals — including a new product family announced last month — to monitor its many diverse cellular telephone switches in its Minneapolis-to-Seattle cellular customer network.

"The X terminal is basically a resource-saver. We've replaced four to six PCs or terminals with one X terminal on each network manager's desktop," said Bill Holt, manager of production open systems administration at the cellular paging subsidiary of US West.

In an effort to resuscitate its 2% market share in the highly combative X market, NCR Corp.-owned Applied Digital recently replaced its entire line of X terminals with reduced instruction set computing-based products. The company swapped in a line of 25-MHz Intel Corp. I960-based displays sporting performance, price and graphics resolution more in tune with the tastes of commercial users, explained Jack E. Denenberg, an NCR/Applied Digital product manager.

US West's NewVector division has had the new $2,595 to $5,895 "Viper" products in alpha testing for about three weeks. So far, the test has shown "very positive performance improvements" over both NCR/Applied Digital's older terminals and those from Network Computing Devices, Inc. in Mountain View, Calif., and Tektronix, Inc. in Wilsonville, Ore. The other vendors' terminals are used in other departments of the company, Holt said.

3533 X stations *are built around Intel's I960 RISC-based CPUs*

However, Holt has not had a chance to judge the user-friendly components of the new NCR/Applied Digital line — such as special installation software — that are supposed to allow me to put X stations in the hands of those who are not technically competent." Those features were not included in the alpha-test version, he explained.

"Right now, with anyone's products, you have to be a basic technoid" to use X, he said. He added that NCR/Applied Digital is fixing a monitor problem that produces a "wavy effect."

NCR/Applied Digital's new line replaces a family of monochrome X displays based on the Motorola, Inc. 68020 chip and color displays running on both the 68020 and Texas Instruments, Inc.'s 34020 processor. However, the vendor said it will continue to service the old line for seven years.

Into the mainstream

Generally, diskless X stations are stretching beyond the engineering community in firms implementing distributed processing that are seeking ways to give users access to multiple computing environments.

Commercial sites considering investments in X terminals are often seeking user-friendly, security-oriented setups that cost less than workstations but have stronger graphics capabilities than personal computers.

Last month, for example, Federal Express Corp. signed a deal worth up to $15 million with 41% market share player Network Computing Devices for X terminals to manage corporate operations.

The firm chose X terminals rather than investing in a workstation or PC for every desktop because "we're trying to achieve windowing and graphics, not a full operating system running applications," said Dennis H. Jones, senior vice president of the company's information and telecommunications division.

According to a survey of 141 X user sites reported in *Reliability Ratings*, a Boston-based research report, 17% bought X terminals for their price/cost-effectiveness over other platforms. However, more than 23% of the respondents said they are using X terminals today for programming, while just 4% said they are using them for general business, according to the study, which was published last month.

NEW PRODUCTS

WAN software

AT&T has introduced Definity High Speed Link, a data module.

The product provides dial-up access to data communications services operating at speeds of 56K and 64K bit/sec., the company reported.

A link is provided between any AT&T digital private branch exchange and high-speed data network services such as the company's Accunet Switched Digital Services and Software Defined Data Network services.

Definity High Speed Link allows users to use existing T.1.5 facilities for dial-up transmission and offers advanced capabilities such as built-in remote maintenance.

The unit costs $2,200.

AT&T
Room 23A25
55 Corporate Drive
Bridgewater, N.J. 08807
(908) 658-2604

Gateways, bridges, routers

Wall Data, Inc. has started shipping Rumba for NetWare.

According to the company, the product is the only Microsoft Corp. Windows workstation connectivity solution designed to operate simultaneously under Novell, Inc.'s NetWare for SAA, NetWare SNA Gateway and Transmission Control Protocol/Internet Protocol (TCP/IP) environments.

Without having to upgrade their Novell networks or replace their NetWare SNA Gateways, Windows users can access mainframe data.

Support for TN 3270 communications via TCP/IP and Rumba remote is provided, offering PC-to-host connectivity for laptops and other personal computers for which dial-up communications are necessary.

License fees begin at $395.

Wall Data
17769 Northeast 78th Place
Redmond, Wash. 98052
(206) 883-4777

Micom Communications Corp. has introduced an internal remote local-area network bridge option for the Micom Marathon Data/Voice Network Server.

According to the company, the bridge option eliminates the need for an external Ethernet bridge when sending data and voice to remote locations.

The option was designed for Marathon 1K and 5K and offers the functions of an 802.3 Ethernet LAN bridge on a single module, the company said.

Plugging directly into Marathon, the option can run on any Ethernet protocol and permits users to integrate voice, data and fax with local- and wide-area network traffic over a low-speed leased line.

The LAN bridge option costs $1,750.

Micom Communications
4100 Los Angeles Ave.
Simi Valley, Calif. 93063
(805) 583-8600

X Window System

Quality Software Products Co. has ported Masterplan 1.1X, a CRT project management program, to the X Window System as a Motif-compliant application.

Up to 9,999 activities can be handled by Masterplan, which uses a four-screen approach that allows users to track all project phases.

Masterplan has a resource screen that monitors resources and a calendar screen that displays a project calendar. Masterplan's network screen is a graphical way to see past and present activities.

The product is available for Unix workstations running X Version 11 Release 3 or later or Unix host computers connected to X client workstations for terminals.

Licenses start at $695.

Quality Software Products
5711 West Slauson Ave.
Culver City, Calif. 90230
(310) 410-0303

Links

Madge Networks, Inc. has introduced the Smart 16/4 MC32 Ringnode, a Token Ring adapter card.

The Smart 16/4 MC32 Ringnode gives users full 32-bit functionality and bandwidth of Micro Channel, and it has been optimized for the IBM Personal System/2 Model 95XP 486 server.

According to the company, the product is the first adapter card to support Micro Channel's busmaster streaming data mode.

The card is optimized to provide throughput in gateways, servers and critical network stations and supports shielded twisted-pair, unshielded twisted-pair and remote booting, the company said.

The Smart 16/4 MC32 Ringnode costs $1,295 or $1,195 for a five-pack quantity.

Madge Networks
42 Airport Pkwy.
San Jose, Calif. 95110
(408) 441-1300

IN BRIEF

New Remote2 from DCA

■ **Digital Communications Associates, Inc.** in Alpharetta, Ga., has announced a new version of its Remote2 asynchronous remote control communications software. The new release adds Lotus Development Corp./Intel Corp./Microsoft Corp. extended memory support.

Other enhancements include new security features for the host personal computer and reduced conventional random-access memory requirements in the host PC.

■ Long-distance carriers **WilTel, Sprint Corp.** and **CompuServe, Inc.** have announced that Dowty Communications' Frame Relay Access Device has met tests for compliance with their frame-relay services. **Northern Telecom, Inc.** also announced that its frame-relay switches are compliant with Dowty devices.

■ **Beame & Whiteside Software Ltd.** has developed what is said to be the industry's smallest Simple Network Management Protocol kernel. The kernel, which is said to consume less than 2K bytes of workstation memory, will be integrated into Version 3.0 of BW-TCP and BW-NFS Transmission Control Protocol/Internet Protocol client software for DOS and Microsoft's Windows.

The software is said to be fully compliant with the Management Information Base II version of the network management standard.

■ **Teleparter International, Inc.** in Farmington, Conn., said it is now shipping Packet/3270 for Windows, a Windows 3270 emulator for portable and stand-alone PCs dialing into Systems Network Architecture mainframes.

■ **Pacific Bell** recently announced plans to replace older telecommunications switching systems throughout California's North Coast region with digital technology based on Northern Telecom DMS 100 switches.

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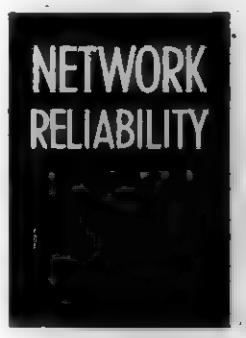

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Rdb tool promises better performance

DBTune customizes design based on actual use

BY MELINDA-CAROL BALLOU
CW STAFF

RICHMOND, Va. — Information Systems Group, Inc. plans to begin shipping Version 2.0 of DBTune next month. The tool for Digital Equipment Corp.'s Rdb relational database management system improves database performance by using workload, volume and environment information to create a physical database design tailored to actual database use, officials said.

The new version of the product incorporates dynamic transaction analysis, which generates optimized Rdb designs.

"Version 2.0 is geared toward getting tuning and productivity results with as little effort from the database administrator as possible," said Tom Bandy, company president. "They can also now control tuning at the component levels of the Rdb database."

Suitable bridge

Information Systems Group and Compu-Design USA worked together to produce a bridge between DBTune and Compu-Design's RPM/V, a tool that detects and profiles application performance. The use of this bridge allows DBTune to make its design decisions based on the more complete information available from RPM/V, company officials said.

"The RPM tool monitors the activity of the database, and we then include that data with our performance analysis," Bandy said.

"It gives the [database administrator] complete control over tuning the database by going in and doing analysis — and it does the work for you. You just punch a key and let it rip," said John Byerly, vice president of MIS at Clinical Reference Laboratory, Inc., a testing laboratory in Kansas City, Kan., that uses a range of Rdb databases for pharmaceutical and blood testing.

The lab, which has seven databases, experienced a 15% to 55% performance gain after using DBTune, depending on how the database was tuned and optimized, Byerly said.

"The dynamic transaction analysis with this new version will let DBTune go out, analyze your database, make suggestions, tune the database, figure out its depth and set up indices for you," Byerly said. "Whenever you use it on a database that's new and has never been tuned, the performance results are tremendous. I haven't had to hire a [database administrator], which has been a tremendous saving."

Version 2.0 of DBTune and the bridge to RPM/V are due to ship Oct. 1. Prices for DBTune range from $4,975 to $9,945, based on the number of users. The bridge is $2,000.

Management by comparison

Data center managers try metric services to measure their efficiency

BY JOHANNA AMBROSIO
CW STAFF

Mom may have told you not to compare yourself with others, but information systems executives have found it a helpful method for pinpointing the inefficiencies in their data center operations.

The two primary vendors of services that compare like-size data centers are Compass America, Inc. and Real Decisions Corp.

Although their approaches differ somewhat, both vendors use metrics to measure various aspects of the data center, including personnel, systems efficiency and what is spent on equipment.

One recent Compass customer was Champion International in Hamilton, Ohio, which undertook a comparative study in January. "Altogether, we identified savings that represent about 3% of the total IS budget," said Tom Walsh, director of MIS network services. "The study more than paid for itself."

Although Champion had 21% fewer IS staffers than even the top-performing companies in the Compass database, the study identified four positions that could be eliminated, Walsh said. Another pinpointed area involved accessing information online instead of printing everything out.

Walsh said another benefit was less bottom-line oriented. "It validated that we are performing well compared to other world-class organizations. That has a positive effect on morale, and that's important because for the past five years, we've been asking people to do a lot."

Another Compass customer is Johns Hopkins Health System in Baltimore. Although that study has not quite paid for itself in real bottom-line benefits yet, service has improved, said Jake Jacobstein, director of operations and technical support.

"We've implemented a few of the recommendations, including some hints about how to make non-IBM printers perform well on an IBM network," he said. "It was a real eye-opener for us."

One of the major differences between Compass and Real Decisions is the basis of comparison they use for the data center being studied. Whereas Real Decisions compares it with similar-size data centers in the same industry category in the U.S., Compass uses a database that contains the Top 10 performing data centers worldwide that are similar in size to the data center being studied. These Top 10 performers are garnered from different industries.

Another major difference is that Real Decisions focuses on chargeback costs — that is, what the data center should be charging for its services — while Compass analyzes the unit costs of many different data center categories.

The unit costs are absolute costs divided by quantities of service provided. Unit costs vary depending on how much work is being processed at any given time.

The Real Decisions study is less detailed and less expensive than the Compass version. On the other hand, the Compass service requires far more work on behalf of the user to collect and categorize the data that Compass then analyzes.

Some of the data collection — up to 900 pieces of it, depending on the installation — is done with proprietary Compass software that resides on the mainframe and scans logs and other software. But some of the data

Continued on page 70

What the metrics mavens do

The two major data center metrics services are Real Decisions in Darien, Conn., and Compass America in Herndon, Va. Both measure various aspects of data center operations to determine what they cost or how they should be charged back, and how efficient they are compared with data centers of similar size.

How they differ

Compass' evaluation is more in depth than Real Decisions', users said, and thus costs more: $28,000 to $100,000, vs. Real Decisions' $25,000 to $45,000.

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DIAMOND

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HP users unhappy with MPE patches

BY MARK HALPER
CW STAFF

While many users of Hewlett-Packard Co.'s HP 3000 minicomputer remain loyal to the machine's MPE proprietary operating system and anxiously await the Unix hooks HP has promised, they do have a beef with MPE patch procedures.

Users complain that patching MPE requires too much downtime for the computer and the network, and that HP issues patches that often introduce new problems while correcting existing ones.

The downtime problem is most severe when users install a whole new operating system, users said.

"It can take three hours, and that's being kind," said Guy Smith, HP 3000 systems manager at Circuit City Stores, Inc. The Richmond, Va.-based electronics retailer operates five HP 3000s.

"Most of HP's customers have such real-time requirements that having to shut down for an hour in this day and age of automation can be big bucks," noted Steve Cole, manager of HP Technical Service at Northern Telecom, Inc. in Research Triangle Park, N.C.

When the user has to patch MPE's optional Network Services module, that means bringing down the network, which most users would rather avoid.

"You live by the networking sword and you die by it," Smith noted. Circuit City networks its 3000s through 250 sites around the country.

Further complicating Network Services patches is the complexity of Network Services itself, Smith noted.

"I would be hard-pressed to train my third-shift operators on how to do an NS patch," Smith said. He noted that while the company tends to implement NS changes overnight when traffic is slow, it has to bring in specialists during off hours.

Cole added that problems patching MPE go beyond downtime.

"The biggest problem is when you receive a patch, you don't just receive one. Applying a patch to fix a specific problem may affect as many as 30 or 40 other modules, and that can create a problem," Cole said.

Cole and Smith said they and other users have voiced their concerns to HP, which they said is working on correcting the problem.

HP last week said it has a twofold plan to address users' MPE patch complaints.

Korak Mitra, marketing manager for product planning, said the company plans to release upgrades to MPE less frequently to avoid confusion over which patches relate to which upgrades. The company has typically issued about four modifications per year; it will now release only one or two while planning major updates every 12 to 18 months, he said.

The major release schedule marks a new model for updates, replacing the frequent release of lesser updates. The old model resulted in users mismatching patches with their particular version of MPE, Mitra said.

Mitra also said HP is working on developing patches that are simpler to install and require less downtime.

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Management by comparison

CONTINUED FROM PAGE 67

must be collected manually by IS staffers, and users who have done it say it is almost always more involved and time-consuming than it may first appear.

"We didn't prepare everything exactly on target," Jacobstein admitted. "But we've started collecting some historical data so we'll have it for the next time we do the study," which is planned for February or March. Walsh, who is planning for another study in about a year, said, "The second time should be a lot simpler."

Compass has about 300 customers; Real Decisions has about 250. Some clients use both services — Real Decisions to get an efficiency ranking within their industry and Compass to find out where they stand worldwide. A few years back, Ralston-Purina Co. used both to revamp its IS operations.

Some computer vendors and consulting organizations offer these services, but not all metrics mavens are created equal. "IBM came in about a year ago to do this kind of study," Walsh said. "They had some knowledgeable people, but they weren't able to come up with implementable ideas. They just told me what I was doing, and I already knew that."

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IN BRIEF

Covia signs with Fujitsu-ICL

■ **Covia Corp.**, the marketer and developer of the Apollo computer airlines reservation system, has signed a $17 million contract with **Fujitsu-ICL Systems, Inc.** to purchase 5,000 of Fujitsu-ICL's Automated Ticket and Boarding Pass Printers during a three-year period. A possible two-year extension for additional printers could potentially expand the value of the contract to $50 million.

■ **Digital Equipment Corp.** is winning accolades from the Profit Oriented Systems Planning Program (POSPP), an organization of information technology executives from large companies, for bringing personal computer-style pricing to the midrange market and "breaking the link between hardware and software," POSPP officials said.

DEC will be the first member of POSPP's newly established Vendor Honor Roll. It is being recognized for shifting its licensing practices last October to offer personal-use licensing and concurrent-use licensing options in response to user complaints.

■ **NCR Corp.** and **Independence Technologies, Inc.** have made available NCR's Top End transaction-processing monitor on the HP 9000 computing system. The port will be available worldwide later this month.

■ **Independent Computer Consulting Services, Inc.** in Columbus, Ohio, is integrating its accounting and distribution applications with Cincom Systems, Inc.'s Supra database management system and Mantis fourth-generation language.

Unify to support Tuxedo TP, Windows

BY JEAN S. BOZMAN
CW STAFF

SACRAMENTO, Calif. — Unify Corp. is pushing its Accell/SQL database-independent tool kit for Unix relational databases into a broader client/server user base.

The $40 million firm announced it will support AT&T's Tuxedo transaction manager to reach networked database servers and Microsoft Corp.'s Windows to reach more desktop users. At the same time, it announced a marketing relationship with the British firm ICL PLC, which will resell the Accell/SQL 2.0 tool kit worldwide as ICL's Open Systems 4GL.

Unify's two new products, Accell/TP for transaction-processing applications and Accell/SQL for Windows, will go into beta-test sites this fall, said Nico Nierenberg, company president. The Windows version is scheduled to be delivered by February, while the Tuxedo-compatible transaction-processing monitor is due to ship in April. Pricing was not announced.

The Accell/SQL for Windows applications will run against relational database management system servers from Oracle Corp., Sybase, Inc., Informix Software, Inc., the Ask Co.'s Ingres Corp. and Unify. Users will access those servers from both Windows personal computers and Unix workstations. Accell/TP will work with the same back-end database servers, accessed by character-based terminals or client machines running the Open Software Foundation's Motif or Sun Microsystems, Inc.'s Open Look graphical user interfaces.

> THE PRODUCTS bolster Unify's claims that it can provide independent application tool kits that work with a wide variety of back-end database servers.

Industry analysts said the products bolster Unify's claims that it can provide independent application tool kits that work with a wide variety of back-end database servers. However, Unify Chief Executive Officer James Hammock noted that 70% of all Accell/SQL users also own the Unify 2000 relational database.

Some analysts question Unify's ability to sell into other database vendors' installed bases two years after moving to a tools strategy. "Their product direction seems relatively sound," said Darlene Brown, a software analyst at Gartner Group, Inc. in Stamford, Conn., "but they're still trying to move away from being a database company."

NEW PRODUCTS

Unix

Alliance Technologies, Inc. has introduced TextMachine, a Unix, full-text, distributed, textual database product.

According to the company, the product is a suite of tools designed for client/server architectures. Users can construct systems to prepare, load, access, collect, monitor and manage distributed databases.

TextMachine offers a variety of capabilities such as searching for text attributes when the exact text is unknown, performing user-transparent global searches across multiple platforms and browsing through documents based on a user-defined document structure.

TextMachine prices range from $50,000 to $300,000.

Alliance Technologies
Suite 250
Shepard Mountain Plaza
6034 West Courtyard Drive
Austin, Texas 78730
(512) 794-9856

Data storage

Contemporary Cybernetics Group has introduced the CY-2000, a magneto-optical disk drive.

The product stores 1G byte on a single disk and is fully compatible with all NCR Corp. computer systems. CY-2000 can be used for multimedia and digital video, desktop publishing and computer-aided design and manufacturing.

The CY-2000 fits into most environments because its dimensions and mounting provisions are identical to standard 5¼-in. floppy disk drives. The optical discs can be erased and rewritten continuously without loss of reliability, the company reported.

Prices start at $3,500.

Contemporary Cybernetics
Rock Landing Corporate Center
11846 Rock Landing
Newport News, Va. 23606
(804) 873-9000

Database management

Object Design, Inc. has introduced ObjectStore, an object-oriented database management system.

Object technology serves as a solution for working with complex information such as images, video, sound and complex documents. ObjectStore was designed for NCR Corp.'s NCR System 3000, and according to the company, is the only object-oriented DBMS available for NCR platforms running the Unix System Version 4 operating system.

Prices start at $11,000.

Object Design
1 New England Executive Park
Burlington, Mass. 01803
(617) 270-9797

Software application packages

Infodata Systems, Inc. has released ShelfSpace, a software solution.

According to the company, ShelfSpace was designed to simplify the process of retrieving, storing and managing corporate policies and procedures, user manuals and technical documentation. Specific words or phrases embedded within the text can be searched for, regardless of their location. A table of contents, chapter and section divisions and cross-referencing features are included.

ShelfSpace on the IBM mainframe costs $75,000. The price will increase to $99,000 in January.

Infodata Systems
#700
5205 Leesburg Pike
Falls Church, Va. 22041
(703) 578-3430

Beacon Software International has released The CICS Connection 2.1, a VSAM file sharing product. Multiple CICS and batch programs can update the same VSAM simultaneously without affecting on-line response time, the company reported. During the daytime, batch jobs can be run while CICS is in use, which eliminates file deallocation problems and end-of-the-month scheduling conflicts. Support is provided for single or multiple CPU's operating in fully distributed local and remote environments.

Prices for a single CPU license range from $15,000 to $45,000.

Beacon Software International
Suite 702
8027 Leesburg Pike
Vienna, VA 22182
(703) 883-9000

Utilities

Kisco Information Systems has introduced Release 2.0 of DSK Manager, a utility designed for the IBM Application System/400.

The product is a disk-management software tool that has utilization analysis programs and disk backup utilities. Data objects can be saved on the AS/400 while they are in use. DSK Manager features master and incremental backup, separate backups for data objects and the capability to back up data files while users are active on the system.

A onetime per-license fee for DSK Manager costs $600.

Kisco Information Systems
120 Beverly Road
Mount Kisco, N.Y. 10549
(914) 241-7233

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Fidelity's development plan leans on JAD and prototyping

BY JEAN S. BOZMAN
CW STAFF

BOSTON — Fidelity Investments has a sprawling information technology infrastructure, with computer processing in Dallas, Cincinnati and Salt Lake City supporting the fund-management firm's 7,500 employees. With an eye to controlling both expense and time, Fidelity — which manages more than $156 billion — is hammering out a single methodology for all new application development.

Fidelity managers are constructing what they see as a comprehensive development methodology designed to address their three-tiered computing environment (see related story page 74) while responding quickly to changing business needs.

"We have a very complex and diverse environment," said Chief Information Officer Albert Aiello. "Our philosophy has been one of using the appropriate tools for the appropriate application."

Nubar Alexanian

Fidelity's CIO Aiello: *'You try to put the data near your customers, and you try to build in an open architecture'*

The new method, called Fidelity Advanced Systems Environment (FASE) 2000, is built on joint application development (JAD), rapid prototyping and enterprisewide data modeling. It was created 18 months ago, following discussions between Fidelity's senior management and managers from Aiello's information systems group, Fidelity Systems Co. "We believe we can cut the time to deliver new systems in half by 1995 and improve quality at the same time," said George Hathaway, a vice president of software development at Fidelity Systems.

Fidelity, with an information technology budget that ranges from 13% to 15% of annual revenue, wants all development projects to support specific business requirements. This has spurred the use of JAD brainstorming sessions with users. Sometimes, less formal discussions between developers and users fit the bill, extending across many business units. The intense discussions lead to on-screen prototyping of personal computer-based applications.

"We are a company made up of many companies," Hathaway explained, "so getting cross-Fidelity teamwork is critical to our success."

The FASE 2000 method is platform-independent, so it can be used to create mainframe, minicomputer or PC applications. To ensure data consistency across Fidelity systems, a common data model was built with the Brown-

Continued on page 74

ON SITE

Fidelity Investments' Fidelity Systems Co.
Boston, Mass.

- **Challenge:** To speed product completion at the investment firm and to maintain data integrity among multiple databases on IBM, Digital Equipment Corp. and Stratus Computer, Inc. systems.
- **Strategy:** Define a standard approach to software development to boost programmer productivity, using integrated CASE techniques, joint application development and prototyping. Standardize on product sets and use a common data repository to ensure timely and accurate data.
- **Results:** A standard software method, called FASE 2000, with the first client/server application scheduled for delivery to 500 desktop users this fall. FAMIS, a client/server system based on Microsoft Corp. Excel and Sybase, Inc. SQLServer.

Conference woos developers with PC-oriented tools

BY GARRY RAY
CW STAFF

BOSTON — Efforts to move systems development to personal computers, including applications for non-PC platforms, took center stage at last week's Software Development '92 Fall conference and exhibition.

Aimed primarily at PC-based developers and development managers, this year's conference was the forum for a number of new and updated product announcements. These included the following:

Atriom, Inc. in Waltham, Mass., unveiled Atriom/Browse and Atriom/Build, a pair of tools that aid in understanding, building and modifying object-oriented C++ programs.

The $395 Atriom/Browse analyzes C++ source-code files to build a version-controlled repository of information, including the objects, classes, methods and files in a program, according to Atriom President Mike Ackroyd.

Atriom/Build, priced at $795, is a superset of Atriom/Browse. It allows program designers to create and modify object models through a set of Microsoft Corp. Windows-based graphical tools. Atriom/Build also generates C++ source code from those object models.

Available for Windows this fall and later for Sun Microsystems, Inc. workstations, the Atriom tools will be distributed by Semaphore in North Andover, Mass., Atriom officials said.

AD/Cycle product

IBM demonstrated SAA AD/Cycle PL/1 Package/2, an OS/2 2.0 implementation of the PL/1 programming language.

Designed to work with the Language Environment component of AD/Cycle — which provides a common programming interface, runtime support and various services for all compliant languages — the $2,750 compiler can be used to develop or maintain PL/1 applications for use with IBM's MVS, VM/CMS, OS/400 or OS/2 operating systems.

According to Bob Thimsen, the OS/2 deliverables manager at IBM's San Jose, Calif., Santa Theresa facility, the new PL/1 "will enable customers to compile and run programs on local workstations and to unload their host systems."

IBM also announced that it will begin beta-testing its C++ compiler, called the IBM Enhanced C Compiler.

Sextant for C, from **Sextant, Inc.** in Ann Arbor, Mich., is a $2,000 reverse-engineering and development tool for C programs. It provides multiple windows for program decomposition, display of call graphs and cross-references of files, functions and various data types. All components are stored in a proprietary repository.

Sextant also includes a programmable text editor and provides an integrated environment that supports a variety of debuggers and compilers. The Unix-based tool supports the Open Software Foundation's Motif graphical interface and runs on a number of Unix workstations.

Hatboro, Pa.-based **Innovative Data Concepts** announced an addition to its Tesseract CXL (TCXL) User Interface Development System for Unix, DOS, Windows and OS/2. Called TCXL/Windows, the $69 library lets developers convert TCXL-DOS programs to the Windows environment with no modification, according to the company.

Watcom International Corp., based in Waterloo, Ontario, announced that it has begun beta-testing programs for its new C and Fortran compilers for Microsoft Windows New Technology. The company expects to ship both compilers during the first quarter of 1993, said Dave Boswell, Watcom's vice president of sales and marketing.

Additionally, the company showed a Windows version of Watcom SQL, a set of client/server database and development tools currently available for MS-DOS.

Software Productivity Research, Inc. in Burlington, Mass., announced a Unix version of its Checkpoint software estimation, measurement and assessment tool.

Like the currently available version for MS-DOS, the Unix version also performs "what-if" analyses of software project costs. Pricing has not yet been established, a company spokeswoman said.

IN BRIEF

CASE tool wins award

■ **Interactive Development Environments, Inc.** has won the Open Desktop Product of the Year award from The Santa Cruz Operation (SCO). The San Francisco-based developer of Software through Pictures, which is an integrated computer-aided software engineering product designed for the SCO Open Desktop environment, won in the software development tools category.

■ **Bull HN Information Systems, Inc.** in Billerica, Mass., and **Unidata, Inc.** in Denver will jointly sell Unidata's UniData relational database management system and application development system for the Bull DPX/20 reduced instruction set computing Unix platform.

Fidelity's new plan leans on JAD

CONTINUED FROM PAGE 73

stone Solutions, Inc. computer-aided software engineering repository tool. Data from multiple systems can be imported to a single data source, thus eliminating data errors caused by transfer of data between computer systems.

The first tangible product of FASE 2000 is a client/server accounting application called FAMIS, for the Financial And Management Information System. Scheduled to be available to-end users next month, the FAMIS application took just six months to develop — far less than standard 12- to 18-month development cycles, IS managers said. The same method is being used in more than 10 other programming projects.

FAMIS will allow end users to see "views" of financial data that was extracted from Fidelity's six mainframes and sent to a Digital Equipment Corp. VAX 4000 database server. The "client" part of the FAMIS application will run on 500 AST Research, Inc. PCs. The "server" part will run on a Sybase, Inc. SQL Server relational database management system and will be displayed with Microsoft Corp.'s Excel spreadsheet under Windows.

Programming, no matter how structured, will not ensure data consistency, however. For that reason, FAMIS draws on data that has been certified as correct by data specialists in business units, said Bert Alexander, Fidelity Systems' technical adviser for data management. "Network technology allows you to get data relatively easily, but you're not maintaining that data yourself," Alexander said. "That's why we have to instill this pride of ownership of data in each business unit."

Now that FAMIS is complete, Fidelity expects to be able to reuse some of its code in future applications. But while the shapes of those programs are not clear, the guidelines for FASE 2000 development are: "You try to put the data near your customers," Aiello said, "and you try to build in an open architecture."

Fidelity's IS philosophy

The FAMIS client/server application is a sure sign of architectural synthesis at Fidelity. The firm has 6 IBM-compatible mainframes, 6 IBM Application System/400s, 3 IBM System/38 minicomputers, 23 Digital Equipment Corp. VAX systems and 11 Stratus Computer, Inc. machines.

Fidelity desktops are covered with thousands of workstations, including 350 Sun Microsystems, Inc. workstations, 150 DEC workstations and 3,900 PCs.

Despite its absorption of new technology, Fidelity has no near-term plans to cart away its mainframes. The mainframes will remain the source of all fund-management transaction data for the next decade, Fidelity CIO Albert Aiello said.

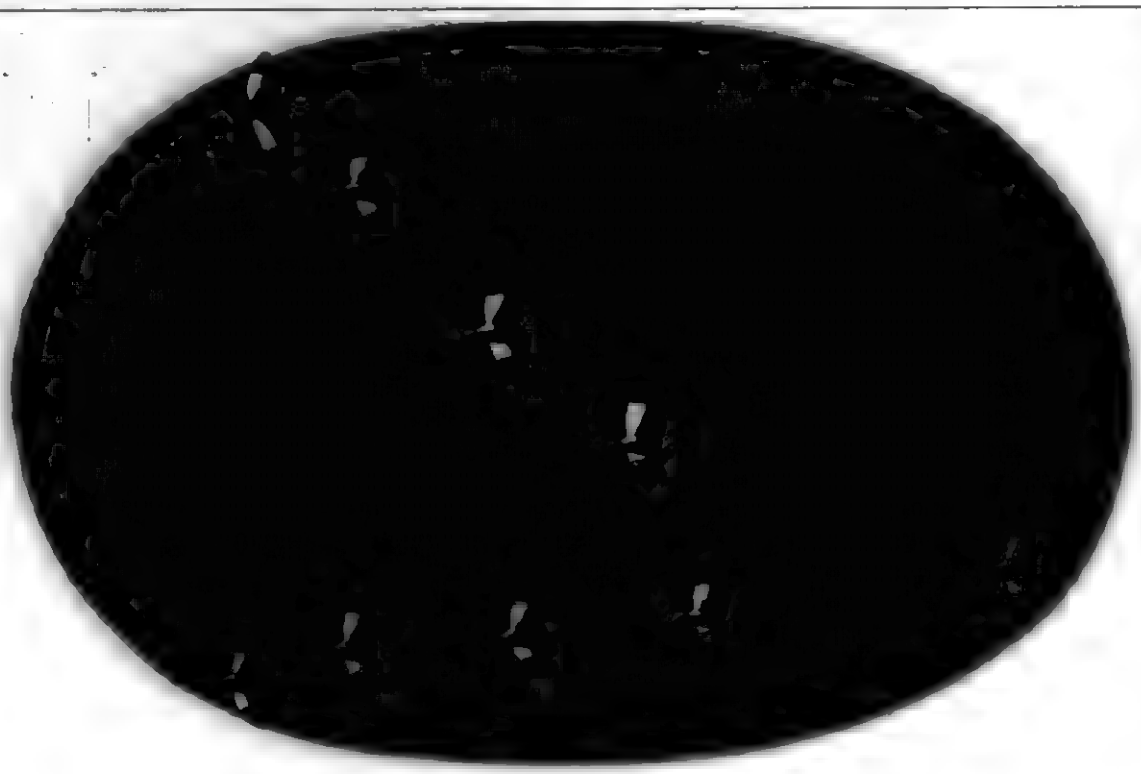
"Systems are built over time," he noted. "They're like the rings of a tree: They just keep growing, and over time you go back and you re-evaluate, and you might decide to chop some of them down."

In a move toward client/server systems, a growing array of relational database servers is bringing decision-support data right into the business units — and onto users' PC screens.

"The biggest problem in distributed architecture is performance and reponse time," said Aiello, who is also president of Fidelity Systems, Fidelity Investments' information technology subsidiary. "What we do is populate some [of the mainframe] data on the server, and it makes for better response times."

A team of technical specialists evaluates new technology, ranging from desktop PC and workstation "clients" to Unix parallel processor database "servers." But Fidelity does not jump at every new product — or change applications without cause. "We don't need to be No. 1 or No. 2 to use a new technology," Aiello said. "We could be No. 100 and still be way ahead of the world at large."

JEAN S. BOZMAN



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NEW PRODUCTS

Compilers

CenterLine Software, Inc. has introduced the CenterLine-C ANSI optimizing C compiler.

The product was designed for Sun Microsystems, Inc. Scalable Processor Architecture workstations running Solaris 1.0 or 2.0. Portability of C programs across heterogeneous platforms is gained via CenterLine C's ANSI compliance. The product offers compliance with the Kernighan & Ritchie C language syntax and can compile a C program in K&R and ANSI mixed mode. Compatibility is also provided with the Sun C language syntax and Sun make files.

Prices start at $495.

CenterLine Software
10 Fawcett St.
Cambridge, Mass. 02138
(617) 498-3000

Application development tools

Oasys, Inc. has introduced Oasys Native SPARC tools, a software development solution designed for Sun Microsystems Inc.'s Scalable Processor Architecture.

The tools have been integrated with Sun's native assembler/linker and include Version 1.86 of the company's Green Hills compilers and the multilanguage, X Window System-based Multi debugger. The compilers support four, intercallable high-level languages. Multi is the only debugger that allows users to simultaneously debug software applications written in C, C++, Fortran and Pascal as well as assembly code, the company reported.

Stand-alone prices for the Oasys C Compiler start at $900.

Oasys
1 Cranberry Hill
Lexington, Mass. 02173
(617) 862-2002

Clark Development Co. has introduced the PCBoard Door Developer's Toolkit.

The tool kit provides users with a library for building Doors for the PCBoard bulletin board system software environment, the company reported. The product offers a number of features such as I/O functions with automatic error handling, string and manipulation functions and a single function call to initialize the door, read the configuration files and set up the communication port. The tool kit is compatible with networks that adhere to Netbios standard calls and supports versions of C and C++ products from Microsoft Corp. and Borland International, Inc.

The PCBoard Door Developer's Toolkit costs $180.

Clark Development
Suite 303
3950 South 700 East
Murray, Utah 84107
(801) 261-1686

NeuralWare, Inc. has introduced DataSculptor, a Microsoft Corp. Windows-based data transformation tool.

The product was designed to reduce the amount of time required to preprocess and analyze data for neural network application development, the company reported. File formats can be read by DataSculptor off of a variety of spreadsheets and databases including DB2, Oracle, Excel and ASCII files. The product runs on IBM personal computers and compatibles with Windows 3.0 or above.

The introductory price for DataSculptor is $495.

NeuralWare
Building IV
Penn Center West
Pittsburgh, Pa. 15276
(412) 787-8222

Dr. Taylor's Software, Inc. has introduced Dr. Taylor's Test and Dr. Taylor's Big Test software utilities.

According to the company, Dr. Taylor's Test automates the testing of Microsoft Corp. personal computer DOS software. Most programming languages can be used with Dr. Taylor's test including C, Basic, assembler, Cobol, dBase, FoxPro and Paradox. A PC acting as an ASCII terminal enables Dr. Taylor's Big Test to test Unix, VMS, mainframe and minicomputers. DOS 3.1 or higher is needed for both products, and Dr. Taylor's Big Test requires an ASCII terminal emulation program.

Dr. Taylor's Test costs $199, and Dr. Taylor's Big Test costs $499.

Dr. Taylor's Software
Pinnacle Meadows
Richford, Vt. 05476
(802) 848-7731

Code libraries

Andor Research, Inc. has released Version 1.0 of the Andor Database Engine, a Microsoft Corp. Windows-based add-on library.

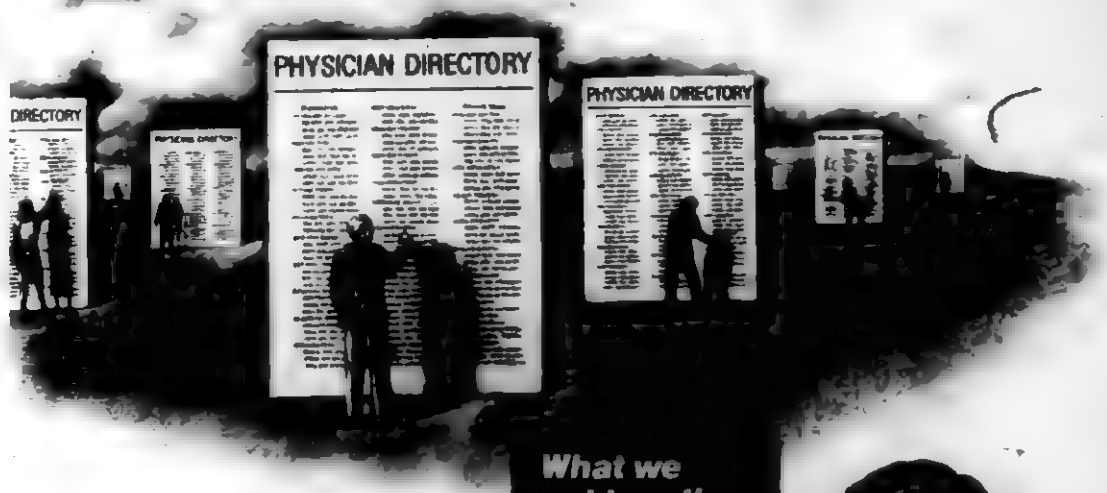
According to the company, the product enables users to add advanced database management capabilities to any program through Dynamic Link Library function calls. Sections of an application such as queries and updating operations can be replaced with procedures written in an optimized database language called ADL.

The Andor Database Engine costs $149.

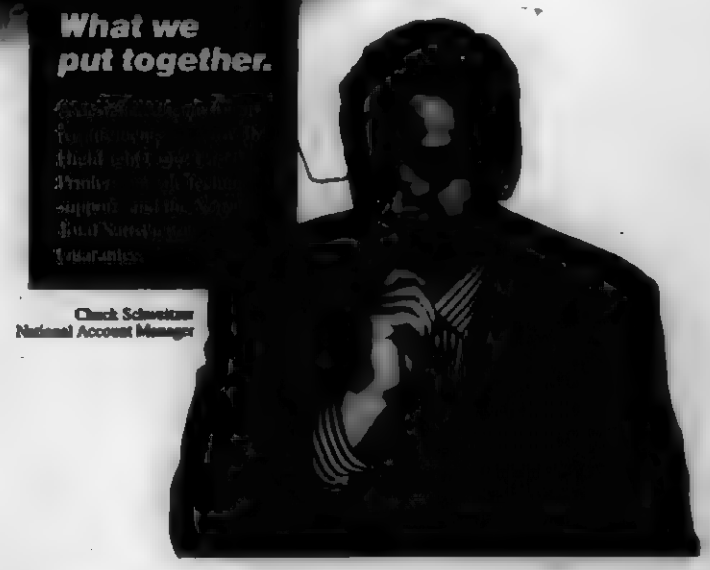
Andor Research
Suite 2000
390 Bay St.
Toronto, Ontario
M5H 2Y2 Canada
(416) 245-8073

XEROX

To add value to their database, they need to add color to their data.



What we put together.



Chuck Schweitzer
National Account Manager

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Compared to Lo
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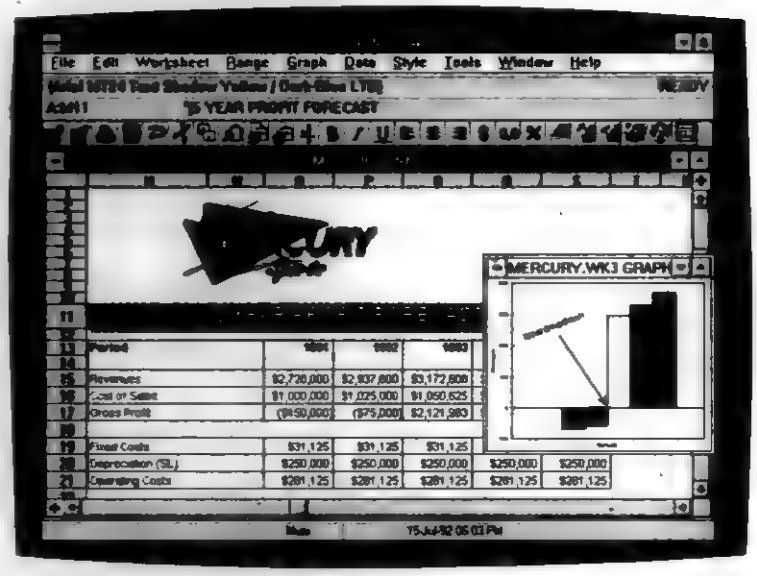
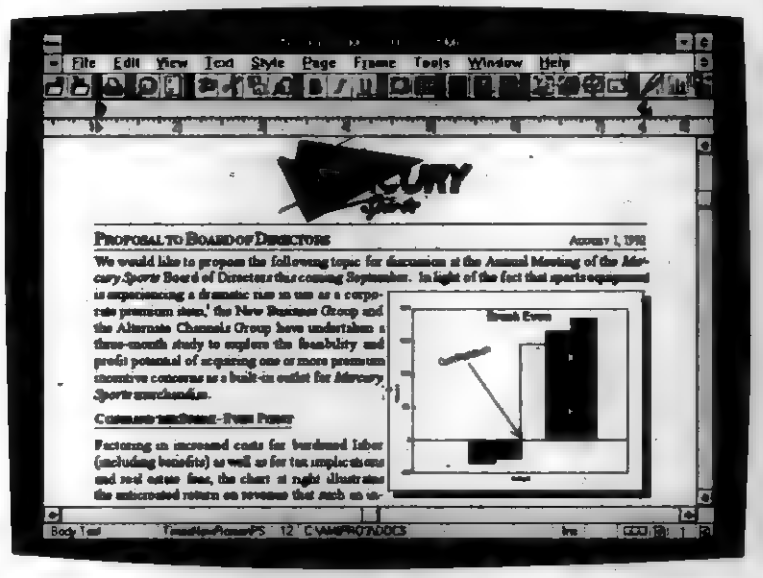


1-2-3for Windows Release 1.1, the ideal choice for 1-2-3 for DOS users moving to Windows, now includes SmartPak, a disk which includes over 25 new features and usability enhancements.



The new Ami Pro 3.0 has been hailed as the best word processor for Windows, with new features that make it more powerful and easier to learn and use than Microsoft Word for Windows.

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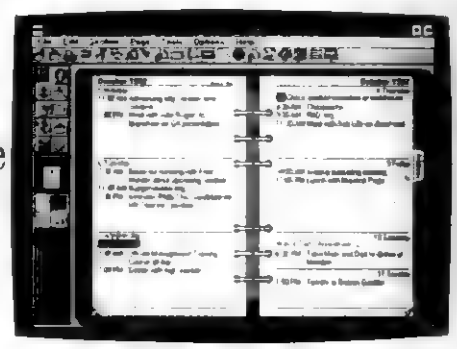

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**Suggested retail value. ***In Canada, call 1-800-GO-LOTUS. When you purchase 10 SmartSuite packages, you'll get a free cc:Mail for Windows Platform Pack (a $495 value).
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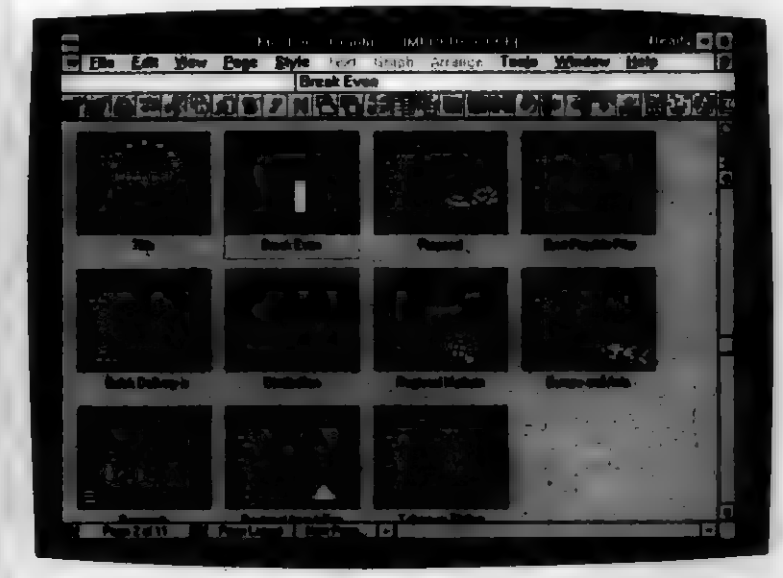
tus SmartSuite, s more like a cubicle.



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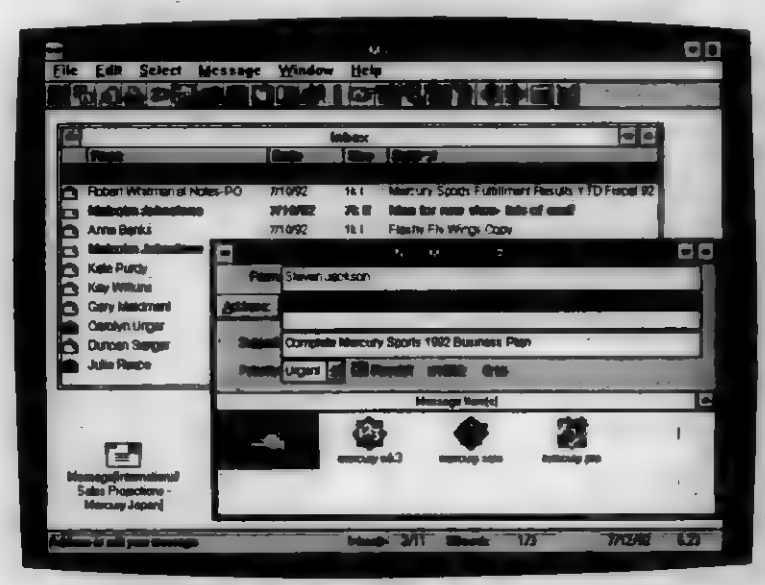

cc:Mail is the world's leading LAN-based e-mail system that allows you to send text, files, graphics and faxes across all major networks and computing platforms without the need for new hardware.

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Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

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Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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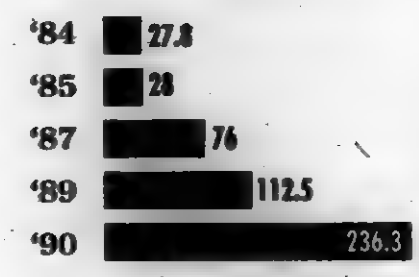
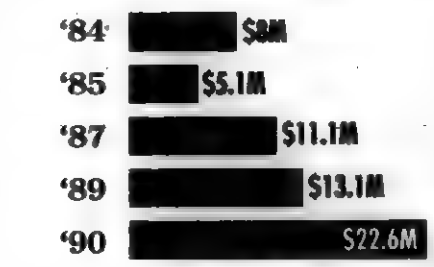
Performance (MIPS)



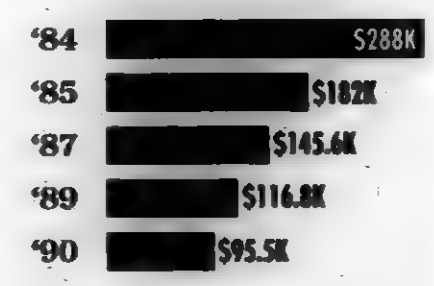
In fact, a 1990 model offered more than double the performance of a 1989 machine . . .

Price



. . . while the price increased by just two-thirds in that time frame. (Note that as performance tripled from '87 to '90, the price only doubled.)

Price/Performance (MIPS)



All told, you get three times the MIPS for the dollar today, compared to '84.

Source: International Data Corp.

Long strange trip

[redacted]

BY ALAN RADDING

Hold everything. You've undoubtedly heard about the discounts, possibly even been tempted by the promise of 30%, 40% and even 50% off list prices. And it's true that no matter what your situation, you *can* get an exceptionally low price on a mainframe.

Take the case of Alamo Rent-A-Car, Inc. in Miami. Back when the airline wars were firing up the rental car business, the company's IBM Enterprise System/9000 Model 900 hit 99.5% CPU utilization. Despite being in dire straits for a new machine, Tom Loane, vice president of computer services at Alamo, still got a great price. "I didn't use these exact words, but I let the IBM salesman know in no uncertain terms that if he took advantage of me now, he was dead meat," Loane says.

In a market like that, how can you possibly fail? For one thing, you can pay too much attention to the discount percentages. Any mainframe buyer can walk away with what appears to be a great deal, but some purchasers have found that the 40% discount they worked so hard to get wasn't quite as good as the 25% discount they might have received down the street.

How could this happen? Well, only a portion of the reported discounts — about 20%, according to Jim Cassell, vice president and director of the large computer strategies service at Gartner Group, Inc. in Greenwich, Conn. — are in real hard dollars. The rest come as soft-dollar savings, such as one-year free warranties.

Not that soft-dollar savings don't count; they just have a tendency to hide the value of those supposedly great deals, and there is the chance that you won't be able to cash in on them.

For instance, when Avondale Mills, Inc., a textile manufacturer in Sylacanga, Ala., spent $800,000 to upgrade from an IBM 4381 to an ES/9000 Model 210, IBM threw in $100,000 worth of credit toward services.

"When we tried to use the credits, we found a lot of limitations. Or they were charging twice the price for the services to begin with," says Michael Baker, computer center manager. Next time around, he says, he'll insist on a "real" discount, even if it seems like less.

Soft-dollar savings can work

Continued on page 82

Radding is a free-lance writer based in Newton, Mass.

Mainframes: The next 10 years

BY SUSAN GANNON
and FRANK GENS

It promises to be an interesting decade for the mainframe. In the next five years, IBM will unveil a low-cost computing platform and start delivering its much-discussed System Complex, or "Sysplex," model. By the late '90s, we'll see massively parallel systems from most mainframe vendors that will lower the costs of high-performance computing forever. Here's a look at what IBM and the plug-compatible vendors have in store for the next 10 years.

Third-quarter '92

Amdahl Corp. ships first eight-way processor, the 8650M. At this point in the game, eight-way processors are the best solution for high power. But bigger processors won't undo the high costs of mainframe computing. The eventual answer is parallelism, which will come later.

Gannon is a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass. Gens is vice president of technology assessment at the firm.

March/April 1993

IBM and Hitachi Data Systems Corp. announce eight-way processors. IBM answers Amdahl with its own eight-way processor, an enhanced 9021 with a 12% to 15% price/performance improvement. This new series will be upgradable from the Summit model as well as the J technology machines, but at a higher price tag than the Summit models.

1993-1994

IBM dabbles with parallel processing via Sysplex. With a parallel system, multiple processors are linked together to act as a single system, offering price/performance that can compete with reduced instruction set computing (RISC)-based servers and networked personal computers. Parallelism can have many definitions, but the end result is the linking of multiple microprocessors to act as a single system to an end user and an application.

IBM's first shot at parallelism in the mainframe world is through its Sysplex architecture, to which IBM will add high-speed interconnect and parallel server versions of CICS and DB2 in the next two to three years. The resulting 390 clusters will deliver performance in the billions of instructions per second (BIPS) range.

Microprocessor-based mainframes deliver more competitive cost per million instructions per second (MIPS). While this will answer the demand for high performance, IBM will also need to address the low-cost price/performance arena.

Here, the company will offer tightly coupled versions of its System/390-based CMOS technology that resides in today's 9221s. These micro-based systems — which are expected to become available in the next 12 to 24 months — will eventually be available in up to 16-way configurations.

By themselves, these micro-based 390 mainframes will not address the high-performance market because their performance will still fall below that of their big brothers based on traditional, bipolar, multichip processors. But they will address the desperate need of the 390 architecture to offer more competitive price/performance.

To address the growing challenge from microprocessor-based parallel systems, IBM will have to offer high-performance and low-cost MIPS. Thus, we believe the future of the 390 line will be in using the combination of CMOS micro-based 390 models in large Sysplex configurations.

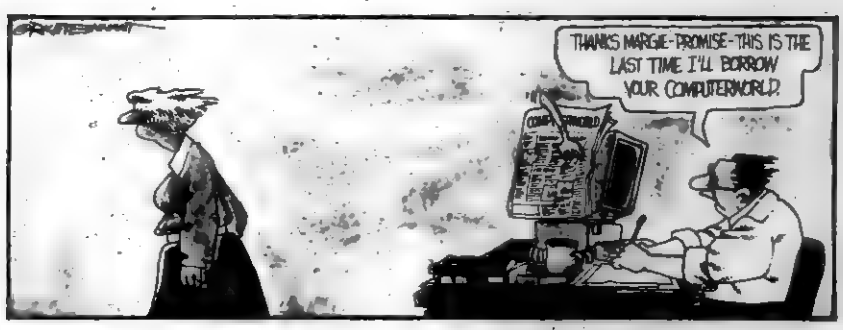
Late 1993

IBM hedges its bet with a RISC-based parallel large system. Although IBM claims that the above strategy can meet the performance and the price/performance of RISC-based parallel systems, it appears that the company is beginning to hedge its bet with a second large-system architecture.

Mainframes shipped in the past year

Vendor	Number of CPUs	Memory range (bytes)	Cache capacity (bytes)	Number of channels/ channel speed	Performance (MIPS)	Supports	Operating system	Escon compatibility	Monthly maintenance fee for processor	Base price
Amdahl Corp. (408) 746-6000 5995-8650M, 5995-6650M	8, 6	512M-2G	256K per CPU	128-512/Up to 17M byte/sec.	357, 280	Ethernet, Token Ring	MVS, VM, TPF, UTS	4Q '92	$45,343, $36,274	$30,089,431 (8650M), $24,071,544 (6650M) includes 512M bytes main storage, 128 channels
5995-4550M, 5995-3550M	4, 3	256M-1G	256K per CPU	128-256/Up to 17M byte/sec.	204, 157	Ethernet, Token Ring	MVS, VM, TPF, UTS	4Q '92	$25,573, $21,624	$17,500,625 (4550), $14,200,701 (3550) includes 256M bytes main storage, 128 channels
Bull HN Information Systems, Inc. (508) 294-6000 DPS 9000/52, DPS 9000/42, DPS 9000/32	2	64M-512M	128K	48/4.5M byte/sec.	NP	Ethernet, Token Ring, SNA, Bull, DSA	Bull GCOS 8	1994	$2,013-$4,025, depending on model	$2,392,000 (DPS 9000/52), $1,794,000 (DPS 9000/42), $1,196,000 (DPS 9000/32) includes two CPUs, 64M bytes main memory
DPS 9000/51, DPS 9000/41, DPS 9000/31	1	64M-512M	64K	24/4.5M byte/sec.	NP	Ethernet, Token Ring, SNA, Bull, DSA	Bull GCOS 8	1994	$963-$2,118, depending on model	$1,258,400 (DPS 9000/51), $920,400 (DPS 9000/41), $572,000 (DPS 9000/31) includes one CPU, 64M bytes main memory
DPS 9000/21	1	32M-512M	64K	24/4.5M byte/sec.	NP	Ethernet, SNA, Bull, DSA	Bull GCOS 8	1994	$438	$250,000 includes one CPU, 32M bytes main memory
Control Data Systems, Inc. (612) 482-4207 Cyber 970-11, 970-31, 970-32	1-2	128M, 256M, 512M	32K	40/Up to 25M byte/sec.	10.4 (970-11), 17.3 (970-31), 34.6 (970-32)	Ethernet, X.25	NOS/VE, NOS	No	$1,925-$4,671, depending on model	$1,650,500 (970-32), $1,032,000 (970-31), $888,000 (970-11) includes 128M bytes DRAM
972-11, 972-31, 972-32	1-2	128M, 256M, 512M	32K	40/Up to 25M byte/sec.	10.4 (972-11), 17.3 (972-31), 34.6 (972-32)	Ethernet, X.25	NOS/VE	No	$1,816-$4,501, depending on model	$1,600,500 (972-32), $982,000 (972-31), $832,000 (972-11)
Digital Equipment Corp. (508) 264-5670 VAX 10000 family	1-4	256M-512M	10K per CPU, 4M on-board processor	1-4/up to 400M byte/sec.	35-125 VUPS	Ethernet, TCP/IP, DECnet	OpenVMS	No	included in system price	$597,000-$1,400,000
Hitachi Data Systems Corp. (408) 970-1000 GX8310, GX8210, GX8110	1-3	128M-6G	None	128 maximum/Up to 17M byte/sec.	NP	SNA	MVS, VM	Yes	$8,135-$17,306, depending on model	$11,324,000 (GX8310), $7,818,000 (GX8210), $5,062,000 (GX8110)

NP=Information not provided by the vendor.



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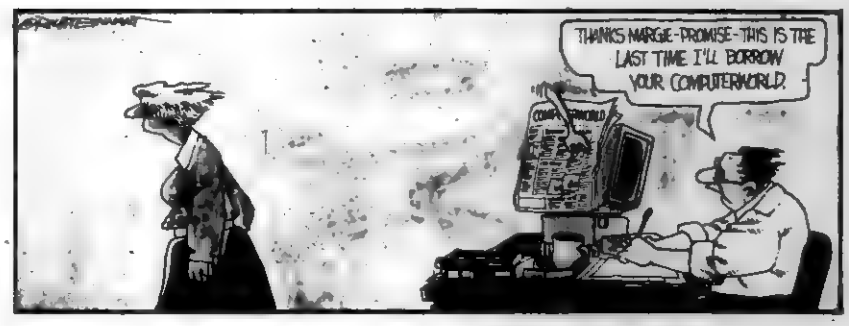

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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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70. Medical, Legal, Accounting Mgt.

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Last February, IBM announced the formation of a supercomputing development center in Kingston, N.Y., under its mainframe development organization. This organization is tasked with developing highly parallel systems based on the RISC System/6000's RISC-based Power microprocessor.

The first models of what is called the Starburst family are expected to be delivered by late 1993 and will be truly parallel.

Mid- to late 1990s

Starburst moves quickly into mainstream commercial processing. IBM is initially aiming Starburst at technical supercomputing, but it is clear that its technology and design also address commercial concerns such as on-line transaction processing and decision support, high performance and costs that are competitive with distributed systems.

Within 24 months of its introduction, IBM is expected to target Starburst as a high-performance database machine (perhaps fitting into a Sysplex), supporting a broad range of commercial computing environments.

By the end of the decade, Starburst will become the successor to the 370/390 architecture.

End of the decade

RISC-based multimicro servers make traditional mainframes obsolete. While 390 microprocessor-based mainframes will stretch to hit the $10,000 per MIPS level by mid-decade, RISC-based large-scale servers such as Starburst will be much cheaper. In terms of performance, RISC microprocessors are competitive with and appear poised to pass the performance of 390 mainframe engines.

It is not just coincidence that almost every large-system supplier has begun developing a next-generation system based on just such a multimicroprocessor (mostly RISC) design.

Mainframe vendors aligning themselves with RISC include: Amdahl with **Sun Microsystems, Inc.**'s Scalable Processor Architecture (SPARC); HDS with **Hewlett-Packard Co.**'s Precision Architecture-RISC; **Bull HN Information Systems, Inc.** with IBM's Power; **Fujitsu Ltd.** with SPARC and **AT&T/NCR Corp.** with CISC-based **Intel Corp.** microprocessors. ●

Shopping for the lease

The rampant discounting and intense competition that marks the mainframe market is mirrored in the leasing industry as these organizations — like the mainframe vendors — vie for a dwindling customer base.

Although **IBM** is increasing its share of the leasing market about 5% to 10% per year, according to industry observers, it's simply taking a bigger share of a smaller pie. Because residual values are falling, leasing is increasingly less attractive, especially with interest rates on conventional loans so low.

What's in it for you? Another opportunity to negotiate.

"You have to shop the leasing," advises Todd Dixon, vice president at Northeast Utilities in Hartford, Conn. "Even ICC will negotiate," he says, referring to **IBM Credit Corp.** (ICC).

Variables to negotiate in leasing contracts include interest rates, estimated residuals and terms.

When Northeast Utilities leased its new mainframe through ICC, it arranged for the disposal of the old mainframe, factoring in the residual value.

And when should you lease rather than buy? A lot depends on how long you plan to use the machine.

"We used to lease, but lately our practice has been to buy," says Marvin Hamann, manager of information systems operators at Land-O-Lakes, Inc., a dairy products producer in Minneapolis.

Now, the company only considers leasing if it doesn't expect to keep the machine for more than two years.

The trick to getting the most from a leasing deal, says William Jackson, director of IS at Aristokraft, Inc., a cabinet manufacturer based in Jasper, Ind., is a short term. Don't go for a lease beyond three years, he advises.

ALAN RADDING

Vendor	Number of CPUs	Memory range (bytes)	Cache capacity (bytes)	Number of channels/ channel speed	Performance (MIPS)	Support	Operating system	Escon compatibility	Monthly maintenance fee for processor	Base price
IBM (800) 426-2468 IBM ES/9000 Model 860	5	9G maximum	None	256/10M byte/sec. (Escon)	NP	Ethernet, Token Ring	MVS/ESA, VM/ESA, AIX/ESA, VSE/ESA	Yes	NP	$19,315,000
IBM ES/9000 Model 740, 660, 640	2-3	4.6G maximum	None	128/10M byte/sec. (Escon)	NP	Ethernet, Token Ring	MVS/ESA, VM/ESA, AIX/ESA, VSE/ESA	Yes	NP	$11,610,000 (740), $9,222,000 (660), $8,220,000 (640)
ES/9000 Model 520	1	2.3G maximum	None	64/10M byte/sec. (Escon)	NP	Ethernet, Token Ring	MVS/ESA, VM/ESA, AIX/ESA, VSE/ESA	Yes	NP	$4,681,000
ES/9000 Model 610, 570, 490	2-4	2G	None	96/17M byte/sec. (Escon)	NP	Ethernet, Token Ring	MVS/ESA, VM/ESA, AIX/ESA, VSE/ESA	Yes	NP	$5,700,000 (610), $4,275,000 (570), $2,920,000 (490)
ES/9000 Model 180	1	512M maximum	None	32/17M byte/sec. (Escon)	NP	Ethernet, Token Ring	MVS/ESA, VM/ESA, AIX/ESA, VSE/ESA	Yes	NP	$462,000
NCR Corp. (513) 445-5000 3600 System	2-8 per node, scalable to 300 nodes	64M-512M per node, scalable to 300 nodes	256K per node, scalable to 300 nodes	8 per node, scalable to 300 nodes/ 100M byte/sec.	40 per CPU	Ethernet, Token Ring, V.35, RS-232, T1, X.25	Unix V, Release 4	2Q '93	$13,000	$3,567,423 includes 384M bytes memory
Tandem Computers, Inc. (408) 285-6000 NonStop Cyclone/ R System	2	64M-2G	1M-8M	2-16/5M byte/sec.	NP	Ethernet, Token Ring	Guardian 90 (Tandem)	No	$661	$279,000 includes two CPUs, 64M bytes memory, 2G bytes disk storage
Unisys Corp. (215) 986-4011 A19-642, A19-632, A19-622	2-4	192M-2.304G	None	96/4.5M byte/sec. (SCSI), 10M byte/sec. (IPI)	184 (A19-642), 138 A19-632), 97 (A19-622)	Ethernet, Token Ring	MCP/AS	No	$14,150-$25,125, depending on model	$18,200,000 (A19-642), $13,760,000 (A19-632), $9,740,000 (A19-622) includes 2-4 CPUs, 192M bytes memory
2200/900	2-8	256M-2G	4.5M	384/4.5M byte/sec.	NP	Ethernet	OS1100	No	$8,700	$8,299,464 includes two CPUs, 256M bytes memory
A19-611	1	96M-1.52G	None	48/4.5M byte/sec. (SCSI), 10M byte/sec. (IPI)	51	Ethernet, Token Ring	MCP/AS	No	$9,190	$5,270,000 includes one CPU, 96M bytes memory
GX8620, GX8520, GX8420, GX8320, GX8220	2-6	512M-10G	None	256 maximum/ Up to 17M byte/sec.	NP	SNA	MVS, VM	Yes	$15,573-$32,457, depending on model	$20,485,000 (GX8620), $17,870,000 (GX8520), $15,006,000 (GX8420), $12,967,000 (GX320)

Your wheeling and dealing guide

If you work for it, you'll get a deal.
Be innovative, and you'll get an even better deal.
Here are some strategies that companies are taking before signing on the dotted line.

COMPARE USED

Want a new computer? Shop used! According to used computer dealers, a lot more mainframe buyers are shopping used for the first time — without intending to buy. The dealers suspect they are being used mainly as leverage in negotiations for new mainframes.

Of course, you can also shop used to buy used and get a great deal that way. "Our business runs fine with second-generation hardware. We haven't bought a new machine for a long time," says Marvin Hamann, manager of information systems operators at Land-O-Lakes, Inc., a dairy products producer in Minneapolis. The company's latest acquisition was a used IBM 3090 Model 200 E.

IBM tried hard to get Hamann to bite on a new machine. "They were offering us a discount off a new machine, but if you take 20% off a $3 million machine, that's still a lot of money," he says. Hamann paid $400,000 and got the horsepower he needed to run a large IDMS database for at least three years before upgrading.

To get the best price, Hamann called nearly a dozen used computer dealers, including Amdahl Corp. dealers, as well as all the leasing companies. To make comparisons easier, he required that the companies itemize their offers instead of combining the machine with the freebies.

TIME IT WELL

What do comedy and mainframe purchases have in common? The importance of timing. That means understanding the fiscal year and quarterly pressures that drive a sales organization. If you can coordinate your purchase with the closing of the books, you may receive an unusually generous deal as the sales organization scrambles to fatten its numbers.

"We installed our new mainframe in December 1991 and got a pretty good deal," says William Jackson, director of IS at Aristokraft, Inc., a cabinet manufacturer in Jasper, Ind. The company purchased a small Enterprise System/9000 Model 190 to replace a 4381 Model 14.

Ordinarily, Aristokraft would have turned to the used market for its mainframe, but "there weren't any available in the size we wanted," Jackson explains. The company also looked at downsizing to a minicomputer. Unfortunately, "it just wasn't feasible to replace our mainframe software. We would have had to scrap everything," Jackson says.

The machine was a good buy in more ways than one. The Model 190 turned out to be in the same software category as the 4381, but several of the Enterprise Systems Architecture software items were priced lower. As a result, software licensing costs actually dropped about $200 a month (see story page 83).

SHOP 'THE OTHER GUYS'

Now more than ever is the time to shop the competition — whether you're just looking or are serious about buying. Plug-compatible manufacturers (PCMs) can't offer the software-related soft discounts that IBM can (see story page 83), but they compensate with a lower list price and greater hard-dollar discounts. As a rule of thumb, the PCMs try to stay at least 10% to 15% below IBM, according to Nancy Stewart, a senior industry analyst at Dataquest, Inc.

Even if you don't actually leave IBM, your consideration of other vendors may force IBM to be more competitive.

When Duke Power Co. in Charlotte, N.C., put out bids to replace its 3090 Model 600 J in January, it found a very competitive environment. The company had bought IBM exclusively for 10 years, "but in today's environment, we just couldn't afford not to competitively bid this machine," says Alvin Park, manager of data center operations.

After the bids were received, the competition got even hotter. One vendor came back offering to sweeten the deal. Another suggested that if the company booked the business in the second quarter, it could do even better. Another threw in a package of software and other soft discounts.

After benchmarking the machines to pin down their actual performance and evaluating the bids according to an extensive set of criteria (see chart below), Duke went with an Amdahl Model 5995.

Northeast Utilities in Hartford, Conn., experienced a similar situation. "We got quite a bidding war going on," recalls Todd Dixon, vice president at the firm. When it came down to the bottom line, however, IBM rose to the challenge.

Continued on page 83

They saved and are glad

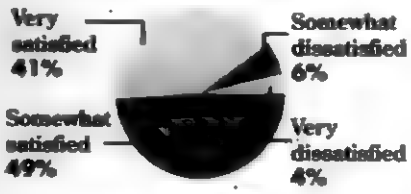
Of 126 respondents who have purchased a mainframe in the past two years:

Most received a discount between 10% and 40% off list price

0%-9% discount:	6
10%-24% discount:	23
25%-39% discount:	24
40%-59% discount:	17
More than 60% discount:	1

(55 respondents didn't know what type of discount they had received.)

The overwhelming majority were satisfied with the price they paid



Source: First Market Research — CW Chart: Janell Genovese

Don't get 'sucker-punched'

It's easy to be blinded by great hardware prices, only to be sucker-punched by unseen software license fees or hardware upgrade charges down the road. Smart shoppers such as Alvin Park, manager of data center operations at Duke Power Co. in Charlotte, N.C., are developing detailed bid evaluation models. Park's model worked so well, he plans to use it again at the end of this year when he puts out a bid to replace an IBM 3090 Model 600 J.

RFP

- The price of each item individual (no bundling).
- Performance benchmarks.
- Specified discounts on future hardware upgrades.
- Warranties and extended warranties.
- Software licensing costs (current and future).
- Environment costs (power, cooling, etc.).

Source: Alan Radding — CW Chart: Janell Genovese

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How to get a better deal

CONTINUED FROM PAGE 79

to your advantage; you just have to link them to what you can really use. Last December, electric power producer Northeast Utilities in Hartford, Conn., shaved 43% off the list price of a $35 million ES/9000, with much of the savings in added-value goodies. The deal was part of IBM's Market Basket program, which bundles a variety of freebies and soft-dollar discounts, says Todd Dixon, vice president at the firm. Included were free disk drives, a year's free maintenance and a large discount on IBM's ImagePlus software — all things the company was planning to buy anyway.

The bottom line is, there is more to getting a great deal than simply ripping the red tag off the box. Besides scrutinizing the deal dangled in front of you, you might want to join the crowd of buyers doing a lot more legwork evaluating IBM's competitors. Many are looking at the used market, which — to maintain its price differential — is very negotiable.

Prices should get even better. Average discounts are expected to drop to 23% this year, compared with an average 18% discount in past years, Cassell says. Others, such as Technology Investment Strategies Corp. in Framingham, Mass., log the average discount at 30%. ●

The software factor

No matter how accurately you forecast software licensing costs, they almost always end up higher than you estimate. Nothing has more of an effect on mainframe cost of ownership.

And it's here that **IBM** has tended to hold a distinct advantage. Unlike the plug-compatible vendors, IBM can play with software licensing prices to move hardware.

For instance, IBM deferred the impact of the full software license upgrade when Hartford, Conn.-based Northeast Utilities moved from a "Group 60" machine to a "Group 80" machine. "They gave us one year at 'Group 70,'" says Todd Dixon, vice president at the Northeast, which saved on software costs.

Some people buy used machines for this very reason: to get a lower software category classification and thus cheaper software.

Sometimes, though, you can get software savings through the compatible vendors, as Alvin Park, manager of data center operations at Duke Power Co. in Charlotte, N.C., discovered.

When Duke Power put out its request for proposal, **Amdahl Corp.** bid a model that had a lower IBM rating (and was thus in a lower category) than the model bid by IBM. By choosing Amdahl, the company's software licensing costs would not increase, even though the company's benchmarks showed it to be an equally powered machine.

"If we had bought the IBM, all our software licensing costs would have gone up, too," Park says.

Just be sure to watch for traps, because sometimes a seemingly innocent hardware upgrade can necessitate a costly software boost.

For instance, Avondale Mills, Inc., a textile manufacturer in Sylacanga, Ala., found that its newly purchased Enterprise System/9000 lost 30% of its performance when running the company's old versions of software (SP versions of VSE under VM), despite assurances that there would be no problem. "It forced us to go to the ESA operating system, and that drove our [application] software costs through the roof," says Michael Baker, computer center manager at the company.

On the other hand, Oregon Mutual Insurance Co. in McMinnville, Ore., saw a substantial drop in software licensing costs when it moved to Enterprise Systems Architecture (ESA) software, part of an IBM strategy to use software to move companies to ES/9000 hardware.

"Over five years, the software cost savings will pay for the machine," says Cary Gardner, computer operations manager at Oregon Mutual.

ALAN RADDING

Continued from page 82

Avondale Mills, Inc., a textile manufacturer in Sylacanga, Ala., looked seriously at a **Hitachi Data Systems Corp.** machine before buying an Enterprise System/9000 Model 210 from IBM. The price differential, about $20,000 on an $800,000 machine, wasn't enough to justify a switch. The firm opted for IBM, saving about 11% as part of IBM's early-install program, which gave the company free use of the machine.

Price per MIPS

Amdahl	$50,000
Hitachi	$53,000
IBM	$65,000

Source: Gartner Group, Inc.

CONSIDER LOYALTY

On the other hand, declaring yourself a true Blue shop and sticking with IBM has its rewards. Duke Power followed an IBM-only policy for 10 years and enjoyed a level of system integration equivalent to none before it changed.

"We didn't shop around," says Cary Gardner, computer operations manager at Oregon Mutual Insurance Co. in McMinnville, Ore. It was IBM's extensive service network rather than great prices that led the company to declare allegiance to IBM. "We're in a remote location, so we feel we get better service here from IBM," he says.

To keep IBM honest, however, Oregon Mutual shopped the used IBM market. The company was looking for a small mainframe, an ES/9000 Model 150, to replace its IBM 4381. In the end, IBM matched the discounts the company found in the used market on a new machine.

Oregon Mutual netted a 40% savings on the new maintenance contract and saved on software licensing. •

ALAN RADDING

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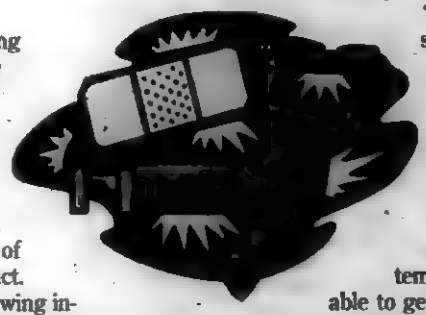
HOT INDUSTRIES FOR JOBS

Lynn Tanaka

BY EMILY LEINFUSS

Job hunting can sometimes be like looking for a needle in a haystack. You know there is that perfect position out there for you, but what position that is and where to find it often remains hidden. This economic slump we're in isn't helping matters, with companies in industry after industry in trouble. Well, we'd like to help you find that oh-so-elusive needle. We might not be able to hand you a job, but we can certainly tell you where to investigate. We asked experts and the gainfully employed to help us compile a list of hot industries with existing job opportunities. Here are our picks:

Health care. Healing the sick has become very big business in the U.S. In 1992, the health care industry hit $817 billion, according to the U.S. Department of Commerce. That's a whopping 14% of the gross national product.



"It's a constantly growing industry. More people will need health care as the population grows older," says Chuck Muller, a principal at Andersen, Jones & Muller Associates, an information systems recruitment firm in Southfield, Mich.

Leinfuss is a free-lance writer based in Sarasota, Fla.

As a boon to IS people, all those recession-proof dollars come wrapped in a highly technology-reliant environment. Job demand is high. One recruiter says he filled 20 IS positions this summer.

The reason for such high demand is that many hospital information technology departments have separate, multiplatform environments, Muller says. They may run clinical information systems on a Digital Equipment Corp. VAX, use IBM Application System/400s with personal computers for physician information systems and put administration and cost accounting systems on IBM mainframes. Companies are looking for manpower that can integrate these islands of technology.

"The challenge for us," says Edward Pastor, director of IS at Swedish American Hospital in Rockford, Ill., "is to get all our systems to talk to one another. We have stand-alone cost accounting systems and statistical systems, and we need to be able to get data from all of them, especially for scheduling," Pastor says.

Beyond technical skills, IS chiefs are looking to hire people who have "extras," such as a background in health care management or biology or a course in medical terminology, says John Glaser, vice president of IS at Brigham and Women's Hospital in Boston.

Glaser says he looks for three things in potential hirees: brains (someone as bright "as a 140-watt bulb"), passion for the work and a demonstrable reason for being in the health care business. "Usually I find people with a streak of altruism," he says.

Recently, Glaser hired six IS professionals to bolster his integration efforts. Half of them had technical experience — particularly in the Token Ring environment. Of the remaining three, two were physicians with IS training and one had been a nurse.

Salaries in the field start at about $30,000, according to *Computerworld*'s 1992 salary survey. For instance, senior programmers in the health care field make an average of $36,313, while IS managers/supervisors pull in $55,375.

According to Suzanne Fairlie, president of ProSearch, an IS recruitment firm in Philadelphia, typical advancement in the health care field comes from moving from hospital to hospital or hospital chain to hospital chain.

Banking/Financial services. Despite the bad-boy thievery of junk-bond kings such as Mike Milken, banking and financial services is still alive and kicking.

In banking, the opportunities are geography- and size-dependent, with large banks and the Midwest your best bet. "In the Midwest, banks have not been hit as hard [as other areas of the country]. They are looking for IS staff," Muller says.

For example, Muller's firm is currently

Continued on page 86

Ongoing coverage of employment prospects appears weekly in Computerworld's *Careers section. For information on the state of jobs in specific industries, turn to these stories in the second half of our calendar:*

July 6: Mail order
Aug. 3: Brokerage houses
Sept. 7: Discount retail
Oct. 5: Media
Nov. 2: Health care
Dec. 7: Tourism trades

Continued from page 85

trying to fill four IS positions at the National Bank of Detroit.

Muller explains that many institutions in the Midwest are run by conservative managers who didn't get involved with risky property management, which has hurt many savings and loans.

Banking IS managers on average earn $58,242, while senior programmers earn $33,958, the *Computerworld* survey found.

Financial services firms — particularly mutual funds and brokerage houses — are also doing quite well and hiring, says Gary Kaplan, president of Gary Kaplan & Associates in Pasadena, Calif. "A lot of people who don't normally invest in the market are investing in mutual funds because they are a safe bet. This is causing back-office operations to be thrown into orbit, and they are staffing accordingly."

Technical expertise in this arena varies, depending on the company's architecture, but Kaplan says he sees a great demand for backgrounds in end-user computing and local-area network skills because of the highly transaction-oriented environment.

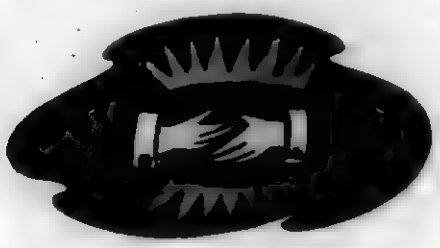
Computerworld's survey says IS managers in finance on average make $71,469, with senior programmers making $34,000.

Kaplan adds that the insurance area of financial services is positive for jobs, particularly health care insurance, the property and casualty field and professional liability insurance.

All of these concerns — banking, brokerage and insurance — are heavily transaction-oriented and computer-dependent, Kaplan says. Networking, workstation and end-user skills will pay dividends in the long run, particularly local- and wide-area networking and PC operating system experience.

You can also make yourself more marketable by delving into imaging systems, expert systems/artificial intelligence and client/server technology — areas banks and financial services firms say are of great interest to them, according to a recent study by Cambridge, Mass., research firm CSC Index, Inc.

Information technology consulting. The consulting industry is hot for two reasons: A lot of organizations are outsourcing their IS operations to firms such as the Big Six consultancies or Electronic Data Systems Corp., and "consultants are being used more and more in lieu of permanent employees," Kaplan explains. Companies are looking to save money by reducing their internal staff spending, he says.



"Our head of IS left the company, and rather than turn to an immediate replacement, we hired a consultant who took us through an analysis of where our systems strategy should go," says Richard Fitch, executive vice president of human resources at California Federal Bank, based in Los Angeles.

Cal Fed eventually outsourced its entire IS operation to Systematics Corp., with Systematics eventually hiring 95% of the bank's IS staff, Fitch explains.

Salaries for IS managers in the consulting industry average $58,500, while senior programmers average $36,000, the survey reported.

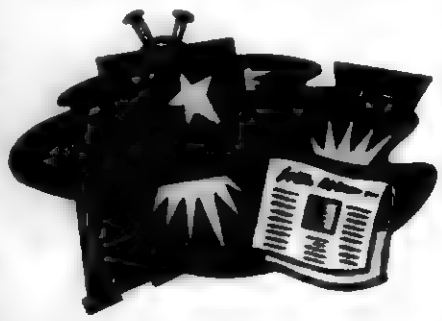
Consulting firms seek systems professionals with experience working with open systems and client/server technologies, says Jennifer Paulett, area staffing specialist at CAP Gemini Sogeti USA in Akron, Ohio. Another way in the door is expertise in a niche area — particularly computer-aided software engineering (CASE), C++ or Unix, she says.

CAP Gemini recently hired several business analysts. A step up from consultants, business analysts are "people with experience working with clients helping solve their business problems," she says.

At Ernst & Young, mainstay employees are experienced in incorporating mainframe CASE tools in large-scale systems development projects using CICS and IBM's DB2, says Jerry Walls, assistant director for human resources. However, the firm recently began searching for people with client/server and object-oriented programming skills. Walls says Ernst & Young has been aggressively hiring for three years. In the past two months, it has hired more than two dozen consultants.

Because of the high level of interaction with clients, consultants need excellent communications skills, he adds. Team players with integrity are in demand in consulting.

"When we hire, we have immediate changeability and utilization. We do not hire people to be on the beach," Walls says.



Communications/Media. Have a penchant to work with Murphy Brown? Lucky for you, the area that encompasses media, broadcasting, cable television, multimedia and the distribution of electronic media is an up and comer for jobs, says Richard Wonder, national director of the IS division at search firm Robert Half International, Inc. in Menlo Park, Calif.

A case in point: Time Customer Service, Inc. in Tampa, Fla., a division of Time Warner, Inc., recently hired a dozen programmers, data processing director Bob Beckstead says. The firm is also looking for application developers, systems programmers and telecommunications people, he adds.

For his part, recruiter Kaplan recently placed an IS executive in the consumer products division at Walt Disney Co. in Anaheim, Calif., and a vice president of MIS at Buena Vista Home Video, a $2 billion company that distributes Disney videotapes.

Communication businesses — from traditional media to cable TV — are fiercely technology-driven. They are always looking for new ways to use technology, such as videoconferencing and new electronic delivery services, to facilitate their form of communication, Wonder says.

"The new frontier in computing is bridging television, computing and telephone. Whether you call it multimedia or transputing, all companies that use computers from an end-user perspective — especially communications companies — will need software applications to utilize these integrated services," Wonder explains. The technical know-how for this area includes software application development, LAN protocols and the ability to create the bridges among devices, he adds.

The emerging technologies of greatest interest in this area are imaging systems, as well as fourth-generation languages (4GL) and end-user programming languages, according to the CSC Index report.

End-user languages and 4GLs are crucial to getting a better handle on using information for decision-making and quick development of systems to support the business, says Linda Peters, vice president at CSC Index in San Francisco. Leveraging information technology is especially important for publishing companies. "While publishing companies utilize highly advanced technology for printing, they have not historically used information technology in an advanced way" in business, Peters says.

The survey found that average pay for an IS manager in media is $50,400 and $28,000 for a senior programmer.

Distribution. In your heart of hearts you have been dreaming about working in the distribution industry. Not.

It may not seem glamorous or interesting at first, but the dissemination of products is do or die these days for almost every company, says Frederick Crawford, director of business development at Cleveland Consulting Associates in Ohio, which follows distribution companies. Practices such as just-in-time manufacturing and quick response, in which companies produce and ship products on demand rather than maintaining costly inventory, are heavily dependent on technology and technologists.

"Look at Wal-Mart. It doesn't sell anything someone else doesn't sell, and information technology, especially in its distribution area, is the bedrock of its success," Crawford says.

There is a lot of room for technical growth in companies whose main business is distribution. Today, 90% of these firms use large-system IBM mainframes running MVS, so the concentration on large-systems skills, such as MVS programming, is vital, Crawford says.

Ingram Micro, Inc., a $2.5 billion computer hardware distributor and an IBM mainframe, high-volume transaction-processing shop, recently hired a manager for financial applications and two senior systems analysts, according to Senior Vice President Mike Kelly.

Crawford predicts that within 10 years the emphasis in distribution will be on open, client/server architectures, so skills will shift to workstations, PCs and AS/400 technologies.

Software companies. The software industry is growing. The Department of Commerce says the industry, which encompasses large and small systems software, will increase by $14 billion by 1995. The companies hiring tend to be those with a diverse product range, says Lawrence Broe, senior associate for IS recruitment at Gary Kaplan & Associates.

"Companies with a broad client base and a broad product mix are doing very well, whereas those that put all their resources behind one or two products are getting hit," Broe says. He points to large production software developers such as Candle Corp. and Computer Associates International, Inc. as examples of busy, diversified concerns.

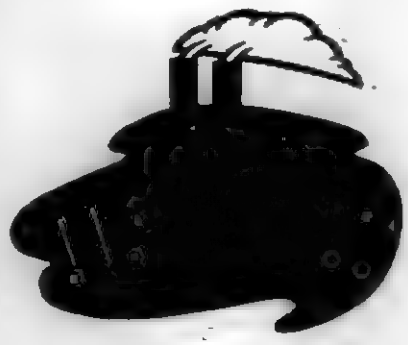
Because it is diversifying its product mix and addressing client/server technologies, CA, for example, is looking for people with specific technical skills, according to Lisa Mars, senior vice president of human resources. Skills in demand are those related to C programming, Unix, DOS, OS/2 and Microsoft Corp.'s Windows.

Software firms tend to have a more technology-driven environment than user firms because technology is their business. At Candle, at least one-third of the entire staff has a technical background, says Linda Bennett, MIS director.

"IS professionals who work in the software industry can really speak the language of the business," recruiter Kaplan confirms.

An added bonus for the technology-minded is that staffers get to work with the latest products because software vendors often test packages in-house.

Because technology is what software companies do, technical professionals get a chance to diversify, according to Mars. "In our organization, people move around all the time. They may work in research and development one minute and product support the next, depending on need."



CA's typical career path starts out in quality assurance or testing, moves to product support and finally goes into development. Mars says developing new products is the company's highest level position. "Most technically oriented people here want to be out at the forefront," she adds.

Typical salaries in computer firms are $68,000 for IS managers, $51,500 for systems and programming managers, and $36,000 for senior programmers. •

MANAGER'S JOURNAL

EXECUTIVE TRACK

The **Federal Reserve Bank of New York** has promoted **Peter Smejkal** to the post of manager in its operations systems department. Smejkal formerly served the same department as special projects director. The bank also named **Sharon T. Wong**, former projects director in the analytical systems department, as a manager in the operations and communications support department.

Karyn Thale is the new director of Technology Services at **Christiansen & Fritsch, Inc.** A veteran of approximately a decade of technology firm marketing, Thale comes to the Portland, Ore.-based direct marketing agency from Microsoft Corp.

The **Times-Mirror Co.** in Los Angeles recently named **Cecilia McRoskey** as the first person to hold the newly minted position of vice president of information technology. McRoskey formerly held the top post at project management firm McRoskey Management Resources.

Veteran information systems executive **Jeffrey Landau** is the new vice president and chief information officer at **National Media Corp.**, a television "infomercial" production company in Philadelphia. Prior to assuming the post, Landau held the same title at Nutri/System, Inc. He will be responsible for worldwide data processing, IS and telecommunications activities and is also charged with integrating National Media's current data processing systems with those of the firm's five subsidiaries.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Neil Margolis, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Muscle-stressed to IS: Get involved!

Ergonomic experts say IS should be part of the team fighting repetitive strain injuries

BY MITCH BETTS
CW STAFF

Walk into some offices and you will see computer monitors glaring like mirrors and desks with "secretarial returns" too skinny to support the computer and keyboard. Control panels and modems are piled up so high that users must crane their necks just to look at the monitor.

If the ergonomic hazard potential is sticking out like a sore thumb, however, "the IS people are conspicuous by their absence," according to consultant Robert F. Bettendorf, president of the Institute for Office Ergonomics, Inc. in Manchester Center, Vt.

These days, ergonomic issues are handled by corporate safety and health departments or personnel departments, if at all. But experts in computer ergonomics argue that IS managers should be part of the ergonomics team that helps fight repetitive strain injury (RSI) and other ailments related to computer work.

Government figures show that RSI, in which muscles and nerves are traumatised by repetitious work done at awkward angles, is the fastest growing occupational hazard (see chart page 90). The incidence of RSI in service industries has climbed tenfold in five years.

For intensive keyboard users, including data entry clerks, reservation agents and newspaper editors, RSI usually results in numbness or shooting pains in the hands, wrists and arms. In severe cases, it can completely disable the arm. The RSI epidemic has also produced an outbreak of lawsuits against computer manufacturers (CW, June 15).

"This is an issue that nobody wants to own, so it ends up in the safety and personnel departments," Bettendorf says. "But there should be a real teaming relationship with the IS department." After all, IS departments buy and install lots of the equipment and accessories that are suspect in RSI. IS managers "should have a big role to play when buying new equipment . . . and if they haven't got the knowledge, they should get some training," says David Parkinson, professor of occupational medicine at the State University of New York at Stony Brook.

Steven Mendo

IS involvement in the RSI issue need not stop with the purchase decision, Bettendorf adds. For instance, IS departments could add ergonomic topics — such as posture and how to adjust chairs — to their usual bevy of personal computer training classes, he says.

One organization that is trying the interdepartmental team approach is the Library of Congress in Washington, D.C. Concerned about RSI among its intensive keyboard users, the library recently formed an ergonomics committee that includes representatives from the facilities management and IS departments.

The facilities management department "is really leading the effort because it's more a physical thing than it is a computer thing," says Herbert Becker, director of information technology services.

Providing employees with a well-designed VDT work area requires coordination between the IS manager, furniture buyer and facilities manager, experts say. For example, the IS manager and the furniture buyer need to match the size of the desk with the size and placement of the computer and keyboard, while the facilities manager should be consulted to ensure proper lighting for VDT work.

Ergonomists generally recommend a package of remedies that include monitors with some sort of antiglare treatment, chairs and desks that are adjustable so arms and wrists are held at a comfortable level, user training, wrist rests and hourly breaks.

"Computer users should be told to take breaks — to stand up, stretch, look around — whenever they need them. Don't go heads-down for two hours," Bettendorf says.

Most employees forget to take a

Continued on page 90

RSI woes not always work-related

RSI is not new. Such injuries have been around for centuries, occur outside the workplace and have been known by such common names as "tennis elbow" and "writer's cramp."

It is not fair to automatically assume that RSI is job-related, according to ergonomics consultant Robert F. Bettendorf. "Off-the-job activities are every bit as important as on-the-job activities," he cautions. Knitting, tennis and piano playing could contribute to RSI.

"If someone is getting pain from using a keyboard, they should recognize that they can't go home and knit for four hours because that may well be a bigger problem than the keying," Bettendorf says. But arguments about what is causing the injury should be put on hold while the RSI sufferer gets medical treatment from an expert in the field. Early intervention can prevent RSI from becoming a permanent disability, experts say.

David Parkinson, professor of occupational medicine at the State University of New York at Stony Brook, warns that many RSI cases are misdiagnosed as carpal tunnel syndrome, which involves compressed nerves in the wrist. That leads to unnecessary surgery, he says. "There have been an inordinate number of decompression operations for what has been called carpal tunnel syndrome, which have given no relief to the patients," Parkinson says.

MITCH BETTS

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CALENDAR

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository AD/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Multivendor and Third Party Computer Maintenance Conference. San Francisco, Oct. 5-6 — Contact: Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Scan-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

NEXSYS Users Conference. Boston, Oct. 6-9 — Contact: Recovery Management, Inc., Littleton, Mass. (508) 486-8866.

Enterprise Computing Forum: Client Server '92. Houston, Oct. 7-8 — Contact: John Hendel, Champion Productions, Burnsville, Minn. (713) 225-1601.

OCT. 11-17

The Third Annual East/West High-Tech Forum. Prague, Oct. 11-14 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

Use, Inc.'s Fall Conference. Atlanta, Oct. 12-16 — Contact: Use, Inc., Lanham, Md. (301) 577-1881.

Europa Telecom '92. Budapest, Oct. 12-17 — Contact: International Telecommunication Union, Switzerland (011-41) 22-730-5926.

Enterprise Network Management Seminar. Elmsford, N.Y., Oct. 13-15 — Contact: Hart Rasmussen, Polytechnic University's Center for Advanced Technology in Telecommunications, Westchester, N.Y. (914) 347-6940.

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

Multimedia World, Inc. Conference. Chicago, Oct. 13-16 — Contact: Jim Prude, Multimedia World, Alexandria, Va. (703) 684-5401.

Microprocessor Forum. Burlingame, Calif., Oct. 14-15 — Contact: Microprocessor Report, Sebastopol, Calif. (707) 823-4004.

DOD-STD Conference. Boston, Oct. 14-16 — Contact: David Maibor Associates, Inc., Needham, Mass. (617) 449-6554.

The National Association of Legal Vendors (NALV) Symposium. Newport Beach, Calif., Oct. 15-16 — Contact: NALV, Nashville, Tenn. (615) 726-3649.

OCT. 18-24

Info/Tech Management '92. Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Nacon '92 Conference and Exhibition. New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

Society of Information Management (SIM) 1992 Annual Conference. Universal City, Calif., Oct. 18-21 — Contact: SIM, Chicago, Ill. (800) 477-4561.

APICS Conference and Exhibition. Montreal, Oct. 18-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Directions '92. Dallas, Oct. 19-22 — Contact: Cognos, Burlington, Mass. (617) 229-6600.

International Society for Hybrid Microelectronics '92. San Francisco, Oct. 19-22 — Contact: Terry Ritter, San Jose, Calif. (408) 945-9992.

OCT. 25-31

The 13th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

ASIS Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

Total Quality Management '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Expo Comm China. Beijing, Oct. 30-Nov. 4 — Contact: E. J. Krause & Associates, Inc. Bethesda, Md. (301) 986-7800.

NOV. 8-14

U.S. Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 652-3888.

12th Annual Eastern American DEC/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalen, Times Fiber Testing Machine Co. (215) 675-7164, Ext. 216.

Synergy '92. Anaheim, Calif., Nov. 9-13 — Contact: Wangaram Publications, Inc., Boston, Mass. (617) 543-8146.

NOV. 15-21

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.

NOV. 29-DEC. 5

CAUSE '92. Dallas, Dec. 1-4 — Contact: CAUSE, Boulder, Colo. (303) 449-4430.

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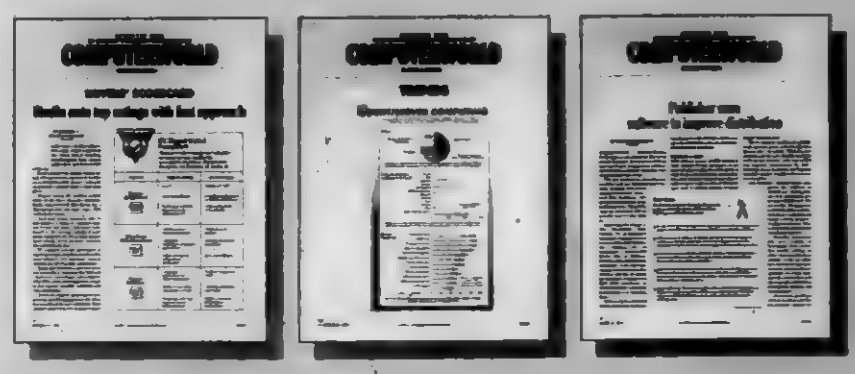

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Muscle-stressed to IS: Get involved!

CONTINUED FROM PAGE 87

break when they are immersed in their work, but there is a new breed of memory-resident software programs that provide an on-screen reminder.

The software monitors the user's keyboard activity and issues a tickler if the user has not switched to some other activity for a period of, say, 10 minutes in every hour. Some packages even suggest stress-reducing exercises that can be done in the office.

Vendors of such products include Escape Ergonomics in Sunnyvale, Calif.; TVM Technologies, Inc. in Glen Cove, N.Y.; and Visionary Software, Inc. in Portland, Ore.

The real value in purchasing the rest-break software may be the message it sends to employees. "It's a message from management that 'We're serious. We want you to take breaks.' Otherwise, people don't really believe it," Bettendorf says.

Management attitudes and psychological factors such as job stress apparently play a role in RSI. A recent study by the National Institute for Occupational Safety and Health found RSI cropping up more among workers who fear losing their jobs, face increased work loads, lack job diversity and are subjected to electronic performance monitoring.

IS executives involved in business process re-engineering projects should also be on the lookout for ways to redesign keyboard-intensive jobs and eliminate unnecessary tasks, Bettendorf adds, so that VDT work is less tedious and more productive.

On the the legal front, the only RSI lawsuit that has gone to trial so far was won by the employer. In December 1990, a federal court jury cleared Amtrak of charges that it failed to provide a safe workplace for an employee who blamed intensive keyboard work for her disabling RSI.

The employee, Debra Haririnia, alleged that Washington, D.C.-based Amtrak was negligent in failing to tell her how to avoid RSI. Haririnia sought $825,000 in damages, but the jury ruled that Amtrak "provided a reasonably safe workplace and equipment" and did not contribute to her injuries.

On the other hand, the advent of the Americans with Disabilities Act of 1990, which went into effect this past July 26, will make it more difficult for employers to ignore the RSI problem.

The act prohibits employers from discriminating against the disabled in hiring and firing and includes RSI in its broad definition of a disability. "It will make it much more difficult to dump an employee with a long-term RSI disability," even if the disability makes it impossible for the employee to use a keyboard, according to David J. Eisen, director of research at The Newspaper Guild in Silver Spring, Md.

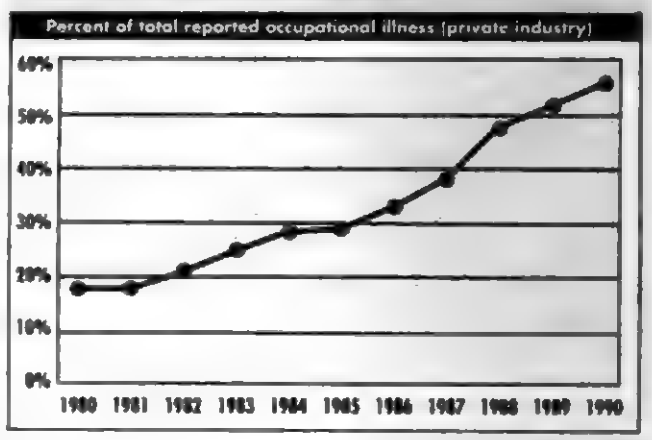
Furthermore, the act requires employers to make "reasonable accommodations for the physical or mental limitations of otherwise qualified persons . . . who can perform the essential functions of the job." For RSI sufferers, one possible accommodation would be voice-activated computers, Eisen said.

A few newspaper employees with RSI are using voice-activated computers to deal with the problem, he said, adding that it would be wise for employers to have several of the machines on hand for people with temporary RSI problems to use.

Although speech recognition products are slow and have limited vocabularies, Eisen said, voice-activated computers can be a "blessing" for RSI sufferers who otherwise could see their careers come to a painful end.

Over and over

Disorders associated with repeated trauma such as carpal tunnel syndrome steadily increased during the 1980s



Source: Bureau of Labor Statistics

INTELLIGENCE FILES

Items of interest from publications, speeches, surveys and research projects

Expert systems vs. complexity

■ Expert systems are being used by more businesses to handle complex transactions so that employees can concentrate on customer relations. American Express, for example, uses a rules-based "knowledge highway" system to manage credit transactions, from card applications to collecting overdue accounts.

Compaq Computer Corp. is using a case-based reasoning system to create a library of customer problems and solutions.

Someday, however, intelligent computers may go too far. Bankers, for example, are talking about using artificial intelligence to help sell financial products that are too sophisticated for their salesmen to comprehend.

Source: *"White-collar computers,"* The Economist, *Aug. 1, 1992.*

Don't discard your ace

■ Managers of information technology are abrogating their responsibility and missing a great opportunity if they turn the job of setting the corporate technology agenda over to a consultant, researcher and consultant Gordon Hewitt says. "Traditionally, the road to the top has not gone through the IT department, so senior executives are often uncomfortable with technology issues. This situation gives the IT manager a great opportunity to shape the thinking of the board," Hewitt says. "A board will profit from listening to its IT manager because IT has shifted from being a cost center concerned only with improving internal processes to a major source of competitive advantage."

Source: *"IT Managers Step Up — to the Boardroom," by Peter Golden,* Beyond Computing, *August/September 1992.*

Quality Police

■ How do you know when your quality initiative is going off track? One sure sign, says IS consultant Michael Hammer, is "when your company has a group within it that becomes known as "The Quality Police."

Source: *Remarks by Michael Hammer during the Q&A period at a management forum sponsored by Hammer & Co., June 1992.*

Dancing with computers

■ "The thing I hated about computers was that you had to sit down to use them. (Actually, this has always been true of intellectual work.) How could you talk about human/machine interaction when all you could do was wiggle your fingers on a 100-year-old keyboard? Some interaction! I wanted to wiggle the rest of me. I wanted to use my whole body to interact with computers."

Source: *Myron Krueger, artist, scientist and pioneering explorer of artificial reality, in an interview with Jas. Morgan for the fall issue of* Mondo 2000.

Motivating the ranks

■ DEC's designated President Robert Palmer knows how to motivate, according to one of his senior managers. "In the first staff meeting I went to, he told the group, 'I need information to make decisions. If I don't get it, I still need to make them. You can either participate, or I'll work around you.' "

Source: *"Digital: The Next Generation," by Glenn Rifkin,* Upside *magazine, September 1992.*

'Where's the beef?'

■ I bet Dave's daughter Wendy inspired him to move toward putting PCs in all of his new restaurants. David Thomas, chairman of Wendy's International, Inc., is pushing technology to get managers away from administrative back-office tasks and out front managing. "That's where technology can help us — not to replace someone, but to get managers out into the restaurant."

Source: *" 'You need a mop-bucket attitude,' " Interview by* Profit *magazine, July/August 1992.*

Learning curve

■ The time it takes an employee to get "up to speed" can cost managers time and money in a project. "CPM Bulletin" says up-to-speed learning is pronounced in white-collar projects such as software development.

In all projects, but particularly in complex ones such as software development, most participants spend much of their first few weeks familiarizing themselves with the project. During this time, they are usually only working at 60% of their potential. It can take six weeks before they reach 100% productivity. Delays can be minimized by limiting the number of new people introduced after the initial stage of such projects.

Source: *"Up to Speed: The Cost of Learning on an 'Ideally Planned' White-Collar Project," "CPM Bulletin," Summer 1992.*

Compiled by Kelly E. Dwyer, assistant editor, features, with contributions from Mitch Betts, national correspondent; Nell Margolis, senior editor, management; and Joanne Kelleher, features editor.

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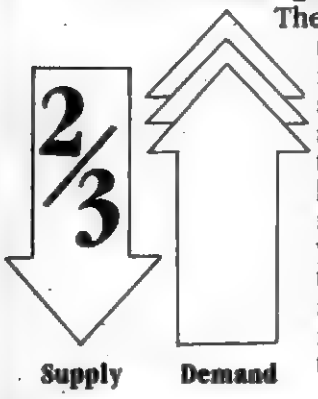
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

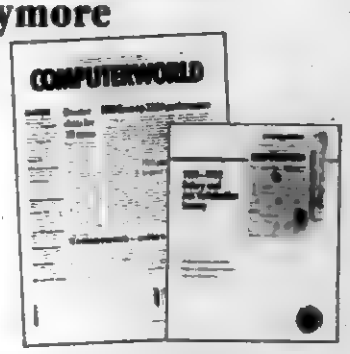
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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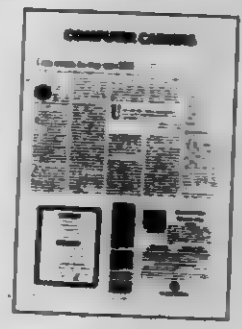

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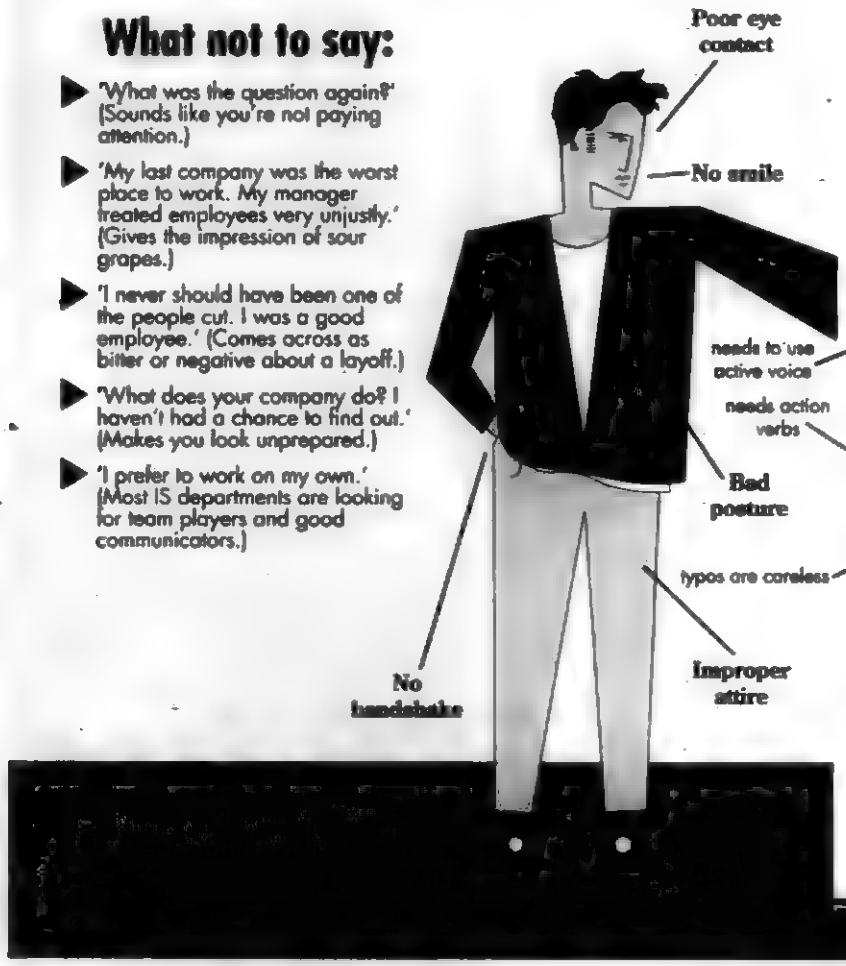
- 'What was the question again?' (Sounds like you're not paying attention.)
- 'My last company was the worst place to work. My manager treated employees very unjustly.' (Gives the impression of sour grapes.)
- 'I never should have been one of the people cut. I was a good employee.' (Comes across as bitter or negative about a layoff.)
- 'What does your company do? I haven't had a chance to find out.' (Makes you look unprepared.)
- 'I prefer to work on my own.' (Most IS departments are looking for team players and good communicators.)



too vague

Joe Jones

Experienced in all aspects of whole life cycle projects ranging from design of systems, coding and testing of software to acceptance and user support. I have trained programmers and users how to use software and products.

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Hardware: 30XX, 9370
Software: MVS/XA, JCL, ISPF, VM/CMS, VSAM, CICS, Interest, File-Aid, CA-Datacom, ADF
Languages: Cobol, Cobol II, BAL, C

EXPERIENCE:
Contract programmer/Analyst 11/88-Present
Designed, coded and maintained Cobol CICS and batch report programs under MVS. Applications included nuclear power plant facilities, management systems, inventory control, security, purchasing, work orders, time accounting and entertainment industry applications. Clients included Motion Movies International and Pacific Power.

How long at each assignment? Which skills were used at each?

Institutional Software, Inc., San Luis Obispo, Calif. 7/87-11/88
Senior systems analyst
Project manager for a Cobol conversion from Hewlett-Packard to CICS on IBM. Responsibilities included designing major portions of the system, converting and creating new Cobol programs, installing the product under MVS/XA and writing utilities for VM/CMS. Installed and maintained IBM 9370 and third-party software on it. Established and maintained project schedules, ~~responsible for the project meeting deadlines.~~

too obvious

California Computer Corp., San Francisco, Calif. 4/84-7/87
Systems engineer
Field support for VM/CMS-compatible minicomputer. Maintained hardware and software for customers. Hardware and software problem analysis and resolution. Trained customers how to use the machine. Supported salesmen during presales activities such as giving demonstrations and presentations.

American Bancorp., San Francisco, Calif. 8/81-4/84
Systms analyst
Technical support to users. Consulted with users on design, development and implementation of programs and systems. Software support.

Data Systems, Inc., San Francisco, Calif. 3/78-8/81
Operator/Programmer analyst
Technical support to users. Debugged customers' programs. Troubleshot telecommunication problems. Operated a Cyber 6400 computer.

EDUCATION:
Computer Learning Center, Los Angeles, Calif. 1978
Completed courses in Cobol, RPG, BAL, JCL, systems analysis and design.

Cuesta College, San Luis Obispo, Calif. 1989
Completed course in C programming language.

The right image (next page)

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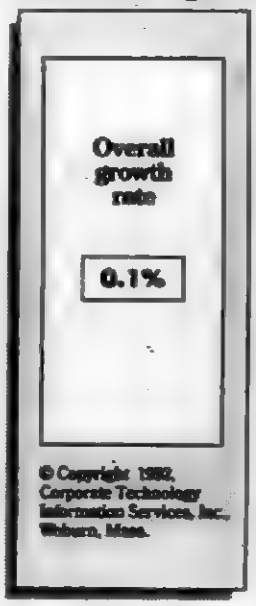

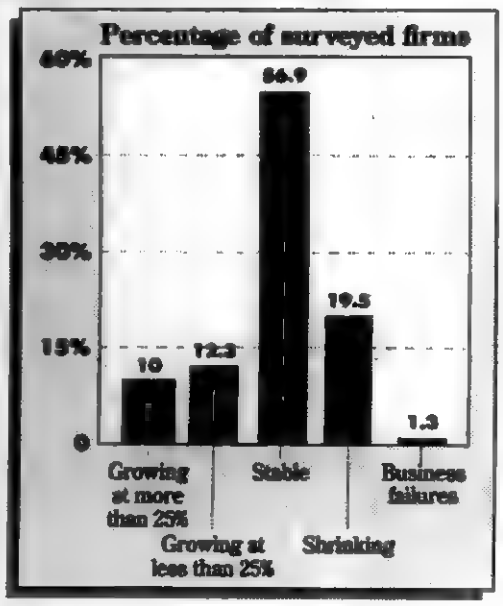

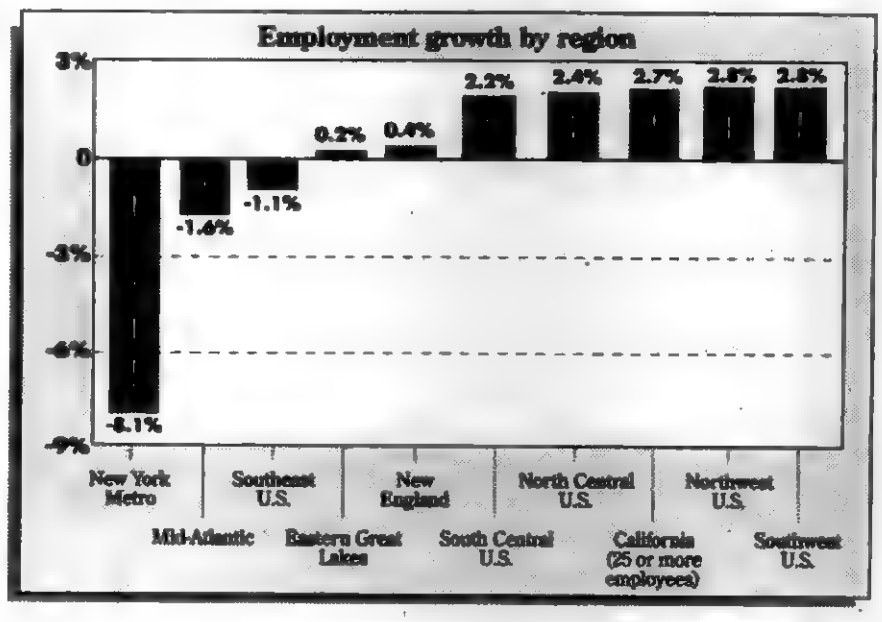

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WANTED: Vice President Purchasing/Marketing, responsibility: purchase/sale computer components. Duties: obtain optimum prices, terms for products; coordinate purchases with Latin American affiliates, negotiate with suppliers, including credit terms; supervise accounts; arrange air/ocean freight, Customs arrangements; coordination with brokers. Analyze new products relevant to Latin American markets. Train, hire subordinate staff and supervise staff of 17. Attend trade shows; analyze Latin American market trends. Maintain, supervise quality/cost control. Fluent Spanish; knowledge of computer hardware/software for Latin American markets. 20-30% foreign traveling. B.A. in Business Administration and 2½ years junior management with emphasis on finance, accounting required. 9-6 M-F. $40,000 p.a. Submit resume Job Service of Fla., 701 S.W. 27th Ave, Room 15, Miami, FL 33135, reference Job Order No. FL 0656368.

Research Analyst/Aircraft Scheduling to design & implement a networked, multi-user decision support system application for aircraft scheduling using a graphical user interface; develop computer models applying operations research techniques to solve complex scheduling problems of routing aircraft; achieve required criteria using object-oriented programming techniques, implement a system for submitting requests to remote DOS & UNIX workstations to run complex mathematical models; utilize image processing techniques to display & edit aircraft-gate assignments; apply concepts of artificial intelligence & neural network methodology to develop mathematical models for aircraft scheduling & passenger demand forecasting; plan, install & support a LAN system for aircraft scheduling which links multiple DOS & UNIX workstations. Master of Science degree in Systems Engineering required as well as 1 year of experience in job offered or 1 year of experience as Software Engineer and/or Systems Engineer and/or Research Assistant or any combination thereof. Will accept applicants with Masters degree in one of the following areas: Industrial Engineering & Operations Research; Operations Research and Systems Analysis; Operations Research; or Transportation Systems. Applicants must have completed 1 course in each of the following: linear & integer programming; operations research; systems design or software engineering; expert systems; numerical analysis; parallel processing. Coursework or experience must have included object-oriented programming as well as design & development of networked multi-user applications, databases & expert systems; image processing & use of neural network methodology in mathematical modeling. 40 hrs. M-F, 9 a.m. to 5 p.m., $39,000 per annum. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of resume, degree certificate and transcripts to Illinois Department of Employment Security, 401 S. State - 3 South, Chicago, IL 60605. Attn: Lan Bolsa. Ref. No. #V-IL-5919-B. NO CALLS. AN EMPLOYER PAID AD.

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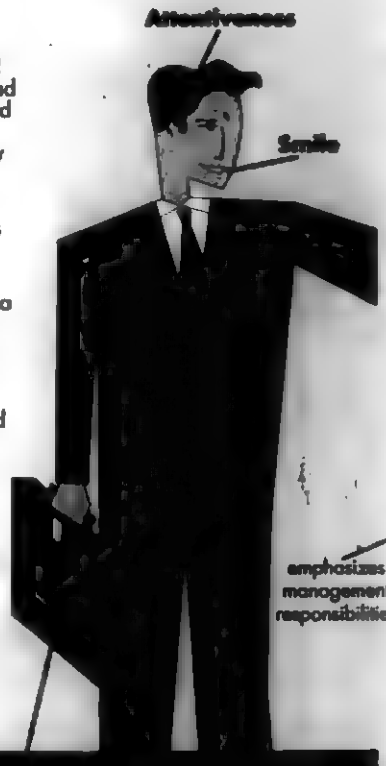

Joseph Jones

EDUCATION:
1978 **Computer Learning Center**, Los Angeles, Calif.
Earned diploma in computer programming and analysis. Completed courses in Cobol, RPG, BAL, JCL, systems analysis and design.

1989 **Cuesta College**, San Luis Obispo, Calif.
Completed course in C programming language.

adds software to make a complete list

Hardware: IBM 30XX (S/MVS/XA), IBM 9370 (VM/CMS), IBM PC (MS-DOS), HP 3000 (MPE)
Software: Cobol, CICS, JCL, Intertest, CA-Datacom, Advanced Debugging Facility, File-Aid, Unicorn (CICS development tool), ALC, Fortran, Nomad, Displa, Telegraf, Basic, Yourdon methodology

spells out unfamiliar acronyms

PROFESSIONAL SUMMARY: gives impact up front
More than 12 years of progressively responsible experience designing and implementing mainframe applications with a strong focus on user analysis/support and financial applications.

EXPERIENCE:
Consultant (Nov. 1988 to Present)
As a member of team, developed and enhanced on-line and batch applications including:

Motion Movies International (Dec. 1990 to March 1991) — spells out dates of employment
Specific applications included royalty and television systems. Developed Cobol and CICS applications in IBM 30XX (OS/MVS) environment. Left position at end of contract.

Pacific Power (Nov. 1988 to Nov. 1990)
Applications included inventory control, purchasing, accounting and management reporting. Used Cobol and CICS in IBM 30XX (OS/MVS) environment with CA-Datacom. Met extensively with users to determine business requirements. Analyzed needs and designed solutions. Wrote and tested structured code. Wrote documentation. Trained users. Made ongoing enhancements per user requests.

Institutional Software, Inc., San Luis Obispo, Calif. (July 1987 to Nov. 1988)
Senior systems analyst/Project leader
Company develops and markets software for the commercial banking market with a diverse product line ranging from mainframe to microcomputer applications.

As project manager, directed a staff of up to 15 employees and contractors in the porting of all product code from HP 3000 to IBM 9370 with Cobol and CICS. Personally designed and rewrote major portions of the applications to accommodate new systems interfaces and file systems. Installed the product under MVS/XA. Wrote VM/CMS utilities. Met with management to determine project milestones and critical components. Took corrective action to bring projects in on time and within budget.

identifies major accomplishments

California Computer Corp., San Francisco, Calif. (April 1984 to July 1987)
Systems engineer
Provided field support for VM/CMS-compatible minicomputer. Maintained hardware and software for customers. Responsible for hardware and software problem analysis and resolution. Trained customers. Supported salesmen during presales activities by giving demonstrations and presentations.

uses action verbs

American Bancorp, San Francisco, Calif. (Aug. 1981 to April 1984)
Research analyst
Provided technical support to users. Consulted with users on design, development and implementation of programs and systems.

Data Systems, Inc., San Francisco, Calif. (March 1978 to Aug. 1981)
Programmer/Operator
Provided technical support to users. Debugged customers' programs. Responsible for troubleshooting telecommunication problems. Operated a Cyber 6400 computer.

Special thanks to Jim Parker, a senior MIS recruiter at Technical Connections, Inc. in Los Angeles

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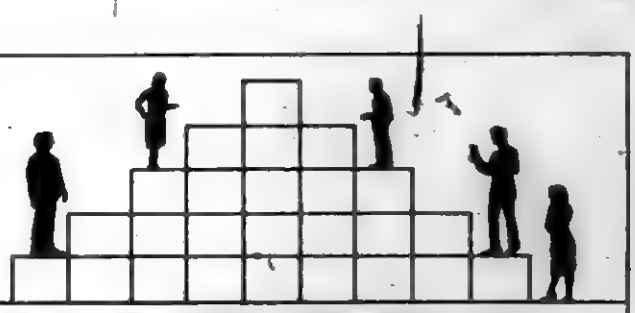

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.
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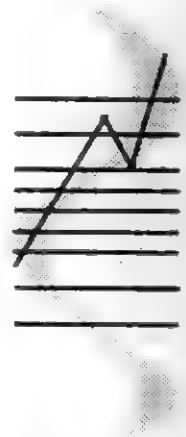

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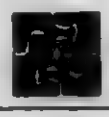

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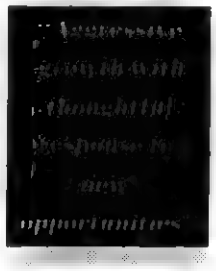

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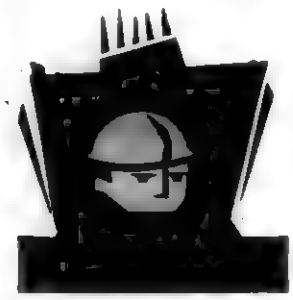
Sidestep customization pitfalls

Preventive measures can help ensure software usability, avoid headaches



BY JOEL GILMAN
SPECIAL TO CW

One of the more hazard-ridden projects an information systems manager can engage in is vendor customized software. You really have to take some precautionary measures if you don't want to end up wasting a lot of money on an unusable system or wasting a lot of time waiting for the final product. Some people have even ended up in court arguing that they never got the system they originally contracted for.

Although there are no hard-and-fast rules — system customization is bound to be a bumpy ride — there are specific problems that notoriously crop up. Keep them in mind and you are sure to avoid some unnecessary headaches.

▶▶ Write clear RFPs

Drafting a request for proposal (RFP) is the first step in any system customization. Unfortunately, most RFPs end up too long and too vague to be meaningful. Considering that this is where you determine what you want the eventual system to be, you should take great pains to be thorough.

In addition, the contents of RFPs are legally binding once they are included in the contract.

For a better idea of what you want to include in the RFP, compare the features you need in the new system with the shortcomings you've found in the off-the-shelf software you've rejected. This will give you a base to start from and ensure that you get better proposals from vendors.

▶▶ Two-part contracts

A well-drafted contract can mean the difference between having to pay for a system you don't want and being free to walk away if you're not completely satisfied. So make it count!

For optimum flexibility, divide the contract into two phases: the prototype and design phase, and the implementation phase.

During Phase I, you will be bound to paying the vendor for prototypes and a customized design. However, once the design is finished, you are in no way obligated to follow through with the implementation. In fact, you could even back off for a little while and compare the customized software with prepackaged software and see which one works better for you.

Until you sign on for Phase II, you are still evaluating the product and have not committed to it. You've spent a lot of money to get to this point, so don't be afraid to speak up if you don't like what you see.

Once you have agreed to the design, Phase II begins, and there is no looking back.

▶▶ Insist on a prototype

During contract negotiations, insist on a system prototype — don't settle for a written spec or design document. With the dummy system, users can interact with the screens and commands and suggest changes for the final system.

Specs simply spell out whether a system will perform a given function, no matter how clumsily or slowly. If users aren't happy with the final system, they have no legal recourse if the vendor can prove it meets the spec. What's more, many courts are poorly equipped to deal with this type of dispute.

Because users can actually use a prototype, they can see right off the bat if a function works well or "just works." The downside is that you have to pay for the prototype. The screen design will be used in the final product, but the underlying software — called scaffolding — is only used for the prototype and will be discarded after the design is approved.

▶▶ Review design thoroughly

Make sure key users thoroughly evaluate the design before agreeing to implementation. One frequent problem is that key users are not involved. Even with a well-designed prototype, an unsatisfactory system can be the result if key users don't take the time to thoroughly evaluate it.

This is a problem purely for the user organization: Key users have to be encouraged and motivated to spend weeks evaluating the prototype.

▶▶ Get a source-code license

If you proceed with the custom system, insist on a source-code license. If the vendor refuses, find a new vendor or use prepackaged software.

Refining and modifying software takes time and can become costly if you can't make changes to the source code yourself.

▶▶ Document and train

Don't skimp on documentation and training. If this is a custom system, you won't be able to pick up a how-to manual from the local bookstore. All your information on the system will come from the vendor, so be sure the vendor provides you with adequate documentation.

How do you know if it's adequate? Ask to see a manual that was written for another customer. Reading this documentation from cover to cover can tell you much about the vendor and the product.

Similarly, be sure the vendor provides training, and be sure to give your people adequate off-site training time.

One final tip: Remember to negotiate for training at the contract stage. Many buyers forget to ask or only vaguely mention it to the vendor. If you don't ask, you don't get, and factoring it in later could be more expensive.

Gilman is a Seattle-based attorney who practices computer law.

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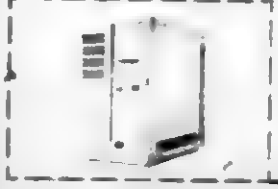

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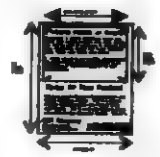

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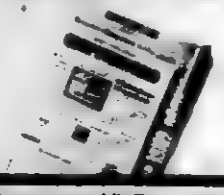

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PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$1,650	$1,900	$1,200
PS/2 Model 80	$1,400	$1,600	$1,100
PS/2 Model 95	$3,000	$3,500	$2,600
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Portable III	$500	$600	$250
Portable 386	$1,100	$1,300	$900
SLT-286	$700	$900	$400
LTE-286	$800	$900	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$1,850	$2,250	$1,400
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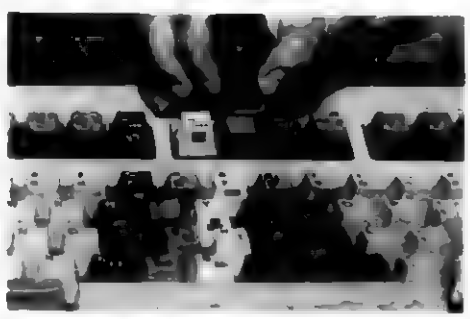

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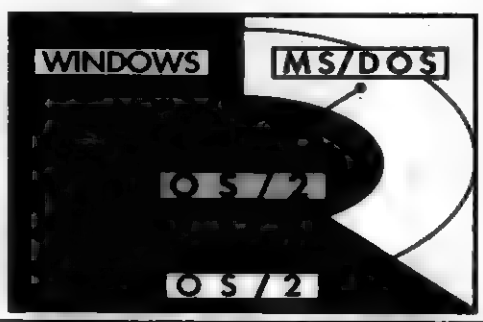

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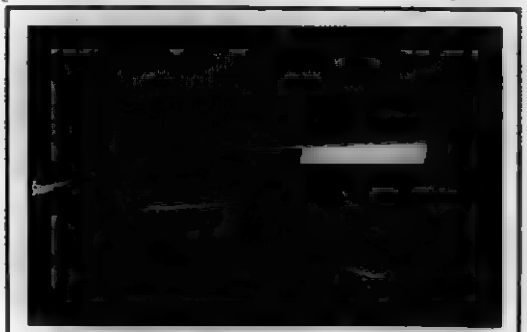

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Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 14,24

A

Aberdeen Group 1,20
Accolade, Inc. 73
Ad Hoc Telecommunications Users Committee 1
A. Davis Grant & Co. 97
Advanced Micro Devices, Inc. 6
Advanced Technology Research 28
Alamo Rent-A-Car, Inc. 79
Aldus Corp. 4
Alias Research, Inc. 51
Alliance Technologies, Inc. 72
Amdahl Corp. 48,81,82,109
American Airlines 6
Amoco Laser Co. 28
Andersen Consulting 6,7,16
Andersen, Jones & Muller Associates 85
Andsor Research, Inc. 75
Apple Computer, Inc. ..... 1,4,6,12, ... 14,39,44,109,110
Applied Digital Data Systems, Inc. 65
Aristokraft, Inc. 81,82
Artisoft, Inc. 16
Atrium, Inc. 73
AT&T 63,72,97
AT&T/NCR 16,81
Au Bon Pain, Inc. 1
Avondale Mills, Inc. 79,83
Axil Workstations, Inc. 54

B

Bankers Trust Co. 14
Banyan Systems, Inc. 4
Beacon Software International 72
BIS Strategic Decisions 37,12
Borland International, Inc. 37,109
Brigham and Women's Hospital 85
Bristol-Myers Squibb Co. 97
Brownstone Solutions, Inc. 73
Buena Vista Home Video 85
Bull HN Information Systems, Inc. 73,81

C

Cabletron Systems, Inc. 14,15
CACI Products Co. 14
CAF Technology, Inc. 44
California Federal Bank 85
Campbell Services, Inc. 24
Candle Corp. 85
CAP Gemini Sogeti USA 85
Carnegie Mellon University 28
Carter McKenzie, Inc. 97
Cascade Communications Corp. 16
Celtic Life Insurance Co. 109
Center for Innovative Technology 73
CenterLine Software, Inc. 75
Champion International 67
Chicago Board of Trade 14
Chipcom Corp. 15
Christiansen & Fritsch, Inc. 87
Cincom Systems, Inc. 72
Circuit City Stores, Inc. 70
Cisco Systems, Inc. 15,63
Claris Corp. 4
Clarity 28
Clark Development Co. 75
Cleveland Consulting Associates 85
Clinical Reference Laboratory, Inc. 67
Colgate Palmolive U.S. 97
Communications Network Architects, Inc. 14
Compaq Computer Corp. 4,12,20,37,39,110
Compass America, Inc. 67
Compu-Design USA 67
Computer Associates International, Inc. ..... 4,10, ... 12,39,85,110
Computerland Corp. 4
Contemporary Cybernetics Group 72
Corel Systems Corp. 51,58
Corporate Association of Microcomputer Professionals (CAMP) 1
Covia Partnership 6
Creative Labs, Inc. 40
CSC Index, Inc. 85
CSX Corp. 63

D

Data General Corp. 109
Dataquest, Inc. 54,82
Dean Witter Reynolds 12
Dell Computer Corp. 4,12,40
DHL Worldwide Express 37,15
Digital Communications Associates, Inc. 65
Digital Equipment Corp. ..... 4,6,7,14,15,16, ... 20,24,28,48,67,72,73,74,58,110
Digital Equipment Computer Users Group (DECUS) 16
Dr. Taylor's Software, Inc. 75
Duke Power Co. 83

E

Educational Testing Service 1
Du Pont Co. 4,16
Elegant Communications, Inc. 15
Encore Computer Corp. 109
Ernst & Young 14
Escape Ergonomics 87,90
Everex Systems, Inc. 109

F

Federal Express Corp. 65
Federal Reserve Bank of New York 87
Fibermux Corp. 15
Fidelity Investments 73
Fidelity Systems Co. 74
Forrester Research, Inc. 10,12,14
Foundation Cooperative Processing 16
Frame Relay Forum 16
Frito-Lay, Inc. 6
Fujitsu Ltd. 72,81

G

Garber Travel 37
Gartner Group, Inc. 10,24,72,79
Gary Kaplan & Associates 85
GM Hughes Electronics 54
Gould, Inc. 109
Groupe Bull 21

H

Harnischfeger Corp 1,20
Harris Corp 52
Hewlett-Packard Co. ..... 6,7,15,16,20,28,32, ... 37,58,70,73,109
Hitachi Data Systems Corp. 48,80,81,83
Hughes Aircraft Co. 10
Hughes LAN Systems, Inc. 54
Hyatt Hotels Corp. 1

I

IBM Personal Computer Co. 6
IBM ..... 1,4,7,10,12,14,15,16,20,24,39,48, ... 63,74,79,80,81,83,44,58,109,110
ICL 72
Inacom Corp. 4
Independence Technologies, Inc. 72
Independent Computer Consulting Services, Inc. 72
Infodata Systems, Inc. 72
Information Systems Group, Inc. 67
Informix Software, Inc. 16,72
Ingram Micro, Inc. 85
Inno Design Corp. 51
Innovative Data Concepts 73
Institute for Office Ergonomics, Inc. 87
Institute of Electrical and Electronics Engineers, Inc. 54
Intel Corp. 6,81,109
Interactive Development Environments, Inc. 73
International Data Corp. 40,109
International TeleManagement Corp. 15
International Communications Association 1
Internetix, Inc. 14
Intersolv, Inc. 6
IPL Systems, Inc. 15

J

James River Corp.'s Neenah Technical Center 1
Jersey City State College 97
John Hopkins Health System 67

K

Kentucky Fried Chicken 6
KI Research, Inc. 15
Kinco Information Systems 72
Knowledge Ware, Inc. 6

L

Landmark Research International Corp. 58
Land-O-Lakes, Inc. 81
Leading Edge Products, Inc. 51
Legato Systems, Inc. 58
Legent Corp. 12
Library of Congress 87
Lithonia Lighting 12
Lotus Development Corp. 37

M

Madge Networks, Inc. 14
Make Systems, Inc. 14
Maspar Computer Corp. 38
Massachusetts Blue Cross and Blue Shield 16
MCI Communications Corp. 63
McRoskey Management Sources 87
Mercedes-Benz of North America, Inc. 97
Merrin Information Services, Inc. 4
Meta Group, Inc. 12,24
Metropolitan Fiber Systems, Inc. 1
MicroLogic Software 44
Microsoft Corp. 1,16,37,44,72,73,87,110
Midas International, Inc. 1
Montgomery Securities 109
Mortgage Guaranty Insurance Corp. 63
Motorola 110
Mountain Gas Company 32

N

NASA 10
National Information Technology Center 1
National Institute for Occupational Safety and Health 87,90
National Media Corp. 87
National Railroad Passenger Corp. 87
National Semiconductor 6
NCR Corp. 65,72
NetFrame Systems, Inc. 52
Network Computing Devices, Inc. 65
Network Equipment Technologies, Inc. 15
Network General Corp. 16
Network Peripherals, Inc. 24
NeuralWare, Inc. 75
New England Memorial Hospital 15
New Jersey Bell 97
Nippon Mining Co. 109
Nippon Steel Corp. 12
Northeast Consulting Resources, Inc. 15
Northeast Utilities 81,82,83
Northern Indiana Public Service Co. 12
Novell, Inc. 4,14,15,16,52,54
Nutri/System, Inc. 87

O

Oasys, Inc. 75
Object Design, Inc. 72
Object Management Group 16
Open Software Foundation 1,30,72
Oracle Corp 1,12,72
Oregon Mutual Insurance Co. 83
Outsource, Inc. 54

P

Packard Bell Electronics, Inc. 40
Parametric Technology Corp. 51
ParcPlace Systems, Inc. 6
Pavo Soft 109
Performance Systems International, Inc. 16
Perot Systems Corp. 6
Petrotechnical Open Software Corp. 16
Philips Consumer Electronics Co. 44
Proactive Software, Inc. 109
Profit Oriented Systems Planning Program 72
Proteon, Inc. 15,109
Prudential Securities, Inc. 110

R

Radio Shack 39
RE/AIMS 109
Real Decisions Corp. 67
Reliability Ratings 39,65
Rising Star Research, Inc. 24
Robert Half International, Inc. 85

S

SAP AG 109
SAP America, Inc. 109
Sega Enterprises Ltd. 73
Semaphore 73
Sequoia Pacific Voting Equipment Inc. 7
Sextant, Inc. 73
Silicon Graphics, Inc. 6,51
Software Productivity Research, Inc. 73
Software Productivity Consortium 73
Software Quality Automation 44
SOMA, Inc. 109
Sony Corp. 58
Sprint Corp. 63
Spry, Inc. 58
State University of New York 87
Stratton-Cheesecomm Management Co. 12
Stratus Computer, Inc. 6,74
Stuart P. Orr & Associates 12
Sun Microsystems, Inc. ..... 16,20,24,51,54,58, ... 72,74,75,81,109,110
Swedish American Hospital 85
Sybase, Inc. 72,73,10
Symantec Corp. 109
SynOptics Communications, Inc. 15
Systematics Corp. 85
Systems Center, Inc. 6
Sytron Corp. 39

T

Tandy Corp. 6,40
Tangram Systems Corp. 6
TeamOne Systems, Inc. 73
Technology Investment Strategies Corp. 82
Technology Solutions Corp. 6
Telnetron Communications Systems, Inc. 64
Tektronix, Inc. 65
Telepartner International, Inc. 65
Teleport Communications Group 1
Texas A&M University 14
Texas Instruments, Inc. 54
The Ask Cos. 73
The American Cancer Society 14
The Burton Group 4,16
The Feld Group 6
The Mennen Group 97
The Newspaper Guild 87,90
The Santa Cruz Operation, Inc. 73
The Wollongong Group, Inc. 16
The Yankee Group 14
Time Customer Service, Inc. 85
TMA Associate 28
Toshiba America, Inc. 40
TransAmerican Insurance Group 12
Tricord Systems, Inc. 58
TVM Technologies, Inc. 87

U

Ungermann-Bass, Inc. 15
Unidata, Inc. 73
Unify Corp 72
Unisys Corp. 7,48
University of Karlsruhe 28
US West, Inc. 85
US West New Vector Group, Inc. 65
U.S. Army Corps of Engineers 1
U.S. Department of Transportation (DOT) 6

V

Ventura Software 39
Virginia Center of Excellence 73
Visionary Software, Inc. 90

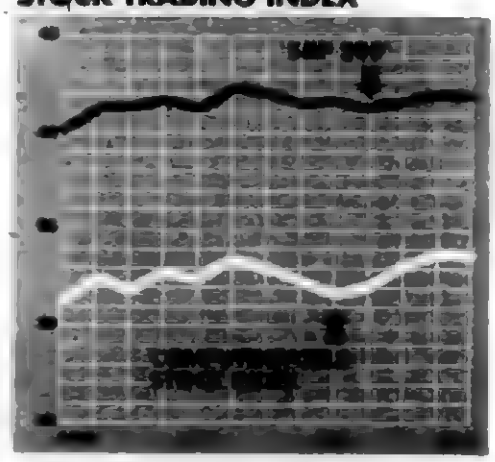
W

Walt Disney Co. 85
Wang Laboratories, Inc. 6,109
Watcom International Corp. 73
Wausau Insurance Cos. 1,30
Wellfleet Communications, Inc. 15
WilTel 63
WordPerfect Corp. 44
WorkGroup Technologies, Inc. 54,109

Z

Zenith 32

STOCK TRADING INDEX



Industry Almanac

SECTOR FOCUS: WORKSTATIONS & SOFTWARE

Laura Conigliaro and Gibbs Moody
Prudential Securities, Inc.
Sept. 10, 1992

Windows New Technology (NT), **Microsoft Corp.**'s (MSFT) high-performance operating system, is expected to elbow its way into the Unix market, possibly stunting or wiping out any growth opportunities for vendors such as **Sun Microsystems, Inc.** (SUNW).

However, NT must first hurdle over a few obstacles.

LAN Manager, a stand-alone product that will be bundled as the networking portion of NT, has so far garnered lukewarm responses from users. Because Windows NT's objective is to target department-level computing and beyond, a more robust LAN Manager — scheduled for delivery at the end of next year — is essential.

LISA DAVIDSON

Software signals

A collection of brokerage firm ratings for selected software stocks

	Alex. Brown & Sons, Inc.	Shearson Lehman Brothers, Inc.
Autodesk, Inc.	Neutral	Neutral
Borland International, Inc.	Buy	Out-perform
Computer Associates International, Inc.	Buy	Neutral
Informix Corp.	Strong buy	Neutral
Interleaf, Inc.	Buy	Under-perform
Microsoft Corp.	Strong buy	Buy
Oracle Corp.	Buy	Neutral
Sybase, Inc.	Neutral	Neutral

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 18, 1992

TOP PERCENT GAINERS

Zeos International Ltd. (L)	69.23
Corporate Software	28.67
Phoenix Technologies	25.81
Planet Corp.	24.07
Pyramid Technology (L)	19.30
Paychex (H)	15.60
EMC Corp.	15.49
Artel Communication Corp. (L)	14.29

TOP PERCENT LOSERS

Amdahl Corp.*	-35.34
Protexon Inc.	-32.50
Symantec Corp. (L)	-30.85
Everex Systems Inc. (L)	-25.00
State of the Art	-24.00
Mace Software	-14.81
Komag Inc.	-14.29
Microcom Inc.	-13.79

TOP DOLLAR GAINERS

Paychex (H)	4.25
Wellfleet Communications (H)	4.13
Novell Inc.*	3.38
Planet Corp.	3.25
Computer Sciences*	2.88
EMC Corp	2.75
Reynolds and Reynolds	2.50
Zeos International Ltd. (L)	2.25

TOP DOLLAR LOSERS

Amdahl Corp.*	-5.13
Protexon Inc.	-4.88
Symantec Corp. (L)	-4.75
IBM*	-4.50
Borland Int'l Inc.*	-4.50
Silicon Graphics	-2.63
Komag Inc.	-2.62
Platinum Technology	-2.00

Exch	52-Week High	52-Week Low		Sept. 18 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 0.79%**
OTC	15.00	8.00	3 COM Corp.*	14.13	0.50	3.67
NYS	70.63	58.25	American Info Techs Corp.*	68.50	0.88	1.29
NYS	44.88	32.88	AT&T*	44.00	0.25	0.57
OTC	4.25	0.75	Artel Communication Corp. (L)	1.00	0.13	14.29
NYS	49.75	40.25	Bell Atlantic Corp.	48.38	-0.25	-0.51
NYS	55.50	43.38	Bellsouth Corp.	52.13	-0.13	-0.24
NYS	6.75	3.75	BOR, Beranek & Newman	4.50	0.00	0.00
NYS	65.88	38.63	Cabletron Systems	62.38	-0.63	-0.99
OTC	31.00	17.50	Chipcom Corp	26.38	0.88	3.43
OTC	55.25	18.63	Cisco Systems Inc. (H)	54.50	1.13	2.11
OTC	35.25	5.75	Compression Labs Inc.	7.25	-0.25	-3.33
OTC	3.38	0.88	Data Switch Corp.	1.75	0.13	7.69
NYS	23.63	14.38	Digital Comm. Assoc.*	14.50	-0.38	-2.52
OTC	15.25	8.00	Digital Systems Int'l Inc.	10.50	0.88	9.09
OTC	9.38	3.63	DSC Communications	9.38	0.63	7.14
OTC	10.88	4.75	Fibronics Int'l Inc.	5.63	0.00	0.00
OTC	37.50	10.50	Planet Corp.	18.75	3.25	24.07
OTC	3.38	1.13	Gandalf Technologies Inc.	2.25	0.13	5.88
OTC	2.25	0.88	Gateway Communications	1.63	-0.06	-3.73
NYS	5.50	2.25	General Datacomm Inds.	3.50	-0.13	-3.46
ASE	5.88	0.50	Go Video	2.38	-0.13	-5.00
NYS	35.75	28.75	GTE Corp.*	33.25	0.13	0.38
NYS	70.63	50.00	ITT Corp	64.25	-0.38	-0.58
OTC	38.25	25.25	MCI Comm. Corp. (H)	35.25	0.00	0.00
OTC	14.50	2.25	Microcom Inc.	3.13	-0.50	-13.79
NYS	18.25	9.50	Network Equipment Tech.*	11.50	-0.38	-3.16
OTC	25.50	8.00	Network General	12.25	0.25	2.08
OTC	20.00	8.50	Network Systems Corp.	12.25	-0.13	-1.01
OTC	18.50	5.63	Newbridge Networks Corp.	18.50	2.13	12.98
NYS	48.25	33.75	Northern Telecom Ltd.*	35.00	0.00	0.00
OTC	65.00	35.50	Novell Inc.*	57.50	3.38	6.24
NYS	88.38	69.13	Nynex Corp.*	83.38	0.63	0.76
OTC	37.50	16.50	Octel Communications Corp.	23.00	0.25	1.10
OTC	9.88	4.00	Penril Data Comm. Netwks.	5.38	-0.13	-2.27
OTC	53.00	10.25	Picturetel Corp.	14.50	-0.25	-1.69
OTC	18.75	9.75	Protexon Inc.	10.13	-4.88	-32.50
NYS	29.50	12.50	Scientific Atlanta Inc. (H)	28.50	-0.63	-2.16
NYS	66.00	53.75	Southwestern Bell Corp.	66.13	0.38	0.57
NYS	26.38	20.75	Sprint Corp.	22.63	-0.38	-1.63
OTC	15.63	4.00	Standard Microsystems Corp.(H)	14.75	-0.38	-2.48
OTC	42.25	14.25	Synoptics Communications (H)	42.00	1.38	3.38
NYS	40.00	32.88	US West Inc.	37.50	-0.63	-1.64
OTC	46.00	24.00	Wellfleet Communications (H)	46.00	4.13	9.85
PC and Workstations						**Up 3.26%**
OTC	14.50	4.00	Advanced Logic Research (L)	4.25	-0.25	-5.56
OTC	70.00	42.75	Apple Computer Inc.*	46.50	-1.13	-2.36
OTC	32.25	11.25	AST Research Inc.*	18.50	1.25	8.20
NYS	19.25	6.75	Commodore Int'l*	7.50	-0.50	-6.25
NYS	35.75	22.13	Compaq Computer Corp.*	34.88	2.00	6.08
OTC	29.00	13.91	Dell Computer Corp.	28.25	1.75	6.60
OTC	7.75	1.50	Everex Systems Inc. (L)	1.50	-0.50	-25.00
NYS	34.00	21.25	Harris Corp.	32.63	1.25	3.98
NYS	85.00	44.63	Hewlett-Packard Co.*	59.50	2.13	3.70
NYS	29.75	14.13	Silicon Graphics	20.25	-2.63	-11.48
OTC	35.88	20.75	Sun Microsystems Inc.*	31.25	0.13	0.40
NYS	31.25	22.25	Tandy Corp.*	24.00	0.00	0.00
NYS	11.13	5.13	Zenith Electronics	8.63	-0.13	-1.85
OTC	26.50	2.75	Zeos International Ltd. (L)	5.50	2.25	69.23
Large Systems						**Off 1.80%**
ASE	20.63	9.38	Amdahl Corp.*	9.38	-5.13	-35.34
NYS	15.50	8.41	Cardion Corp	14.00	-0.13	-0.88
NYS	16.38	5.25	Convex Computer	8.25	-0.13	-1.96
OTC	19.63	1.88	Cray Computer	3.00	0.00	0.00
NYS	52.25	22.75	Cray Research Inc.*	25.88	0.00	0.00
NYS	22.50	7.13	Data General Corp.	10.00	0.38	3.90
NYS	65.50	33.25	Digital Equipment Corp.*	39.38	1.38	3.62
NYS	105.88	81.63	IBM*	83.50	-4.50	-5.11
OTC	13.25	7.50	Kendall Square Research	9.25	0.25	2.78
NYS	121.25	88.25	Matsushita Electronics	98.00	0.00	0.00
OTC	19.75	6.75	Pyramid Technology (L)	8.50	1.38	19.30
OTC	17.88	8.13	Sequent Computer Sys.	16.13	-0.50	-3.01
OTC	18.38	5.00	Sequoia Systems Inc.	8.00	0.00	0.00
NYS	54.25	37.38	Stratus Computer Inc.*	46.38	0.38	0.82
NYS	15.13	9.50	Tandem Computers Inc.*	10.88	-0.25	-2.25
NYS	11.75	3.63	Unisys Corp.*	8.88	0.00	0.00
ASE	7.50	0.25	Wang Labs Inc. (b)*	0.44	-0.06	-12.40
Software						**Off 0.17%**
OTC	66.50	31.50	Adobe Systems Inc. (L)	32.75	0.38	1.16
OTC	13.25	2.50	Ai Corp	3.50	0.13	3.70
OTC	45.00	11.50	Aldus Corp.	13.00	0.25	1.96
OTC	19.75	8.50	American Software Inc.	9.63	-0.50	-4.94
OTC	20.00	9.75	Ask Computer Systems	15.25	-1.00	-6.15
OTC	92.00	23.25	Autodesk Inc	48.50	-1.00	-2.02
OTC	37.75	7.00	Bachman Info. Systems	7.00	-1.00	-12.50
OTC	42.50	31.50	BGS Systems Inc.	38.25	1.75	4.79
OTC	78.00	37.25	BMC Software Inc.	58.75	1.75	3.07
OTC	20.50	9.00	Boole & Babbage	18.88	0.38	2.03
OTC	66.75	35.00	Borland Int'l Inc.*	41.88	-4.50	-9.70
OTC	11.25	3.63	CE Software	4.50	0.38	9.09
ASE	18.63	6.88	Cheyenne Software Inc. (H)	18.63	1.75	10.37
OTC	20.38	6.88	Cognos Inc. (L)	7.25	0.38	5.45
NYS	17.00	7.50	Computer Associates*	15.50	-0.50	-3.13
Peripherals and Subsystems						**Up 0.22%**
OTC	10.00	2.88	Archive Corp.	7.63	0.00	0.00
OTC	26.75	13.50	Banctec Inc. (H)	26.50	0.25	0.95
OTC	23.50	8.63	Cambex Corp.	12.63	0.63	5.21
ASE	12.25	4.91	Cognitronics Corp.	11.50	0.13	1.10
NYS	23.88	12.88	Conner Peripherals*	20.88	-0.75	-3.47
ASE	19.88	4.41	Datarem Corp.	6.25	-0.88	-12.28
NYS	20.50	5.88	EMC Corp.	26.50	2.75	15.49
OTC	8.38	4.75	Emulex Corp.	5.88	0.13	2.17
OTC	23.00	14.25	Evans & Sutherland	16.13	-0.13	-0.77
OTC	40.63	21.00	Exabyte	24.00	0.25	1.05
OTC	27.75	15.75	Intelligent Info. Systems	27.75	2.25	8.82
OTC	11.25	4.75	Iomega Corp.	6.25	0.00	0.00
OTC	34.75	10.25	IPL Systems Inc.	12.50	-0.50	-3.85
OTC	24.50	10.75	Komag Inc.	15.75	-2.63	-14.29
OTC	15.25	3.88	Maxtor Corp.* (H)	14.63	0.75	5.41
OTC	12.63	5.75	Micropolis Corp.	10.25	0.63	6.49
NYS	103.63	86.38	3M Co. (H)	101.25	1.88	1.89
OTC	7.00	3.88	Printronix Inc.	5.00	-0.63	-11.11
NYS	26.75	7.00	QMS Inc.	8.38	-1.00	-10.67
OTC	18.00	8.88	Quantum Corp.	15.00	-0.50	-3.23
OTC	12.75	3.75	Radius Inc. (L)	4.75	0.00	0.00
NYS	12.88	5.38	Recognition Equipment	11.25	0.13	1.12
OTC	13.13	5.38	Rexon Inc.	11.25	1.13	11.11
OTC	17.63	7.25	Seagate Technology*	14.75	-0.25	-1.67
NYS	78.00	28.75	Storage Technology*	29.25	-1.75	-5.65
NYS	25.63	16.00	Tektronix Inc.	21.38	0.88	4.27
NYS	82.25	57.50	Xerox Corp.	78.63	1.88	2.44
Services						**Up 2.57%**
OTC	19.38	11.88	American Mgmt. Systems*	16.75	-0.38	-1.86
NYS	5.38	2.88	Analogic Inc.	3.13	-0.13	-3.85
OTC	19.00	12.50	Analysts Int'l	18.00	0.25	1.41
NYS	49.00	32.50	Auto Data Processing*	47.13	0.25	0.53
NYS	24.16	12.50	Comdisco Inc.*	16.25	0.00	0.00
OTC	13.50	7.75	Computer Horizons	9.25	0.25	2.78
NYS	84.88	57.00	Computer Sciences*	66.75	2.88	4.38
NYS	10.13	7.00	Computer Task Group	8.00	0.50	6.67
OTC	40.50	15.00	CompUSA Inc.	35.00	2.25	6.87
OTC	19.25	6.00	Corporate Software	9.50	2.00	26.67
OTC	30.75	9.25	Egghead Discount Software	9.25	-0.75	-7.50
NYS	33.00	23.38	General Motors E (EDS)*	29.50	-0.88	-1.25
OTC	30.38	6.25	Intelligent Electronics	10.63	0.00	0.00
OTC	14.88	4.00	Maniel	8.13	-1.00	-10.96
OTC	15.75	7.00	Microage Inc.	9.75	-0.38	-3.70
OTC	31.50	17.88	Paychex (H)	31.50	4.25	15.60
NYS	78.50	51.75	Policy Management Sys. (H)	74.00	-0.50	-0.67
NYS	44.63	34.00	Reynolds and Reynolds	44.63	2.50	5.93
OTC	32.00	21.25	SEI Corp.	25.25	-0.25	-0.98
OTC	24.38	16.88	Shared Medical Systems	22.00	1.75	8.64
OTC	30.00	13.50	Sungard Data Systems (H)	29.00	0.50	1.75
NYS	3.63	1.13	Ultimate Corp.	1.88	0.13	8.33

KEY: (H) — New annual high (L) — New annual low
* Companies tracked in Computerworld Stock Index

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IN BRIEF

Amdahl loss likely

■ **Amdahl Corp.** last week said a decline in demand for its new 5995M mainframe is likely to cause an operating loss of between 10 cents and 20 cents a share in its fiscal third quarter, which ends Sept. 25. Revenue is expected to fall below second-quarter levels of $692.9 million, the Sunnyvale, Calif., company said. The depressed global economy was blamed for the company's woes.

■ Looking to expand its services globally, **Lotus Development Corp.** last week acquired three consultancies. The three acquired firms are: **SOMA, Inc.** in Toronto; **PAVOSOFT** in Paderborn, Germany; and **RE/AIMS** in Dallas. All three will operate as part of Lotus Consulting Services. Terms of the acquisitions were not disclosed.

■ **SAP AG**, the parent company of **SAP America, Inc.**, posted profits of $35 million for the first half of the year ended June 30, an increase of 24% from the same period a year earlier. Revenue for the period was up almost 26% to $273 million. SAP's North American operations were cited as a significant contributor to the upbeat results.

Short takes

Proteon, Inc. and **Symantec Corp.** warned analysts that their quarterly results would be below expectations.... **Encore Computer Corp.** completed a two-phase, $150 million financial restructuring with **Gould, Inc.** and its parent company, **Nippon Mining Co.**.... **Proactive Software, Inc.**, a developer of customer service applications, has received $4 million in second-round venture capital financing.... **Intel Corp.** last week announced the first cash dividend in the company's history, a 10 cents per share payout to be distributed on Dec. 1 to shareholders of record as of Nov. 1.

DG makes waves in RAID storage market

Forms new unit dedicated to supplying RAID subsystems for Unix machines from IBM, Sun, HP

BY KIM S. NASH
CW STAFF

NEW YORK — Data General Corp. last week upped the stakes of its hardware-centric survival gambit by forming a new division dedicated to making and selling RAID storage subsystems for other vendors' Unix machines.

At a briefing here, DG Chief Executive Officer Ron Skates outlined plans to storm a virtually untouched market: storage products based on redundant arrays of inexpensive disks (RAID) technology for Unix lines from IBM, Sun Microsystems, Inc. and Hewlett-Packard Co., among others. Skates said the product line, called Clariion, is "a tremendous opportunity" for the Westboro, Mass.-based company. Tom West, senior vice president, will head up the Clariion division.

The subsystems will be sold through value-added resellers, OEMs and distributors, the company said.

The Clariion unit is a smart way to plug a gap between declining MV minicomputer revenue and slowing sales of DG's Unix-based Aviion line of workstations and servers, analysts said. For the most recent quarter, DG reported an $11.7 million loss, compared with $35.6 million in profits last year. Sales dipped from $301 million to $259 million.

Although he declined to reveal sales projections for Clariion, Skates pointed out that more than $22 billion is up for grabs in the storage market, according to Montgomery Securities. When IBM recently rolled out a RAID subsystem for its Application System/400, executives suggested that RAID for the RISC System/6000 is not far behind.

However, Skates said that with DG's head start, "we are confident we can go against anyone who comes along."

"DG is ahead of [RAID] competitors [in the Unix market] by several months. That's a sizable step," agreed Stephen Widen, program director at WorkGroup Technologies, Inc., a consulting firm in Hampton, N.H. Widen said he expects first-year sales of Clariion to range between $150 million and $200 million.

DG's hardware bent stands in contrast to the strategies of other former high rollers in the proprietary minicomputer market, such as Wang Laboratories, Inc. Wang bet on a software/service makeover as its ticket out of the financial basement.

But DG stuck with systems, unveiling its Unix-based Aviion line four years ago. DG has since delved into the storage market with RAID products for Aviion and the proprietary MV line, HADA II and HADA, respectively. However, Clariion is targeted strictly at non-DG machines. Skates explained that the company will essentially become a third-party supplier of RAID for RS/6000 and HP 9000 Series 800 lines, among others.

Storage overkill?

Clariion begs the question of why anyone needs 24G bytes of storage under his desk. Most Unix business applications do not require it, explained Steve Despain, information systems programmer at Celtic Life Insurance Co. in Chicago.

RAID intrigues Despain, but he said, "The application I have on the RS/6000 just doesn't need it because it's not that a big deal if the application goes down." However, the company is seriously considering RAID for an E series AS/400 it plans to buy before the end of the year.

"We're looking at RAID there because we'll be running mission-critical apps," which could include imaging, Despain explained. Indeed, relatively inexpensive deskside RAID could kick-start data-intensive technologies such as imaging and voice recognition, Widen added.

Trumpeting storage

Data General's foray into the third-party RAID market consists of the following:

Clariion disk array

Capacity: Up to 24G bytes.

Price: $28,000 for entry 2.5G-byte/stripe system; $20,000 for add-ons. $46,000 for entry 6G-byte/stripe system; $34,000 for add-ons.

Availability: November for RS/6000, SPARCstation versions. By early 1993 for HP, Unisys Corp., ICL PLC versons.

Clariion tape backup array

Capacity: Up to 20G bytes.

Price: $30,000.

Availability: By early 1993.

Borland/Symantec war over 'secrets' heats up

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. last week claimed that a former Borland employee other than ex-Vice President Gene Wang had transferred confidential information to Symantec Corp., Wang's new place of employ.

Borland released a statement attributed to human resources manager Kim Begley, alleging that Lynn Georganes, Wang's administrative assistant, had twice requested and been granted permission to return to Borland to retrieve "personal items" and files from the Borland computer system.

According to the statement, Georganes copied several files to floppy disks and appeared to delete "numerous" files. After her second access to the system, Georganes was stopped by Scotts Valley police, and the contents of the disks were reviewed, according to the statement.

Begley said she was then informed that the disks contained "Borland confidential information." Georganes could not be reached for comment.

The statement is the latest chapter in the Borland vs. Symantec saga that began two weeks ago when Borland accused Wang of stealing Borland confidential information for Symantec to use [CW, Sept. 7].

Frenzied pursuit

Since that time, Borland has engaged in a faxing frenzy, sending search warrants, court orders and Begley's statement to the press.

Symantec, however, has been relatively silent, sending out nothing more than short, one-page responses to Borland's allegations.

Symantec's only reply came in a statement that said Begley's declaration contained "obvious errors" and was merely "hearsay." The statement did not indicate whether the disks had indeed contained confidential Borland information.

A second hearing Sept. 29 will explore whether Symantec violated a previous temporary restraining order.

PC price dive takes toll; Everex announces layoffs

FREMONT, Calif. — Everex Systems, Inc. further tightened its belt last week, announcing layoffs that analysts said were yet another sign that the personal computer price war is taking its toll.

The company said it would reduce its work force by about 12%, or 250 people worldwide. The layoffs follow closely on the heels of a similar pruning in August and bring the total head count at Everex to about 1,850.

Steve Hui, chief executive officer at Everex, attributed the action to the brutal price wars currently roaring through the PC industry. He said the company would try to sidestep them as much as possible by concentrating on such higher margin areas as networked, fault-tolerant computers. Everex's newly formed Advanced Systems Division was established to further this aim, he said.

The recent low-end PC lines introduced by Apple Computer, Inc. and IBM Personal Computer Co. have further eroded the niche that Everex had successfully mined in the past, said Richard Zwetchkenbaum, an analyst at International Data Corp. "Everex used to push better performance at a lower price," he said. "Now, it's hard for vendors to fly in that atmosphere because the air is getting awfully thin."

CAROL HILDEBRAND

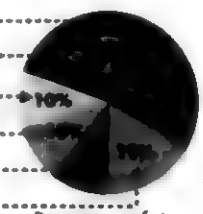
TRENDS

HIGH-PERFORMANCE WORKSTATIONS

U.S. manufacturing sites, which have had a long history of CAD/CAM use, are showing a slight increase in use of commercial applications.

INDUSTRY DISTRIBUTION

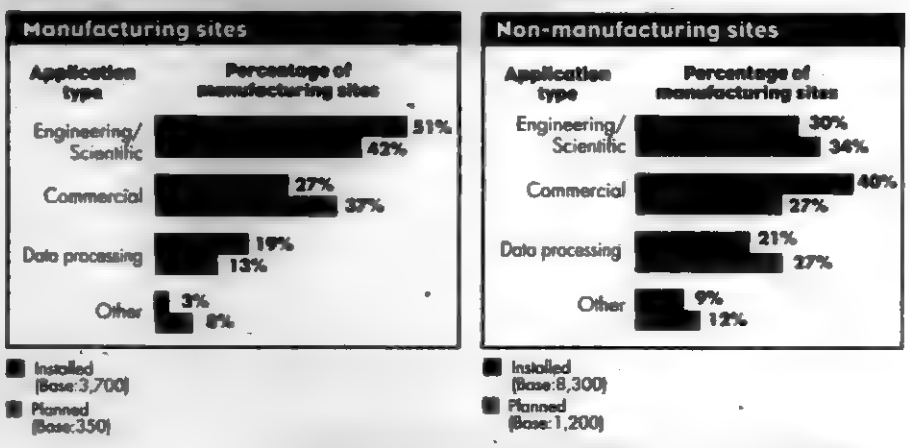
The Top 5 industries heavily using high-performance workstations include:



Percentage of sites (Base: 12,000)

USAGE

About one-fifth of the workstations at both types of sites are used for data processing, which includes application development, computer operations and information management.



TOP 4 APPLICATIONS

Manufacturing	Non-manufacturing
1. CAD/CAM	1. CAD/CAM
2. Engineering	2. Software development
3. Manufacturing	3. Accounts receivable
4. Software development	4. Integrated accounting

Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Stephanie Faucher

NEXT WEEK

Business applications programmers just can't take the PC seriously as a development platform. That's because PCs lack the tools, methodologies and support facilities that make sense for team-oriented developers in large companies. In Depth reveals what developers are pining for so they can take advantage of the easy-to-use PC.

James Yang

The straight line may still be the shortest distance between two points — but it isn't the only path to IS leadership. Witness, for instance, El Segundo, Calif.-based defense and technology player Hughes Aircraft, where some of the leading lights of IS, including Chief Information Officer Jim Wensley, come from non-IS backgrounds. See Manager's Journal.

INSIDE LINES

Universal management

▶ Satisfying its hunger for mainframe-class systems management tools for commercial Unix, Sun is expected today to announce a major deal with Computer Associates. Sources close to the duo confirmed that CA will port its CA-Unicenter suite of integrated systems management applications to the Sun Solaris platform. Deliveries are expected within a year, sources said.

Just leave it under the mat

▶ A bug in CA's License Management Program — the software that prevents CA products from being run on unlicensed mainframes — could prevent some users from turning on the latest release of CA-7 automated scheduling software. Users upgrading to Release 3.0 who are on a CPU license arrangement need a software code or "key" to activate the program. But they don't know that unless they read the documentation. License Management has been a sore point for some CA customers, and hoping to head off the problem, the vendor recently sent a letter to CA-7 users offering the key at no charge over the phone. CA said most of its users have site licenses and won't need a key, but one user said he doesn't want to expose his company's business operations to practices he can't control. Until CA comes up with a different solution, he said he doesn't plan on upgrading to Release 3.0.

Slippery when wet

▶ Mike Maples, Microsoft's executive vice president of worldwide products group, said the company's timetable for a general release of its New Technology (NT) is two to three weeks behind schedule. Maples left the door open for other slips, adding that Microsoft is reviewing feedback from the 14,000 beta-test copies of NT in developers' hands before setting the final ship date. But he was quick to add, "There's no reason to believe it won't ship by around the first of the year."

Chipping away

▶ IBM, Apple and Motorola are reportedly months ahead of schedule in producing the first big fruits of their alliance and could have a working sample of their new microprocessor, the Model 601, out within weeks. The three companies originally thought they could not produce a prototype chip until early next year, but the new development could speed up the entire schedule.

Loaded for Compaq

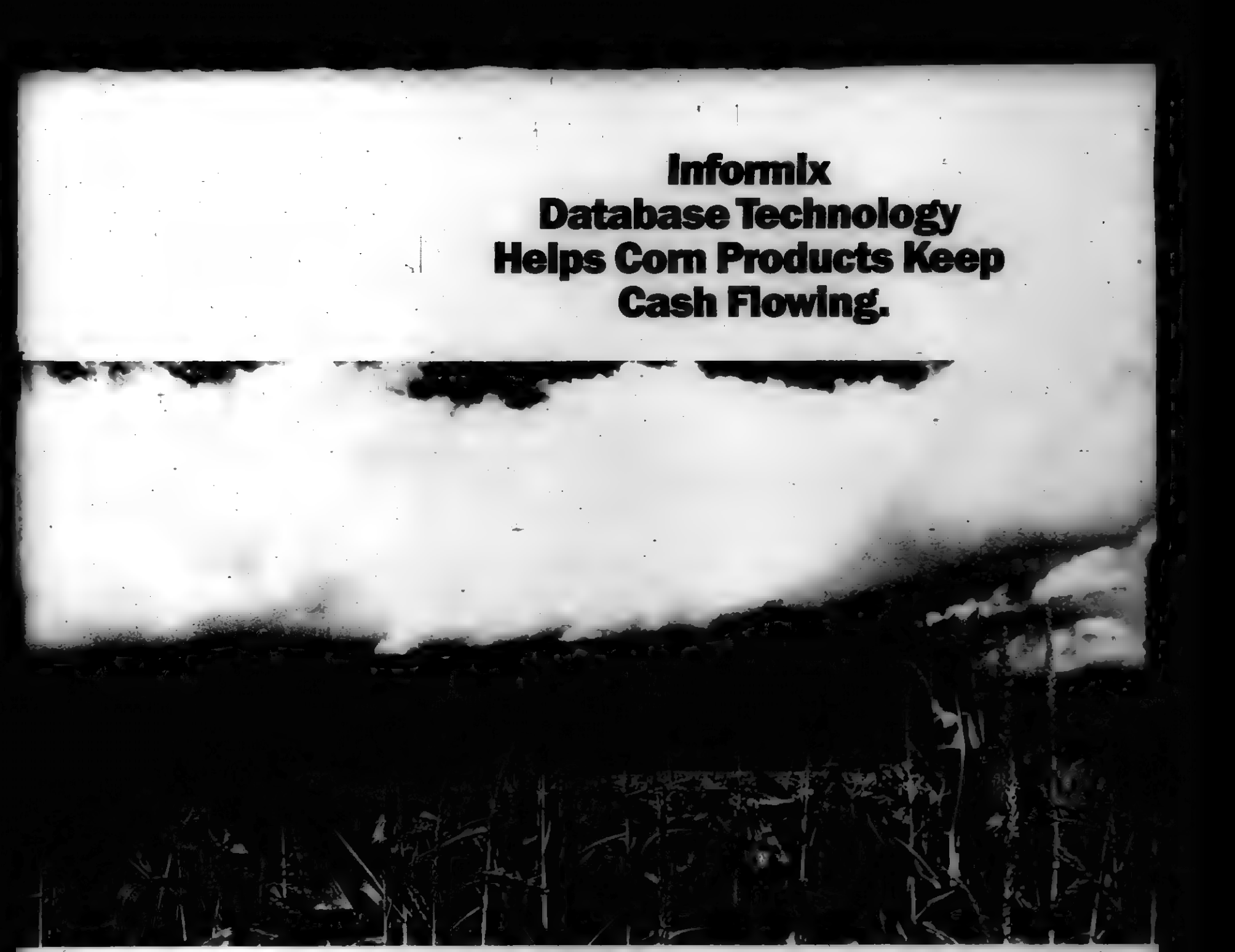
▶ Oct. 6 will likely see the debut of an IBM 486-based color notebook, priced at or below a competitive Compaq product, said one source who has been briefed. Also on the agenda are docking stations for the notebooks. As for the ValuePoint line, IBM isn't talking much, but one source says the machines don't look like anything IBM has put out before. Pricing is expected to be competitive with the clones.

Pink Tide rises at DEC

▶ Layoff and resignation figures for the past quarter at DEC will be released after Sept. 30, with numbers expected to total at least 5,000, according to inside sources. This is double the highest number of departing employees for any previous quarter but only 25% of the total amount of people expected to be axed by the end of 1992, the sources said.

Unix Expo's International Award for Excellence in Open Systems will be a tie this year, sources tell us, with Kmart and Australia's Department of Planning and Housing in Victoria each declared a winner in implementing open systems. Kmart reckons it has saved more than $150 million with its Unix-based Strategic Store Environment, and the Australian agency counts staff savings in excess of $2.1 million a year. Nine companies entered the contest, including Salomon Brothers in New York, the public prosecutor's office in Sydney, Australia, and the Burlington Coat Factory in Lebanon, N.H. The winners take home a glass sculpture from Tiffany's. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

Informix Database Technology Helps Corn Products Keep Cash Flowing.



When Corn Products, a unit of CPC International Inc., needed to move mission-critical accounting functions off the mainframe, they turned to Concepts Dynamic, Inc.—an Informix VAR—and Informix, the experts in UNIX relational technology.

Millions of Dollars in Annual Receivables.

Corn Products, whose corn sweeteners and starches are used in everything from soft drinks to pharmaceuticals, needed to process an enormous amount of cash receivables. They needed a system that would track cash through multiple lock boxes and automatically reconcile financial transactions to multiple receivable ledgers.

Corn Products chose the CDI/Informix UNIX solution.

Replacing Mainframe Collections Software.

Corn Products chose Concepts Dynamic's Credit Management System to achieve complicated receivables processing goals. By using CDI, Corn Products' customer invoices are fed into receivables with full data validation, audit trails, and financial control. And CDI replaces mainframe collections software with a cost-effective, flexible UNIX solution.

Corn Products and thousands of other companies have called on Informix and Informix VARs to successfully handle their critical data.

If you're considering UNIX for data management, talk to Informix. Because we're the experts.

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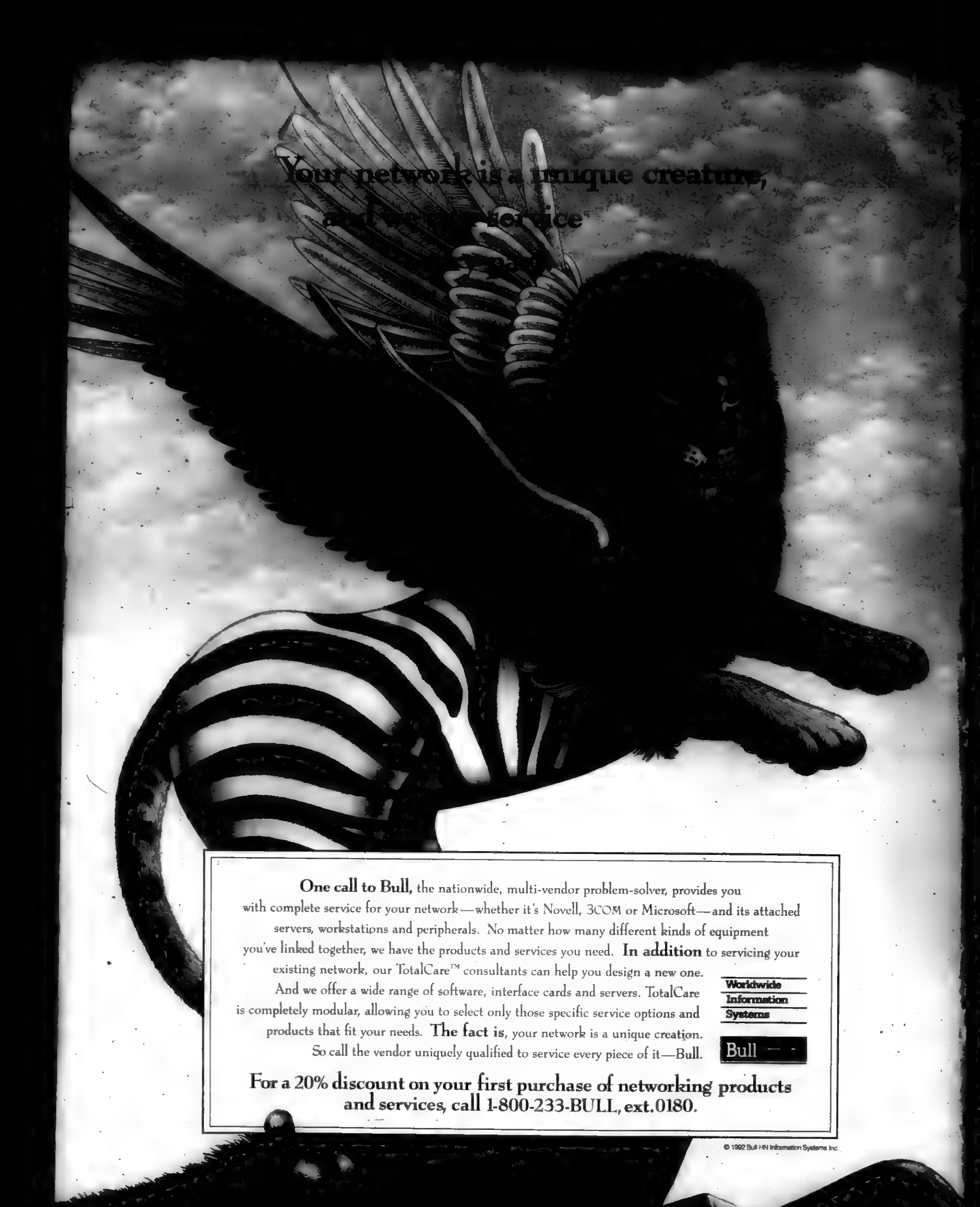

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COMPUTERWORLD

Brand loyalty no longer name of the game in PCs

BY CAROL HILDEBRAND
CW STAFF

Having reached pricing parity with their new lines of personal computers, IBM and Compaq Computer Corp. now face another hurdle: savvy users who are no longer willing to stick with one vendor based on name alone.

The two companies have embarked on somewhat similar strategies aimed at bumping up volume through a three-pronged attack that will sell differently configured PC lines through various distribution channels, but users said adding value to the mix is vital.

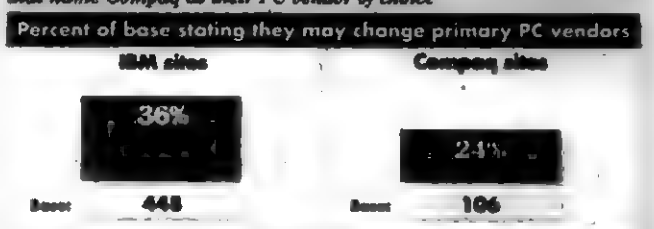
"I have end users who would rather have clones than an IBM machine," said Ben Berry, manager of computer services at Hughes Aircraft Co. "The company has just been in a position of negative mind share for so long that users shy away from it now in many cases."

One thing is certain: Brand-name loyalty is largely a thing of the past. These days, users expect a lot more than a big name to secure their fidelity. For example, the two companies' previous insistence on taking the high-margin road with their products had users walking away in hordes; it will take a lot more to bring them back.

Continued on page 8

Changing allegiances

Of the sites surveyed that consider IBM their primary PC vendor, 36% may look for a new PC vendor next year, compared with 24% of the sites that name Compaq as their PC vendor of choice



Source: CW Database Division — CW Chart: Michael Siggins

AIX users get CICS

IBM brings transaction processing to RS/6000

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — IBM pasted a "Ready for Commercial Prime Time" label on its RISC System/6000s last week by moving the mainframe world's premier transaction-processing software to the Unix-based workstation and server line.

With the introduction of the AIX version of CICS, IBM broadcast the message that it will not sit idly by while competitors hitch a ride on the downsizing trend at IBM's expense. Reinforcing that point was the unveiling of several other transaction-processing software products for AIX, a pair of powerful new RS/6000 models and additional AIX software (see story page 12).

"If there was any doubt in your mind, the fact that we have CICS on AIX does show we're deadly serious about Unix," said Jeff Mason, IBM's director of advanced workstations and AIX systems. "This is a great opportunity for our mainframe CICS customers to take their next CICS application and try it on a 6000."

The AIX CICS/6000 product is scheduled to ship in June 1993 at prices ranging from $3,700 to $29,600. It is built on the Open Software Foundation's Distributed Computing Environment and Transarc Corp.'s Encina on-line transaction-processing technology.

At a glance

- The **Customer Information Control System** is a software subsystem that allows businesses to run on-line transaction processing applications, such as those used by banks to access information in large databases.
- IBM counts 36,000 licenses sold for CICS, which is installed in 490 of IBM's 500 largest accounts.
- 300,000 programmers have been trained in CICS application programming.
- More than 1 billion lines of CICS code are on the market today.
- Key feature of AIX CICS/6000: support for the CICS family application programming interface.

The entire suite of new AIX products — several to be available in December — is based on emerging and de facto industry standard technologies from

Continued on page 12

Palmer to shuffle DEC market plans

Changes expected to reshape business units

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. Chief Executive Officer-elect Robert Palmer is expected on Thursday to detail sweeping structural changes intended to snap the listless minicomputer maker back into shape.

Late last week, DEC's upper management was said to be considering a number of proposals, including stealing a page from IBM by establishing customer-driven global business units in areas such as direct merchandising and multivendor services.

Winning 'em back

But as Palmer settles into his new job this week, one of the first things he may need to do is woo back users disgruntled by the consequences of the ongoing layoffs of DEC service representatives — cuts that have been accelerating during the past month.

"They have not only been cutting people, but [they] seem to users to be taking the best away, leaving behind those who are not as technically qualified or who do not follow up on things," said Bill Mayhew, chairman of the Digital Equipment Computer Users Society Business Practices Special Interest Group Ser-

Continued on page 10

Perot loses prospect to former exec

Railroad taps Feld to lead client/server charge

BY MARK HALPER
CW STAFF

FORT WORTH, Texas — After rejecting an outsourcing pitch from Perot Systems Corp., transportation giant Burlington Northern, Inc. has tapped recent Perot resignee Charles Feld to guide it through an estimated multimillion-dollar information systems overhaul.

Feld, who left Perot earlier this month to restart his own consulting business [CW, Sept. 21], said last week that his departure was not related to his Burlington Northern win — a contract that effectively establishes him as interim chief information officer at the $4.5 billion company.

"I assumed when I left Perot that I could work honorably anywhere in the country, except at Burlington Northern," Feld said, claiming Perot executives encouraged him to accept the Burlington job after their contract bid failed.

Burlington Northern's Robert Brydges, assistant vice president of computer operations, said Feld essentially replaces former CIO Robert Hanson, who left earlier this year. "It's a unique arrangement — he's a contract CIO, so to speak," Brydges observed.

"We're trying to build their business based on getting in and getting out as quickly as possi-

Continued on page 16

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ISSC turns to renowned CIO

BY NELL MARGOLIS
CW STAFF

TARRYTOWN, N.Y. — A year after one of the largest mergers in U.S. banking made his high-flying job history, former Security Pacific Corp. information systems chief John P. Singleton last week touched down in the executive suite of IBM outsourcing subsidiary Integrated Systems Solutions Corp.

Earlier this month, according to ISSC Marketing Vice President Lane Jorgensen, Singleton quietly moved into place as general manager of business development. The newly minted post places him among the firm's top honchos reporting directly to President Dennie M. Welsh.

In his new role, Singleton will be called on to leverage marketing acuity and an eye for the relationship between business and

Continued on page 20

INSIDE

Unix devotees intrigued by native NetWare. Page 4.

Users like AS/400 hardware but question IBM estimates. Page 4.

Compaq sets segmented server strategy. Page 8.

Sun, CA align on Unix systems management. Page 12.

In Depth — Why are large system developers shunning the PC? Page 85.

EXECUTIVE BRIEFING

September 28, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

PC HARDWARE

WHO'S CHOOSING WHOM? With users no longer blindly loyal, PC heavyweights must toss other lures to would-be buyers besides a good name. *Page 1*

COMPAQ'S DUAL SERVER is aimed at both the high end and the mainstream volume market. *Page 8*

IBM NAILS DOWN PART 2 of its three-pronged PC strategy with a revamped PS/2 line. *Page 8*

THE USUAL SUSPECTS HAVE COME OUT behind Intel's new 33-MHz I486SX chip. *Page 8*

THE PEN-BASED MARKET, slow to develop, tries to recast itself with more of a mobile slant. *Page 15*

HEALTH CARE SUPPLIES MAKER tells how leasing brought order to threatened PC chaos. *Page 42*

MICROSOFT'S WINDOWS SOUND SYSTEM has the stuff to make corporate users take their first steps toward multimedia. *Page 37*

MANAGEMENT

THE ROAD TO IS LEADERSHIP isn't necessarily through IS at Hughes Aircraft, which appoints non-IS professionals to IS leadership posts, reasoning that they know better what users need. *Page 87*

IS OUTSOURCING FADING AWAY? No way, say consultants: It's getting bigger, broader and more attractive to financially stable firms that are looking to leap into advanced technologies without losing focus on core businesses. *Page 88*

INDUSTRY

DEC CONSIDERS HOW BEST TO STRUCTURE itself in its bid to push forward, as users respond to service layoffs. *Page 1*

U.S. REP. MAJOR OWENS (D-N.Y.) says that Section 1706 discriminates against minority contractors and should be repealed. *Page 33*

ORACLE POSTS $307 MILLION in first-quarter revenue, an increase of 25% over the previous year. But revenue was offset by a onetime accounting charge, resulting in a $33.5 million loss. *Page 109*

PAUL GILLIN APPLAUDS the new, more user-oriented FCC. *Page 32*

ANTIVIRUS SOFTWARE MAKER MCAFEE ASSOCIATES plans an initial public offering next month. *Page 109*

OUTSOURCING

OUTSOURCING IS BECOMING MORE ATTRACTIVE to financially stable firms that want to get into advanced technologies without losing focus on core business, experts say. *Page 88*

BURLINGTON NORTHERN SCOTCHES the idea of outsourcing with Perot Systems but taps a former Perot executive to help with an IS overhaul. *Page 1*

EDS WINS A MULTIMILLION-DOLLAR CONTRACT renewal to process Medicaid claims for the state of California, but the state's fiscal crisis makes much of the job conditional. *Page 16*

DATABASE MANAGEMENT

▶Inaccurate, outdated, corrupted and missing data is becoming a major problem as businesses become more information-dependent and key functions are downsized to more vulnerable platforms. *Page 81*

▶Pyramid and Sequent say they will support Oracle 7's parallel server option, an offering that allows multiple copies of Oracle to share the same set of disk drives. *Page 69*

▶Cognos upgrades Impromptu, its SQL query tool for Windows. *Page 77*

APPLICATION DEVELOPMENT

▶The need to drag old host-based systems into a client/server world puts the state of North Carolina out front in terms of state government use of CASE. *Page 6*

▶Business applications coders can't take PCs seriously as development platforms because the machines lack the tools, methodologies and support facilities these developers need. *Page 85*

▶The recent Software Development Fall '92 show indicates developers are focusing more on management issues and less on technology glitz. *Page 75*

▶Software AG is well under way with its move to client/server computing, but users say its work is far from done. *Page 70*

▶Powersoft has teamed up with several big-name CASE makers in alliances to lure users who want to build client/server applications. *Page 75*

UNIX

▶IBM brings its market-leading transaction processing software to the Unix-based RS/6000 platform, broadening downsizing options for its own customer base and giving competitors another hurdle to jump when luring IBM users to other Unix platforms. *Page 1*

▶As expected, Computer Associates will port its CA-Unicenter systems management software onto Sun Microsystems' Unix-based Solaris environment. *Page 12*

▶Univel's UnixWare, due out at Networld in mid-October, raised a faint cheer from users at a chapter meeting of Novell Users International. Users say they like the UnixWare concept of integrating Unix-based application servers with Novell NetWare servers; however, they say they want freedom to choose their own Unix — not necessarily Univel's client/server platform, Unix System V, Release 4.2. *Page 4*

INTERNETWORKING

▶Users are starting to pay attention to how routers are put together, as issues such as fault tolerance, performance and scalability grow. *Page 59*

▶Combat heats up in the ripe low-end internetworking market as Hewlett-Packard and other vendors continue to hone inexpensive products for far-flung corporate sites. *Page 14*

▶Network General introduces a new version of Sniffer that helps users analyze and fine-tune LAN-to-LAN router connections. *Page 60*

▶DEC and Systems Center are joining up to offer networking tools that better integrate SNA and DECnet networks. *Page 61*

LANS

▶The rapid growth of wireless data networking is raising questions about security and reliability. *Page 59*

▶At their association's conference, Banyan users applauded the company's new receptiveness, open platform strategy and management team. *Page 14*

▶Banyan users are generally happy with the company's direction but last week peppered executives with a list of technology requests and a nagging pricing complaint. *Page 14*

▶Consultant Robert Stearns talks about the Pinocchio Syndrome, or fibs that vendors tell. *Page 33*

STORAGE

▶Micro Technology countersues DEC, seeking to validate its position in a dispute over whether the latter has the right to license storage technology. *Page 109*

▶A quick study of a few key angles can help you make a wise decision about which storage media — RAID or DASD — is right for your business. *Page 71*

▶Tiny 2½-in. disk drives have passed 200M bytes in capacity and are rapidly going higher. *Page 28*

Company index appears on page 107

Midrange
• Unexpected upgrades forced on some AS/400 users is a sticking point, says an Aberdeen Group survey 4

Graphical information systems
• Federal officials are relying on donated GIS software to generate daily maps that track a variety of Hurricane Andrew relief operations ... 49

Project management
• Project management software helps Chemical Bank streamline its retail banking systems integration efforts with Manufacturers Hanover Trust 50

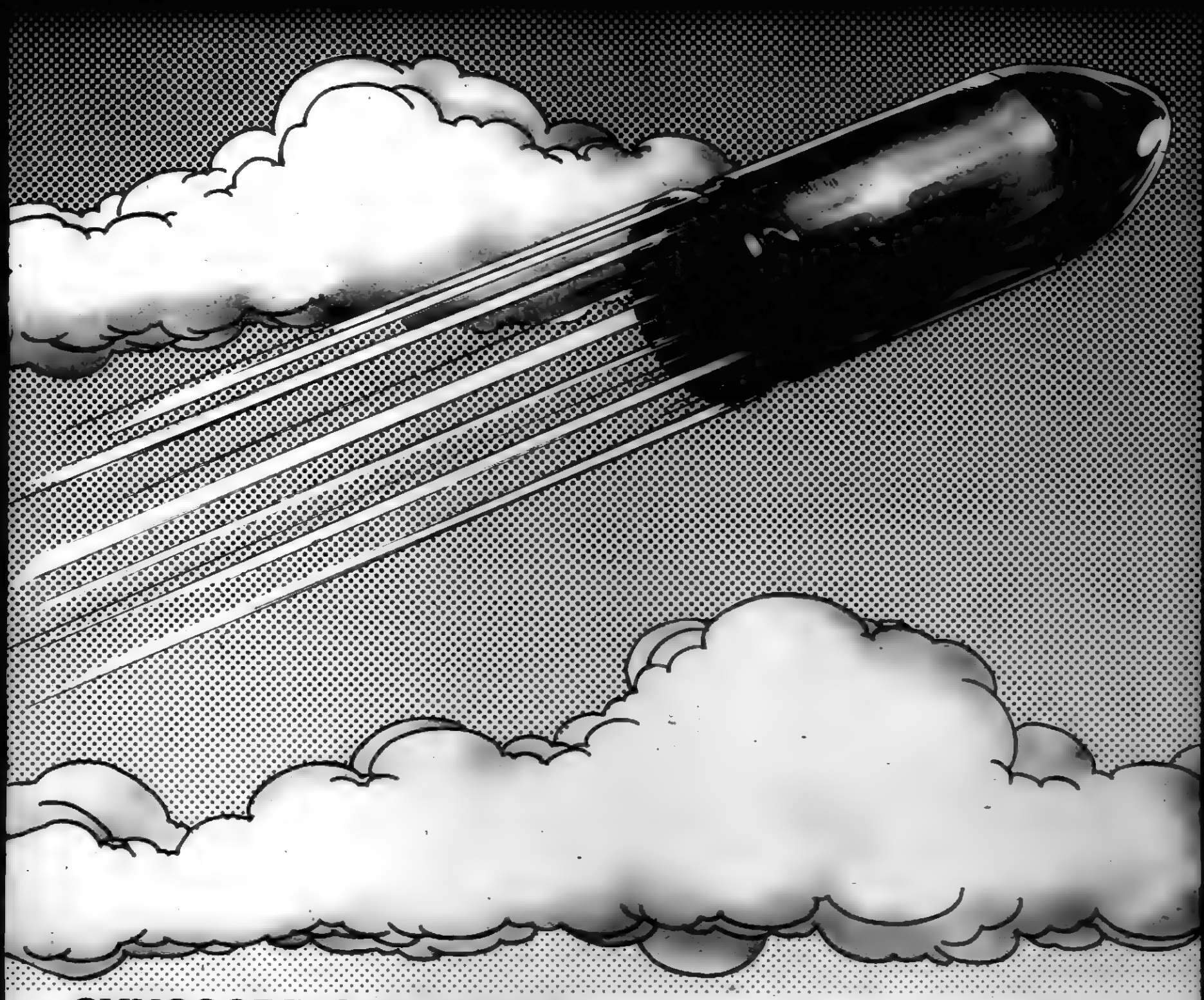
Imaging
• Automatic signature verification has been slow to catch on. Procrastination and cost-justification problems are at the heart of the issue 28
• New products featured at Imaging Expo. 54

PC software
• Jesse Berst gives points to consider before you take your Windows machine on the road 38
• Seybold San Francisco offers products for the future of electronic publishing 24
• October is a busy month on the virus front, with several new — but rare — strains emerging 37

Training
• If your firm's budget doesn't allow for training this year, you might consider volunteering your IS skills to a nonprofit organization. They benefit from your expertise, and you benefit from broadening your skills in areas that you don't have exposure to in your day job 94

Advertising trends
• Advertising consultant explores ad trends in the computer industry and how they might affect a buyer 103

Departments
• Advanced Technology 28
• Application Development 75
• Calendar 93
• Computer Careers 94
• Computer Industry 109
• Desktop Computing 37
• Editorial/Viewpoint 32, 33
• Enterprise Networking 59
• Executive Report 81
• Friday Stock Ticker 108
• In Depth 85
• Inside Lines 110
• Large Systems 69
• Manager's Journal 87
• Marketplace 103
• News Shorts 6,16
• WYSIWYG 110



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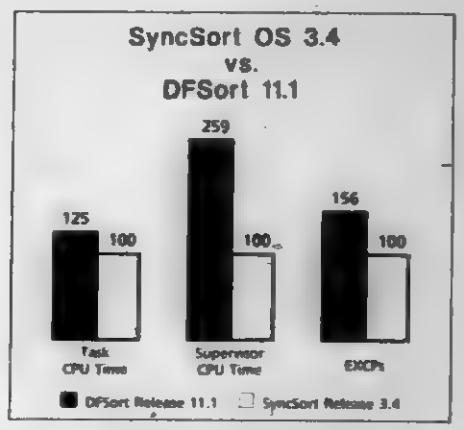

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Upgrades, service top AS/400 users' concerns

BY KIM S. NASH
CW STAFF

In 1989, IBM representatives advised LensCrafters to start its Application System/400 setup with three B models. But the Cincinnati-based eyeglass maker immediately found the machines to be slow and otherwise inadequate and has since had to upgrade every year.

"That's sooner than we thought, for sure," said Eric Bergeron, programmer/analyst. "We've continually been right on the border of having to use the biggest AS/400s as they evolved," he explained.

Such undersizing problems are common, according to a recent survey of 300 AS/400 users conducted by Aberdeen Group, a research firm in Boston. In fact, the most common cause for users to upgrade systems early on is inaccurate sizing estimates made by suppliers, the survey said.

Forty percent of the 240 people who received estimates from IBM said they were wrong — too small — 94% of the time.

Some users said they think they have the situation figured out. IBM's tiered pricing scheme means each hardware upgrade puts more money in its pockets. IBM responded that users are "consistently honing their competitiveness . . . with advanced applications" that may require upgrades.

The Aberdeen survey unearthed many users who do not fully trust IBM for an upgrade, according to John Logan, executive vice president. They wait as long as possible, wringing as much as they can from current systems, then buy only incrementally bigger models, he explained.

Almost half of the respondents said they plan to upgrade within 12 months. This compares with 43% who said they upgraded during the past 48 months. This expected jump in business is in part because of capacity in installed systems "hitting a breaking point," Logan said.

"These people have been left with a very bad taste in their mouth," he said, referring to fears that IBM will underestimate the size processor that users need, forcing them to upgrade to a bigger, more expensive system in only a few months.

Still selling

Overall, the survey was positive. The brisk-selling AS/400 earned top grades in several areas, including hardware-related performance pieces such as CPU, printers and hardware support (see chart).

Westinghouse Security Electronics, based in Santa Clara, Calif., has been "quite pleased" with its Model E35 performance, said Peggy Payne, information systems manager. Payne said she liked the line's scalability, which makes for economic pricing. "I've never dealt with a better-run IBM division," she said.

Those users polled also expressed concern and sometimes anger regarding networking and support issues, including the following:

- **Local service.** IBM's restructuring resulted in the loss of some experienced technical people, which left some users in a pinch, according to Aberdeen Group.

"Local branches are doing as well as they can, but they lack the quality people they had a couple years ago," said Rodger Peck, former president of Common, a large IBM user group.

- **Training.** The versatility of the AS/400 operating system can also cause problems for those not well-versed in its functionality, Aberdeen Group found. IBM needs to focus on providing specialists in key areas to help users through unique situations, according to Logan.

Making the grade

AS/400 users like key features such as the CPU and OS/400 but gave lower grades to CASE, network management and training

Hardware	
CPU	A
Disk drives	B
Tape drives	C
Printers	B

Software	
OS/400 operating system	A-
OS/400 relational database	B+
Network management	C
CASE	C

Support	
Hardware support	A
Software support	B
Programmer training	C+
Systems management training	C+

Based on a survey of 300 AS/400 users

Source: Aberdeen Group

Unix for NetWare set for launch

Targets business users who view Unix as top platform for business apps

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Univel plans to announce its UnixWare family of client/server products at the Networld '92 show in Dallas the week of Oct. 13, Univel President Joseph Applebaum told a group of interested but cautious Novell, Inc. users last week.

A joint venture formed by Novell and Unix System Laboratories, Inc. (USL) late last year [CW, Dec. 16, 1991], Univel is eyeing the burgeoning trend in downsizing host applications to department local-area network servers, said John Kiger, Univel's manager of product architecture.

At last week's meeting of the Northeast chapter of NetWare Users International, LAN administrators got a preview of Univel's upcoming UnixWare Enterprise Computing family, founded on the UnixWare Application Server and UnixWare Personal Edition products. The client/server system, based on USL's Unix 4.2, features built-in access to Novell's NetWare servers via Novell networking protocols.

The idea is for users to continue using NetWare servers for file- and printer-sharing and IBM host access while making use of Unix 4.2's multiuser power, fault tolerance and business-friendly features, Kiger said.

Against all odds

UnixWare allows Novell to hedge its bets against the potential loss of business users who see Unix, rather than NetWare, as the optimal platform for running critical business applications, said Marc Trachtenberg, director of technology at New York-based Novell value-added reseller NetLAN, Inc. The question is whether UnixWare can make a dent outside the NetWare installed base — particularly among users who are already seriously committed to running their business applications on Unix, he added.

LAN administrators at last week's conference expressed a cautious interest in Univel's presentation. One manager questioned whether his company could cost-justify bringing Unix into a NetWare environment, particularly from a training and support standpoint.

USL has been grooming Unix 4.2 to appeal to LAN business users, with introductions during the past year offering business-oriented features such as a Motif-based graphical user interface to shield users from the complexities of Unix commands and Veritas, USL's fault-tolerant, remotely managed file system.

UnixWare further sweetens the pot with support for existing MS-DOS, DR DOS and Microsoft Corp. Windows applications; support for popular SQL-based database management systems such as Oracle Corp.'s Oracle; and transparent integration of NetWare and Unix files.

And by equipping Unix 4.2 with native support of Novell's IPX/SPX and NetWare Core Protocol (NCP), USL hopes to gain a firm niche in Novell's huge installed base of business LAN users, Trachtenberg said.

Doubts claims

Nevertheless, Jose Menendez, a senior systems analyst at Montefiore Medical Center in New York, spoke for several LAN managers when he said, "What brand of Unix and box we choose depends on what the [application vendor] recommends." Based on experience, Menendez expressed skepticism about Univel's claims that UnixWare will run "thousands" of existing Unix and DOS applications. "We don't want to have to tweak [an application] for it to run," he said.

USL competitor The Santa Cruz Operation (SCO) plans to have built-in IPX for the next release of its Open Desktop product due out in a few months, an SCO spokeswoman said. Built-in support of NCP will also be announced in the near term, possibly at Networld, she added.

Univel's UnixWare will compete directly against Microsoft's Windows New Technology (NT) for users who want their servers to support Windows 3.1 applications, NetWare "and Unix for on-line transaction processing, database management and SQL" queries, Trachtenberg said. "Our clients are taking a wait-and-see attitude with both" NT and UnixWare, he added.

For example, New York Hospital is one of many organizations with mixed NetWare and Unix systems that are going to Transmission Control Protocol/Internet Protocol rather than IPX as their common LAN protocol, said Paul Epstein, a data network manager at the hospital.

It is also questionable whether Novell will sit still while its servers are relegated to file- and print-server status. With popular database vendors such as Oracle, Gupta Technologies, Inc. and Informix Corp. supplying NetWare Loadable Modules and the upcoming System Fault Tol-

UnixWare revealed

At the foundation of Univel's Unix/NetWare environment are the following:

UnixWare Personal Edition:

Operating environment: *Single-user, multitasking Unix 4.2 with DR DOS, MS-DOS and Windows sessions supported.*

NetWare links: *Built-in IPX/SPX and NetWare Control Protocol.*

Unix links: *TCP/IP and Network File System (NFS) optional.*

User interface: *Mouse-driven, windows-based with Open Look or the Open Software Foundation's Motif's look and feel, plus drag-and-drop features.*

UnixWare Application Server:

Operating environment: Multiuser Unix 4.2; 386, 33 MHz with 120M-byte hard disk minimum.

User interface: X Window System or character-based.

NetWare links: Same as Personal Edition, plus IPX router, terminal services for DOS (NetWare Virtual Terminal).

Unix Links: NFS, TCP/IP built in.

Options include: NetWare-compatible file- and print-sharing among servers; encryption; and USL's Veritas fault-tolerant file and file administration system.

erance III (SFT 3) Version 3 designed to support disk-mirroring, "we can provide support of mission-critical applications, too," Novell spokesman Ed Martinson said. "So maybe Unix will have the same functionality but at a higher cost." He said SFT 3 is due out early next year.

Concurrent with the UnixWare announcement, a group of third parties will announce supporting products, including software, to enable UnixWare clients to transparently access services such as NetWare for SAA, Novell's gateway to IBM's Systems Application Architecture systems, Applebaum said.

The price of UnixWare will be "competitive with Unix but not lower than Windows," Applebaum said.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

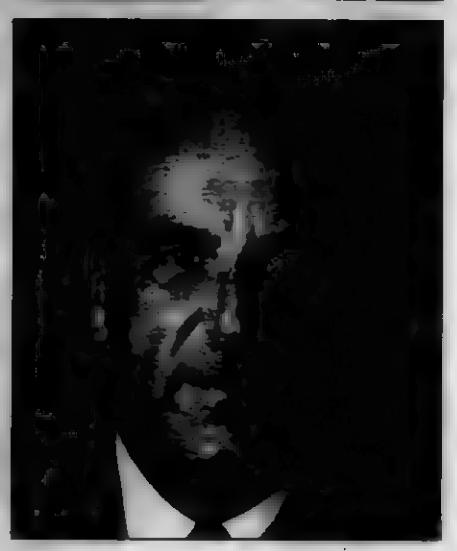
Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation

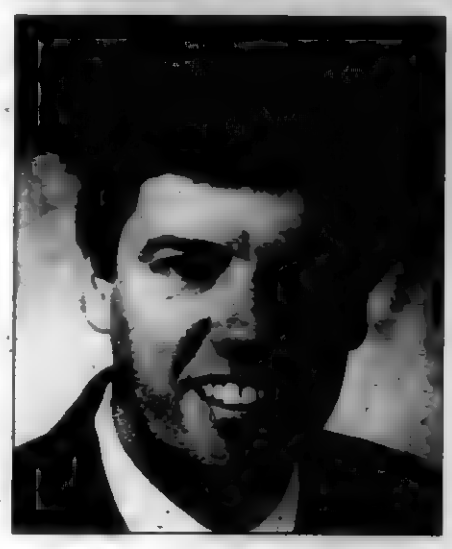


"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.



The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision making by making access to information easier. . . much easier.

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NEWS SHORTS

Wang layoffs total 2,000

Chapter 11-protected Wang Laboratories, Inc. will have laid off 2,000 workers by the end of this month, with most cuts made in the U.S. Some of the planned 5,000 employee reductions have been delayed to comply with local laws and to meet customer commitments, a spokesman said. The company also warned that costs associated with Chapter 11 restructuring will result in a "sizable" loss for fiscal 1992. Separately, Wang announced it will put imaging applications on and resell the latest high-end IBM RISC System/6000 servers.

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Service firm sues Unisys

Datasat, Inc., a San Diego-based third-party maintenance company, has filed an antitrust lawsuit against Unisys Corp. The lawsuit, filed last week in U.S. District Court in San Diego, alleges that Unisys has forced its mainframe computer customers to buy maintenance service contracts and equipment from Unisys as part of its systems software licensing practice. A lawyer representing Datasat said the suit seeks "tens of millions of dollars" in damages.

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Sun backed suit against OSF

The Open Software Foundation (OSF) last week publicized court documents showing Sun Microsystems, Inc. as the financial backer in a 1991 lawsuit that Addamax Corp. in Champaign, Ill., filed against the OSF. Sun confirmed that it is assisting Addamax, a small security software firm, with a $7.5 million line of bank credit to fund its legal expenses. Addamax's antitrust lawsuit, still pending in U.S. District Court in Boston, accuses the OSF, Digital Equipment Corp. and Hewlett-Packard Co. of conspiring to fix software prices.

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HP net management to go low cost

HP is expected next week to introduce HP OpenView Interconnect Lite, a low-cost, Unix-based software application that will enable users to manage multivendor Token Ring and Ethernet networks via Simple Network Management Protocol (SNMP) and the OSF's Distributed Management Environment (DME) graphical user interface, HP said. Available Nov. 1, it will be priced at $10,000, according to the company.

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Lotus kills Windows app suite

Lotus Development Corp. last week said it has ended an unannounced effort to develop a Windows version of its Lotus Works application software suite. The raging personal computer price wars — and market research indicating that Windows users preferred full-blown applications — made Lotus realize it should spend its research and development dollars on more fruitful endeavors, a company spokesman said. Lotus will continue offering a DOS version of Works, he added.

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Short takes

Candle Corp. in Los Angeles said last week it had developed a Posix-compliant software layer for use with IBM's MVS mainframe operating system. The layer will allow Candle to develop cross-platform management products. . . . Shareholders of **AICorp.** in Waltham, Mass., are set to vote Wednesday on the company's proposed merger with Palo Alto, Calif.-based **Aion Corp.** . . . **Unisys'** defense subsidiary, **Paramax Systems Corp.**, has been awarded a $69 million contract from the Federal Aviation Administration to provide software and software re-engineering support for the FAA's Terminal Software Development program. . . . **Unisys** and the **Wollongong Group, Inc.** have signed a deal that grants Unisys a worldwide license to market its own version of Wollongong's SNMP-based management system. . . . **Cabletron Systems, Inc.** in Rochester, N.H., announced that it is working with the **OSF** to develop network management applications that will conform to the OSF's DME. . . . **Information Resources, Inc.** has reportedly ported its Unix-based executive information system software to the Sun platform.

More news shorts on page 16

Coming of (technology) age

North Carolina battles to move off ancient systems to reach cutting edge

BY KIM S. NASH
CW STAFF

RALEIGH, N.C. — The last staff member who knew anything about the Mohawk Data Sciences minicomputer running North Carolina's statewide accounting system quit in June. Now, not only is the decade-old machine on the verge of keeling over, but the one person who could perform triage is no longer around.

The same state that boasts achievement awards for telecommunications and overall information systems structure is nearly archaic in other technology areas. For instance, the Department of Transportation's mainframe-based highway tracking system was written in assembler 20 years ago and is virtually incomprehensible to today's staff.

"Our current [accounting] systems are so old they could die at any minute," said Tom Runkle, deputy state controller for information resources management. "It's hair-raising."

Pinching pennies

Despite the need to quickly update some of these systems, an ever-slimmer budget has forced the state to plan carefully for the future. That so far has included shaving IS staff by laying off six of 60 programmers in the last year. "We can't afford to do a lot of hiring, so we have to make sure everything we do from now on is as lean as can be," Runkle explained.

One key piece of its strategy is a recent $1 million investment in computer-aided software engineering (CASE) tools from Andersen Consulting in Chicago. Foundation for Cooperative Processing (FCP), a workbench for building client/server applications, is being used to pull accounting, transportation and other dangerously old systems into the future.

The state has been doing traditional mainframe-based development since 1989 with Foundation, Andersen's original workbench. That alone puts it several steps ahead of other states when it comes to CASE, said Dale Nelson, president of the National Association of State Information Resource Executives, a group of government IS leaders based in Lexington, Ky.

A set of stringent technology laws passed by North Carolina's general assembly predicated the FCP purchase (see chart). Effective Sept. 1, the laws mandate a minimum level of technologic uniformity across the state. Ultimately, all key systems will talk to one other, regardless of the hardware on which they reside. That is a big reason the state stuck with Andersen.

Another is the client/server direction the state is taking. Outside consultants drew up blueprints in 1991 for a $1.6 million, 90-user system to track construction projects on the state's 77,000 miles of highways. They suggested revamping the IBM 3090 mainframe-based system to run in client/server mode — a concept now coming to life. Analysis and design are complete, and code generation is under way.

Simpler, less expensive projects such as non-mission-critical pilots might have eased the state into client/server CASE, but it does not have the luxury of time.

At first, the prospect of designing for client/server "posed serious problems," said Stephen Arrants, MIS director. The client/server development experience of North Carolina's programming staff totaled "zero," according to Runkle. As Arrants put it: "We definitely had a business problem in search of a technology."

After searching for an integrated tool set that met client/server needs, the state landed back at Andersen's door, buying an FCP starter kit. The kit included products, training and onsite support on a real-life project.

Progress has been steady, with two large, time-sensitive applications due to be deployed soon. So far, $150,000 to $200,000 has been spent on refreshing the old accounting system with graphical front ends. Plus, the client/server highway management system is on track for initial delivery within six months. It will run over 55 local-area networks anchored with IBM OS/2 servers and personal computer clients.

But there was a glitch in the beginning. FCP requires that business logic models be developed in the C language, which none of North Carolina's programmers knew. So they had to contend with dual training in C and the Andersen product. "The boot camp wasn't a practice exercise; we made real things happen fast," Arrants said.

The menu-driven FCP insulates the programmer from the nitty-gritty of coding graphical user interfaces, Arrants said. "Everyone bought in quickly once they saw the fast results."

Thou shalt ...

The General Assembly of North Carolina passed eight laws on Sept. 1 to unify IS across all 22 state agencies. A new executive-level technology committee must do the following:

1. Publish a statewide information technology strategy.
2. Report annually on statewide technology initiatives.
3. Build a special fund for technology projects, aside from the regular budget allocated by the state.
4. Recommend to the governor the relative priorities of the information technology of the executive agencies.
5. Set a quality-assurance policy to be adopted by all state agencies for information technology projects, IS training and software documentation.
6. Establish quality reviews for major state projects.
7. Review and approve information technology plans of all state agencies.
8. Promote procurement policies and procedures consistent with published industry standards for open systems.

CW Chart: Stephanie Faucher

CORRECTIONS

In the *Computerworld Premier 100* packaged with the Sept. 14 issue, it was incorrectly reported that Hughes Aircraft Co. was the first vendor to provide an Ethernet wide-area network satellite option. AT&T Tridom has been offering this capability since June 1991.

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An item in the Sept. 21 issue of *Computerworld* should have said that Systems Center, Inc. acquired market rights to a product called AM:PM from Tangram Systems Corp.

. . . . . .

Notes at the bottom of the chart in the Salary Survey in the Sept. 7 issue of *Computerworld* inaccurately listed Portsmount, Wash., instead of Portland, Ore., in the section on the Pacific Northwest.

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Intel chips snapped up

BY CAROL HILDEBRAND
CW STAFF

SANTA CLARA, Calif. — The usual suspects have come out in force behind Intel Corp.'s new 33-MHz I486SX chip, which was announced last week.

An Intel spokesman said the new chip operates more than twice as fast as a 33-MHz 80386DX processor.

Vendors using the new chip include the following:

- **IBM** unveiled three new Personal System/2s based on the new processor. Models 76 and 77 feature Extended Graphics Array graphics, Small Computer Systems Interface and 8M bytes of random-access memory. The Model 85 is a low-end server with eight 32-bit slots, five storage bays and up to 3.2G bytes of storage. Prices range from $2,735 to $4,165.
- **Dell Computer Corp.** popped the new chip into both its Performance and D series lines of computers, for $200 less than a similarly configured 33-MHz DX model. Thus, an SX machine with 4M bytes of RAM, a 120M-byte hard drive and DOS and Windows costs $1,899.
- **Zenith Data Systems** will be using the chip in three models of its Z-300/400 series and in one model in the Z-Station desktop lines. Starting at $1,639, the 300/400 series is available immediately. The Z-Station will be available in the fourth quarter.
- **AST Research, Inc.** added machines based on the new chip to both its Power Premium and Bravo desktop lines. Pricing ranged from $1,595 to $3,895.

Senior writer Michael Fitzgerald contributed to this report.

Brand loyalty no longer name of PC game

CONTINUED FROM PAGE 1

Figures show that while Compaq is gaining in its efforts to win back mind share, IBM is still behind the curve. A quarterly survey by the CW Database Division showed that the number of IBM PC customers planning to leave the vendor increased 6.5% from the spring quarter to the summer period. Conversely, the number planning to leave Compaq dropped by 16% (see chart page 1).

Compaq's Pfeiffer: *'We did not respond to needs in time'*

In a move aimed at bringing back its eroding customer base, IBM has embarked on fundamental changes, breaking out its PC hardware division into a semi-autonomous company, with smaller groups or brand teams responsible for the success of a particular product line.

Speaking at the Personal System/1 announcement this month, Robert Corrigan, head of IBM Personal Computer Co., said giving his brand teams the freedom to effectively market their products was vital to bringing IBM back to the forefront. "The real issue is not whether I am untethered [to make decisions] but whether the brand teams are untethered," he said.

IBM's product rollout is not yet complete, with the ValuePoint line — aimed at cost-conscious corporate customers — a month away from announcement and a portable announcement slated for Oct. 6.

Eckhard Pfeiffer, president and chief executive officer of Compaq, said he sees three different flavors of old-time Compaq customers: those that never considered leaving, those that were being forced to leave because of price considerations and those that deserted to clone vendors early on.

When analyzing the fickleness phenomenon, Pfeiffer said, "The key message we got was that we did not respond to needs in time."

With Compaq now focused on three different market segments, with products that are realistically priced, Pfeiffer said it is winning users back. He said the company has scored strongly in that second category, "where customers are willing to pay $150 more for service and reliability." At the lower end, "we're still fighting on a day-to-day basis," he said.

But users are not so easily wooed. Julio Duran, manager of distributed systems at Florida Power & Light in Miami, said the company has moved away from blind vendor loyalty.

"Whoever is going to add the greatest value to FPL is going to be our vendors," he said. With his two biggest criteria being reliability and the flexibility to upgrade, Duran said he would stick with the Top 2 tiers of vendors, "but we've changed from the past, when FPL was very tightly coupled with brand-name vendors like IBM and Compaq."

While it will not be easy for IBM and Compaq to get rebellious users back on track, analysts said the trend is indeed toward first-tier vendors. "There is definitely a trend toward what we call a 'flight to quality,' " said Peter Kastner, an analyst at Aberdeen Group in Boston.

Analysts cited a number of methods designed to keep corporate buyers returning to the same vendor. Among the most popular is an increase in service and support. For example, IBM's PS/2 announcement last week (see story below) was highlighted by the unveiling of an unprecedented three-year warranty on its machines.

Some companies, with mission-critical applications tied to their local-area networks, need to know that the vendor will be there in the long run. For Conyer, Ga.-based Lithonia Lighting, IBM's willingness to do backflips is what keeps Chief Information Officer Charles Darnell coming back. "They're here when I need them," he said.

Senior writer Michael Fitzgerald contributed to this report.

High and low roads taken

Compaq's server announcement next week will detail its plans to diversify its server strategy in much the same way as it did its PC lines, according to Gary Stimac, head of Compaq's Systems Division.

Last week, Stimac outlined plans to introduce two new lines of servers on Oct. 5: a low-end, or "mainstream," family designed to be Novell, Inc. NetWare-ready and a high-end line that will come in above the company's SystemPro line and will eventually replace it. "We traditionally have had the most powerful servers," Stimac said. "Now, we're also going to go after the low-end volume market."

The mainstream line will have models based on both Intel Corp.'s 33-MHz I486DX chip and the 33/66 486DX2 processor, sources close to the company said. The servers will be very competively priced, starting at about $3,500.

Although NetWare will not be preloaded on the machines, Stimac said, the software will be included in the package.

The four models of the high-end line will be based on both the DX2 chip and the Intel 50-MHz 486DX processor, sources said, and will start at slightly below $15,000. The servers will be equipped with a variety of remote diagnostics. The line will also include the TriFlex architecture, which has a separate 64-bit processor bus and a 128-bit memory bus that operate in conjunction with the 32-bit XT/AT bus and Compaq's DataFlow Manager.

Analysts and users hailed the low-end direction for Compaq.

Bill Lodge, project leader at Turner Corp. in N.Y., said a mainstream server is something he needs. "I would particularly like low-cost servers that we can use as file servers," he said.

CAROL HILDEBRAND

IBM turns to service to buttress premium line

BY CAROL HILDEBRAND
and MICHAEL FITZGERALD
CW STAFF

NEW YORK — The second plank of IBM's Personal Computer strategy was nailed into place last week when the company announced a revamped Personal System/2 line distinguished by added service and support and technology additions under the hood.

Users voiced approbation for the extended service, which includes an unprecedented three-year warranty on the new models up through the Model 296 servers but said they thought the pricing could be more competitive. Prices on the new models range from $2,265 for a Model 56 with a 50-MHz 486SLC2 clock-doubling chip to $14,015 for the Intel Corp. 50-MHz I486DX-based Model 95 server with a 1G-byte hard drive.

"We think these PS/2s are going to make a big difference. We were looking to switch to Compaq, but we think now we'll stay with IBM," said Joseph Kalina, an assistant vice president at The First National Bank of Chicago's Community Banking/Systems Department.

Sam Inman, head of marketing at IBM Personal Computer Co., claimed that IBM's service outdoes both Dell Computer Corp.'s and Compaq Computer Corp.'s. He said IBM offers a three-year warranty, compared with the others' one year.

"The three-year warranty can be worth up to $2,800 for a customer, compared to the difference for not having to get a maintenance agreement after the first year," Inman said.

Richard Zwetchkenbaum, an analyst at International Data Corp., called the service "very aggressive."

Kalina said IBM's offer of a three-year warranty and an embedded processor, which will help the bank track its PCs, offsets what he called mediocre pricing. "Inventory control is key for us; we don't know where half this stuff is. We'd like to put that chip on the systems we have today," he said.

Others were not so sanguine. While saying that "you have to look at it," Loren R. Wahl, an information specialist at James River Corp.'s Neenah, Wis., Technical Center, said IBM does not really factor into his firm's buying decisions now.

Faced with this kind of skepticism, IBM is in the midst of defining a new PC strategy that will see it produce three lines of machines.

The final member of the trio will catch the limelight at the end of next month: The company will then unveil its ValuePoint line aimed at price-conscious corporate customers.

Different strokes

IBM is loading features onto its new boxes while lopping price tags on older models. Two examples:

	NEW	OLD
	PS/2 56 SLC2-0B6	PS/2 56SLC LS-25K
Processor	25/50-MHz 486SLC2	25/50-MHz 386SLC
RAM	8M bytes	4M bytes
Hard drive	104M bytes	Diskless
Price	$2,265	Was $2,700; now $1,665
Software	OS/2 preloaded	
Misc.	XGA-2 SCSI	

CW Chart: Stephanie Faucher

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("","",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code != FAIL)
  {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
          remove_xact(dbproc_commit, commid, 1);
      }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL)
  {
      remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.O. McGovaren and C.J. Date: *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 488, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE   SAVINGS
SET      S_BALANCE = S_BALANCE - 250.00
WHERE    S_DEPOSITOR = 'JONES'
UPDATE   CHECKING
SET      C_BALANCE = C_BALANCE + 250.00
WHERE    C_DEPOSITOR = 'JONES'

COMMIT   WORK;
```

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Shuffling DEC plans

CONTINUED FROM PAGE 1

vice Group. "DEC is entitled to fire whomever they want, but I don't think they have an effective method for factoring in customer satisfaction."

Getting closer to customers is key to Palmer's proposed initiatives, according to an internal company memo obtained by *Computerworld*.

In addition to creating a direct merchandising and multivendor services business unit, Palmer is considering building a components business unit and making an even stronger commitment to systems integration, according to the memo.

Product development, previously driven by technology considerations during the reign of founder Kenneth H. Olsen, will focus on the requirements of the business units, which will manage their own advertising, pricing and marketing strategies, the memo said.

If implemented, the initiatives would allow DEC to more closely align engineering development with customer requirements because presumably the business units will be more in tune with users' needs.

Gone, ostensibly, will be the maze of overlapping marketing and development groups that evolved out of Olsen's matrix management organization. In its place will be one network communications organization, one hardware engineering group and a separate software group, according to inside sources familiar with the restructuring.

DEC's Palmer *plans to get close to customers*

In a way similar to that of the business units, individual countries will execute their own business plans and manage sales and services organizations. But a worldwide sales representative will be responsible for developing and managing the overall DEC sales organization.

"Instead of being like one huge slab of chocolate, it looks as if DEC will have little notches which can be broken off into bite-size items," said Terry Shannon, president of Gander Resources, a market research firm based in Ashland, Mass. "The bottom line here is accountability; there will be more of that than there ever has been before with the old matrix system of management and finger-pointing."

A DEC spokesman said the points contained in the "confidential" memo are part of "work in progress . . . and ought not to be taken out of context" of the final plan.

Chris Christiansen, an analyst at International Data Group, a market research firm based in Framingham, Mass., said these proposed changes are "the proper model for doing a profitable business . . . [although] it would be disruptive to operations at a key time for DEC overall. But they must do it now, since any longer delay would have an even greater adverse effect on DEC's business."

Revolving door

The reorganization of the company has already included significant layoffs, which have been occurring behind the scenes during the past few months. Sources estimated that several thousand employees have departed during this quarter alone; exact figures will be made available in the next two weeks.

An informal survey of about 30 DECUS members across the U.S. and over a range of sites (from one-man shops to Fortune 1,000 companies) conducted by Mayhew found that cuts of between 8% and 10% of DEC field service representatives have been occurring nationwide.

One DEC user who is still committed to the company but who has experienced adverse consequences as a result of the layoffs is Robert Ayr, data center manager at PacifiCare Health Systems, a health maintenance organization based in Cypress, Calif.

"Before they had the layoffs, they would do value-added services. Now I get nailed for additional charges for any little thing they do, and they don't seem as attentive as they were," Ayr said. Ayr's local service office lost about six engineers.

"They still have some guys who are very good, but they're using them for other things," Ayr said.

DECUS Local User Group Chairman Jeff Killeen added that DEC's emphasis on third parties and distributors to fill in the gap for DEC service people has not always been successful for smaller accounts because "they do not seem to be putting the technical people in place to do the backup to sales and support as they should."

Some users are satisfied with the third-party arrangement, however. "It's virtually seamless from our perspective," said Bob Johnson, director of information services at Quorum Health Group, Inc. in Nashville.

Another internal change at the company will be the establishment of commission-based sales beginning Jan. 1 [CW, Sept. 14]. This will result in a 10% cut in base salary for salesmen, sources said.

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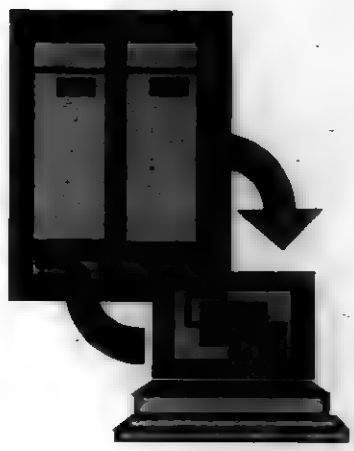

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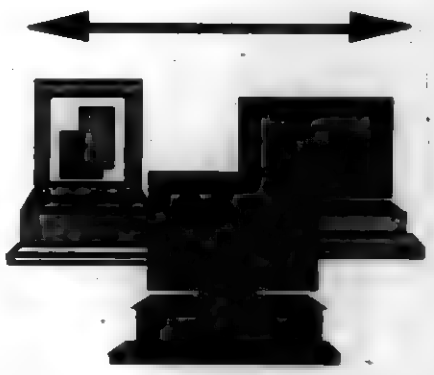

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CA to port CA-Unicenter tools to Solaris

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — As expected, Computer Associates International, Inc. last week announced its plans to port its CA-Unicenter systems management suite to Sun Microsystems Computer Corp.'s servers and workstations running Sun Microsystems, Inc.'s Solaris 2.0 operating system. The product is supposed to ship in 12 months.

Under the agreement, both CA and Sun will market CA-Unicenter for Solaris. CA will eventually port other applications to Solaris, according to Sanjay Kumar, senior vice president of planning. He declined to specify which applications would follow.

Paul Cubbage, an analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm, said he believes the addition of the CA-Unicenter port will benefit Sun's Solaris customers with more robust systems management capabilities. For example, Cubbage said, CA-Unicenter for Solaris will help Solaris users better manage their accounting and security software applications.

The Sun Solaris port will be based largely on work CA has conducted to develop a Unicenter version for Hewlett-Packard Co.'s HP/UX Unix environment, and it will exploit Unix System Laboratories, Inc.'s OpenLook user interface. CA-Unicenter for Unix, which was announced by CA and HP in 1991, is currently in beta testing and is slated to begin shipping in early 1993.

Scott McNealy, president and chief executive officer at Sun, said the agreement will help reassure users who are attempting to downsize mainframe-based applications to Unix that their data will be well taken care of.

More than open systems

Brent Moore, a programmer at Brigham Young University in Provo, Utah, has been testing the HP version of CA-Unicenter for Unix for several weeks. The university is trying to move some of its smaller mainframe applications, such as its budgeting systems, off of its Amdahl Corp. plug-compatible mainframe to its faster and less-expensive HP 9000 Model 827 Unix-based multiprocessing systems.

But Moore said he expects CA-Unicenter for Unix to provide more than open systems management capabilities. The software, he said, can also be used to help Brigham Young replace its expensive microfiche financial archiving storage systems. CA-Unicenter for Unix would replace the microfiche by electronically distributing the school's financial records.

In addition, Moore said he is looking ahead to other planned CA-Unicenter ports, including ports to Novell, Inc.'s NetWare network operating system and IBM's OS/2 2.0 operating environment. Moore plans to integrate these open systems management products among all three environments.

In addition to its agreements with HP and Sun, CA has a deal with Sequent Computer Systems, Inc.

Separately, at the Unix Expo trade show here last week, the Islandia, N.Y., vendor pledged its support to IBM's new CICS for IBM's RISC System/6000 environment, called AIX CICS/6000, which provides IBM AIX users with on-line transaction processing (see story page 1).

Initial CA ports to AIX will include CA-Masterpiece, a suite of financial applications, CA-Collection Management, CA-Recovery Management and CA-Telon. A CA-Unicenter port to AIX is expected to follow, industry observers said.

OSF to establish testing, certification program

Declaring itself in the "second phase" of its development, the **Open Software Foundation** last week said it will establish a testing and certification program to brand genuine versions of its technologies as they appear in products from IBM, Digital Equipment Corp., Hewlett-Packard Co. and other vendors. Testing and certification costs are $10,000 for Motif and $35,000 for OSF/1 operating system implementations.

ROUNDUP

UNIX EXPO

XSoft, a division of Xerox Corp., introduced GlobalView for X, a set of office-productivity and document-management packages for Unix workstation users in the X Window System environment. GlobalView for X, which is scheduled to ship in the fourth quarter, supports both OpenLook and Motif Windows managers. Pricing starts at $1,495, with additional software modules retailing for $495.

Information Builders, Inc. unveiled a new release of its Focus for Unix language that is said to enhance performance, graphics and interoperability for Unix users. Focus for Unix Release 6.5 is compatible with Information Builders' Enterprise Data Access/SQL applications development software. Available on most Unix platforms, Focus for Unix is priced, depending on the number of users, between $3,000 and $123,000 for up to 128 users.

Unix System Laboratories, Inc. (USL) and **IBM** struck a deal to port USL's Tuxedo transaction processing system to IBM's Enterprise System/9000 mainframe line under the AIX/ESA Unix operating system. Tuxedo will be the first on-line transaction processing monitor commercially available for the mainframe AIX/ESA. Beta-test versions of the code are slated to be available at the end of this year, with general availability in early 1993. Pricing was not disclosed.

Tandem Computers, Inc. introduced NonStop-UX Release 2.0, its version of **USL**'s Unix System V, Release 4 for its fault-tolerant computers. Other announcements included the Integrity System Management Suite and the CM-1300 system, a new high-end Integrity fault-tolerant Unix system. An entry-level Integrity CM-1300 system is priced at $179,800. The Integrity System Management suite is priced starting at $5,000. Both systems are available now, according to the vendor.

Unix computer-aided software engineering vendor **Interactive Development Environments, Inc.**, based in San Francisco, demonstrated a modeling tool designed to let users generate SQL queries that work with any relational database. Software through Pictures Information Modeling is a multiuser tool that works with **Sun Microsystems, Inc.**'s OpenLook and OSF/Motif interfaces and Sun's ToolTalk and HP's SoftBench development frameworks. The $7,500 product is due out in December.

AIX users get CICS

CONTINUED FROM PAGE 1

Transarc and the OSF. That presents some risk for users because these technologies are unproven in the market, analysts noted.

IBM seems well aware of that, however, stressing that *none* of the new products are recommended for full production environments. Rather, users are being advised to develop, test and prototype distributed environments first.

One RS/6000 shop doing that is Wausau Insurance Cos. in Wausau, Wis., one of three early support accounts setting up AIX CICS/6000 this month. "The idea of running CICS/6000 on top of DCE is the innovative part here," said Bob Denison, open systems development unit manager at Wausau. "Once it's on top of that architecture, it should be a real smooth port to other platforms. That's the key. We don't necessarily want to go to distributed platforms that are only IBM."

Smart move

Some users saw last week's announcements as both a savvy survival tactic and a welcome expansion of their options.

"They just ate into their own market, but it's something they had to do. If IBM didn't, their competitors would," said Chuck Hemann, manager of engineering computer operations at Harnischfeger Corp., an industrial manufacturer in Milwaukee that runs a large RS/6000 network.

Hemann said that while business operations at his firm still rely on an IBM 3090 mainframe, the increasingly powerful Unix environment on the engineering side is now considered a viable alternative for large applications.

"I see one or two mainframe upgrades in the future, but probably no more," Hemann noted. "We're in the midst of installing a [manufacturing and resource planning] system, and it's probably the last big application on the mainframe."

IBM officials said they believe customers will use AIX CICS/6000 to build new business applications on their Unix servers rather than to off-load the mainframe. Users and analysts, however, said they expect a hefty mixture of both approaches.

"Because CICS/6000 has such very nice integration with the CICS family, IBM may have their cake and eat it, too," said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Even if a customer leaves his databases on the mainframe and doesn't downsize, there will be nice communication [between AIX] and CICS on the mainframe."

IBM officials also noted the financial success of the RS/6000 line, introduced in Feburary 1990. The Unix platform is likely to become profitable by year's end, said Bill Filip, IBM vice president and president of the Advanced Workstations and Systems Division.

IBM's 1994 goal, he added, is to become the worldwide revenue leader for the entire Unix market.

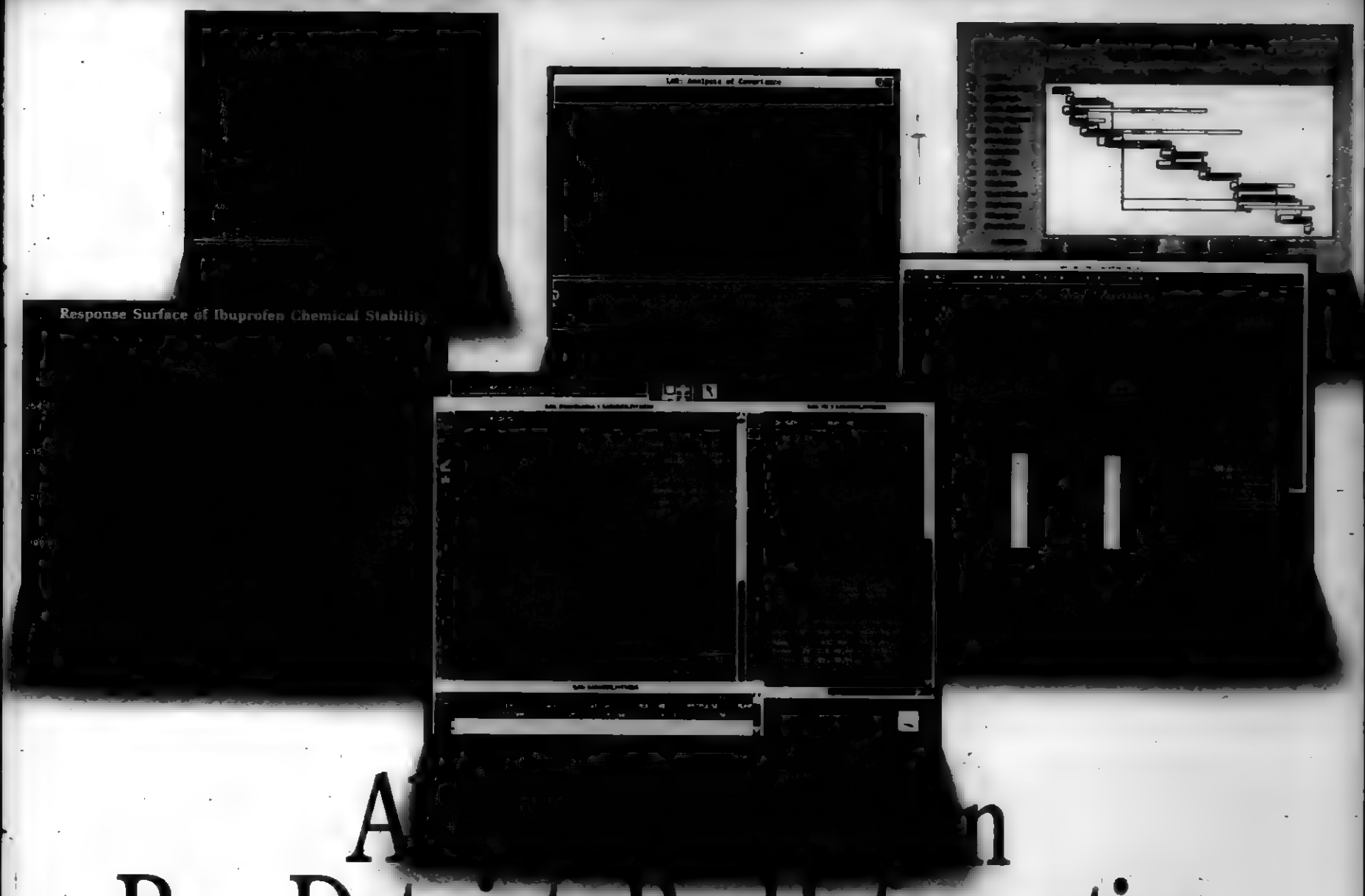
Depending on what kind of Unix systems are counted — midrange, workstations or personal computers — the top market leaders vary between IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and NCR Corp.

For IBM to reach its goal of revenue dominance in Unix, analysts said, the computer giant needs to roll out symmetrical multiprocessing capabilities for the RS/6000, improve the graphics lineup and deliver faster implementations of the RS/6000's Power Architecture chip.

Big Blue opens up

Also highlighted by IBM last week were the following:

- A hardware boost for the RS/6000 line, with Models 580 and 980 shipping next month with 20% additional performance, enhanced storage, memory, software development tools and systems management. Priced from $70,000 for the Model 580 and $117,800 for the Model 980.
- An upgrade path for the low-end RS/6000 Model 220, with a faster processor supplied in early 1993 that can move up to the PowerPC-based chip later in the year.
- An AIX database — still unnamed — was on display at UnixExpo and is likely to appear in 12 to 18 months, along with multiprocessor versions of the RS/6000.
- Three products, shipping in December, based on the OSF's DCE for AIX/6000 and intended for initial development work. The AIX DCE products, with license charges ranging from $150 to $2,400, provide distributed functions such as directory services.
- Encina for AIX/6000: a suite of products extending the AIX DCE services to address transaction processing capabilities such as database updates. Available in December at license charges ranging from $400 to $1,800.



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War brewing for branch sites

HP, others hone internetwork gear for geographically dispersed firms

BY JOANIE M. WEXLER
CW STAFF

Hewlett-Packard Co. and several other vendors loaded up on new product artillery last week in what promises to be a fierce fight for the myriad low-end internetworking opportunities cropping up at corporate branch sites.

HP, Advanced Computer Communications, Inc. (ACC), Newport Systems Solutions, Inc. and Xyplex, Inc. all took aim at companies growing increasingly distributed and seeking low-cost equipment that needs minimal upkeep for their far-flung, lightly staffed locations.

HP hit an aggressive price point with a $4,500 stand-alone router that contains connections to one Ethernet local-area network and one wide-area network.

However, its $6,500 one-LAN/three-WAN router, also introduced last week, is of more interest to customers such as Schlegel Corp., a sealant manufacturer in Rochester, N.Y.

More diversified

The three WAN ports allow Schlegel to create more diverse router paths "so there is no single network point of failure," said Brian Williams, manager of data processing and telecommunications. Most under-$7,000 routers today have just one WAN port.

The HP routers have frame-relay interfaces bundled in and will also connect to Integrated Services Digital Network terminal adapters from Ascend Communications, Inc. and Switched Multimegabit Data Service access devices from Digital Link, Inc., HP said.

"Now that a [router] product is available at such a low cost, I'm going to run out and get quotes on frame-relay service," Williams said. This is because Schlegel has small sites that do not justify $1,000 a month for a dedicated 56K bit/sec. line but need performance levels equivalent to the rest of the company, he said.

HP has followed in the footsteps of Proteon, Inc., which announced a $4,995 router in July that it claims can be configured by nontechnical staff in under 15 minutes. However, Lisa Sjursen, network administrator at Schlegel, said the HP claim, at least, "is a little deceiving."

An individual HP router can be configured in 15 minutes, she said, "but then it took HP personnel two days running diagnostics and 'fiddling' to get it to work with the rest of the network."

Sjursen said Schlegel installed four routers, "and none of the implementations went smoothly," though they were all done by HP — not Schlegel — staffers.

Internetworking vendors have been taking creative approaches to carving out niches in the low-end market; many have built inexpensive stand-alone or personal computer-based routers that require minimal configuration effort, while others have bundled multiple communications services into hublike devices or added compression techniques to optimize network use.

ACC's new router, for example, includes bandwidth optimization features on a device priced from $3,750 to $5,050. The vendor has combined data compression, traffic prioritization features and automatic dial-up of additional lines when 56K bit/sec. WAN links are congested.

Newport Systems also offered an extra-cost data compression module with a release of $995 to $2,195 multiprotocol routing/bridging software for 386/486 PC platforms that competes with Novell, Inc.'s NetWare-oriented routing software.

Meanwhile, Xyplex rolled out a communications hub that integrates routing, switching, terminal serving, wiring concentration and other technologies into a $2,495 to $4,495 base box for which users must purchase modules at additional cost.

Take the low route

Low-end routing will take off as companies become increasingly distributed

Source: CSMI Corp.

Banyan users laud firm's strategy shift

BY MICHELE DOSTERT
CW STAFF

BOSTON — Recent personnel and strategy changes at Banyan Systems, Inc., the Westboro, Mass.-based local-area network vendor, were enthusiastically received by information systems managers attending the Association of Banyan Users International (ABUI) meeting last week.

Previous ABUI conferences were characterised by user complaints about late products, poor support and corporate arrogance. In contrast, this year's attendees were uniformly positive about changes in Banyan's corporate culture, especially its new multiplatform strategy.

"The thing I'm really happy about is the new interoperability stuff. Selling their Enterprise Network Services for Novell's NetWare and connecting to Unix by porting to The Santa Cruz Operation's [Unix] are good starts; now they need to keep it up, connect to more platforms," said Bill Sheehan, a support specialist at Boston-based Stone and Webster Engineering Corp. (see story below).

Banyan's *Hamilton cites key strategic alliances*

ABUI officials and members attribute the changes largely to key personnel additions. Three months ago, Peter Hamilton, a 20-year veteran of Hewlett-Packard Co.'s Network and System Management and OpenView Products Division, assumed the title of Banyan president and chief operating officer. Founder David Mahoney remained chief executive officer and chairman.

"We now have a three-prong strategy," Hamilton said in an interview. "We will develop our Enterprise Network Services product for other platforms besides Novell, and we will port our Vines OS to other platforms." SCO Unix was the first, but other ports will follow, including reduced instruction set computing, he said.

As evidence of Banyan's new openness, Hamilton cited strategic alliances and support agreements with Digital Equipment Corp., Gupta Technologies, Inc., Synoptics Communications, Inc., Apple Computer, Inc., Novell, Inc., Compaq Computer Corp., NCR Corp. and Microsoft Corp. "To better serve our customers, we're building quality alliances so we can provide collaborative support and interoperability to our mutual clients," he said.

Banyan has long had the reputation of a company with great technology and horrible marketing. However, in 1990, Jim D'Arezzo, formerly vice president for European and international marketing at Compaq, became Banyan's vice president of marketing. Most Banyan users said they admire the job he has done in expanding Banyan's market presence.

Under D'Arezzo, Banyan has shifted its emphasis from direct sales to building an effective reseller channel, which has helped Banyan gain mind share in the LAN community and Banyan users gain better access to support. While IS often complains about reseller support, some Banyan users claim that before these changes were implemented, they had difficulty getting support from anyone.

"We now have over 1,000 selling sites worldwide, which is double what we had a year ago," D'Arezzo said. "We're building our channel slowly because we want to guarantee that the resellers we add can provide good support for Vines users."

"Banyan has just opened up so much in the last year," said ABUI Vice President Ted Kull at the Philadelphia office of Banyan (and Novell) reseller Frederick Computers Plus. "They're meeting deadlines, improving their marketing and building user contacts."

Vines users air wish list, complaints during Q&A

BY MICHELE DOSTERT
CW STAFF

Although Banyan Systems, Inc. users were generally happy with the direction the company is taking, they took advantage of a question and answer session with company executives to air a list of requests topped by complaints over Banyan's upgrade pricing matrix for its five-, 10- and 20-user versions of Vines.

Under that matrix, the price increase from five to 20 users is approximately $1,000 more than double the price increase from five to 10 users.

Although the pricing was announced in February, most users were unaware of the change until recently — and decidedly unhappy about it. Banyan officials promised to review the pricing structure but held out little hope that it would change. "We studied our pricing structure thoroughly and felt that this was the best pricing for the value offered," said Jim D'Arezzo, Banyan's marketing vice president.

Banyan users also expressed concern about migrating from their Banyan Corporate Network Servers (CNS), the non-industry-standard 386- and 486-based servers that Banyan has stopped selling. Banyan responded that while it still considered the CNS systems to be robust platforms, it would soon announce special pricing programs for those wishing to move to Vines on industry-standard personal computer server platforms. CNS hardware would be depreciated by users in the normal course of business.

Users also bombarded company executives with requests to extend Vines support to a number of platforms, including the following:

- Support for RISC-based systems, both as server platforms and as clients. Banyan replied that it is in the process of choosing the first RISC platform to which it will port Vines, and it polled users on their favorite RISC platform.
- Scalable Processor Architecture-based machines from Sun Microsystems, Inc. were the overwhelming user choice.
- Users also asked if Banyan could shrink the size of its native protocols to lessen network traffic and free random-access memory on the client. Banyan said it was always trying to optimize Vines to reduce network traffic. However, the company would give no timetable for enabling users to load Vines into extended memory, which prompted angry murmurs from users.
- Symmetric multiprocessing (SMP) support for Vines 5.0. SMP support is available for Vines 4.11. Banyan officials promised that SMP support would be included in the forthcoming "merge release" of the two versions of the Vines operating system.
- 5250 terminal emulation support so that Vines networks can enjoy the same interoperability with IBM Application System/400s as they do with IBM mainframes. Banyan said no such product was in the works but that it would investigate further.
- Support for application servers, such as print and mail servers. Banyan officials suggested that users investigate using machines running Vines on SCO Unix as application servers.

Pen vendors stress systems' mobility

BY MICHAEL FITZGERALD
CW STAFF

LOS ANGELES — The Pen-Based Expo last week yielded several new products and a strong effort by pen-based vendors to change pen computing's image — almost trying to take the pen out of it. Virtually all the executives at pen-based vendors who were interviewed said the focus on the pen interface misses the point of the technology.

"There is definitely a shift away from the idea of pen-based computing to the concept of mobile computing," said D. Bruce Walter, president of Grid Systems Corp. Walter and numerous others said mobile computing is a familiar concept to users, while the idea of pen computing confuses them.

"The key is not the pen, but the pen is the obvious thing about these computers," agreed Jerrold S. Kaplan, chairman of Go Corp., maker of the PenPoint operating system. "The whole point is mobility."

Dissenting opinion

The lone voice of dissent came from Gordon W. Arbeitman, a senior programmer for pen systems at IBM. Mobile computing "is not the only part of pen computing," Arbeitman said. IBM sees a role for tablet devices in a desktop environment. The company demonstrated a pen-capable, active-matrix, color flat-panel display that it originally showed at Comdex/Fall '91. The prototype product is targeted as a desktop tool.

Arbeitman did agree with Ron Oldewicz, president of Reston, Va.-based tablet developer TelePad Corp., that turning attention away from the pen to the issue of mobility would help pen computers seem a less radical shift from current technology, which should help the market.

"You have to give [information systems] a solution that's close to what they have now," he said. "You can't tell users to throw away what they have in favor of an elegant solution."

Users at the show agreed with this opinion.

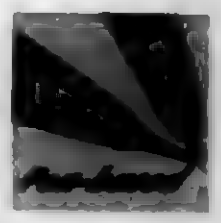
Joe Barrett, lead technical analyst for architecture and applied research at Whirlpool Corp. in Benton Harbor, Mich., said, "We don't want to throw technology at a business problem, but [the pen-computing] paradigm is different enough that we wanted to" get pen-based systems in the hands of users to see what reaction the new machines receive.

In the meantime, users continue to wait for products they can work with. Some vendors even said they see the market delays as being positive.

"MIS is frustrated because there is not enough consistently shipping technology to do pilots, but the delay could turn out to be a good thing because MIS will have time to really weigh what they're doing," said Ronald J. Brown, president of Oakland, Calif.-based Notable Technologies, Inc. His firm released PenComm, a 3270 pen interface product, and PenCrush, a software compression utility.

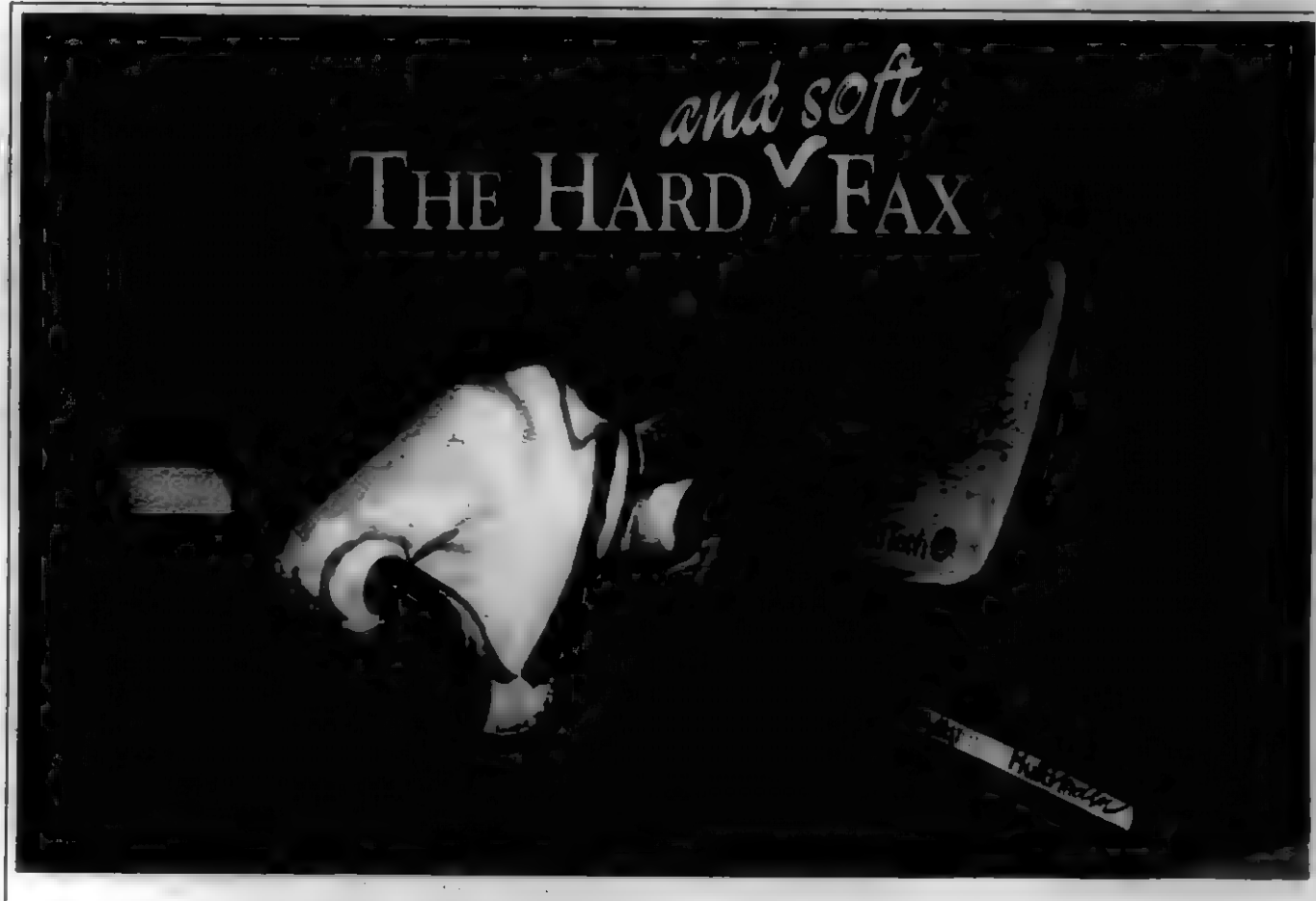
A variety of other products were introduced or shown:

• **Dauphin Technology, Inc.** showed its Dauphin 5500 Pentop, a 5.5-pound system with a passive-matrix color screen and an 80M- or 130M-byte hard drive. The Lombard, Ill.-based maker of portable systems, which won the major Lapheld II defense contract, said it will begin shipping later in the year.



• **PenMetrics, Inc.**, a Corvallis, Ore.-based software maker, showed its FieldNotes, a pen-based geographic information system that lets field workers adapt software for outdoor geography.

• Cambridge, Mass.-based software maker **SuperScript, Inc.** showed PenSieve, which interprets handwriting according to its context to improve character recognition.



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NEWS SHORTS

Borland, Lotus claim legal wins

Lotus Development Corp. and Borland International, Inc. spent about an hour in front of the judge last week regarding their software copyright infringement contest. The judge reportedly refused to grant Borland's request for an immediate appeal and also said he would hold judgment on the issue of the copyrightability of the "long prompts" that Lotus claims Borland illegally copied. True to form, both sides claimed victory, with Lotus pointing out the judge's refusal of the appeal and Borland stating that the judge showed signs of reversing his earlier decision.

Lotus, Philips in 'Smartphone' talks

Lotus is engaged in negotiations with Philips Electronics N.V. to develop next-generation telephones featuring LCD screens and computer functions, according to industry sources. The project, which will couple software from Lotus and hardware platforms from Philips, will target the emerging market for on-line consumer services such as shopping. Neither company would comment on the report.

Separately, Lotus said it will expand its CC:Mail products to include native X.400 support so that CC:Mail networks can link directly to X.400 networks, such as those provided by public carriers, without having to translate from CC:Mail to the X.400 format. Lotus has not set a price or a rollout date.

Sprint to broaden bandwidth

Sprint Corp. last week said it will deliver a broadband (faster than 1.5M bit/sec.) network to the industry by the middle of the decade to support emerging medical image, graphics, scientific modeling and other high-bandwidth applications. Meanwhile, the carrier has named router vendor Cisco Systems, Inc. and wide-area gear maker Digital Link, Inc. partners in its contract with the University of California's Lawrence Livermore National Laboratory to create a public Asynchronous Transfer Mode service at T3 (45M bit/sec.) speeds for initial use by the Department of Energy and NASA.

Execs band to boost Silicon Valley

Silicon Valley, a newly formed coalition trying to get the region's economy back on track, shifted into high gear last week by naming heads of 13 specific committees. Among the business leaders named are Ed McCracken of Silicon Graphics, Inc., T. J. Rodgers of Cypress Semiconductor Corp. and Sandra Kurtzig of The Ask Cos. The group aims to address problems such as smog and overcrowding that are hindering business development in the area.

Cypress' *Rodgers*

Short takes

Computer Associates International, Inc. introduced CA-Simply Business, a suite of five Microsoft Corp. Windows-based applications. Priced at $567, the package includes accounting, word processing, spreadsheet, scheduling and presentation graphics modules. . . . **Next, Inc.** announced that Chrysler subsidiary **Chrysler Financial** will purchase 2,500 copies of the NextStep 486 operating system for 486 computers. Other new customers include **Mobil Corp.** and **McCaw Cellular Communications, Inc.**. . . . **Motorola, Inc.** said it is working with **Apple Computer, Inc.** to integrate a radio receiver into Apple's Newton Personal Digital Assistant, giving Newton devices the power to receive wireless messages. . . . **Micrografx, Inc.** plans to ship PhotoMagic, a sub-$100 collection of stock color photo images, special effects and editing tools, at the end of the month. . . . A reduced instruction set computing-based adapter from **Rasterops Corp.** announced last week will reportedly allow **Apple** Macintosh II computers to run at the speed of a Macintosh Quadra 950.

California renews EDS pact

BY MARK HALPER
CW STAFF

SACRAMENTO, Calif. — Electronic Data Systems Corp. and California's Department of Health Services last week renewed their Medicaid system vows with a deal that is full of variables and involves a sweep of technology old and new, borrowed and blue.

EDS beat out Computer Sciences Corp. for the four-year deal, which is unlikely to live up to its $399 million potential, according to the state. Still, the pact calls for EDS to process some 145 million Medicaid claims annually and to make as many as 52 enhancements to the system. CSC bid $445 million.

It is not clear how much of the $399 million that EDS bid will be allocated to claims processing, but EDS has secured that portion of the contract, according to Nancy Beaird, executive program director at EDS' State Operations Division.

California has the option to exercise the enhancement portions but almost certainly will not hire EDS for all of them, said Ben Thomas, division chief at the health services department's Payment Systems Division.

Because of California's limited fiscal resources and the shifting nature of the health care business, the state could hire other contractors for some of the enhancements or "some may not get done at all," Thomas said.

For instance, he said the state is not sure it will tap EDS for the integrator's proposed $7 million project to retool the department's information systems operations into a managed health care model. California is looking for a vendor to help match IS with its long-term plan to convert its Medicaid system, called Medi-Cal, from a fee-based operation into a managed care operation for the state's 4.9 million Medicaid recipients.

Other uncertain enhancements include adding a data element dictionary and a treatment authorization system, he said.

Red tape hurdles

The EDS contract takes effect Dec. 1, provided it clears a five-day protest period and a 30-day review by other state agencies. The processing portion will not kick in until June 30. Until then, EDS will continue to process under the terms of an existing five-year contract with the state. The new contract is slated to run four years with three additional one-year options.

While EDS will be modernizing the statewide operation with features such as magnetic card systems for eligibility verification and automated claims adjudication systems, it will continue to rely on older technology for raw claims processing. Namely, claims will run through a Cobol CICS database on an IBM 3090 at the company's Information Processing Center here.

Beaird explained that budget-constrained state government contracts typically run on such older technology and that California has not allocated any funds for updating that portion of the technology. "State governments are not typically wildly enthusiastic about funding just for technology refreshment," Beaird said.

EDS manages the state's leased lines through its EDS Net network, she said. State-run IBM 3090s are used for eligibility verification, while the EDS-operated mainframe is used for claims processing, she said.

EDS also intends to implement automated claims processing systems at treatment facilities and pharmacies. It will start at the pharmacies because many of them, especially the large chains, are already outfitted with computer hardware. EDS is adding a modified version of Telepaid, supplied by Medco Containment Service, Inc. in Montvale, N.J., to its 3090 to support claims processing.

The eligibility systems are slated to come on-line in January 1994, and the pharmacies' claims processing systems will come on-line in June 1994, she said.

Perot loses prospect to former executive

CONTINUED FROM PAGE 1

ble. But it's hard to tell how long that will take," Feld said. He estimated it would take at least six months "and possibly longer."

At Burlington Northern, Feld will preside over a massive IS redesign that will include a purge of disparate minicomputers, workstations and dumb terminals in favor of a common client/server platform. Burlington Northern will continue to operate its three Amdahl Corp. mainframes located at its data center in St. Paul, Minn., Feld said.

The IS overhaul dovetails with a sweeping restructuring of Burlington Northern's business operations in which the company is aiming to improve customer service, cater better to regional customer needs and improve coordination with the IS and business practices of other transportation companies.

Donaldson Lufkin & Jenrette analyst and Vice President of Research Joel Price described the IS overhaul as part of a "major cost improvement plan," which includes layoffs, improved utilization of train capacity and more efficient shop and repair operations.

While Burlington is profitable — it earned $136 million for the year ended Dec. 31, 1991 — "it is not as profitable as other railroads," and revenue "has been faltering," Price noted.

One of the goals of the IS project is to establish common applications in areas such as revenue billing that all transportation providers would use, and thereby make it easier for customers to do business among carriers, as they often do in the transportation field.

Brydges said Burlington Northern's three Amdahl Corp. mainframes will become network servers in the company's client/server scheme.

Both Brydges and Feld said Burlington Northern has not yet selected its server platform.

"It's hard to tell at this point," said Feld, who led a large OS/2-based client/server implementation while he headed IS at Frito-Lay, Inc., a company he left last spring.

Brydges said Burlington Northern plans to scrap a collection of Digital Equipment Corp. PDP 11s, IBM 3270 terminals and workstations from DEC, Wang Laboratories, Inc. and Xerox Corp.

He said the company is looking to Feld to implement functionality much like what he installed at Frito-Lay, where his system was well-regarded for tracking product and supporting differences in local customer bases in terms of prices, customer tastes and other market conditions.

Feld said Burlington Northern decided not to outsource computer operations roughly two weeks before he left Perot on Sept. 7. He also noted that the railroad first became interested in a possible outsourcing deal with Perot because he had made consulting contact with the company prior to joining Perot in July.

While conceding that the railroad's rejection of Perot, its deciding to outsource, his leaving Perot and his winning a contract with Burlington Northern all entailed "strange timing," Feld also noted that his exit and subsequent contract acceptance "were separate decisions."

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HEWLETT PACKARD

IBM, DEC sign disaster recovery deal

WHITE PLAINS, N.Y. — Customers whose data centers go down during disasters may be able to recover slightly faster, thanks to a deal inked last week between Digital Equipment Corp. and IBM.

The agreement calls for DEC and IBM disaster recovery centers around the country to be linked electronically. It will simplify the task of moving telecommunications and applications from the customer's downed data center to computers at IBM and DEC sites.

For customers to qualify, they must sign up with the disaster recovery services of either or both companies.

Before the deal, a user with critical applications on both vendors' equipment would move the IBM applications to an IBM recovery center and the DEC applications to a DEC recovery center. The user's staff would then establish communications between the two places, an often time-consuming process that left users without access until the links were complete.

Now those telecommunications links over T1 lines will be automatically provided between the IBM and DEC centers. Users need only to call the DEC center or the IBM center instead of both.

ISSC turns to renowned CIO

CONTINUED FROM PAGE 1

technology that reportedly characterized his reign as head of Security Pacific Automation Corp. (SPAC), the IS subsidiary of the nation's then fifth-largest bank.

"Back before [Bank of America], our perspective on Singleton was that he had set up a very bureaucratic 'technocracy' at SPAC," recalled Los Angeles-based IS consultant Andrew Garsten, who formerly worked in the trust group's IS department at Security Pacific. "But that was because we didn't see everything they were doing — the more strategic stuff like optical character recognition and check processing."

Retrospect, Garsten said, has altered his view and that of many of his former colleagues. "Singleton had a political vision, and he was able to take it all the way to the top of the company and sell it there," he said, "At the time, we criticized him for being such a political animal, such a marketing maven, but he was extremely effective at it, and he led Security Pacific to a position where it was strategically relying on information technology."

Beyond banking

Jorgensen declined to detail what Singleton will be doing under his newly created title but noted that his efforts will not be confined to the banking arena. He reiterated ISSC's resolve to fan out well beyond conventional outsourcing into a panoply of custom-tailored alliances across a broad span of vertical industry niches.

Even without details in hand, however, one industry observer said he sees Singleton's arrival as an important strategic advance for ISSC.

"This is something they need badly because right now, they don't do their own new business development — they get that from IBM," noted J. P. Richard, vice president of outsourcing at Vienna, Va.-based market research firm Input. ISSC's reliance on its parent for new business development, Richard said, has placed the subsidiary at a competitive disadvantage.

"Lawyers who have worked on some of the major outsourcing deal negotiations have mentioned that it loses points for ISSC when they send in IBMers who aren't as well-versed in outsourcing to go up against teams from EDS who know it inside-out," he said.

Singleton was not available for comment.

Security Pacific, then a $10.4 billion bank based in Los Angeles, and the $12.3 billion, San Francisco-based Bank of America, merged in 1991.

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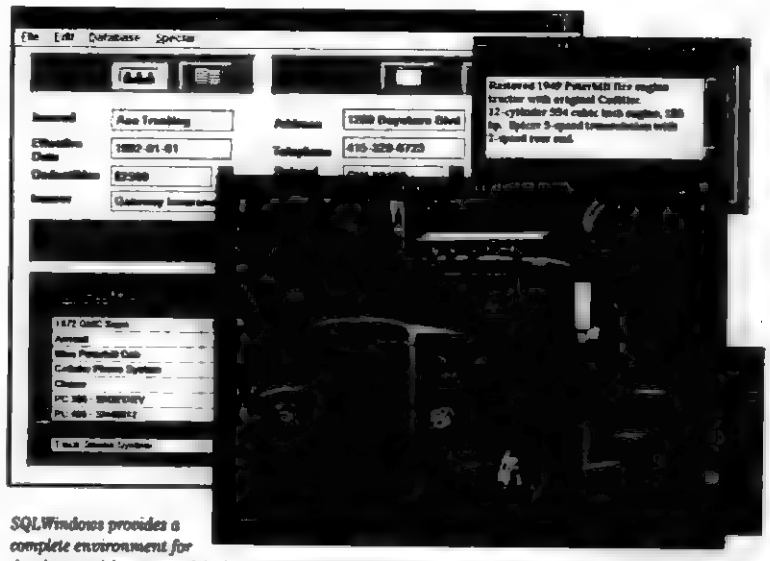

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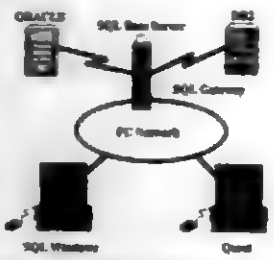

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Seybold takes vendors, publishing industry to task

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — Long lines and delayed keynotes got Seybold San Francisco off to a slow start last week. However, things picked up quickly at the show when organizer Jonathan Seybold took the podium.

Seybold kicked off the electronic publishing conference by reminding vendors of their shortcomings and calling for a restructuring of the electronic publishing industry.

Vendors, according to Seybold, have yet to deal effectively with a number of issues, including color, rich data formats (including images, sound and video) and the "skill gap" between people who know the technology of printing and those who know the craft of printing.

He also said the industry needed to be restructured and emphasized that old relationships are based on the limits of old technology and no longer apply.

Seybold also suggested that companies not participating in this restructuring "may be blindsided."

The speakers who followed Seybold all seemed intent on proving that they would not be among those caught by surprise.

Notable among the keynotes were Apple Computer, Inc. Chairman and Chief Executive Officer John Sculley, who reiterated Apple's desire to pursue a strategic thrust into "higher-end publishing systems" in 1993. Sculley indicated that Apple will pursue other platforms, including Microsoft Corp.'s Windows, and the IBM and Apple PowerPC, and will expand its offerings to include everything from media servers to digital cameras during the next 36 months.

Next, Inc. Chairman and CEO Steve Jobs, Sculley's onetime counterpart at Apple, was next on the docket, and he wasted no time firing the first volley at Apple. "I'll show you some stuff that's actually real," Jobs said, drawing laughter from the crowd as he climbed to the stage. Jobs then began preaching the gospel of "operation productivity" vs. "management productivity," claiming that while the former is where computers produce results, the latter is where most computer companies have focused their attention.

Jobs then demonstrated NextStep Version 3.0, the latest generation of Next's object-oriented environment, using it to develop an application that created a link to a database from which information could be immediately sent to a publishing package for printing.

Focus on print

Printing was prominent in the statements made by Adobe Systems, Inc. President and Chief Operating Officer Charles Geschke as he demonstrated the company's new page-rendering accelerator chip, PixelBurst. The chip, which will be available only through OEMs, provides up to 10 times faster page rendering for some images. Geschke also indicated that PhotoShop for Windows should be available sometime early next year.

Among the other vendors that announced products at the show were the following:

- **Adobe** announced a deal with Sun Microsystems, Inc. under which Sun will integrate Adobe's Display PostScript technology into the Solaris environment. Adobe will also port its Adobe Illustrator and PhotoShop applications to Solaris as part of the agreement.
- **Interleaf, Inc.** unveiled Interleaf RDM, an object-oriented document management system that can reportedly manage data across a variety of applications and platforms, including Windows, the Macintosh and Unix. The Windows version is scheduled to be released during the first quarter of 1993. Pricing will range between $2,500 and $3,000, depending on the quantity purchased.

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The Life of Brian

"We're so confident in our network storage technology, that if you'll send us your network systems administrator for 4 hours, we'll pay that person's salary for a full day," invites Brian Swafford, founder and president of QStar Technologies, Inc.

I Was Just A Kid.

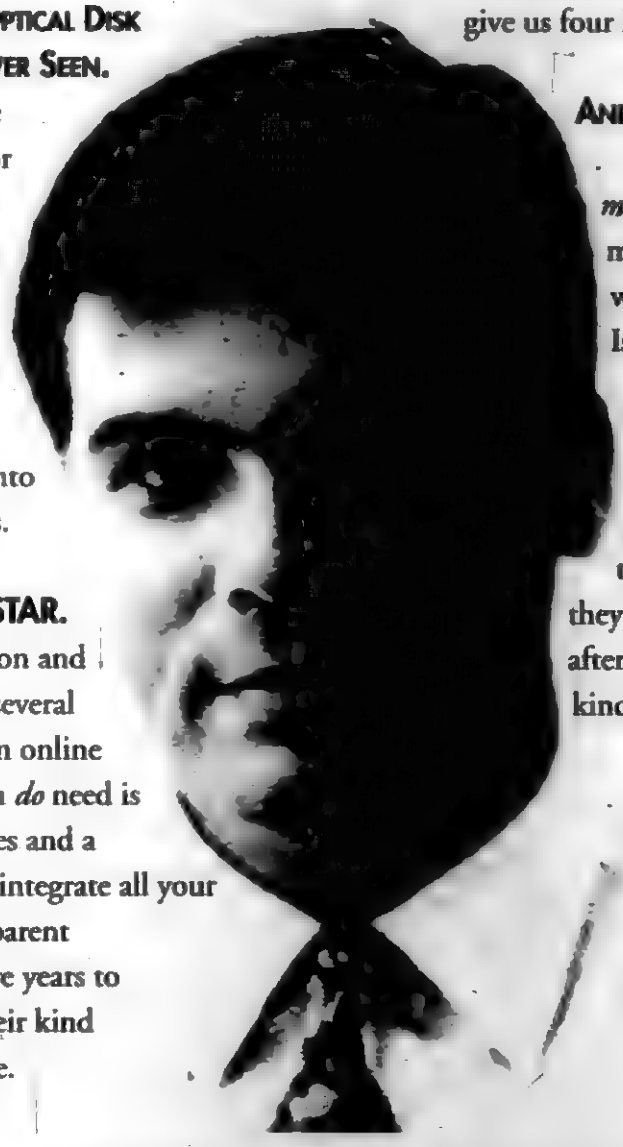
Even when I was young, I wanted to do world-changing kinds of things. I remember wanting to build the ultimate library, where anyone could access every book ever written at the touch of a button. My library would reside on a giant space station.

So I Majored In Math, And Joined NASA.

Actually it was a double major: math and physics. Math for the massively complex file management algorithms, and physics because … well, getting that much stuff into orbit seemed like a non-trivial physics problem. Is it any wonder I found myself at NASA's National Space Science Data Center heading up Networking and Mass Storage R&D?

I Got To Build The Neatest Optical Disk Networks This Planet Has Ever Seen.

If you've heard of the Space Physics Analysis Network — or SPAN — I worked on it. And on many massive optical storage systems as well. I never did get to build my space station library of every book ever written, but it's amazing just how much information I got into orbit on revolving optical disks.



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SOME COMPANIES WILLING TO PAY FOR A IT'S THE ONLY

Design. Engineering. Testing. Service. Support. When you think about it, these are what make one computer better than the next. Which makes it all the more surprising that companies are cutting back in these areas. And, amazingly, some do little but stick their name on at the end of somebody else's assembly line.

It would be like buying a car, looking under the hood, and discovering that it was built by a company you'd never heard of from a place you'd have trouble finding on the map.

It makes you wonder about the kind of company that would do it. Why they would make the decision to put their name on a product over which they maintain little control. And why they would then sell it to their customers.

Obviously, at some point during some meeting in some boardroom, the mandate came down:

Find a way, any way, to cut costs.

At Compaq, when we set out to build affordable PCs, we took a decidedly different approach.

All three of the new COMPAQ computers—the COMPAQ ProLinea, COMPAQ Contura, and COMPAQ DESKPRO/i—are Compaq designed. Compaq built. Compaq tested. And, perhaps most telling of all, each one is Compaq supported.

Precisely because all three of our new, affordable computers are true COMPAQ products, we back them with the same comprehensive service and support as the rest of our computers.

Other PC companies do things differently, like offering substantially limited service and support for products they apparently have less confidence in. Dell has even gone so far as to withdraw their

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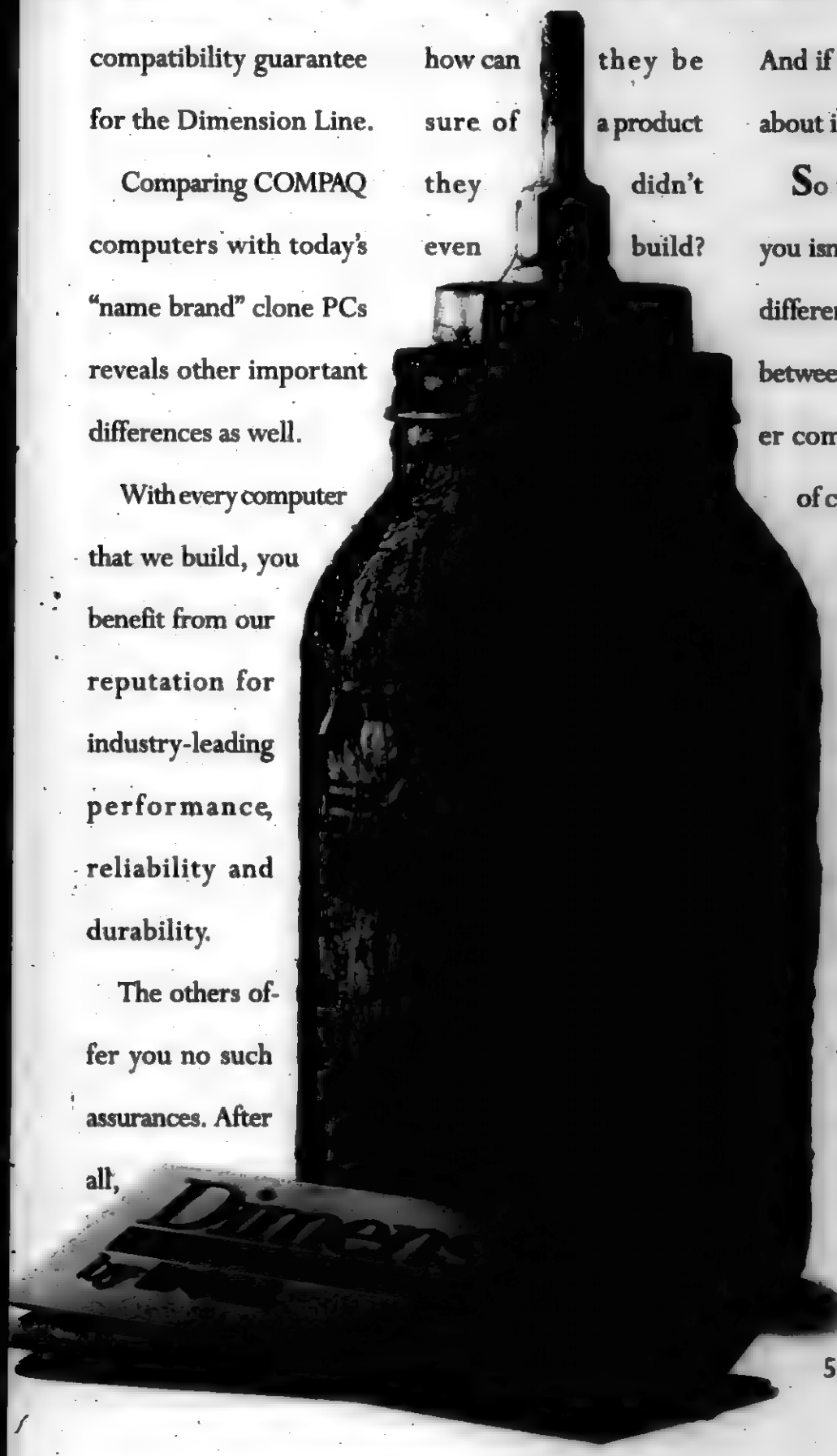

compatibility guarantee for the Dimension Line.

Comparing COMPAQ computers with today's "name brand" clone PCs reveals other important differences as well.

With every computer that we build, you benefit from our reputation for industry-leading performance, reliability and durability.

The others offer you no such assurances. After all, how can they be sure of a product they didn't even build?

And if they can't be sure about it, how can you?

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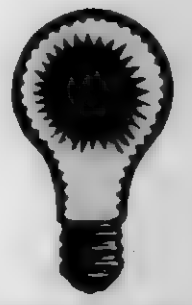


Some ideas are better than others. Unlike a lot of today's clones, the new COMPAQ PCs are all designed, engineered and tested by Compaq.

COMPAQ

ADVANCED TECHNOLOGY

TECH TALK

Paste-on antenna

■ Two communications researchers at the Georgia Tech Research Institute in Atlanta have developed a new kind of broadband antenna. Called a spiral-mode microstrip antenna, the device is thin — less than a third of an inch — and can simultaneously serve a number of applications such as radio, cellular telephone and other wireless networks. The researchers, who founded Wang-Tripp Corp. to market the antenna under an exclusive license from Georgia Tech, also foresee applications in inter- and intraoffice communications.

Baby calculators

■ Babies, it seems, have innate computational abilities — despite the worrisome decline in math and science scores of their older siblings. In a report published last month in *Nature*, a researcher at the University of Arizona in Tucson demonstrated how infants as young as five months were capable of noticing addition and subtraction on small sets of objects. In the test, rubber Mickey Mouse dolls were presented to children and then placed behind screens, replicating correct and incorrect results to a 1 + 1 = and 2 - 1 = calculation. Seeming to expect the correct number of dolls to emerge from behind the screen, the infants looked significantly longer at the dolls when the wrong number of Mickeys appeared.

Optical multiplexer

■ An experimental device able to selectively switch multiple information-carrying wavelengths from one optical fiber to another has been invented by Bellcore, the research and development arm of the seven regional Bell holding companies in Red Bank, N.J. The so-called integrated acousto-optical filter could obviate the need to electrically switch channels, effectively increasing the speed and efficiency of optical networks. Bellcore said its filter works 1,000 times faster than current optical multiplexing technologies.

Is that John Hancock or Hancocks?

Technologies for capturing signatures abound, but verification systems are rare

BY ELLIS BOOKER
CW STAFF

In the shadow of computer-to-computer transactions, an individual's signature — be it on a contract or a check — continues to be the quintessential mark of business.

Surprisingly, while technologies for electronically capturing, storing and presenting signatures abound, far less are commercially available in the way of *automated* systems for comparing signatures.

"All banks have so-called signature cards," explained Steve McNair, president of FTP Consulting Services, Inc. in Euless, Texas. "Some small banks still view the [physical] card. . . . At others it's on microfiche, and still others have personal computer or mainframe-based systems to present it on a screen."

Nor is banking the sole application for signature image presentation.

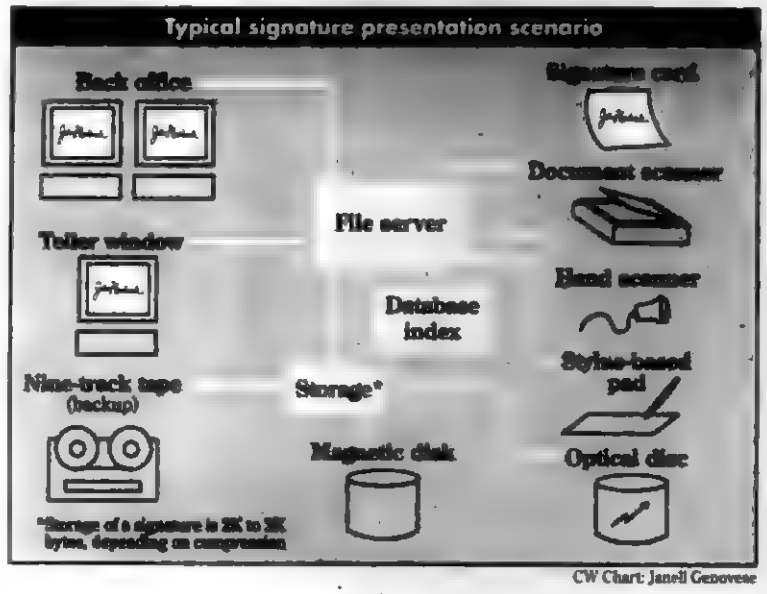
In April, voters in New York began using a verification system dubbed Signature Capture, Reproduction and Imaging System for the Board of Elections (SCRIBE). The $9.1 million system was developed by Andersen Consulting in Chicago; when fully implemented next year, SCRIBE will service 3 million voters and 23,000 election inspectors.

Still, McNair said he is aware of only one company with an automated system for comparing an on-file signature image with an image of a signature stripped off a check. And that firm — DocEye in Sweden — until now had done business exclusively in the Netherlands.

Why isn't automated verification more common? According to McNair, the answer has to do with cost-justification for the technology and the way the back offices of banks really work.

"Banks do [signature verification] on high-dollar items," he said. "But a lot of banks, until they get burnt, are not doing the signature verification they ought to be doing."

Joe Uhland Jr., director of marketing and sales at SQN, Inc. in Rancocas, N.J., agreed with this assessment.



CW Chart: Janell Genovese

"We are good at taking images from the file. And we know how to capture the signature from a check," Uhland said. SQN has installed several hundred of its signature presentation systems at some 150 U.S. banks and has digitally scanned some 40 million signatures over the years.

Uhland said human intervention is still needed with a majority of signatures. Many checks have illustrations printed on them — "like a mural of a sunset where the signature goes," he said — and that makes automated recognition difficult.

One way around the comparison of signature images is to compare the unique pen-stroke pressures made during a signature. Such systems use a pressure pad to record the image of the signature and the velocity and vectors of the pen as it completes the mark.

But McNair said retail establishments have not gravitated toward these systems because of cost.

On the other hand, companies ranging from clothing retailers to United Parcel Service, Inc. have begun deploying pen-based systems to capture signatures at the point of sale.

But McNair observed that this application does not involve verification.

"Retailers want that signature so they can do an American Express-type statement, with a signature," he said.

The issue of how to verify identity has returned with a vengeance — and a new kind of credit card scam proves the point. In the scam, thieves armed with a valid card number encode the number onto the magnetic strip of another charge card. Later, when they make a purchase with the fake card, the stolen number read off the magnetic strip — not the one on the face of the card — is used for payment.

The solutions to this and other frauds could involve systems for comparing signatures. But analysts state that, for now, the complexity and expense of these systems makes it more likely that simpler alternatives, such as personal identification numbers, will start being used in conjunction with charge cards.

And what about the signature? Will it go the way of the pocket watch?

"I think the signature's going to be around for a long time just because it's so universal," Uhland said.

"Besides," he added, "it's a lot less invasive than, heaven forbid, a retinal scan."

New crop of notebooks coming

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — Notebook personal computers will gain the storage capacity of desktop computers, and desktop capacity will reach into the gigabytes once manufacturers begin using the new crop of high-capacity 2.5- and 3.5-in. hard drives displayed at the recent Data Show '92 in Tokyo.

Toshiba Corp. started the race with its announcement earlier this month of a 213M-byte, 2.5-inch hard drive that is scheduled to start shipping next month.

Hewlett-Packard Co. displayed its "Kitty Hawk" 1.3-inch hard drive. At barely 32 grams, the lightweight system currently offers a maximum capacity of 21.4M bytes. Mass production is scheduled to start early next year, an HP official said.

Maxtor Corp.'s highest capacity offering in the 2.5-in. form factor is currently 128M bytes, but a 256M-byte model should be ready in time for the Comdex/Fall '92 show in November, an official said.

Seagate Technology, Inc. showed both 1.05G-byte, 3.5-in. and 209M-byte, 2.5-in. hard drive models. The 0.75-in.-high, 2.5-in. model achieves 200M-byte-class capacity using conventional aluminum platters, according to Seagate. Volume production will begin later this year.

Quantum Japan exhibited a 1.25G-byte, 3.5-inch hard drive that is scheduled to enter volume production at year's end. In the 2.5-in. form factor, Quantum showed a 160M-byte drive. Sample shipments are expected to start shipping at the end of next month, according to a Quantum official.

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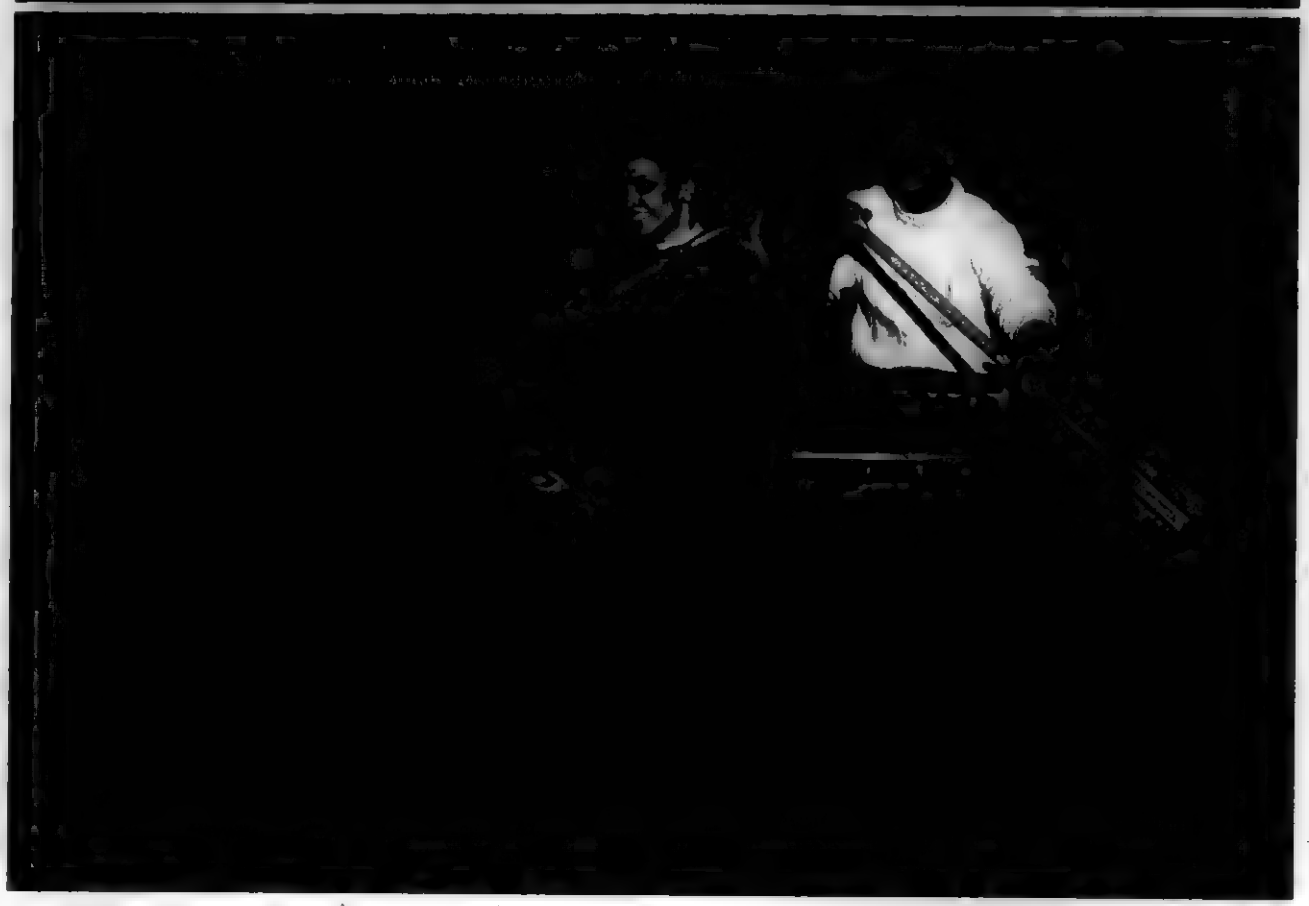
Network printing.

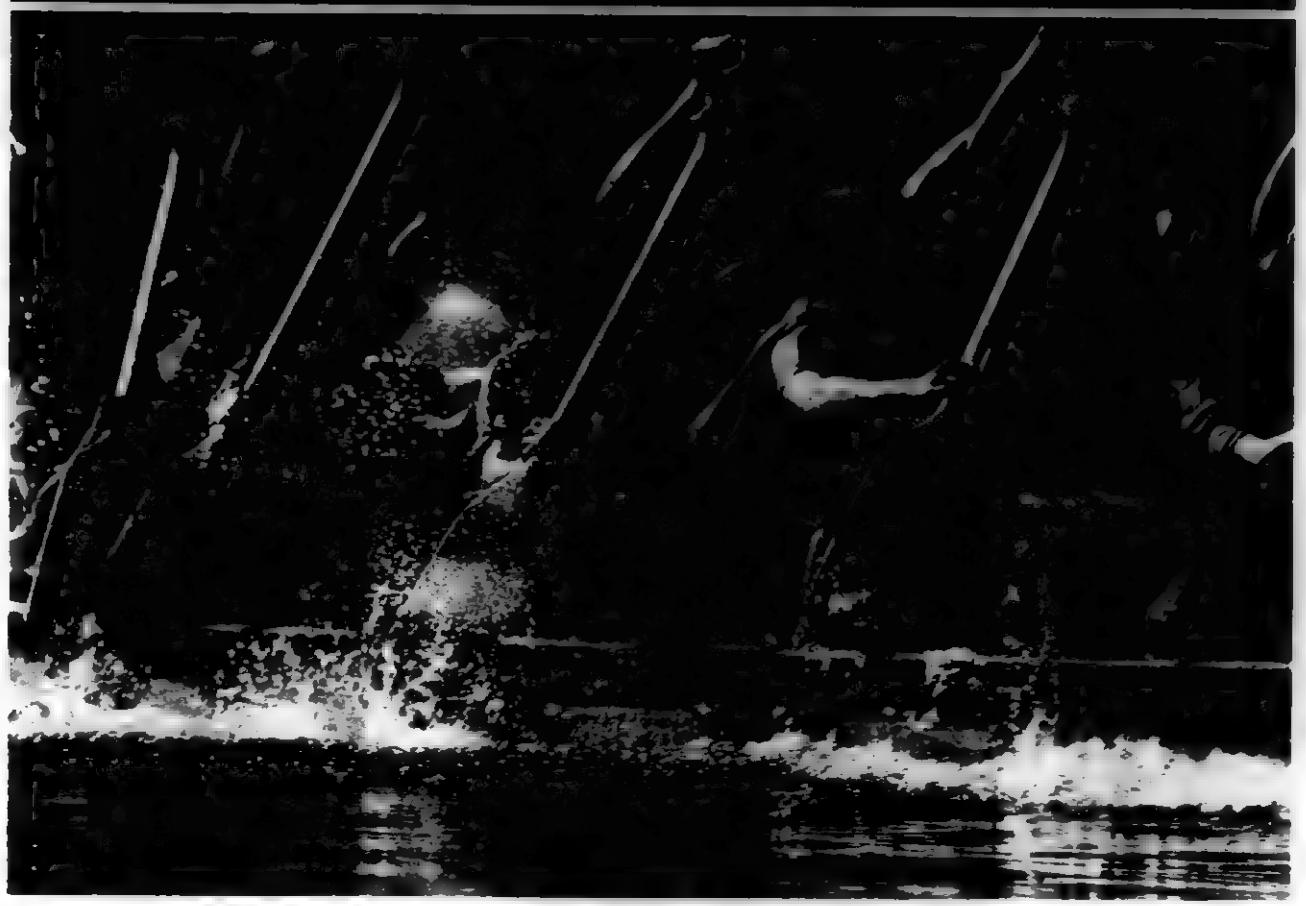


When it comes to network printing, you want to move swiftly. Give the job to the LaserJet IIISi printer from Hewlett-Packard.

The LaserJet IIISi printer has a 17 page-per-minute engine and a RISC-based formatter for fast text and graphics. It's also network-ready. When you add an HP JetDirect card, the printer is seen as a node on the network. That means you can place it anywhere along the network. Anywhere your users need easy access to their output. You're no longer limited by a faraway server.

The LaserJet IIISi avoids bottlenecks by pulling data through the interface card 30 times faster than the standard parallel rate. It is therefore able to print 18 times faster than ordinary printers. And, since your file server is relieved of some print server functions, you'll enjoy faster transaction times and increased speed across your entire system.

Network printing with the LaserJet IIISi.



With an HP JetDirect card, the LaserJet IIISi is able to function seamlessly with your current network because we collaborate directly with network operating system vendors. In fact, HP's Novell Solution is Novell-certified.

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Microsoft® LAN Manager	*802.3* *Token Ring (4/16 Mbps)*
IBM LAN Server	*Token Ring (4/16 Mbps)*
AppleTalk	*LocalTalk* *EtherTalk*
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SCO UNIX	*Ethernet/802.3*

The fastest printer in the LaserJet family also speeds up the process for network managers. You can now troubleshoot the entire printing network and track data transfer from network to printer. You'll finally be able to take full advantage of your network management software.

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LaserJet Printers

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*Suggested U.S. list price for base printer. Optional HP JetDirect cards, $695-$895, purchased separately. **For operating HP-UX or SunOS, a one-time purchase of $400 in configuration software is required. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. Microsoft is a U.S. registered trademark of Microsoft Corp. †In Canada call 1-800-387-3867, Ext. 7096. ©1992 Hewlett-Packard Company PE12271

EDITORIAL

Gimme access

Who says big government is the enemy of free enterprise?

Certainly not the Federal Communications Commission, which this month took another step in a series of recent moves to bust up the local telephone monopoly on users' budgets.

The FCC's landmark decision allowing private carriers to compete with telephone companies so that business customers can receive complete point-to-point interstate services is good news. Viewed with other recent decisions, it's part of an overall sign that the new FCC — under Chairman Alfred Sikes — is taking user interests very much to heart.

The FCC's move will permit vendors, other than local telephone companies, to tie into local lines in order to connect customers to long-distance carriers. Therefore, corporate users will soon be able to buy long-distance service that completely bypasses the Bell system, giving them far more options for playing competing vendors against each other. At this point, corporate customers are the only ones who'll benefit, and the changes don't apply to intrastate service. But the trend is clear.

Sikes summed up his philosophy last year in an interview: "I believe strongly in pluralistic markets. In order to... dramatically enhance user options, we've got to have very few entry barriers."

Amen. In the past year, the commission has also moved to further deregulate AT&T, set aside bandwidth for wireless communications before that market even hits its stride and proposed that users of switched services be given the same equal-access choices it just provided to users of dedicated lines. It will also offer local telephone companies the flexibility to compete more aggressively on price and service.

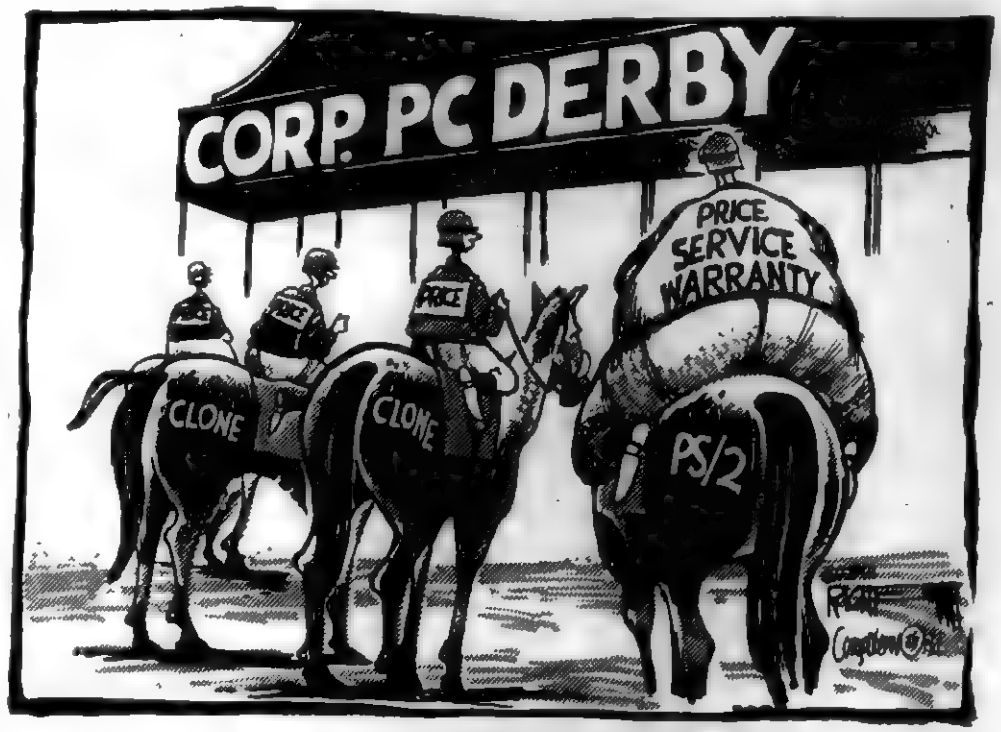
The locals' argument that competition will hurt remote customers by squeezing telephone profits doesn't hold water. Those same customers should also have more options to choose from.

All this isn't going to make life any easier for the beleaguered telecommunications manager, who can't be blamed for sometimes pining for the days when installing a telephone line was as simple as calling Ma Bell. But that simplicity carried a steep price. And can anyone really argue that competition in long-distance services hasn't been a plus for business?

Competitive pricing has made telecommuting viable, spurred the growth of videoconferencing and may lead to fax machines carrying more information than first-class mail by the year 2000. It has also made calling cross-country as cheap as calling across town in some areas.

Sure, regulation is simpler. Remember how much simpler it was to fly cross-country before airline deregulation? All it cost was a month's pay. I'll take my chances and opt for a choice.

Paul Gillin, *Executive editor*



LETTERS TO THE EDITOR

Focus off track

Regarding "Client/server on track at railroad" [CW, Sept. 7], as James Shefelbine's supervisor, I feel you misrepresented our data processing environment at Burlington Northern.

Our purpose in developing the Unix-based network was to allow users access to the most appropriate environment for their work needs — RISC, PC or mainframe — and we have done so with the support and cooperation of our computer operations group. It was our understanding that these accomplishments, and not your obvious prejudice against mainframe data processing shops, was to be the article's focus.

Computerworld is a highly respected trade publication and needs to positively focus on information technology development.

Jean Remus Arndt
Fort Worth, Texas

Few opportunities in PC programming

I was somewhat dismayed by your cover story, "'Old-timers' wrestle with dinosaur image," [CW, Aug. 24] which seems to imply that most Cobol/CICS/MVS programmers will find themselves unemployed in the next few years unless they acquire PC programming skills quickly.

It is surely true that many corporations have cut back severely on personnel in every area, including programming, during the past few years.

I am doubtful, however, that the opportunities in the PC programming area are really very great. It is unclear to me how many corporations are actually moving production systems to PC LANs on more than a small, experimental basis, and it is unclear to me that there is a compelling reason to do so.

Why, in principal, should hundreds of small computers connected by cables be less expensive than one large computer? If anything, a LAN seems to be far more complex than a mainframe and includes far more possible points of failure.

Is the tremendous cost-saving potential of LANs really more than the marketing hype of certain technology vendors?

Jacob Stein
Monsey, N.Y.

Pace group clarifies Wang statement

I strongly object to "Users 'dis' Wang VS" [CW, Inside Lines, Aug. 3].

The statement "We're definitely moving away from the Wang name toward more open themes" in no way is meant in the derogatory sense.

Our conference is called Pace '92 and is sponsored by the Americas Pace Special Interest Group. The Pace '92 theme is "At your own Pace," which means moving toward open systems while maximizing investments in the VS.

I have no interest in slamming Wang. Wang and its user groups continue to have very strong partnerships.

Ramsay Millar
Chairman
The Americas Pace Special Interest Group

Different ball game for career women

Regarding "The buck stops here: *Computerworld* 1992 salary survey" [CW, Sept. 7], James Hackett, director of legislative data systems at the Rhode Island General Assembly in Providence, is part of the problem, not part of the solution.

In the article, he is quoted as saying, "I'm critical of [women] that work for me that don't demand more and that haven't sought management positions." His operative verb is *critical*.

A sensitive manager, of either gender, would be "helpful" or "eager to mentor" or "encourage." But, like Henry Higgins, Hackett wonders, "Why can't a woman be more like a man" and *demand*.

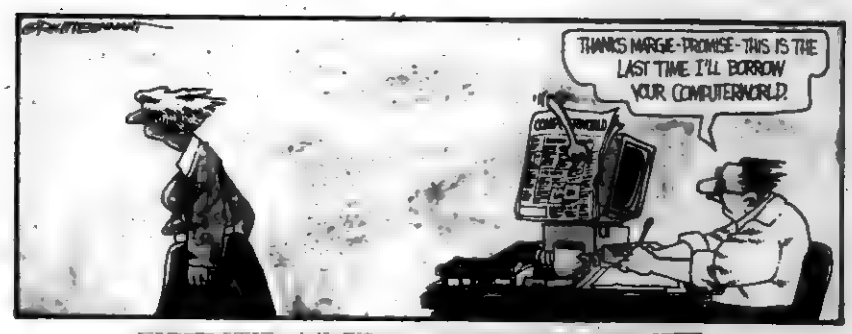
Well, Mr. Hackett, women don't generally demand; we don't find it very fruitful, and when we do, we're accused of being "bitchy."

The aggressive, demanding personalities you seek are the hallmarks of dysfunctional (and generally male-dominated) organizations that women of my acquaintance find so stifling.

A more enlightened manager would look for ways to entice women into managerial roles where their unique styles and skills could work wonders.

Carol Anne Ogdin
Santa Clara, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*



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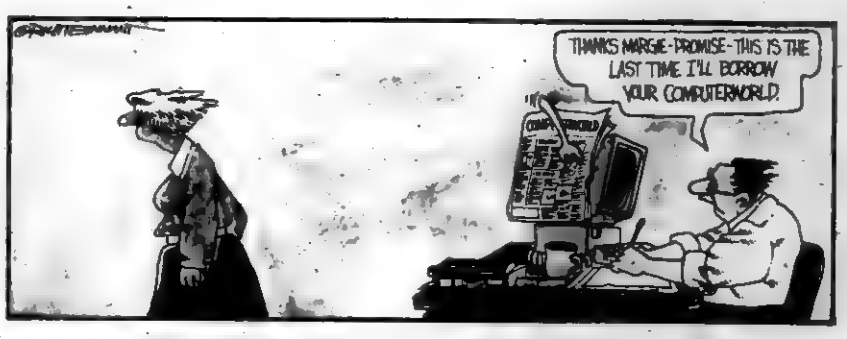

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One more aid to discrimination

Section 1706 doesn't give minorities, small businessmen a fair shake

REP. MAJOR R. OWEN

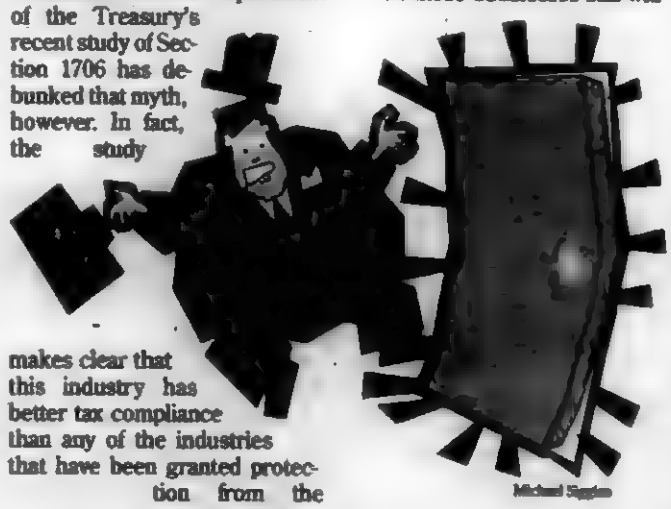
If we are ever going to approach fairness in our tax laws, we must repeal Section 1706 of the Tax Reform Act of 1986, which discriminates against self-employed computer professionals — and minority entrepreneurs in particular.

Section 1706 effectively made it more difficult to classify computer consultants as independent contractors for employment tax purposes. It requires businesses to use a 20-question, common-law test for determining whether these consultants are employees or independents.

The test is so troublesome that Congress in 1978 created a "safe harbor" provision that allowed businesses to make the determination based on reasonable judgments and customary industry practices. Until we do something about the unpredictable common-law test, all taxpayers deserve some sort of secure haven as a backup.

> NEWLY self-employed consultants — especially minority entrepreneurs — stand little chance.

The problem is that Section 1706 removed the safe harbor from only one industry — the technical services industry — because of a mistaken belief that tax compliance was particularly bad in this field. The U.S. Department of the Treasury's recent study of Section 1706 has debunked that myth, however. In fact, the study makes clear that this industry has better tax compliance than any of the industries that have been granted protection from the common-law test.



Michael Siggins

The point about discrimination has particular importance to me. I have heard from many African-American computer programmers and analysts who have had the door to self-employment slammed in their faces because of Section 1706.

Many businesses are unwilling to use the services of valid, self-employed consultants because they do not want to attract the attention of IRS auditors.

Of those businesses still willing to hire independent consultants, many have candidly admitted that the common-law test prompts them to look for consultants who rent expensive office space, own expensive equipment, regularly advertise and have several well-known clients.

As a result, new entrants into the ranks of self-employed computer professionals — and especially minority entrepreneurs — stand little chance. Big, established firms get bigger, while new, small businesses without fancy offices and equipment and blue-chip clients are cast aside.

Section 1706's discrimination against the technical services industry has resulted, in turn, in a second discrimination against an already disadvantaged class.

Unjustifiable

My new congressional district will include Brooklyn Technical High School, which has a high percentage of African-American, Hispanic and Asian students and trains many of tomorrow's computer professionals.

Some of these students may have the dream of being self-employed in the growing high-technology industry. How can I justify a discriminatory law like Section 1706 to them?

A few businesses claim that it would be too much trouble to repeal Section 1706 because they have learned to live with it and, indeed, profit handsomely from it. They are sitting pretty and want to further insulate themselves from the competition that will result from more entrepreneurship.

But if they were sitting on the other side of the fence, where the view isn't quite as pretty, their attitude would be very different. Lots of people make a living with all sorts of discrimination, but that hardly means that discrimination should be continued.

Owens (D-N.Y.) is a member of the U.S. House Committee on Education and Labor.

Pinocchio vendors: Selling you the world

ROBERT STEARNS

These are tough and competitive times. There are too many vendors with similar products, all trying to sell to the same group of customers. In order to get attention, vendors have had to turn up the volume. In the process, a few cross that fine line between truth and fiction. They are not overtly lying, but their noses are getting a bit longer.

If you are having trouble telling if your vendor suffers from Pinocchio Syndrome, perhaps the following list of common misstatements will help:

- **"This is not just an OEM deal. It's a strategic partnership."** The implication is that there's more being shared here than just a specific product; and this should be more beneficial to the customer than a simple distribution agreement. In the vast majority of cases, this is simply not so, particularly from the perspective of the supplying vendor. It's just that one or both of the vendors worry that a straightforward OEM deal will be seen as a sign of weakness.
- **"If we (or when we) replace the OEM product with one of our own, we'll continue to support the older product, and the new product will be fully compatible."** Customers who vendors anticipate will resist buying an OEM product are salved with the implication that the situation is temporary, that an in-house-developed product is on the way (perhaps the result of newly acquired know-how via the "strategic partnership").

Customers who fear that the OEM deal may be temporary and that they should buy directly from the original manufacturer are assured of continuing support, updates, parts, even compatibility with future generations.

The truth is that in the vast majority of cases, OEM deals continue much longer than either partner anticipates. The larger vendor's internal development efforts can never quite seem to leapfrog or even catch up with the OEM technology, and original manufacturers are reluctant to end long-term, successful distribution relationships.

If an OEM relationship does end, however, customers should not expect support to continue for long. Divorce is ugly, and compatibility between generations is very difficult and costly to achieve (assuming it is even desirable).

> IF AN OEM relationship does end, customers should not expect support to continue for long.

- **"Release 1.0 is fully beta-tested and works perfectly."** Release 1.0 *never* works perfectly — that's why there's a Release 1.1, and that's also why it's a good idea to get a list of beta-test site customers.
- **"That feature is planned for the next release, but (don't worry) it's field-upgradable."** Vendors call this "selling futures." Sometimes the claims are valid (and someday you may win the lottery). The desired feature may or may not be in development. Even if it is, it may not be in the next release — hell, it may never work. It may also never work but still be in the next release, which is a lot worse.

Besides, field upgrades are often very bloody affairs and often performed not by a senior development engineer but by a fairly inexperienced customer service agent. In other words, you might be better off if the vendor is fibbing.

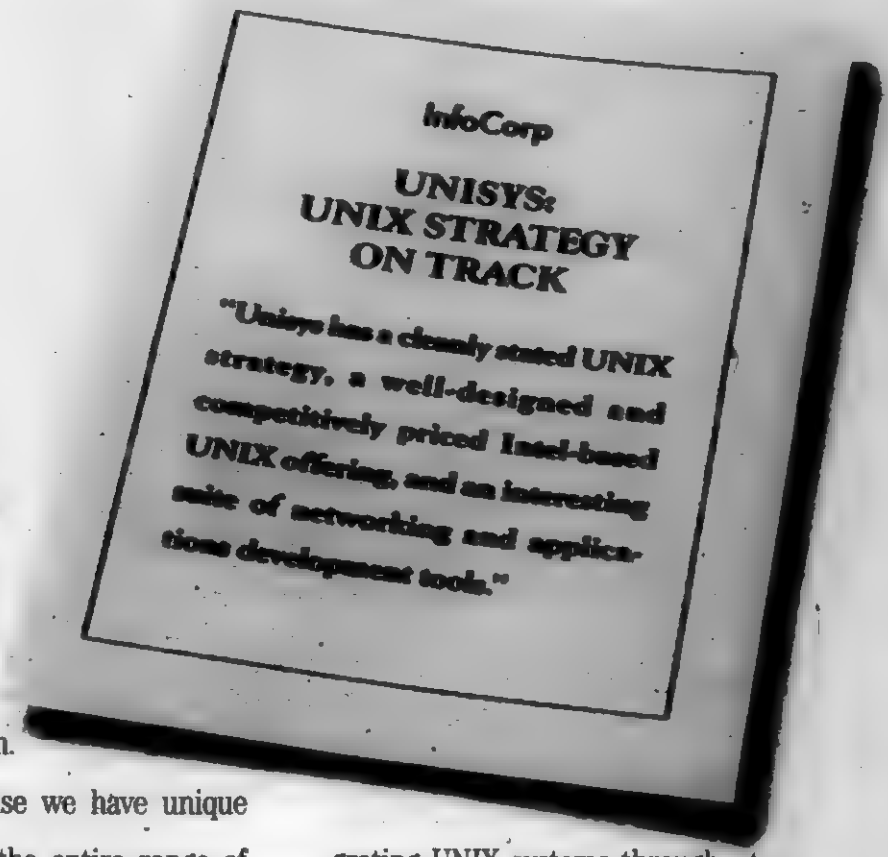
- **"We are fully standards-compatible."** For anything more complex than a cable, this claim is usually meaningless. Which standards? De facto standards like SNA or NetWare? Formal standards like those approved by CCITT? Standards in formation, like OSI? All of the above? Some of the above?

The fact is that in most complex products you'll find a mixture of standard and proprietary approaches, and that's usually fine. Just make sure you understand what's being said.

Stearns, a 20-year industry veteran, works for an international consulting company.

Recently the analysts looked into our UNIX strategy and discovered what sets us apart.

Vision.



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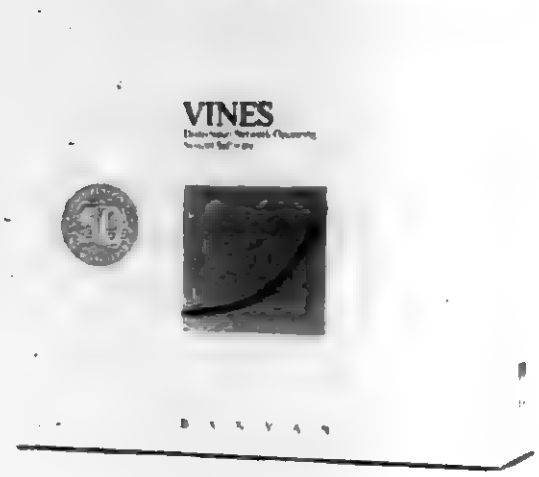

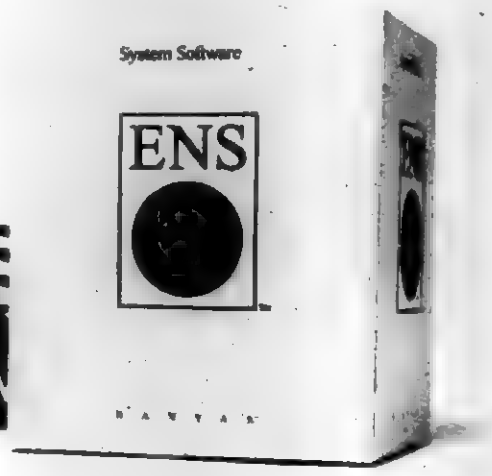

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It's trick or trick for IS in October

Beware of a slew of new viruses, including Halloween, Datacrime, Karin

BY JAMES DALY
CW STAFF

There will be many tricks but few treats for information systems security managers this month as a gaggle of new viruses surface. The Octoberfest of virulent code includes, naturally, a Halloween virus as well as several other destructive programs and the fall's usual rogues' gallery [CW, Aug. 31].

New additions on the DOS virus list include **Violator B1**, a non-memory-resident parasitic virus that infects all .COM files, including COMMAND.COM. Although rare, Violator B1 can cause damage to data by reformatting Track 0 on all drives. Trigger dates are the fourth day of October, November and December.

Another virus joining the lineup is **Anarkia B**, a generic file infector variant of the well-known Jerusalem virus that infects .COM, .EXE, .SYS, .BIN, .PIF and overlay files and generally slows down the system.

Anarkia B activates on Oct. 12 after it becomes memory-resident and then deletes any programs the user attempts to execute.

Karin, or Redstar, is a rare nuisance virus that activates Oct. 23. It is a non-memory-resident infector of .COM programs, including COMMAND.COM. When an infected program is run, the virus displays the message, "Karin hat GEBERTSTAG," which roughly translates to "Karin's birthday." The system will then need to be rebooted to end the display.

If the COMMAND.COM is infected, the system boot may possibly fail.

Datacrime is a rare, destructive, non-memory-resident virus that attatches to the end of .COM files, increasing the file's length by 1,168 bytes.

The virus will continue to propagate until Oct. 12; then, when it is executed, it will display a message similar to "Datacrime Virus" or "Released: 1 March 1989." A low-level format of the hard disk follows.

Errors in the code will often make the system crash following infection.

There are several other strains of Datacrime that also activate Oct. 12, including Datacrime-B, Datacrime II and Datacrime IIB.

Halloween is a nuisance virus that infects .COM and .EXE files, including COMMAND.COM. Naturally, it is executed on Halloween. At that time, a 10K-byte file with a blank file name will be created in the current directory. The file contains pure virus code. The user will then receive the message "Runtime error 150 at 0000:0AC8."

Halloween-infected programs will experience slow program loads when an infected program is executed.

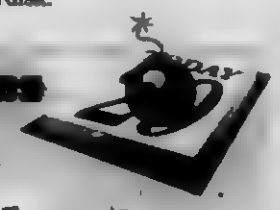
There are also two other viruses that can be activated on any day between Sept. 1 and the end of the year: **1554** and **1704**.

The 1554 strain is a memory-resident virus that infects .COM, .EXE and COMMAND.COM files and renders them inoperable.

The 1704 virus is a memory-resident .COM file infector that causes the infected file size to increase by 1,704 bytes. When activated, 1704 also reformats the hard disk.

Unleashed viruses

A list of the viruses scheduled to strike during the month of October



October

All month: Crew 2480, Mendoza, Cascade, Aircop B
Each Monday: Bad Guy 2, Exterminator
Each Tuesday: Demon, AHI
Each Friday: Alabama, Frere Jacques, Pay Day.
Skism will hit the last three Fridays of the month.
Every 10 days (Sept. 10, 20, 30): Day 10
Oct. 2: Flip
Oct. 4: Violator B1
Oct. 5: Frog's Alley
Oct. 8: Taiwan
Oct. 12: Anarkia B
Oct. 13: Mendoza, Anarkia
Oct. 18: Form 18, Skism
Oct. 20-30: Plastique
Oct. 23: Karin
Oct. 24: Form
Oct. 25: Skism
Oct. 31: Violator B1, Halloween

Source: Fifth Generation Systems, Inc.

Microsoft sound card dressed to impress

BY CHRISTOPHER LINDQUIST
CW STAFF

Sound cards have been around for several years, but none of them have managed to make more than a dent in the corporate market. Microsoft Corp. is looking to change that. Its Windows Sound System is aimed squarely at the corporate user who wants a plug-and-play system to add sound capabilities to a personal computer.

The Sound System consists of both hardware and software. On the hardware side, users get a microphone, headphones and a card that fits into any available AT-bus slot in the PC. The card has connections for microphone and line inputs, such as a compact disc/read-only memory (CD-ROM) drive, as well as left- and right-channel line and headphone or speaker outputs. Users will not find any joystick or Musical Instrument Digital Interface ports on this card. Microsoft makes a point of saying the card is not intended for games or musicians.

The Setup program installs several software utilities, including the following:

- **Volume Control** (no more reaching behind the machine to adjust sound levels).
- **Recording Control**, through which you choose the active input channel and level.
- **Quick Recorder**, which allows users to record and embed sound annotation into documents.
- **Voice Pilot**, which provides voice recognition for control of applications.
- **ProofReader**, which audibly reads back spreadsheet information on Microsoft's Excel and Lotus Development Corp.'s 1-2-3 for Windows spreadsheets.
- **SoundFinder**, which can be used to browse through a variety of sound files.

It also includes SoundScapes, a "sound-based screen saver," Music Box 2.0, a CD-ROM control panel, a guided tour and a sound library with sample sounds.

Setup is quick and easy. A user starts the installation software before opening the machine, and the Setup program determines if the default base address of the card is acceptable. If not, it graphically shows the user how to set the only jumper on the card to a usable address.

Once the card is installed, the software determines available interrupts and direct memory access channels and configures the card automatically.

After setting up the card, the user can connect the microphone and speakers or headphones. Probably the quickest introduction to the system is the SoundFinder. With it, users can select multiple sound files to test. Icons and descriptions can also be attached to the sounds for easier identification. The Sound System can play sounds in a variety of formats, including those for the Next, Inc. family of computers and the Apple Computer, Inc. Macintosh.

The Quick Recorder allows users to easily create sound snippets that can be dragged and

Continued on page 42

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WINDOWS VIEW

Jesse Berst

Road warriors

It requires extra effort to take Microsoft's Windows on the road. Because Windows is so demanding of computer resources, a portable that's just fine for DOS-based computing may come up short if you try to use it with Windows. If your IS department supports users, managers, salespeople or executives who want Windows to go, you'll want to weigh the following six considerations in addition to normal buying criteria: power and hard disk size, pointing device, screen, file-transfer software, telecom software and fax software.

First, you'll need a more powerful machine. Don't try to get by with anything less than a system based on the Intel 386SX at 16 MHz. If your budget permits, you'll be much happier with a 486-based machine.

Second, you'll need more disk capacity. For space and cost reasons, most laptops max out at 60M or 80M bytes. At that size, you've got enough room for one or two serious Windows applications and a handful of Windows utilities. If you go beyond that, you'll probably need to use compression software.

Don't be scared off by compression software. It has been perfected to the point that Microsoft plans to incorporate it into DOS 6.0. This software compresses and decompresses data on the fly. You won't even notice much of a delay.

Windows users do, however, have to keep a small uncompressed area available for the Windows swap file. Just follow the manufacturer's directions. The best-selling product is Stacker from Stac Electronics in Carlsbad, Calif., but there are a half-dozen other compression solutions if you prefer.

Setting up Windows on a portable without solving the pointing device problem is, well, pointless. You just can't run Windows efficiently from the keyboard alone. Some travelers use an ordinary mouse. A mouse is fine if you typically transport your laptop from one desk to another, but if you have to work in planes or other confined areas, you'll need a more compact solution. Microsoft, Logitech and others manufacture clip-on trackballs that attach to the side of the laptop.

I find these clip-ons awkward and uncomfortable. My favorite portable pointer is Thumbelina, a tiny trackball that fits in the palm of your hand. Made by Appoint, Inc. in Pleasanton, Calif., Thumbelina is adequate for ordinary point-and-click operations and ideal for computer presentations, thanks to its long cord and small size.

The most elegant solution, however, is something built into the laptop. IBM's PS/2 Model CL57SX, for instance, has a built-in trackball, albeit in an odd location at the upper left. You can find other laptops with various solutions, ranging from trackballs to thumb-operated rollers to so-called "mouse keys." Be sure to try out these devices before buying — some people adapt readily, but others don't like them at all.

Monochrome is out

Next, turn your attention to the screen. Don't try to run Windows on a monochrome machine. You won't be able to distinguish icons or buttons. Look for a portable with a gray-scale screen. Sixteen shades of gray is sufficient. Sixty-four shades is a little nicer, although it's not really necessary.

Of course, the ultimate screen solution for Windows is a color LCD. Unfortunately, color portables are heavier and more expensive than their gray-scale counterparts. In fact, most of them are still so expensive that you can't justify them except for sales presentations and demos, where the excitement of color can mean the difference between getting the sale or not.

It's tempting to save a few dollars by opting for passive-matrix color. I've tested both passive- and active-matrix portables. Passive-matrix color is fine for personal work, where the washed-out colors don't make much difference. For sales presentations, however, you need the visibility and vibrance of active matrix.

So much for the hardware. On the software side, you also have special considerations. For file transfers from the laptop to the desktop, you may choose to simply shuttle floppies from the portable to the desktop machine.

If you want a Windows-based solution, you might try WinConnect from Traveling Software in Bothell, Wash. For a product that combines transfer software with a file manager and other utilities, check out Xtree for Windows from Executive Systems in San Luis Obispo, Calif.

Most road warriors need a telecommunications package, and here the news isn't great. There are at least a dozen Windows communication packages but none that I consider truly outstanding.

You're in better shape if you want to send faxes. There are several outstanding fax programs for Windows, including WinFax Pro from Delrina Technology in Toronto and the new UltraFax from Z-Soft in Marietta, Ga. One word of warning: Make sure to check that the fax software you're looking at supports your modem.

Berst is publisher of Redmond, Wash.-based "Windows Watcher" newsletter.

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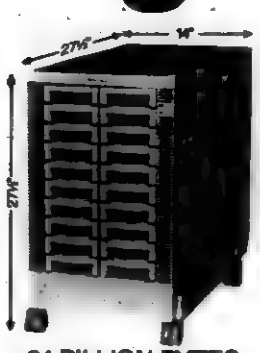

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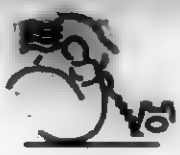
Quattro Pro 4.0



Part of a series of articles on questions commonly asked of personal computer software vendor support groups. This week's column focuses on Borland International, Inc.'s Quattro Pro 4.0.

Q I have plenty of memory, but I still get "not enough memory to complete operation." Won't Quattro Pro use extended memory?

A Quattro Pro won't store spreadsheet information in extended memory. It stores spreadsheet information in expanded memory, or EMS. You can use an expanded memory manager such as QEMM or 386 to the max. You can even use EMM386.EXE, which comes with DOS 5.0. These programs will convert your extended memory to expanded memory.

Q I have an expanded memory manager and it helped some, but Quattro Pro gives me the "out of memory" message when I still have some memory left.

A Set/Options/Other/Expanded Memory to Both. That way, Quattro Pro 4 will store everything it can in memory.

Q How do I change the font in a header or footer?

A In Quattro Pro 4, the font used for headers and footers is Font 1 under /Style/fontTable. Change this font, and it will change the header and footer fonts. You may need to assign a different font to the rest of your document.

Q How do I get my headers and footers to print?

A Make sure that /Print/Layout/Break Pages is set to Yes. Quattro Pro won't print headers and footers at the top and bottom of pages if it isn't keeping track of where pages begin and end. If you are using a laser printer, make sure that the top and bottom margins are big enough to avoid the printer's nonprintable region.

Q My keystroke macros created in a previous version of Quattro Pro do not run properly in Quattro Pro Version 4.0.

A Select /Options/Startup/Use Dialogs/No. Also, select /Tools/Macros/Key Reader/Yes.

Q When I try to print on legal paper, Quattro Pro only prints on 8- by 11-in. paper.

A Be sure to change the page length to 14 inches in the /Print/Layout menu. Also, select the legal-size mode under /Options/Hardware/Printers/1st or 2nd Printer/<CR> (select the correct Make, Model and then legal-size mode).

Q How can I speed up printing on a Novell, Inc. network?

A In Quattro Pro 4.0, make sure the device for your default printer is set to Network Queue rather than a captured port.

Q I'm running on a network and receive the error message "Cannot Open Resource Library." How do I correct this?

A Each user's private directory must contain a set of MP and RF files. There should be no MP or RF files in the main program directory. Also, be sure the user's path statement contains both the user's private directory and the Quattro Pro program directory. The order is important in the path statement; the private directory should appear before the Quattro Pro directory.

A New DEXPO.

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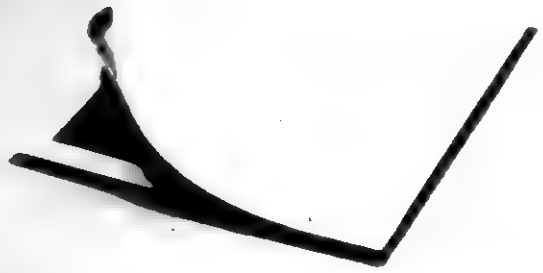

Las Vegas, December 8-10, 1992 begins a new decade for DEXPO. It's your opportunity to experience the future as it develops. As one of the millions of DEC users, you know DEC is expanding to include Alpha-based products, and full migration to Open Systems interoperability.

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IN BRIEF

Intel to close N.J. division

■ **Intel Corp.** will move its Princeton, N.J.-based Digital Video Interactive (DVI) Technical Operation to Chandler, Ariz., and close the Princeton facility during the next 12 months. The move is being made to better control costs and centralize Intel's DVI activities in one location, a spokeswoman said.

The move is expected to save Intel about $20 million a year in travel costs. Eighty percent of the 170 employees in Princeton will be offered transfer packages. The spokeswoman said the move will not affect projects that are under way and that no work has been canceled.

■ **Computer Associates International, Inc.** has bundled its CA-Textor word processing software with **Reference Software International's** Grammatik 5 for Windows. The bundled package is available for $99 in a limited offer.

■ **IBM** said it has "enhanced" its OS/2 Developer Assistance Program. Developers can now join the program by calling (407) 982-6408 or via CompuServe after Oct. 18. IBM also announced it will ship a compact disc/read-only memory with beta-test versions of future OS/2 code and development tools.

What you know about Borland is great software

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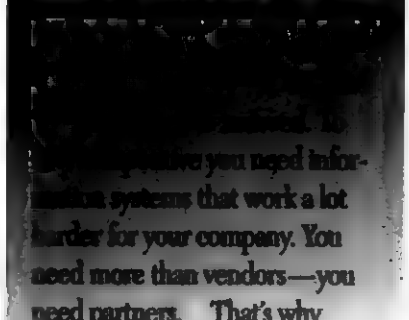
Ranked #1 (Company in J.D. Power and

User Satisfaction Study.* The most awards for technical excellence worldwide.

What you may well Borland

BorlandEase



...you need information systems that work a lot harder for your company. You need more than vendors—you need partners. That's why Borland created EASE, the most innovative IS support program in the industry. EASE lets you *Evaluate*, *Adopt*, and *Standardize* your systems more *Easily* than ever, with quality programs and flexible options that give you more control over your systems, your time, and your budgets.

The most flexible programs

You may have heard that Borland products consistently win the most awards and are used by thousands of companies worldwide. You may not know that Borland is committed to being the *easiest* company in the world to do business with.

We're the only one of the "big three" PC software companies that provide customized solutions that work for you. Instead of asking you to do business "our" way.

We've made it so easy for you to do business the way *you* want to that we call our service program EASE—*Evaluate*, *Adopt*, and *Standardize Easily*. Quite simply, the flexibility of EASE puts Borland way ahead of our competition—so that we can put you way ahead of yours.

Here are some of the EASE programs that you can choose to create the service solution that's right for you.

An inside look

The **Executive Briefing** program lets you discuss your unique needs with Borland executives who talk your language. It's an opportunity to get an inside look at Borland's software and service direction. Because the more you know, the better decisions you can make.

Each briefing is tailored to address how Borland's software and services solve *your* critical issues. Issues like corporate mission, enterprise-wide data sharing, client/server technology, expediting applications development, and increasing user productivity.

More time to evaluate

The **Corporate Acceptance Program (CAP)** lets you evaluate products well before they are released, without the burdensome requirements of *beta* testing. By giving you more time to evaluate, CAP keeps your technology decisions ahead of the competitive curve. You have time to budget

not know is how works with IS

for software further in advance. And you learn how emerging products will fit into your company's fast-changing information architecture.

Reduced training costs

Borland employs more than 400 support experts to help your people quickly reap the benefits of greater productivity.

In addition to Borland's standard support, we offer a variety of **Enhanced Technical Support** programs from which you can choose the kind of support that's right for your users, your installation requirements, and your style of doing business. Here are just a few:

- ***Priority Support Hotline*** *provides instant, toll-free access to senior technical support engineers.*
- ***KnowledgeBase CD*** *puts an encyclopedia of technical information at your fingertips.*
- ***Discounted training materials,*** *like courseware and videotapes, speed your product knowledge.*
- ***VIP CompuServe Bulletin Board*** *gives you 24-hour access to top Borland engineers as well as thousands of expert users and developers.*

Easier upgrades

Borland's new **Maintenance Program** saves you from the paperwork, worry, and administrative hassle of upgrades.

Together we do "zero-based budgeting" around what you want to accomplish, and over the time frame you require. You get an upgrade program that's customized to your needs, and your style of doing business. We even offer a centralized delivery option that further reduces administrative costs.

Volume purchase discounts

The **Volume License Agreement (VLA)** gives you purchasing power combined with personal service. VLA gives you discounts on the software your users prefer, and the flexibility to work within your existing business relationships. You don't have to change the way you do business, because with EASE you can work with your existing resellers.

And VLA gives you more than discounts. The Gold Disk program makes it easy for you to control the distribution of new software in your company. Plus, you can order just the amount of documentation you need, and take delivery as often as you like to keep on-site storage to a minimum.

The greatest of EASE

There's nothing like Borland's EASE services to support you in putting the world's best PC software to work in your organization.

1. ***Executive Briefings*** keep you informed every step of the way.
2. ***Corporate Acceptance Program*** provides ample lead time for product evaluation.
3. ***Enhanced Technical Support*** keeps your users up and running . . . *(not to your office).*
4. ***Maintainence Program*** helps you keep pace with fast-changing technology.
5. ***Volume License Agreement*** gives you purchasing power combined with personal service.

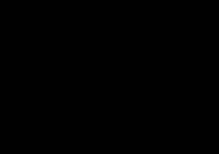
Borland delivers the services that IS professionals need, along with a time-tested track record for product excellence, reliability, and company stability.

Only Borland puts it all together for IS

ComputerWorld readers rank Borland tops

In *ComputerWorld*'s 1992 IS Brand Preference study, IS professionals were asked which brands of PC software they preferred. Time and again, Borland topped the charts.

A stable partner for the long term



Every aspect of our software and service is engineered to make your company more productive. That's why we win more technology and product awards worldwide than anyone else. Why we earned the prestigious J.D. Power and Associates 1991 ranking as the #1 software company (tied with WordPerfect) for Customer Satisfaction Among Business Users. Why Borland products are used in *every* Fortune 500 company. And why you can count on us to make your company more successful throughout the '90s and beyond.

COMPUTERWORLD PREFERENCE STUDY

	PC DEVELOPMENT TOOLS AND APPLICATIONS SOFTWARE			
	Database Management Systems (DOS-based)	DBMS Client/Server Computing	System-level Compilers	Object-Oriented Programming Systems
Installed in company	#1 dBASE #2 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best technology	#1 dBASE	#1 dBASE	#1 Borland C++	#1 ObjectVision
Best price performance	#1 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best service/support	#1 Paradox #2 dBASE	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best documentation	#1 Paradox #2 dBASE	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Prefer to do business with	#1 Borland	#1 Borland	#1 Borland	#1 Borland
Plan to buy	#1 dBASE #2 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision

***ComputerWorld* readers rank Borland software best in categories important to IS.**

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When you're working with Borland, you know your company is in good hands.

Our partnerships with companies like IBM* and Novell put you squarely in the mainstream of enterprise-wide computing. And our industry leadership in Object-Oriented Programming and data integration guarantees that the Borland products you buy today will fit into your information systems for years to come.

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*J.D. Power and Associates 1991 Computer End User Satisfaction Study for Application Software Publisher: Phase IV: Business End User Summary. Responses from Business End Users at 4,396 business sites.

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COMPUTERWORLD.

The Nonstop Computer Newspaper That Works for You.

8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigra receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

The world of information systems never stops. And neither does Computerworld.

In fact, 58 reporters, editors, writers, and designers work around the clock and around the world to bring you the most up-to-date news in IS.

What's more from the time your issue rolls off the presses at midnight on Friday, it takes some 25 airplanes, 5 trains, 7 tractor trailer trucks, and 37 major city postal centers to deliver *Computerworld* to your desk by Monday morning.

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The Newspaper of IS

Keeping track of leased PCs

BY MICHAEL FITZGERALD
CW STAFF

MCGAW PARK, Ill. — At a large company such as Baxter Healthcare Corp., administering leased personal computers often leads to the heavy use of aspirin.

The headaches involved in tracking and handling leased PCs can turn into even more of a migraine than those that go with purchasing PCs because leased PCs have to be returned. Big leasing companies such as Comdisco, Inc. and Chrysler Systems Leasing, Inc. have created specialized electronic data interchange systems to help customers manage their leased PCs. Comdisco's Comdisco Lease Administration System Software, or CLASS system, the first in its field, was a significant factor in leading Baxter to lease notebook computers for one of its divisions, according to Maxcine Ashcraft, field automation coordinator at Baxter's hospital supply division.

"Our biggest concern was tracking," Ashcraft said, adding that the Comdisco on-line system allowed Baxter to easily change information it maintains on its 550 notebooks. She said Comdisco's willingness to change aspects of CLASS to suit Baxter's needs was also a factor.

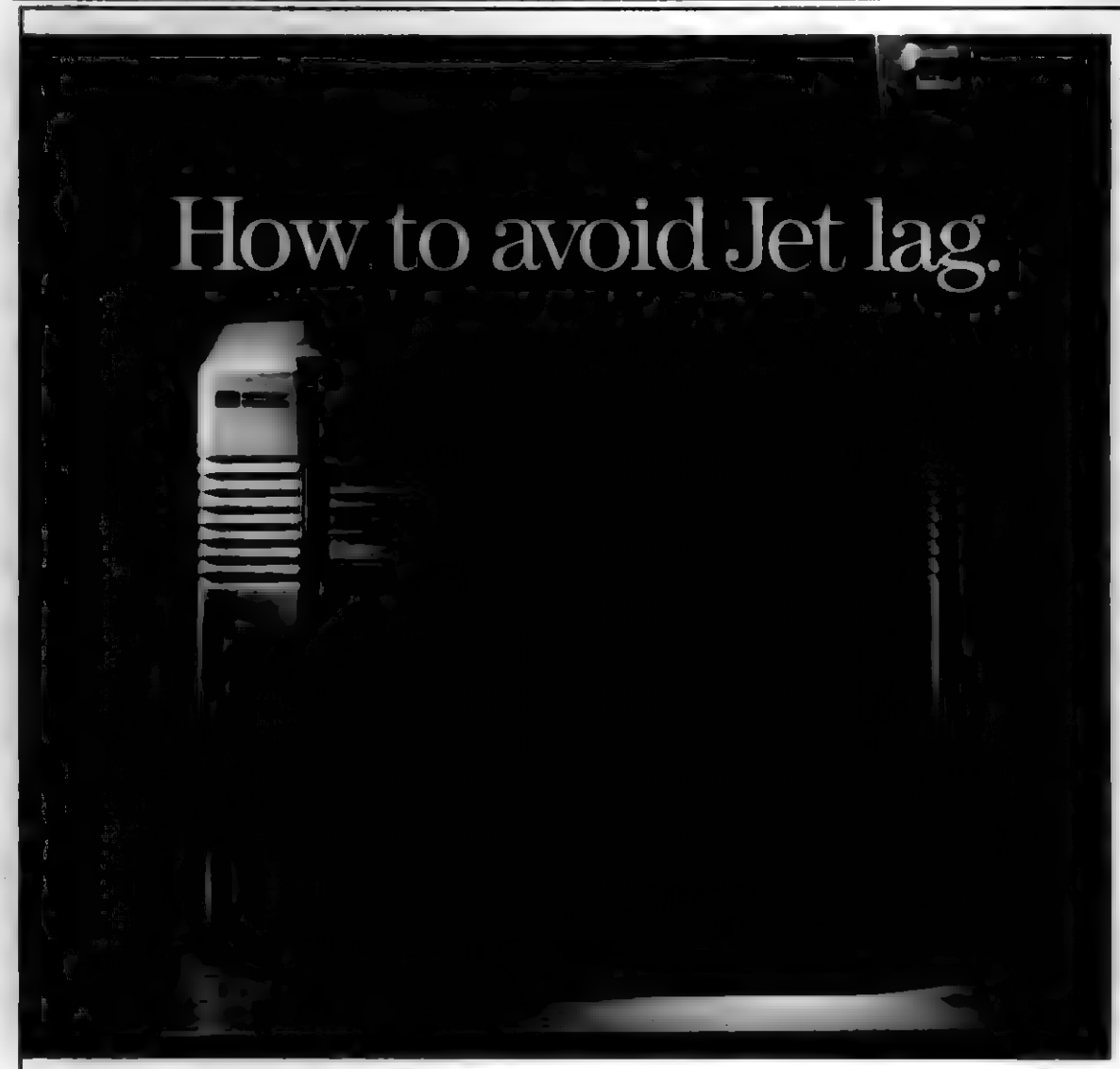
Ashcraft built what she called a "catalog" for Baxter's leasing needs. The catalog contains the pertinent information on what Baxter leases with each notebook, including an expansion station and external monitor and keyboard. Baxter later added printers and 9.6K bit/sec external modems to the catalog.

Today, Ashcraft said, she has her catalog set up so she can order a new notebook and its accessories simply by pressing one or two keys on her keyboard. She can then transfer the leasing information to an asset management module within CLASS.

"When I learned what I had to do in this position and then looked at CLASS, I saw it as my savior. I can't think of any other way I would've done it," said Ashcraft, who speculated that a clumsy operation setup in a Lotus Development Corp. 1-2-3 spreadsheet probably would have been her only other option.

Despite such strong words of praise, CLASS may become a thing of the past for Ashcraft's group, through no fault of its own. The primary reason Baxter leased notebooks rather than purchasing them was to stay abreast of technology. In late 1989, Baxter wanted to outfit the hospital supply division's field sales force with computers. It chose the first 386SX notebook, Compaq Computer Corp.'s LTE 386S/20.

"The Compaq LTE is a little outdated now," she said. Baxter's lease ends in late 1993, and it plans to begin reviewing a variety of notebooks early in 1993 to see whether notebook technology has developed to the point where purchasing will work better than leasing.



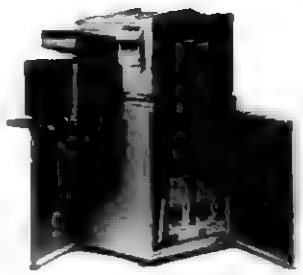
Choose accessories that keep pace with the fast HP LaserJet IIISi printer.

With the17-page-per-minute *HP LaserJet IIISi printer*, it takes less time to print a page than to walk over and take it out of the printer. It's perfect for shared or networked environments.

Now you can add accessories designed to make your high-capacity printing solution even more productive. The new 1,500-sheet *HP paper feeder* lets your HP LaserJet IIISi printer and the people using it get more done between refills. And switch between paper trays without getting up.

Your company will save even more time by keeping paper, toner cartridges, and other supplies in one convenient location—underneath the printer. The *HP LaserJet printer cabinet* is roomy on the inside, compact on the outside. It was custom designed to match the footprint of the HP LaserJet IIISi printer with an HP paper feeder. Exactly.

Get your company's high-capacity printing solution off to a flying start. See your authorized HP reseller or contact your HP sales representative about the HP LaserJet IIISi printer and custom accessories. For more information call 1-800-752-0900, ext. 7000.



Enhance the high-capacity HP LaserJet IIISi printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

Sound card impressive

CONTINUED FROM PAGE 37

dropped into documents such as spreadsheets that support Object Linking and Embedding. After activating the Quick Recorder, a user can speak into the microphone to create a voice annotation to the document. Quick Recorder's editing tools allow you to perform actions such as speeding up and slowing down the sound as well as cutting and pasting segments. The sampling rate of the recording can also be selected; lower rates provide lower-quality sound but also use less disk space.

One of the more useful pieces of software is the ProofReader. ProofReader installs itself as a menu item in Excel or Lotus 1-2-3 for Windows and allows data to be read back to the user either as it is entered or by selecting a range. A user-definable dictionary lets the data entry person enter new words. It is very helpful to hear what you are entering as you type in numbers from a hard-copy list, for example.

Probably the most entertaining — and potentially the most useful — piece of software is the Voice Pilot, which allows you to control Windows applications through voice recognition. Voice Pilot comes with predefined vocabularies for some 15 applications, such as Excel and Lotus 1-2-3 for Windows, but users can create their own "voice macros" and apply them to any Windows program.

For example, I wrote a simple macro that allows me to call a remote system, read my mail and log off, all without touching the keyboard or mouse. Some tasks get tedious, such as saying "left," "right," "up" and "down" over and over to select menu items, but shortcut words can be written for common items. Whether the people sitting near users' cubicles will want to hear them talking to their computer all day is an issue worthy of discussion.

In all, the Windows Sound System may be just what the industry needs to audition multimedia at many businesses that may have considered it more of a toy than a tool.

The Windows Sound System is scheduled to be available early next month for a list price of $289.

IT'S SMOOTH SAILING ALL THE WAY TO Alpha

With the Digital Fleet of Application Reengineering and Migration (ARAM) Services

From start to finish, your migration to [illegible] made easier with Digital's Application Reengineering and Migration (ARAM) Services — a logical, step-by-step approach to implementing an open applications environment.

When planning your migration, begin by using our comprehensive porting and conversion services. Then, plan for longer-term strategic reengineering by taking advantage of Digital's COHESION solutions — a complete set of integrated capabilities for new and existing application development.

Here, in the first of an ongoing series on Digital's ARAM Services, we'll focus on our Migration Services offerings — specifically those aspects that position you to take maximum advantage of COHESION.

What ARAM Services Can Do for You

Today, changes in hardware technology are inevitable. Processors utilizing the latest technology have obvious benefits for maximum software performance. But overall, it's the migration of existing applications to the new platform that prompts concern.

Having assembled a software application portfolio over a number of years, an IS or engineering manager has a daunting task — and a lot of questions. Which applications should be moved? In what order? What kinds of special tools are needed? How will the staff react?

To help answer these questions and implement migration, Digital provides a full range of Application Reengineering and Migration Services that are available in several options, featuring:

- Assessment of the existing applications portfolio to discover improvement opportunities.
- Migration and optimization of applications to Alpha platforms.
- Preparation of the existing software for "forward engineering" to the COHESION environment.
- Business process reengineering and the utilization of IS as the enabling support for the resulting changes.
- Reuse and redesign of systems to take advantage of client/server, distributed environments.

Application Migration Centers (AMCs) Make Migration Easy

Your immediate questions are: How do I prepare today to migrate to Alpha? How difficult will this migration be? Digital answers your questions by providing you with migration services that make the process easy and efficient.

We can keep you on the right course with a wide range of reengineering and migration support services. Utilizing Digital's COHESION solutions as key elements in your reengineering efforts, our ARAM services help you plan for and implement the move to Alpha platforms.

We have Application Migration Centers (AMCs) in place across the U.S. that help you facilitate the planning process, that provide implementation help, and that continue to support you with longer-term application reengineering needs. Specifically, AMCs offer you:

- Migration Assessment Consulting Services
- Application Porting Services
- Comprehensive Alpha Training.

One, two, or all three offerings can be tailored to fit your business environment. From do-it-yourself support, to medium-level shared support, to providing for your total support requirements — AMC services are flexible according to your needs and your budget.

The centers have already provided substantial support for the porting of a great number of independent vendor software packages. These successes — along with the ability of AMCs to move portable code and provide easy-to-use porting tools and enabling software — secure for you an easy and successful migration.

Migration Assessment Consulting Services

AMCs can deliver Alpha Migration Assessment Consulting Services for OpenVMS and OSF/1 today. These services cover the development of an integration and migration strategy along with conversion and porting software. Assistance is also provided in migrating to an open systems environment.

Specifically, the assessment consultancy can offer you:

- A better understanding of potential benefits and impacts of Alpha via a thorough assessment of your application environment.
- Increased awareness of potential issues (if any) around your migration along with the size of the effort required. This knowledge will help facilitate overall planning and staffing.
- An understanding of the activities needed for the implementation — and the milestones associated with them.

The assessment process is conducted in [illegible] phases in order to give [illegible]

Porting Service Package

Digital offers a [illegible] of porting service alternatives to meet a range of business requirements. The Porting Service Package — a set of software migration tools, training, documentation, and remote support — allows you to work either in your VAX VMS or in your MIPS ULTRIX environment to recompile, relink, and translate your applications to Alpha. What's more, these packages have already proven their success through a great number of third-party porting experiences.

Comprehensive Alpha Training

To provide you with the understanding, knowledge, and skills to successfully implement and optimize your new Alpha systems, a full breadth of training courses has been developed. Courses include Alpha VMS Migration, Alpha OSF Migration, and Alpha Technical Overview.

Expertise You Can Count On

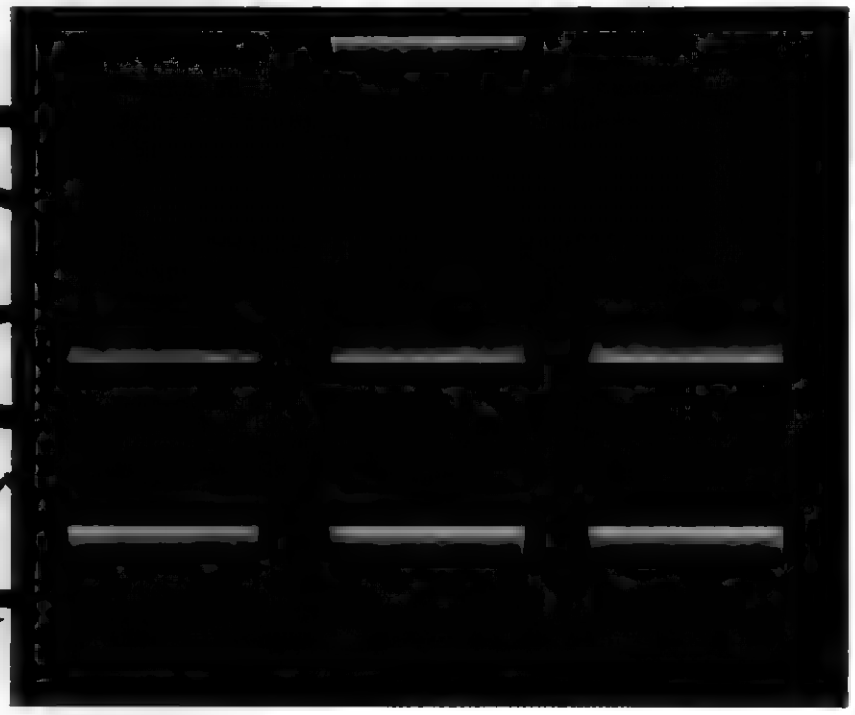
With today's rapid changes in technology environments, you're looking for state-of-the-art products and comprehensive services. Digital — a full-service provider of reengineering solutions, including a comprehensive set of Alpha porting and conversion tools — has what you're looking for.

We offer you the complete solution — Alpha hardware, the COHESION software development environment, and ARAM Services. This is the kind of total approach that will chart your course toward open applications, keeping you competitive in the '90s and beyond.

For more information and a FREE initial on-site assessment through our regional Application Migration Centers, call 800-DEC-INFO (800-332-4636).

continued

A PATH TO OPEN APPLICATIONS



Digital's Application Reengineering and Migration Services offerings are both modular and flexible — providing the assistance you need in planning for and implementing your move to RISC-based Alpha platforms.

Need *FASTER* Applications? Get *FASTER* Memory

The MS7AA series of Alpha-ready memory options — the fastest, highest-capacity memory from Digital to date — unleashes the full performance potential of today's VAX 7000 and VAX 10000, along with tomorrow's Alpha systems.

The MS7AA series' innovative use of PCB layout and packaging technologies provides 512 MB in a single module and sustained bandwidths of up to 640 MB/s due to interleaving and 70 nanosecond parts. These features highlight the fact that crisp, responsive performance isn't a matter of MIPS alone but of sufficient memory capacity and bandwidth for a variety of application needs.

ENGINEERING TRUTH #1:

Whether it runs at 10 SPECmarks or 100, your CPU's performance still depends on your memory system's ability to keep up with it.

More Memory, More Performance

Under-resourced applications page and swap more frequently and take longer to execute tasks — delaying your applications and your progress. The payoff of configuring and maintaining the right amount of memory is higher productivity — from applications and from people. To that end, MS7AA memory options provide a generous 3.5 GB capacity — a welcome feature for database management, CAD, and other applications that are memory constrained (512 MB of memory is currently supported under OpenVMS V5.4). Our engineering staff recommends the following as a baseline for VAX 7000 and 10000 systems:

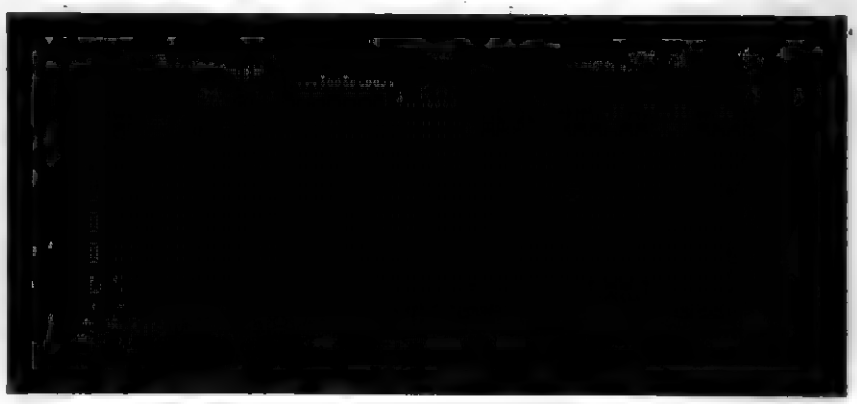
- One CPU — 128 to 256 MB
- Two CPUs — 256 to 384 MB
- Three CPUs — 384 to 512 MB
- Four CPUs — 512 MB.

Note: Ask your Digital sales representative to help you factor in current and projected application demands to arrive at your own needs.

Interleaving: Automatic, Fast, and Free

Another key MS7AA feature, interleaving is the method of accelerating data transfers by providing access to multiple memory banks simultaneously. MS7AA memory modules are designed in groups of DRAMs, or banks, each with its own controller so it can operate independently.

With one bank of memory, the CPU must wait for each transaction to be processed and returned on the system bus before it issues another command. With multiple memory banks, the CPU can interleave operations among them, issuing parallel commands and keeping data moving at full speed on the system bus — ultimately accomplishing two to three times the workload.



PARTNER SHIPS

Digital and MTI Systems

A Total Approach That's GOOD for Business

MTI Systems, a division of Arrow Electronics, Inc., became an Authorized Digital Distributor (ADD) in 1976. Sixteen years later, the term "distributor" doesn't begin to encompass the range of tightly integrated computer systems and software applications, technical services, and complete support that MTI offers today's Fortune 1000 businesses.

"MTI has always led the way in the evolution process of distribution. We've always been first in terms of the increased offerings provided by a Digital distributor," says Bob McInerney, MTI Systems President. "We were the first to incorporate a technical sales force and the first to have on-site technical resources."

McInerney explains that MTI has evolved to fill changing business needs. "To flourish in the '90s and beyond, companies have begun to rely not only on a distributor's technical expertise, but on its business expertise as well — its ability to analyze a business problem and enhance mission-critical applications already in place," he says. "MTI designs applications that meet a company's critical needs today and that provide growth for the future."

Wide Range of Expertise, Plus Personalized Service

A provider of traditional VAX system support services, MTI offers expertise in a wide range of areas, including:

- Systems integration
- Hardware integration
- Local and wide area network support
- On-site consulting
- System and network design and management
- Custom desktop integration.

What's more, MTI offers customized solutions in areas such as process and discrete manufacturing, human resources, and finance. ▶

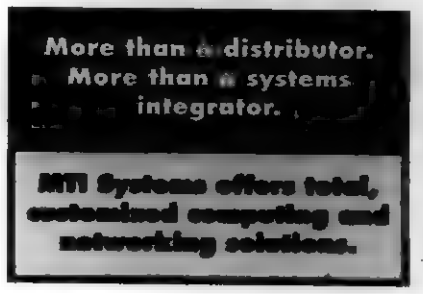
Key to the organization are dedicated sales specialists and technical engineers, who provide personal service from the pre-sale through the post-sale process. In fact, it's this kind of unique project management approach that sets MTI apart from other distributors. Says McInerney, "Clients view us not as a vendor but as a partner, who is there to help them every step of the way."

Along with expertise and dedicated personnel comes personalized service. With eight technical sales offices, MTI can offer local rather than centralized resources. The result? Individualized attention for more efficient and effective computing solutions.

MTI Partners with the Best

To date, MTI has provided Digital solutions to banking and financial institutions, hospitals and health care industries, manufacturing, nonprofit corporations, and a variety of other corporate computing environments. Through its partnership with Digital, plus partnerships with leading software vendors, MTI is able to offer a total computing solution to clients.

For example, Digital, MTI, and Excalibur recently collaborated in configuring a complex application for a large southeastern U.S. corporation. The company needs to place all its paper files online so that any one document can be accessed from any terminal. Toss in the fact that the company is utilizing a large IBM mainframe plus Novell-based PCs.



"In this case, a successful outcome takes more than just an understanding of the software," says McInerney. "A VAX system will play host for all of these documents. Therefore, you have to deal with all of the connectivity issues as well. MTI does that."

Strong Backing from Arrow

As a division of Arrow Electronics, Inc., a $1.9 billion electronics distributor, MTI is able to provide its clients with specialized programs and services. These include:

- An online inventory management system, offering instant information on product availability, location, and delivery
- A portfolio of 13 individual financial programs
- A Customized Order Program, whereby technicians configure and load major operating systems, such as UNIX, MS-DOS, OS/2, and VMS, as well as specific applications software.

MTI's single objective is to provide effective, dependable computing solutions to its clients — solutions that will certainly help businesses to excel in the '90s and beyond.

For more information on MTI Systems, call MTI at 800-645-6530.

PROGRESS AND VMS
A Winning Combination

Bring Digital's highly flexible VMS operating system together with PROGRESS software and what do you get? A heterogeneous computing environment where the network acts as the system — and where applications and their supporting platforms reside transparently.

The PROGRESS Application Development Environment is an integrated environment that comprises a 4GL, a relational database management system (RDBMS), and associated development tools. The PROGRESS environment also brings more than 2,000 layered value-added reseller application packages to the table — each capable of being deployed in a client/server environment and each completely customizable.

Simply stated, with PROGRESS, your application of choice can be platform-independent — letting you utilize the best Digital system for your specific organizational function.

The VAX VMS environment offers the open standards necessary to integrate with any other platform that adopts industry-accepted interface standards. VMS also offers a combination of "high-integrity" and "open system" benefits, such as:

- Availability
- Reliability
- Security
- Production systems support
- Interoperability
- Portability
- Consistent user interface.

"In evaluating which hardware and software platform to use, we chose VAX VMS because we needed a rich, robust environment. We also wanted to make sure our investment was protected. Using PROGRESS on VAX VMS opened up even more opportunities for us. PROGRESS really is a complete 4GL language."

Albert Hoff
Director of Information Services
Washington School of Information Processing Cooperative

What's more, VMS acts as a "bridge" from one generation of hardware technology to the next, and between systems from various vendors — protecting your investment in application, training, and systems.

The Digital/Progress team brings power, simplicity, and sophistication to the desktop — a combination that lets you simply utilize a flexible, open environment, or have this environment support as technical an application as you care to build.

For more information on the Digital/Progress solution, call Progress Software Inside Sales at 800-4PROGRESS (800-477-6473).

TERMINAL technology

Have You Heard the Latest?

The ELT320
Designed for Performance

Digital and Planar Systems, Inc. have joined forces to provide text terminal users with the ELT320 — a state-of-the-art electroluminescent (EL) flat panel display. Manufactured by Planar Systems and weighing only 4.5 pounds, the ELT320 is ideal for applications where space is at a premium, such as hospitals, critical care facilities, trading floors, point-of-sale locations, and laboratories. ELT320 performance features include:

- User-definable keyboard setup
- Six local memory pages
- Local editing
- Built-in diagnostics
- Low ELF emissions
- Communication speeds up to 38.4 K baud
- Auxiliary RS-232-C serial port.

Utilizing bright EL technology, the ELT320 terminal comes with a binder-thin display and provides crisp, flicker-free images that are easy on the eyes and readable over a wide viewing angle. In addition, the terminal comes with adjustable arms for ergonomic positioning at eye level.

All in all, the design and performance features of the ELT320 can improve system performance and enhance user productivity. What's more, the ELT320 is compatible with Digital's VT320, but uses just one-tenth the volume of this conventional Digital terminal.

For more information on the Planar ELT320 flat panel terminal, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 65G.

The Planar ELT320

Digital's X Window Terminals
Designed for Productivity

If you're a terminal user in a large or medium-sized firm looking to enhance productivity for administrative tasks, look here. Digital's new VXT 2000 family of Window Terminals, operating in server mode, provides higher productivity gains than in the past — without any significant host, network, or application impact.

These server mode terminals offer a host of benefits when used for administrative functions, including:

- No application modifications
- Improved productivity and effectiveness for systems managers and users
- Easy installation on existing networks
- Remote system management
- Reduced cost of ownership.

Digital's VXT 2000

Digital's new VXT 2000 family of Window Terminals provides productivity gains without impacting host, network, or application.

By installing the server-based VXT 2000 family of Window Terminals, telemarketing and customer service managers can be assured that users aren't taxing the host for booting, overloading the host memory, or overloading the network itself. In fact, Digital has conducted performance characterization studies that show a 50 percent or greater reduction in both network and host loading as compared to other X Window terminal approaches. What's more, a single system manager can manage hundreds or thousands of VXT 2000 Window Terminals from one office.

Plus, server-based functionality efficiently centralizes administrative management functions — allowing you to spend less time on system management functions and more time on the business at hand.

For more information on Digital's VXT 2000 family of Window Terminals, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 65H.

A FREE DECmultiJET Ink Jet PC Demo
Is a Phone Call Away

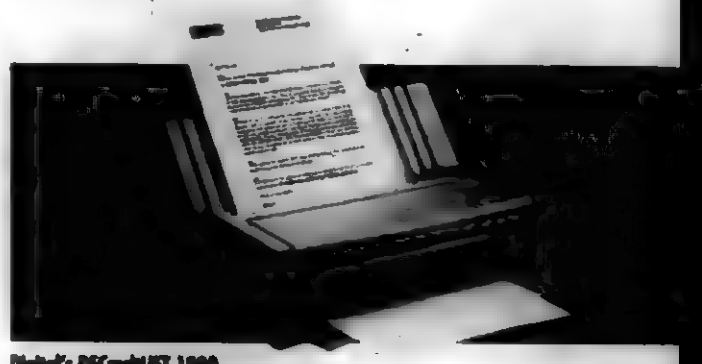
Digital has great news for PC users. For the first time, we're offering a special demo floppy (3½ inches) that gives complete details on our high-quality, black-and-white ink jet desktop printing solutions. This animated, online presentation will explain the features, benefits, and functionality of Digital's DECmultiJET 1000 and DECmultiJET 2000 family of ink jet printers — formerly our DECjet line of printers.

Both models are compatible with industry-standard PCs and have the ability to print labels, transparencies, and plain paper. Add laser-like quality and efficient paper handling — and its no surprise that in a recent issue of *PC Week Buyer's Guide* the DECmultiJET 1000 was compared favorably to nearly a dozen other models. In fact, its speed and functionality were among the highest listed, and its price was one of the lowest. (Comparisons made among portable printers under 11 pounds.)

To get your FREE DECmultiJET demo floppy, be among the first 100 people to call 800-DIGITAL (800-344-4825), press 2, and reference ext. 65F.

Product	Order #	Price
DECmultiJET 1000	FR-LJ16P-AA/CDC	$329
DECmultiJET 2000	FR-LJ36P-AA/CDC	$539

To order DECmultiJET 1000 or 2000 printers, call 800-PC-BY-DEC (800-722-9332).



Digital's DECmultiJET 1000

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NEW PRODUCTS

Fax

ZSoft Corp. has introduced UltraFax, a Microsoft Corp. Windows-based program for managing fax communications.

The product features document management, image enhancement, data file transfer and optical character recognition. A full-featured editor is included along with a multiple document viewer and a document manager. According to the company, with automatic data field insertion, users can create custom cover pages from any Windows application.

UltraFax costs $119.

ZSoft
Suite 100
450 Franklin Road
Marietta, Ga. 30067
(404) 428-0008

Peripherals

Calcomp, Inc. has introduced the CCL 600, an 11- by 17-in. monochrome laser printer.

The CCL 600 has 600 by 600 dot/in. true engine resolution and supports 8.5-in. and tabloid-size media. Resolution can be switched to 300 by 300 dot/in., and the product prints on both plain paper and transparency film. Through Microsoft Corp.'s TrueImage, the CCL 600 becomes Adobe Systems, Inc. PostScript language-compatible and has native TrueType fonts to support Microsoft's Windows and Apple Computer, Inc.'s Macintosh System 7.0.

The CCL 600 costs $4,495.

Calcomp
2411 West La Palma Ave.
Anaheim, Calif. 92801
(714) 821-2000

RasterOps Corp. has introduced PaintBoard PC, a true-color accelerated display adapter.

PaintBoard PC was designed for the Microsoft Corp. Windows environment and provides high-resolution, 24-bit color in a single-slot solution, the company reported. The product has three graphics processors and supplies support for a variety of resolutions — up to 1,024 by 768 in noninterlaced mode.

The PaintBoard PC adapter costs $1,299.

RasterOps
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

QMS, Inc. has introduced the ColorScript 210 and ColorScript 230, two color print systems.

According to the company, these terminal printers have controllers that include an Intel Corp. 80960CA reduced instruction set computing processor operating at 25 MHz. Features include the QMS Simultaneous Interface Operation and Emulation Sensing Processor technology, Context Switching, job spooling and automatic error recovery.

The ColorScript 210 costs $4,995, and the ColorScript 230 costs $7,995.

QMS
1 Magnum Pass
Mobile, Ala. 36689
(205) 639-4400

Software application packages

DeLorme Mapping has introduced MapExpert.

MapExpert is a compact disc/read-only memory product that provides a map database of the U.S. for locating, viewing, customizing and printing an unlimited variety of maps, the company reported. MapExpert runs on Microsoft Corp. Windows-based personal computers. Users can preview and print high-quality color or black-and-white maps on any Windows-supported printer. Tools for personalizing, annotating, updating and highlighting maps are included.

The product costs $495.

DeLorme Mapping
Lower Main St.
Freeport, Maine 04032
(207) 865-4171

Best Programs, Inc. has introduced the FAS1000, a fixed asset management software program.

FAS1000 features include seven depreciation schedules, automatic book defaults and the ability to calculate more than 20 methods of depreciation. It includes more than 20 standard reports with user-defined sort-and-range criteria for each asset tracking range.

According to the company, the product has a state-of-the-art relational database structure and can import information directly from a Lotus Development Corp. spreadsheet. FAS1000 runs on IBM AT, Personal System/2 or compatibles.

FAS1000 costs $795.

Best Programs
11413 Isaac Newton Square
Reston, Va. 22090
(703) 709-5200

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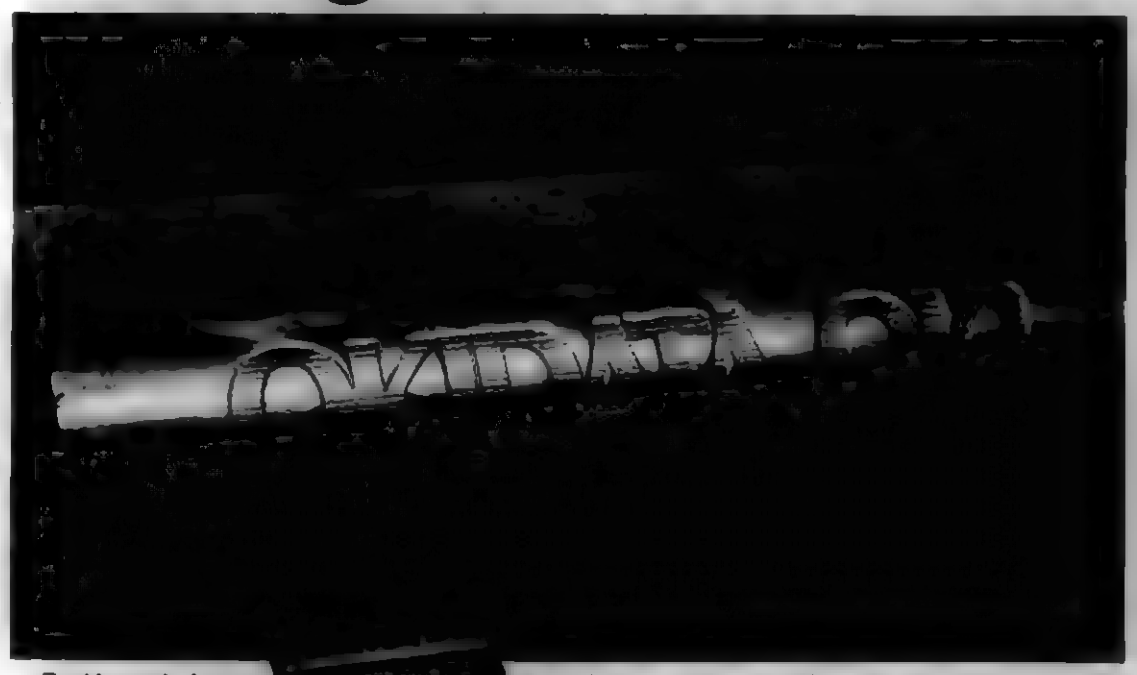

Frankly, we don't expect people who buy our new Pacemark 3410 to print on aluminum the thickness of a beverage can.

But our demonstration tells you a lot about how rugged Okidata's new dot matrix printer is – and how well it'll handle your heavy-duty printing load.

Sharp, clear 8-part forms, for example, are no problem for a printhead that can handle metal sheets. And continuous duty back-room data processing chores are a natural for a machine so reliable, it's been rated at 8000 hours MTBF.

But the all-new Pacemark 3410 has more than muscle on its spec sheet: speeds up to 550 CPS, built-in bar code fonts, and a full range of paper-handling options (top, bottom, and rear feed; labels, envelopes, heavy card stock, etc.).

Plus one more impressive feature – the Okidata OK! Our pledge that Okidata® printers will deliver performance and value that don't just meet your expectations, but surpass them.

So if you're looking for a reliable, heavy-duty printer for DP, multi-part forms, bar code or network printing, see your Okidata dealer. Or call 1(800)OKIDATA.

OKI OK!
OKIDATA OK!

We don't just design it to work. We design it to work wonders.®

THE USEFULNESS OF APPLICATION DEVELOPMENT SOFTWARE IS BEYOND QUESTION.

Companies throw out lots of claims about the value of their application development software. But how valuable are application development tools that can't do the whole job? Or that deliver applications that people can't easily use? At Cognos®, we've combined the industrial strength of PowerHouse®4GL with the easy-to-use client/server technology of PowerHouse Windows.™ The result is a combination of power and ease of use traditional development solutions can't begin to match.

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OPEN TOOLS FOR A CHANGING WORLD.

1-800-4-COGNOS or 617-229-6600 ext. 81. (In Canada, 1-800-361-3163.)

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IN BRIEF

Solbourne shuffle

■ **Solbourne Computer, Inc.** named Carl Herrmann president and chief executive officer. It also named Herrmann and Geoffrey A. Moore to its board. Herrmann joined the Longmont, Colo.-based workstation maker in July 1991 as vice president of international operations; he had been acting president since April.

■ **Microsoft Corp.** has released WinLogin, a tool intended to help administrators manage Windows configurations on networked personal computers. WinLogin allows users to store and retrieve their personal Windows configurations from any PC on the network. When a user logs on with his user name, the configuration is automatically retrieved from a central database. WinLogin has a suggested list price of $29.95.

■ **New Jersey Bell's** installation and maintenance groups will use **NCR Corp.** mobile computers, departmental database servers and scalable multiprocessors under a $3.3 million contract announced recently.

Continued on page 55

GIS helps clean up in Andrew's wake

Donated software generates daily maps that track a variety of hurricane relief operations

BY MARYFRAN JOHNSON
CW STAFF

MIAMI — After Hurricane Andrew's destructive sweep through Southern Florida stripped miles of streets of their names, a local software company helped get federal relief efforts on track with a geographic information system (GIS) that now plays a crucial role in the cleanup operation.

The week after Andrew struck, Digital Matrix Services, Inc. volunteered its expertise in GIS mapping using its InfoCAD software.

"We felt the storm in our own backyards. There were people in our company who lost their homes, so we wanted to help in some way," said Juan DeAngulo, vice president of U.S. sales at Digital Matrix. Several phone calls to Washington, D.C., put Digital Matrix in touch with Federal Emergency Management Agency (FEMA) officials, who welcomed the help.

FEMA artery

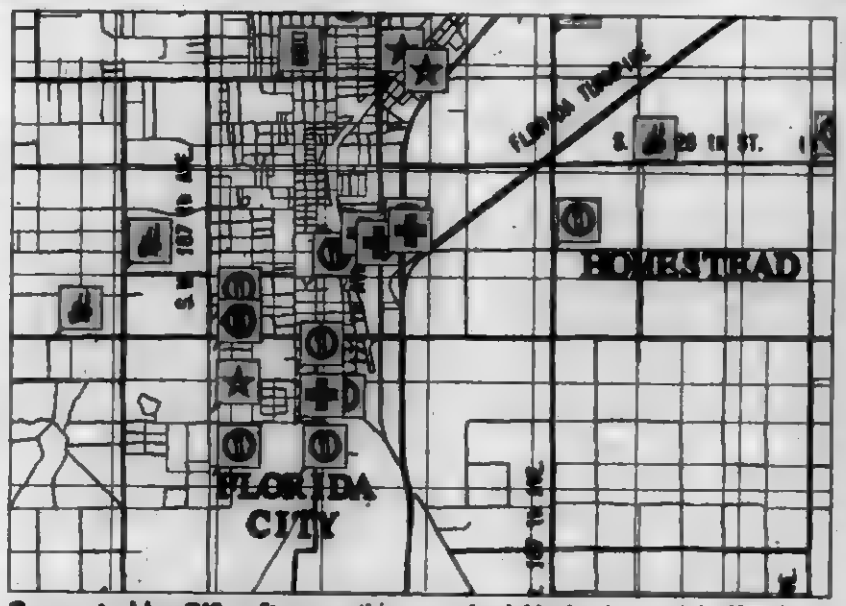
Equipped with a recent set of digitized maps covering the entire South Dade County area, the software vendor set up shop at the heart of FEMA operations in the abandoned Eastern Airlines offices at Miami International Airport.

Digital Matrix runs its software on a variety of Unix systems, but its main platform is Hewlett-Packard Co. Apollo 9000 Series 700 workstations. InfoCAD is a full-function GIS with capabilities for database searching, imaging, plotting, spatial analysis, routing, geocoding and other design functions.

"The first thing the FEMA people needed was good data such as street location information," DeAngulo said.

At FEMA's request, Digital Matrix began expanding the content of the digitized maps by scanning in geodetic survey maps and more than 100 aerial photos from the U.S. Army Corps of engineers. Also included were latitude and longitude coordinates so that helicopters making supply drops could find their way around.

The result was a highly consolidated map for coordinating services to the stricken areas.



Generated by GIS software, *this map of neighborhoods struck by Hurricane Andrew is updated daily to help coordinate federal relief efforts*

Every day at 8 a.m., FEMA issues a freshly updated map that is overlaid with locations for health stations, trash burn sites, Red Cross operations, tent cities, kitchens and other services. Most recently, Dade County GIS data and map information was added to the system.

This effort is believed to be the first time FEMA has relied so heavily on a GIS to organize and manage emergency relief.

Voluntary power

The HP Apollo 9000 Model 710 workstation originally running the InfoCAD package was swiftly overwhelmed by the intensified data flow. So HP volunteered and sent along its top-of-the-line Model 750, three X Window System terminals, an HP PaintJet XL300 for high-resolution printing and an HP ScanJet IIC for scanning aerial photos into the digitized maps.

"Our pen plotter was also not good enough for the task, not because of the quality but [because of] the time a map took to do," DeAngulo said. So the company hauled in an electrostatic plotter from Calcomp's plotter division in Anaheim, Calif. "Now we can plot one complete map of the area in five minutes," he noted.

"There is a constant effort going on to update the charts and maps," said Ron Kensinger, an HP sales representative in Miami.

"Army people were in here the other day and needed latitude/longitude information on where to put the port-a-potties. That was kind of a high-tech use for a real low technology!"

Integration needs grow as banks merge

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Combining the operations and information systems of two major banks — one with assets of $70 billion and one with assets of $65 billion — is no easy project. Just ask Frank Sisto.

Sisto, vice president of retail banking systems at Chemical Banking Corp., is overseeing the retail banking systems development portion of the merger of Chemical and Manufacturers Hanover Trust Co. The merger may have been "officially" completed on Dec. 31, 1991, but Sisto said Chemical and Manufacturers Hanover still have 43 retail banking software integration projects to complete.

To streamline the systems consolidation between the two banks, Chemical has relied on project management software from Applied Business Technology Corp. in New York. Chemical used Applied Business' Project Workbench Release 3.05, a personal computer-based project management program that runs under DOS.

According to Sisto, Chemical's 43 project managers use Project Workbench to do their weekly progress reports on the retail banking systems projects. In addition, the project management software is used to coordinate the related activities of 340 systems professionals.

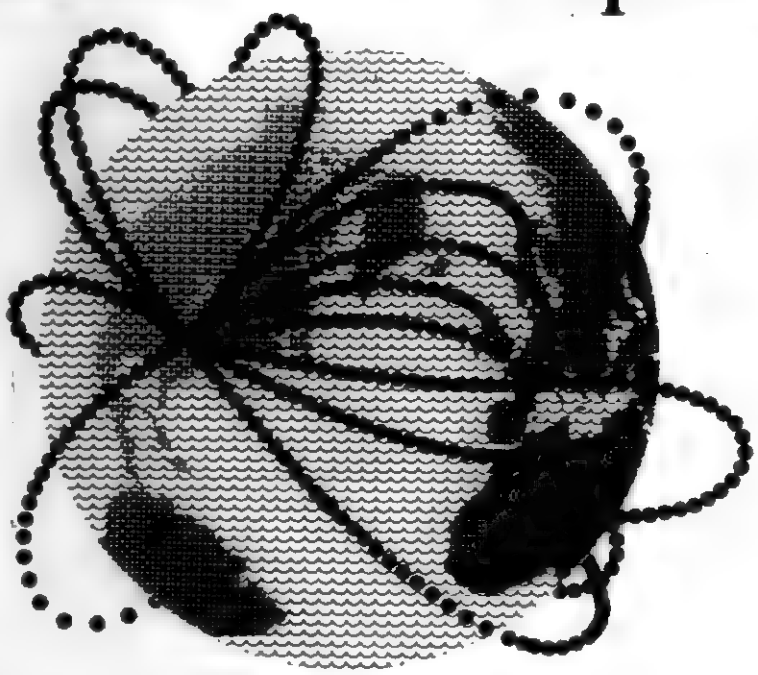
Reports written by the project managers are routed over a Novell, Inc. NetWare-based network to a Symantec Corp. Q&A database, which houses information on the projects. Project managers and their supervisors evaluate timetables for project activities, which tasks are being conducted and the deadlines that have to be met for all projects.

Use of the software is critical to maintaining the resources required for the projects, Sisto said.

By using Project Workbench, project managers are able to synchronize the deadlines for each task, he added. For example, a project manager replacing systems software in the data center must be cognizant of how these changes will affect branch automation.

David Green, a Chemical consultant, said Project Workbench has benefited Chemical in three major areas. First, Green said, the software has helped each project manager plan the "delivery schedule" for each task. The software has also enabled Chemical to accurately track the progress of the more than 12,000 tasks required to complete the 43 projects. In addition, it helps project managers communicate their needs to one another.

If messages were parcels, we'd outdeliver Federal Express®.



Get global LAN e-mail connectivity through a local telephone call.

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ON SITE

CHEMICAL

Chemical Bank
New York

- **Challenge:** To manage the software development process during merger between Chemical Bank and Manufacturers Hanover.
- **Technology:** Applied Business Technology's Project Workbench project management software.
- **Results:** Met every deadline for each of seven major retail systems projects completed since late 1991.

Chemical has used Project Workbench in various ways since 1982. Green said it has worked particularly well in systems merger projects in part because of its comparative strength in managing human resource elements.

Sisto said the project management software helped Chemical meet every deadline for seven retail banking projects completed since late last year. He said use of the software, paired with strong management backing, helped support implementation of sound project management practices.

Moving made easy

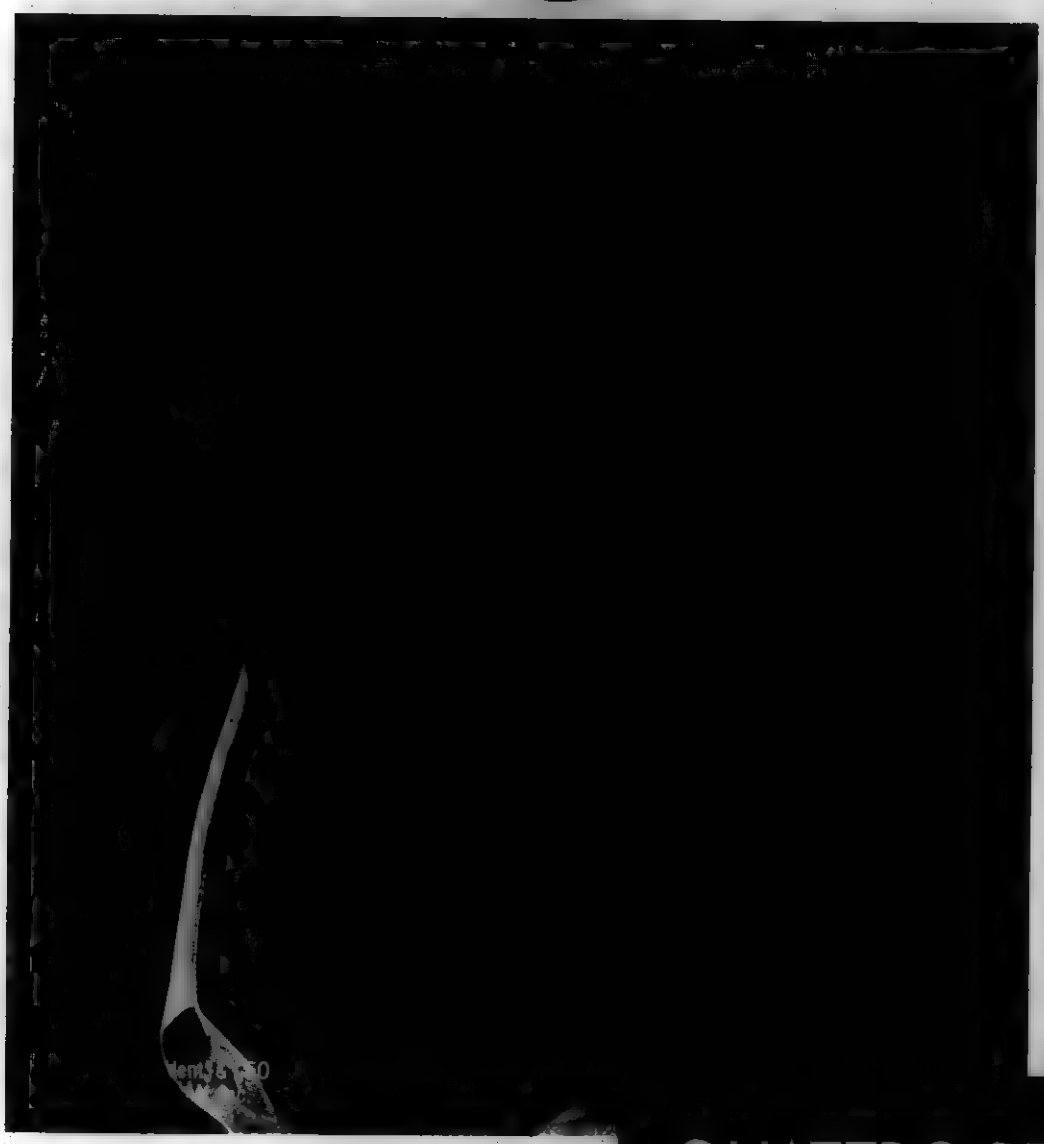
Looking back at some of the activities Project Workbench has helped support, Sisto noted how the bank moved its data center from Manhattan to Wilmington, Del., over a single weekend in July. Using Project Workbench to coordinate the six months of planning, the bank was able to move its data files, switch its networks and have the data center running within 24 hours.

A month before Chemical moved its data center, the bank had already moved the former Manufacturers Hanover's NCR Corp.-based applications from its last branch and ported them to an IBM Enterprise System/9000 Model 900 mainframe.

Chemical will begin using a Microsoft Corp. Windows version of Applied Business' Project Workbench that began shipping last week.

The bank has been beta testing the release for a few months, and Sisto said the Windows version is even easier to use than the DOS version. In preliminary testing, Sisto said, the software's report management facilities are more flexible under Windows than on DOS.

Outrageous.



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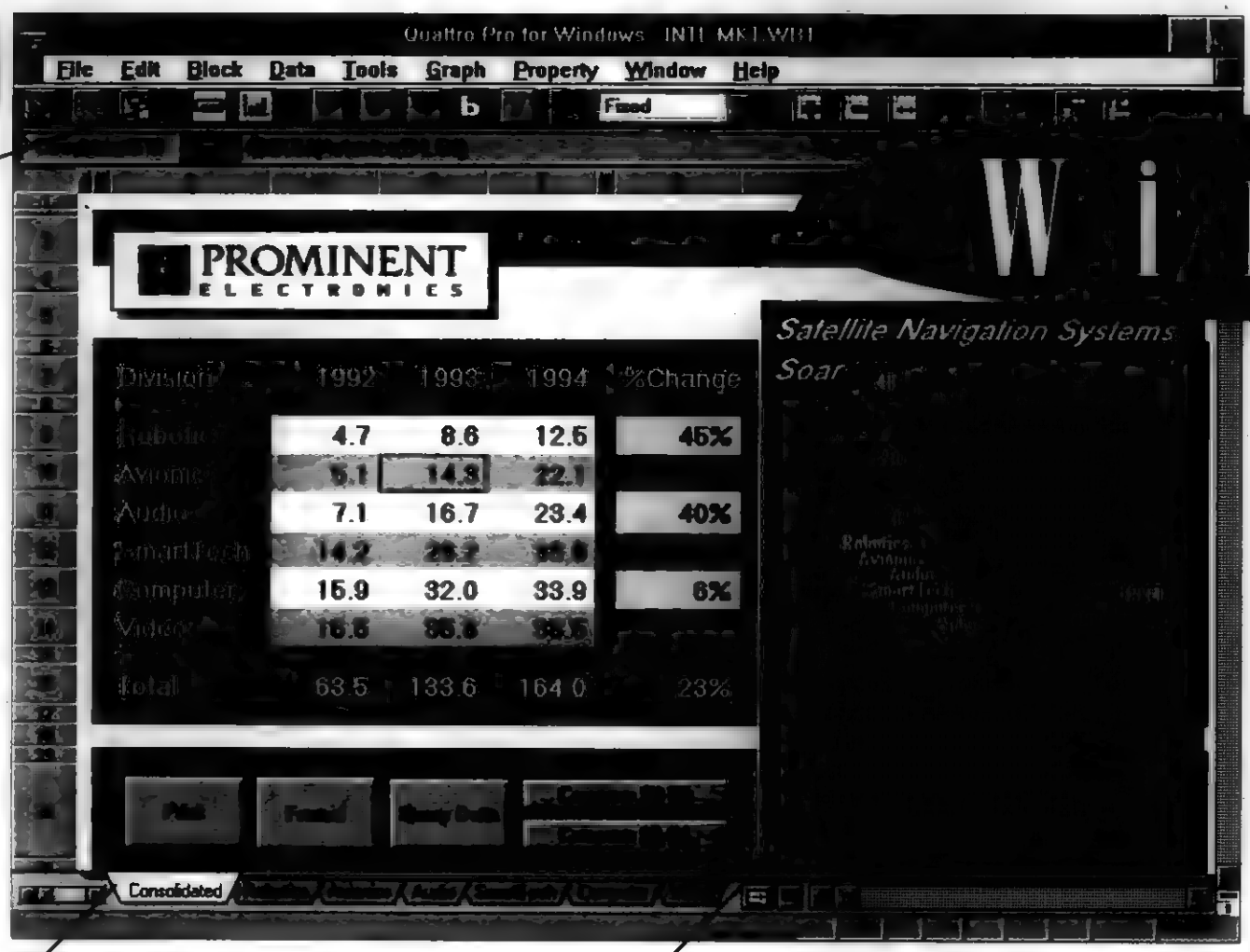

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Spreadsheet Notebooks* with nameable tabs are nothing less than a revolution in spreadsheet productivity. From everyday tasks to complex projects, Spreadsheet Notebooks are the easiest way to work with your spreadsheet. You organize and manage your spreadsheet work more intuitively than ever before. Finding information is as easy as flipping through the tabs of a notebook. Multi-page 3-D linking and consolidation is easy for everyone. Model building, group formatting, and presentation preparation are greatly simplified.

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Weather	13.2	13.9	19.6	18.9	65.6	16.4
Medical	11	12.1	13.8	11.8	48.7	12.2
Solar Research	9.8	10.2	7.3	6.9	34.2	8.6
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†Usability Sciences Corporation Study, July, 1992. BI 1472

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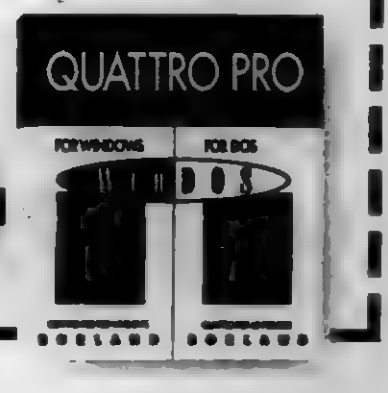

90-DAY MONEY-BACK GUARANTEE

Imaging conference keys on work flow

BY TOM HOFFMAN
and ELLIS BOOKER
CW STAFF

NEW YORK — Only a handful of vendors used the Imaging Expo trade show two weeks ago as a launchpad for new products. Those that did generally brought along enhancements to existing product lines, promising to ease the addition of imaging to existing applications and business settings.

Taking center stage once again were work-flow software systems, which manage the routing and processing of images and associated work among individuals and applications. The focus on work flow has become a familiar theme at recent electronic document imaging shows and conferences.

Optika Imaging Systems, Inc. introduced three new software modules for work flow, signature verification and multilevel electronic file folder management. The modules are linked to Optika's FilePower local-area network-based image- and data-management software suite.

Each of the three software modules are network- and platform-independent and are based on SQL database management servers. The software modules are compatible with all of Optika's FilePower products and can be purchased as part of the initial system or as incremental enhancements.

PaperClip Imaging Software, Inc. announced a work-flow component to a new version of its flagship PaperClip software. PaperMover automates creating, deleting, updating and routing documents and folders in the PaperClip system. PaperClip 2.0 also includes support for Intelligent Character Recognition, IPX on Novell, Inc. networks and dual-image storage systems. Scheduled to ship Oct. 1, PaperClip 2.0 ranges in price from $1,995 for the single-user version to $10,850 for the network version.

PRC, Inc., based in McLean, Va., introduced a document-imaging and work-flow tool kit called RoleModel Image. The client/server-based software was designed to support pilot, departmental and enterprise-wide systems without application modifications. The tool kit provides standard application programming interfaces that were designed to work with users' current application programming environments, computer-aided software engineering tools or fourth-generation languages. The software is compatible with industry standards such as Transmission Control Protocol/Internet Protocol, Government Open Systems Interconnect Profile, Unix and Windows. But no pricing or availability information was provided.

Digital Equipment Corp. announced an agreement with **Genesis Software, Inc.** in Kansas City, Mo., under which DEC will market, distribute and service the Genesis ImageNow software. ImageNow was designed to integrate document images in character cell-based applications such as DEC's DECforms software and CICS applications running in IBM's MVS environments. ImageNow, which works with DEC's DECimage Express document imaging software system, can also be integrated with DEC's Pathworks personal computer networking software. ImageNow is available in a 10-user package priced at $6,448.

FileNet Corp. announced that it has pushed up the date to deliver its Series 6000 servers. Originally slated for a fourth-quarter debut, successful beta testing enabled FileNet to begin shipping the servers this month. The Series 6000 servers, introduced in May, are based on reduced instruction set computing technology from IBM and were designed to provide enterprise-wide imaging applications on industry-standard server platforms and workstations.

For Xba
Roads Le

It's been a very difficult and confusing couple of years for Xbase developers. Filled with uncertainty and doubt about the future. At times, some questioned whether Xbase even had a future.

CA-Clipper

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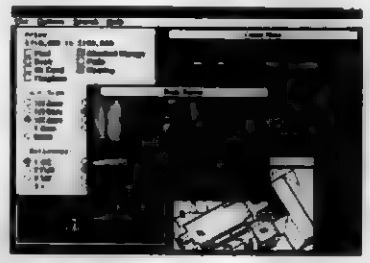
CA-dBFast

This new system will provide a fully object-oriented Xbase language, native code compiler, an IDE (Integrated Development Environment) and both DBF-style and client-server database support.

It will support Windows, Windows NT, OS/2 and UNIX. The complete product will be demonstrated at Fall Comdex and available for beta testing in the fourth quarter of 1992.

Two Easy Ways To Get There: Go GUI Today With CA-dBFast Or Go The DOS Route With OOP Via Clipper. Your Choice.

There are two migration paths to this ultimate Xbase system: The OOP (Object-Oriented Programming) path of CA-Clipper and the GUI (Graphical User Interface) path of CA-dBFast with Windows support.



Both paths will provide immediate benefits and will protect and leverage the substantial investments you've made in Xbase.

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Video to get multiuser boost

MOUNTAIN VIEW, Calif. — Start-up firm Starlight Networks, Inc. is scheduled this week to release software designed to create a video application server for multiuser, networked multimedia applications.

The Starworks software runs on an Intel Corp. I486-based computer with an Extended Industry Standard Architecture bus sitting on an Ethernet network. Starlight said that such a server can support up to 20 simultaneous users working with IBM-compatible personal computers or Apple Computer, Inc. Macintoshes.

According to Starlight, multiuser, multimedia applications that Starworks can assist include training, point-of-sale, on-line reference and video databases. A company spokeswoman said the software, when placed on a dedicated server, can manage the flow of data for the video application, maintaining the steady stream of data that video applications require.

The server is said to be compatible with popular local-area network operating systems such as Novell, Inc.'s NetWare, Apple's AppleShare and Microsoft Corp.'s LAN Manager. It also works with various digital video systems, including Intel's Digital Video Interactive, Apple's Quicktime, Microsoft's Audio Video Interleave, and the JPEG and MPEG standards from the Joint Photographic Group and Motion Picture Experts Group.

Starworks, scheduled for delivery next month, will initially be available through value-added resellers and systems integrators or to volume corporate buyers. The 12-user version has a list price of $9,950, and the 20-user version is priced at $18,495. The vendor said Starworks will be available for general sale in second quarter 1993.

IN BRIEF

HP airs wiring hub

■ Hewlett-Packard Co. introduced a 10Base-T wiring hub that the company said can be upgraded to Simple Network Management Protocol with a software upgrade that does not interrupt operations or require hardware alteration.

■ IBM came out with a mail-order catalog and toll-free number for ordering RISC System/6000 systems and peripherals. Customers can call (800) IBM-CALL from 8 a.m. to 7 p.m. EST to request products or information.

■ Harris Corp. in Fort Lauderdale, Fla., recently declared itself the first company to comply with the IEEE open systems standard for Posix 1003.5, which defines the interface between the Ada language and the operating system. System designers using Harris' Night Hawk line of computers and Ada can now build high-performance, multithreaded Ada applications that are readily portable to other systems running Posix-compliant Ada.

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NEW PRODUCTS

LAN hardware

Reflexion Technologies, Inc. has introduced EtherPort Executive, a portable Ethernet adapter.

The EtherPort Executive includes prebuilt drivers and an intelligent desktop connector. EtherPort Executive features support for thin coaxial and twisted-pair Ethernet connections, the company reported.

The product also has drivers that support Novell, Inc.'s NetWare.

EtherPort Executive costs $399.

Reflexion Technologies
109 Fourier Ave.
Fremont, Calif. 94539
(510) 656-4900

LAN software

Digital Equipment Corp. has announced InfoServer Client for the Macintosh.

According to the company, the software expands the availability of information to Apple Computer, Inc. Macintosh users by providing access applications on DEC's InfoServer 150 network storage server.

Improvements of 30% to 60% have been made for network multimedia applications operating on Apple's Quicktime, and the product gives networked Macintosh users access to thousands of MS-DOS compact disc/read-only memory databases.

The InfoServer Client for Macintosh software costs $785.

Digital Equipment Corp.
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

Modems

PSI Integration, Inc. has introduced PowerModem III, an internal fax modem.

The product was designed for the Apple Computer, Inc. Macintosh PowerBook. Features include very low power consumption and compatibility with System 7.0. PowerModem III sends and receives faxes and data at rates of 14.4K bit/sec. With data compression, the actual throughput can achieve speeds of up to 57.6K bit/sec. Support is included for an assortment of data compression and error correction standards such as V.32 bis, V.32, V.42 bis, V.42 and V.23.

PowerModem III costs $799.

PSI Integration
Suite 200
851 E. Hamilton Ave.
Campbell, Calif. 95008
(408) 559-8544

Micro-to-micro

Micro-Integration Corp. has announced PC Support File Transfer for Windows, a Microsoft Corp. Windows-based file-transfer product designed for use with IBM's PC support.

PC Support File Transfer includes Multiple Document Interface, cut and paste and on-line, context-sensitive help facilities. Interactive and batch operations are available, and full compatibility with Rumba/400 provides a seamless operation.

The product works with IBM System/36, 38 and Application System/400 systems and is compatible with a number of communications platforms including twin-axial, asynchronous, Synchronous Data Link Control and Token Ring.

A single-user version of PC Support File Transfer for Windows costs $195.

Micro-Integration
215 Paca St.
Cumberland, Md. 21502
(301) 777-3307

Unix

Futureware Systems, Inc. has released Version 1.4B of V/Mail, an electronic-mail system for Unix and Unix-based systems.

According to the company, V/Mail is an E-mail application for dumb terminals and graphical Unix workstations. Features include enhanced security, highlighted bar menus, scroll menus for file selection and pop-up Help windows. A word processor-style message editor can compose and send multipage messages, memos and letters.

Prices start at $50.

Futureware Systems
Suite 203
2550 Golf Road
Rolling Meadows, Ill. 60008
(708) 437-8700

Workgroup software applications

Design Data Systems Corp. has announced Version 2.0 of SQL Time.

SQL Time is a project accounting and management product. SQL Time can be used in client/server and Unix multiuser environments and enables users to confront each phase of budgeting and invoicing. According to the company, departmental budgets can be established, reported on and tracked against actuals. The product offers a variety of reports, including time and attendance and activity and disbursements analysis.

SQL Time prices range from $1,800 to $43,000.

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Suite 105
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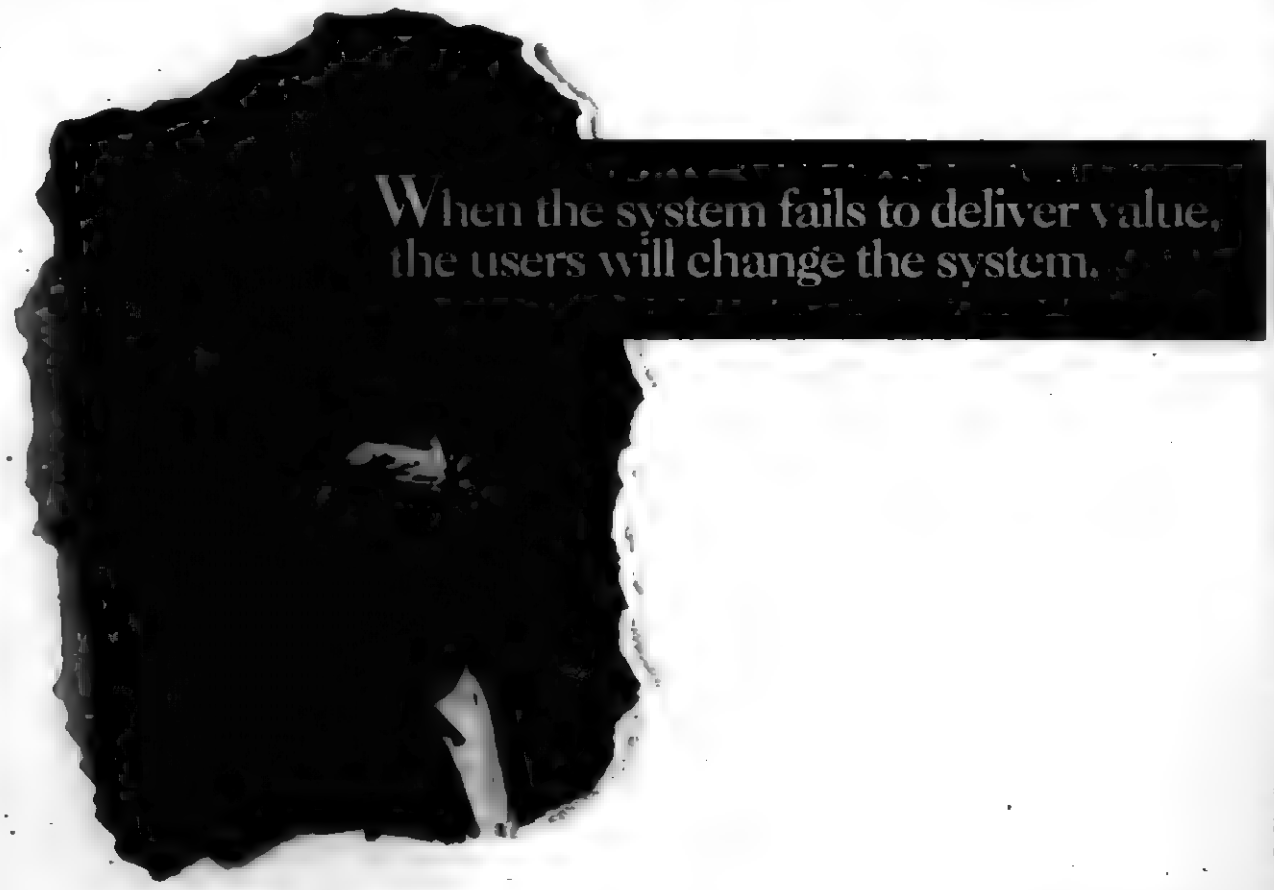

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Is wide-area wireless secure?

ANALYSIS

BY ELLIS BOOKER
CW STAFF

Princess Diana thought her romantic telephone call in late 1989 with an American oil magnate was private — until portions of it were published in a London tabloid recently.

Di's mistake? She reportedly used a cellular telephone, the signals from which can be intercepted by commonly available radio scanners. Already a popular medium for voice, wireless is fast coming into its own as a solution for mobile data users.

But is it safe? Are electronic notes and files sent across the air susceptible to transmission errors or, even worse, interception by prying eyes?

Answering this question is very important to mobile workers and the companies that employ them. Wireless data networking "untethers" ambulatory workers, many of whom already tote laptop, notebook or palmtop computers.

According to a study by BIS Strategic Decisions, a Norwell, Mass., research firm, the wireless messaging market will grow 75% between 1992 and 1995, from $18 million to $173 million. BIS predicts that by the year 2000 the mobile data market will reach about 6% of the installed base of mobile communications subscribers.

Safe contention

Providers of wireless data networks, not surprisingly, contend that their networks are secure because of some inherent features of the technology that make eavesdropping difficult and because of error-checking and error-correcting protocols.

The carriers point out that there are a number of basic differences between a wireless data message — typically sent over a wireless packet network — and a voice phone call placed over an analog cellular network.

For starters, data is typically sent in digital form, making it hard to decipher even if the raw signal is intercepted. In addition, the transmission of a text message (the predominant kind of transmission on wireless wide-area data networks today) occupies a very small window of time and is sent from a comparatively low-powered transmitter, making signal capture difficult.

Finally, unlike the cellular scenario, scanners for wireless digital data are not widely available.

Security "is a question that almost always gets asked early in the selling process by potential customers," said Robert Euler, president of marketing at wireless packet network service provider Ardis in Lincolnshire, Ill. "We almost always get over that objection in five minutes."

Ardis, jointly owned by Motorola, Inc. and IBM, began operation in 1990. The other nationwide provider of a wireless packet data network is New York-based Ram Mobile Data.

Ardis officials note that their network addresses messages to individual devices, each with a unique identification. "If someone stole a device, they'd be capable of decoding messages to that device. ... But we could disable that ID so that the unit wouldn't receive messages," Euler said. Similarly, messages from such a "disabled" device would not be processed by the network.

Most communications analysts agree that the security concerns related to wide-area wireless data are no more (or no less) significant than for conventional, land-based networks.

"This issue is often raised, and it's a red herring," said David Kerr, an industry analyst at the Mobile & Wireless North America Service of BIS.

A more significant obstacle for users than security concerns is the inability to cost-justify an investment in wireless connectivity, Kerr said. "Mobile workers today are typically not the priority for IS investments," he said.

Intruder alert

Still, Kerr and others said that no network — wireless or otherwise — can fully foil a determined intruder.

"Once you capture the 'hiss,' you pass it through a frequency analyzer ...," began Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. But Dzubeck stopped himself. "I don't want to have you publish how it's done," he said. "It's enough to say I've got engineers who work for me [who can do it]."

Ira Brodsky, president of DataComm Research Co. in Wilmette, Ill., said he thinks the biggest issue that will haunt future wireless systems may not be eavesdropping but service fraud, the same problem that conventional long-distance companies confront today.

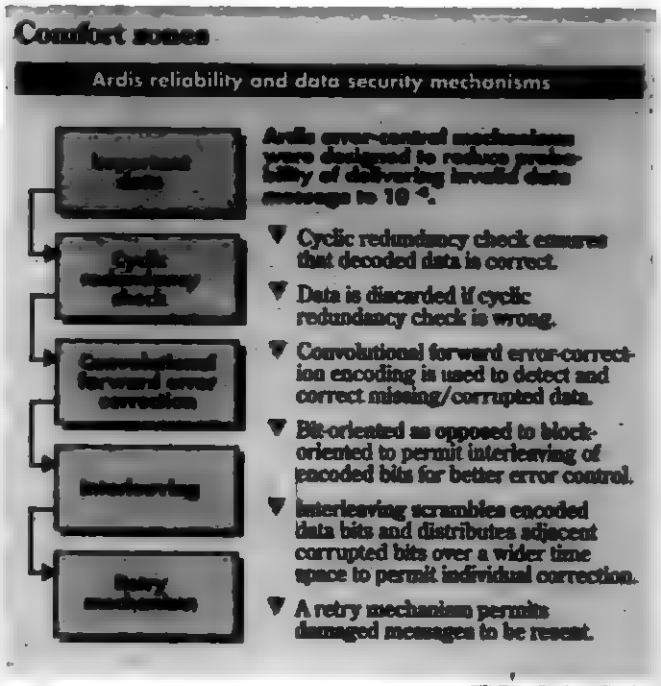
"A mobile hacker doesn't need to be anywhere in particular to emulate a user," Brodsky said.

Because of this, he predicted that active security systems, perhaps involving industry-standard Personal Computer Memory Card International Association cards for mobile computers, will constantly "shift" a user's password so that "the last [password] that worked won't work on the next access to the network."

Even Dzubeck conceded that unscrambling the digital signal on a radio frequency packet network to tease out its messages would require "weeks of work" and involve specialized hardware.

Still, Dzubeck said he figures that in the future — perhaps following a publicized security breach — "all [wireless data] will be encrypted."

To date, he added, only one or two commercial customers using wide-area wireless networks have added encryption.



CW Chart: Stephanie Faucher

LAN growth spurs router design focus

Reliability, availability, hot swapability are key

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Hardware: Part 1 of a two-part series on router architectures.

As local-area networks proliferate and the applications running on them become increasingly mission-critical, users are taking a closer look at the architectures of the devices they rely on for linking LANs into sprawling internetworks: routers.

The way routers are fundamentally designed largely determines how the gear will hold up in the areas of performance, reliability and scalability as internetworks burgeon and traffic loads increase.

"We're about to see a fundamental change in the way internetworking is purchased," asserted Nick Lippis, president of Strategic Networks, Inc., a Rockland, Mass.-based consultancy. He predicted a user priority shift from volume of protocols supported and straight performance numbers to "reliability, availability and hot swapability."

For example, explained Jeff Marshall, senior managing director of communications at Bear, Stearns & Co. in New York, "I've instructed my people to start looking at how devices are put together to see if they have forward scalability and to determine what barriers we'll hit if we continue to grow at specific rates."

Marshall said that as LAN-based applications grow, "router architecture issues will absolutely have more significance."

Primarily, the brokerage firm uses Wellfleet Communications, Inc. routers and some Cisco Systems, Inc. devices. To date, the rival vendors have taken different design approaches.

Router hardware architectures are roughly divided into two categories (see diagram). Most, such as Cisco's current line, operate on the concept of a centralized processor that handles key functions and is shared by multiple, relatively dumb network interface cards that exchange data over a shared "highway," or bus.

Continued on page 64

CW Chart: Stephanie Faucher

Sniffer net analyzer able to distinguish router protocols

BY ELISABETH HORWITT
CW STAFF

MENLO PARK, Calif. — The latest incarnation of Network General Corp.'s Sniffer protocol analyzer, announced last week, is said to help network managers resolve response time problems and bottlenecks on wide-area links between local-area networks.

While a number of products are said to monitor overall traffic levels across an internetwork link, Expert Sniffer Internetwork Analyzer stands out because of its ability to analyze how various routers handle different types of protocols, such as Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell, Inc.'s IPX, Network General said.

What has made this function difficult is that each router vendor uses a proprietary method of packetizing the protocols, which a monitor must understand in order to perform router traffic analysis, according to Network General Vice President Jay Weil.

Sniffer has the useful ability to analyze what percentage of bandwidth each protocol is taking up at any given time "and which is hogging the network," said Tom Wood, a senior industry analyst at Business Research Group, a Newton, Mass., research firm.

Traffic cop

The product can also act as a troubleshooter when the network manager uncovers an unexplained traffic bottleneck or a user who is unable to send across the network, Weil said. For example, protocol analysis can discover that "routers are not configured right and are sending updates to each other every five seconds instead of every five minutes," resulting in traffic congestion, he added.

One limitation of this Sniffer version is its inability to analyze traffic patterns across an internetwork that includes multiple, multihop router connections. Users must take the Compaq Computer Corp. 386 portable that houses Sniffer and install it for about a day to analyze a link between two particular routers, Weil acknowledged. The device is then unplugged and moved onto the next link, so that analyzing an entire network could take a week or two, he added.

Given the changeability of many internetworking installations, the analysis may be out of date by the time it is finished. Another limitation of this type of analysis is that it leaves out the effects of changing routing algorithms that react to changes in traffic patterns.

"Network General is talking about the old mind-set of protocol analysis — you plug in, see if it works, plug elsewhere," Wood said.

However, Network General expects to deliver a distributed version of Sniffer Internetwork Analyzer that will be able to collect information across multiple internetwork links in one place sometime next year, Weil said.

Wood praised the current product's expert system module as "a step in the right direction" that provides guidance for less technical network managers.

The expert system can perform the analysis and display exactly what symptoms it has uncovered, Network General said. The user can get an explanation of the symptoms by simply hitting the "explain" key.

Hearty welcome

George Morales, network analyst at Holiday Inn Worldwide — which has a mixture of Novell IPX, TCP/IP and Systems Network Architecture (SNA) on its wide-area networks — is glad to see the product. If there is a problem on the network, IBM support people's typical first answer is "the network is congested," Morales said. Up until this point, he said, we have not had a tool that could show performance as opposed to traffic levels "to show tangible evidence that there are no errors or no congestion on a particular segment."

While Morales has yet to test Sniffer Internetwork Analyzer, he said he plans to do so soon. He is also interested in the distributed version.

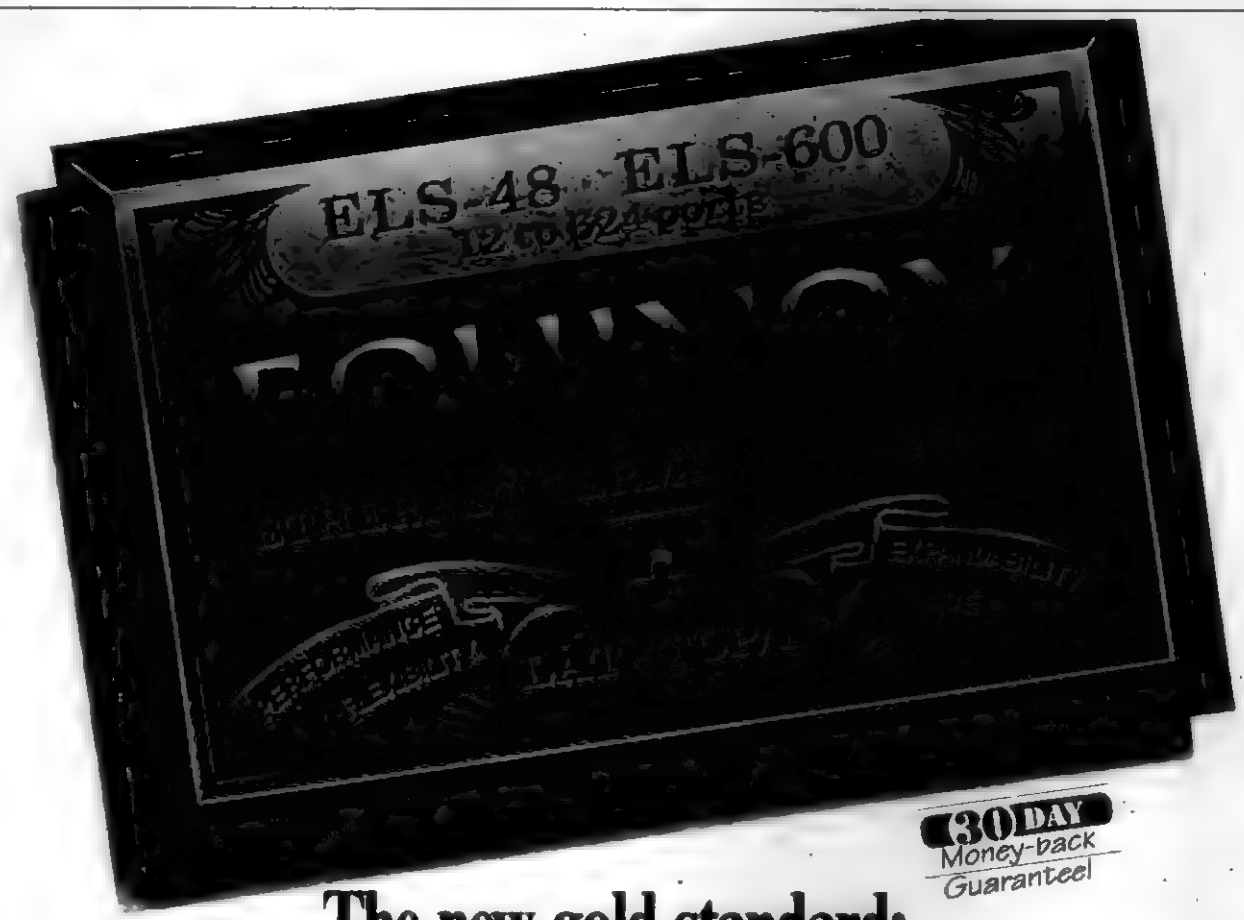
"I also want to see something while it's happening without having to break the line," Morales explained. "When you [break the line], then you re-establish the link, the problem is often gone."

Sniffer Internetwork Analyzer comes in three modules, each of which includes the preceding modules.

LM 2000 WAN Module monitors traffic over asynchronous, bisynchronous, IBM SNA, X.25 and frame-relay links, the vendor said. It will be available next month, priced at $8,495.

Sniffer Internetwork Analyzer analyzes more than 140 protocols and supports Cisco Systems, Inc., Wellfleet Communications, Inc., Vitalink Communications Corp. and Retix routers. Priced at $15,500, it is scheduled to ship in the fourth quarter of this year.

Expert Sniffer Internetwork Analyzer includes all of the above modules plus an expert system module and the ability to analyze bandwidth utilization statistics. Priced at $18,500, it is scheduled to ship in the first quarter of 1993.



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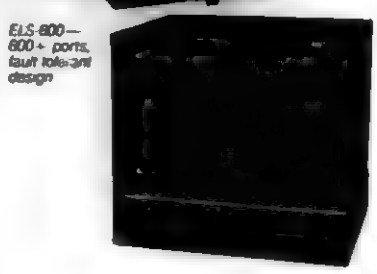
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PolyCenter links SNA with DECnet

BY MELINDA-CAROL BALLOU
CW STAFF

Information systems departments attempting to manage mixed IBM and Digital Equipment Corp. sites may welcome the announcement earlier this month of products that DEC officials said will allow them to integrate IBM Systems Network Architecture (SNA) and DECnet networks.

DEC, together with Systems Center, Inc. in Reston, Va., jointly developed and will soon release PolyCenter SNA Manager Version 1.0 [CW, Sept. 7]. Together with Solve:Connect for EMA from Systems Center, these products will let users exchange information bidirectionally on DEC and IBM resources and monitor and control several types of networks at once, including SNA, DECnet Phase IV, Transmission Control Protocol/Internet Protocol and DECnet Open Systems Interconnect (OSI) from either DEC's DECmcc Director, Systems Center's NetMaster or IBM's NetView.

"Large customers are now using IBM and DEC systems together to deliver applications. It's no use just managing one or the other," said Michael Matthews, vice president of strategic marketing at Systems Center. "We built an object-oriented model of an SNA environment so that we can project the SNA world onto an OSI management system and vice versa, for instance."

Users spoke of the need for and the economic benefits of managing mixed networks from one product.

"Absolutely, we would like to be able to manage both our networks from one side and have even attempted to do that with other products, but they have typically fallen short of being able to manage enough [types of] events to make it worthwhile," said Joe Papa, systems software specialist at the California legislature in Sacramento, which has both DECnet and SNA networks. "In order to be able to do real troubleshooting, you need to be able to get sophisticated with the network integration management tool."

Henk Hazelhoff, assistant consultant in corporate information systems at Dow Chemical Corp. in Midland, Mich., added, "The big benefit would be that operators familiar with NetView and who occasionally need to do something in the DEC world would be able to do so, and the reverse would also be true."

Additional products unveiled by DEC include: DECathena Version 1.1, a turnkey distributed computing and management environment that now offers client support for Sun Microsystems, Inc., Hewlett-Packard Co. and IBM Unix platforms; PolyCenter Systems Census Version 1.0 configuration software; PolyCenter System Watchdog Version 1.0 and PolyCenter Account Manager Version 1.0.

Managing scattered systems

Systems Census integrates three software products that collect system configuration information and consolidate the data into either Rdb on VMS or Oracle Corp.'s SQL relational database management systems on Ultrix for viewing. This can allow IS departments to more easily manage large, geographically scattered systems, officials said. The three portions of the product include an Agent that discovers, identifies and collects system data; a Consolidator that consolidates the data collected by the Agent into the SQL database and provides sample reports; and a graphical user interface (GUI) that provides multiple views of the data via a Motif interface.

System Watchdog Version 1.0 lets managers detect and solve problems occurring on systems connected by local- or wide-area networks, and the PolyCenter Account Manager facilitates the process of registering users on VMS systems and associated applications.

DEC will also begin offering consulting services in November for a Lights Out Computing Design service that will allow users to design remote, automated data centers that can run unstaffed. This service will provide users with a design, a set of recommendations and a cost-benefit analysis.

PolyCenter SNA Manager Version 1.0 is priced at $15,314, and Solve:Connect for EMA pricing ranges from $20,000 to $70,000, depending on IBM processor. Both products are slated to ship in November. DECathena Version 1.1 pricing for a start-up package starts at $45,000; support for Sun clients is shipping now, and support for HP/UX and IBM AIX clients is set to ship in November and January, respectively. The Systems Agent, Consolidator and GUI are shipping this month and are priced separately starting at $355. The System Watchdog is scheduled to ship next month; its two components are priced separately starting at $175.

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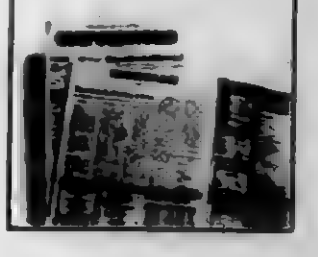

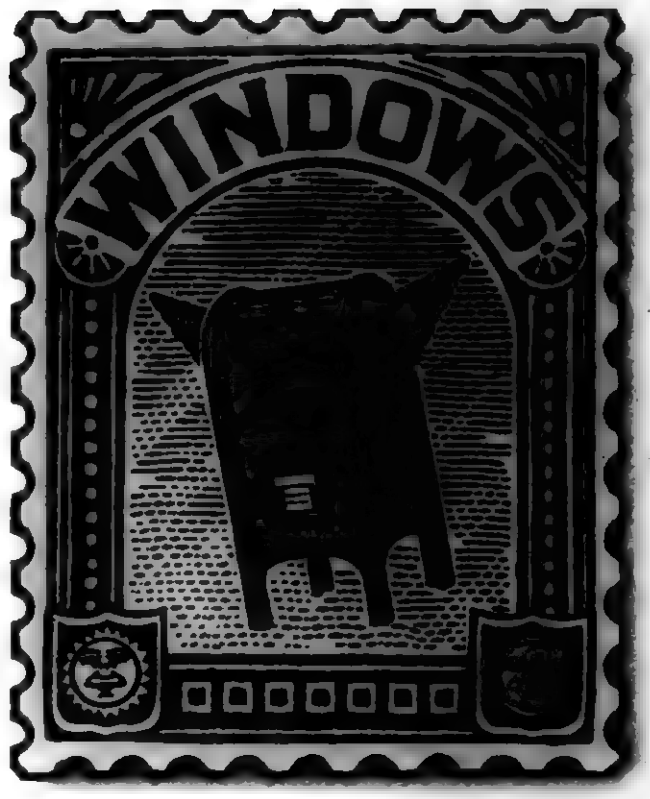

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LAN TIMES READERS CHOICE 1992

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LAN increase spurs focus on router design

CONTINUED FROM PAGE 59

The main processor handles such tasks as packet forwarding, routing table updates and network management.

Other "centralized" vendors include Advanced Computer Communications, Inc., start-up Coral Networks, Inc., CrossComm Corp., Digital Equipment Corp., IBM, Network Systems Corp., Proteon, Inc., 3Com Corp., Retix and Vitalink Corp.

However, "the single-CPU approach ..... means there is a limit in the growth of that box and a possible single point of failure," Lippis said.

While many observers harp on the single-processor vulnerability threat, many longtime Cisco users report they have never had an outage.

"Cisco gets around the issue by using industry-standard, proven components," said Coyne Gibson, information technology manager at Convex Computer Corp. in Richardson, Texas. While newer architectures are attempting to address user needs for bulletproof internetworking equipment, these vendors "are to some degree coping with less mature and more complex technology, which makes them more failure-prone," Gibson said.

On the other hand, he acknowledged, "if Cisco's fundamental architecture doesn't change soon, they're not going to be able to compete from a performance standpoint."

Cisco is expected to soon announce a statement of direction for an Asynchronous Transfer Mode switch as its new router architecture. Regarding breathing new life into its existing design, Thomas Daly, Cisco's director of hardware engineering, said, "Cisco feels that building bigger boxes by adding multiple [central processors] is a good concept."

Gibson said reliability is his No. 1 purchase criterion "because I have a very small staff, and we don't want to spend our time worrying about unstable, flaky equipment." He has also been beta-testing Coral's fault tolerance-oriented Broadband Enterprise Switch for some time.

Westford, Mass.-based Coral attempts to alleviate the single-point-of-failure issue by offering redundant options for every router component, explained Sally Bament, senior product manager.

Cisco shop Young & Rubicam, Inc., a global advertising agency based in New York, "has never had a problem" with its Cisco routers, according to Howard Maynard, senior vice president and director of MIS. However, he said his concern with fault tolerance is growing proportionally with the increasing mission-critical nature of his applications.

To that end, "we're considering putting two routers at key locations," he said.

Unlike Cisco's design scheme, distributed router architectures involve coupling a processor with each network interface card to distribute tasks for parallel processing. The idea is to achieve higher performance, confine the effect of a processor failure to its associated, single network and preclude draining the resources of one shared processor as networks get added.

To date, Wellfleet, with its latest Backbone Node line, is the only vendor that falls 100% into the distributed category. However, Coral, DEC and Retix take a somewhat hybrid approach in that they distribute the packet processing function to improve performance.

Cisco has also reportedly begun moving some tasks onto boards to reduce the performance-hindering number of interrupts on the central CPU.

From a redundancy standpoint, Coral's product is positioned at the highest end of today's router array. Coral, Wellfleet and Retix also offer hot-swapability features, which allow users to add or replace certain components while the router keeps running.

Wellfleet relies on its distributed design as opposed to a one-for-one redundancy scheme to achieve no single point of failure, said Karen Barton, director of product marketing, though the Backbone Node has redundant power supplies and data buses.

Cisco represents the opposite extreme with no redundant components. Daly explained, "Cisco doesn't believe in fault tolerance because networks are not fault-tolerant." Rather, he said, Cisco recommends that users achieve networkwide fault tolerance with savvy, mesh-oriented network design schemes.

Next week: Software architectures.

Merging traffic

Router architectures also differ in how they make use of the bandwidth of the internal bus — or data highway — among network ports.

Coral Networks and Network Systems, for example, use a scheme analogous to circuit switching in which they nail up dedicated paths between ports to guarantee consistent network performance.

This costs more because the device requires a bigger bus, and channels in the highway may at times go unused while awaiting transmission from their assigned network. However, the scheme does guarantee performance at line speeds.

All other router vendors use an arbitration method in which communicating ports contend for bandwidth. Router longevity is more limited with this less-expensive scheme, users and analysts noted.

Wellfleet has taken a twist on the shared backplane by splitting its gigabit-per-second bus into four 256M bit/sec. buses over which packets are randomly sent. The scheme couples the efficiencies of statistical bandwidth use with redundancy features. Should one of the four random buses fail, packets would automatically contend for the three remaining.

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NEW PRODUCTS

Network management

Isicad, Inc. has introduced Command HelpDesk, a software package for network help desk and troubleshooting applications.

Command HelpDesk was designed to work with logical network management systems and with Isicad's Command physical network management software package. Users on the network can instigate network requests and trouble tickets. Tools and network processes are provided to help users resolve conflicts.

The product runs on Sun Microsystems, Inc. SPARCstations and Hewlett-Packard Co. Series 700 workstations.

Command HelpDesk costs $12,250.

Isicad
1920 W. Corporate Way
Anaheim, Calif. 92803
(714) 533-8910

Network services

Mainstream Data, Inc. has released Mainstream Newscast for QuickMail.

The product is an electronic-mail news delivery system designed for Apple Computer, Inc. Macintoshes that offers business access to wire services. Mainstream Newscast for QuickMail works in conjunction with CE Software, Inc.'s QuickMail local-area network E-mail system.

Mainstream Newscast for QuickMail costs $695 for the server software. Monthly subscriptions to the various news wires range from $50 to more than $1,000.

Mainstream Data
Suite 200
420 Chipeta Way
Salt Lake City, Utah 84108
(801) 584-2800

Gateways, bridges, routers

CrossComm Corp. has introduced Ilan Jr., an advanced IBM/Token Ring router designed for branch and remote offices.

According to the company, Ilan Jr. is a configured version of the company's Universal Router and can route Systems Network Architecture, Synchronous Data Link Control, NetBIOS and other IBM products. Once it is plugged in, Ilan Jr. automatically learns network topologies and offers advanced diagnostic tools.

Ilan Jr. local costs $6,000; Ilan Jr. remote costs $6,500.

CrossComm
450 Donald Lynch Blvd.
Marlboro, Mass. 01752
(508) 481-4060

Sonic Systems, Inc. has announced DigiLink, a high-speed digital bridge.

The product links remote Ethernet local-area networks through Integrated Services Digital Network (ISDN) telephone lines. The product offers a transmission speed of 128K bytes, which is 13 times faster than a 9.6K bit/sec. modem. DigiLink includes an Ethernet adapter and the ISDN Terminal Adapter and does not require any other hardware. It is configurable through the serial port of an Apple Computer, Inc. Macintosh or is IBM Personal Computer-compatible over a dumb terminal with ASCII terminal emulation software.

DigiLink costs $3,495.

Sonic Systems
#100
333 W. El Camino Real #280
Sunnyvale, Calif. 94087
(408) 736-1900

Proteon, Inc. has introduced the DNX 300 series of bridging routers.

DNX 300M, the first in the series, integrates multiprotocol remote sites and departmental local-area networks into corporate networks via support for Ethernet, Token Ring and a variety of wide-area networks.

The product was designed to make it easy to construct and maintain an internetwork. Proteon's Transportable Software Architecture is incorporated into the series, and support is provided for standard protocols, including Transmission Control Protocol/Internet Protocol.

The DNX 300M is priced from $4,995 to $7,995.

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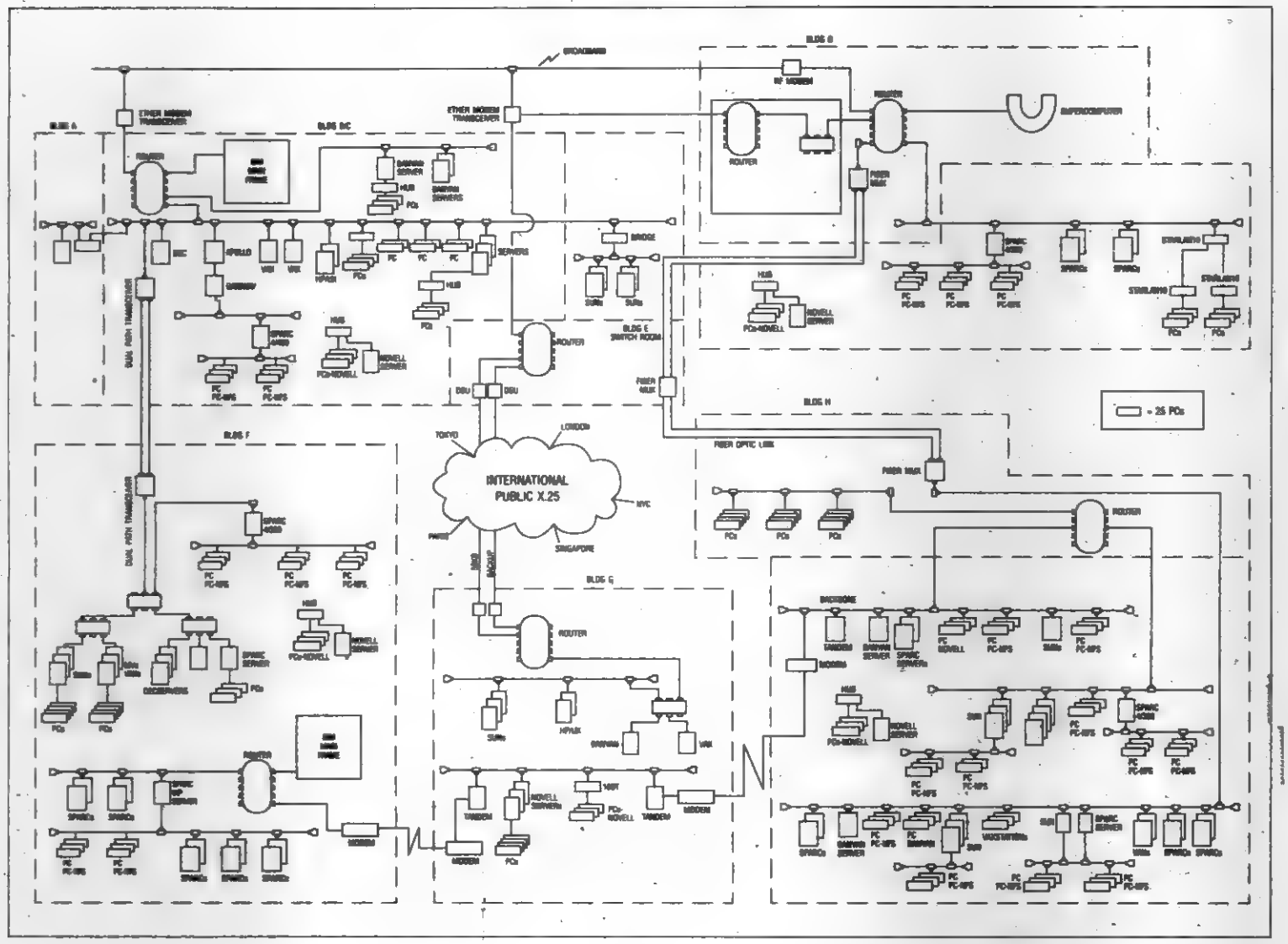

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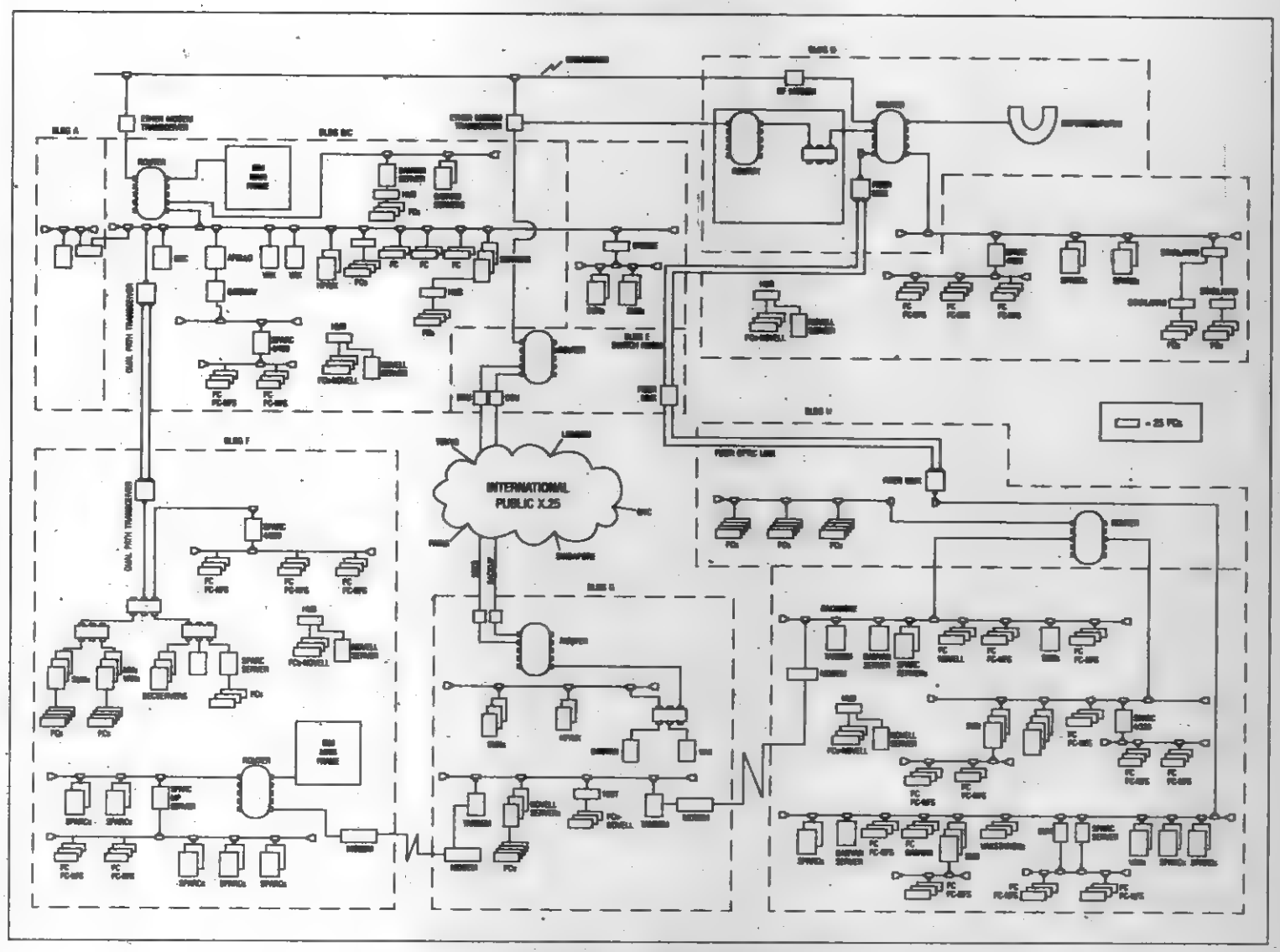

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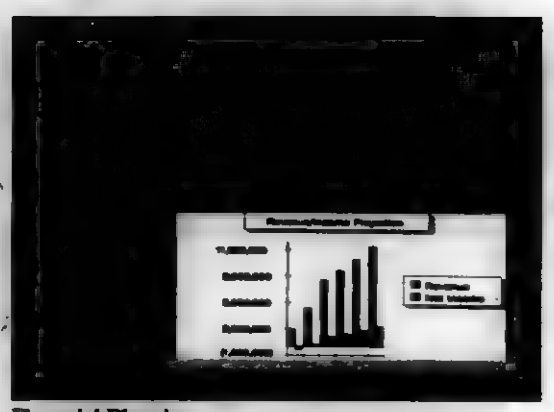

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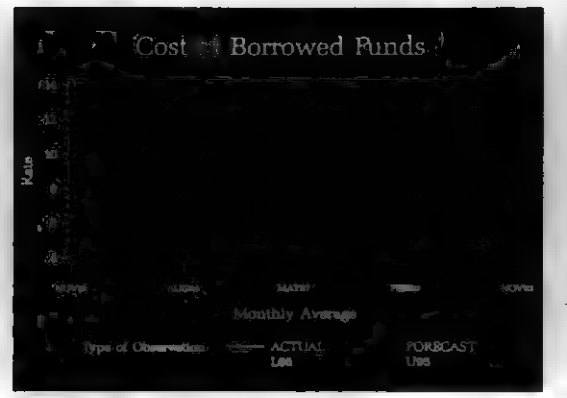

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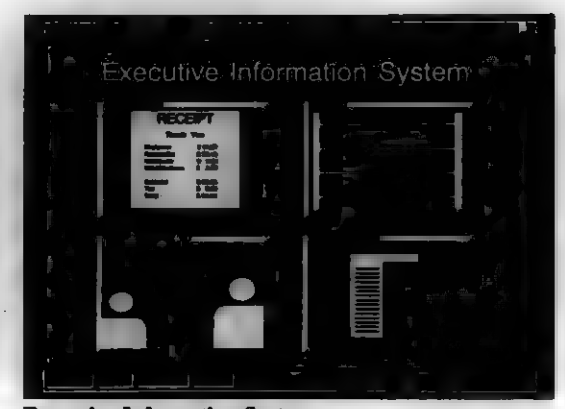
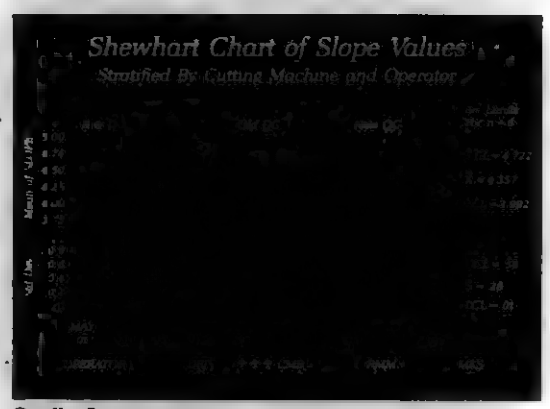


Executive Information Systems



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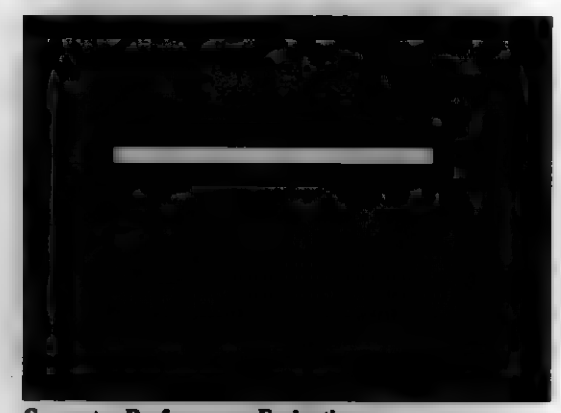

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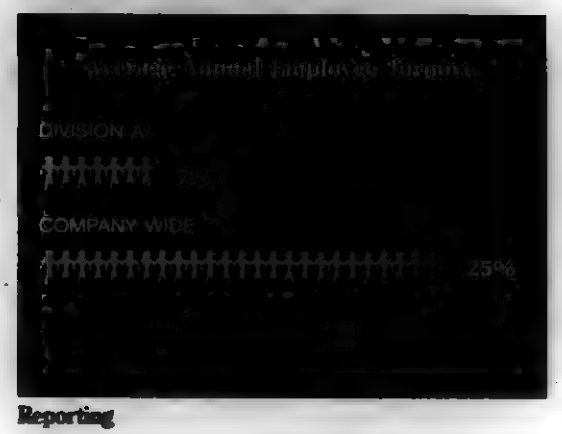

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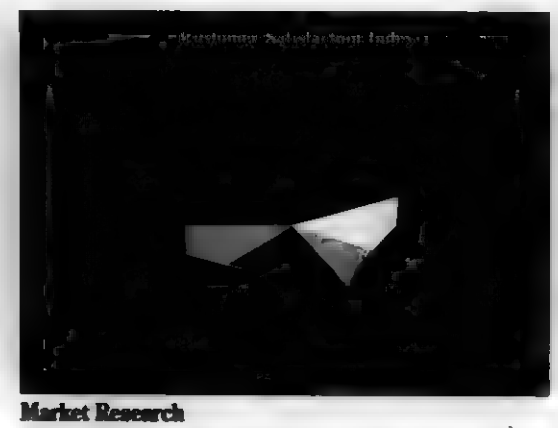

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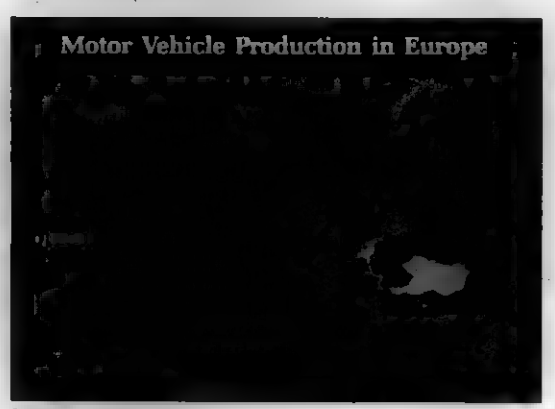
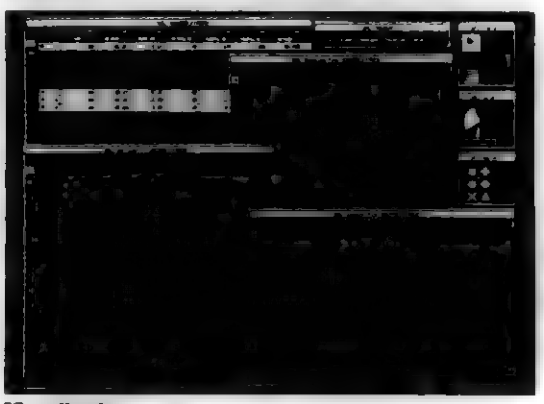
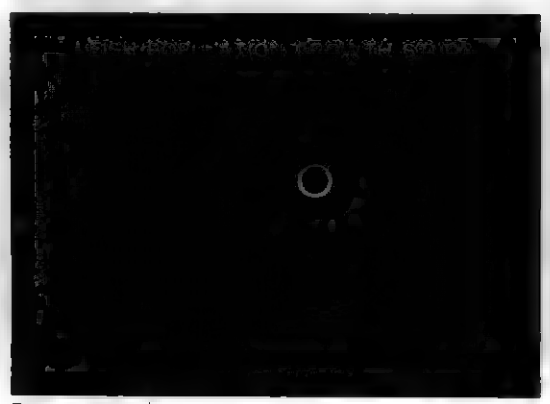


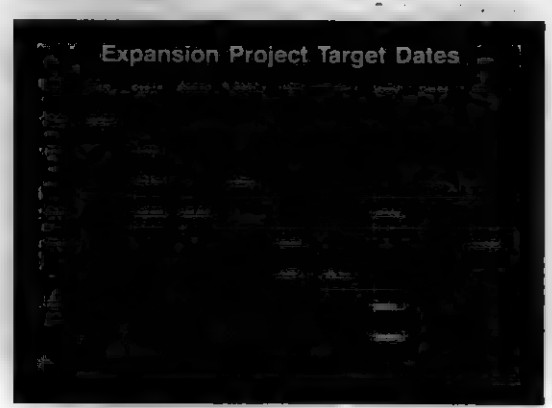
Business Graphs



Visualization



Data Analysis



Project Management

IN BRIEF

IBM helps gas firms

■ **IBM** has announced data access software for the petroleum industry. The Exploration and Production Data Access System, which runs on mainframes under MVS and DB2, will help professionals locate data anywhere in the enterprise. The software is scheduled to be available Oct. 30; future features will include a geographical selection of data.

■ A new partnership between **Sequoia Systems, Inc.** and **Minx Software, Inc.** is aimed at helping global concerns run 24-hour international operations with open systems. The companies will jointly market Sequoia's Series 400 and Series 40 Unix-based fault-tolerant computers running Minxware manufacturing resource planning II software. Under the agreement, the two firms will launch a cooperative marketing and sales training effort, according to sources.

■ Aiming to beef up the commercial allure of its massively parallel DECmpp 12000 series computers, **Digital Equipment Corp.** has teamed with **MathSoft, Inc.** to port MathSoft's technical calculation software to the DEC machines. Adapting popular software for these machines is vital to expanding their appeal, the companies said.

Oracle gains parallel server support

Pyramid, Sequent aim to extend option beyond DEC and supercomputers

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — When Oracle Corp. introduced its parallel server option for computing clusters in March 1991, it only supported Digital Equipment Corp. VAXclusters and supercomputers. Eighteen months later, two vendors of commercial Unix systems say they are ready to support the same option to make their systems more viable as on-line transaction processor (OLTP) workhorses.

Pyramid Technology Corp. in Mountain View, Calif., and Sequent Computer Systems, Inc. in Beaverton, Ore., both demonstrated their parallel server systems at the recent International Oracle Users Group meeting. Both said they are ready to ship beta-test versions of modified system software that will support Oracle's parallel server option this fall. By 1993, both plan to support production applications on the computing clusters.

When the parallel server option was first introduced with Oracle 6.2 for DEC VAXclusters, it fit with DEC Lock Manager. Other vendors had to invent their own lock managers, something that took Pyramid and Sequent 18 months to devise and refine. Oracle now offers the parallel server option as a module with its new Oracle 7 relational database [CW, June 15].

Pyramid and Sequent chose to let multiple CPUs access the same set of disk drives so that on-line computers can take over for computers that fail. Their lock managers prevent duplicate updates of a single database that "loosely coupled" computers share. That way, multiple copies of Oracle can exist on separate machines yet share data stored on one set of disk drives.

> THE two vendors are in a near dead heat to get the software out.

The net effect of the parallel server software is near fault tolerance, industry analysts said.

"The option doesn't give you as much fault tolerance as machines intended for that purpose," said Omri Serlin, president of ITOM International in Los Altos, Calif. "But it does protect the integrity of the database if a particular machine goes down, which is a top concern for most systems people."

Serlin said he believes the option will be effective for centralized parallel servers but not for geographically dispersed ones.

Beta-test site candidates said they are happy with the prospect of parallel server software, saying it will boost the reliability of Unix systems.

> PARALLEL SERVER SOFTWARE will be effective for centralized parallel servers but not for geographically dispersed ones.
>
> OMRI SERLIN
> ITOM INTERNATIONAL

One Sequent user, who has tested Oracle 7, plans to install Sequent's parallel server software as soon as it arrives. "We already have the hardware in place and [are] ready to go," said Michael Higgins, technical support manager at Byer California, a San Francisco maker of women's apparel.

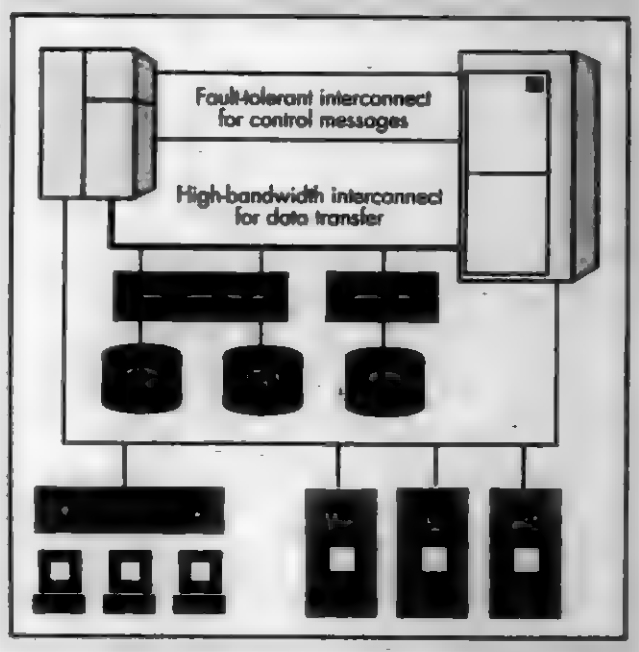
Byer has two high-end Sequent Symmetry 2000 Model 750s. One machine runs the Oracle Financials application package, while the other runs custom Oracle applications. Higgins said he wants both kinds of applications to update the same single-image Oracle 7 database, spread across two machines. To date, Byer programmers have used workarounds to post updates to two databases.

The two Unix vendors are in a near dead heat to get their parallel server software to customers. "We expect Pyramid to have it first and Sequent to have it second," said David Card, director of systems research at International Data Corp. in Mountain View, Calif.

In time, software such as Oracle's parallel server might change information systems managers' perception of Unix as unsuitable for OLTP, some users said. "It's now cheaper to rewrite your legacy system and put it on a Unix box than to leave it on your mainframe," said Michael Corey, president of the International Oracle Users Group. "Up to now the missing piece has been the uptime."

Doing things in sequence

Sequent's parallel server approach provides near fault tolerance by linking multiple computers to a shared disk



CW Chart: Stephanie Faucher

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Software AG making move to client/server

BY GARY H. ANTHES
CW STAFF

PHOENIX — Information systems executives at a conference here said they are pleased with Software AG of North America, Inc.'s strategy for deploying its mainframe products to client/server environments and are happy with the products the company has rolled out so far.

However, mainframe users attending the company's second annual Strategic Choices Executive Conference said Software AG has further to go before it can move comfortably and easily into the distributed systems world.

Lechmere, the Woburn, Mass.-based retail chain, is phasing out its aging IBM Series/1 minicomputers in favor of Unix-based RISC System/6000s, which have been installed in its 23 New England stores.

Lechmere will rewrite inventory and merchandising applications in Natural for AIX, Software AG's fourth-generation language for RS/6000s that was announced in April.

According to Lou Kleynen, Lechmere's vice president of company IS, the move will make it much easier to write and maintain applications, which had been written in an assemblerlike language for the Series/1. Moving development to the Unix boxes will also free up some 25% of the company's IBM 3090 Model 200E, where the development work is now done.

Kleynen said he is awaiting the arrival of several Software AG tools needed to completely execute Lechmere's strategy: Transfer, a utility for moving mainframe Natural programs to AIX; an AIX version of Natural Construct, the mainframe application generator; an AIX version of the Predict repository; and AIX security and performance tools.

At its fingertips

Everything Lechmere needs is in the works, said David A. MacSwain, marketing vice president at Software AG. He said Transfer will be available early next year, Construct and Predict for AIX by year's end and the security and performance tools in nine to 12 months.

"The [Unix] product line is still evolving, and some bugs need to be worked out," Kleynen said. "Software AG has people who know AIX and people who know Natural, but they aren't experts yet in the Natural AIX product set."

However, he called Software AG "very responsive" and said he is sure the company will deliver on its promises.

Software AG President Michael J. King said the company will give its Unix customers the same service that its traditional mainframe customers enjoy, even though profit margins are much thinner on the desktop than in the glasshouse. King said that repositioning the 23-year-old mainframe software firm for client/server computing is "a very tricky piece of management."

Software AG began shipping Unix versions of its flagship products — Natural, Adabas and NetWork — in April. They are at the heart of the company's distributed computing strategy, called Entire, for offering a consistent, homogeneous environment for developing software to be deployed in networks of heterogeneous systems.

Dole Fresh Vegetables Co. in Salinas, Calif., a division of Dole Foods, Inc., will use Entire products in its replacement of an IBM 4381 mainframe running MVS/SP with a Hewlett-Packard Co. HP 9000 running HP/UX Unix.

Software AG's King: *Repositioning the company to client/server is 'a very tricky piece of management'*

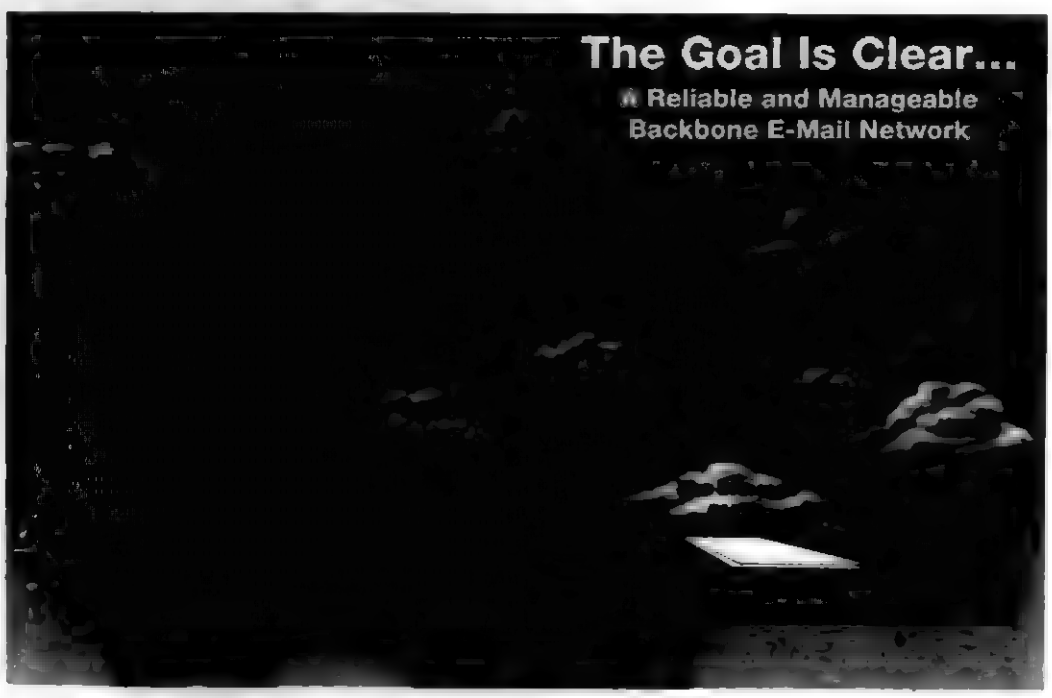
David Alexander, information technology manager at Dole, said data is periodically downloaded from the mainframe to a standalone, DOS-based local-area network via a cumbersome VTAM translation process. But eventually the Entire architecture will allow users on the LAN to transparently access files on the HP 9000 and other HP/UX-based servers at diverse locations.

He said he hopes the move to HP will knock $300,000 off his $2 million annual IS costs.

But Alexander expressed some concern over Software AG's current reach into the Unix world. "I don't have a lot of confidence yet in their ability to support my Unix environment. There's not a support team set up yet."

However, analysts said the company will deliver, albeit cautiously. "Technologically, they are very sound," said Robert Tasker, a vice president at International Data Corp. in Framingham, Mass.

"Entire provides the most comprehensive solution put forward for enterprisewide production computing," according to the Boston-based Aberdeen Group in a recent report. "The challenge ... will be to deliver the functional capabilities described by the Entire product set."



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Atlanta, GA Atlanta Marriott Marquis Tuesday, October 6	**Dallas, TX** Marriott Park Central Tuesday, October 13	**Los Angeles, CA** Westin Bonaventure Tuesday, September 22	**Princeton, NJ** Hyatt Regency Tuesday, October 13
Boston, MA The Westin Hotel Tuesday, November 17	**Denver, CO** Denver Marriott West Thursday, September 24	**Minneapolis, MN** Minneapolis Airport Marriott Thursday, October 22	**San Francisco, CA** Sheraton Palace Thursday, September 24
Chicago, IL Chicago Marriott Downtown Thursday, September 17	**Detroit, MI** Hyatt Regency Wednesday, November 4	**New York, NY** Helmsley Palace Wednesday, September 30	**Santa Clara, CA** Renaissance Ctr-TECHMART Wednesday, September 23
Cincinnati, OH Marriott Tuesday, December 1	**Houston, TX** Hyatt Regency Wednesday, October 14	**Orange County, CA** Irvine Hyatt Regency Thursday, October 8	**Washington, DC** Hyatt Regency Crystal City Tuesday, September 29

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How to know when to purchase RAID

BY KIM S. NASH
CW STAFF

You just downsized, rightsized or otherwise added an IBM Application System/400 to your happy home. Now you have to choose which kind of storage products should house data processed by the new midrange system: direct-access storage devices (DASD) or redundant arrays of inexpensive disks (RAID).

IBM's 9337 subsystem, a just-unveiled product based on RAID technology, complicates the decision for midrange users. The heat is on in the RAID arena, with Storage Technology Corp. and IPL Systems, Inc., among others, having at least announced comparable devices.

And let us not forget that each of these vendors, in addition to EMC Corp., XL/Datacomp, Inc. and others, also offers traditional DASD setups.

Shop around

Although several topics should be addressed before laying out cash for storage products, answers come quickly after a little analysis, users and consultants said. They advised prospective buyers to do the following:

• **Uncover vendor incest.** Knowing which companies resell so-called competitors' products can yield added insight into pricing strategies. Such knowledge helped Art Hobson cut a better disk drive deal four months ago.

Western Folder Distribution Co., a travel brochure distributor in Itaska, Ill., set out last April to buy eight drives to go with the company's new AS/400 Model E45. Uninterested in RAID, Hobson, director of data processing, elected not to wait for IBM's impending 9337 announcement and requested the 9336 model directly from IBM.

About that time, IPL and EMC announced systems featuring "hot spares," extra drives that automatically shift into gear when another one fails. The concept prompted Hobson to shop around. In the process, he found that XL/Datacomp resells IPL drives, while Decision Data Corp. peddles EMC products.

"IPL gave us the best price first off, but then we kept going back and forth with all of them for two weeks" until Western Folder ended up getting 10 drives for the original price of eight, Hobson said.

Ironically, XL/Datacomp ultimately quoted Hobson a better price on IPL drives than did IPL itself. Manufacturers can only go so low before they undercut their own resellers, Hobson pointed out, adding that "it's almost always better to check out what deals the reseller offers."

• **Be real.** Realistically assess whether the data your shop shuttles around would actually cause business problems if users could not get to it for a few hours during unforeseen downtime.

"You want to believe you need all your data all the time, but that is not the case for a large majority of businesses," said Jim Porter, an analyst at Disk/Trend, Inc., a market research firm in Mountain View, Calif.

That means most users probably do not need RAID devices. In fact, buy them "only if you're an airplane reservation system or some other specialized situation where your application positively can't poop out ever," Porter advised.

For shops already running fault-tolerant processors such as those from Tandem Computers, Inc., Stratus Computer, Inc. or IBM, RAID is recommended. Most other shops could live without it.

• **Consider the savings.** Companies doing disk mirroring — completely duplicating disk drive configurations — could save money by buying RAID, said James Bailey, senior vice president at Massachusetts Financial Service Center, Inc. in Boston.

Mirroring means buying two disks for each one that is actually used in daily operations. The second acts as a backup. "That's expensive," Bailey said.

"Mirroring might be slightly more reliable, but RAID-5 is nearly there," said David Andrews, an analyst at ADM Consulting, Inc. in Cheshire, Conn. He said he expects demand for the 9337 RAID product to "swamp" IBM from people who now mirror.

The RAID market as a whole is heating up. IPL announced a subsystem that rivals IBM's 9337, and Data General Corp. introduced RAID for other vendors' Unix machines.

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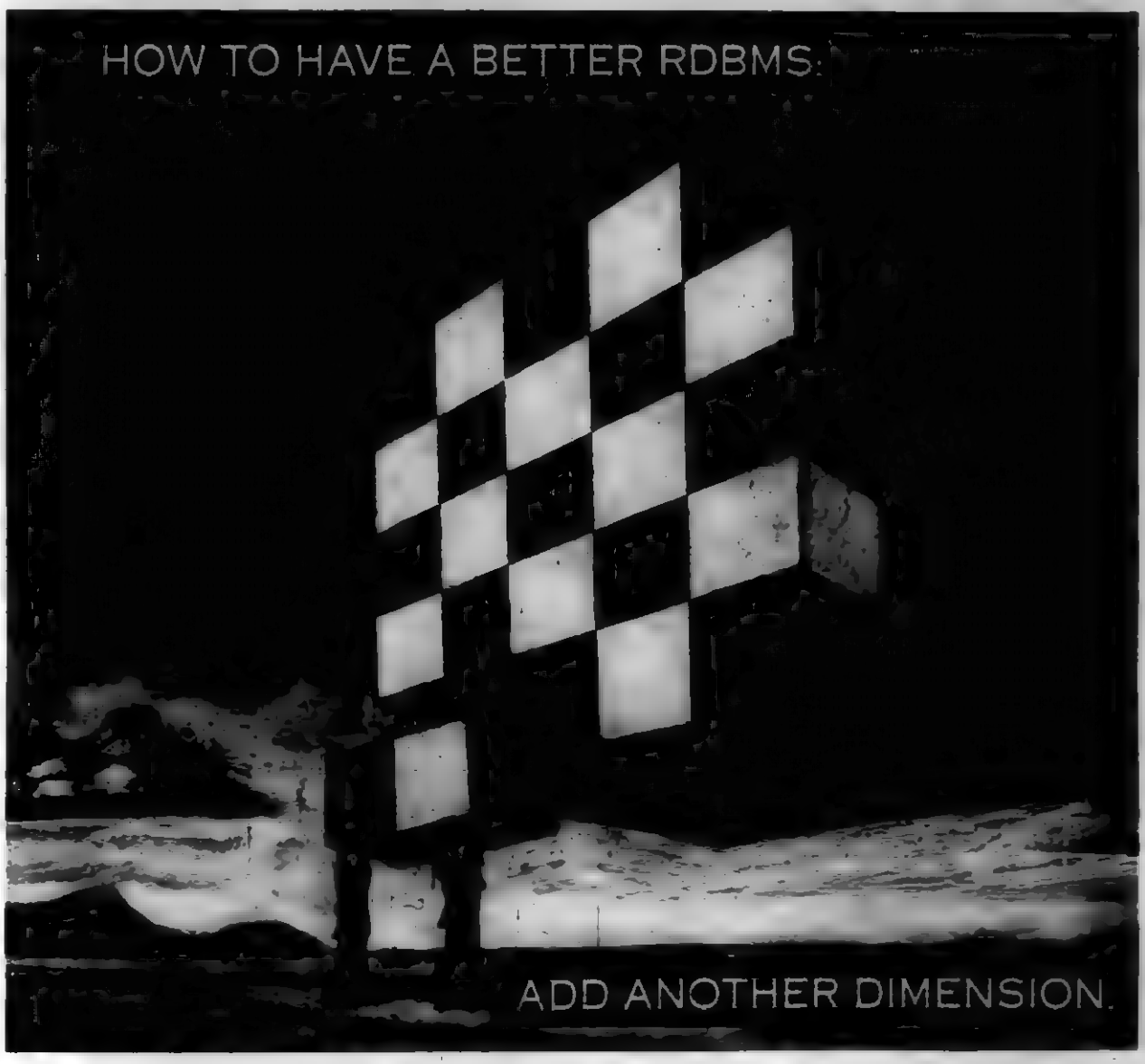

There are a lot of relational data base management systems running on UNIX. Unfortunately, all have one thing in common: They were based on a mathematical premise, not a business premise.

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Comdisco upgrades disaster support

Revamp costs $47 million; vendor claims it alone supports high-end IBM mainframes

BY PAUL GILLIN
CW STAFF

CHICAGO — In a bid for more big iron business, Comdisco Disaster Recovery Services has installed a top-of-the-line IBM Enterprise System/9000 Model 900 mainframe as part of a $47 million upgrade of its hardware facilities.

With the move, Comdisco now claims to be the only disaster recovery vendor to provide disaster support for the high end of the IBM mainframe line.

The upgrade brings the Carlstadt, N.J., facility's processing power to 345 million instructions per second and its disk storage capacity to 2.5T bytes.

According to Comdisco Disaster Recovery Executive Vice President Douglas Cogswell, the move is intended to make a statement. "The disaster recovery industry has been knocked for being late with new technology. This is on the leading edge," he said.

Comdisco customer Sal DiBari, vice president of data security and disaster recovery services at Chemical Bank, Inc., said the move is key to a big customer like him.

"It's important that our vendor keep pace with technology, and our needs in the future will lean toward the vendor who can do that," he said. Chemical Bank has multiple ES/9000s backed up by Comdisco.

Comdisco is also upgrading its IBM Application System/400 capabilities at recovery sites in North Bergen, N.J., Toronto and Wood Dale, Ill. And it will roll a Digital Equipment Corp. VAX 6620 into its North Bergen facility later this fall. The company is also investing $18 million in technology upgrades in Europe.

Keep on growing

Comdisco said it hopes the moves will further fuel a growth rate that topped 30% last year. A crop of recent disasters — including April's Chicago flood and Hurricane Andrew — have helped boost business for Comdisco. The company handled 18 recoveries in Chicago and nine in Miami last month.

Revenue should top $200 million this year, according to Cogswell. The company operates five data centers in the U.S.

Comdisco has also installed $2 million worth of local-area network technology in four work-area recovery centers.

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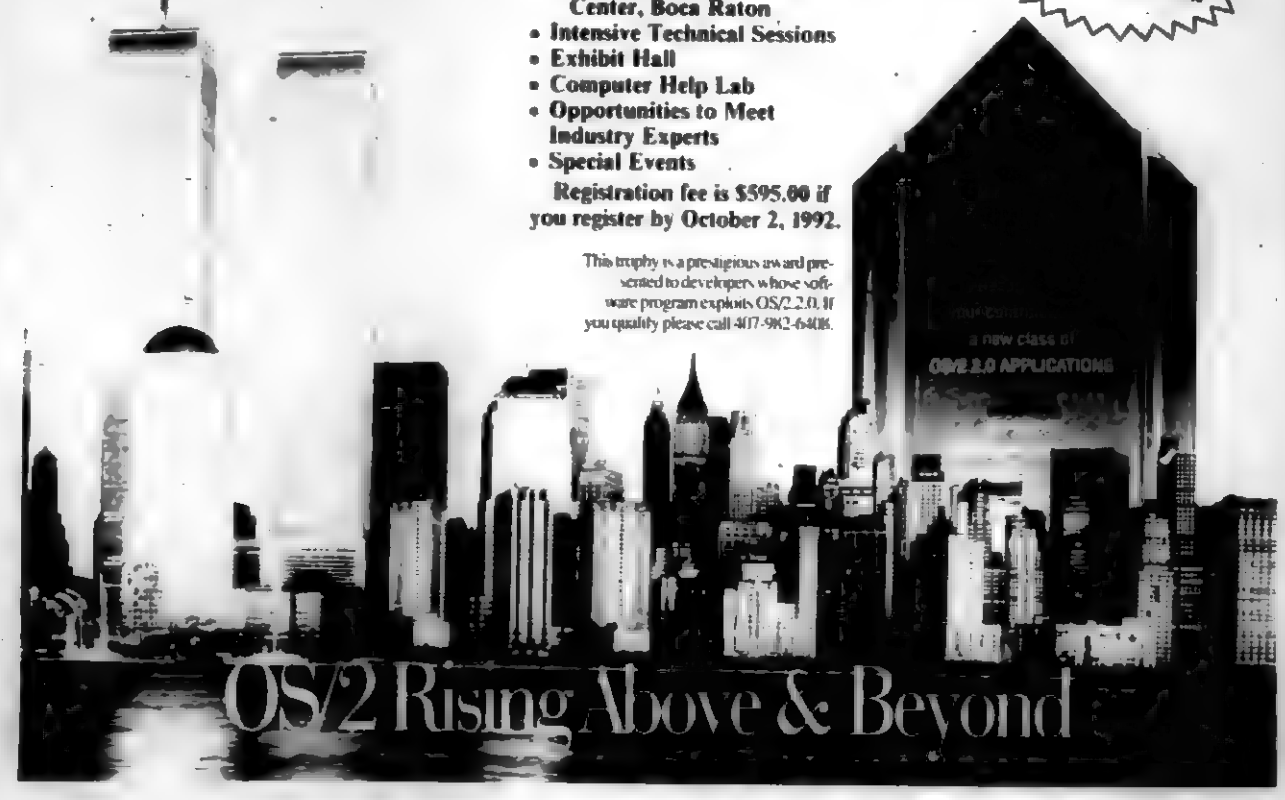

OS/2 Rising Above & Beyond

IN BRIEF

DEC signs GSA deal

■**Digital Equipment Corp.** recently concluded negotiations for its first General Services Administration microcomputer products and services contract. The contract allows DEC to sell its Dealtop Direct products and multivendor services at a discount to the federal government.

■**New digs for Datagaard Recovery Services:** The Louisville, Ky., disaster recovery vendor has completed a 28,000-sq-ft recovery center and headquarters.

Of the total, 21,000 sq ft is dedicated to disaster recovery with a 15,500-sq-ft hot site, a 3,500-sq-ft cold site, a "dark room" processor and disk storage room, a communications network control center and fully equipped customer support areas.

■**The Transaction Processing Performance Council** (TPC) is close to approving the third in its series of benchmarks that measure the performance of transaction processing systems.

TPC-C, an on-line transaction processing benchmark, was designed to provide consistent comparisons regardless of the hardware or operating environment, according to the TPC.

■**GE Medical Systems**, a Milwaukee developer of diagnostic imaging systems, has signed a five-year software and services contract with Structural Dynamics Research Corp.

Under the agreement, Structural Dynamics will act as the global supplier of mechanical design automation software for GE Medical Systems through 1997.

The size of the contract was not disclosed. However, according to a Structural Dynamics press release, orders from GE Medical Systems for Structural Dynamics I-deas software is expected to total several million dollars.

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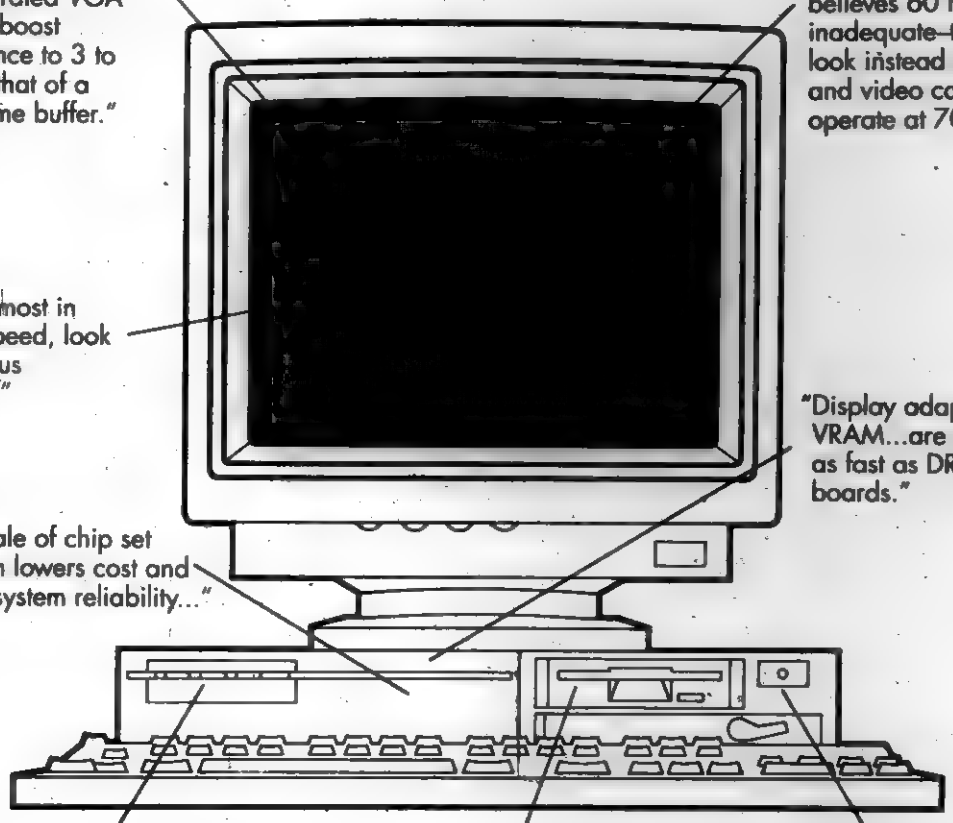

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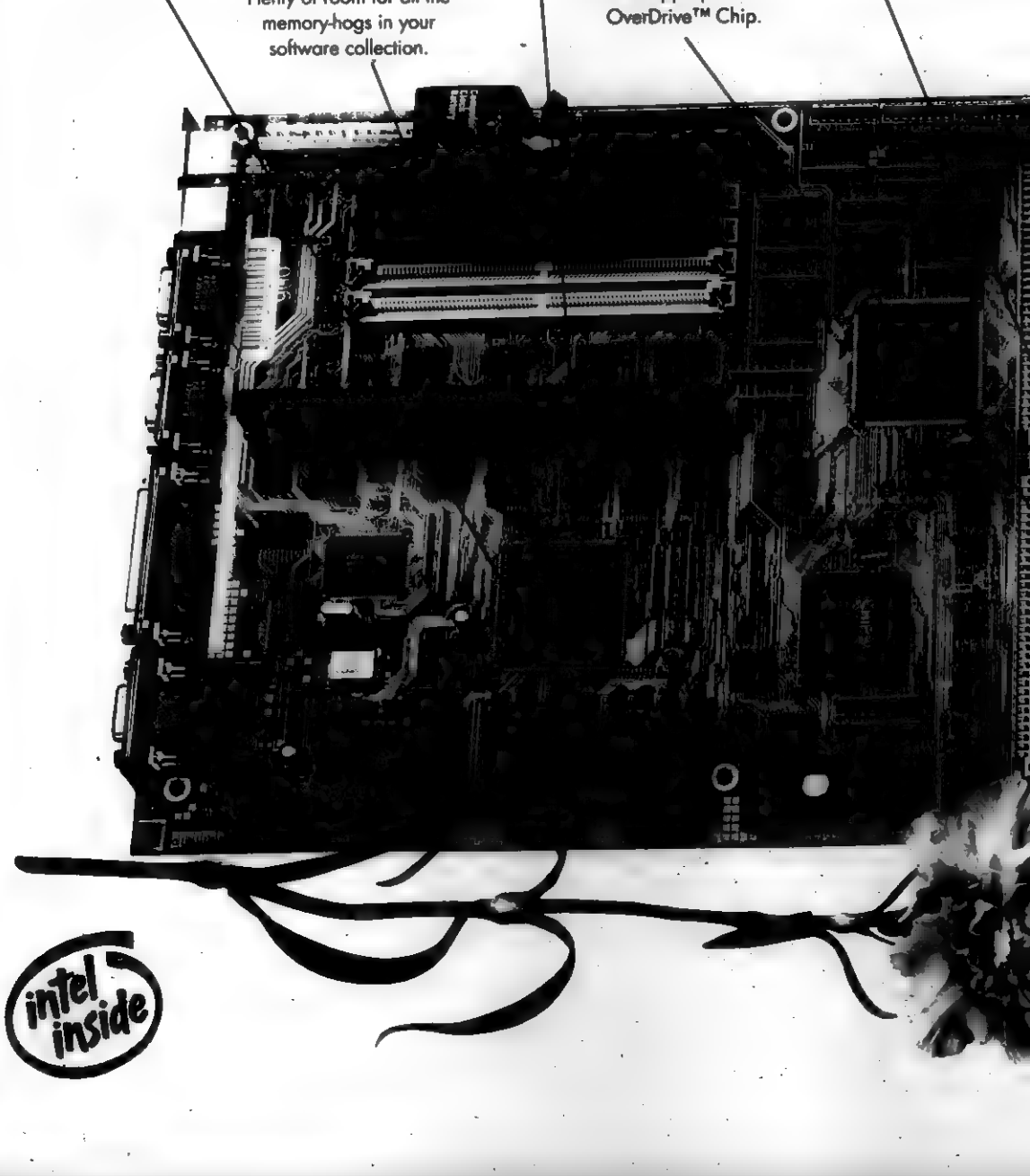

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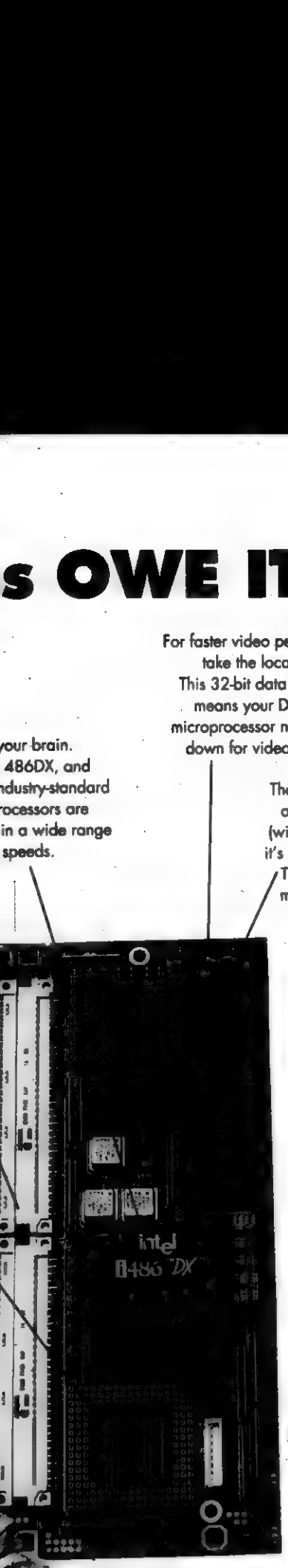

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Local bus video	yes	no	no
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Application support available	YES	NO	YES	NO

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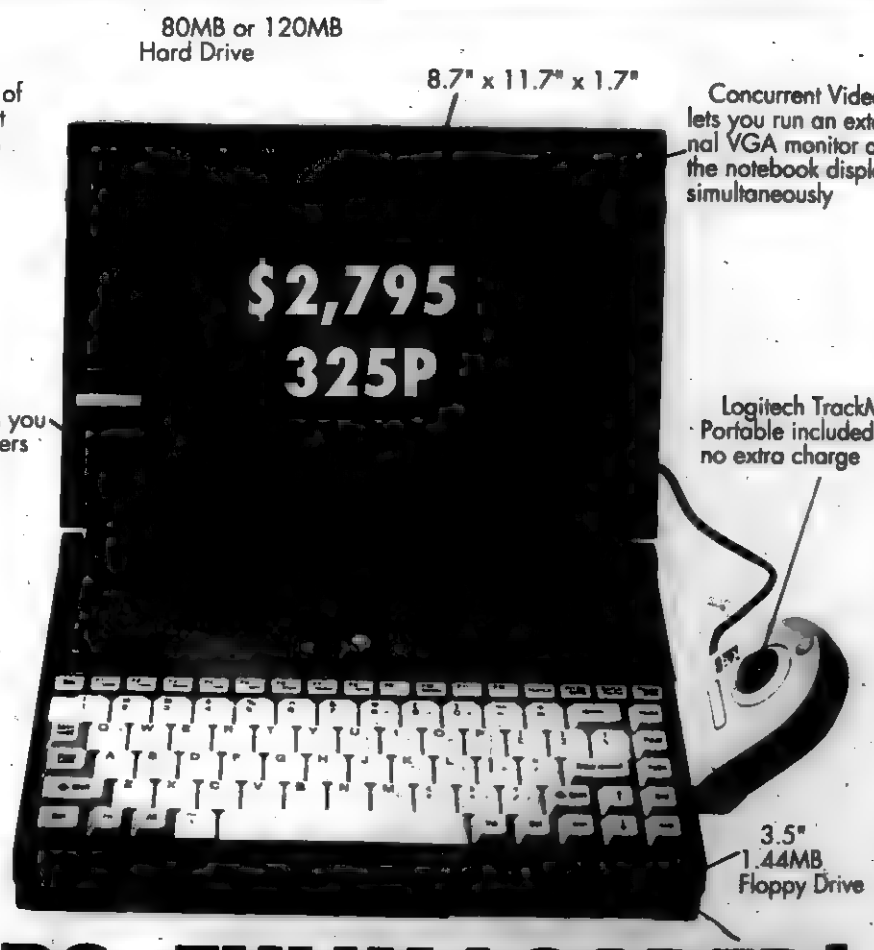

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1988 Digital expands its Network Application Support (NAS), unveiling the industry's most open computing environment for the 1990s.

1988 Digital and Apple announce an agreement to link Macintosh® and AppleTalk® with VAX® and DECnet/OSI enterprise networks.

1980 Digital, Intel™ and Xerox® jointly introduce Ethernet.

1977 First VAX is introduced.

1960 Digital ships world's first PC (PDP-1). Includes first interactive computer game.

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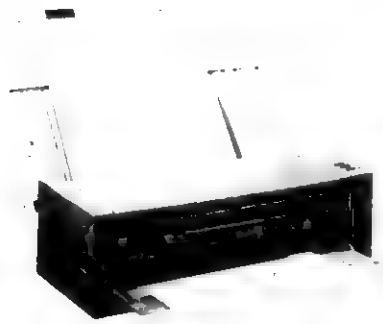

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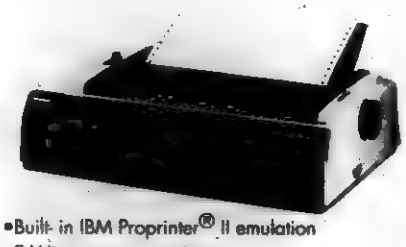

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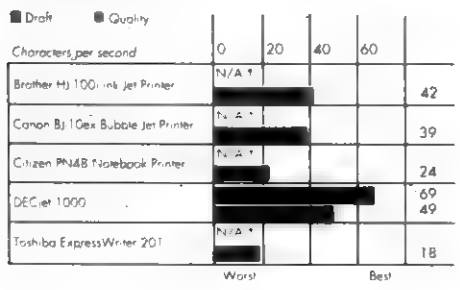
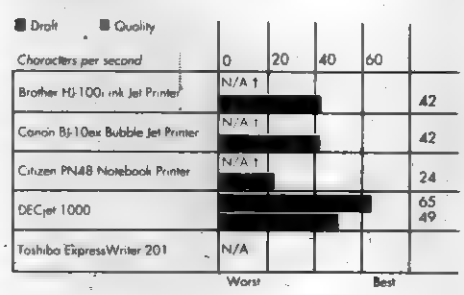
Epson Emulation



IBM Emulation



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NEW PRODUCTS

Software application packages

QDB Solutions, Inc. has released QDB/Analyze.

According to the company, QDB/Analyze is a software product designed for improving the quality and integrity of information stored in corporate databases. It targets problems such as incorrect billing, cost overruns and product recalls.

The product is a data quality management tool that uses data modeling and relational database design concepts. A semantic model of the data quality specifications is maintained that enables data quality to be measured at the record, field and database levels. QDB/Analyze runs under Microsoft Corp.'s Windows 3.1 or on an IBM-compatible 486 or 386 personal computer, according to the company.

Pricing starts at $30,000 for a single license.

QDB Solutions
3 Cambridge Center
Cambridge, Mass. 02142
(617) 577-9205

Cincom Systems, Inc. has released Mantis 2.4, a product designed to help users create applications that run on Digital Equipment Corp.'s VAX/VMS architecture.

Mantis 2.4 offers a set of tools for fast system development, interactive prototyping and refinement, system testing and implementation, the company reported. A new Screen Repaint Optimization feature executes programs faster, and the Mantis Options compiler provides default attributes.

The product has a Universal Export Facility that simplifies porting Mantis applications from one platform to another.

Prices range from $8,600 to $116,000.

Cincom Systems
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

California Software Products, Inc. has introduced Release 1.2 of its RPG/400 software system, Baby/4XX.

According to the company, Baby/4XX was designed to downsize Application System/400 native code from a midrange system to a personal computer where it can be used in multiuser or single-user mode or recompiled and used on a network.

This release includes subfile support, external printer support and enhanced development tools. Baby/4XX runs on both the AS/400 and the PC. Under OS/2, the product provides the capability to integrate AS/400 applications with Microsoft Corp. Windows, DOS and OS/2 software such as spreadsheets, word processors and databases.

Prices start at $3,500.

California Software Products
525 N. Cabrillo Park Drive
Santa Ana, Calif. 92701
(714) 973-0440

Systems Center, Inc. and Tangram Systems Corp. have announced Tangram's AM:PM software distribution product.

AM:PM offers host-controlled software solutions for users of Novell, Inc. and OS/2 local-area networks, DOS, OS/2 and Apple Computer, Inc. Macintosh workstations in the Systems Network Architecture networking environment, the company reported.

AM:PM transports software among unattended servers and workstations and IBM MVS mainframes. Remote data management, collection for product applications and data distribution is provided.

Prices range from $75,000 to $200,000.

Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-8000

Utilities

BMC Software, Inc. has introduced LoadPlus Version 1.3, a DB2 load utility.

According to the company, this version loads DB2 up to six times faster than the load utility provided with DB2 Version 2.3 and requires approximately one-fourth the CPU time.

Users can access data up to 12 times longer than with the DB2 utility and can use LoadPlus Version 1.3 to replace all of the data in a table. Ease of use and new features that improve flexibility have been added.

LoadPlus Version 1.3 prices start at $15,000.

BMC Software
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(713) 240-8800

System software

Prism Solutions, Inc. has introduced Prism Warehouse Manager.

According to the company, Prism Warehouse Manager is the first software product created to automate the design, development and maintenance of a data warehouse environment. The product automatically generates programs and control statements to transport information from a variety of sources into the data warehouse.

To load the relational database, Prism Warehouse Manager supplies mainframe-executed Cobol programs.

Prices range between $80,000 and $170,000.

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Management, not tools, steals conference spotlight

BY GARRY RAY
CW STAFF

The recent Software Development Fall '92 may not have been a barnburner of snazzy new development tools, but in the era of "total quality," that may have been for the best.

While this mixed gathering of approximately 2,000 programmers and development managers was clearly interested in staying at the head of the technology curve, it also sat transfixed through two days of management seminars on topics such as "Growing a Successful Change Agent," "The Learning Organization: What Neural Networks Teach Us about Management" and "Coding, Cowboys and Software Sages."

The seminars were clearly aimed away from development tools, methodologies and new techniques and toward broader management issues such as team- and consensus-building.

Developers grappled over a perennial issue of software design: whether current application bottlenecks and quality concerns could be solved through new tools and methodologies or through changes in how software projects are managed.

In this corner

In one camp were those who dismissed the idea that new programming techniques would solve today's problems. "I don't believe in magic solutions," said Chris York, a software project engineer at Cummins Electronics Co. in Columbus, Ind. "A lot of people are talking about object-oriented software, but it's just the latest [trend]," he observed.

Development methodologies and models also came under attack from Richard Cohen, a consultant and developer based in Silver Spring, Md.

Cohen, author of the MacBubbles computer-aided software engineering (CASE) tool for the Apple Computer, Inc. Macintosh, said, "If you think too much about the model and not enough about the problem at hand, the model is a bad model. The same thing goes for tools."

That idea was echoed by conference chairman Larry Constantine, an authority on software development and software teams.

"There's a shift in the field to the recognition that technology is not going to solve all of the problems," he said. More effective than technology solutions, according to Constantine, is that managers make small adjustments in their methods, such as making "visible," or explicit, any existing development processes; adding "professional critics" to all software teams; and making sure that team leaders are neutral in the way they accept feedback and problem reports from staff members.

"There are small steps that any company can take to make a difference in quality, but people issues are the key component to reduced software defects and increased productivity," Constantine said.

Familiar problem

Other attendees were nonplussed about the emphasis placed on management issues. "There aren't so many [issues] as people believe," said Forrest Johnson, senior vice president at UAI Technologies, Inc. in Research Triangle Park, N.C.

However, Johnson, who has a staff of more than 50 developers at the financial services software firm, countered that "the management issues that exist [in software development] aren't that much different from any other job."

Although he attended a number of management seminars at the conference, Johnson was mainly brushing up on object-oriented programming, Microsoft Corp.'s Windows New Technology and CASE tools.

Conversely, some who came for a full serving of technology were sated by the management seminars.

"I came up through the ranks as a programmer," said Stephen Scott, a manager at SRC Systems, Inc., a development house in Bala Cynwyd, Pa. "So to get the management seminars in this context, where the issues and examples are relevant to [developers], has been helpful."

Powersoft teams up with LBMS, Bachman

BY KIM S. NASH
CW STAFF

BURLINGTON, Mass. — Powersoft Corp. is on the move. The privately held company, based here, recently closed several joint development and/or marketing deals with computer-aided software engineering (CASE) firms, including Houston-based LBMS, Inc. and Bachman Information Systems, Inc., also based here.

After selling off its last shrink-wrapped software package earlier this year, Powersoft is now focusing solely on PowerBuilder, its client/server application development tool. Powersoft has stated no plans to become a full development life-cycle vendor but has teamed up with CASE vendors.

Set a place

The players bring different but complementary tools to the table

Powersoft: PowerBuilder, a Microsoft Corp. Windows-based development tool for building graphical applications and interfaces.

LBMS: Systems Engineer, a CASE workbench that includes a LAN-based repository.

Bachman: Namesake workbench, a tool set that does forward and re-engineering.

Each party benefits from the deals: Powersoft supplies graphical tools missing from other tool sets and gains sales channels when these vendors resell PowerBuilder. The trick will be getting PowerBuilder to work smoothly with workbenches from other vendors.

Patience is a virtue

Bachman and LBMS users concerned about that integration will have to wait a few months to judge it. Neither company has set an official release date for PowerBuilder-enabled tools, but the products are expected to be out in early to mid-1993.

Bachman's deal with Powersoft is part of a larger scheme to get past its re-engineering reputation. Company officials touted Model Driven Development (MDD), a strategy for full life-cycle CASE based on reusable models created by a user to represent different business functions.

"The goal is to be able to find and redeploy work you've done before," explained Chris Sole, Bachman's director of strategic marketing.

PowerBuilder, which Bachman plans to sell and support, supplies a means of generating and saving graphical front ends and full-fledged applications — a piece missing from Bachman's tool set.

Part of the plan

Also part of MDD is Bachman's intention to develop design tools for popular relational database management systems, starting with SQL Server from Sybase, Inc. and Microsoft Corp.

Ultimately, Bachman plans to provide tools for users to generate applications for the platform of their choice, Sole said. But that has not happened yet.

A problem with current so-called client/server solutions is that they address a limited number of operating environments. For example, PowerBuilder generates Microsoft Windows-based systems rather than Unix or IBM OS/2.

Programmer nirvana would be an integrated set of tools that could produce applications for various platforms. Powersoft's latest pacts push Bachman and LBMS closer to that end, but some traditional CASE vendors have already dipped their toes in the water.

Some KnowledgeWare, Inc. users, for instance, are building cooperative applications for combination OS/2 and MVS setups.

For its part, LBMS plans to link PowerBuilder into Systems Engineer, a full life-cycle tool set.

LBMS and Powersoft made an agreement to sell each other's products.

IDE unveils development tool for Unix workstations

BY GARRY RAY
CW STAFF

NEW YORK — A new development tool for Unix workstations will make it easier to create and reuse object-oriented software components for C++ application programming.

Object Oriented Structured Design/C++ (OOSD/C++), announced by San Francisco-based Interactive Development Environments, Inc. (IDE) at last week's Unix Expo, combines a language-sensitive graphical programming editor, an annotation facility, a variety of tools to check the completeness and consistency of an object-oriented design diagram and a C++ code generator to automate the design of user interfaces.

OOSD/C++ was designed to work with IDE's Software through Pictures computer-aided software engineering (CASE) development environment, according to a company spokesman.

At the core of OOSD/C++ is a graphical editor that allows developers to visually construct object-oriented software designs. Integrated with IDE's CASE environment and repository are resulting designs that can include public and private classes, templates, global and local scoping and single and multiple inheritance. OOSD/C++ can be integrated with Centerline Software, Inc.'s ObjectCenter programming environment, allowing developers to interactively switch between OOSD/C++ designs and C++ code.

Design retrieval

Included with OOSD/C++ is a reuse browser that provides access to multiple design libraries, company officials said. Using the browser, developers can retrieve one or more designs for modification or extension. After browsing and selecting designs, OOSD/C++ automatically redraws the designs in its graphical editor.

Separately, IDE announced a training, consulting and development-assistance program for OOSD/C++ customers. Called Success Package for C++, the program combines a number of on-site and telephone support services to assist customers in launching their first C++ development project.

OOSD/C++, available immediately for Sun Microsystems, Inc. SPARCstations, is priced at $75,000 for five users, including the Success Package for C++. Subsequent versions to be released this year will support IBM RISC System/6000 and Hewlett-Packard Co. HP 9000 Series 700 workstations.

Champs tosses development tool for Rdb into ring

BY MELINDA-CAROL BALLOU
CW STAFF

CRYSTAL RIVER, Fla. — Champs Software, Inc. recently announced the release of Champs/CASE, a software development tool for rapid application development in conjunction with Digital Equipment Corp.'s Rdb/VMS.

Champs/CASE lets developers move DEC RMS flat files or Cobol-based applications to Rdb, DECforms' Interactive Forms Definition Language (IFDL) and ANSI-compliant C code, officials said, by generating SQL or C code.

"A main target for this product is people who want to build transaction-oriented systems that do not need to make use of DEC's [Application Control Management System] transaction-processing monitors," said Terry Poupart, director of research and development at Champs. "Many people built products with RMS, for instance, and need a tool to migrate to Rdb, DECforms or standard C.

"To make a transition, you have to be an expert in all three — SQL, IFDL and C — before you can even begin. We take care of that," he added.

Champs/CASE offers its own repository and Rapid Development Language and produces C programs with embedded SQL, he said.

The product is divided into three modules. The first is a Dictionary Development and Maintenance Module, which defines and maintains a database schema definition; an Application Development and Maintenance Module, which generates batch and forms-based application programs; and an Object Dependency Tracking Module, which analyzes the use and relationships of application objects.

Champs/CASE can also be integrated with DEC's DECforms, which allows developers to create and maintain form panels that can then be invoked by Champs/CASE applications.

Champs/CASE is scheduled to begin shipping in January 1993, the company said. Pricing will range from $9,000 to $60,000, based on CPU.

IN BRIEF

TeamNet runs HP

■ **TeamOne Systems, Inc.** recently announced that the TeamNet data and configuration management system now runs on **Hewlett-Packard Co.**'s Apollo 9000 Series 400 and Series 700 workstations. TeamNet tracks file changes made by any tool that runs on any platform on a Network File System-based network, according to the firm.

■ **The Virginia Center of Excellence for Software Reuse and Technology Transfer** in Herndon, Va., received a $7.2 million contract from the Defense Advanced Research Projects Agency for research in reusable architectures and components, integration of reuse technology into organizations, methodologies to encourage reuse in the software industry and methodologies for determining when reuse is cost-effective.

■ **Intersolv, Inc.** in Rockville, Md., has begun shipping APS 2.2, an enhanced code generator that produces code for client/server applications. Beta-tested at 16 sites, APS 2.2, which is priced at $9,500, can target code for IBM mainframes, Application System/400s or OS/2 systems.

21 MEGABYTE*

New 3M Floptical® diskettes may look like ordinary 3.5-inch diskettes, but they offer over 28 times the capacity*—at a low system and media cost.

As the world's largest manufacturer of media, 3M is a leader in producing the new Floptical diskette using a unique combination of magnetic recording and optical servo track technology. Optical tracks are engraved on the barium-ferrite media surface so the drive can read more data more precisely (1,245 tracks per inch vs. 135 on standard floppies). This not only gives you increased capacity but also improved reliability and performance.

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Co-developed by IBM and 3M, the new 3M ECart™ ½-inch tape cartridge for the new family of 3490E drives delivers the same proven reliability you've come to expect from 3M 3480 cartridges—with up to twelve times the capacity of the original uncompacted 3480 cartridges, a new shell and improved cartridge handling features.

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Cognos eases SQL query process across RDBMSs

BY MELINDA-CAROL BALLOU
CW STAFF

BURLINGTON, Mass. — Cognos, Inc. has announced Impromptu 1.1, a desktop SQL query tool for Microsoft Corp.'s Windows that offers cache mode and local snapshot support for increased performance and ease of operation across platforms and relational database management systems.

Impromptu uses a Microsoft Windows interface to allow users to perform complex queries across SQL databases without having to understand SQL, the RDBMS structure or network navigation. This version offers support for Digital Equipment Corp.'s Rdb, Oracle Corp.'s RDBMS, Sybase, Inc.'s SQL Server, Microsoft's SQL Server, Borland International, Inc.'s InterBase and Hewlett-Packard Co.'s Allbase/SQL, as well as SQL Net, Transmission Control Protocol/Internet Protocol, DEC Pathworks, HP NS3000 and serial connections for networking.

Impromptu offers a Query Bar that does SQL query operations such as sorting, grouping, calculating minimum average and maximum values, totals, subtotals and averages. The product also handles network navigation and database access, which eliminates complex sign-on procedures, officials said. Users point and click on items of interest and the SQL query syntax is automatically generated and sent to the host.

Traffic reduction

The cache mode feature available with this release lets users bring data down to the local personal computer and then perform further queries without having to requery the database, thereby reducing database processing and network traffic. If the required data is not in the local cache, Impromptu will query the database. Other tools require separate database queries with each iteration, according to Cognos.

"One of the big issues users face is network traffic and a drain on systems resources," a Cognos spokesman said. "Cache mode lets them cut down on that significantly."

Local snapshots let users save queries on the PC for later use, giving them access to data without requiring that they be connected to the database.

Satisfied user

Miglautsch Marketing, a direct marketing and catalog sales company based in Milwaukee, is using Impromptu in conjunction with Borland's InterBase RDBMS, The Santa Cruz Operation's SCO Unix and VAX/VMS platforms.

"We've found Impromptu to be really helpful for initial data pulls, for trying to find out what's in a file and for marketing people because it's all point and click," said John Miglautsch, company president. "As a query tool, it's exceptional. Where it isn't quite as powerful is in building real applications, but it is primarily a query tool. It has a feature which limits the number of records that come down, which is helpful for the largest databases and for tailoring joins so that users don't have to figure out what they ought to be."

Miglautsch added that with data conversions and transfers of more than 100,000 records, Impromptu "isn't as fast as you might like it to be," so for production applications, users might require a different option.

Impromptu 1.1 is available immediately and costs $595.

128 MEGABYTE

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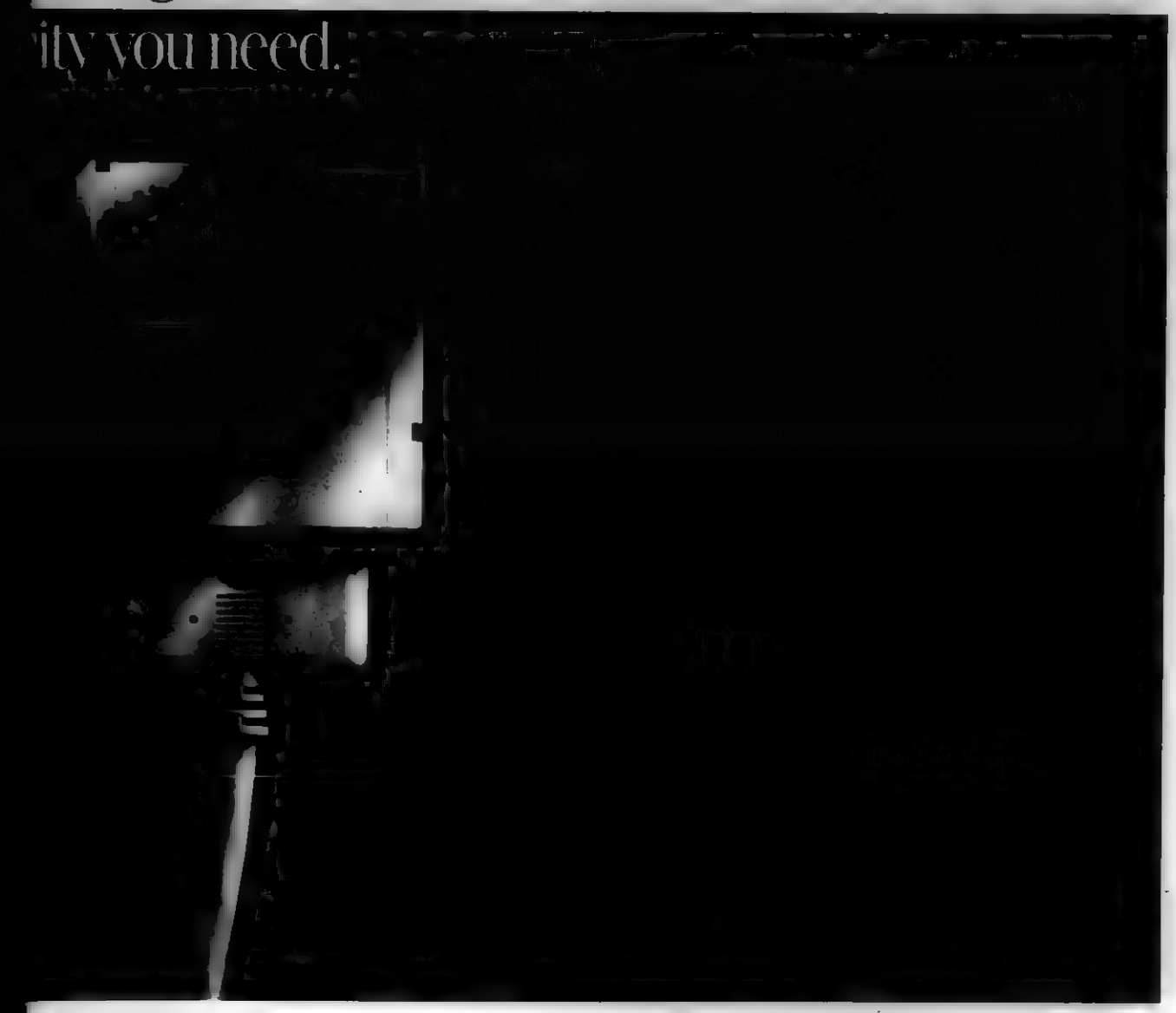

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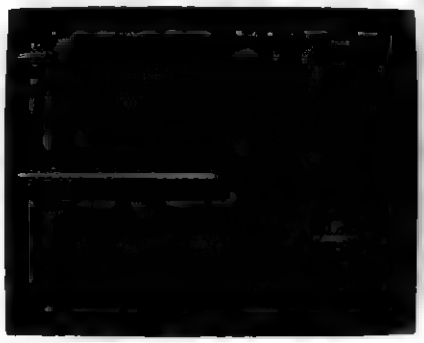

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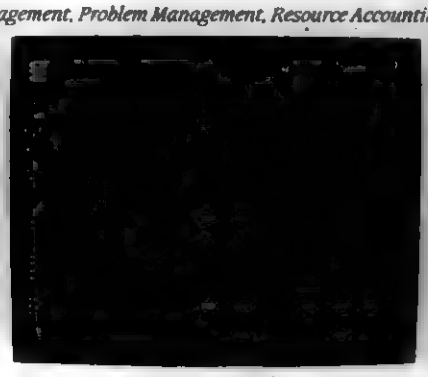

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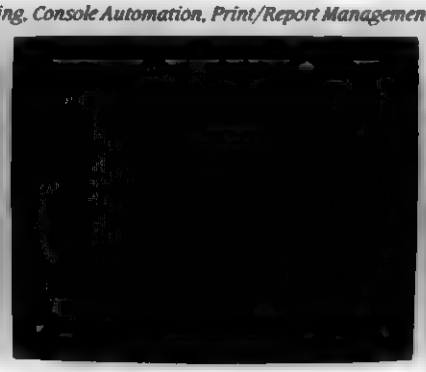
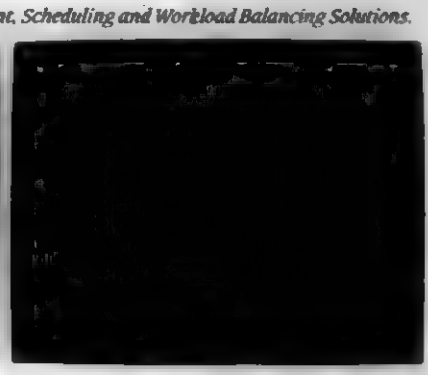


Help Desk includes Machine Generated Problem Tracking and Priority Escalation— so people are immediately notified of critical problems.



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NEW PRODUCTS

Application development tools

Financial Modeling Specialists, Inc. and Borland International, Inc. have released Version 3.4 of ParaTrak, a Paradox script documentation program.

ParaTrak 3.4 was designed for use with Paradox 4.0, Borland's personal computer relational database. ParaTrak 3.4 can analyze code developed by users customizing Paradox 4.0, which helps in tracking global variables and discovering potential errors.

The product runs in Paradox and uses the Paradox Engine and Turbo Pascal to produce documentation in Paradox tables. Users can control the documentation by performing tasks such as modifying default reports or adding their own and sorting and querying for specific data.

ParaTrak 3.4 costs $375.

Financial Modeling Specialists
Suite 410
8027 Leesburg Pike
Vienna, Va. 22182
(703) 356-4700

Acucobol, Inc. has started shipping AcuView.

According to the company, Acu-View is the computer industry's first integrated business quality graphics package for Cobol.

Users can incorporate variations of five categories of graphs — pie, line, bar, table and word charts — into their Acucobol-85 applications and develop customized charts choosing selections from a catalog of more than 100 standard chart designs.

Prices for AcuView start at $979.

Acucobol
Suite 201
7950 Silverton Ave.
San Diego, Calif. 92126
(619) 689-7220

Wind River Systems, Inc. has introduced MicroWorks, a software development environment designed to let users write, test, load, debug and run applications for high-volume embedded systems.

According to the company, MicroWorks is a fully bundled development and runtime environment that executes the entire software development process. For customized applications, the product combines development tools and a micro kernel-based operating system.

A porting guide of documentation and software templates is included, and MicroWorks supports host development on Sun Microsystems, Inc. SPARCstations and Hewlett-Packard Co. 900/300, 400 and 700 workstations.

MicroWorks costs $12,500 per project license.

Wind River Systems
1010 Atlantic Ave.
Alameda, Calif. 94501
(510) 748-4100

Compilers

Software Engineering Associates has released Portable Basic, a compiler for Sun Microsystems, Inc. workstations.

The product is compatible with Microsoft Corp.'s GW-Basic and runs on Sun 3 and Sun 4 workstations running SunOS 4.1. The compiler provides a migration path from personal computers to Sun workstations. Users can write applications and utilities as well as graphical displays, numeric programs and simple text filters. Color graphics capabilities are included to draw lines, rectangles, points, ellipses, arcs and circles, and text can be printed to the screen in multiple fonts, the company reported.

Prices start at $600 for a single CPU license on Sun 4 computers.

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

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THE data pollution PROBLEM

Missing, wrong and otherwise rotten data costs U.S. firms billions each year. Find and fix, experts advise.

Jon Nelson

Connecticut Mutual's Shelby: *'We've been blind to the fact that files live longer than the programs we write to produce them'*

BY BOB KNIGHT

When Lamar Alexander took over the job of U.S. education secretary, his top goals included cleaning up a polluted loan database so that student borrowers would not continue to get a free ride.

According to a General Accounting Office report, taxpayers paid $3 billion because information provided by the nation's banks on defaulters hadn't been entered properly into a centralized database at the Department of Education.

The result? Deadbeat students continued to get loan renewals, while applications from deserving students were rejected. Today, Alexander and the department are still wrestling with the problem.

Knight is a Chicago-based free-lance writer.

Sadly, the problem of inaccurate, corrupt data isn't confined to the government. Many corporations are also discovering anew that the garbage-in, garbage-out bugaboo is back — in a big way.

Almost two-thirds of 501 medium and large companies recently surveyed by *Computerworld* reported problems resulting from inaccurate, outdated or missing data.

Although companies tend to be silent about the issue, word of damage has seeped out from Salomon Brothers, Inc., TRW, Inc., Prudential Securities, Inc., Trump's Castle Casino, General Accident Insurance and others.

Experts blame the rise in problems caused by dirty data to downsizing, an increase in data warehouses, re-engineered legacy systems, client/server networks and increased user access. Those factors, combined with a lack of action on the part of information systems groups, means the garbage-in, garbage-out syndrome is more pervasive — and far more dangerous — than ever.

"Businesses are becoming more and more dependent on large data stores to support things like sales and manufacturing," says Mark Hansen, president of QDB Solutions, Inc. The Cambridge, Mass., software consultancy applies Total Quality Management principles to on-line data.

The litany of consequences ranges from improper billing to cost overruns, delivery delays or errors, product recalls and improper reporting of regulatory information. With a recent rise in downsizing, some analysts predict the problem is likely to get worse.

Richard Finkelstein, president of Performance Computing, Inc. in Chicago, says one of the biggest challenges occurs when data is strung out onto a local-area network of users who may not be clear on the concept of data integrity.

"While mainframe software might have holes in the dam, PC software doesn't have a dam at all," Finkelstein says. "There is absolutely no protection there because, to a large extent, programmers and end users of the PC software products do not recognize the sources of the corruption. They don't understand the issues because the issues aren't being discussed."

One reason the issues are hushed up is that some companies are embarrassed. Others fear the legal and monetary repercussions of problems that can result from incorrect data.

"For the past 40 years, IS organizations have spent all their time figuring out how to move and store data better and faster without spending any time trying to improve the quality of data," Hansen says.

It's ironic, he notes, that many companies that embrace Total Quality Management have thus far ignored the data that underlies many critical applications.

main points

- Almost two-thirds of the 501 companies polled report problems with poor-quality data.
- Most companies remain close-mouthed.
- Fixes include more training, replacing problem equipment, using specialized equipment and forming task forces.

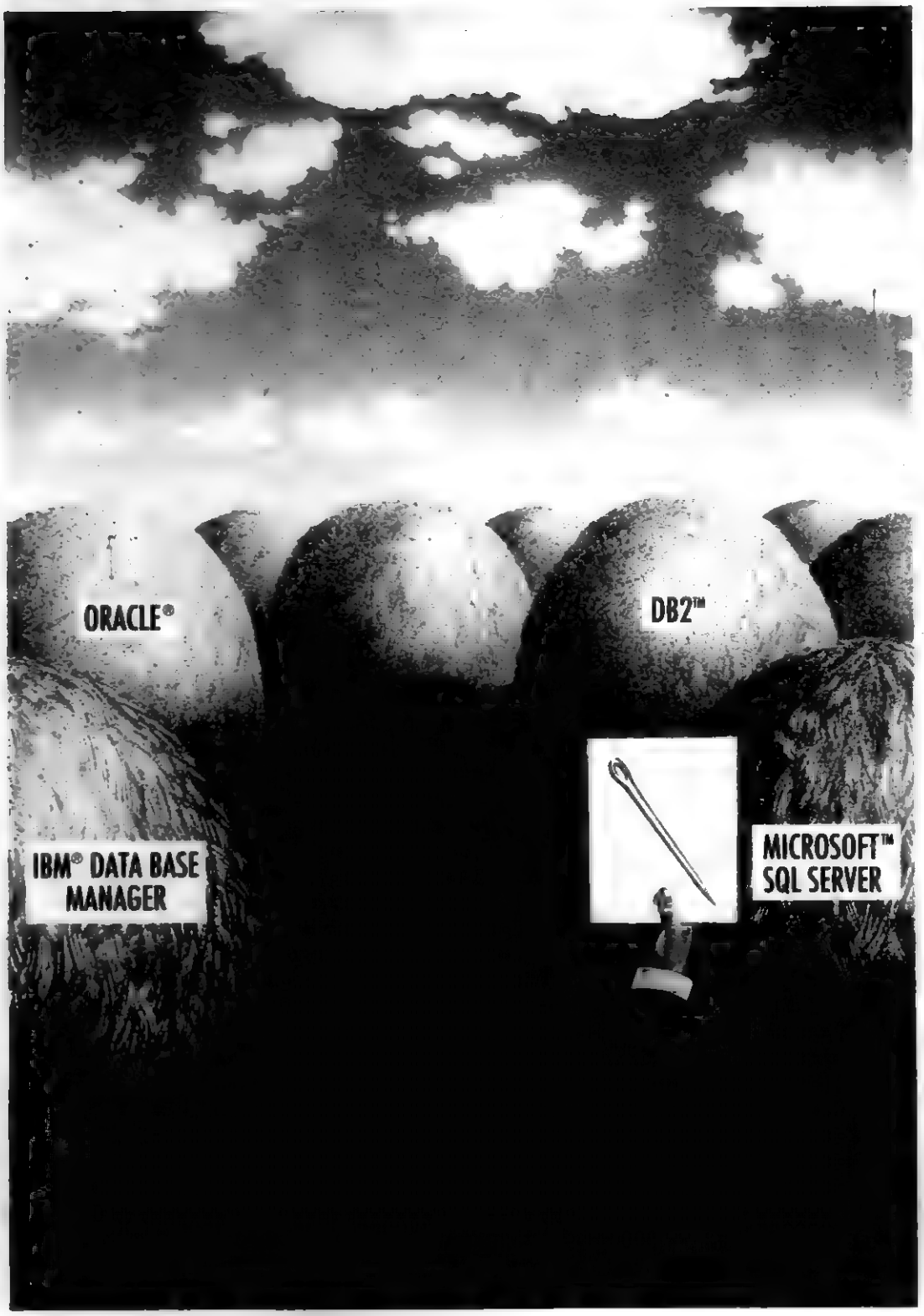
Tales of hapless organizations that have suffered from ignoring the issue routinely make the rounds in IS and consulting circles. Following are two of the more recent stories.

In 1990, a major New York securities broker lost more than $200 million when its employees entered incomplete data into a new risk management system the firm was building. As a result, the firm missed a big trading opportunity when the report failed to show that a key transaction had been made.

Another example is a major New York bank that rejected a state's verbally approved $10 million loan appli-

Continued on page 83

Finding a RAD solution for developing client/server applications is like . . .



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The data pollution problem

CONTINUED FROM PAGE 81

cation because the bank had no record of the state's account number. An investigation showed that the account number was hung up in a batch program upstream. But it was too late: By then, the state had been cut off by the bank.

Airlines are especially bad, says Richard Wang, an assistant professor at MIT. Inaccurate data regularly forces planes to take off one-half to one-third full, he says, costing airlines tens of millions of dollars.

However, a slowly growing awareness has led more organizations to deal aggressively with faulty data.

"The main thing we have a concern with is inputting," says Ken Gaylord, quality manager at the Versatec Division of International Paper Corp. in Athens, Ga. "You've got to start out right to begin with."

Even though no major errors have been caused by data entry, Gaylord says, the company has devised a careful set of checks and balances to prevent glaring errors. Some businesses are also experimenting with a small but growing handful of software products aimed at sampling, analyzing and correcting data quality (see story page 84).

At the Account Services Department of Denver-based Colorado National Service Corp., the data-checking routine begins every day at 5:30 a.m., according to Roy Pall, assistant vice president of the Colorado Bankshares, Inc. subsidiary.

problem

- Poor-quality data residing in corporate databases costs U.S. businesses and the government billions each year.

Each morning, workers sift through data from electronic funds transfer, on-line financials, remote data entry, a bank clearinghouse and the company's own proof department, Pall explains.

Automated balancing software from Unitech Systems, Inc. in Lisle, Ill., helps determine whether data and source are accurately balanced. Research shows if the problem stems from a user error or from system integrity. Another safeguard: Source data is always balanced before being passed to IS.

No easy fixes

But getting to the root of such a complex problem isn't easy, IS managers and consultants warn.

John Zachman, an IBM systems architecture veteran who now heads Zachman International, a La Canada, Calif., consultancy, says one the toughest problems ironically results from the conscientiousness of database administrators.

"The database administrator discovers a performance problem, changes the structure of the data at the physical level and what happens? He just changed the meaning of the data relative to the enterprise," Zachman says.

Ronald Shelby, second vice president of Connecticut Mutual Insurance Co. in Hartford, places much of the blame squarely on his fellow systems people, however well-meaning they are.

causes

- Data entry errors.
- Data entered incorrectly because complete and accurate information was not available.
- Faulty data purchased from outside vendors.
- Data "mismatched" during merging process.
- Poorly synchronized transaction processing.

"The thought never occurs to us that, if I write 10 programs that have separate files and if 40% of the data is in files that overlap, then that results in even more systems work to build those batch programs and to summarize them," he says. "We've been blind to the fact that files live longer than the programs we write to produce them."

One result, he says, is that money is wasted creating redundant systems. Worse, reuniting the various islands of data is very expensive.

As a result, he says, "We spend tens of millions of dollars, and we've added very little value to the business."

And even though technology has improved, data can still be compromised by sabotage, viruses, crashes and other hazards. "We had an East Coast customer a few weeks ago who called in and said he suffered a [data] drive crash," says Bob Kleckner, vice president of technology marketing at X L Datacomp, Inc. in Hinsdale, Ill., a subsidiary of Storage Technology Corp. in Louisville, Colo.

"Now part of the procedure in a case like that is to pull whatever data you can off the disk drive and pump it onto a new drive and try to put the data back," Kleckner says. "Well, we were about 98% successful, and that's usually pretty good, but we had to ask the question, 'What didn't get restored?' "

Unfortunately, the client had failed to do backup and recovery, so data was in fact lost, Kleckner says.

results

- Banks and brokerage houses violate SEC reporting.
- Utilities, telephone and transportation companies bill incorrectly.
- Hospitals cannot collect receivables because of invalid patient information.
- Aerospace firms and large government contractors have cost overruns and late deliveries because of unreliable project management data.
- Manufacturers face product line rework and recalls caused by unreliable design and production management data.

Measure by measure

It is likely to take a long time for large corporate and government units to beat the dirty data problem. After all, Hansen notes, it took a long time to create the corrupt data and to percolate it through multiple layers of complex systems.

Most experts agree that the first step, as in many areas, is to simply acknowledge that a problem exists.

Companies committed to quality are in a strong position to tackle the problem, MIT management professor Robert Goldberg adds.

"When the chairman of the board says that quality is of the highest priority, the quality of the data should be included," Goldberg says.

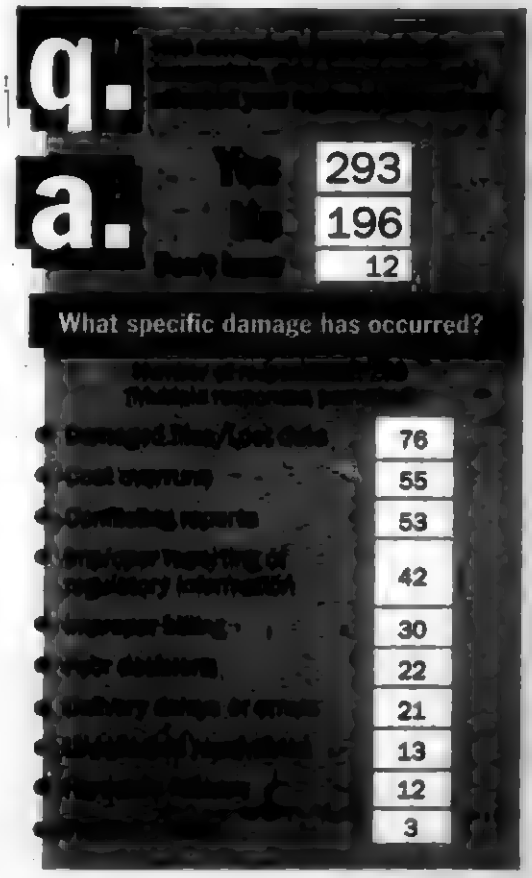
While few are eager to tackle the complex and odious task of cleaning up dirty data, Linda Amoroso, data quality manager at Sun Cos. in Philadelphia, suggests the job isn't without its comforts. "We have found that we have databases out there running for the sake of running, which is not unique to us," Amoroso says. "But it feels very good to know that we are eliminating computer time and production scheduling time."

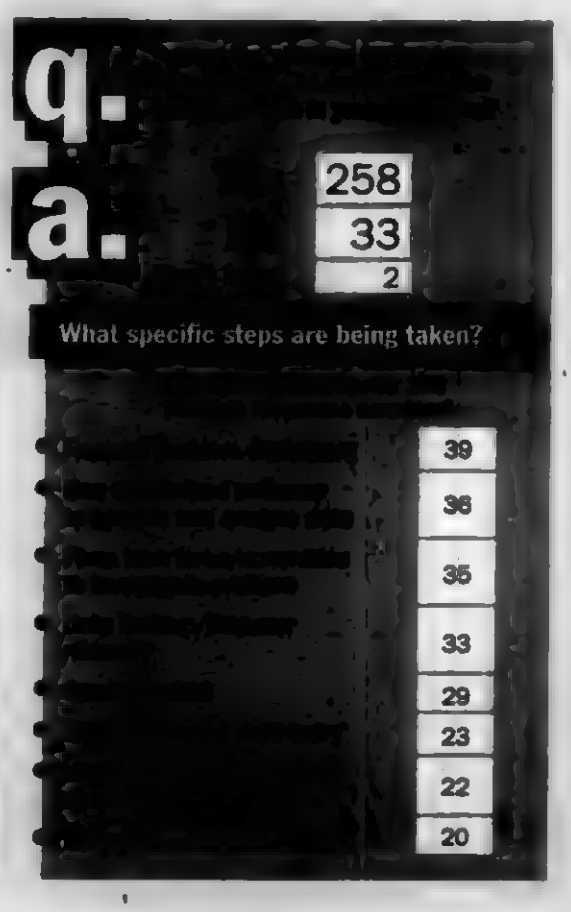
Consultants and IS directors say they hope the short-term payoffs are satisfying enough to keep firms tackling the problem for the long haul.

"There is no single silver bullet," QDB Solutions' Hansen says. "Just as with TQM [in manufacturing], we need little iterative systems that improve data quality, not a wholesale rewrite of our data." •

The dirt on dirty data

Almost 60% of 501 IS managers at medium and large companies (annual sales more than $20 million) surveyed by *Computerworld* report problems caused by poor-quality data. Nearly all are taking steps to correct the damage.





An arsenal of products to attack your data woes

▶INFOPAC-ABS
Automatic Balancing System gives MVS users an automated way to check that application information balances with itself or with other applications. Besides ensuring integrity, the program also compiles information for management reporting across applications.
Mobius Management Systems, Inc.
New Rochelle, N.Y.
(914) 632-7960

▶QDB/Analyze
A data quality management tool that lets organizations monitor and certify the accuracy, completeness and integrity of information stored in databases. The rule-based system runs under Microsoft Corp.'s Windows 3.1 on 486 and 386 personal computers.
QDB Solutions, Inc.
Cambridge, Mass.
(617) 577-9205

▶Bachman Database Administrator, Bachman/DBA Catalog Extract
OS/2-based Database Administrator uses an expert system to help database administrators create, manage and enhance optimized DB2 systems.
Catalog Extract for MVS, VM or SE lets database professionals synchronize the design on workstations with a database catalog.
Bachman Information Systems, Inc.
Burlington, Mass.
(617) 272-9003

▶ACR/Plus 1.0
A set of rules-based software tools for MVS environments that verify file use, balance summary-level information and reconcile data items at multiple levels of detail. PC-based interfaces are optional.
Unitech Systems, Inc.
Lisle, Ill.
(800) 950-5225

Other product and service providers:

IntelligenceWare, Inc.
Los Angeles, Calif.
Database statistical analysis, reporting.
(310) 216-6177

Database Design Solutions
Pottersville, N.J.
(908) 439-3727

The Quality Assurance Institute
Orlando, Fla.
(407) 363-1111

New breed of data quality software
The new varieties of data quality software can help IS managers sample and correct data. Shown here is a portion of a sample from QDB/Analyze, which automatically generates detailed reports describing exceptions in databases.

43372	19-341	4/2/92	IBM	100	$89.38	Duplicate order number
43372	21-342	4/3/92	DEC	250	$53.25	Duplicate order number
59972	35-214	4/3/92	GLW	3,000	$32.50	Large trade inconsistent with customer history
87654	11-234	4/4/92	CCI	175	$18.25	Customer number invalid
97654	09-768	4/4/92	HSY	200	$27.50	Price outside daily high/low range

Source: QDB Solutions, Inc. CW Chart: Stephanie Faucher

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MIT profs organize investigation

A pair of professors at MIT say they are "very close" to bringing a U.S. subsidiary of Japan's Fujitsu Poqet Computer Corp. and France's Bull HN Information Systems, Inc. into a research consortium that would explore ways to ensure data integrity.

Richard Wang, assistant professor at the Cambridge, Mass., institution, says he is confident the agreement will be signed by early next month. The consortium, called Total Data Quality Management, is under the direction of Stuart Madnick, a full professor at MIT.

The idea began last spring when Poqet, then a separate company, approached Wang with a Poqet personal computer "to see if we could make use of it," Wang explains. "They were interested in using it for data acquisition technology. Their claim was that if you used the right data-capture device from the very beginning, you could make your data cleaner rather than have to use data quality [techniques] down the road."

The consortium would bring together vendors such as Bull and Fujitsu Personal Systems in Santa Clara, Calif., with users such as Boston's State Street Bank, Wang says.

"We would provide the research opportunities and the research results to these companies before they get published," Wang says. "They would be able to talk to us in helping identify research directions, and they would be able to send people here."

resources

- "Cleanup efforts target dirty data," (*Computerworld*, October 28, 1991).
- "How clean is your data?" *Data Based Advisor*, February 1992.
- "Database function: Today's DBMSs provide integrity checks, triggers and stored procedures," *DBMS*, November 1991.
- "Spring cleaning of the DB2 catalog," *Database Programming and Design*, July 1992.
- "The big picture: Proper data object identification can help separate important information from the junk," *Database Programming and Design*, July 1992.

Clean up your data act

As catastrophic as the results of bad data can be, there is hope. QDB Solutions, Inc. President Mark Hansen suggests a broad, five-step, Zero Defect Data approach for improving corporate data quality.

1. Identify the data to be improved. Start with a high-level assessment of where data quality has the greatest impact on the bottom line. Once you've identified where data quality improvement will affect the bottom line, ask database users which data gives them the most trouble. Select a manageable portion of the database for data improvement.

2. Measure the quality of the data in the database. As the old adage goes, "You can't manage what you don't measure." Ascertaining current quality is the key to making improvements. Get users to specify business rules about the data. Then use those rules to find records that are inaccurate, incomplete, inconsistent or outdated.

You should also measure the levels of technical integrity in the database, such as uniqueness of primary keys, referential integrity and incomplete or missing data. Such contraints are not usually enforced as well as they should be, particularly in older databases or flat-file systems.

3. Identify causes of poor data quality. Armed with these measurements, apply the "80/20 rule." Identify the 20% of your company's data quality problems that cause 80% of the errors detected by your measurements. For each of the data quality problems in the top 20%, look at some of the defective records you have found and identify their causes.

Causes to look for include data entry errors, data intentionally entered incorrectly because complete and accurate information was unavailable at the point of entry, faulty data purchased from outside vendors, data that was mismatched during a merging process and poorly synchronized transaction processing.

4. Improve systems to prevent data quality errors. For each of the causes of errors identified above, develop an action plan to prevent errors from recurring. In the long run, it's better to invest your energy in fixing the causes of your data quality problems than to try to scrub data after the fact. Whenever possible, enforce data quality constraints at the database, using triggers or stored procedures. Contraints that can't be enforced at the database can sometimes be enforced using edits embedded within the application code. (Warning: Be careful with such edits.)

Look for opportunities to re-engineer systems to improve quality. Minimize the number of processing steps between data entry and the database (each processing step represents an opportunity for error). In a networked environment, ensure that all applications users who have access to the database are included in your quality control program.

5. Measure your improvements. Once you've implemented the improvements, continue to measure the database to ensure that quality is improving.

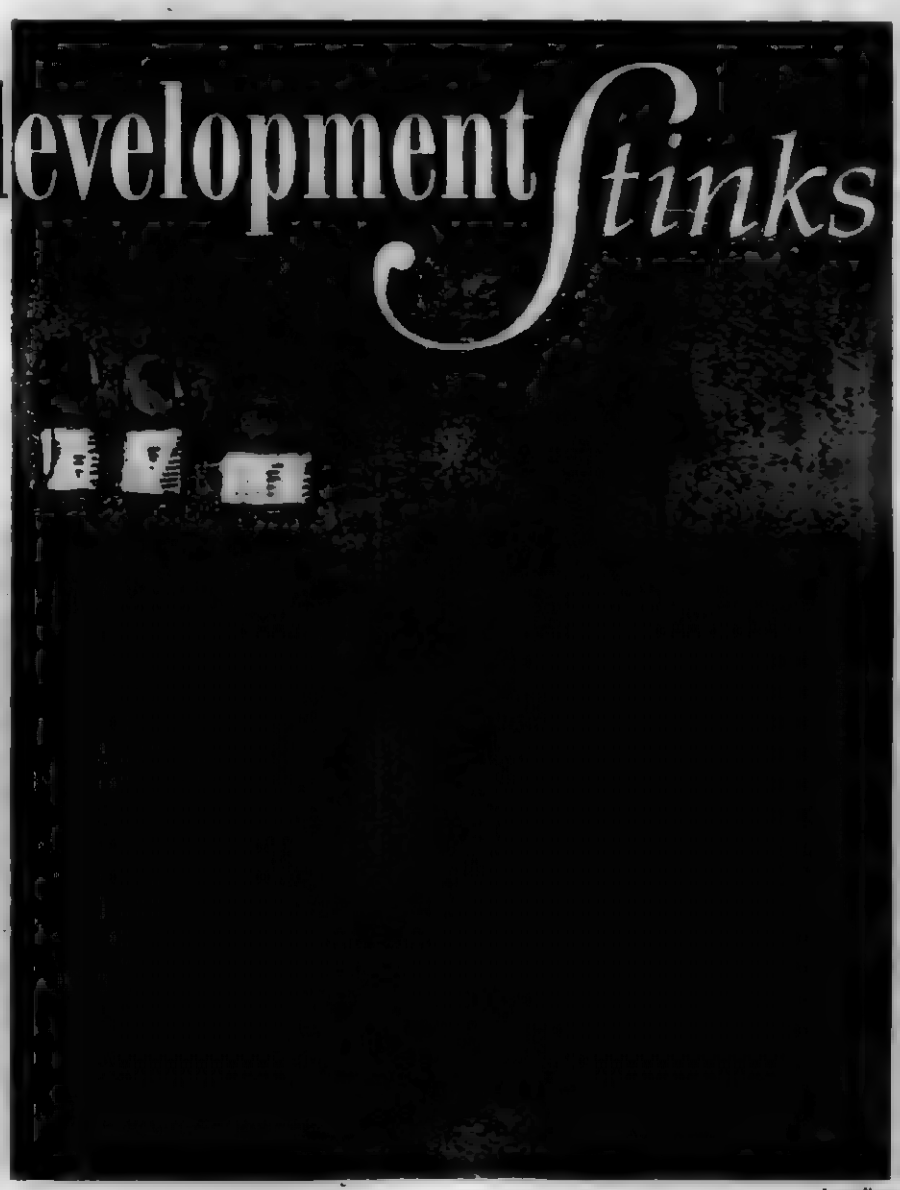
Once you've completed your project, start again from Step 1. Data quality, Hansen says, requires a continuous improvement approach.

PETER TIETJEN

Why PC development stinks

Business applications coders can't take PCs seriously because the machines lack the tools and support facilities these developers need

BY DAVID VASKEVITCH



James Yang

Business applications developers have been called backward, obsolete and paranoid for not downsizing development from the mainframe to the personal computer. But truth be told, most of these developers have become very serious about moving all or part of their applications development onto PCs or local-area networks.

What's holding them back? PCs lack the tools, methodologies and support facilities that make sense for the million-plus team-oriented developers who work on business applications such as order entry, accounts payable and inventory control. The development functionality available on PCs and LANs is geared to different development communities — systems software developers or builders of small-business applications (see story page 86).

Something's got to give, and that something is vendors. They need to give business systems developers the languages and tools to build desktop applications, to process business rules and to store and retrieve records from databases. A coherent system infrastructure, which links and coordinates the pieces of a large business application, is very important, as are facilities that aid in team development and version control.

Here's what developers want:

Give us some high-level tools!

Large business systems typically have three components: the user interface, the database and the business rule processing. The allure of PC tools such as Powersoft Corp.'s PowerBuilder, Microsoft Corp.'s Visual Basic and Asymetrix Corp.'s ToolBook is that they help create user-interface applications as much as 10 times faster than Fortran or Cobol.

But PC-based tools concentrate on only part of a big system — the part the user sees. That's not enough for large-system developers, who need tools such as Cobol, computer-aided software engineering (CASE) or expert systems to deal with large volumes of data and complex sets of business rules. They need help with integrating nondesktop pieces of an application into the overall system.

Cobol may not be suitable as a system programming language or for building graphical user interfaces (GUI), but it does excel at expressing business logic. CASE tools enable a developer to diagram a model of the business, express detailed rules using the same diagrams and then generate Cobol code automatically. Expert systems enable system designers to express business rules directly, instead of having to convert them into a programmatic representation.

These primary business rule tools have no place today in the PC environment.

The sad fact is that today's PC development offerings ignore the picture of the business system of the future. This system has different components that work in concert but may physically run on a variety of computers. For example, the desktop applications may run on individual PCs, the business rules processes may run on local servers, while the database may be distributed among local servers and one or more mainframes.

The developer of a large business system wants to know how this kind of application, distributed across many computers, gets tied together. In the future, it will do so in three ways:

- **Communications facilities.** These will provide the glue that lets a Visual Basic program in a desktop PC talk to a Cobol program in a server, and it lets the Cobol program talk to a DB2 database in a mainframe.
- **Distributed transaction support.** Such support will enable applications to make changes in two or more databases in different machines at the same time without having to worry about how to coordinate all the communications among the databases.
- **Administrative infrastructure.** A "watchdog" monitor will track the distributed sys-

Continued on page 86

Vaskevitch is director of enterprise computing at Microsoft Corp. in Redmond, Wash.

Continued from page 85

tem's status. If an order-entry user in Akron, Ohio, sees a frozen screen, for example, he will know whether it belongs to his machine, the local server, the warehouse server, the mainframe or the network.

Give us team development •

Until recently, PC tools have operated on the premise that only one person works on an application and that the application is not split into several pieces. Thus, for example, once a developer opens a spreadsheet, nobody else can change it while he works on it. Certainly, given Lotus Development Corp.'s 1-2-3 or Borland International, Inc.'s Quattro, for example, it's barely even imaginable, let alone implementable, that two people could modify the same macro sheet at the same time.

But what happens when we're talking about building an order-processing system (with many components) designed to handle hundreds of locations spread around the world? The project probably spans many teams, each with a dozen or more developers.

The strategy at the heart of an industrial-strength development language such as C or Cobol is to facilitate multiperson and even multiteam development. The assumption is that many people will be making changes to the same code base at the same time. There are specific facilities for sharing common definitions, subroutines and data structures.

With this structure in place, an automated build system pulls together the elements required to construct a working system, including common code and shared data, enabling the developer to focus solely on the part of the system he is changing. A version control system ensures that while a developer works on one part of the system, other developers do not change the very same code. Finally, an automated test system, working with the version controller and the automated builder, lets each developer test his changes while ensuring that he didn't break anything else.

This setup works because the development environment supports a concept of modularity: breaking things up into pieces and then gluing the pieces back together in a controlled fashion.

A development support infrastructure focused on supporting teams will be critical if PCs are to be useful for building large applications.

Give us analysis and design tools •

Until now in this discussion we have assumed that programmers program. While this is certainly true, it is far from the only activity critical to the development of an application. When we look at how the professional applications programmer spends his time, the importance of analysis (and design) really stands out. In fact, when building a business application, he spends more than half of his time in nonprogramming activity.

The problem is that the PC world neither acknowledges nor supports this activity. The PC world still emphasizes *how* to build rather than *what* to build.

In the mainframe world, a whole category of tools and methodologies has evolved to support developers in analyzing and designing applications. In their automated form, these tools include dictionaries (repositories), modeling tools and forward- and reverse-engineering facilities and associated tools, particularly those related to data administration, to make these approaches an integral part of the development and operational environment.

CASE tools, for instance, are a key choice for automating the development environment and, in particular, supporting analysis and design activities. However, existing CASE tools are either mainframe-based and mainframe-focused or PC-based but incomplete.

While mainframe-based CASE vendors are adapting their environments to client/server architectures, GUI front ends and distributed databases, these vendors are far from done. Moreover, the most successful large CASE tools are still unavailable for environments such as Microsoft's Windows and Apple Computer, Inc.'s Macintosh. Even when CASE products operate in such environments, they tend to be less sophisticated than the offerings familiar to professional applications programmers.

The upshot is that for developing large business applications on PCs, a critical category of tools used to support more than half the work effort is not yet available in the form developers need.

Today, PC-based applications tend to be personally focused or relatively small in scope. Larger applications used to run the business are still built on mainframes. This big-iron orientation isn't the fault of developers; the tools they need for viable PC development are missing.

These tools need to focus on business rules as well as user interfaces, provide facilities for tying together large systems with many components, support development teams with many programmers and recognize that the business system development process focuses as much on analysis and design as on programming.

Once they get what they need, developers will take PCs seriously. •

PC tools favor stand-alone developers, not teams

There are more than a million applications developers working on large business projects who do not have the tools required for serious development in a PC environment. Throughout the '80s, PC-based tools were focused on these three groups of programmers:

• The stand-alone tool programmer. This person produces small utilities for use by himself, friends and maybe even distribution as shareware. He works in Pascal or C and is the target of fast and friendly environments such as Microsoft's Quick C or Borland's Turbo C.

This community includes both professional programmers working on small projects (or large projects in small companies) and amateur programmers who work late at night at home on one or more DOS machines.

• **The professional tool programmer.** This person works on producing a product either for commercial, shrink-wrapped distribution or for distribution within a large organization.

On larger projects, this programmer works with heavy-duty compilers that have sophisticated optimization and support of multiple-memory models and linking conventions. While C or C++ may be his primary programming language, he uses assembler either for performance reasons or to gain low-level access to hardware.

The software this developer writes is often intrinsically multiuser and must work on a LAN and take advantage of its communication and synchronization facilities.

This forces the programmer to deal with up to three operating systems: Windows on the workstation, OS/2 or Unix on the server and the LAN tying the network together.

• **The stand-alone application programmer.** This person writes applications to run a home or small business. These applications may be stand-alone or used in conjunction with shrink-wrapped software that provides accounting and other functionality.

Focusing on business needs rather than technical functionality, this developer uses high-level simple languages or database-oriented languages such as Borland's dBase, Fox Software, Inc.'s FoxBase or PAL, the Paradox Application Language for Borland's Paradox database. His systems are often ad hoc and unstructured, with minimal documentation. His development schedule is generally measured in days or weeks.

The business application programmer is a different developer from the three above and has different needs. He focuses on business, not technical, requirements, and his language of choice is Cobol. Most of his heavy-duty applications development is done in conjunction with a large team or with many small teams.

In the large companies at which you'll find this programmer, PC-based applications must generally access mainframe-based data. To achieve cooperative processing, PC-based code must interoperate with server-based code, which must work closely with mainframe-based software.

As a result, the development team must include the skill set to deal with Windows, OS/2 (server), MVS (IBM mainframe) and, perhaps, VMS (Digital Equipment Corp.'s VAX) and Unix.

Up until this point, the mainframe has been the only place in which tools and facilities exist to meet the needs of these business systems developers.

What's appropriate?

PC development tools work best for single programmers creating small-scale products

	One-man project	Team development
Tools (utilities, shrink-wrap)	•Pascal, Quick C, Turbo C •Single programmer •DOS/Windows	•C, C++, assembler •5- to 6-person team •Windows, OS/2, LAN
Business applications	•dBase, Fox, PAL, Basic •Single programmer •DOS, Windows	•Cobol, C •Multiple teams •MVS, VMS, Unix, OS/2

CW Chart: Janell Genovese

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Edward L. Suggs Jr., 40, has been named president of a newly formed IS unit at **Coastal Healthcare Group, Inc.** Prior to the promotion, Suggs ran the billing and collection units for the Durham, N.C.-based health care management organization.

.....

Barnett Banks, Inc.'s director of management information, **Andrea Mims**, recently assumed additional responsibilities at the Jacksonville, Fla.-based financial institution. Mims, a former independent management consultant who joined Barnett last year, will coordinate the bank's financial systems with those of its information systems subsidiary, **Barnett Technologies, Inc.** The new duties include management reporting and maintaining the integrity of financial data.

.....

John L. Diesem, formerly senior vice president of Systems and Technology at the **American Stock Exchange** in New York, has joined the **Paramount Communications, Inc.** publishing operation **Simon & Schuster, Inc.** as Systems and Technology Group vice president in charge of planning and integration. Diesem will be responsible for planning, architecture, resource management, business unit liaison, system practices, security, quality assurance and advanced technology functions.

.....

In Pleasantville, N.Y., **Reader's Digest Association, Inc.** has a new position — director of global MIS — and a new person to fill it: **Richard T. Brant**, 47, formerly a partner at Arthur Andersen & Co.

.....

J. Peter Schmidt was recently appointed director of information management, sales, service and marketing at the Warren, Mich.-based **North American operations planning** division of **General Motors Corp.** Schmidt, a 23-year GM veteran, had been serving as group information manager at the automobile manufacturer's former truck and bus group.

Round up the unusual suspects

At Hughes Aircraft, the road to IS leadership isn't necessarily through IS

BY MARK HALPER
CW STAFF

The squeaky user may often get the grease, but at Hughes Aircraft Co., he's also been known to get the CIO assignment.

Driven by an exasperated sense of user must know best how to make information technology sing a strategic song, the $7.7 billion defense equipment manufacturer for some three years now has entrusted its corporate chief information officer post and several divisional information systems leadership positions to individuals who collectively could not claim a single day of previous IS experience.

Corporate CIO R. James Wensley — a Hughes engineer for 30 years until he was asked to navigate the company's IS direction in 1990 — explains what prompted this trend of dubbing relative outsiders as IS lords. The trend, he claims, emerged less by design than by happenstance. He recalls an IS old guard addicted to the latest and greatest computer offerings; their impressive but costly technological stable, he says, was not translating into strategic advantage.

"The users were poorly coupled with information technology," Wensley says. "There was a real disconnect."

Gary Osborn, CIO of Hughes' Space and Communications Group — who as a Hughes veteran of 30-plus years had no IS background when he stepped into the IS leadership fold in 1991 — was even more blunt in his appraisal of the previous state of IS affairs.

"None of the systems were integrated, you never could get at the information you needed, it was not user-friendly, and it was expensive as hell," Osborn recalls.

Steve Maguire

Like Wensley, he contends that El Segundo, Calif.-based Hughes' IS shops had loaded up with the best equipment money could buy but to little avail to the user — or even worse, to the bottom line. While the glasshouse was full of impressive equipment, it was also replete with redundancies and inaccessibilities, he says.

Excess baggage

"I think the IS guys got locked into their technology," Osborn continues. "If it existed, we owned it. We had redundant data everywhere. We spent all our time arguing over who had the right data."

Wensley and Osborn, along with two currently outgoing divisional IS heads, Anthony Chang at Radar Systems and Dino Ruffoni at Ground Systems, have all been denied the luxury of a leisurely orientation in IS. To the contrary, each has presided over some massive and ongoing downsizing projects at the missile maker, which is in midflight on a bumpy and slightly delayed excursion to take data off its mainframes and scrap much of its eclectic collection of big iron and heavy-duty software.

Osborn recalls how Hughes first grew interested in him as a CIO candidate. "I complained loudly enough about [the IS operation] that they asked me to go away and take a look at what I would do to fix it," says Osborn, who was serving as associate manager of the company's Space Vehicles Division when he was asked to begin an IS study in 1990. By February of the following year, Hughes had installed him as divisional CIO.

Wensley, who was manager of tactical engineering in Hughes' Electro-

Continued on page 92

How the other half lives

How does the life of a design engineer or product manager or business unit leader differ from that of a divisional or corporate CIO?

Hughes Aircraft CIO Gary Osborn sums it up in three syllables as he describes the workday world on the CIO side. "Politics," he says.

And he ought to know. Osborn is one of a handful of Hughes executives who were longtime engineers or project leaders until the company catapulted them into CIO status.

Corporate CIO Jim Wensley agrees with Osborn's trisyllabic take.

"I'm not sure I would put it that way, but in my past career [as a Hughes division manager and design engineer] when I decided I wanted to do things, I could just get them done," he says. "Now, it's by consensus. There's a lot of selling involved."

In other words, politics.

"Too much of it," says Osborn, who before being named CIO in 1991 was assistant division manager of space vehicles. "You spend a lot of time trying to convince the rest of the operations [to buy into your IS agenda]. And in terms of the pecking order, [IS] is still not at the top. Resources are tough to come by."

Wensley further notes that selling ideas means selling down in the organization as much as it means getting upper management to buy in. "If you don't have the troops behind you, you're not going to get anywhere," he says.

And politics is only part of the rough-and-tumble world of the IS professional. As outgoing Radar Systems CIO Anthony Chang notes, "IS is a service organization — it doesn't matter how good a service you provide, it's never good enough."

With that assessment, it is perhaps no wonder that Chang says he is now "glad to be getting out" of his CIO job, a post he says he nonetheless enjoyed. Chang is resuming full-time duties as associate division manager for advanced systems, which makes weapons and fire control systems.

MARK HALPER

Outsourcing proves itself a useful business tool — no fad

BY NELL MARGOLIS
CW STAFF

BOSTON — Is outsourcing on the wane? The term may be, consultants and users say; the concept, on the other hand, is gearing up for another boom.

New reasons to outsource and a broader selection of ways to structure the deals will fuel outsourcing beyond its status as a quick fix for bleeding bottom lines, said information systems management consultant Philip J. Pyburn in a recent address before Boston-area members of the Society for Information Management.

As user firms veer away from viewing information technology as a direct competitive weapon — the "mine is bigger than yours" camp — and recast information technology as a tool for enabling and supporting core business activities, Pyburn noted, the firms will also increasingly turn to a variety of carefully tailored outsourcing arrangements to grease the way to their goals.

Outsourcing is quickly evolving into a game everyone can play, said Pyburn, who is president of Cambridge, Mass.-based Management Support Technology Corp. "A second point is, everything is up for grabs," he added. Pyburn said he envisions savvy firms eyeing each discrete element of an overall business blueprint as fair game for outsourcing: in some cases under the traditional facilities management contract, but with increasing reliance on partnerships, ad hoc alliances, joint ventures and hybrid forms tailored to the needs at hand.

Pyburn: *Outsourcing is a game everyone can play*

"The key question in an outsourcing decision used to be, 'Can we run our IS shop as cost-productively as an outside service vendor can?' " he said. "In the '90s, the key questions will be, 'What are we trying to accomplish in this business? How does IS help?' And, 'Can our internal IS resources get us there fast enough? And without a weakening of strategic focus?' " When the answers to either or both of the last two questions head toward "no," Pyburn said, users will head toward outsourcing.

New York-based Revlon, Inc. did, for instance, when it hired Chicago-based systems integrator Andersen Consulting to run its mainframe-based data processing operations while the firm's internal IS forces focused on a move to client/server [CW, Feb. 10].

So did Hewlett, N.Y.-based Anchor Bank Corp. when, in the wake of a successful turnaround effort, it entered into a complex outsourcing and software development alliance with Little Rock, Ark.-based bank services specialists Systematics, Inc. [CW, April 13].

Both deals mark subtle, but critical departures from the outsourcing "megadeal" of the late 1980s. The Revlon/Andersen pact, for instance, is shorter in scope than the traditional 10-year megadeal and specifically tied to a finite corporate goal. Anchor/Systematics is a six-year deal; moreover, unlike the once-typical farming out of IS, it is premised on extensive co-development efforts in the future.

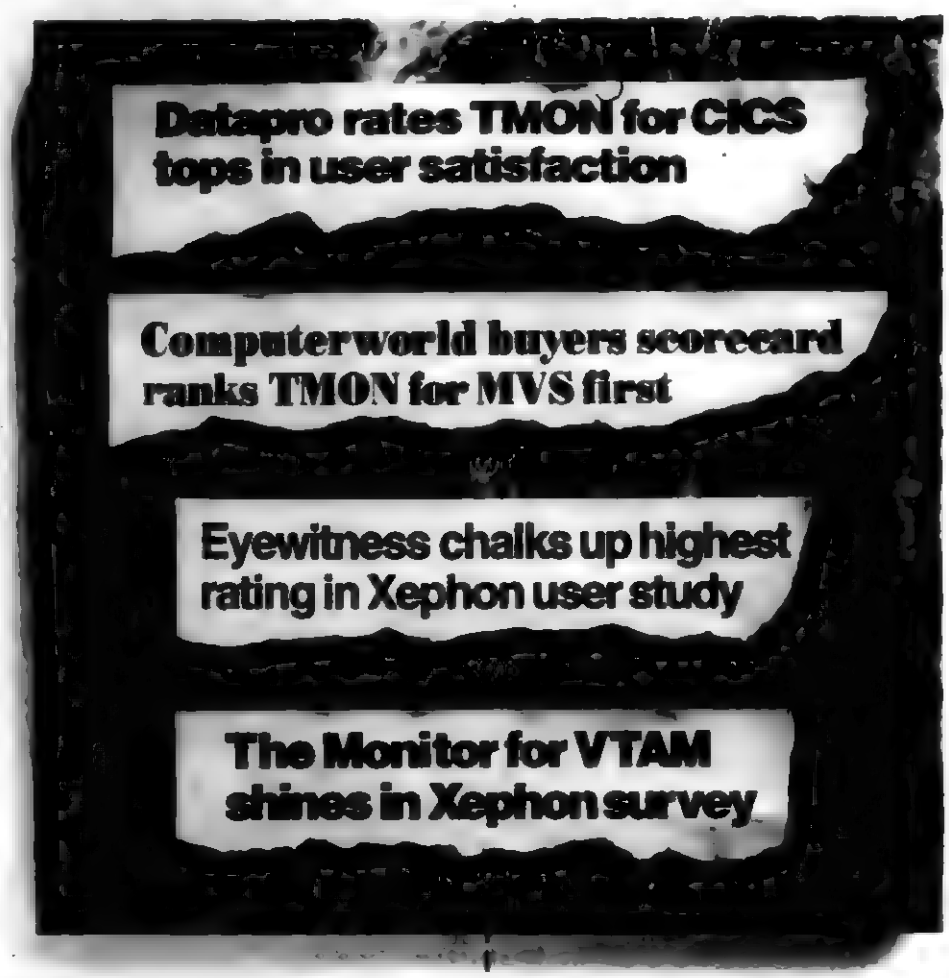
Wave of the future

"That's the way we believe outsourcing will be going," said the chief information officer at a major insurance company in the Midwest who requested anonymity for himself and his firm. Last year, faced with "the major task of revamping all our legacy systems while we moved to client/server, implemented CASE and basically retooled all our people," the firm outsourced its mainframe-based IS operations — outgoing but still mission-critical — to a professional services vendor.

"Our only other choice was to hire [the outsourcer] to build the new systems," the CIO noted. "We considered giving that nice juicy plum to an outsider, but we also wanted to demonstrate to our own employees that we really do think about them a lot."

Did the employees get the message? "Oh my, yes," the CIO said. "The consultants fit right in. We've accomplished better quality work faster than we originally thought possible." What is more, he added, "although we never went into this for cost-saving reasons, when we put the pencil to it, we found that we'd even saved a little money."

Not surprising, said DuWayne Peterson, former Merrill Lynch & Co. CIO and now president of DuWayne Peterson Associates, a consulting firm in Pasadena, Calif. "Everybody's thinking about" new-wave outsourcing. But they are not necessarily calling it "outsourcing," Peterson said. As the pattern of shipping out IS gives way to a panoply of flexible alliances and to variations such as transitional outsourcing along Revlon/Andersen lines, he said, "Outsourcing is becoming less of a phenomenon and just a standard part of the smart way of doing business."



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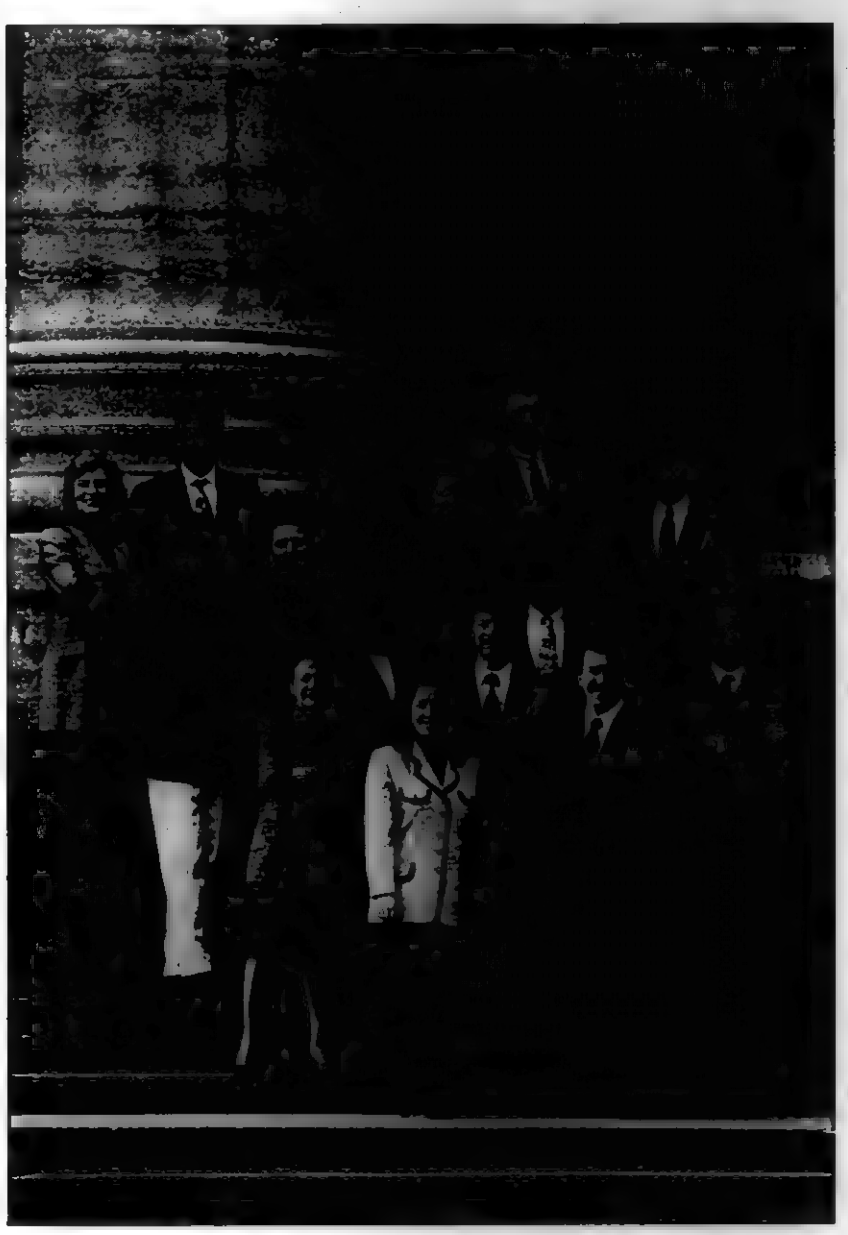

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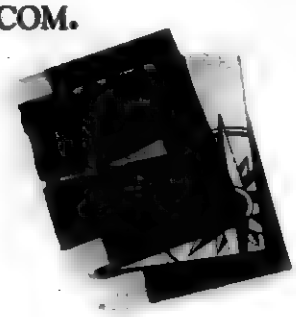

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The unusual suspects

CONTINUED FROM PAGE 87

Optical and Data Systems Group when he was tapped for corporate CIO in 1990, recalls that he "had shown an interest" in improving the strategic use of IS.

"And that's usually what happens at Hughes," he says. "If people show an interest in something, then somebody gives them the job."

Osborn spells out a basic difference between how he and the other overnight IS experts have conducted matters and the leadership strategies of their IS-steeped predecessors.

"Most of us are project-oriented: in other words, focused and cost-conscious," he says of the gang of four. "So we manage IS as a project, not as a general staff without a plan or a schedule."

While Wensley did not have IS experience, he did have a background as a computer user by virtue of extensive hands-on experience with computer-aided design (CAD) programs.

"That labeled me as someone interested in IT," Wensley recalls, "which is a little distorted because CAD is a little different from the business use of computers."

Continued on page 93

Back to basics

Hughes Aircraft CIO Jim Wensley and others point out that Hughes is not exclusively seeking technology users, rather than techies, as CIOs. After all, Wensley notes, the company still has some divisional CIOs whose backgrounds are pure IS, and the incoming CIO of the new Aerospace and Defense Sector — a newly minted corporate entity that is swallowing up the divisions headed by non-IS-reared Anthony Chang and Dino Ruffoni — is an IS practitioner, Mahvash Yazdi.

But Wensley et al. agree that their own careers took an unusual twist when they landed in their respective CIO chairs.

This fall — possibly this week — Chang is exiting his CIO job to devote full-time attention to the post he never relinquished: associate division manager at Hughes' Advanced Weapons Division. "I still don't know anything about information systems," he comments.

But if his self-described accomplishments in his three-year stint as divisional CIO are accurate, that statement is a modest one. According to Chang, under his "business leadership," Radar Systems cut IS operating costs from about $120 million in 1989 to a projected $37 million next year — some of which may be attributable to reduced business.

MARK HALPER

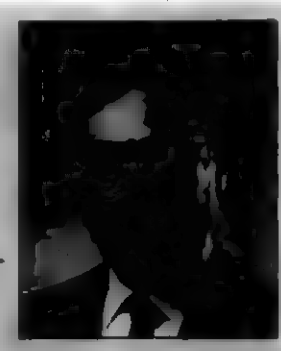
R. James Wensley, corporate CIO

"That's what usually happens at Hughes: If people show an interest in something, then somebody gives them the job."

•••

- **1958:** Joined Hughes as an engineer in guided missile lab.
- **1965:** Was senior project engineer on thermal control development test program for Surveyor lunar lander.
- **1977:** Responsible for spacecraft, thermal and structural design; became involved in group's CAD initiative.
- **1984:** Associate manager of group technology division.
- **1990:** Named corporate CIO.

Gary Osborn, divisional CIO



"I complained loudly enough [about IS] that they asked me to go away and take a long look at what I would do to fix it."

•••

- **1959:** Joined Hughes as a messenger upon high school graduation. Studied business at UCLA and Harvard while on the job.
- **1978-81:** Rose through manufacturing operations; served as manufacturing department and laboratory manager.
- **1987-1991:** Associate manager, Space Vehicles Division.
- **1991-present:** Director of Materiel & Information Systems; CIO of Space and Communications Group.

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However they got to their positions, all four faced the colossal challenges of cutting costs and bringing computing power out of the glass house and into the hands of Hughes' users.

When Osborn stepped into his new job, he began looking for two things: superfluous equipment to jettison and techniques to make data available to those users who could gain strategic advantage from it.

The Space and Communications Division is now engaged in an ambitious distributed computing project that entails loading up several Hewlett-Packard Co. 9000 minicomputers with business information readily available to Hughes' shop floor workers and business managers through PC connections [CW, Aug. 24]. Until that system is implemented, Osborn says, many users will simply go without the strategic information that remains on an IBM mainframe.

Osborn also has distributed computing plans for manufacturing and engineering operations. While this process will add equipment such as minicomputers and workstations to Hughes' technology stable, he says, it will also mean scrapping larger, more expensive iron.

In the Radar Systems Group, which is now in the process of being absorbed into the new Aerospace and Defense Sector, outgoing CIO Chang has already implemented a distributed scheme. In this case, "distributed" does not translate into "downsized." Rather, Chang notes, his distributed solution keeps data on an IBM mainframe and sends it out to PCs for processing.

Anthony Chang, divisional CIO (outgoing)

"It doesn't matter how much [IS] service you provide; it's never good enough."

• • •

- **1972:** Joined Hughes as member of technical staff, performing a variety of programming tasks in support of radar product lines.
- **1978:** Named associate manager of Radar Systems Group's Advanced Systems Division.
- **1989:** Additionally named information technology director of newly reorganized Radar Systems Group.
- **1992:** This fall, expected to cede information technology director's title to devote full time to management job.

The 3000s overfloweth

When Chang discovered that his colleague Ruffoni had excess computing capacity on the HP 3000s in Ruffoni's department, he struck a deal to buy some of the overflow. That move enabled Chang to retire his own department's 3000s.

In a corollary move, Chang discovered excess capacity on his departmental VAXs and has been selling processing to other Hughes operations.

Chang says his cost reduction measures have also included shrinking the company's number of software licenses — his group has jettisoned its Software AG AdaBase programs in favor of IBM's DB2 — and slicing payroll from 900 to 450 through layoffs, retirements and attrition.

In fact, Chang claims that he is leaving Radar Systems' IS operations in a state advanced well beyond other Hughes departments.

CALENDAR

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The Third Annual East/West High-Tech Forum. Prague, Oct. 11-14 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

Uss, Inc.'s Fall Conference. Atlanta, Oct. 12-16 — Contact: Uss, Inc., Lanham, Md. (301) 577-1881.

Europa Telecom '92. Budapest, Oct. 12-17 — Contact: International Telecommunication Union, Switzerland (011-41) 22-730-5609.

Enterprise Network Management Seminar. Elmsford, N.Y., Oct. 13-15 — Contact: Hart Rasmussen, Polytechnic University's Center for Advanced Technology in Telecommunications, Westchester, N.Y. (914) 347-6940.

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

Multimedia World, Inc. Conference. Chicago, Oct. 13-16 — Contact: Jim Prusk, Multimedia World, Alexandria, Va. (703) 684-5401.

Microprocessor Forum. Burlingame, Calif., Oct. 14-15 — Contact: Microprocessor Report, Sebastopol, Calif. (707) 823-4004.

DOD-STD Conference. Boston, Oct. 14-16 — Contact: David Maiker Associates, Inc., Needham, Mass. (617) 449-6554.

The National Association of Legal Vendors (NALV) Symposium. Newport Beach, Calif., Oct. 15-16 — Contact: NALV, Nashville, Tenn. (615) 726-2649.

OCT. 18-24

Information Technology Association of America (ITAA). Colorado Springs, Oct. 18-21 — Contact: ITAA, Arlington, Va. (703) 522-5055.

Society of Information Management (SIM) 1992 Annual Conference. Los Angeles, Oct. 18-21 — Contact: SIM, Chicago, Ill. (312) 644-6610.

Object Oriented Programming Systems, Languages and Applications Conference (OOPSLA). Vancouver, Oct. 18-22 — Contact: Daniel E. Steinbach, OOPSLA '92, Londonderry, N.H. (603) 432-7757.

Distribution Strategies for the Consumer Electronics Industry Conference. London, Oct. 19-20 — Contact: Susy Shevin, BIS Strategic Decisions, Luton, U.K. (011) 44-582-405678.

Alcom's Fourth Annual "Lights On" Conference. Las Vegas, Oct. 19-20 — Contact: Alcom, Orange, Calif. (714) 997-7966.

Ink Jet Printing Conference. San Jose, Calif., Oct. 19-20 — Contact: BIS Strategic Decisions, Woburn, Mass. (617) 932-9500.

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Volunteering in your spare time reaps full-time rewards

Nonprofit organizations offer many opportunities for career development

FIRST PERSON

BY JAMES LAWLER
SPECIAL TO CW

You have just had your performance review, and your boss has lauded your improved communications, project management, programming, training and presentation skills. He has also given you a bonus because it didn't cost your firm a penny for you to enhance these skills.

Why?

You gained this experience by volunteering at nonprofit organizations.

Volunteer work isn't often thought of as an educational opportunity, but it should be. Donating time to work on systems for a nonprofit can, for example, provide an IS professional with invaluable experience in hardware and software he would never see on the job.

There are a variety of systems-related tasks that most charities and interest groups would welcome assistance with. For instance, you could help organizations customize packaged software or train users.

In addition to gaining experience in areas that are outside your normal work responsibilities, you can also acquire more "soft" skills, such as leadership or project management abilities that will help you in your information systems career.

These skills can be gained by doing volunteer work of any kind. For instance, you could volunteer to head up charitable events including bike-a-thons, carnivals, picnics and raffles in support of local and national charities. These activities require negotiating skills as well as planning and communication skills.

Start early

It is advisable to participate in a volunteer activity early in your career because the career path for an IS professional is typically narrow. Early on, you usually support one department on one piece of technology, which limits you and your career growth.

However, volunteering allows you to explore other career paths and gives you a broader overview.

By interacting with a wide variety of individuals, you gain interfacing skills that will be valuable as you advance in your career and become more involved with a larger end-user community.

In addition, when you work with nonprofit organizations, you learn that many of the situations they are faced with are not black and white. It is helpful for an IS professional to be exposed to this because relationships with users are not always black and white, either.

You could also teach students how to use a computer. I am involved with a project in Harlem, instructing high school students about computers.

A typical IS professional — programmer or developer — could benefit from such an experience because he doesn't get much exposure to training or teaching others in his day-to-day work.

Another challenge I've been faced with in this teaching environment is that the schools only have 286-based computers. So in addition to teaching students computer basics, I have also been negotiating with firms to donate better personal computers.

Become a bargainer

Negotiating is one skill I have needed repeatedly during my career and in many volunteer situations.

For example, earlier in my IS career, I was a volunteer consultant at a national charitable organization in New York. I had to work through a political situation because a vendor who was close to a board member was trying to use his connection to have us select his firm's software package, which was not suitable for the group's needs. Therefore, it took some finesse for me to persuade the organization to select software that was offered by another vendor.

Lower level IS professionals may not face political situations such as this one on a regular basis. However, for a lower level IS staff member considering a managerial path but lacking sufficient managerial experience, this type of training provides a unique opportunity to develop skills.

Finally, if you've been laid off, volunteering is a way to keep your skills current while you're out of work, and it allows you to network for a new job.

Lawler is vice president of the Advanced Systems Group at Merrill Lynch & Co. in Princeton N.J.

Getting started

Finding an organization that needs your skills may take some time. Here are some tips to ease the selection process:

- Inquire at your human resources department about nonprofit organizations in your community that your company already sponsors.
- Investigate agencies that have touched you or your family members. It may be more fulfilling to volunteer for an organization that you have a personal interest in.
- Discover if others in your firm are volunteering. You may find it easier to volunteer with someone you know.
- Volunteer at your alma mater by helping to teach students or speaking on career-related issues.

JAMES LAWLER

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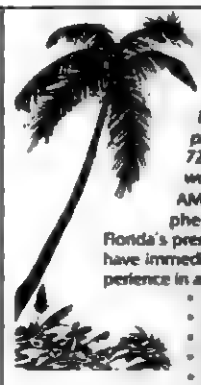

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Keep moving and avoid pigeonholes

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chuck Muller, a principal at Andersen, Jones & Muller Associates in Southfield, Mich., a recruiting firm specializing in the placement of information systems professionals.

Q I am employed at a Fortune 500 company and have been a programmer/analyst in a large IBM mainframe environment for the last three years. I have the opportunity to get training and work on a development project using client/server technology and workstations. Should I dilute my mainframe skills?

A Moving data from mainframes to the local user area via client/server methods is beginning to become a hot area in data processing. Working in a graphical user interface and local-area network environment will complement your mainframe skills and increase your marketability. Knowledgeable candidates have been hard to find, resulting in higher salaries for the available candidates.

Q I work for a manufacturing company that rotates programmers from one project to another in different application areas. It seems that just when I get to know one area really well, I am moved to another. Would focusing my applications experience in one area, such as manufacturing-related systems, be better for my marketability?

A Having expertise in one applications area may be beneficial if you really like the area and want to become a "guru" in it. The downside to this approach is that you will then be pigeonholed in this niche, and you will be considered only for positions in that area. The reality is that when most firms are searching, they require candidates with a specific hardware and software background and let the applications experience fall where it may. Your broad applications knowledge will most likely increase your job prospects.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I am considering relocating from the Midwest to the southeastern U.S. because it seems to have more potential for job and career growth in the computer field. What is the best strategy for making this kind of move?

A The first thing you should do is narrow your target area to one or two selected cities and then do an extensive amount of research on each. This research should include visiting your library and requesting a "welcome package" from the target area Chamber of Commerce. This will give you information on housing, schools, areas and cost of living, as well as firms you will want to contact.

Secondly, research computer industry publications to find the firms with a technical environment that can take advantage of your strongest skills and contact them directly.

You will need to be specific in your reasons for relocating and be familiar with the area as companies are reluctant to get involved with out-of-town candidates because of the cost.

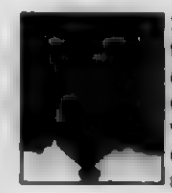
Q In my discussions with other programmers and in scanning the want ads, positions in contract programming frequently come up. I have worked for the same firm for three years and am thinking about my first job change. What are the positives and negatives of contracting?

A Contracting usually involves working for a contract service firm at a client company on a specific project for a defined set of time. Contract companies will usually hire you for your strongest skills, which they can immediately put to use on a client contract. After the first assignment, they will attempt to find you another contract. The pay is usually above market average, although options for training in new areas are limited. Also, if a new contract cannot be found, there is the potential of the company's laying you off.

We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Sewell at (508) 875-8931.

TIP of the MONTH

How to shake an image that is holding you back in your career



➤ You need to objectively assess why you have that image, which may require some very frank discussions with colleagues. Then you need to determine how to change the way you work, which can be very difficult because old habits die hard. But follow through — your change in actions will speak louder than anything else.

Brian D. Jaffe, manager, end-user services
Clairol, Inc., New York

➤ I'd make myself more visible to the people that have that image of me, to show them it's not true. I'd try to prove them wrong and to change their perceptions. If the image was just, I'd try to make a change. I truly believe that while first impressions are long lasting, they can be changed.

Don Malpass, programmer/analyst
Kennebec Valley Medical Center, Augusta, Maine

➤ The one way to get an image is through what you've accomplished. If it's an unfavorable image and it's warranted, perhaps you need to re-evaluate the way you've been doing things. Evaluate what caused you to earn the unfavorable image and make a change in the way you do things the next time.

Robert M. Goldberg, vice president, IS
Old Stone Bank, Warwick, R.I.

➤ We run into the problem of being perceived as too technical by our user group. We need to communicate on their level as much as possible. It's important to not use acronyms and lingo that they won't understand. You have to know the function of each department and what their roles are in order to help them.

Fran Moss, financial systems analyst
Memorial Medical Center of Jacksonville, Jacksonville, Fla.

Compiled by Kelly E. Sewell, assistant editor, features.

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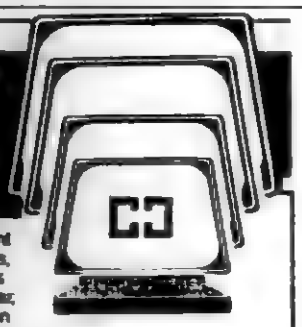

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Software Engineer with Educational Computer Software company. Duties include designing, coding, debugging and testing projects and products in Technology-based learning systems including: - Educational software capacity for new product research and development; -Programming new product development; implementing design specifications, and upgrade existing products; Trouble-shooting for in-house staff. Requires a M.S. degree in Computer Science with two years experience in the job offered or two years experience as College Instructor/Researcher in computer science, electrical engineering. Must be able to demonstrate legal ability to work permanently in the United States. Salary is $33,000 per year. Hours are from 9:00 a.m. to 5:00 p.m., forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Refer to #56892. Employer paid ad.

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NEW YORK: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662, Valerie Galba, 201-587-0090

WASHINGTON, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031, Katie Kress, 703-573-4115

CHICAGO: 10400 West Higgins Road, Suite 300, Rose mont, IL 60018, Patricia Powers, 708-827-4433

LOS ANGELES: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, Barbara Murphy, 714-250-0164

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Director of Personnel
Lincoln Land Community College
Shepherd Road
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Qualifications:

- MS in Engineering/Computer Science or related field; MBA a plus
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- Experience working in large software development environment is desired
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ALL APPLICANTS MUST PROVIDE THREE (3) REFERENCES WHICH MAY BE CONTACTED PRIOR TO THE INTERVIEW. APPLICATION DEADLINE: OPEN UNTIL FILLED.

For more information and an application package contact: Eastern Municipal Water District, 2045 S. San Jacinto St., P.O. Box 8300, San Jacinto, CA 92581. Phone: (714) 925-7676 or 800-488-6111. AA/EOE.

NOTE: Professional recruiters need not contact us regarding this position.

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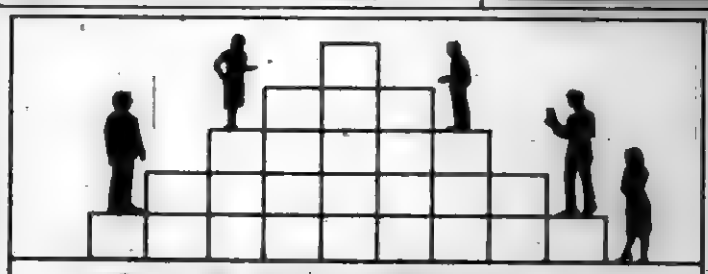

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Send resume and names, addresses, and telephone numbers of at least four references by February 1, 1993, to: Dr. Bernice Folz, Director, Graduate Programs in Software, Mail #5025, University of St. Thomas, 2115 Summit Avenue, St. Paul, MN 55105-1096. The University of St. Thomas is an Equal Opportunity/Affirmative Action employer.

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Flashy ad, but what's it trying to say?

MAKING CIRCUITS

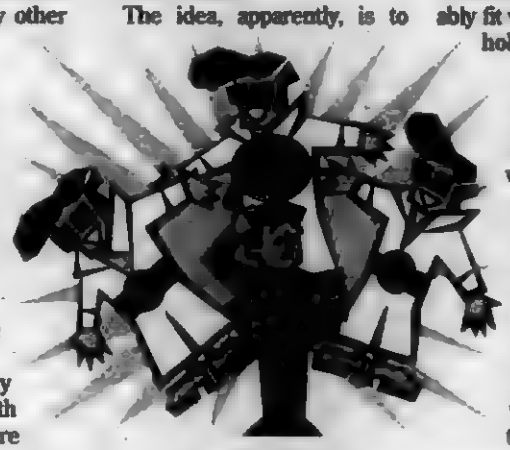
BY JOHN R. CARROLL
SPECIAL TO CW

I am no computer whiz, but I do know a thing or two about advertising, and I think it's fair to say that even if I were, say, a lifer information systems guy, I'd have a devil of a time upgrading my system if I relied on computer ads to help me.

For starters — and I don't mean to be politically incorrect about this — computer ads pretty much all look the same, sort of like a roomful of Elvis impersonators. They're slick, flashy, hairy-chested in their aggressiveness and constantly boasting about their performance.

Mostly they sing one of three tunes: price, speed and gimcracks. Of course, the look of the ads has even less variety: You get your choice of computer screens, computer screens or computer screens, plus more arrows than Custer's last stand.

To top it all off, they include enough techno-speak to give Einstein a retroactive headache. The typical headline goes something like this: "486-33/50 ISA system with noninterlaced SVGA monitor." No doubt that's music to R2-D2's ears, but how many other people can dance to it?



Creative confusion

Things get even more confusing when the ads go for the creative approach. In one ad, a dog is chomping on a printout under the headline "Delicious output." Now it's anyone's guess what that has to do with the price of printers.

Another shows a guy standing on his hands, with a portable computer where one of his forearms should be. The headline says, "Do you notice anything unusual about this man's computer?" Well, yeah — it's surgically attached to his arm. No doubt that's convenient for him, but it must be awful for his tailor. I'd like to know more about computer technology, but that kind of commitment is a little out of my league. Probably yours, too.

Some computer advertisers actually do make an attempt to explain their products in understandable terms, usually by employing similes: Finding the right system is likened to looking for a needle in a haystack; operating certain software systems is compared to trying to fit a square peg in a round hole.

The idea, apparently, is to draw you into the ad with something familiar before numbing your brain with technospecifics. But to me, it's like buying a pig in a poke. Not only that, this technique can easily make you feel that your mental abilities never progressed past the grammar school level. That's a pretty loopy way to butter up your sales prospects.

Also very big in computer ads is Murphy's Law. Presumably advertisers invoke the time-honored law because it gives a company lots of problems to fix. Of course, Murphy's Law will inevitably strike your new system as well, and off you go again, looking for another fix. Overall, there's a certain circular appeal to this approach that would probably fit very nicely in that round hole we talked about earlier.

Go too far

As you can no doubt tell for yourself, I don't learn very much from the vast majority of computer ads. And I learn even less from the rare ads that stand out from the crowd.

Given the staggering number of companies vying for the reader's attention, it's no surprise that some will go off the deep end to be noticed. The problem is, once you notice the ad, you spend more time scratching your head than dialing the toll-free number.

There was one ad, for instance, that showed an old tinted photo of Richard Nixon shaking hands with Mao Tse-tung. The only line of copy said, "It's what we do for computers." What? Send them to China? A lot of good they will do me over there.

Another ad showed a farmhouse in the middle of nowhere with the funnel of a tornado sitting about two car lengths away. Right above the house is the tiny headline, "Hey, at least the data's safe." Are they trying to tell me I should store my data at a farmhouse in the tornado belt? I don't get it and probably neither do your users.

But the ad that really lost me was the one that showed a cow in the middle of a thoroughbred horse race. The jockey is laying the whip on old Bessie pretty good, but I suppose it paid off because right in there on the next page, the cow is in the winner's circle, with a blanket of carnations and a jubilant jockey on its back.

According to the headline, a particular brand of computer can put me in the same place.

Well, maybe I don't want some little guy hitting me with a whip every time I sit down at the computer. That's what editors are for.

In general, these ads appear to target someone who either had Bill Gates for a college roommate and got to keep his notes or grew up on a computerized farm (see cow ad). Everyone else might as well be reading the *Iliad*.

Carroll is president of Carroll Creative, Inc., an advertising consultancy in Boston, and an advertising critic for *Marketplace*, a nationally syndicated business show produced by American Public Radio.

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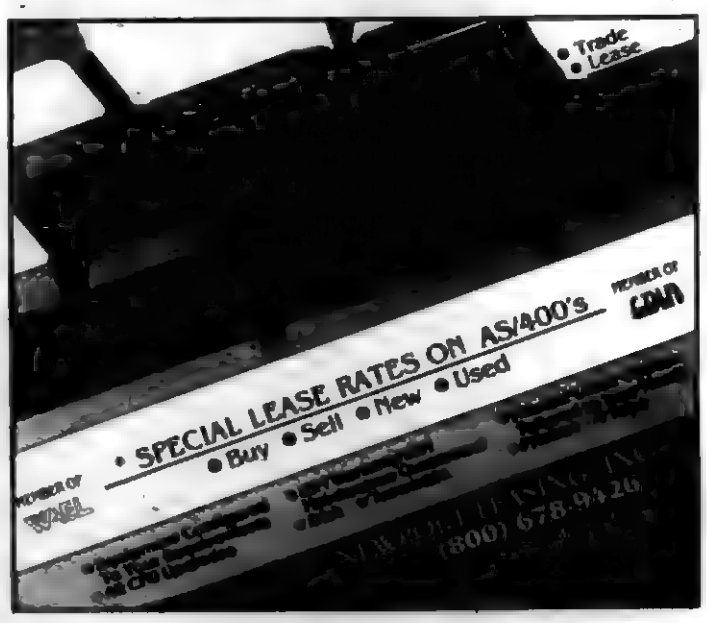

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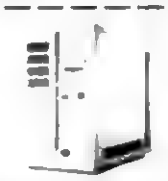

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Call for all the details.
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(In MA., 508/879-0700)

NOTICE OF REQUEST FOR PROPOSAL

The City of Lenexa, Kansas, a Kansas City metropolitan community of 39,000 with 300 full time employees and an annual budget of $36,000,000 will accept sealed proposals until 10:00 AM on November 2, 1992 for a complete financial software system.

Proposals should be plainly marked on the outside of the envelope as follows: Financial Software - Proposal Opening 11/02/92 10:00 AM

Proposals will be opened at 10:00 AM November 2, 1992 at Lenexa City Hall, 12350 West 87th Street Parkway, Lenexa, Kansas.

Requests for copies of the Request For Proposal should be directed to: City of Lenexa, 12350 West 87th Street Parkway, P.O. Box 14888, Lenexa, Kansas 66215-0888, Attention: Carol Gonzales Phone: (913) 492-6800

Sealed proposals are to be sent to: City of Lenexa, 12350 West 87th Street Parkway, P.O. Box 14888, Lenexa, Kansas 66215-0888, Attention: Sandra Howell

The City of Lenexa reserves the right to accept or reject any or all proposals. Sandra Howell, City Clerk/Finance Director

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RFP No. 2287, due Thursday, 10/22/92, at 3:30 p.m. for the acquisition of hardware software, installation services and technical support necessary for the implementation of a local area network for the Department of Environmental Quality. Charge $10.00.

RFP No. 2288, due Wednesday, 10/28/92, at 3:30 p.m. for the acquisition of 80486SX workstations and peripherals necessary to develop an advanced electronic classroom for the University of MS School of Business Administration. Charge $10.00.

RFP No. 2288, due Tuesday, 10/13/92, at 3:30 p.m. for the acquisition of maintenance services for an existing IBM 4381 mainframe and peripherals for Jackson State University. Charge $10.00.

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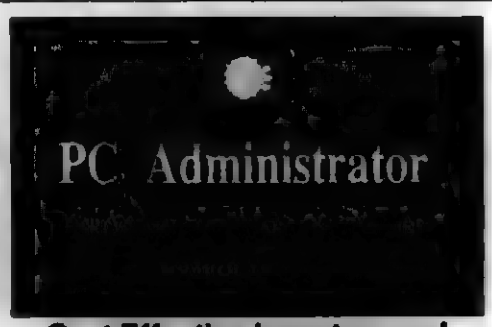

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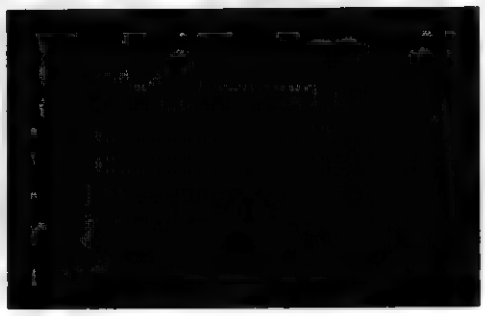

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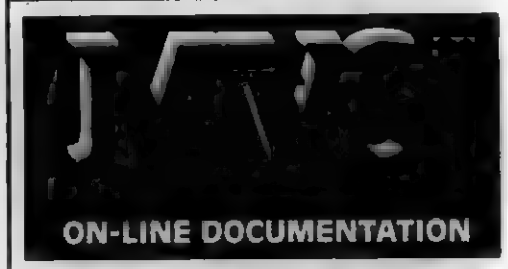

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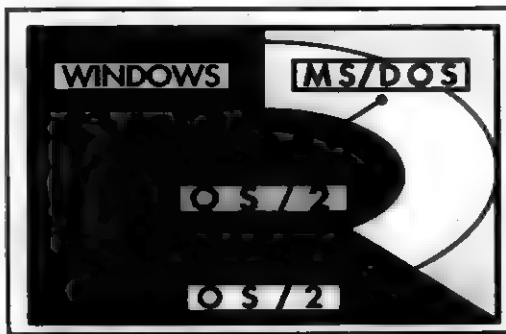

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Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 59

A

Aberdeen Group 4,8,70
Access Corp. 72
Acucobol, Inc. 80
Addamax Corp. 6
ADM Consulting, Inc. 71
Adobe Systems, Inc. 24,47,109
Advanced Computer Communications, Inc. 14,59
AICorp. 6
Aion Corp. 6
Amdahl Corp. 12,16
American Stock Exchange 87
Anchor Bank Corp. 87
Andersen Consulting 6,28,87
Apple Computer, Inc. ....14,16,24,37,47, ...55,58,65,73,75,85
Applied Business Technology Corp. 50
Appoint, Inc. 38
Ardis 59
Arthur Andersen & Co. 87
Ascend Communications, Inc. 14
AST Research, Inc. 8
Asymetrix Corp. 85

B

Bachman Information Systems, Inc. 75
Bank of America 20
Banyan Systems, Inc. 14
Barnett Banks, Inc. 87
Barnett Technologies, Inc. 87
Bear, Stearns & Co. 59
Bellcore 28
Best Programs, Inc. 47
BIS Strategic Decisions. 59
BMC Software, Inc. 73
Borland International, Inc. 16,40,77,80,85,108
Brigham Young University 12
Burlington Northern, Inc. 1
Business Research Group 60
Byer 69

C

Cabletron Systems, Inc. 6,109
Calcomp, Inc. 47,49
California Software Products, Inc. 73
California's Department of Health Services ..16
Candle Corp. 6
CE Software, Inc. 65
Centerline Software, Inc. 75
Champs Software, Inc. 76
Chemical Banking Corp. 50
Chrysler Financial 16
Chrysler Systems Leasing 40
CIC 110
Cincom Systems, Inc. 73,110
Cisco Systems, Inc. 14,16,59,60
Claris Corp. 40
Clearpoint Research Corp. 6
Coastal Healthcare Group, Inc. 87
Cognos, Inc. 77
Colorado National Service Corp. 83
Comdisco Disaster Recovery Services 72
Comdisco, Inc. 42
Communications Network Architects, Inc. ..59
Compaq Computer Corp. 1,8,14,60,110
CompuAdd Corp. 109
Computer Associates International, Inc. ....12, ...16,40,110
Computer Sciences Corp. 16
Computersite Engineering 20
Connecticut Mutual Insurance Co. 83
Convex Computer Corp. 59
Coral Networks, Inc. 59
CrossComm Corp. 59,65
Cummins Electronics Co. 75
Cypress Semiconductor Corp. 16

D

Dai-Ichi Kangyo Bank 110
Data General Corp. 71
DataComm Research Co. 59
Dataguard Recovery Services. 72
Dataquest, Inc. 12
Datasat, Inc. 6
Dauphin Technology, Inc. 15
Decision Data Corp. 71
Dell Computer Corp. 8,110
DeLorme Mapping 47
Delrina Technology 38
Department of Energy 16
Design Data Systems Corp. 58
D. H. Brown Associates, Inc. 12
Digital Equipment Corp. ....1,6,12,14,16,20,54, ...58,59,61,69,72,73,76,77,109
Digital Link, Inc. 14,16
Digital Matrix Services, Inc. 49
Dole Foods, Inc. 70
Dole Fresh Vegetable Co. 70
Donaldson Lufkin & Jenrette 1
Dun & Bradstreet 110
DuWayne Peterson Associates 67

E

Electronic Data Systems Corp. 16,20
EMC Corp. 71
Executive Life Insurance Co. 20
Executive Systems, Inc. 38

F

Federal Aviation Administration 6
Federal Emergency Management Agency 49
FileNet Corp. 54
Financial Accounting Standards Board 109
Financial Modeling Specialists, Inc. 80
Florida Power & Light 8
Frame Technology Corp. 40
Frederick Computers Plus 14
FTP Consulting Services, Inc. 28
Futureware Systems, Inc. 58

G

Gander Resources 10
GE Medical Systems 72
General Atlantic Partners 109
Genesis Software, Inc. 54
Georgia Tech Research Institute 28
Go Corp. 15
Grid Systems Corp. 15,110
Gupta Technologies, Inc. 4,14

H

Harnischfeger Corp. 12
Hewlett-Packard Co. ....6,12,14,28,49,55,61, ...65,70,75,76,77,80,87,93,109,110
Hughes Aircraft Co. 6,87,92
Hughes Corp. 1

I

IBM ....1,4,6,8,12,15,20,38,40, ...49,54,55,59,60,61,65,69,70, ...71,72,73,75,76,87,93,109,110
Icot Corp. 109
Information Builders, Inc. 12
Information Resources, Inc. 6
Informix Corp. 4
Integrated Systems Solutions Corp. 1
Intel Corp. 8,47,40
Interactive Development Environments, Inc. 12,75
Interleaf, Inc. 24
International Oracle Users Group 69
International Data Corp. 69,70
Intersolv, Inc. 76
IPL Systems, Inc. 71
Isicad, Inc. 65
ITOM International 69

J

James River Corp. 8

K

Kidder Peabody & Co. 109
KnowledgeWare, Inc. 75

L

Lawrence Livermore National Laboratory 16
LBMS, Inc. 75
Lechmere 70
Lithonia Lighting 8
Lotus Development Corp. 16,37,47,85

M

Mainstream Data, Inc. 65
Management Support Technology Corp. 87
Manufacturers Hanover Trust Co. 50
Massachusetts Financial Service Center, Inc. 71
Mathsoft, Inc. 69
Maxtor Corp. 28
McAfee Associates, Inc. 109
McCaw Cellular 16
Medco Containment Service, Inc. 16
Merrill Lynch, Inc. 87
Micro Technology, Inc. 109
Micrografx, Inc. 16
Micro-Integration Corp. 58
Microsoft Corp. ....12,14,24,37,40, ...47,49,55,58,73,75,77,80,85
Minx Software, Inc. 69
Mobil Corp. 16
Montefiore Medical Center 4
Motorola, Inc. 16

N

NASA 16
National Association of State Information Resource Executives 6
NCR Corp. 8,12,14,28
NEC 110
NetLAN, Inc. 4
Network General Corp. 60
Network Systems Corp. 59
New Jersey Bell 49
New York Hospital 4
Newport Systems Solutions, Inc. 14
Next, Inc. 24,37
North American Operations 87
Notable Technologies, Inc. 15
Novell, Inc. 4,14,50,55,58,60

O

Open Software Foundation 1,6,12
Optika Imaging Systems, Inc. 54
Oracle Corp. 4,89,77,109

P

PacifiCare Health Systems 10
PaperClip Imaging Software, Inc. 54
Paramax Systems Corp. 6
PenMetrics, Inc. 15
Pensoft Corp 40
Performance Computing, Inc. 81
Perot System Corp. 1
Philips Electronics N.V. 16
Powersoft Corp. 75,85
PRC, Inc. 54
Prism Solutions, Inc. 73
Proteon, Inc. 14,59,65
PSI Integration 58
Pyramid Technology Corp. 69

Q

QDB Solutions, Inc. 73,81
QMS, Inc. 47
Quorum Health Group, Inc. 10

R

Radio Shack 40
Ram Mobile Data 59
RasterOps Corp. 16,47
Reader's Digest Association, Inc. 87
Reference Software International 40
Reflexion Technologies 58
Retix 59,60
Revlon Corp. 87
Robertson, Stephens & Co. 109

S

Schlegel Corp. 14
Seagate Technology 28
Securities and Exchange Commission 109
Security Pacific Automation Corp. 20
Security Pacific Corp. 1
Sequent Computer Systems, Inc. 12,69
Sequoia Systems, Inc. 69
Shearson Lehman Brothers, Inc. 108
Silicon Graphics, Inc. 16
Society for Information Management 87
Software AG of North America, Inc. 70,83,110
Software Engineering Associates 80
Software Publishers Association 16
Solbourne Computer, Inc. 49
Sonic Systems, Inc. 65
Sprint Corp. 16
SQN, Inc. 28
SRC Systems, Inc. 75
Stac Electronics 38
Starlight Networks, Inc. 55
Stone and Webster Engineering Corp. 14
Storage Technology Corp. 71
Strategic Networks, Inc. 59
Structural Dynamics Research Corp. 72
Sun Co. 83
Sun Microsystems, Inc. 6,12,14,24,61,65,75,80
Sun Microsystems Computer Corp. 12
SuperScript, Inc. 15
Sybase, Inc. 50,75,77
Symantec Corp. 50,109
Synoptics Communications, Inc. 14
Systematics, Inc. 87
Systems Center, Inc. 6,61,73

T

Tandem Computers, Inc. 12,71
Tangram Systems Corp. 6,73
TeamOne Systems, Inc. 76
TelePad Corp. 15
The Ask Cos. 16
The C.I.T. Group 110
The First National Bank of Chicago's Community Banking/Systems Department 8
The Santa Cruz Operation 4,14
Tivoli Systems 110
Toshiba Corp. 28,110
Transaction Processing Performance Council 72
Transarc Corp. 12
Traveling Software, Inc. 38
Turner Corp. 8

U

UAI Technologies, Inc. 75
Uniface Corp. 109
Unisys Corp. 6
Unitech Systems, Inc. 83
Univel 4
Unix System Laboratories, Inc. 4,12
U.S. District Court, Boston 6

V

Ventura Software 40
Veratec Division National Paper Corp. 83
Verity, Inc. 109
Virginia Center of Excellence for Software Reuse and Technology Transfer 76
Vitalink Communications Corp. 59,60

W

Wang Laboratories, Inc. 6,16,110
Wang-Tripp Corp. 28
Wausau Insurance Cos. 12
Wellfleet Communications, Inc. 59,60
West Virginia Network 14
Western Folder Distribution Co. 71
Westinghouse Security Electronics 4
Whirlpool Corp. 15
Wind River Systems, Inc. 80
Windata, Inc. 49
Wollongong Group, Inc. 6

X

X L Datacomp, Inc. 71,83
Xerox Corp. 12,16
XSoft 12
Xyplex, Inc. 14

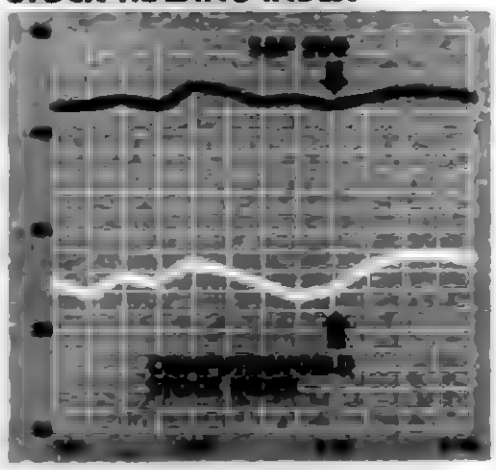
Y

Young & Rubicam, Inc. 59

Z

Zachman International 83
Zenith Data Systems 8,109
ZSoft Corp. 38,47

STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO OUTPERFORM: **Borland International, Inc.** (Shearson Lehman Brothers, Inc.). Business opportunities for Borland's (BORL) Quattro Pro for Windows spreadsheet have boosted the company's rating. Analyst David Readerman forecasted that combined fiscal year 1993 revenues for Quattro Pro for Windows and Quattro Pro for DOS will be $160 million, or 28% of Borland's revenue. It is also projected that during calendar year 1993, Quattro Pro for Windows' market share will grow beyond its present 9% revenue share of the $1.4 billion personal computer spreadsheet market. Borland is expected to push for more PC databases in its installed base and to unify Quattro Pro for Windows front-end analysis tools with Paradox for Windows' back-end database storage and manipulation engine.

SOFTWARE SURVEY

According to a recent survey conducted by the Software Publishers Association (SPA), there are strong economies of scale in a software firm's ability to run its business. Larger firms are reaping benefits, spending less on research and development (see table below) and reporting a median revenue per employee of $180,000. Smaller firms, with a median revenue per employee of $103,000, are spending more and getting less. "While size alone doesn't determine profitability, this study shows that larger software companies have a decided advantage in their financial operations. This does not mean that small companies are not profitable. But it does illustrate one of the challenges small software companies have in getting started," said David Tremblay, research director at the SPA.

Software costs

A list of expenses as a percentage of net revenue, by company size for software companies

	Small (under $5 million)	Large (over $30 million)
Research and development	16.5%	11.6%
Sales and marketing	38.7%	35.4%
Operating income	-1.8%	16.0%

Survey of 90 SPA members

Source: Software Publishers Association

Computerworld Friday Stock Ticker

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DSC Communications (H)	16.00
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Tandy Corp.*	13.54
Advanced Logic Research	11.75
Data General Corp.	10.00

TOP PERCENT LOSERS

Rasterops (L)	-52.70
Exabyte (L)	-36.98
State of the Art (L)	-21.05
Wordstar	-18.75
Chips and Technologies	-17.65
Cognos Inc. (L)	-17.24
Gandalf Technologies Inc.	-16.67
Network General	-16.33

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Tandy Corp.*	3.25
3 COM Corp.*	2.63
Micrografx Inc.	2.00
DSC Communications (H)	1.50
Progress Software Corp. (H)	1.50
Policy Management Sys.	1.50
Sprint Corp.	1.38
Newbridge Networks Corp. (H)	1.25

TOP DOLLAR LOSERS

Exabyte (L)	-6.88
BMC Software Inc.	-5.63
Autodesk Inc.	-5.13
Wellfleet Communications (H)	-5.00
Rasterops (L)	-4.88
Adobe Systems Inc. (L)	-4.50
Motorola Inc.* (H)	-4.00
Borland Int'l Inc.*	-3.63

Exch	52-Week High	52-Week Low		Sept. 25 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Off 2.22%**			
OTC	16.75	6.75	3COM Corp.*	16.75	2.63	18.58
NYS	70.63	56.25	American Info Techs Corp.*	68.38	-0.13	-0.18
NYS	45.38	32.88	AT&T* (H)	43.50	-0.50	-1.14
OTC	4.25	0.75	Ariel Communication Corp.	1.06	0.06	6.00
NYS	49.75	40.25	Bell Atlantic Corp.	48.13	-0.25	-0.52
NYS	55.50	43.38	Bellsouth Corp.	52.00	-0.13	-0.24
NYS	6.75	3.75	Bolt, Beranek & Newman	4.25	-0.25	-5.56
NYS	65.88	36.63	Cabletron Systems	60.50	-1.88	-3.01
OTC	31.00	17.50	Chipcom Corp.	26.75	0.38	1.42
OTC	58.25	18.63	Cisco Systems Inc. (H)	53.25	-1.25	-2.29
OTC	35.25	5.75	Compression Labs Inc.	6.88	-0.38	-5.17
OTC	3.38	0.88	Data Switch Corp.	1.75	0.00	0.00
NYS	23.63	14.13	Digital Comm. Assoc.* (L)	15.00	0.50	3.45
OTC	15.25	8.00	Digital Systems Int'l Inc.	9.75	-0.75	-7.14
OTC	10.88	3.63	DSC Communications (H)	10.88	1.50	16.00
OTC	10.88	4.75	Fibronix Int'l Inc.	5.63	0.00	0.00
OTC	37.50	10.50	Fiserv Corp.	15.00	-1.75	-10.45
OTC	3.38	1.13	Gandalf Technologies Inc.	1.88	-0.38	-16.67
OTC	2.25	0.88	Gateway Communications	1.50	-0.13	-7.69
NYS	5.50	2.38	General Datacomm Inds.	3.25	-0.25	-7.14
ASE	5.88	0.50	Go Video	2.38	0.00	0.00
NYS	35.75	28.88	GTE Corp.*	33.13	-0.13	-0.38
NYS	70.63	50.00	ITT Corp.	64.00	-0.25	-0.39
OTC	36.25	25.25	MCI Communications Corp.	35.00	-0.25	-0.71
OTC	14.50	2.25	Microcom Inc.	3.25	0.13	4.00
NYS	18.25	9.50	Network Equipment Tech.*	10.88	-0.63	-5.43
OTC	25.50	9.00	Network General	10.25	-2.00	-16.33
OTC	20.00	8.50	Network Systems Corp.	11.38	-0.88	-7.14
OTC	20.25	5.63	Newbridge Networks Corp. (H)	19.75	1.25	6.76
NYS	49.25	32.63	Northern Telecom Ltd.*	32.63	-2.38	-6.79
OTC	65.00	36.50	Novell Inc.*	56.25	-1.25	-2.17
NYS	88.38	69.13	Nynex Corp.*	82.13	-1.25	-1.50
OTC	37.50	16.50	Octel Communications Corp.	21.00	-2.00	-8.70
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.13	-0.25	-4.65
OTC	53.00	10.25	Picturetel Corp.	14.00	-0.50	-3.45
OTC	18.75	8.50	Protexon Inc. (L)	8.50	-1.63	-16.05
NYS	29.50	12.88	Scientific Atlanta Inc.	27.50	-1.00	-3.51
NYS	69.00	53.75	Southwestern Bell Corp.	66.13	0.00	0.00
NYS	26.38	20.75	Sprint Corp.	24.00	1.38	6.08
OTC	15.63	4.00	Standard Microsystems Corp.	14.88	0.13	0.85
OTC	43.00	14.25	Synoptics Communications (H)	40.00	-2.00	-4.76
NYS	40.00	32.88	US West Inc.	37.88	0.38	1.00
OTC	46.75	24.00	Wellfleet Communications (H)	41.00	-5.00	-10.87
PC and Workstations			**Off 2.10%**			
OTC	14.50	4.00	Advanced Logic Research	4.75	0.50	11.76
OTC	70.00	42.75	Apple Computer Inc.*	46.50	-1.00	-2.15
OTC	32.25	11.25	AST Research Inc.*	15.00	-1.50	-9.09
NYS	19.25	8.75	Commodore Int'l	7.38	-0.13	-1.67
NYS	35.75	22.13	Compaq Computer Corp.*	33.63	-1.25	-3.58
OTC	29.00	13.91	Dell Computer Corp.	28.13	-0.13	-0.44
OTC	7.75	1.00	Everex Systems Inc. (L)	1.44	-0.06	-4.13
NYS	34.00	21.25	Harris Corp.	32.25	-0.38	-1.15
NYS	65.00	44.63	Hewlett-Packard Co.*	57.75	-1.75	-2.94
NYS	29.75	14.13	Silicon Graphics	18.50	-1.75	-8.64
OTC	35.88	20.75	Sun Microsystems Inc.*	30.75	-0.50	-1.60
NYS	31.25	22.25	Tandy Corp.*	27.25	3.25	13.54
NYS	11.13	5.13	Zenith Electronics	6.25	-0.38	-5.66
OTC	25.50	2.75	Zeos International Ltd.	4.75	-0.75	-13.64
Large Systems			**Off 1.11%**			
ASE	20.63	8.88	Amdahl Corp.* (L)	9.00	-0.38	-4.00
NYS	16.38	5.25	Convex Computer	5.50	-0.75	-12.00
OTC	19.63	1.88	Cray Computer	3.00	0.00	0.00
NYS	52.25	22.75	Cray Research Inc.*	25.75	-0.13	-0.48
NYS	22.50	7.13	Data General Corp.	11.00	1.00	10.00
NYS	65.50	33.25	Digital Equipment Corp.*	40.13	0.75	1.90
NYS	104.75	81.63	IBM*	82.25	-1.25	-1.50
OTC	13.25	7.50	Kendall Square Research	8.00	-1.25	-13.51
NYS	121.25	88.25	Matsushita Electronics	94.00	-2.00	-2.08
OTC	17.50	6.75	Pyramid Technology	8.25	-0.25	-2.94
OTC	17.88	8.50	Sequent Computer Sys.	16.38	0.25	1.55
OTC	18.38	5.00	Sequoia Systems Inc.	7.00	-1.00	-12.50
NYS	54.25	37.38	Stratus Computer Inc.*	43.88	-2.50	-5.39
NYS	15.13	9.50	Tandem Computers Inc.*	11.25	0.38	3.45
NYS	11.75	3.63	Unisys Corp.*	9.38	0.50	5.63
ASE	7.50	0.25	Wang Labs Inc. (b)*	0.50	0.06	14.16
Software			**Off 6.21%**			
OTC	66.50	28.25	Adobe Systems Inc. (L)	28.25	-4.50	-13.74
OTC	13.25	2.50	Ai Corp.	3.50	0.00	0.00
OTC	45.00	11.50	Aldus Corp.	12.75	-0.25	-1.92
OTC	19.75	8.50	American Software Inc.	9.00	-0.63	-6.48
OTC	20.00	9.75	Ask Computer Systems	13.13	-2.13	-13.93
OTC	52.00	23.25	Autodesk Inc.	43.38	-5.13	-10.57
OTC	37.75	7.00	Bachman Info. Systems	7.00	0.00	0.00
OTC	42.50	32.00	BGS Systems Inc.	37.25	-1.00	-2.61
OTC	79.00	37.25	BMC Software Inc.	53.13	-5.63	-9.57
OTC	20.50	9.25	Boole & Babbage	18.50	-0.38	-1.99
OTC	86.75	35.00	Borland Int'l Inc.*	38.25	-3.63	-8.66
OTC	11.00	3.63	CE Software	4.25	-0.25	-5.56
ASE	19.50	7.34	Cheyenne Software Inc. (H)	18.63	0.00	0.00
OTC	17.88	6.00	Cognos Inc. (L)	6.00	-1.25	-17.24
NYS	17.00	7.50	Computer Associates*	15.00	-0.50	-3.23
NYS	12.38	9.75	Computervision Corp.	9.88	-0.88	-8.14
OTC	30.00	6.75	Cornerstone Inc. (L)	7.50	0.25	3.45
OTC	47.88	8.50	Edsel Corp.	8.00	0.00	0.00
OTC	25.50	11.50	Group I Software	13.50	-1.00	-6.90
OTC	6.63	3.50	Hogan Systems Inc.	5.00	-0.25	-4.76
OTC	36.25	18.50	Information Resources	26.13	-0.38	-1.42
OTC	22.00	3.88	Informix Corp.	20.50	-0.50	-2.38
OTC	22.38	12.50	Intergraph Corp.	14.25	-0.50	-3.39
OTC	15.00	6.25	Interleaf Inc.	6.25	-0.25	-3.83
OTC	20.25	9.88	Intersolv Inc.	16.25	-1.13	-6.47
OTC	21.38	9.88	Knowledgeware Inc.	9.88	-1.88	-15.98
OTC	46.25	27.25	Legent Corp.*	46.00	-0.25	-0.54
OTC	38.75	15.50	Lotus Development*	19.13	-0.63	-3.18
OTC	7.38	1.88	Mace Software	3.00	0.13	4.35
OTC	22.25	6.50	Mentor Graphics	7.50	-0.75	-9.09
OTC	37.38	27.25	Micro Focus	35.38	0.13	0.35
OTC	20.50	6.50	Micrografx Inc.	10.50	2.00	23.53
OTC	88.84	57.50	Microsoft Corp.*	78.75	-1.13	-1.41
OTC	21.13	12.00	Oracle Corp.*	19.00	-1.25	-6.17
OTC	49.75	15.50	Parametric Technology	46.00	-2.50	-5.15
OTC	11.00	3.50	Phoenix Technologies	4.50	-0.38	-7.69
OTC	25.25	12.13	Platinum Technology	13.25	-1.75	-11.67
OTC	48.29	29.00	Progress Software Corp. (H)	47.50	1.50	3.26
OTC	26.63	4.00	Quarterdeck Office Sys.	4.25	-0.38	-8.11
OTC	32.75	11.75	Rainbow Technologies Inc.	17.75	-0.50	-2.74
OTC	22.75	4.38	Rasterops (L)	4.38	-4.88	-52.70
OTC	17.25	5.38	Rose Systems	6.25	-0.50	-7.41
OTC	12.25	8.50	Sapiens USA Inc.	10.13	-1.63	-13.83
OTC	26.25	7.50	Software Publishing Corp.	9.25	-1.25	-11.90
OTC	8.50	2.00	Software Toolworks Inc.	3.00	0.00	0.00
OTC	7.25	1.75	Spinnaker Software	2.25	-0.25	-10.00
OTC	16.50	3.25	State of the Art (L)	3.75	-1.00	-21.05
NYS	25.25	13.75	Sterling Software Inc.	17.38	-0.13	-0.71
OTC	30.00	9.25	Struct. Dynamics Research	9.25	-1.00	-9.76
OTC	38.75	16.00	Sybase Inc.	38.50	0.75	2.10
OTC	51.00	10.25	Symantec Corp.	10.25	-0.50	-4.65
NYS	15.50	5.25	Systems Center Inc.*	5.63	-0.13	-2.17
OTC	84.25	13.00	System Software Assoc.	21.50	-3.50	-14.00
OTC	23.75	14.50	Walker Interactive Systems	16.75	-1.50	-8.22
OTC	6.63	1.63	Wordstar	1.63	-0.38	-18.75
Semiconductors			**Off 3.80%**			
NYS	21.50	7.38	Advanced Micro Devices	11.50	-0.75	-6.12
NYS	11.13	7.00	Analog Devices Inc.	10.38	-0.50	-4.60
OTC	12.00	6.75	Atmel Corp.	11.13	0.25	2.30
OTC	14.13	3.25	Chips and Technologies	3.50	-0.75	-17.65
NYS	21.50	7.38	Cypress Semiconductor Corp.	8.88	0.13	1.43
NYS	12.25	6.25	Dallas Semiconductor (H)	11.25	-0.38	-3.23
OTC	88.75	38.50	Intel Corp.*	84.75	-0.50	-0.77
NYS	9.88	4.88	LSI Logic Corp.	6.38	-0.25	-3.77
NYS	22.38	12.13	Micron Technology	14.50	-0.13	-8.65
NYS	91.50	54.00	Motorola Inc.* (H)	86.00	-4.00	-4.44
NYS	12.38	3.88	National Semiconductor*	10.88	-1.25	-10.31
OTC	27.00	8.25	Sierra Semiconductor	9.88	-0.63	-6.95
NYS	46.00	26.00	Texas Instruments* (H)	43.75	-1.25	-2.78
OTC	10.50	6.00	VLSI Technology	7.75	-0.13	-1.59
OTC	7.25	2.13	Weitek	3.13	0.00	0.00
ASE	5.63	2.00	Western Digital Corp.	4.50	-0.13	-2.70
OTC	32.50	17.25	Xilinx	18.00	-2.50	-12.20
OTC	11.50	6.00	Zilog Inc.	8.00	0.38	4.92
Peripherals and Subsystems			**Off 5.16%**			
OTC	10.00	2.88	Archive Corp.	7.00	-0.63	-8.20
OTC	28.75	13.75	Bancitec Inc.	25.25	-1.25	-4.72
OTC	23.50	8.63	Cambex Corp.	11.50	-1.13	-8.91
ASE	12.25	5.00	Cognitronics Corp.	11.38	-0.13	-1.09
NYS	23.88	12.50	Conner Peripherals*	20.25	-0.63	-2.99
ASE	19.88	4.88	Dataram Corp.	6.00	-0.25	-4.00
NYS	20.63	5.88	EMC Corp (H)	19.25	-1.25	-6.10
OTC	8.38	4.75	Emulex Corp.	5.63	-0.25	-4.26
OTC	23.00	14.25	Evans & Sutherland	16.00	-0.13	-0.78
OTC	40.63	14.50	Exabyte (L)	15.13	-8.88	-36.98
OTC	29.50	15.75	Intelligent Info. Systems (H)	27.38	-0.38	-1.35
OTC	11.25	4.75	Iomega Corp.	6.13	-0.13	-2.00
OTC	34.75	10.75	IPL Systems Inc.	12.38	-0.13	-1.00
OTC	24.50	10.75	Komag Inc.	15.25	-0.50	-3.17
OTC	15.25	4.38	Maxtor Corp.*	13.63	-1.00	-6.84
OTC	12.63	5.75	Micropolis Corp.	8.75	-1.50	-14.63
NYS	103.75	85.38	3M Co. (H)	100.75	-0.50	-0.49
OTC	6.75	3.50	Printronix Inc.	6.75	0.75	15.00
NYS	26.75	7.00	QMS Inc.	8.25	-0.13	-1.49
OTC	15.00	8.88	Quantum Corp.	13.50	-1.50	-10.00
OTC	12.75	3.75	Radius Inc.	4.38	-0.38	-7.89
NYS	12.88	5.88	Recognition Equipment	10.75	-0.50	-4.44
OTC	13.13	5.38	Reson Inc.	10.50	-0.75	-6.67
OTC	17.63	7.25	Seagate Technology*	13.13	-1.63	-11.02
NYS	78.00	26.63	Storage Technology*	26.63	-2.63	-8.97
NYS	25.63	16.00	Tektronix Inc.	22.13	0.75	3.51
NYS	82.25	59.00	Xerox Corp.	78.75	0.13	0.16
Services			**Off 2.25%**			
OTC	18.38	11.88	American Mgmt. Systems*	18.63	-0.13	-0.67
NYS	5.38	2.88	Answercomp Inc.	3.13	0.00	0.00
OTC	19.00	12.50	Analysts Int'l	18.75	0.75	4.17
NYS	49.00	33.88	Auto Data Processing*	46.63	-0.50	-1.06
NYS	15.50	7.06	Caridian Corp.	14.13	0.13	0.89
NYS	24.18	12.50	Comdisco Inc.*	16.13	-0.13	-0.77
OTC	13.50	7.75	Computer Horizons	9.13	-0.13	-1.35
NYS	84.88	57.00	Computer Sciences*	69.50	0.75	1.09
NYS	10.13	7.00	Computer Task Group	8.00	0.00	0.00
OTC	40.50	15.00	CompUSA Inc.	32.00	-3.00	-8.57
OTC	19.25	6.00	Corporate Software	8.50	-1.00	-10.53
OTC	30.75	8.50	Egghead Discount Software (L)	8.50	-0.75	-8.11
NYS	33.06	23.38	General Motors E (EDS)*	30.25	0.75	2.54
OTC	30.38	6.25	Intelligent Electronics	10.25	-0.38	-3.53
OTC	14.88	4.88	Marisel	8.25	0.13	1.54
OTC	15.75	7.00	Microage Inc.	9.00	-0.75	-7.69
OTC	32.00	17.88	Paychex (H)	31.25	-0.25	-0.79
NYS	76.50	51.75	Policy Management Sys.	75.50	1.50	2.03
NYS	44.75	24.88	Reynolds and Reynolds (H)	44.25	-0.38	-0.84
OTC	32.00	21.25	SEI Corp.	24.50	-0.75	-2.97
OTC	24.38	18.88	Shared Medical Systems	21.63	-0.38	-1.70
OTC	30.00	13.50	Sungard Data Systems	28.75	-2.25	-7.76
NYS	3.63	1.13	Ultimate Corp.	1.88	-0.13	-7.69

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

HP revises Q1 results

■ **Hewlett-Packard Co.** last week said it would restate fiscal 1992 earnings to reflect changes in how it accounts for retiree medical coverage and income taxes. Medical coverage changes will result in a one-time, $322 million after-tax charge for the first fiscal quarter of 1992, which ended Jan. 31, transforming a $302 million profit into a $30 million net loss. Changes in how the company accounts for income taxes were spread out throughout fiscal 1992, which ended July 31, and will have no material impact on restated earnings, the company said.

■ **CompuAdd Corp.** in Austin, Texas, has protested the U.S. Air Force's award of a $740 million contract to **Zenith Data Systems** for 300,000 Intel Corp. 1486-based personal computers, related equipment and office automation software. The contract, called Desktop IV, was split last year between CompuAdd and another vendor but was withdrawn when a number of bidders complained they were knocked out of the running unfairly.

■ Cabletron Systems, Inc. last week posted robust second-quarter net profits of $19.3 million, up 27% from the same period last year. Revenue for the quarter ended Aug. 31 was $96.7 million, up 39% from 1991's corresponding period, the Rochester, N.H., company said.

Short takes

Icot Corp., a San Jose, Calif.-based peripherals vendor, said it expects to post "a significant loss" in its first fiscal quarter, ending Oct. 24, due to a slowdown in orders from **IBM**, its largest customer.... Adobe Systems, Inc. in Mountain View, Calif., has made an equity investment of an undisclosed amount in **Verity, Inc.**, a Mountain View-based developer of document retrieval software.

Oracle posts $33.5 million loss

Though revenue grows, new pay-as-you-go accounting rule kills profits

BY JEAN BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. said last week it took a onetime $43 million after-tax charge for more than $60 million in software orders deemed uncollectible in its first fiscal quarter, transforming a $9.9 million operating profit into a $33.5 million loss.

Oracle took the charge as part of its switch to the software industry's new pay-as-you-go accounting system, devised by the Financial Accounting Standards Board and enforced by the Securities and Exchange Commission.

"It normalizes their sales practices [with the industry's]," noted Rich Edwards, a senior analyst at Robertson, Stephens & Co. in San Francisco.

Quick on the books

In the 1980s, analysts said, Oracle routinely sold multimillion-dollar contracts for several years' worth of software and booked the revenue immediately.

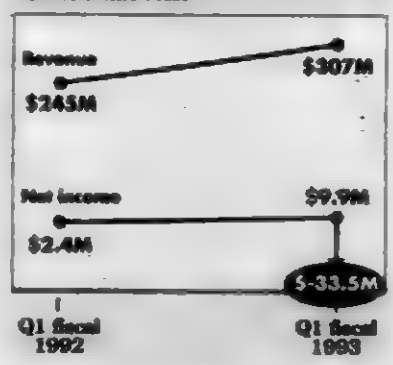
The loss, among the few quarterly deficits in Oracle's 15-year history, obscured what was a reasonably strong period.

Oracle posted $307 million in revenue for the quarter ended Aug. 31, up 25% from the comparable time period last year. Much of the growth, however, was attributed to a currency exchange boost from the company's strong European sales.

Some analysts said the numbers in Oracle's first-quarter report do not paint the entire picture of its global business.

By the numbers

A $43 million after-tax charge pummeled Oracle's first-quarter income from roughly $10 million (an increase of more than 300% from the same period last year) to a $33.5 million loss



Out of sorts

"You have to sort through onetime events, like currency exchange rates and a re-recognition of revenue [for past sales], to see how well Oracle did," said Terence Quinn, a research vice president at Kidder Peabody & Co. in New York.

Licenses for IBM mainframe and proprietary versions of Oracle continued to decline, according to Quinn, while those for desktop products were relatively flat. Sales of Unix products contributed heavily to growth.

MTI files suit against DEC over storage patent validity

BY MELINDA-CAROL BALLOU
CW STAFF

ANAHEIM, Calif. — Digital Equipment Corp.'s struggles with third-party storage vendors are not subsiding, despite lawsuits and licensing programs by DEC to quell them.

Micro Technology, Inc. fired its own salvo last week when it disclosed a countersuit filed against DEC that claims DEC's Digital Storage Systems Interconnect (DSSI) and Computer Interconnect storage patents are invalid.

DEC instituted a DSSI licensing program earlier this year — which increased in price last month — and the company allows third parties to license the technology for a royalty fee.

DEC is also expected to establish a Computer Interconnect licensing program within two weeks in an attempt to gain royalties from third parties implementing products that use those technologies.

While more than 25 vendors signed on to the licensing programs, Micro Technology did not. Last year, DEC sued Micro Technology in Germany over a separate matter: DEC's Standard Disk Interconnect/Standard Tape Interconnect (SDI/STI) storage patents.

DEC does not offer a licensing program for its SDI/STI technology.

"DEC was making it public that we had not signed up for the DSSI program, which cast some doubt on our company's credibility, and the market needed a response from us," said Tom Raimondi, president of product marketing at Micro Technology, explaining the rationale behind the lawsuit.

Plenty of evidence

Raimondi said Micro Technology has documented information showing that other vendors implemented the DSSI and Computer Interconnect communications protocols before DEC did and that they are in the public domain.

He added that for Micro Technology to sign a licensing agreement whereby the company acknowledges the validity of the patents and pays royalties when it believes the patents to be invalid is not an option. "We felt that we had no choice but to seek a court opinion," Raimondi said.

DEC officials said the suit is without merit.

Micro Technology also announced a product designed to insulate customers from the potential consequences of the SDI/STI dispute. Dubbed the MSD13C, the new SDI disk interface does not use any of the technology in question, Micro Technology officials said.

A separate U.S. lawsuit filed by DEC against Micro Technology over the SDI/STI technology is in the discovery stages at this time.

Success not assured

Industry analysts were somewhat skeptical of the countersuit's prospect for success.

Paul Wolfstetter, program analyst for large systems at Gartner Group, Inc., a market research firm in Stamford, Conn., said that "if DEC were to lose, it would mean substantial exposure to them, but I think DEC is a big enough company to know what they have and have not [in terms of valid technology]."

Added John Donovan, an analyst at WorkGroup Technologies, Inc., a Hampton, N.H., market research firm: "When DEC does an interface, it's a very precise standard, and if you comply with it, I suspect that it would be hard to avoid (infringement), since they don't leave very much room for creativity."

McAfee to go public

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — McAfee Associates, Inc., the antivirus software maker that has carved a niche for itself by giving away its software, hopes to go public next month, pending the completion of an initial stock offering.

Unlike competitors that sell shrink-wrapped software in retail stores, McAfee Associates' set of virus detection, disinfection and protection programs are distributed as shareware on electronic bulletin boards. Founder John McAfee then relies on honest users to voluntarily send in between $25 and $35 per program.

That strategy has been successful: The prospectus for the initial public offering (IPO) says the company has already snagged 10,000 licenses at corporations.

McAfee's offerings include Scan, a memory- and file-scanning program with some disinfection capabilities, the Clean disinfection program and VShield and Sentry, which are resident file infection and activity checking programs. The firm also produces several utilities packages.

McAfee has long maintained that antivirus software is custom-made for electronic distribution because it needs to be regularly updated.

Small but mighty

The company is still relatively small — having only 26 full-time employees and reporting revenue of $6.3 million in the first half of the year — but has profited from increasing consumer awareness about viruses.

Next month's IPO is expected to offer 2 million shares, which would leave the firm with 11 million outstanding shares after the offering. If the price of the stock reaches its expected midrange of $13 to $15 a share, it will also make McAfee a very rich man. Initially, he will sell stock worth $7 million and retain stock valued at about $63 million.

However, the highly public McAfee has come under some criticism in recent years for spending more time hyping the virus scare than attending to his products.

"One is still left with the impression that the program... could benefit from more attention to function and less to the promotion of the services of McAfee Associates," wrote Christopher Feudo in "The Computer Virus Desk Reference."

THE OLD SWITCHEROO

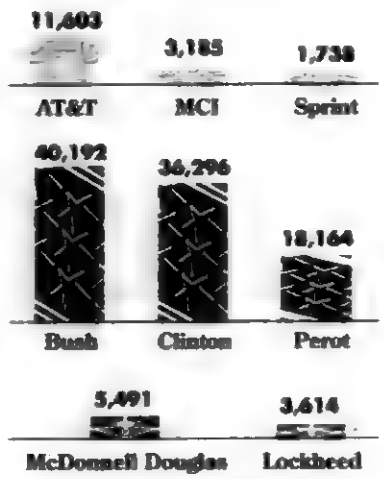
Police have arrested a Florida couple suspected of using their portable bar-code label printer to put false price codes on merchandise in stores around the country. The alleged swindle involved applying false bar codes with much lower prices, buying the items at the reduced price from inexperienced cashiers and later returning the merchandise for full value (with a fake receipt). The suspects — who may have been clearing $6,000 a day — were caught by an alert clerk at a Kmart near St. Paul, Minn.

It had to happen

Barry Watkins, a congressional wanna-be from Illinois and also the president of a software company in Des Plaines, Ill., has a unique approach to fund-raising based on his computer expertise. To drum up funds, he's developed The Dan Quayle Spelling Checker, which comes bundled with the Dansaurus thesaurus and a selection of Quayle-Lite quotes. It's being marketed through a toll-free number: (800) SOFTHEAD.

Press Rivals

The number of times each rival has been mentioned in a random sample of the popular press during the summer months



Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

TECH TRIVIA

1. The last two letters in the names of many early computer companies were "AC," as in Illiac and Eniac. What did the letters AC stand for?

2. In the 1959 movie "Desk Set," Katherine Hepburn and her staff were worried they might be replaced by a computer Spencer Tracy was installing. What was the name of that computer? Emorac, Calla Lilly One or Univac?

3. Some computer people are a little strange. According to the book *Bit by Bit*, one computer notable was known for using a tie to hold up his pants. Was that person Charles Babbage, Steve Wozniak or Alan Turing?

ANSWERS

1. Automatic computer 2. Emorac 3. Charles Babbage

Sources: *Minneapolis-St. Paul Star Tribune*; The Delahaye Group, Inc.; special thanks to the Computer Museum, Boston

The 5th Wave

"NO, NO! YOU HIGH-FIVE THEM ON THE HAND! THE HAND! NOT THE FACE!"

INSIDE LINES

Diamond in the rough

▶ If it's true that the day of the megadeal is in decline in the outsourcing business, then EDS may have bucked the trend in one recent contract. Merrill Lynch analyst Stephen McClellan estimates that the company's deal with Household Credit Services to provide processing services for EDS parent General Motors' new GM Card credit card could blossom into a $500 million revenue stream if the card takes off.

Everybody's doing it

▶ Now that Compaq's ProLinea line appears to be a roaring success, entry-level product lines are popping up like mushrooms after a rain. The latest entry is from NEC. Sources say that Oct. 5 will see the unveiling of a broad family of computers that are slated to compete with Compaq's line. Prices will be at least competitive and may even be slightly below average.

Another dimension

▶ Speaking of ProLinea, Compaq isn't the only company with product availability problems. Parts of Dell's Dimension line is backlogged, sources say, and the company's SLI notebook, introduced in June, has missed its umpteenth shipping date — this time Sept. 21. Sources say the product is not expected to ship until Christmas, and at least one user says he switched to a Contura notebook because of the glitch.

Nothing to write home about . . . yet!

▶ While Compaq doesn't yet have a pen-based system, it does have people working on one, and they were at the Pen Expo looking at everything, including operating environments such as CIC's PenDos and Grid's PenRight. Toshiba officials hinted that by first-quarter next year, they, too, will have a pen-based system on the market, probably very similar to a system their company just announced in Japan.

Shooting quivers

▶ Dauphin, which announced a color-based pen system at Pen Expo, also displayed a mockup of a roughly 6- by 8-in. system it plans to ship next year. Sources close to the company said the product will feature Intel's coming 3.3V I486SL at the core of a new system that features longer battery life. They also said it may use HP's impending 1.3-in. hard drive.

GUI with a gimmick

▶ Ever wonder why no one thinks palmtops will use GUIs? It has a lot to do with the icons being too small to read. So IBM is working on a pen device with a built-in magnetizer that will explode icons so they can be read. The product is still too slow, said Gordon Arbeitman, senior programmer of pen systems.

Cross currents

▶ HP has entered into discussions with Legent to port at least some of Legent's systems software cache onto HP's HP/UX environment. In addition to CA, HP already has similar deals with Dun & Bradstreet, Software AG and Cincom Systems. Unix systems management leader Tivoli Systems is also planning to ally with HP.

Merry Christmas!

▶ Those shareholders willing to interrupt their holidays will get to speak at Wang's annual meeting, slated for Dec. 23, but the pre-Christmas gathering isn't likely to be very festive. Wang common stock now trades at about 50 cents per share, having plummeted 93% from a 52-week low of $7.50.

A network manager looking for a new job recently knocked on the door of The C.I.T. Group, a New York bank co-owned by Manufacturers Hanover and Japan's Dai-Ichi Kangyo Bank. He filled out the standard forms while waiting for the interview to begin. But when he got to the end of the application, he found a disturbing note: "Your employment can be terminated at any time, for any reason." Although he was offered a position, he declined. The money wasn't good enough, he said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

Where are you headed with your applications development?

BACHMAN

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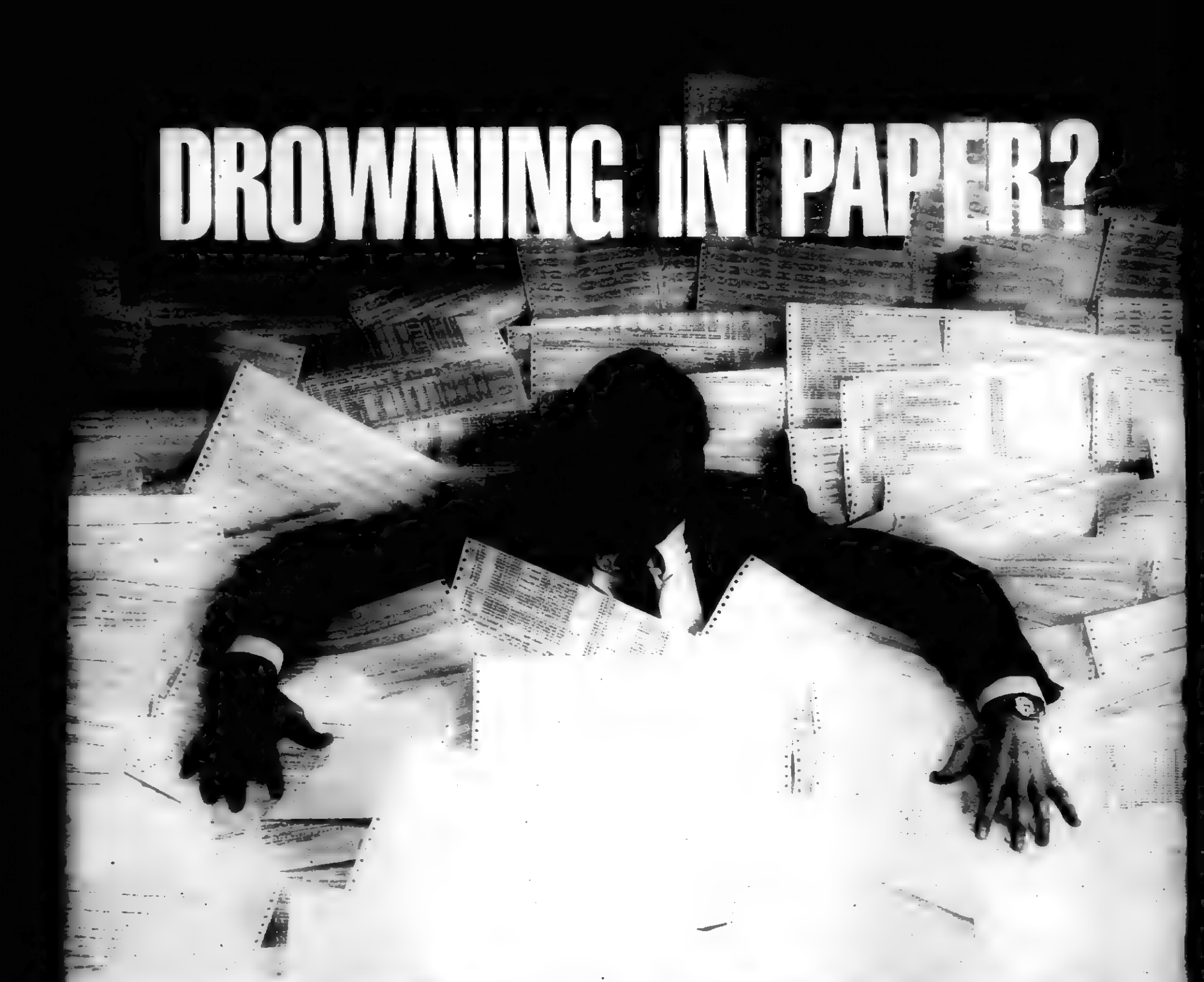

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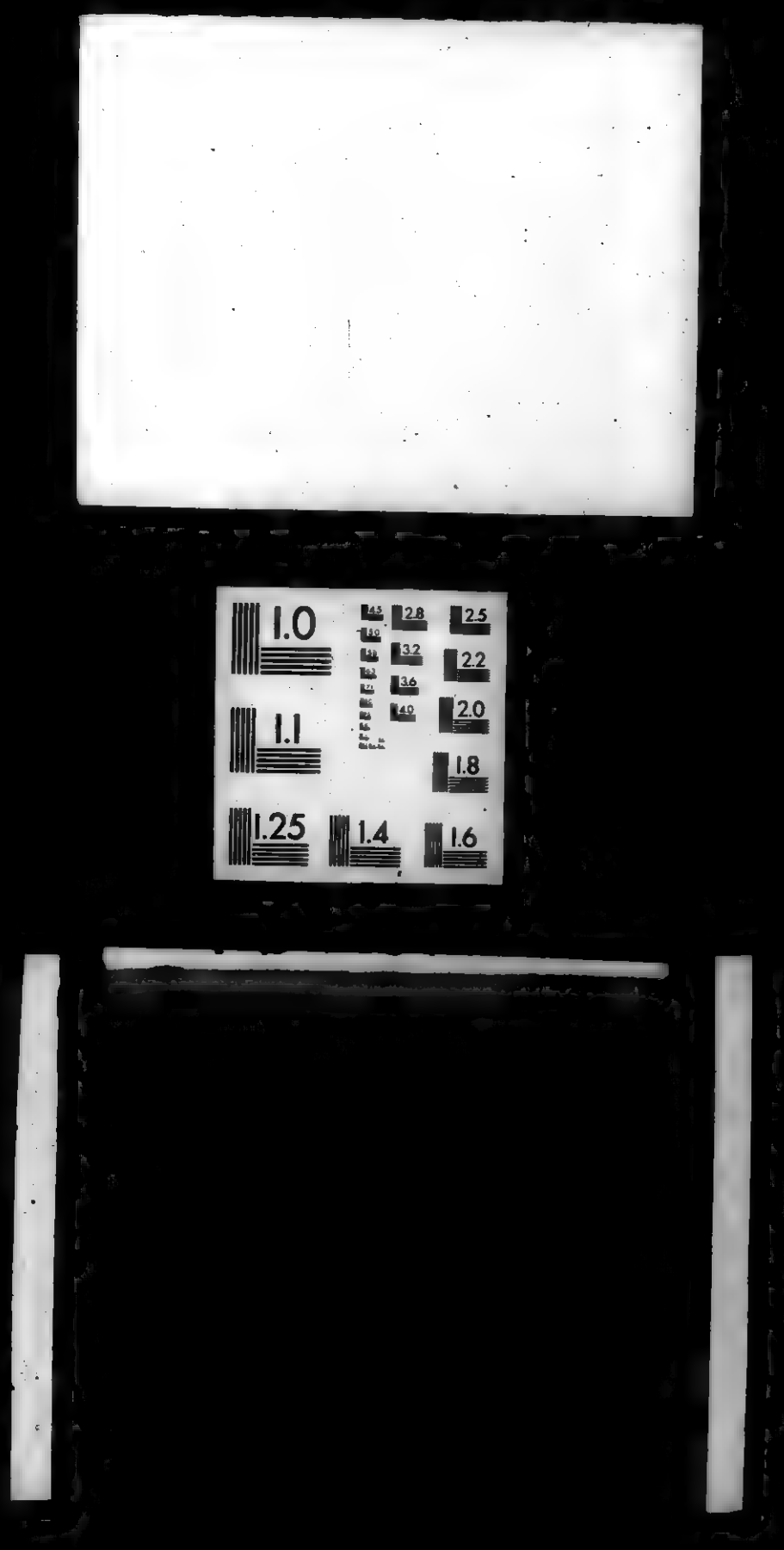
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October 5, 1992 · Vol. XXVI · No. 40 · 126 Pages · $2/Copy · $48/Year

COMPUTERWORLD

Hertz revamp eyes HP minis, outsourcing

BY MARK HALPER
CW STAFF

OKLAHOMA CITY — The Hertz Corp. will soon migrate portions of its host-based software to Hewlett-Packard Co. minicomputers, a move that will keep some data processing in-house as the company proceeds with its agonizing outsourcing evaluation.

A source close to the $2.6 billion car rental leader said Hertz is in the process of moving its rates and possibly its credit card programs off an IBM 3090 at its data center here and onto an HP high-end reduced instruction set computing minicomputer, which Hertz would operate. The HP system could kick in as soon as this month.

The company has already migrated its reservation software, which ran on a Unisys Corp.

Continued on page 16

Turbo Ethernet on way

Start-up pumps network speed to 100M bit/sec.

BY JOANIE M. WEXLER
CW STAFF

UNION CITY, Calif. — Users can expect to see yet another high-speed, local-area network alternative emerge by the end of next year aimed at helping them migrate to more powerful LANs with a minimum of headaches and expense. This latest scheme, though, will have a familiar face: Ethernet.

Work is afoot by start-up Grand Junction Networks, Inc. — recently founded by several former 3Com Corp. executives — and others to cram 100M bit/sec. speeds onto Ethernet networks running across unshielded twisted-pair wiring.

The likes of multimedia advocate Apple Computer, Inc., Cisco Systems, Inc. and National Semiconductor Corp. have unofficially endorsed the technology. Hewlett-Packard Co. and Grand Junction will reportedly make separate technology presentations to the IEEE standards committee on Ethernet next month.

Users lauded any effort to pump more life into Ethernet, which runs across roughly 20 million nodes worldwide. However, some worry that the late start on the standard's work means it will not be finished in time to accommodate their spiraling bandwidth requirements.

"If products were available today in an industry-standard implementation, I would be very interested because I have definite needs to increase my bit rates,"

Continued on page 12

AMR sues partners over failed venture

BY MARK HALPER
CW STAFF

DALLAS — The outsourcer suspected of covering up technical problems on the now-defunct Confirm reservation project has gone on the offensive, charging its user partners with a litany of contractual violations — including failure to make payments.

AMR Information Systems, Inc. alleged in a suit filed in state court last week that partners Hilton Hotels Corp., Marriott Corp. and Budget Rent A Car Corp. made it impossible for AMR to complete development work because the partners withheld funds, failed to complete specifications on time and made poor staffing assignments.

AMR, which was solely responsible for development, is seeking unspecified damages. It claimed Marriott failed to pay at least $2.2 million in fees. AMR did not say how much it claimed Budget and Hilton failed to pay for the defunct $125 million project, which began in 1988.

Confirm was to have been a state-of-the-art reservation system integrating airline, car rental and hotel information. Work ceased last summer as insurmountable technical problems arose. The problems made it impossible to integrate the system's Transaction Processing Facility reservation component with its MVS- and DB2-based decision support component.

Design downfall

The system was also crippled by an AMRIS design error that rendered the system's DB2 database unrecoverable in the event of a crash, Charles Biebighauser, former AMRIS vice president of operations, said earlier this year.

AMR allegedly covered up technical problems long before finally alerting its user custom-

Continued on page 10

IS control shifts to standards

Whose fistful of budget dollars? Not necessarily the IS department's. Once the sole purview of IS, control over a company's technology buying budget is becoming increasingly distributed to internal user departments. And converging trends — technological, economic and corporate — map out a clear message: Sole control is not coming back.

But even as it loses its dominion over hardware and software purchasing decisions, IS is establishing a beachhead on what may be an even more strategic turf: platform standards.

Story begins on page 83.

Dave Chan

Sears cuts cloud IBM deal

Divested units may still be serviced by Advantis

BY NELL MARGOLIS
and ELLIS BOOKER
CW STAFF

SCHAUMBURG, Ill. — Sears, Roebuck and Co.'s decision to sell off parts of its financial service subsidiaries and focus exclusively on its troubled core retail business casts into question the starting strength of Advantis. The network outsourcing unit is a joint venture mounted last month by Sears, IBM and Integrated Systems Solutions Corp., IBM's outsourcing subsidiary.

At least in the early stages of the new Sears game plan, however, most observers are betting that the projected $1 billion venture will emerge unscathed.

At issue is the lucrative data processing — and, in particular, networking — business generated by Sears' Coldwell Banker real estate holdings, Dean Witter Financial Services Group and Allstate insurance unit. In August, when IBM's Networking

Continued on page 20

Bankruptcy has silver lining for America West IS efforts

BY GARY H. ANTHES
CW STAFF

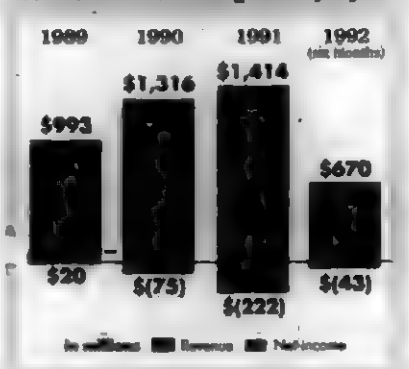
TEMPE, Ariz. — "Sorry, no applications and not accepting resumes at this time," said a sign greeting visitors at the headquarters of America West Airlines. Nearby, a sprawling but sparsely populated parking lot on a recent workday morning offered mute testimony to the forces that have knocked thousands of people from the airline's payroll and millions of dollars from its income statement.

But the irrepressible regional airline sees its parking lot as half full, not half empty. Thanks to a big new round of financing last month and the heroic efforts of its information systems staff and others, the company said it will emerge from bankruptcy, where it has struggled for the past 15 months.

Continued on page 14

Not so friendly skies

America West Airlines has experienced financial turbulence during the last few years



INSIDE

Windows for Workgroup previews, but it's not quite ready to take on Notes. Page 4.

A forceful Robert Palmer takes the helm at DEC, declaring he will make the company leaner, meaner and more responsive to users' needs. Page 14.

IBM to port CICS to HP RISC-based minis and servers. Page 16.

Product Spotlight — EDI is getting cheaper, but it still takes time. Page 75.

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EXECUTIVE BRIEFING

October 5, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

OUTSOURCING

HERTZ'S AGONIZING OUTSOURCING evaluation may soon end as the company reportedly readies a hybrid information systems overhaul that will entail migrating some mainframe programs to new in-house Hewlett-Packard minicomputers while tapping an outsourcer for other functions. *Page 1*

THE OUTSOURCER THAT WAS DEVELOPING the Confirm reservation system files suit against its user partners for allegedly causing the project's collapse, while the outsourcer continues to come under suspicion for covering up technical problems. *Page 1*

AS SEARS GOES BACK TO BASICS, will fallout from spin-offs of its financial subsidiaries undercut a Sears/IBM joint outsourcing venture? *Page 1*

CALIFORNIA REPUBLIC BANK envisions new technology additions and cost savings as reasons to outsource its IS operations to Unisys. *Page 6*

INDUSTRY

DEC'S NEW CEO, ROBERT PALMER, sets the stage for reorganization and, in an interview with *Computerworld*, promises to survey customers for input into engineering and product development. *Page 14*

THE TRAVELERS, noted among the nation's insurance players as a technology innovator, recently agreed to sell a 27% equity stake to financial services giant Primerica, planned a 10% work-force cut to shore up its crumbling capital base and set about honing its focus on core businesses. *Page 88*

THE PRICE WAR THREATENS most second- and third-tier PC vendors, but analysts say there are things to look for in picking your company. *Page 109*

EVEREX SYSTEMS HAS REDUCED SALARIES and lost executives and will this week drop head count for the third time since August. But it appears the vendor will be able to hold off bankruptcy. *Page 109*

THE BUSH ADMINISTRATION ATTACKS Gov. Bill Clinton's proposal for a civilian technology agency. *Page 24*

WORKGROUP

HP INTRODUCES ITS FIRST-EVER RISC-based industrial workstation, which spruces up its industrial line but clocks well below HP's advertised 100-MHz PA-RISC 7100 rate — a development that portends performance uncertainty for the upcoming general line. *Page 43*

MICROSOFT EMPHASIZES THE "GOOD CLIENT" features of Windows for Workgroup and the upcoming Windows NT, while also touting mail-enabled applications. Lotus, meanwhile, hopes to position Notes more clearly as one way to stay ahead of Microsoft. *Page 4*

NETWORKING WITH WINDOWS FOR WORKGROUP and Windows NT. *Page 4*

LARGE SYSTEMS

▶IBM unleashes CICS, its 20-year transaction-processing monitor for IBM mainframes, by striking a deal under which HP will offer the program. The landmark accord signals a heightened awareness by the computer giant that users are interested in multiple platforms and open systems. *Page 16*

▶Users of American Software's manufacturing software cite vast improvements in the company's quality and service a year after problems spurred several user lawsuits. *Page 59*

▶DEC focuses on groupware as strategy for All-In-1. *Page 61*

MANAGEMENT

▶As their control over technology acquisition budgets wanes, IS organizations are tightening their grip on platform standards. *Page 83*

▶Reeling from the blows of bankruptcy, the IS group at America West Airlines is reshaping itself and helping to get the company back on its feet. *Page 1*

▶Are you paying a lot for technical support? Some vendors waive support fees or toss in unique services to close a deal, but many companies don't receive these 'extras' simply because they don't ask for them. *Page 101*

▶William Davidow, from venture capital firm Mohr, Davidow Ventures, discusses the new kinds of information demands that IS will have to meet in emerging 'virtual corporations.' *Page 29*

SOFTWARE DEVELOPMENT

▶The claims made by object-oriented proponents — increased productivity, easy maintenance and so on — hold some truth. However, many IS shops aren't ready to make the necessary investment in time and resources nor are vendors ready to provide the programming environments needed to exploit benefits. *Page 81*

▶Digitalk's Parts, an object-oriented development tool kit, is winning user raves for bridging the gap between power and ease of use. *Page 71*

▶Viacom International has vastly improved the flow of data to its business units by redeveloping outdated applications. *Page 59*

▶A cross-platform development tool formerly available only to commercial developers will be upgraded next week with embedded client/server functions and packaged for corporate use. *Page 71*

▶CASE World '92 in Boston focuses on issues such as education, cultural changes and software quality. *Page 74*

ENTERPRISE NETWORKING

▶Users looking for investment protection in router architectures should consider the devices' software 'smarts' for sustaining performance and reliability as internetworks grow. *Page 49*

▶The Yankee Group reports that international firms are getting serious about the new frame-relay services as the basis for their global LAN-to-LAN links. *Page 8*

▶The complex choices in telecommunications technology present a challenge to users hoping to implement strategic wide-area networks. *Page 49*

LANS

▶LAN managers say they are running themselves ragged trying to track down trouble spots on remote LANs, but they don't seem ready to adopt centralized LAN management. *Page 54*

▶Novell introduces NetWare SNA Links, which is said to provide an interim solution to routers by interconnecting geographically dispersed NetWare LANs via IBM front ends. *Page 8*

▶Is Datapoint's Arcnet on the verge of fading away? *Page 41*

PC HARDWARE

▶A year after introduction, Apple's PowerBook has restored its luster and added big bucks to Apple's coffers. And new models are coming. *Page 33*

▶Though pen computers have fallen short of their hype, users remain interested in the technology. *Page 36*

▶Next makes a bid for the 486 PC market. *Page 15*

▶In Japan, the next generation of pen-based systems is due for delivery in early 1993. *Page 36*

▶This week, *Computerworld* introduces a new weekly Management section, replacing the former Executive Report and Manager's Journal sections. Created in response to the growing need for expanded weekly coverage of high-visibility topics relating to IS management, the new section provides a more consistent vehicle for this kind of in-depth reporting. *Page 83*

The 5th Wave appears on page 110

Downsizing
• Users attending a downsizing conference in New York last week share the promises and pitfalls they've experienced with their own 'rightsizing' efforts 7

Electronic Data Interchange
• A study by The EDI Group says it still takes time to make a go of EDI (two years from initial pilot to full implementation) but less money, with the cost to add a trading partner dropping from $1,700 to $600 this year 75

Careers
• Minorities in IS say they often seek certification because they still feel pressured to prove their skills 93

Components
• Texas Instruments says it believes it has a way to integrate diverse functions on a single chip 25

DBMS
• Silicon Graphics has put the concept of distributed Sybase databases to work, nearly a year before Sybase is expected to ship its Replication Server software to users. The workstation firm will have 26 cooperating servers in place worldwide by mid-1993 — all updated by a single copy of the corporate database 60

PC software
• Editor in chief Bill Laberis explores the chasm separating what users want from the 32-bit environment of the future and what is likely to be delivered 28

Software distribution
• Novell will release its software distribution tool; Lotus is still promising delivery, but it has yet to announce an expected arrival date 8

Midrange
• AD/Cycle may be suffering, but IBM's SDE Workbench/6000 CASE framework recently drew new support from more than 20 CASE vendors 73

Open systems
• Maturing open systems shops are finding a host of problems that need addressing, such as capacity planning, data archiving and lack of standard procedures for managing Unix-based data centers 41

Security
• A federal watchdog agency castigates the Drug Enforcement Administration for lax computer security 24

Viruses
• The question of whether there can be a good computer virus is dividing the research community 25

Departments
• Advanced Technology 25
• Application Development 71
• Buyers' Scorecard 66
• Company Index 107
• Computer Careers 93
• Computer Industry 109
• Desktop Computing 33
• Editorial/Viewpoint 28, 29
• Enterprise Networking 49
• Friday Stock Ticker 108
• In Depth 81
• Inside Lines 110
• Large Systems 59
• Management 83
• Marketplace 101
• News Shorts 6,16
• Product Spotlight 75
• Trends 110

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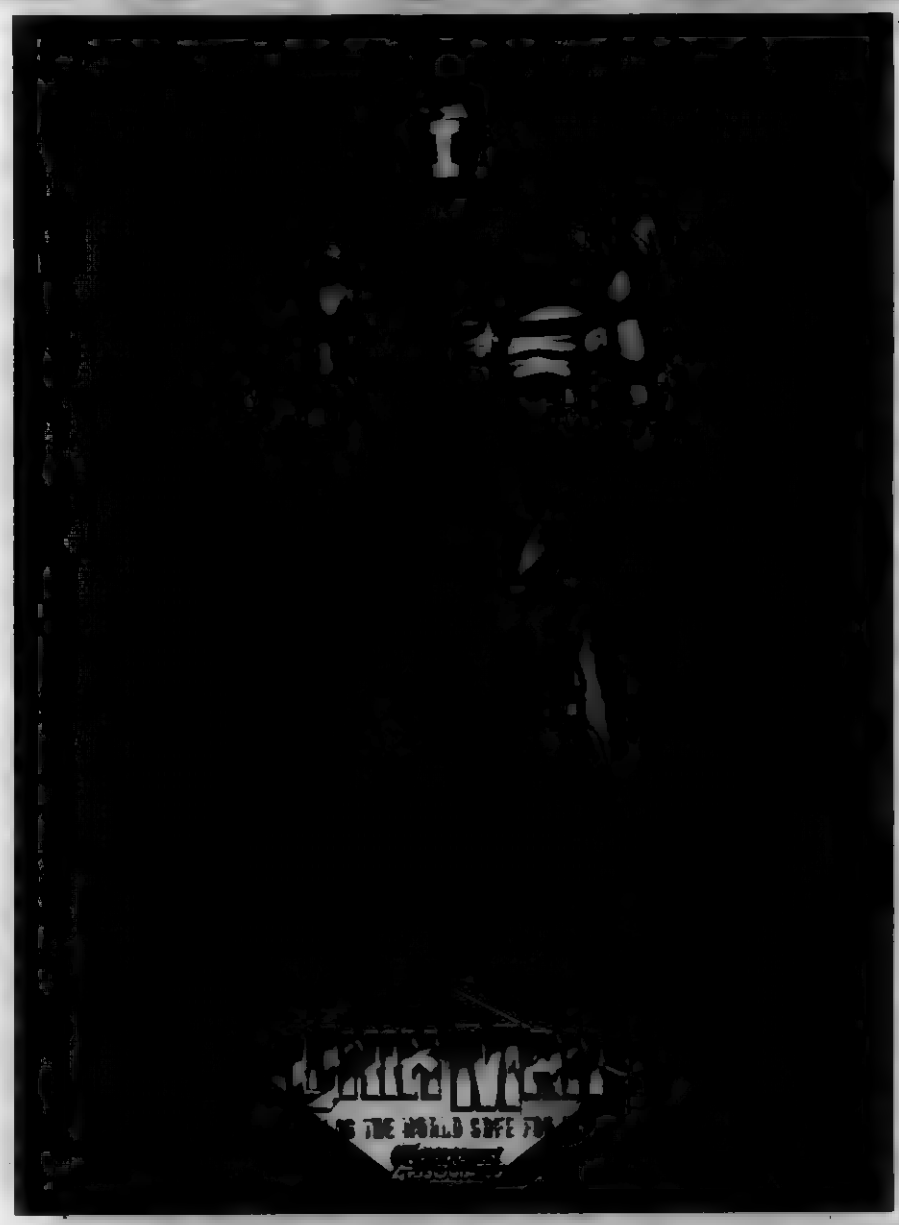

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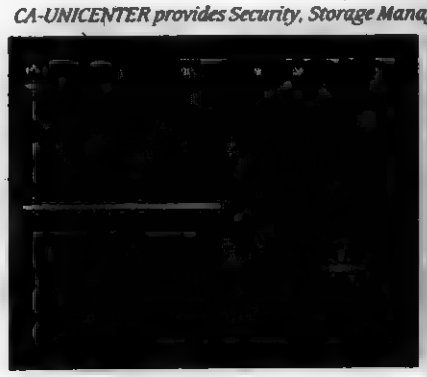

Security Control gives you single-point control for the entire system. It provides the first and only method for limiting authority of superusers.

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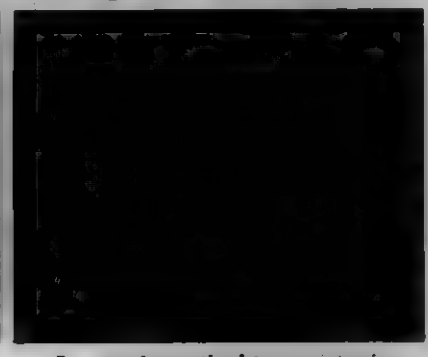

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Microsoft groupware to ship soon

Replication, a key competitive feature, is missing but will be added in '93

BY CHRISTOPHER LINDQUIST
CW STAFF

BELLEVUE, Wash. — Microsoft Corp. is "reaching out" to the corporate "enterprise," but its hands may remain empty for some time. The software giant acknowledged last week that it is not yet ready to ship either a groupware alternative to Lotus Development Corp.'s Notes or its long-awaited Windows-based database.

Moreover, demonstrations at a strategy briefing for the press here last week revealed that these products lack a key competitive ingredient: replication, or the ability to manage multiple copies of database information across multiple systems and ensure the timeliness of that information. According to company officials, that capability will not appear until next year.

Windows for Workgroup, which Microsoft touts as an open, scalable framework for building a workgroup environment, will probably ship by Comdex/Fall '92 in November.

Jesse Berst, publisher of the Redmond, Wash.-based "Windows Watcher" newsletter, said the company has most of the "plumbing" in place, such as a store-and-forward mail engine, to compete head-on in the workgroup arena.

However, Steve Ballmer, Microsoft's executive vice president, indicated that Microsoft was not going to present an all-in-one "package" to compete with the popular Notes groupware. Instead, he insisted, Microsoft was looking to provide a "modular" approach, starting with the operating system and extending to applications and development tools such as Microsoft Mail, Windows for Workgroup and the Access database, which would allow users, value-added resellers (VAR) and others to produce customized workgroup systems.

Microsoft's Ballmer: *Not planning all-in-one package to compete with Lotus' Notes*

Yet while Microsoft was touting its "modular" approach to building a workgroup environment, some users were skeptical.

"If I were them, I'd say that the modular approach is best when I don't have a tool to compete with Notes," said a chief information officer at a large bank that uses Notes. Microsoft has "a lot of work to do to create as comprehensive an environment as Notes," the CIO said.

Others were more optimistic. Webb Edwards, MIS director at First Interstate Bank in Los Angeles, said his company has room for both approaches, but he will have to wait to see pricing before he can make a final decision. "We'd have to sit down and find out what the modular approach will really cost you," he said.

Mac endorsement

Microsoft executives said throughout the day that the Apple Computer, Inc. Macintosh was an "adequate platform" for running workgroup applications and that Macintosh support would be built into all Microsoft workgroup plans (see story below).

On tap for a 1993 delivery is the slightly delayed Windows New Technology (NT) operating system, which the company expects will play a vital role as a server and high-end workstation platform. Dwayne Walker, director of Windows NT and networking products, clarified the networking capabilities of Microsoft's forthcoming 32-bit operating system by noting that it will contain basic peer-to-peer connectivity as well as a limited file-and-print subset of the functions found in Microsoft's LAN Manager.

Simultaneous with the release of Windows NT, Microsoft will release a LAN Manager for NT product, based on the 32-bit functionality of the NT platform.

Despite its technological shortcomings, Microsoft was insistent about its ability to successfully compete in the workgroup market. The firm's senior vice president, Jeff Raikes, detailed several programs aimed at providing users and third-party vendors with the support they need to create enterprise-specific applications, which included everything from sharing technical information to actually referring customers to integrators and consultants.

When questioned as to what Microsoft could do to gain the trust of VAR-wary users, Raikes reiterated the company's commitment to spend $100 million on U.S. product support services as well as expand the ranks of Microsoft Consulting Services' 140 members.

However, at least one user was not impressed. "I think their applications are too limited," said Rory Read, senior vice president of MIS at Insurance Company of the West in San Diego.

Software giant teases with product previews

While Microsoft was not overly forthcoming about new products at its strategy briefing, more than a few hints were dropped throughout the day.

- Demonstrations were given of Windows for Workgroup's Network Dynamic Data Exchange, which allows links across networks, and Clipbook, which allows multiple "pages" of clipped information to be retained.
- Microsoft's Windows-based database, Access, was used as the basis of a scoring system from the Professional Golfing Association and as a Lotus Notes-like bulletin-board system. Of primary interest was Access' reported ability to read "live" data from multiple database types without the import/export required by most personal computer databases.
- Executive Vice President Mike Maples confirmed that MS-DOS 6.0 will have some networking and electronic-mail capabilities built into it.
- Vice President of Desktop Applications Pete Higgins indicated that a multimedia version of Microsoft Word and a tool kit to allow Excel to browse and manipulate multidimensional data will be available in the future.
- Higgins also demonstrated Object Linking and Embedding Version 2.0's "edit in place" feature.
- Visual Basic 2.0 will contain support for both the Messaging Application Programming Interface and the Open Database Connectivity standards.
- Bill Gates said mail connectivity will be available for most Microsoft applications as an add-in by year's end, with the technology being built into all future versions of the products.
- Hermes technology, a central network management system based on Windows NT, was shown (see story below).

CHRISTOPHER LINDQUIST

Challenge noted

Lotus' comfortable lead in the workgroup computing market could get its first serious challenge when Microsoft's Windows for Workgroup ships this month.

"If Microsoft has its way and gets a zillion third-party developers to write to it, then Notes alone will not carry the day for Lotus," said Jonathan Yarmis, a vice president at Gartner Group, Inc. in Stamford, Conn. "It could very much be a problem for Lotus' Notes.

The extent of Microsoft's threat depends on how appealing its workgroup approach is to users and developers. Microsoft is pushing the idea that existing operating systems and applications can be tweaked to become workgroup-enabled, using Windows for Workgroup as a framework. It has also referred to Lotus' Notes as a big and separate workgroup computing product that would not leverage existing investments.

To counter the Microsoft splash, Lotus is working to better define Notes. In an interview last week, Cliff Conneighton, newly appointed director of marketing for communications products, frequently referred to Notes as an application development environment and said it was but one component of Lotus' overall workgroup strategy. Lotus, he said, also offers CC:Mail and other applications — from its personal information manager, The Organizer, to its spreadsheet line — that contribute to a workgroup environment.

He also said Windows for Workgroup is system software that "should be useful for [the] print and file sharing" that Lotus plans to support with its own applications. However, he said, it is not a full-blown workgroup platform. For example, the mail component is not a complete mail application because it does not have directory services, gateways and administration tools.

He also said the next release of Notes, Version 3.0, is on schedule. The official ship date falls sometime between March and June 1993.

One beta-test customer, who requested anonymity, said Version 3.0 is in good shape although there continue to be some glitches with the text search-and-retrieval engine, which is technology from Verity, Inc.

Another Notes user said the Apple Macintosh client support, promised for Version 3.0, was a bigger project than Lotus had expected.

ROSEMARY HAMILTON

Windows workgroups tuned for networking

BY MICHELE DOSTERT
CW STAFF

BELLEVUE, Wash. — It will probably surprise millions of MS-DOS users to discover that Microsoft now considers the Apple operating system, with its built-in networking capabilities and integrated applications, to be a shining example of a proper personal computer operating system.

At a strategy briefing here last week, Microsoft executives carefully positioned the forthcoming Windows for Workgroup product as analogous to Apple System 7. The operating system will not compete with low-end, peer-to-peer local-area network operating systems, and it will not work in conjunction with them.

One better than Windows

According to Microsoft, these peer-to-peer network operating systems will be subsumed by Windows for Workgroup, which will also offer embedded Microsoft Mail client software and mail-enabled scheduling and groupware applications.

But users will be able to access more than one Novell, Inc. NetWare server in simultaneous sessions — something Windows 3.11 users cannot do.

Microsoft officials also demonstrated a prototype of a new network management system, dubbed "Hermes," which is slated to appear late in 1993.

Hermes features will reportedly include an inventory window; the ability to automatically distribute or upgrade software on a client PC; the ability to view and report information up into a corporatewide network manager; a query capability that will allow managers to look for servers with low disk space or outdated versions of an application; and an autodiscovery utility that can query all PCs attached to a server and report back on configuration, software loaded, ports available, drive space and other variables.

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("","",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code 1 == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
          remove_xact(dbproc_commit, commid, 1);
      }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL)
  {
      remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.O. McGoveran and C.J. Date: *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 498, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE  SAVINGS
SET     S_BALANCE = S_BALANCE - 250.00
WHERE   S_DEPOSITOR = 'JONES'
UPDATE  CHECKING
SET     C_BALANCE = C_BALANCE + 250.00
WHERE   C_DEPOSITOR = 'JONES'

COMMIT  WORK;
```

Early Client/Server RDBMS products, like Sybase, don't automatically assure the consistency of distributed transactions. When related data on multiple servers must be updated by one transaction, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications.

ORACLE7™, the Cooperative Server RDBMS, automatically processes distributed transactions, with NO SPECIAL CODE. With ORACLE7, all it takes to update multiple servers is the same simple SQL you would use for a single-server update. ORACLE7 lets applications programmers concentrate on solving business problems rather than computer problems.

For more information on ORACLE7's simple solution to distributed Transaction Processing, call 1-800-633-1071 ext. 8187 and commit to a better solution.

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NEWS SHORTS

Apple cuts Macintosh prices

With several new Macintoshes just introduced and more on the way Oct. 19, Apple Computer, Inc. moved to clear the shelves of old models last week by slashing prices 11% to 36%. Models affected include the Macintosh Classic II, LC II, IISI, IICI, Quadra 700 and selected configurations in the Quadra 950 line, the company said.

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CA buys into C++ world

Computer Associates International, Inc. entered the C++ market last week when it acquired the assets of Glockenspiel Ltd., a privately held C++ developer based in Dublin. According to Marc Sokol, CA's director of product strategy, the $1.5 billion software company plans to embed Glockenspiel's CommonView class library technology into CA's ongoing Aspen project in order to provide portable application development across Microsoft Corp.'s Windows, IBM's OS/2 2.0 and the Open Software Foundation's Motif environments.

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DEC adds controllers

Digital Equipment Corp. announced two new Hierarchical Storage Controllers (HSC), which will be able to accommodate Small Computer Systems Interface (SCSI)-2 devices. Users will be able to mix and match SCSI and DEC's own Systems Disk Interconnect in the same box with the new HSC 65 and 95 controllers, DEC officials said. This will pave the way for DECstorme, a modular storage technology.

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Europe ices network competition

The European Commission's Council of Ministers last week failed to vote on a Services Directive that, if implemented, would have required all European Community countries to allow outside bodies to come in and build network infrastructures within their borders.

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Sequoia results sink

Sequoia Systems, Inc. last week revised its revenue statement for the year ended June 30, down to $65,692,000 as opposed to the $71,021,000 previously reported by the fault-tolerant computer company. The revised results, expected to be formally released this week, will likely show a loss "significantly higher" than the previously reported $860,000, according to Sequoia. Sequoia also said Chief Financial Officer Kent R. Allen resigned to pursue other interests. The company expects revenue for the quarter ended Sept. 27 to be lower than analysts have predicted.

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Compuware plans OS/2 port

Compuware Corp., a Farmington Hills, Mich.-based vendor of mainframe systems software tools, will port its packages to OS/2 with the assistance of Pragma, Inc. in Hartford, Conn. "We recognise we can't keep all our eggs in the mainframe basket any longer," said Michael May, a Compuware product management director.

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Short takes

Easel Corp. last week completed its acquisition of object-oriented tools vendor **Enfin Software Corp.**, although it has yet to detail how the Smalltalk-based Enfin development tools, Enfin/2 and Enfin/3, will fit into the Easel product line. . . . **The Coca-Cola Co.** has selected **Premenos Corp.**'s EDI/400 package to implement worldwide electronic data interchange for its bottlers. . . . The **Transaction Processing Performance Council (TPC)** in San Jose, Calif., said last week that it had approved the proposed TPC-C benchmark standard for on-line transaction processing applications. . . . **Hitachi Data Systems Corp.** last week enhanced its 7900 semiconductor disk with a new redundant arrays of inexpensive disks Level-3 backup feature. . . . **Sybase, Inc.** said last week that it will supply up to $30 million in client/server software to **AT&T** for AT&T's $1.4 billion Treasury Multiuser Acquisition Contract.

More news shorts on page 16

Marriott rests on RS/6000

Hotel chain signs $25 million property management deal with IBM

BY MARYFRAN JOHNSON
CW STAFF

WASHINGTON, D.C. — In a systems integration deal worth a minimum of $25 million, IBM and Marriott Corp. last week unveiled plans to base the hotel chain's new property management system on 173 RISC System/6000 Unix servers.

The worldwide installation, encompassing up to 250 hotels, begins this month and will take roughly two years to complete. The goal is to set up a single architecture with one integrated database for sales, catering, human resources, back-office accounting and front-office operations, such as check-in.

"This is really our first big in-depth Unix project," said Steve Hanna, vice president of hotel systems at Marriott. "A systems integration project of this size has never been done before in the hotel industry."

Hotel guests may start noticing the difference as the RS/6000 Model 540s and 560s help launch Marriott's "First 10" program, which focuses on making a lasting impression of great service on customers during the first 10 minutes of their hotel stay.

"The new system will enable us to check people in before they arrive and see that they don't get passed off between a number of employees," Hanna said. "We've done training in 110 of our hotels on this already."

Business has been brutal for the hotel industry during the recession, with an oversupply of rooms and an undersupply of demand, analysts said. Keeping customers happy and encouraging their return have become paramount concerns.

"The bottom line in the hotel industry has been greater use of technology [to provide] more efficient back-of-the-house service. Now that's moving to more efficient front-of-the-house service as well," said John Rohs, an analyst at Wertheim Schroder & Co. in New York. "The battle is over how to make a hotel guest the most comfortable."

With IBM doing the data conversion and Informix Corp. handling the software development and relational database work, Marriott will migrate a variety of separate applications off old IBM Series/1, System/36 and System/38 processors.

Marriott's centralized reservation system will remain on IBM mainframes under a DB2 database system at the corporate data center in Frederick, Md. The RS/6000s will be able to tap into the mainframe, as needed, over an X.25 network via Systems Network Architecture or Transmission Control Protocol/Internet Protocol.

"Every hotel is a city unto itself," Hanna noted. "Each one will have its own RS/6000 with its own customer profiles."

To plan for scalability, Marriott built in a "35% hedge" above the worst-case processing load for each hotel. "Also, in dealing with IBM, we worked out an evergreen provision to refresh the technology as part of this deal," Hanna added.

Marriott's support staff for the project, including help from Informix, numbers 28 application developers, 25 help desk staffers and at least a dozen teams to handle the rollout and installation.

Ken Thornton, vice president and general manager for IBM's mid-Atlantic area, said the primary competitors for the Marriott project were Hewlett-Packard Co. and AT&T. The $25 million "Phase 1 value" of the contract — one of the largest commercial wins for the RS/6000 — covers hardware, software and services.

Along with project management and consulting work, IBM will install other equipment such as terminals and printers. Each RS/6000 will be customized with Marriott's software and application code.

Calif. bank taps Unisys in $56M outsourcing pact

BY THOMAS HOFFMAN
CW STAFF

BAKERSFIELD, Calif. — When California Republic Bank agreed to outsource information systems operations in a 10-year, $56 million pact with Unisys Corp. last week, the potential savings of as much as 20% expected from the pact was only one of several reasons behind the decision, according to a top bank executive.

The ability to leverage new technology upgrades at no additional cost also helped lead the firm to an outsourcing deal, according to Bruce W. Roat, chief financial officer at the $600 million bank. Under the agreement, Unisys will run all of the bank's IS functions, including its data center, host and check processing, application support, data communications and branch automation.

The deal allows California Republic to upgrade its IS infrastructure without the cost of adding new technologies such as Unisys' Item-Image Processing system, an image-based check processing system. "Over time, there will be significant upgrades to the data center," Roat said. "We've projected a widening gap in how much it would have cost Unisys to do it and what it would have cost us," he added.

As part of the contract, Unisys plans to use the bank's data center as a platform to serve other prospective outsourcing customers in the Western U.S. Though a decision has not yet been reached, Roat said the bank could stand to share revenue with Unisys as part of the commercial service agreement.

Joint partnering on IS services by outsourcing customers and their vendors is not unique, said Ladd Willis, managing vice president at First Manhattan Consulting Group in New York. Willis said many banks that enter into such agreements with outsourcing vendors usually receive a percentage of revenue based on IS services the vendor provides to other firms using the customer's data center.

Roat would not specify the deal's projected cost savings in dollar terms, but he did say that the bank expects to reduce its IS operating expenses by 20% within five years by outsourcing its operations. Had the bank continued to run its own IS operations, Roat predicted, the costs to run its IS functions would have increased 15% annually.

Roat said Unisys has hired all of the bank's 70 full-time IS staffers, including MIS manager Kenneth McMillan, who will oversee the data center.

The data center houses Unisys V510 and V380 mainframes and other equipment.

The first scheduled project under the agreement has already started, Roat said. Unisys is replacing the bank's overburdened analog data communications system with a point-to-point digital data network. Following that project, Roat said, Unisys plans to upgrade branch automation systems at the bank's 14 branches in Kern County and Northern Los Angeles County.

Users share stories of downsizing pros, cons

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — They may have walked in wearing rose-colored glasses, but attendees at last week's Downsizing/Rightsizing conference left with their eyes wide open after getting an earful of advice from downsizing veterans.

Many of the downsizing problems experienced by attendees at the conference were staff-related, executives said.

Richard L. Kolbe, director of MIS at Harley-Davidson, Inc. in Milwaukee, said his information systems staff members underwent four weeks of training in an IBM Application System/400 midrange environment when the motorcyle maker started testing the computers. Unfortunately, Kolbe said, no one took the training seriously.

"People didn't show much interest, since they thought [the AS/400 platform] was just a passing fancy," Kolbe added. Once Harley-Davidson decided to downsize from its NAS 9060 plug-compatible mainframe to the AS/400 environment in mid-1991, its IS staff had to be retrained.

This forced Harley-Davidson to double its initial training costs and write off the original four-week training session.

Yet, Kolbe and other attendees said that overall, downsizing is justifiable.

For example, Bill Sheridan, manager of office technology at Baxter Healthcare Corp., said his company has reduced its mainframe reporting overhead by 80%, or $28,000 per month, since it began downsizing to a personal computer local-area network environment.

In addition, Sheridan said, Baxter is delivering data 30% to 50% faster under the PC LAN environment than it was able to do through its former mainframe platform.

However, Rogers Group, Inc., a $200 million Nashville-based contractor in the middle of a five-year migration from an IBM 4381 mainframe platform to a Unix-based client/server environment, has experienced mixed results in terms of cost savings.

Rogers Group is paying one-tenth the maintenance fees for system software that it paid under its IBM 4381 mainframe environment, according to Thomas J. Gmitter, director of information services at Rogers Group.

On the downside, Gmitter said, the contracting firm underestimated the overall cost of the project. "We had a ballpark figure for downsizing, but we ended up getting blindsided by some telecommunications costs" for LANs and wide-area networks, Gmitter said. Hardware and software costs are easy to project, he explained, but he warned conference attendees to beware the hidden costs of telecommunications.

It is more difficult to project telecommunications costs, Gmitter said, because prices for telecommunications services and equipment vary widely, unlike commodity items such as PCs.

Although the project has been successful thus far, Gmitter said, the firm encountered an unexpected snag — fallout from the merger of AT&T and NCR Corp. As part of the new client/server configuration, the company decided to use AT&T's StarServer E LAN servers.

Since NCR took over support for Rogers Group's hardware, Gmitter said, the service has been "substandard," particularly for Rogers Group's AT&T servers.

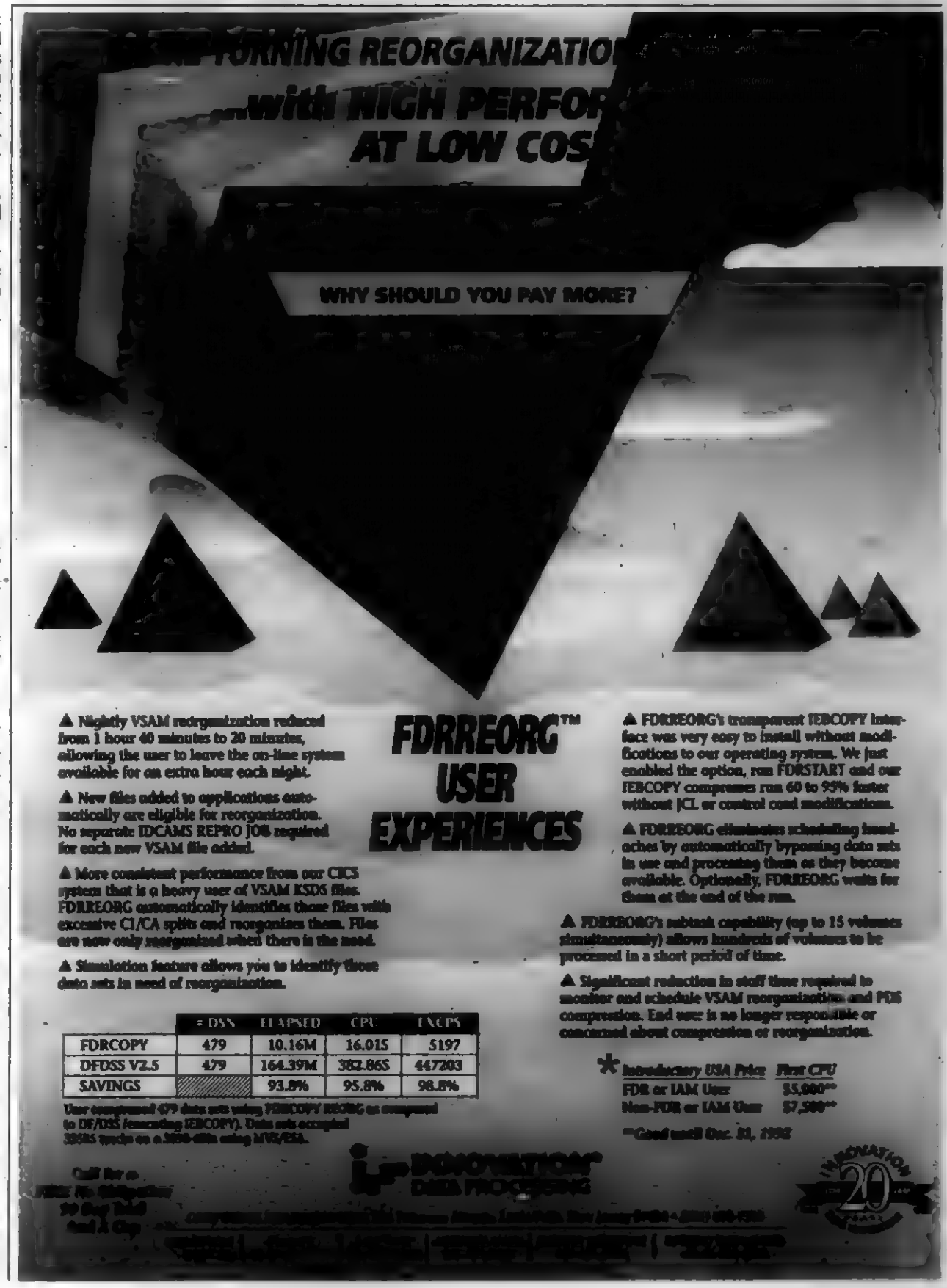
For example, Gmitter said it took a full seven months before NCR isolated a major glitch with faulty backplanes in the servers. As a result of the poor service, Gmitter said, Rogers Group plans to move to another hardware vendor during the next 18 months.

Gmitter said he expects the move to provide Rogers Group with more reliable support during its migration to the Unix client/server platform.

What pearls of wisdom does Gmitter offer to others who are considering downsizing? "Know your vendors very well," Gmitter cautioned.

Harley-Davidson's Kolbe: *Staff considered AS/400 'a passing fancy'*

> "WE HAD A ballpark figure for downsizing, but we ended up getting blindsided by some telecommunications costs" for LANs and wide-area networks.
>
> THOMAS J. GMITTER
> ROGERS GROUP



Global firms eye frame relay

Technology preferred over X.25 packet switching to link remote LANs

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Corporate telecommunications managers attending a global networking conference here last week said they are looking to install international frame-relay networking services as the best way to interconnect their local-area networks worldwide.

This is despite the fact that such services are still sparse, limited and vulnerable to the glitches that overseas networks are famous for, according to conference sponsor The Yankee Group in Boston.

Frame-relay services attain faster throughput than do older, packet-switched technologies such as X.25 by eliminating overhead associated with acknowledging receipt of transmissions by each node along the way. But frame relay's speed advantage works only over reliable lines that do not require frequent retransmission because of error, according to Berge Ayvazian, Yankee Group's vice president in charge of communications research.

As a result, such services will work well only in major metropolitan areas and modern countries where reliable, digital, fiber-based lines are primarily available, Ayvazian said. Indeed, carriers such as AT&T, Infonet and BT are limiting their initial overseas frame-relay offerings to just those regions (see chart).

Coming into focus

The global frame-relay market will soon be served by various vendors

Carrier	Area	Planned Availability
AT&T	UK, France, Germany, Belgium, the Netherlands, Spain, Sweden	4th quarter 1992
BT	London and Paris	Now
	Amsterdam and Frankfurt, Stockholm, Brussels, Zurich and three more locations in the UK	Year-end 1992
	Madrid and Edinburgh	1st quarter 1993
Cable & Wireless	Europe — 17 nodes	Mid-1992
	UK	
	Hong Kong — 1 node	
	Japan	1993
Infonet	Canada, Hong Kong, France, UK, Germany, Sweden, Finland, Belgium, Switzerland, the Netherlands	Second half 1992
Sprint	London and Tokyo	2nd quarter 1992
CompuServe	London	1992
	Frankfurt	
	Toronto	

Source: The Yankee Group — CW Chart: Janell Genovese

However, a significant number of international firms said they still see frame-relay services playing a valuable role in their international networks. A recent survey of 92 European companies by Yankee Group's European division found that 15% of users plan to interconnect their LANs via frame relay; 24% by Integrated Services Digital Network (ISDN); 33% via leased lines; 24% via X.25; and 4% by other means.

On this side of the Atlantic, both General Electric Co. and Frank Russell Co. are moving aggressively to bring frame relay onto their international networks.

GE, which broke new ground three years ago by outsourcing its overseas network to AT&T, France Telecom, Inc. and BT, is preparing to upgrade that network to support a mix of inverse multiplexing, asynchronous transfer mode (ATM), frame relay and ISDN services, said Barry Volante, program manager of telecommunications planning.

For GE, the main attraction of those technologies is their ability to handle a range of protocols, applications and aporadic, "bursty" bandwidth demands, Volante added.

GE has been testing frame-relay services that can provide links of 64K to 512K bit/sec. and plans to begin deployment of a multicarrier, frame-relay network by year's end, Volante said. "I think there are enough frame-relay facilities in Europe to satisfy most users in most main areas; they are adequate for us."

Backbone planned

By the middle of next year, GE hopes to deploy an ATM backbone, probably both here and in Europe, Volante said. "It all depends on how fast the vendors deliver; our experience has not been good on that."

ATM's cell-relay technology is said to support higher speeds and more flexible allocation of bandwidth among devices than does frame relay.

One issue likely to catch a number of global users is migration from value-added networks — as in the case of Frank Russell — if they have "outsourced" the operation of those networks to a carrier.

The Tacoma, Wash.-based financial services firm is in "serious discussion" with its carrier, BT, about how it might link its LANs over BT's frame-relay services, said Bill Branson, a senior network engineer.

Branson said BT's frame-relay connection would cost $750, or approximately half the price of an X.25 or 9.6K bit/sec. leased-line link.

However, his firm cannot do away with X.25 completely, partly because frame relay will probably be feasible only in certain parts of the globe: "We feel safe with New York, London" and Pacific Rim areas that will be linked shortly by AT&T's fiber-optic backbone, he said.

In addition, Frank Russell needs X.25 to connect Wang Laboratories, Inc. systems. "If we just wanted LAN connections, we'd install a Cisco router," which supports frame relay, Branson said. He said he is discussing with BT the possibility of installing Telematics International, Inc. X.25 packet assembler/disassembler boxes. The X.25 packets would be encapsulated in frame relay so that both types of traffic could go over the frame-relay connection.

NetWare SNA Links sidesteps routers

BY ELISABETH HORWITT
CW STAFF

SUNNYVALE, Calif. — Novell, Inc. last week announced what it called an interim solution for IBM shops that are not quite ready to install router-based links between local-area network sites but that would still like their remote LAN users to be able to share resources. However, according to at least one beta-test user, the trade-off for convenience may be a throughput too slow for some of the feistier LAN applications.

Novell's NetWare SNA Links is a NetWare Loadable Module (NLM) said to enable a NetWare server to encapsulate Novell IPX traffic inside Systems Network Architecture (SNA) packets and send it to remote servers using IBM 3745 front-end processors as routers. Based on Novell's NetWare for SAA NLM, the product precludes the need for traffic to go through IBM mainframes by making use of peer-to-peer SNA protocols, Novell said.

The advantage of this setup is that it enables users to interconnect their LANs via existing network facilities. Many LANs are already linked to IBM front ends to gain access to IBM hosts. And IBM has been steadily bettering its front ends' ability to support multiprotocol LAN traffic.

Danny Thomas, a state of Florida communications engineer who beta-tested the product, said the main disadvantage of NetWare SNA Links is the 56K bit/sec. throughput supported by NetWare for SAA gateways. "The product executed major applications flawlessly; we just had to wait," he said.

On the other hand, NetWare SNA Links eliminates, or at least puts off, the need to set up a new and expensive internetwork of routers and leased lines, a Novell spokesman said. Indeed, Novell expects many users to implement its product as a stopgap while they are moving their LAN traffic off the SNA backbone and onto Novell IPX or Transmission Control Protocol/Internet Protocol-based routers, he added. "Many [user] companies are doing that, but it takes a big investment; meanwhile, [SNA Links] offers a cheap, simple solution."

The state of Florida, for example, will use NetWare SNA Links as an "intermediate step" until the government agency brings in routers to interconnect its Novell LANs, Thomas said. "Right now, it's a pretty cheap way to link LANs together using our existing investment" in IBM front ends and Novell NetWare for SAA gateways, Thomas said.

The product could also be viewed as an interim step for companies that are committed to using IBM's Advanced Peer-to-Peer Networking (APPN), the Novell spokesman indicated.

The question is how many companies want to use their SNA front ends as LAN switches, even temporarily.

"We're considering APPN as a way to make it easier to connect our [IBM host] data centers, but not for LAN-to-LAN traffic," said Pat Carragee, assistant commissioner for network systems at the City of New York Computer and Data Communications Services Agency.

NetWare SNA Links is said to use Novell's packet-bursting capabilities to send multiple packets at once. The product is available in 1-, 20- and 60-server packages at $1,250, $18,000 and $40,000, respectively.

Novell plays Navigator in network turbulence

BY ROSEMARY HAMILTON
CW STAFF

PROVO, Utah — Novell, Inc. plans to begin shipping a software distribution tool this week that is said to tackle a critical user problem: easing the installation and maintenance burdens of running multiple applications on a network.

When Network Navigator DOS-LAN Distributor Version 2.0 hits the market, Novell will beat out other firms, including Lotus Development Corp., that have promised but not delivered similar products.

Lotus, which has not yet revealed an official shipping date for its offering, code-named Lynx, now says the software will work with the upcoming Notes Version 3.0, instead of Version 2.1 as was originally planned. This should delay its delivery until early next year.

Software distribution management is becoming more of a key issue for users as the mix of applications, operating systems and personal computer platforms grows more complex and costly.

At Price Waterhouse, an application bug fix alone can be a major problem, said Sheldon Laube, national director of information technology.

"The cost, when you are talking about 15,000 PCs, can be extraordinary," Laube said. "And how do you organize it? We need an automated method. We've been beating up [vendors] for this for two years."

However, Laube has not yet seen the Novell product, although he has tested Lynx. He said it addresses the "bulk of the software distribution issues."

The Novell product is a revamped version of an Annatek Systems, Inc. offering that has been on the market since the late 1980s. Novell acquired Annatek earlier this year. As a Novell product, Navigator no longer requires a mainframe host and can reside on a local-area network server instead.

The current version supports both Microsoft Corp. DOS and Windows environments and has a license fee of $1,000 for five nodes. An IBM OS/2 version is now in beta testing, said Barbara Goldworm, a product line manager at Novell.

Meanwhile, Goldworm said Novell and Lotus have discussed their products, although she could not provide details.

Michael Mitsock, a senior product manager at Lotus, said the two products could complement each other because the Novell offering focuses on distribution while Lotus' Lynx will zero in on asset management.

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AMR sues partners over failed venture

CONTINUED FROM PAGE 1

ers, an issue believed to be a focal point in the partner's settlement claims.

At issue is the disbursement of funds and assets of the project, including millions of lines of decision support, database and application code.

Assertions of a cover-up started percolating last spring, initiated by Max Hopper, IS chief at AMRIS' sister company, American Airlines. Hopper had been dispatched by parent AMR Corp. to assess the AMRIS situation. He subsequently issued an internal memo criticizing AMRIS managers because they "did not disclose the true status of the project in a timely manner."

Although about that time AMR fired or reassigned about 22 IS managers at AMRIS, it claimed it did not fire them for concealing information. The company has also retracted Hopper's earlier cover-up stance and said last summer that it was investigating whether a cover-up occurred. An AMR spokeswoman last week declined to say where that investigation now stands.

The AMR suit makes no mention of the cover-up assertions. As of late last week, none of the user partners had filed counterclaims or otherwise raised the alleged cover-up in court.

A Budget spokesman last week said, "We were surprised that AMR elected to file at this point in time." He added that Budget "had been in ongoing settlement discussion with AMR, and those conversations were amicable."

He also said Budget "strongly disagrees" with claims by AMR in its suit that the user partners "were somehow responsible for the failure of Confirm."

The Budget spokesman declined to state whether Budget plans to file a counterclaim. Hilton and Marriott both refused to comment on the suit and their efforts to settle with AMR.

The suit charged Marriott and Budget with failing to make "required partnership contributions" while still involved in the project and said Hilton "formally withdrew from the partnership," an action prohibited by the partnership.

These actions, AMR stated, "are in violation of their contractual and fiduciary duties pursuant to the Confirm partnership agreement and have frustrated and rendered impossible the achievement of the partnership objectives."

AMRIS also alleged that the user partners missed a deadline for providing a clear definition of system functionality, subordinated the goal of developing a marketable system to developing one suitable to their own needs and failed to assign knowledgeable personnel with decision-making authority to the project. The partners also impeded progress by insisting on including unimportant features in the system, AMRIS claims.

AMRIS accuses Marriott of having "formulated a plan to assign blame for any delay in completion of the Confirm project to AMRIS and to withdraw from the partnership."

According to the AMR filing, the Confirm agreement limits AMRIS' responsibility for cost overruns to 20% of the fixed price of the contract.

Meanwhile, the user partners are seeking solutions for upgrading their reservation systems and filling the void left by Confirm's demise. Budget has said it has talked with outsourcers, including Electronic Data Systems Corp. [CW, Aug. 17], while also reviewing either upgrading its existing system or developing a new one on its own.

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CA settles suit with Boston bank

BOSTON — Computer Associates International, Inc. has reached an out-of-court settlement with State Street Bank and Trust Co., which it sued last year based on claims the bank was operating as a service bureau using CA software without paying proper licensing fees.

Lawyers representing State Street Bank refused to comment on the settlement beyond confirming that the suit was settled two weeks ago. Arnold S. Mazur, executive vice president at CA, said a cash payment was made, but he declined to say to whom and how much money changed hands. The original suit claimed that State Street owed CA back royalties of at least $8 million.

State Street was permitted to run CA's Datacom/DB database management and other system software in a time-sharing, service bureau and/or remote batch environment under a fee structure that fluctuated depending on the amount of users accessing the software. CA had alleged that State Street only paid licensing fees entitling it to run jobs for 15 users, which CA claimed the bank exceeded.

Following the settlement, Mazur said the two parties signed a new mainframe CPU-based licensing agreement for State Street's main data center and another data processing facility.

THOMAS HOFFMAN

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GSA Number GS00K90AGS5251-PS02.

Compaq closes umbrella on server foes

BY MICHAEL FITZGERALD
CW STAFF

HOUSTON — "It's sunburn time!"

So said Compaq Computer Corp. last week to other clone makers, previewing the ProSignia and SystemPro/XL server lines, which debut today.

"We are closing the pricing umbrella and buying up all the [sunblock]," declared Virgil Hornstein, director of systems marketing at Compaq's North America division.

Compaq's assessment was supported by analysts, who said that ProSignia's aggressive pricing and excellent feature set look likely to be a winner in the market.

"At five grand for a 100-person server with its features, it sounds like a no-brainer," said Kimball Brown, an analyst at International Data Corp. in Framingham, Mass. "They essentially took the SystemPro, went through the whole list of features and eliminated everything people wouldn't pay extra for, like the automatic drive array and the second processor."

The ProSignia starts at $2,699 for a 33-MHz Intel Corp. 1486-based system with 4M bytes of random-access memory. Compaq will offer 11 models of the ProSignia, with five based on the 33-MHz 486 and six based on the 33-MHz/66-MHz 486DX2 dual-speed processor from Intel. The most expensive of these is a DX2-based model with 8M bytes of RAM and a 1G-byte hard drive for $8,789.

High marks

Users contacted spoke highly of the new system. ProSignia "fits well between the two lines [DeskPro M and SystemPro/LT] we're currently buying from Compaq," said beta-test user John Brozowski, personal computer local-area network technical manager at United Parcel Service, Inc. in Mahwah, N.J. "It kind of fills a gap, where the M is a good low-end file server with no room to grow and the LT is overkill for a lot of people."

In addition, users said they welcomed Compaq's move to providing seven-day, 24-hour service and a three-year warranty for the new servers.

Analysts did caution that the ProSignia line was likely to take sales away from the LT line.

Brozowski cited Compaq's decision to use a standard Fast Small Computer Systems Interface-2 controller in the ProSignia as a feature he particularly liked. Analysts noted Compaq's addition of remote management features to the ProSignia as another factor that will win points for it in the market.

Gary Stimac, Compaq senior vice president and general manager of the systems division, said ProSignia's new lower pricing means Compaq will begin charging for some systems engineering services it previously gave out for free.

Stimac said that decision was driven by watching accounts buy a Compaq server, learn the network with help from Compaq's systems engineers and then buy less expensive servers.

"We are not going to get beaten by a company like Dell on performance and value, but at the same time, we've built as much support into the system as possible, and if people want more, they will have to pay something for it," Stimac said.

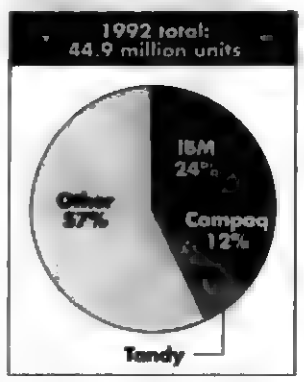
Compaq also released four models of the SystemPro/XL and a redesigned high-end model with a new architecture, called TriFlex, designed to support up to four processors. The company also released ProLiant, an external storage system.

Analysts downplayed the high-end XL product.

"The best of [that] is yet to come," said Cheryl Currid, president of Currid & Co., a consultancy in Houston.

Serving somebody

Compaq hopes its new generation of servers can help close the advantage held by IBM in the Intel-based arena



Source: Computer Intelligence/Infocorp

Start-up pumps up Ethernet network

CONTINUED FROM PAGE 1

said Mark Kuester, supervisor of data communications engineering at Alabama Power Co. in Birmingham. "However, I'm afraid we're going to have to go with FDDI within the year.

"If I make a big investment in 'almost standard' products, what do I do when the standards come out?" he asked.

The goal of Grand Junction's technology — dubbed "Fast Ethernet" — is to offer a more incremental transition to faster networks than 100M bit/sec. Fiber Distributed Data Interface (FDDI) and its copper-based counterparts can provide.

Fast Ethernet is possible because of the internodal distance-stretching allowed by today's star-wiring hub LAN schemes, explained Ethernet inventor Bob Metcalfe, a "founding board member" and investor in Grand Junction as well a co-founder of 3Com. Metcalfe is also publisher and chief executive officer of *Infoworld*, a sister publication to *Computerworld*.

Grand Junction, which announced its formation here last week, said it anticipates product availability by the end of 1993, with per-connection prices "in the range of two to three times that of current 10Base-T cards for 10 times the throughput," said Jack Moses, vice president of marketing at Grand Junction and former 3Com manufacturing vice president.

Will pay the price

10Base-T is the name for 10M bit/sec. Ethernet running over unshielded twisted-pair wiring. The pricing formula translates into $400 to $600 per connection, compared with current 10Base-T prices of about $200.

"I'd pay $500 or $600 per card," said Robert Gullett, a network analyst at Allied Van Lines, Inc. in Naperville, Ill., which currently pays about $180 per 10M bit/sec. for a 3Com Ethernet card. "But I wouldn't go as high as $1,000."

Fast Ethernet could be a nail in the coffin of emerging FDDI technology over unshielded twisted-pair wiring from a price and ease-of-migration standpoint (see story below).

On the other hand, FDDI prices have been falling by half for the last two years, so it is feasible that when the first 100M bit/sec. Ethernet links emerge, the prices could be comparable, analysts noted.

Grand Junction's Fast Ethernet is being billed as a to-the-desktop solution for LAN-oriented multimedia and other high-bandwidth applications. However, other vendors intend to prove that multimedia can run just fine over 10M bit/sec. Ethernets with product demonstrations next week at Networld '92 in Dallas (see story at right).

Some analysts are skeptical that any shared-medium LAN will be appropriate for delay-sensitive traffic, such as audio.

Doug Gold, director of communications research at International Data Corp., said, "I don't buy Ethernet for multimedia; there's too much overhead associated with the delay" caused by Ethernet's contention access method.

Some users are content with life-prolonging technologies available for Ethernet, such as switching hubs that dedicate a full Ethernet's 10M bit/sec. capacity to each desktop. "We already segment our networks quite a bit," said Joe Cesario, vice president of technology and development business systems at the First National Bank of Chicago. The bank uses Alantec Corp. PowerHubs for dedicating Ethernets.

"I do anticipate that by the end of next year we might be getting into multimedia applications that would drain bandwidth," he said.

"We could do that with more PowerHubs or a faster medium," Cesario said.

Is Fast Ethernet worth it?

PROS

- Designers, channels and users transfer Ethernet skills.
- Any existing software relying on the Ethernet format would not have to change.
- Devices currently able to translate Ethernet signals should be able to coexist with Fast Ethernet.

CONS

- Late start in lengthy standards process could keep some users away.
- Introducing another technology choice could stall user implementations.
- For multimedia applications, may not be equally as reliable as emerging technologies designed to handle delay-sensitive traffic, such as Asynchronous Transfer Mode and FDDI-II.

Networld demos

While the industry ponders whether any shared LAN is reliable enough for delay-sensitive multimedia traffic, several vendors intend to demonstrate applications such as training videos, retail point-of-sale and video databases running over existing LANs at next week's Networld '92 show in Dallas.

For example, the team of Alantec, ProtoComm, Inc. and Intel Corp. plans to demo full-screen, full-motion video over Ethernet using off-the-shelf products.

"For real-time video and audio, you need some way of overcoming Ethernet's contention scheme," Yancy Lind, director of marketing at Dallas-based Alantec, said. "You can do that either with private Ethernets" provided by Ethernet switchlike devices such as Alantec's PowerHub, Synernetics, Inc.'s Lanplex or Kalpana, Inc.'s EtherSwitch, "but we've found that we can support five full-motion audio/video sessions simultaneously across a single [10M bit/sec.] Ethernet."

In the demo, Alantec's hub will supply the transport, while Intel will provide the compression board. ProtoComm will provide its VideoComm video server, which runs as a Novell, Inc. NetWare Loadable Module. VideoComm is an extension of NetWare allowing video files to be placed on a Novell server and played back in a client/server scenario, said Dan Heist, president of the Trevose, Pa., multimedia application developer.

"Ethernet is a good technology for client/server applications where you're sending traffic point-to-point or from a server to many workstations but isn't as good for teleconferencing," he explained.

The setup costs about $2,000 per seat, including hub port, compression board and VideoComm client and server software, according to Lind.

Meanwhile, Fibronics International, Inc. will team with other vendors "to marry the LAN infrastructure with video requirements," said Moshe Levin, corporate vice president for marketing and business development at Fibronics. Starlight Networks, Inc. will demonstrate StarWorks software, which is said to transform an I486 EISA computer into a video server supporting up to 20 users simultaneously on one Ethernet.

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Big changes in store for DEC

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Setting a decisive tone, Digital Equipment Corp. Chief Executive Officer Robert Palmer confirmed last week to analysts and the press an evolving billion-dollar cost-cutting plan and customer-bonding efforts.

The cost cuts will come primarily in the form of further layoffs and a streamlining of DEC's product offerings and business units. Palmer said he would not give specifics about the reorganization, but he did say that the multitude of DEC hardware organizations will be brought under one group and that redundant products, particularly hardware, will be phased out.

"The historically high margins on hardware and the business model upon which Digital was built are no longer sustainable," Palmer said. "We will eliminate redundancy and simplify our product set."

New business units, which will be announced later, will have greater autonomy and more of a marketing orientation than the current structure, he said [CW, Sept. 28]. Similar to the personal computers announced in August, DEC will also institute new approaches to modular computing and flexible manufacturing. "This will allow us to respond to customer demand by putting subsystems together in a wide array of cost-effective, flexible combinations," he said.

Stella Johnson

Palmer will cut $1 billion through layoffs and product streamlining

A new DEC vice president of engineering will oversee the streamlining and development of all product lines. That person will be chosen from within DEC in a few weeks. Sources said Bill Strecker, vice president and chief of technology, is likely to fill the spot. Palmer emphasized, however, that the company will seek fresh blood from outside the company as part of a higher level managerial shakeup.

DEC's Alpha AXP 64-bit platforms, the rollout of which is expected to begin next month, according to sources, are the "necessary but not sufficient cause" of DEC's recovery, Palmer said.

Analysts agreed with Palmer that DEC must both cut costs and generate revenue.

Areas of focus will include systems integration, which according to Palmer is profitable, grew 20% for DEC per year and for which revenue exceeded $2 billion for the last fiscal year. DEC integration software, such as Network Application Support products and networking, will be a key aspect to that strategy, Palmer said.

Educating DEC sales representatives and customers as to the added value of such software services and being able to then charge appropriate prices will be challenging for DEC, however.

Overall, analysts said they were impressed.

"There will be no more of the emperor's new clothes games. Palmer . . . discussed [problems] with more candor than I'm used to hearing from DEC," said Terry Shannon, president of Gander Resources, a market research firm in Ashland, Mass.

Palmer speaks

DEC will act to better link engineering projects to specific customer requirements, CEO Robert Palmer said in an interview with *Computerworld* last week.

Acknowledging that DEC's engineering-centric focus in the past has led to product overlap and products that were "different just to be different," Palmer said DEC will now make customer account managers "a conduit for putting [customer] information into the business units. The units will then make decisions based on inputs from all accounts." He said business units will be measured on a profit and loss basis.

"It will be a formal way for turning customer input into engineering proposals. We . . . have been on the mark many times, but we've also had misses and redundancy in our product set that we can avoid in the future," Palmer said.

He refused to be specific about which products might be discontinued until "the [decision] process is finished." But analysts suggested that those products might include VAX 9000s, DECstations, certain PDPs and storage offerings. Palmer emphasized that DEC will "continue to provide migration paths."

Cost-effective investments in engineering will allow DEC to reallocate more resources to software and to focus more effectively on targeting Unix and Microsoft Corp.'s Windows New Technology environments, while continuing to support Open VMS, Palmer said. He added that DEC has some catching up to do in the commercial Unix arena. "We are investing heavily in OSF/1 . . . [and] we are behind our own schedule [for Unix OLTP] somewhat. We have to bring that back into line," he said.

DEC will be simplifying its pricing structure and business practices to make it easier to buy products from the company, Palmer said.

DEC will also seek outside managerial expertise to address a long-standing problem for the company: marketing.

"We don't do a good job of explaining our vision and the vast breadth of solutions that we offer. We have not valued marketing as a discipline and as an honorable profession," Palmer said.

Palmer said the company does not have the time now to include customer input on field personnel decisions because of its financial situation. It will attempt to in the future, he added.

MELINDA-CAROL BALLOU

Silver lining for America West IS

CONTINUED FROM PAGE 1

Since the airline declared bankruptcy in June 1991, its IS personnel have endured job and pay cuts, while hardware and software vendors have been forced to accept huge reductions under renegotiated lease payments.

Meanwhile, the IS department has boosted its efficiency and improved service to end users by bringing in modern systems development tools, methodologies and management practices.

America West began service nine years ago, and during most of the 1980s its revenue — but not its profit — climbed like a jet, reaching a cruising altitude of $1.4 billion last year.

But a string of misfortunes and missteps — including the recession, a drop in air travel during the Persian Gulf conflict and a disastrous foray into trans-Pacific routes — sent the company into a nosedive, forcing it to post losses for each of the past eight quarters.

Since the Chapter 11 filing, a cost-cutting binge has trimmed unprofitable routes; customer service has improved; and $53 million in new financing was received, including $8 million in loans from optimistic local businessmen.

Looking under rocks

Meanwhile, America West's IS department is doing its part to cut costs, and its IS budget has fallen from $17 million to $14.6 million during the last couple of years. "There is no rock we aren't turning over," said Thomas L. Smith, the airline's vice president of IS.

So far, the airline has found quite a bit of gold under those rocks. It renegotiated leases with all of its hardware and software vendors, cutting operating costs 25% to 50%. "It's one of the lovely things you get to do when you're in Chapter 11," Smith said.

Smith said he brought in major outsourcing vendors, but none could find additional cost savings. "They looked at our numbers and said, 'I don't believe this,' and they basically just backed off. In every case with them, our costs would have gone up," he said.

"We have also, unfortunately, taken money away from our people," Smith added. Indeed, the airline first froze salaries — already below industry averages — then cut them 10%, leaving IS staffers earning 20% to 25% below industry norms, according to Smith. "We lost a lot of people," he acknowledged.

The punishing financial situation has left little room for perks in IS. A number of IS employees wear shorts to work, unusual even in a place where summertime temperatures top 100 degrees for weeks on end. "The dress code was something we could give them when we couldn't give them anything else," Smith said.

"It's been kind of a roller-coaster ride," said Rod Yacovetta, team leader for financial applications. "I've seen it go from real bad to real good to real bad and back. But we're definitely on the right track now, and I think morale will only continue to improve."

Smith said turnover in IS has been high, and staffing has fallen by 20%, to 197 employees, during the past two years. But by making IS more cost-effective and responsive to user needs, the retrenchment spawned a more challenging, leading-edge, technological environment that enabled the airline to hang onto many of its best people.

New machines

For example, in came an IBM 3090 mainframe, computer-aided software engineering tools from Atlanta-based KnowledgeWare, Inc., a development methodology from James Martin & Co. in Reston, Va., and rigorous project management practices.

In the process of being phased out are a Unisys Corp. 1194 mainframe, the Unisys Mapper fourth-generation language and chaotic approaches to system development.

Smith acknowledged that the IS department had nowhere to go but up when he joined the company late in 1989. Pulling out slides used in a management presentation, he ticked off 23 serious IS flaws then found at America West, including poor service, poor user relationships, low morale, no project schedules, equipment running at capacity, redundant applications and incomplete data.

He said IS efforts during the 1980s were marked by a haphazard, piecemeal approach dominated by contractors, not all of whom left behind good software and good documentation as they hurried, check in hand, out the door.

As IS is helping the airline recover, so the bankruptcy has helped IS, Smith said. "All our applications were pretty shaky. Chapter 11 made us slow down, and it allowed us to go back to users and identify their needs."

For example, Steve Hawes, manager of customer service administration, said IS developed tracking and analytical software to support Operation Baggage Storm, a project that propelled America West over the course of a year and a half from the bottom to the top of the industry in baggage handling performance.

The first major project in the new IS regime was to enhance a key application for measuring the profitability of air routes, move it from the Unisys to the IBM system and expand the base of users.

The profitability tool is aiding the airline's recovery by enabling it to beef up its most profitable routes while pinpointing low-margin routes, said Lynn Caddell, director of IS development.

NextStep 486 faces uphill climb

BY JAMES DALY
CW STAFF

REDWOOD CITY, Calif. — Next, Inc.'s recent announcement of a fat sales contract with Chrysler Corp. subsidiary Chrysler Financial marks an early win for a new version of the NextStep operating system, which operates on personal computers running Intel Corp.'s i486 microprocessors.

Chrysler Financial plans to purchase 2,500 copies of NextStep 486, a version of the NextStep 3.0 object-oriented operating system that will boast snazzy multimedia functions and sophisticated application development capabilities when it ships early next year.

"Next was never an option before because we had no interest in going to a new platform," said Mike Adelson, project manager of branch automation and retail systems at Chrysler Financial. "Plus, we always thought Next's workstations were too costly, so we always looked for DOS- and Windows-based solutions."

Southfield, Mich.-based Chrysler Financial will use NextStep 486 in a client/server environment to support its branch organization, which includes more than 100 branches in North America.

Next Chairman Steven Jobs has called NextStep 486 the "Trojan horse" that will finally get the firm's foot in the door of corporate America. San Jose, Calif.-based research firm Dataquest, Inc. estimated the installed based of 486-based computers to be approximately 2 million.

But analysts said they do not expect NextStep 486 to work miracles for Next because of its limited appeal to the high end of the PC market. "NextStep 486 will make some users who have always thought of NextStep as a strange and proprietary operating system turn around and give it a second thought," said Paul Cubbage, an analyst at Dataquest. "I'm a little skeptical [about] how much new market it will provide. It will make Next stronger in the high-end applications development market, where they are already a player, but in the DOS world it's going to be lost in the noise."

Potential cost concerns

Beyond any mind-set barriers it may need to surmount, the company also faces thorny financial obstacles in selling to 486-based PC users. In addition to shelling out $995 for the user version of NextStep 486, users may need to purchase extra circuit boards, memory and disk drive capacity to bring a typical 486 PC up to the sophisticated color, sound and video capabilities of the Next machine — which could add several hundred dollars to the cost of the machine.

Next users said they hope to see an application windfall as a result of NextStep 486. "Anything that increases the number of people using NextStep increases its appeal to developers, and that means more and better applications for me," said Eric Spahr, a vice president at Shearson Lehman Brothers, Inc. in New York who has equipped his traders with the NextStation.

Some current Next users just see NextStep 486 as a facilitator for easing the environment into their DOS-centric organizations. "People don't want to think that they have to junk their systems to tap into the Next OS; NextStep 486 will lessen that perceived risk," said Vincent Annunziata, president of MC² Technologies in Westport, Conn., a subsidiary of Phibro Energy, Inc.

IBM, Motorola bow RISC chip

BY MARYFRAN JOHNSON
CW STAFF

AUSTIN, Texas — In an industry where meeting a deadline is the equivalent of arriving months early, IBM and Motorola, Inc. were gleeful last week about their first production of the PowerPC 601 microprocessor chip.

The vendors raced through design and first fabrication in 12 months to produce a reduced instruction set computing (RISC) chip they claim equals the performance of leading RISC microprocessors but is only half the size.

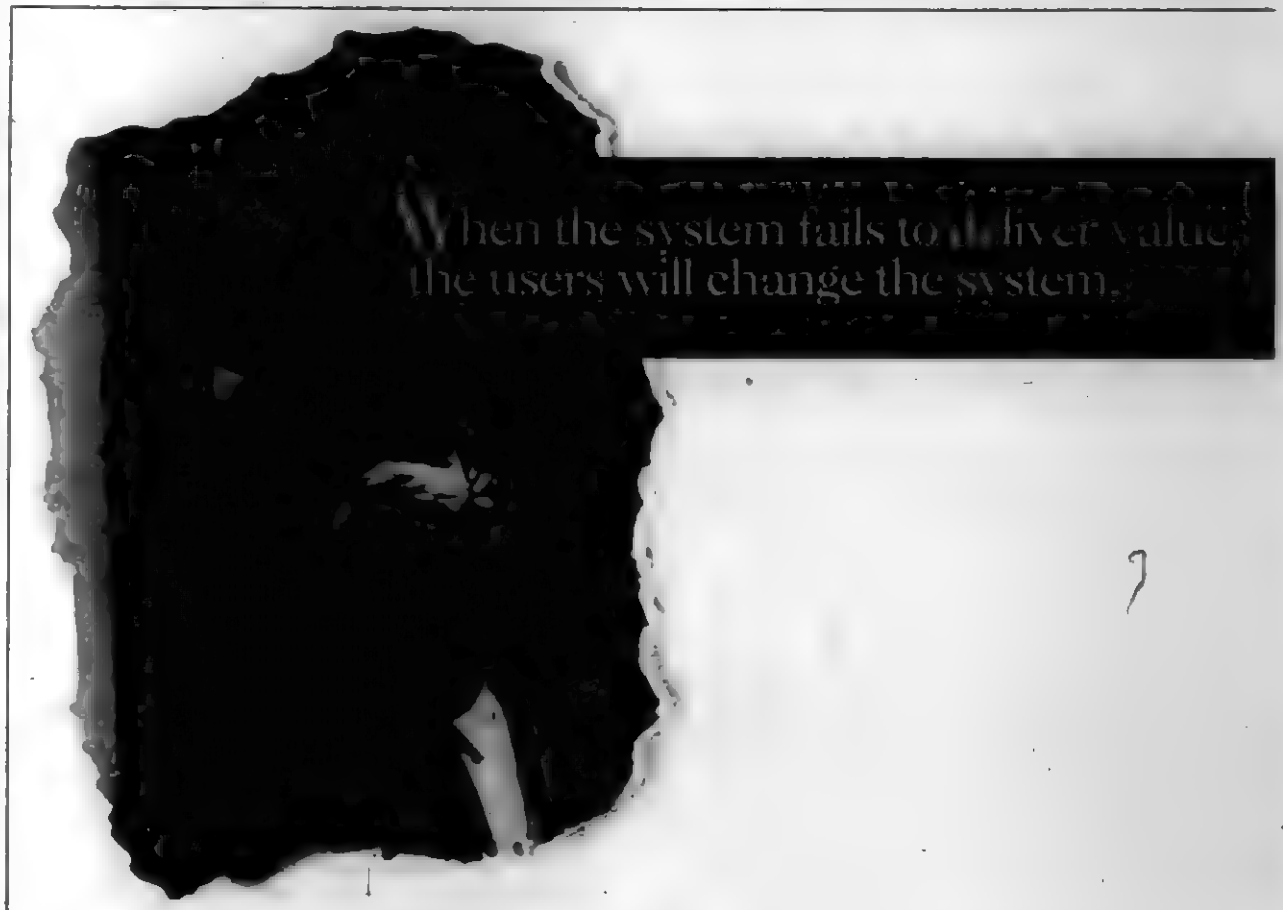
The PowerPC chip — a hybrid of Motorola's 88110 chip and IBM's RISC System/6000 chip — packs 2.8 million transistors into dimensions of approximately four-tenths of an inch per side.

The 601 chips will be offered in versions running at clock speeds of 50 MHz or 66 MHz.

Products using the 601 are expected in 12 to 18 months from IBM, Apple Computer, Inc., Groupe Bull and Thomson-CSF. Follow-on PowerPC chips, the 603, 604 and 620, will see first silicon near the end of 1993, IBM said.

Phil Hester, vice president of systems and technology at IBM's Advanced Workstations and Systems Division in Austin, Texas, said the companies have no plans "at this point" to produce chips running on both the Motorola 88110 and RS/6000 architectures.

Current applications running under AIX on the RS/6000 will run without modification on the PowerPC chip, Hester said. Apple Macintosh users will be able to run their existing software under an emulation facility.



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NEWS SHORTS

High-end Amdahl machine ships

Amdahl Corp. said last week that it shipped the largest IBM-compatible mainframe ever, an eight-way processor that handles 350 million instructions per second. It is about 1½ times as powerful as an IBM Enterprise System/9000 Model 900, analysts said. Amdahl would not identify the first user of the Amdahl 5995M-9650 machine.

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Sun strikes object storage deal

Object Design, Inc. and SunSoft, Inc., a Sun Microsystems, Inc. subsidiary, announced a multiyear agreement to incorporate object storage technology into Sun Project DOE (Distributed Objects Everywhere). The agreement calls for Object Design, based in Burlington, Mass., to develop a Persistent Storage Manager Engine and license it to SunSoft.

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FDDI presses on

Two vendors last week expanded users' connectivity options to 100M bit/sec. Fiber Distributed Data Interface (FDDI) networks. Network Peripherals, Inc. has announced drivers for its Micro Channel Architecture (MCA) adapters so that they can support both IBM RISC System/6000- and Personal System/2 AIX-based servers along with Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager servers. The $2,695 to $4,995 adapters are available in versions for fiber or shielded twisted-pair media. Meanwhile, Crescendo Communications announced $1,495 to $4,290 32-bit MCA FDDI adapters for networking over fiber and unshielded or shielded copper.

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Wang ships Unix imaging product

Wang Laboratories, Inc. said it began shipping Unix-based imaging products last week, meeting a schedule laid out in June. Open/Image for AIX is a three-piece package: imaging systems software, priced at $1,600 per node; application programming interface software, priced between $4,300 and $29,900, depending on number of users; and Wang RISC series hardware, Wang's relabeled IBM RS/6000 line, priced from $19,500 to $97,500.

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Epoch unbundles

Epoch Systems, Inc. in Westboro, Mass., last week took its first step toward a software-only business model with the announcement of unbundled software for network backup. Epoch introduced its EpochBackup product for use on Sun's Scalable Processor Architecture platform for $9,900.

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CallPath gets smarter

IBM said a new release of its DirectTalk/2 voice-processing application for the IBM CallPath computer-integrated telephony product is slated to ship Dec. 4. DirectTalk automates the dissemination of information by giving callers telephone keypad access to information stored on computer databases. The new version runs on OS/2 2.0 and reportedly includes a text-to-speech feature that allows a computer to "talk" to callers.

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Short takes

Da Vinci Systems Corp. said last week that eMail for Windows 2.02 is slated to ship next week. . . . Santa Clara, Calif.-based **Software Publishing Corp.** has announced layoffs of some 15% of its staff, or 120 people. . . . Broomfield, Colo.-based **McData Corp.** claimed it became the first vendor besides IBM to deliver a 3270 controller with native Escon support when it released its LinkMaster 7100 Network Controller Release 3.0. . . . NASA selected **Hughes Information Technology Co.** in Reston, Va., for a $685 million contract to develop and operate a huge database system to support the $8 billion Earth Observing System series of spacecraft, part of the Mission to Planet Earth program. . . . With potential consequences looming for third-party storage vendors in the U.S., the German Patent Court upheld the validity of **Digital Equipment Corp.**'s Standard Disk Interconnect/Standard Tape Interconnect patents.

IBM extends CICS to HP users

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — In a watershed concession to the reality that it cannot win all the hardware deals, IBM last week threw a 10-gallon hat into the open systems arena by making its venerable CICS transaction-processing program available to Hewlett-Packard Co. users.

IBM said the HP agreement, which calls for HP to offer CICS on its proprietary and Unix minicomputers and on its Unix workstations, is the first of what will be several CICS accords to come with other computer makers.

The announcement came one week after IBM said it was porting CICS to the AIX operating system for use on IBM's RISC System/6000 workstation [CW, Sept. 28]. The porting pacts are seen as evidence that the computer giant now realizes that users want traditional mainframe functionality such as CICS on smaller, distributed platforms running non-IBM operating systems.

That's what it's for

"That's the point of open systems," said David McGoveran, an analyst at Alternative Technologies in Boulder Creek, Calif., who characterized the agreement as "a landmark move" that will cost IBM hardware sales in some instances and gain it box business in others.

"This will open the doors for some people to leave and at the same time open doors to let some people in. I can't imagine it won't make MIS shops considering buying Unix feel more comfortable buying IBM," he said.

However, McGoveran pointed out that the port to HP operating systems will be a tall task if CICS is to function flawlessly with databases. In an IBM world, CICS and such IBM databases as DB2 have typically been constructed with co-functionality built-in. In HP's case, CICS will have to be tailored to various databases, which will be a challenging task, he observed.

"You could end up with a very interesting set of problems in terms of database integrity," McGoveran cautioned, explaining that the timing of data changes must be coordinated across CICS and the database.

IBM is opening its CICS kimono to ward off threats from other transaction-processing vendors, such as AT&T/NCR Corp., Unix System Laboratories, Inc. (USL) and Transarc Corp. in Pittsburgh, which offer software products tailored for distributed environments on open platforms, noted Rikki Kirzner, a senior analyst at Dataquest, Inc. in San Jose, Calif.

To IBM's benefit, a growing mix of CICS users could help preserve IBM's installed base as they tie new open systems hardware to IBM mainframes, analysts noted.

CICS contagion

The spread of CICS to other platforms could also have the mixed effect of causing users to buy IBM's RS/6000 platform because they would know there are other platforms to back up or replace IBM in the event of problems, some analysts observed.

Rich Sevcik, general manager of HP's Systems and Server Group, said the company plans to make CICS available for MPE and Unix machines in the second half of 1993. He said the company has not yet set pricing. He added that HP plans to implement the X/Open Co.'s XA interface standard for tying CICS into relational databases on HP machines.

Sevcik further noted that users will still be able to choose between other transaction-processing products for HP hardware, such as NCR's Top End and USL's Tuxedo, sold by third parties, and Transarc's Encina, which HP also resells.

Hertz revamp eyes HP minis, outsourcing

CONTINUED FROM PAGE 1

2200 mainframe at a separate Oklahoma City facility, to another HP mini, the source said.

Rich Sevcik, general manager of HP's Systems and Server Group, last week said HP is "in the process" of selling Corporate Business Systems to Hertz, which already runs other equipment from HP, as well as a host of other brands.

Under one scenario, Hertz would next tap an outsourcer to handle computer operations not transferred to the HP systems. Those functions include financial processing, yield management and claims processing for a former Hertz car insurance group now owned by Hertz minority owner Ford Motor Co.

Hertz is believed to be leaning toward IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary to groom the outsourcing portion of its information systems landscape. The company was expected to have made a decision by now but has labored through an endless review process that has entailed numerous internal and external possibilities.

A Hertz spokesman last week could not confirm that the company is migrating some mainframe operations to HP platforms. He said outsourcing "is still under review" and that "no resolution has yet been made."

The spokesman declined to elaborate on the company's IS review. Asked if an outsourcing arrangement would keep HP operations in-house, he said, "It cannot be assumed what will or will not be outsourced."

Many hands in the pie

The car rental company's painstaking review of its IS operations has included outsourcing pitches from Electronic Data Systems Corp., AMR Information Services, Inc., Unisys and ISSC [CW, June 22].

Hertz's outsourcing evaluation also included proposals from two Hertz or Hertz-related entities, the source said.

In one, Gary Orrell, Hertz's staff vice president of corporate MIS, proposed spinning out a separate processing business that would potentially have serviced other customers as well. Hertz is believed to have held preliminary talks with Budget Rent A Car Corp. along those lines. Hertz also received an IS proposal from Hertz Technologies, Inc., a Hertz spin-out that provides market technologies such as handheld computers for car attendants.

Industry observers said they expect Hertz to make a final outsourcing decision by the end of the year, when the company's fiscal year ends.

The outsourcing review also included a proposal from HP to downsize mainframe functions to HP's Corporate Business Systems, which were introduced last May as a cheaper, high-performance mainframe alternative platform.

Complicating matters, Hertz IS executives in Oklahoma City developed HP migration plans without notifying Hertz corporate executives at headquarters in Park Ridge, N.J., according to the source.

Orrell could not be reached last week. Orrell appears in an HP promotional video extolling the virtues of the new HP machines. Hertz currently operates some 14 HP 3000 minicomputers to run its counter operations.

According to the source close to Hertz, the car rental company is implementing an HP 3000 version of the Corporate Business System running HP's proprietary MPE operating system. HP also offers HP 9000 versions running HP/UX, the computer maker's Unix implementation.

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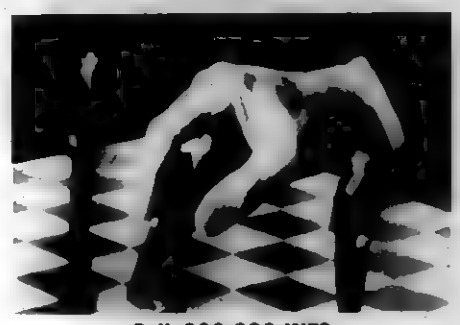

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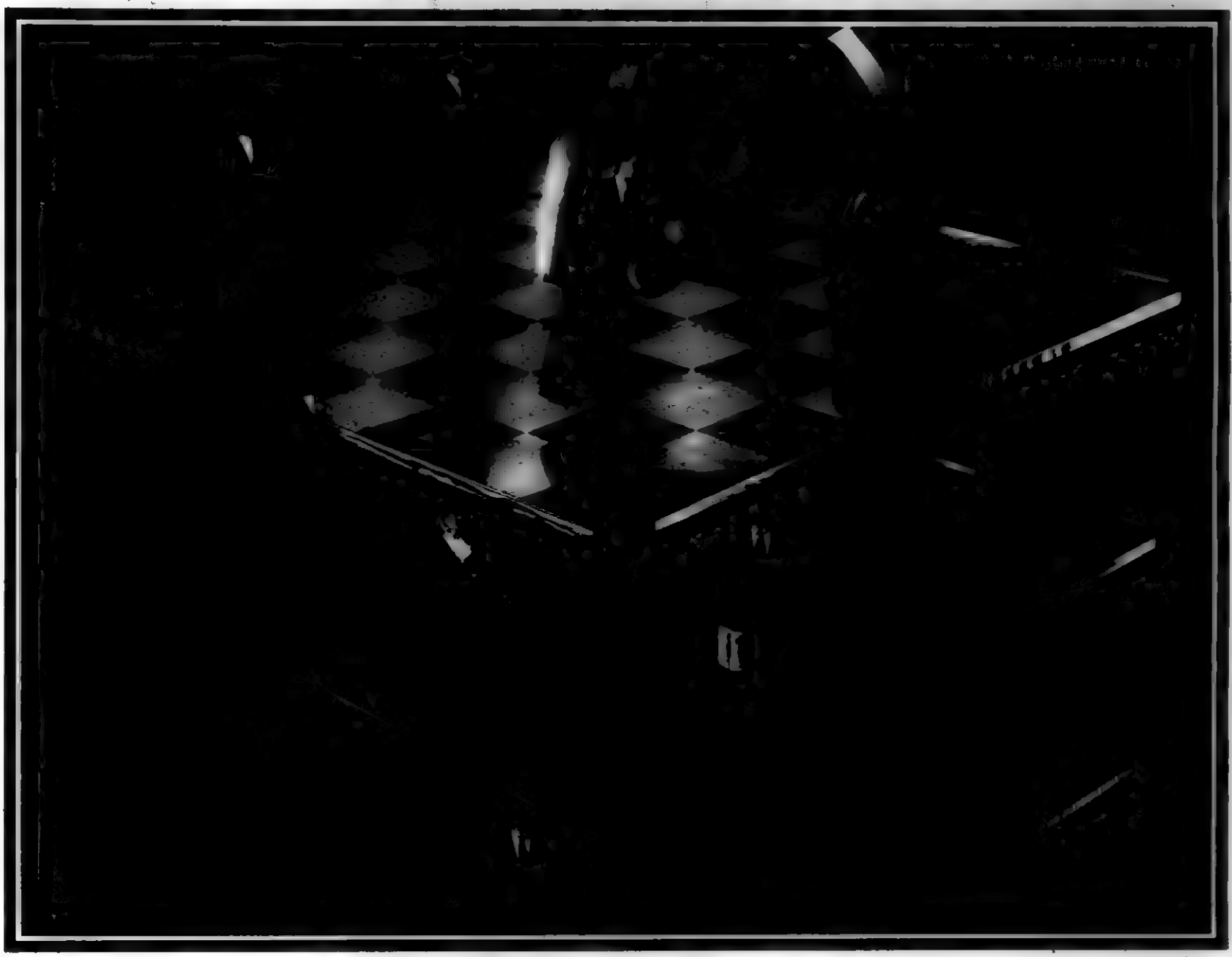

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Sears' cuts impact slight

CONTINUED FROM PAGE 1

Systems Services Division was combined with Sears Technology Services, Inc. to form Advantis, the co-venturers stated that the new outsourcing firm would "support the information requirements" of all Sears business groups.

ISSC Chief Executive Officer Dennie M. Welsh pegged Advantis as "a near billion-dollar business on Day 1." Neither Sears nor the IBM group — none of whose executives were available for comment last week — has revealed financial details of Advantis. That silence includes how much business each of the initial outsourcing customers is expected to bring to the party. However, analysts estimated that Dean Witter and Coldwell Banker are worth a combined 13% to 18% of Advantis' anticipated start-up business.

The way the new Sears blueprint affects the fledgling outsourcing firm, several analysts said, will depend on factors currently unknown, such as how Sears ends up divesting its ownership and who picks up what Sears rolls out. If, for instance, a real estate player with its own information systems clout were to buy a major stake in Coldwell Banker, it well might prefer to fold Coldwell's IS operations into its own, several analysts said.

On the other hand, they said, if Sears opts for a public offering, it is difficult to picture the investment bankers who market the issue or the ultimate shareholders wanting to undo an outsourcing deal that holds out the promise of dollars saved and technological hurdles leaped.

While the final outsourcing contracts have not yet been inked, an IBM spokeswoman said last week, negotiations continue unaffected by Sears' sudden zeal for getting back to basics.

A Sears Technology Services executive who requested anonymity agreed that last week's announcements would not affect the Advantis deal.

Ted Grossman, an IS professor at Babson College in Wellesley, Mass., speculated that the Sears units, before being divested, would sign on with Advantis, agreeing to use its network services for a specified time period.

The question is for how long, noted Howard Anderson, president of Boston-based market research and consulting firm The Yankee Group.

"Sears will probably want to have contracts that give potential buyers an optional out" of Advantis outsourcing, he said. "The other way to go is to make Advantis part and parcel of what a buyer or investor gets: Love me, love my dog," he added. "It's hard to picture [Sears Chairman Charles] Moran going for that choice when what he clearly wants is flexibility."

In fact, said Frank Dzubek, president of Washington, D.C.-based Communications Network Architects, Inc., the Advantis tie-in could prove more of a come-on than a turnoff to potential investors in Sears' real estate and brokerage businesses. "The outsourcing deal pares these businesses down to basics just as it does the Sears merchandising group," he noted. "Besides, having expensive networking backbones out of the picture might give buyers or investors a price break."

Meanwhile, analysts agreed, Sears' resolve to revert to its original retail persona and give archrivals Kmart Corp. and Wal-Mart Stores, Inc. a run for their money is likely to underscore the company's need to make quantum leaps in IS without tripping over huge bills — demands that Advantis will be relied on to supply, several analysts said.

	1991	1992
U.S. IS budget	$1,734M	$1,233M
IS staff	6,238	6,362
Installed value (mainframes, minis, supercomputers)	$493M	$687M
PC installed base	354,000	350,000
Percent of IS budget spent on personnel	30%	40%
Percent of IS budget spent on training	2.2%	3%

Figures include parent and all subsidiaries

Source: Sears, Roebuck and Co. CW Chart: Janell Genovese

CORRECTIONS

Because of an editing error in the Sept. 28 issue, the name of the coalition that has formed to help Silicon Valley address problems that are hindering business development was cited incorrectly. The organization is Joint Venture: Silicon Valley.

.....

IBM's PL/1 compiler, not its unannounced C++ compiler as reported in the Sept. 21 issue, is priced at $1,800.

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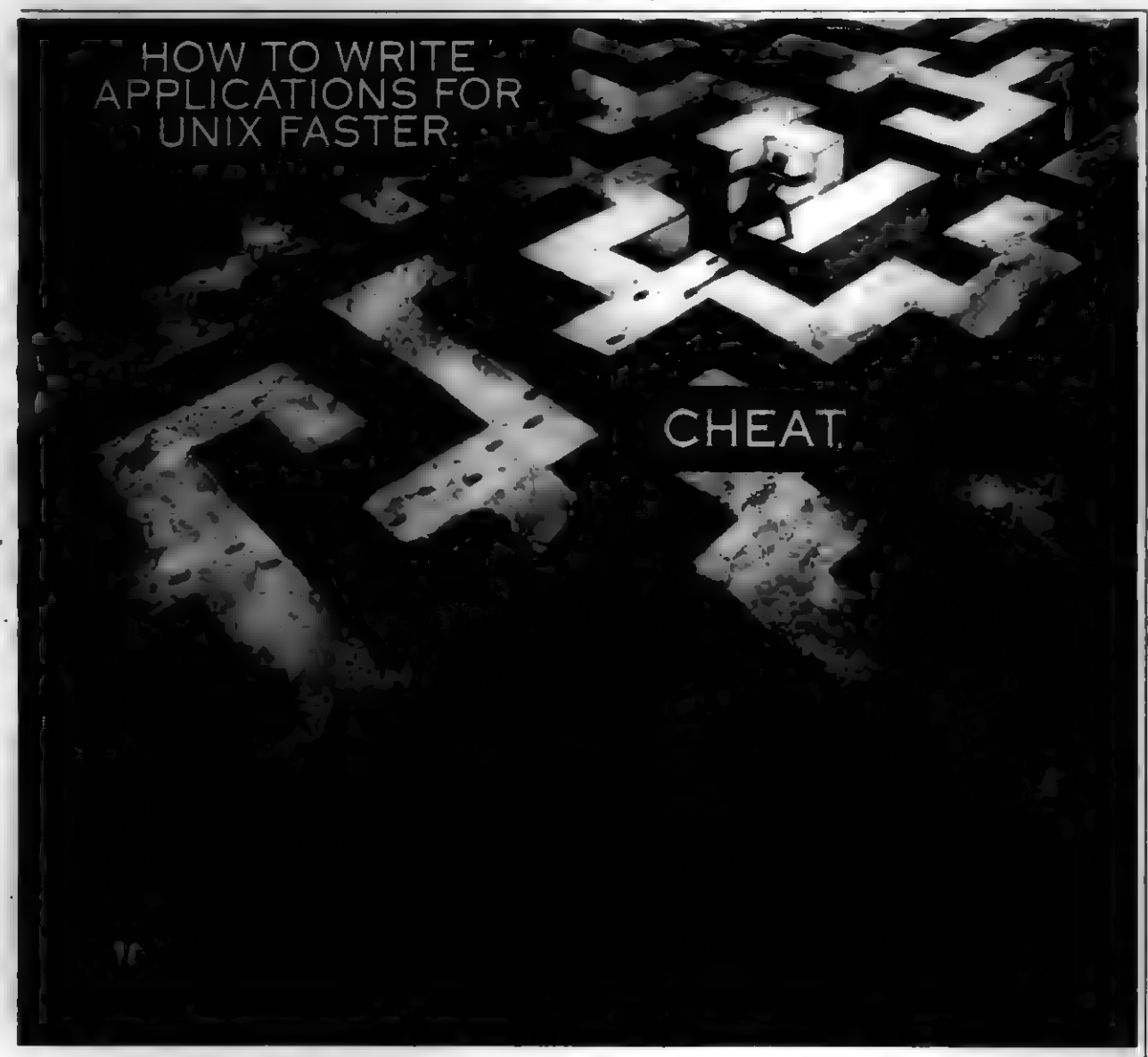
Because of a production error, profit growth for Bankers Trust New York Corp. was incorrectly stated as negative 25% in the *Computerworld Premier 100* Sept. 14. The correct figure is positive 25%.



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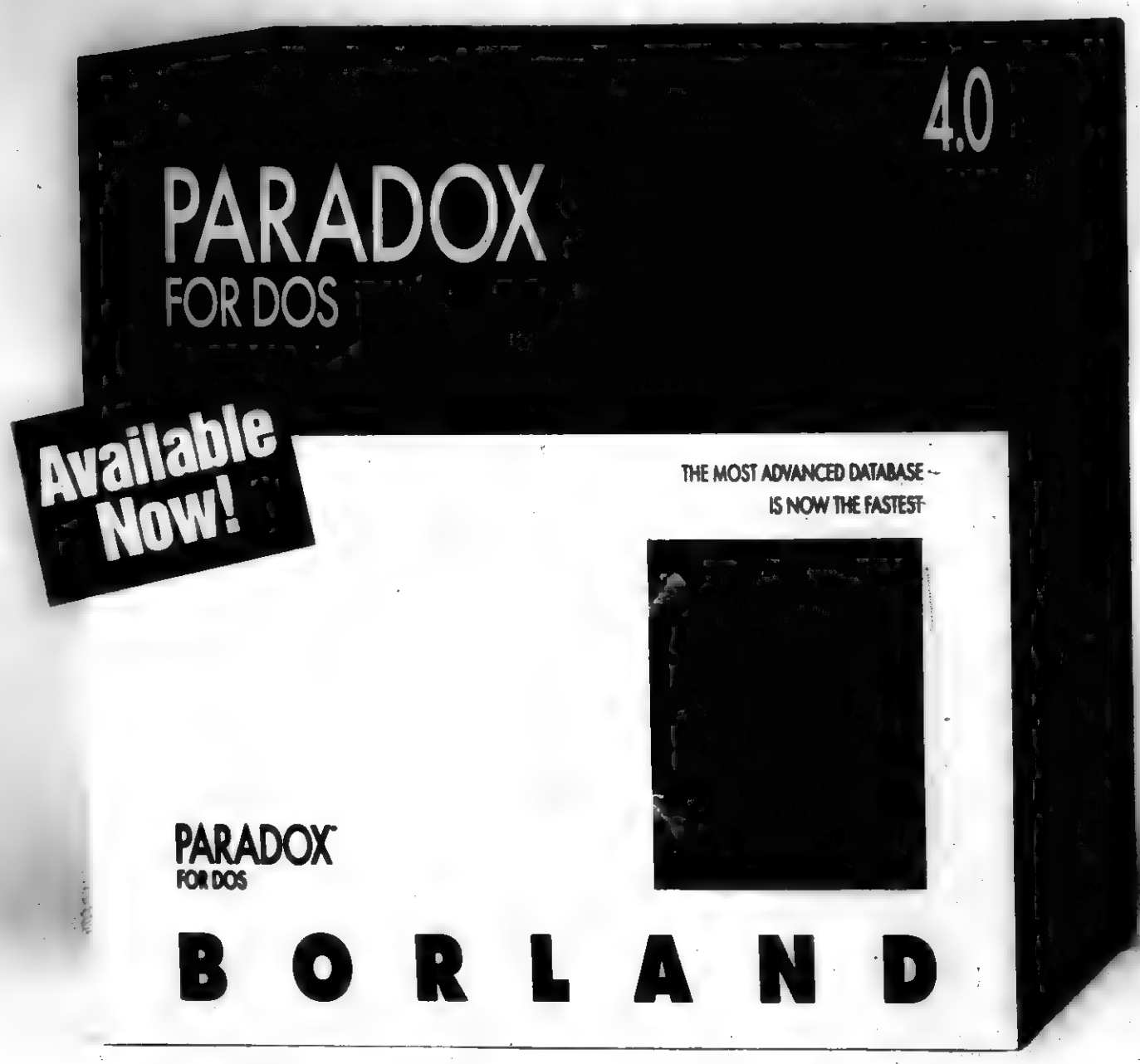

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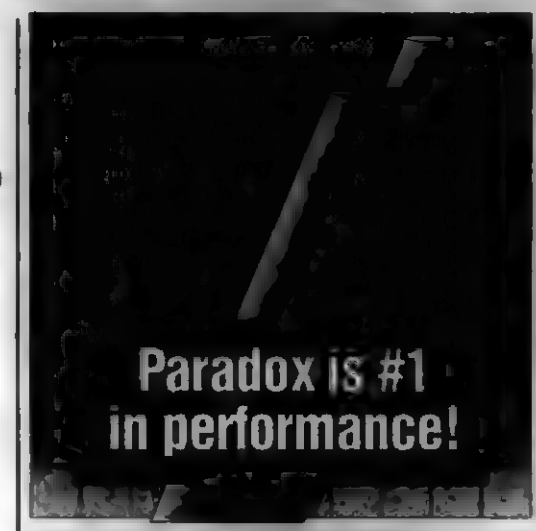

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Clinton's civilian DARPA idea criticized

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Bush administration last week criticized a proposal by presidential hopeful Bill Clinton to establish a civilian counterpart to the Defense Advanced Research Projects Agency (DARPA), which fosters the development of new technology in areas such as computers, communications and materials.

In a speech at the National Press Club, Robert M. White, Undersecretary for Technology at the U.S. Department of Commerce, said the so-called Civilian Technology Corp. championed by Clinton would be "very inefficient" because it would be "technology-driven." Instead, the Bush administration favors "market-pull" approaches, White said.

For example, White said that had the government responded to calls to "push" high-definition television a few years ago, the U.S. might now be locked into an inferior analog video standard.

"As it is, the competition being encouraged by the [Federal Communications Commission] will very likely lead to a U.S. digital standard that will become the world standard," he said.

Computer companies have generally supported Clinton's idea, saying the federal agency could help fund risky technologies they might not be able to tackle on their own. John Young, chief executive officer at Hewlett-Packard Co., recently endorsed Clinton in part because of Clinton's proposal, an HP spokesman said.

No customers

But some in the industry are less enthusiastic. "It's fundamentally a bad idea," said Gordon Bell, an independent computer industry consultant and former head of research and development at Digital Equipment Corp. "Its fundamental flaw is that [unlike DARPA], it has no customer. It would be . . . trying to solve no particular problem. All that's going to do is raise our taxes."

White said the benefits that some said would flow from a civilian DARPA are already available in the Commerce Department's Advanced Technology Program, a small, industry-driven program that gives grants to firms and consortia for research and development in new technologies with broad applications.

White said the president has not softened his opposition to "industrial policy," as has been widely reported. He said the administration remains opposed to the idea, which it defines as "coordinated government action to direct productive resources to help domestic producers in selected industries become more competitive."

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DEA computer security is lax

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Computer systems and associated policies and procedures at the Drug Enforcement Administration (DEA) are woefully inadequate to safeguard information vital to national security and to the safety and privacy of those involved in the war on drugs, the U.S. General Accounting Office (GAO) charged last week.

In a report released at a congressional hearing, the GAO said the DEA is not fully complying with federal computer security law. Testifying before a subcommittee of the House Government Operations Committee, Howard G. Rhile, a director in the GAO's Information Management and Technology Division, cited the following computer security shortcomings at the DEA:

- "Extremely lax" controls on access to data and to computers processing sensitive data.
- Sloppy control of passwords, including the use of "DEA" as a default password, passwords taped on computer terminals and unattended computers left logged on.
- Cleaning and maintenance personnel without proper security clearances being allowed to work unattended in areas where national security information is processed.
- No accurate inventory of computers used to process sensitive data.

"Our 15 months of investigation have revealed promises, beginning steps and good intentions," Rhile said. "But little has changed. [It is] too little and much too late." He said the situation puts people at risk and compromises the government's effectiveness in combating drugs.

Officials at the DEA and the U.S. Department of Justice, of which the DEA is a part, testified that they were in basic agreement with the GAO findings. They said the DEA is establishing an agencywide computer security program that includes stringent access controls for all systems and data encryption for personal computers; conducting "risk analysis/vulnerability assessments" for all systems; improving written policies for PC security; and beefing up security training.

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Then there's the ability to print in sizes up to 11" by 17". Which can really make your day if it's filled with everything ranging from envelopes to double-page layouts to CAD plots to spreadsheets.

The built-in motorized paper trays can hold up to 1,500 sheets, more than any other desktop printers. Allowing you to put your time to far better uses than loading paper.

To Compaq engineers it simply wasn't enough for our printers to understand both PostScript Level 2 and PCL 5. Therefore, unlike other printers, ours have an Intelligent Emulation

YOU'D BE OUT OF A JOB.

Sensing feature that continually monitors, with radar-like precision, the language which anyone is using at any moment. It will then automatically adjust to that emulation, without your lifting a finger.

A truly network-ready printer should meet all of your network needs. This is why our new COMPAQ PAGEMARQ Laser Printers provide a direct connect to both Novell and AppleTalk environments, without the need for a print server.

The printers also offer you five interfaces, so that you can simultaneously run Ethernet or Token Ring, AppleTalk, both a serial and a parallel port, and even an Internal FAX Modem. Which will lead to better communication across the entire network. Rather than the kind of language that best remains unprinted.

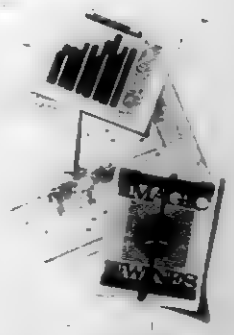
Completing the picture is the 800 x 400 COMPAQ High-Resolution Print Mode, created to give you exceptionally crisp text and graphics.

Both the Programmable Font Modules and internal 60-MB Hard Drive let you store PostScript fonts permanently, without having to constantly download.

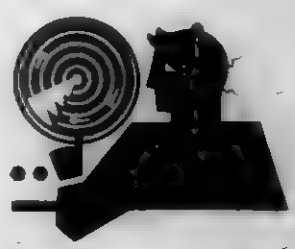
Thus, what you've got amounts to far more than merely a network printer.

You have the brainchild of a company which holds the belief that utter chaos does not have to be standard operating procedure in your network.

For more on COMPAQ PAGEMARQ printers, just turn to the next page.



They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple Twin-Trays hold up to 1,500 sheets. Impressed?



Our Intelligent Emulation Sensing feature continually monitors, then automatically adjusts to either PostScript Level 2 or PCL 5 depending upon which language you're using. You needn't lift a finger.

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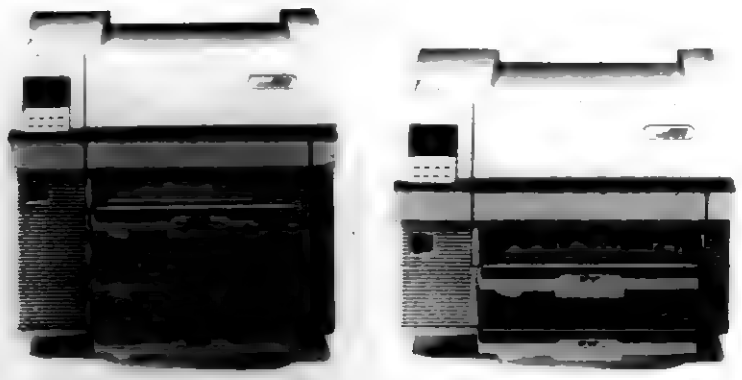

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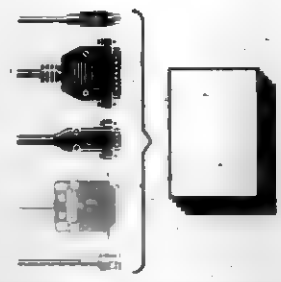

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ADVANCED TECHNOLOGY

TECH TALK

Pill-pushing robot

■ After two months on the job, the first robotic pharmacy is in fine health. In July, the Automated Pharmacy Station was put into operation at St. Clair Hospital, a 337-bed institution in Pittsburgh. Able to process up to 1,200 different medications (tablets, capsules, syringes and so on) per hour, the robotic system is linked to the pharmacy computer. After scanning a bar code with the patient's identification number, it fetches the correct medicine (also labeled with a bar code) and delivers it to a "check station," where a pharmacist verifies it for accuracy. The automated system, which will be tested for a year at St. Clair, was developed by Pittsburgh-based Automated Healthcare, Inc.

Simulation under way

■ Los Alamos National Laboratory earlier this year began offering simulation and technology transfer services to commercial companies under a new program called Computational Test Bed for Industry. The cost-shared program, which for now is closely associated with the laboratory's 3-year-old Advanced Computing Laboratory, offers both training and joint projects at Los Alamos, as well as time on one of the laboratory's supercomputers. Initial funds for the Test Bed come from the U.S. Department of Energy's Technology Commercialization Initiative. The University of California operates Los Alamos for the Energy Department. The laboratory hopes to evolve major projects attracted to the Test Bed into formal joint ventures with private industry.

Chip talk

■ The largest technical conference on semiconductors and related technologies will convene when the 38th Annual IEEE International Electron Devices Meeting (IEDM) gathers Dec. 13 to 16 in San Francisco. IEDM organizers plan forums for conducting frank discussions about the future shape of the global semiconductor industry.

Can a 'good' virus be a bad idea?

The applications for friendly viruses are endless, but users remain divided over issue

BY JAMES DALY
CW STAFF

Imagine, if you will, a piece of code that scurries around unnoticed by end users. Its tasks are simple but ambitious: to efficiently distribute processing and put wasted capacity to work. Or to attach itself to other programs and keep information current by updating files and deleting old data.

Sounds like a pretty good idea, huh?

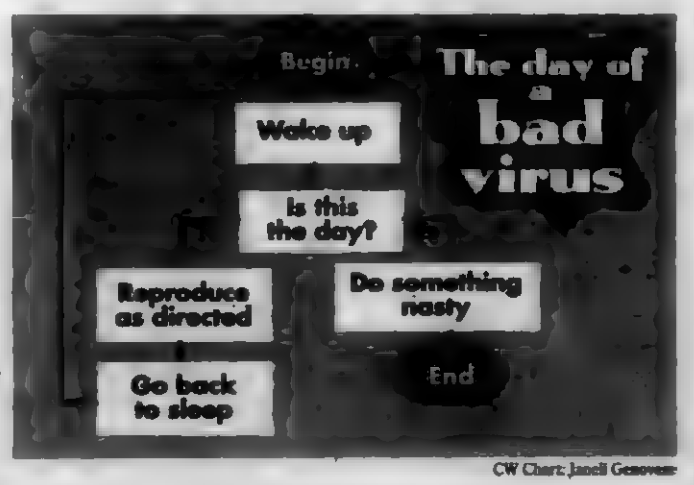
What if Frederick Cohen, a researcher who coined the term "computer virus" in 1983, told you that the piece of code that was doing all these wonderful things was in fact a virus.

But that is what Cohen has in mind — making the computer virus into a virtuous and downright handy assistant. "The features that make viruses a threat to data integrity can also make them a powerful resource for the distribution of computing resources," said Cohen, president of ASP, Inc., a software house in Pittsburgh. "And it's a lot cheaper to maintain a system when it maintains itself."

Cohen says that in most computers, the hours spent waiting for instructions far exceed the time spent processing. Large multiprocessor machines often have more difficulty distributing the work load to the various processors than they have solving the problem.

Enter the computer virus. "What makes a virus good or bad is the sequence of events it sets off," he said. An important distinction between a good virus and a bad one is that the good virus has a preprogrammed birth-and-death process. It knows what it has to do, does it and then disappears.

A useful virus might be an automated bill collector, a small program designed to collect a single bill. The collector sends a series of letters to the debtor and the virus evolves by modifying itself according to the debtor's response. The computing environment "gives birth" to a new bill collector every time a new case is taken on, and it "kills" the collector when the bill is paid.



CW Chart: Janell Genovese

Cohen's firm currently uses good viruses, which it euphemistically terms "tiny agents," in a financial application it markets called Payback. "These viruses don't replicate in normal PC environments because they can't live outside of the custom environments we provide," he said.

Another example of a good virus is the Lenstra-Manasse creature, a program named after two cryptographers that works on major international research networks and finds the factors of large numbers by combining the efforts of many computers. Each segment of the Lenstra-Manasse program reports its results back to a central location via electronic mail, and the central computer then distributes new, evolved pieces of the program.

Another researcher, Mark Ludwig, recently wrote a book called "The Little Black Book of Computer Viruses." Ludwig claimed the 178-page ebony volume is not destructive, but educational. "These viruses are designed so that security people can see what a virus looks like and how it behaves. How can anyone realistically be in charge of security without having ever seen a virus?" Ludwig said.

Cohen's and Ludwig's comments have caused an incendiary reaction in some quarters. Critics compare a virus with a visitor who neither announces himself nor asks permission to rummage through your belongings. "Viruses by their very definition happen without your knowledge, so how could something that is happening to your system without you knowing about it be good? It's a contradiction," said Chengi Jimmy Kuo, a virus researcher at Symantec Corp. in Santa Monica, Calif.

Opponents say modifying a program could mean the owner of the program loses his rights for technical support, ownership or copyright. Another argument is that someone could get a copy of the virus and modify it to include something malicious. Another more practical consideration: "The antivirus programs will have to distinguish between 'good' and 'bad' viruses, which is essentially impossible," said Vesselin Bontchev, a virus researcher at the University of Hamburg in Germany.

TI makes modular chips with Prism system

BY ELLIS BOOKER
CW STAFF

Earlier this month, Texas Instruments, Inc. announced a new method for producing semiconductor chips that uses reusable "modules."

TI's system, dubbed Prism, puts multiple semiconductors with different functions on one chip. Customers designing custom chips deliver their functional requests to TI, whose engineers can then choose from the chip's "library" of embedded functions.

TI said its concept will mean time and cost savings to its customers, reducing product development cycles from three years to as little as six months.

An additional benefit, the Dallas-based semiconductor company said, is that the use of multiple modules on each semiconductor can decrease the component count on new electronic systems by up to 50%.

"This sounds somewhat similar to standard cell design, where they have a functional design for a semiconductor and have those blocks predefined in software tools," said Jim Feldhan, a senior vice president at In-Stat, Inc., a semiconductor consultancy in Scottsdale, Ariz.

Feldhan said techniques to speed the development of chips are improving yearly, but increases in the manufacturing time for these sophisticated devices have somewhat offset the gains.

The standard cell technique, Feldhan said, probably takes eight months to a year to produce a customized chip.

Use of gate arrays, a technique that uses predefined arrays of logic on the chip interconnected into different functions in the final phase of chip manufacture, can produce a custom chip in as little as four months, he said.

So-called "user programmable" chips, which are given their function by software code after production, are a final option. Unfortunately, Feldhan said, these programmable semiconductors are more expensive and slower than truly custom devices.

In addition, not only are chips being designed faster, but they are also being designed by different people, as software tools for building custom chips become more user-friendly.

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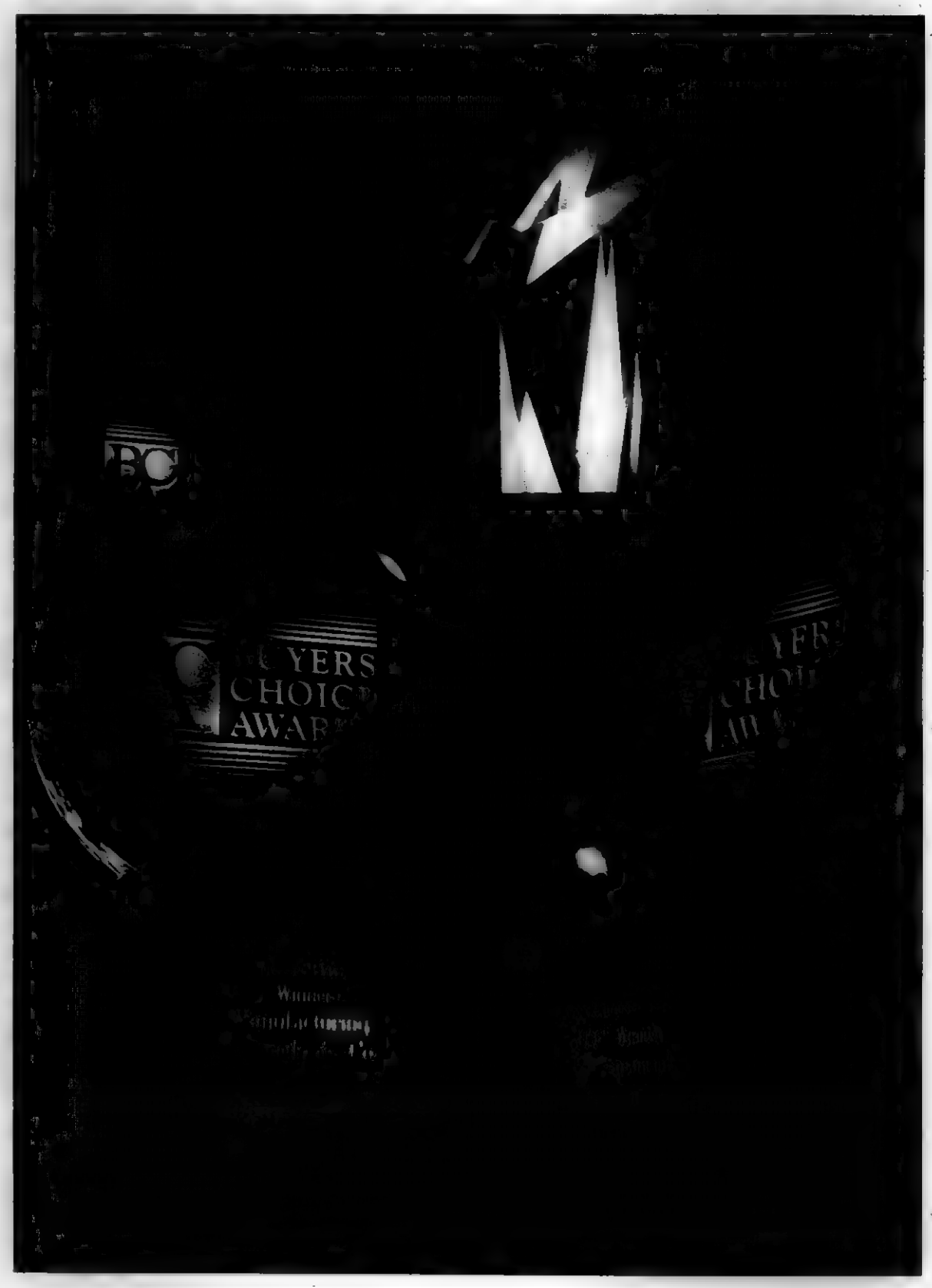

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EDITORIAL

Land of OS

At an industry conference last month that featured virtually every luminary in the PC business, Intel's Chief Executive Officer, Andrew Grove, took center stage as one of the last speakers. He summed up the meeting accordingly: "I've never seen so many people spend so much money to engage in two days of self-pity."

His words were a fitting compliment to the remarks of conference organizer Stewart Alsop, who opened the proceedings by asking attendees to ponder the industry's ability to deliver to its customers as promised.

The tone of the conference was refreshing if for no other reason because at least some of your key information technology providers are questioning their own actions. It's amazing what a humbling effect single-digit growth can have.

Also underlying this uncertainty and unease is the mother of all battles for the 1990s, the struggle for supremacy in the 32-bit desktop environment. Whatever standard or standards emerge will be every inch as important to users as was the de facto IBM computing standard of computing from 1970 to1990.

The customers want the integrated environment of the 1990s and beyond to be a fundamentally open event, with the ability to mix and match operating systems, database management systems and hardware. With few exceptions, this burning need is diametrically in opposition with the baseline strategies of the major providers of computing environments today.

So the initial shots of the mother of all battles are actually flying between the vendor community and the users, while intense competitive struggles are waged among the vendors.

Users have got to be realistic. The truly open environment they want is just not going to materialize anytime soon, especially if what users want is the efficiency of open systems *and* the robustness of the proprietary environment they want to leave behind.

For example, Microsoft has been billing its forthcoming Windows NT as the kind of operating system users want. In time, it will run on almost anything, preserve your existing software investment and feature built-in networking and security features like no other operating system.

But delays in its release are piling up. Last month I was told NT was a few weeks behind schedule, making for an early 1993 release. Now Microsoft is buying time into the second quarter of 1993, and the door's open for more delays pending beta-test results. Kudos to Microsoft for not rushing to release a product before its time!

My guess is that Microsoft as well as Sun, IBM and other 32-bit desktop players are discovering just how broad the gulf is between what they can deliver anytime soon and what users claim they need. Maybe that's the source of self-pity Grove was seeing.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

HP cannot ignore software costs

"HP aiming stations at office desktops" [CW, Aug. 24] stated that one of the tenets of Hewlett-Packard's workstation strategy included "producing low-cost, high-volume workstations that surpass the power of Intel Corp. high-end personal computers and sell in the $3,500 to $5,000 range."

The main obstacle to RISC workstation cost-parity with the conventional high-end PC market is no longer hardware costs, but software costs.

While HP can argue that it has no control over the cost of third-party vendor application software on its workstations, I just paid HP $2,190 for its Fortran compiler for the HP 9000/720 workstation; the manuals alone were $195. I can buy Microsoft's Fortran compiler for DOS (manuals included) for $300.

Secondly, the initial HP marketing hype on the IBM-mainframe-to-HP Corporate Business System downsizing initiative is somewhat incomplete. The horsepower cost issue is only a small part of the picture.

I saw little evidence at Interex that HP and its business partners truly understood the massive and extremely expensive application software conversion task. This software conversion responsibility is too critical for HP to relegate to a few ambitious business partners.

HP will have to get its hands dirty on the software side and candidly discuss with potential customers the formidable software conversion task and substantial cost in its marketing effort.

Jerry K. Greig
Lafayette, La.

Abandon ship

"Why successful companies fail" [CW, Aug. 17] made interesting fictional reading. I had the opportunity to compete directly with Cullinet in the years John Cullinane mentioned, as a salesman and later as vice president at ADR.

At no time were the problems of Cullinet due to a lack of customer focus. They were an absolute ignorance of the management to the obsolete nature of embedded pointer network systems when the relational model arrived.

I even recall the bitter letters from Mr. Cullinane in your editorial section about the relational model. Mr. Cullinane was one of the last to depart the sinking ship of obsolete technology.

In his forthcoming book, Mr. Cullinane should devote an entire chapter to being in the right place at precisely the right time as a universal indicator of success. He should devote another chapter to how to stay there — quoting Bill Gates or others who avoided his mistakes.

John J. Valentine
New Hope, Pa.

In AS/400 field, gender not a salary factor

Your annual salary survey, "IS pay dips; women still lag" [CW, Sept. 7] prompted my response.

Over the last 10 years of recruiting for the System/38 and AS/400 platforms, we have noted similar apparent differences in salary based on gender. This is very surprising, given the emphasis that most decision makers place on hiring the best people.

In our mid-1992 survey of AS/400 people, we examined data of 1,267 people on this issue. When you do a multiple regression and include both experience and educational background, there is no correlation at all between gender and salary. This is true for both managers and programmers. All the variance is explained by tenure — experience — and educational differences. We do note a significant percentage of women have dropped out of the field after six to eight years.

One can argue that this is an excellent time for women to advance in a field such as the AS/400. It requires an increasing set of people, business, integration, creative problem solving and technical skills. Women may even have a slight advantage, at least in the AS/400 world.

Nate Viall
Nate Viall & Associates
Des Moines, Iowa

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Postmodern information forms

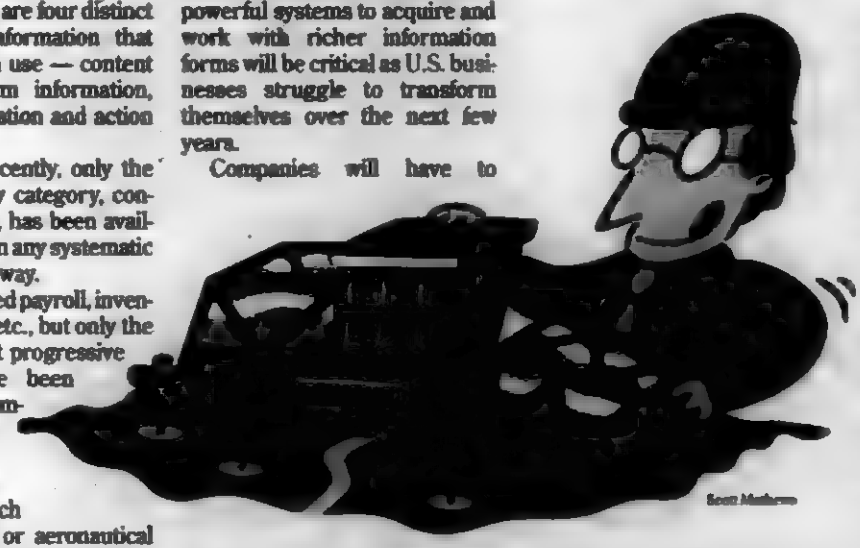
WILLIAM DAVIDOW

We have barely scratched the surface of information use in business and industry, and we're going to have to go a lot deeper very quickly if we hope to keep U.S. business and industry competitive.

All told, there are four distinct categories of information that corporations can use — content information, form information, behavior information and action information.

But, until recently, only the most elementary category, content information, has been available to industry in any systematic and manageable way.

We've managed payroll, inventory, parts lists, etc., but only the largest and most progressive companies have been able to afford computer systems capable of handling form information such as architectural or aeronautical blueprints or machining instructions specifying the curve of a fender.



Scott Mosher

Missing pieces

Still completely out of reach for almost all companies are systems able to generate behavioral information — intelligence about how a product or process will perform based on sophisticated modeling and simulation — and action information, the dynamic data needed to automatically trigger appropriate responses to changing conditions.

That is changing, however. Powerful computer systems that process MIPS and store gigabytes are finally becoming affordable. Learning how to use these powerful systems to acquire and work with richer information forms will be critical as U.S. businesses struggle to transform themselves over the next few years.

Companies will have to change almost everything about how they operate — turning themselves into "virtual" corporations in which employees are largely self-directed, information is shared freely across all levels, suppliers and customers are co-producers of products and the customers are the real managers. These changes will require information far different from what IS departments are used to processing and will demand an unheard-of degree of integration.

By its very nature, behavior information reduces the time and cost of product design because it allows for highly sophisticated modeling and simulation across a heretofore impossible range of conditions. With action information, information systems act on the data they receive — designing new product generations, machining parts, performing assembly, delivering a service — without a human liaison between computer and factory floor. This is the final, most difficult step: closing the loop between manufacturing or service and data processing.

On the same level

The marketplace of the future will move so fast there will be little time to bring suppliers or distributors up to speed. Rather, all of these parties must now be privy to the same information from the beginning, adding their expertise to decision-making and sharing a common destiny with the virtual corporation.

By the same token, because keeping the customer is vital, he must also be enlisted in product design, service and sometimes even manufacturing. All of this is only possible with sophisticated broadband networks.

We cannot begin to implement these new forms of information using our present organization structures or management philosophies.

The IS manager occupies a critical role in the transformation and successful growth of the virtual corporation.

If we fail to win the virtual battle, there is no doubt in my mind that we are in for a long and painful economic decline.

If we do our jobs right, we'll play an extremely valuable part in revitalizing our nation's business and industry.

Davidow, a partner at Mohr, Davidow Ventures in Menlo Park, Calif., is co-author of The Virtual Corporation, *which will be published by Harper Business Books this week.*

Technical dysfunction in system professionals

SHERYL KAY

Paul Jones is a computer scientist, an expert in his field of supercomputing. Betty Smith is a high-powered CIO at a billion-dollar international banking firm.

Neither of these people can work the telephone system at their company. Not the switchboard, mind you, just their desk phones. Ask them to transfer a call and they're confounded.

I spend a lot of my life talking to computer professionals on the phone, and I can tell you, the consistency of this phenomenon is amazing. Ninety percent of the time when I have to be transferred, I'm disconnected.

I'm still not sure why it happens. The instructions for operating telephones are certainly no worse than some programming documentation, and the box itself is no more ominous than a standard PC keyboard.

And it's not only telephones. Recently I set out to do some shopping, stopping first at the ATM to pick up some cash. The line was long, and while waiting, I noticed that the man in front of me was reading a book about computer security.

"Good book?" I asked.

"Not bad," he said, and then went on to tell me that as the security operations manager for a local bank's data center, he tried to keep up with relevant books.

@#$%& ATM

The queue was moving rather quickly, so we only chatted a few more moments before it was "Dan's" turn. Six minutes later, having gone through four menus seven times, Dan still didn't have his money. (He even hit the machine once.)

"This is incredible," he said. "I only need $25, and this crazy machine keeps telling me to try again."

Unfortunately, he hadn't noticed the top line of the screen, which stated very clearly, "Please make your withdrawals in multiples of $10."

"You know, Dan, that's happened to me once or twice," I said, making it up as I went along. "I decided to try withdrawing $30 instead, and that seemed to work better."

Fifteen seconds later, three tens appeared, Dan drove off happy and I finally got my turn.

Much later, while resting by a fountain in the mall, I noticed an old Data Processing Management Association acquaintance. The last time I had seen him he was doing CICS sysgens for a major food manufacturer.

I wanted to go over and say hello, but he was in some deep conversation with a watch retailer and I didn't want to interrupt.

"Look, I've tried to start this thing for 10 minutes now," he was saying, "and it still has a double zero here. I have pushed this button and held down this button and numbers keep flashing, but I can't get it set. Could you show me something more traditional?"

The whole time, his 8-year-old daughter was tugging on his sleeve, making him a bit edgy.

The clerk immediately pulled out five watches and the two became absorbed in the new time pieces. At the same time, the little girl had grabbed the LED watch and was fussing with it.

After my old friend and his daughter had left, I couldn't resist strolling by the watch counter. Just as I expected .!!. in the two minutes she held it, his daughter had set the hour, minute, month, date and day functions.

Seasoned pro

Interested in getting some real insight into why technical people so often seem to lack technical street smarts, I decided to call a man I know who has been in data processing for 25 years and is now executive vice president of R&D at a Fortune 100 computer vendor.

He offered a few thoughts and then suggested that the person I really ought to talk to was the executive vice president of training, a woman with lots of experience with learning theories.

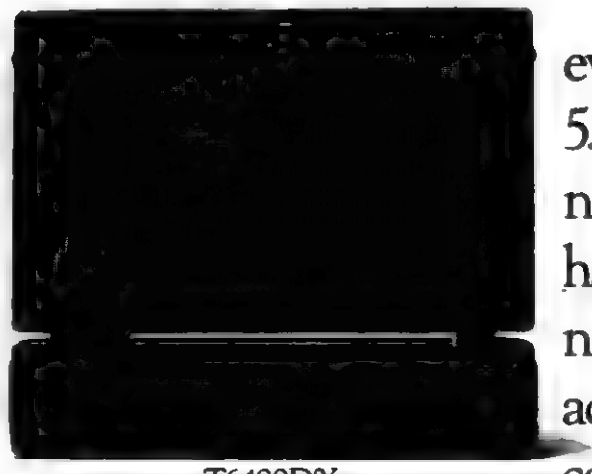
"She may have some ideas for you," he said. "Hold on, I'll transfer you."

I quickly shot back, "Hey, just in case, do you have her extension?" But it was already too late. I was talking to a dial tone.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

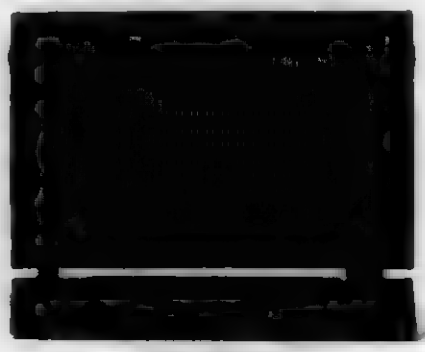
We make the most complete And we stand behind

When your job description includes buying portable computers by the tens, twenties, thirties and hundreds, you naturally want to know a bit more about the company that makes those computers than you'll discover by reading their spec sheets.



T6400DX

(Although our spec sheets do make excellent reading.)



T2200SX

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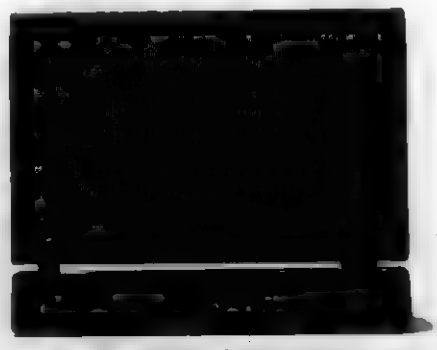
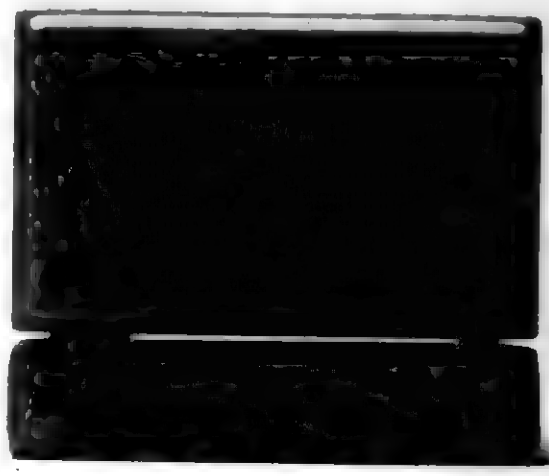


T3300SL/120MB

Each portable computer in our line has been engineered for easy integration into your existing system—providing all the important ports you need, in addition to the unique expandability option of our DeskStation IV, which comes complete with everything necessary to turn your Toshiba portable into a desktop computer.

T6400SXC



We also provide the broadest range of accessories—adapters, modems, memory cards—to make your portables (amazing as it sounds) even more useful.

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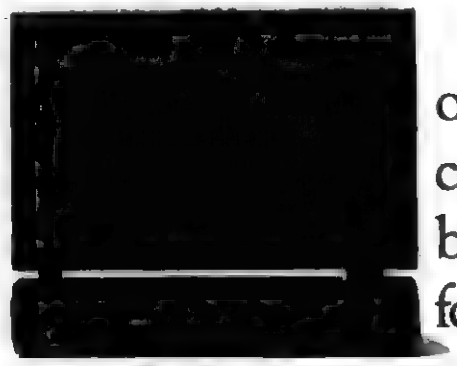
line of portable computers. every one of them.



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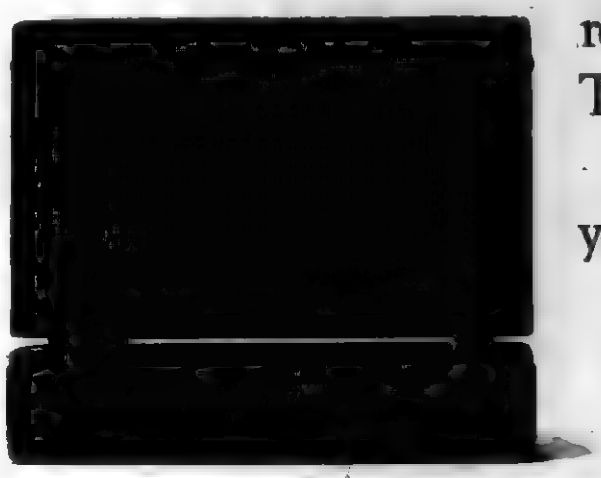
T3300SL/80MB

For example, every one of our portables comes with our standard international warranty, covering parts and labor for one year in 24 countries worldwide.

T6400SX



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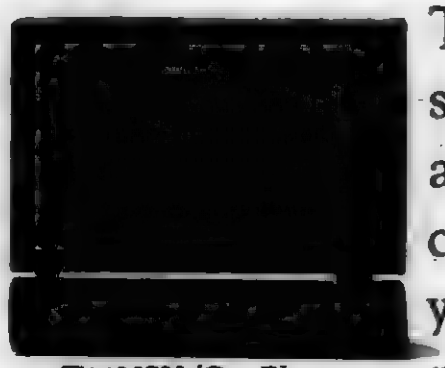

T4400SX/Gas Plasma

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In fact, there's even an 800 number for you, right now, today.

T4400SX/LCD

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intel inside

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TOSHIBA

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ComputerWorld Spreadsheet Brand Preference Study
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FIRST PLACE Best Service/Support	Lotus	Lotus	Lotus

Lotus 1-2-3

*Based on Software Publishers Association share data, May 1992, for North America. **In Canada, call 1-800-GO-LOTUS. ***While supplies last. Demo disk not available for palmtop version of 1-2-3. ©1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Incorporated. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a trademark of UNIX Systems Laboratories, Inc.

Tiny PowerBook resuscitates Apple

One year later, company is stronger as well as richer, thanks to popular portable

ANALYSIS

BY JAMES DALY
CW STAFF

Can a 5-pound machine rejuvenate a $6 billion company? It not only can — it has.

Last October, Apple Computer, Inc. divebombed Comdex/Fall '91 and the sizzling portable personal computer market with the introduction of a trio of notebook-sized Macintosh computers — the PowerBooks.

On October 19, almost a year after that introduction, Apple is expected to unveil the latest additions to the PowerBook line: four slim new models, including two that can be docked with desktop machines.

The slick elegance of the machines has changed the way many view Apple. "The PowerBook made Apple once again an intriguing company," said Andrew Zimmerman, a partner in the management consulting group at Coopers & Lybrand and a recent PowerBook fan. "Before, it just wasn't practical to think about the Mac platform in terms of portables. The PowerBook changed that."

With 300,000 of the sleek machines being snapped up in their first year, the PowerBooks have become a billion-dollar business that has had a significant impact on Apple's bottom line. Recently, Apple USA President Robert Puette said sales of the PowerBook helped Apple's U.S. sales for fiscal 1992 (ended Sept. 25) to grow by 11% to 12% above sales a year earlier.

Apple said it expects the resulting PowerBook windfall to lead the company to a 1% growth in PC market share worldwide, up from the 9.1% the company held in 1991, according to Dataquest, Inc.

Reputation at stake

But Apple had more riding on the introductions than dry market share numbers. Apple's previous entry in the laptop market, the Apple Portable, was a clunky 16-pounder that was widely considered a dog.

"The original Mac portable looked like it was designed by an engineer who failed his course," said Craig Ellerbroek, director of research and technology planning at Martin Marietta Corp.'s information systems group in Orlando, Fla.

Suddenly, many in the industry were wondering if the company that had such a history of sparkling technological innovation had its curveball anymore. Chairman John Sculley said at the time of the PowerBook rollout: "We missed the boat in the portable market. And if we continue to look inward like we have been, Apple will no longer be an important player in this industry."

The PowerBook series changed that — and restored users' faith in Apple. "The PowerBook is the only portable machine I've ever owned that will draw a crowd when I pull it out in an airport lounge; it fascinates people," Ellerbroek added.

That enchantment was experienced at corporate headquarters as well. "The PowerBook seemed to have some sort of magical power when users talked about it with us," said Neil Selvin, Apple's director of marketing for portable computing. "It was much different than the way they spoke about our older machines. And that has created a buzz here."

Pent-up demand for an adequate portable Macintosh was so great that product shortages were felt almost immediately, much like those experienced soon after the introduction of the immensely popular Macintosh Classic.

Unlike the way it fumbled the ball in the portable market, Apple may have actually timed the introduction of the PowerBook perfectly. Sales of notebook PCs are expected to make up more than half of the nearly 5 million mobile PCs projected to ship in 1995, according to Norwalk, Conn.-

Continued on page 36

More power to come

Apple's latest plans include the dockable PowerBook duo, which will offer desktop docking mechanisms. The new models are expected to include two NuBus slots as well as support for 8-bit color on a 16-in display or 16-bit color on smaller displays so the machines can be hooked to external monitors.

The 4-pound notebooks will also feature a backlit supertwist display with 640-by 480-pixel resolution and 16 shades of gray. They are expected to sell for less than $3,000 as a package. The rollouts follow the August introduction of the PowerBook 145, a replacement for the midrange PowerBook 140.

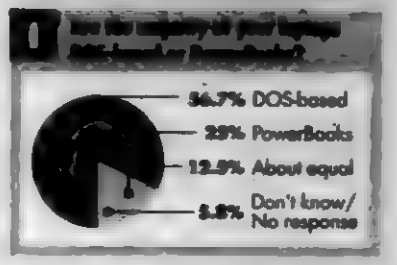
Also in the pipeline are new versions of the current PowerBooks featuring the same 16-level gray backlit supertwist LCD screens that the notebooks have. The Model 100 and Model 170 are expected to be replaced with a pair of machines that are slated to be a pound or more lighter than existing models, run as much as 32% faster and offer a higher resolution screen.

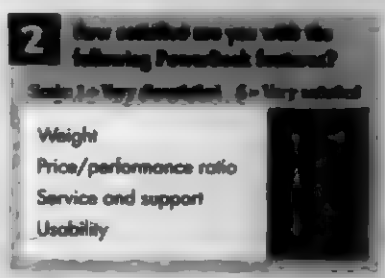
JAMES DALY

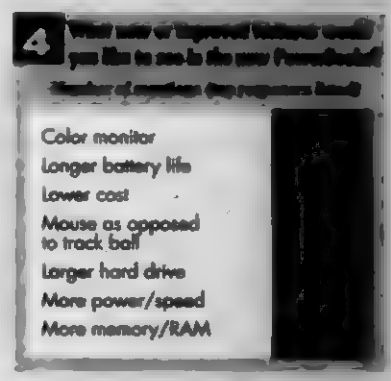
Good start

Users like the Apple PowerBook's ease of use but are less enamored with its price

Survey of 104 respondents who have both Apple PowerBooks and DOS-based laptops at their site







CW Chart: Stephanie Faucher

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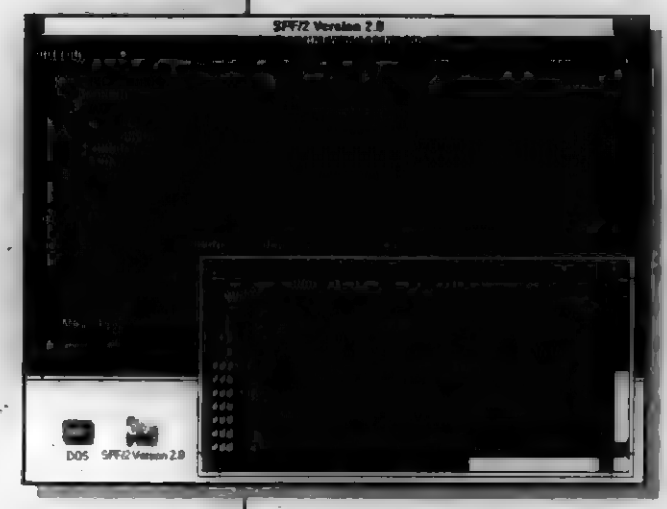

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NEC's UltraLite SL/25C: Color a key concern

Technology Analysis — A roundup of expert opinions about new products. Summaries written by product research coordinator Derek Slater.

The success of the UltraLite SL/25C, from NEC Technologies, Inc., hinges on the color display. Some reviewers loved the active-matrix color screen, while others found it dark or difficult to read from the sides. In other aspects, the UltraLite offers reasonable weight but suffers from very low battery life.

Performance: The UltraLite offers strong video performance and undistinguished processing scores.

Ease of use: Reviewers were divided on the display. The keyboard offers firm feedback.

Power supply: Despite the power-conscious processor, battery tests yielded an average life of about 1.5 hours, which is low compared with other color notebooks.

Design: The product has average weight for a color notebook — about 7 pounds. The size is also typical. *PC Computing* found the sharp corners of the box a carrying inconvenience.

Service and support: *Infoworld* praised the support policies, which include a two-year warranty.

Overall: Users will want to examine the UltraLite for themselves to determine whether the screen fits their tastes. It is priced at $4,599.

NEC UltraLite SL/25C

Reviewer	Performance	Ease of use	Power supply	Design	Service and support	Overall value
Infoworld 7/27/92	Good	No color bleeding	Satisfactory	Satisfactory	Excellent policies	Reasonable price for active matrix
PC Magazine 8/92	Good video scores	Keyboard could be improved	Poor battery performance	Solid	Free technical support hot line	Mostly positive impressions
Windows Magazine 7/92	NC	Most readable screen	Shortest battery life	Durable	NC	More affordable
PC Computing 9/92	NC	Gloomy screen	Underpowered	Several neat features	NC	Might pay to check this out
Byte 8/92	Respectable	Dim backlighting	Good power management features	Bulky	NC	Display not that good
Users						
Vic Mutnick, New York Life Insurance Co.	▄	▄	▌	▀	▀	Good company
Robert Sleeboom, Software AG	▀	▀	■	▀	▄	Very satisfied
Analysts						
Margaret Jacobs, Datapro Information Services Group	▄	▀	▌	▄	▀	Outstanding display, cramped keyboard
Kurt Hoch, Faulkner Information Services	▄	▌	▄	▌	▄	Kind of expensive

Key: ▀ Very good ▄ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

NEC is a private company based in Boxboro, Mass. The firm, founded in 1989, has approximately 3,700 employees. NEC does not release financial data.

NEC responds

Rus Graham, product marketing manager:

Ease of use: We've investigated this idea that the screen is darker, and we don't find that it's much darker than the competitors.

Power supply: We offer 1.5 hours at the very minimum, but with some of the power-saving features inherent in the system you can get up to 5 hours.

Premium Exec: Price earns it consideration

AST Premium Exec 386SX/25C

Reviewer	Performance	Ease of use	Power supply	Design	Service and support	Overall value
Infoworld 7/27/92	Relatively slow	Extremely pale display	Fine battery life	Satisfactory size and weight	Very good	Fair price for passive matrix
PC Computing 9/92	Lagged behind	Keys well laid out	Lagged behind	More durable	NC	Hard to argue with price
Windows Magazine 7/92	NC	Noisy keyboard	Small battery charger	Solid construction	NC	A bargain for color
PC Magazine 8/92	Average	Washed-out colors	2.5 hours	Range of options	One-year warranty	Workable, affordable
PC World 5/92	NC	Best passive-matrix display	Almost 2 hours with constant use	A pleasure to carry	NC	Least expensive
Users						
Fred Leonard, Chaparral Computers and Networks	▀	▀	NC	▀	▀	Price is surprisingly low
Robert Sleeboom, Software AG	■	■	■	■	■	Less expensive
J. Briscoe Stephens, NASA	▄	▄	▄	▄	▀	Very reasonable price
Analysts						
Margaret Jacobs, Datapro Information Services Group	▄	▄	▄	▄	▀	Good

Key: ▀ Very good ▄ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

AST reported profits of $18.6 million for the quarter ended in June, down about 9% from the same quarter in 1991. Quarterly revenue was $266.3 million, up 26%. The company recently announced that it is reducing operational costs to address lower profit margins.

AST responds

Bret Berg, product marketing manager:

Performance: Our next-generation notebook, the Power Exec, has cache for better performance. It also weighs 6 pounds and goes well over 3 hours for battery life.

Ease of use: Sound is one of the most subjective variables, and you can't please everybody. Many users indicate that they like the audible feedback.

Premium Exec 386SX/25C launched AST Research, Inc. into the color notebook market in November of last year. Newer models have surpassed it in weight and battery life, but the product is still worth a look for low-end color users.

Performance: Based on the Intel Corp. 80386SX chip, the Premium Exec has no cache memory and lags slightly behind its competitors in terms of performance.

Ease of use: Reviewers gave the passive-matrix display mixed grades. The keyboard layout is very good, although some reviewers found the keys to be irritatingly noisy.

Power supply: A battery charge lasts approximately 2 hours with heavy use. Notebooks that implement the power-concious SL chip outperform the Premium Exec in this area.

Design: The Premium Exec weighs in at 7.5 pounds. It carries standard notebook measurements.

Service and support: Support policies include a one-year warranty, fax and bulletin board service, as well as toll-free telephone support 14 hours a day. According to *Infoworld*, the quality of technical support is very good.

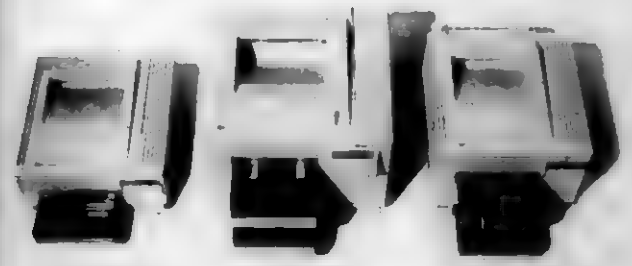
Overall value: Despite its drawbacks, the Premium Exec is worth a look because of its $3,595 price tag, reviewers said.

Until now, network printers have had the same fifteen-foot restriction.

With HP network-ready LaserJets, you can put your printers where your users are.

Now you can forget about tethering your printers to some faraway server. Because network-ready LaserJet printers can be placed anywhere along your network. Just plug them in as you would PCs and you're ready to roll.

Since you're putting printers by your users, it's as if you're giving them their very own personal printer. Which means they won't have to travel as far for output. Because they're closer to the printer, they can handle some of the routine maintenance tasks, such as paper loading, themselves. Best of all, you won't have to contend with extra boxes, wires or power cables.



HP LaserJet III *HP LaserJet IIISi* *HP LaserJet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,* Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3073 for the HP Connectivity Solutions Guide.

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Pen computing sparks interest

Anxious managers seem willing to wait for the technology to mature

BY MICHAEL FITZGERALD
CW STAFF

LOS ANGELES — Hype kicked the pen industry out of the nest early on, and the Pen Expo conference here recently showed pen vendors still struggling to find their wings.

Continued user interest in the new technology may yet lift the pen market, as demonstrated by the approximately 800 users who turned out for the show. The draw for most of them was the hope that pen-based computers will provide capabilities where other portable computers have proved less than useful.

"It's a question of pen-based technology vs. doing things by hand," said Richard Mann, assistant district superintendent at the City of Los Angeles Department of Water & Power (DWP). Mann said DWP would like to automate field workers who use paper forms to track crucial information, and he said pen computing may be the answer.

Other users at the show said they see pen computers as more functional than keyboard-based computers. A personal computer manager at a multibillion-dollar pharmaceuticals company said his firm's entire sales staff has notebooks but does not use them during the working day. Instead, they handle transactions and file reports in hotel rooms after hours. He said pen computers could help salesmen make quick notes during or immediately after a presentation.

Scott Shafer, director of workstation product marketing at NCR Corp., said NCR was encouraged to release its System 3130, shown behind closed doors at the show and scheduled for release this week, because the large majority of some 990 companies worldwide that are testing its existing 3125 pen-based system have said they do not want to roll out pilots until a better platform exists.

While user frustration at the shortage of pen systems runs high, there were a fair number of product releases or enhancements at Pen Expo.

The NCR 3130 adds several features over the 3125, including a backlit screen with better etching, which provides a better feel for the user, a 40M-byte or 60M-byte hard drive — up from 20M bytes before — and a ruggedized leather operating case.

Meanwhile, the following were among a string of products announced:

•**IBM** showed OS/2-Pen, its upcoming pen-based operating system, on its ThinkPad 700T.

IBM's OS/2-Pen *was announced at Pen Expo*

•**Tusk, Inc.** in Lake Park, Fla., released its All-Terrain SuperTablet, a 10.1- by 12- by 2-in. combination pen and keyboard machine. The SuperTablet is based on the 25-MHz 80386SL and has a math coprocessor and a local-bus video architecture. Base memory is 8M bytes of random-access memory. The device accepts either pen or keyboard input. A base model with an 85M-byte hard drive will sell for $5,995.

•**Communication Intelligence Corp.** in Redwood City, Calif., released Version 2.0 of its PenDOS operating environment.

•Westerville, Ohio-based **Concept Technologies, Inc.** showed its Stroke of the Hand cursive word processor.

•**JFK Associates, Inc.** in Malvern, Pa., demonstrated its RitePad reference design, intended to run DOS programs in a pen environment. The RitePad was designed to weigh 2 pounds in a 10- by 6- by 1-in. form factor and is based on Chips and Technologies, Inc.'s PC/Chip.

Go Corp., the Foster City, Calif., maker of the PenPoint operating system, said it would bundle five applications with its operating system in what it calls its Hot Apps promotion.

The applications are Ink Development Corp.'s Inkware NoteTaker, Pensoft Corp.'s Personal Perspective personal information manager, Penmagic Software's The Executive Assistant, Sitka Corp.'s PenCentral connectivity software and Notable Technologies, Inc.'s PenCross crossword puzzle.

Japan's pen systems set for '93 rollout

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — By early next year, computer users worldwide will start seeing the wave of pen-based computers launched recently at the Data Show here, where almost all major Japanese personal computer manufacturers demonstrated their new offerings or prototypes.

Toshiba Corp., Canon, Inc., Fujitsu Ltd., Hitachi Ltd., Oki Electric Industry Co. and Wacom Co. each exhibited pen computers at the annual computer show. Toshiba and Oki Electric displayed production-ready pen-based notepad computers, announced earlier this month, that will ship in December. The other companies displayed pen computer prototypes, most of which are slated for release next year.

This wave of pen computer products will make its presence felt first in vertical markets, according to Satoshi Uchiyama, a senior computer industry analyst at Dataquest Japan Ltd.

Around the corner

Pen-input computers and shrink-wrapped pen-based software applications for personal use will start appearing next year, but pen computers will not sell in volume until prices come down from the initial $3,000 to $5,000 range, Uchiyama said.

An example of products displayed was Toshiba's 3-pound Dynanote, which will be priced in Japan at $3,980. It is equipped with a low-power Intel Corp. 25-MHz 80386SL processor, a 1.8-in. 40M-byte hard drive and 4M bytes of random-access memory.

Dynanote's Video Graphics Array LCD uses a reflective, side-lit design to allow easy reading even with the side lighting turned off. The machine's nickel-hydride battery lasts up to eight hours with the side light off, company officials said, or up to three hours with it on.

The machine runs both Go Corp.'s PenPoint and Microsoft Corp.'s Windows for Pen Computing operating systems.

Dynanote will make its overseas debut next month at Comdex/Fall '92 in Las Vegas, a Toshiba official said.

Perhaps the most technologically innovative entry in the pen computer race is the "Type B" prototype from Canon. This 20-MHz, 386SL-based model uses Canon's "ultrasonic digitizing pen-input" technology, which company officials said significantly improves pen-to-screen response and input precision.

Canon has not decided when the Type B will be released, a Canon official said.

PowerBook resuscitates Apple

CONTINUED FROM PAGE 33

based research firm Inteco Corp.

The portable market is also expected to begin another growth spurt soon, as mobile PCs are brought in as the primary computer in areas such as sales and field service that have remained uncomputerized.

Rick Marolt, IS manager at Great Central Insurance Co. in Peoria, Ill., has begun issuing PowerBooks to field representatives handling claims and safety inspectors. "It's a great size and very light — just what we need for the job," he said. "Plus the PowerBook's [central] trackball is the first intelligent placement of a trackball I've seen on a keyboard."

Apple has firm plans to back up the success of the PowerBook. In recent months, Apple has had to change its price/performance ratio to respond to increasing pressure from faster and cheaper portables from manufacturers of IBM PC clones. That has helped prompt Apple executives to re-examine the PowerBook's configurations, according to Senior Vice President Roger Heinen.

Not all the PowerBooks were a success, however. One machine that did not live up to the expectations of users or Apple was the PowerBook 100, the low-end machine Apple built with the help of Sony Corp. "It was a total disappointment, completely underpowered," Marolt said.

So far, sales of the slower and less feature-packed PowerBook 100, which is now available at fire sale prices at many stores, have been below expectations, according to Selvin. "Although sales of the 100 are good, it's certainly not as successful as we thought it was going to be," he said. "A lot of people felt it came out underpowered, and they were looking for a faster machine with more storage and memory."

The new models could further open up the PowerBooks — and the Macintosh line as a whole — to a new class of user, particularly on the low end. "If Apple refreshes the low end, and they do it well, it could appeal to a whole new group of users who were never very impressed with the 100," said Pieter Hartsook, editor of "The Hartsook Report," a Macintosh newsletter published in Alameda, Calif.

Apple plans a full schedule of PowerBook enhancements. Last spring, Sculley said a color PowerBook could be available as early as the first quarter of 1993. Selvin also hinted that improved connectivity would be a large part of the future emphasis of upcoming PowerBooks.

HELP LINE

Windows 3.1

Part of a continuing series of tips by PC software vendors, based on questions commonly asked of their customer support personnel. This week's questions focus on Microsoft Corp.'s Windows 3.1.

Q I have a sound card that plays the Windows file CANYON.MID, but when I choose the Sound icon from Control Panel, all the dialog box selections are unavailable (dimmed). Why does this happen?

A You are using a sound card that is a MIDI synthesizer. You must use a card that supports the playing of audio files (files with the .WAV filename extension). For example, if you are using the original Adlib Music Synthesizer Card, it must be upgraded to the Adlib 2000 or Gold card.

Q When I choose the Ports icon in Control Panel, the Advanced button in the Ports dialog box is unavailable (dimmed). Why is this?

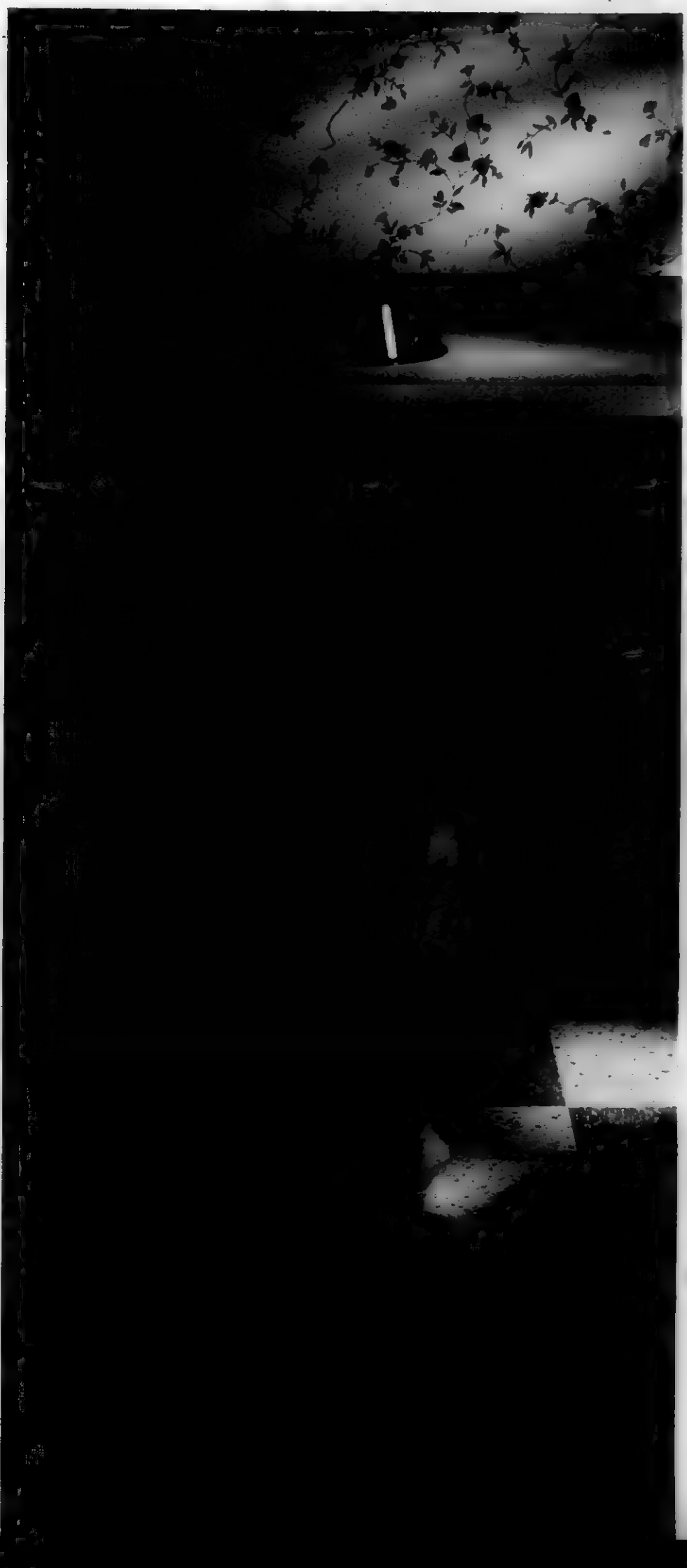
A If the Windows 3.1 COMM.DRV file is not installed correctly, the Advanced button in the Ports dialog box will be unavailable.

If you upgraded from Windows 3.0 to 3.1 and you were using a third-party communications driver in 3.0, the Windows 3.1 Setup program will not update the communications driver.

To make sure that your COMM.DRV file is installed correctly, try the following:

1. Make sure you have the following setting in the boot section of your SYSTEM.INI file: **COMM.DRV=COMM.DRV**

2. Using the MS-DOS expand command (installed in the WINDOWS directory of your hard drive during Windows setup), reinstall the COMM.DRV from the Windows Setup disks (Disk 1 for 3-in. disks; Disk 2 for 5-in. disks) into the SYSTEM subdirectory of your WINDOWS directory by typing the following: **expand a:/comm.dr_:/windows/system/comm.drv**



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NEW PRODUCTS

Systems

QSI Corp. has added the 386SL/25-based notebook computer to its Klonimus Lite series.

The series includes the Klonimus Lite 286, 386SX and 386SL models. Expansion modules, double battery packs and an AC adapter/charger with the ability to automatically switch between domestic and foreign voltages are included.

Every model in the line has a high-density 3-in. floppy disk and weighs 7.4 pounds.

Notebook prices range from $1,269 to $1,665. Desktop prices range from $1,033 to $2,781.

QSI
95 Rockwell Place
Brooklyn, N.Y. 11217
(718) 834-4545

Macintosh products

Computer Associates International, Inc. has started shipping an Apple Computer, Inc. Macintosh version of CA-Cricket Graph III.

CA-Cricket Graph III is a graphing package designed to help users analyze data and create high-quality chart output. Features include new data handling and analysis capabilities, plus an improved drawing environment with an expanded tool set for professional layout and bezier-bar drawing. Expanded color control and increased speed have also been added. The product is compatible with Macintosh System 6.0.7 and higher.

CA-Cricket Graph III costs $195.

Computer Associates
1 Computer Associates Plaza
Islandia, N.Y. 11788
(516) 342-5224

Strategic Mapping, Inc. has introduced Version 1.5 of Atlas Pro, a geographic information management system.

Atlas Pro 1.5 was designed for the Apple Computer, Inc. Macintosh. Additional enhancements include extensive connectivity to databases, new tools for zooming and mapping and improved street-level mapping and address matching. According to the company, users can analyze and display information based on actual location. The software supports interactive querying on a variety of database systems, including those from Oracle Corp., Informix Corp. and Sybase, Inc.

Atlas Pro 1.5 costs $795.

Strategic Mapping
Suite 250
4030 Moorpark Ave.
San Jose, Calif. 95117
(408) 985-7400

Peripherals

Jakus Associates has started shipping ParaStor, a parallel port quarter-inch back-up tape drive.

The product saves information at a rate of 6M bytes per minute and can accommodate desktop, laptop and notebook personal computers. ParaStor is compatible with DOS, Novell, Inc., Pick and Unix systems and has a range of capacity from 100M bytes to 1G byte. ParaStor does not require tools or controller cards to be installed. Software and cables are provided.

Prices range from $1,395 to $2,895.

Jakus Associates
Suite 72
1526 Brookhollow Drive
Santa Ana, Calif. 92705
(714) 668-7333

American Megatrends, Inc., announced three motherboards that use Intel Corp.'s 1486 DX2 66-MHz microprocessor.

Operating at 27.25 million instructions per second (MIPS), the EZ-Flex 66-MHz CPU card uses Intel's DX2/66 CPU and supports the 16 X 9 single in-line memory module for up to 128M bytes of random-access memory on the motherboard. The 66-MHz Super Voyager motherboard operates at 29.3 MIPS, supports Intel's OverDrive and is a baby-AT-size board with 64K or 256K of cache. The Enterprise II Extended Industry Standard Architecture motherboard supports all of Intel's double-clock and upgrade processors and has a full-size AT footprint that can be used for file server and Unix applications.

Prices start at $1,600.

American Megatrends
6145-F Northbelt Pkwy.
Norcross, Ga. 30071
(404) 263-8181

Pixelworks, Inc. has introduced WhirlWin 1600, a 1,600 by 1,200 resolution graphics board.

WhirlWin 1600 is a single-slot AT-bus graphics controller that is Extended Industry Standard Architecture-compatible. The product has programmable display timings, which enable it to interface to any 1,600 resolution monitor, the company reported. Sixteen colors from a palette of 16.7 million can be displayed. The high resolution of the WhirlWin board enables users to work on large, high-refresh, noninterlaced monitors.

WhirlWin 1600 is based on Chips and Technologies, Inc.'s 82C481 Accelerator chip and uses new hardware-assisted functions to increase bit block transfers. Support is provided for Microsoft Corp.'s Windows 3.1, X Window System and many computer-aided design packages.

WhirlWin costs $1,895.

Pixelworks
7 Park Ave.
Hudson, N.H. 03051
(603) 880-1322

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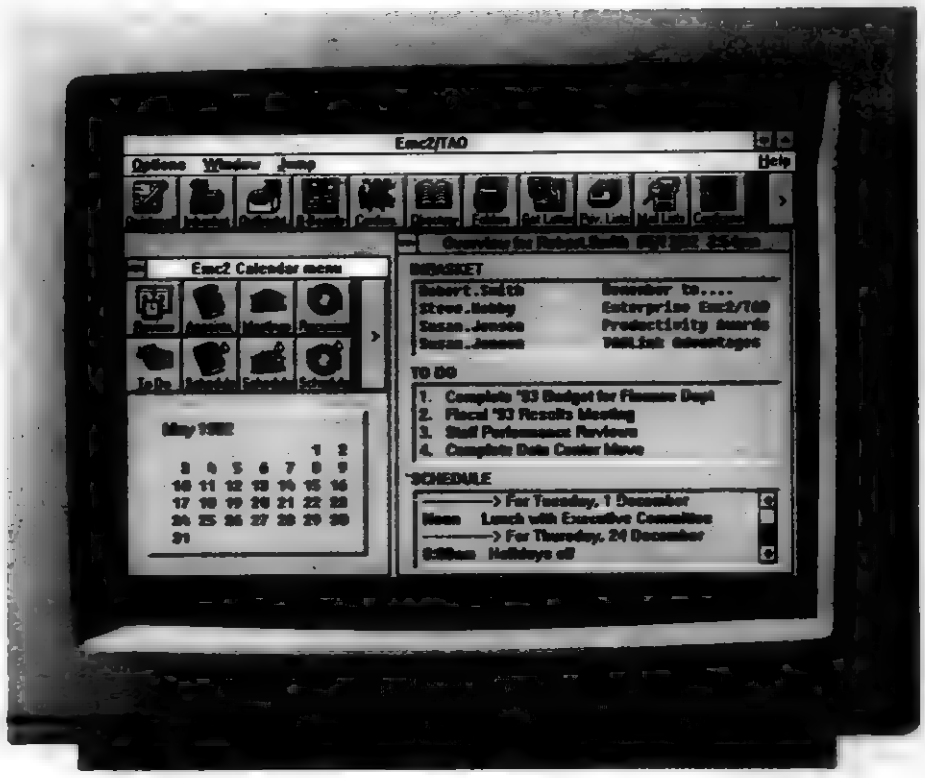
E-Mail For Both Mainframe And LAN Is A Huge Headache...



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GARTNER GROUP REPORT

Open systems growing pains

BY MARYFRAN JOHNSON and THOMAS HOFFMAN
CW STAFF

"You gotta be careful about getting locked into open systems."

So said the IBM salesman to the customer — or so goes the story making its way along the grapevine in the Unix community.

However accurate the quote may be, it does hold a certain grim humor. While open systems are supposed to preclude vendor "lock-in," users who are putting these environments into practice are encountering their share of problems.

"What I continue to worry about is scalability," said David Carlson, senior vice president of corporate information services at Kmart Corp., based in Troy, Mich., an extensive and early adopter of open systems. "It turns out that projections on how much capacity you need for the life of the system are generally too conservative."

Kmart's "Superstore" environment, anchored by 5,000 Unisys Corp. U6000 Unix multiprocessors, serves 2,300 Kmart stores. The company's information systems operation was recently recognized for its achievements with Unix Expo's International Award for Excellence in Open Systems.

While the plus side of the ledger far outweighs the minus side for Kmart, Carlson said one of his perennial concerns is coordinating different versions of software on thousands of processors and point-of-sale devices. "One has to be very careful about writing code that won't affect things on the [Token Ring local-area networks]," he noted.

Hyatt Hotels, Inc. is another early adopter of Unix technology, with a 3-year-old installation that includes AT&T 3B2 Unix servers and Hewlett-Packard Co. HP 9000 Model 800 Unix servers.

Kevin F. Reilly, director of operations and technology at Hyatt, said the company is pleased with the performance of the Unix machines but still has rough spots to iron out.

One benefit of Hyatt's Unix-based system is the ability to process 30 hotel room reservations per second, Reilly said. One of the drawbacks, however, is data archiving limitations.

Archive delays

Hyatt uses an Informix Software, Inc. database that houses 8G bytes of data. Reilly said it often takes five to six hours to archive data from the database because of backup problems. Possible solutions to the problem are being discussed with database vendors, Reilly said.

Hyatt has also experienced Unix-related problems with the character-mode terminal interface working poorly over a LAN. "I'm still looking for a really decent performance monitor under Unix," Reilly said. "And I'm constantly looking for better tools" to tune the database.

The Au Bon Pain, Inc. chain of French bakery cafes — another business based on Unix — has encountered setbacks such as compatibility problems among its Network File System, SQL Net and Microsoft Corp. Windows environments, said MIS director Mark Factor. The Boston-based franchise runs a Unix environment based on a Sun Microsystems, Inc. SPARCstation.

Other problems have cropped up with running Lotus Development Corp.'s 1-2-3 spreadsheets over Unix, which have been unable to access system resources or pass messages in files under the Unix platform, Factor noted.

At US West's NewVector Group in Bellevue, Wash., the computing environment is divided among IBM and Amdahl Corp. mainframes and Sequent Computer Systems, Inc. Unix servers.

"The thing that's holding us back is data center infrastructure," said John Black, a systems architect at NewVector. "In general, open systems shops have more expensive infrastructure costs than an IBM/MVS environment. We love the flexibility of Unix, but it's also killing us because no two Unix shops run in exactly the same way."

That translates into higher "people costs" to run large Unix environments, he explained, with an average 90-day ramp-up time to get new Unix employees productive.

"The industry needs to drive that down to 30 days," Black contended.

To encourage greater standardization on managing Unix shops, he helped establish a new user group called MOSES for Massive Open Systems Environmental Standards, which includes British Telecommunications PLC and Burlington Coat Factory, Inc. among its members.

"There are so many more skills needed in the Unix world. It crosses so many boundaries you don't have in a mainframe world," added Chuck Hemann, manager of engineering computer operations at Harnischfeger Corp., a Milwaukee-based industrial manufacturer that uses both an IBM mainframe and a network of IBM RISC System/6000 Unix workstations and servers.

Like other users in such mixed environments, Hemann said Unix has gained a grudging respect from mainframe staffers. "They realize Unix is here to stay," he said.

Unix headaches

Pioneering users are running into new and unexpected problems as their open systems installations mature:

- Ensuring scalability of systems and networks.
- Checking capacity planning (usually it's too conservative).
- Keeping communication reliability between environments such as the standard Network File System, SQL Net and Microsoft's Windows.
- Archiving massive amounts of data and finding decent performance monitors and database tuning tools.
- Coordinating different versions of software on distributed processors.
- Coping with the lack of standard procedures for managing Unix-based data center environments.
- Budgeting for higher "people costs."
- Recovering from overly ambitious pilot projects when they bog down.

CW Chart: Michael Siggins

Pioneer Arcnet struggles against newer networks

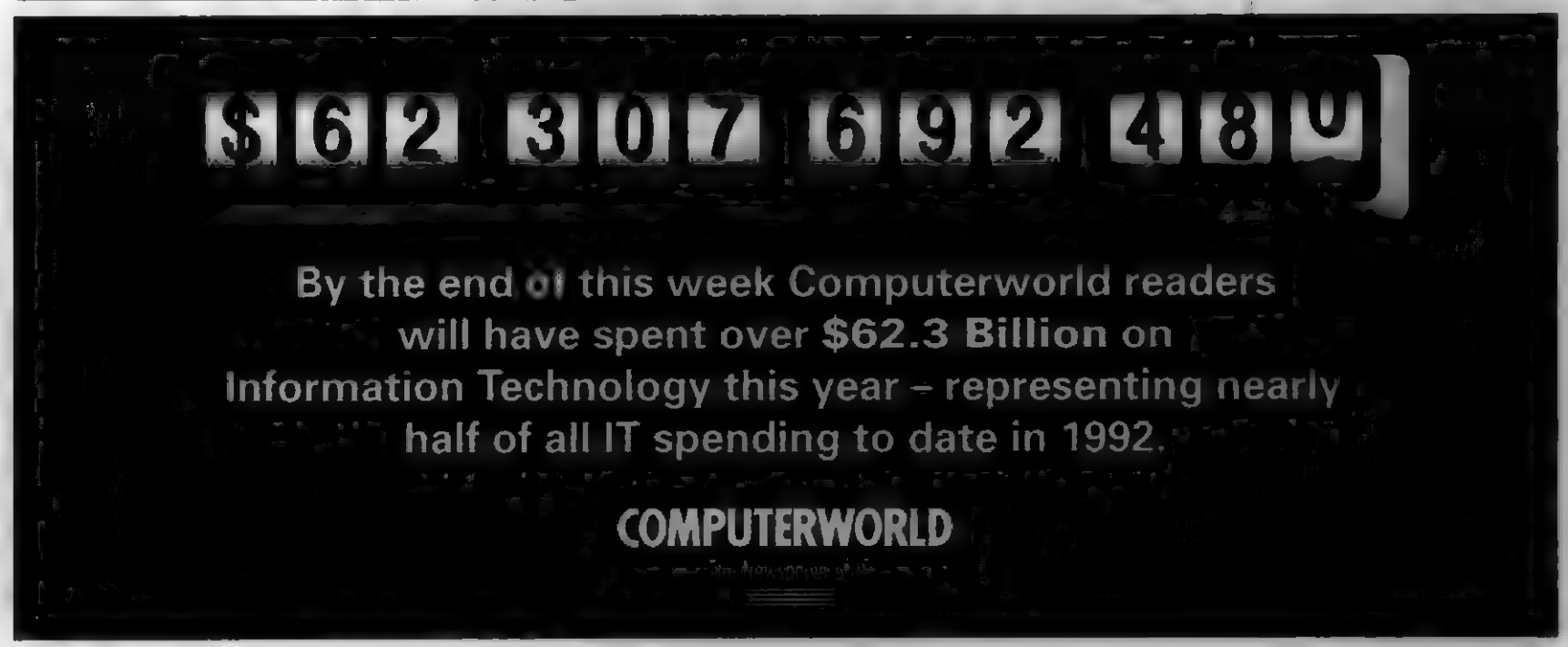
MICHELE DOSTERT
CW STAFF

Arcnet local-area networks — one of the early, standard technologies that helped build the current LAN momentum — are rapidly being superceded by Ethernet and Token Ring topologies.

"Almost all the [Arcnet] cards sold are for new nodes on existing Arcnet LANs" instead of for new network installations, said Susan Frankle, a LAN analyst at International Data Corp. in Framingham, Mass.

In the early days of LANs, from around 1985 to 1989, Arcnet had many fans. First, it was cheap — around $150 per interface card — compared with approximately $400 for an Ethernet adapter. Second, the token-bus Arcnet technology running on inexpensive coaxial cable was very fault tolerant; it would keep running through electrical noise, kinks and other cabling obstacles. Third, before the advent of graphics-based applications, the tech-

Continued on page 45



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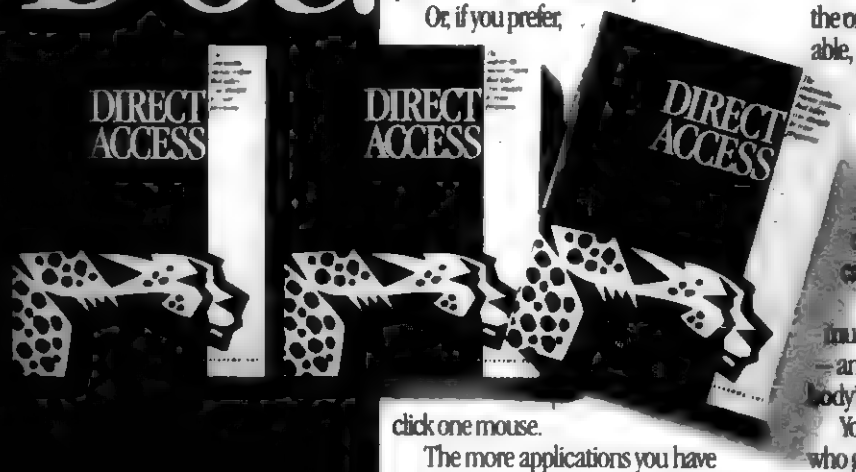
Or, if you prefer,

Direct Access searches your hard disk, groups your applications logically and generates menus and submenus automatically. All you have to do is point and click.



click one mouse.

The more applications you have on your disk, the more you'll delight in Direct Access.

That's because Program Manager insists on grouping your programs into five arbitrary categories: "Windows Applications," "Non-Windows Applications," "Accessories," "Games" and "Main."

Not very intuitive, eh?

Direct Access, on the other hand, gives you a multitude of utterly sensible program groupings – 17 of them.

And that doesn't count the customized ones you dream up yourself.

What does all this mean to you?

It means you can get to a spreadsheet by simply clicking "Spreadsheet." Summon a word processor by stroking "W." And access a DBMS by selecting, you guessed it, "Database."

You can even park your favorite programs right on the main menu and ask for them by name.

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If the only PC you're responsible for is the one on your desk, Direct Access is valuable, indeed.

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You can decide for yourself precisely who gets access to which menu items.

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FIFTH GENERATION SYSTEMS, INC

Questions hang over HP as workstations miss 100 MHz

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Users of Hewlett-Packard Co. industrial workstations saw their near-term PA-RISC future recently, and it is not 100 MHz — a vision that raised questions about HP's yet-to-be-released upgraded general line.

HP introduced three I/O-intensive industrial models based on the newest implementation of its Precision Architecture-RISC chip, the 7100.

While HP has given the processor advanced billing as a 100-MHz speed demon, the version going into the industrial machines due for shipment next month operates at 50 MHz.

Ron Vernon, an HP marketing manager, said HP sacrificed speed to make the machines more affordable to cost-conscious, industrial-grade users who must pay a premium for ruggedization.

The company priced two Unix entry-level models running HP/UX Version 9.0 at $13,390 for the HP 745I, which includes four Extended Industry Standard Architecture (EISA) slots, and at $15,990 for the HP 747I, which includes two EISA slots and six VME slots. HP tagged the HP 742RT, which runs HP's RTE real-time operating system, at $7,995.

New market to explore

Although HP has recently implemented 96-MHz 7100 chips in its two minicomputer lines, it has been slower to bring its blazer into the workstation arena.

The general workstation operations will probably reserve 100-MHz speeds for niche users, HP said.

"There will be a whole series of [general workstation] products," said Dave Logan, marketing manager for HP's systems technology division, which develops PA-RISC. "The lower prices will run at less than 100 MHz."

However, Vernon added, based on price/performance specifications for the new industrial machines, even speeds short of 100 MHz should still yield notable gains over HP's existing PA-RISC-based HP Apollo 9000 general workstation line.

Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco, pointed out that a 50-MHz implementation may not enable HP to leapfrog Sun Microsystems, Inc. in the race for workstation technical supremacy, but a 75-MHz implementation of the 7100 "should be more than enough" to surpass Sun.

In a sign that developments in industrial workstations may begin to parallel those in general workstations, HP reorganized the two into the same group.

Despite the lower MIPS (or millions of instructions per second) ratings, the 7100-based industrial machines mark a significant price/performance leap in HP's industrial offerings, a business area in which the company has been slipping.

"Over the last few years, we have not been doing so well," Vernon conceded. "This is our effort at rejuvenation."

The new industrial models are the first to incorporate HP's PA-RISC, even though HP has been building PA-RISC into other machines since 1986.

The existing industrial models are built on Motorola, Inc.'s 68000 processor, and according to Vernon, HP will continue to support them through 1996.

Vernon said that because the 7100 chips provide more MIPS and have more embedded functionality such as enhanced graphics and, for the first time, floating-point capabilities, they are more cost-effective to users than the earlier PA-RISC chips.

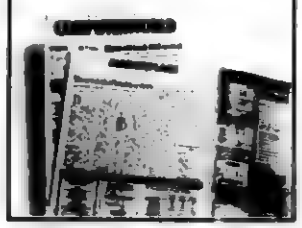
In with the new

With its industrial workstations based on the 7100 RISC chip, HP improved on the price/performance of its current models

	Model 745I	HP Apollo 750
Processor	50-MHz 7100 RISC	66-MHz PCXS RISC
MIPS rating	69	73
Memory	32M bytes	64M bytes
Storage	525M bytes	1.3G bytes
Moniter	19-in. color	19-in. color
Price	$19,940	$52,900

Source: Hewlett-Packard Co. CW Chart: Janell Genovese

Check out the Marketplace Pages on Page 101.



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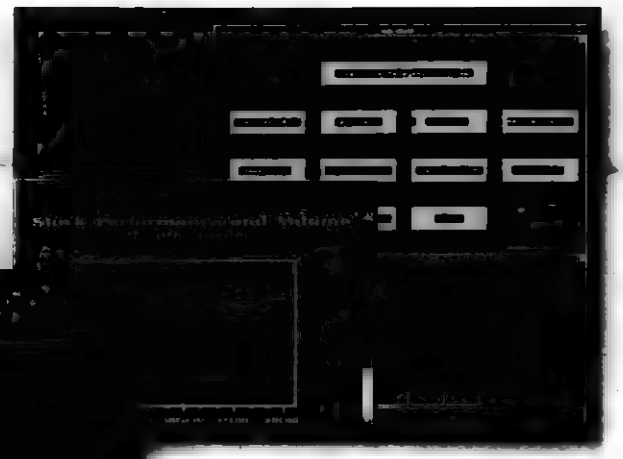
Executive



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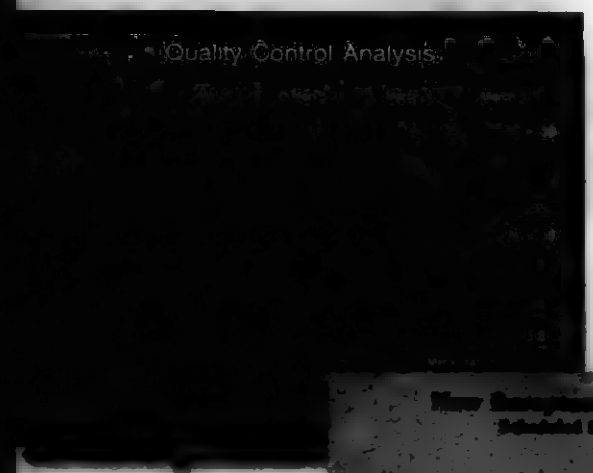

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Pioneer Arcnet struggles

CONTINUED FROM PAGE 41

nology's 2.5M bit/sec. speed left networks with bandwidth to spare. And fourth, Arcnet nodes could be positioned up to 2,000 feet from the cable backbone — a vast improvement over Ethernet's 100 meters. This continues to be an advantage.

However, most of these advantages have disappeared in the last few years. Gerry Baldwin, president of Vancouver, B.C.-based LAN reseller Azcom Information Systems, said, "There is no demand for Arcnet anymore. Why would I put in an Arcnet card, which costs around $120 for 2.5M bit/sec., when I can run a 10M bit/sec. Ethernet card priced at around $175 and getting cheaper every day?"

Baldwin said running Microsoft Corp. Windows or graphics applications on Arcnet is "just suicide, so there's no customer demand for it. Everyone wants Ethernet or Token Ring for the bandwidth."

While Arcnet developer Datapoint, Inc. released a 20M bit/sec. Arcnet version in February (see story below), LAN users seeking greater bandwidth tend to be migrating to Ethernet or Token Ring. At the University of Texas M. D. Anderson Cancer Center, for example, "every new LAN that goes in is 10Base-T [Ethernet over unshielded twisted-pair]," said Bruce Pinkham, IS coordinator. "At one time, we had 1,000 Arcnet nodes, but we are slowly moving them to 10Base-T as well."

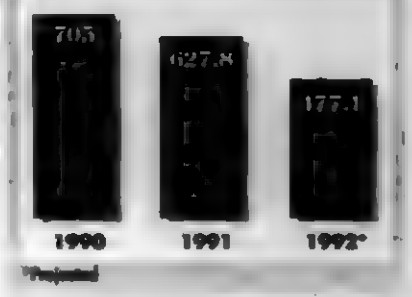
"We run on Arcnet here in our offices," said Joe Kelly, a LAN analyst at Datapro Information Systems in Delran, N.J. "But we have to switch to Ethernet or Token Ring because 2.5M bit/sec. is just too slow for our SQL database queries."

The niches where LAN watchers expect Arcnet's continued successes are in manufacturing, where its fault tolerance is a major plus, and in small branch offices where simplicity is important.

"We have it in 40 branch offices connecting two or three PCs together; it works great for that, so we won't replace it," said an MIS manager at a Texas manufacturing and distribution firm.

Whither Arcnet?

Its price advantage gone, Arcnet is in a rapid sales decline



Source: International Data Corp.

In search of faster Arcnet

Datapoint Corp. delivered a 20M bit/sec. Arcnet card in February 1992. However, most analysts and some Arcnet vendors said the new Arcnet Plus is too late — and too expensive at $995 per card.

Jeff Chumbley, director of product marketing at adapter card maker Thomas-Conrad in Austin, Texas, said, "We looked at Arcnet Plus but decided not to go ahead with it. It's too expensive, and since it was so slow coming to market, it lost its chance when Ethernet dramatically improved its price/performance numbers."

A spokesperson at New York-based Arcnet vendor Standard Microsystems Corp. also cited Arcnet Plus' tardy appearance and high prices as reasons why Standard Microsystems is not offering Arcnet Plus. "They're asking you to pay over five times the price for twice the performance of 10Base-T."

However, Robert Hollingsworth, director of marketing at Datapoint, said Datapoint will be able to drop the $995 per-card price before the Networld '92 show in Dallas next week because the vendor is moving its manufacturing in-house.

Hollingsworth explained that the 20M bit/sec. Arcnet Plus cards are targeted at niches within the network, such as servers, where applications demand faster speed and where the power of the computer is not the bottleneck.

The company will roll out a "Test Drive" program at Networld whereupon users can experiment with the higher speed cards in various network nodes to determine if the network is causing the bottleneck.

Arcnet Plus is backward compatible; on a network running both 2.5M and 20M bit/sec. cards, multiple 20M bit/sec. cards communicate at the higher speeds, and intercommunicating 2.5M and 20M bit/sec. cards default to the lower speed.

However, many resellers and users seem excited about an alternative high-speed Arcnet scheme from Thomas-Conrad. The Thomas-Conrad Networking System can deliver 100M bit/sec. throughput over coaxial, shielded twisted-pair or fiber-optic media. Although the system has distance limitations of 100 to 900 meters depending on the type of cabling, it works with existing Arcnet and local-area network operating system drivers and is priced starting at $595 per adapter.

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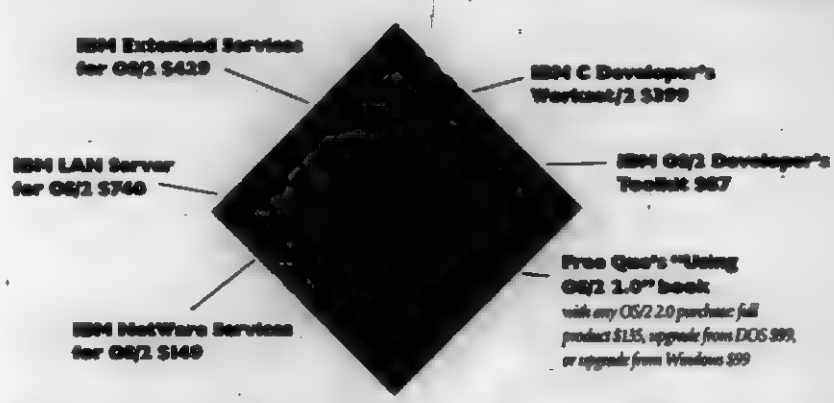

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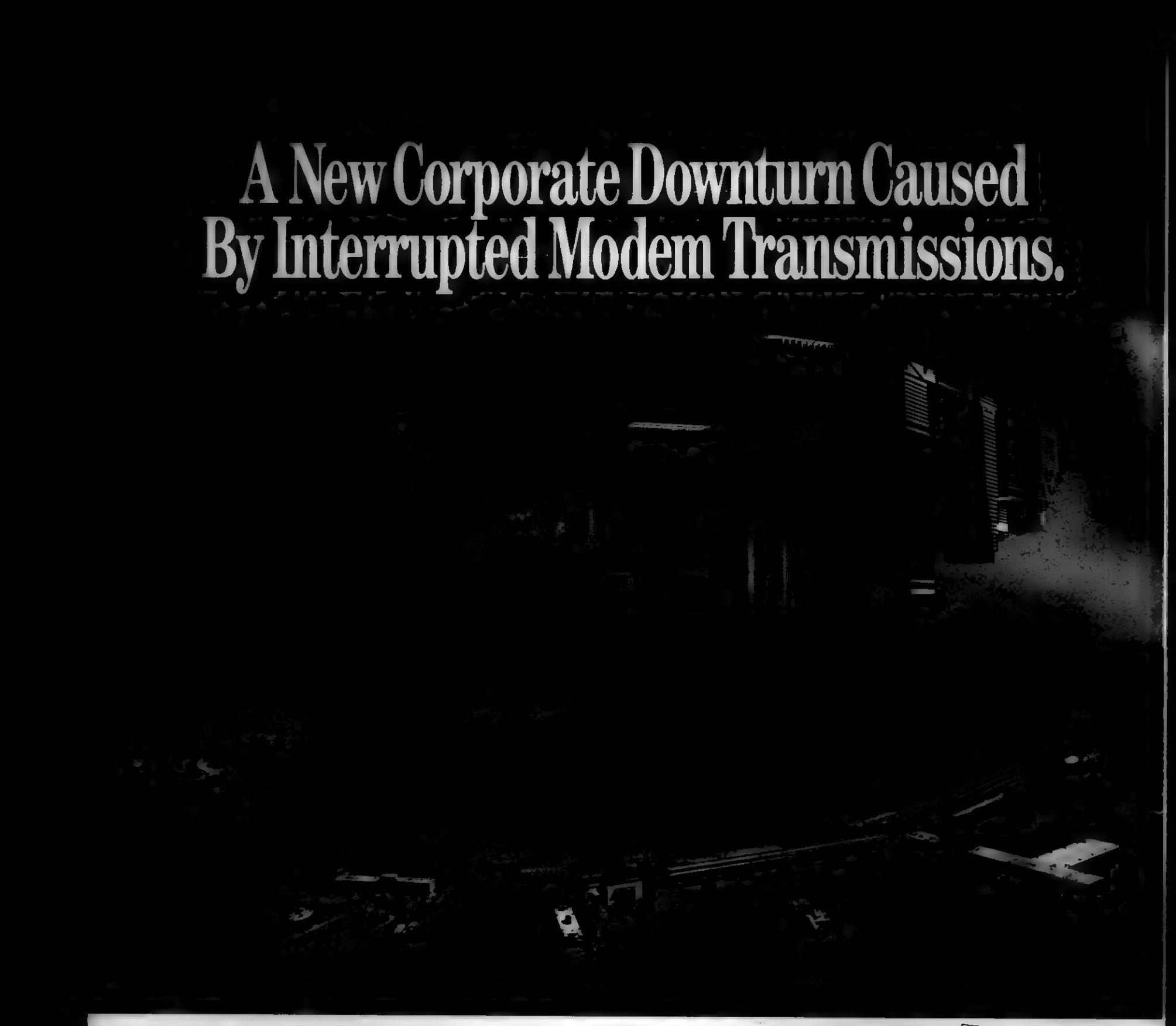
A New Corporate Downturn Caused By Interrupted Modem Transmissions.



Your daily business routine could be turned upside down by an interrupted modem transmission. One moment you're sending or receiving data, the next moment you're fuming. Has the Escape Sequence used by your modem just interrupted your transmission?

While our real world examples of interrupted transmissions due to escape sequences have been limited to our BBS and Hayes' own data files, our analysis is based on the theoretical possibility that you can experience this situation in your business. Will you be the one who proves our theory?

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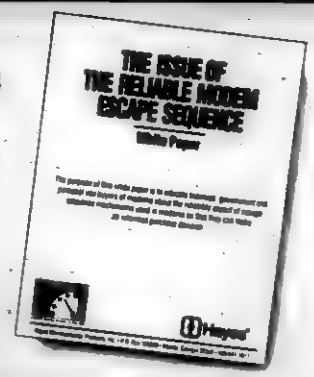

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NEW PRODUCTS

LAN hardware

Intel Corp. has introduced the StorageExpress system.

StorageExpress is an integrated solution for centrally managed, unattended backup of workstations and file servers on Novell, Inc. NetWare networks, the company reported. An intelligent control unit preconfigured with NetWare Runtime, a Microsoft Corp. Windows 3.1-based application for point-and-click customizing of backup and restore functions and a peripheral unit that supports two 8mm magnetic tape drives are included.

The StorageExpress EL system costs $9,995 and includes a control unit with a 200M-byte hard drive and a peripheral unit with a 2.2G-byte tape drive. The StorageExpress XL system costs $13,995 and includes a control unit with a 500M-byte hard drive and a peripheral unit with a 5G-byte tape drive.

Intel
2200 Mission College Blvd.
Santa Clara, Calif. 95052
(503) 629-7354

Intellicom, Inc. has announced the TPair-PNA/QL, a portable network adapter.

According to the company, the product is the only parallel port adapter that includes software and hardware to connect any laptop, notebook or desktop computer to an IEEE 802.3 10Base-T Ethernet network. Through an integrated auxilliary parallel port, the TPair-PNA/QL provides a continuous local print capability designed to gather network statistics from the product's compliant Simple Network Management Protocol agent. Simultaneous support is provided on multiple servers running Novell, Inc. NetWare 286 and 386, Transmission Control Protocol/Internet Protocol and NetBIOS, among others.

The TPair-PNA/QL costs $468.

Intellicom
20415 Nordhoff St.
Chatsworth, Calif. 91311
(818) 407-3900

The Wollongong Group, Inc. has evolved its WIN/TCP for VMS product line to Pathway for VMS, its line for the VAX environment.

Pathway's architecture offers network services including applications, protocols, network management, security and distributed file services. Pathway was designed to move across strategic computing platforms, based on open systems standards. The product has the ability to connect to Apple Computer, Inc. Macintosh, Unix, DOS, Microsoft Corp. Windows, VAX/VMS and OS/2 computers.

Prices start at $1,000.

The Wollongong Group
1129 San Antonio Road
Palo Alto, Calif. 94303
(415) 962-7100

Unix

BBN Systems and Technologies has announced BBN/Probe, a Unix version of its time series data analysis software.

The product runs on Sun Microsystems, Inc. and Digital Equipment Corp. Unix workstations. BBN/Probe 3.0 has interactive and data reduction and analysis capabilities for engineering analysis, telecommunications network management and process control and simulation applications. A high-level structured programming language is included, which was designed to create procedures for producing quick-look reports, performing repetitive analyses or automating applications.

Prices start at $13,000.

BBN Systems and Technologies
10 Moulton St.
Cambridge, Mass. 02138
(617) 873-3000

Xalt Software Corp. has introduced Xalt Office.

Xalt Office consists of five integrated applications for managing information and communications for Unix users, the company reported. Xalt Desk is the application interface and integrates the Office applications. Xalt Calendar is a time manager and scheduler. Xalt Notes enables users to post or stick notes electronically. Xalt Mail is an electronic-mail application, and Xalt People Manager is a combination of company directory, organization chart, general-purpose mailing, phone and fax number card file and E-mail address book. The applications can work together or individually and run on Sun Microsystems, Inc. SPARCstations, IBM RISC System/6000s and Hewlett-Packard Co.'s 700 series.

Xalt Office costs $199.

Xalt Software
Suite 201.
60 Sugarloaf Lane
Alamo, Calif. 94507
(510) 947-4814

Cabling

Optical Data Systems, Inc. has introduced Token Ring transceivers and extenders.

According to the company, cable distances are extended, and network security on a Token Ring network is increased with the products. The ODS 834 extender provides ring-in/ring-out functionality, which increases network flexibility and reliability. The ODS 836-NC is a fiber-optic Token Ring transceiver. ODS 873 is a fiber-optic Token Ring personal computer adapter for XT/AT bus and Micro Channel PCs.

Prices range from $495 to $1,630.

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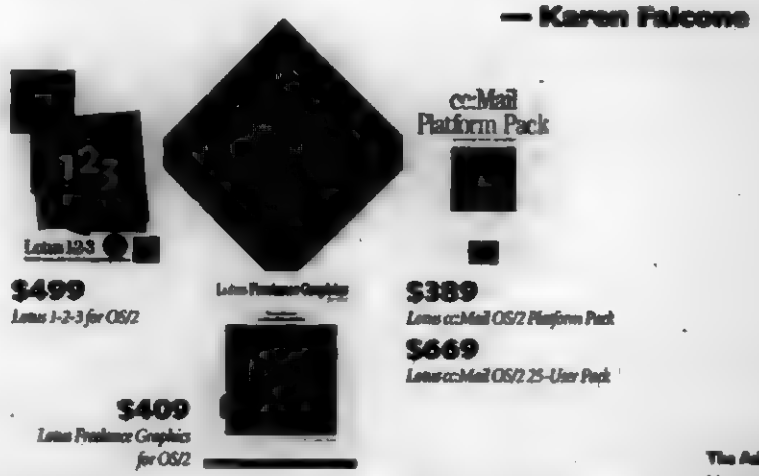

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Router software 'IQ' important as nuts, bolts

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Software: Conclusion of a two-part series on router architectures.

Companies taking a closer look at how the architectures of internetworking gear can help protect their investments must consider a device's software design as carefully as they do its hardware scheme.

Router purchasing decisions are growing more strategic as companies become increasingly dependent on local-area networks. Therefore, users are now folding into the buying equation such issues as how to maintain network reliability and performance as growing numbers of network segments draw on a router's resources.

While router hardware design plays a fundamental role in these criteria [CW, Sept. 28], its software counterpart is equally important to a router's ability to limit the effect of component failures, figure out for itself how to recover, reroute around failed links, talk to network management systems, optimize the use of network bandwidth or better handle special traffic, such as IBM protocols.

Crash containment

On the component failure side, "we are now seeing a trend toward compartmentalizing software functions," said Fred McClimans, program director of local-area communications at Gartner Group, Inc., a consultancy based in Stamford, Conn. This would mean, for example, that "a TCP/IP crash would not disrupt a DECnet network," he explained.

He cited newer generation software from Wellfleet Communications, Inc. and Coral Networks, Inc. as stronger at minimizing router vulnerabilities. Market leader Cisco Systems, Inc.'s centralized architecture, which emphasizes robust protocol support, diverse applications and high-speed network interfaces in its software, "does not lend itself to compartmentalizing failures," McClimans said.

For example, Mohammed Eloasy, director of research information services at the Dana-Farber Cancer Institute in Boston, a Cisco shop, said, "Our entire router crashed because someone was sending bad packets. This comes under the heading of unacceptable."

Savvy software

Wellfleet and Coral, which distribute processing functions throughout their routers to different degrees, confine the failure of one protocol to its associated network, allowing the rest of the router to keep cranking.

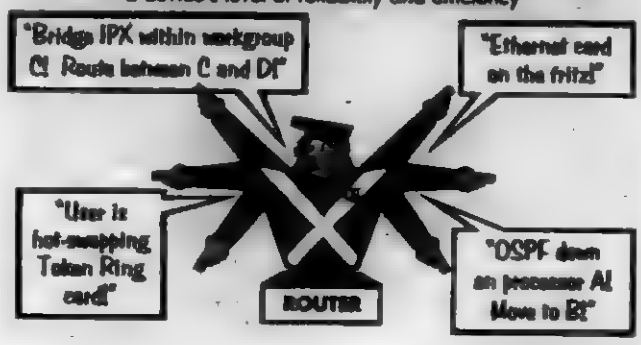
To achieve this, though, "the software has to be smart enough to bring the failed process to life on another processor or know what to do if a user is hot-swapping a network interface card," said Steve Collins, director of product marketing for high-end internetworking at Wellfleet.

Several users stated that a router's ability to automatically reroute a traffic path around a

Continued on page 53

Software smarts

The degree of sophistication in router software largely determines a device's level of reliability and efficiency



CW Chart: Michael Stanton

Are technology questions standing in the way of telecom progress?

In this new "User Voices" column, which will appear at regular intervals in our technical sections, Computerworld *shares user opinions solicited at random on a computer-related issue. This week, users spoke out on the increasingly complex choice of telecommunications technologies.*

USER VOICES

Computerworld: What information, if any, is missing for you to implement a strategic wide-area telecommunications strategy? For example, are there outstanding questions about new technologies — such as how they work, their pricing and availability — holding you back?

Users: As a global corporation, my concerns have to do with what services will be available worldwide and what it will cost to bridge from one country to another.

If I need to get from New York to London to Paris to Belgium, it is difficult for me to design such a network because I have to go to so many sources. I could go to a single-source integrator, but I run the risk of my network winding up overengineered. From my experience, every time I ask a vendor to do that, I wind up with a whopping price tag and a network so elaborate that it exceeds my needs.

Vendors smell a big opportunity and miss the point that we're trying to put together a cost-effective network — not necessarily one that is infinitely robust and redundant. A lot of outfits may need that; we may not.

Brian Williams
Manager of data processing and telecommunications
Schlegel Corp.
Rochester, N.Y.

First of all, service availability and pricing are scarce; services are available in some areas and not in others.

Also of particular interest to us in the client/server environment is when we want to do a SQL query from a remote site to a central database with OS/2, we have to have some sort of dial-in Synchronous Data Link Control (SDLC) or leased line connected into that. There is to date no inexpensive, usage-based service that allows 56K bit/sec. speeds into this database. What I would like to see is a pay-as-you-go circuit all the way [from the long-distance carrier] to my office.

Also, there is still a big question as to how IBM's OS/2 is going to interface with Integrated Services Digital Network (ISDN). Right now, you select SDLC or Token Ring (as interfaces within OS/2 Communications Manager), but there is no ISDN selection available.

Jerry Noble
Director of telecommunications and PC support
American Cancer Society
Austin, Texas

People who have designed and defended a network to management and received the necessary funding are finding it difficult to go back and ask to change it because technology is changing. There is so much technology flooding the industry, it is difficult for management to stay aware of and be comfortable with new technology, and there is always a resistance to change.

Also, we must be satisfied that there is a migration strategy that is workable on a phased rather than a forklift basis. It would take a Herculean effort to determine which sources of information are reliable, then glean sufficient information to evaluate all our options.

What is needed is a little time for network managers to understand what the new technologies are, identify the sources of good information and the good applications of technology, then learn from them and apply them against the needs of their own network. Then, they must work with providers to understand how much it would cost to make modifications to new services.

Phillip Evans
Director, telecommunications
First Systems Corp.
Dallas

put in place is based on the OSI model. We're waiting for emerging OSI protocols to get a little more firm. Since I doubt I will ever be into private networking on a big scale, I don't really care too much about the "copper side" of networking.

This means I don't care if my packet goes by satellite, twisted-pair or fiber because I know there are going to be faster and better technologies and a wide variety of vendors. We'll get the software side right and buy the best and cheapest connectivity. The bottom line is, will they [the carriers] move the protocols I want efficiently and effectively?

I don't intend to worry if frames or cells are faster. If my application doesn't move fast enough on medium X, I'll try Y or Z. I use BT Tymnet frame-relay services now, and I expect that to be our long-term strategy because it's an excellent service. I provide an Ethernet cable and power plug on each end. I don't have a clue as to what frame relay is and I don't care. My job is shipping garments.

Michael Higgins
Technical support manager
Byer California, Inc.
San Francisco

As far as Switched Multimegabit Data Service, frame relay, fiber-optic linkages and specialty carrier products such as software-defined networks go, we have a fairly good understanding of each of those technologies, what types of applications should run over them and the pricing schemes related to them so we can do economic and technological comparisons. I am waiting for various user pioneers to gain some experience with these technologies, but from a carrier/vendor point of view, the necessary information is readily available.

We run a traditional private-line T1 backbone. In 1993, we are going to examine what that backbone should look like with regard to all these new technologies. It's all a matter of evaluation for us. While there is always an issue with having the appropriate in-house expertise to evaluate brand-new technologies, we intend to pull from user group coalitions, vendors, carriers and others for that expertise.

Jim Reed
Assistant vice president, telecommunications
Geico
Washington, D.C.

Responses compiled by senior editor Joanie M. Wexler.

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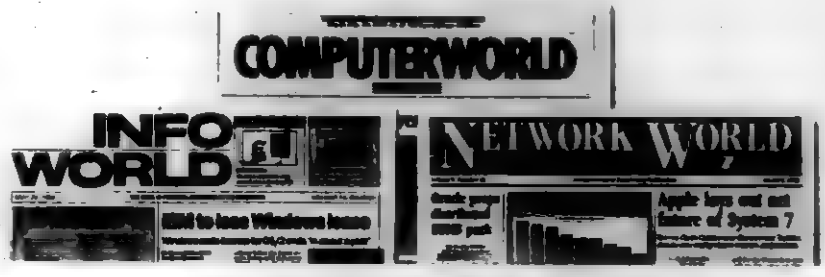

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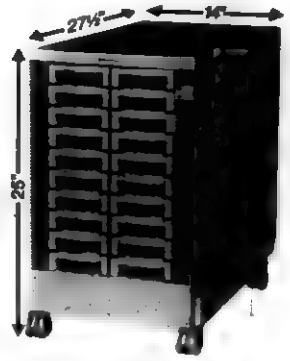

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Router software IQ important

CONTINUED FROM PAGE 49

failed link is of primary concern to them because routers are generally more reliable than communications lines.

"The software has to be superintelligent because if something goes away, the router has to know what to do," said Bruce Russell, technology architect at Amex Life Assurance Co. in San Rafael, Calif.

"What's most critical first and foremost is to be able to reroute traffic because my business is to keep everything up and running," said David Eisenlohr, vice president of telecommunications at the Pacific Stock Exchange in San Francisco, which recently embarked on an initial search for a router vendor.

To that end, Cisco, Advanced Computer Communications (ACC) and others offer a dial backup software capability. The router detects if one link has failed and dials up a circuit-switched connection on the fly to maintain uptime.

Notification please

Eisenlohr said his No. 2 router priority is immediate failure notification to network management. "Fault tolerance doesn't do you any good if you never know you've activated the fault-tolerant features," he said. "What happens when the second failure comes along?"

Less critical but handy and economical are software features that help optimize bandwidth use. For example, Coral has a unique "intelligent bridging" option that allows companies with workgroups that span geographic areas to bridge among themselves and route between themselves and other workgroups.

This scheme allows users to bundle the high-speed benefit associated with bridging technology with the security-oriented firewalls afforded by routers, explained Sally Bament, Coral's senior product manager.

Cisco led the industry with the concept of traffic prioritization, which is useful for users routing traffic over low-speed, wide-area, serial lines. The router's software knows to give priority to the most delay-sensitive application if two applications collide on the network, explained Christine Hemrick, Cisco's director of software product marketing.

ACC implements a twist on the concept with a "fair queuing" algorithm that evenly divides bandwidth among all applications so that no application continually gets bumped. The company also uses data compression techniques to optimize bandwidth use.

For IBM-heavy shops, CrossComm Corp. said it will announce today the second version of its Protocol-Independent Routing (PIR) software module, which routes all protocols in a nonstandard way at layer two of the Open Systems Interconnect model so that traditionally unroutable IBM protocols can be routed. The only drawback with PIR, McClimans said, is that "the architecture would not interface in large, heterogeneous router networks."

CrossComm has now designed a PIR feature that gives priority to IBM Systems Network Architecture (SNA) traffic merging with LAN traffic over a backbone to ensure that SNA devices respond to front-end processor calls within the required 10-second time limit.

The feature will then prioritize SNA traffic, sending host-to-host communications before terminal-to-host traffic, for example.

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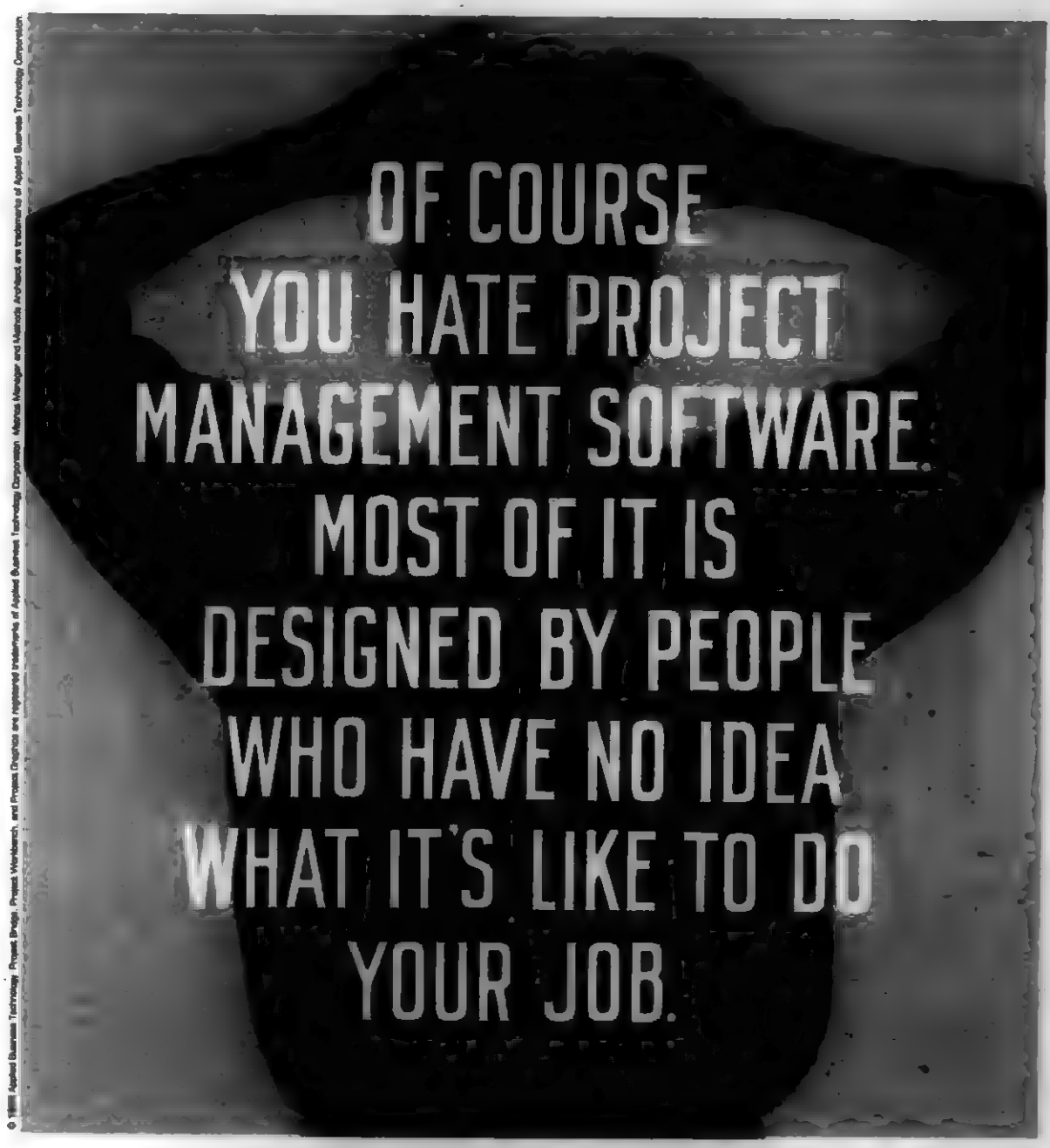

Project management software seems to have one fundamental flaw: the people who design it usually aren't project managers. So they don't think the way you do. They give you functions you don't need or they oversimplify your job with products that soon become obsolete.

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APPLIED BUSINESS TECHNOLOGY

Lack of benefits keeps centralized LAN management from catching on

BY ELISABETH HORWITT
CW STAFF

NEW YORK — "How often are you at your desk?" a speaker queried an audience of local-area network administrators at the recent meeting of the Northeast chapter of Novell Users International. The answer from one attendee: "Twice; once in the morning and once right before going home."

LAN managers interviewed at the conference said they are being run ragged trying to track and troubleshoot an ever-growing, constantly changing installation of remote LANs. However, their companies are still far from adopting the centralized approach to LAN management that is embodied in products such as Novell, Inc.'s NetWare Management System, an MS-DOS-based heterogeneous platform.

This jibes with a recently published survey by Deloitte & Touche [CW, Sept. 7]. The survey found that LAN management responsibility was typically spread out across LAN administrators, end users, information systems and telecommunications departments, and that 39% of the 789 respondents relied on user feedback to determine LAN performance problems.

New York Hospital, for example, uses a combination of centralized and decentralized network management, with different levels of administration parceled out among users, IS and telecommunications, according to Paul Epstein, a data network manager in the hospital's telecommunications department. Local administrators, who are generally users "with computer interest," handle local management tasks such as adding new users to the network, doing file server backups, installing new programs and maintenance, Epstein said.

Telecommunications and IS share responsibility for troubleshooting, with telecommunications generally handling problems with network links and IS handling mainframe, server and personal computer problems, Epstein said.

A mixed bag

However, none of this is cut-and-dried: For example, telecommunications still manages the servers on some LANs, "because telecom managers were the first to implement Novell LANs, and as demand grew, IS began taking over responsibility but hasn't totally taken it yet." In addition, some user groups still do their own network administration, falling back on IS or telecommunications when they get into real trouble, Epstein said.

Indeed, local user groups and LAN administrators seem loath to give up responsibility for running their own LANs.

Upper management at one major Wall Street firm has twice tried to "take LAN administration from users and centralize it, but it didn't fly," according to one LAN analyst at the firm. One major reason was that LAN managers, who were typically responsible for supporting a group of users at one installation, resisted the idea of "becoming management's gophers," she added. "The question is, what do you get from central administration?" she asked, adding that the companies also "lacked facilities" to manage the remote LANs effectively.

Several attendees said their companies are still struggling to carve out an effective strategy for parceling out LAN management responsibility.

At Montefiore Medical Center, for example, users have been managing their own LANs for some time, said Jose Menendez, a senior systems analyst at the Bronx, N.Y., organization. As a result, the IS department is now struggling to find ways to succor "LAN orphans," or groups of users whose designated LAN support person has moved on, leaving no one who knows how to deal with that particular LAN's problems, he added.

Montefiore's IS department is now learning how to manage its own LAN, "not so much so we can manage users' LANs, but so we can work with them to ensure that systems integrators give them the right ongoing support," Menendez said.

The LAN analyst at the Wall Street firm said her company also "has groups where a user wears a LAN administrator's hat as well as other hats, and when he leaves, there is no backup."

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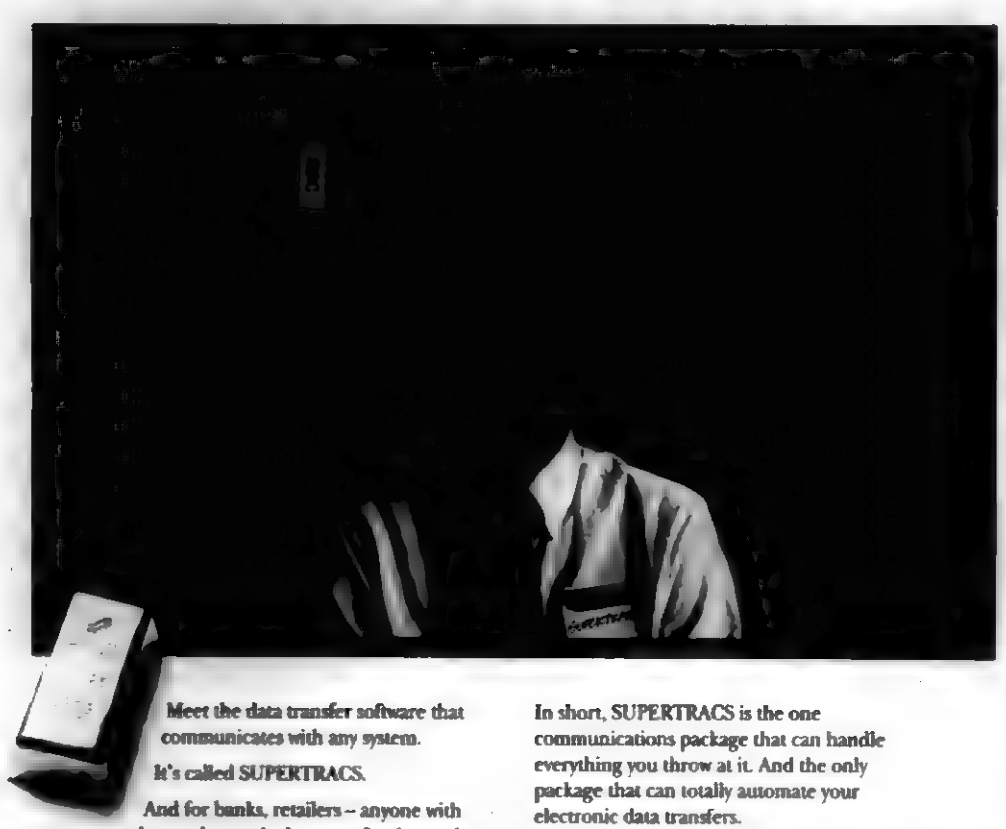

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NEW PRODUCTS

Network management

Frontier Software Development, Inc. has announced Token Ring versions of its Netscout local-area network distributed analyzer products.

According to the company, the products are among the first to support Token Ring under Remote Monitoring Management Information Base Standard.

The products include Netscout Model 9520, a software agent package that provides full Remote Monitoring Management Information Base support, including real-time data capture. Netscout Model 9250 is a software client package that integrates full LAN diagnostic and protocol analysis into the Sun Microsystems, Inc. SunNet Manager.

Prices start at $1,495.

Frontier Software Development
1501 Main St.
Tewksbury, Mass. 01876
(508) 851-8872

Oneac Corp. has started shipping MopUPS/RM, resource management software for its ON Series of network uninterruptible power supply (UPS) systems.

According to the company, MopUPS/RM monitors UPS activities and provides automatic shutdown in Novell, Inc. NetWare environments. The product runs as NetWare Loadable Modules or Value Added Process.

The product continually shows changing power conditions and can operate as a background task to perform remote management. MopUPS/Rm has resource-management features that include power fail alert, invertor shutdown, percentage of load level and low battery alert. The software operates on a server or workstation.

MopUPS/RM costs $149.

Oneac
27944 N. Bradley Road
Libertyville, Ill. 60048
(708) 816-6000

Ungermann-Bass, Inc. has announced NetDirector Release 16.6, a scaled-down version of its network management system.

New features include Adaptive Internetwork Management capabilities. NetDirector Lite provides the full functionality of NetDirector for remote branch offices or stand-alone networks with fewer than 125 nodes.

The product provides a seamless upgrade path that allows users to migrate to a larger version of NetDirector without having to reconfigure.

Net Director Lite costs $4,500.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95052
(408) 496-0111

Gateways, bridges, routers

Alantec has introduced the PowerHub Model 5000.

The product can accommodate up to 76 network users and provides 12 times more bandwidth from Ethernet networks. Designed for use in network-intensive environments, the PowerHub Model 5000 delivers 120 million bit/sec. of Ethernet bandwidth.

The Model 5000 can be used in a variety of local-area network configurations and provides bandwidth to workgroups running client/server applications, the company reported.

PowerHub Model 5000 costs $27,950.

Alantec
2380 Bering Drive
San Jose, Calif. 95131
(408) 955-9000

Xyplex, Inc. has introduced the Network 9000 intranetworking hub.

The product uses a new Multi-Media Midplane Architecture, which gives it the ability to integrate routing, switching, wiring concentrator and communication server technologies.

In a single slot of the hub, Network 9000 can create a new network segment by attaching 10Base-T concentrators directly to bridge and router modules, the company reported. Management functions are available for all the cards on the chassis, when an additional Management Processor Module is attached to the hub.

Prices start at $2,495 for a five-slot hub and $4,495 for a 14-slot hub.

Xyplex
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Ascom Timplex, Inc. has announced Link+System technology enhancements.

According to the company, the features reduce bandwidth requirements for voice and fax transmission by up to 90%, improve the quality of low bit rate compressed voice and provide more support for multinational Integrated Services Digital Network networking.

A partnership with Pacific Communications Sciences, Inc. (PCSI) has incorporated PCSI's new low bit rate algorithm into a number of Link+System products. The alogorithm reduces bandwidth requirements and improves low bit rate voice quality at or below 8K bit/sec.

Link+System also features 8K and 16K bit/sec. Adaptive Transform Coding compressed voice for voice applications.

Prices for the new features range from $5,500 to $12,000.

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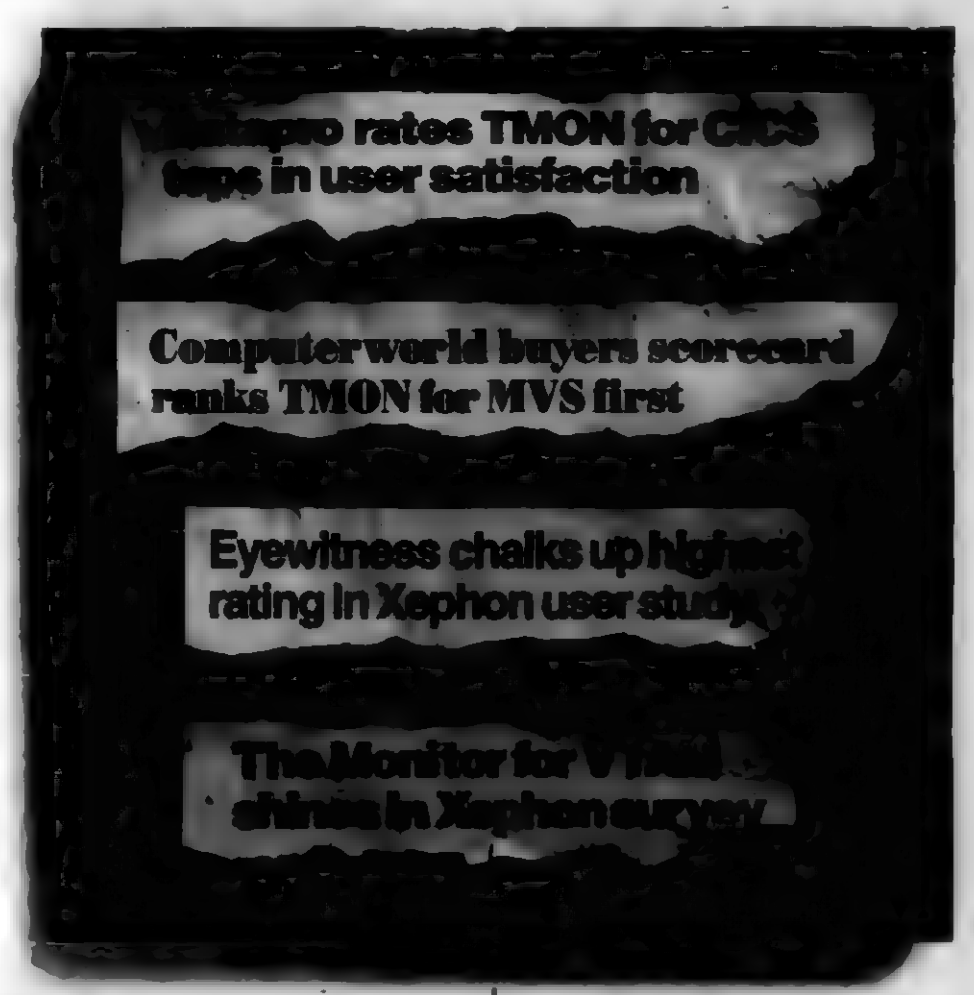

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BY THOMAS HOFFMAN
CW STAFF

NEW YORK — You might not expect the company that runs the world's most successful music video network to run its business on an archaic information systems structure. But until recently, that is how it was at Viacom International, Inc., operator of the MTV and Showtime cable networks.

In early 1990, Viacom management began to rethink its IS requirements. For years, the company had relied on a slow, centralized IBM MVS environment powered by an IBM 3084 mainframe to support its business divisions, which include Viacom Cable, Viacom Networks and Viacom Entertainment.

Frustrated by the lack of information available from the mainframe, the company lured Henry Leingang, then vice president of information services at the Trian Group (formerly Triangle Industries, a mergers and acquisitions firm), to manage the decentralization of Viacom's information systems as vice president and chief information officer.

Viacom International, a subsidiary of $1.7 billion parent holding company Viacom, Inc., commissioned Price Waterhouse to help determine weaknesses in its IS infrastructure.

Continued on page 64

American Software image improves

Customers report turnaround for the better with AS/400 package

BY JOHANNA AMBROSIO and KIM S. NASH
CW STAFF

ATLANTA — Manufacturing software vendor American Software, Inc. is mending fences with its customer base. A year after its revamped suite of packages for the IBM Application System/400 hit the streets, users are reporting vastly improved software and service. However, several lawsuits related to earlier problems are still pending.

"A year ago I was much more frustrated," said Frederick Allard, director of information systems at Kinney Manufacturing Co. in Warwick, R.I. "Now I'm not. The software works, and I get what I need."

That was not always the case. "When the AS/400 version first came out, the quality was very poor. Now it's excellent," said Michael Bowman, manager of applications development at Siecor Corp. in Hickory, N.C., a seven-year American Software customer. "ASI has finally gotten started on applying quality principles. I see a lot of positive changes."

American Software executives said the majority of its 1,200 customers — most of which use the company's software on IBM mainframes — are satisfied, as measured by the company's 24% compound annual growth rate during the past five years. In addition, repeat business accounts for 60% of revenue, the executives said.

Also, within the past two years, American Software has implemented a quality improvement program. The latest facet is an executive information system that allows top managers to more closely monitor the firm's response to customers.

Fiscal 1992 revenue: $113M
Profit: $18.5M
Total employees: 1,000
Major application lines: Logistics, materials management, financial control applications
Major customers: S. C. Johnson Wax, Ford Motor Co., Siecor Corp., LaRoche Industries, Rolls Royce Motor Cars Ltd.

CW Chart: Michael Siggins

On the rocks

Still, relationship-mending with one group of customers has been stymied. One of these, GTE Corp.'s lighting division, filed a lawsuit in August 1991 against American Software, alleging major performance problems with Release 2.12 of the AS/400 software. That release was made available in December 1988; the revamped version, 3.01, came out in April 1991. The most recent version, 3.02, was introduced in April 1992.

Court documents in the GTE case state that as GTE added warehouses to the system, the software "virtually collapsed." Customer orders were lost or were never entered. Furthermore, it cost GTE roughly $4 million to implement a system that was originally supposed to cost approximately $1 million. GTE has requested a $17 million award.

American Software countersued GTE's lighting division in September 1991, alleging nonpayment of $707,000 for software and services. James McGuone, an American Software attorney, said, "It's a typical large project problem suit where they were trying to start a whole new distribution system. It's a very large, very complicated project, and you can't attribute it to a singular problem."

McGuone said other factors might have been at work, including the communications network with which GTE was trying to tie the system together, and American Software executives said the

Continued on page 61

Then *and* Now ES/9000

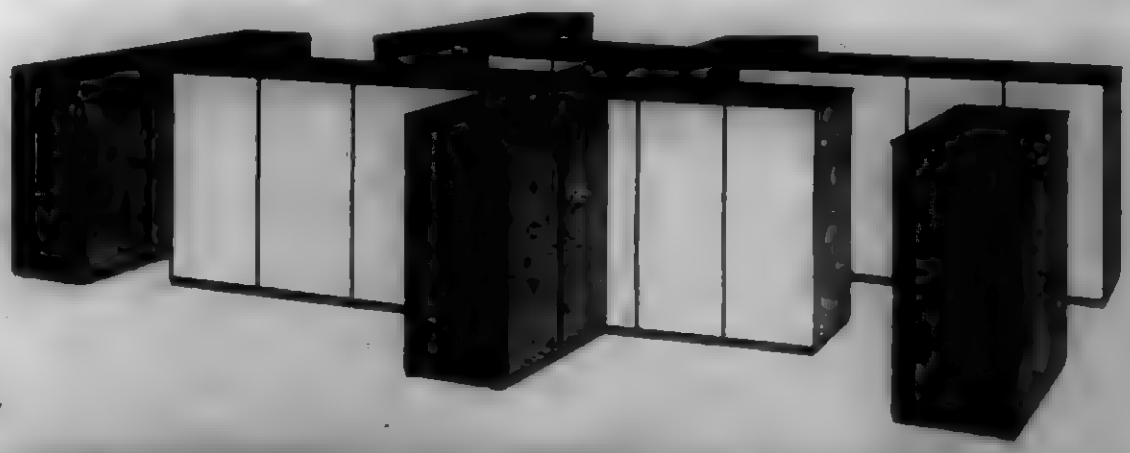
Status report on key features of IBM ES/9000 mainframes announced two years ago

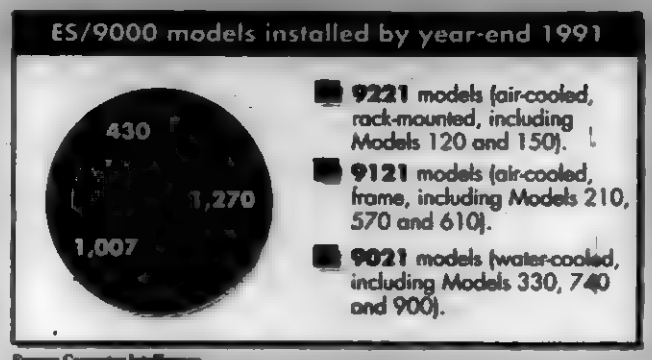
Escon announcement
- Fiber channels supporting distances of 5.6 miles.
- Distances since extended to 37 miles.
- 17M byte/sec. data rate.
- Reduced cable size and weight.

Escon: Although IBM has delivered this feature and even enhanced it beyond the original announcement, only 250 or so ES/9000 customers will actually be using Escon by year-end 1994, predicted market research firm International Data Corp.

Sysplex announcement
- Sysplex provides single point of control for multiple MVS/ESA systems.
- Maximum of eight systems per Sysplex.
- Distance up to 3 km (1.8 miles) from system(s) to Sysplex timer.

Sysplex: Although the basic hardware and some rudimentary software are available, the software to really enable Sysplex will not be ready until the mid-'90s. Sysplex will not become widely used until the late 1990s, although many large customers say they support the basic concept.





Source: Computer Intelligence

MVS/ESA Version 4 highlights
- APPC/MVS provides SAA connectivity for MVS.
- Cross-system coupling facility improves multisystem communications and management.
- Dynamic reconfiguration management provides less system disruption for the addition and deletion of I/O devices.

MVS/ESA Version 4: This crucial component of the ES/9000 system is being used by about 11% of the worldwide base of 13,500 MVS customers, typically the largest ones, according to Gartner Group, Inc.

CW Chart: Michael Siggins

Server from Silicon Graphics synchronizes Sybase

Firm concocts home remedy — 'replication server' — for global data coordination ills

BY JEAN BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — The challenge of synchronizing data on a global basis, among dozens of database servers, is a big one. But Silicon Graphics, Inc. has come up with a homegrown "replication server" that will synchronize 26 Sybase, Inc. database servers by mid-1993.

Installation of the servers began in July, nearly a year before Sybase is expected to ship its off-the-shelf Replication Server to coordinate such global updates.

Silicon Graphics claimed to have received little help from Sybase in the design of its server network. But it did claim to have solved many of the problems with synchronizing data between multiple, distributed copies of the same database.

Replication servers act as messengers and proofreaders — delivering database updates and checking them for errors — ensuring that all users see the same thing.

Silicon Graphics' custom replication server "wakes up" remote databases and updates all product-configuration and pricing changes from its headquarters. It was designed to allow autonomous operations to go on at remote sites, while enforcing the central site's "business rules" and a single set of product prices, said Tom Arnold, manager of information architecture at Silicon Graphics.

Off-line updating

Based on Sybase's SQL Server relational database, the Silicon Graphics replication server updates remote database servers while they are off-line. The process takes about five to 10 minutes during the early morning, while the remote server is "asleep" in its local time zone, Arnold explained. "The replication server goes to the source database and asks if any changes were made in the last 24 hours," he said. "It builds an image of these changes and posts them to the target database."

The project to develop the Silicon Graphics replication server began in October 1991. Since July, eight such servers have been installed in U.S. cities, and 18 are to be installed worldwide by mid-1993. But $800 million Silicon Graphics is probably not alone in trying to install a replication server for the Sybase relational database management system. Sources said some of Sybase's Wall Street sites are trying to do the same thing, but Sybase declined to acknowledge any of its customers' replication server efforts.

> "THERE IS A NEED to be able to move control of applications out to where users are using it ... whether it be New York or Paris or Tokyo."
>
> MARK PINE
> SILICON GRAPHICS

However, Mark Pine, a Sybase vice president, told users at a conference last June that the firm's Replication Server was a key piece of its distributed database strategy. "There is a need to be able to move control of applications out to where users are using it," said Pine, "whether it be New York or Paris or Tokyo."

The information systems lessons learned about the complexity of distributed databases have been sobering, Arnold said. "None of the database servers, whether they're Oracle Version 7 or [the unannounced] Sybase 5.0, will automatically make this [process] easy," he said. Because real networks have downtime and introduce errors into data, IS managers must deal with error messages and snarled transmissions. "Just because you've got the tools doesn't mean you're home free," Arnold said.

The two greatest obstacles to getting distributed databases to work are these, Arnold said: synchronizing all of the networked databases and taking notice of unexpected network failures. Synchronizing all servers at the same time was ruled out because it would bring Silicon Graphics' network to a standstill.

OLICOM MAKES TOKEN-RING NETWORKS WORK FASTER

This advertisement remote bridges

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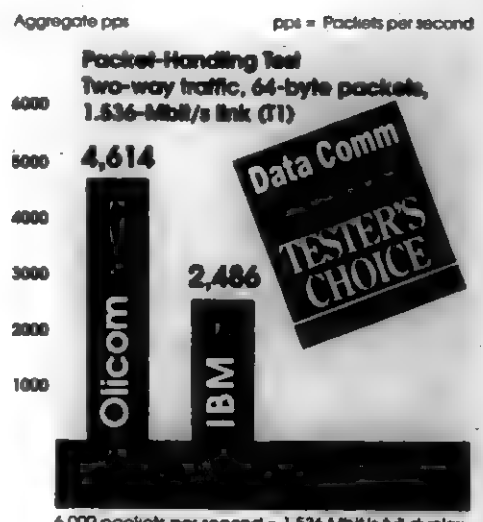

6,000 packets per second = 1.536 Mbit/s full duplex
Compression off

Data Comm's Test Lab says, "Olicom's remote Token-Ring bridge delivers unparalleled packet processing—a major advantage for high-speed WAN links."

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DEC focus shifts All-In-1 to groupware

BY MELINDA-CAROL BALLOU
CW STAFF

As Digital Equipment Corp. reorganizes, the company focus for its All-In-1 office automation software is shifting significantly.

A key service and development plant for All-In-1 in Charlotte, N.C., was disbanded last month as part of a widespread series of company layoffs.

Most development work for the product had already been moved to England, but the layoffs signaled a change in emphasis from All-In-1 on VMS to TeamLinks, a groupware, client/server suite of applications that began shipping last month.

After delays of nearly six months, users welcomed the release of the TeamLinks Information Manager but want DEC to continue its commitment to traditional All-In-1 as well.

"The attraction of TeamLinks is its integration with popular word processors and document conversion capabilities," said Jeoff Newell, information systems manager at BT in London.

With 3,500 All-In-1 users, Newell will seek to connect sales reps in the field using personal computer laptops to the VAX-based All-In-1 system in the office.

"I'd be extremely worried if DEC stopped development work [on All-in-1], but moving to client/server is good. Probably 60% to 70% of our users have PCs available to them, so why not use that CPU power sitting on their desks?" Newell said.

The TeamLinks Information Manager includes a Microsoft Corp.'s Windows-based file cabinet that lets users share files and offers access to All-In-1 Integrated Office System Server V3 files; document conversion via DEC's Compound Document Architecture Converter Library; work flow management with TeamRoute software that routes and tracks forms and documents across the enterprise; and integration of Microsoft's Word and Excel for Windows with X.400 mail services and with Lotus Development Corp.'s 1-2-3 and Ami Pro, Aldus Corp.'s Freehand Graphics and WordPerfect Corp.'s WordPerfect for Windows.

Users can automatically use DEC's electronic mail, distributed directory, conversion services or the All-In-1 file cabinet and network filing services from within a Microsoft Word or Excel application, DEC officials said.

Other Windows applications can also be integrated with TeamLinks.

The TeamLinks Information Manager is shipping now and is priced at $295 for a single client.

American Software image

CONTINUED FROM PAGE 59

AS/400's operating system may have been at fault. Both suits are still in litigation.

Another ongoing series of lawsuits involves Lykes Pasco Packing Co., a Zephyrhills, Fla.-based distribution company that sued American Software and was then countersued. The original suit alleged that Version 3.01 failed to live up to the vendor's promises and that the firm neglected to perform promised services.

American Software countersued for nonpayment and was recently awarded $470,000 in nonbinding arbitration.

Reynolds Metals Co. did not sue American Software but "will never do any more business with them," said James Matsey, corporate director of IS. He said Reynolds experienced problems similar to the GTE allegations. He said his newest complaint is that because of the performance problems, Reynolds needed to purchase larger AS/400 models than it originally anticipated, and American Software charged them software upgrade fees each time. "I don't see why a vendor should be rewarded for putting out poor code," Matsey said.

Cal Norman, senior vice president at American Software, acknowledged some past performance problems with Release 2.12 but said they were fixed in Release 3.01. "Tiered pricing says that you're licensed to operate this software on this machine. If you move to another machine, there is a standard upgrade fee," he said.

Hub City, Inc. has suffered some problems similar to those cited by GTE, according to Herb Brosz, manager of division services at the Aberdeen, S.C.-based company. Although Hub City has sued the vendor, the situation has deteriorated so much that Hub City has withheld maintenance fees for 1991 and 1992. "They know why, too," Brosz said.

One particularly thorny problem is that American Software has yet to enhance an order-entry module for Hub City as promised in a contract signed three years ago, Brosz explained. Brosz's staff has had to construct work-arounds to get the system to properly date purchase orders and project delivery dates for goods sold.

"What we have works, so it's not worth scrapping," Brosz said. "It's what we're missing that's the real problem."

Norman responded that the contract with Hub City stipulated that the modifications could be made at American Software's timetable.

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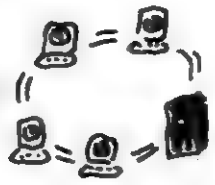
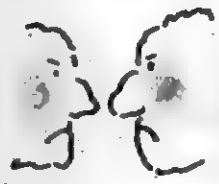
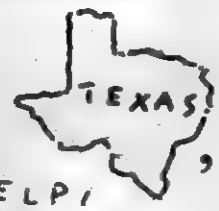
What's more, the  we had sometimes didn't  to

each other. And forget about the rest of our offices throughout

the . Our people in couldn't communicate

with our people in . They, in turn, were cut off

from . And nobody could talk to the guys in  ,

but that's another story. Our PC managers were .

No one knew what to do.

Then, at a big , someone had a great .

"Let's put in charge of everything!" he exclaimed.

Everyone at the meeting because they knew IS would

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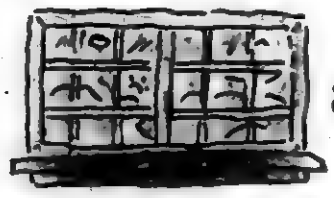
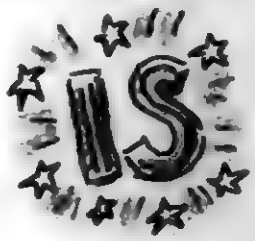
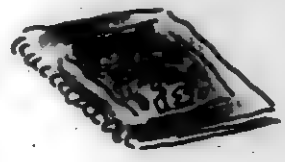
see the big and bring order to the . And so they did. They created a client/server architecture with Microsoft  as the GUI, as the communication medium, and core applications that on both. They also replaced our old 286's with snazzy new 486 , and trained local people to provide and service.

Now, everything works. We can even talk to the guys in now, although we still don't understand what they're saying. But like we said, that's another . For the whole story on  , write us or 800-343-6474 and ask for our  , **"The Book on IS."** It'll answer all your about **IS.** And tell you why **it's the biggest computer market in the** .

COMPUTERWORLD

The Newspaper of Information Systems.

It's Showtime for Viacom's network revamp

CONTINUED FROM PAGE 59

The Big Six consulting firm discovered poorly documented applications, redundant data and an excess of manual steps and duplicate work.

After careful evaluation, Leingang and his staff settled on the IBM Application System/400 platform in December 1990. Key reasons for the move included the availability of financial software suited to tracking Viacom's artistic properties.

In the entertainment industry, revenue is based largely on a firm's rights. Viacom needed customized software to meet those unique needs. Leingang said he found those applications in a suite of products called World Software from J. D. Edwards & Co., a Denver-based AS/400 software developer.

World Software includes applications for financial reporting, budgeting, fixed assets, purchasing and accounts receivable.

During the past two years, Viacom has rolled in eight high-end AS/400 midrange computers to run J. D. Edwards' and other software to replace its aging MVS-based applications. Rather than port the code from MVS, Viacom redeveloped the new applications to mirror the functionality of the old software while providing more robust features to the new product suite. Time-consuming and expensive? Yes. But Leingang said the process provided Viacom with the functionality it needed.

MTV MUSIC TELEVISION®

The right term

Do not call it downsizing, the IS director cautioned. The AS/400s will sport more than 100G bytes of disk space compared with 40G bytes on the IBM 3084. He said he prefers the term rightsizing.

The AS/400s are connected over an IBM Virtual Token Ring Network. A high-speed backbone bridge using Proteon, Inc. routers links the headquarters network to other Token Ring networks at Viacom sites around the country. Viacom has 60 local-area networks throughout the U.S.

So far, Viacom has replaced 70% of its MVS-based applications with comparable AS/400 programs.

In most respects, the new platform costs more than the older mainframe environment. But the increased expenditures were planned, he said. Since Viacom began the project two years ago, it has increased its IS staff by two-thirds, from less than 60 employees to more than 100 today.

The expanded IS structure, however, has created cost savings. After comparing different operating environments, Leingang and his staff projected that the AS/400 platform would be up to 30% less expensive to develop and operate than another mainframe.

Viacom is now better able to route information among its operating units than it was two years ago. For example, Viacom's Showtime Networks, Inc. is able to share general ledger and accounts payable software with its regional offices, which Showtime was unable to do before the network environment was upgraded.

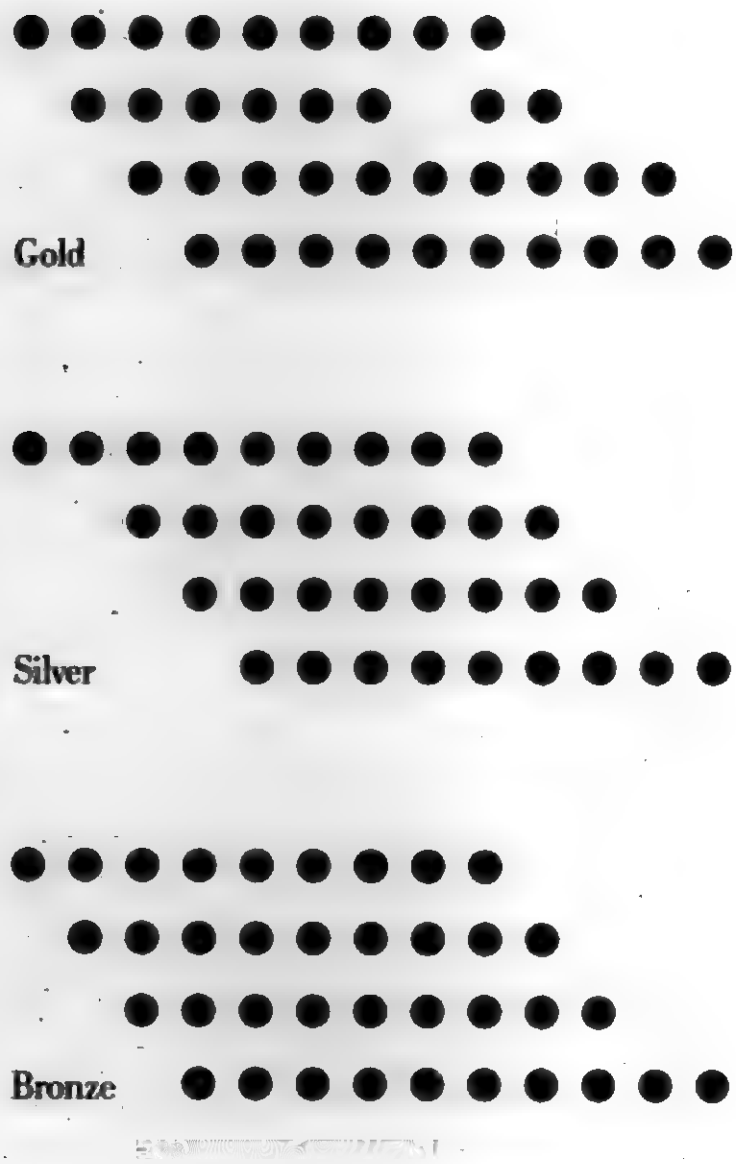
IN BRIEF

Access offers add-on GUI

■ **Access Corp.**, a Cincinnati-based software development firm, rolled out an add-on graphical user interface (GUI) that can be tacked on to versions of the company's line of document management tools. The GUI will be incorporated into Access' IBM Application System/400-based programs, which start at $50,000, with RISC System/6000 and other versions expected to ship next month, a spokeswoman said.

■ **Andersen Consulting** has opened a center to demonstrate various systems integration concepts and technologies for the process industry. Process 2000, which opened last week in Atlanta, is the latest of Andersen's systems integration centers designed for a vertical market.

■ **Amdahl Corp.** will market a file-management system that continuously backs up Unix files scattered throughout a distributed data network. The Enterprise File Manager system is based on General Atomics, Inc.'s UniTree Unix file-management system. The Amdahl Unitree software is compatible with Amdahl's mainframe UTS operating system for Unix and is priced from $66,000, not including a $20,000 UTS license, a special network controller and a $52,000 installation fee.



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NEW PRODUCTS

Database management

NewEra Software, Inc. has announced Shaman, the System Hardware Manager.

Shaman is a configuration management product designed for MVS environments. The product automatically processes the I/O Control Program (IOCP) file. Shaman does all of its work on a personal computer when the IOCP is downloaded from the mainframe.

The diagram of the configuration in on-line mode is interactive. With a click of the mouse, configuration objects such as controllers, processors, switches and control units can be identified, added, modified and deleted. Dialogs are provided to make configuration management easier.

Prices range from $7,500 to $25,000.

NewEra Software
Suite 125
3600 Pruneridge Ave.
Santa Clara, Calif. 95051
(408) 984-8116

Software application packages

Legent Corp. has announced that its Xcom 6.2 file-transfer software now supports the IBM VSE operating system.

According to the company, the connectivity enables users to transfer data such as reports and files among 25 different platforms including micros, midranges and mainframes. The product is a VTAM application that executes standard Xcom 6.2 functions including complete unattended file transfer.

The VSE version features remote printing for report distribution and automatic error recovery and allows applications to be constructed with LU 6.2.

Prices range from $9,500 to $29,400.

Legent
8615 Westwood Center Drive
Vienna, Va. 22182
(703) 734-9494

InterConnections, Inc. has announced new versions of its Leverage for NetWare internetworking products.

The releases offer improved support for Microsoft Corp.'s Windows platform and include enhancements in features, performance and security.

VAX/VMS users can seamlessly print with Network Print Services. Novell, Inc. NetWare users can access and transparently share VMS files with File Sharing Services. Improved compatibility with later releases of Windows, VMS and DOS application software are new to this product. Terminal Emulation Services offers a seamless native IPX transport protocol to the VAX for DOS and Windows emulators, the company reported.

Leverage for NetWare starts at $16,590.

InterConnections
14711 NE 29th Place
Bellevue, Wash. 98007
(206) 881-5773

Minitab, Inc. has announced two new versions of Minitab Statistical Software for VAX/VMS computers: the Standard and Enhanced versions of Release 9.0.

Users can customize and extend the scope of Minitab operations and automate repetitive tasks with the Standard Version. This version also includes a more powerful macro language. Every feature in the Standard Version is also in the Enhanced version.

Additional features in the Enhanced version include professional graphics and quality control capabilities.

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BUYERS' SCORECARD

EMC's Harmonix leads disk array race

BY DEREK SLATER
CW STAFF

Redundant arrays of inexpensive disks (RAID) storage systems are on the launching pad, expected to blast off into a multibillion dollar industry within the next few years, analysts say.

One potential advantage of the multidisk systems includes very high data transfer rates achieved by performing several write operations simultaneously. RAID can also lower total storage costs by using standard 5¼- or 3½-in. storage media.

Analysts predict that the IBM Application System/400 will be one of the hottest platforms for RAID storage. EMC Corp. may have a nice jump on the race. Its Harmonix line finished with the top score in the Buyers' Scorecard on disk array subsystems for the AS/400 platform. EMC's overall score of 91 placed it ahead of IPL Systems, Inc.'s 7936 line at 87 and IBM's 9336 at 84.

EMC's Harmonix models use 3½- or 5¼-in. disks. Maximum capacity is 6.8G bytes per unit, with cabinet subsystems reaching up to 68G bytes of available storage. Harmonix products feature a flexible caching scheme that provides faster data access. Users gave the EMC line very high satisfaction ratings in overall performance. Harmonix also earned the highest score in fault tolerance; the units can include an optional spare drive that copies and monitors the system and mirrors data on any drive that begins to show a high error count.

EMC's small footprint also drew users' praise, though physical dimensions ranked as the least important area in the survey.

IPL's general strategy is to compete directly with IBM's storage products, according to company officials. IPL recently beefed up the 7936 line with two new models, expanding total storage space to 54G bytes in a standard IBM rack. The 7936 products offer an optional hot-swap drive similar to EMC's, as well as optional cache memory on the controller.

High-scoring areas for the IPL 7936 included compatibility and value for the dollar. The IPL systems scored in the middle of the group in overall performance, but the company claims an average seek time of less than 7 msec. for the newly announced Model 42, which would make the product faster than its competition.

IBM's 9336 Disk Unit is not a true RAID product, though a 9336 unit can perform disk mirroring when so directed by the AS/400 system software. It uses 5-in. disks, with total capacity reaching 3.4G bytes per unit or 20.6G bytes per rack.

The 9336 scored well in important areas such as reliability and compatibility, while earning lower satisfaction marks in performance and value for the dollar.

IBM has recently introduced a new model, the 9337, that implements a RAID Level 5 architecture. (In RAID-5, each disk in the array stores both data and parity information; a subsystem can tolerate the failure of one drive but no more.) Capacity for the 9337 is up to 5.8G bytes. It is due to be delivered next month [CW, Sept. 7].

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their disk array subsystems in 14 specific categories. Users also rated the importance of each category. (See the methodology on the following page for a complete description of the scoring process.) ●

Disk array subsystems

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 24 users for EMC's Harmonix, 30 users for IBM's 9336 and 18 users for IPL Systems' 7936.

Total possible score **100** Mean score **87**

Product	Highest ratings	Lowest ratings
EMC's Harmonix SCORE 91	Overall performance Reliability Footprint	Documentation Sufficient capacity Availability of compatible drivers
IPL Systems' 7936 SCORE 87	Value for the dollar Reliability Quality of vendor support	Documentation Fault tolerance Ease of backup/ data redundancy
IBM's 9336 SCORE 84	Compatibility with installed system Reliability Responsiveness of vendor service	Value for the dollar Documentation Ease of backup/ data redundancy

RATINGS IN ORDER OF IMPORTANCE

Users indicate high satisfaction with the reliability of all three products. EMC's Harmonix gains the highest score in five of the six key areas.

(Additional ratings on next page)

User importance rating:

9.7 Reliability

9.1 Quality of vendor support

9.0 Responsiveness of vendor service

8.9 Overall performance

8.8 Compatibility with installed systems

8.5 Value for the dollar

RATINGS IN ORDER OF IMPORTANCE

(Disk arrays, continued from previous page)

8.5 Sufficient expandability/ storage capacity

IPL 7936	8.9
EMC Harmonix	8.9
IBM 9336	8.7

8.4 Ease of backup/data redundancy

EMC Harmonix	8.9
IPL 7936	8.3
IBM 9336	7.6

8.3 Fault tolerance

EMC Harmonix	9.0
IPL 7936	8.5
IBM 9336	7.8

8.4 Availability of compatible drives and parts

EMC Harmonix	8.8
IBM 9336	8.6
IPL 7936	8.3

8.0 Ease of migrating data from other storage systems

IPL 7936	9.1
EMC Harmonix	9.0
IBM 9336	8.1

7.3 Ease of installation and configuration

IPL 7936	9.0
EMC Harmonix	9.0
IBM 9336	8.6

7.2 Documentation

EMC Harmonix	7.4
IBM 9336	7.4
IPL 7936	7.2

6.8 Footprint

EMC Harmonix	9.4
IBM 9336	8.7
IPL 7936	8.5

Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer. Quotes are selected from user responses.)

EMC's Harmonix

Likes

Speed
"EMC has a good footprint and outstanding performance."

Dislikes

Price
"The cost is rather noncompetitive."

IPL's 7936

Likes

Price/Performance
"It's very low-cost."

Dislikes

Poor service
"The service and support is the biggest weakness."

IBM's 9336

Likes

Reliability
"It does a good job; it's trouble-free."

Dislikes

High price
"The price is high compared to third-party products."

Loyalties

Would you buy the product again?
(Reasons are based on most frequently stated answer.)

EMC's Harmonix

Response base: 24

Likely
The reason: Reliability

Number of respondents

IPL's 7936

Response base: 18

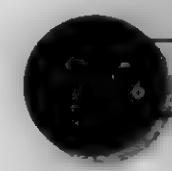
Likely
The reason: Good price/ performance

Unlikely
The reason: Performance

Number of respondents

IBM's 9336

Response base: 30



Likely
The reason: Satisfied with vendor

Unlikely
The reason: Better products available

Number of respondents

Vital statistics

Total number of respondents: 74

What is your position?

CIO/VP/IS director	19
IS manager	15
Operations manager	12
Systems analyst	6
Other	22

How long have you been involved with disk arrays?

Five years or longer	33
3-4 years	8
1-2 years	19
Less than one year	14

What is your responsibility for disk arrays?

Evaluate or recommend vendors	73
Determine need	72
Set standards for organization	69
Select vendors	52
Establish purchase agreements	43

How many disk array systems do you have installed?

Three or more	28
Two	13
One	33

METHODOLOGY

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 24 users for EMC Corp.'s Harmonix, 18 users for IPL Systems, Inc.'s 7336 and 30 users for IBM's 9336 Disk Unit.

Users rated their satisfaction with their installed disk array subsystems; they were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and firms for their assistance in preparing this Buyers' Scorecard: CW Database Division; Lee Elizer, Data Storage Concepts; Montgomery Securities.

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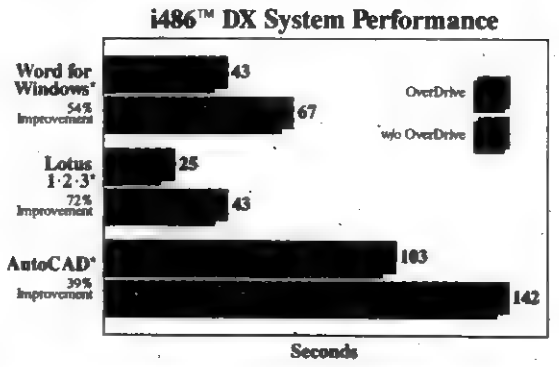

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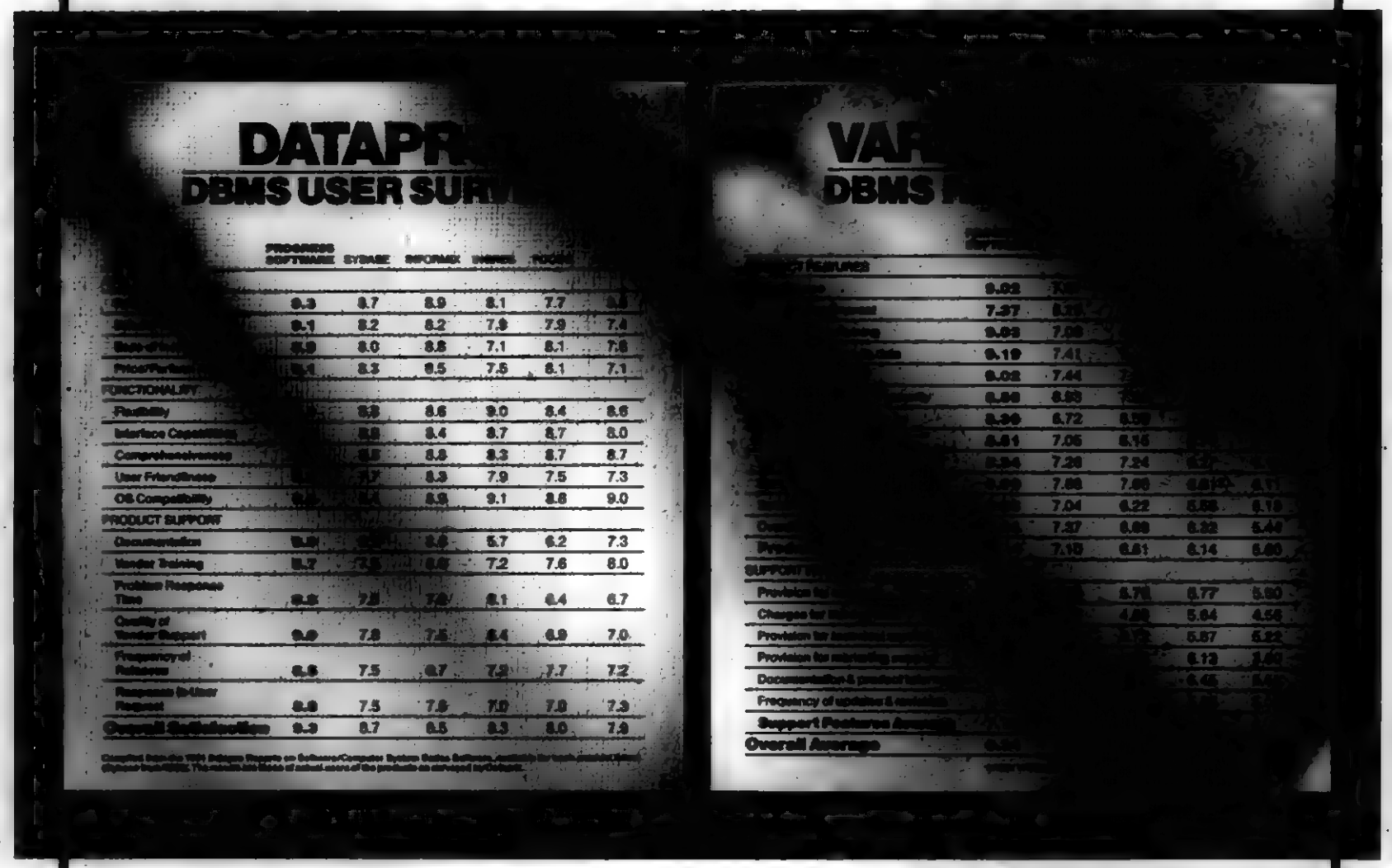

DATAPR
DBMS USER SUR

	PROGRESS SOFTWARE	SYBASE	INFORMIX	ORACLE	INGRES
	8.3	8.7	8.9	8.1	7.7
	8.1	8.2	8.2	7.9	7.9
	8.9	8.0	8.8	7.1	8.1
	8.1	8.3	8.5	7.5	8.1
FUNCTIONALITY					
Flexibility		8.8	8.6	9.0	8.4
		8.8	8.4	8.7	8.7
		8.5	8.8	8.3	8.7
		8.7	8.3	7.9	7.5
OS Compatibility		8.4	8.9	9.1	8.8
PRODUCT SUPPORT					
			8.0	8.7	8.2
		7.5	8.0	7.2	7.6
		7.8	7.9	8.1	8.4
	9.0	7.8	7.5	8.4	8.9
		7.5	8.7	7.9	7.7
		7.5	7.6	7.0	7.8
	9.3	8.7	8.5	8.3	8.0

VAR
DBMS

	8.02		
	7.37		
	8.02		
	8.19		
	8.02		
	8.88		
	8.36	8.72	
	8.81	7.05	
	8.84	7.28	
	8.02	7.88	
		7.04	
		7.37	
		7.19	
		8.71	
		4.88	
		8.13	
Overall Average			

Rated on everything from performance and reliability to service and support, PROGRESS trounces all of its competitors in the 1991 Datapro user surveys and the 1991 VARBUSINESS Software Report Card.

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SOFTWARE

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CPWADV1005

IN BRIEF

CV/Tools to include Microsoft

■ **Microsoft Corp.** in Redmond, Wash., and **Systems & Software, Inc.** in Irvine, Calif., are teaming up to allow Systems & Software, a vendor of development tools for embedded systems programming, to incorporate Microsoft development tools in its CV/Tools tool bench. The agreement also gives Systems & Software rights to some source code in Microsoft's C/C++ 7.0 compiler.

■ **Sun Microsystems, Inc.** subsidiary SunPro in Mountain View, Calif., will provide **Metaware, Inc.**'s X86 code-generation technology in some of its new compilers for X86-based versions of the Solaris operating system. The Metaware technology will be included in a new line of language products sold under the SunPro ProCompiler name.

■ Irvine, Calif.-based **Pick Systems**, provider of the Pick database and operating system, has announced that it will include SQL support and run on all major operating systems by the end of next year. The company also said its Pick 6.0 with Flash Basic development system has been updated to generate optimized executable programs.

■ Providence, R.I.-based **Cadre Technologies, Inc.** announced a new set of development tools called Teamwork Analysis Solutions. The tool set supports dynamic analysis of a software system design, rapid application prototyping as well as requirements analysis.

■ **Caseware, Inc.** in Irvine, Calif., will be integrating San Diego-based **Telesoft**'s RISCAda Ada development environment into its Caseware/CM software configuration management system.

Tool takes developers further than Next

BY CHRISTOPHER LINDQUIST
CW STAFF

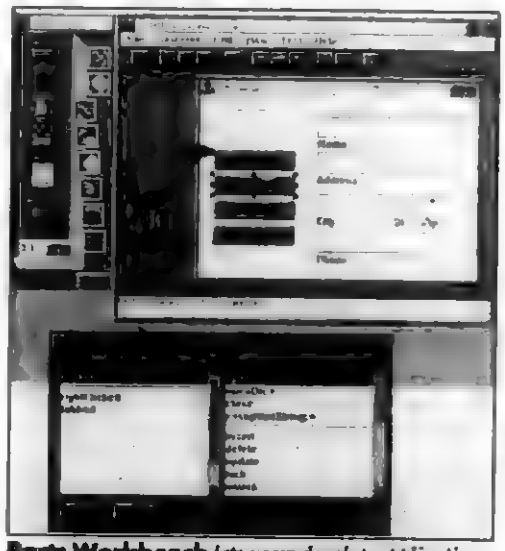
The line between tools powerful enough for serious developers and simple enough for less advanced users is being shaved finer by the release of a family of object-oriented development tools from Los Angeles-based Digitalk, Inc.

Parts Workbench lets users develop applications simply by choosing and connecting various "parts" from a "catalog."

At first glance, the environment seems to behave in a fashion similar to Next, Inc.'s NextStep development platform. However, users indicated that the Digitalk product goes well beyond the much-vaunted Next tools.

"It's like NextStep taken to the next step," said David A. Taylor, president of San Mateo, Calif.-based Enterprise Engines, Inc. and author of *Object Oriented Technology, A Manager's Guide.*

One big difference between NextStep and Parts Workbench is the latter's ability to create more complex applications without ever requiring the user to write code, said Dan Shafer, president of Graphic User Interfaces, Inc. in Redwood City, Calif., and publisher of the "Inventive User" newsletter. "The programming process [in NextStep] is fairly elaborate and complex."



Parts Workbench *lets users develop applications by choosing and connecting parts from a catalog*

But Parts Workbench is more than just an easier way to develop software: It provides several powerful features that dramatically increase its potential for corporate development, users said.

Taylor said one of the most intriguing features of the product is its ability to create object-oriented parts using any language that can compile to a Dynamic Link Library, including Smalltalk/V, Cobol or C. "It gets us above the level of the language wars," he said. "Take stuff built in different languages, put them all in .DLLs and attach them."

Theoretically, users could move legacy systems into parts and simply attach them to other parts from other systems or from new development.

While Shafer indicated that the catalog of parts supplied with Parts Workbench was "pretty impressive," he noted that the product's ability to create nested parts — parts built from other parts — could enable the building of some extremely powerful and complex tools that would be guaranteed to function from application to application. "This is a first," Taylor agreed. Digitalk "has broken new ground."

Users also said they had yet to discover the limits of Parts Workbench, something they could not say for other products such as Microsoft Corp.'s Visual Basic. "Almost inevitably there's a wall that you hit," said John Tibbetts, president of San Francisco-based Kinexis.

However, Parts Workbench's combination of powerful graphical tools with a Smalltalk/V-based scripting language seems to have solved the problem. "The wall seems to have been pushed either way back or just disappeared with the mixed mode of expression," Tibbetts added.

Parts Workbench is available for OS/2 2.0 for a list price of $1,995. A 32-bit version is due to ship by the end of 1992. The Relational Database Interface and Cobol Wrapper for the creation of parts from legacy Cobol code are expected to ship during the first quarter of 1993.

Cross-platform tool gains functions

BY GARRY RAY
CW STAFF

A cross-platform application development tool set that has been used to port major commercial applications such as Intuit Co.'s Quicken financial management software will be broadened this month with client/server functions. It will also be offered to corporate application developers for the first time.

Universal Component System (UCS) from Software Transformation, Inc. in Cupertino, Calif., includes more than 25 types of software components that can be used to build portable graphical user interfaces (GUI) and system-level services.

Applications created using UCS are portable across Apple Computer, Inc.'s Macintosh and Microsoft Corp.'s Windows, according to developers using the tools. Software Transformation officials said the tools will also be made available for a variety of Unix platforms in early 1993.

Prior to this week, UCS included two classes of support for application development. The first, the UCS Foundation Series, is a library of portable system service components supporting memory and file management, event handling and timers. The Interface Series includes components such as dialog boxes, menu bars, buttons and lists.

UCS components are invoked through an application programming interface and are linked to applications though dynamic and runtime libraries. To port applications, developers recompile source code on the target platform with the appropriate UCS libraries.

Using such a tool, "we wouldn't have to worry about what the Mac does and what Windows does," said Wendy Sternick, president of Kaetron Software Corp., a developer of business graphics software in Houston. Kaetron is evaluating a number of porting tools.

The Connectivity Series, planned for announcement this week, adds to UCS Named Pipes, Object Linking and Embedding (OLE), clipboards and a superset of Apple's Apple Events protocol. Using these, "the developer doesn't have to worry about the underlying techniques of data sharing," said Doug Donzelli, vice president of engineering and founder of the company.

Components in the Connectivity Series include a Clipboard Component Family to add copy, cut and paste facilities to Windows and Macintosh programs; a Link Component Family, which allows programs to be linked in a fashion similar to that of the Apple Edition Manager and Windows OLE; a Task Component Family to identify communication tasks among applications; and an Action Component Family, which allows applications to be controlled by other programs using the Apple Events protocol.

Pricing varies depending on components and support.

Matesys ups client/server offerings

BY GARRY RAY
CW STAFF

LARKSPUR, Calif. — Users and developers of client/server applications will gain expanded database access with two products from Matesys Corp., a vendor of client/server application development tools.

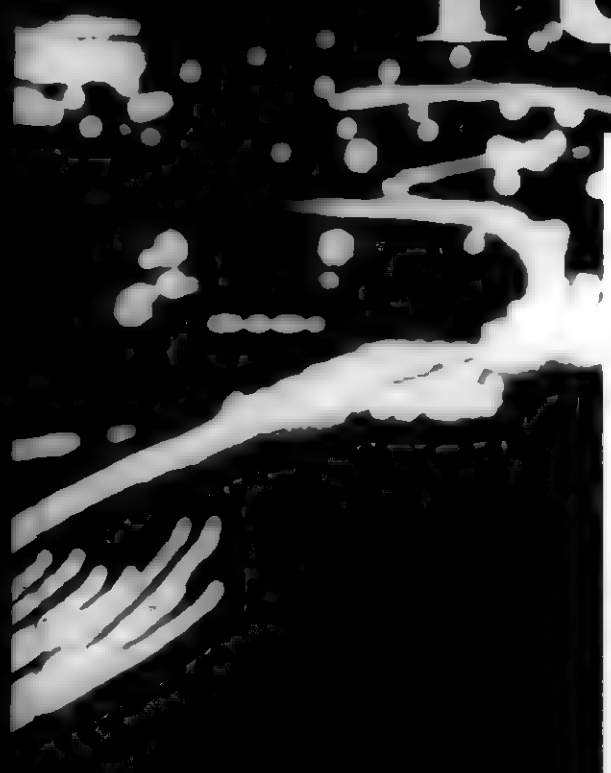
The company said ObjectVision 2.0 includes support for three gateways from Sybase, Inc. in Emeryville, Calif. ObjectView now supports Sybase Open Gateway for IBM's DB2 Release 2.0, Sybase Net-Gateway for OS/2 and Sybase Open Server for OS/2.

Support for Sybase's DB2 gateway is provided through extensions to the ObjectView fourth-generation language, allowing an ObjectView application to access DB2 as if it were a Sybase server, company officials said. Access to the Sybase gateways for OS/2 will provide faster execution of ObjectView applications, they added.

In a related announcement, Matesys said it has formed a marketing agreement with NCR Corp. According to the agreement, NCR will sell ObjectVision 2.0 for use with databases that run on the company's NCR 3600 massively parallel system, including the NCR/Teradata database, the Oracle Corp. Parallel Server and the Sybase Parallel Server.

ObjectVision 2.0 will also work with client workstations connected to the NCR 3400 and 3500 database servers, Matesys officials said.

In the Fast LAN



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AIX workbench wins support

Over 20 CASE vendors announce tools for environment

BY GARRY RAY
CW STAFF

Keeping true to its commitment to make its AIX RISC System/6000 a major corporate development platform, IBM recently mustered support from more than 20 tools vendors for its AIX Software Development Environment (SDE) Workbench/6000.

SDE Workbench, announced by IBM in January, gained momentum in July when the company declared that it would make major portions of the AD/Cycle application development framework available under AIX. At that time, IBM officials also said SDE Workbench would eventually support the AD/Cycle Information Model and a repository of its own.

Last week, King Chan, the systems manager for AD Platform at IBM's Toronto Application Development Technology Laboratory, said IBM will be "including something like a repository, but we don't like to call it that because it provides a certain connotation we don't want." IBM's Toronto lab has been unusually forthright in its adoption of industrywide computer-aided software engineering (CASE) standards, rather than proprietary IBM tools, to promote SDE Workbench.

"This is what IBM and its customers have wanted," said Mickey Williamson, editor of "CASE Strategies," an Arlington, Mass.-based CASE industry newsletter. "IBM's concept with AD/Cycle hasn't really been an open system," she said.

Support times two

SDE Workbench, an adaptation of the Softbench development framework from Hewlett-Packard Co., includes two types of support for compliant CASE tools. Visual integration is achieved through the Open Software Foundation's Motif user interface, as well as through standard menus and commands appearing in the SDE Workbench interface.

The second support, control integration, allows CASE tools to intercommunicate through a messaging layer included in a Broadcast Message Server.

Unix CASE tools can be migrated to SDE Workbench through SDE Integrator/6000, an optional tool set that supports C, C++ and an Encapsulation Description Language. Vendors that recently announced support for SDE Workbench are in various stages of visual and control integration.

Among the tools gaining integration with SDE Workbench are the following:

•Hyperwork/6000, an object-oriented analysis, development, maintenance and runtime environment from **PBS Professional Business Software GmbH** in Wittland, Germany. Due in March 1993, Hyperwork/6000 is said to provide object-oriented CASE tools and an active object database to store persistent objects such as data, methods and graphical application interfaces.

•**Template Software, Inc.** intends to deliver its Snap development tools for SDE Workbench by the fourth quarter. Snap is an application development template that provides a reusable framework for graphical user interfaces (GUI), communication and permanent storage.

•San Francisco-based **Software Research, Inc.** announced that its Software Testworks test and analysis tools are now integrated with SDE Workbench. The tools work with a variety of languages.

•**Neuron Data, Inc.**, the Palo Alto, Calif.-based vendor of the Neuron Data Open Interface GUI builder, will add SDE Workbench integration to the next major upgrade of its tools. Open Interface provides a development environment including modifiable text editors, tables, buttons and menus that can be ported to Microsoft Corp.'s Windows, Motif, Sun Microsystems, Inc.'s Open Look, Microsoft and IBM's OS/2 Presentation Manager and the Apple Computer, Inc. Macintosh.

•Toronto-based **Netron, Inc.** has provided first-level integration with SDE Workbench in its Netron/CAP and Netron/Client development tools. Netron/CAP is a Cobol application framework that includes reusable software designs.

•**Intellicorp** said its Prokappa object-oriented integration tools will support SDE Workbench by the first quarter of 1993. The tools include object class libraries that allow Unix client/server application to be integrated into MVS/CICS production environments.

Bench press

IBM's AIX Software Development Environment (SDE) Workbench/6000 is gaining third-party support

Platform

AIX Version 3.2 for RISC System/6000.

Description

Based on HP's Softbench CASE integration framework, SDE Workbench/6000 provides a common visual interface and integration support for CASE tools sold by IBM and third-party vendors. CASE tools can communicate with each other through an interval messaging protocol using the embedded Broadcast Message Server (BMS).

Components

Development manager: Provides file and directory management, hooks to three IBM version control managers and callable links to other Workbench/6000 tools.

Program builder: Similar to the Unix Make command, will maintain lists of source, object and executable files for compilation and linking.

Program editor: Programmable code and documentation editor that supports integration with other tools through the BMS. Also includes wrappers for Unix VI and Emacs editors.

Program debugger: Based on the AIX Version 3.2 debugger dbx.

Static analyzer: Graphical analysis of all program declarations, functions and variables.

CW Chart: Stephanie Faucher

CASE show goes beyond technology

Besides new products, CASE World '92 tackles education, cultural, quality issues

BY KIM S. NASH
CW STAFF

BOSTON — New development products popped up at CASE World '92, but this time, the twice-yearly show also focused on other issues, such as education, cultural changes and software quality.

Experienced computer-aided software engineering (CASE) users now realize that workbenches are part of a process that must include project management, careful training and ways to measure the effects of automated development. If CASE World represents reality, then vendors have taken note. The following products were unveiled here last week:

•**Digital Equipment Corp., Silicon Graphics, Inc.** and **SunSoft, Inc.** presented a proposal for a vendor-independent messaging format for getting various CASE tools to work together.

•**Hewlett-Packard Co.** kept its open CASE banner— SoftBench — at the fore by hosting a panel on the topic with fellow CASE Communique group members Informix Software, Inc., Cadre Technologies, Inc. and Hughes Network Systems, Inc. The group promotes SoftBench as a Unix CASE framework over ToolTalk from **Sun Microsystems, Inc.**

•Even **AT&T** is in the framework fray now. It launched a set of guidelines and standards for building mainframe applications from OS/2-based workstations.

•EasyCASE Plus 3.2 from **Evergreen CASE Tools, Inc.** in Redmond, Wash., has a $795 personal computer-based product for doing analysis and design.

•**Software Quality Automation** in Lawrence, Mass., introduced a suite of testing aids targeted at Microsoft Corp.'s Windows applications. SQA:Manager starts at $995 for a single-user version.

•**Synon Corp.** and **Computer Systems Advisors, Inc.** announced a joint marketing deal under which Synon users building programs for IBM Application System/400 machines will have access to Computer Systems Advisors' object-oriented upper CASE tool.

•**SRA Corp.** in Arlington, Va., unveiled Re-engineering Workbench, a product designed to transform Cobol programs into CASE models. The utility works with Intersolv, Inc.'s Excelerator II integrated CASE tool set.

•**Applied Business Technology Corp.** in New York introduced a metrics tool for making sure new applications conform to preset quality standards. The product links to other Applied Business project management aids, including Project Workbench, a Windows version of which began shipping last week.

•**Viasoft, Inc.** announced Via/Recap, an MVS-based product for measuring software quality through function-point analysis. The Phoenix-based company also indicated that an OS/2 version of its flagship Via/Insight CASE workbench will ship by year's end.

Education was a secondary theme at the show this year, with several seminars sponsored by Digital Consulting, Inc. devoted to helping potential users sort through various aspects of application development, such as object-oriented methods, CASE products vs. CASE issues and project management. Venerable CASE figure James Martin announced video and compact disc/read-only memory courses.

Computer-aided testing was the subject of a well-attended seminar. Raising productivity on the build side means the testing end has to handle more programs faster.

Testing and debugging products targeted specifically at CASE users are hitting the market at a faster clip now.

NEW PRODUCTS

Application development tools

Procase Corp. has introduced C/Spot/Run, a tool designed to let users develop working code faster.

The combination of analysis tools plus capabilities within Unix development help users spot errors, comprehend dependency relationships, evaluate code structure and achieve running code faster. C/Spot/Run has an intuitive user interface that unites functions such as semantic analysis, dependency analysis, source-code filtering and navigation and graphical representation of function calls. The product supports Sun Microsystems, Inc.'s SPARCstation and Hewlett-Packard Co.'s Apollo 9000 and Series 700 workstations.

C/Spot/Run costs $995.

Procase
Suite 100
3130 De La Cruz Blvd.
Santa Clara, Calif. 95054
(408) 727-0714

1 Software Engineering has announced Tree4C, Tree4Fortran and Tree4Pascal, reverse-engineering tools.

The products run on Sun Microsystems, Inc. workstations and were designed to parse source code to show a program's structure chart to better understand and maintain existing code, the company reported. After source code has been reverse-engineered, TreeSoft 2.1, a Unix-based software engineering environment, provides selective reuse support. TreeSoft 2.1 supports default editing, graphical viewpaths, project modeling configuration management and other features.

Tree4C, Tree4Fortran and Tree4Pascal cost $1,500 each.

1 Software Engineering
Suite 438
Las Posas Road
Camarillo, Calif. 93011
(805) 389-1778

Digitalk, Inc. has started shipping the 32-bit version of its object-oriented Smalltalk/V development environment designed for IBM's OS/2 2.0.

According to the company, the new version provides Smalltalk/V applications that are up to 100% faster and 50% smaller than 16-bit OS/2 applications. Additions include a debugger with enhanced single-stepping capability, the ability to call both 16-bit and 32-bit Dynamic Link Libraries, enhanced support for bitmaps and for OS/2's common dialog boxes and double-byte character set characters in Smalltalk/V code.

Smalltalk/V Version 2.0 for OS/2 costs $995.

Digitalk
9841 Airport Blvd.
Los Angeles, Calif. 90045
(310) 645-1082

American Cybernetics, Inc. has introduced Multi-Edit 6.1 for DOS, a text editor.

Multi-Edit 6.1 for DOS features include color templates, new search and replace options and more user interface and configuration enhancements. A user configurable syntax highlighting feature was designed for language-specific color coding of keywords, comments, symbols and strings in a source file.

Multi-Edit Standard 6.1 costs $129, and the 6.1 Professional version costs $199.

American Cybernetics
Suite 112
1830 W. University Drive
Tempe, Ariz. 85281
(602) 968-1945

Software Maintenance & Development Systems, Inc. has announced Version 8.0 of Aide-De-Camp, a software configuration management system.

According to the company, Version 8.0 extends the user's ability to monitor and identify the change history of important relationships between software components. Aide-De-Camp's language-specific support components to object-oriented programming languages have been expanded, providing a variety of software entity relationships.

A single-user license costs $3,500.

Software Maintenance & Development Systems
200 Baker Ave.
Concord, Mass. 01742
(508) 369-7398

Computer-aided software engineering

Four Seasons Software has introduced 4S-BriefCase, a computer-aided software engineering (CASE) product.

The product can be used in three ways: as a prototyping tool to define forms, as a CASE-tool implementation product and as a way to integrate all phases of the application development life cycle. 4S-BriefCase provides a variety of capabilities, including a customized form for every table, a report description generated for every table and code that performs referential integrity checks. A set of menus guides users through the generated applications.

Prices for 4S-BriefCase range from $720 to $26,000.

Four Seasons Software
2025 Lincoln Highway
Edison, N.J. 08817
(908) 248-6667

Languages

Microsoft Corp. recently extended the reach of its Visual Basic development language with the introduction of Visual Basic for MS-DOS in Standard and Professional versions.

The languages were designed to allow applications to be written once and run under either DOS or Windows with little or no modification. Programs can be compiled to a stand-alone executable file, according to Microsoft.

The Professional version comes with features not in the Standard version, including Intel Corp. 80386/1486 code optimization, a custom control development kit and an integrated sequential access method database engine.

The suggested list price for the Standard version is $199. The Professional version lists for $495.

Microsoft
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

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Object-Oriented Methodology 2 Days Tuesday-Wed. $895		DC	BO	CH		SD	DC	SF	KP	BO
C Programming 4 Days Tuesday-Friday $1745			SJ		KP		BO		SJ	
Advanced C Programming 4 Days Tuesday-Friday $1745		DC	BO	KP		SJ			BO	KP
C++ Programming 4 Days Tuesday-Friday $1745	SJ					KP		KP	SJ	BO
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PRODUCT SPOTLIGHT

EDI everywhere still takes time...

1 to 5 partners (initial pilot)

2 years

100 partners (significant implementation)

'92 '93 '94 '95 '96

Most firms can easily justify an EDI investment within three to five years

Days to get a new partner up and running.

...but less money

• The median cost to add a trading partner has dropped, but it's still high when you're adding a lot of partners.

1991: $1,700

1992: $600

(Out-of-pocket expenses and personnel)

• The cost to send a standard EDI transaction set is also on the decline.

1991: 57 cents

1992: 44 cents

(Standard: 1.5K-byte purchase order)

• Per-month VAN charges for large hubs have increased because of more transactions being sent

1992: More than $4,000

1991: Roughly $2,000

Major VANs are sure to counter this trend with lower communications costs for their largest customers.

Illustrations by Susan Green

Source: Annual survey by The EDI Group Ltd.

BY RUTH ANDERSEN and D. J. MASSON

Is EDI finally coming of age among U.S. corporate users? A recent survey of 1,500 business and data processing managers by The EDI Group Ltd. suggests the answer is a resounding yes. Is the road to EDI still bumpy? Yes again, but value-added network (VAN) providers and translation software vendors are working hard to smooth out some of the bigger ruts.

If it were easy to move business data in electronic fashion among companies, everyone would be doing electronic data interchange, or EDI. But according to the EDI Group, fewer than 5% of all company-to-company documents currently move in standard EDI formats. That number's about to change, however: Large-scale users say they plan to add an average of more than 300 trading partners by the end of 1993, according to the survey. They also plan to convert up to 50% of their non-EDI business documents.

The growing interest may have a lot to do with the improvements in VAN services and the software itself, which is now addressing the most difficult EDI implementation problems, including education and application integration. Other new software capabilities include support for Unix-based server platforms, mapping and implementation setup tools, on-line Help and support for ANSI X12 and EDIfact standards.

But if EDI's so difficult, why bother with it at all? Because in the end, it offers significant cost savings and could even be considered necessary for implementing business processes such as just-in-time inventory, total quality management and zero-defect production. •

It's going to be a bumpy ride

The road to EDI can be likened to the roads around Chicago after a bad winter — rough, tough and full of potholes. Unresolved issues abound, especially for large-scale EDI users (typically called "EDI hubs"), many of which already have hundreds of EDI trading partners (usually called "spokes") and plan to add hundreds more in the upcoming years.

Adding partners

➤The first and most pressing problem for hub implementations is the cost of adding trading partners. While the median cost in out-of-pocket expenses and personnel per new trading partner is only $200 for hubs (compared with $600 for the average firm), it is still a significant expense and can be a barrier to implementation when the number of new trading partners is large.

One day and $50 — that's what hubs should be spending to add new trading partners to make it economically feasible, according to experts at several EDI VANs. Most hubs are still far from meeting this criteria.

One way to keep costs low is to work closely with your VAN to get trading partners up and running. Most VANs offer trading partner support through optional consulting services and "hub" programs that identify, train and install EDI technology for smaller "spoke" partners of a VAN customer.

But things are still tough when two inexperienced companies want to set up EDI communications. It's difficult, it's expensive and things move very slowly as the companies try to learn how EDI works and hammer out the legal side of agreements. Furthermore, there's often little or no pressure forcing them into EDI.

One thing VANs could do to help out here is to ease connections between networks. Most VANs still charge extra for interconnection, and sometimes there are problems moving data quickly and reliably among different networks.

On the translation software side, vendors could make their packages easier to use. They are finally starting to do this, with point-and-click versions. Several vendors, notably **TSI International**, have announced workstation-based, off-the-shelf software that will be available in mid-1993.

Inexperienced companies might consider choosing a VAN that provides its own translation software because it can get things up and running and provide ongoing support.

Market leaders

Top sellers of translation software include the following:

MAINFRAME

Sterling Software, Inc.'s Ordernet Services Division, Dublin, Ohio
IBM, Armonk, N.Y.
Digital Equipment Corp., Maynard, Mass.
General Electric Information Services, Rockville, Md.
EDI Solutions, Inc., Minneapolis
TSI International, Wilton, Conn.

MIDRANGE

Premenos Corp., Concord, Calif.
Sterling Software's Ordernet Services Division, Dublin, Ohio
IBM, Armonk, N.Y.

PERSONAL COMPUTER

Supply Tech, Inc., Ann Arbor, Mich.
TSI International, Wilton, Conn.
GEIS, Englewood, Colo.
EDI, Inc., Gaithersburg, Md.
Harbinger, Atlanta
Sterling Software's Ordernet Services Division, Dublin, Ohio
IBM, Armonk, N.Y.
EDS Canada Ltd., Scarborough, Ontario
APL Group, Inc., Wilton, Conn.
American Business Computer, Ann Arbor, Mich.

Source: Input

From pilot to ramp-up

You can invest a lot of time — two years, on average — and money to go from an EDI pilot to a large-scale implementation (see graphic page 75). However, you can take comfort in the fact that your investment lessens with each trading partner you add and with each step you take up the EDI learning curve.

The major barrier you'll encounter while ramping up an EDI implementation is the time spent negotiating communications details with the new trading partner and explaining EDI concepts. Most EDI vendors (especially VANs) offer help in new trading partner implementation.

Add to this the problems of making EDI work with existing applications and deciding on the proper platform for running EDI, and it is no wonder that many EDI managers are still waiting for the benefits of EDI to accrue to their company.

Spreading the news

➤Many potential trading partners in small and midsize firms are still ignorant about EDI, despite years of effort to spread the news by private educational firms, EDI standards organizations and industry groups. EDI VANs (see story page 79) are increasingly supporting this need by running implementation training sessions and expanding user meetings to focus on trading partner support.

The need for education is also important as EDI expands into new areas and new industry groups implement EDI standards for communication among their members.

In the area of financial EDI and in industries such as health care, construction and entertainment, the use of EDI is very low, and massive amounts of education are still required.

The No. 1 barrier to successful EDI implementation is still "distribution of EDI information" and "education," according to 60% of large-scale EDI users surveyed.

Communications costs on the rise

➤EDI hub companies in particular have to deal with the fact that as their EDI volume grows, so do communications costs. Large EDI hubs average more than $4,000 per month in VAN charges, up from about $2,000 per month last year. This is despite the fact that their per-document transmission costs are decreasing.

As total VAN communications costs increase, there's more likelihood that EDI hubs will move their EDI transmissions onto a dedicated EDI platform, bypassing the VANs. In essence, the hub can set up its own VAN and communicate directly with its many trading partners. Though they are expensive, you can purchase fault-tolerant hardware/software combinations, such as **MPACT EDI Systems, Inc.**'s software running on the Tandem Computers, Inc. platform, that allow this kind of "in-house" VAN.

The major VANs, of course, are sure to counter this trend with even lower communications costs to their largest customers.

Most firms active in EDI send transmissions between one and five times per day, with one-third of the VAN users sending transmissions directly to trading partners over phone lines, bypassing the VAN mailbox.

Some accept bulk transfers of messages sent during off hours and then sort and send messages later.

Regardless of the eventual configuration of the VAN market, it is clear that EDI users can expect total EDI communications costs to keep rising as they add partners, but per-transaction costs will decrease over time.

All articles written by D. J. Masson and Ruth Andersen. Masson is president of Treasury Management Associates, a Colorado-based consulting firm, and research director at Oak Park, Ill.-based The EDI Group Ltd. Andersen is an independent consultant specializing in EDI planning and financial EDI and is marketing director at The EDI Group. All research provided by The EDI Group.

Integration: The hardest part

➤Some people define EDI as the computer-to-computer exchange of business information in a standard format. This definition includes companies that might electronically receive, for instance, purchase orders but then follow a paper-based process to complete the transaction.

A more advanced definition of EDI is the exchange of business data among application systems in a standard electronic format. This means that one company's purchase order system is actually talking to another's order processing system.

It is not surprising that people consider this type of transaction a major implementation issue. Many firms are using applications developed long before the advent of EDI; the cost of modifying or in some cases replacing these applications can be significant. EDI software providers are addressing this need by offering better mapping and integration tools.

Most mainframe, midrange or front-end software packages offer some kind of mapping utility, including creation of special maps; ability to handle multiple versions of standards; ability to divert errors or exceptions for special processing; ability to enter bar-code data; and ability to move any portion of data to or from EDI transaction sets to or from any portion of the application record.

Two-thirds of respondents to the EDI survey cited "the need to modify application systems to take advantage of EDI" as a major implementation issue.

Several companies offer PC-based software that allows the user to turn around data in incoming EDI messages into outbound EDI transaction sets.

There are also software vendors that produce a dedicated mapping utility.

Database vendors are also getting involved by inserting EDI modules into their database management systems. Computer Associates International, Inc. is looking into this.

Which platform should you choose?

EDI translation software exists for almost any hardware/operating system combination used by U.S. businesses. The bad news is that for many of the most popular platforms, there is a confusing array of packages, often with radically different features and capabilities.

Though EDI can be performed on a stand-alone personal computer, this is usually only workable for a small firm or as a pilot for a larger implementation. Larger firms must choose between running the EDI software on the same platform as their application (usually a midrange machine or mainframe) or using a dedicated high-end PC (or other platform) as a front-end EDI server.

As the throughput capabilities of PCs rise and the costs of Unix-based reduced instruction set computing (RISC) platforms fall, more firms will use these types of platforms for EDI processing.

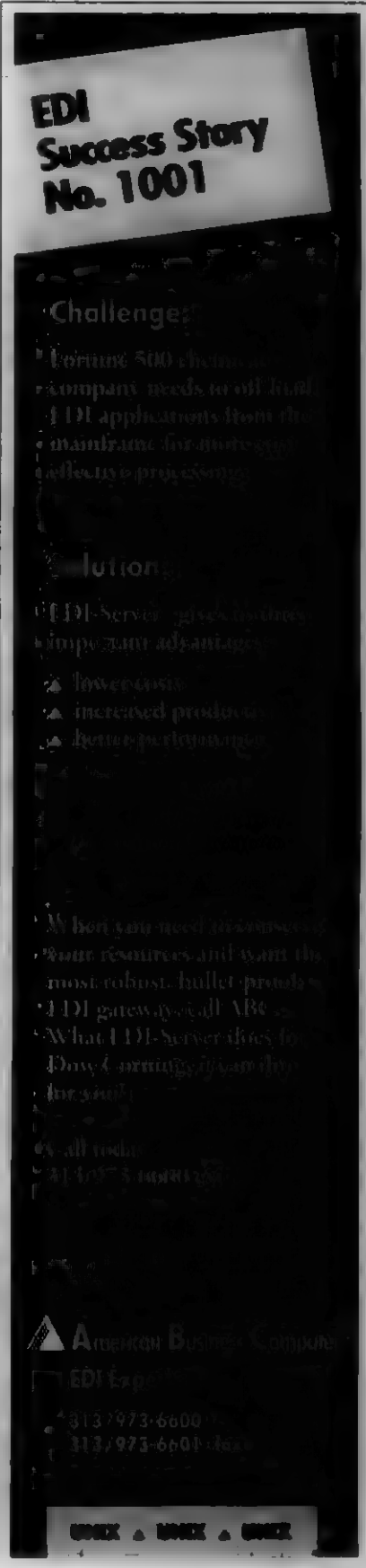
EDI software available for PC or RISC platforms now offers extensive mapping and implementation setup tools, making the connection to existing applications faster and easier than for most mainframe-based software.

The other development that must be considered is Unix and DOS-based database applications for PC and RISC platforms. The advanced "search and query" capabilities of these applications allow complex real-time application systems to be developed that previously could be run only on a large mainframe. In many cases, EDI capabilities are being built into these systems as new applications are developed.

Especially as people move toward client/server, RISC will become more popular. High-end Unix machines offer security, fault tolerance and a stable operating system designed for high-speed commercial applications. Buyers may be willing to pay $15,000 to $20,000 for a really secure box, compared to $7,000 to $8,000 for a high-end PC system.

Unix-based EDI translation software

Vendor	Version of Unix supported	Mailboxes	Client/server architecture supported	EDI standards supported	Price
American Business Computer (313) 973-6600 EDI-Server	AT&T V.3, AT&T V.4, ADX, HP/UX, Tandem Integrity, Sun/UX, Interactive 386	Yes	Yes	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG, any document in X12 or EDIfact Syntax	$50,000
EDI-Excel	AT&T V.3, AT&T V.4, AIX, HP/UX, Tandem Integrity, Sun/UX, Interactive 386, SCO Unix, DYL/NIX, Amdahl UTS, DG/UX, UTX/32, Altos Unix, PTX	No	No	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG, any document in X12 or EDIfact Syntax	$7,500-$40,000
DNS Associates, Inc. EDI/Edge (617) 862-8569	AIX System V, Release 4, Ultrix, SunOS, SCO Unix, HP/UX	Yes	Yes	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact	$6,000 starting price, depending on configuration
GE Information Services (800) 334-5669 EDItransit	Altos Unix, UTS, System V, DG/UX, UTX/32, HP/UX, Interactive, AIX, SCO Unix, Sun/UX, PTX	No	Depends on Unix machines	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG	$9,000-$41,500, depending on Unix platform
Premenos Corp. (800) 426-3836 EDI/E	AIX, HP/UX	Yes	Yes	ANSI X12, EDIfact	$10,000-$30,000
St. Paul Software (612) 641-0963 Datatran	All common Unix versions	No	Yes	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG, several industry subsets	$3,500-$30,000
Sterling Software, Inc. (614) 793-7000 Gentran for Unix	AT&T Unix V.3	No	Yes	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG, Tradacoms, Odette	$7,500-$42,500
Unisys Corp. (215) 986-3601 Enlighten	Unix V.3, Unix V.4	Yes	Yes	ANSI X12, TDCC, UCS, WINS, VICS, EDIfact, AIAG, TDI, Tradacoms, CII	$10,000-$40,000



The world's fastest dial modem can really make information fly.

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Motorola Codex's new V.fast. You just can't find a faster dial modem.

Our new networked-managed V.fast modem, 326XFAST, is the only dial modem available today to provide through-put up to 115.2 Kbps async, 19.2 to 24 Kbps sync.

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Speed like that is ideal for applications like remote LAN access that's notoriously slow, especially in a Windows environment. With V.fast, remote PC users can work just as productively as if they were on a local node.

It's also ideal for: multi-media and graphics-intensive applications, large file transfers, desktop publishing and off-peak polling. Plus, it's the perfect back-up for DDS and VSAT digital technologies and as a Switched 56 alternative.

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1-800-426-1212 Ext. 212
Fax# 508-261-1204.

Which VAN's for you?

Following are descriptions of the leading value-added networks:

• **Advantis.** The recent creation of the planned merger between **IBM Information Network** and **Sears Communications Co.** Potentially a formidable competitor in this arena.

• **AT&T.** Manages VAN services as part of its Easylink electronic-mail system. Does not offer EDI translation software; certifies compatibility of different software packages with its system. Primary strengths: strong support of X.400, the ability to link E-mail, fax and EDI communications, longtime experience in telecommunications.

• **BT North America, Inc.** A division of BT Tymnet. Does not offer translation software; certifies compatibility of different software packages. Primary strengths: international communications network, no-cost gateway service, experience and backing of parent company.

• **General Electric Information Services.** One of the largest VANs, with more than 8,000 customers worldwide. Primary strengths: long experience in network communications, financial EDI. Offers translation software and consulting.

• **IBM Information Network.** (Will become Advantis in 1993.) Primary strengths: the ability to provide complete electronic communications solutions (including hardware) and its large existing base.

• **Sears Communications.** (Will be Advantis in 1993.) Began as the proprietary communications network that **Sears, Roebuck and Co.** used. Does not offer EDI translation software. Primary strengths: an excellent technological base and extensive retail experience. Offers translation software and consulting.

• **Sterling Software, Inc.** Offers EDI software and VAN services through its Ordernet Services Division. Primary strengths: the ability to provide a complete software/communications solution and assistance for mass implementations of trading partners. Offers translation software and consulting.

• **Other VANs.** Other players in the EDI VAN market include **Harbinger EDI Services, Kleinschmidt, Inc., Railinc Corp.** and **Transettlements, Inc.**

In addition, many of the telecommunications companies, some of the regional Bell operating companies and the computer networks such as **Compuserve, Inc.** offer various types of EDI VAN services.

VOICES OF EXPERIENCE

"DON'T UNDERESTIMATE the time involved. As more and more customers are added, it takes more and more time. The world is not on the same standards.

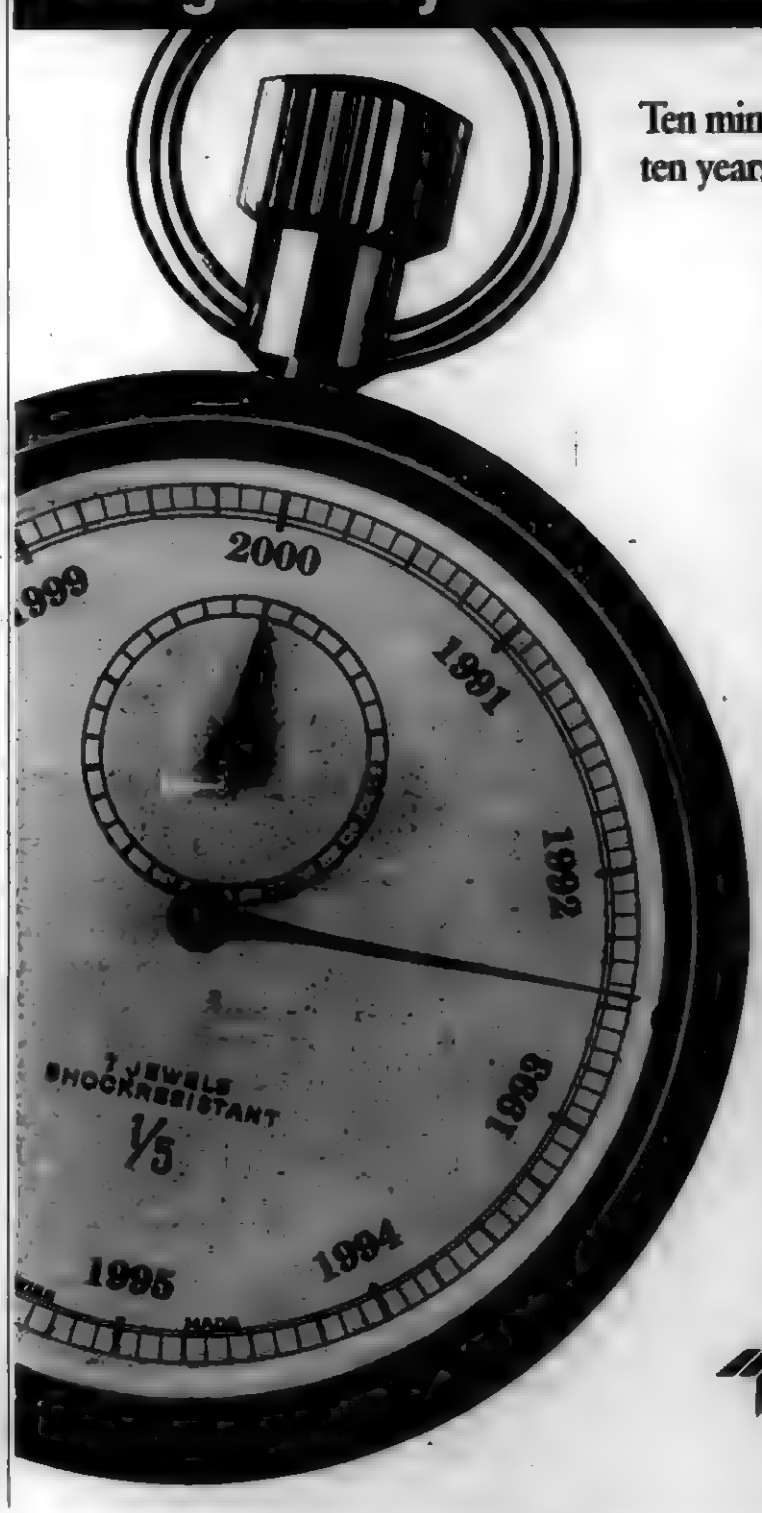
"Another thing: Use preprogrammed software, and lock the vendor in by buying maintenance agreements. Make the vendor keep you updated."

Bob Storandt, management systems manager
Flambeau Corp., Baraboo, Wis.

"LEARN AS MUCH as you can about change management. We're running into things at the middle management level in MIS and end-user management that we never encountered at the senior level. For the first time, change is hitting home — the fear of losing jobs or losing [staff]. We realize that the head count is simply being redeployed. But some of our managers don't know that."

Daniel Browning, director of EDI
Baxter Healthcare Corp., Deerfield, Ill.

Give ten minutes to us.
And get ten years on them.



Ten minutes with Tandem can put you ten years ahead of your competition.

Because, while they're still trying EDI on yesterday's computers, you can be doing EDI on the only system ready today for the commercial messaging challenges of tomorrow.

Only a Tandem solution can meet the EDI needs of one department now—and expand to meet your entire company's full range of messaging needs years from now. Step by step, cost-effectively. All the while supporting information exchange between you and your trading partners 24 hours a day, 7 days a week.

Tandem is the leading supplier of event-driven, online solutions for electronic commerce. Our NonStop systems are the platform of choice for seven out of ten value-added network service providers in the U.S. We have customers already using 1988-compliant X.400 networking. Connect through us, and you can connect to virtually anything.

So leave your competition ten years behind. Ten minutes with our EDI Information Pack will show you how. Just call 1-800-482-6336 (U.S.) or 1-800-345-8636 (Canada), and ask for it.

TANDEM

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VOICES OF EXPERIENCE

"YOU'VE GOT TO understand that it's going to change some of the ways you do business, and it's going to do away with some people."

David Brown, systems manager
Stride Rite Corp., Cambridge, Mass.

"WE CHOSE TO write our own translator, which in retrospect was a mistake. It slowed us down about two years. Since then, we've purchased Sterling's Gentran, which allowed us to leverage our investment.

"EDI started out as an MIS project here without a lot of commitment from other areas of the company. If I had it to do over again, I would get as broad a base of support as I could."

Philip Catlin, programmer/analyst
Totes, Inc., Loveland, Ohio

"I SHOULD HAVE surveyed my trading partners earlier to find out how they were doing business so I would have more knowledge about how to develop my application interfaces. You need to talk to a trading partner base that comprises approximately 50% of your business. The idea is to talk to the people you're doing a majority of your business with, and when you find out what they need, the 'little guys' will do what the 'big guys' do."

Larry Statham, EDI programming manager
Egghead Software, Issaquah, Wash.

Reported by Robert Knight, a free-lance writer based in Chicago.

Sometimes you need it now

Imagine an automated purchasing system that — in minutes — could track production and inventory to determine needed materials, query multiple suppliers' order entry systems for price and availability, place the order and receive price confirmation and delivery information.

You may think this kind of systems integration is years away. But "real-time EDI" services offered by most of the major value-added networks (VAN) and some translation software vendors make this possible today.

Essentially, the difference between real-time and more traditional batch-process EDI is this:

- **Real-time EDI:** The communication link through the VAN is maintained until all information is exchanged and the transaction is complete.

Average process time: One to 10 minutes.

Relevant applications: Order processing, just-in-time inventory management, retail quick response, transportation inquiries and price quotation systems.

- **Batch-process EDI:** Groups of transactions are sent to a VAN, which places them into mailboxes. Trading partners then retrieve them at a later time.

Average process time: One hour to one day.

To successfully perform real-time EDI, the application, EDI translation and communications systems of both trading partners need to be tightly integrated.

It also works best when you have high volumes of small, standardized transaction sets. That's because the application systems of the trading partners must communicate several types of information back and forth with each other until the transaction is completed.

Not all translation software is capable of working in real time. Packages designed to handle standard batch EDI may have difficulty because they aren't able to stay online to wait for a response from the trading partner.

Most of the major VANs are offering some type of real-time EDI service, often integrating the service with their more traditional batch EDI processing.

D. J. MASSON and RUTH ANDERSEN

Real-time EDI translation software

Vendor	Operating system supported	Price
American Business Computer (313) 973-6600 EDI-Server	Unix	$50,000 starting price
EDI-Excel	DOS, Unix	$7,500-$40,000
CANAC Telecom (416) 860-2851 Pro EDI	DOS, OS/2, Unix, HP 3000	$4,700
Digit Software, Inc. (301) 593-8052 MacEDI	Macintosh	$1,900
Digital Equipment Corp. (603) 884-3366 DEC/EDI	MVS, VMS	$10,000 starting price
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What's the Object(ive)?

You've heard all the hoopla about object-oriented technology. Now find out what's really going on.

BY E. TED PRINCE and
DAVID R. KNIEFEL

If object-oriented technology (OOT) has caught your eye, then you're probably looking for the straight dope on its benefits and current limitations. You need help.

OOT is being touted as the solution for the full range of application development environments from end users' ad hoc queries to sophisticated, professional programmer development tools.

But things can get a bit foggy: OOT is often incorrectly identified as a prototyping tool or as a programming environment that supports graphical user interfaces (GUI). (Prototyping and GUIs are merely elements of the technology.)

OOT is actually a shift in the way people think about and approach systems development. It affects problem analysis, systems design and programming and the end-user interface to the application environment.

With OOT, the concentration shifts from modeling business processes and data to creating objects, which consist of elements of information/data and actions (messages) related to those elements in a business process. Objects are defined, programmed, documented and placed in a repository for use in future business applications.

At certain levels of abstraction, objects can become "artifacts" — indicators of the information, actions and language the business uses. Because developers and end users use the same language and business objects, communications and therefore systems requirements are significantly improved.

To get to the bottom of claims about what technology can do for you, we surveyed companies moving to OOT. Their experiences reveal that many OOT claims hold a germ of truth, but many information systems shops are not ready for the required investment in time and resources needed to make OOT a success.

Prince is president of Computer Power Group, a software consulting firm in New York. He is a former CIO at the Australian Department of Social Security. Kniefel is director of special technical services for Computer Power Group's Eastern region and a former partner at Deloitte & Touche's Advanced Technology consulting practice.

In fact, some pioneers have gotten themselves into major messes. Furthermore, OOT vendors have not, in most cases, provided programming environments to exploit OOT's benefits.

What are users doing and what are their experiences? Is this something you could recommend to your chief financial officer and live? Find out as we uncover the claims and the current reality about OOT.

Claim to fame

OOT improves productivity.

OOT is supposed to increase developer productivity through the reuse of objects, which significantly reduces the amount of coding required to support a business area. However, you can't give object-oriented technology to 15-year veterans of procedural programming and expect success.

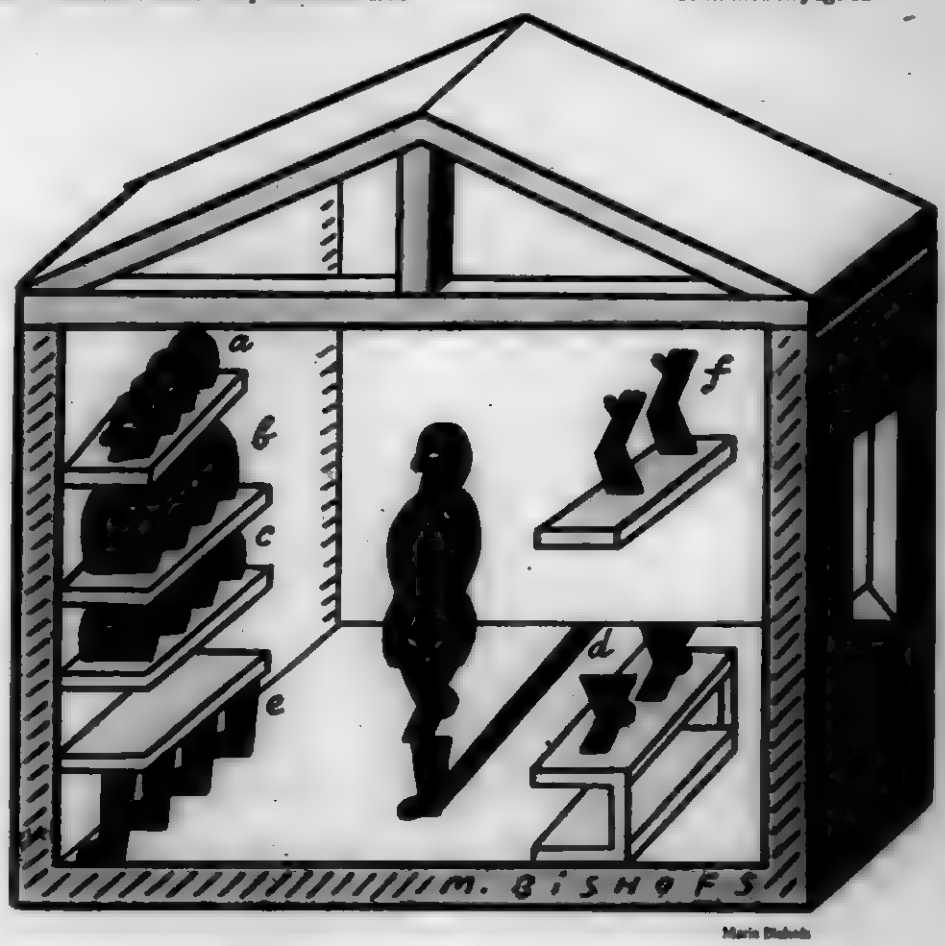
Productivity improvements can start to accrue only when developers become familiar with the brave new world of object orientation. This is not a fast or easy transition. It requires rethinking how development has always been done and, hence, comes with a steep learning curve. Developers need to shift their thinking from developing business process models to object identification and object behavior analysis. Promoting object reuse documentation becomes imperative.

The OOT learning curve is one of the reasons the New York Stock Exchange is getting higher productivity from a fourth-generation language (4GL) than from using newer OOT programming tools and languages, such as C++, notes John Fischer, chief information officer at the exchange. The 4GL is more mature, more familiar and, therefore, more immediately useful to the staff.

OOT's learning curve is similar to that of older technologies, such as computer-aided software engineering (CASE) and 4GLs. Organizations that introduced CASE two or three years ago are just now beginning to reap the benefits. The real productivity payoffs from OOT will take approximately 18 months to three years.

Unfortunately, some companies can't wait that long. One foreign bank we know attempt-

Continued on page 82



Marie Bishofs

Continued from page 81

ed to build a major banking system using OOT. Productivity didn't improve, and the bank ended up scrapping the effort (an act of technological heroism) after several years and hundreds of man-years of effort.

In all fairness to the technology, part of the problem with the current lack of productivity benefits from OOT may rest with IS shops themselves.

Besides inadequate training to help change developers' thinking, few shops have productivity measures in place. They wouldn't know a productivity increase if one hit them in the head. For example, we talked to two firms — one in cosmetics and one in finance — that introduced C++ without knowing how productive they had been using previous development languages.

Another company, a pharmaceuticals maker, has never measured productivity in its current CASE environment. It is moving to OOT but will have no figures to use for comparison.

These companies failed to put themselves in a position to know if and when they will achieve productivity gains. If you're considering moving to OOT, a metrics program is essential.

Claim to fame

OOT is becoming a standard for design and development.

There is nothing about OOT that is standard today, including the vocabulary used to describe OOT concepts.

OOT is routinely confused with GUIs, while object-oriented design is mixed up with prototyping and programming in C++.

Furthermore, there is no accepted system development life cycle (methodology) for OOT design and development. What few attempts there have been at creating new methodologies have not reflected the radical change OOT brings to analytical processes — namely, thinking in terms of objects rather than the independent business process and data models software engineering espouses.

For now, users must be content with object-oriented programming (OOP) tools and languages, such as Smalltalk, that were developed for objects. These items provide the framework for capturing systems design using OOT principles.

Because object-oriented methodologies and programming environments are in a state of flux, new releases can wreak havoc on a company. Computer Power Group found this out when we applied OOP languages and techniques to our own development efforts. A programming environment and language upgrade that came in the midst of our project forced us to abandon one OOT environment and continue development in another.

This situation has probably been repeated at many organizations.

All of this confusion may well be raising the consciousness of management and software engineers to the need for extensible and fully documented systems architectures. Because OOT can fill this need, that alone may suffice as its major contribution to development staffs.

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Claim to fame

OOT improves maintenance.

One of OOT's selling points is that it improves applications maintenance. Applications developed using OOT are constructed using objects with inheritance (objects are linked, incorporating one another's attributes and messages), not using lines of code. Maintenance consists of maintaining objects, not lines.

Furthermore, because objects are intended to be reused, they need to be fully documented. Such detailed documentation enhances the maintainability of object-oriented applications. Changes to an object are easier for two reasons: Object code complexity is cut down, and because changes are inherited among associated objects, alterations ripple through the application.

Unfortunately, OOP languages, such as C++, are not building object-oriented applications. That's because object-oriented languages are primarily being used as smarter ways of cutting old line procedural code, rather than for building true OOT systems. Languages are generally not implemented with the programming environment (tools) necessary to support the full object-oriented paradigm. Nor are they backed up by the training and support required to shift developer thinking.

Because objects are being neither constructed nor inherited, nor are they communicating with one another, object maintenance is nonexistent. What you get is the maintenance of lines of C++ code — deja vu all over again.

That's not to say improved maintenance is not happening; a major utility built a large system using OOT design principles and techniques programmed in PL/1. The organization has had two years of improved maintenance by adhering to OOT design principles.

The point is that OOT and programming languages are no substitute for good design, documentation and hard work. Given some solid development disciplines, OOT is a framework through which you can build maintainable systems.

Claim to fame

OOT reduces complexity.

Complex code is hard to take care of and maintain and typically has an increased chance of containing a high number of errors. One aim of using objects to build systems is to reduce a system's complexity, making it cleaner and more manageable. However, the benefits of OOT in this area may be hidden because companies aren't measuring complexity in the right way.

One complexity metric, which includes the number of logic branches in a program (the higher the number, the more complex the code) indicates objects on average have a complexity index of three, while each module in older procedural languages has an index of 12 to 15. This metric, known as the McCabe Cyclomatic Complexity Metric, recommends a level of no more than 10; there is a strong correlation between higher indices and higher error rates per 100 lines of code.

These numbers are true when programs are analyzed at their lowest logically complete unit (that is, an object or a module). Complexity is often much more dependent on the design and technology employed, so determining complexity at this low level is not always helpful.

Perhaps an approach more indicative of business system complexity is looking at systems requirements. The idea is to decompose each general requirement into its component, testable parts. The gross number of requirements indicates the complexity of the business environment for which the application is destined.

System complexity is managed through straightforward design, simple programming and clear documentation. With OOT's emphasis on graphical programming, higher levels of abstractions through object classes and object documentation to further object reuse, it may provide a solid way to navigate and understand inherently complex business and technological systems environments.

Claim to fame

OOT can be implemented by extending CASE tools.

CASE tools help build reasonably extensible and well-documented applications that can be maintained. Furthermore, CASE permits you to capture the process and data models as well as system design through graphical design aids. Productivity is the result of code generation driven from the models and graphical designs.

Certain CASE vendors are hoping to capture the emerging market for OOT development environments or to preserve their existing customer bases by adding objects to their products. Texas Instruments, Inc. has promised objects in its Information Engineering Facility. C++, for its part, is an extension of the C programming language that incorporates objects.

Unfortunately, creating an OOT development environment isn't as easy as plopping objects into existing products. The underlying constructs of separate process and data models found in CASE tools do not lend themselves to OOT development.

OOT is a fundamental shift in the approach to analyzing business problems, system design and programming. CASE tools embrace the information engineering approach to systems development with different development teams generally producing its attendant process-modeling and data-modeling activities. The focus is on the decomposition of the business process and its recomposition (or generation) in some appropriate computer code to be applied to some file of data.

OOT places the focus on objects (information) and the appropriate actions that apply to an object in a particular application environment. Information and the actions applied to the information are tightly bound. An application (or business solution) is a collection of objects and messages generated by the object actions.

This new paradigm for systems development changes the development process. The concentration is on business information analysis and the actions that affect that information.

.....

OOT has been getting a lot of hype, much of which it deserves. But don't be swayed by the bluster. If you're interested in the technology, put yourself in a position to make it work. Start to master the learning curve now, and institute solid measurement programs so you know if you're achieving the productivity and simplification benefits touted. •

THE BUCK STOPS Where?

As the IS team loses its iron grip on information technology spending, it tightens its hold on platform standards

David Chen

BY ELLIS BOOKER
CW STAFF

For a time, even as computing power spun out from central data centers into divisions, workgroups and desktops, central information systems organizations held tight control of the IS purse strings.

Not anymore.

But while equipment spending decisions are no longer their sole preserve, IS departments are not losing their grip on the wheel when it comes to plotting their firms' technological courses, according to IS chiefs and industry observers. To the contrary, even as budget decisions are diffusing throughout the company, IS may be shoring up more power than ever by tightening control over platform standards.

At many companies, the centrifugal forces that placed processing and even applications development in the hands of line organizations have vested these same units with control over their own IS budgets and IS purchasing decisions.

Centralized IS departments "have to learn to live with this," says Sidney Diamond, until recently the chief information officer at Baltimore-based Black & Decker Corp. and now a consultant in private practice. "Otherwise, it'll be unfortunate for themselves and for their companies."

Diamond and other IS leaders pointed, in particular, to the plunging cost of relatively easy-to-use personal computer hardware as central to the dilution of actual control.

Suppose, for instance, that an operating unit's general manager is instructed to consult with the central IS group on purchases over $100,000. On paper, this implies that the central IS group holds sway over important aquisitions; in the real world, $100,000 can buy an awful lot of PC hardware and software.

Most IS executives seem resigned to this reality. That might be because central IS organizations have not simply surrendered power and stepped into the shadows.

Instead, according to several users and analysts, they have assumed a much more explicit and active role in setting companywide standards for hardware and software platforms. In so doing, they have also maintained overall control, despite the dispersal of their financial authority.

"If anything, this has strengthened IS' power. The corporation is looking to IS as the glue," said John T. Kohler, former senior vice president and CIO at Kimberly Clark Corp. in Dallas and now senior vice president of technology solutions and head of the manufacturing practice at Chicago-based Technology Solutions Corp., an IS consultancy.

Anticipating integration

Companywide architectures have gained in importance as companies have learned the value of anticipating integrated systems, Kohler said.

"I don't think anyone buys a desktop today without thinking about connectivity," he said, adding that "in my experience, the standard architecture doesn't have exceptions, except when there will never be connectivity issues — and those cases are becoming few and far between."

Both the dispersal of spending authority away from IS and the concentration of standards-setting power in IS' hands are clear trends.

However, industry observers noted that IS leaders are still left to wrestle with a host of ambiguities. For starters, said Alex Nedzel, an analyst at Ernst & Young's Center for Information Technology and Strategy in Boston, the exact degree of top-down spending and standards authority varies, depending on the kind of organization under inspection.

"In any company where there's a real benefit for synergy between business units, you'll be able to marshal energy for a top-down author-

Continued on page 89

MAIN POINTS

- Control over technology purchasing decisions, once the sole preserve of centralized IS, is increasingly distributed to business units.
- At the same time, IS departments are tightening their control over platform standards decisions.
- As paradigms shift, IS and business leaders are wrestling with a slate of ambiguities: For instance, who funds infrastructural initiatives and how?

Items of interest from publications, speeches, surveys and research projects

Hot legalities

■ Here are some of the critical legal issues chief information officers can expect to deal with in the next five years:

• Electronic repossession: In software contract negotiations, vendors and users will continue to battle over the issue of remote disabling of software.

• Data blending: When users acquire proprietary data for use in a geographic information system, they should clarify whether that data can be blended with the company's own databases.

• Investment protection: CIOs may want contract language ensuring that, if a software vendor gets into financial trouble, the customer can obtain the source code and finish developing or modifying it.

Source: Speech by Baltimore attorney Julien A. Hecht at the Capital-area chapter meeting of the Society for Information Management, Sept. 16, 1992.

Media feels EDI pressure

■ The nation's retailers, known for their aggressive pursuit of electronic data interchange (EDI) with business partners, are pressuring the newspaper industry to get with the EDI program. Sears, Roebuck and Co. has begun preliminary EDI trials for exchanging advertising orders with Times Mirror Co. and Gannett Co. newspapers.

Similarly, Dillard Department Stores, Inc. will soon begin EDI testing with *The Dallas Morning News* and *The Daily Oklahoman*.

Source: "EDI Takes On New Urgency," by George R. Cashau and Rosalind C. Truitt, Preantime, September 1992.

Good riddance to 'CIO'?

■ As the walls between information systems departments and business units continue to fall, the viability of the CIO position is increasingly being called into question.

"I think it's definitely on its way out — and high time, too," says one veteran IS leader, who requested anonymity. "The whole title was manufactured out of thin air to stroke the egos of people who didn't think 'MIS director' sounded corporate enough to give them membership in the club. Besides, CIO has always looked ridiculous — and faintly menacing — to a whole bunch of people who are old enough to recall when those letters were preceded by AFL-."

Source: Private conversation at the Boston-area chapter meeting of the Society for Information Management, Sept. 17, 1992.

Too many Notes

■ Lotus Development Corp.'s Notes workgroup software will be one of the major drivers behind exploding network bandwidth usage, says Howard Maynard, MIS director at New York-based ad agency Young & Rubicam, Inc. The reason is that Notes allows users to replicate large databases across internetworks, and users will be eager to update those large files with great frequency, maybe even once a day or once an hour.

Young & Rubicam alone has 200 Notes servers around the world that must receive those file updates, Maynard says.

Source: Recent interview with Computerworld.

Compiled by Mitch Betts, national correspondent, with contributions from Nell Margolis, senior editor, management, and Joanie M. Wexler, senior editor, networking.

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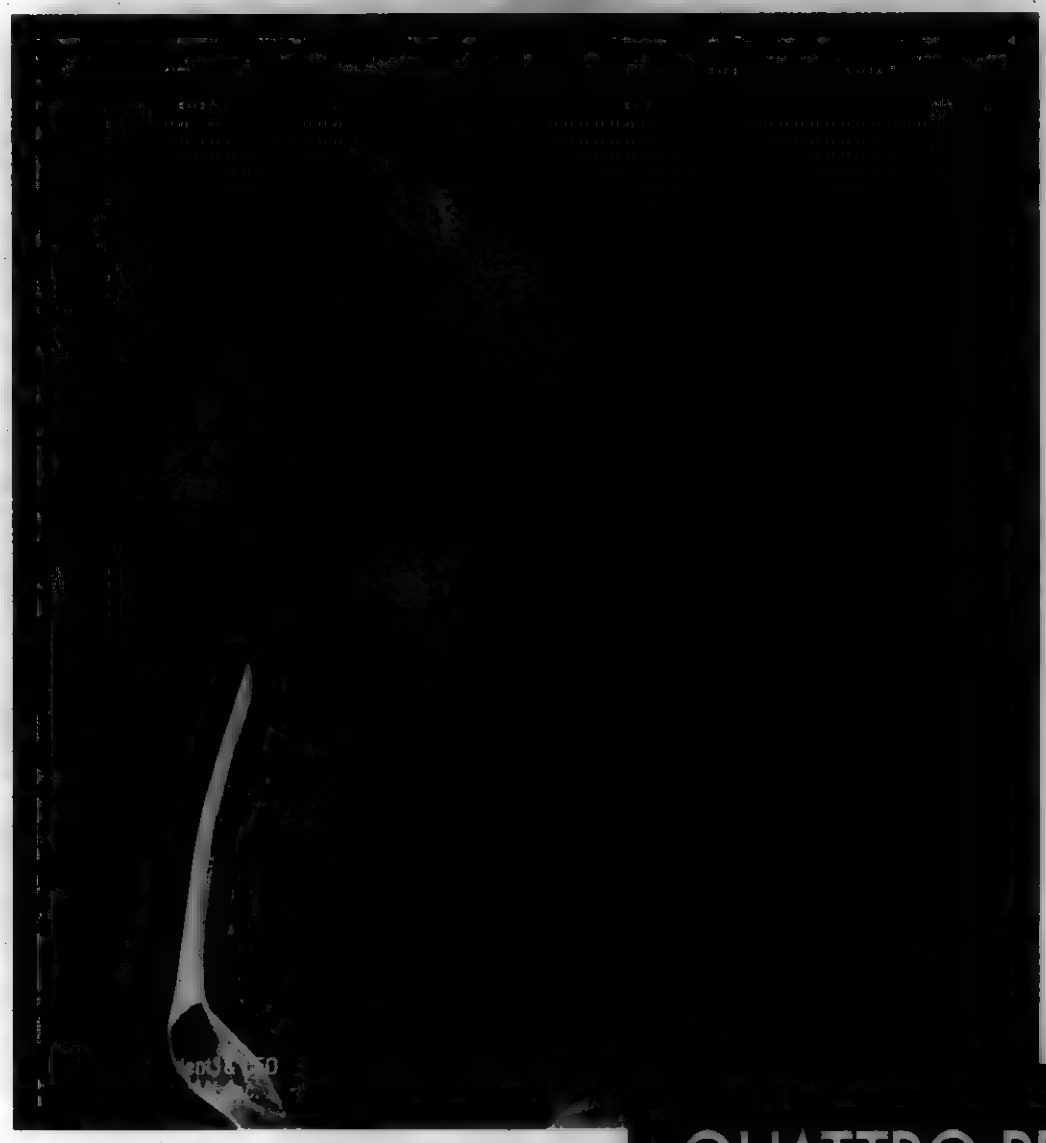

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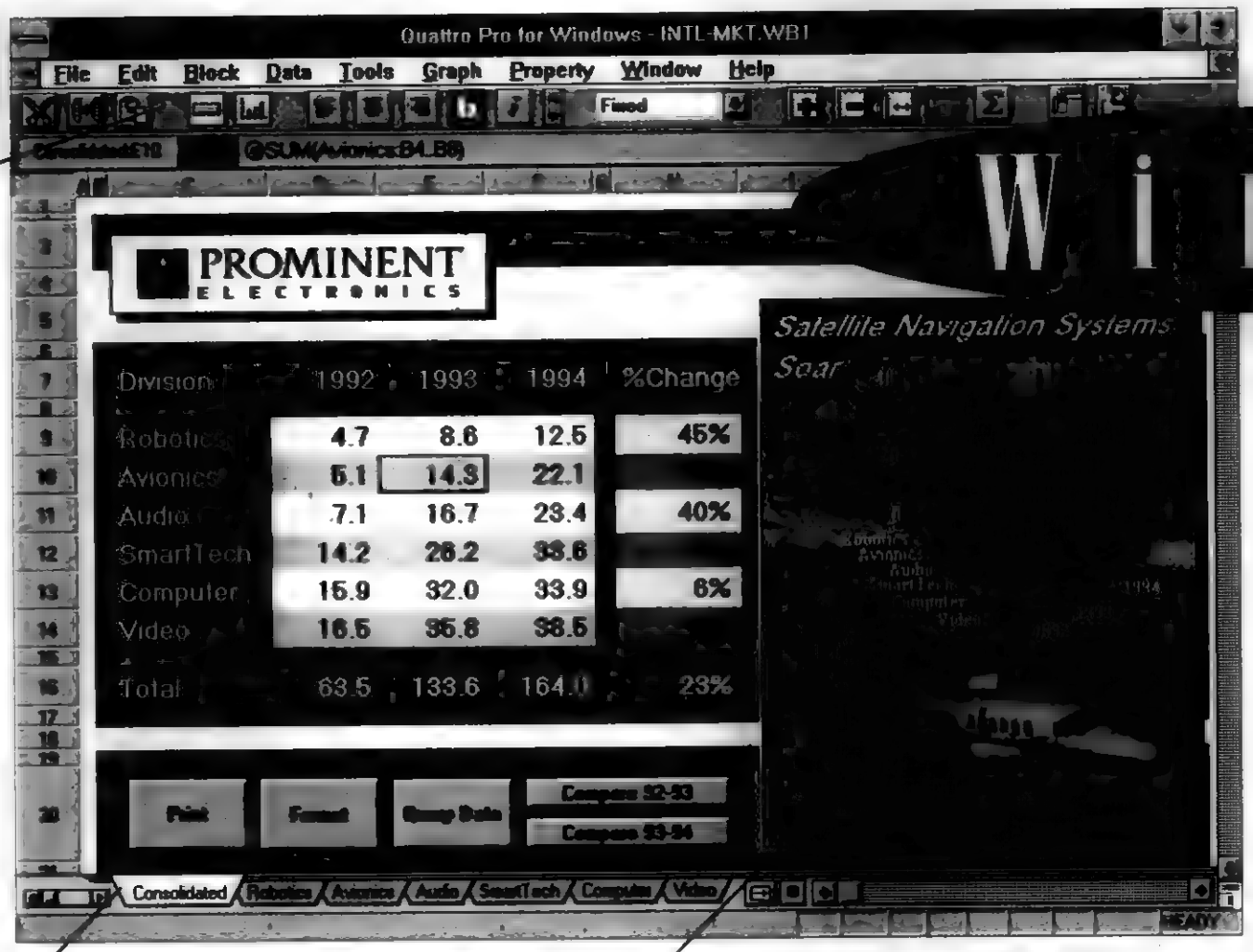

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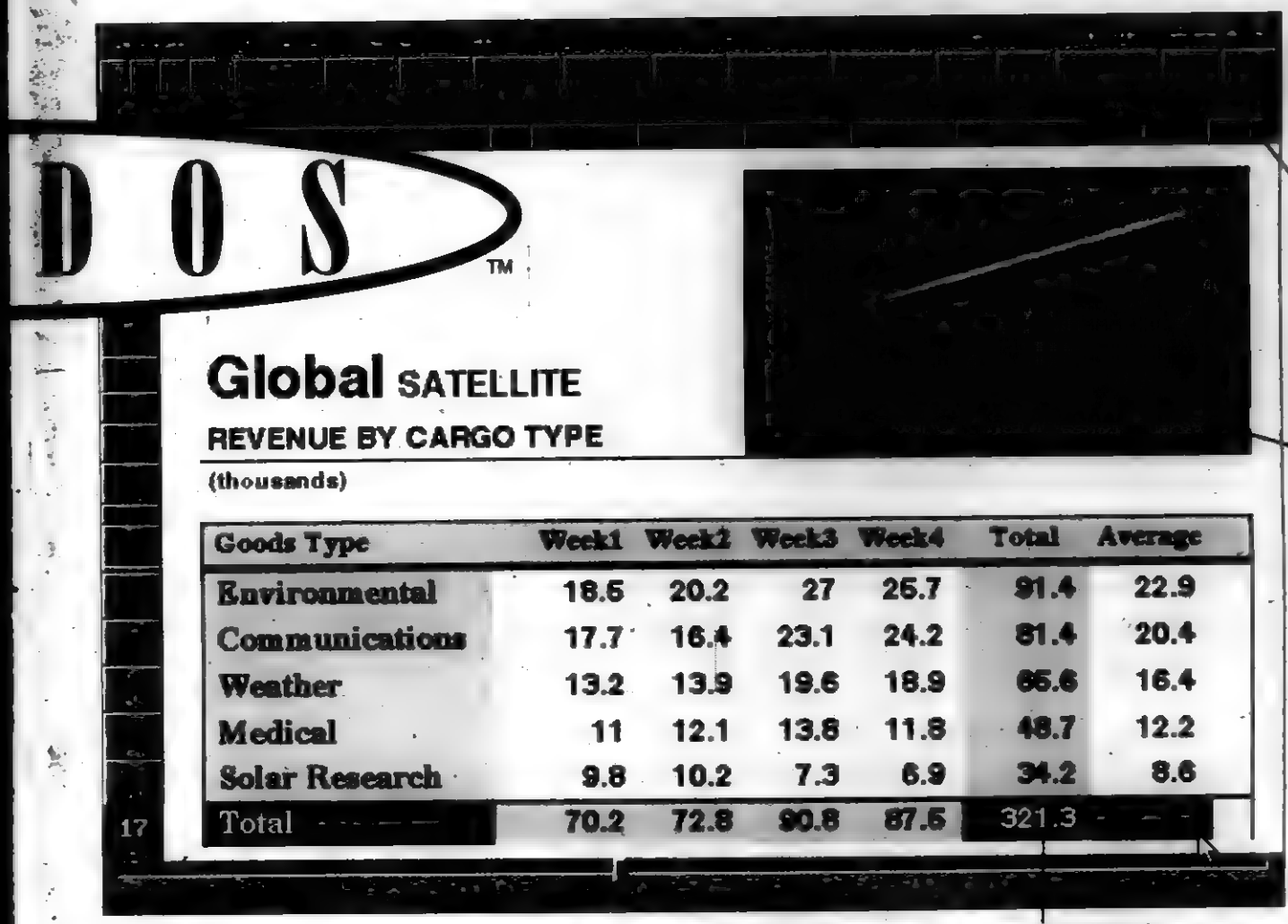

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Primerica buys into Travelers Corp.

BY NELL MARGOLIS
CW STAFF

HARTFORD, Conn. — An investment deal touted by The Travelers Corp. as "the capstone of a five-year program to increase our capital base to an unquestionably strong position" is also likely to strengthen the firm's marked emphasis on the importance of information technology, according to industry observers.

Travelers' increasingly urgent search for a deep-pocketed partner to help the $52.8 billion firm shore up its flagging finances ended late last month with a $722 million equity buy-in by New York-based financial services conglomerate Primerica Corp.

The firm also announced a restructuring that will ax an estimated 3,500 jobs during the next two years — a work-force cut of approximately 10%.

According to a company spokesman, the Primerica investment and the payroll cuts, which the firm estimates will save it $95 million by 1994, "are entirely unrelated."

"Taken as a whole, these actions represent a dramatic move to secure the future of The Travelers — a future built on a secure financial foundation," Chairman and Chief Executive Officer Edward Budd said in a statement circulated to employees on the day of the announcements.

"It's way too early to tell" where the ax will fall, the spokesman said.

Despite the possibility of individual jobs lost in either The Travelers restructuring or in future efforts to eliminate redundancies among combined Travelers/Primerica information systems teams, the IS function appears to be a safe bet for continued — if not enhanced — prominence within the new Primerica-flavored Travelers.

The 125-year-old firm has long enjoyed a reputation as a technology innovator, noted Ann Purr, manager of information management resources at Atlanta-based IS/insurance company trade association LOMA.

Purr credited former Chief Information Officer and current Executive Vice President Joseph Brophy in particular for making "Travelers a name that always comes up as being on the [IS] cutting edge — or, when not there, at least trying for it."

According to a Primerica spokeswoman, Travelers' IS clout was one of the factors that attracted both President James Dimon and Chairman Sanford Weill to buy a 27% stake in the company.

In the immediate wake of last month's double announcement, one Travelers' IS employee who requested anonymity said, "Most of the people I've talked to are more relieved than worried, at least for the moment."

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EXECUTIVE TRACK

Rudolph G. Johnstone, 56, has been named senior vice president of corporate data processing, marketing services and corporate human resources at New York-based **Westvaco Corp.**

Johnstone's promotion at the paper, packaging and chemicals manufacturer will become effective Nov. 1.

.....

George Steel is the new president of **Halliburton Geophysical Services, Inc.**

Steel, 46, formerly served as vice president of data processing at Halliburton Geophysical, which is a unit of Dallas-based oil well services provider **Halliburton Co.**

He succeeds retiring executive George Tilley.

.....

In Atlanta, **Holiday Inn Worldwide** has voted to give Vice President of Information Technology **Richard Smith** a title promotion — to senior vice president of information technology — and a seat on the board of directors.

Smith, who checked in at the hotel chain in 1990 after serving as an information systems executive at Federal Express Corp., has spent the past two years spearheading a $60 million strengthening of Holiday Inn's 1,600-hotel on-line reservation system.

Chairman Bryan Langton noted that Smith's appointment to the board was a recognition of not only his achievements but also of the importance of information technology as an enabler of the company's business.

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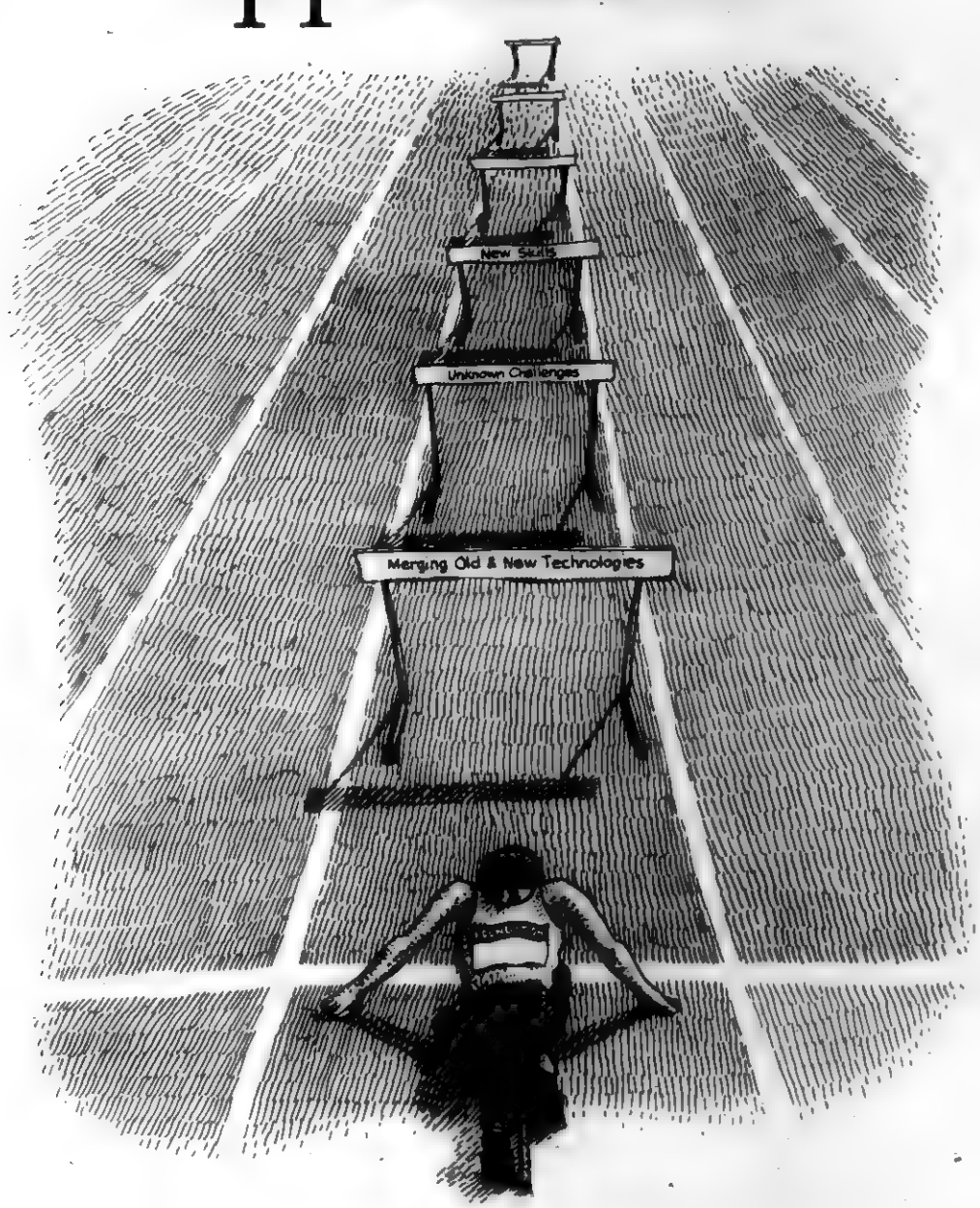

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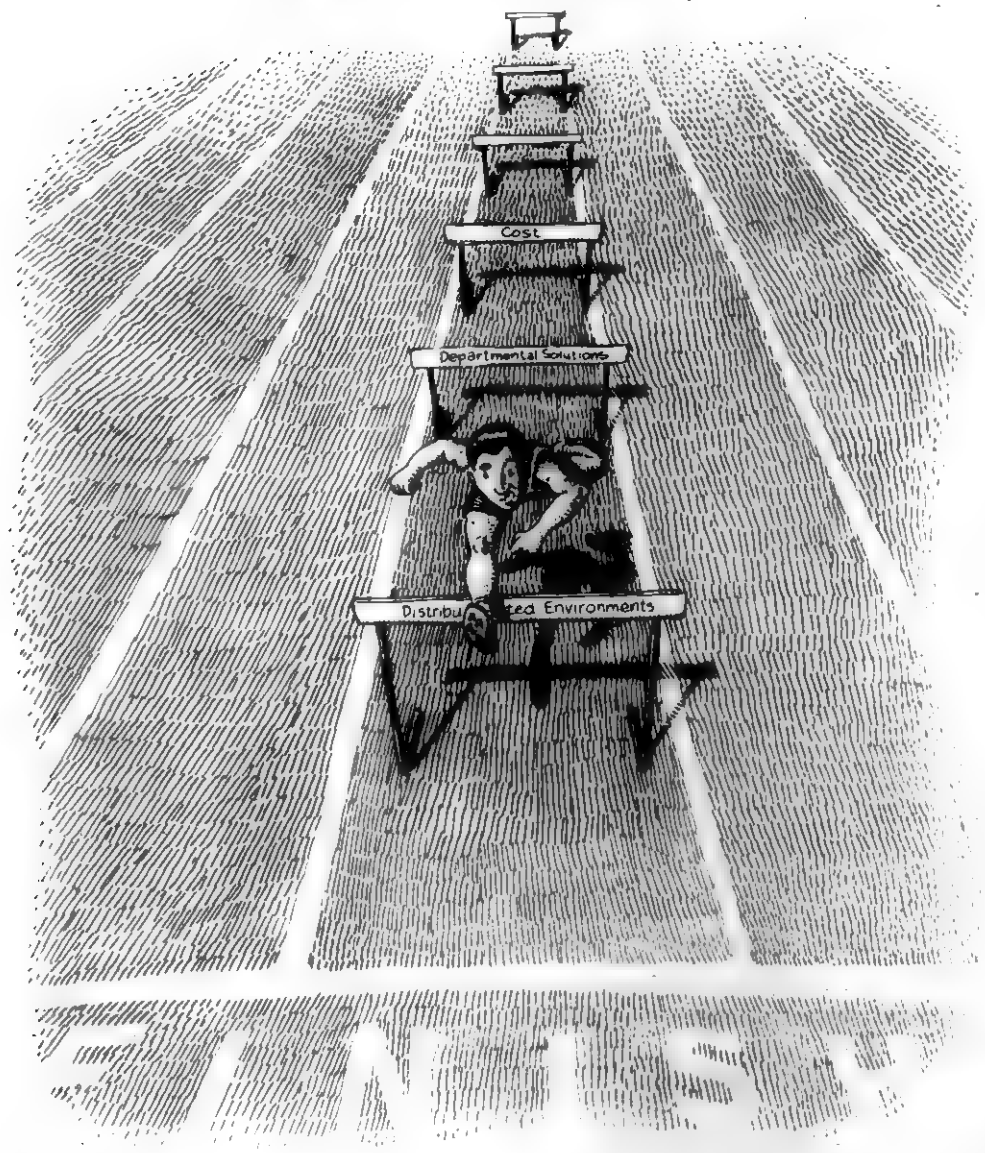

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The buck stops where?

CONTINUED FROM PAGE 83

ity," he said. But the general trend toward dispersed authority is clear enough to Ernst & Young that it now defines the title CIO as "chief infrastructure officer" rather than chief information officer. "These people are consensus builders," Nedzel said.

In addition, the decentralized budgetary structure sparks questions of how to fund long-range, companywide "infrastructures" (see story at right).

Moreover, many IS chiefs are still adjusting to this new role — one that is paradoxically more important and less powerful than before. Neal Nottleson, CIO at S. C. Johnson Wax in Racine, Wis., prefers the word "influence" to "control" when asked to describe the function of his department on IS purchasing decisions. Nevertheless, at Johnson Wax, application development is still the sole province of the central IS organization.

"There's nothing to stop [operating units] from hiring programmers," Nottleson said. "But they won't have IDs to get into the system."

Meanwhile, other firms have traveled farther along the curve, going so far as to spin off their centralized IS units, which then serve the operating units much as any outside vendor would.

"For 10 years, IT has been trying to discipline people to do what we know is right," said Jonathan Palmer, chief executive officer of Barnett Technologies, Inc., a wholly owned subsidiary of Barnett Bank, Inc. in Jacksonville, Fla. His conclusion? "We can sell advisory services . . . [but] trying to rule by decree is a frustration for everyone."

Formed in 1990, Barnett Technologies is a for-profit entity that sells information technology and operational services to the 33 banks in the Barnett chain as well as to outside customers. Key among those services are hardware and software standards, generally positioned as guidelines rather than mandates.

But what happens if a business unit decides to be a rogue, spending its money on something not on IS' approved list?

The customer is always right, at least in Palmer's shop. "We say we can support the systems you install and help you manage the risk," he said, adding that he does not have veto power on information technology purchases at the units.

At North American Van Lines, Inc. in Fort Wayne, Ind., the three major divisions have long had spending authority over single PC purchases and may soon have expanded authority over local-area networks and client/server systems.

But there is strong control over standards exerted by the 130-person central IS group, which reviews all platform requests. "We don't support Macs, and so if we get a request for one, we say 'No,' " Vice President of Information Systems Richard Goodspeed said.

Some industry observers say recent hard times have increased the autonomy of the units, while others say central authority has grown a bit stronger. "I think the recession has caused people to realize you can't have information technology expenditures that aren't in lockstep with strategic objectives," Nedzel said.

Unconventional projects

If there is a downside to the decentralization and distribution of purchasing authority, some IS observers say, it isn't the dilution of IS' control. Rather, they note, it hinges on the question of how to fund technology-driven initiatives that don't fit traditional molds.

Take infrastructural initiatives — corporatewide networks or a shift to a massively parallel central database server. Such investments are not project-related and thus cannot be billed to the operating units, said Ernst & Young technology center analyst Alex Nedzel.

Generally, central IS organizations that charge for services bill back direct, project-related charges but also assess customers a fixed amount for "overhead," which includes infrastructure.

"In every company I've worked at, the colonies have said they were taxed too much," Sidney Diamond, the former CIO at Black & Decker, ruefully notes.

Similarly problematic are the so-called hidden costs of distributed computing: communications, training, architectural evaluation and the help desk, says John T. Kohler, a senior vice president in the Dallas office of TSC.

"Coming up with a way to fund these indirect costs, which aren't project-related, is a real challenge," he says.

The challenge looms less large for the independent IS subsidiary, noted Barnett Technologies' CEO, Jonathan Palmer. "It's up to each bank CEO to understand the investments we're making," he said. "And up to me to see that [they] understand the investments we're making and the benefits."

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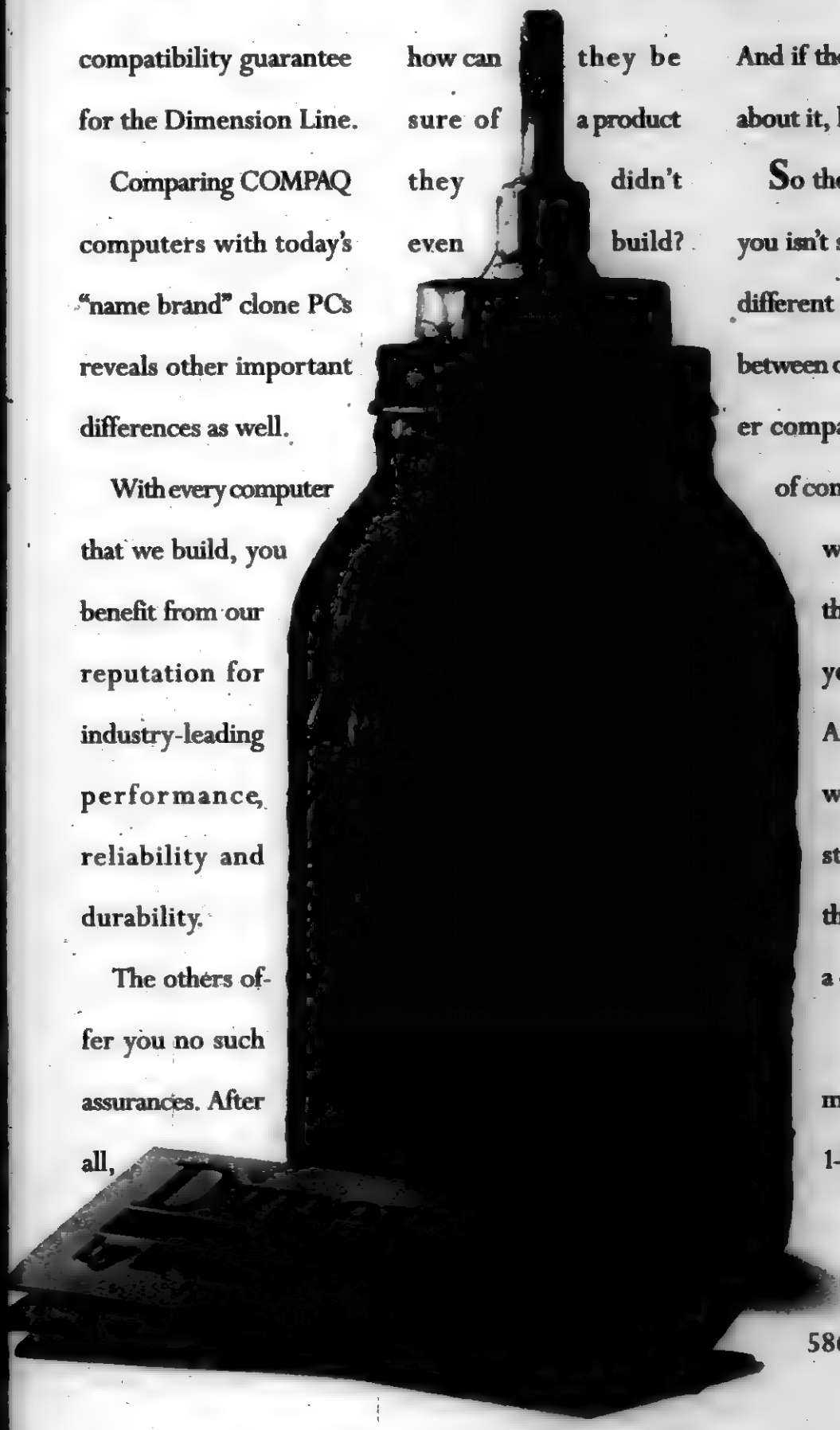

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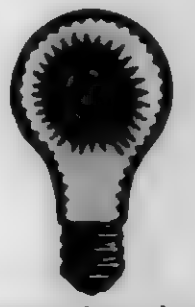

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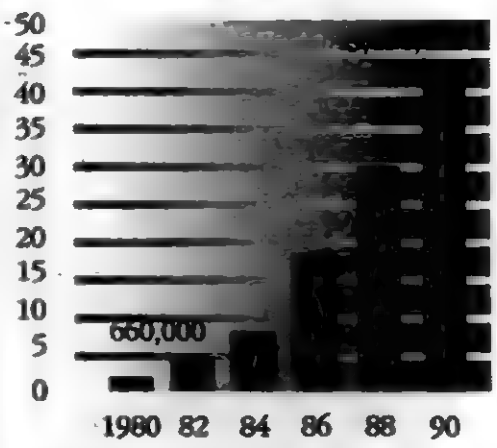

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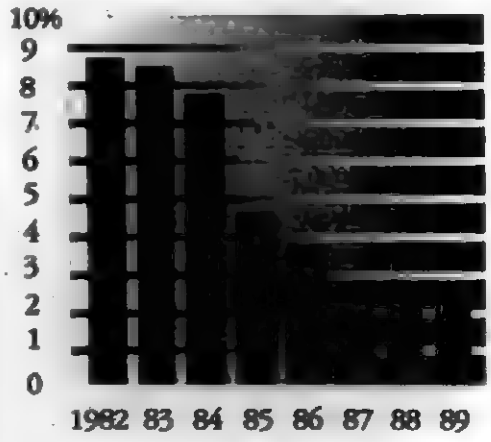

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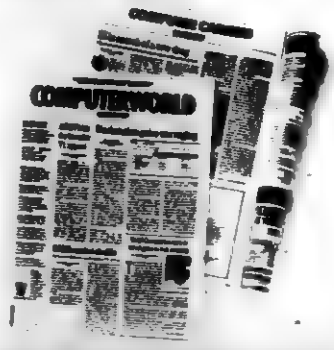

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Tougher proving ground for minorities

BY ALICE BREDIN
SPECIAL TO CW

A few years ago, three Ivy League graduates applied for similar information systems jobs at a manufacturing firm. All three had computer science degrees, and all three were hired. But one candidate, who was black, had to go through four interviews before he was offered the job, while the other two candidates, who were white, were required to go through two.

The apparent discrimination didn't stop there, says Vivian C. Wilson, president of Washington D.C.-based Black Data Processing Associates. "About three years later, [the black employee] hadn't been promoted and the other two had, so he left the company."

Wilson, who is also manager of customer services and information technology at Ameritech Services, Inc.'s Cleveland office, is one of many people who say barriers such as these still exist for blacks, Asians, American Indians, Hispanics and other minorities in much, though not all, of the IS world.

Wayne Hicks, who works for the Internal Revenue Service in Detroit as an assistant division chief, says barriers are more prevalent when the skills of an employee are subjective.

"Either you know hardware and software or not, but more and more companies are looking for business and technical aspects of a job, and business aspects are subjective," he says. "Historically, whenever things get subjective, people of color tend to be at the bottom end."

Even when it comes to hard skills, minorities feel they are more pressured than others to show proof of their abilities, Wilson says. "Many minorities speak of having to work extra hard to prove themselves because they say they still work in an environment where their talents are doubted. But now a lot of our members are also getting certification for skills to have a piece of paper to back up their experience," Wilson says.

Some recruiters say part of the problem lies in the scarcity of minorities with well-rounded, professional backgrounds. But according to Wilson, even those *with* training can't always find jobs.

Money where mouth is

Wilson says she suspects some companies of paying lip service to minority hiring. "A recruiter will call me looking for a minority with 15 or 20 years of experience in a technology that wasn't even around that long ago," she says.

Minorities who have gained stature in their fields say stereotyping still exists. "On a regular basis, I will make presentations in a group, and afterward, people often will come to me and comment on the fact that I am a good speaker," Hicks explains. "I often wonder whether they are listening to content or whether they are surprised that a black man can put two sentences together."

Prejudice based on stereotypes appears to be consistent across the country. Mexican-American Jorge Zepeda-Godinez is a member of the technical staff in charge of designing hardware for switching systems at AT&T Bell Laboratories in Naperville, Ill. In his conversations with other AT&T employees across the country, he hears of the same problems that he faces.

"There is a perception that if you are a minority, your work is not good, and you're not capable of carrying out a particular assignment," Zepeda-Godinez says.

This is not to say that all minorities are treated unfairly. Roxanne Burrus is a senior systems specialist at the New York office of White Plains, N.Y.-based Nynex Corp. She says Nynex and other Bell telephone companies have a history of placing minorities in management positions and treating minorities fairly.

Burrus has risen through the ranks and has been able to move around the company freely. "But I have heard too many stories to think that my experience is the norm," she says.

Jefferson George also says his American Indian heritage has not caused him discrimination. George is a member of the technical staff at AG Communications Systems in Phoenix, a manufacturer and provider of office switching systems.

Being a Navaho, George says, has not had an impact on him in the workplace because he works with people of a variety of different ethnic backgrounds. "I'm just another person in the work force," he says.

Change of attitude

There's plenty of evidence to suggest, on the whole, that IS needs to change its attitude toward minorities. But the change cannot come in the form of a government mandate; most recruiters say that when a company treats minorities equally, the attitude is initiated more by the firm than external influences.

Brian Hoffman, vice president and partner at Winter, Wyman & Co., a search and placement firm in Waltham, Mass., says it's companies with a conscience or the ones that feel they need to hire minorities that take that approach.

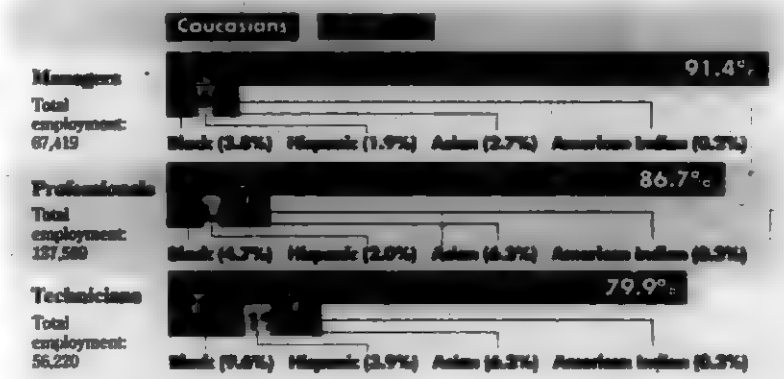
"Companies are realizing if they don't learn to recruit a diverse work force, they will be not be able to fill their positions in the future," Hoffman says.

The very fact that more minorities are entering the work force may be a solution in itself. According to the November 1991 "Monthly Labor Review," in 2005, 62% of the labor force will be minorities, up from 57% in 1990. Additionally, 68% of those entering the work force over the next 15 years will be minorities.

Bredin is a free-lance writer based in New York.

In the minority

The number of minorities in the computer field is low, with the fewest in upper management posts



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SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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INDUSTRY CURRENTS

Good news from the media

Technology advances are creating more jobs in broadcasting and print

BY SALLY CUSACK
SPECIAL TO CW

Working around headlines, deadlines and the folks who deliver the news sounds a lot more glamorous than it really is, but information systems jobs in the media are seldom boring.

Take Tracy A. Mitchell, a training and support specialist at WHDH-TV, a CBS affiliate in Boston. Mitchell says she never knows from one day to the next if she will be in a planning meeting with business managers or "stringing cable across the ceiling."

Flexibility and fast response are both critical in this kind of environment, says Mitchell, who assists with the ongoing maintenance and development of the station's Novell, Inc. NetWare-based local-area network.

"If the phone rings and it's the anchor person who can't read the teleprompter because of a systems problem, you had better be able to fix it before the commercial ends," she says.

Andrea Mann, a computer programmer analyst at the Gannett Co.'s *Rockford* (Ill.) *Register Star*, likens her job at the paper to her previous position in the medical industry. "Someone has to be on call 24 hours a day — you can't have systems downtime."

In spite of this, the aura of working in the media retains its appeal. Steven D'Abrosca, a systems and program analyst at The Providence Journal Co., says he doesn't really mind the occasional 2 a.m. phone call when a critical system breaks down.

"The newspaper has to get out every day, regardless of what else happens," he says. "Besides, I really enjoy what I do."

Adding to the appeal these days is the fact that systems jobs in both broadcast and print media are relatively plentiful and offer technological challenge.

Technology boost

Employment in broadcasting is on the upswing because of public demand for faster information delivery and advances in communications technology, recruiters say.

Developments in microwave and laptop technology are improving real-time reporting from remote locations, and fiber-optic technology is making it possible to combine voice, data and image transmissions, says Gavin E. Murphy, manager of IS at employment specialist Robert Half International, Inc. As a result, there is an increasing need for networking, microwave and video experts.

In the meantime, a general trend toward downsizing is creating demand for people who have personal computer or workstation experience and who know how to manage a migration from larger systems.

People in the broadcast media tend to be attuned to visual aid, so a lot of Apple Computer, Inc. Macintosh technology and other graphical user interface tools are used, says Richard Wonder, a director at Robert Half.

The majority of jobs are in broadcast-oriented software companies or in broadcast groups that own a number of station properties and operate full-fledged IS organizations, says John D. DiFronzo, vice president and general manager of Group W Information Services, part of the Westinghouse Broadcasting Co.

Group W, for example, currently owns five network-affiliated TV stations, 17 radio stations and two cable networks. Numerically, the best odds are in major metropolitan areas, but Petterson suggests small-town television and radio for those just starting out.

Newspapers are also hungry for IS talent. Newspaper publishing is so dependent on automation that IS people have secure jobs even though dips in advertising lineage are forcing cuts in other departments.

Technology is evolving rapidly at newspapers. At the *Providence Journal*, which has a systems staff of 33 full-time people, D'Abrosca is writing an interface between an application on the newspaper's proprietary Atex, Inc. publishing system and an Oracle Corp. database program running on Sun Microsystems, Inc. workstations under Unix.

Mann also stresses the climate of change. Although she's currently working on an IBM System/38-based subscription system, Mann says she believes the key to job security in the publishing industry is a willingness to "stay current and learn," particularly PC technologies. "Do that and you'll prosper," she says.

Cusack is a free-lance writer based in Marstons Mills, Mass.

Realm of possibilities

What areas of the country offer the best IS opportunities? While major metropolitan areas still offer the majority of employment opportunities in the media, IS professionals and recruitment specialists agree that those looking for the proverbial "foot in the door" should be willing to look at smaller markets.

Salaries: According to the 1992 *Computerworld* Salary Survey, salaries for IS professionals in the media are somewhat lower than in other industries. A programmer/analyst with three to five years experience earns $32,875, slightly lower than the average programmer/analyst salary of $34,942. A PC specialist commands $24,250, compared with an average industry salary of $31,945. Salaries also fluctuate depending on geographic area and experience.

Hottest job titles: Software developer, hardware technician, LAN specialist/administrator, communications analyst and PC and workstation coordinator seem to be the hottest titles in most media IS departments. In some larger shops, where midrange computer technology has supplanted mainframe-based applications, corresponding skills are required. For example, those experienced with IBM's Application System/400 systems are in demand.

Technical skills needed: Knowledge of emerging technologies, such as multimedia, fiber optics, GUIs and laptops, as well as good communication skills are prerequisites.

Long-term outlook for industry: According to John D. DiFronzo, vice president and general manager of Group W Information Services, the broadcast industry is going to accelerate information technology use during the next decade.

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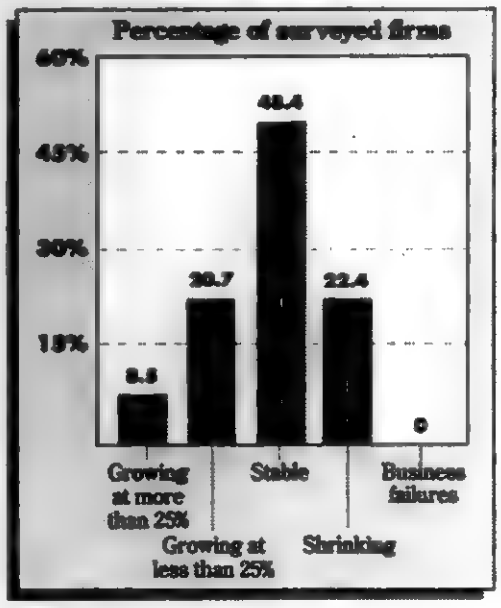

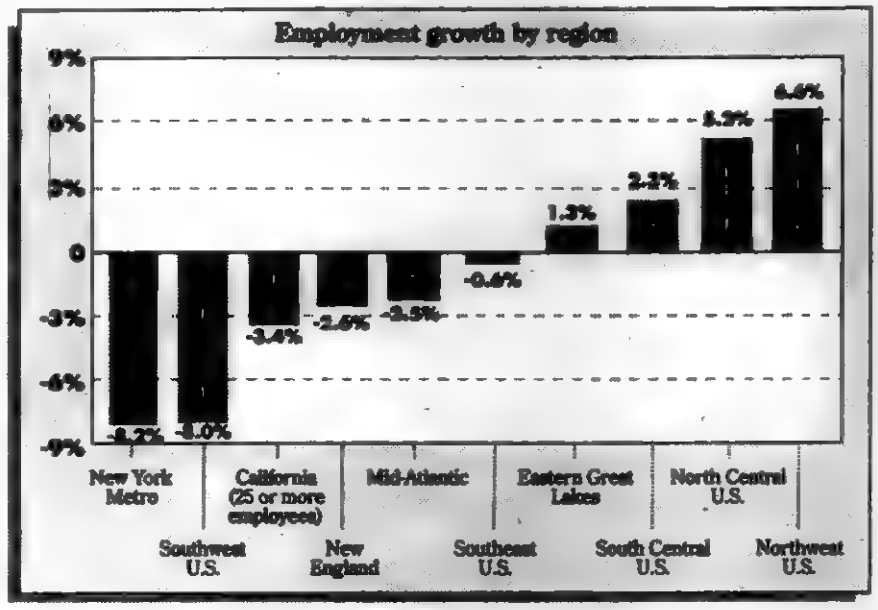

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Programmer/Analyst: Will program, modify, develop, code, test, and debug UNIX based operating systems including systems application integration. Will use Expert Systems tools, Natural language (including soft coding in LISP), SQL, SPSS, and Assembly language to program in C++ in a Unix and X-Windows based environment. Requires M.S. degree in Computer Science. Education to include completion of one course using LISP; two database courses using SQL, one course in Object Oriented Programming using C++; and one course in Expert Systems. Education to include completion of a Master's project in the use of loading and verification of Expert Systems tools. Hours: 8:30 a.m. - 5:00 p.m. 40 hours per week at $30,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605. ATTN: Lori Bokas, Ref. #V-IL 6016-B. No Calls. 2 copies of your resume required. An Employer Paid Ad.

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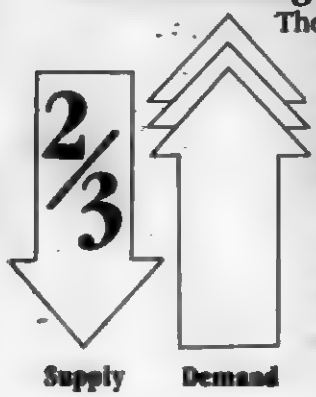
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ■ ■
7 are Passive ■ ■ ■ ■ ■ ■ ■
1 is a Non-mover ■

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

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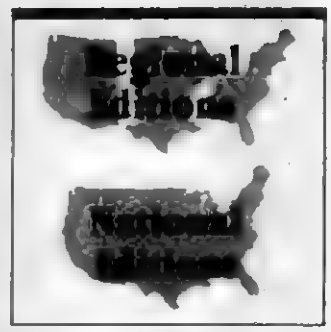

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

Computerworld needs just 2 working days for your ad to appear

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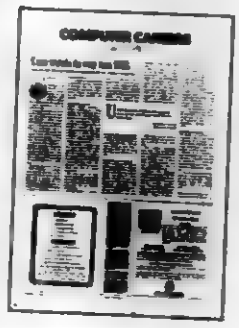
Computerworld costs no more than local papers

And with a regional rate of just $182.95 per inch, your cost-per qualified candidate reached is better than any newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

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PC software services: Ask and you may receive

BY LINDA MUSTHALER
SPECIAL TO CW

Personal computer software vendors will do just about anything to secure your business, and very often, this means tossing in a unique service or two. While few of these services constitute hard-cost savings, they can offer you new ways to save time, avoid service problems or learn the underside of the technology. Also, for the most part, they're free. The catches are that if you don't ask, you may not be offered these services, and not everyone qualifies for them.

If you're purchasing a lot of software (100 copies or more), you are more apt to receive some of these perks, but even people buying smaller amounts can get lucky.

If you ask your sales representative if there's anything else he can do for you, you may get more than the average customer. But it depends on the situation and how badly the vendor wants the sale.

Available for all types of customers

Customer advisory boards

If your sales rep hasn't mentioned customer advisory boards (CAB) yet, now is the time to ask. Many large software vendors have national and regional CABs designed to be two-way communications forums.

These groups consist of major corporate customers — typically 12 to 20 members per group. Some vendors are selective and like to keep them small, but many are pretty open. CABs generally meet one to four times a year to discuss upcoming product plans, client needs and wish lists. Also, corporate members are privy to preannounced products.

In-house trade shows

In recent years, users have started holding their own "in-house trade shows," inviting vendors to display and demonstrate their products on site.

Attending vendors may offer one-day-only discount software, seminars and product door prizes.

Central Power and Light in Corpus Christi, Texas, puts on an annual computer trade show that gives employees the opportunity to ask questions and share ideas with vendor representatives.

No-charge tech support

Because of the bad economy and escalating costs, many vendors have taken to charging a fee for premium support services, such as toll-free technical consultation. If your company represents significant business to a vendor, you may be able to persuade your sales representative to waive or reduce the fee for technical support. The best approach is to indicate that you are willing to buy immediately if technical support is thrown in.

Customized license programs

Most major vendors are coming out with new software licensing programs, so it's not unheard of to customize your own. The main thing is to be up front with your sales rep about what you want in the agreement, including terms, quantities, length of contract, upgrades, software swaps and so on. Very few vendors are willing to lose a client over an inflexible licensing plan.

Reserved for long-term customers or customers buying in volume

Customized on-site seminars

Educational programs often overlook information systems support personnel. Inquire about workshop-type technical training for the IS staff. This might include tutorials on installing the product; integrating it with operating systems, networks and other application products; common help desk questions and upgrade issues. Vendors may even send a systems engineer to your site for a few days to answer technical questions.

User group meetings

Vendors often conduct monthly user group meetings at customer sites. These can help reduce support costs and promote the use of advanced technology among end users by supplementing the more formal training program.

Meeting with product developers

If you have enough buying power with a vendor, you might be able to meet with product developers. Here, you can share your views or get an early inside look at the developers' plans. One note: These meetings take place under nondisclosure agreements, but they could help formulate strategic IS plans.

Software installation

If your company is purchasing a lot of software for a large number of PCs, ask the vendor to provide help with the installation. The vendor may hire a few short-term contractors to do this for free. When it recently upgraded its word processing software, for example, Enron Corp. in Houston didn't have the resources to install the software on the hundreds of stand-alone PCs. The software vendor, eager to make the sale, hired college students to install the upgrade.

Software customization

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Musthaler is an industry analyst at Currid & Co. in Houston.

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The BoCoEx index on used computers

Closing prices report for the week ending September 25, 1992

	Closing price	Ask	Bid
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PS/2 Model 30 286	$500	$900	$300
PS/2 Model L40SX	$1,000	$1,200	$900
PS/2 Model 55SX	$850	$900	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$1,650	$1,900	$1,200
PS/2 Model 80	$1,400	$1,600	$1,100
PS/2 Model 95	$3,000	$3,500	$2,600
Compaq Portable II	$425	$500	$375
Portable III	$500	$600	$250
Portable 386	$1,000	$1,200	$900
SLT-286	$700	$900	$400
LTE-286	$800	$900	$500
Deskpro 386s	$1,000	$1,200	$700
Deskpro 386/33	$1,850	$2,250	$1,400
Apple Macintosh Classic	$750	$875	$500
SE	$725	$775	$500
IIX	$2,450	$2,750	$2,000
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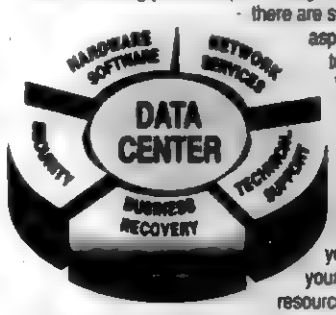

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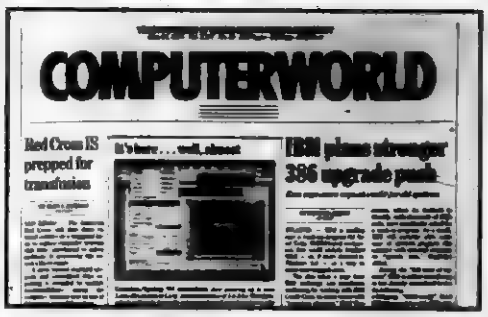

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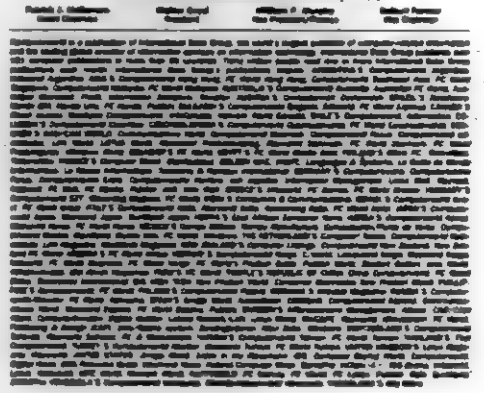

ADVERTISERS INDEX

American Business Computers 77
Andersen Consulting 88/89
Applied Business Technology 53
AT&T Business Communications Services 18-19
AT&T Network Cable Systems 72, 73

BMC 58
Borland International 22-23, 85-87

CANAC Telecom 38
Chipcom C3
Comdisco 65
Command Technology Corp. 33
ComNet 89
Compaq Computer Corp. 24/25, 90-91
Computer Associates 3
Corporate Software 43, 45, 47
CW Marketing 41
CW Recruitment 43, 53, 54, 60, 61, 65, 84

Data General 52

EDI Able 80

Fifth Generation 42
Fischer International 40

GE Advanced Concepts 74

Hayes Microcomputer 46
Hewlett-Packard 35, 37, 39

IBM 64, 84
Information Resources 15
Information Builders 17
Informix 13
Innovation Data Processing 7
Intel 68-69

J.D. Edwards 26-27

Key Consulting 82

Landmark Systems 55
Legent Corp 56-57
Lotus Development Corp 32

Micro Focus 11
Motorola Codex 78

Nikkei Weekly 24

Olicom 60
Oracle Corp. 5

Progress Software 70

Q-Star Technologies 21

Ross Systems 10

SAS Institute 44, C4
Software Engineering of America 9
Sterling Software 54

Tandem 79
Toshiba America 30-31

VMark Software 20

Wellfleet Communications 48

XOpen 88

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Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

+1 Software Engineering 74
3Com Corp. 1,109

A

Advanced Computer Communications, Inc. ..49
Advantis 1,79
Aeroflot 62
AG Communications Systems 93
Alabama Power Co. 12
Alantec Corp. 12,95
Allied Van Lines, Inc. 12
Allstate Insurance 1
Amdahl Corp. 16
American Airlines 62
American Cancer Society 49
American Cybernetics, Inc. 74
American Megatrends, Inc. 38
American Software, Inc. 59
America West Airlines, Inc. 1
Ameritech Services, Inc. 93
Amex Life Assurance Co. 49
AMR Information Services, Inc. ... 1,10,16,62
Annatek Systems, Inc. 8
Apple Computer, Inc. 1,4,15,38,47,71,95
Applied Business Technology Corp. 74
Ascom Timplex, Inc. 95
Ask Computer Systems, Inc. 109
ASP, Inc. 25
AST Research, Inc. 34
Atex 95
Atmel Corp. 108
AT&T Bell Laboratories 93
AT&T 6,7,8,74,79,110
Automated Healthcare, Inc. 25

B

Babson College 20
Baxter Healthcare Corp. 7
BBN Systems and Technologies 47
Bell Canada 109
BT North America, Inc. 79
BT Tymnet 8,79
Budget Rent A Car Corp. 1,10
Byer California, Inc. 49

C

Cadre Technologies, Inc. 71,74
California Republic Bank 6
Canon, Inc. 36
Caseware, Inc. 71
Caseworks, Inc. 74
Central Power and Lighting 101
Chips and Technologies, Inc. 36,38
Chrysler Corp. 15
Cisco Systems, Inc. 1,8,49
City of Los Angeles Department of Water and Power 36
Coldwell Banker 1
Communication Intelligence Corp. 36
Compaq Computer Corp. 12,15
CompuCom Systems, Inc. 109
CompuServe, Inc. 79
Computer Associates International, Inc. 38
Computer Power Group 81
Computer Systems Advisors, Inc. 74
Computervision Corp. 109
Coral Networks, Inc. 49
Crescendo Communications 16
CrossComm Corp. 49
Currid & Co. 12

D

Da Vinci Systems Corp. 16
Dallas Semiconductor Corp. 108
Dana Farber Cancer Institute 49
Dataquest Japan Ltd. 36
Dataquest, Inc. 15
Dean Witter Reynolds 109
Dean Witter Financial Services Group 1
Defense Advanced Research Projects Agency 24
Dell Computer Corp. 15
Deloitte & Touche 54
Digital Equipment Corp. .. 14,16,24,64,47,74
Digitalk, Inc. 71,74
Dillon, Read & Co. 109

E

EDI Systems, Inc. 76
Electronic Data Systems Corp. 10,16
EMC Corp. 66
Enron Corp. 101
Enterprise Engines, Inc. 71
Epoch Systems, Inc. 16
Everex Systems, Inc. 109
Evergreen CASE Tools, Inc. 74

F

Federal Communications Commission 24
Fibronics International, Inc. 12
First Interstate Bank 4
First Manhattan Consulting Group 6
First National Bank 12
Ford Motor Co. 16
Four Seasons Software 74
Fox Television Stations, Inc. 95
France Telecom, Inc. 8
Frank Russell Co. 8
Frontier Software Development, Inc. 95

G

Gander Resources 14
Gannett Co. 95
Gartner Group, Inc. 4,49
Geico 49
General Electric Information Services 76
General Electric Co. 8
General Motors 110
Go Corp. 110
Grand Junction Networks, Inc. 1
Graphic User Interfaces, Inc. 71
Groupe Bull 15
GTE Corp. 59

H

Harley-Davidson, Inc. 7
Harnbinger EDI Services 79
Hewlett-Packard Co. 1,6,24,28,47,73,74
Hilton Hotels Corp. 1,10
Hub City, Inc. 59
Hughes Information Technology Co. 16
Hughes Network Systems, Inc. 74

I

IBM ..... 1,4,7,8,14,15,28,36,47,59,62,64, ... 66,74,79,95,108,109
Infonet 8
Informix Corp. 6,38
Informix Software, Inc. 74
Ink Development Corp. 36
In-Stat, Inc. 25
Insurance Company of the West 4
Integrated Systems Solutions Corp. 1,16
Intel Corp. 12,15,28,47,74
Intellicom, Inc. 47
Intellicorp 73
Interconnections, Inc. 65
International Computer Security Association 25
International Data Corp. 12,109
Intersolv, Inc. 74
Intuit 71
IPL Systems, Inc. 66

J

Jakus Associates 38
James Martin & Co. 14
J.D. Edwards & Co. 59
JFK Associates, Inc. 36

K

Kaetron Software Corp. 71
Kalpana, Inc. 12
Kinesis 71
Kinney Manufacturing Co. 50
Kleinschmidt, Inc. 79
Kmart Corp. 20
Knowledge Ware, Inc. 14

L

Legent Corp. 65
Librex Computer Systems, Inc. 109
Los Alamos National Laboratory 25
Lotus Development Corp. 4,8
Lykes Pasco Packing Co. 59

M

Marriott Corp. 1,6,10
Massachusetts Mutual Life Insurance Co. ..109
Matesys Corp. 73
Mathsoft, Inc. 64
Matsushita 110
Mc² Technologies 15
McData Corp. 16
Metaware, Inc. 71
Microsoft Corp. ...4,8,28,38,47,65,71,74,110
Minitab, Inc. 65
Minx Software, Inc. 64
Montefiore Medical Center 54
Motorola, Inc. 15

N

National Semiconductor Corp. 1
NBI, Inc. 109
NCR Corp. 73
Netron, Inc. 73
Network Peripherals, Inc. 16
Networking Systems Services Division 1
Neuron Data, Inc. 73
New York Hospital 54
NewEra Software, Inc. 65
Next, Inc. 15,71
Northern Telecom Ltd. 109
Northgate Computer Systems, Inc. 109
Novell, Inc. 8,12,38,47,54,65,95
Nynex Corp. 93

O

Object Design, Inc. 16
Oki Electric Industry Co. 36
Oneac Corp. 95
Open Software Foundation, Inc. 73
Optical Data Systems, Inc. 47
Oracle Corp. 38,73,95

P

Pacific Communications Sciences, Inc. 95
Pacific Stock Exchange 49
PBS Professional Business Software GmbH ..73
Penmagic Software 36
Pensoft Corp. 36
Perot Systems Corp. 49
Phibro Energy, Inc. 15
Pick Systems 71
Pilot Software, Inc. 109
Pixelworks, Inc. 38
Price Waterhouse 8,59
Prime Computer, Inc. 109
Procase Corp. 74
Proteon, Inc. 59
ProtoComm, Inc. 12

Q

QSI Corp. 38

R

Ralinc Corp. 79
Robert Half International, Inc. 95
Rogers Group, Inc. 7

S

Sanford C. Bernstein 109
Schlegel Corp. 49
Sears Communications Co. 79
Sears, Roebuck and Co. 1
Sequoia Systems, Inc. 64
Shearson Lehman Brothers, Inc. 15,108
Siecor Corp. 59
Silicon Graphics, Inc. 62,74
Sitka Corp. 36
Software Maintenance and Development Systems, Inc. 74
Software Publishing Corp. 16
Software Quality Automation 74
Software Research, Inc. 73
Software Transformation, Inc. 71
Sony Corp. 33
SRA Corp. 74
Standard & Poor's Corp. 109
Sterling Software, Inc. 76,77,79,
Strategic Mapping, Inc. 38
Sun Microsystems, Inc. ... 28,16,47,71,74,95
SunSoft, Inc. 16,74
Sybase, Inc. 38,62,73
Symantec Corp 25
Synernetics, Inc. 12
Syron Corp. 74
Systems & Software, Inc. 71

T

TechnoGnosis International, Inc. 109
Telematics International, Inc. 8
Template Software, Inc. 73
Texas Instruments, Inc. 25,81
The Hertz Corp. 1
The Providence Journal Co. 95
The U.S. General Accounting Office 24
The Wollongong Group, Inc. 47
The Yankee Group 8,20
Thomson CSF 15
Toshiba Corp. 36
Transettlements 79
Trian Group 59
Triangle Industries 59
TSI, Inc. 77
Tusk, Inc. 36

U

Unigermann-Bass, Inc. 95
Unisys Corp. 1,6,14
United Parcel Service, Inc. 12
United We Stand America 110
University of Hamburg 25
U.S. Department of Commerce 24

V

Verity, Inc. 4
Viacom Cable 59
Viacom Entertainment 59
Viacom, Inc. 59
Viacom Networks 59
Vinsoft, Inc. 74

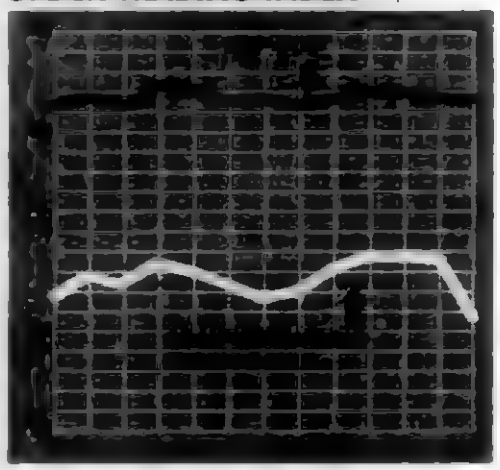
W

Wal-Mart Stores, Inc. 20
Wang Laboratories, Inc. 8
Wellfleet Communications, Inc. 49
Wertheim Schroder & Co. 6
Westinghouse Broadcasting Co. 96
WHDH-TV 95
William K. Woodruff & Co. 109
Winter, Wyman & Co. 93

X

Xalt Software Corp. 47
Xyplex, Inc. 95

STOCK TRADING INDEX



Industry Almanac

SECTOR FOCUS: SEMICONDUCTOR EQUIPMENT

(Shearson Lehman Brothers, Inc.). According to a May 1992 survey conducted by Shearson, semiconductor capital budget statistics suggested that equipment spending for the sector would rise 6.9% in 1992. Since then, the pace has quickened, and a 14.5% growth rate has been projected.

During the first six months of this year, close to 40% of the 1992 forecast expenditure was already spent, indicating that the entire projected amount would likely be exhausted. Shearson's analysts predicted a modest recovery for the industry.

RECOMMENDATION CHANGES

UPGRADED FROM BUY TO STRONG BUY: **Dallas Semiconductor Corp.** and **Atmel Corp.** (Alex. Brown & Sons, Inc.). Alex. Brown recently upgraded both Dallas Semiconductor's (DS) and Atmel Corp.'s (ATML) ratings from buy to strong buy. Reasons: The two semiconductor companies displayed increasing product diversity, a strong sales momentum and rapidly accelerating earnings.

While Dallas' two biggest product lines — Timekeeping, with about 30% of sales, and Nouvolafile Memories, with about 20% of sales — will probably be flat sequentially, a collection of small product lines should generate an expected $2 million in sequential growth. Atmel has received several component approvals from **IBM** (IBM).

LISA DAVIDSON

Shearson on semiconductors

Semiconductor companies buoyed by slight recovery

	Shearson Lehman Brothers, Inc.
Advanced Micro Devices, Inc.	Underperform
Chips and Technologies, Inc.	Neutral
Dallas Semiconductor Corp.	Outperform
Intel Corp.	Neutral
Micron Technology, Inc.	Buy
Motorola, Inc.	Buy
National Semiconductor Corp.	Neutral
Texas Instruments, Inc.	Buy

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 2, 1992

TOP PERCENT GAINERS

Wordstar (L)	23.08
Radius Inc.	22.86
AI Corp.	21.43
Informix Corp. (H)	15.24
Platinum Technology (L)	15.09
Rasterops (L)	14.29
DSC Communications (H)	13.79
Standard Microsystems Corp	13.45

TOP PERCENT LOSERS

Sequoia Systems Inc.	-50.00
Computervision Corp. (L)	-48.10
Software Publishing Corp.	-22.97
Spinnaker Software	-22.22
Evans & Sutherland	-17.19
Ultimate Corp.	-16.67
Stratus Computer Inc.*	-15.95
Penril Data Comm. Wrkts.	-14.63

TOP DOLLAR GAINERS

Informix Corp. (H)	3.13
ITT Corp.	3.00
Platinum Technology (L)	2.00
Standard Microsystems Corp	2.00
Southwestern Bell Corp	1.75
Parametric Technology	1.75
IPL Systems Inc.	1.63
Autodesk Inc.	1.63

TOP DOLLAR LOSERS

Stratus Computer Inc.*	-7.00
Computervision Corp. (L)	-4.75
Hewlett-Packard Co.*	-4.63
IBM* (L)	-3.75
Sequoia Systems Inc.	-3.50
Digital Equipment Corp.*	-3.00
Legent Corp.*	-2.75
Evans & Sutherland	-2.75

Exch	52-Week High	52-Week Low		Oct. 2 Close	Wk. Net Change	Wk. Pct. Change
Communications and Network Services					Off 0.81%	
OTC	17.00	8.00	3 COM Corp.* (H)	16.50	-0.25	-1.49
NYS	70.63	56.25	American Info Techs Corp.*	67.88	-0.50	-0.73
NYS	45.38	32.88	AT&T*	42.13	-1.38	-3.16
OTC	4.25	0.75	Ariel Communication Corp.	0.94	-0.13	-11.76
NYS	48.75	40.25	Bell Atlantic Corp.	48.25	0.13	0.26
NYS	55.50	43.38	Bellsouth Corp	52.13	0.13	0.24
NYS	6.75	3.75	Bolt, Beranek & Newman	4.00	-0.25	-5.88
NYS	65.88	36.63	Cabletron Systems	58.88	-1.63	-2.69
OTC	31.00	17.50	Chipcom Corp	25.75	-1.00	-3.74
OTC	58.25	18.63	Cisco Systems Inc.	51.25	-2.00	-3.76
OTC	35.25	5.75	Compression Labs Inc.	5.88	-1.00	-14.55
OTC	3.38	0.88	Data Switch Corp.	1.75	0.00	0.00
NYS	23.63	14.13	Digital Comm. Assoc.*	15.13	0.13	0.83
OTC	15.25	8.00	Digital Systems Int'l Inc.	8.75	-1.00	-10.26
OTC	12.38	3.63	DSC Communications (H)	12.38	1.50	13.79
OTC	10.88	4.75	Fibronix Int'l Inc.	5.63	0.00	0.00
OTC	37.50	10.50	Planet Corp.	13.25	-1.75	-11.67
OTC	3.38	1.13	Gandalf Technologies Inc.	1.81	-0.06	-3.31
OTC	2.25	0.69	Gateway Communications	1.63	0.13	8.33
NYS	5.50	2.38	General Datacomm Inds.	3.50	0.25	7.69
ASE	5.88	0.50	Go Video	2.38	0.00	0.00
NYS	35.75	28.88	GTE Corp.*	33.50	0.38	1.13
NYS	70.63	50.00	ITT Corp.	67.00	3.00	4.69
OTC	38.25	25.25	MCI Communications Corp.	34.88	-0.13	-0.36
OTC	14.50	2.25	Microcom Inc.	3.25	0.00	0.00
NYS	18.25	9.50	Network Equipment Tech.*	12.13	1.25	11.49
OTC	25.50	8.00	Network General	11.50	1.25	12.20
OTC	20.00	8.50	Network Systems Corp.	11.50	0.13	1.10
OTC	21.00	5.63	Newbridge Networks Corp. (H)	19.75	0.00	0.00
NYS	49.25	31.13	Northern Telecom Ltd.* (L)	31.13	-1.50	-4.60
OTC	32.50	18.63	Novell Inc. (9)*	27.38	-0.75	-2.67
NYS	88.38	69.13	Nynex Corp.*	81.75	-0.38	-0.46
OTC	37.50	18.63	Octel Communications Corp	18.25	-2.75	-13.10
OTC	9.88	4.00	Penril Data Comm. Wrkts.	4.38	-0.75	-14.63
OTC	53.00	19.25	Picturetel Corp.	13.25	-0.75	-5.36
OTC	18.75	7.75	Proteon Inc. (L)	8.25	-0.25	-2.94
NYS	29.50	12.88	Scientific Atlanta Inc.	27.75	0.25	0.91
NYS	69.00	53.75	Southwestern Bell Corp.	67.88	1.75	2.65
NYS	26.38	20.75	Sprint Corp.	24.00	0.00	0.00
OTC	16.88	4.25	Standard Microsystems Corp	16.88	2.00	13.45
OTC	43.00	14.25	Synoptics Communications	40.75	0.75	1.88
NYS	40.00	32.88	US West Inc.	37.75	-0.13	-0.33
OTC	46.75	24.00	Wellfleet Communications	41.75	0.75	1.83
PC and Workstations					Off 4.45%	
OTC	14.50	3.75	Advanced Logic Research (L)	4.25	-0.50	-10.53
OTC	70.00	42.75	Apple Computer Inc.*	43.75	-1.75	-3.85
OTC	32.25	11.25	AST Research Inc.*	14.13	-0.88	-5.83
NYS	19.25	6.75	Commodore Int'l	7.00	-0.38	-5.08
NYS	35.75	22.13	Compaq Computer Corp.*	32.63	-1.00	-2.97
OTC	29.63	13.91	Dell Computer Corp. (H)	27.63	-0.50	-1.78
OTC	7.75	1.00	Everex Systems Inc.	1.50	0.06	4.31
NYS	34.00	21.25	Harris Corp.	31.13	-1.13	-3.48
NYS	65.00	44.63	Hewlett Packard Co.*	53.13	-4.63	-8.01
NYS	29.75	14.13	Silicon Graphics	18.88	0.38	2.03
OTC	35.88	20.75	Sun Microsystems Inc.*	29.00	-1.75	-5.69
NYS	31.25	22.25	Tandy Corp.*	26.63	-0.63	-2.29
NYS	11.13	5.13	Zenith Electronics	5.88	-0.38	-6.00
OTC	25.50	2.75	Zeos International Ltd.	4.13	-0.69	-13.16
Large Systems					Off 7.41%	
ASE	20.63	8.50	Amdahl Corp.*	8.50	-0.50	-5.56
NYS	16.38	5.25	Convex Computer	5.38	-0.13	-2.27
OTC	19.63	1.88	Cray Computer	3.00	0.00	0.00
NYS	52.25	22.75	Cray Research Inc.*	25.00	-0.75	-2.91
NYS	22.50	7.13	Data General Corp.	10.88	-0.13	-1.14
NYS	65.50	33.25	Digital Equipment Corp.*	37.13	-3.00	-7.48
NYS	104.75	78.50	IBM* (L)	78.50	-3.75	-4.56
OTC	13.25	7.50	Kendall Square Research	7.75	-0.25	-3.13
NYS	119.25	88.25	Matsushita Electronics	91.50	-2.50	-2.66
OTC	17.50	6.75	Pyramid Technology	8.25	0.00	0.00
OTC	17.88	9.88	Sequent Computer Sys.	15.25	-1.13	-6.87
OTC	18.38	3.50	Sequoia Systems Inc.	3.50	-3.50	-50.00
NYS	54.25	36.88	Stratus Computer Inc.*	36.88	-7.00	-15.95
NYS	15.13	9.50	Tandem Computers Inc.*	10.50	-0.75	-6.67
NYS	11.75	3.63	Unisys Corp.*	8.38	-0.88	-9.33
ASE	7.50	0.25	Wang Labs Inc. (9)*	0.50	0.00	0.00
Software					Off 1.03%	
OTC	68.50	25.50	Adobe Systems Inc. (L)	26.88	-1.38	-4.87
OTC	13.25	2.50	Al Corp.	4.25	0.75	21.43
OTC	45.00	11.50	Aldus Corp.	13.63	0.88	6.86
OTC	19.75	8.50	American Software Inc.	8.75	-0.25	-2.78
OTC	20.00	9.75	Ask Computer Systems	13.13	0.00	0.00
OTC	52.00	23.25	Autodesk Inc.	45.00	1.63	3.75
OTC	37.75	6.63	Bachman Info. Systems (L)	6.63	-0.38	-5.36
OTC	42.50	32.00	BGS Systems Inc.	37.00	-0.25	-0.67
OTC	79.00	37.25	BMC Software Inc.	51.50	-1.63	-3.06
OTC	20.50	9.50	Boole & Babbage	10.50	0.00	0.00
OTC	86.75	35.00	Borland Int'l Inc.*	39.13	0.88	2.29
OTC	11.00	3.63	CE Software	4.25	0.00	0.00
ASE	19.50	7.41	Cheyenne Software Inc.	19.13	0.50	2.68
OTC	17.88	5.75	Cognos Inc. (L)	5.88	-0.13	-2.08
NYS	17.00	7.50	Computer Associates*	15.13	0.13	0.83
NYS	12.38	5.13	Computervision Corp. (L)	5.13	-4.75	-48.10
OTC	20.00	6.75	Comshare Inc.	8.50	1.00	13.33
OTC	47.88	6.50	Essel Corp.	7.75	-0.25	-3.13
OTC	25.00	11.50	Group I Software	12.50	-1.00	-7.41
OTC	6.63	3.50	Hogan Systems Inc.	5.00	0.00	0.00
OTC	36.25	18.50	Information Resources	27.13	1.00	3.83
OTC	23.63	4.44	Informix Corp. (H)	23.63	3.13	15.24
OTC	22.38	12.50	Intergraph Corp.	13.50	-0.75	-5.26
OTC	15.00	6.88	Interleaf Inc.	9.25	0.00	0.00
OTC	20.25	9.88	Intersolv Inc.	14.75	-1.50	-9.23
OTC	21.38	9.50	Knowledgeware Inc. (L)	10.25	0.38	3.80
OTC	49.25	26.75	Legent Corp.*	43.25	-2.75	-5.98
OTC	36.75	15.50	Lotus Development*	17.13	-2.00	-10.46
OTC	7.38	1.88	Mapic Software	2.88	-0.13	-4.17
OTC	22.25	6.50	Mentor Graphics	6.75	-0.75	-10.00
OTC	37.25	27.25	Micro Focus	35.00	-0.38	-1.06
OTC	20.50	6.50	Micrografx Inc.	9.50	-1.00	-9.52
OTC	88.84	57.84	Microsoft Corp.*	78.75	0.00	0.00
OTC	21.13	12.00	Oracle Corp.*	19.38	0.38	1.97
OTC	49.75	15.50	Parametric Technology	46.75	1.75	3.89
OTC	11.00	3.50	Phoenix Technologies	4.88	0.38	8.33
OTC	25.25	11.25	Platinum Technology (L)	15.25	2.00	15.09
OTC	49.00	29.00	Progress Software Corp. (H)	45.25	-2.25	-4.74
OTC	28.63	4.00	Quarterdeck Office Sys.	4.63	0.38	8.82
OTC	32.75	11.75	Rainbow Technologies Inc.	18.13	0.38	2.11
OTC	22.75	4.00	Rasterops (L)	9.00	0.63	14.29
OTC	17.25	5.38	Ross Systems	5.63	-0.63	-10.00
OTC	12.25	8.50	Sapiens USA Inc.	10.25	0.13	1.23
OTC	28.25	7.13	Software Publishing Corp.	7.13	-2.13	-22.97
OTC	8.50	2.00	Software Toolworks Inc.	2.88	-0.13	-4.17
OTC	7.25	1.78	Spinnaker Software	1.75	-0.50	-22.22
OTC	16.50	3.25	State of the Art	3.75	0.00	0.00
NYS	25.25	13.75	Sterling Software Inc.	18.00	-1.38	-7.91
OTC	30.00	8.75	Struct. Dynamics Research (L)	10.00	0.75	8.11
OTC	37.50	16.00	Sybase Inc. (H)	34.38	-2.13	-5.82
OTC	51.00	9.63	Symantec Corp. (L)	10.50	0.25	2.44
NYS	15.50	5.25	Systems Center Inc.*	5.63	0.00	0.00
OTC	24.25	13.00	System Software Assoc.	16.75	-2.75	-12.79
OTC	23.75	14.50	Walker Interactive Systems	17.38	0.63	3.73
OTC	6.63	1.50	Wordstar (L)	2.00	0.38	23.08
Semiconductors					Off 0.64%	
NYS	21.50	7.38	Advanced Micro Devices	11.25	-0.25	-2.17
NYS	11.13	7.00	Analog Devices Inc.	10.13	-0.25	-2.41
OTC	12.00	6.75	Atmel Corp.	11.75	0.63	5.62
OTC	14.13	3.25	Chips and Technologies	3.69	0.13	3.57
NYS	21.50	7.38	Cypress Semiconductor Corp	8.38	-0.50	-5.63
NYS	12.25	6.38	Dallas Semiconductor	11.63	0.38	3.33
OTC	88.75	38.50	Intel Corp.*	82.50	-2.25	-3.47
NYS	9.88	4.88	LSI Logic Corp.	5.88	-0.50	-7.84
NYS	22.38	12.13	Micron Technology	15.88	1.38	9.49
NYS	91.50	54.00	Motorola Inc.*	88.50	0.50	0.58
NYS	12.38	4.00	National Semiconductor*	11.63	0.75	6.90
OTC	27.00	8.25	Sierra Semiconductor	9.25	-0.63	-6.33
NYS	45.00	25.00	Texas Instruments*	41.38	-2.38	-5.43
OTC	10.50	6.00	VLSI Technology	7.50	-0.25	-3.23
ASE	5.63	2.00	Weitek	3.00	-0.13	-4.00
OTC	31.00	16.75	Western Digital Corp.	5.00	0.50	11.11
OTC	11.50	6.00	Xilinx	16.75	-1.25	-6.94
			Zilog Inc.	7.63	-0.38	-4.69
Peripherals and Subsystems					Off 1.21%	
OTC	10.00	2.88	Archive Corp.	7.13	0.13	1.79
OTC	28.75	13.75	Banctec Inc.	25.38	0.13	0.50
OTC	23.50	8.63	Cambex Corp.	11.25	-0.25	-2.17
ASE	12.25	5.00	Cognitronics Corp.	11.38	0.00	0.00
NYS	23.88	12.50	Conner Peripherals*	18.75	-1.50	-7.41
ASE	19.88	4.88	Dataram Corp.	5.50	-0.50	-8.33
NYS	20.63	5.88	EMC Corp.	20.00	0.75	3.90
OTC	8.38	4.75	Emulex Corp.	5.63	0.00	0.00
OTC	23.00	13.25	Evans & Sutherland	13.25	-2.75	-17.19
OTC	40.63	13.38	Exabyte (L)	13.38	-1.75	-11.57
OTC	29.50	19.75	Intelligent Info. Systems	27.75	0.38	1.37
OTC	11.25	4.75	Iomega Corp.	8.13	0.00	0.00
OTC	15.25	13.00	IPL Systems Inc.	14.00	1.63	13.13
OTC	21.25	10.75	Komag Inc.	15.00	-0.25	-1.64
OTC	15.25	4.38	Maxtor Corp.*	13.63	0.00	0.00
OTC	12.63	5.75	Micropolis Corp.	8.63	-0.13	-1.43
NYS	103.75	85.38	3M Co.	100.25	-0.50	-0.50
OTC	6.75	3.50	Printronix Inc.	5.38	-0.38	-6.52
NYS	28.75	7.00	QMS Inc.	7.38	-0.88	-10.61
OTC	19.00	8.88	Quantum Corp.	12.88	-0.63	-4.63
OTC	12.75	3.75	Radius Inc.	5.38	1.00	22.86
NYS	12.88	6.50	Recognition Equipment	9.63	-1.13	-10.47
OTC	13.13	5.38	Reuon Inc.	10.63	0.13	1.19
OTC	17.63	7.38	Seagate Technology*	12.50	-0.63	-4.76
NYS	76.00	23.88	Storage Technology* (L)	23.88	-2.75	-10.33
NYS	24.25	16.00	Tektronix Inc.	21.13	-1.00	-4.52
NYS	82.25	59.00	Xerox Corp.	76.88	-1.88	-2.39
Services					Off 2.86%	
OTC	19.38	11.88	American Mgmt. Systems*	19.13	0.50	2.69
NYS	5.38	2.88	Anacomp Inc.	3.13	0.00	0.00
OTC	19.00	12.50	Analysts Int'l	18.00	-0.75	-4.00
NYS	49.00	34.38	Auto Data Processing*	48.38	-0.25	-0.54
NYS	18.50	7.00	Candan Corp.	14.25	0.13	0.88
NYS	24.16	12.50	Comdisco Inc.*	15.63	-0.50	-3.10
OTC	13.50	7.75	Computer Horizons	8.50	-0.63	-6.85
NYS	64.88	57.00	Computer Sciences*	57.00	-2.50	-3.80
NYS	10.13	7.00	Computer Task Group	7.88	-0.13	-1.56
OTC	40.50	15.00	CompUSA Inc.	33.50	1.50	4.69
OTC	19.25	6.00	Corporate Software	7.63	-0.88	-10.29
OTC	30.75	8.00	Egghead Discount Software (L)	8.00	0.50	5.88
NYS	33.06	23.38	General Motors E (EDS)*	27.75	-2.50	-8.26
OTC	30.38	6.25	Intelligent Electronics	10.13	-0.13	-1.22
OTC	14.88	4.50	Mantel	7.88	-0.38	-4.55
OTC	15.75	7.00	Micrognp Inc.	8.25	-0.75	-8.33
OTC	32.00	17.88	Paychex	29.00	-2.25	-7.20
NYS	76.50	61.75	Policy Management Sys.	74.25	-1.25	-1.66
NYS	44.75	24.88	Reynolds and Reynolds	43.50	-0.75	-1.69
OTC	32.00	21.25	SEI Corp.	25.00	0.50	2.04
OTC	24.38	16.88	Shared Medical Systems	21.50	-0.13	-0.58
OTC	30.00	13.50	Sungard Data Systems	26.25	-0.50	-1.87
NYS	3.63	1.13	Ultimate Corp.	1.25	-0.25	-16.67

KEY: (H) — New annual high. (L) — New annual low.
* Companies tracked in Computerworld Stock Index.

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IN BRIEF

Ask settles 1985 suit

■ **Ask Computer Systems, Inc.** said last week it agreed to settle a class-action suit related to its 1985 initial public offering, and it will restate fiscal fourth-quarter earnings to reflect a $5.2 million charge. The charge deepens the Mountain View, Calif., firm's loss in the period ended June 30 to $8.1 million on revenue of $432.4 million. Ask is kicking up to $5.5 million into a settlement fund, a sum that its liability insurance carrier will match to pay off eligible claimants.

■ **3Com Corp.** posted fiscal first-quarter profits of $4.8 million, up 146% from the comparable period last year. Revenue was $130.9 million, the Santa Clara, Calif., firm said.

■ **Computervision Corp.** said its financial performance in the quarter ended Sept. 27 will be "substantially" below the firm's plan and that of the same period last year. The Bedford, Mass., computer-aided design and manufacturing software developer blamed worsening global economic conditions and the company's uncertain condition before public debt and equity financing moves that followed its restructuring from now-defunct **Prime Computer, Inc.**

Short takes

Pilot Software, Inc. in Boston and **TechnoGnosis International, Inc.** in Boca Raton, Fla., have ended merger discussions.... **CompuCom Systems, Inc.**, a Dallas reseller and integrator, has received a private placement of $18.5 million from a group of investors led by **Massachusetts Mutual Life Insurance Co.**... **Northern Telecom Ltd.** has named **Bell Canada** Chief Executive Officer Jean Monty president and chief operating officer.... Ronald Erickson has resigned as chairman and interim CEO of **NBI, Inc.**, a Chapter 11-bound word processing vendor.

IBM: Looking good, but long road ahead

IBM's restructuring will boost profits by saving $4B a year; long-term health remains in question

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM's most recent cost-cutting moves, including an increase in the number of employees taking an early retirement option and the consolidation of some manufacturing plants, will no doubt help the company shore up its profitability statement. Still, IBM may not be entirely out of the woods quite yet, analysts said.

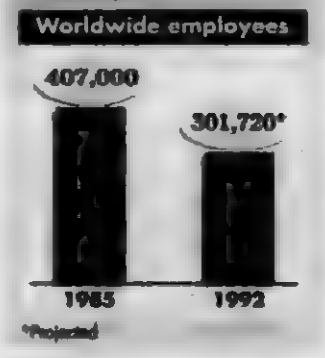
Taken together, the actions will save IBM some $4 billion a year, beginning next year, at a cost of $2.1 billion to pay for the early retirement program. IBM said last week that some 40,000 employees — about 8,000 more than its last estimate in July — will leave the company this year through the early retirement program.

By year's end, IBM will have reduced its employee count by 26% as compared with the head count in 1985 (see chart) and cut its manufacturing floor space by 40% as compared with the same space in 1985.

IBM will pare down some manufacturing capacity by selling off equipment and by "eliminating duplicate functions in plants worldwide," a spokesman said. The company will not shutter entire plants, he added.

Steep decline

IBM's head count has dropped 26% since it began offering early retirement incentives six years ago



Source: IBM

The vast majority of the plant cutbacks will come in IBM's semiconductor and mainframe facilities, the spokesman said, although the company would not detail which actions it is taking where.

The major U.S. mainframe plants are in Kingston and Poughkeepsie, N.Y., and the primary semiconductor-producing facilities are located in East Fishkill and Endicott, N.Y., and Burlington, Vt.

No layoffs planned

Although some employees may be moved around to accommodate the changes in manufacturing facilities, IBM is sticking to its no-layoffs policy, at least for the time being.

Observers said the actions come as no surprise, and they do not expect the plant cutbacks to affect customers.

"The excess capacity wasn't being used anyway," said Philip Reuppel, an analyst at Sanford C. Bernstein in New York. "The semiconductors are used internally, and there will be adequate numbers of mainframes to meet customer demand."

Still, the company is by no means restored to good health. "The key question is that when things turn around economically, how much leverage will these cutbacks benefit IBM?" said Jay Stevens, a senior vice president at Dean Witter Reynolds in New York.

"This really will help cut expenses and achieve greater profitability," Reuppel said. But, he added, he still forecasts "modest" revenue growth of 2% to 4% for IBM through 1993. "IBM's growth is not predicated on economic recovery so much as on the continuation of computer spending," he said.

Of the 40,000 employees taking the early retirement option, approximately 28,000 are from the U.S., about 8,000 are from Europe and the rest are from other geographic areas, an IBM spokesman said.

The U.S. program is over, but international employees have until the end of the year to make a decision.

Survival of the fittest as PC price war rages

BY MICHAEL FITZGERALD
CW STAFF

Price bombs have sent personal computer vendors scurrying for cover and casualties have been severe.

The woes of companies such as Everex Systems, Inc. (layoffs and losses), Northgate Computer Systems, Inc. (failed merger efforts, piece of the company sold for cash) and Librex Computer Systems, Inc. (out of business) are well-documented.

"There is a growing perception that many of the second- and third-tier [companies] are going to be out of business because of overall aggressive pricing," said Lawrence Freitag, vice president at Standard & Poor's Corp. in New York.

Most analysts said they believe the industry will suffer through the shakeout in the next 12 to 18 months. Analysts said that prices may rise slightly after the shakeout comes, but PC technology is too commodity-oriented to allow the pricing disparities that existed before.

PC buyers warily eyeing their hardware options right now might want to consider the following tips from financial analysts on how to best gauge a supplier's financial viability:

• **Read financial information.** The Securities and Exchange Commission requires publicly traded companies, such as Compaq Computer Corp. and Everex, to file regular reports on their financial status, called 10Qs and 10Ks, and annual reports, all of which contain financial data.

The 10K also contains a Management's Discussion and Analysis section that reveals what happened and why in the company's financials. Annual reports also contain useful management comments on company performance.

• **Profitability.** "Are these people making money?" asked Benny Lorenzo, an analyst at Dillon, Read & Co. in New York. "If they're not, or if their profitability is fairly thin — take a look at their 10Ks and 10Qs, look at their liquidity and the direction of gross margins. Does their cost structure allow them to be profitable with their declining gross margins today?"

Eric Zimits, an analyst at William K. Woodruff & Co. in Dallas, said acceptable net profit margins for healthy companies appear to be dropping, from more than 10% to between 4% and 6%.

• **Debt levels.** Even when a company posts a bad quarter or two, it may remain viable. Analysts said companies with low debt-to-asset ratios — less than 50% — are better bets than highly leveraged companies.

• **Revenue growth.** "The market seems to be segmenting into those that are growing like wildfire and those that are showing little growth," Zimits said. A company with low or flat revenue growth for many quarters may be headed for trouble, analysts said.

Much to consider

Analysts said that in today's changing market, PC buyers must consider many factors. Price cutting, which in many industries is a red flag, is business as usual in the PC market. But restructurings to cope with market changes can reveal problems, particularly if a company cuts research and development spending.

Many PC makers, particularly smaller ones, are not publicly traded and thus are not required to disclose financial information. But there are still ways to ascertain their long-term viability.

Geographic reach is one factor to consider. "Most secure vendors will have successful operations around the world and make it a priority to invest in geographic diversification," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Channel diversity, brand recognition and management stability and vision are also important factors, he added.

Everex eyes more cuts

Everex Systems this week will cut staff positions for the third time since August.

Tomorrow is the deadline for employees to accept a severance package. Everex said it hopes to get 400 people to take the package, and sources said if this number does not step forward, the company will lay people off.

Everex employs 1,850 people. In the last month, the company has lost two vice presidents: Tom Caress, vice president of national sales, and Mark Marlow, vice president of business development.

MICHAEL FITZGERALD

TRENDS

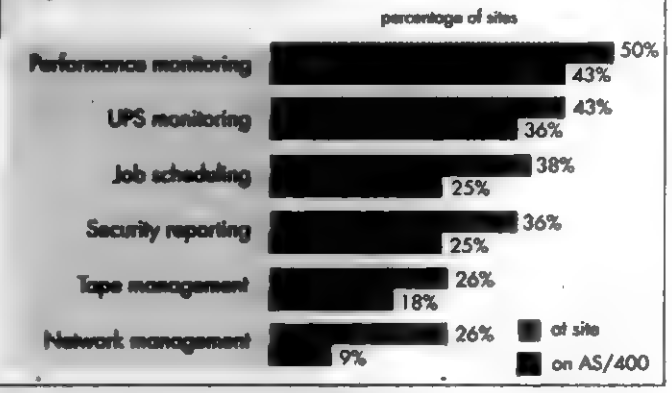
Software and the AS/400

According to respondents:

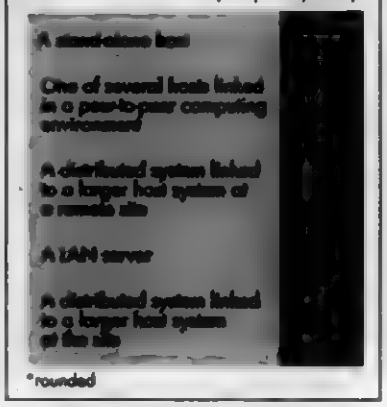
- Monitoring and performance software are more popular system software features
- Most of the AS/400s function in a stand-alone environment
- The AS/400 is not the strongest application development platform

*Figures are weighted averages

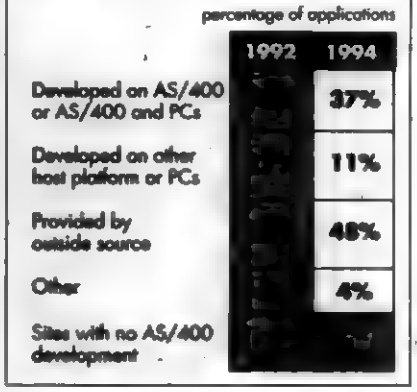
Q Which of the following system software features are at your site and on the AS/400?



Q How many of your AS/400s are:



Q Where do you get your AS/400 applications now and where do you expect to get them in 1994?

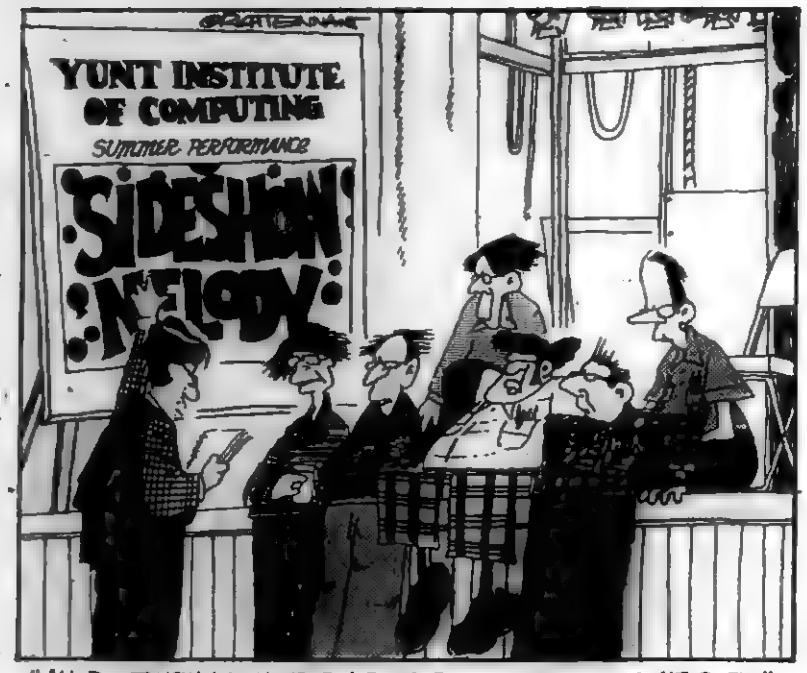


Stephanie Faucher

Base: Senior IS managers at 210 U.S. medium and large AS/400 installations (Model 30 and larger)

Source: International Data Corp., Framingham, Mass.

The 5th Wave



"ALL RIGHT, NOW, WE NEED SOMEONE TO PLAY THE PART OF THE GEEK."

INSIDE LINES

The sky's not falling!

Despite recently published reports indicating that the Federal Trade Commission (FTC) may be close to a decision concerning Microsoft's trade practices, Chief Executive Officer Bill Gates said he has seen no evidence to that effect and cast doubt on the reports by noting that "the FTC has a staff organization whose ethics prevent them from commenting on investigations." Gates also said that while the FTC has requested information, it had not yet arranged any interviews with Microsoft employees — 26 months after the company was made aware of the investigation.

From 'Blue' to 'Green'

IBM and KnowledgeWare are getting ready to announce what could become the final straw that breaks up the AD/Cycle alliance once and for all. According to inside sources, the two companies are going to position KnowledgeWare as the "cross-life cycle" vendor of choice for IBM mainframe customers — a thought that does not exactly enthrall the rest of the AD/Cycle vendor gang.

Faxing Tolkien

Within the next year, expect such heavyweights as AT&T and Matsushita to throw their support behind an open personal communicator platform that will promote the standardization of technologies on handheld machines that will be able to send and receive electronic mail and faxes and create documents on the fly, among other things. The platform will be centered around Go's PenPoint operating system and AT&T 's Hobbit CPU.

But does Spock know, Captain?

IBM is readying a massively parallel computer that it will announce at a supercomputer show in November. Code-named "Vulcan" and under development at the IBM research center in Yorktown Heights, N.Y., the RISC-based computer will eventually include a family that scales up to TFLOPS by the end of the decade. The initial introduction will be a smaller family member, however.

Choice cuts

Although word circulated last week that General Motors' cost-cutting hatchet will strike EDS as deeply as it will other suppliers, don't count on any sharp fall-off in EDS' $3.3-billion line of business with its parent company. Analysts noted last week that a healthy EDS — including a sound GM Class E stock — is vitally important to GM, and the auto company must treat its data processing cow sacredly. What's more, few major data processing contracts between the two companies are up for renewal soon, and a couple were recently renewed well before their expiration date. EDS' C4 design and development project, as well as other re-engineering initiatives, also seems to be humming along.

Long-haired router

Network Systems will today become the first router vendor to announce a High-Performance Parallel Interface (Hippi) for its gear, according to Kevin Collins, product manager for technical computing at the Brooklyn Park, Minn., firm. Hippi is an industry-standard high-speed network campus environment that runs at 800M bit/sec. speeds. Collins said a Hippi on the Network Systems DX router line will give users on lower-speed Ethernet, Token Ring and FDDI LANs access to corporate resources such as disk arrays, storage devices, workstation clusters and supercomputers running on Hippi.

"Thank you for calling United We Stand America," said the telephonic Texas twang last week. "Your call will be included in our total count of callers supporting Ross Perot." "But wait," said a reporter calling the 800 number, "I'm calling to say I DON'T support—" CLICK! Too late. The reporter has just joined the ranks of those asking Perot to throw his hat into the ring yet again. Perot of all people should know that even the most primitive logic systems have two states. Another problem: What's to stop Perot diehards from stuffing the digital ballot box by calling repeatedly? Staff News Editor Alan Alper's box with news tips galore. Phone, fax or CompuServe him at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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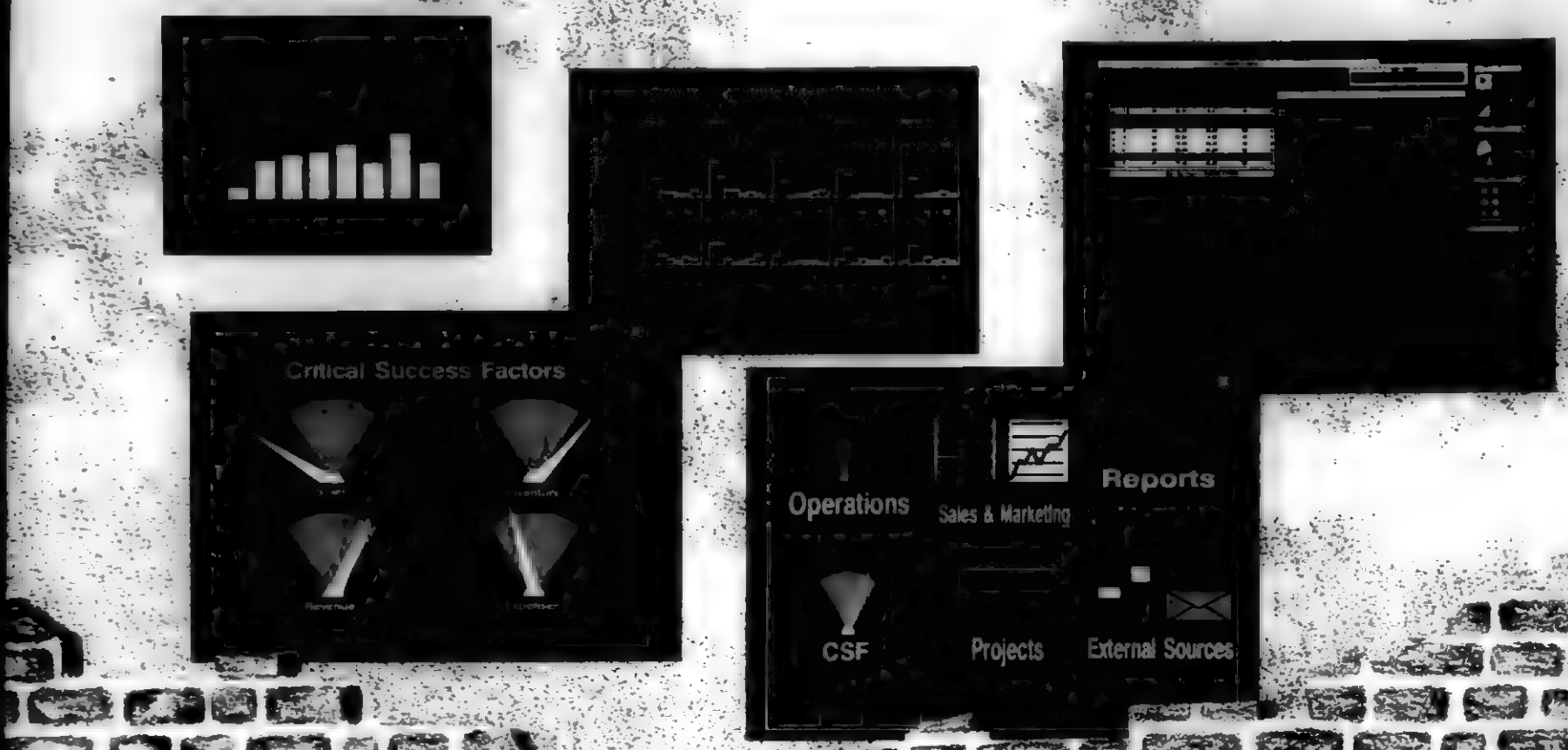

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COMPUTERWORLD

Marriott suit damns AMR role in Confirm

BY MARK HALPER
CW STAFF

ROCKVILLE, Md. — A trail of fraudulent and misleading activity that wound throughout AMR Corp.'s managerial ranks duped Marriott Corp. into continuing to invest in the now-defunct Confirm computerized reservation project, the hotelier claims.

In a suit filed recently in state court here, Marriott claimed that AMR and its outsourcing subsidiary, AMR Information Services, Inc., concealed technical problems and misrepresented financial realities related to the Confirm project.

The suit also alleged that both Max Hopper — information systems chief at AMRIS sister company American Airlines — and AMR Corp. Chairman Robert Crandall were involved in the deception.

The Marriott filing portrays the working environment at AMRIS as a "fear-based culture," where employees were fired for being forthright about development problems and where, at one point, nearly half of the Confirm development team members were looking for new jobs.

Marriott seeks $64 million in damages in what is shaping up as a classic case of who knew what, when. Marriott alleges that because it had refocused its reservation system efforts on Confirm and away from its own Marsha system, it lost the strategic edge that Marsha had provided.

Continued on page 8

Sun slowed by overloaded plate

SPARCstation 10, multiprocessing delays starting to sap user patience

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Like a juggler with too many balls in the air, Sun Microsystems, Inc. is scrambling to deal with shipping delays on parts of its new SPARCstation 10 line while navigating a rocky upgrade path to the Solaris 2.0 operating system.

For some members of its user audience, this act is wearing a bit thin.

Adding to the uproar surrounding Sun's product transition is yet another round of hardware and software set to roll out during the next several weeks. Among those announcements will be a low-end color workstation priced well below $5,000 and based on the microSPARC chip unveiled last week by Texas Instruments, Inc. (see story page 16).

"Sun has a lot of things to get out the door in a timely fashion," said Laura Conigliaro, an analyst at Prudential Securities, Inc. in New York. "If they do, they can be ahead of the curve as far as the competition is concerned. But that's a very big 'if.' "

Anil Gadre, vice president of product marketing at Sun Microsystems Computer Corp., the company's workstation unit, blamed the slow deliveries on an unexpectedly strong surge of customer demand for the SPARCstation 10s.

Gadre said that while Sun has already shipped thousands of Model 20s and 30s, the more powerful Model 41 missed its September delivery date and will not ship in volume until December. For users maxed out on power and capacity with the SPARCstation 2s, the 40-MHz Model 41 is a far more attractive machine.

The waiting game

The multiprocessor Models 52 and 54 — slated for first-quarter 1993 deliveries — must wait for the Solaris 2.1 release, which can handle the symmetric multiprocessing operations that 2.0 cannot. Solaris 2.1 is expected to ship early next year, but Sun officials have not committed to any dates.

In the meantime, some of Sun's customers are feeling a bit like mushrooms: kept in the dark and dining on doses of vendor fertilizer.

"Nobody's telling me any-

Continued on page 16

ALL A STATE OF MIND

Tempered hopes best route to CASE

BY KIM S. NASH
CW STAFF

Computer-aided software engineering has been stomped on by bitter users taken in by overblown claims of a cure-all for systems backlogs. Well, it is not a panacea: Witness the mainframe-based CASE tool sets, trumpeted as far back as the mid-1980s, that fell short of expectations. Hence, when many CASE pioneers fell, they hit hard.

Consider what happened to a major Canadian oil company that bought an integrated tool kit from a major vendor three years ago.

The company wanted to rewrite IBM 3090-based programs to run in a client/server environment anchored by Unix boxes.

Projects dragged on because the tool was "too confining," according to one developer. It forced programmers to build in one structured way, he said, driving the redesign effort "massively over budget and over schedule."

Other CASE tools are more flexible in the methods they will allow. Eventually, Unix-based component tools were brought in to jump-start the project, and the firm will likely swap tools, the developer said.

But qualified successes do exist behind the negative hyperbole. Several factors — most notably tempered hopes — separate these shops from those that have shelved CASE tools and tech-

Continued on page 20

Bloom off the rose

CASE sales growth has slowed but is expected to pick up in 1993

$1.64	
$2.06	26%
$2.45	19%
$2.79*	14%
$3.50*	25%

*projected

Source: CASE Associates, Inc.

PRODUCT EVALUATION
Amdahl 5995M

Big iron battle

NEW PRODUCT In-Site

Evaluators of Amdahl's latest mainframe rate it about average in reliability and performance and better than IBM in capacity and space savings

See New Product In-Site, page 90

	Amdahl 5995M Model 4380	IBM ES/9000 Model 900
Reliability	3.5	5
Performance	3.5	4
Installation	3.5	4
Support	4	4
Size/Utilities	4	3.5

Ratings are based on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations

Laptop thefts spur security efforts

Thieves covet access to host databases, seek corporate information jewels

BY JAMES DALY
CW STAFF

Laptop computers are on the move in a lot of places these days, but not always in the hands of their owners.

As purchases of easily transportable laptop and notebook computers have soared in the past 18 months, so has their theft. And it is not just petty thieves who are to blame.

According to one federal security consultant, John Shey, a nationwide band of computer "hit men" with ties to organized crime are being paid upward of $10,000 to steal portable computers from Fortune 1,000 executives. Rival executives are believed to be behind the contracts.

"It's not the machines they're after; it's the data inside," said Shey, president of Shey Technology Group, Inc. in Campbell, Calif.

Laptops also provide a perfect way to steal information from a corporate database because they have all the software needed to dial into the company's mainframes.

Yet many executives treat these treasure troves of corporate data with sloppy nonchalance. In a survey by International Data Corp., only 1% of the respondents said they perceived security as a problem with portables, despite numerous high-profile thefts (see story page 41).

Continued on page 12

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INSIDE

OS/2 could benefit from slipping Windows NT availability. Page 4.

Dunkin' Donuts MIS director Dave Bennett readies a fresh batch of Unix systems to bring processing closer to the storefront. Page 6.

IBM centralizes view of databases, LANs. Page 4.

Lotus looks to give users easier entree into Notes workgroups. Page 14.

Integration Strategies — Cross-platform development a tough row to hoe. Page 101.

EXECUTIVE BRIEFING

October 12, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

CASE

CASE HAS BEEN STOMPED ON by bitter users taken in by vendors' overblown claims, but at shops with the right mix of caution and inventiveness, CASE can make the grade. *Pages 1, 20*

USERS STILL BELIEVE in the concept of AD/Cycle but have lost faith in IBM's ability to get them there. At a user conference in Chicago last week, non-IBM alternatives were demonstrated. *Page 8*

MUSICAL CHAIRS AMONG product strategy setters in three major CASE companies means users should brace for product and strategy shifts during the next year. *Page 93*

OUTSOURCING

AMR AND ITS OUTSOURCING SUBSIDIARY misled Marriott into continuing to invest in the troubled Confirm computerized reservation project, according to a Marriott suit, which complains that Marriott has now lost the competitive edge it once held with its own reservation system. *Page 1*

USERS EXPLORE their global network outsourcing options. *Page 65*

SEASONAL BUSINESSES often let costly processing power sit idle for much of the year, but as seed and gardening vendor W. Atlee Burpee discovered, outsourcing could help. *Page 77*

OUTSOURCING WAS AN EASY DECISION for the oil industry's emergency-response organization, Marine Spill Response Corp. *Page 116*

ENTERPRISE NETWORKING

IBM TARGETS THE DISTRIBUTED SYSTEMS management arena with an OS/2 version of SystemView that promises soup-to-nuts LAN systems management, automated software distribution. *Page 4*

BYPASS CARRIERS WASTE NO TIME getting into the long-haul telecommunications business, as MFS Datanet rolls out a nationwide LAN interconnect service. *Page 15*

CABLETRON POSITIONS SPECTRUM to manage users' combined SNA and LAN backbones and adds SNA support to its hubs. *Page 10*

A LOWER-PRICED PRODUCT MAY HELP USERS who want their mainframes to exchange files with other vendors' systems via the Open Systems Interconnect's FTAM protocols. *Page 69*

SECURITY

LAPTOPS ARE PORTABLE, powerful — and easily stolen. *Page 1*

FEDERAL RAIDERS SEIZE 16 truckloads of DOS software. *Page 6*

SECURITY FIRM HOPES TO THWART thieves, facilitate recoveries with computer registry. *Page 41*

UNIX

SUN IS IN THE MIDST OF significant product transitions for both hardware and software, and customers are feeling the heat with shipping delays for new systems. *Page 1*

TANDEM COMPUTERS' ENHANCED INTEGRITY Unix processor will be able to run off-the-shelf Unix System V, Release 4 software. *Page 86*

CLIENT/SERVER

▶Editor in chief Bill Laberis talks about some of the ecstasy — and agony — of the 'rightsizing' movement. *Page 32*

▶A pioneer user finds that building client/server systems is a high-risk undertaking that requires an overhaul of the IS department. *Page 118*

▶Dunkin' Donuts decides to buy 800-plus Sun workstations to fill out its Unix client/server architecture. *Page 6*

▶Having automated its North American truck rental operations, U-Haul turns its attention to open systems and client/server computing at its Phoenix headquarters. *Page 55*

▶A revamped graphical database supports client/server application development. *Page 37*

▶SAP users welcome the vendor's client/server direction, even though many have no immediate plans to implement the technology. *Page 77*

WORKGROUPS

▶An IBM manager drops some hints about the new workgroup repository the company is developing, including one that will be based in part on the existing AIX software development environment. *Page 8*

▶Users gain an inexpensive alternative to Lotus' Notes client software as Beyond swaps in its sophisticated mail package for Lotus' mail front end. *Page 14*

▶Lotus is working to get rid of the image that Notes is too expensive. *Page 14*

▶Lotus shoots for 1,000 Notes customers by year's end and credits its IBM deal with winning it customers. *Page 14*

▶Texas Instruments and Sun unveil the 50-MHz microSPARC chip, a high-volume, low-cost RISC chip intended for low-end workstations, portables, laptops and X terminals. *Page 16*

LARGE SYSTEMS

▶DEC tries to set up future wins by early focus on massively parallel programming. *Page 24*

▶DEC's long-term storage plans are starting to come together with new product introductions. *Page 84*

▶Supercomputer maker MasPar offers a new generation system with five times the first generation's performance and cuts prices on older machines to compete with those of high-end workstations. *Page 84*

SYSTEMS INTEGRATION

▶Challenges with networks, development tools, user interfaces and incompatible databases make it difficult to transplant pilot software projects into the enterprise. Commercial firms are eager to help IS departments, which will spend nearly $5 billion on software-related integration and development in 1992. *Page 101*

▶Microsoft has decided it's time to enter the big leagues and is going after a piece of the systems integration market, although some users and analysts are taking a "show-me" attitude. *Page 37*

▶VARs with high inventories and long-term accounts receivable usually spell trouble. *Page 129*

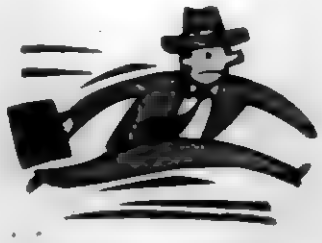
INDUSTRY DEBATE

▶Undocumented APIs for Windows raise the question of whether Microsoft should be building fences between its Windows and applications groups, thus building the trust of developers and customers. *Page 37*

▶Sematech's funding has been preserved, but with the charge to be environmentally correct. *Page 137*

▶A computer industry alliance outlines its federal technology and trade agenda. *Page 137*

▶Carl Malamud, author of *Exploring the Internet*, talks about why ANSI should provide wider and cheaper access to its standards and dicusses a petition drive he coordinated to help make that happen. *Page 33*



▶Computerized trading systems, such as airline reservation systems, could squelch, rather than promote, competition. *Page 109*

▶Predicted record revenue for Compaq's third quarter is offset by news of the company's worldwide layoffs. *Page 137*

MANAGEMENT

▶Commercial users are beginning to realize how dependent they are on software, but few understand how to manage that component. *Page 96*

▶IS managers at biotech firms have it tough. They have small staffs and few system and data standards, making government reporting a bear. At the root of the problem is that top management is focused on science R&D and capital, not business systems. *Page 115*

▶Ohio State University is studying the biomechanics of keyboard work to learn about repetitive stress injuries. *Page 118*

▶IS has it easy compared with other white-collar professionals. *Page 121*

The 5th Wave appears on page 138

Local-area networking
- Dolphin unveils a LAN monitor said to do its own troubleshooting 68
- Standard Microsystems unwraps a Token Ring chip set and adapter card 58
- IBM clones get a wireless LAN adapter 59
- A reorganized Novell messaging division cuts prices and unveils new protocol delivery dates 15
- Lotus' CD/Networker lets LAN users share applications from a CD-ROM 59

Multimedia
- Multimedia goes handheld 46
- Will multimedia networks boost the success of matchmaking services? Great Expectations thinks so. 65

Software development
- James Martin & Co. and Intellicorp test a new information engineering workbench incorporating an object-oriented methodology 93
- Ingvar J. Petursson, McCaw Cellular Communications' CIO, says object orientation is too important to overlook or to dismiss as a fad 33
- Central Point hopes PC Tools 8.0 will improve its quality image 46
- NCR introduces its first application development tool, called NICE 93

Desktop
- IBM signals a PC comeback with impressive new notebooks 12
- IBM Europe releases its aggressively priced ValuePoint line of PCs 12
- Microsoft's NT delay could spell relief for IBM 4
- The future is where Compaq's SystemPro/XL line will find its place 55

Service/Support
- Proactive Software targets help desks with a piece of integrated system 58

Departments
Advanced Technology 28
Application Development 93
Calendar 119
Company Index 135
Computer Careers 121
Computer Industry 137
Desktop Computing 37
Editorial/Viewpoint 32, 33
Enterprise Networking 65
In Depth 109
Inside Lines 138
Integration Strategies 101
Large Systems 77
Management 115
Marketplace 129
New Product In-Site 90
News Shorts 6,16
Workgroup Computing 138
WYSIWYG 138

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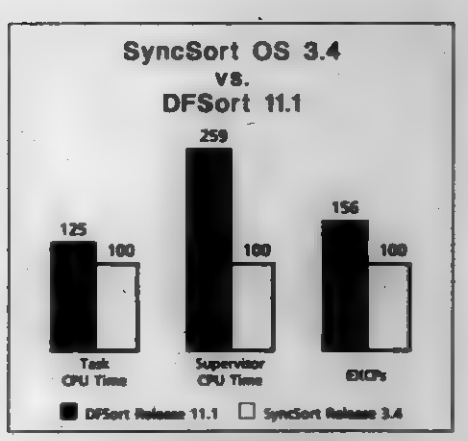

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SystemView for OS/2 debuts

Will allow management of distributed databases, servers, workstations

BY ELISABETH HORWITT
CW STAFF

NEW YORK — In a new move to retain customers as they move off mainframes, IBM last week announced a slew of distributed systems management products built around a standards-oriented, OS/2-based version of SystemView.

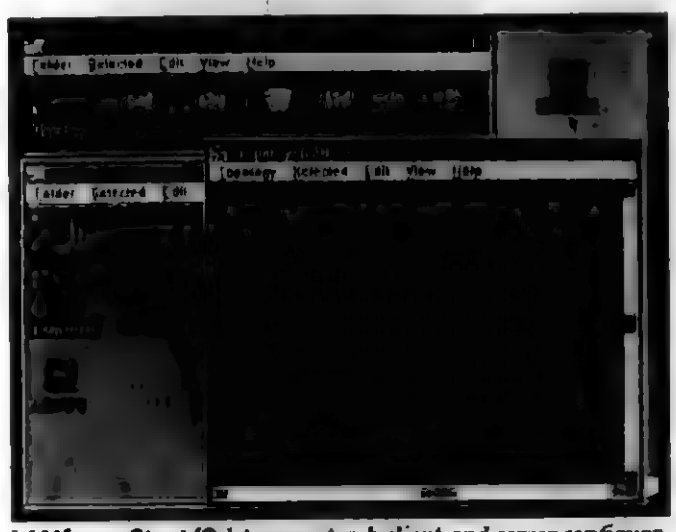
The key introduction, due out between December and late next year, includes DataHub, a platform for managing distributed databases, and LANfocus, a product family that is said to allow users to manage and administer local-area network servers and workstations, from a single OS/2 console.

Vendors such as Hewlett-Packard Co. and Sun Microsystems, Inc. are "doing similar things, but not across the board to the degree that IBM is addressing [management of] databases, workstations, servers and LAN devices," said Dick Boyle, a program director at Stamford, Conn., research firm Gartner Group, Inc.

Key attributes of the new platform are SystemView's common graphical user interface (GUI), object-oriented data structure and standards support, which enable users to administer a wide range of devices without having to worry about the "unique parameter definitions" required to manage each type of system, Boyle said.

SystemView Information Warehouse DataHub, a family of products, is said to enable users to manage heterogeneous databases distributed across all major IBM platforms.

Some users were cautiously optimistic about DataHub.



LANfocus Start/2 *lets users track client and server configurations and connections in different windows*

"DataHub serves a real need. The issue is when it will extend beyond IBM," said John Chatfield, a senior principal analyst at the Salt River Project in Phoenix.

A number of leading database administration, performance monitoring and capacity planning software vendors have announced plans to support DataHub. They include Candle Corp., Legent Corp., Platinum Technology, Inc., Boole & Babbage, Inc. and VM Systems Group.

More support coming

IBM spokesman Tom Aser hinted that IBM plans to provide DataHub support for AIX and Novell, Inc. NetWare.

DataHub allows the database administrator to perform functions such as user authorization, table updating, data distribution and backup across heterogeneous databases that comply with IBM's Distributed Relational Database Architecture, Aser said.

DataHub is potentially quite useful to the Federal Reserve Bank as a way of integrating administration across "a bunch of different databases" now installed at the bank, said an information systems executive at the bank who preferred anonymity.

IBM gained credibility as an open, standards-based vendor with its announcement that SystemView will support the Open Software Foundation's (OSF) Motif GUI, as well as OSF Distributed Management Environment application programming interfaces as they become available. The OS/2 version will also support Simple Network Management Protocol and Common Management Information Protocol, IBM said.

Early shipments of DataHub are scheduled for next spring, with general availability likely late next year, IBM said.

The basic OS/2-based console product is priced at $2,000; prices for database support modules range from $200 to $140,000, based on system size and software tools.

Senior editor Johanna Ambrosio contributed to this report.

Soup to nuts for LAN managers

If IBM delivers on the promise of its new OS/2 2.0-based LAN management and software distribution products; life is going to get a lot easier for LAN managers, according to Gartner Group's Dick Boyle.

IBM announced LANfocus Management/2, a LAN system management platform with tools for monitoring and troubleshooting LAN systems activities and applications; and Configuration, Installation and Distribution (CID), a family of products for automatically configuring and distributing software to LAN workstations and servers. Both product families will support OS/2 2.0, DOS 5.0 and DOS 5.0 with Microsoft Corp. Windows 3.1 clients, as well as Novell's NetWare.

In addition, LANfocus Management/2 will be able to manage any network device that supports SNMP and CMIP, IBM said. IBM is also developing LANfocus agents for managing IBM Database Manager, Communications Manager and LAN Server. LANfocus promises soup-to-nuts management of LAN systems through a combination of IBM and third-party applications, the vendor said. The platform will be able to manage IBM Token Ring devices via IBM's LAN Network Manager, IBM said. Other IBM applications will include the following:

- LANfocus Start/2, which is said to provide icon-based screens for managing, planning and validating network system configurations.
- LANfocus Monitor/2 will monitor direct-access storage devices, random-access memory and CPU usage and performance levels.
- LANfocus Fix/2 monitors network hardware and software.
- LANfocus NetView Tie/2 provides a gateway for reporting events to a NetView host.

LANfocus Manage/2 1.0, slated for availability in second-quarter 1993, costs $1,245.

The keystone of IBM's CID offering, Distribution Manager/2 (DM/2) Version 2.0, may be the first product family to enable users to automatically download configuration and software code tailored to different workstations, instead of loading the same cookie-cutter configurations to a group of users in bulk, Boyle said.

DM/2 2.0, set for release by year's end, costs $1,495 for the server and $95 per client.

ELISABETH HORWITT

IBM may pass Microsoft in operating system race

BY ROSEMARY HAMILTON
and CHRISTOPHER LINDQUIST
CW STAFF

IBM will likely gain a proverbial window of opportunity in the next several months as rival Microsoft Corp. moves its delivery schedule for Windows New Technology (NT) well into 1993.

Analysts and users contacted last week said Microsoft's shift, combined with increasing momentum behind OS/2 2.0, could give IBM the lead for the next few years in the high-end desktop operating systems race.

"The million copies IBM has distributed is pretty significant," said Jeff Tarter, publisher of "Softletter" in Watertown, Mass. "IBM already has a pretty strong lead, and NT's delay could be very bad news for Microsoft."

The delay was summed up by a message from Microsoft in its MSWIN32 forum on CompuServe: "Based on the latest information and our determination to ensure that the final code is of very high quality, the final release of Windows NT will be in early 1993, not end of 1992, as previously anticipated."

Microsoft also confirmed that an end-user beta test scheduled for September has just begun production and will not be in user hands until the end of this month.

The causes of the delay are unclear. Cameron Myrhvold, director of developer relations at Microsoft, last week attributed the slips to performance and compatibility improvements. "You can spend a lot of time squeezing the last bits out."

Developers who have been working with Windows NT for some time said the major parts of the operating system seem to be very stable, but details such as improved DOS and Windows 3.0 and 3.1 compatibility could still be an issue.

No need to worry

Hamilton Laboratories in Wayland, Mass., has been shipping Windows NT development tools for several months, and President Douglas Hamilton said he could point at no glaring bugs. "I don't see any cause to say 'Aha! See, they've run into serious problems,' " he said. "[It's taking] just a little bit more work than they expected."

While Microsoft is stuck in neutral, IBM is hinting that it will not be long before it doubles its OS/2 shipments. Shon Saliga, manager of OS/2 at the OS/2 Programming Center in Boca Raton, Fla., said last week: "We are on our way to 2 million."

The key for IBM is to keep its momentum going, and for the short term that means delivering on its promises for 1992. The company says it is on schedule to deliver an assortment of fixes and additional features that it has been promising since spring. A Service Pack that will include more than 200 bug fixes and the expected 32-bit graphics engine is scheduled to ship midway through this month.

The new engine effectively replaces a hybrid engine of 16-bit and 32-bit technology that IBM shipped with OS/2 2.0 earlier this year.

The Service Pack "is absolutely key to us," said George Oliver, manager of information delivery technologies at the Royal Bank of Canada.

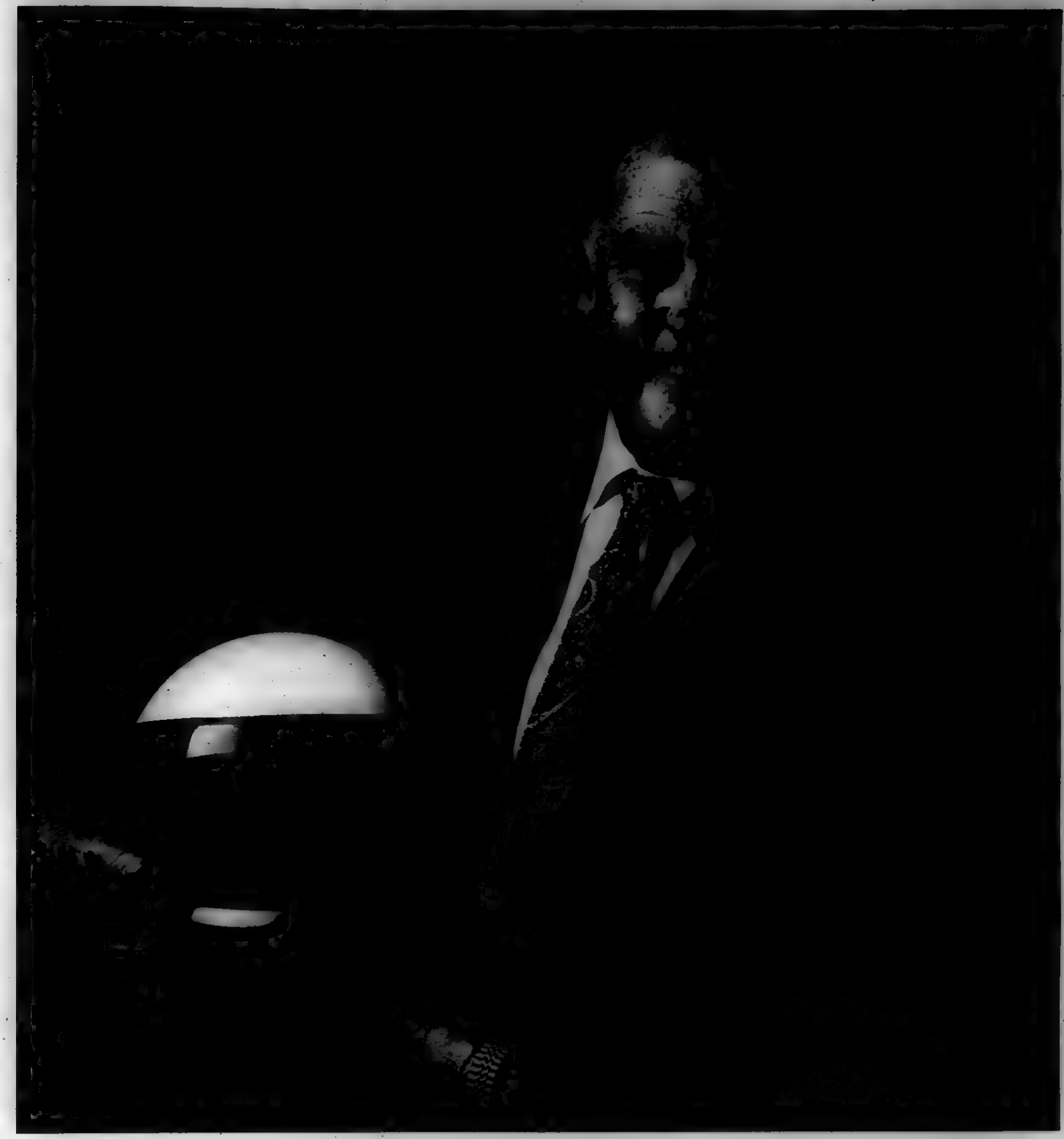
IBM said it would follow this release with another Service Pack that would not include the new graphics engine for users who want the bug repairs but are not yet ready for the new graphics function. Finally, it will ship by year's end a point release of 2.0 that will support Windows 3.1.

Corporate users said the effects of the slip would be minimal, as projects that would use Windows NT are generally long-term in nature.

Keith Dart, a systems analyst at GTE Mobilenet in Pleasanton, Calif., said that while he is interested in NT, he does not need it immediately and would be happy to get on the beta-test program.

Other users may simply have more than enough to do just installing Windows 3.1 without having to deal with testing Windows NT as well.

Theresa Doyle, vice president of computers and information services at Dean Witter, said that while she would like to see if Windows NT will be usable for stock analyst workstations, she is just "so busy" getting current systems installed that the delay "is not going to have any effect in my area."



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NEWS SHORTS

Live video on deck for Notes

Danvers, Mass.-based PictureTel Corp. and Lotus Development Corp. said last week said they have swapped technology to bring PictureTel's dial-up videoconferencing capabilities to Lotus' Notes workgroup software. Users will reportedly be able to dial up a videoconference through their Notes application. Availability and pricing were not announced.

TI cranks up 486 production

Texas Instruments, Inc. has started volume production of a line of 486-class microprocessors to be used in notebook and desktop machines, the first of which will appear at Comdex/Fall '92 next month. Prices for the TI486 chips — six models in all — range from $59 for a 20-MHz 486SLC to $99 for a 33-MHz 486DLC. That compares with Intel's pricing of $94 to $317 for comparable parts.

Cellular data service to debut

Westinghouse Electronic Systems and Bell Atlantic Mobile Systems, Inc. said last week they would launch the nation's largest data-over-cellular service in the Baltimore area in the first quarter of 1993. The partners will use technology from Cellular Data, Inc. in Mountain View, Calif. The plan calls for Bell Atlantic to sell its packet data cellular services to Westinghouse, which will resell cellular data services integrated with software and hardware to end users.

Quattro Pro bugs reported

Borland International, Inc.'s Quattro Pro for Windows has barely shipped, but reports of problems are filtering in. The spreadsheet reportedly requires more system resources than other Microsoft Corp. Windows spreadsheets, requiring users to close other applications just to get Quattro Pro to load. A Borland spokesman would not comment on the package's resource requirements, other than to say that if there is a problem, its technical support staff would take care of it.

Novell concedes security threat

Responding to a recently discovered security threat to its NetWare LAN operating systems, Novell, Inc. is distributing a patch for NetWare 3.11, NetWare 2.2 and NetWare for Unix customers. The fix can be downloaded from the NetWare bulletin board on CompuServe. The security gap, as demonstrated in a Netherlands laboratory, allows any user logged on to a LAN to gain network supervisor status, providing unlimited access to all of the data stored on the server. According to Novell's Jan Neumann, executive vice president of the NetWare Systems Group, the break-in would be confined to one server.

Short takes

Microsoft is set to ship the software development kit for its Open Database Connectivity application programming interface. The kit will allow developers to write a common set of Windows code that will be able to access multiple back-end databases. . . . **Microsoft** has created a chief information officer position and filled it with Neil Evans, a nine-year employee and general manager of the Information Technology Group. . . . **Toshiba America Information Systems, Inc.** this week will cut the price of its Satellite T1850C low-end color notebook by roughly 30%, down to as low as $2,250. . . . **Symantec Corp.** plans to acquire **Certus International Corp.**, developer of antiviral and security software for personal computers. . . . **Computerland Corp.** announced a major restructuring last week, splitting the company into two divisions: Franchising and Distribution and the Corporate Division. . . . **JWP, Inc.**'s president and chief operating officer, David L. Sokol, resigned his position and his seat on the board of directors amid continuing losses. Andrew T. Dwyer, chairman and chief executive officer, will take on the role of president.

More news shorts on page 16

Donut maker dips into Sun

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Dunkin' Donuts of America, Inc. is expected to reveal this week that it will use Sun Microsystems, Inc. gear to provide networked computing resources to automate 840 of its 2,600 franchise stores in the U.S. Many of the stores had been using IBM-compatible personal computers or paper records to track inventories and support office automation.

Automation has been inconsistent throughout the Dunkin' Donuts enterprise, and vital data about sales and up to 15% of inventory was being lost at some stores. The Sun systems will provide a consistent architecture within the company and allow each office to more easily communicate data to headquarters and one another, said Dunkin' Donuts MIS director Dave Bennett.

The firm's contract with Sun, worth $8 million over four years, underscores its commitment to Unix client/server architecture as the basis for all its information systems. The chain now uses a 22 million instructions per second Sunserver 490 as the primary computer for 400 employees at its Randolph, Mass., headquarters.

Dunkin' Donuts studied the use of Unix store systems by other restaurant chains, including McDonald's Corp., Pepsico, Inc. and Mrs. Fields Cookies, Inc. before deciding on the multiuser Sun platform. "This is our first-generation system, but other chains are on their third-generation or fourth-generation systems," Bennett said. "I'd be foolish not to try to learn from their experience."

The first batch of distributed Sun workstations will be rolled out to Dunkin' Donuts franchise owners sometime next year.

Each Sun computer will participate in a peer-to-peer network, rather than as a lowly cog in a top-down, host-based system. That design fits the Dunkin' Donuts organization, which consists of a headquarters staff, a small number of company-owned stores and more than 1,300 franchise operations, Bennett said.

Stores will send their daily transactions to the headquarters' Oracle Corp. Oracle 6 database over a company wide-area network for analysis by regional market. The central Sun server will be able to download software revisions to the stores. Sun's SPARCstation IPC color workstations will act as local hosts and clients to the central server at franchise stores.

David Powers

Dunkin' Donuts' *Bennett says it is substantially cheaper to run his operations on Sun*

On board each SPARCstation IPC will be a suite of store management software, including modules for inventory management, sales tracking and distribution, developed by a team of five central-site Dunkin' Donuts programmers. A route-management package that tracks distribution to other Dunkin' Donuts outlets and local convenience stores has already been tested by some owners.

The SPARCstations — including the Solaris operating system and custom software — will be sold to the franchises for less than $12,000 — the price of three cash registers, Bennett said. He estimated the cost of operating with the Sun systems is roughly one-tenth the cost of running the business on IBM midrange mainframes.

However, several loose ends remain in the Dunkin' Donuts client/server system, including a lack of performance monitoring software for the enterprise Unix network, due to be supplied under Sun's recent agreement with Computer Associates International, Inc.

Dunkin' Donuts, which has $1.3 billion in revenue through sales in 18 countries, has proven to be a corporate maverick in its move toward an open systems standard. It is just one operating unit of Allied Lyons PLC, a $9 billion British conglomerate that runs on large-scale IBM mainframes. "They're interested in understanding to what extent open systems makes sense [for them] and in how to deploy it," Bennett explained.

Feds seize counterfeit DOS

BY JAMES DALY
CW STAFF

REDMOND, Wash. — In what was described as the largest seizure of counterfeit software ever, U.S. marshals announced the confiscation of 16 trailer trucks filled with counterfeit Microsoft Corp. DOS software in a series of raids conducted last month throughout Northern California and New Jersey.

Law enforcement officials impounded 150,000 bootleg copies of the DOS Version 5.0 operating system in a crackdown that focused on an alleged counterfeiting enterprise called U-Top Printing Corp., based in Sunnyvale, Calif. The pirated software had a street value of more than $9 million, Microsoft officials said.

The high-profile raids occurred just prior to congressional action on a bill to strengthen software counterfeiting penalties. The software piracy bill, S. 893, has passed the House of Representatives and was expected to go before the U.S. Senate last week.

If passed, the bill would make software copyright infringement a felony, upping the maximum term of imprisonment to five years with a possible fine of up to $250,000.

Willful infringement is now subject to a maximum fine of $25,000 or imprisonment of up to one year or both.

Microsoft has filed suit in federal court against U-Top and its owners, James and Shirley Sung, for copyright infringement, trademark infringement and related claims. An attorney for the Sungs said they had simply produced DOS copies on behalf of computer makers they believed had valid licenses to manufacture the operating system.

In the past, U-Top had legally produced versions of DOS for Milpitas, Calif.-based Caliber Computer Corp. and MTD Data Services, Inc. in Bellevue, Wash. But Caliber and MTD are no longer licensed to make the program, Microsoft officials said.

The Business Software Alliance estimated that software piracy cost U.S. businesses $12 billion last year.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation

"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
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IBM CASE delays send users elsewhere

BY JOHANNA AMBROSIO
CW STAFF

CHICAGO — Users gathered here last week at the Repository AD/Cycle (RAD) International Users Group conference remain faithful to the church of structured software design but expressed little confidence in the ability of IBM to lead them to the promised land.

"I'm still a great believer in the concept of Repository and AD/Cycle because they will have a dramatic impact on our ability to manage data and exploit information," said Walter Viali, manager of the information systems enabling center at Texaco, Inc. in Houston. "But IBM has no credibility. Who are they to talk about disciplined applications development?"

IBM's Repository Manager, announced in September 1989, was supposed to have acted as an integration mechanism through which computer-aided software engineering (CASE) tools would share information. But Repository Manager never materialised as a usable product, and in July, IBM began briefing customers about a shift in direction: putting a repository on local-area networks [CW, July 20].

Donnette Bruno, president of RAD, said, "People were waiting for IBM, but they're not any longer." In fact, she said, the user group is considering changing its name to make it less tied to IBM.

Like many of the other users that met here last week, Texaco is now exploring options other than IBM for a repository, including InfoSpan in Minneapolis, Reltech Products, Inc. in Fairfax, Va., and BrownStone Solutions, Inc. in New York.

Texaco's loss of faith is significant for IBM because Texaco is one of approximately 30 user organizations that take part in IBM's ShowCASE program.

"At our next meeting, we're going to talk about what we want to see and when," Viali said. "We've got a real credibility problem in our own organizations because IBM changes direction every three months." Texaco disbanded its repository team late last year, he added.

At Barnett Technologies, Inc. in Jacksonville, Fla., where Bruno works as a data administrator, "We're building our own infrastructure," she said.

That is a tack that other users are also exploring, said Robert Holland, chairman of consulting group Holland Systems Corp. in Ann Arbor, Mich. "People are building their own repositories, relying on their CASE vendors for integration or looking at alternative repositories," he said. "People don't see IBM delivering, so they're paying attention to others who are."

Cathy J. Lewis, director of applications development marketing at IBM Programming Systems in Somers, N.Y., denied that IBM's CASE star has been tarnished. "We believe a good number of customers look to us for leadership in applications development," she said.

Ed Peters, chief information officer at The Hay Group in Washington, D.C., and one of the users on the committee who met during the late 1980s to draw up requirements for AD/Cycle, said there is still a lot that can be accomplished.

"There have been disappointing delays from the prime vendor to make the environment fit together properly," Peters said. "But people can still drive forward. . . . If IBM doesn't have the products, we can't wait because our business will not wait."

Repository pact bugs AD/Cycle allies

Last week, an IBM manager lifted the curtain a bit on a workgroup repository the firm is working on, saying it will be unveiled in pieces throughout next year and 1994, and it will be based on the existing CASE environment for the RISC System/6000 family of Unix-based computers.

Also last week, IBM announced an agreement to pitch KnowledgeWare, Inc.'s tools as the cross-life cycle, software development family of choice to customers.

The KnowledgeWare deal is essentially meant to allow IBM to compete with Texas Instruments, Inc. and other providers of integrated CASE solutions, said Cathy J. Lewis, director of applications development marketing at IBM Programming Systems.

Lewis dismissed the notion that the expanded deal with KnowledgeWare will add stress to the AD/Cycle Alliance. Some of the other alliance members have, however, privately registered their displeasure over what they perceive to be KnowledgeWare's elevation.

The new repository, dubbed AD Platform, will initially provide basic intertool communications, with full-scale data integration coming "as soon as possible thereafter," said John Swainson, manager of the applications development technology center at IBM's Toronto laboratory. That will allow one tool to pick up a flow chart from another tool, for example.

The new repository will be a "scalable development environment" that can support "multiple clients, multiple servers and hundreds of people," he said. It will run under AIX and OS/2.

Other features include the following:

- The ability to track different versions of software being developed, at the level of both a whole program and individual pieces of data.
- One logical point from which to control everything.

Swainson also said IBM is building the new system on top of the existing AIX CASE framework. This framework, developed with Hewlett-Packard Co., provides an intertool messaging scheme.

Marriott suit damns AMR role in Confirm

CONTINUED FROM PAGE 1

Marriott has operated Marsha since 1984, using reservation centers in Omaha and Salt Lake City, and claimed to have reduced its cost and improved its effectiveness.

An AMRIS spokeswoman last week declined to comment on the allegations and said that neither Crandall nor Hopper would be available for interviews. Marriott also declined comment.

Marriott's suit was filed three days after Fort Worth, Texas-based AMRIS filed an action in Dallas against Marriott and Confirm's other user partners, Hilton Hotels Corp. and Budget Rent A Car [CW, Oct. 5].

AMRIS alleged in its suit that the three user partners withheld funds, missed deadlines for submitting design specs and made poor staffing assignments that harmed the Confirm project.

Besides resolving large issues, AMR and Marriott must also settle on a venue for the legal action. As of late last week, Hilton said it had not filed any actions, and Budget had not returned phone calls inquiring whether it planned legal recourse.

The AMRIS spokeswoman characterized Marriott's Maryland filing as a case of "forum shopping," meaning Marriott had filed in Maryland to move the case out of Dallas and into Marriott's home territory.

Plans gone awry

The four firms had formed a consortium called Intrico to oversee development and marketing. AMRIS was assigned to development, and Marriott, Hilton and Budget were financial partners.

Development efforts ceased last summer. Databases were virtually irrecoverable in the event of a crash, and the system's Transaction Processing Facility reservation component did not integrate well with its MVS and DB2-based decision-support component.

Marriott claimed in its suit that officials at AMR and AMRIS knew of technical problems long before admitting to them or to their seriousness last April. It also claimed that AMRIS deliberately falsified financial representations of the project.

The suit named Crandall and Hopper as two of six AMR executives "who played a significant role in the events surrounding AMRIS' defrauding of Marriott and leading up to AMRIS' ultimate breach of its contract."

For instance, the suit alleged that Crandall and Hopper gave "false assurances" to Marriott that deadlines would be met. On one occasion in April 1991, Crandall assured Marriott that a stripped-down version of Confirm would be complete by June 1992, even though AMRIS had known in February that it could not meet that deadline.

A month after Crandall's assurance, John Mott, a former AMRIS official, told Marriott "the assumptions made in scheduling the [modified version] were 'quite poor,' " the suit alleged.

The suit also alleged that Crandall and Hopper had communicated to Marriott last April that they believed AMR employees had concealed information. Hopper had at one point issued an internal AMRIS memo criticizing staff members because they "did not disclose the true status of the project in a timely manner" [CW, Aug. 10].

Marriott claimed that Crandall wrote to Marriott, Hilton and Budget on April 29 stating: "The individuals to whom we gave responsibility for managing Confirm have proven to be inept. Additionally, they have apparently deliberately concealed a number of important technical and performance problems."

According to Marriott, other AMR executives who defrauded the hotel include former AMRIS President Russell Harrison; Mott, former president of AMRIS' Travel Services Division in charge of development; David Harms, a former vice president of AMRIS Travel Services; and Robert Geller, former assistant vice president of AMRIS Travel Services.

The suit claimed that AMR fired Mott, Harms and Geller last April for concealing data.

Mott, who recently joined Electronic Data Systems Corp.'s financial business unit, said last week he left AMRIS voluntarily.

The other managers named in the suit either declined comment or could not be reached.

Too many pilots

Confirm's "fatal flaw" was a faulty management structure in which no one group had ample authority over the project, according to John Mott, the former president of AMRIS' Travel Services Division.

Although Intrico had a permanent president in place, it was governed by a board that consisted of representatives from all four parties who met once a month. "You cannot manage a development effort of this magnitude by getting together once a month," noted Mott, who was named in a suit brought by Marriott regarding the defunct reservation system project.

"Had they allowed the president of Intrico to function as CEO in a normal sense and empowered their senior reps [to] work together with a common goal and objective, it would have worked," he said. Mott further claimed that the partners never empowered Intrico to be anything more than a sales force, adding that each of the groups maintained separate identities.

"A system of this magnitude requires quintessential teamwork," he continued. "We essentially had four different groups. . . . It was a formula for failure."

MARK HALPER

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("","",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code 1 == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
          remove_xact(dbproc_commit, commid, 1);
      }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
      abort_xact(dbproc_commit, commid);
      error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL)
  {
      remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.C. McGoveran and C.J. Date: *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 466, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE  SAVINGS
SET     S_BALANCE = S_BALANCE - 250.00
WHERE   S_DEPOSITOR = 'JONES'
UPDATE  CHECKING
SET     C_BALANCE = C_BALANCE + 250.00
WHERE   C_DEPOSITOR = 'JONES'

COMMIT  WORK;
```

Early Client/Server RDBMS products, like Sybase, don't automatically assure the consistency of distributed transactions. When related data on multiple servers must be updated by one transaction, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications.

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Cabletron tackles LAN/SNA integration

BY ELISABETH HORWITT
CW STAFF

ROCHESTER, N.H. — Cabletron Systems, Inc. last week joined the eager throng of hub, router and communications controller vendors that are hoping to become vehicles for the integration of local-area network and IBM Systems Network Architecture (SNA) traffic.

Cabletron went a step further and also introduced products said to enable users to manage both SNA and Simple Network Management Protocol (SNMP) networking installations via its Spectrum network management platform.

Scheduled to ship next March, BlueVision consists of a NetView-based application for monitoring SNA devices and mainframe applications with a bidirectional link to Cabletron's Spectrum system. The latter is an SNMP-based system designed to manage a broad range of LAN and internetworking devices.

"In the battle between LAN managers and IS managers for management of SNA/LAN installations, we are letting customers choose" whether to manage from the IBM or the LAN side, according to Tom Burkardt, who is Cabletron's director of IBM connectivity products.

Information systems managers can manage SNA installations through a terminal emulation window into familiar, text-based NetView host applications or from Spectrum's icon-driven, "intuitive" graphical user interface, Burkardt said.

In addition, BlueVision allows managers to view SNA and LAN devices and traffic on the same console, for purposes of troubleshooting and capacity planning. This fits in with another Cabletron announcement last week to provide support for IBM Synchronous Data Link Control devices on its hubs (see story below).

Cabletron was smart enough to get its SNA networking and management capabilities from "companies that know and live by SNA, rather than reinvent the wheel," said Dick Boyle, a program director at Gartner Group, Inc., based in Stamford, Conn.

Old friends

Cabletron got the SNA management side of BlueVision from NetTech, a Raleigh, N.C.-based IBM business partner headed by a former IBM NetView developer, Cabletron said.

Right now, no one else offers the same level of integration between SNA and LAN management, Boyle said. IBM is keeping its SNA management on NetView, "which really doesn't understand SNMP," Boyle added.

Cabletron plans to enhance BlueVision with the ability to manage IBM Token Ring devices via IBM's LAN Network Manager application, Burkardt said. The vendor also plans to add management capabilities for some of the newer SNA products — possibly IBM's Advanced Peer-to-Peer Networking protocol, Burkardt said. BlueVision is tentatively priced at $14,995 for the core technology, Cabletron said.

Token of thanks

Users now have their first smart wiring hub alternative for blending IBM SNA and LANs. Last week, Cabletron announced a module for its Multi Media Access Center (MMAC) that reportedly allows IBM cluster controllers to sit directly on a Token Ring LAN.

Other hub vendors, such as 3Com Corp., are expected to follow suit soon with SNA-to-LAN modules, analysts predicted.

Cabletron's module leverages IBM-oriented vendor Synch Research, Inc.'s Synchronous Data Link Control-to-Logical Link Control (SDLC-to-LLC) conversion technology. SDLC is a bit-oriented protocol within an SNA network; LLC protocols are used in LAN communications.

Some IBM cluster controllers, such as the 3274 and older models of the 3174, cannot be outfitted with Token Ring adapter cards. Companies wishing to bring them into the Token Ring fold must replace them with a minimum Model 3174 63R, which lists for $8,700. Token Ring adapter cards for the newer models cost about $3,475. In contrast, MMAC conversion modules cost $3,495 for two ports and $5,195 for four ports.

"We have a lot of ancient controllers that could use a boost, so we are potentially interested," said Vincent G. Curatolo, vice president of distributed systems and services at Merrill Lynch & Co., a large MMAC shop in New York.

JOANIE M. WEXLER

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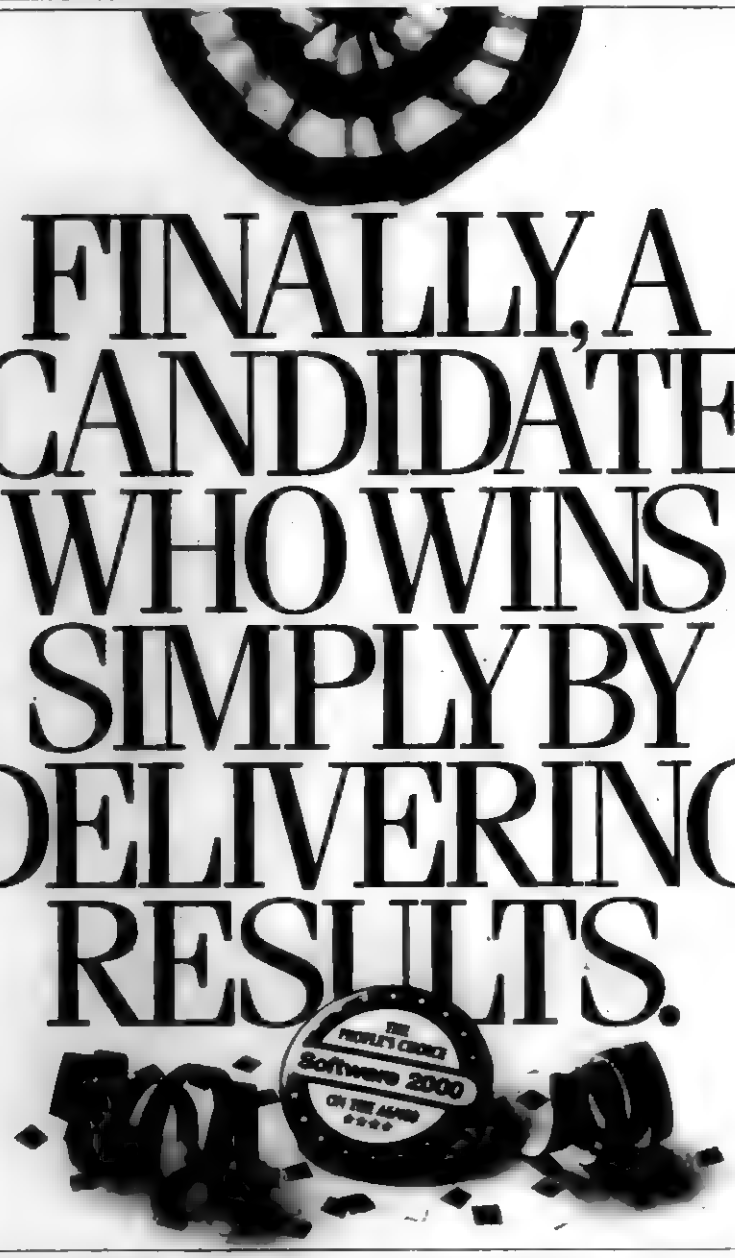

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Latest IBM notebooks outdo predecessors

Big Blue's ThinkPad line impresses users, analysts with aggressive pricing, innovative features

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — The release of three notebooks last week by IBM Personal Computer Co. may be a sign that the company has left behind its clumsy initial efforts in that crucial market.

The ThinkPad 700, 700C and 300 stack up to the competition, unlike their predecessors, the oversized, overpriced L40SX and the underpowered N51SLC and N51SX.

Users and analysts were impressed by the ThinkPad line, IBM's biggest ever portable announcement. Most said they saw it as a sign that IBM may be able to turn around its fortunes in the portable computer market.

On the ball

"I was really pleasantly surprised.... They did what they told us they were going to do, for the first time in a long time. And when can you remember the last time an IBM product was cheaper than somebody else's?" said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co.

Delivering on that promise means that the ThinkPad 700C, a new active-matrix color notebook that will have a street price of less than $4,000, will be the first IBM PC product in several months to appear on New York Life's approved products list, Nelson said.

Nelson added, "This product was on the drawing board before they [reorganized] so maybe it shows they're going in the right direction" as a company.

"It's yet to be determined how competitive they can be, but I think there's no question that IBM is getting more serious about this market," said David R. Korus, an analyst at Kidder, Peabody & Co.

"We will not be the premium price vendor in this market," affirmed Scott Bower, director of ThinkPad marketing.

IBM also made its ThinkPad 700T pen-based system generally available and released the EasyStation expansion station. It cut prices on its CL57SX and existing notebooks 11% to 44%.

The ThinkPad 700 and 700C use IBM's 486SLC chip and have a built-in Trackpoint II device, which sits between the G, H and B keys on the keyboard. Both put the floppy drive in the front of the system, instead of the side, and include a removable hard drive and upgradable modem. The processor can be upgraded to IBM's clock-doubling 486SLC2 in January.

When less is more
IBM's new notebook offers more features than its 2-year-old predecessor for less money

	IBM PS/2 Model L40SX	IBM Thinkpad 700/700C
Processor	20-MHz 80386SX	25-MHz 486SLC (upgradable)
Power cells	Nickel-cadmium battery	Nickel-metal hydride battery
Monitor	VGA monochrome screen	Upgradable to active-matrix color
Storage	60MB- or 80MB-byte hard drive	Removable hard drive
Weight	7.3 pounds	6.5 pounds
Price	$5,995 with 60MB-byte drive at introduction	$2,750, 80MB-byte hard drive $2,950, 120MB-byte hard drive $4,295, 120MB-byte drive/color screen

Sources: IBM
CW Chart: Michael Siggins

Swapping made easy

"The mouse integrated with a keyboard is a good solution ... and the removable hard drive would really simplify doing swap-outs in the field when you need to do maintenance and repairs," said Carrie M. Ulvestad, national manager of dealer and vehicle systems at Hyundai Motor America in Fountain Valley, Calif.

Analysts said that to be successful, IBM has to turn such favorable first impressions into sales, and it must be able to deliver products on demand.

"If you have great products and you can't deliver them, you don't get a second chance [in today's market]," said Andrew M. Seybold, editor in chief of the "Outlook on Professional Computing" newsletter in Brookdale, Calif.

IBM origin

Before the announcement, sources had speculated that IBM's high-end products would be built by AST Research, Inc., but in fact the 700 and 700T are designed and built by IBM. The 300 is manufactured by Zenith Data Systems under an existing agreement.

IBM's Robert L. Kanode, director of ThinkPad manufacturing, said he expects IBM and the market to move to build-to-order for notebooks within the next six months.

Analysts said IBM's push to add features was part of a trend in the notebook market, which had fallen into the same price-cutting battles as had desktop machines.

IBM previews ValuePoint PCs in Europe

BY MARTIN LAMONICA
IDG NEWS SERVICE

LONDON — IBM Europe's Personal System/ValuePoint (PS/VP) personal computer line, introduced last week, is expected to send another wave of price cutting through the already cut-throat PC market.

U.S. customers have been anticipating October delivery of the ValuePoint line, whose debut in the U.S. was recently delayed until later this month.

IBM is aiming the PS/VP line at all markets, including cost-conscious corporate users, said Rod De St. Croix, a PC analyst at International Data Corp.'s European Research Center here.

Gauntlet thrown

IBM is convinced that the ValuePoint line is aggressively priced. "We're not out to start a price war, but if anybody else wants to start one we'll finish it," said Howard Ford, Personal Systems director at IBM UK.

Pricing for the low-end PS/VP C series begins at $1,266 for a 25-MHz 386SLC system with 2M or 6M bytes of memory and a 80M- or 170M-byte hard disk. The PS/VP F series, based on Intel Corp.'s 25-MHz I486SX chip, starts at $1,601, while the 33-MHz I486DX-based M series starts at $1,993. The PS/VP W series, which features Intel's clock-doubling 33/66-MHz 486DX2, starts at $2,700.

The F, M and W series offer a choice of 4M, 8M or 16M bytes of random-access memory. The C and F lines come with 80M to 170M bytes of hard disk storage, and the M and W lines offer up to a 212M-byte hard disk.

The PS/ValuePoint line will compete with not only other PS/2 models but also IBM clones sold in Europe under the Ambra label by IBM's subsidiary ICPI, according to De St. Croix. ICPI's 486-based Sprinta is comparable to IBM's PS/VP M20 PC and costs $1,991, only $555 less.

CORRECTIONS

Because of reporting and editing errors, "Hertz revamp eyes HP minis, outsourcing" [CW, Oct. 5] contained several inaccuracies. Although Hertz has purchased several Hewlett-Packard Co. minis and is weighing various downsizing options, it has not committed to some of the migration plans mentioned in the story. Specifically, Hertz has not committed to moving its rate or credit card processing programs from IBM mainframes to HP systems. It has not migrated its reservation software from a Unisys Corp. mainframe to another HP mini. The company's outsourcing evaluation included proposals from one — not two — internal entities. Hertz Technologies, Inc. did not present the firm with an information systems proposal. And the migration plans were developed with the knowledge and supervision of Hertz senior management.

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Because of a reporting error, a story in the Oct. 5 issue referred to Charles Biebighauser, former vice president of operations at the Intrico travel industry consortium, as an executive at AMR Information Services, Inc. AMRIS was a member of Intrico.

Laptop thefts spur security efforts

CONTINUED FROM PAGE 1

The list of people who have had laptop PCs stolen ranges from U.S. Army General Norman Schwarzkopf, whose plans for the January 1991 strike against Iraq were on the machine, to Compaq Computer Corp. Chairman Ben Rosen. Schwarzkopf got his back (and subsequently changed those battle plans); Rosen did not.

NCR Corp. executives in Paris also got a rude surprise upon returning to the Nikko Hotel after dinner one night. They found the doors to their hotel rooms removed from the hinges. The only things taken by the nimble-fingered thieves were two laptops containing valuable corporate secrets, according to security consultant Paul Joyal, former security director for the Senate Intelligence Committee. An NCR spokesman, however, called the story a myth.

Joyal, now president of the Silver Spring, Md.-based security firm Integer, Inc., said he learned from insiders that French intelligence agents stole the machines. "You have some very smart people walking around with the keys to the kingdom under their arm, yet they treat it like a toy," Joyal said.

Many firms are starting to come to grips with the problem, but only after getting burned. An information systems director at one large chemicals plant said, "We finally became aware of just how vulnerable we were when the laptops started disappearing. There's a lot of competitive data on these things, so it's like stealing files out of a filing cabinet."

> "FIRST THING I want to do is nail the sucker down."
>
> BRIAN REDLER
> THE EQUITABLE

Some firms have come up with ingenious ways of denying access to information even when a laptop is stolen. At Conde Nast Publications, Inc., an identification chip has been placed in the laptop to verify the user's authentication to the mainframe. If a laptop is stolen, access is turned off to that machine. The next time someone tries to dial up on the stolen laptop, the mainframe sends out a program that erases their hard disk.

Companies such as Shearson Lehman Brothers, Inc., Paine-Webber, Inc., Martin Marietta Corp., Grumman Corp. and The Boeing Co. have already instituted stringent portable computer protection policies. And Ryder Truck Rental, Inc. in Miami has an entire department responsible for laptop security.

Methods vary, but experts suggest that a good first step is to physically secure the computer. Companies such as San Rafael, Calif.-based PC Guardian sell 5-ft steel security cables to tightly attach a laptop or notebook to a desk or table.

"First thing I want to do is nail the sucker down," said Brian Redler, manager of information security at The Equitable insurance company in New York.

Step 2 should involve encrypting the data. Beaver Computer Corp. in San Jose, Calif., has a product that encrypts the data on a laptop's floppies and hard drive. Information cannot be accessed without a password. Better yet: "Only allow people on the road to store information to their floppy," Joyal said. "Then when they're done working, they can just carry the floppy around with them."

Another strategy is forwarded by Security Dynamics Technologies, Inc. in Cambridge, Mass. Its SecurID works in tandem with the host mainframe to continually change the logon used to dial in. A logon that was good when a laptop was lifted may be obsolete minutes later.

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Lotus to give Notes packaging a face-lift

Company looking for ways to combat user view of groupware product as being too expensive

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. hopes to soon snuff out the lingering perception that its Notes groupware platform is too expensive and too large by introducing some new packaging schemes that will position it as easier and cheaper to install.

Company executives said Lotus also continues to look for ways to push Notes out to greater numbers of users, but they added the firm does not currently plan to release a scaled-down or runtime version of Notes.

"A concept that some users have been asking for is a runtime model. That's something that we've talked about," said Robert Weiler, Lotus' senior vice president of North American operations. "We do not have something like that coming. Not now."

Several Notes users contacted last week said they had discussed the notion of a scaled-down version of the software, or Notes Lite, either with Lotus officials or at user group meetings but had not yet received final word from the company.

Kevin Brown, chairman of the Boston Notes User Group, said he had heard of a scaled-down product that would include "the ready-made applications and the ability to use mail." Sample Notes applications are delivered with all releases of Notes.

In addition, other users said they had heard Lotus would deliver a version without the full-blown application development environment.

On the notion of scaled-down Notes, Brown said that while no confirmation had come from Lotus, "it would be a good idea because it is a way to get Notes more embedded."

Cliff Conneighton, director of marketing for communications products at Lotus, said, "A lot of people have a lot of ideas on how to get Notes out to more and more people. Our goal is to get it out to more people, but we have more implementation work to do on that."

Weiler said new Notes packaging, scheduled to be introduced this week at Networld '92 in Dallas, will at least help nagging cost issues. While value-added resellers (VAR) already sell Notes in small quantities, the packaging was designed to reinforce the notion that users can license only a few copies. The packaging will also include new installation documentation designed to make it easier to bring up a Notes environment.

"This is to get away from the concept our adversaries keep trying to pump out about Notes being a [$62,500], enterprisewide product," Weiler said.

The group packs are aimed at companies and users wishing to do small pilot projects.

Lotus actually eased up on pricing restrictions months ago by discontinuing its policy of requiring a 200-node minimum, which took the price of Notes above $60,000. Lotus and its VARs have been working with a Notes list price of $495 per user.

Notes nears 1,000 served

Lotus is shooting to hit the 1,000 mark for Notes customers by year's end.

As of early this month, the company counted 800 customers, nearly 200 of which were picked up since June from the IBM/Lotus deal. When IBM selected Notes as the local-area network piece of its office strategy in June — effectively killing its own OfficeVision/2 LAN efforts — it also offered a trade-in deal for its office LAN customers to move to the Lotus software. This trade-in program expired Sept. 30.

Robert Weiler, senior vice president of North American operations at Lotus, said 187 IBM customers took IBM up on its offer. Richard Sullivan, director of office marketing at IBM's U.S. marketing group, said that number represented 60% of its total OfficeVision LAN users. The remaining 40% have so far elected to stay with the IBM LAN software.

Weiler said that without the IBM deal, Lotus would "still be trying to establish credibility. Companies have said to us that without IBM, you guys would still be talking to our guy who buys spreadsheets."

The OfficeVision/2 LAN deal was actually an extension of a 1991 agreement that set up IBM as a remarketer of Notes. However, Weiler said the LAN piece was critical to winning over IBM users. "A lot of people were waiting for [OfficeVision/2] LAN. These were people who had money budgeted or were waiting for it," Weiler said.

ROSEMARY HAMILTON

BeyondMail gives users access to Notes data

Cheaper approach may force Lotus to cut prices

BY JOANIE M. WEXLER
CW STAFF

CAMBRIDGE, Mass. — In a move lauded as the industry's first step toward mix-and-match groupware, a third-party vendor last week gave electronic-mail users access to Lotus Development Corp.'s Notes databases without having to run a Notes client.

Analysts said the announcement is likely to cause Lotus to rethink its Notes pricing structure, something Lotus executives last week indicated they are not currently planning to do (see story above).

Beyond, Inc. rolled out BeyondMail for Lotus' Notes, a Microsoft Corp. Windows-based version of its messaging system that gives non-Notes users limited participation in Notes conversations for about one-fifth the cost of running a Notes client.

Modular separation

Users and analysts expressed relief at what they consider to be the kickoff of a trend toward separating mail front and back ends. Such modularity would allow users to choose their interface and messaging features independently from an underlying mail engine.

"What must happen overall is that mail front ends get separated from back ends," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. (PG&E) in San Francisco. PG&E is a Notes shop that does not use the Notes integrated messaging capability, in part because it is "rudimentary," Beckman said.

Beckman also said he does not want to have to gateway between his Banyan Systems, Inc. Vines network system software and the Notes mail systems and run two parallel systems. The Beyond product does not require a BeyondMail-to-Notes gateway.

Notes participation

Also key: Beyond has beaten Lotus to the punch in integrating its mail system with most Notes groupware functionality. Lotus has yet to allow its own CC:Mail package to participate in Notes. In fact, some users have criticized Lotus for not enabling them to easily integrate applications from other vendors into Notes.

However, several observers agreed that large Notes shops looking for inexpensive client alternatives are not likely to rush to Beyond for their enterprise messaging platform, although that is Beyond's stated goal.

One reason is that they expect their current mail vendors to begin adding to their own software at least some of the sophisticated sorting and filtering capabilities that are Beyond's strength.

"My guess is that everyone will build in mail-filtering capabilities eventually," said Howard Maynard, senior vice president and director of MIS at Young & Rubicam, Inc., a worldwide advertising agency and large Notes user. Young & Rubicam already uses a variety of mail systems, including CC:Mail.

In fact, 1,200 CC:Mail users at a user group meeting in San Francisco last month saw a demonstration of a CC:Mail version that contains some filtering capabilities, although Lotus did not announce a delivery date.

In addition, because Beyond is a relatively small mail vendor — with about 100,000 users compared with 2 million CC:Mail desktops — users might not be willing to turn to the lesser known technology for an enterprise system.

"I'm not interested in mail for Notes access it if requires me to learn a new system," Maynard said. "While saving $300+ per user is a lot of money, it's not so much if you consider the total investment in energy, training and consistency" throughout a large firm.

Lotus' Notes lists for $495 for a client/server software bundle. BeyondMail for Lotus' Notes costs about $100 per desktop. CC:Mail in large installations has dropped to less than $50 per desktop, according to David Whitten, program director of office information systems service at Gartner Group, Inc., a Stamford, Conn.-based consultancy.

However, the economics of the Beyond move "force Lotus to rethink its [Notes] pricing," said David Coursey, editor of "P.C. Letter," an industry newsletter owned by *Infoworld*, a sister publication to *Computerworld*.

To date, Lotus has not announced a plan to allow a CC:Mail-only user to access Notes data, "nor is it in their best interest to do so" because it could curb Notes sales, Coursey said. "However, Beyond and others will be able force their hand."

E-Mail skips need for Notes client

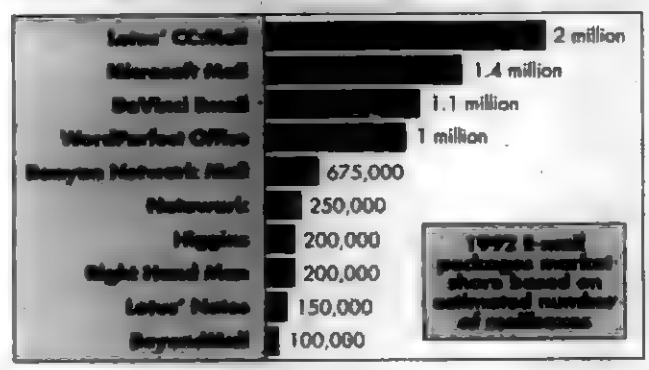
AT A GLANCE:

BeyondMail for Notes

- Microsoft Windows-based.
- Replaces Notes Mail front end.
- Gives BeyondMail users access to Notes databases and conversations without requiring a Notes client.
- About $100 per desktop.
- Availability slated for first-quarter 1993.

Growing competition

BeyondMail has a long way to go to catch CC:Mail



Source: "Electronic Mail and Micro"

CW Chart: Stephanie Faucher

Messaging costs cut by Novell

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — Amid a divisional reorganization started about six weeks ago, Novell, Inc. last week slashed prices for its neophyte Global Messaging Server by roughly 70% and added some of the key mail protocols it pledged to support when it announced the product in March.

The goal behind reducing prices of the NetWare-integrated distributed messaging system to under $7 per mailbox was the realization that "we need scalable pricing available to a wider range of users," said Arvind Agrawal, vice president and general manager of Novell's Messaging Products Division. "We want to give the technology a boost . . . by making available a widely deployed messaging infrastructure."

However, while the price reduction "could provide incentive to users, it will take time for Novell's strategy to take hold," said Judith Rosall, an analyst at International Data Corp. in Framingham, Mass.

Rosall also predicted the move will not spur a price war because competing products from SoftSwitch, Inc., Digital Equipment Corp., Microsoft Corp. and Hewlett-Packard Co. do not make for apples to apples cost comparisons. Novell also filled in its blueprint for integrating Unix-oriented Simple Mail Transfer Protocol (SMTP), IBM's Systems Network Architecture Distribution System (SNADS) and X.400 protocols into its Message Handling Service-based Global Messaging engine, which has been shipping for about two months.

Prices and availability are as follows:

- **SMTP:** $2,995 for an unlimited user version; available in late November.
- **SNADS:** $2,495 for a 20-user version and $6,995 for an unlimited user version; available now.
- **X.400:** $6,995 for an unlimited user version; available first quarter 1993.

Bypass goes nationwide

BY JOANIE M. WEXLER
CW STAFF

OAKBROOK TERRACE, Ill. — On the heels of a recent Federal Communications Commission decision allowing alternative access carriers to link into local public networks for long-distance access, MFS Datanet, Inc. last week rolled out a nationwide local-area network interconnection service.

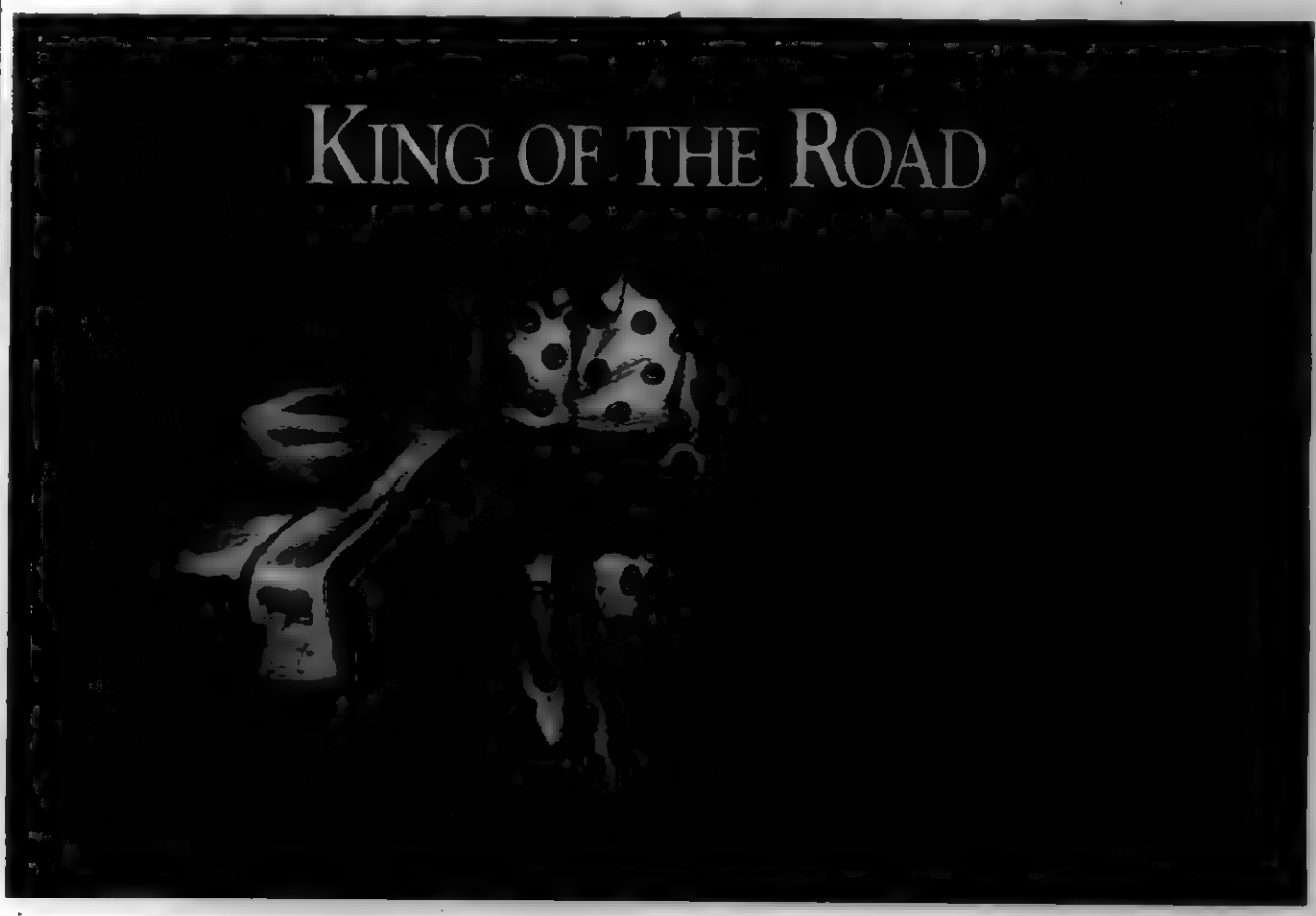
With the announcement of its High-speed LAN Interconnect (HLI) service, MFS has become the first "bypass" carrier to extend its network beyond metropolitan-area islands.

The recent FCC ruling allowing MFS Datanet and others to connect to existing long-distance networks through local Bell company networks will bring the service to market more quickly and less expensively than if the carrier had to build its own network infrastructure, said Al Fenn, MFS Datanet president.

HLI will provide users with wide-area speeds equivalent to the native speed of the LANs attached to either end, Fenn explained. The carrier said it intends to deliver the service over T3 (45M bit/sec.) and Asynchronous Transfer Mode infrastructures.

The service will initially roll out in December in Washington, D.C., New York and Chicago and is slated to be available by mid-1993 in all 14 metropolitan areas now serviced by MFS.

Pricewise, Fenn quoted a $4,800-per-month price for linking Ethernets between Boston and Washington, D.C. User sites in each city would pay $900 per month, plus share a fixed $3,000-per-month intercity transport fee.



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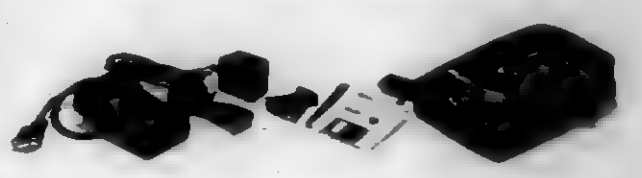

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NEWS SHORTS

EDS, HDS execs shuffle

John Staedke

Electronic Data Systems Corp. last week plucked Gary B. Moore from his post as chief executive officer of Hitachi Data Systems Corp. and named him chairman of EDS Japan. He was replaced by John Staedke, 51, another former EDS executive who became HDS' executive vice president of marketing last year. Moore should strengthen ties between Hitachi and EDS, analysts suggested.

DEC management moves begin

Digital Equipment Corp. CEO Robert Palmer moved quickly last week to appoint William Strecker vice president of engineering and chief technology officer and to appoint Richard Poulsen president of Digital Europe. Poulsen replaces Pier Carlo Falotti, who departed in July to become CEO of The Ask Cos. Bobby Choonavala succeeds Poulsen as vice president of DEC's General International Area (GIA). The GIA covers all countries except the U.S., Europe and Africa.

Intersolv to buy developer

Intersolv, Inc. intends to buy the major assets of Interport Software Corp., a Fairfax, Va.-based developer that recently filed for Chapter 11 protection. Interport developed some of the technology used in Design Recovery, Intersolv's re-engineering tool set announced in January. About 10 of Interport's approximately 30 employees are expected to join Intersolv.

Software piracy bill passes

Just hours before adjourning last week, the U.S. Senate approved a bill, passed earlier by the House, that imposes felony criminal penalties — including prison sentences of up to 10 years — for unauthorized copying of software, which is defined as illegal copying of 10 or more copies with a retail value of $2,500 or more in a 180-day period. The president is expected to sign the legislation.

FDDI prices keep dropping

The cost of a single link to a 100M bit/sec. Fiber Distributed Data Interface network running over copper wiring has dropped below $1,000. Interphase Corp. in Dallas last week rolled out a $995 adapter for Extended Industry Standard Architecture-based personal computers and workstations and a $1,495 single-attach fiber version. Until now, single-attach copper connections have hovered in the $1,300 to $1,500 range.

Short takes

Calgary, Alberta-based **Amoco Petroleum Co.** last week said it has signed a five-year data processing and network operations outsourcing contract with **SHL Systemhouse, Inc.** valued at $70 to $90 million. . . . **Memorex Telex Corp.** and **Amperif Corp.** in Chatsworth, Calif., said they will jointly develop an IBM-compatible redundant arrays of inexpensive disks (RAID) product to compete with **Storage Technology Corp.**'s Iceberg RAID disk array. But they did not give shipping dates. . . . DEC last week broke ground for a semiconductor facility in Hudson, Mass., that will manufacture future versions of DEC's Alpha 64-bit microprocessors. . . . The **Internal Revenue Service** has awarded **Unisys Government Systems, Inc.**, a Unisys Corp. subsidiary, a one-year, $115 million contract to provide information systems, application and system software support and training to support the IRS' tax returns processing. . . . DEC said it will develop and incorporate **X/Open Co.** XPG4 specifications across the company's Open VMS and Unix platforms. . . . The **U.S. Council on International Banking** is co-sponsoring a study to find out whether, how and to what extent information technology is making banks more productive. . . . **GE Information Services** announced a new, Unix-based electronic data interchange translation and management system.

Sun slowed by overloaded plate

CONTINUED FROM PAGE 1

thing, and the local sales office doesn't know what's going on," said Harry Perrin, assistant vice president of investment systems at Teachers Insurance Annuity Association in New York, one of Sun's large commercial customers, with 340 workstations.

"The delays have been very annoying, but it's more a credibility issue now than anything else," Perrin added. He ordered 30 of the SPARCstation 10 Model 41s in May and then agreed to one of Sun's upgrade plans as an interim step. He bought SPARCstation 2s with the promise of an upgrade to the Model 41s. When he tried to swap the SPARCstation 2s for the smaller Model 20s, however, Perrin discovered he was locked in to the prior promotion and had to wait.

Mark Factor, MIS director at the Boston-based Au Bon Pain, Inc. chain of French bakery cafes, also declared himself "very disappointed in Sun" after a Model 41 he was promised in August never materialized.

"Sun has to realize they're not dealing with a single-user workstation base anymore," Factor said. "They have whole corporate enterprises relying on them. They've got to think a little more like IBM would, not like a standard PC maker."

At Du Pont Co. in Wilmington, Del., the research and development department opted to buy SPARCstation 10 clones rather than wait. "You just can't get them from Sun," said David Pensak, corporate adviser for computer technology at Du Pont's R&D lab. "When we asked, they said they had no idea when they could ship. So we ordered clones."

Pensak said he was also unimpressed with the SPARCstation 10 Model 20 — an "interim," unadvertised machine based on a 33-MHz version of TI's Viking SuperSPARC chip. The Model 30 runs at a 36-MHz clock speed, while the tardy Model 41 will run at 40 MHz. "I'd rather buy a first-class ticket on the *HMS Titanic* than do a limited-availability machine," Pensak said.

Although some Sun sales representatives have been blaming TI's chip production problems for the hardware delay, Sun officials stressed that TI has met all production targets and is not at fault. The sales force "shouldn't be telling [customers] that story," Gadre said.

Other users have a more resigned view of the delays.

"I guess I'm kind of jaded," said Bob Vick, systems manager at Fidelity Investments, Inc. in Boston, which just received four SPARCstation 10s two weeks ago. "Every hardware and software vendor promises things before they're able to deliver."

While the hardware delays may be vexing to some users in the short term, Sun is facing a far more difficult and long-term job persuading users to move to Solaris 2.0.

"Solaris 2.0 scares us to death," said Jerry McEachern, manager of technology resources at the *Houston Chronicle*, which is building an open systems installation that will eventually include 1,000 Sun systems. "Our applications are written specifically for the current operating system, and it's going to be a big change for us."

Chip wave

The long-awaited "Tsunami" chip for low-end workstations in the Scalable Processor Architecture (SPARC) market splashed ashore last week as TI and Sun unveiled their jointly developed microSPARC chip.

This 50-MHz single-chip microprocessor holds forth the threat of low-priced workstations that can invade high-end personal computer territory with superior performance and greater scalability. Samples of the microSPARC processor are available now from TI for $500. Volume production in the fourth quarter of this year will provide microSPARCs at $179 each for 10,000 unit quantities.

Sun is expected to introduce a low-end, under-$5,000 color workstation based on the microSPARC chip next month. TI officials said a raft of other SPARC-compatible products will follow as well, including X Window System terminals, portables and desktop systems.

"At $179, the 50-MHz microSPARC has substantially higher performance in terms of MIPS than the [Intel Corp.] 486DX microprocessor, but it sells for about half the price," said Wally Thines, executive vice president of TI's semiconductor group.

"This chip certainly represents the next stage in this whole convergence of the PC coming up and the workstation coming down," said Ken Anderson, author of a comprehensive guide to Unix workstations published by Altus, Inc. in Santa Ana, Calif. "This also feeds into Sun's strategy to drive the cost of the desktop down as far as they can with a lot of performance."

The low-end Sun workstation will be the first high-volume platform shipping with the new Solaris 2.0 operating system.

MARYFRAN JOHNSON

Amdahl gives Unix a boost

SUNNYVALE, Calif. — Amdahl Corp. last week aligned its 11-year-old UTS Unix system with Unix System Laboratories, Inc.'s (USL) System V, Release 4, making it easier for users to move toward a single Unix standard at mixed-vendor sites. The firm announced UTS 4 as an enhanced version of its 2-year-old UTS 2.1 operating system for IBM-compatible mainframes.

Amdahl has several hundred UTS sites worldwide but hopes to ride the open systems wave to gain more. To that end, UTS 4 supports most major Unix standards. It is based on USL's System V, Release 4.1 ES, which combines features from several flavors of Unix.

But UTS users will have to change some binary code to gain full advantage of UTS 4 features, said Mark Bussmann, Amdahl's director of open systems marketing. Amdahl is providing migration aids to revise UTS 2.1 code and will allow users to have both UTS 2.1 and UTS 4 for 90 days at no extra charge.

Analysts said they doubt whether many IBM-compatible mainframe sites would jump on the open systems bandwagon.

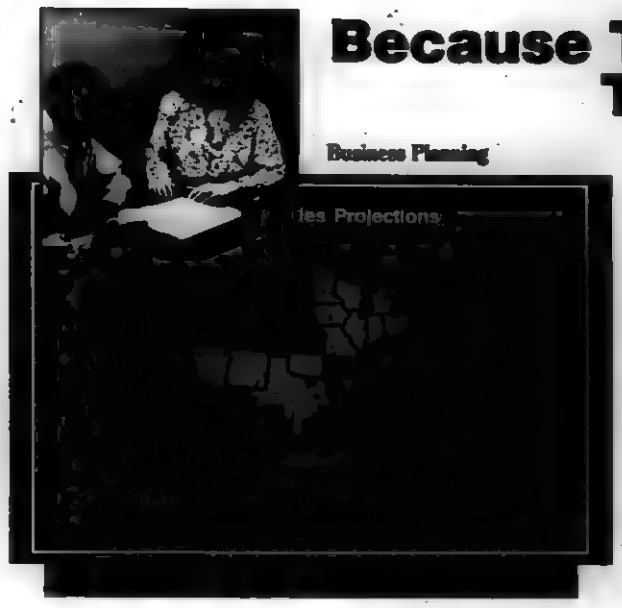
"It does not appear that Amdahl is creating a market so much as they are responding to a niche opportunity," noted Mark Hess, vice president of Gartner Group, Inc.'s large-computer group in Stamford, Conn.

"It will make our Unix platforms even more compatible," said UTS 2.1 user Peter Bauer, director of information systems at the Marshfield Clinic. The Marshfield, Wis., site runs Unix on an Amdahl 5995 A mainframe, a Data General Corp. laboratory computer and Unix workstations.

UTS 4 will be generally available in the first quarter of 1993, with prices ranging from $20,000 to $45,000 — the same price range as UTS 2.1.

Monthly license fees range from $4,500 to $34,500, depending on the size of the computer.

JEAN S. BOZMAN



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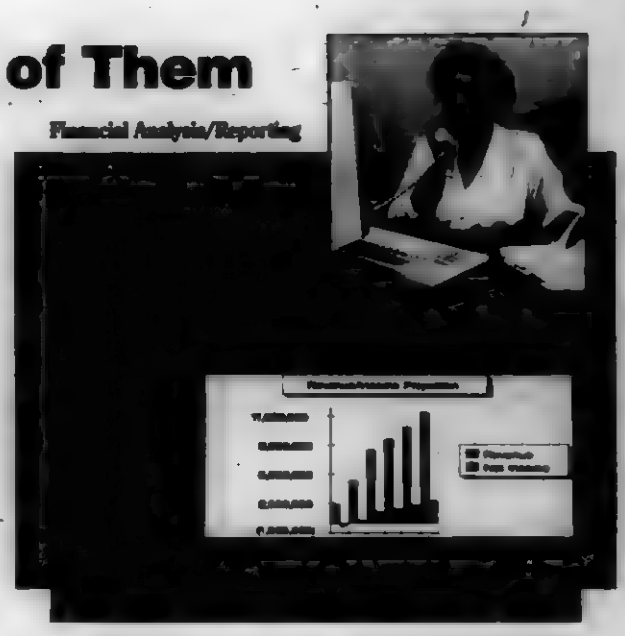

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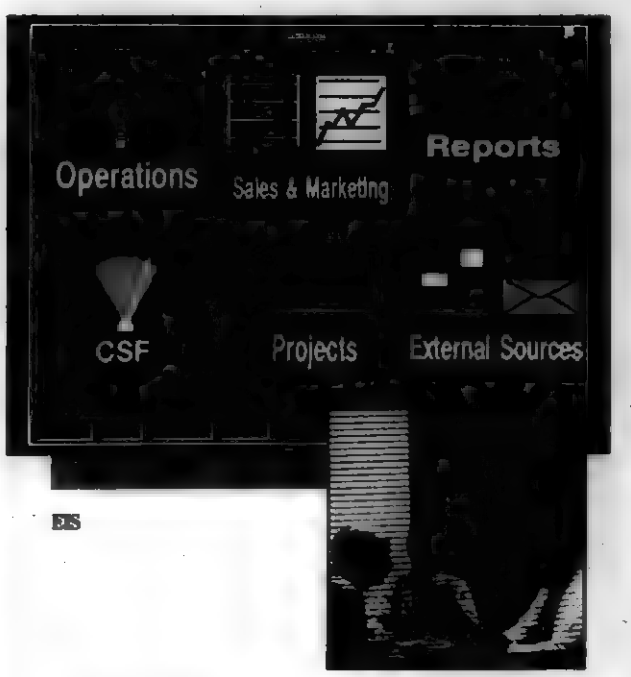

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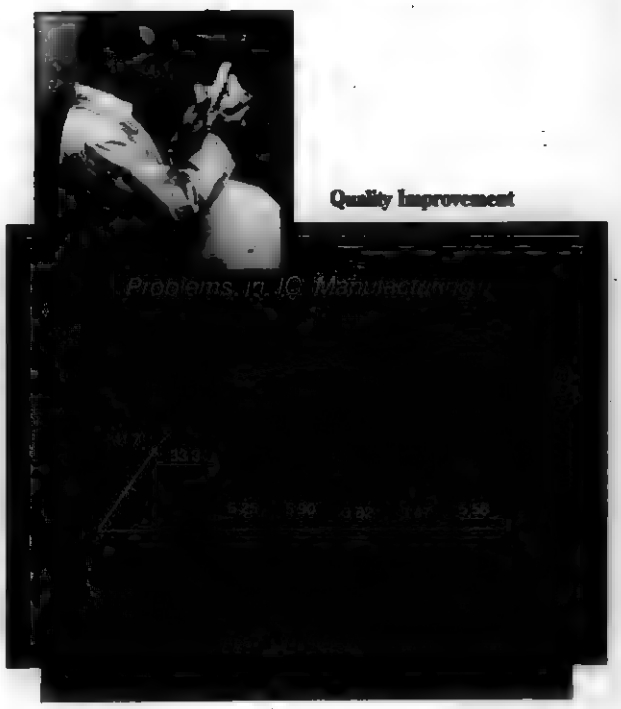

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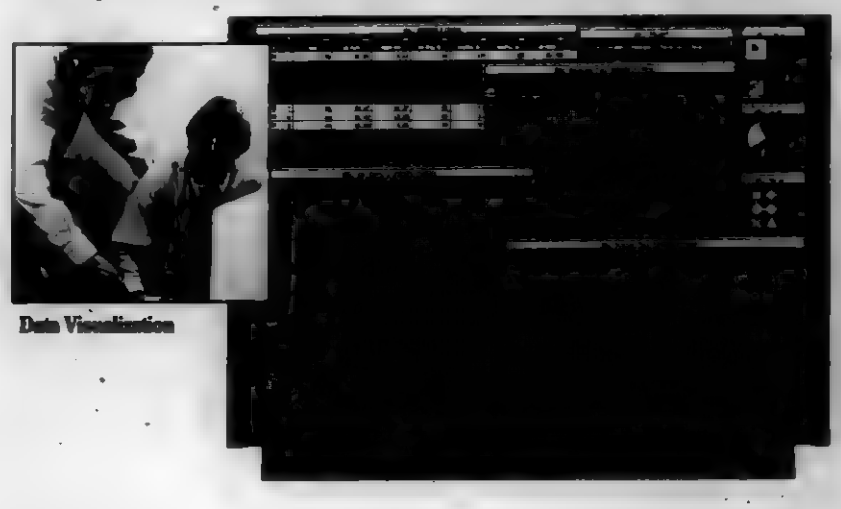

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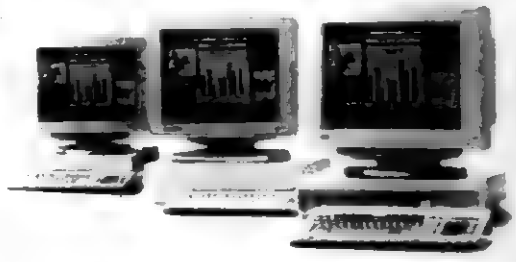

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HEWLETT PACKARD

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Best route to CASE

CONTINUED FROM PAGE 1

niques. The right mix of caution, perspective and experimentalism is key, according to 10 heavily invested users interviewed by *Computerworld*.

Users have shifted their focus to bigger concepts once wholly separate from application development. Business process re-engineering, for example, now serves as an entree for CASE products. The current rage to plot and remake how a firm does business calls for just the tack CASE takes, proponents say. By looking at information systems in chunks of tasks or models, CASE philosophy meshes with that of business process re-engineering.

The definition of CASE is growing from "set of tools" to "way of thinking," according to Peter Cobin, manager of technical analysis at Otis Elevator, Inc. in Farmington, Conn.

Moreover, done right, CASE is never finished.

Cobin and other users have teamed CASE with project management tools that provide an enterprisewide view of IS rather than focusing on single development tasks. CASE users must be intimately involved in business planning to really exploit the technology, agreed Bernie Stephan, director of special technical services at Computer Power Group's San Francisco office.

Slow is a watchword for CASE shops. Several users who slapped tools in place and dove into development later regretted their haste. "Whatever you do, don't slam people up against a harsh deadline to learn this stuff," advised Kim Albee, a member of the research and integration team at the *Minneapolis Star Tribune*. The newspaper plans to rewrite six major applications, with a go-live target of January 1994, using KnowledgeWare, Inc. tools.

Also part of the group therapy is learning, en masse, a new way of programming. That is, developers must abandon a line-by-line code-writing style for business and data modeling. Programmers must drop a solo, craftsmanlike approach for an orderly, team-oriented method.

"You're no longer developing in a vacuum, doing each system separately," explained Ray Speight, development manager at North Carolina's Department of Administration.

Many CASE initiatives run into training woes

CASE is making a double-duty downsizing and data center consolidation possible at the Federal Reserve System, which plans to whittle 12 processing hubs to three by 1994. And that project — at least in one district — has brought home the need to face up to training issues. The "T" word, it seems, is cause for grief in many CASE shops.

Take the bank's San Francisco office. Efforts to pilot an automatic check-handling system using KnowledgeWare's Application Development Workbench (ADW) for front-end analysis and design work hit a snag when, at code-generation time, the staff reverted to manual Cobol writing.

Federal Reserve System
San Francisco

Business:
Nationwide banking network that sets U.S. monetary policy.

CASE tools:
KnowledgeWare's ADW since 1990.

Biggest lesson:
Without on-line tools for project management and guidelines, you risk getting mired in development methods you don't understand.

"We just didn't have time to use KnowledgeWare's generator," said MIS manager Masako Velasquez. "Our training wasn't that complete."

That is probably because Velasquez's group may have underestimated the amount of training CASE requires.

It did not set up a methodical instruction program led by an outside party, a tactic imperative to doing good CASE, experts said. Federal Reserve simply handed the tool to developers to play with to see what they could construct, she said.

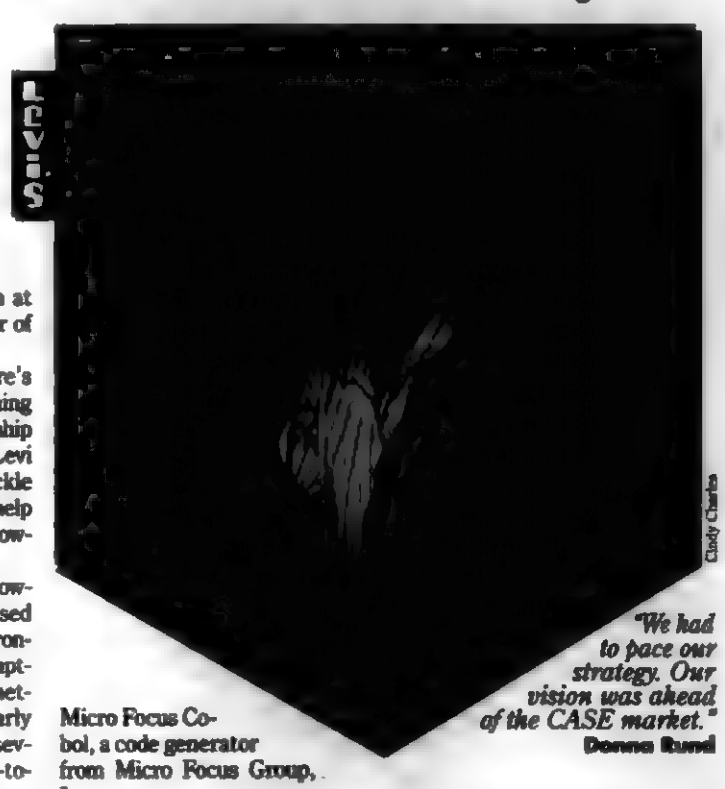
However, like other integrated CASE tools, ADW is time-consuming to learn because training Cobol programmers in the information engineering methodology is a big hurdle. "A new methodology means a new mind-set," Velasquez noted.

So Velasquez is taking a step backward before moving forward by hiring Ernst & Young to help the staff learn information engineering, data modeling and other techniques for organizing development projects.

A wiser Velasquez now offers one caveat for new users: Do not underestimate the culture shock your shop will experience.

Being a trailblazer isn't easy

Levi Strauss & Co. doesn't have CASE all sewn up, but the jeans maker has been on the cutting edge of the technology since its 1989 investment in KnowledgeWare's Application Development Workbench (ADW).



Cindy Charles

"We had to pace our strategy. Our vision was ahead of the CASE market."
Donna Rund

Sound nice? It was no fun at all, says Donna Rund, director of information engineering.

As one of KnowledgeWare's biggest customers, the clothing firm enjoys a close relationship with the vendor. But Levi Strauss has often had to tackle problems before the tools to help have existed from either KnowledgeWare or other vendors.

That is not necessarily KnowledgeWare's fault: Rund crossed application development frontiers. For example, she attempted cooperative, local-area network-based development early on, setting up teams of six or seven programmers for a start-to-finish pilot project with ADW.

Although automation did speed up parts of the development process, productivity actually fell because the tool set was organized so that just one person could work on a section at a time.

Levi Strauss & Co.
San Francisco

Business:
$4 billion clothing maker.

CASE tools:
KnowledgeWare's ADW since 1989.

Biggest lesson:
You name it.

"We [learned we] had to pace our strategy. Our vision was ahead of the CASE market," Rund explained.

So Levi Strauss invented its own LAN development system, folding into the ADW scheme CA-Telon, a fourth-generation language now sold by Computer Associates International, Inc., and Micro Focus Cobol, a code generator from Micro Focus Group, Inc.

Other large KnowledgeWare users visit Levi Strauss to learn from its mistakes and successes, such as mixing tools from different vendors. Visitors such as Humana, Inc. and The Gap, Inc. take home nitty-gritty information such as just how integrated data types are or which data or process model layer you can drill down to — details not always available at vendor-sponsored user-group meetings.

One of the thornier problems in the beginning for Levi was sorting out which glitches were caused by ADW and which resulted from a programmer skill base ill-suited for CASE.

Sometimes ADW took more arrows because of a lack of appropriate skills than because of actual faults, Rund observed.

CASE is now a key piece of Levi Strauss' massive effort to re-engineer its business worldwide. CASE focuses on a balance of business and technical skills, which are "what we need going into the future," Rund said. But CASE is too narrow a vision for Levi Strauss. Which products the company uses matters less than shifting programmer orientation.

"We have to think in piles of design, not piles of lines of code," she said.

CASE helps forge business/IS alliance

It is not as cozy as, say, a Democratic bus ride across the Midwest, but the relationship between business and information systems at Ultramar Canada, Inc. is closer than it was two years ago. And CASE was the lubricant, according to Ian Wickins, supervisor of wholesale systems.

Ultramar Canada, Inc.
Toronto

Business:
$12 million oil company.

CASE tools:
Combination of products from Bachman Information Systems, Intersolv, Inc. and IBM since 1990.

Biggest lesson:
Never underestimate the amount of training programmers will need.

"Whether we [in IS] are making inroads in setting business direction, I don't know," Wickins said. "But we're involved an awful lot in showing them ways to improve what directions they are taking."

While Ultramar has hired its three CASE vendors for tool instruction, the oil company relies on internal executives to teach IS about the business side of the house.

Where CASE comes in is the role it played in pointing out the need for Ultramar's IS staff to build business acumen in addition to technological know-how. This resulted in the firm's devising a training profile for each programmer that assessed business savvy, tool proficiency, interpersonal skills and time management. As a result of tying the profiles to regular performance reviews, according to Wickins, Ultramar has witnessed 15 of 40 projects in the last year coming in on time and within budget.

In the process, IS has taught management a thing or two, Wickins said. For example, an IBM DB2-based point-of-sale (POS) system erected last year was designed using products from Bachman Information Systems, Inc. to interface with existing applications. The POS program collects customer data that is later used for marketing and billing.

It is a relatively simple application, but one that IS — not management — invented, according to Wickins. "We probably wouldn't have gotten moving on it without the business training," he added. He said IS' new understanding of how Ultramar functions lets developers come up with better ways to get those jobs done, rather than reacting to user requests.

STORIES BY KIM S. NASH

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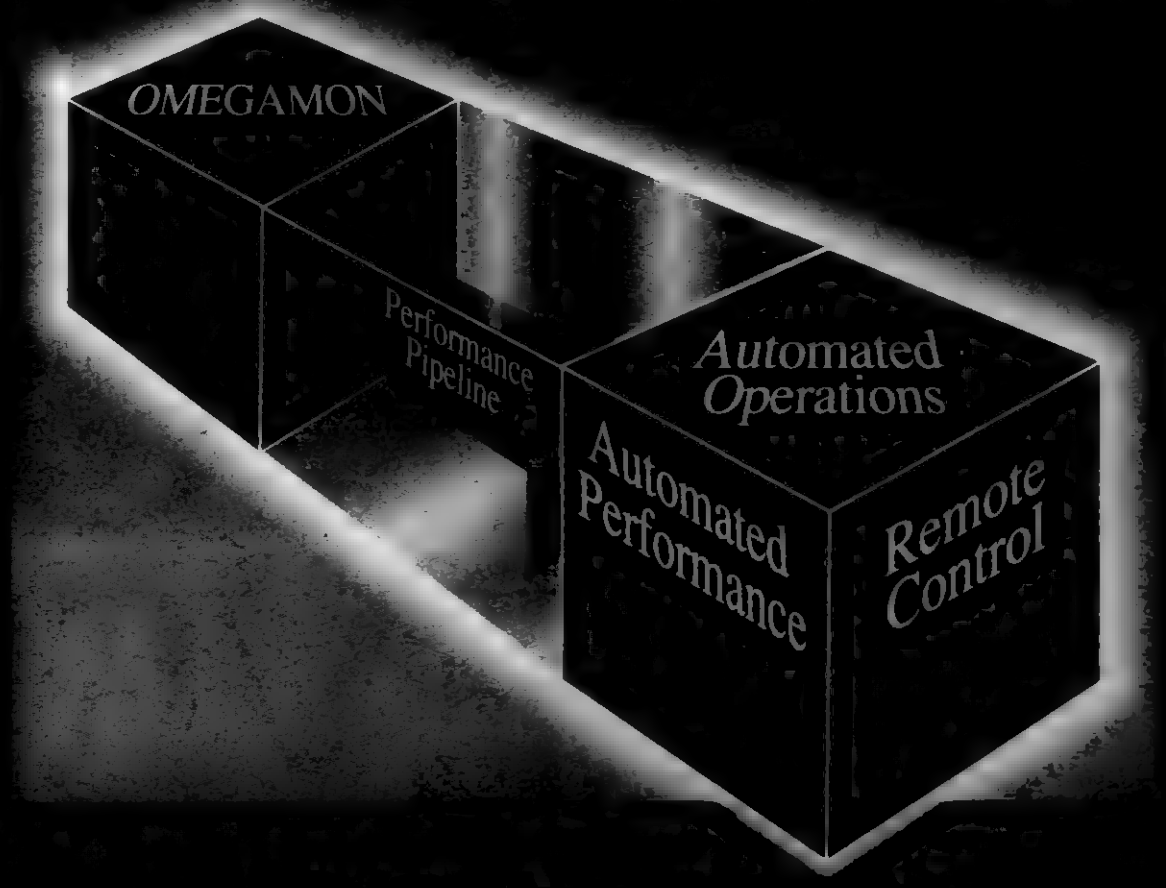

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DEC makes massively parallel move

Parasphere software environment offers many tools to ease application development

BY MELINDA-CAROL BALLOU
CW STAFF

CAMBRIDGE, Mass. — Digital Equipment Corp. is attempting to cultivate the nascent massively parallel computing market via a combination of repackaged hardware, university seeding programs and software products that speed application development.

"Our goal is to simplify the development environment so that you don't have to be a rocket scientist programmer or research specialist to take advantage of parallel processing," said Ram Appalaraju, DECmpp program manager, at a briefing here last week. Analysts said that both the lack of tools and the extreme difficulty of creating applications has hampered the growth of the massively parallel market.

DEC's massively parallel software environment, dubbed Parasphere, includes a "revamped" Motif-based implementation of DEC's Digital Parallel Programming Environment (DPPE). Originally developed by Maspar Computer Corp. in Sunnyvale, Calif., DEC's version of DPPE uses the DECfuse computer-aided software engineering tool kit and a Fortran compiler based on specifications drawn up by the High-Performance Fortran Forum, a consortium of parallel computing vendors and researchers.

DPPE includes a DECmpp Parallel Performance Analyzer to fine-tune parallel programs and a DECmpp Parallel Debugger to automatically identify code problems.

DECmpp High-Performance Fortran adds parallel extensions to standard Fortran.

"[DEC's] overreaching software environment is impressive — ISVs [for example] want to be able to write to one environment, rather than to both MIMD and SIMD architectures," said Debra Goldfarb, director of high-performance research at International Data Corp., a market research firm based in Framingham, Mass.

Parasphere offers program development tools, including DECmpp VAST-2 Optimizing Preprocessor to translate linear Fortran into parallel Fortran, math and image libraries; language compilers; system software; and third-party applications.

DEC also announced new DECmpp 12000/SX single-instruction, multiple-data computers based on comparable machines from Maspar that are said to be four times faster than previous models (see story page 84). They also provide hardware I/O subsystems that facilitate high-volume, high-speed external data storage, officials said.

The Intel Corp. i860-based DECmpp 12000/MX, the first multiple-instruction, multiple-data system to be offered by DEC, was also announced and is expected to ship by the summer of 1993, DEC officials said. The company will eventually ship parallel machines that incorporate the Alpha chip, they added.

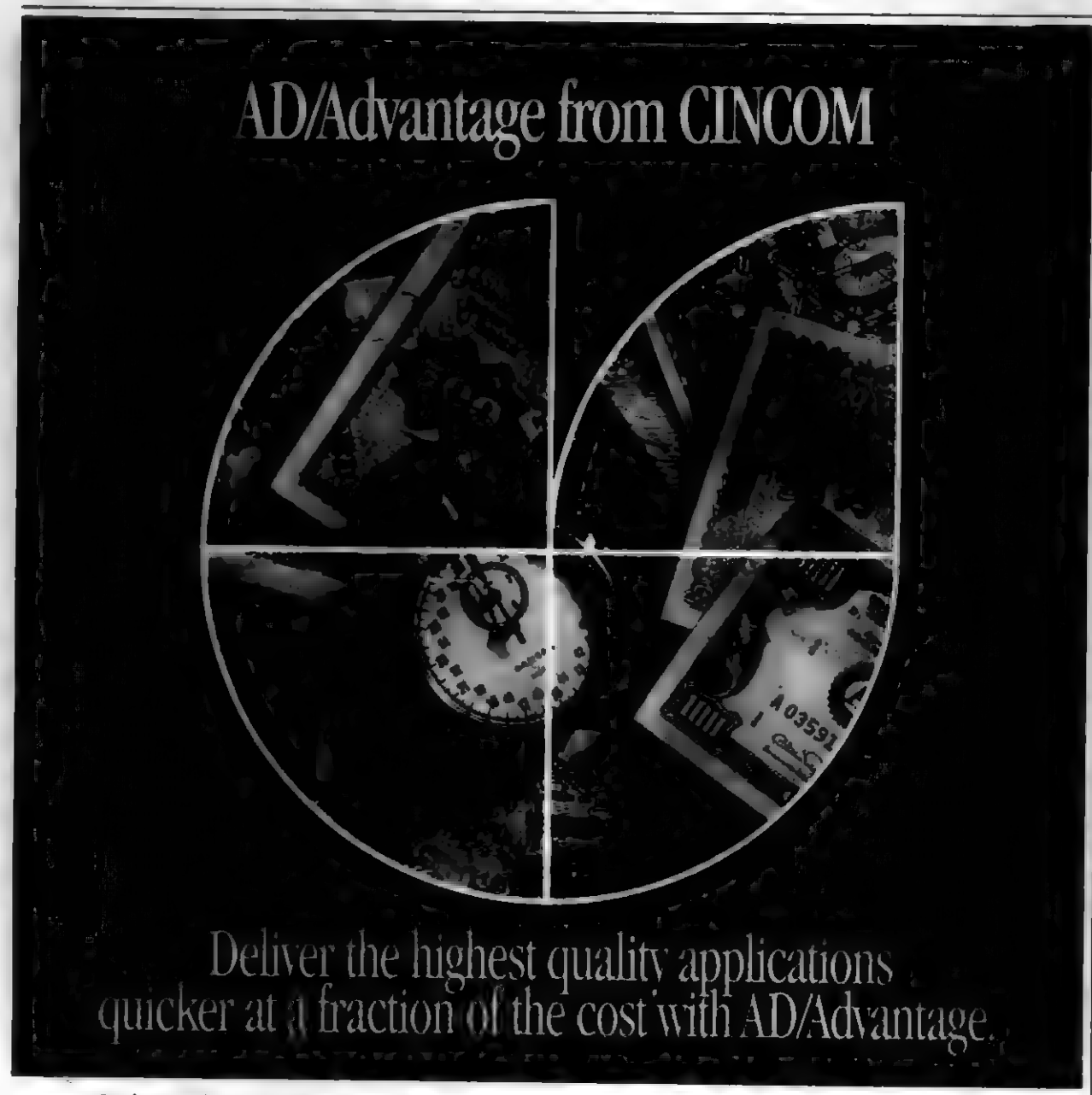
> "OUR GOAL IS TO simplify the development environment so that you don't have to be a rocket scientist programmer or research specialist to take advantage of parallel processing."
>
> RAM APPALARAJU
> DEC

Despite the availability of more effective software tools, parallel programming requires a very different approach to algorithm creation and application development. DEC is therefore supporting an aggressive university discount program to encourage future parallel programmers, as well as users of DEC equipment.

For example, DEC contributed several hundred thousand dollars worth of hardware to Washington University in St. Louis, according to Michael Miller, an associate professor in the electrical engineering department.

Florida Atlantic University in Boca Raton, Fla., installed one of the DECmpp 12000/SX machines recently with the help of DEC and Motorola, Inc. "We have quickly gotten our faculty involved in putting courses together and getting [the machines] out in front of students at the graduate and undergraduate levels," said Joseph Campbell, associate dean of engineering.

Pricing is as follows: DPPE, slated to be available in early 1993, is priced at $4,710; DECmpp High-Performance Fortran costs $11,800; DECmpp VAST-2 Optimizing Preprocessor is priced at $11,800; and DECmpp Image Processing Library and DECmpp Math Library are $4,710. DECmpp 12000/SX ranges from 1,024 to 16,384 processors and costs $175,000 to $1.8 million.



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ADVANCED TECHNOLOGY

Financial services firms move in parallel

Massively parallel processing-based systems bring competitive advantage to early adopters in world of finance

BY THOMAS HOFFMAN
CW STAFF

In the early '80s, financial services companies were among the first from the manufacturing sector to adopt the use of "engineering" workstations.

Now, the industry is pioneering the use of supercomputers and massively parallel processing (MPP) computing systems to conduct complex financial analyses for itself and its customers.

Early users of these high-performance computer systems have given their companies a competitive advantage, especially on tasks requiring complex analyses.

Consider Prudential Securities, Inc., which began using supercomputers in 1988. The company recently upgraded from an Intel Corp.-based IPSC/2 parallel-processing supercomputer to an IPSC/860 system that houses 32 i860 microprocessors.

Time savings

Prudential used to perform so-called mortgage-backed securities analyses for its customers on Digital Equipment Corp. VAX 8800 and 6440 minicomputers. The VAXs often took 24 hours or more to do the job, said David Audley, director of financial strategies at Prudential. Using the Intel machine, Audley said, transactions are usually done in less than one minute.

Flushed with the success of these first Intel platforms, Prudential will next month add one of Intel's next-generation MPP systems, the Paragon. Prudential ordered the low-end machine, which has a list price of $2 million and is rated at 5 billion floating point operations per second (GFLOPS). Audley said the Paragon system will offer up to 10 times more throughput power than the IPSC/860.

Specifically, the IPSC/860, with its 32 nodes of processors performing simultaneously, achieves a computing performance of 760 SPECmarks. A SPECmark illustrates how much faster a high-performance machine can run an industry-standard benchmark. The new Paragon system, Audley said, will incorporate 40 microprocessors and achieve 2,800 SPECmarks.

"We've been able to enter product areas and business lines and compete at a more profitable level with these machines than we would have been able to do" before installing the parallel systems, said Audley, who is affectionately known as "the rocket scientist of Wall Street" because he was the software and systems development chief for the Strategic Defense Initiative's "Star Wars" program prior to joining Prudential in 1987.

One market barrier that has impeded the widespread use of supercomputers and MPP systems has been their high cost.

Such high-performance systems can cost from less than $200,000 for an entry-level MPP system to more than $60 million for a high-end machine.

Nevertheless, some Wall Street firms, including Prudential, have received fast paybacks for their investments in these systems.

Financial appeal

Audley described a recent transaction Prudential conducted for a multibillion-dollar client. Because of the speed and effectiveness of the IPSC/860, the client was impressed enough to award Prudential a contract that paid for the company's Intel system.

Besides Prudential, notable users of massively parallel processors in the financial sector include Bear, Stearns & Co., J. P. Morgan & Co., Merrill Lynch Mortgage Capital, Inc., The Federal Home Loan Mortgage Corp. (known as Freddie Mac), American Express Travel Related Services and Dow Jones & Co.

In general, financial services firms tend to use MPP systems instead of supercomputers. The appeal of MPP comes down to cost.

"These companies are considering massively parallel systems more than supercomputers for price advantage," said Stavros A. Zenios, associate professor at The Wharton School at the University of Pennsylvania.

However, Zenios said, there has been skepticism by some financial firms about MPP systems because of what he believes is a misperception that these systems are not mature and cannot perform as expected.

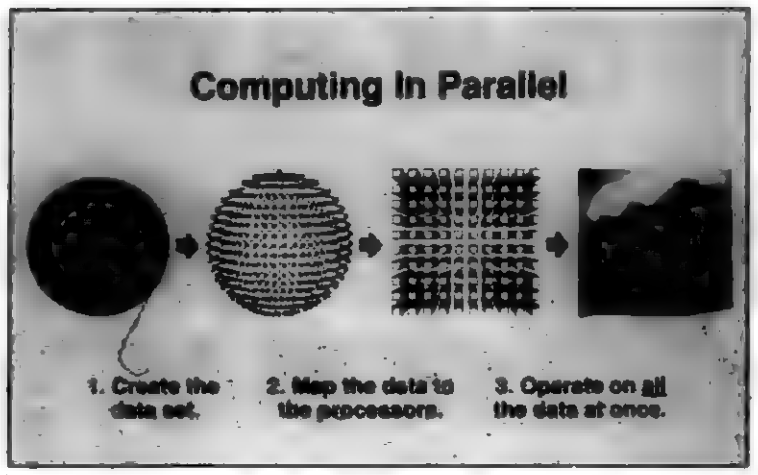
While Zenios said those beliefs are wrong, he conceded that there is a dearth of robust application software on the commercial market targeted for financial analytics in parallel computing.

Some early MPP system users developed their own applications in-house. Merrill Lynch Mortgage Capital in New York developed collateral mortgage-back obligations analytic applications for its I/860 MPP system, based on similar applications the firm used on its IBM 3090 600S mainframe.

Still, early users are looking for system enhancements. Laurin McArthur, who works in systems development at Merrill Lynch, said he would like to see a more robust version of the Unix operating system for its IPSC/860 MPP system. Intel is working on a stronger version of Unix for its MPP systems.

But Audley, whose firm also developed its own financial applications for the I/860, is not upset by the lack of financial software for high-performance computing environments. In fact, he's delighted by it.

"In an industry such as ours, the lack of application software allows us . . . to compete most favorably with industry competitors," he said.



Thinking Machines Corp.

The making of MPP

By now, most people in the computer industry have at least heard of MPP systems. However, not everyone is familiar with the concept behind MPP systems and how they compare with supercomputer and traditional mainframe architectures.

Unlike supercomputers, which usually house one powerful processor in a complex instruction set computing architecture, MPP systems consist of hundreds, sometimes thousands, of inexpensive, scalable, reduced instruction set computing microprocessors operating in parallel. Both systems are used for complex computations, analysis and modeling.

Because they utilize many microprocessors, MPP systems tackle assignments by breaking up the analysis into different tasks. To see how this works, try this test at your next dinner party.

Let one guest be the mainframe computer. Ten or more guests will stand for the MPP system. Now give each "system" the same task: sorting through a deck of cards to remove all cards with hearts. The MPP players will complete their assignment long before the harried mainframe finishes his job.

Parallel exploitation

Many of the leading supercomputing and MPP systems vendors, such as Cray Research, Inc. and Thinking Machines Corp., are forging close ties with database vendors such as Oracle Corp. and Sybase, Inc. to exploit their powerful relational database management system environments for application development.

For example, NCR Corp. is working with Sybase and Oracle on application development for NCR's 3600 parallel processing system, according to Mike Denny, assistant vice president of major financial accounts at NCR. Next year, NCR is slated to introduce its next-generation parallel system, the 3700, which it jointly developed with its subsidiary, Teradata Corp. Teradata, acquired by NCR last year, is now part of NCR's Large Computer Systems Group.

Meanwhile, MPP vendors are working on new systems. Thinking Machines is working on memory and processor upgrades for its CM-5 MPP systems, which it introduced last year. Cray Research is scheduled to introduce new software packages for the financial services sector by early 1993. Cray is testing its next-generation MPP system, code-named the Cray T-3D. The system will incorporate DEC's Alpha chips. No timetable for delivery has been set.

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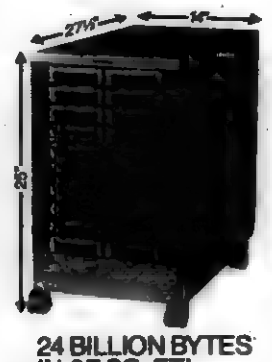

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Introducing

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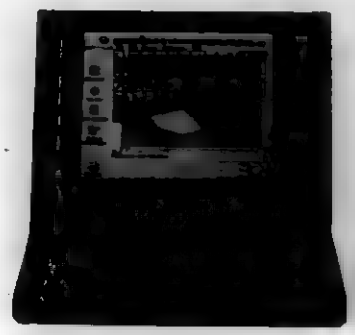

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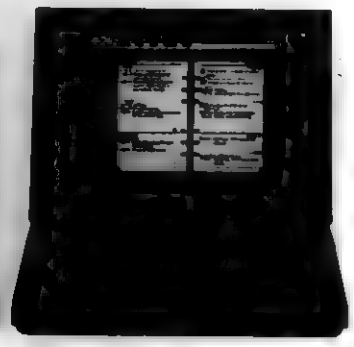

The ThinkPad 300. Your ideas in 64 crisp shades of gray.

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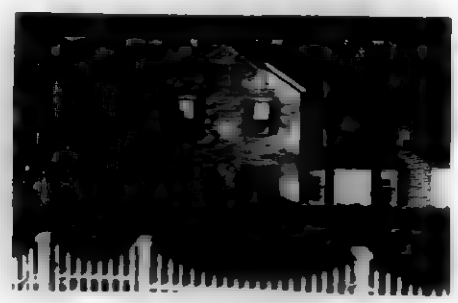
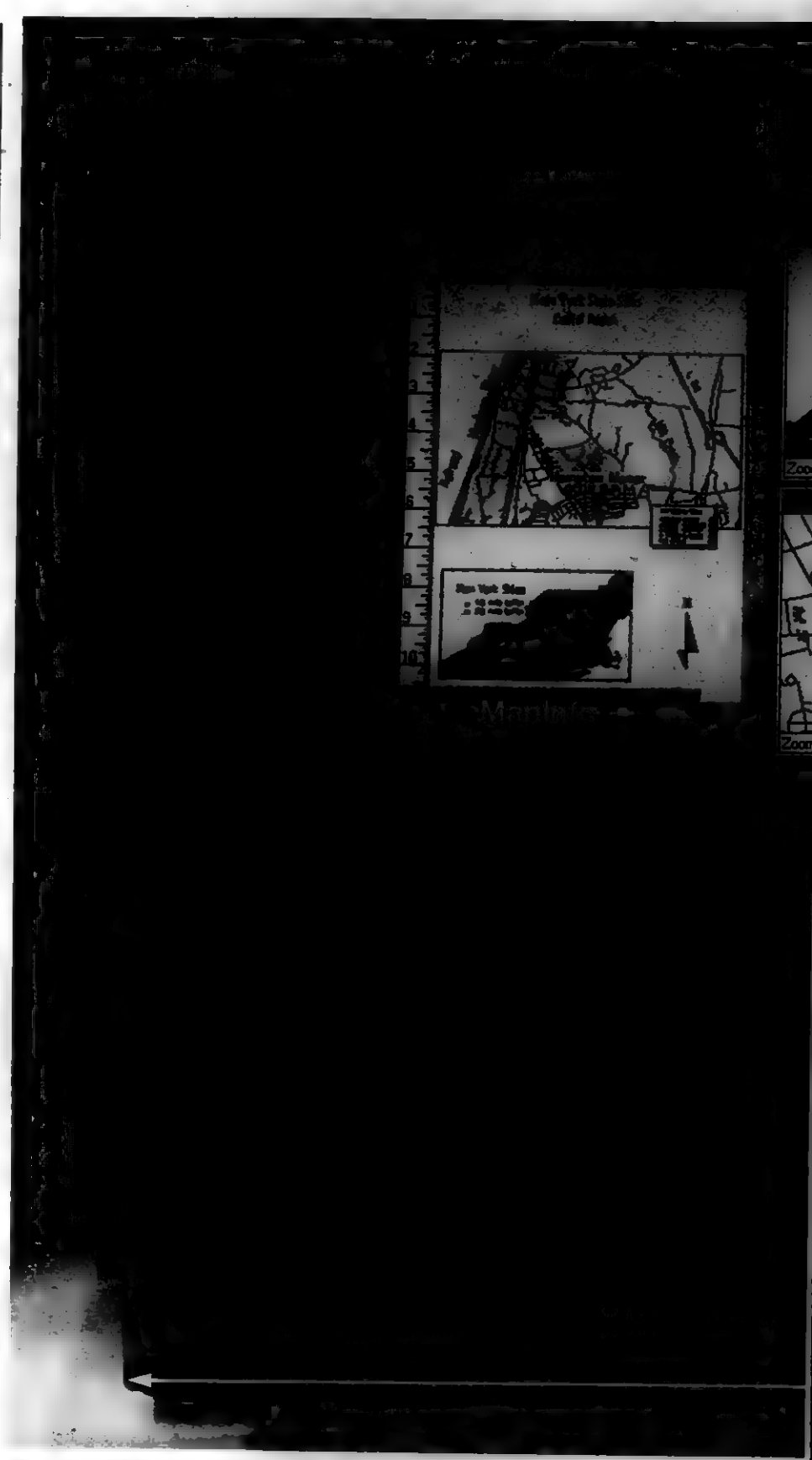


that money doesn't grow on one, the ThinkPad 300 series has the same slim design and an even slimmer price tag. And all ThinkPads are expandable, with a range of add-on products available.

IBM ThinkPads are easy on the eyes in more ways than one. Immediately apparent is their attractive silhouette. But their beauty extends far beyond the superficial. The



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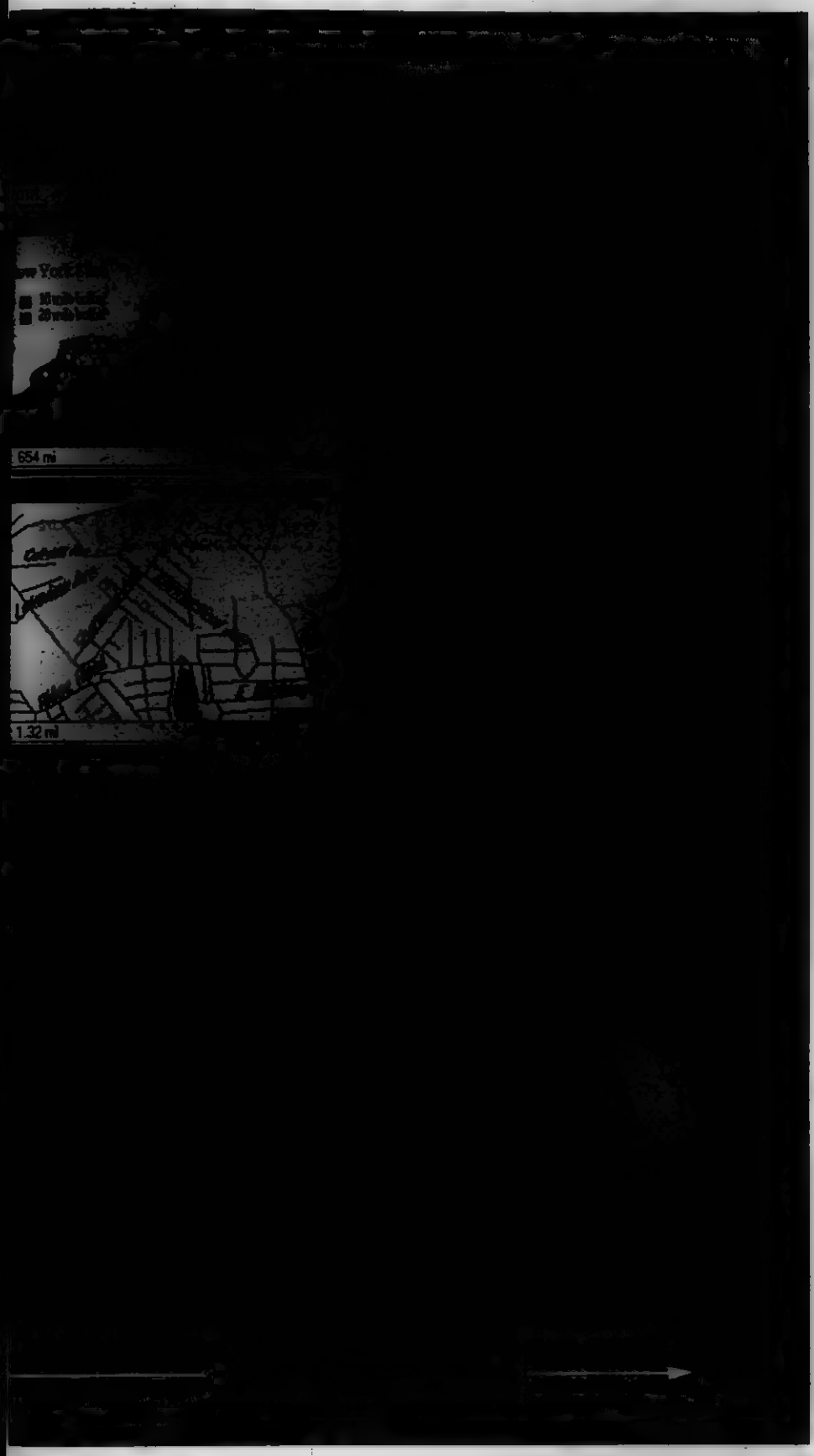
Use it wherever



700 series screens rival desktop display clarity. All screens are eminently readable and adjustable. In fact, everything about the ThinkPad is engineered to make life easier, from the full-size keyboard to the front-loading diskette drive. Some even have removable hard disks for easy upgrades, security and virtually unlimited storage.

With the ThinkPad 700, we didn't just build a better mousetrap, we built a better mouse. The TrackPoint II, perfectly situated in the keyboard, lets you command the entire screen with one fingertip.

ThinkPad	Model 700C	Model 700	Model 300
Processor	486 SLC/25 MHz	486 SLC/25 MHz	386 SL/25 MHz
Display	10.4" Active Matrix Display 256 Color Screen	9.5" Monochrome Display 64 Grayscale Screen	9.5" Monochrome Display 64 Grayscale Screen
Battery Life†	2–4 Hours	3.8–7.5 Hours	4–10 Hours
Weight	7.6 Lbs. with Battery	6.5 Lbs. with Battery	5.9 Lbs. with Battery
Warranty	3 Years (International)	3 Years (International)	1 Year (International)
Price††	$4,350	$2,750	$2,375

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EDITORIAL

Cat in the hat

For the past several months, we've been running a series of articles on our experience of moving to client/server computing. We're replacing our once state-of-the-art minicomputer-based editing and composing system with a spiffy workstation/PC arrangement.

It's been hell.

Also, for the last year I've been attending numerous conferences and seminars as well as informal discussions where users have spoken about their moves to client/server and the PC development worlds. The most accurate summary on the subject came from one IS manager, who said this: "Whatever anyone tells you about downsizing, client/server or whatever, take it from me. It's going to be twice as hard, take twice as long and be a lot more expensive than you thought. But I think it's worth it."

As we approach the 75% completion stage of our installation, even our cynical users — who have suffered mightily under the weight of the installation — are starting to see the light. They are burning fewer effigies of our suppliers, and some actually enjoy using their new workstations to build the pages you read.

However, some of the basics of our operations that are so crucial to a newspaper, such as file management, still can't be done as well as they can on the creaky old mini-based system. And other discrete features of the old system have not yet found their way into the new one. They're coming — we are told. They're coming.

The point here isn't to bore you with our problems. If you're moving to client/server or in some way seeking to rightsize, you no doubt have your own. But consider this: Of the client/server applications in use today, perhaps as many as 90% involve minis and mainframes as the server. Why?

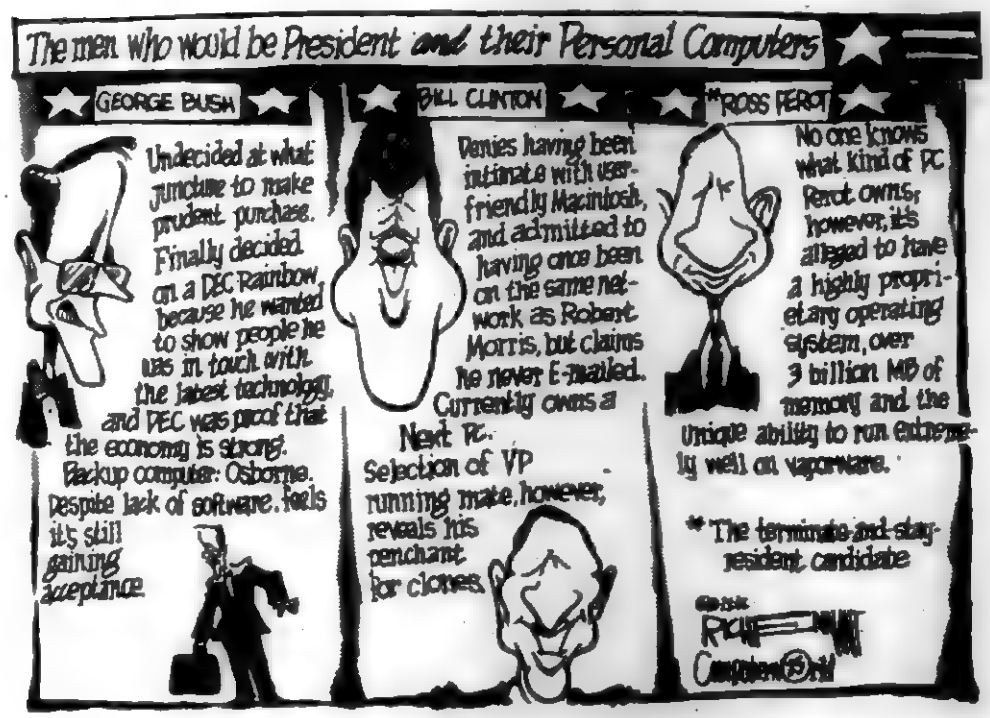
To get some good reasons, consult the article "Why PC development stinks" in our Sept. 28 issue. The bottom line is that if your company's development is team-oriented (and if it isn't, please check your pulse — your operation might be dead), PCs lack the tools and methodologies that mission-critical applications demand. That's why most serious development takes place with big iron at the hub, not because IS managers have a fondness for big Blue chunks of metal. By the way, the article was written by Microsoft's director of enterprise computing, not by some mainframe bigot.

At some point, the numbers will reverse and 90% of development will take place independent of big iron. However, there are several weeks between now and the end of the century.

Our rightsizing experience has shown us the light of the future, and there are many marvelous things coming just around corner. Meanwhile, we have to get a paper out Monday.

Bill Laberis

Bill Laberis, *Editor in chief*



LETTERS TO THE EDITOR

Letter criticizing OS/2 triggers angry responses from readers

Micheal Shallop's remark in "Letters to the Editor" [CW, Sept. 14] about Windows 3.1 compatibility is off base. IBM has stated on numerous occasions that Windows 3.1 support will be available with the next release.

As for the time he couldn't boot after installing a driver, there is some interesting reading in the README file. Interestingly enough, I actually read it and know how to recover.

As for the quirks? Windows wasn't a stable product, much less a serious one, until 3.0. I work with Windows 3.1 at my office and use OS/2 2.0 at home, and I have many of the same packages installed on both systems.

Yes, I find that initializing applications on OS/2 is slower, especially Windows applications. But once up, they appear to run just as well. I also have to reboot my Windows system at least once a day due to a crash of some kind, but not OS/2.

I also have a DOS application that I cannot run under Windows because of insufficient base memory. So I have to drop Windows to run it. With OS/2, it's no problem. It gives a very clean 640K to run any DOS application in.

Granted, I wish the documentation was better, but Microsoft ain't doing so hot either. Has anybody figured out EMM386 by reading the MS-DOS manual?

OS/2 is probably for the power user, but when you consider all the goodies that come with it for $139, it's one hell of a deal!

Jim Herman
Seattle

.....

I am beginning to wonder about people [Micheal Shallop] who proclaim their problems with OS/2 as if bragging about something. And why a publication such as *Computerworld* would feature an article based on a homebrew PC.

I have installed OS/2 on a number of 386 and 486 systems with various configurations and have had no significant problems.

There is no doubt that problems exist. OS/2 is breaking new ground and is pushing limits in many areas in a very diverse hardware environment. To me the surprise is that, from what I can tell, the extent of the problems is small.

I know there are no fundamental problems that handicap OS/2, as it has proven itself stable and reliable on my systems for several months.

From my perspective, the larger problem is what I perceive as a hostility toward acceptance and support, such as the bragging about OS/2 problems, the lack of diligence in third-party development of device drivers or some of the stories I have seen that are grossly biased, factually contradictory or incorrect.

I hope that the proven experience and the significant sales will, over time, reduce this hostility.

Bryan R. Leipper
Reno, Nev.

.....

The recent letter by Micheal Shallop brought up an interesting issue. Why is it IBM's job to support all third-party devices? Why shouldn't the manufacturer of the add-on product provide its own drivers?

IBM, Apple, Dell or any other computer manufacturer does not have the resources to test and provide drivers for every product manufactured by third parties.

Yes, OS/2 has some problems, and yes, IBM doesn't give you the drivers you want, but if the third-party vendors wanted that product to work with OS/2 they would provide the proper drivers for you.

Let's face it: They know their product better than IBM does.

Wayne Brissette
Cedar Park, Texas

A decision not worth laboring over

Regarding "It ain't over yet" [CW, Sept. 7], I concur that there is no need to choose between Windows and OS/2, especially with OS/2 2.0. I run Windows programs, DOS 5.0 programs, DOS 4.0 programs under Virtual DOS Machine, OS/2 tasks, local database, remote LAN database and four mainframe sessions concurrently without problems. At any time, I have more than a dozen tasks executing without clobbering one another.

V. Venkatakrishnan
Mansfield Center, Conn.

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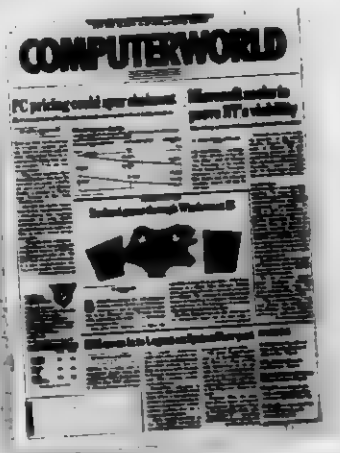

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Object orientation: More than meets the eye

INGVAR PETURSSON

I hear many people referring to object orientation as just another trendy "buzzword." This is generally what happens to any new technology or concept that appears on the scene. In this case, however, I think we are missing a golden opportunity to fundamentally change the way we engineer software and the business practices that drive its development.

Object-oriented development concepts and tools have been around for quite a while in telecommunications. The switches that make up our national telecommunications fabric are not all managed by a single process controller. Instead, they act as independent entities that receive messages from many other independent entities, or objects, and take action based on a set of embedded switching "methods."

THE MESSAGE IS that object modeling does not apply only to software engineering practices. It also applies to how we model organizational structures.

This has enabled telecom providers to expand their networks, change internal switch software and upgrade customer services with relatively few mishaps and little retesting of existing services.

These same benefits can now be realized in the way we build our general business applications.

It just makes sense that the creation of libraries of application objects has the potential to dramatically reduce the time and cost of building new applications. The testing required is minimized because only those objects that have been changed need to be retested.

Reusability, application quality and speed of development are all reasons for information services to adopt object-based software engineering. But there are even stronger reasons for the general business side of our organizations to adopt object-oriented concepts. There are a couple of ways that object orientation can improve practices and organizational design:

•**Business processes.** Classical process-flow modeling of a business practice may model a "best practice" in a given area, but it locks the participants into limited ways of achieving the business goal. There is little flexibility for changing the resulting process flow in a dynamic business environment.

Applying object analysis and modeling to a business process identifies the "entities" (e.g., customer or employee) that enable a service to be performed, the "messages" that need to go between them and the "methods" that the entities need to employ to manage their piece of the puzzle.

This leaves a great deal of room for situational customization of the regular business process, making changes in a competitive environment much easier to handle.

James Kemmerer

•**Empowerment.** Customers of most companies today are looking for individualized attention to special situations. This requires quick thinking and decision-making on the part of employees in the customer contact chain.

When employees are simply part of a larger, strictly defined process, they tend to punt in special situations, sending the customer to a supervisor or another link in the process flow. Customers are left dissatisfied.

Modeling an employee's work as a set of responsibilities, methods, tools and support structures from other entities in the organization enables them to tackle business situations flexibly and leaves them feeling empowered in their jobs.

The message here is that object modeling does not apply only to software engineering practices. It also applies to the way we model our business practices and organizational structures in order to achieve that ever-elusive goal of customer satisfaction and business productivity.

If we continue to treat object-oriented analysis and design as just another fad, we will miss a golden opportunity to make dramatic and long-lasting improvements, not only in software development but in our business structures.

Peturson is vice president and chief information officer of McCaw Cellular Communications, Inc. in Kirkland, Wash.

ANSI standards should be more widely available

CARL MALAMUD

ANSI standards are expensive and hard to get. That means they aren't standards; they're secrets.

The American National Standards Institute (ANSI) — a private organization — is the self-designated national coordinating body for U.S. standards development. In the field of computer networks, technical standards are crucial, defining how we build the open systems that are the foundation for the emerging global network.

The U.S. has always been in the lead in computer networks, and an important, vibrant industry has developed to supply local and international markets. Firms such as Sun, Cisco Systems, DEC, Synoptics Communications and many others derive billions of dollars in revenue and employ tens of thousands of professionals from the sale of standards-based products and services.

The emerging global network is built on standards. Widespread availability of documents leads to widespread implementation. Problems in the standards are quickly discovered and fixed. Standards in the global network are more than just paper tigers: They define interoperable services that work.

Not all standards are publicly available, though. ANSI charges up to $10 per page for a large body of crucial documents.

ANSI, as the U.S. representative body to the international standards-making community, has an exclusive license on the sale of many key international specifications, including the crucial Open Systems Interconnect (OSI) standards. OSI documents are sold in the U.S. by ANSI and its licensees for prices of several hundred dollars per inch of paper.

High-priced standards mean college students and young professionals don't read the documents. These documents are a crucial part of their education, and lack of accessibility leads to lack of knowledge.

Access demanded

To demonstrate that there is a demand in the U.S. for ANSI to change its policies and permit online, free distribution of standards, a petition was circulated during the last two months.

The petition states the importance of making technical standards freely available electronically and underscores the importance of access to the competitive status of U.S. industry and the education of U.S. professionals. More than 500 computer and communications professionals signed this petition. Employees of almost every significant participant in today's computer and communications industries have signed this petition.

Although the signature of an individual does not necessarily reflect a corporate policy, it is clear that there is widespread support for wider dissemination of technical standards coming from all parts of the profession: Industry, research and academic communities are all heavily represented.

It is time for ANSI to join the modern world and start using the computer technology its standards help define.

Malamud is the author of Exploring the Internet: A Technical Travelogue (Prentice Hall, 1992), a book that, among other things, describes the international campaign to make standards documents more accessible.

Screens exhibiting similar data show the difference between traditional applications (above) and real world applications developed using Sybase's Gain (right).

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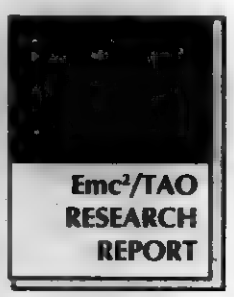

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COMMENTARY

Christopher Lindquist

Breaking down walls

It can't be easy to be Bill Gates. Sure, he's worth billions. Sure, he can afford Porsches you can't legally drive in this country. Sure, he can make statements to the effect that wiring one's house with fiber-optic cable isn't really all that expensive. But really, how many of us would like to become the subject of a Berke Breathed cartoon?

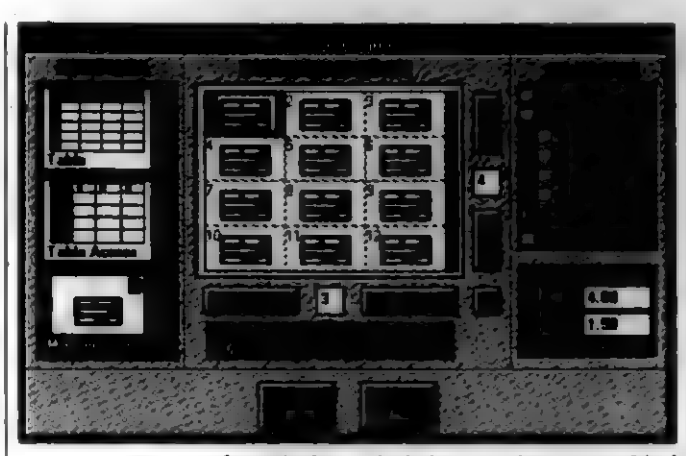
And how many of us would really want to be held to the professional standards that Microsoft is held to every day? When you live your life under the eyes of the Federal Trade Commission, jealous competitors and the press, it's no wonder the Redmond crew can seem a little paranoid at times. But then again, maybe they should be.

The latest attack came in the form of undocumented Windows API calls. API calls are necessary. These are the hooks that tell the operating system what to do, such as open and close files and move the cursor.

In Windows, as in DOS and most other operating systems, there are "undocumented" calls that may or may not perform a variety of functions. These are sometimes obsolete versions of current calls, "works in progress" for future versions of the product, or just calls that are not used for much of anything now but that leave space for future development.

Microsoft has long told programmers not to use these calls, and programmers have just as

Continued on page 41



Dataease Express for Windows *includes more than 40 graphical buttons that initiate program actions*

RDBMS targets client/server world

Dataease enables Windows app development

BY GARRY RAY
CW STAFF

TRUMBULL, Conn. — Users of Dataease International, Inc.'s personal computer-based relational database management system recently gained built-in access to Microsoft Corp.'s Windows.

The new RDBMS, called Dataease Express for Windows, includes enhancements to Dataease's Prism client/server technology and helps users build graphical client/server applications, according to officials.

Dataease officials said the new version includes more than 40 graphical buttons that can be placed on reports, menus, database forms and tables to initiate program actions.

The buttons support such actions as opening files, running reports and finding database tables. Another new feature, the company said, is support for various graphics formats, including Windows BMP, PCX, Tag Image File Format and PostScript EPS.

The RDBMS also includes the company's Prism technology, as have previously released DOS and OS/2 versions. Prism is a layered database protocol that allows development of client/server applications that can access a number of database types.

Prism incorporates a client application programming interface (API), a server API and the Dataease Repository.

Several features

Dataease Express for Windows is shipping with support for Borland International, Inc.'s dBase and Paradox databases, both of which are accessed through a new driver implementing Microsoft's Open Database Connectivity guidelines.

Optional support will ship this year for databases including Oracle Corp.'s Oracle, IBM's DB2 and OS/2 Database Manager and Novell, Inc.'s NetWare SQL.

Dataease Express for Windows costs $395.

Microsoft discovers systems integration is a new ball game

BY CHRISTOPHER LINDQUIST
CW STAFF

Microsoft Corp.'s recent attempts to grow up and play with the big boys in the computer market have included announcing that it, too, will join the systems integration and "enterprise solution" fray with the likes of Computer Associates International, Inc., Digital Equipment Corp., Electronic Data Systems Corp. and IBM.

Whether the shrink-wrapped software giant will be able to compete or will be warming the bench remains to be seen, according to analysts and users.

"They have a lot to prove," said Neal Hill, a senior software analyst at Forrester Research, Inc. in Cambridge, Mass.

Hill described Microsoft's previous mode of business as "build a product, throw it over the wall and wait for people to send you checks. Then you wait for a couple of support calls."

If Microsoft wants to be a systems integrator, that wall has to disappear: The energy needed to hold hands with accounts costs time, effort and profit margins. Microsoft will not be a viable systems integrator, Hill said, "until they're really willing to swallow hard and say 'OK, our profit margins are going to be smaller.'"

Microsoft recently publicly displayed several of its programs aimed at raising its credibility as an enterprise systems vendor (see chart). But simply being willing to make sacrifices does not mean customers will risk their businesses to give Microsoft a chance to prove itself.

Microsoft has long been seen as a vendor of shrink-wrapped "commodity" software products. Such an image will be hard to shake when competing with industry-specific software makers, value-added resellers and systems integrators that make a living out of understanding a partic-

Continued on page 44

Battle plan

Microsoft has recently unveiled a selection of programs intended to increase its visibility as an enterprise systems vendor

- Program that offers customers seven-day-a-week, 24-hour-per-day telephone access to technical support.
- Hot Site Premier Support under which Microsoft will place a technical support representative on-site.
- Resellers and systems integrators can enroll in the Partner or Alliance programs, which provide development services such as consulting, early access to products, customer support tools and marketing information.
- The Microsoft Development Network CD, which provides technical information for developing applications.
- A variety of electronic services, including expanded forums on CompuServe and increased capabilities of Microsoft's electronic bulletin board.

CW Chart: Michael Siggins

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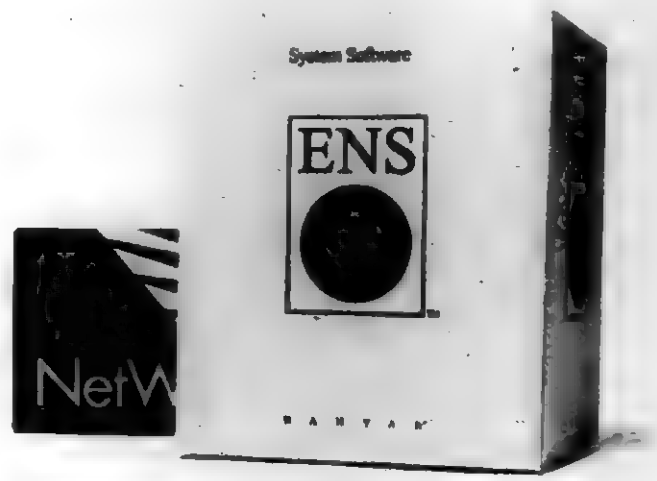

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IN BRIEF

Eo picks partners

■ Eo, a Silicon Valley start-up long reported to be working on a new class of handheld products called personal communicators, finally poked its head above ground recently when it announced technological partnerships with AT&T and Japanese giants Matsushita and Marubeni. There was no word on specific product prices or arrival dates, but Chief Executive Officer Alain Rossmann promised his Mountain View, Calif.-based company will deliver those plans by the end of the year.

■ Platinum Software Corp. is shipping a new integrated client/server accounting package for Microsoft Corp.'s Windows clients and Microsoft SQL Server for OS/2 database servers. Called Sequel to Platinum, the software uses the Microsoft/Sybase, Inc. SQL Server's stored procedures and triggers to enforce business rules. The first module, a general ledger package, has a base price of $15,000; other accounting modules, not yet available, will be priced at $10,000.

■ Microsoft has unveiled a plan it said will assist businesses looking to integrate Microsoft software into their organizations. The first stage of the plan increases support to value-added resellers and integrators that wish to use Microsoft products. The plan, Microsoft Solutions Channels, includes technical support and the chance to participate in the design of Microsoft products.

Security firm targets theft of portables

Hopes to thwart thieves, facilitate recovery of stolen computers with software, nationwide registry

BY JAMES DALY
CW STAFF

SETAUKET, N.Y. — A security company hopes to make a dent in computer thefts through the combination of a registration service and a software-based identification product.

The International Computer Recovery Center (ICRC) was announced by IDX Technologies, Inc., the security firm, as part of a two-pronged plan to help combat computer theft.

The second phase consisted of the rollout of IDX's Computer Owner Protection (COP) software, an identification code-bearing package that makes computers permanently and uniquely identifiable.

The proliferation of portable computers such as laptops and notebooks has begun wreaking havoc on the minds of many a computer security officer, according to IDX President Fuller O'Connor.

With 120M-byte hard disks running upward of 25-MHz on 5-pound laptops, portables are a frequent repository for mission-critical tasks and can often carry sensitive data.

Because they allow field access to central computers, portables also provide a perfect way to steal information from a corporate database. Thieves are not only taking laptops to get at the data stored in the disk drive but to dial into company mainframes.

Laptop theft has affected such national figures as U.S. Army General Norman Schwarzkopf and Compaq Computer Corp. Chairman Ben Rosen.

"Laptops and notebook computers are God's gift to thieves," O'Connor said. "They're portable, powerful and very easily stolen." But despite the obvious threat, many users are unaware of their vulnerability. In a recent survey by International Data Corp., only 1% of the respondents said they saw security as a problem or limitation of portables.

Help for police, owners

O'Connor said he wanted the ICRC to be the "missing link" between computer owners and the police. The registry will contain ownership information of all registrants with products that are using COP and will also handle serial numbers for computer products that do not incorporate COP software.

A five-year registration costs $49, O'Connor said.

When a stolen or lost computer is recovered, law enforcement personnel can call the center and immediately determine the legitimate owner.

Identification of a stolen computer can be facilitated with the $49 COP package, which gives each computer a unique 11-digit code number.

The software can be installed either by the computer owner or manufacturer. COP software also comes with warning decals that can be attached to the computer to make it a less appealing target for thieves.

IDX is also negotiating with several large personal computer makers to have the COP technology installed during the initial assembly process, a company spokeswoman said.

Diverse modems the wave of the future

BY MICHAEL FITZGERALD
CW STAFF

The march of communications technology continues, and it is producing glimpses of what appears to be opportunities for variety in a commodity market.

Modems released recently follow the computer industry trends of smaller, faster and more powerful, while also bringing the brave new world of wireless communications a step closer.

For instance, Motorola, Inc. released its InfoTac pocket-size radio-packet modem. Designed to work with any RS-232-equipped mobile computer, the modem was designed to independently store and send data. InfoTac can serve as a stand-alone messaging tool that transmits wireless messages, and it can be programmed to automatically respond. Slated to be available next month, it will cost $1,350.

Meanwhile, Racal-Datacomm, Inc., based in Sunrise, Fla., introduced the ALM 3226, a fist-size data/fax modem with cellular capabilities. The ALM 3226 plugs directly into a serial port, with no cables, and operates at up to 14.4 bit/sec. for data. The modem can transfer data via cellular communications and can be controlled remotely. It will sell for $750 when it becomes available next month.

MODEMS OF THE FUTURE are smaller, faster, more powerful and wireless.

However, analyst Curtis Price at International Data Corp. in Framingham, Mass., said cellular was a future that may demand too much courage from users.

Radio frequency and cellular "is definitely an area of opportunity, but I'm not quite sure if users are ready to throw their data on wireless communications because of the lack of integrity of the medium," Price said.

More conventional modems are also being introduced. QuickComm, Inc. released its Spirit II data/fax modems, which operate at up to 14.4 bit/sec. QuickComm in San Jose, Calif., is pricing its modems aggressively: $249 for an external modem and $229 for the internal version.

Apple Computer, Inc. PowerBook users can upgrade their modem to a 14.4 bit/sec. modem made by Campbell, Calif.-based PSI Integration, Inc. PSI released its PowerModem IV, a data/fax modem. PowerBook users can buy the $799 PowerModem IV for $399 through November.

AT&T offered a glimpse of what will likely be the future of modem technology, announcing that it will ship in December a 3.3-volt V.32 bis data pump chip set packaged to fit in a Personal Computer Memory Card International Association (PCMCIA) format. The new product will feature three chips shrunk down to PCMCIA size and will be aimed at the data/fax market. A data pump translates data from analog to digital and vice versa.

PCMCIA-type modems are already on the market, and Megahertz Corp., a modem maker in Salt Lake City, announced it will release two PCMCIA data/fax modems next month: one a 14.4 bit/sec. modem, the other offering 2.4 bit/sec. data (9.6 bit/sec. fax). Both will feature the ability to plug directly into a phone line. Pricing has not yet been determined.

Lindquist

CONTINUED FROM PAGE 37

long ignored them. There are good reasons why Microsoft would like to see the calls unused. For one thing, it makes their support job that much harder. When a new version of, say, DOS comes out, any undocumented calls may conflict with what the new operating system is trying to do. Those conflicts can cause crashes, and the first company to be blamed is, of course, Microsoft.

It's easy to see why. The user simply deduces that a) the old operating system worked fine, b) the program worked fine with the old operating system and c) the program doesn't work with the new operating system. Therefore, the problem is with the new operating system.

That may indeed be the case, but I suspect that often the problem lies in the fact that the developer of the program used undocumented calls to get his program to do something, and now that little white lie has caught up with him.

Unlikely situation

It's also pretty unlikely that the vendor is going to come forward and say, "Yes, we use undocumented calls, so our product is likely to be unstable from release to release of the operating system." That is tantamount to saying, "We're risking our product and your use of it on calls Microsoft told us not to use." It's much easier just to blame Microsoft. Everyone else does, and it's quite likely you'll be believed.

Now some vendors, including very large ones such as Lotus and Borland, admit to using undocumented calls on occasion, when no other solution seems possible. They even work with Microsoft to find the least risky way of using such calls. So why should Microsoft's feet be held to the fire so much more quickly? There are legitimate reasons.

For starters, Microsoft has to at least put forth the image that everyone, including its own applications group, gets fair treatment when writing Windows programs. At the very least, using undocumented calls gives the appearance of impropriety.

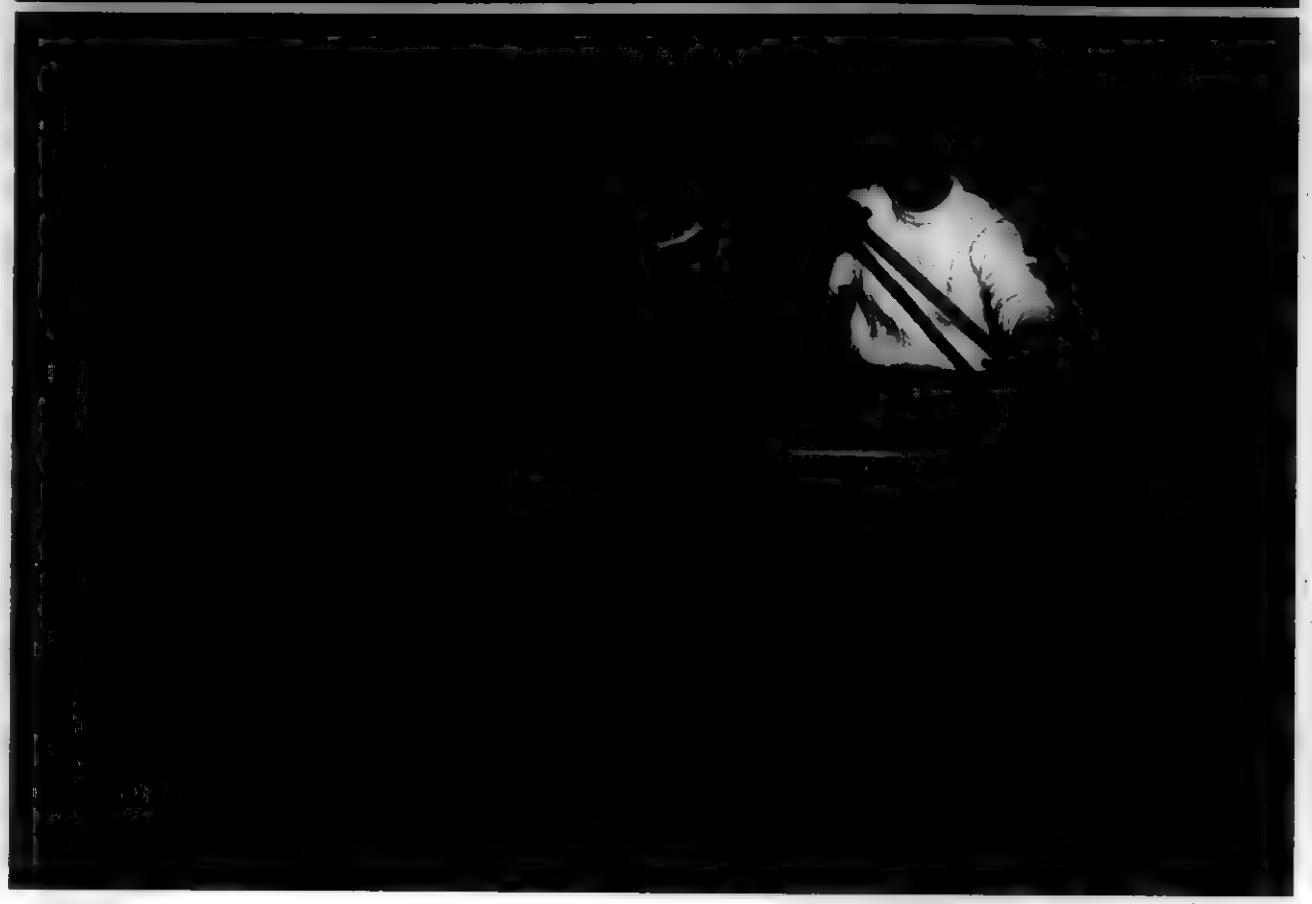
Secondly, Microsoft has done some things in the past that indicate some rather close interaction between the systems software and applications groups. It can be noted that coincident with the release of Windows 3.1 came new versions of PowerPoint, Excel and Project that took advantage of the new features, such as Object Linking and Embedding (OLE), available in the upgraded Windows. Some vendors, including Lotus with 1-2-3 for Windows, do not support OLE to this day.

Microsoft no longer maintains that there is any "Chinese Wall" separating its development groups. And from a legal perspective, perhaps there shouldn't be. However, the legality of the issue may be secondary to Microsoft's building the trust of the customers and vendors who use, rely on and sometimes compete with its products.

In Microsoft's case, the poetry of Robert Frost may have been right: "Good fences make good neighbors."

Lindquist is a *Computerworld* West Coast correspondent.

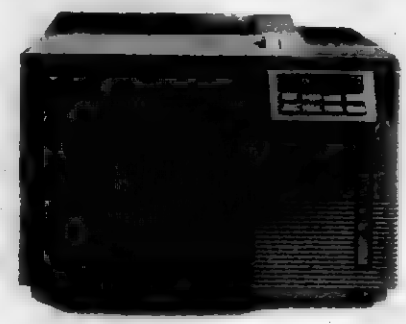
Network printing.



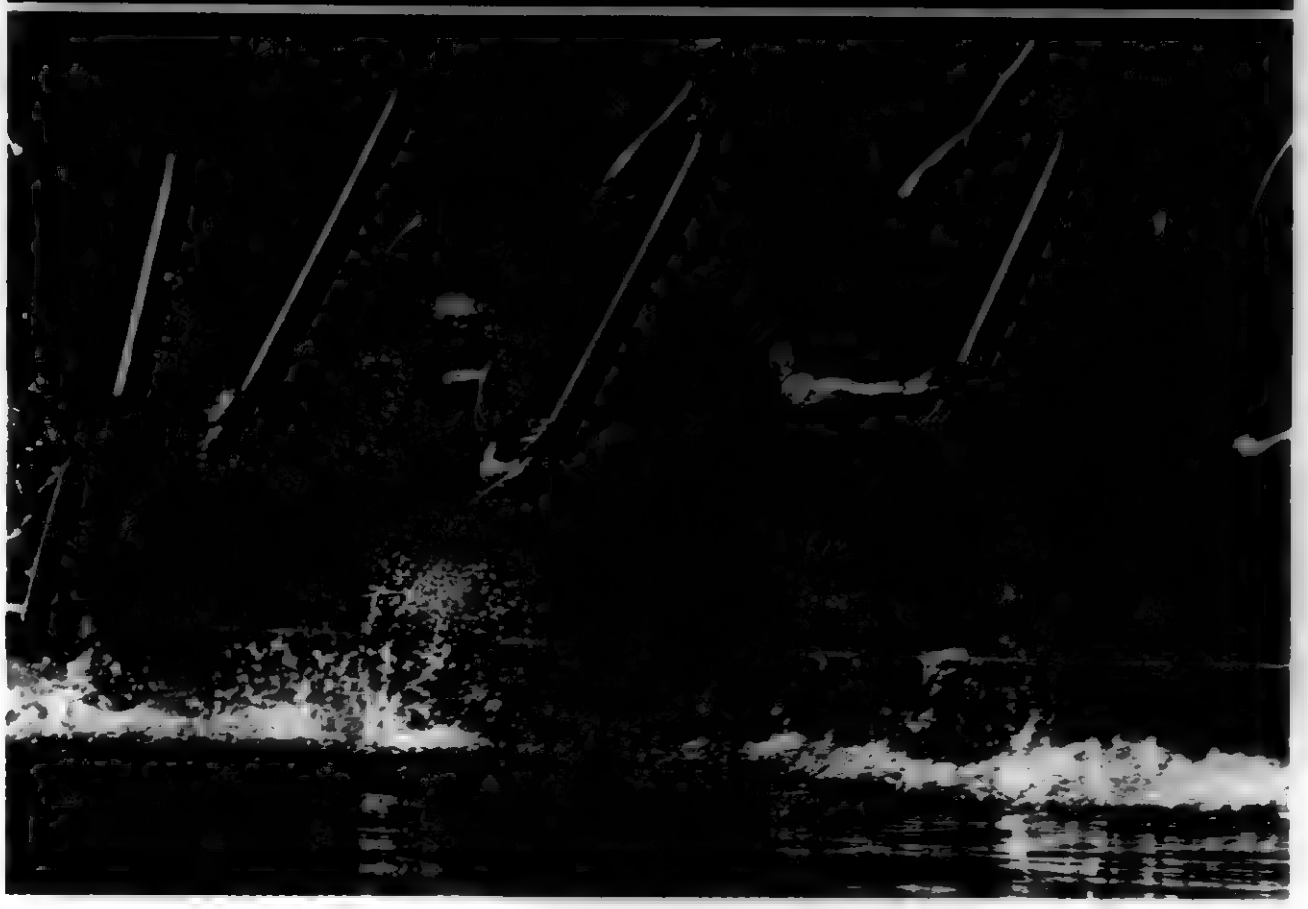
When it comes to network printing, you want to move swiftly. Give the job to the LaserJet IIISi printer from Hewlett-Packard.

The LaserJet IIISi printer has a 17 page-per-minute engine and a RISC-based formatter for fast text and graphics. It's also network-ready. When you add an HP JetDirect card, the printer is seen as a node on the network. That means you can place it anywhere along the network. Anywhere your users need easy access to their output. You're no longer limited by a faraway server.

The LaserJet IIISi avoids bottlenecks by pulling data through the interface card 30 times faster than the standard parallel rate. It is therefore able to print 18 times faster than ordinary printers. And, since your file server is relieved of some print server functions, you'll enjoy faster transaction times and increased speed across your entire system.



Network printing with the LaserJet IIISi.



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3Com 3+Open	*802.3* *Token Ring (4/16 Mbps)*
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IBM LAN Server	*Token Ring (4/16 Mbps)*
AppleTalk	*LocalTalk* *EtherTalk*
*HP-UX***	*Ethernet/802.3*
*SunOS***	*Ethernet/802.3*
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HELP LINE

Freelance Graphics for Windows

Part of a continuing series of tips from personal computer software vendors, based on questions commonly asked of customer support personnel. This week's questions focus on Lotus Development Corp.'s Freelance Graphics for Windows.

Q How can I change the default font that is used in my graphs in Freelance Graphics for Windows?

A With no graph currently on the page, do the following: Select Graph New and choose any type of graph from the Graph New Gallery list.

Choose any style and select OK. Choose Done. Select Graph, All Text; select the desired default graph font and select OK.

Select Graph Replace Defaults. This change will affect only new graphs created in the current file.

To change the default graph font for any future files, select Tools Save Default Presentation.

Q Can I start Freelance Graphics for Windows without having to see the initial "Welcome to Freelance Graphics" dialog box that appears on the screen?

A From the Accessories group in the Windows Program Manager, select Notepad.

Select File Open, type FLW.INI and select OK.

Locate the line in the FLW.INI file that reads "Skip Welcome=0" and change the 0 to 1.

Select File Save. Select File Exit and then restart FLW.

FLW will bypass the welcome screen and load an untitled presentation. This new presentation will be opened with the last selected SmartMaster file.

Q How can I obtain a blank page?

A Method 1: If there is no file open, select File New and select NOMASTER.MAS as the SmartMaster file.

This particular SmartMaster file is a blank file that yields a plain white page when loaded. The NOMASTER.MAS can also be selected at startup in the "Welcome to Freelance Graphics" dialog box.

Method 2: If you have a file open and want to insert a blank page, select Page New and choose the Blank Page layout and click OK.

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It will support Windows, Windows NT, OS/2 and UNIX. The complete product will be demonstrated at Fall Comdex and available for beta testing in the fourth quarter of 1992.

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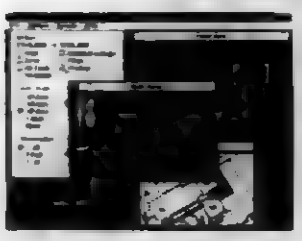

There are two migration paths to this ultimate Xbase system: The OOP (Object-Oriented Programming) path of CA-Clipper and the GUI (Graphical User Interface) path of CA-dBFast with Windows support.

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Microsoft finds new ball game

CONTINUED FROM PAGE 37

ular market niche.

Such is the opinion of at least one customer.

"I think their applications are too limited," said Rory Read, senior vice president of MIS at Insurance Company of the West in San Diego. "They're not a viable vendor in our market."

Microsoft will have a tough road ahead competing with vendors such as IBM that already have a history of knowing what it takes to please a customer.

"This is the one area where the old-line host systems vendors have a leg up," Hill said. "They know what it takes."

Still in the game

Other users are not willing to dismiss Microsoft yet. "Obviously with Microsoft's track record with success, it's something I'd have to investigate," said Richard Ambrose, information systems manager at Hexcel Corp. in Dublin, Calif. "I'd have to do a wait and see."

Hill is waiting as well. "What I haven't seen yet is a really convincing demonstration that they're willing to do whatever it takes," he said, noting that Microsoft appears to be in a state of flux as it attempts to pin down its long-term strategic direction.

"They have to decide what their core competencies are and focus on those," Hill said.

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PC Tools strives to recover from bugs

BY CHRISTOPHER LINDQUIST
CW STAFF

BEAVERTON, Ore. — Central Point Software, Inc. hopes the release of Version 8.0 will remove the quality stigma surrounding its PC Tools software utilities package.

When Version 7.0 shipped last May, it was soon plagued with reports of bugs in several utilities, the worst of which was failed backups.

As a maintenance upgrade, Version 7.1 reportedly fixed many of the problems, but some users still reported difficulties.

One user who encountered problems, "no more than any other guy," was Don Kugler, a software engineer at Gould American Microsystems, Inc. in Pocatello, Idaho. "I was about tempted to throw it out the window," he added.

Now Version 8.0 has shipped, and Central Point said it hopes a new organizational structure and improved quality-control procedures will prevent a repeat scenario. Kugler, for one, said he is pleased. "I like it."

Charles Boesenberg, Central Point's president, chief executive officer and chairman, said the company has reorganized to be more focused and structured in its approach to software development.

The number of quality assurance personnel has been tripled, the size of beta-test pools has been doubled, and the way in which software is tested has become far more stringent, Boesenberg said. For example, an automated technique has been added to test multiple system configurations.

In addition, after Central Point cofounder and former CEO Cory Smith's recent departure, the company brought in executives from several large software firms, including Lotus Development Corp., Legent Corp. and Informix Corp., to help manage the company, which had $84 million in sales last year.

The changes were necessary because the company "had stayed with a recipe that wasn't sensational," Boesenberg said.

Major improvement

At least one user who ran into problems with Version 7.0 has found Version 8.0 to be a great improvement. Loren Nozot, systems manager at Azusa Pacific University, has been a PC Tools user for years but said he was disappointed with Version 7.0 because he had some problems creating reliable backups with the product. "I really think they've done a good job this time," he said. "It's definitely a lot better and more reliable than Version 7.0."

The new version of the product includes support for Small Computer Systems Interface devices, including tape units for backup.

For the corporate user, a systems manager can configure custom versions of PC Tools 8.0, including custom menus and password protection, as well as create a set of installation disks that only install the proper configuration on user personal computers.

Version 8.0 also includes a complete edition of Central Point's antivirus product rather than a "detect-only" version. Drag-and-drop support, a memory optimizer and a task switcher have also been added.

PC Tools Version 8.0 is available now for a list price of $179.

Sony unveils 2-lb. portable CD-ROM drive

BY MICHAEL FITZGERALD
CW STAFF

Sony Corporation of America recently announced its Multimedia CD-ROM Player, which was designed to bring the versatility of multimedia to a handheld package.

The Multimedia CD-ROM Player fits a compact disc/read-only memory extended architecture (CD-ROM XA) drive, an Intel Corp. 8088-compatible processor and an LCD into a 2-pound, 7- by 6- by 2-in. package. It can connect to a television or a personal computer, as well as a printer.

The specialized CD-ROM XA drive allows the player to use multimedia CDs, which can hold approximately 39,000 images, 300,000 pages of text, 70 minutes of sound or 16 hours of compressed digital audio. (A normal CD can hold 74 minutes of compressed digital audio.)

Sony intends to ship the Multimedia CD-ROM Player in November, with a list price of $999.95 and two multimedia titles. A nickel cadmium battery pack generates up to two hours' worth of power. IBM said that it will sell Sony's product as well.

Among the new multimedia titles announced in conjunction with the Multimedia CD-ROM Player were the first five from IBM's Multimedia Publishing Studio, Axxis Electronic Publishing, Inc.'s "Zagat-Axxis CityGuide" and "The Civil War" from Random House, Inc.

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NEW PRODUCTS

Macintosh products

Strategic Mapping, Inc. has introduced Version 1.5 of Atlas Pro, a geographic information management system.

Atlas Pro 1.5 was designed for the Apple Computer, Inc. Macintosh. Additional enhancements in this version include extensive connectivity to databases, new tools for zooming and mapping and improved street-level mapping and address matching. According to the company, based on actual location, users can analyze and display information. The software supports interactive querying and a variety of database systems, including DB2 and those from Oracle Corp., Informix Corp. and Sybase, Inc.

Atlas Pro costs $795.

Strategic Mapping
Suite 250
4030 Moorpark Ave.
San Jose, Calif. 95117
(408) 985-7400

SuperMac Technology, Inc. has released the ThunderLight Color Graphics card. According to the company, the card enables Apple Computer, Inc. Macintosh color-publishing users a 1,200% increase in QuickDraw acceleration for true color graphics on displays of up to 21 inches.

The product supports displays from 12 to 21 inches with resolutions from 512 by 384 pixels to 1,152 by 870 pixels and includes a new SuperZoom feature that lets users alter resolutions with a hot key when using multimode displays. A display management utility called SuperVideo simplifies the process to configure a user's display.

The ThunderLight Color Graphics card costs $2,399.

SuperMac
485 Potrero Ave.
Sunnyvale, Calif. 94608
(408) 245-2202

Software application packages

Addstor, Inc. has introduced SuperStor PRO, an enhanced version of its SuperStor Version 2 data compression software.

Designed to increase disk capacity on personal computers, SuperStor PRO adds Microsoft Corp. Windows-based utilities to improve usability in a Windows environment. A Windows-based Joint Photographic Experts Group, Inc. image compression utility from Optibase, Inc. is included. The product offers an integral disk cache, compatibility with extended memory and password protection. Enhancements to the company's Universal Data Exchange technology have been made, and SuperStor PRO features increased performance over SuperStor Version 2.

The product costs $149.95.

Addstor
1040 Marsh Road
Menlo Park, Calif. 94025
(415) 688-0470

Micrografx, Inc. has started shipping Windows OrgChart 2.0, organization charting software.

Windows OrgChart is an updated version of Roykore, Inc.'s Instant ORGcharting product. Users can automatically create tree diagrams and organization charts.

New features include the ability to implement and save changes instantly, support for object linking and embedding and a fit-to-page feature that allows for the reduction of large organizational charts onto one page and a best-fit specification that can resize all fonts. Windows OrgChart 2.0 has automatic line drawing and box alignment and provides numerous chart configurations.

The product costs $149.

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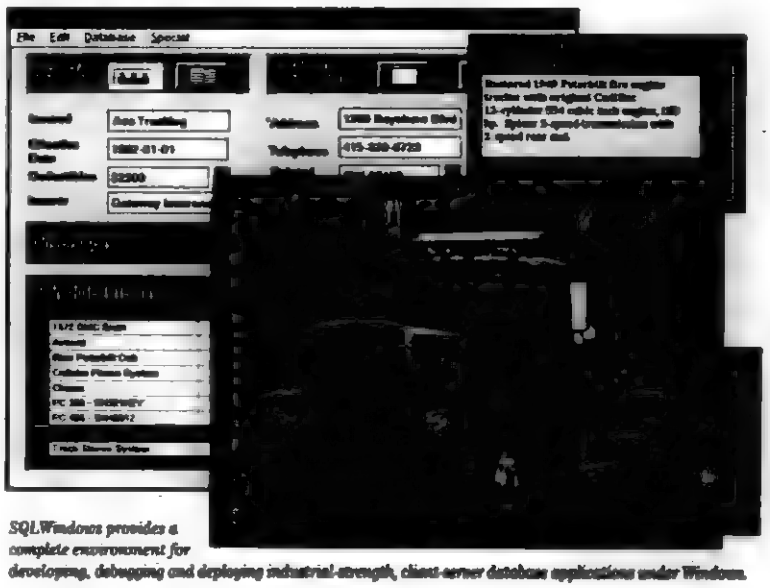

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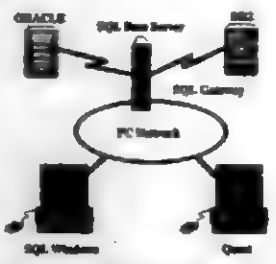

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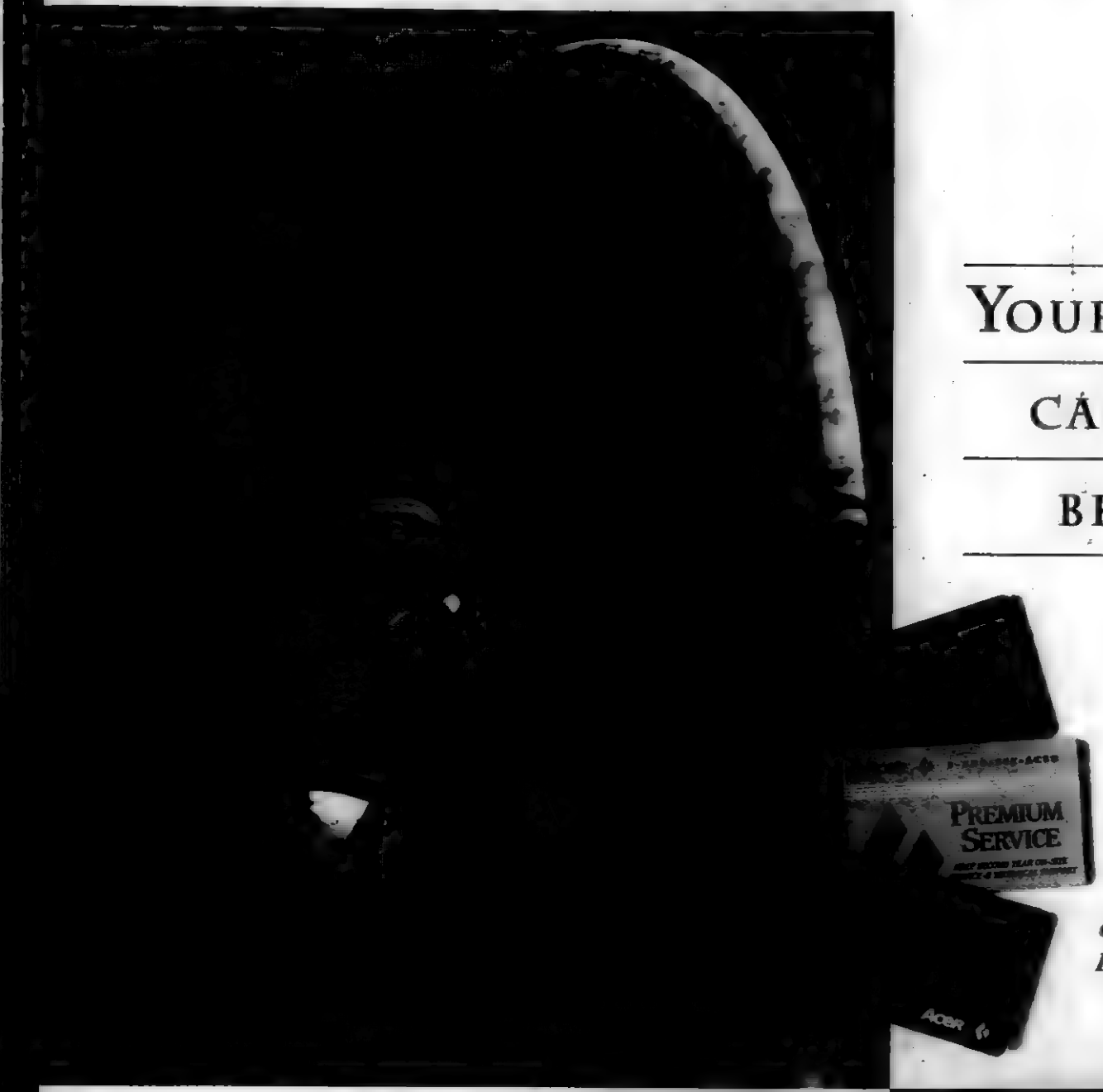

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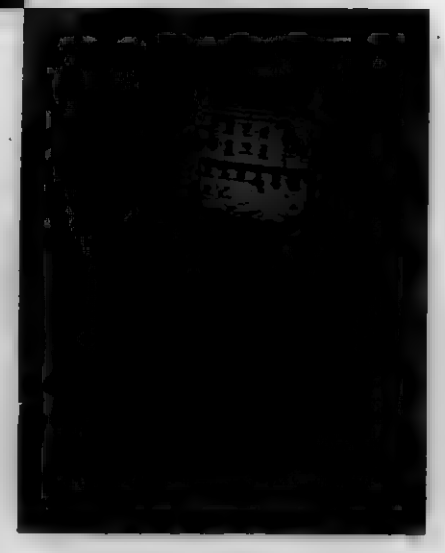

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Model	AcerPower 486e Model 5557	AST® Power Premium®	Dell® DE 486DX2/50	Gateway™ 486DX2/50 E
Memory Std./Max.	8MB/256MB	4MB/80MB	8MB/96MB	8MB/64MB
Monitor	UVGA-NI	No	UVGA15-NI	UVGA-NI
Hard Drive	210MB	210MB	230MB	340MB SCSI
Expansion Slots	(8) 5 EISA/2 ISA/1P	4 EISA	6 EISA	8 EISA
Local Bus/Flash BIOS	Yes/Yes	Yes/Yes	No/No	No/No
MSRP*	$3,299	$3,695	$3,469	$3,595

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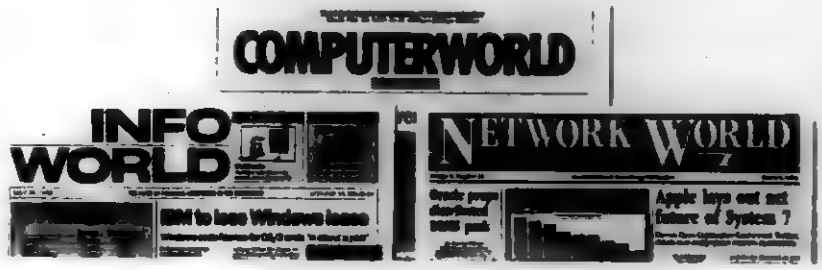

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U-Haul preps for open systems move

Undaunted by failure of first conversion attempt, firm examines RISC

BY GARY ANTHES
CW STAFF

PHOENIX — Having successfully completed a major project to automate its field operations in the late 1980s, U-Haul International, Inc. is now gearing up for its next big advance in data processing: a move to open systems and client/server computing at its headquarters.

But for now it is back to the drawing board for the world's largest consumer truck rental company, its first stab at client/server an apparent failure.

U-Haul's move to distributed computing was sparked by a mandate from top management to purge the company of its two IBM 3084 mainframes, said Michael T. O'Loughlin, director of systems development. "They said, 'Look at downsizing.' They read the magazines, too."

With those marching orders, U-Haul's previous chief information officer mapped out a plan that included systems based on Intel Corp. microprocessors running The Santa Cruz Operation's (SCO) Unix. The CIO said that would provide the biggest bang for the information systems buck, which is now a $12 million annual operating budget and an $8 million capital budget.

ON SITE

U-Haul International
Phoenix

- **Challenge:** To move headquarters' data processing to open systems and client/server environments.
- **Existing system:** Two IBM 3084 mainframes and Computer Associates' CA-Datacom.
- **Status report:** Pilot project based on Intel 1486-based server, SCO Unix and Oracle RDBMS showed poor performance. Considering RISC systems from Hewlett-Packard and IBM running Unix version of CA-Datacom.

Try again

In a test of the concept, a human resources application was ported to a Tricord Systems, Inc. server with an Intel 1486 microprocessor, SCO Unix and the Oracle Corp. relational database management system. Performance was so poor that U-Haul abandoned the effort. "Oracle said the problem was with Intel and said we should go to RISC," O'Loughlin said.

He said U-Haul had reached the bleeding edge of technology. "The vendors kept saying, 'We don't have any customers doing that, but yeah, it'll work.' We were pioneering with SCO Unix, and there are not enough utilities and tools [available that are] needed for a production environment."

O'Loughlin said U-Haul has pulled back and is now looking at other options, especially reduced instruction set computing (RISC) systems from IBM and Hewlett-Packard Co. The company is leaning toward the HP environment because it will be the first Unix environment for which Computer Associates Interna-

Continued on page 58

U-Haul automated *its stores and is now looking for a client/server system for its headquarters*

Compaq steps into the future with SystemPro/XL

BY MICHAEL FITZGERALD
CW STAFF

Compaq Computer Corp.'s new SystemPro/XL represents a complete redesign of its SystemPro high-end server line that gives it a path into the future. Most users and analysts contacted said they think the future, rather than the present, is where that product fits for them.

The SystemPro/XL, announced last week as part of a massive server announcement from Compaq, was almost lost in the shadow of Compaq's low-priced ProSignia. The XL, as the new high-end server at Compaq, will initially use 50-MHz Intel Corp. 1486DX processors, a step up from the SystemPro line it replaces, which topped out at 33-MHz 486DXs.

It will currently support two 50-MHz processors and in the future will support up to four P5 processors, which will give Compaq a legitimate superserver competitor in the performance arena. Beyond that, Compaq expects the same architecture to run at least two of Intel's P6 processors, although these are still in a design phase.

Roll of the dice

"I'm not so sure that the XL is not like betting on the future because that's geared to multiple processors and Windows NT," said Glenn W. Sandusky, vice president and chief information officer at Miller Mason & Dickenson, a benefits consulting company based in Chicago.

Sandusky's shop uses SystemPros, and he said he wants to move a couple of outlying offices off minicomputers onto local-area networks. But he said the XL might be overkill. He added that he would take advantage of a new 30-day evaluation program from Compaq to put the new machine through its paces.

The XL features Compaq's new TriFlex architecture, which takes the I/O, processor and memory subsystems and gives them their own bus to provide better performance.

Server specs

Under TriFlex, Compaq has a 64-bit processor bus to handle the P5 and future 64-bit chips from Intel.

It also includes a 128-bit memory bus and the 32-bit Extended Industry Standard Architecture bus, and it manages the three subsystems through its new TriFlex DataFlow Manager. A base model is slated to cost $13,999, including 16M bytes of random-access memory and a 550M-byte hard drive.

The XL also gives Compaq and its users the flexibility to change their minds about their server, according to one analyst.

John O. Dunkle, president of market research firm WorkGroup Technologies, Inc. in Hampton, N.H., said the XL's architecture will let Compaq put in either future generations of Intel chips or reduced instruction set computing chips.

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By the end of this week Computerworld readers will have spent over **$63.8 Billion** on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

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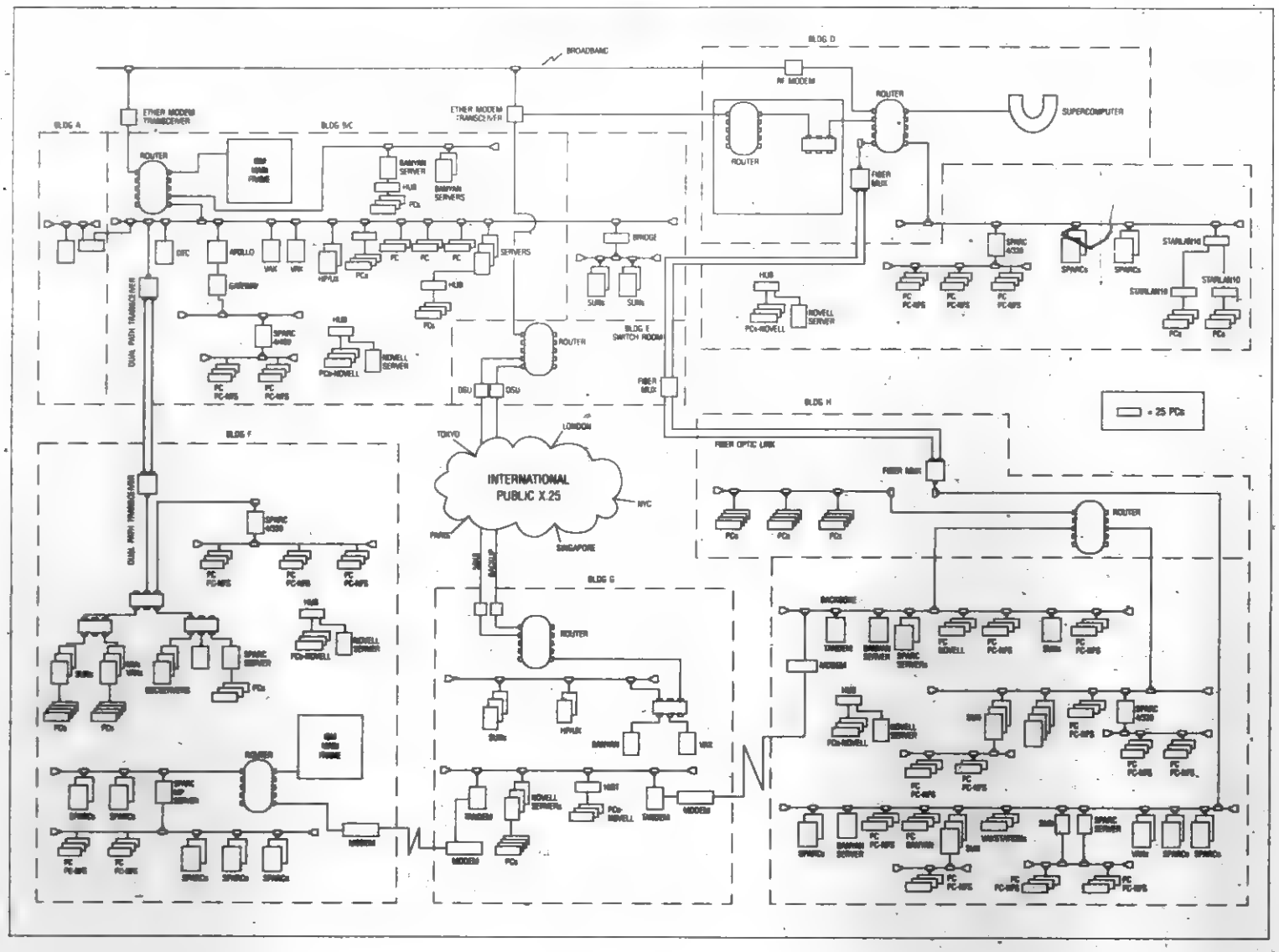

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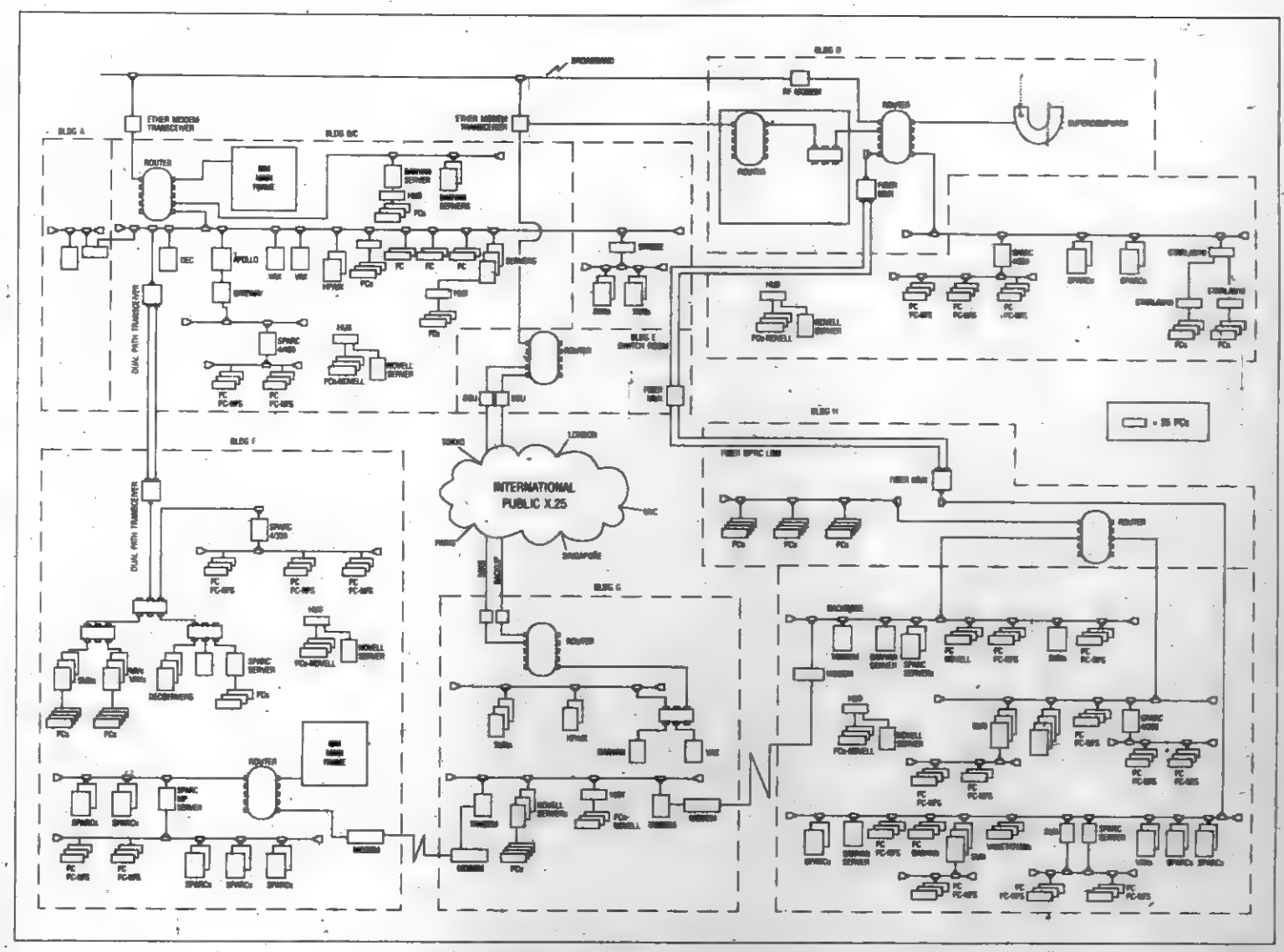

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Caere's PageKeeper eases image indexing

BY CAROL HILDEBRAND
CW STAFF

Caere Corp. took a step toward easier image indexing when it announced PageKeeper late last month.

Demonstrated at the Seybold conference in San Francisco, the Microsoft Corp. Windows-based information management software was designed to help users search through networked personal computers and databases more easily and to retrieve text more quickly.

"Because finding the right information is so important, we designed PageKeeper to find useful material, not just words. Now, you don't need to organize your information anymore — you just have to ask for it," said Larry Miller, vice president of marketing.

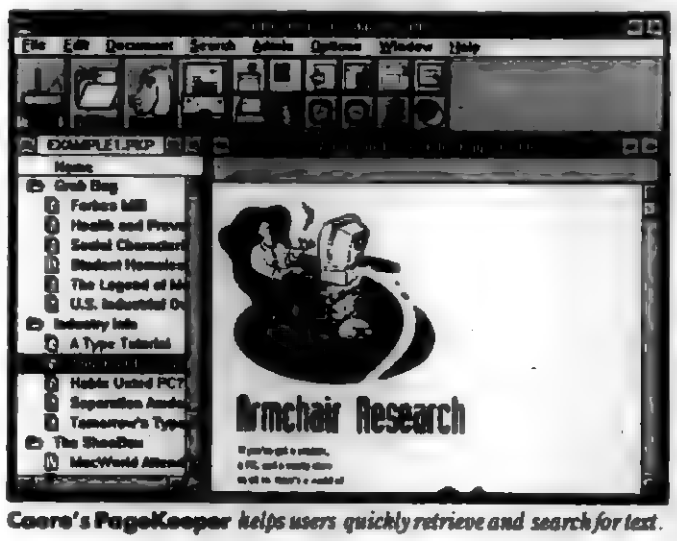
Plugs a gap

Analysts said the product would help fill a market need that has not yet been addressed.

"We need to get from a world in which the only kinds of things we can search on are text and numbers to a world in which any object that can be stored can be accessed without need for excessive human intervention," such as teaching an employee to search on key wording, said Amy Wohl, a principal at Amy D. Wohl Associates in Bala Cynwyd, Pa.

The company said that information management at the desktop level has not reached the level of the minicomputer and mainframe environments for various reasons: Host-based environments require expensive optical equipment as well as technical specialists to do the searches. The firm opted for Windows to provide a graphical user interface that less experienced individuals would also be able to use.

The software uses automatic input, which accepts information without requiring manual entry. It indexes information from files stored on a hard disk to scanned-in printed documents, thus allowing a search on an entire document, not merely certain key words. The built-in optical character recognition software allows users to scan in text and convert it to editable form, as well as compress it at ratios up to 50-to-1.



Caere's PageKeeper *helps users quickly retrieve and search for text.*

A couple of new retrieval methods first present search results in order of relevance to the original request and reference tangential documents that may be of interest, the company said.

Pricing is set at $895 for a single-user or $1,995 for a five-user license. The product is slated to ship in the fourth quarter.

Integrated support system unveiled

BY CHRISTOPHER LINDQUIST
CW STAFF

Mountain View, Calif.-based ProActive Software, Inc. has announced the shipment of the Support Advantage segment of its Customer Information Resource system.

Customer Information Resource is a set of client/server applications intended to help companies serve a variety of customer needs, from manufacturing to sales and support. Support Advantage is the first piece and is aimed at help desk/product support environments where support staff members are required to collect customer information and utilize it to resolve customer problems.

Sunnyvale, Calif.-based Actel Corp. was handling its support calls the old-fashioned way — with paper and pencil. The written information was then sent to a data-entry service every month for entry into the corporate database. "It was a crude fashion of entering information," said Steve Gurklys, technical support manager.

As an early beta-test user of Support Advantage, he soon found himself appreciating the product. "I'm impressed with [ProActive's] vision," he said. "They really do care about the end product."

Gurklys was also impressed with the product's search speed and flexibility and said that while support people were initially hesitant, that has changed.

Support Advantage allows customer information to be entered into standard SQL databases using a graphical front end. Customer information can then be searched, and problem resolutions can be tracked.

Through Object Linking and Embedding, a variety of image, voice and text information can be attached to a customer record for later retrieval.

Catalog query

In addition, Support Advantage catalogs support information and solutions that can later be searched using a query by example method. In this way, solutions to common problems can be addressed quickly and with minimum duplication of effort.

The product also contains a "work-flow engine" that can be used to send information to appropriate users across a network. For example, a rule could be defined that automatically sends problem reports about a specific product directly to the product manager.

The interface and operation of Support Advantage can be customized extensively using the ProActive Toolset, which is available separately.

Support Advantage currently runs on Unix using Sybase, Inc.'s SQL Server as a database engine, and it uses Microsoft Corp. Windows 3.1 client systems. It is slated to be available by year's end on Informix, Inc. and Oracle Corp. databases as well as X Window System clients.

Pricing for Support Advantage begins at $14,900, depending on the number of users and platform supported. The ProActive Toolset begins at $15,000.

U-Haul goes client/server

CONTINUED FROM PAGE 55

tional, Inc. will introduce its CA-Datacom DBMS and its Ideal fourth-generation language. That will make it easy to port applications written in the mainframe versions of those products — about 40% of U-Haul's mainframe code — to Unix, O'Loughlin said.

U-Haul management also directed O'Loughlin to explore outsourcing of mainframe processing as a possible interim measure while a client/server solution is put in place. But he said the odds of doing that are not good. "There's concern about the security of corporate data," he said.

In the meantime, the mandate to get rid of the mainframes has softened, and U-Haul may end up keeping one of them, O'Loughlin said. He said a document inquiry application with a huge database of customer history may require the big box.

Despite its false start toward client/server computing at headquarters, U-Haul is far from inexperienced in the use of networked workstations. During much of the 1980s, U-Haul's rental centers sent in sales information to headquarters every day. However, even with 250 people to sift paper and key and correct data, it took U-Haul two weeks to process the information and generate reports.

Unisys to the rescue

To break that logjam, U-Haul installed a network of Unisys Corp. CTOS workstations at its 1,100 rental centers and 78 district offices. Now 110M bytes of point-of-sale data flow up through the regional centers to the data center here every day, while 30M bytes of truck status information is sent back to field locations. U-Haul produces reports in a few hours, and the company has trimmed 200 people from its clerical data processing staff.

Originally installed just for data collection, the distributed system now includes a complete suite of in-store applications all written by U-Haul.

But that spirit of independence has made some employees nervous about the company's reliance on a single vendor. "Management told us not to get locked into Unisys," O'Loughlin said. In response, his staff ported the in-store applications to DOS, but so far the new software remains undeployed — a "research project" that he said gives U-Haul leverage over Unisys when it upgrades the CTOS units.

RISC-based Token Ring chip set debuts

BY MICHELE DOSTERT
CW STAFF

Standard Microsystems, Inc. (SMC), long a power in Ethernet and Arcnet network adapters, has introduced a new line of 16M and 4M byte/sec. Token Ring network interface cards and Multistation Access Units, based on its own Token Ring chip set.

Previous to SMC's entry into the Token Ring market, vendors consisted of IBM, which used its own chip set, and about 30 third-party vendors, such as Madge Networks, Inc. in San Jose, Calif., and Proteon, Inc. in Westboro, Mass., that used a chip set developed by Texas Instruments, Inc.

However, SMC claimed that its new reduced instruction set computing (RISC)-based chip set will establish new price/performance standards in the Token Ring industry. Benchmarks from SMC show its card equaling the Madge card in performance but having a 33% better price/performance score.

SMC also promised there will be none of the interoperability problems experienced when Token Ring cards based on the TI chip set hit the market. "We have tested and retested in all possible configurations, and our card interoperates with every other Token Ring card out there today," said Bob Gohn, product manager for Token Ring products.

Elite network cards

SMC's new Token Ring network interface cards, called the EliteSeries 4/16, use two RISC processors to speed throughput on the card. SMC's card also offers the first Token Ring network interface card with a Simple Network Management Protocol agent embedded in the card. This agent is included at no charge in the SMC Token Ring network interface card.

The EliteSeries 4/16 is priced at $599 per card. "However, we've been careful to build a margin for resellers into our pricing structure, so the street price of the card may well be considerably lower," said Art Nehr, product marketing manager for Token Ring products.

SMC has no plans to market its chip set to other Token Ring card vendors, although the company said it will probably sell the chip set to builders of high-performance routers and bridges.

SMC's Token Ring cards, available in both Micro Channel Architecture and Industry Standard Architecture versions, are slated to be available through resellers next month.

Analysts were positive about SMC's move into the Token Ring market.

Stan Schatt, senior systems analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., said, "They've added value with their SNMP agent, and their low price could really shake up the Token Ring market, which needs it."

External wireless adapter released

BY ELLIS BOOKER
CW STAFF

SAN DIEGO — The industry's first external wireless network adapter for IBM-compatible computers was released recently by data communications products company Solectek Corp.

Unlike other wireless local-area network systems now on the market, the 4- by 7-in. Solectek AirLAN adapter does not require an internal card. It attaches to the parallel port of a desktop or portable computer.

The system was jointly developed with NCR Corp. and is compatible with NCR's WaveLAN, a spread-spectrum, wireless LAN that NCR began shipping to customers in late 1990.

The market for wireless LANs as replacements for conventional office LANs has been minuscule, according to Ira Brodsky, president of Datacomm Research Co. in Wilmette, Ill.

"Most of the market isn't in the office; it's been in environments like retail stores and warehouses," said Brodsky, who estimated that total sales of wireless LAN gear this year will be $260 million.

Significantly, however, Brodsky said he believes $215 million of this market represents portable applications in which "wireless is essential for adding mobility."

Portia Isaacson, president of Dream IT, Inc., an information systems consultancy in Colorado Springs, said she sees increasing interest in wireless office LANs as portables become more prominent in white-collar settings.

"My little company, like a lot of others, has quite a few notebook computers, but there hasn't been a way to interface them with WaveLAN," said Isaacson, whose company recently installed the NCR wireless network.

WaveLAN-compatible

Isaacson also said she was excited that the Solectek device is compatible with WaveLAN. "One weakness of wireless technology today is that all the systems are proprietary," she said.

An NCR spokeswoman would not comment on the company's own timetable to bring forth next-generation WaveLAN products targeted at mobile workers.

"We can say that NCR customers want wireless for desktop and portable platforms, and we realize we have to offer a solution for in-building roaming," she said.

The AirLAN adapter, which complies with the IEEE 802.3 Ethernet standard, runs at speeds of up to 2M bit/sec. at distances up to 800 feet, according to Solectek. The adapter will ship in December from retailers and distributors at a suggested retail price of $899.

Solectek also promised future products, including a Personal Computer Memory Card International Association (PCMCIA) 2.0 version to coincide with the introduction of laptops using PCMCIA 2.0 cards.

Lotus ships CD-Networker

BY ROSEMARY HAMILTON
CW STAFF

Lotus Development Corp. began shipping a software tool late last month that allows users on a local-area network to share applications stored on compact disc/read-only memory (CD-ROM).

The company also announced plans to deliver its core applications via CD-ROM.

"We see a need from the standpoint of a software publisher to start using this medium," said David Newbold, product line manager at the Lotus One Source group. "Some of our applications are pretty complex, and convenience is a major thing [to customers]."

Lotus CD/Networker 4.1 is the first version of this software tool made available to the general market. Previous versions were offered to users of the company's One Source financial data service.

The software allows users to access data and applications from a CD-ROM drive. The company will also offer a stand-alone version, but the networked version provides multiple users simultaneous access to up to 28 CD-ROM drives per server.

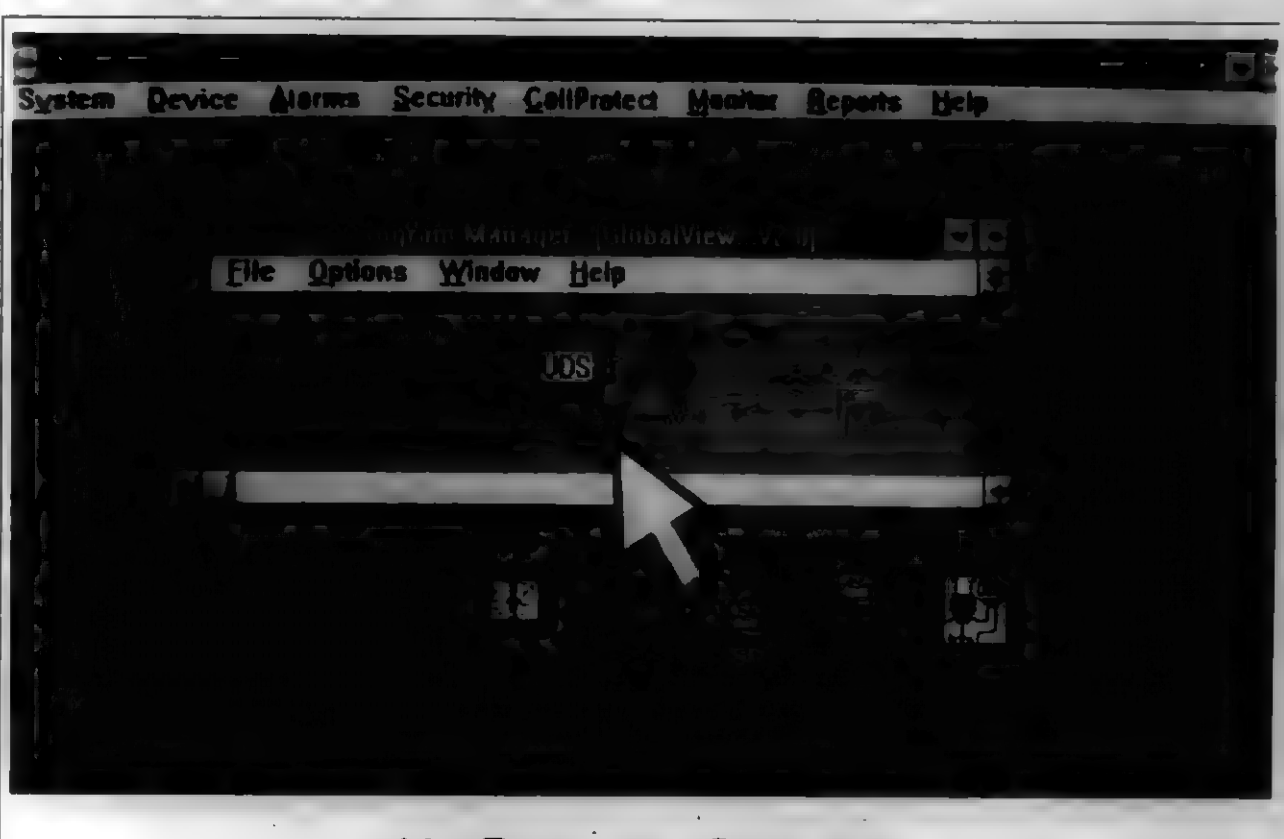
Lower cost

"It will address the cost-per-seat issue, having lower incremental costs because you don't need a CD per user," said John Donovan, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Newbold said users need to license the server versions of applications for use with CD/Networker. Some application code will then reside on the workstation, while the "high-density stuff, like Help, is on the CD-ROM."

Michael Bragen, president of Business Management Consulting in Lexington, Mass., said, "Now that the technology is available, the imagination of users will be captured and that should start to drive demand."

CD/Networker carries a list price of $995 per server, regardless of the number of workstations.



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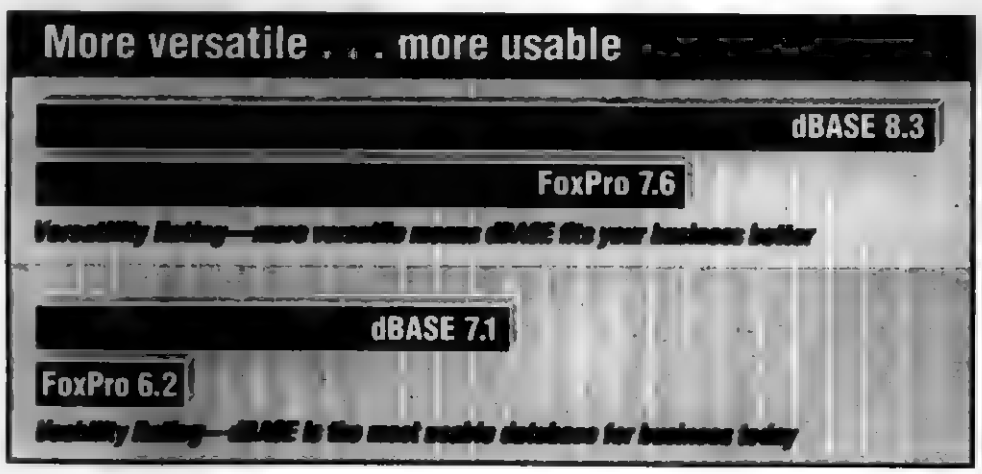

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Source: 1992 *ComputerWorld* I/S Brand Preference Study

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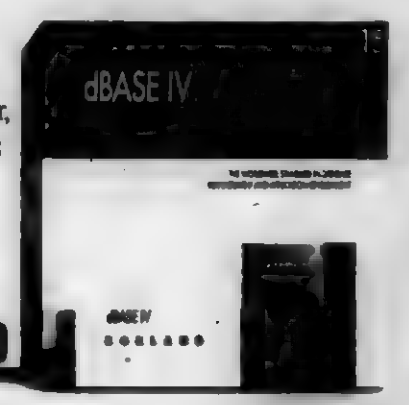

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Software Craftsmanship

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NEW PRODUCTS

Local-area networking hardware

Proxim, Inc. has introduced RangeLAN/PCMCIA and RangeLAN/Parallel, wireless local-area network adapters.

The products were designed for applications such as terminal emulation, electronic mail and file-, printer- and modem-sharing.

According to the company, RangeLAN/PCMCIA fits into a Type II credit card slot of notebook, subnotebook, palmtop or pen-based computers.

RangeLAN/Parallel provides wireless connectivity to any personal computer when it is connected to the parallel port.

RangeLAN/PCMCIA and RangeLAN/Parallel cost $595.

Proxim
295 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 960-1630

Artisoft, Inc. has started shipping EtherBasket, a multipack of 12 Artisoft AE-2 or AE-2/T Ethernet adapters. According to the company, the AE-2 adapter supports thick and thin coaxial cables. The AE-2/T adapter supports thick coaxial cable and 10Base-T cable.

Both products are 16-bit adapters that offer 100% compliance with IEEE 802.3 Ethernet standards.

The EtherBasket costs $2,999. User manuals and two driver disks are included in the package.

Artisoft
691 E. River Road
Tucson, Ariz. 85704
(602) 293-6363

Local-area networking software

GigaTrend, Inc. has started shipping MasterSafe Enterprise, high-performance tape backup software that backs up and restores multiple local- and wide-area networks.

The product uses communications technology that was designed to comply with Novell, Inc.'s Storage Management Services architecture and backs up data over Token Ring, Ethernet, ArcNet and fiber-optic topologies, the company said.

Network backups and restores are executed at a tape station on the network rather than at a file server or workstation.

The software kit costs $2,995.

GigaTrend
2234 Rutherford Road
Carlsbad, Calif. 92008
(619) 931-9122

Workgroup software applications

Tallgrass Technologies Corp. has announced support for heterogeneous operating environments by adding Apple Computer, Inc. Macintosh and Unix agent options to NetSecure, its server-based Novell, Inc. NetWare Loadable Module (NLM) network backup solution.

Tallgrass said NetSecure was designed to integrate into the NetWare operating system to give the user flexibility, maximum performance and high-level security.

Users with The Santa Cruz Operation's Unix System V, Release 3.2 and Macintosh workstations running System 6.05 and above can now receive workstation agents provided by NetSecure. The agents enable the product to back up and restore local Macintosh and Unix workstation hard drives.

The Macintosh and Unix NLM options cost $495 each.

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Lenexa, Kan. 66214
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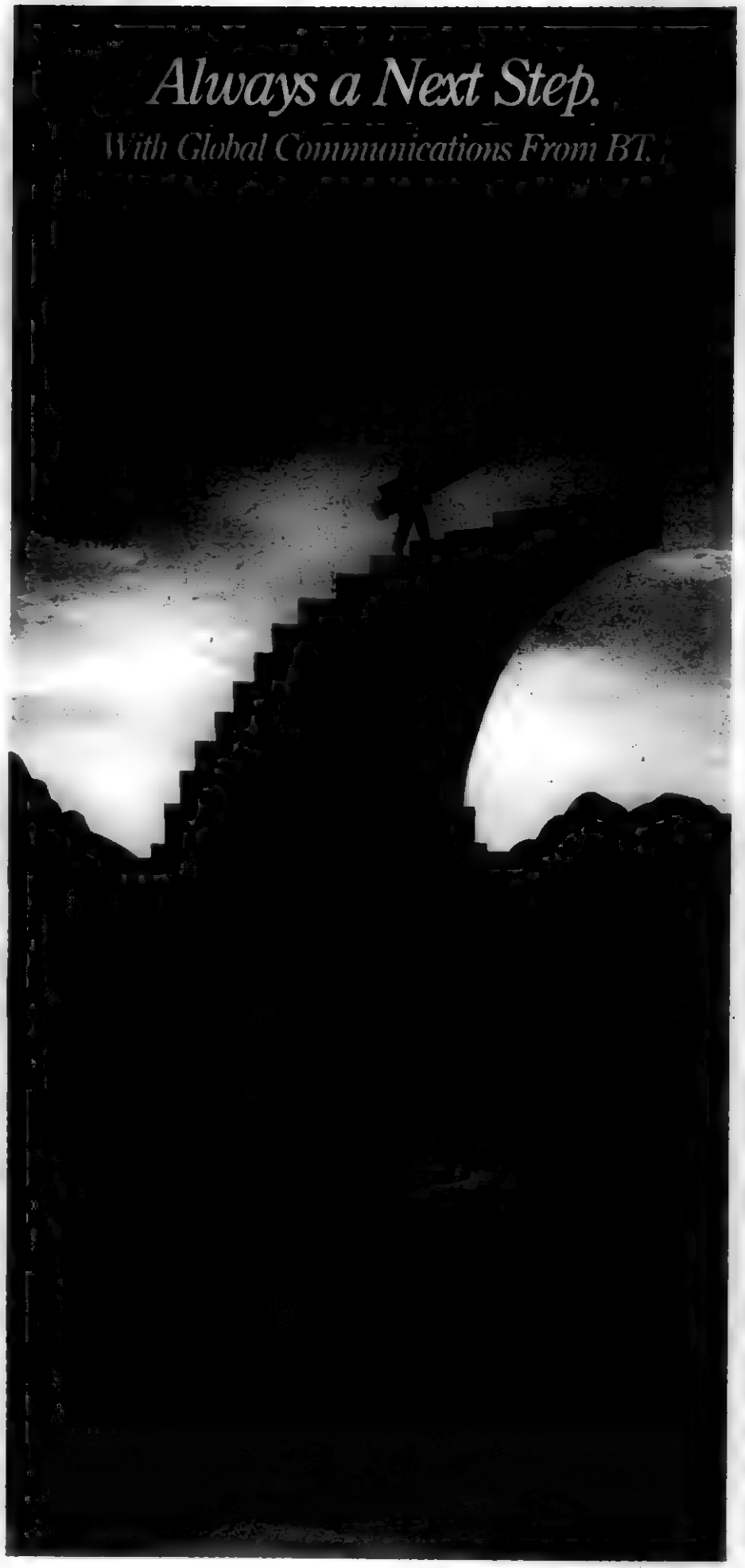

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IN BRIEF

Global net agreement

■ Six international telecommunications carriers have signed a Global Networking Project agreement under which each carrier will contribute capacity on its undersea fiber-optic networks to provide a worldwide, shared-facilities network. As a result, each carrier will be able to access capacity on the shared network on a more flexible, as-needed basis for restoration of service after a network failure or to meet sudden unanticipated swings in user bandwidth demand, the consortium said.

The six carriers are AT&T, BT, Deutsche Bundespost-Telekom, France Telecom, Australia's OTC and Japan's Kokusai Denshin Denwa.

■ **Ingram Micro, Inc.** will begin distributing Reach Software Corp.'s electronic-mail products in North America this month, Reach said last week. A joint promotion provides resellers with free trial, 10-user versions of Reach products when purchasing Novell, Inc.'s NetWare Version 3.11.

Seeking help in overseas networking

Telecom users explore their global network outsourcing options at Yankee Group conference

BY ELISABETH HORWITT
CW STAFF

NEW YORK — No one came up with a universal definition for network outsourcing at the recent Yankee Group Global Network Strategies conference. However, telecommunications managers agreed that they would love to turn the grunt work of provisioning, managing and supporting their overseas networks over to someone else. The problem is finding the right carrier, or consortium of carriers, to do it.

"U.S. multinationals are investing in global networks during the '90s the way they invested in domestic networks in the '80s: spending about 20% of their communications budget" on expanding networks overseas, said Berge Ayvazian, vice president of communications research at The Yankee Group.

According to Ayvazian, such companies require the following types of help for their global networks:

- High-quality, reliable circuits that do not deteriorate once they travel beyond major metropolitan areas.
- A single point of billing that takes one kind of currency.
- Trouble management and restoration of circuits.
- Coordination among and interoperability between carriers.

In addition, such companies strongly desire — if not require — rapid service delivery, service-level guarantees, value-added customer services and reduced operational costs, Ayvazian said.

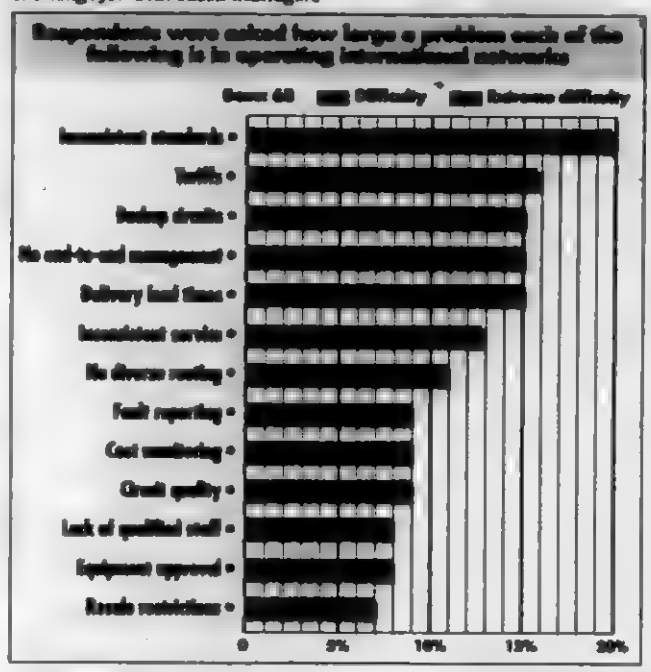
However, cost consideration was the least important criterion for choosing a global network provider, according to a recent Yankee Group survey of 68 U.S.-based multinational companies. The top priority was compression of lead times for deploying new circuits and services.

Users and analysts agreed that it is now virtually impossible for multinational firms to get all their global networking needs met by one carrier or even by one of the recently formed carrier consortia.

General Electric Co., for example, is meeting a broad range of user needs and applications by implementing a combination of Integrated Services Digital Network, frame relay, Asynchronous Transfer Mode and inverse multiplexing, delivered by several different carriers, according to Barry Volante, program manager of telecommunications planning.

Standard complaints

Differences in standards throughout the world present the biggest challenge for U.S.-based managers



Bevy of choices

Major carriers such as AT&T, Sprint Corp., MCI Communications Corp., Infonet and BT have introduced a range of outsourcing-like services, including management and maintenance of users' networking equipment, one-stop billing and one-source troubleshooting of multicarrier network problems.

"Is this network outsourcing?" Ayvazian asked at the conference. "No one is running your mainframes; there is no transfer of personnel. But the carriers are managing your networks."

A growing number of multinationals are opting for, or are at least considering, some form of global network outsourcing, according to Yankee Group senior analyst Roberta Wiggins. It offers a chance to downsize or even eliminate overseas telecom staff, as well as offload the hassle of dealing with a dozen foreign carriers, each with its own currency and language, Wiggins pointed out. Furthermore, users are encouraged by seeing companies

Continued on page 72

Great expectations for multimedia courtship

BY JOANIE M. WEXLER
CW STAFF

CHICAGO — Multimedia networking has come to the lovelorn.

Great Expectations, Inc., which claims to be the largest dating franchise in the country, is integrating its 135,000-member database with photographs and TV-quality desktop video over Arcnet-based local-area networks to make romance consumerism more efficient.

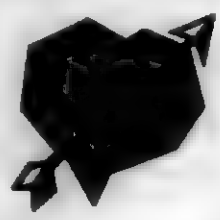
The dating service's members can opt to search for potential mates across a set of specific variables, such as "30-year-old women who like The Beatles and investments." They can then click on the names found and access each qualified individual's photograph and introductory videotape from a networked, in-office workstation, said Jim Ditkowsky, senior marketing representative at the Chicago site.

Going 'Platinum'

The Great Expectations service, called "Platinum," has contributed to the Chicago office's 25% increase in dollar sales since the system went live last fall, he said. Platinum is running in nine of the company's 43 locations.

Most dating services require members to consult a binder containing photographs and profiles of would-be partners. They then plug in a videotape containing multiple videos that members have recorded to introduce themselves, fast-forward to the prospect of their choice and view a full-motion video of their potential date on a television screen.

Great Expectations also offers this approach for a lower membership fee. But singles apparently have less time these days to spend on screening dates and fumbling with paper and VHS cassettes.



"We're seeing more shoppers for dating services and more competition," Ditkowsky said. "But as soon as a shopper sees Platinum, they sign right up with us." About one-third of Great Expectations' Chicago-area members have gone Platinum.

However, Great Expectations founder and President Jeffrey Ullman said he is ambivalent about automating a business that hinges on emotions. "I'm both intrigued and terrified," he said. "While Platinum can be a time-saver to our busy members, the potential detriments are that it may overemphasize the visual in lieu of other qualities."

Houston software developer Dataseek, Inc. provides the database management, application, digitizing, compression, networking and storage services for "tens of gigabytes of data" to the dating service's local offices, said Mark Everding, Dataseek president.

Dataseek keeps a mirror version of Great Expectations' data and comes in twice a month to update the server's hard disks. Ditkowsky said he suspects that with the advent of Integrated Services Digital Network (ISDN) — the long-coming high-speed digital public network — Dataseek will be able to update the servers remotely.

Ditkowsky is looking to ISDN to allow him to offer Platinum to members in their homes, as well as other services such as real estate and job searches, limited "only by the imagination," he said.

The Dataseek application runs on top of ProtoComm, Inc.'s VideoComm video server software, which is a Novell, Inc. NetWare Loadable Module. The underlying LAN is Thomas-Conrad, Inc.'s proprietary 100M bit/sec., Arcnet-based Thomas Conrad Networking System.

Each videotape consumes 6M to 12M bytes of storage. Dataseek has daisy-chained 1.7G byte disk drives together to each MS-DOS-based LAN server to store 10G bytes of videos locally, Ditkowsky said.

The videos are stored locally "because T1 lines between sites are too expensive," and just one video at a time can run over a T1, Everding said. In addition, high LAN speeds are needed for TV quality, he explained.

However, sites within a region — such as those in Chicago, suburban Schaumburg, Ill., and Milwaukee — are networked via low-speed lines through a Dataseek host for exchanging date requests and responses.

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Dolphin monitor gains error troubleshooting

BY ELISABETH HORWITT
CW STAFF

NORCROSS, Ga. — Dolphin Networks, a division of Digital Technology, Inc., has enhanced its line of network management tools with Dolphin Expert System Protocol (ESP), a family of network protocol analyzers that are said to provide real-time monitoring and analysis of local-area network traffic and error events.

Dolphin ESP reportedly incorporates an expert system that automatically troubleshoots problems on Arcnet, Ethernet or Token Ring LANs. The product consists of a DOS-based software program and a customized 16-bit Industry Standard Architecture card that monitors one of the above network topologies.

The products can analyze seven network protocols, including Novell, Inc.'s IPX/SPX, Transmission Control Protocol/Internet Protocol, Banyan Systems, Inc.'s StreetTalk, Apple Computer, Inc.'s AppleTalk, Open Systems Interconnect and NetBIOS, Dolphin said.

The network manager can set the product to "trigger an alarm when it sees an error of a particular type," said Dolphin spokesman Philip Kim. The alert is forwarded to the network management platform, where it is displayed on the screen; the platform can then take control of the remote protocol analyzer to determine the source of the problem, Kim said. The expert system can provide diagnosis and suggestions to the user.

Triggers can be based on Media Address Control addresses, protocol type, frame size, bad frames and user-defined patterns, the company said. The Arcnet version is priced at $995, the Ethernet version at $1,495 and the Token Ring version at $1,995.

In addition, Dolphin expects to release in first-quarter 1993 Dolphin ESP Plus, which will come on its own portable personal computer, the company said. The PC will be configurable with two cards to concurrently support analysis of two types of LAN topology, Dolphin said. The system will also support Fiber Distributed Data Interconnect, Token Ring and Ethernet, with an optional $495 Arcnet card.

In addition, one ESP Plus station will be able to send traffic across a wide-area network link to another station, with both stations reporting their analysis of the packets being sent, Kim said. This will allow network managers to pinpoint a trouble source that is changing the packets en route, he added.

ESP Plus will cost $29,995.

NEW DEALS

DOE, Sprint to help lab

■ **The Department of Energy** and **Sprint Corp.** have announced a program to upgrade the University of California Lawrence Livermore National Laboratory data network. Under a $50 million agreement, Sprint will provide Asynchronous Transfer Mode (ATM) service, and TRW Electronic Systems Group will provide 11 ATM switches handling speeds of up to 622M bit/sec.

■ **BT's Global Network Services** (GNS) and **Syncordia** network outsourcing subsidiaries will work on a three-year contract to provide a British Petroleum Co. subsidiary, BP Chemicals, with a global network. GNS will link BP Chemicals' sites to a backbone network, managed by Syncordia, that will stretch across 20 countries. The contract is valued in the millions, BT said.

21 GIGABYTE*

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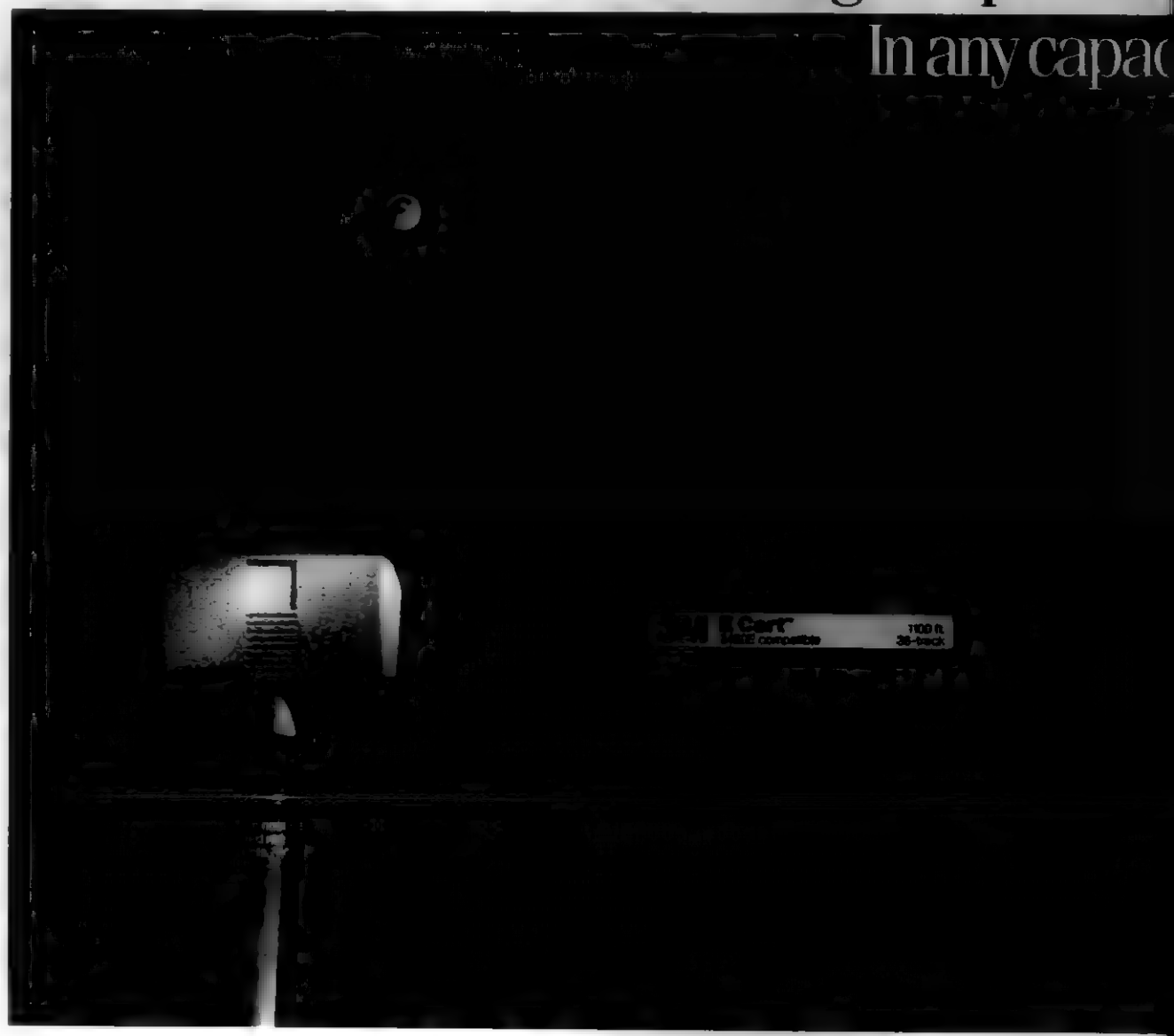

Proginet claims IBM-OSI price edge

BY ELISABETH HORWITT
CW STAFF

UNIONDALE, N.Y. — Help is on the way for users who would like their IBM hosts to exchange files with other vendors' systems via Open Systems Interconnect's (OSI) FTAM protocols but who are put off by the $300,000 price tag of IBM's OSI Communications Subsystem.

Proginet Corp. last week introduced Host.FTAM, an implementation of OSI File Transfer, Access and Management (FTAM) on IBM MVS/ESA hosts that provides more file-transfer functionality than IBM's product, at prices beginning at $85,000, according to Proginet spokesman Brian Berns.

Proginet will coannounce its product with Novell, Inc., and the two vendors will guarantee interoperability between Host.FTAM and Novell's FTAM product, Berns said. In addition, Proginet is currently working to test interoperability between its product and FTAM software from companies such as Tandem Computers, Inc., Hewlett-Packard Co. and Digital Equipment Corp., he added.

Proginet is talking with IBM about possibly making Host.FTAM available through OEMs or integrating it with IBM products, according to sources close to Proginet.

Proginet Vice President Joe Mohen said the firm will initially target government organizations and contractors that are moving to OSI under the Government OSI Profile as well as international organizations that need to communicate with Europe, where OSI is mandated by many governments.

Daily recommendation

The U.S. Department of Agriculture (USDA) currently uses IBM's FTAM product to enable IBM hosts to exchange files with Data General Corp. and Unix systems, according to Doug Harsha, a computer specialist at the Fort Collins, Colo., agency.

FTAM provides certain features that the Transmission Control Protocol/Internet Protocol's File Transfer Protocol counterpart "simply doesn't have," Harsha said.

However, current vendor implementations, including IBM's, lack some of FTAM's richer features — in particular, a "very important" Checkpoint Restart feature that enables a system to pick up a file transfer where it left off after an outage, he added.

Proginet's Host.FTAM reportedly supports the recovery feature. The USDA is awaiting documentation in order to evaluate the product, Harsha said.

International trial

The Boeing Co. also plans to evaluate Proginet's Host.FTAM, according to Laurie Bride, manager of communications technology at the aerospace company's computer services division. As an international company, Boeing wants OSI's ability to provide a common scheme for addressing users on a global basis. "Plus OSI has a general richness of services," Bride said.

Boeing installed IBM's OSI Communications Subsystem last fall but has no plans to use it in production "at this point in time," she said. She would not offer an explanation. Like the USDA, Boeing is "particularly interested" in Host.FTAM's Checkpoint Restart feature, Bride said.

128 MEGABYTE

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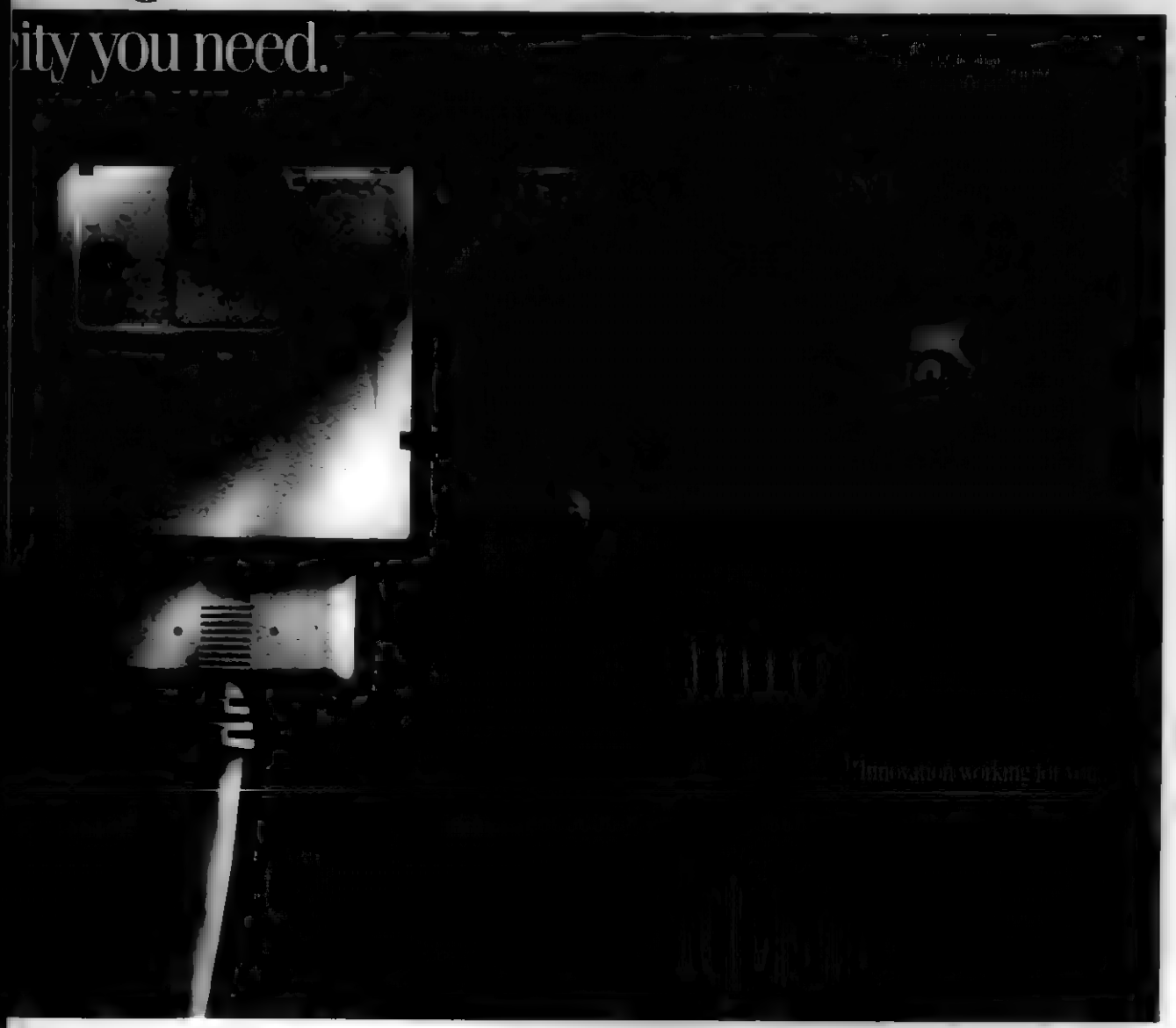

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Frank Russell eases into outsourcing with BT

BY ELISABETH HORWITT
CW STAFF

TACOMA, Wash. — Where some companies jump into network outsourcing with a splash, Frank Russell Co. slipped into its outsourcing deal with BT gradually, over a period of years.

The financial services company began using BT North America, Inc. in the late 1980s, when it was still Tymnet. "We had no big applications" to cost-justify Tymnet's X.25 packet-switched services, said Bill Branson, a senior network engineer at the Tacoma, Wash., financial services company. When Tymnet offered to "do a pilot and keep the costs down," Frank Russell took a chance.

This began paying off as users started realizing the advantages of using the global X.25 connections for electronic-mail exchange, particularly with sites in Australia and other parts of the globe where telephone calls are hard to set up, Branson said. The company has already cost-justified its X.25 network service on E-mail alone, he added.

X.25 connections cost about 40% less than a star configuration of 9.6K bit/sec. leased lines that radiate out from headquarters to remote sites, according to Branson.

The one drawback of Tymnet services was that connections to other countries involved X.75 gateways between Tymnet X.25 links and foreign carriers' X.25 networks. Those gateways "had a performance problem," Branson said.

Then, in 1990, BT approached Frank Russell with its Global Network Services offering, under which the UK-based carrier acts as a single point of contact and coordinator of customers' global networks. "We liked it; it offered easier coordination and management" of links to various parts of the world, Branson said. "The local PTT connections became invisible."

Later on, the financial services firm took another chance: that BT's Synchronous Data Link Control (SDLC) service would be reliable enough to justify getting rid of an IBM 9370 host in London, leaving London users dependent on an SDLC-based connection to the Tacoma host. This, too, paid off, enabling Frank Russell to realize substantial cost savings by eliminating maintenance and lease costs of the midrange host, Branson said.

"When I first joined the company I thought, 'We're paying BT too much; we could install our own equipment,' " Branson recalled. "But with BT we don't need to deal with PTTs on an ongoing basis; and I don't get calls in the night like I did with another global company."

Letting BT run its network has saved Frank Russell from hiring telecommunications people to do the job, freeing up some money to hire people it really needs, such as capable local-area network managers, Branson said. Global network outsourcing makes sense because most X.25-based wide-area networks require the same basic management skills, no matter what industry sector the user happens to be in or what the configuration happens to be, he added.

In contrast, LANs go all the way up to the application layer, which is extremely industry-specific and product-specific, Branson said. Value-added resellers may be technically expert, but they tend to be tied to a particular product, "either because they are in with some vendor or that's where they have experience," he added. "You have Novell, and they say, 'You really ought to have [Microsoft Corp.'s] LAN Manager.' "

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Seeking help for overseas nets

CONTINUED FROM PAGE 65

such as J. P. Morgan & Co., Unilever Corp. and GE win impressive concessions in outsourcing contracts. "J. P. Morgan chose BT because BT was willing to customize and agree to cash penalties" if certain service levels were not met, Wiggins said.

With outsourcing services just beginning to emerge, it is up to users with clout to pressure the carriers to meet their needs, Volante said.

"Some years ago, a vendor told us, 'Your U.S. network needs 40 nodes.' I said, 'It only needs 20; here's a traffic report.' They replied, 'It still needs 40 nodes' — but that was based on where their nodes were. They were trying to make our applications fit their network."

Aldus Corp., a Seattle-based publishing and presentation software company, runs all of its internal applications across a global client/server network, said Don Moore, manager of communications technology.

"We decided we couldn't outsource the whole process, but we wanted one-stop shopping: that is, end-to-end service where the carrier takes 100% responsibility" for the links, with a single point of billing for local and interexchange services.

Tips that Moore gave to The Yankee Group audience included, "never buy on price alone; never buy something that is not available yet; and never sign a large order, even if discounts are offered for big commitments."

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–Peggy Turner, CFO

"I thought you said these were going to increase productivity."

–Greg Collins, Office Manager

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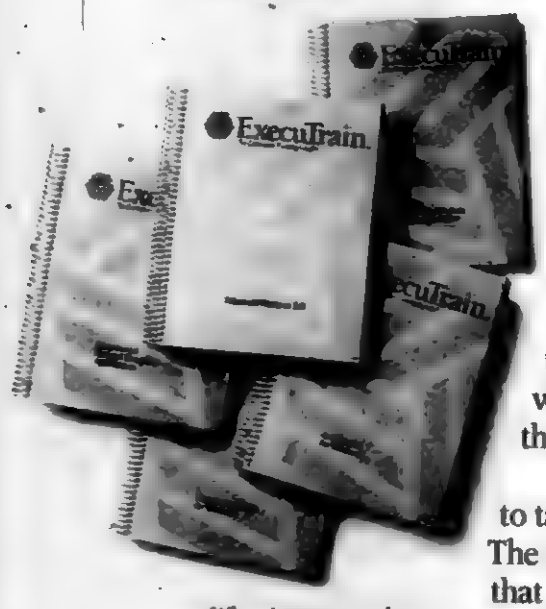

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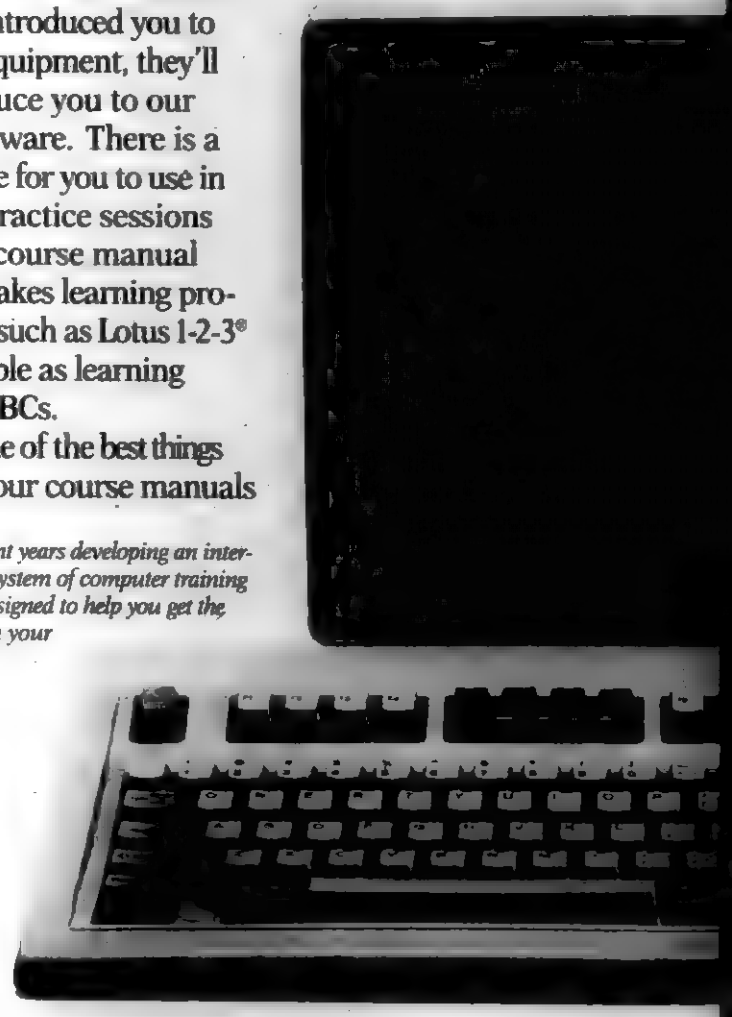

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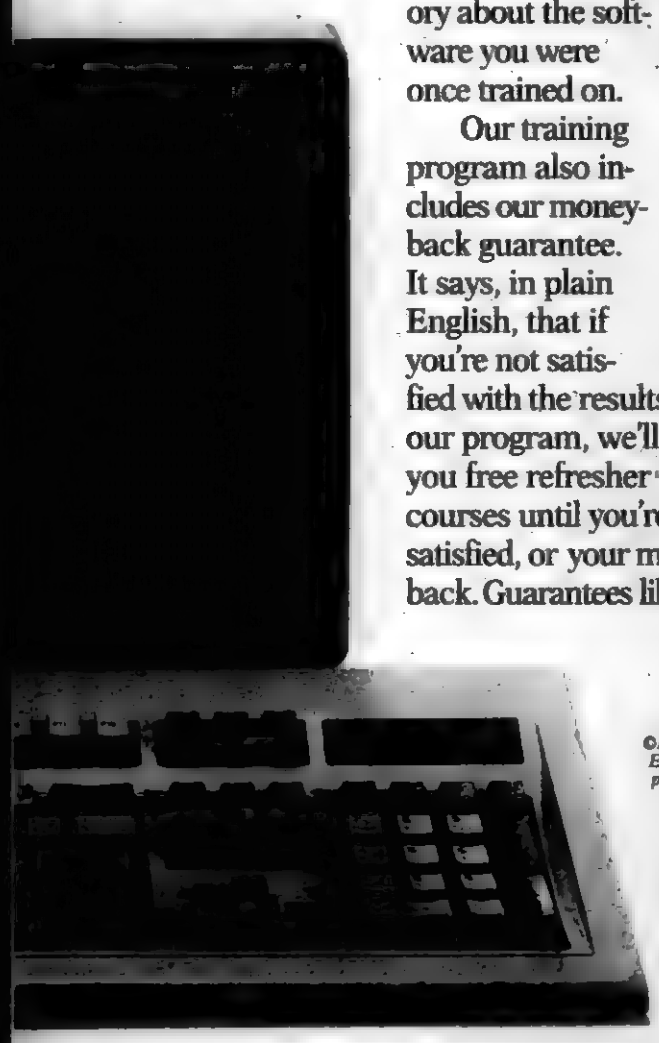

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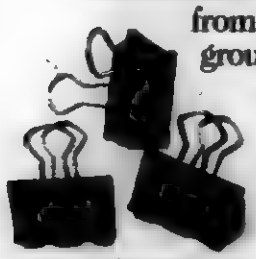

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COMMENTARY

Jean S. Bozman

The next generation

A new generation of relational databases will be able to toss data to one another across the world in real time and not drop a bit of it.

Those products will be widely available in 1993 from a number of RDBMS vendors. But users know that building distributed databases will not be as easy as playing building blocks with a shrink-wrapped box. They know that the trick to distributed databases is not features and functions; it's IS management and common sense.

Thus, it will become a matter of style whether an IS organization moves quickly to adopt distributed databases or decides to let others be the pathfinders. Some, concerned by the complexity involved in multisite updates, have elected to wait.

"There are no rules and no examples you can follow," noted Jensen Lee, project manager at AT&T's Distributed Computing Group in Piscataway, N.J. "It's an open game."

Potential roadblocks

The potential complexities of truly distributed databases — not to be confused with distributed data processing — are many. Each database server in a network of geographically dispersed servers must be advised of changes in other databases. Two or more servers must vote, through a process called two-phase commit, on whether or not to accept the updates.

Continued on page 79

Weather drives Burpee to outsourcing

Seasonal business surges lead to inefficient use of processing power, prompt seed firm to hire CSC

BY MARK HALPER
CW STAFF

WARMINSTER, Pa. — Add a chapter on the vicissitudes of nature to the primer on outsourcing.

No, this is not another natural disaster story. Rather, it is a tale of why the weather prompted one business to hand over its data processing to a computer services company.

For W. Atlee Burpee & Co., business is brisk three months out of the year, when it fields mail-order and wholesale requests for its line of seeds and gardening products.

Troll negotiated *the outsourcing deal for Burpee*

From January to March, as gardeners nationwide prepare for blossoming springs and bountiful summers, the company has typically kept its IBM 4381 mainframe humming, logging a steady stream of orders, balancing inventory and tracking invoices and revenue.

But as business slows to a trickle for the remainder of the year, Burpee has always been left with vastly underused processing power.

And although mainframe use wilts from April through December, Burpee nonetheless has to continue making full monthly lease payments. It also pays five computer operators and technical managers on a full-time basis even through the lean months.

So the company decided last month to nip its Warminster data center in the bud and hire an outsourcer, El Segundo, Calif.-based Computer Sciences Corp. (CSC), to plough its processing fields for a per-use fee.

Burpee's Forte is *overseeing inventory management system*

"Fixed costs in a seasonal business can significantly eat into profits," explained Chris Troll, who negotiated the deal for Burpee while he was vice president of operations. Troll left earlier this month when he purchased Haverford Electronics in Philadelphia.

"We needed the equipment for three months; we had it here for 12 months," said Joseph J. Forte, who is remaining with the seed vendor as director of information systems.

The outsourcing contract, which came as part of a companywide initiative to reduce costs, takes effect Nov. 1, when Burpee plans to pull the plug on its leased 4381 and cut over to a CSC data center in Niles, Ohio.

The data center is run by CSC CompuSource, a CSC subsidiary that specializes in providing pro-

Continued on page 80

Users like SAP future but focus on today

BY JOHANNA AMBROSIO
CW STAFF

SAP America, Inc.'s largest North American customers applauded the software vendor's release of its client/server applications, even though many of them said they have no immediate plans to implement them.

Some components of the client/server system, called R/3 and available in Europe since July, are now ready for the North American market. The software will eventually include a suite of manufacturing and financial applications that will mirror the functionality of the Lester, Pa.-based vendor's R/2 packages, which run on IBM mainframes.

The initial R/3 applications cover financial and fixed asset accounting, materials management, sales and distribution and human resources. A second R/3 release, to be delivered in mid-1994, will include production planning, quality assurance, plant maintenance and other functions.

R/3 runs on Unix-based computers from Bull HN Information Systems, Inc., Digital Equipment Corp., Hewlett-Packard Co. and IBM, as well as systems based on DEC's VMS and HP's MPE-IX platforms. The software is priced at $40,000.

But many of SAP's North American customers said at a recent user conference in Orlando, Fla., that they are not ready for the client/server software. Indeed, most said they are still working to install SAP's mainframe software in their sites worldwide.

Future consideration

"When it makes business sense, we will consider R/3," said Robert Strickler, manager of administrative information systems at Eastman Chemical Co. in Kingsport, Tenn. "But we are not changing direction right now, and our priority is to get R/2 installed."

Eastman Chemical is implementing most of the SAP mainframe modules in divisions around the world, starting in Asia, then going to Europe and finally the U.S.

Even Eastman Kodak Co. in Rochester, N.Y. — an R/3 beta-test site that also helped develop the software — is still "experimenting with R/3 to see how we will use it," said David Humphrey, Kodak's SAP team leader. The most likely initial application, according to Humphrey, will be to replace 36 IBM System/3 minicomputers with Unix-based boxes in international locations, including Chile.

"R/3 is still out in the future," Humphrey said, "but we want to understand it and see where it will fit within Kodak."

Ron Crumpler, project director at Dow Chemical Co. in Midland, Mich., agreed. "I'm very interested in it, but I can't say when I'll be getting to it. My hands are full right now."

Andrew J. Harriss Jr., director of applications at Du Pont Co. in Newark, Del., said, "I'm excited about R/3 as a direction, and it's certainly in our future, but our

Continued on page 79

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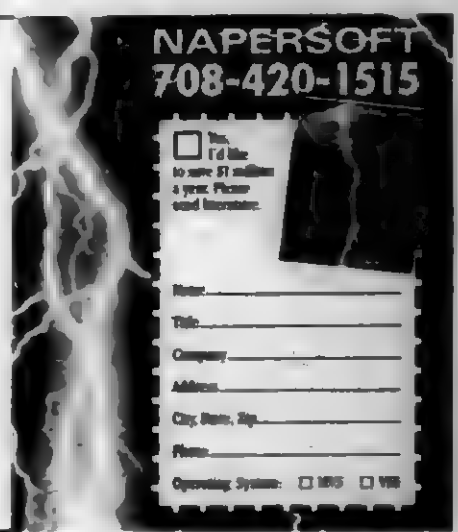

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Bozman

CONTINUED FROM PAGE 77

Oracle's new Oracle 7 database was designed to handle that, as can competing products from The Ask Cos.' Ingres Products Division, Sybase, Informix Software, DEC and Hewlett-Packard, among others.

Then there is the matter of network reliability and how to handle data errors. IS managers should think about carrying out such updates synchronously — all at once — or posting the changes throughout a 24-hour day. The amount of network traffic generated by such updates must also be considered, just as the user must think about what the content of the local databases will be.

Then there's the matter of which server is the "master" server and which time zone should be the reference point. Some users have chosen Greenwich Mean Time; others have selected the time zone of their corporate headquarters.

The level of complexity can be reduced, however, by selecting some servers that must be updated at once and leaving the other servers alone. Oracle 7's "snapshot" facility, for example, will allow users to create a time-delayed update of changes to the master database.

On the fence

Some users will watch the first wave of distributed servers roll out before making any hard and fast conclusions about the technology.

At AT&T, Lee is putting multiple databases in a single place — his computer room. He intends to install Oracle's parallel server option, which lets multiple copies of Oracle 7 on two to four Unix machines share the same disk drives. That way, many applications will share the same Oracle database and the database will not fail if one of the Unix machines stops.

Another Oracle parallel server site analyzed it this way: The value of distributed databases, or cooperating database servers, really depends on the kind of business you're in. An international or manufacturing firm has many sites around the world that must keep track of the same set of products and prices. But users with many applications who must share the same data may prefer a centralized approach and the IS controls that come with it.

That's where IS skill and analysis come in. Said Michael Higgins, a technical support manager at Byer California, an Oracle 7 shop: "Everybody who has two or more machines faces the same fork in the road: to go distributed with two-phase commit or to get everything into one big database." The great thing for users is that there are now a lot of RDBMS vendors that are prepared to support either scenario.

Bozman is *Computerworld*'s West Coast senior editor.

Users like SAP future

CONTINUED FROM PAGE 77

first priority is getting the R/2 foundation right."

Some customers are planning to implement R/3 as an adjunct to the mainframe software. "We will follow SAP to R/3, but it will operate under R/2," said Richard Avery, director of MIS at Cooper Industries, Inc. in Houston.

Market leverage

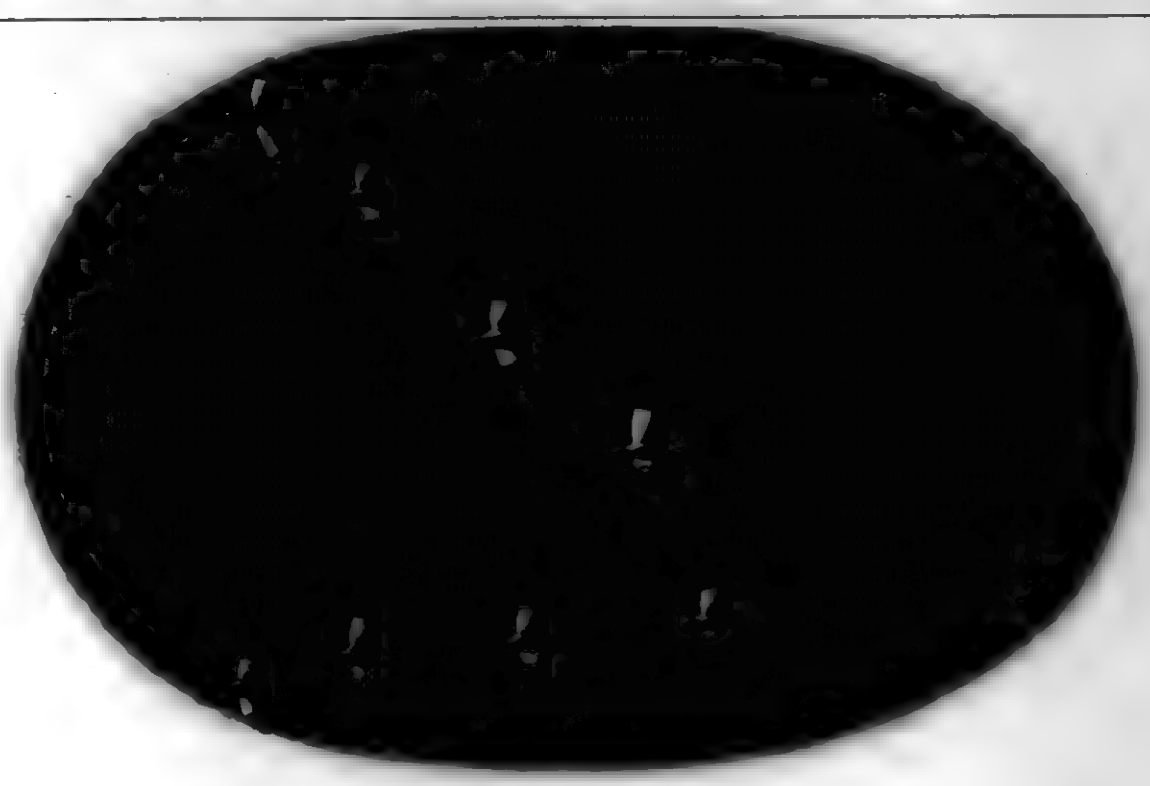
Nevertheless, SAP executives said they are looking to R/3 to open markets that have heretofore been closed to the company, especially at midsize user organizations. "We hope to do in one year with R/3 what we did in many years with R/2" in revenue, said Hasso Plattner, SAP's deputy chief executive officer.

Although he declined to give specific sales expectations, he did say the company was hoping for an R/3 user base in the three digits by the end of next year. So far, the company has 2,300 customers worldwide for its R/2 system. Plattner also said that SAP expects to derive between 20% and 30% of its total sales from R/3 by the end of next year.

There are approximately 70 R/3 sites in Europe, primarily in Germany, the headquarters of SAP America's parent company. There are some 10 beta-test sites in North America, and virtually all of them run pilot applications, Plattner said. At least half of the total R/3 customers to date represent new business for SAP, he added.

The company will also release OS/2-based R/3 software, he said, and will soon improve the graphical user interface. By 1995, SAP plans to have an easy migration path for customers that want to switch from the mainframe software to the client/server version.

Additionally, SAP has committed to enhancing the R/2 software, at least through the end of decade. This will include a newer, more graphical user interface, according to Plattner.



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Weather drives Burpee to outsourcing

CONTINUED FROM PAGE 77

cessing to small to medium-size companies.

Burpee plans to retain its computer operators until Nov. 6 to cover possible slippage in the cutover. The company is simply transferring tapes from its leased 4381 to a CSC 4381 in Niles, according to Troll.

Troll estimated that Burpee will spend roughly $1.8 million in processing fees during the five-year life of the contract, a figure that will halve the company's fixed processing costs. The in-house 4381 has cost approximately $800,000 a year to lease and operate. Burpee will stop paying those fees when the machine's lease expires at the end of this month, Troll said.

The 4381 has been operating at about 80% capacity from January through March and at about 20% capacity during the remainder of the year, according to Troll.

The company will continue to spend about $700,000 a year updating and maintaining software, according to Troll. IS director Forte will continue to oversee a five-person application development and programming staff. He is also in charge of overseeing a new local-area network-based inventory management system.

According to Troll, Burpee weighed outsourcing proposals from other vendors, including Andersen Consulting. "It came down to a relationship," he recalled. "When we got together with Computer Sciences, we felt real comfortable."

"With the others, it was a feeling of once we got there, we wouldn't have a say anymore," Forte said.

Escape option critical

While it was changes of a seasonal nature that prompted Burpee to turn to CSC for an outsourcing solution, shifting winds of another type played a role in how the deal was structured.

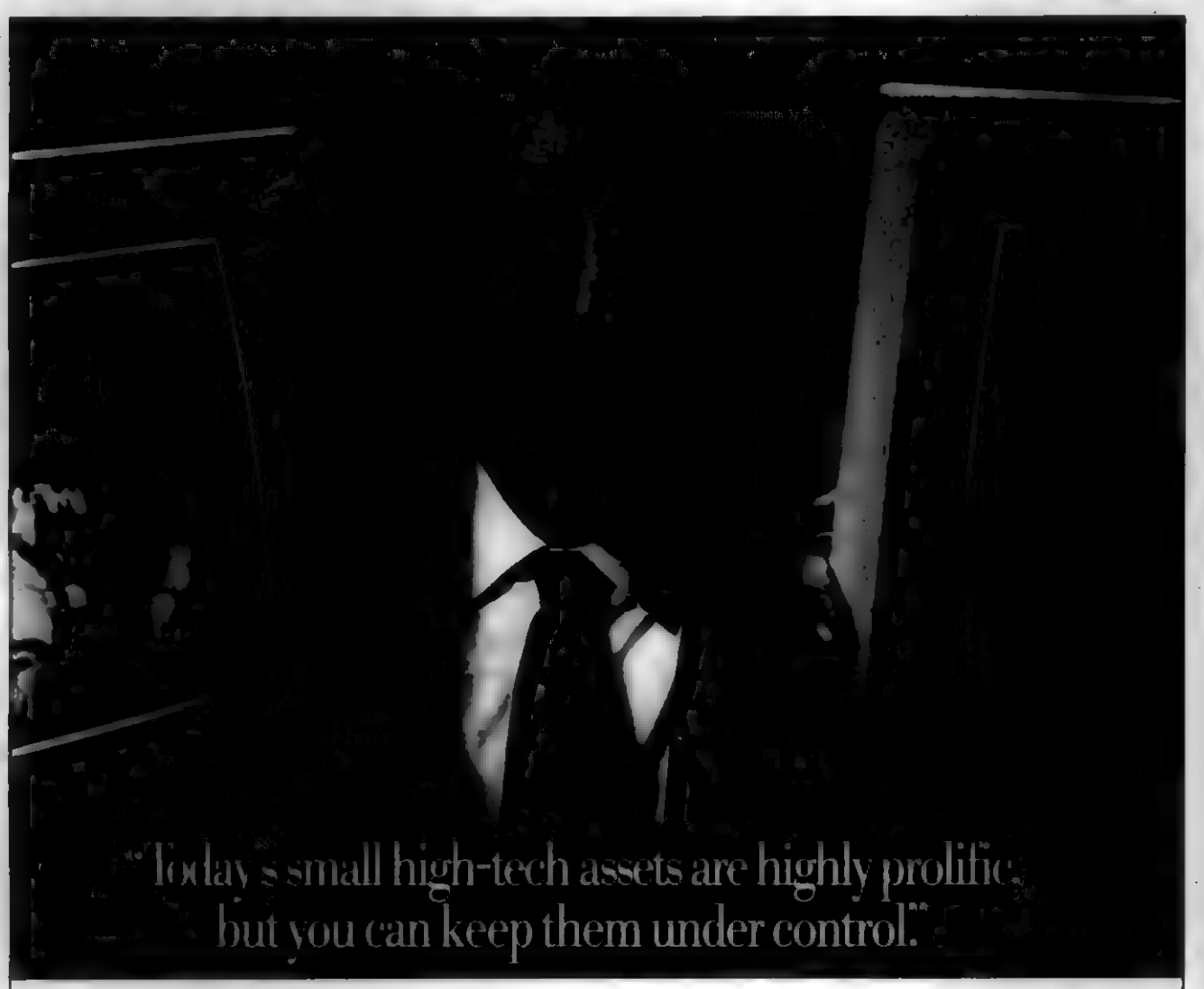
Specifically, the five-year contract includes an option for Burpee to back out of the arrangement after three years. Burpee said it wanted the walk-away clause because of uncertainty over future strategic and computing directions owing to Burpee's recent acquisition by George J. Ball, Inc., a large Chicago-based commercial seed provider.

"In case we do have a change in strategy, I'd like a way out of this," said Chris Troll, who negotiated the deal for Burpee while he was vice president of operations.

Troll said the acquisition was also a factor in Burpee's decision to limit the accord to five years. It is not uncommon for outsourcing contracts to run seven to 10 years.

"Whenever you're acquired by another company, it's difficult for anyone to look in a crystal ball and say, 'Everything will be the same in 10 years,'" Troll said.

MARK HALPER



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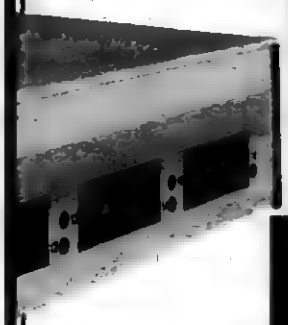

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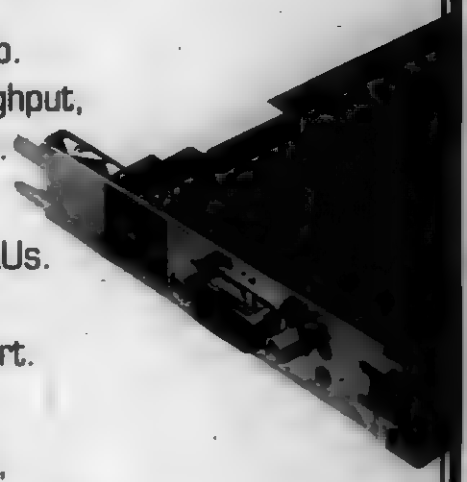

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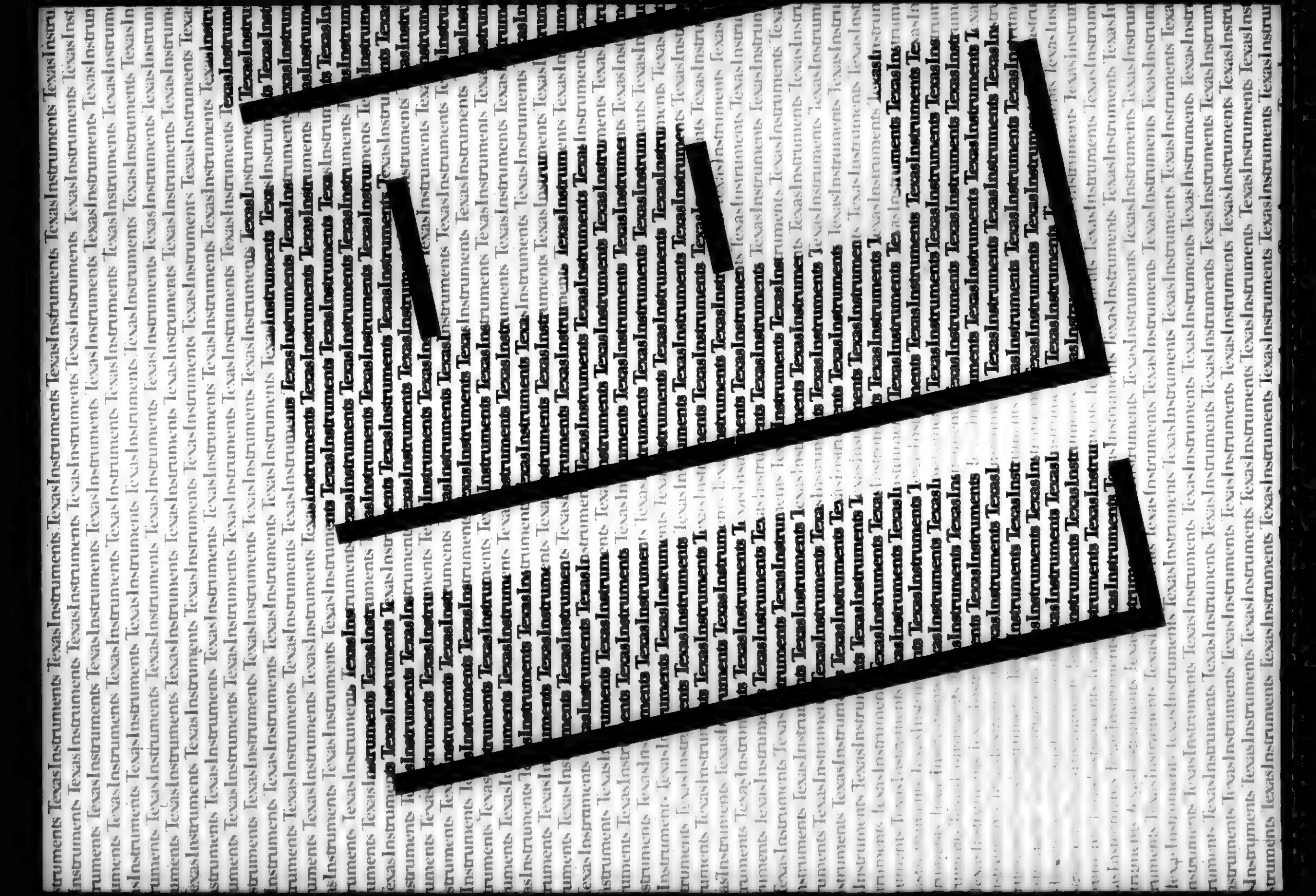
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DEC takes first steps in storage strategy

BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp. recently announced the first products for its modular storage strategy: two new Hierarchical Storage Controllers (HSC) that support Small Computer Systems Interface-2 (SCSI-2) via new channel cards.

"The real message behind this is that we are extending storage functionality and price/performance advantages to high-end customers with the new modular subsystems," said Susan Heon, a mass storage marketing manager at DEC.

"You'll see announcements later this fall which extend the rollout; a single I/O subsystem will support [Computer Interconnect, Digital Storage Systems Interconnect] and SCSI and eventually FDDI," she added.

Dubbed the HSC65 and HSC95, the new controllers will support up to three and four channel cards, respectively. These new channel cards and SCSI-2-ready upgrade kits for the HSC40, 60, 70 and 90 controllers are expected to ship in first-quarter 1993.

The HSC65 and HSC95 servers feature an improved performance of 1,800 I/O requests per second and an embedded 64M-byte cache for a transfer rate of 4.2M byte/sec., DEC officials said. The HSC65 offers support for 20 devices, and the HSC95 offers connections for 48.

"For existing DEC customers, this is good news — they'll be able to mix and match CI and SCSI drives, and they can get higher performance HSCs at a lower price. And there are promises that the DSSI drives will be incorporated in the future," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. "But it remains to be seen whether users can go out and buy third-party SCSI drives and implement them legally inside of the VAXcluster technology."

He added that although DEC is finally revitalizing and improving the HSC technology, it is late in doing so.

While DEC is not scheduled to ship SCSI-2 support until January, MicroTechnology, Inc. in Anaheim, Calif., began shipping its Stingray CI-attached server earlier this year, which allows current DEC customers to plug SCSI-2 peripherals into their Computer Interconnect VAXclusters, according to Tom Raimondi, vice president of product marketing at the firm.

"DEC's announcement of HSC65 and 95 is in line with where the industry is going; the fact that in the future they'll be able to support SCSI is what the customer is asking for," he said.

MasPar revs up speed with MP-2 platform

BY ELLIS BOOKER
CW STAFF

SUNNYVALE, Calif. — MasPar Computer Corp. recently introduced its second-generation massively parallel supercomputer, offering a system with five times the performance of its initial system, the MP-1.

Analysts said the power increase in the just-announced MP-2 was to be expected in an industry where significantly more powerful systems debut every 18 months.

The more notable news, they said, was the new pricing on MasPar's MP-1 platform, which was reduced to $75,000 for an entry-level configuration.

A massively parallel processor (MPP) system costing about the same as a high-end workstation "should open some interesting market possibilities," said Gary Smaby, president of Smaby Group, Inc., a high-performance computing consultancy in Minneapolis.

"A local-area network can now have a $75,000, 1,000-processor MPP as a server with 1,600 MIPS of compute power," said MasPar President and Chief Executive Officer Jeff Kalb. "This [pricing] allows people to bring this kind of technology into the workgroup," he said.

Greater accessibility

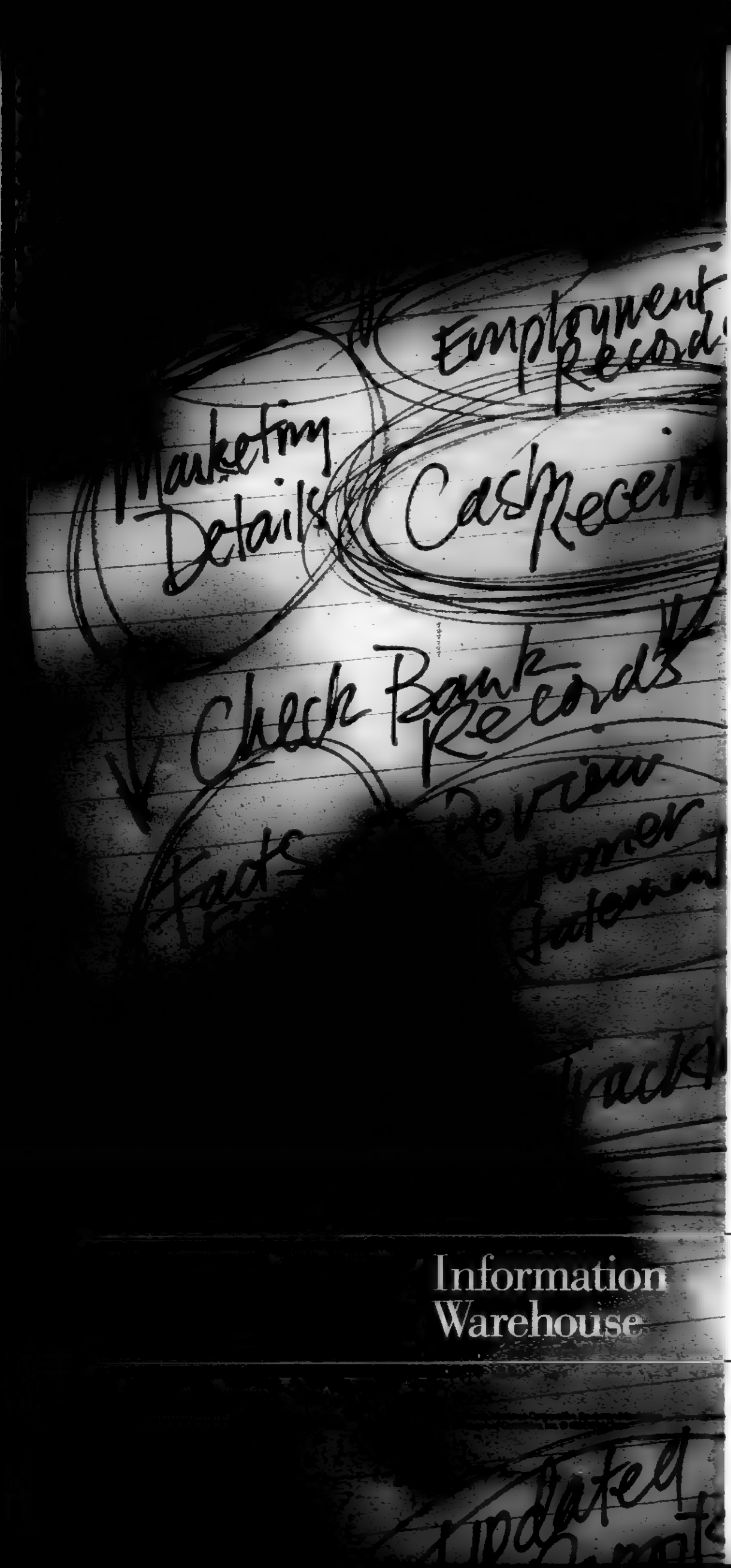
Charles Casale, chairman of the Aberdeen Group, a Boston-based consulting firm, agreed that the pricing was significant. "People who have [Cray Research, Inc. supercomputers] that are fully loaded can now get a MasPar," he said, adding, "It's a cheap, incremental way to try MPP."

But Casale said Aberdeen has been cautious about the widespread applicability of MPP, noting the thinness of application software for this kind of machine.

The MP-2, with configurations of 1,024 to 16,384 processors, ranges in price from $260,000 to $1.6 million.

The MP-2 uses new, customized reduced instruction set computing chips, each offering 12.3 million floating-point operations per second. The MP-2 is also binary-compatible with the more than 130 MasPar MP-1s that have shipped so far.

Digital Equipment Corp., which has been selling the MP-1, extended its OEM agreement to cover the MP-2 family as well.



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Encore unveils Unix-based mainframe

BY MARYFRAN JOHNSON
CW STAFF

FORT LAUDERDALE, Fla. — From its small but significant niche in the technical arena of real-time computing and parallel processing, Encore Computer Corp. recently launched a Unix-based mainframe targeted at data centers.

Whether this shift in company strategy is brilliant or boneheaded is a question Encore will answer during the next year, as its Infinity 90 series runs into well-entrenched competition from NCR Corp., Hewlett-Packard Co. and Digital Equipment Corp. Also racing toward what analysts call the "alternative mainframe" market are Pyramid Technology Corp. and Sequent Computer Systems, Inc., both with upcoming introductions of mainframe-class systems.

"The alternative mainframe is low-cost, scalable and probably 18 months to two years ahead of traditional mainframes in terms of openness," said Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn.

Users attracted to these boxes are currently stymied in their migration to distributed client/server environments by a lack of sophisticated system- and network-management software, Cassell noted. Until such products are available, the task of managing a distributed environment is best handled centrally, in a centralized fashion, he added. Alternative mainframes offer "a way to start doing that," Cassell said.

Impressive speed

Available now at an average price of $1.3 million, Encore's Infinity 90 is a highly scalable, symmetric multiprocessor that runs a standard Unix operating system and is based on Motorola, Inc.'s 88000 reduced instruction set computing processors.

The Infinity 90's claim to fame is roaring I/O capacity and throughput performance. It can reportedly transfer data at 53M byte/sec., compared with the 4.5M-byte/sec. rate of many mainframes.

Though impressed with the technical punch of Encore's mainframe, analysts pointed out several challenges this $225 million company faces in getting a mainframe business off the ground. Encore is virtually unknown outside technical mid-range markets and has no built-in sales channel for mainframe-class systems.

Bringing the Infinity systems to market quickly and "generating immediate sales" is the real challenge Encore faces, said Larry Tanning, vice president of SuperSolutions Corp., a Minneapolis-based systems integrator now testing an Infinity 90 as a potential platform for large applications in health care and finance.

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Off-the-shelf Unix gains Integrity

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Tandem Computers, Inc.'s enhanced Integrity system, announced last month, will allow users of the fault-tolerant Unix machine to buy off-the-shelf applications based on AT&T Unix System V, Release 4. Tandem dressed up the 2-year-old Integrity with a new fault-tolerant version of Unix System V, Release 4 and a user-friendly console.

The enhancements target small information systems shops and were designed to increase Tandem's share of the fault-tolerant Unix market, analysts said.

However, a lack of connectivity between Tandem's traditional Guardian fault-tolerant systems and the Integrity machines has prevented Tandem from building its Unix business faster, analysts said [CW, March 30]. "Tandem is putting a lot of effort into looking for new customers, but they are not able to capitalize on their installed base," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. NCR Corp. is reselling the Integrity machines as its StarServer FT networking systems, she added.

Third-party options

Users of Tandem's Integrity system, who tend to be in the communications, banking and transportation sectors, have already turned to third-party vendors for Unix packages.

One benefit to Unix is that it is easier to find people to program custom Unix applications than Guardian software, said Bill Godwin, a manager at Infonet Services Corp. in El Segundo, Calif., which provides electronic-mail services to 7,000 sites worldwide.

The new NonStop-UX Release 2.0 was designed to further reduce the number of Unix system "panics" that can crash a system and to speed recovery from a crash

The enhanced NonStop-UX 2.0 software is priced at $22,000. Tandem's icon-based Integrity console software for simplified system management costs $5,000.

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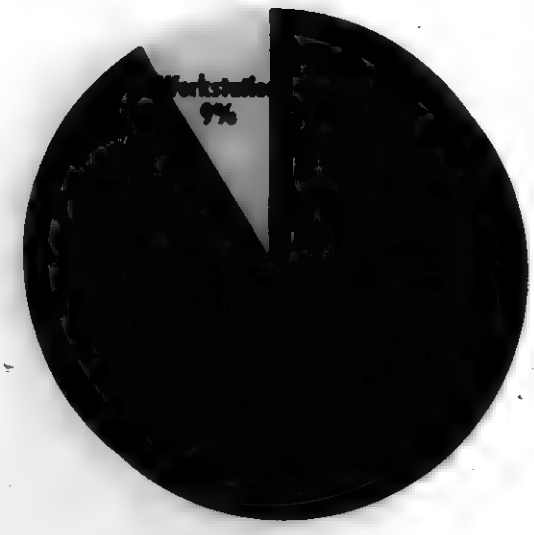

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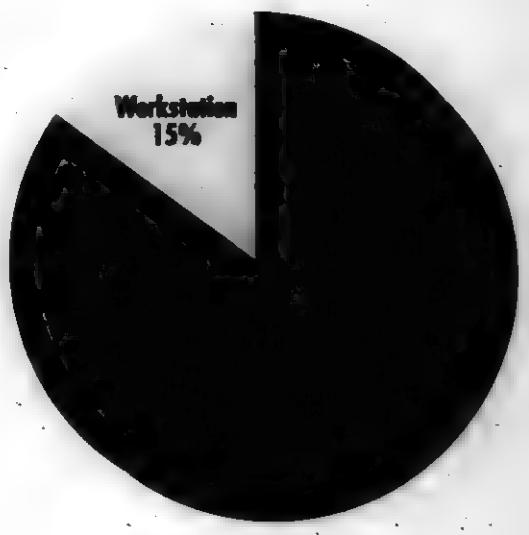

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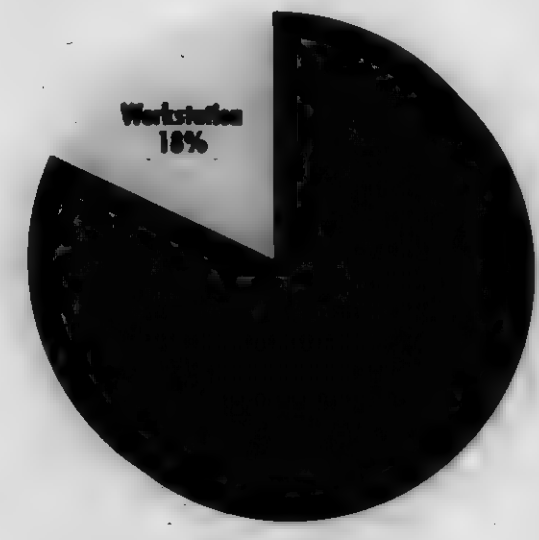

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LARGE SYSTEMS

Amdahl 5995M: More muscle, less cost

Evaluators say Amdahl's 4550 mainframe has some advantages over IBM machines, but they also experienced reliability problems in the first few months using the system

NEW PRODUCT IN-SITE

Computerworld's New Product In-Site is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

AMDAHL CORP.'S 5995M MODEL 4550

- Despite early product glitches, Amdahl's 5995M series mainframe wins bids against IBM in these large shops based on price, service and capacity. Discounts have been as deep as 60% off the list price of $17.5 million for the Model 4550 four-way processor.
- The 4550 is an interim upgrade for these corporate sites, which are considering Amdahl's top-of-the-line six-way and eight-way processors when they become available.
- Series 5995M's new features, such as Enhanced Performance Facility, Concurrent Maintenance and Escon compatibility, are not fully in place at these sites because of staged delivery schedules and user caution about their implementation.

Amdahl Corp. is not pulling any punches in its mainframe market share battle with IBM and Hitachi Data Systems Corp. (HDS). The company is offering the biggest, meanest mainframes on the market at some of the best prices users have seen in years.

"In terms of discounting, Amdahl has been unbelievably aggressive," said Susan Gannon, a senior analyst at Technology Investment Strategies Corp. (TISC), a research firm in Framingham, Mass. "1992 has been a tough year for them. They anticipated getting a lot more machines out. They are giving away what they can to make the customer base happy."

SITE PROFILES

Installation descriptions for companies that evaluated the Amdahl 5995M Model 4550

	Retail	Utility 1	Utility 2	Education
Number of Model 4550s	1	1	Multiple	1
Time installed	3 months	3 months	6 months	3 months
Other mainframes	3 Amdahl	3 IBM, 1 Amdahl	Multiple IBM	None
Operating system	MVS/ESA	MVS	MVS; UTS	MVS/ESA
Number of staff members	240	100	Varies with site	17
Main memory	512M bytes	512M bytes	768M bytes average	1G byte
Expanded storage	512M bytes	512M bytes	1,028M bytes	2G bytes
Number of channels	96	128	192	128
Application types	TSO/IMS/CICS and batch	Batch/on-line	IMS/DB2/CICS/ TSO and batch	Batch/on-line

METHODOLOGY: Product ratings are based on evaluations from four user sites (profiled above). These are production users of Amdahl 5995M Model 4550. The users are members of Computerworld's Product Evaluation Council.

The best evidence of this is discounts of up to 60% on Amdahl's 5995M series. Four users of the four-way processor Model 4550, the largest capacity machine currently installed, reported receiving good discounts and solid performance in their evaluations of the system, which is rated at 183 million instructions per second (MIPS). The largest model in the line, the 8650 eight-way processor — rated at 311 MIPS, more than any other machine available — is just being delivered to sites this month after a 90-day delay.

The evaluators were selected from more than 30 members of the *Computerworld* Product Evaluation Council, a group of information systems organizations that regularly evaluates and operates new products in production environments. Consultants from TISC and Howard Rubin Associates developed the questionnaire and rating system used to evaluate the product.

BENCHMARKS

	MIPS
Amdahl's 5995M Model 4550 (Four-way processor)	183
Amdahl's 5995M Model 8650 (Eight-way processor)	311
IBM ES/9000 Model 900	240
IBM 3090 Model 600J	119

AMDAHL VS. IBM

The same method was used with a different group of evaluators to assess IBM's Enterprise System/9000 Model 900, rated at 240 MIPS, for a previous New Product In-Site [CW, May 11]. As can be seen by the ratings summary, the two products received a very close overall rating. However, IBM's model received the highest rating for reliability, while Amdahl's 4550 was only slightly better than average. IBM also edged its competitor in performance, ease of installation and operation — even though ES/9000 users were struggling with the challenges of installing fiber-optic Escon channels.

The 4550 surpassed the 900 in floor space size and utility use because it allows more flexible power options and provides opportunities for consolidation and upgradability to the six- and eight-way models, while IBM has yet to announce when its eight-way product will be ready. Both products received above-average ratings on price, based on heavy discounting by the vendors.

RELIABILITY

Unlike the IBM evaluators, who reported near-perfect operations, two of the four Amdahl evaluators experienced outages that shut their mainframes down unexpectedly.

Retail evaluator: "Both outages were extremely short. We took a channel hit, they diagnosed something and brought it back up. Within the next day or so we scheduled an outage and replaced a part."

In one case the problem was an environmental sensor card that falsely showed a problem with power. The retail site has one 4550 and three other Amdahl mainframes.

Utility 2 evaluator: "We've had two major outages. One was pretty extensive — about six hours in duration. We have been experiencing problems. Amdahl has been working hard on resolving these problems."

The 4550's Dual Logging Entry card failed in one case, and the microcode was not at the proper level to determine the problem. Teradata Corp. devices and front-end processor failures also occurred related to the connection with the Amdahl processors. Utility 2 has multiple 4550s installed and has been using them for about eight months. The company also uses multiple ES/9000 Model 900s.

PERFORMANCE

Based on a combination of database transaction and production applications, the evaluators found the 4550 met their performance expectations. They were comparing the systems with reported performance numbers from Amdahl and with how well the systems ran on previous smaller capacity processors.

Education evaluator: "Prior to this, we had an IBM 9021 Model 720 in a 117 MIPS machine, six-way processor. We weren't sure what to expect going from a relatively slow six processors to a relatively faster four processors rated at 183 MIPS. Our database and on-line transaction times really improved significantly. The individual speed of the processors seemed to matter more in our environment than the number of processors."

Utility 1 evaluator: "It met expectations based on an application which ran on an IBM 3090 600. It ran faster because it's a bigger machine."

Retail evaluator: "We upgraded and moved work load around so it wasn't all that quantifiable. The feeling was that it was performing as expected based on the net of an additional 100 MIPS into the shop."

Utility 2 evaluator: "Some of our analysis looked at performance of an

IMS database application on Amdahl 1400s and compared it to 4550s. The ratios varied from 1.7-to-1 to 1.97-to-1. I expected the 1.7 to be higher. We had a box with partial Enhanced Performance Facility (EPF) on it, which we rated at 1.94 of an Amdahl 1400 with the base 4550 at 1.8."

The users are awaiting delivery of Amdahl's EPF, which is supposed to increase performance 10% to 11%. The utility 2 user expects to gain a 10% to 12% performance boost from the full EPF and 7% to 8% from the partial EPF he has now. The retail and utility 2 sites have only partial EPF installed and are waiting for the rest.

The Amdahl users' reports contrasted with the IBM evaluators, who said the ES/9000 Model 900 exceeded their expectations based on their benchmarks. The combination of faster processors and higher speed channels dramatically increased on-line response time and decreased batch runtime.

TECHNICAL SUPPORT

While the Amdahl evaluators rated support at the same level as the IBM group, they also praised their support teams, saying they were more responsive than IBM in some cases.

One exception to this was one evaluator, who reported that some of the field engineers did not understand the dynamic microcode upload that is part of the new concurrent maintenance feature, and they did not explain it to customers sufficiently. This led to communications and microcode management problems.

The evaluator: "That probably contributed to some of the failures we experienced. Amdahl has been working hard to smooth out the problems."

Retail evaluator: "I'm very, very happy with the support team we have. We have a systems engineer with an excellent background and very good people skills."

Education evaluator: "Support has been outstanding to this point. In addition to putting in the new CPU, we replaced all of our direct-access storage devices (DASD) with Amdahl DASD, and it just went like clockwork."

PURCHASE AND MAINTENANCE COSTS

The 4550 users were able to get millions of dollars off the list price in making their deals with Amdahl. All said the discounts and overall packaging made the difference in their decision to purchase Amdahl systems over competitive offerings.

Retail evaluator: "We paid even less than I expected to achieve. We were an all-Blue shop. The experience with PCMs so far has been very rewarding. There was a significant gap between the pricing from Amdahl and IBM on similar amounts of horsepower. Amdahl made it an easy decision. We compared an IBM 9000 Model 860 vs. the 4550. The difference in purchase price was in the millions of dollars."

Utility 1 evaluator: "We purchased the system through a competitive bidding process, and it was competing against an ES/9000 Model 900. The price was significantly lower, at least a couple million dollars."

Education evaluator: "We had a competitive situation with IBM, Hitachi and Amdahl. IBM did not appear to be real competitive. But Amdahl and Hitachi just went neck and neck. They were just a whisker apart at the end. Amdahl came out very marginally better."

MAINTENANCE

The concurrent maintenance feature is causing some concerns among users because it requires them to change procedures.

Currently, users make microcode changes during scheduled systems outages. Amdahl's new feature allows the changes to be made while the system is running application jobs. The problem is that Amdahl has asked some users to make microcode changes using this feature when the users are not comfortable doing it that way.

Utility 1 evaluator: "My operations folks have been complaining about an unusually high number of bulletins from Amdahl saying, 'You've got 48 hours to put this microcode change on or your machine may crash.' We've been able to stall them off because a lot of the stuff they've been coming down with is concurrent maintenance. Being an old operations type myself, I prefer not to do it concurrently with stuff running. We eventually made the changes, and we didn't lose the machine in the interim."

Gannon: "There will be advantages to concurrent maintenance, but it's not top on the priority list yet. People still like to have more hands-on."

EASE OF INSTALLATION

The evaluators reported no installation problems. Most were new acquisitions, rather than migrations. In the case of the IBM evaluation, most sites were migrating from other IBM processors.

Education evaluator: "We do this every two years, and they all have about the same amount of work in them."

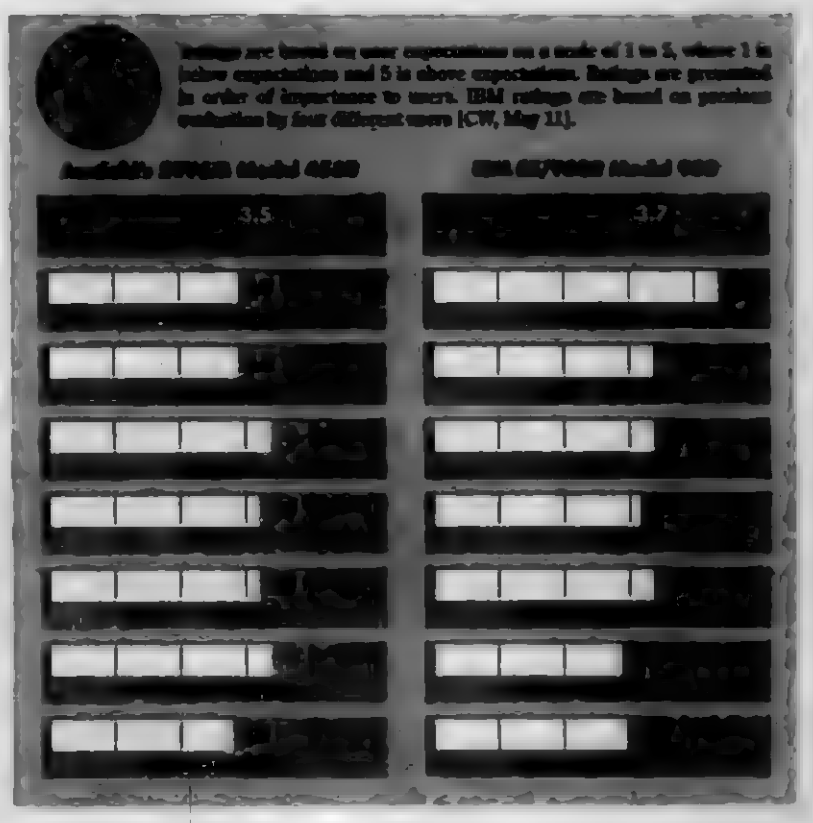
FOOTPRINT SIZE AND UTILITY USE

The 5995M series allows a two-for-one consolidation of older Amdahl and IBM processors onto a single 4550. The six- and eight-way systems will allow even more consolidation. The evaluators found this to be a great benefit.

The systems also offer the option of 450-H or 60-H power connections, while IBM's ES/9000 Model 900s require 60-H connections. By choosing Amdahl, the retail user was able to use excess capacity on the site's 450-H uninterruptible power supply, while he would have had to add capacity with the IBM model.

Utility 2 evaluator: "We've been in a consolidation phase and going to the 4550s has been great because of the size of the footprint and the consumption, especially compared to the Amdahl 1400."

Education evaluator: "The 4550 is significantly cheaper in floor space, air conditioning, electrical power — the whole deal."



EASE OF OPERATION

Operation of the 4550 is about the same as prior generations except that new consoles are not compatible with Candle Corp.'s current version of AF Remote, the utility 1 evaluator said.

Utility 1: "We had to send the data to our command center via coaxial cable. That works here, but for our other four data centers it won't work. Amdahl's been working with Candle to get their console operations supported by AF Remote."

Utility 2: "It's the same as previous systems. We expected more features for automated operations. It really doesn't offer anything different for this series from the previous ones. It requires the same amount of operator intervention."

Reported by Michael L. Sullivan-Trainor and Garry Ray, CW staff.

AMDAHL RESPONDS

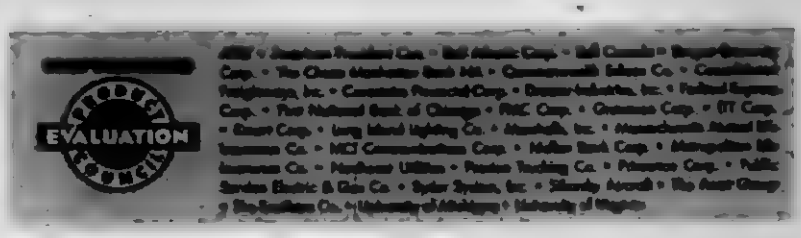
Here is Amdahl's response to the issues raised in this evaluation:

Reliability: The channel problem reported by users involved I/O interface handler failures they experienced after we made a change in our manufacturing process to eliminate the use of chlorofluorocarbons. That problem was resolved by further modification of the manufacturing process and was limited to an identifiable subset of customers who have been notified as part of a proactive program to replace all suspect interface handler boards.

There were also a few front-end processor (FEP) failures caused by the operational responses of certain FEPs to mainframe system recovery activity when operating in our UTS/Unix system environment. To correct the FEP problem, 5995M firmware has been modified on all machines, and modifications have been installed on the FEPs to bring them into compliance with OEMI Parallel Channel specifications. We believe our customers now consider both the interface handler and FEP problems to be completely resolved. We are aware of only one environmental sensor failure among all the machines we have installed.

Price: Aggressive discounting in the mainframe marketplace has been a fact of life for the last couple of years. Amdahl, however, does not seek to take the lead with respect to pricing, although we do intend to remain competitive.

Maintenance: Because of concurrent maintenance, it may appear that more changes are being made to the mainframe than in the past since they are being done individually rather than in a group. But actually the total number of changes has not significantly increased.



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CASE firms play musical chairs

BY KIM S. NASH
CW STAFF

Elbow room in the computer-aided software engineering (CASE) market is dwindling as more vendors crowd the arena at every hardware level. That means your application development dollar is hot property now more than ever.

The major vendors are vying to pry that money from information systems pockets in different ways, such as by adding consulting services, beefing up user training programs and making tool sets more modular.

A round of musical chairs among product strategy-setters at three major CASE companies means that users should brace themselves for modified product directions during the next 12 months. Here is the rundown:

■ **KnowledgeWare, Inc.** Paul Hessinger, former chief technology officer at Germany's Softlab, Inc., is now responsible for business strategy and technical research at KnowledgeWare.

KnowledgeWare's *Hessinger wants to boost service*

Hessinger plans to put his consulting experience — courtesy of 17 years at Computer Task Group, Inc. — to work at his new home, substantially boosting KnowledgeWare's service offerings.

KnowledgeWare plans to focus on hand-holding in two areas, Hessinger said. One is tool instruction; the other is making "customers cost-effective with the technology," he explained. To see hard, bottom-line results from complex application development methods, users have to think beyond CASE as a tool and see it as an aid to reforming business tasks, according to Bernie Stephan, director of special technical services at Computer Power Group's San Francisco office.

That is precisely KnowledgeWare's new emphasis, Hessinger said, adding that the company has stepped up the hiring of instructors and consultants. Expect more vertical market offerings in the future as well, such as templates for applications oriented toward specific industries.

Softlab's Rockwell bringing open systems development ideas

■ **Intersolv, Inc.** The Rockville, Md., company created a new position in North American marketing to accommodate Peter Privateer, who left his post as staff vice president of strategic product planning at KnowledgeWare in Atlanta two months ago. Industry observers said Privateer had lost faith in KnowledgeWare products and had been looking to leave; both Privateer and his alma mater declined to comment on the reasons behind his departure.

Intersolv, meanwhile, is on the rise, analysts said. Now that it has dropped out of IBM's AD/Cycle alliance, the company is aggressively pursuing the client/server application development tools market. Intersolv is ahead of most other CASE vendors in building applications to run in client/server mode, according to Paul Bloom, an analyst at Volpe, Welty & Co, in San Francisco.

APS 2.2, a code generator, is key to this push, as is the company's local-area network-based repository. "Intersolv is on the ascendancy," Bloom said.

■ **Softlab, Inc.** New chief technology adviser Robert Rockwell brings open systems development ideas to Softlab's table. Rockwell just ended a year's stint as technology director at Eureka Software Laboratory, a European CASE project to set standards for Unix application development.

That is an avenue Softlab intends to pursue as part of an all-out push to cull U.S. business. The company is strengthening its San Francisco beachhead by hiring several consultants. Softlab recently introduced two tools here: Systems Maintenance Toolset, a back-end CASE suite, and Maestro II Release 2.1, an OS/2 version of a full life-cycle workbench.

Parent company BMW is not averse to digging deep to help the cause. "We want to accelerate U.S. growth via acquisition," stated Michael Metcalf, U.S. marketing manager.

Early last year, Softlab and KnowledgeWare talked merger, but the deal fell flat when KnowledgeWare rejected Softlab's bid of an estimated $350 million, according to a source close to the firms [CW, April 6]. Softlab would not specify current acquisition targets.

Martin, Intellicorp test workbench

BY GARRY RAY
CW STAFF

Information engineering, the brainchild of systems guru James Martin, will be married to object-oriented techniques in a new development workbench being tested by James Martin & Co. in Reston, Va., and Intellicorp, Inc. in Mountain View, Calif.

Object Management Workbench (OMW), first announced by the companies earlier this year, will undergo field testing immediately, the two companies announced recently.

According to officials at both firms, OMW extends the information engineering (IE) methodologies that Martin and others have proposed since the early 1980s. Like conventional IE, it allows executives and information systems professionals to embody business models in software. Those models include business rules and business data structures, which are then implemented in specific software systems.

The marriage with object-oriented techniques is a modification of the original IE model. Based on the notion that object-oriented approaches are more flexible and adaptable than the structured techniques of traditional IE, this updated thinking is espoused in Martin's latest book, "*Object-Oriented Analysis and Design*," which he co-authored with James Odell. According to one James Martin & Co. official, that new methodology "has driven the diagramming standards and functionality of OMW."

Tool trio

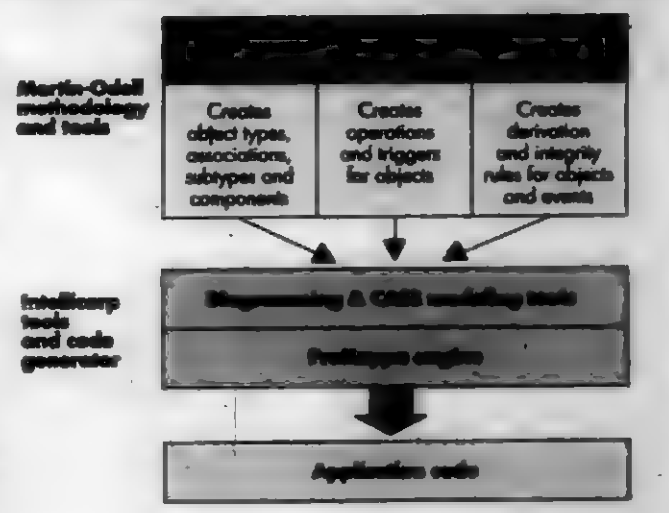
OMW, the official said, includes three major components: an object diagrammer, an event diagrammer and a business rule editor. The tools are currently implemented within Intellicorp's ProKappa development environment, which runs on the Open Software Foundation's Motif user interface.

The object diagrammer allows users to develop classes of objects and supports subtyping and components. In addition, users can attach attributes as well as value types to objects and encapsulate one object within another.

The OMW event diagrammer implements event modeling.

Continued on page 97

OBJECT MANAGEMENT WORKBENCH



CW Chart: Stephanie Faucher

NCR offers NICE app development tool

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — They say you should take things nice and easy. NCR Corp. hopes its first foray into the personal computer software market, an application development tool called NICE, will make application developers' lives easier.

NICE, which stands for Natural Interface for Computing Environments, is a software development kit designed to work with Microsoft Corp.'s Visual Basic product and Microsoft or Borland International, Inc.'s C languages. It runs under Windows 3.1.

"We built it to ... create a better user interface," said Steve Banfield, project leader for NICE. Banfield pointed to some 20 built-in custom controls, such as a dynamic keypad layout, multifunction buttons, graphic button and an edit box.

"The No. 1 thing we offer is the human interface design guide," Banfield said. NCR hired many scientists to create a tool that walks a developer through steps to devise an optimal interface for the way people interact with a computer. NCR claimed that developing prototypes is up to 60% faster when NICE is used.

It also claimed that in a test, novice computer users needed only 20 minutes of training to become proficient in a system, and were 69% less likely to need help after training. The retailer that conducted the test saved 80% of its training costs.

At first glance, one user who saw NICE demonstrated said it looked interesting.

"We'd want to know about this product; otherwise, we'd have to go through trial and error to build applications and have the users change things to their liking," said Joe Barrett, lead technical analyst for architecture and applied research at Whirlpool Corp.

Barrett said NCR's emphasis on creating a tool that was oriented to the way humans work could be a plus.

Gregory J. Busek, NICE product manager, said NCR originally developed NICE for one of it's retail customers.

"Retailers see in some cases 300% to 400% turnover in cashiers, and training costs are a big thing for them. We needed an interface that would make this easier to learn," Busek said. He noted that NCR was able to reduce the average training time for a point-of-sale system from two hours to 20 minutes and said he thought the product might sell in the shrink-wrapped market.

NICE will go on sale next month for $295. NCR will market it through *The Connection*, a catalog, and through its direct sales force. In January, NCR plans to introduce a version of NICE with pen extensions.

SOME COMPANIES WILLING TO PAY FOR A IT'S THE ONLY

Design. Engineering. Testing. Service. Support. When you think about it, these are what make one computer better than the next. Which makes it all the more surprising that companies are cutting back in these areas. And, amazingly, some do little but stick their name on at the end of somebody else's assembly line.

It would be like buying a car, looking under the hood, and discovering that it was built by a company you'd never heard of from a place you'd have trouble finding on the map.

It makes you wonder about the kind of company that would do it. Why they would make the decision to put their name on a product over which they maintain little control. And why they would then sell it to their customers.

Obviously, at some point during some meeting in some boardroom, the mandate came down:

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Other PC companies do things differently, like offering substantially limited service and support for products they apparently have less confidence in. Dell has even gone so far as to withdraw their

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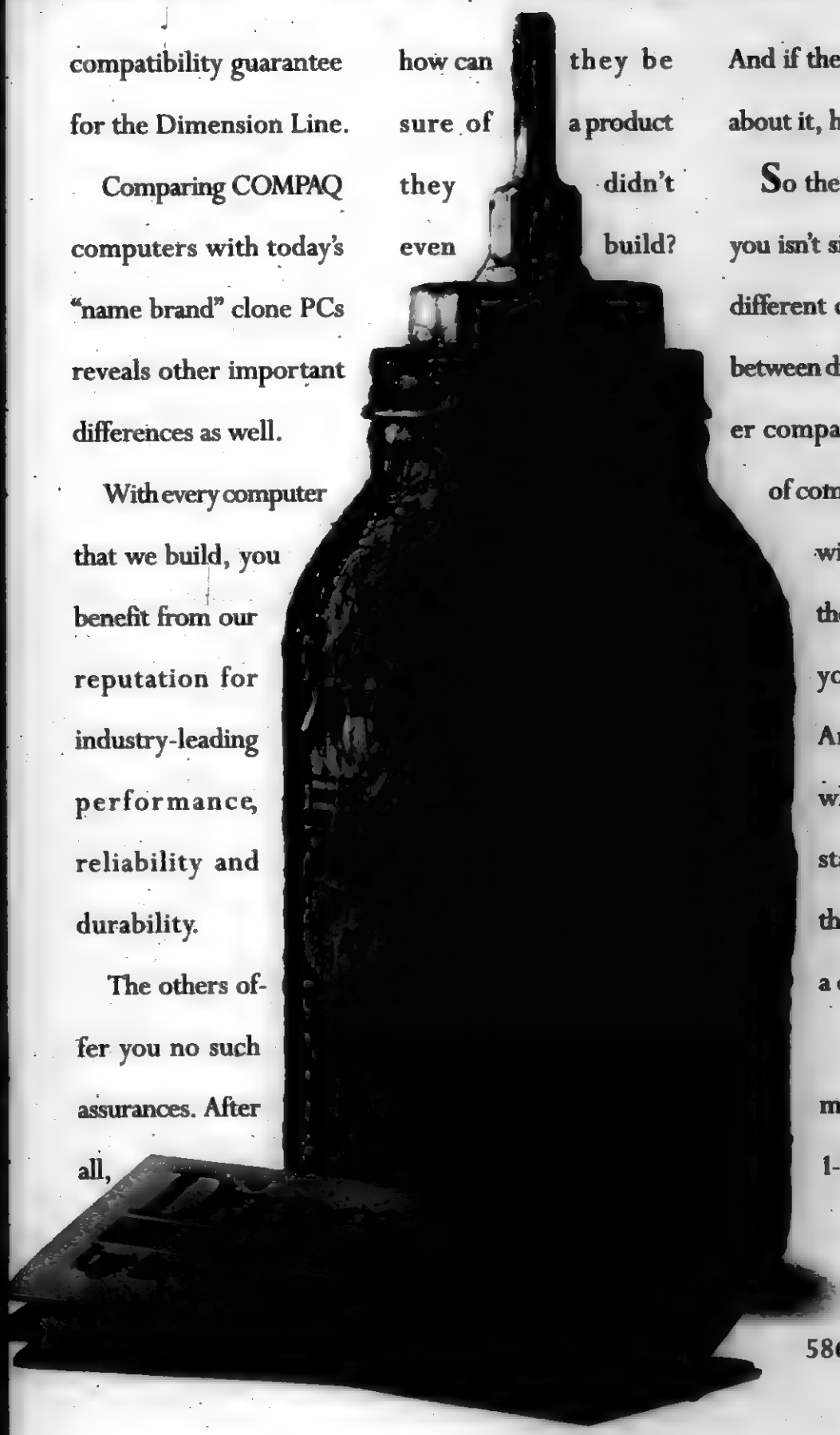

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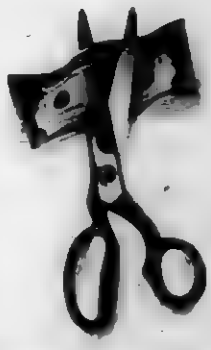
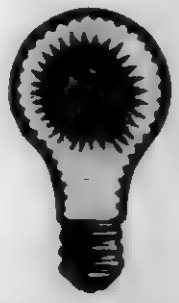


While other companies have been forced to cut corners, at Compaq, we've managed to lower our prices without lowering our standards.



Some ideas are better than others. Unlike a lot of today's clones, the new COMPAQ PCs are all designed, engineered and tested by Compaq.

COMPAQ

COMMENTARY

Jim Paul

Still room for heroes

For the first time since the event's inception in 1987, the Software Engineering Institute (SEI) opened its annual symposium to companies that are not producing software for the Department of Defense. Twelve hundred people attended last month — nearly double the previous year. It was a likely place to get a handle on the state of software engineering.

Understanding the process of producing software has become a priority in organizations such as the military and its contractors. Both rely heavily on large amounts of software to run communications, command and control and weapons systems such as the F15 fighter and Patriot missile.

Yet most private-sector companies are beginning to realize how dependent they are on software and how expensive software can be. Few understand how to manage that component.

So the question is, "How do we manage the process so that software projects come in on time, on budget and with few bugs? How do we minimize the risk?"

The SEI is searching for those answers. Run primarily by Carnegie Mellon University in Pittsburgh, it has its own full-time staff as well as "affiliates" from industry and the military. Collaboration among government, business and academia in software engineering is not unusual. Many countries in Europe also have ongoing projects, but few have yet produced any significant results.

Although the SEI does do some work specific to the kind of real-time programs that are embedded in weapons, most of the work presented at the symposium focused on the Capability Maturity Model. It is for this model that the SEI is best known.

Measuring maturity

The Capability Maturity Model is a yardstick to assess the capability of an organization to produce quality software. The model stems from the need of the military to assess the qualifications of bidders to deliver software. For example, the SEI or a consultant (some are licensed by the SEI) can, through the use of a survey, interviews and observations, rank a company as to its "process maturity," and thus the likelihood that it can deliver complex software.

There are five levels of maturity in the Capability Maturity Model. The first is the organization that relies on hot guns to produce its software, with no internal controls or measurements. At the opposite end, Level 5, is the organization that continuously tracks projects and measures results. These results are used to further refine the software production process.

Of 15 companies evaluated by the SEI, virtually none has rated more than Level 2. Somewhat of a relief is the fact that Capability Maturity Model evaluation results have not yet weighed heavily in contract decisions.

SEI staff members stress that the model should be used for more than just evaluation. It should be the starting point of a cycle to refine a company's software capabilities.

How does an organization improve its development processes? By measuring the results and making refinements. The steps in process refinement are nearly identical to the problem-solving steps used in most Total Quality Management (TQM) programs. Team-building is an important component of both.

Most, if not all, of the people making presentations for organizations involved with the SEI were also conducting TQM programs. Bill Craig, presenting for Micom, said, "We view the CMM as a subset or special topic under our TQM program."

Neither TQM nor the Capability Maturity Model offer specific guidance about programming languages, programming methods such as object-oriented programming or specific vendors' computer-aided software engineering tools. Both are vendor-neutral. What they provide is management structure and reality checking. They help assure that whatever software engineering decisions you do make are motivated by the right factors and that the results can be evaluated in the objective light of the Capability Maturity Model.

Programmer value

As the process of software development comes more under control, will there be room for the superstars of programming? Will a desire to be precise eliminate innovation? "I tell my people not to focus on the numbers. They are tools, and the goal is the process," one panelist said of his experience using the Capability Maturity Model.

Companies using the Capability Maturity Model are not losing sight of the fact that smart, motivated people write good software. No one wants to kill the golden geese.

Hughes Aircraft's John Weaver, one of the keynote speakers, said, "There is no substitute for good people. The goal of these changes is to leverage the skill of our people."

Even with the Capability Maturity Model, there will always be room for heroes.

Paul is a consultant and principal at Northeast Consulting Group in Pittsburgh.

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IN BRIEF

Synon selling planning tool for AS/400 users

■ Synon Corp., an IBM Application System/400 application development vendor in Larkspur, Calif., began selling Silverrun, a planning and analysis tool from **Computer Systems Advisers, Inc.** in Woodcliff Lake, N.J. The companies plan to build a bridge between their respective tools by mid-1993. Silverrun, which runs under OS/2 and Microsoft Corp.'s Windows, is available in English and French versions, with a Japanese version due out early next year.

■ Measuring the size and productivity of existing and under-construction applications is the subject of upcoming workshops by **Productivity Management Group, Inc.** in East Amherst, N.Y. The $425, one-day sessions will focus on using function-point analysis to track software development activity.

■ **Cortex Corp.** in Waltham, Mass., has begun shipping CorVision 5.0, an application generator for building Unix programs. The product, priced at $35,000 for the first seat, can produce programs for Ultrix from **Digital Equipment Corp.**, HP/UX from **Hewlett-Packard Co.** and SCO Unix from **The Santa Cruz Operation.**

■ **Seer Technologies, Inc.**, a Cary, N.C.-based firm co-founded by IBM and First Boston Corp., enhanced its High Productivity Systems tool set to help distribute host-based applications to IBM AIX, OS/2 and DOS clients.

Firms test workbench

CONTINUED FROM PAGE 93

which allows users to establish the types of operations, events and processes that might occur within the business.

For example, the event diagrammer could be used to model "temporal events" such as stock market activity or "state events" such as converting an airline ticket to a fulfilled state when a passenger gets on an airplane. The tools also support triggers, which are information flows that activate other operations.

Finally, the business rule editor can be used to capture business policies and rules and then attach these to specific objects and events. For example, a rule indicating that an airline flight is overbooked could be attached to an airplane object.

But some observers are leery of the Martin and Odell methodology and its planned implementation in OMW.

"I'm confused about how they portray object interaction," said Ron Schultz, a senior software engineer at Berard Software Engineering, Inc., a consultancy in Gaithersburg, Md. Schultz has recently completed a comparative analysis of object-oriented methodologies for Berard.

Concerning the Martin and Odell approach, he said, "There are no object and class specifications. I don't see how it provides for reuse. The modeling process is not well-defined." However, Schultz added, "It lends credibility to have Martin bestow his name upon object orientation."

Aside from the methodology, "The objective was to create a modeling process that was more intuitive for [the IS department] and business users," said James Wyatt, president of James Martin & Co.

According to Wyatt, tools such as OMW make it possible for users to create models of a business using IE and object-oriented processes and then execute the model immediately. That provides an interactive environment for business and systems modeling that is difficult to obtain using existing modeling methods, including traditional systems analysis.

"The problem now is the quality of the systems analysts. We want to decrease the role of the analyst in the critical path and allow business users to directly interact with the computer," Wyatt noted.

That direct interaction with modeling tools is the first step in a technique that James Martin & Co. is calling "enterprise visioning." Broadly speaking, its intent is to allow executives to "vision" and test alternate business models.

Wyatt said it is a natural evolution of IE, rather than a switch to yet another snazzy modeling technique. "We wouldn't call IE a dead end. We're trying to go a step further," he said.

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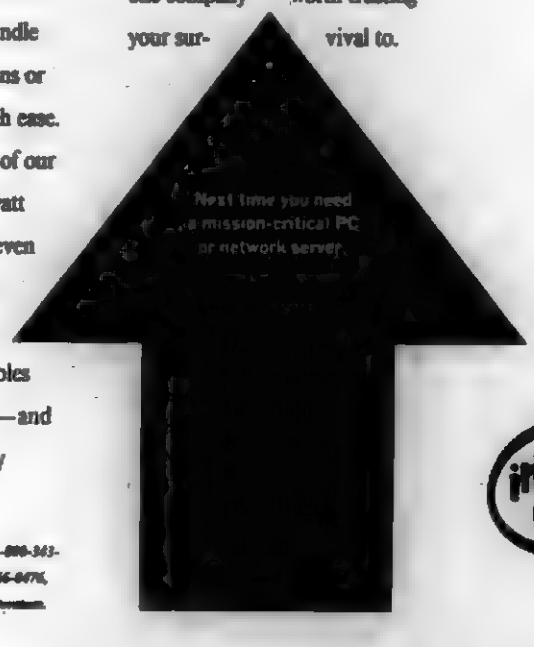

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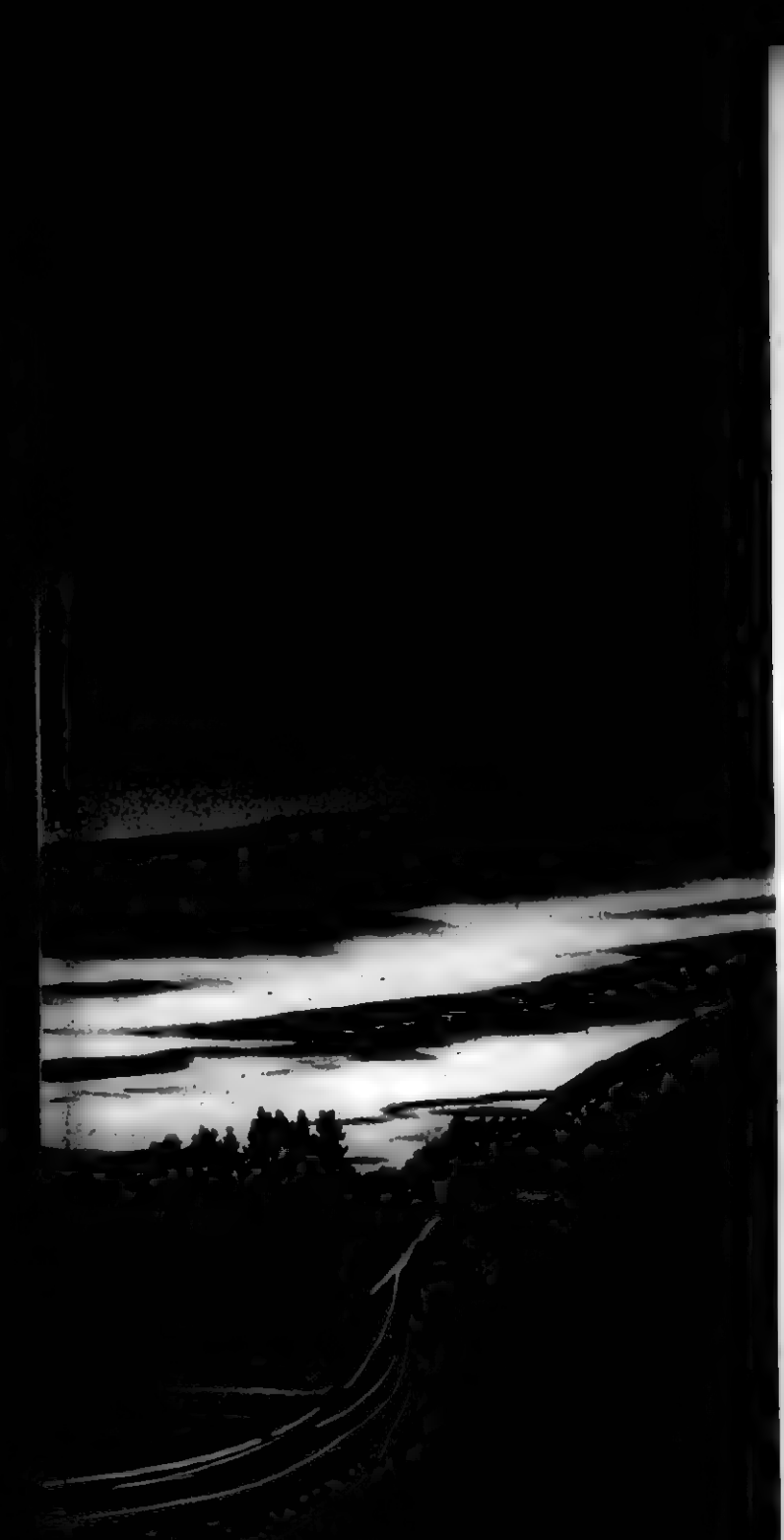

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NEW PRODUCTS

Application development tools

CaseWorks, Inc. has announced CASE:W Visual Integration Platform (VIP).

According to the company, the product is the first Microsoft Corp. Windows-based client/server development tool designed for use with C, ObjectWindows and Microsoft Foundation Classes platforms. Standard languages are used when developing applications, and the product provides high-level graphical designers that generate various components on the interface, including menus, panels and windows. The output from the graphical designers is assembled by source code designers that also define how they are to be generated into the source code.

CASE:W VIP costs $2,995.

CaseWorks
Suite 130
1 Dunwoody Park
Atlanta, Ga. 30338
(404) 399-6236

TeleSoft has announced Version 2.1 of TeleUse, a user interface management system.

According to the company, the product was designed for the interactive development of graphical user interfaces based on the Open Software Foundation's Motif. Ease of use enhancements are offered in this version, including an improved user interface, a more powerful Dialog Manager with expanded C++ integration and support and third-party tool integration. A session manager provides direct access to all of the company's facilities and third-party development tools. Enhanced C++ support and a C++ example are provided.

TeleUse 2.1 costs $7,500.

TeleSoft
5959 Cornerstone Court West
San Diego, Calif. 92121
(619) 457-2700

Emulex Corp. has announced the Emulex Communications Executive, an application development tool kit.

According to the company, the tool kit was designed to enable users to write custom communications applications by using Emulex's DCP-286 line of personal computer-compatible communications coprocessors.

The product runs under DOS and Unix operating systems and supports communications protocols including Synchronous Data Link Control, X.25 and High-Level Data Link Control. Features include the ability to allow development with the standard Microsoft Corp. C compiler under DOS and the ability to create runtime modules for DOS and Unix. An on-board kernel supports real-time, preemptive multitasking operations.

The tool kit costs $2,000.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Languages

Software AG of North America, Inc. has announced Natural for DB2 2.2.

The product is a new version of Software AG's application development environment, which allows DB2 users to develop fourth-generation, product quality applications for IMS/DC, CICS and batch. Full SQL DML support is provided for DB2 application development.

Natural for DB2 2.2 offers a new DB2 Tools facility that has interactive support for a variety of database administration functions related to DB2. These functions include data definition language and data control language support as well as application plan maintenance. An interactive SQL feature provides immediate generation of SQL statements.

The cost of Natural for DB2 ranges between $72,000 and $171,400.

Software AG of North America
11190 Sunrise Valley Drive
Reston, Va. 22091
(703) 860-5050

Code libraries

Liant Software Corp. has introduced Figaro+ 3.0 C, a Phigs+-based programming library.

Figaro+ 3.0 C was designed to allow users to develop graphics applications in the object-oriented environment of C++. Fully callable from C++, the product enables users to develop applications by accessing Figaro+ 3.0 graphics routines and libraries from C++ and from object-oriented programming languages.

Figaro+ 3.0 C costs $2,600.

Liant Software
959 Concord St.
Framingham, Mass. 01701
(508) 872-8700

IMSL, Inc. has released the C/Math/Library for Silicon Graphics, Inc.

According to the company, the product is a library of C functions for solving mathematical problems such as interpolation and approximation, differential equations, transforms, optimization and linear systems. On-line documentation is included. The C/Math/Library is available with both node-locked and floating licenses.

Prices start at $3,000.

IMSL
Suite 3000
14141 Southwest Freeway
Sugar Land, Texas 77478
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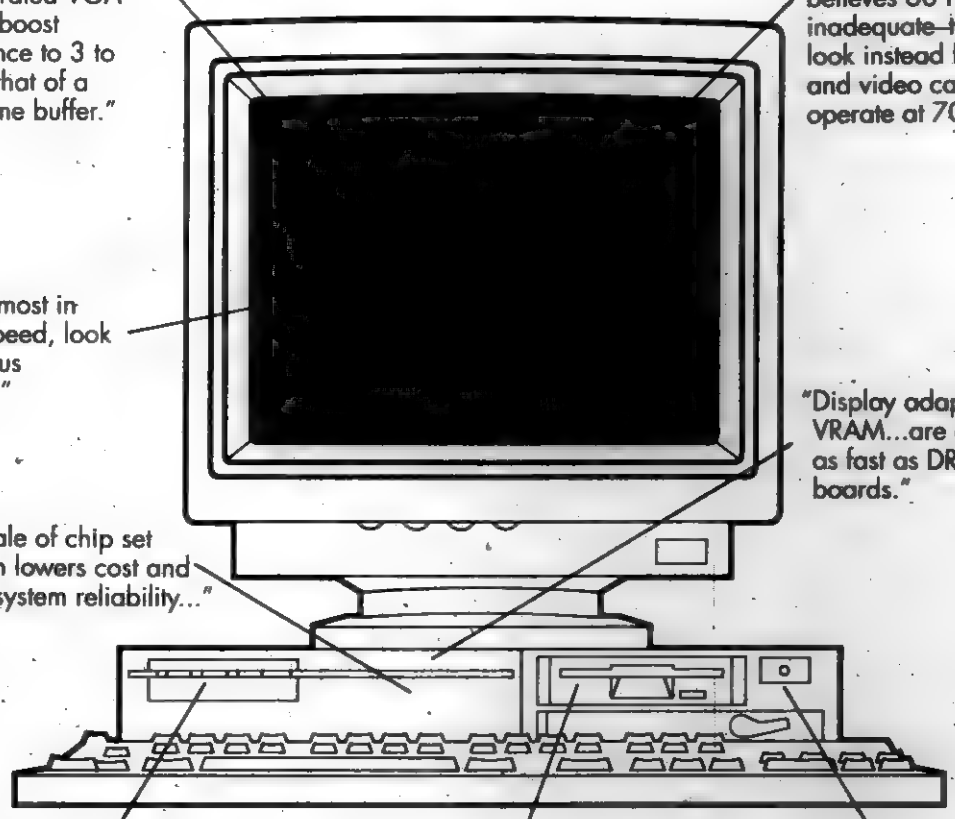
"At 1,024-by-768 resolution, PC magazine believes 60 Hz is inadequate—too flickery—... look instead for monitors and video cards that operate at 70 or 72 Hz."

"For the utmost in display speed, look at local bus designs..."

"Display adapters using VRAM...are often twice as fast as DRAM-based boards."

"A high scale of chip set integration lowers cost and improves system reliability..."



"To save space, look for built-in parallel and serial ports, and IDE and video circuitry."

"To take advantage of a 32-bit operating system such as OS/2 2.0 or Windows NT (when it ships), you will want at least 8 MB of RAM, so a 16 MB motherboard may prove limiting in the next couple of years."

"Note that metal SIMM sockets are preferable to plastic ones."

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• 3.5" 1.44MB floppy drive
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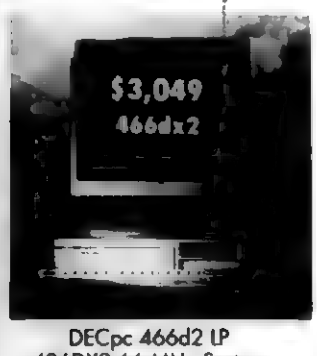
• Free shipping.



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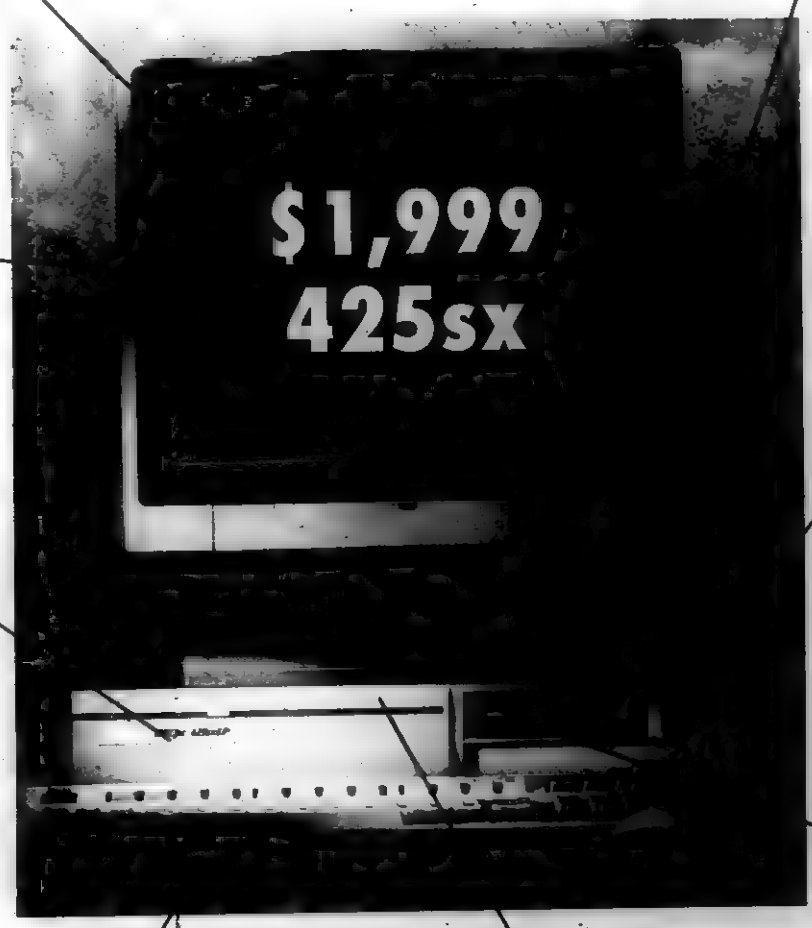

GUI acceleration

Up to 72 Hz refresh rate

Local bus video

Metal SIMM clips

Upgradable design

Up to 64MB RAM on motherboard

Built-in parallel and serial ports, IDE and video circuitry

VRAM instead of DRAM

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DIGITAL'S NEW P

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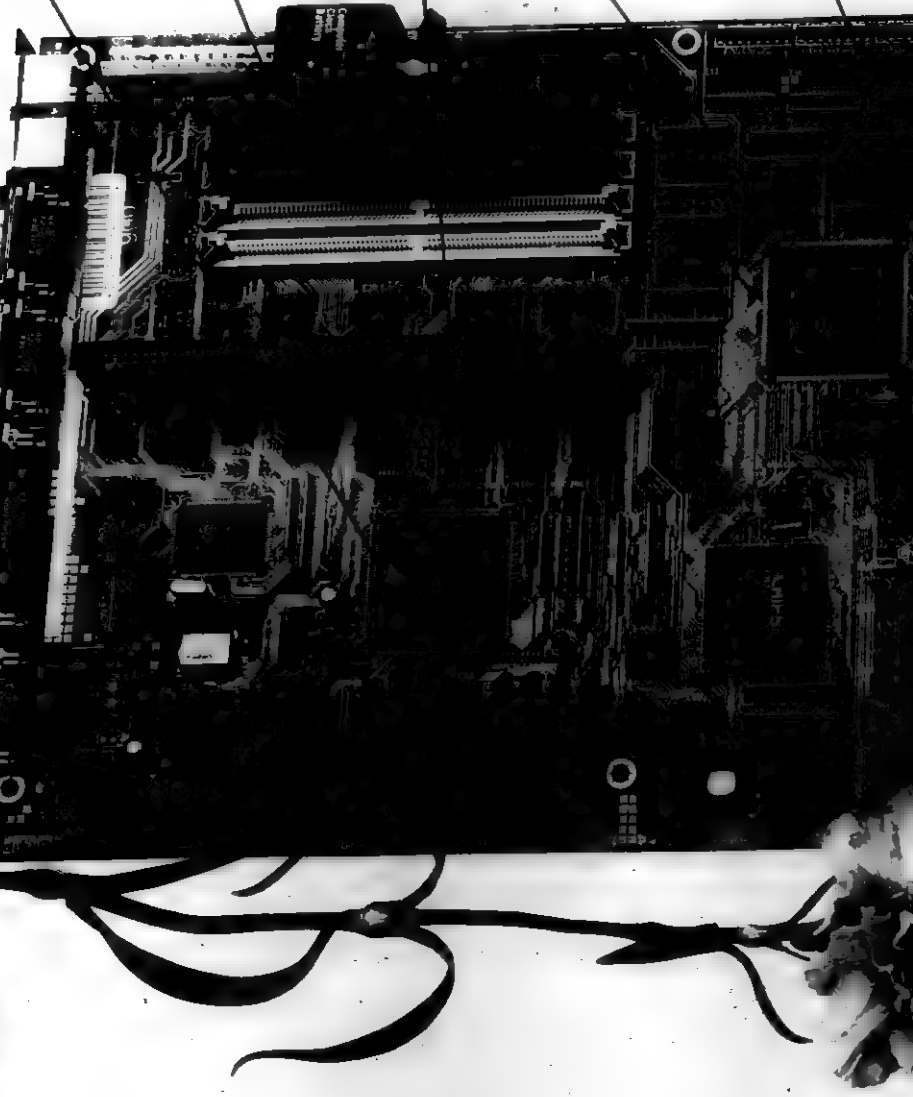
The built-in GUI accelerator makes Windows fly, yielding a four-fold speed improvement over standard VGA. With full 1024 x 768 resolution.

Our mother has a daughter. This one carries the microprocessor, cache and data bus for system upgrades.

Add up to 64MB of RAM on this motherboard. Plenty of room for all the memory-hogs in your software collection.

The Vacancy Socket is the quick and easy way to upgrade your DECpc. Just add the appropriate Intel OverDrive™ Chip.



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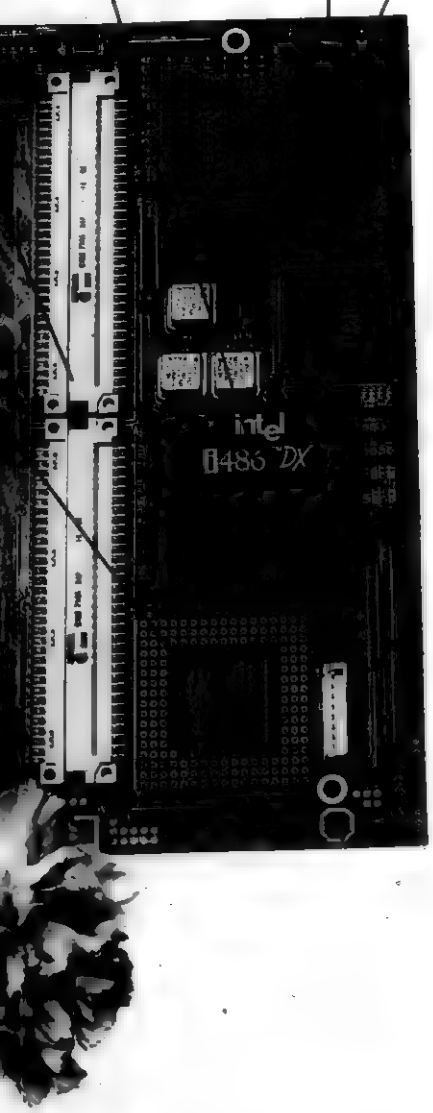

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Our new motherboard was born in Digital's very own, highly automated, ISO 9000-compliant factory. As opposed to somebody's garage.

But the real beauty of this mother is how much she does for you. She takes care of the floppy drive and the hard drive. Provides for the video controller and the GUI accelerator. Even tends to two serial ports and one parallel port. And because this motherboard takes care of all the basics, you can use her three expansion slots to truly customize your system.

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Upgradable	yes	yes	yes
Cache included	128KB	8KB	8KB
Cache maximum	256KB	64KB	256KB
GUI acceleration	yes	yes	no
Local bus video	yes	no	no
Maximum RAM	64MB	32MB	64MB
Hard disk bays	2	1	1
List price	$1,849	$2,449	$1,849
Estimated street price	$1,849	$2,252	$1,849
30-day money-back guarantee	yes	no	yes
Shipping included	yes	N/A	no

4MB RAM, 120MB hard drive, keyboard, mouse, DOS, Windows, no monitor. Competitive price survey 9/10/92.

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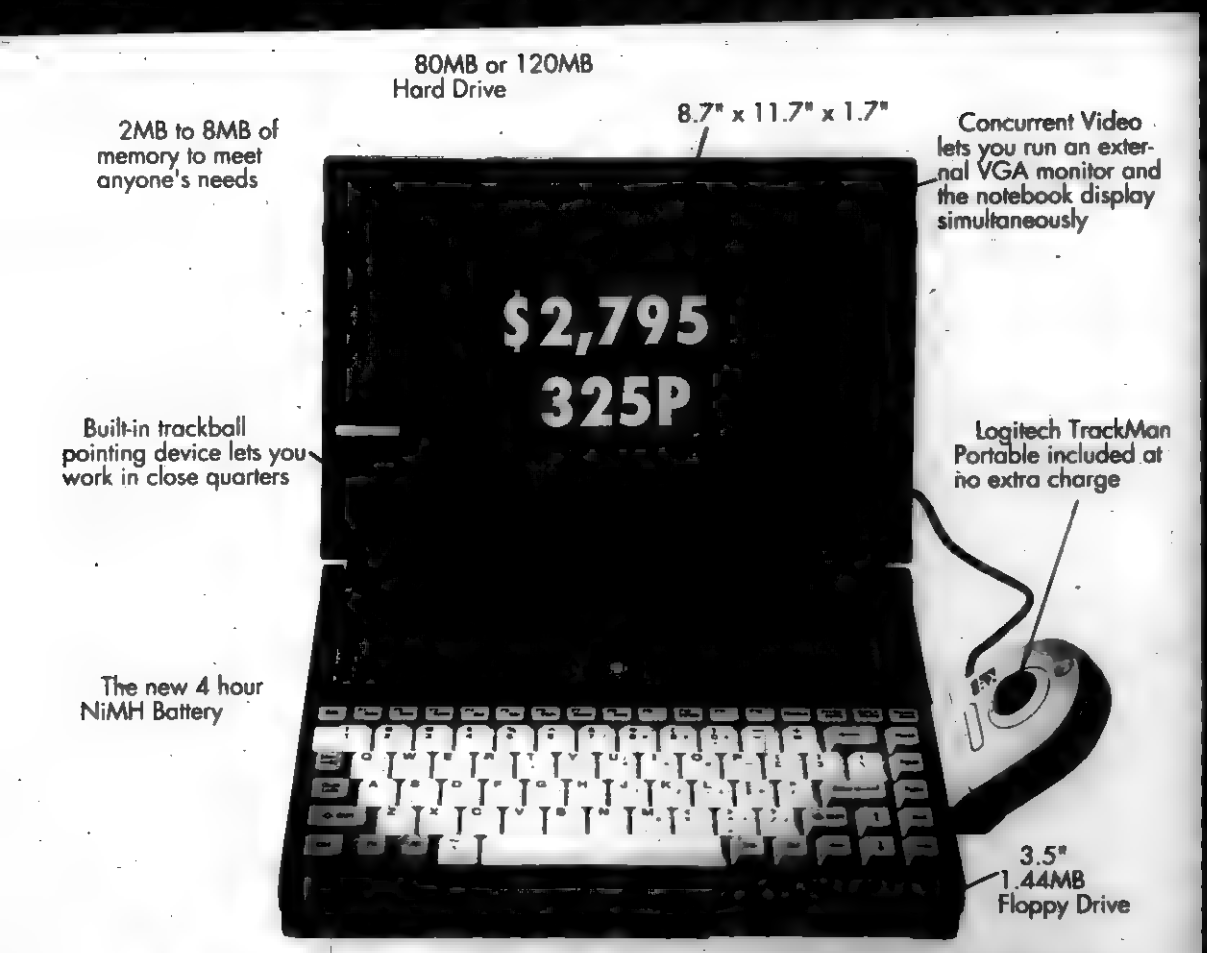

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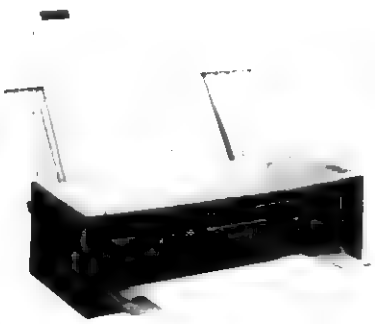

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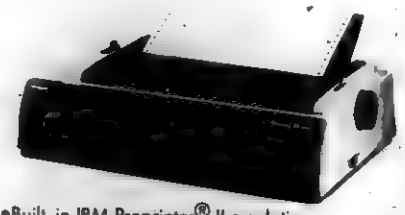

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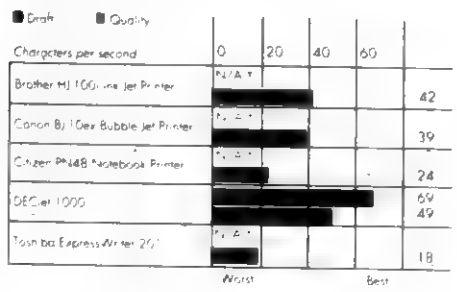
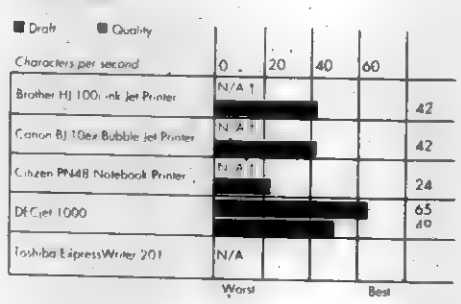
In head to head tests, *PC Magazine* pitted the DECmultiJET 1000 ("DECjet 1000") against portable printers from Brother, Canon, Citizen, Kodak® and Toshiba®. The results? *PC Magazine* reports "the DECjet...had the highest speeds in quality printing: 49 cps in both emulations."

Epson Emulation



IBM Emulation



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Distributed systems: Tough to take root

BY JULIA KING
SPECIAL TO CW

Thinking about transplanting software development pilots into larger corporate settings? Then be prepared to act less like Johnny Appleseed and more like Indiana Jones. Information systems managers and consultants experienced in building cross-platform, client/server-based enterprise systems say there are many pitfalls.

"Basically, what we have right now is very much a seat-of-the-pants technology," says Aaron Zornes, vice president and director of applications development strategies at Meta Group, Inc., a consulting firm in Westport, Conn.

"It is really more art than science at this point because many people don't even understand all of the requirements," Zornes adds.

Challenges with networks, choosing suitable software tools and user interfaces and reconciling incompatible databases further complicates matters, according to experienced hands.

Unlike traditional mainframe applications, consultants and IS managers say developing enterprise systems to operate in today's distributed environments actually involves architecting two or more programs to run on different computing platforms.

Programs must be optimized not only to run on various machines but also to perform efficiently over the network, an area in which many developers have little expertise.

One result, notes Tom Love, president of OrgWare, a Roxbury, Conn., consulting firm, is that developers are moving from a pure applications environment to a systems environment, which can present problems. "Developers now have to deal with communications," Love notes, "and ... in real time, which is much more complex."

Little wonder that in many companies the work of developing enterprise applications is still in the very early stages.

Yet some IS managers have taken steps to successfully meet these chal-

Continued on page 102

No easy answers from commercial integrators

Many firms are hungrily eyeing this $5 billion market. Here's help weeding out the worthy from the wannabees.

BY MARK MEHLER
SPECIAL TO CW

Information systems shops forced to turn to commercial integrators to help migrate existing applications off the mainframe, or develop client/server applications from scratch, will find a bevy of questions and a shortage of yes or no answers.

Among these conundrums: How much attention should be focused on a vendor's proprietary methodology? How does one define a truly "open" methodology? Should you contract a single integrator for both business and systems re-engineering? Do the traditional management consultancies have an edge by virtue of their experience in re-engineering business processes?

"Users have no mechanism to distinguish among the technological capabilities of the integrators in this market," says Oliver Pflug, an analyst at G2 Research, Inc.

Others suggest that users inundated with competing integrator claims strip the decision down to basics.

"Everybody is a client/server specialist, everybody claims to do enterprisewide strategic [consulting], everybody has the best methodology," notes Ira Sager, a principal at Bellevue, Wash.-based consultancy Para-Technology, Inc.

"These terms have become almost meaningless. What a user needs to look at are the people. Are they programmers who've been working in Cobol for six years who started working in C++ six months ago?" Sager says.

It's not hard to see why commercial systems integrators are falling all over themselves chasing enterprise applications development business.

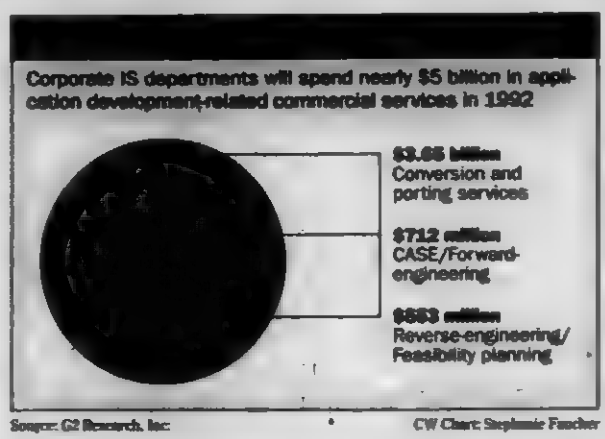
There's big money to be had.

According to G2 Research, IS organizations will spend nearly $5 billion this year on services related to designing and creating software code (see chart).

Moreover, G2 Research says demand for such services is growing at roughly 21% a year — about 10% more than the overall commercial integration market. Annual growth in computer-aided software engineering (CASE) services tops 28%.

Observers cite several driving factors. Chief among them: a lack of IS experience with personal computer local-area networks and client/server environments. And no vendor of development tools can yet offer a complete solution, opening up a huge opportunity for service providers experienced in meshing multiple hardware and software platforms.

Product vendors, too, increasingly see relationships with integrators as critical to penetration of Fortune 1,000 companies.



Know the players

Consultants says it's important for IS to know the major players in application development — their approaches and their strengths.

Big integrators can be divided into two camps: firms with large investments in their own methodologies and tools, which are licensed or sold as stand-alone products or as part of integration engagements; and those that rely on commercially available products to develop custom systems.

Andersen Consulting, Ernst & Young, Electronic Data Systems Corp. and Digital Equipment Corp., in varying degrees, fall into the former category. SHL Systemhouse, Inc., Computer Task Group and Technology Solutions Co. are among the latter.

Continued on page 106

Distributed systems: Tough to take root

CONTINUED FROM PAGE 101

lenges. Following are accounts of the problems they have encountered and their solutions.

DSC Communications Corp.

Eighteen months ago, DSC Communications Corp. in Plano, Texas, created software in much the same way as many other companies: in the glasshouse.

First, users got their names on a list. Then they waited in line. Then, IS would write up requirements and maybe even specifications. Finally, after several months or more, "maybe something might come out the back door of the IS department," says Jim Myckleby, vice president of IS at the $500 million digital switch manufacturer.

But all too often, he acknowledges, what came out was not asked for or, worse, completely useless. User needs had often changed while IS was developing and implementing the application.

Today, by contrast, there is almost no waiting for new or revised business applications, according to Myckleby. The reason? Programs are now written by users employing Oracle Corp.'s SQL-forms development tool. End users now build their own client/server applications, guided by a 128-page manual of in-house development rules, guidelines and conventions furnished by the same IS department that once kept users on what seemed like eternal hold.

Myckleby is the first to acknowledge that setting up users as programmers might be a bit crazy, as some colleagues keep telling him.

"But it's also a question of survival," he says. "I couldn't hire enough people to satiate users' appetite for new applications. It was too expensive and meant too many programmers. It was time for IS to recognize that we're not the only ones who are computer-literate."

Myckleby's first step was to swap out an IBM mainframe for a lower cost Amdahl Corp. 5995/1100 system running both Unix and MVS. Next, IS addressed the issue of incompatible operating environments by standardizing on a single database engine and set of development tools, both from Oracle.

Today, the Oracle relational database is housed on the Amdahl system. On the client side are the computer-aided software engineering (CASE)-based tools, which reside on some 2,000 IBM and compatible personal computers and another 500 or so workstations from Sun Microsystems, Inc. and Hewlett-Packard Co.

"This is a different tack from traditional client/server in that the Amdahl is our big server in the sky. But our strategy was to make sure we had a hardware platform that was extremely reliable and one where we could manage and secure data," Myckleby explains.

As for training, DSC employees attend either in-house classes taught by IS staffers or formal training sessions sponsored by Oracle. IS professionals also work one on one with users still learning Oracle, a process that usually lasts about a month, according to Myckleby. Other support is provided by an IS contact assigned to each department.

In the year and a half that DSC's "Open Shop" applications development strategy has been under way, users have created both departmental *and* enterprise appplications, Myckleby says.

Among the latter are quality reporting applications now used by all seven of DSC's divisions and a manufacturing program for tracking component subassemblies and shop-floor processes.

Both applications have now been turned over to IS, which Myckleby says can easily maintain them "because they were built by users just as IS would have built them."

During the same period, the role of DSC's applications development staff — now 30% leaner than in January 1991 — has also changed substantially.

"We've gone from processors of information to data architects, data engineers and systems integrators," Myckleby says.

Empowering users with needed data and tools, he adds, has effectively created a new matrixed development organization under IS.

Overall, Myckleby concludes, the "entire organization has become more key to the business process and less focused on being the technology center. We're here to solve business problems, and technology is second."

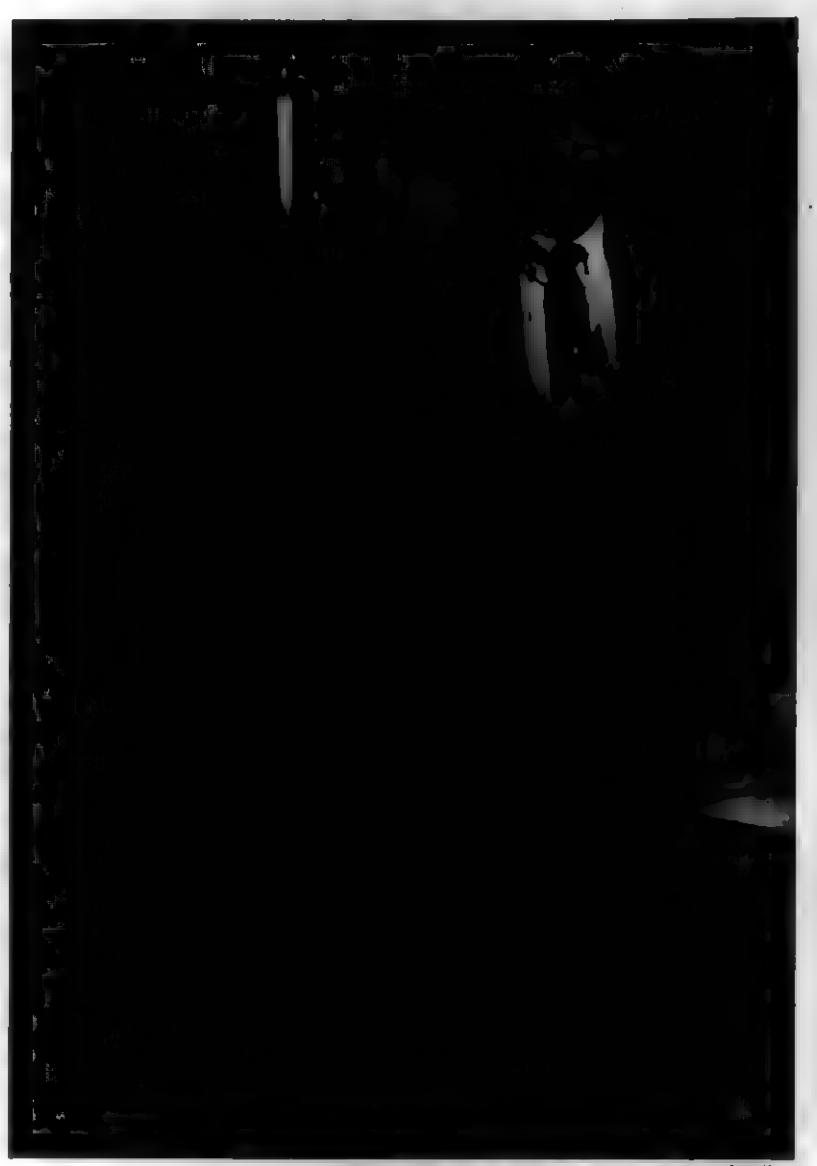
DSC COMMUNICATIONS CORP.
Plano, Texas

CLOSE UP

GOAL: To eliminate slow, "glasshouse"-based application development.

STRATEGY: Switched from IBM to Amdahl Corp. 5995/1100 system running Unix and MVS. Standardized on single Oracle Corp. database engine. Users write own client/server applications using Oracle SQLforms development tool running on 2,000 PCs and 500 Sun Microsystems, Inc. and Hewlett-Packard Co. workstations.

PAYOFF: IS development staff trimmed 30% in 18 months. IS role switched from information processors to data architects, data engineers and systems integrators. New matrixed development organization created under IS.



Reid Horn

DSC's Myckleby: *'We've gone from processors of information to data architects'*

Aluminum Company of America

A few weeks from now, developers at Pittsburgh-based Aluminum Company of America (Alcoa) will roll out a prototype client/server-based purchasing application that, if early interest means anything, users seem eager to buy into.

"The idea is to enable users to make their own purchases so that the purchasing department can focus more on big-ticket items," explains Travis Morse, who manages client/server systems support. "Some users have already had a peek at it, and they have loved it."

Built using Powersoft Corp.'s PowerBuilder, an object-oriented development tool, the application splits the purchasing function into two distinct parts.

On the server side, an on-line catalog of commonly purchased items resides in a Sybase, Inc. relational database on a Digital Equipment Corp. VAX. On the client side, users of PCs and Macintoshes can browse through the catalog and initiate an electronic data interchange-based purchase order from a DB2 database on the corporate mainframe for items priced under $5,000.

But before the purchasing program or any other client/server-based prototype can make the transition to enterprise application, Alcoa must finish building a wide-area network that will link 10,000 of its users at more than 100 sites worldwide when it is completed next year.

During the last three years, Alcoa has spent $8 million on the network, which now links 50 company sites; another $9 million is earmarked for completion. The network will eventually route a limited number of standardized communications protocols, still to be determined by the company's IS department.

Meanwhile, Morse says one-fifth of the company's 200 applications developers have been evaluating hundreds of CASE-based and fourth-generation language tools in hopes of standardizing on development software by mid-October. The company has established standards for network clients (Intel Corp. 80386- or I486-based, Microsoft Corp. Windows-capable desktop systems).

Continued on page 104

ALUMINUM COMPANY OF AMERICA
Pittsburgh

CLOSE UP

GOAL: To let system users write own orders via EDI on PCs and Macintoshes so Alcoapurchasing department can focus on big-ticket items.

STRATEGY: Build $17 million WANs linking 10,000 users at more than 100 sites worldwide. Then roll out prototype client/server-based purchasing application based on Powersoft Corp.'s PowerBuilder, an object-oriented development tool. Develop CASE and client/server skills via in-house training programs.

PAYOFF (anticipated): More satisfied customers, faster orders, greater focus on large, profitable accounts.

Where are you headed with your applications development?

BACHMAN

Distributed systems

CONTINUED FROM PAGE 102

But Morse says the next hurdle — perhaps the biggest of all — is either acquiring or developing the skills necessary to optimize network-based, enterprisewide, client/server applications. Optimizing both application and network performance, according to Morse, is complex, "under-the-covers" work, requiring the skills of savvy network architects and experts in data access and database design.

"Sure, some of the development tools that are around today are easy enough for even users to learn how to use," Morse says. "But the database design and networking that must be done for applications to work well are skills that are few and far between."

Because it's tough to find qualified people, he continues, skills must be developed in-house, a time-consuming task. To that end, Alcoa continues to train applications developers in WANs and client/server topologies, as it has for the past several months.

For now, Morse is concentrating on the basics. "Right now, we're focused on building the infrastructure and trying to get developers' skills up," he says.

MORTGAGE GUARANTY INSURANCE CORP.
Milwaukee

GOAL: To shift key mainframe-based underwriting system to desktop platforms.

STRATEGY: Replace 3270 terminals with IBM PS/2 workstations on OS/2 and Windows platforms. Convert an SNA network to a WAN. Integrate expert system technology into the new, $5.5 million Advanced Technology Acquisition System with Andersen Consulting's Foundation. Train mainframe-based Cobol applications programmers in PC-based development techniques.

PAYOFF: 20% reduction in mainframe use.

Mortgage Guaranty Insurance Corp.

No one can accuse Mortgage Guaranty Insurance Corp. of being timid in tackling distributed development.

Defying popular wisdom to "start small," the Milwaukee insurer dove into client/server development 2½ years ago with one of its backbone business applications, a mainframe-based underwriting system used daily by hundreds of the firm's 1,500 employees.

Converting the application involved, among other things, replacing 3270 terminals with IBM Personal System/2 workstations running OS/2 and Windows, converting a Systems Network Architecture network to a WAN capable of routing multiple communications protocols and, last but not least, integrating expert system technology into the new Advanced Technology Loan Acquisition System, dubbed "Atlas."

John Seaman, director of systems services, says that finding a code generator or other suitable tool for a graphical user interface (GUI)-based environment was the first development challenge.

Because GUI-based applications involve about 10 times more code than traditional mainframe applications, such a tool was indispensable, he says.

The second hurdle was training mainframe-based Cobol applications programmers in PC-based development techniques.

"All of the development tools on PCs are different. The languages are different, as are the tools to program, test and edit," Seaman says.

He continues, "Mainframers are used to the comforts of source-code managers, as well as a lot of infrastructure and called subroutines that do a lot of work for you. On the PC, we had none of this, so we were starting from scratch."

Developers and technical support staffers were also starting from scratch in learning how to use unfamiliar network diagnostic tools.

James Schiegel

Mortgage Guaranty's Seaman *dove into distributed development*

"New network hardware and software had to be learned, as well as mechanisms for updating all devices on the network with software changes. You could spend a year researching and developing the networking aspect alone," Seaman says.

Developers spent the first year not only acquiring new networking expertise but also learning the intricacies of the OS/2 operating system, developing prototypes of PC/mainframe connections and researching and evaluating various application development tools.

Few OS/2-based development tools were available in 1990, Seaman says, so Mortgage Guaranty chose Foundation for Cooperative Processing, a CASE tool from Chicago-based Andersen Consulting. The software was used to design screens and windows for Atlas' PS/2-based clients.

On the mainframe, which acts as a large file server under Atlas, a CICS program funnels data to a DB2 relational database. The two program components communicate via IBM's Advanced Program-to-Program Communications (APPC) routines executed on the client side, where all edits and validation procedures are also done.

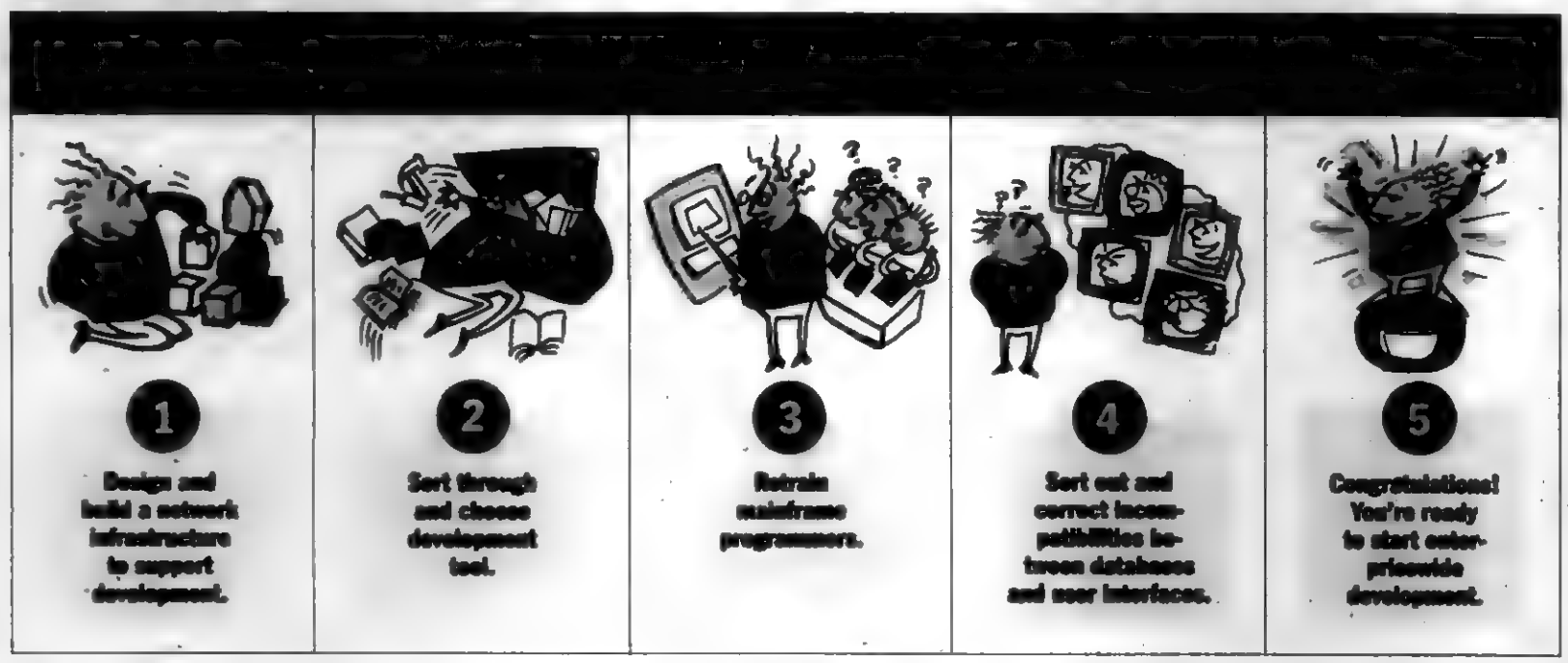
Thirty months and $5.5 million later, Atlas today consists of 55 full-screen windows. The system has been running in production mode for a little more than three months, according to Seaman.

"For now, all of the work is done at the PC, and the mainframe is only housing the database," he explains. "But by doing just that, we have reduced mainframe utilization by a minimum of 20%."

In the long term, Seaman has plans to more fully use a distributed database environment. Instead of a CICS transaction and PC calling APPC, the PC will write to a database that it thinks is on the PC, Seaman explains.

"We would like to set it up so if the mainframe or communication lines are down, a server could process loans without the mainframe at all," Seaman says. •

King is a free-lance technology writer based in Ridley Park, Pa.



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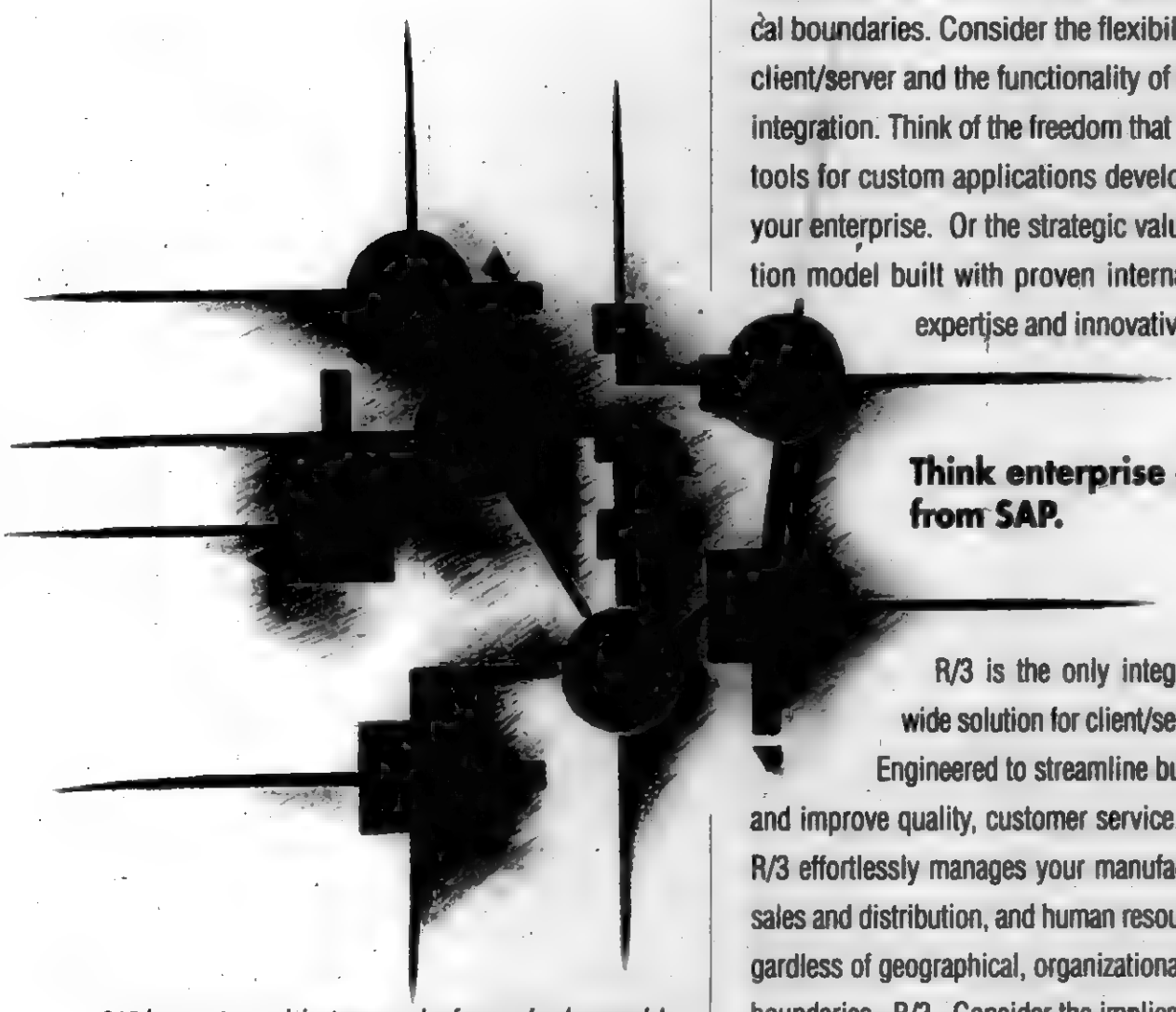

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No easy answers from integrators

CONTINUED FROM PAGE 101

To be sure, each approach has advantages and disadvantages, notes Russ Tahmoush, corporate methodology manager at DEC.

For example, licensing a proprietary methodology can help improve account control and boost revenue, he says. But it also requires large maintenance and upgrade expenditures and can be a competitive liability if the methodology is too rigid or incompatible with third-party approaches and tools.

DEC itself sells a CASE platform called Cohesion and is weighing the licensing of its internal Digital Program Methodology.

Open or closed?

Many customers are drawn to integrators with proprietary products, seeing them as concrete evidence that the services provider is conversant with the technology.

But those same customers, G2's Pflug argues, are likely to find that other vendors' tools will not deliver the maximum performance and functionality under even the most open proprietary methodologies.

➤**Andersen Consulting.** Among the major integrators, Andersen has made by far the largest investment in products, offering its Method/1 methodology and a wide range of planning and analysis, CASE and project management tools under its Foundation umbrella.

Approximately 25% of its total integration engagements involve the sale of proprietary products, according to Don Dall, managing director of the Foundation line.

Software sales of $80 million in fiscal 1992 were up 30% from 1991, making Foundation among Andersen's fastest-growing businesses.

Foundation competes heavily against CASE offerings from Texas Instruments, Inc., KnowledgeWare, Inc. and others. Andersen director of technology transfer Glover Ferguson acknowledges the potential for bias among consultants.

However, Ferguson insists that consultants are a fiercely independent lot who don't always choose Andersen products.

Ferguson adds that Andersen's strengths in change management and strategic services and the firm's specific industry expertise are even more crucial than products in its applications development efforts.

➤**Ernst & Young.** Another member of the Big Six, Ernst & Young makes similar claims regarding its products and services.

John Parkinson, Ernst & Young's chief scientist, says the firm's Navigator methodology "is as open as we could possibly make it." He adds that the firm's ability to team with third-party tools vendors is restricted only by its audit relationships with some of those vendors. About 50% of the firm's integration deals involve the licensing of Navigator, Parkinson says.

Unlike integrators such as DEC that have different organizations for systems re-engineering and management consulting, "there is no handoff between advisory groups here," Parkinson says.

A recent G2 study, however, suggests that most users still prefer to separate those functions. Some 57% of responding IS organizations said they do not perform systems and business re-engineering at the same time, believing that no one vendor can do both effectively.

➤**EDS.** EDS claims to have 50 documented client/server application success stories. Besides its EDS Systems Life Cycle methodology, which it has licensed to a few customers, the mega-integrator offers a consolidated data modeling tool (Incase), a reverse-engineering tool (Source Code Interviewer) and a work-flow analysis package (Apache).

The latter two software products are usually bundled into IS services pacts, says Brad Rucker, systems engineering manager at EDS' strategic methods and tools group.

Rucker says Apache, in particular, addresses EDS' long-perceived weakness on the front end. "We're striking out at a broader [base of business]," Rucker says. "We're involved at the feasibility/consulting, applications development and back-end process management levels."

Rucker maintains that EDS is less tied to its own tools than are its major competitors.

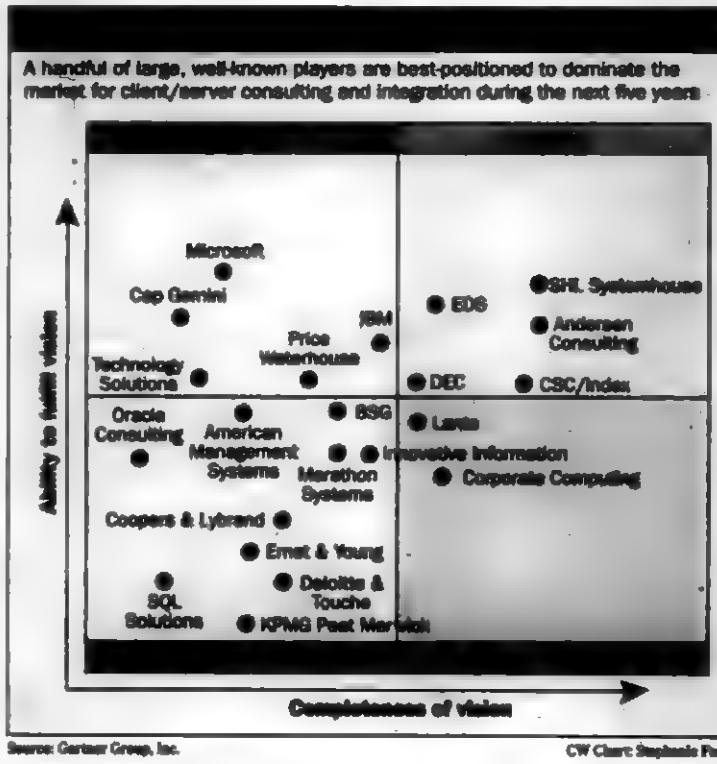
He notes, for example, that EDS uses TI's CASE product in its General Motor Corp. engagements.

"There are no one-stop shops," he concludes. "Everything must be organized around the customer's specific development environment. You have to be able to bring the strongest suite of tools to every deal."

Regardless of today's rhetoric, EDS, Andersen, DEC and SHL Systemhouse are expected to be among a handful of vendors that dominate commercial application development consulting during the next five years, predicts Bonnie Digrius, program director at Gartner Group, Inc. in Santa Clara, Calif. (see chart).!•

Mehler is a free-lance writer based in Jackson Heights, N.Y.

A handful of large, well-known players are best-positioned to dominate the market for client/server consulting and integration during the next five years



Source: Gartner Group, Inc. CW Chart: Stephanie Faucher

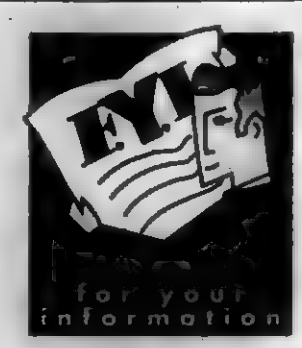
ADVICE

Picking a solid partner

Bonnie Digrius, program director, Gartner Group, Inc.:
"Many of these companies say they are doing a lot more [client/server development] than they really are. The real challenge is in sifting the chaff from the wheat."

Oliver Pflug, analyst, G2 Research, Inc.:
"IS managers should try to get all the references they can. Has the integrator done this type of thing before? Have they brought similar projects in on time and on budget?"

Ira Sager, principal, Para Technology, Inc.:
"What is the service provider bringing to the party? Keep in mind that its methodologies and tools are secondary to its understanding of your business goals. Like operating systems, methodologies should be transparent to the user."



➤ Field-office personnel have written more than 2,000 applications at **The Michigan Department of Social Services.** The Lansing-based agency uses more than 3,000 CTOS workstations from Unisys Corp. at 140 central and field offices.

Among new client/server applications: assistance payments budgeting, opportunity training, licensing services and unified day care. Officials say productivity payoffs exceed $40 million.

➤ **AGS Management Systems** says it will release OS/2 and Windows versions of its first computer-aided software engineering (CASE) client/server development framework in the fourth quarter. An automated process management system handles estimating, project management, tools management and deliverables management.

The product encompasses Enterprise Architecture Planning Methodology, Information Engineering Methodology and more. For details, call (215) 265-1550.

➤ **James Martin Insight, Inc.** announced a new video-based course titled "I-CASE Tools." Aimed at helping information systems professionals select the best tools, the course demonstrates leading products from Cadre Technologies, Inc., Computer Associates International, Inc., Easel Corp., IBM, Texas Instruments, Inc. and others. A commentary by James Martin also includes the state of the current CASE industry and predictions for the next 10 years. A three-month rental costs $1,350. For more details, call (800) 526-0452.

➤ **XZT Software, Inc.** has begun shipping Release 3.0 of the XVT Portability Toolkit and Version 1.1 of the XVT Design graphical, interactive design tool. The products let programmers design and create applications that will run on six graphical user interfaces (GUI) and 26 platforms without rewriting. Prices for Toolkit range from $1,450 to $4,400, depending on the GUI supported.

Pricing for Design runs from $1,200 to $4,400. For additional information, call (303) 443-4223.

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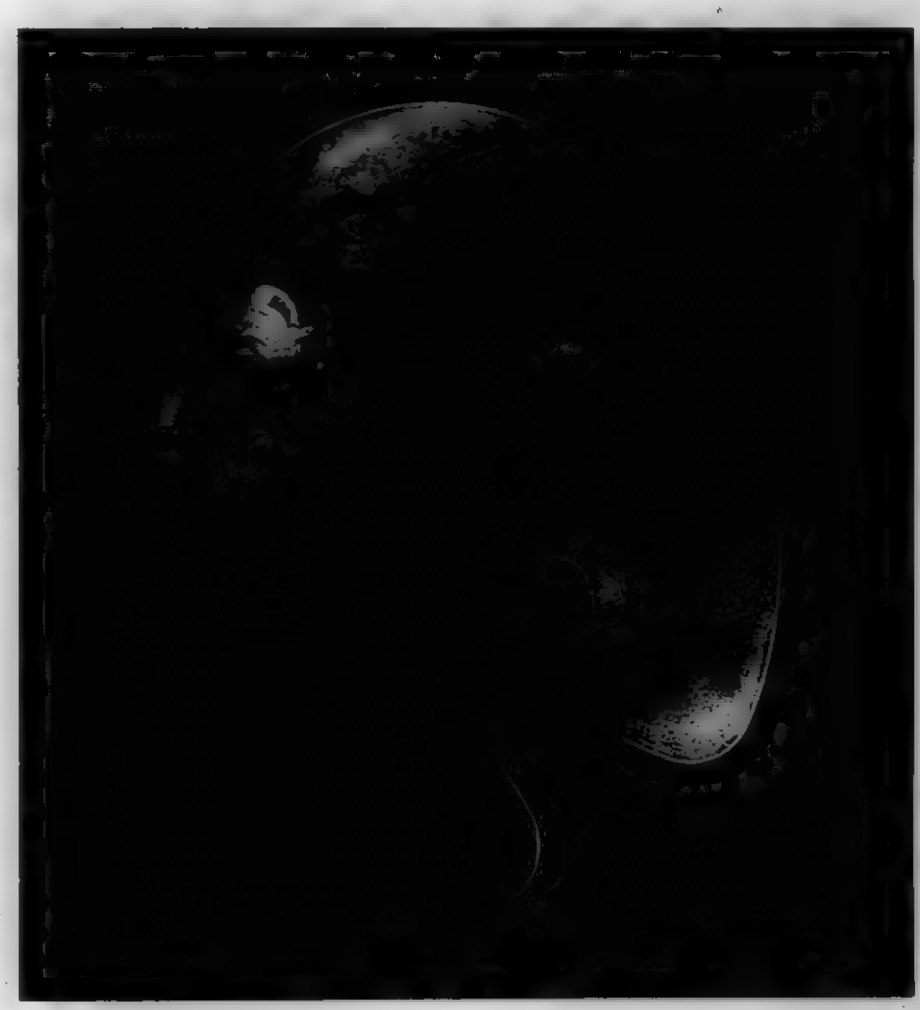

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- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 99. Sys. Integrators/ VARs/Consulting Mgt.

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BUY, SELL & SUE?

Computerized trading systems could squelch, rather than promote, competition

BY BENJAMIN WRIGHT

The tradition of the marketplace — in which buyers and sellers convene in town squares, farmers markets and shopping malls to haggle and trade — is a long-standing one. Today, this concept has been updated. Remote buyers and sellers, equipped with computers, telephones and fax machines and using electronic mail and electronic data interchange, can meet and do business in "virtual marketplaces."

These multimember market systems, the most well-known of which are airline reservation systems, are using technology in innovative ways (see story at left). But as more and more electronic emporiums spring up, legal issues arise with them.

Computerized trading systems change the dynamics of trade and the distribution of power within markets. The systems can foster competition, but if abused, they can also stifle it.

Antitrust laws promote competition in the marketplace by outlawing certain practices. The laws are complex, and the practices they prohibit are defined in vague terms such as "unreasonable restraint of trade." It is difficult to find concrete rules about what is and is not allowed under the laws.

Participants in electronic marketplaces need to be alert to the types of antitrust problems that can crop up. The following stories, while not all involving electronic marketplaces per se, pinpoint key legal issues to be aware of:

•Market exclusion: Beware the group boycott. Antitrust laws prohibit companies from colluding to exclude a competitor from a market. In *Silver* v. *New York Stock Exchange*, for example, the U.S. Supreme Court said the expulsion of a member from an industry group without a legitimate reason (such as failure to pay dues) could be an illegal group boycott, particularly if the group commands a large portion of a market. In this case, the stock exchange had severed a few brokers' telephone access to the trading floor, without explanation or a fair hearing. The court condemned

Continued on page 110

Wright is a Dallas-based attorney and author of *The Law of Electronic Commerce: EDI, Fax and E-mail* (Little, Brown & Co.). This article does not provide legal advice for any specific situation.

High-tech juice keeps electronic emporiums humming

UNTIL RECENTLY, MARKETS for electronic buying and selling were like business computers in the 1950s. Examples of them were well-known, but they were not numerous enough to make a large impact on general business practices. Airline reservation systems come to mind.

What is striking today is the surge in the number of new electronic market systems, their creative use of diverse technologies — modem, fax, voice response and satellite transmission — and the disparate industries they serve. The systems that follow illustrate the breadth of the emerging electronic commercial world.

No system here is any more or less likely to raise legal problems than another. But as these systems and others like them cause electronic commerce to proliferate, an understanding of the law of electronic trade becomes essential to conducting business.

AMIX. The American Information Exchange, or AMIX, is a computerized forum for buying and selling data in the broadest sense of the word. Shunning the term "bulletin board," the Mountain View, Calif., organization bills itself as an "on-line marketplace" for software, research data, newsletters and consulting services.

Its greatest success to date is in the object-oriented software field. Writers of

To page 112

Continued from page 109

this as a group boycott.

The court in *U.S. v. Realty Multi-List, Inc.* disapproved of a powerful real estate broker's multiple listing service in Georgia, which had erected unreasonable barriers to new membership. Newcomers had to present favorable reports on their credit and business reputations, maintain customary office hours and pay admission fees apart from the cost of membership. The court feared the rules excluded new competitors from the brokerage market.

Lesson: Participants in electronic marketplaces should be careful about blackballing competitors or setting unreasonable rules. Some form of "due process" can be adopted, but it should not be just a pretext for strangling competition.

•Market bottleneck: Keep it open. In antitrust law, an "essential facility," or bottleneck, refers to a resource that competitors must use to participate in a market. If a company seizes an indispensable bottleneck in a market, it has an obligation to open that bottleneck to competitors.

In the 1970s, banks in Western states formed two electronic funds clearinghouses but then refused to let savings and loans (S&L) use them. The S&Ls convinced the U.S. Department of Justice that the clearinghouses were market bottlenecks. The S&Ls needed access to clearinghouses for funds transfers, but it would have cost too much to construct their own.

After the Justice Department brought suit, the banks granted the S&Ls the same use of the clearinghouses the banks had.

In the case of an airline reservation system, the problem was not that the airline operating it, United Airlines, refused to let competitors take reservations through it. Rather, the problem was that United discriminated against competing airlines using the system. First, United charged varying fees to other airlines based on the principle that the more direct the competition between United and another airline, the greater the fee. Second, United refused to list certain competitive flights.

The courts upheld a Civil Aeronautics Board ruling that United's reservation system was an indispensable bottleneck in the airline industry and that United had violated antitrust principles by not making the system fair to all airlines.

Lesson: Electronic bottlenecks in a market must be open to all market participants. For instance, electronic buyers and sellers should make sure the group controlling the marketplace does not charge any class of participants in a marketplace a greater fee just because that class includes competitors.

Buyer and seller beware

When traders agree to buy and sell, they are forming legal contracts, even though they may not be exchanging paper. Occasionally, when the parties cannot cooperate, those contracts wind up in court. Buyers and sellers in computerized markets can avoid that fate with some forethought.

In *Basnt International Corp. v. Mast Industries*, for example, a buyer and seller fought an expensive lawsuit about five faxed purchase orders covering $103,330 worth of textiles. The issue was whether the purchase orders constituted binding contracts.

To avoid misunderstandings, buyers and sellers in computerized markets should think through the process by which electronic offers are matched with electronic acceptances so that they know precisely when they are bound by a contract. Without a clear statement in messages or in general trade rules in the market, it can be ambiguous which messages are offers, which are acceptances and at which point the parties become obligated.

Traders should also consider the terms and conditions that go along with their electronic contracts to ensure that those terms are desirable. A dispute between American Multimedia, Inc. and Dalton Packaging, Inc. centered on whether terms on the back of a purchase order were effective if the buyer faxed just the front side of the order to the seller. (The court ruled that the terms were effective because the seller was well aware of them.)

Because of its concern over terms and conditions, some participants on the National Gas Network feel compelled to transmit lengthy legal boilerplate terms with electronic messages.

•Price fixing: Give not even the appearance. The Airline Tariff Publishing Co. (ATP) and its members have suffered a recent barrage of price-fixing allegations. ATP is an electronic fare clearinghouse that the airlines use to communicate airfares throughout the industry. Allegedly, major airlines have abused this communications facility to fix prices. Supposedly, some airline members, using arcane computer codes, have signaled prices to others. Critics have also charged that the airlines use ATP to coordinate fare changes by sending up test balloons to see how rivals react.

These allegations have resulted in an ongoing Department of Justice investigation and a related class-action lawsuit. The airlines have tentatively settled the class action by agreeing to make a $44 million cash payment and to issue $368.5 million in discount coupons to travelers. Still, the airlines deny any wrongdoing, and it is still unclear whether they violated the law.

Lesson: Competitors need to be very careful when they interact in an electronic environment. Even the appearance of collusion can be damning.

Competitors should have antitrust counsel review their plans before exchanging competitive information such as prices, discount structures, production schedules, market statistics or customer lists. Rules of trade in electronic markets may be necessary to warn participants against abuses.

And it may be prudent to erect information barriers (such as blind bidding mechanisms) to keep competitors from seeing sensitive information.

•Standards setting: Stick to the knitting. When an association of companies sets up an electronic market, it often must establish standards of communication, such as technical protocols, and rules of trade, such as the process for requesting, making and accepting bids. Likely, the standards and rules will be formulated by committees of company representatives.

There is nothing wrong with industry groups setting standards for legitimate purposes. But the antitrust laws do forbid using the standards process as a weapon against competition.

Consider the fate of Allied Tube and Conduit Corp., a maker of steel pipe for electrical conduits. Its competitor, Indian Head, Inc., had developed a new conduit made of plastic. The National Fire Protection Association had for years certified steel pipe as safe, and in 1980, Indian Head petitioned the association to certify plastic pipe as safe, too. Certification required a majority vote at the annual conference.

Sensing a threat to its business, Allied spearheaded a conspiracy to reject Indian Head's petition by packing the annual conference with bogus voters.

Allied won the vote but lost Indian Head's ensuing lawsuit. The courts held that Allied had twisted an industry process for setting legitimate safety standards into a competitive sword. The courts levied $11.4 million in damages against Allied and its co-conspirators.

Lesson: Standards committees of participants should limit their purpose strictly to setting legitimate standards — communications protocols, trade rules, safety codes and so on — all in a spirit of due process for all industry members. They should not set rules intended to make it difficult for this or that class of competitors to take part in the market. •

Don't give up records

How a dispute is resolved among traders can depend on the records available to show what transpired. But who keeps the records?

AMIX, for one, keeps permanent records of the communication it handles. If a dispute goes to arbitration, the arbitrator has the authority to view all relevant records.

The argument for allowing a market service provider such as AMIX to keep records is that the provider is usually neutral and therefore unlikely to falsify the records. That makes the records more credible.

In the long run, however, the policy of having service providers keep records raises problems. It can be unclear who owns the records and what the confidentiality of those records is, particularly in terms of disclosing them to government agencies such as tax authorities.

For that reason, larger electronic traders may prefer to keep their records in-house. They can prevent those records from being falsified by ensuring that record creation and storage are overseen by people such as internal auditors, who are independent from people such as purchasing managers, who negotiate the recorded transactions.

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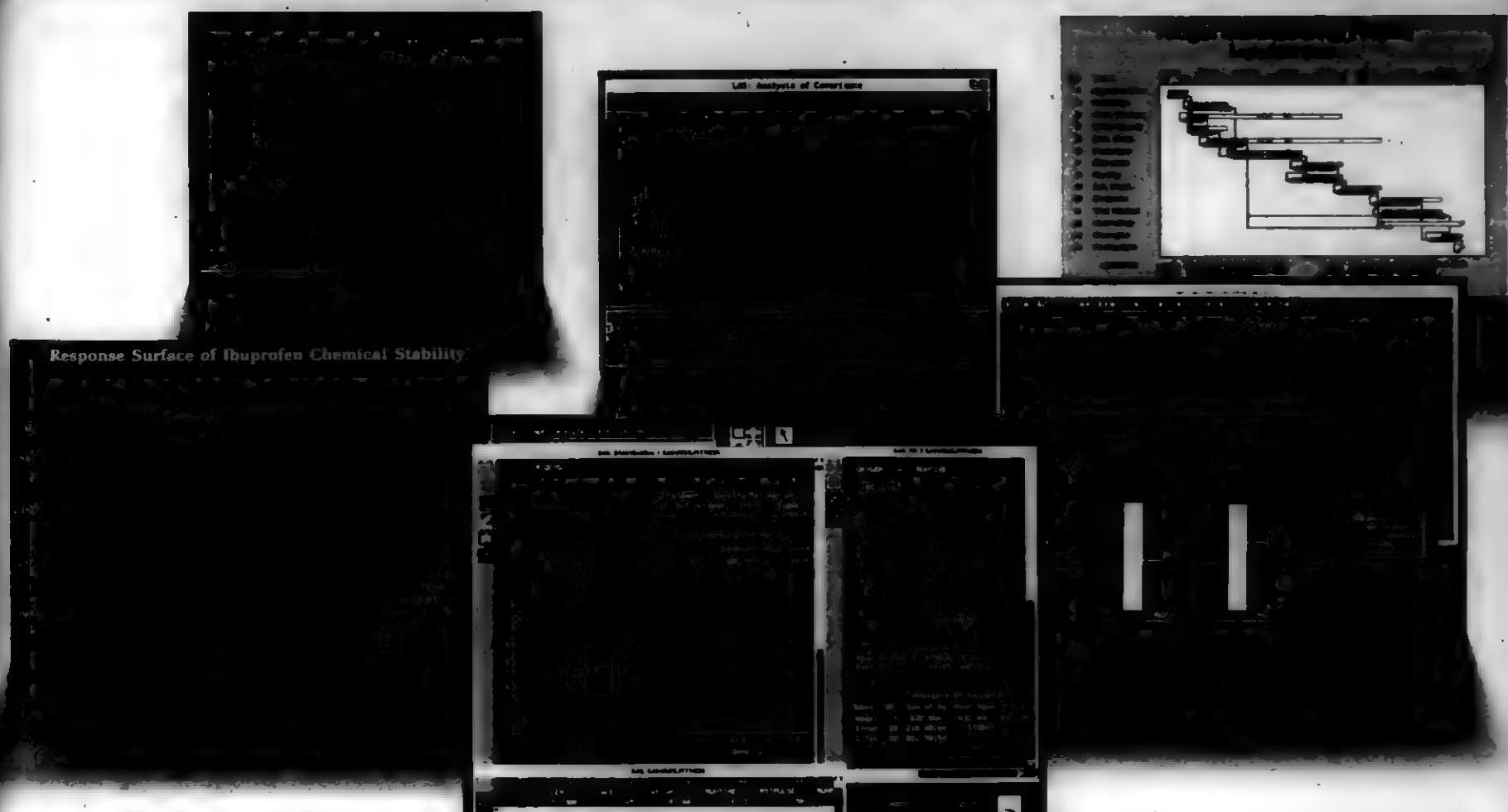

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Continued from page 109

particular software objects (for example, a piece of code that writes data to a disk) can load them on the system and sell them. If a buyer bites, he downloads the code. AMIX then debits his credit card, cuts a check to the seller and keeps a commission.

AMIX members seek their trading partners by posting public notices or broadcasting private requests for bid to selected individuals. Electronic responses can be public or private.

The organization prides itself on its ability to make a market for small units of data. "Our goal is to shave transaction costs to the bone. For that reason, it is profitable for both us and our customers to have users selling bits of code for even as little as one dollar," says Gayle Pergamit, director of marketplace development at AMIX.

One of those "transaction costs" AMIX has anticipated is the occasional dispute, which might involve payment for or quality of the information sold. "AMIX designed a binding process of arbitration to speed the resolution of disagreements and minimize the associated costs," Pergamit says.

All AMIX members must agree in advance to abide by the arbitration procedures explained on the back of the AMIX user manual. In a dispute, the unhappy members must exchange messages within specified time frames to try to resolve the matter on their own. If that fails, AMIX assigns an employee to help the members settle their differences. And if that fails, AMIX appoints an arbitrator, who makes a legally binding decision and assesses an arbitration fee on one or both members.

Although AMIX has yet had no occasion to use the arbitration rules, employees have conducted mock arbitration drills. Pergamit explains that the presence of the arbitration rules cuts down on the potential for litigation that is present in any commercial deal.

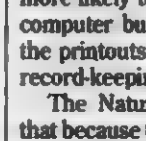
Natural Gas Network. The Natural Gas Network links the owners of natural gas with utilities — principally in the Northeast — that buy gas. Operated by Artis Ltd. in Lexington, Mass., the Natural Gas Network routes buy/sell and other transactional messages among 57 subscribers via two separate communications channels. First, the sender transmits a message via modem to the network's data center, then the network broadcasts the message simultaneously to target recipients via satellite.

Because a trader can specify which subscriber or subscribers are to receive its message, it can, with telephone-like privacy, make successive sweeps through the market. A seller, for example, can offer gas at a starting price, make a few sales and then offer a lower price just to buyers who declined the first offer.

In a sense, the Natural Gas Network functions like a closed telex network because received messages are printed automatically by dedicated printers. According to Charlie Stone, vice president for sales and marketing at Artis, the purpose of the printing is "to attract the recipient's attention. We want something that interrupts and makes noise." The printouts are thus more likely to be read than messages on computer bulletin boards. Furthermore, the printouts serve accounting and legal record-keeping purposes.

The Natural Gas Network maintains that because the gas market shifts rapidly, satellite distribution works better than fax. Network messages can be broadcast to dozens of recipients simultaneously.

A fax machine in broadcast mode, on the other hand, "works in a sequential fashion," Stone argues. "It can take hours to broadcast 40 faxes. A broadcast fax service is better than a fax machine, but even that service relies on phone lines that can have busy signals."



World Trade Center Network. Rather than trying to outdo fax, World Trade Center (WTC) Network exploits it. WTC Network is a sophisticated bulletin board sponsored by the World Trade Centers Association in New York (an association of more than 140 trade centers) and operated through the General Electric Information Services (GEIS) value-added network.

International traders from 75 countries place ads on the board to buy or sell products ranging from machine tools to sheep. Members of the participating associations may access the ads by modem; nonmembers can phone a 900 number to ask that selected ads be faxed to them. Seventy-five print publications throughout the world also reprint summaries of the ads, which instruct readers how to obtain more information via modem or the 900 number.

Traders may accept the advertised offers by direct fax or phone or by private electronic mail via GEIS. Although "a lot of people like to send faxes in response to ads," says Anna Jankowsky, marketing manager at WTC Network, "E-mail is very cost-effective."

WTC Network informally polices trading on the network. According to Jankowsky, "when advertisers place ads, they receive a notice that if they have problems with any computer network users, they should contact us and we'll investigate. We've only received one or two complaints, however."

BENJAMIN WRIGHT

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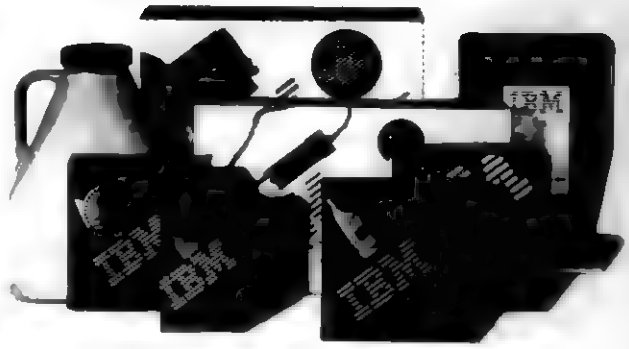

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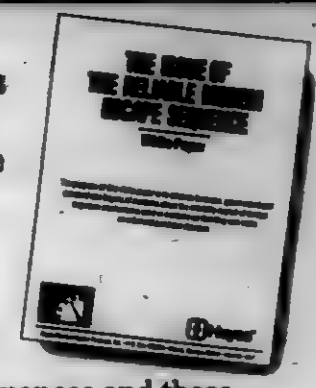

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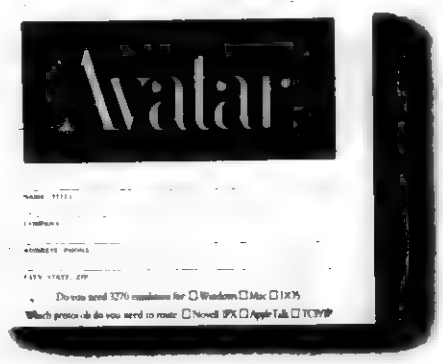

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Come see us at Networld in Dallas, booth #2115. (Okay.)

The drug's the thing

Vala Kondo

With their focus on research, biotech firms keep IS staffs small and computer managers juggling functions

INDUSTRY CLOSE-UP
IS in Biotech

BY JULIA KING
SPECIAL TO CW

At Neurogen Corp., Cristopher Dircks isn't just systems manager. He's the entire computer department. Besides computers, Dircks is also responsible for the telephone system, security and lab equipment at the Branford, Conn.-based biotech firm.

"I spread myself thin, and sometimes things don't get done," he admits. "But we can't get additional IS staff until the importance of systems is recognized [by upper management]."

Welcome to computing in the biotech industry, where drugs are king and IS is often a lonely (and versatile) servant.

Because the emphasis is on science and research, not information technology, these computer departments tend to be small. As a result, the manager, who is often a former scientist, is pulled in different directions.

Many users — also scientists — are personal computer-literate and can be demanding. To top it all off, there is relatively little stability in the fast-paced field: Companies can double or even triple in size or disappear altogether in the span of several months.

"We are growing so fast and the need for computers is so great that it is like a moving target," says Wendy Baker, a senior database analyst and project manager of the laboratory information management system at Synergen, Inc. in Boulder, Colo. "The way we need to react and make quick decisions is different from other industries."

Be-all

These characteristics combine to put a lot of pressure on the IS manager, who must deal with the lack of standards and government reporting pressures while trying to be a jack-of-all-trades.

"I started out with responsibility for anything that plugs into the wall," says one IS manager who asked to remain anonymous. "And even now, I don't think management would think twice about asking me to pick up payroll or some other function."

Information technology is just not a priority from a top management point of view, says Michael Hawotte, a consultant at A. T. Kearney, Inc. in Chicago who specializes in the biotech and pharmaceutical industries. "People at the top tend to be very research-oriented," Hawotte says. "They don't understand that technology will make them much stronger in the long term."

Even so, IS departments are ensuring that users don't suffer.

At Neurogen, in addition to giving scientists what they want, which is often PC-based software, Dircks has positioned IS as a support department that "derives its satisfaction from producing a seamless flow of data."

Face it, Dircks says. "The scientist always wins. They always get what they want." So, he reasons, why not try to make them as happy as possible by supporting them? "If that means going out and buying new software in a Macintosh version, we will," he says.

But giving scientists whatever hardware, software and support they demand seems to solve only some problems while creating others. For starters, hardware and/or software standards are all but nonexistent at many of these young enterprises, where off-the-shelf software and workstation- and network-based information systems are the norm.

Secret persuasion

At San Francisco-based Genentech, Inc., senior IS director and scientist Polly Moore is looking to standardize around Apple Computer, Inc. machines for the research scientists. She says gentle persuasion is her secret to establishing standards at the 16-year-old company.

"My department manages by setting up an environment to lead users in a particular direction," Moore explains. "We try to do a very good job of supporting the Apple product line by having an Apple repair shop with quick turnaround time, a help desk and by producing [software] documentation."

She ensures that users, who are free to buy either PCs or Apple computers, typically pick Macintoshes because "they'll get all of this support. If they pick something else, they see there's not the same kind of help. In the end, 95% of users pick the easy way out," Moore says. Genentech, with some 2,300 employees, is one of the oldest and largest biotech companies.

Few and far between are biotechnology firms such as Centocor, Inc. in Malvern, Pa., which more than five years ago adopted and implemented a single hardware platform and network standard, in this case Digital Equipment Corp. gear. But such standardization isn't a cure-all.

Were he to choose platforms all over again, IS Vice President Kim Pol-

Continued on page 116

EXECUTIVE TRACK

Richard T. Brant is the new director of global management information systems at **The Reader's Digest Association, Inc.** Brant was formerly a partner at Arthur Andersen & Co. At Reader's Digest, he will be responsible for financial, production, editorial and human resources systems development in the U.S., as well as systems development support in the Far East and Mexico for the Pleasantville, N.Y.-based publishing firm.

Don A. Hayes is the new vice president of information technology at Stamford, Conn.-based **GTE Telephone Operations**, a unit of telecommunications giant **GTE Corp.** He succeeds **Donald E. Peeples**, who will retire in 1993.

Hayes, 54, was formerly president of the firm's GTE Data Services unit.

James A. Williams has been named vice president and manager of data processing services at Los Angeles-based **Sanwa Bank California**. A 20-year veteran of the banking industry, Williams came to Sanwa — a $7.2 billion bank that is reportedly the state's sixth largest — from Security Pacific Automation Corp.

Thomas Gildea, vice president of business IS at Chicago-based **Helene Curtis Industries, Inc.**, has been named the **Society for Information Management**'s Chicago Chapter IS Executive of the Year. The award salutes Gildea's spearheading of an automated sales and marketing system that allows the cosmetics manufacturer's IS staff to supply internal clients with on-the-spot analyses of product income and volume projections.

Charles L. Pedersen has been named an executive vice president at San Francisco-based Union Bank, where he heads the operations and automation group. He is credited with being the driving force behind the bank's forays into electronic banking.

Outsourcing a natural for oil disaster unit

Nonprofit corporation finds EDS a good partner to its standby 'firehouse-like' emergency status

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — For many companies, the outsourcing decision is pure agony. But for Marine Spill Response Corp. (MSRC), the company's unique mission made the decision to outsource the information systems function relatively easy.

The nonprofit corporation was formed in 1990 to be the oil industry's emergency response unit for disasters like the Exxon Valdez spill of 1989 [CW, June 15]. Under the best-case scenario, therefore, logistics and data processing activity at MSRC will add up to a few peaks separated by long valleys.

"We're like a firehouse," explained IS director Barry Berkowitz. "We have to have a large investment in equipment and people that don't do anything, normally. They're just training, playing checkers and patting the firehouse dog Sparky — until there's a fire."

It would make no sense for MSRC to acquire mainframes and a complete IS infrastructure for emergency cleanup efforts and then have that infrastructure go unused most of the time, Berkowitz said. With outsourcing, "I can turn up the heat when I need it and pay for what I use, when I use it," he said. MSRC signed its five-year outsourcing contract with Electronic Data Systems Corp. in October 1990.

Actually, Berkowitz said, the basic decision to outsource the IS function was made by a blue-ribbon industry panel after the Valdez spill. The decision has worked out well because MSRC and EDS have developed a close partnership, Berkowitz said.

In fact, he added, the relationship is so close that the only way an observer can tell MSRC and EDS employees apart is by the company name on their paychecks. The EDS account manager, Jay DePew, is an active participant in MSRC management meetings, and Berkowitz has special access to EDS management.

> "WE'RE LIKE A firehouse . . . just training, playing checkers and patting the firehouse dog Sparky — until there's a fire."
>
> BARRY BERKOWITZ
> MSRC

However, Berkowitz also keeps a watchful eye on EDS prices. "I constantly check with other users and trade publications to see if we're getting a good deal," he said. "If I see a lower price somewhere else, I ask EDS to get me that price."

For much of the last two years, Berkowitz served as virtually a one-man IS department, if you count only the MSRC staff. But one month ago he hired an IS manager to help with the job of monitoring the performance of EDS and MSRC systems.

"I've got to be honest: A one-person shop is tough. It is possible, but it takes a lot of one individual's life," Berkowitz said.

But don't expect a ballooning IS staff at MSRC. The former U.S. Air Force officer is a firm believer in a lean organization.

Berkowitz said he probably could justify an IS organization of 10 MSRC staffers, but that would create duplication, with MSRC and contractor employees paired off doing the same work. "Instead of having a meeting with five people," he noted, "you'd have a meeting with 10 people, and you'd have a lot of redundancy with people walking around the halls together."

The drug's the thing in biotechnology IS shops

CONTINUED FROM PAGE 115

lock says, "the client/server platform would be very attractive." Any changes will likely mean additional work. Currently, Centocor is in the process of migrating some applications from DEC VAXclusters to PCs, he adds.

While companies with diverse software, hardware and networks are managing, potential problems loom ahead. These include not only tying together disparate research and development systems but also integrating them with newly implemented business and manufacturing systems capable of tracking raw materials and finished inventory by lot and location.

Dirty data syndrome

Multiple computing platforms and incompatible software packages can also work to compromise data accuracy and integrity, which are critical in the highly regulated biotechnology industry.

"With the [Food and] Drug Administration, the accountability issue is very significant," says Bob Myers, vice president of information science at U.S. Bioscience, Inc. in West Conshohocken, Pa. "We have to be able to survive an FDA audit. That may mean recreating a document submitted two or more years ago."

Indeed, FDA reporting requirements can turn IS departments upside down. That's what happened at Centocor some five months ago, when the regulatory agency ordered the company to conduct another round of clinical trials and resubmit its product application. The request took the company by complete surprise, Pollock says.

"We had geared up and had the infrastructure in place to prepare for product launch. We had put in a sales automation system, having it designed, tested and implemented before the first salesperson was hired. Then, we had to change our plans and the sales automation system was scrapped," he says.

Now, salespeople hired to sell the new product are instead assisting with the new round of clinical trials, he says.

Biotech firms have taken a variety of approaches to meeting stringent data accuracy and integrity requirements. Synergen, for example, maintains data on clinical results and quality control on a separate PC-based lab information management system.

Meanwhile, U.S. Bioscience has incorporated error-checking capabilities into all data management software and has established elaborate data handling procedures. At Centocor, a separate applications development staff with expertise in managing clinical data serves the company's R&D arm.

For the time being, "the focus at most biotech companies is on R&D and getting capital, not on business systems," Pollock says. "That's because for the first 12 years and $200 million, you're not selling anything."

The first 12 years comprise seven years of basic research and five of clinical trials. Pollock says most biotech companies don't begin to think about IS in any kind of strategic way until after receiving regulatory approval.

And while difficult for IS managers, this is how it should (and probably always will) be, Hawotte says. "Biotechs have a wait-and-see attitude about IS because they have to wait and see if they have a product," he says.

King is a free-lance writer based in Ridley Park, Pa.

Anatomy of biotech IS

Size of IS department:
- Ranges in size from one person to a handful during R&D stage.
- IS departments grow once products are available.

IS professional background:
- Many technology overseers have a knowledge of PCs and networking rather than mainframes.
- IS staff members are often scientists with computer skills.

Hardware:
- During R&D stage (prior to product approval), most biotech firms use Macintoshes, PCs and LAN-based workstations.
- The largest piece of hardware would be a DEC VAX.

Applications software:
- Most biotech firms buy rather than build applications software.
- Few biotech firms have an applications development staff.
- Customization is done by chief technology overseer.

User base:
- Computer literate.
- Scientists with specific needs for systems and software.
- High maintainance requirements.
- Good understanding of biotech business.

Miscellaneous:
- Few, if any, standards.

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No shortcut to client/server

BY MITCH BETTS
CW STAFF

ARLINGTON, Va. — Building client/server systems requires combining a bunch of immature products that seldom work as advertised — but that's not all. It also requires a total revamping of the information systems department, according to Paul Hamel, vice president of systems and planning at Textron Financial Corp.

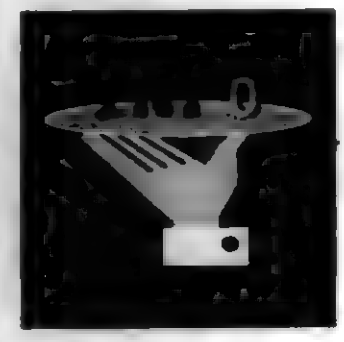
The Providence, R.I.-based company built its first client/server system in 1991; it found the experience nothing short of traumatic. "We went closer to the bleeding edge than we should have," Hamel said.

"We underestimated the degree of complexity and risk we were taking on," he explained at a client/server conference held here last month. "We had sufficient problems with the implementation that my career was on the line — as it should be."

Happy ending

After several missteps and schedule slippages, the client/server project eventually arrived at a happy ending. But Hamel shared his company's pioneering experience — including details about "where we took the arrows and where the blood flowed" — at the conference, which was sponsored by the Technology Transfer Institute and Arte Consultants, Inc.

Hamel said he learned "the hard way" that client/server systems cannot be built by a traditional IS department that is divided into hardware, software and networking units and staffed by specialists in each technology.



Client/server systems are actually complex webs of hardware and software that are inextricably linked to each other, Hamel said. Therefore, the IS department needs to reorganize as a "consultancy" that assembles a development team made up of multitalented generalists.

The top skills needed by the client/server development team are project management skills and systems integration skills, Hamel said. "Our goal is that everyone in our IS organization will be a systems integrator," he said, with each staff member having at least a basic understanding of all the relevant technologies.

However, the ever-candid Hamel acknowledged that he has yet to figure out how to apply this "consultancy model" to the labor-intensive support and maintenance of client/server systems.

Eventually, the innovative system turned out to be a "competition-beating" success for the business unit, as well as the springboard for a second client/server project now under way, Hamel said.

But Hamel warned other users that the client/server field has abundant risks, including shifting standards, poor disaster recovery, immature products (especially on the client side) and consultants who are self-proclaimed experts but lack hands-on experience.

Ohio State to study keyboard stress injuries

BY MITCH BETTS
CW STAFF

COLUMBUS, Ohio — Ohio State University's Biodynamics Laboratory has received a $22,000 grant to study the biomechanics of keyboard work that may provide clues about how to prevent repetitive stress injuries (RSI).

This class of injuries is spreading quickly, according to federal government data, and has fast become a major issue not only for those who suffer from it but also for managers increasingly expected to alleviate or prevent it [CW, Sept. 21].

The grant was made by the Office-Related Cumulative Trauma Disorder Research Committee, a group of 14 companies that is promoting RSI research to help employers and equipment manufacturers combat the problem.

"Little is known about the forces and stresses on the hands and forearms that occur when typing at a computer keyboard," said William Marras, director at the Biodynamics Laboratory. "The results will be helpful in understanding the optimum keying techniques, operator postures and the relationship between them and keyboard design."

The study will include field analysis of how computer users type in real job situations, laboratory research and development of a biomechanical model of the stress on hands and wrists.

> "LITTLE IS known about the forces and stresses on the hands and forearms that occur when typing at a computer keyboard."
>
> WILLIAM MARRAS
> BIODYNAMICS LAB

The committee includes Aetna Life & Casualty Co., Apple Computer, Inc., Bank America Corp., Cigna Corp., IBM, Key Tronic Corp., McClatchy Newspapers, Inc. and NCR Corp., among others.

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CALENDAR

OCT. 25-31

Fourth Annual Conference and Expo on Disaster Recovery and Business Resumption Planning. Atlantic City, Oct 25-28 — Contact: John Bannan, Delaware Valley Disaster Recovery Information Exchange Group, Inc., Mt. Laurel, N.J. (609) 778-5702.

The 13th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Margaret Yao Pursell, Treasury Management Association, Baltimore, Md. (301) 907-2862.

Breakthrough '92 Conference and Exhibit. Tampa, Fla., Oct. 25-30 — Contact: Xplor International, Palos Verdes Estates, Calif. (310) 373-3633.

The Society for Imaging Science and Technology (IS&T)'s International Congress on Advances in Nonimpact Printing Technologies. Williamsburg, Va., Oct. 25-30 — Contact: IS&T, Springfield, Va. (703) 642-9090.

Electronic Messaging '92. San Francisco, Oct. 26-28 — Contact: Electronic Mail Association, Arlington, Va. (703) 875-8620.

Strategic Information Planning Conference. Orlando, Fla., Oct. 26-28 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

American Society for Information Science (ASIS) Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

Interop '92. San Francisco, Oct. 26-30 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399, Ext. 2502.

Total Quality Management '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Information Security Symposium. Toronto, Oct. 28-30 — Contact: Datapro Canada, North York, Ontario (416) 496-3131.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

European Software Business Development Conference. Boston, Oct. 29 — Contact: Laurie Martin, Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Expo Comm China. Beijing, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause & Associates, Inc., Hong Kong (011) 5-773-343.

NOV. 1-7

Conference on Organizational Computing Systems. Milpitas, Calif., Nov. 1-4 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Technology and Innovation in a Global Economy. San Francisco, Nov. 1-4 — Contact: Diane Fournaris, The Institute of Management Sciences, Providence, R.I. (401) 274-2525.

Network the '90s Seminar. Bellevue, Wash., Nov. 2 — Contact: Fibronics International, Inc., Lowell, Mass. (506) 937-1600.

National Roim Users Group. San Francisco, Nov. 2-6 — Contact: National Roim Users Group Headquarters, Chicago, Ill. (312) 321-6804.

The Users PRL Users Group. Florida, Nov. 4-6 — Contact: Lynn Girard, Users PRL, Melbourne, Fla. (407) 242-6922.

The 1992 Harvard-Renaissance Conference on Russian-American Information Technology Trade and Investment. Cambridge, Mass., Nov. 5-6 — Contact: Ralph Cohen, Renaissance Overseas Group, Westport, Conn. (203) 221-4313.

Marketing the IS Organization Internally. London, Nov. 5-6 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

Unisys Technology Symposium. Boston, Nov. 6 — Contact: Unisys Corp., Blue Bell, Pa. (215) 986-6412.

Fundamentals of Computer Law Conference. Santa Clara, Calif., Nov. 6-7 — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

NOV. 8-14

MacIS '92 Conference. New Orleans, Nov. 8-11 — Contact: Managing Apple Computers in Information Systems, Chicago, Ill. (312) 644-6610.

Share '92. Tampa, Fla., Nov. 8-11 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

James Martin World Seminar with Dr. Carma McClure's Corporate CASE Tutorial. New York, Nov. 9-13 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Synergy '92. Anaheim, Calif., Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

U.S. Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 652-3868.

Autofact '92. Detroit, Nov. 10-12 — Contact: Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Society of Motion Picture and Television Conference and Equipment Exhibit. Toronto, Nov. 10-13 — Contact: Technology Solutions, New York, N.Y. (212) 505-9900.

Voice '92. Atlanta, Nov. 10-13 — Contact: Voice '92, Houston, Texas (713) 974-8637.

Virus Research Conference. Washington, D.C., Nov. 11-13 — Contact: Virus Research, International Computer Security Association, Washington, D.C. (202) 364-8252.

Perspectives on Decision Support and Executive Information Systems for the '90s Conference. Cambridge, Mass., Nov. 12-13 — Contact: Decision Support Technology, Inc., Cambridge, Mass. (617) 354-6400.

12th Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalon, Tinius Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

NOV. 15-21

Information Industry Association 1992 Annual Conference: "Knocking Down Info Walls." San Francisco, Nov. 15-19 — Contact: Information Industry Association, Washington, D.C. (202) 639-8262.

Guide's 1992 Conference. Atlanta, Nov. 15-20 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

Troubleshooting, Maintaining, Upgrading PCs Seminar. Fort Lauderdale, Fla., Nov. 16-17 — Contact: Quest, Spotswood, N.J. (908) 251-3217.

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.

19th Annual Computer Security Conference and Exhibition. Chicago, Nov. 16-18 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2200.

Comdex/Fall '92. Las Vegas, Nov. 16-20 — Contact: Comdex/Fall, The Interface Group, Needham, Mass. (617) 449-6600.

ISDN/Broadband '92. Reston, Va., Nov. 16-20 — Contact: Information Gatekeepers, Inc., Boston, Mass. (617) 232-3111.

Transaction Processing Networks Conference. Washington, D.C., Nov. 17-18 — Contact: Telecommunications Reports, Conference Department, Washington, D.C. (202) 842-0520.

The International Computer Training Association. Orlando, Fla., Nov. 17-19 — Contact: International Computer Training Association, New York, N.Y. (212) 355-5049.

Unicom '93. Washington, D.C., Nov. 17-19 — Contact: North American Telecommunications Association, Washington, D.C. (202) 296-9800.

Comforum. Orlando, Fla., Nov. 19-20 — Comforum, Chicago, Ill. (312) 938-3580.

NOV. 22-28

Openforum '92. Utrecht, Netherlands, Nov. 23-27 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

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How hard are you working to bring home the bacon?

BY JILL VITIELLO
SPECIAL TO CW

Napoleon frequently worked 16-hour days, and he expected his top councillors to exhibit a stamina and zeal equal to his own. At a meeting late one night, when the councillors began to doze off, Napoleon reprimanded them: "Do let's keep awake, citizens. It's only two o'clock. We must earn our salaries."

If you are putting in marathon days — and nights — to justify collecting a salary that probably has not risen greatly since the recession began, you are not alone.

In a recent *Computerworld* survey of 1,478 information systems managers and professionals, respondents said they are experiencing higher levels of stress than ever before, primarily because of increased work loads, mounting business demands and budgetary constraints.

Difficult to prove

So, are you working as hard as you think — that is to say, several times harder than anyone else you know? The answer is: Maybe, but it would be hard to prove.

Actually, at least some of the scanty documentary evidence is against you. If the length of a workweek is any indication of how hard individuals work, then people in the computer industry have it easy, according to the U. S. Bureau of Labor Statistics.

In its most recent estimates based on a 1991 survey of various industries, the bureau reported that systems analysts, programmers and engineers work an average of 40.2 hours per week, compared with accountants, bank executives, human resources executives and marketing executives, who average 44.1 hours per week.

> "HOW OFTEN DO you find yourself resolving a technical or systems implementation issue while showering or supposedly listening to your significant other?"
>
> L. PAUL OUELLETTE
> OUELLETTE & ASSOCIATES

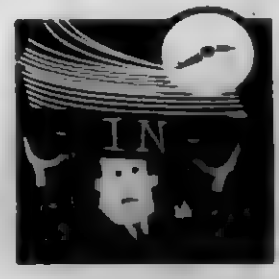
Other research suggests that these averages may be on the low side, however. In her recent and much-discussed book, *The Overworked American*, Juliet B. Schor wrote that the typical American works 47 hours each week. That is a total of 164 more hours per year than 20 years ago — the equivalent of an additional month of work every year.

The American Productivity and Quality Center, a nonprofit association located in Houston, that came up with slightly higher figures.

More than 40% of those responding to a survey on work habits said they worked more than 50 hours a week. Nearly 65% of top managers reported that they regularly clock 50-hour weeks.

This survey showed that people in manufacturing work the longest workweek — nearly 48% work more than 51 hours, compared with 37% of those in the service sector and 28% in the public sector, who report the same number of hours per week.

Of course, measuring how hard people work based on the length of time they spend at the office does not account for how productively they use that time, how well they perform and the work's difficulty. In fact, so many variables exist that it is tough to compare how hard two different IS professionals work, let alone assess how their work loads compare with people in other professions.



Who works harder?

"We're at a loss to find any benchmarks to define 'hard work,'" says Brian Hoffman, a partner at Winter, Wyman & Co., a professional placement firm in Waltham, Mass. "The systems analyst who implements a new software package in a department that is hostile to the program will work much harder than a colleague with identical skills and experience who installs the same program in a department that welcomes its introduction."

Workweek statistics also fail to capture the amount of "personal" time spent on work, and some observers said they feel this is significant for IS.

"How often do you find yourself resolving a technical or systems implementation issue while showering or supposedly listening to your significant other?" asks L. Paul Ouellette, chief executive officer at Ouellette & Associates, Inc., a Bedford, N.H.- based computer consulting firm.

IS professionals are under the gun, says Richard Wonder, national director of IS at Robert Half International, Inc. in New York. They are expected to keep up with new developments that will speed work and improve quality, but technologies are changing so quickly that staying abreast of changes can feel like a job in and of itself.

"The only profession analogous to ours in that regard is the medical profession, where doctors are required to be state-of-the-art to do their jobs properly," Wonder says.

If you are feeling the pressure, do not look for any relief soon. One solution to long work weeks proposed by the American Quality and Productivity Center survey respondents was more and better technology.

Vitiello is a free-lance writer based in East Brunswick, N.J.

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DEPARTMENT MANAGER $80K-$70K — Bank credit and commercial
WINDOWS/OS2 DEVELOPERS $95K — C, SDK, Visual, Basic, PM exp
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Analyst/Project Leaders

Work with end-users to analyze business needs. Facilitate JAD sessions, determine primary business entities, design data models, refine and normalize logical data models. Must have 8-10 years experience as a DBA, Analyst or Business Analyst and a strong relational database background.

Senior Programmer/Analyst

Provide systems analysis, design, programming and prepare client proposals and presentations. Requires at least 4-7 years of IBM mainframe, DB2 and CICS experience with strong structured programming techniques and at least 1 year in the functional/design phase of systems development life cycle.

Programmer/Analysts

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At least 4-6 years Windows programming experience with preferably 6+ months of object oriented design experience is required. Experience with C and at least one year in C++ are essential.

Case Tools/Systems Analysts

Requires 4-6 years experience to include information strategy planning, business process design; business area analysis, application externals design, and implementation and consulting experience with one or more CASE products (IEW, IEF, Bachman etc.).

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Truth best approach for job search

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Brian M. Hoffman, a partner at Winter, Wyman & Co., a professional placement firm with offices in Boston and Waltham, Mass.

Q I have been out of work for more than two months. Friends have advised me to leave my resume showing that I am still employed; others have told me to show the layoff and the date. What will work best with hiring companies?

A I do not recommend including false information on your resume or cover letter. In fact, if you get an interview based on the fact that you are still employed, it can be a real deal killer when the company learns the truth. My advice is to be truthful and market yourself on your strengths and technical competencies.

Q I work in a traditional IBM mainframe, Cobol environment, but I am interested in becoming a creative personal computer professional. I have a 486 machine with OS/2 at home. How can I head in that direction without giving up my career status and earnings and starting over?

A You may not be able to do what you want without some change in status and earnings.

If your interest is strong, you will probably need to consider a lateral or backward move to get your career going in another direction.

While considering this option, form alliances with PC professionals in your organization. Ask them questions and get to know what a career in the commercial PC marketplace entails.

Q My company does not have flex time for the information systems staff. How can I interest it in such a program?

FAST TRACK
CAREER ADVICE FOR THE '90s

A First, research your regional market to find other IS shops that offer it. Find out what has worked for them and why. Second, enlist your immediate manager's support and assure him that the research will not detract from ongoing projects. Third, contact the human resources staff. They are the experts in this area and can be good advocates.

Q I am a professional woman returning to the IS market after starting my family. I am seeking a senior programmer/analyst role.

My background includes a four-year degree and more than three years of full-time experience in programming and analysis. What should I expect in terms of my marketability, and how do I approach employers?

A Your marketability will be closely tied to three things: the length of time you have been away from the workplace; the job level you were at when you left and how willing you are to consider another level; and the suitability of your expertise for current market needs — for instance, if high tech and manufacturing were hot when you left, you may have a tougher time than if your background was in financial services or bio-tech, which are popular right now.

When approaching companies, use personal and professional contacts. If your former employer has no openings, try to connect with any former colleagues who have moved to a new company.

You will also need to be candid about why you left the work force, the hours you can work and your openness to travel.

☞ Burned out? Grappling with work/family issues? Worried about skills stagnation? We want to hear about these and other issues that affect your career. Call your questions in using the Fast Track line at (508) 820-8522, or fax them to Kelly E. Sewell at (508) 875-8931. If we use your question, we will send you a gift.

How to deal with know-it-all users

➤ Agree with them, but then do it your way. I never run into a confrontation when I deal with users that way. What I program works, and when they see that, they are content.

Mary Dal-Favero, computer specialist
National Institute of Standards and Technology, Gaithersburg, Md.

➤ Explain the IS point of view so you have both sides on the table. If they still want to be know-it-alls, then let them be. They are the customer, and the customer is always right.

Shelley Goodman Brown, MIS training coordinator
Consolidated Freightways, Inc., Portland, Ore.

➤ Don't disagree or get involved in open conflict. Prepare for encounters with the person, using materials to back up your argument.

Arthur Pembroke, Bureau chief of microcomputer application group
Montana Department of Social and Rehabilitation Services, Helena, Mont.

➤ Generally, we try to reason with that person and show them we have expertise in what we do. It makes them feel confident about their job and they won't question ours.

John Parke, project leader
Total System Services, Atlanta

➤ The user may voice a concern about what is being done, which makes them come off as a know-it-all. I try to find out what the concern is so I can do something about it.

Alan Mick, software project manager
Eastman Kodak Co., Rochester, N.Y.

Compiled by Stefanie McCann, assistant researcher.

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Call your local TDHS office for applications, or (512) 450-3915. Our Telecommunications Device for the Deaf (TDD) number is (512) 450-4795. Mail application forms to TDHS, P.O. Box 149030, Austin, TX 78714-9030, Mail Code W-101. Resumes accepted. Applications accepted until position filled.

UNIVERSITY OF St. Thomas — **Faculty Position** — Graduate Programs in Software

The Graduate Programs in Software Department at the University of St. Thomas invites applications for a tenure-track position beginning September 1993. Qualifications include a Ph.D. with teaching experience and industrial experience. Candidates must be committed to continued professional growth and have strong graduate teaching and applied research capabilities in two or more areas: databases, distributed databases, object-oriented databases, multi-media databases, structured analysis & design methodologies, software engineering.

The Graduate Programs in Software Department offers two degrees: a Master in Software Design and Development and a Master of Science in Software Engineering. The master's program seeks to improve the software environment by providing knowledge, theory, skills, and experiences that are very workplace oriented.

The University of St. Thomas, Minnesota's largest private college or university, is an urban, liberal arts, Catholic, co-educational, comprehensive university with over 10,000 students about one half at the undergraduate level. The University, which offers programs at the baccalaureate, masters, and doctorate levels, is located equidistant from downtown Minneapolis and downtown St. Paul. A new campus in downtown Minneapolis opened this fall and will serve approximately 1,500 students.

Send resume and names, addresses, and telephone numbers of at least four references by February 1, 1993, to: Dr. Bernice Folz, Director, Graduate Programs in Software, Mail #5025, University of St. Thomas, 2115 Summit Avenue, St. Paul, MN 55105-1096. The University of St. Thomas is an Equal Opportunity/Affirmative Action employer.

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DUTIES AND RESPONSIBILITIES: The Director will plan, direct, and manage the administrative (including personnel and budgetary) and operational activities of the University's Center for Information Technology Services (CITS). This person will develop and implement policies, organizational structures, and Information Systems architectures to provide information technology services which support the University's academic, research, patient care and public service missions and administrative functions. In the performance of these duties, this person will lead the review and upgrading process for the University's information technology infrastructure, support, and systems; establish quality control standards and monitor quality assurance and performance; oversee the integration of voice, data, and video communications services; and direct the incorporation of IT integration into the instruction and research environments. This person will also oversee the implementation of new services to provide information technology training and consultation to University Departments, and represent the department in all University information technology related activities.

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QUALIFICATIONS: Required: Bachelor's degree in Business Administration, Computer Science, Engineering or related field or an equivalent combination of education and experience; seven years experience in managing complex technical information systems with service orientation; five years management experience; and the ability to communicate effectively both verbally and in writing. Preferred: Master's degree in Business Administration or a related field; experience in information technology administration for a large organization or University environment, including the management of telecommunications, systems development, and user services; and five to seven years supervisory experience.

COMPENSATION: Open, depending upon qualifications and experience.

APPLICATION PROCEDURES: Application material must include a resume and the name, address, and phone number of three references. Applications will be accepted until the position is filled. However, the review process will begin on November 16, 1992. Send applications materials to:

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Computerworld/Corptech Career Index

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October 1992

Corptech technology employment index

U.S. Dept. of Labor manufacturing statistics

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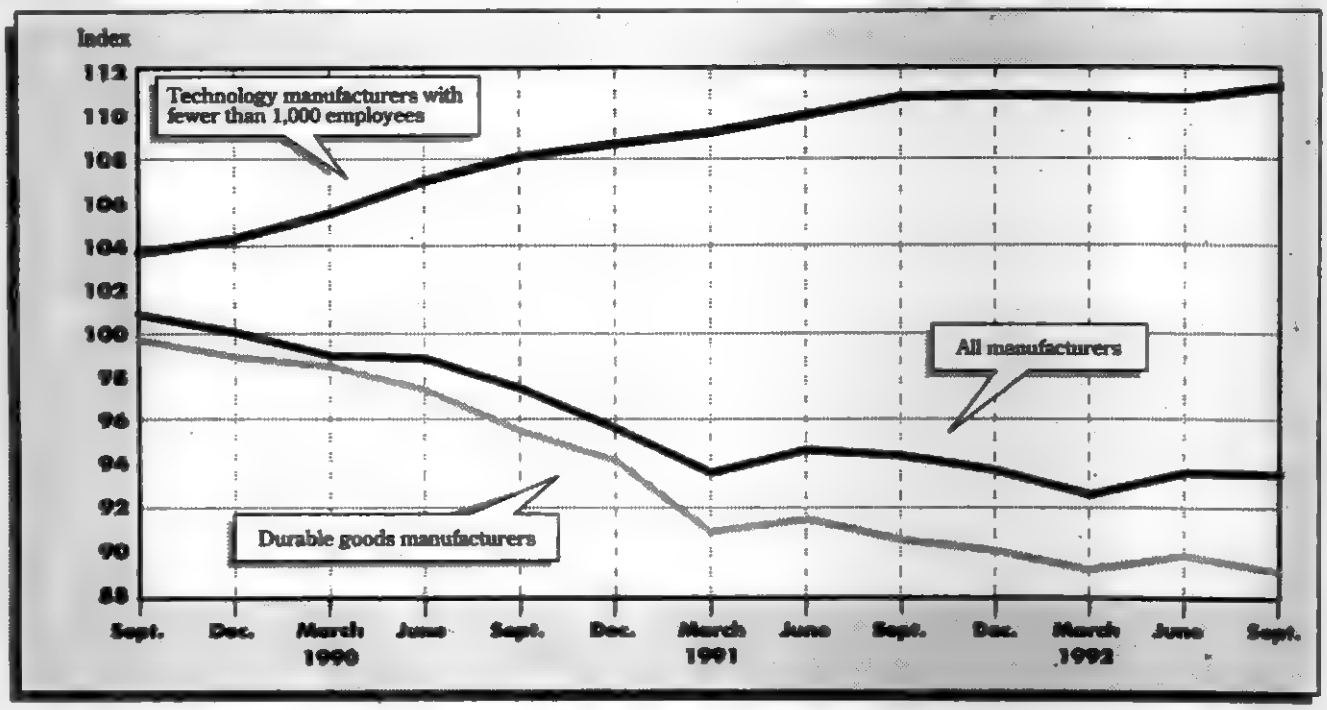

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Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	35,940
Communications Systems	30,264
Public Utilities	43,687
Transportation	49,151
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SOURCE: 1992 Survey of Computerworld's Audience, June 1991.

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personal computers	73,925
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Software Vendor	160,264
for large-scale systems	71,152
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SOURCE: Skill Survey of **Computerworld's** Audience, June 1991.

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"*Computerworld* recruitment advertising has been equally successful for Abacus Consultants. Although we've experienced many such situations, one specific instance comes to mind. After local advertising proved unsuccessful for finding a particularly hard-to-find individual in the Denver area, the client gave us the go-ahead to advertise nationally. We ran one recruitment advertisement in *Computerworld* - and got an instant response from just the candidate we were looking for - right here in our local area. It just goes to show that *Computerworld* delivers far better candidates than any other source.

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When bad VARs happen to good companies

BY STEVEN M. DEYO
CW STAFF

It is not that hard to tell a good value-added reseller (VAR) from a bad one — once you've signed on with one. Too bad it's so hard to distinguish between the two before the sale. Let's face it: You are hiring the company's technical expertise sight unseen.

What's difficult about choosing a VAR is that there are thousands of them, but only a few do a lot of business.

In 1992, for instance, the entire U.S. VAR population will sell a projected $7.1 billion in systems, with the average VAR taking in just $750,000 annually.

With "thousands of VARs doing very little business each," says Seymour Merrin, president of Merrin Information Systems, Inc. in Palo Alto, Calif., it's imperative that buyers screen out those that are likely to drop the ball or go out of business.

Most buyers agree that you have to look at a reseller's staff size and qualifications with a heavy emphasis on financial stability, references, training and technical support.

Learn from mistakes

Unfortunately, most people learn these guidelines from experience. Janet Mace, information systems director at Anaheim City Hall in Calif., has had her share of bad experiences and is now smarter for it.

"Every [VAR] we deal with prices everything at least three times more than what it should be," she says. When one VAR tried to sell her a $7,000 system, Mace insisted that the reseller break the bid down by item and price to show what her money was buying.

Armed with this information, Mace was able to save money when she bought the 486 machine somewhere else.

Once bitten, most purchasers make sure they're not around for the second bite. Harvey Soren, IS manager at Guimarra Vineyards Corp. in Bakersfield, Calif., is very careful about VAR selection, having watched one VAR go out of business when he was in the middle of a transaction. "We got stuck," he says.

Soren now avoids VARs with lackluster sales or poor cash flow.

To distinguish VARs that are trailing financially, he advises purchasers to inquire about the VAR's inventory. "If they stock a lot of inventory, I would probably stay away from them," he says.

Another indicator is an abundance of accounts receivable. Customers may be slow in paying because of unresolved disputes or complaints. Even if that's not the case, a VAR can be put out to pasture when customers take their time paying sizable bills, Soren says.

Looking for Mr. Good VAR

When choosing a VAR make sure it:

- Shows financial stability through low inventory and short-term accounts receivable.
- Employs trained, degreed experts, often in specialty fields such as LANs, GIS and so on.
- Answers questions promptly and accurately.
- Doesn't confuse pricing by bundling products or services.
- Offers training a la carte or as part of a project proposal.

This is a more difficult measure to take, however. "I'd ask if they're on net 10 [days], or net 30 or net 45. If someone does net 30 or more, I won't touch them," Soren says.

Once you've determined that a VAR is in the pink, it's essential to check whether it has a record of satisfied customers by calling a few, preferably those provided by someone other than the VAR, according to Brad Bishop, chairman at Avcom Systems, Inc. in Sunnyvale, Calif.

The systems integrator says he would like to see a Better Business Bureau for resellers and consultants because "in the computer industry, it's everyone for themselves." In the meantime, his best advice is to find a VAR the old-fashioned way: by word of mouth.

You should also get references from a VAR's most established customers, says Joanne Tamer, a consultant at SOS, Inc. in Venice, Calif.

Once you've checked out a VAR's finances and references, you need to determine whether the VAR can support you beyond the sale. Anyone can sell you a computer, but "value-added" is two-thirds of a VAR's job title.

"I don't think I'd hire him if he didn't do training," Tamer says. "I would also want to know that there was a certain amount of ongoing telephone support bundled into the cost for the first 60 days so I don't have to pay 50 bucks every time I pick up the phone. The good [VARs] have always offered training because it makes them a lot more money on bids as prices come down on margins for equipment."

People power

Soren says a good VAR has enough staff to handle each area of expertise the VAR it claims to support. How much is enough? At least one person for each area of expertise and enough staff to handle the phone traffic from the VAR's customer base.

The final test of a truly good VAR is whether it can save you money. Buyers agree that a good one will. Mace, who is beginning to implement Ultrix at her company, chose a VAR with telecommunications expertise, which, as she says, "saved [us] time, money and was convenient because we're not experts in Ultrix, because it's too new."

Some people take VAR shopping so seriously that they are willing to pay big bucks for an expert to do it — even up to $300,000. That's what Mace says she is paying an independent project manager to "keep us from being taken" on an Application System/400 filtration system. For this $2 million project, Mace considers that to be a bargain.

Deyo is a free-lance writer based in St. Paul, Minn., and editor in chief of the Computer User newspaper group.

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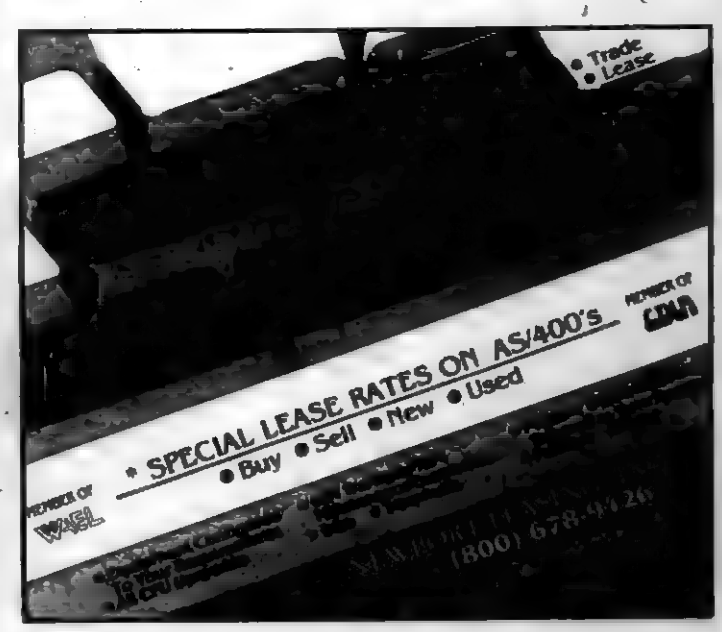

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PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$1,650	$1,900	$1,200
PS/2 Model 80	$1,400	$1,600	$1,100
PS/2 Model 90	$3,100	$3,500	$2,700
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Portable III	$500	$600	$250
Portable 386	$950	$1,100	$800
SLT-286	$700	$900	$400
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Deskpro 386e	$900	$1,000	$700
Deskpro 386/33	$1,700	$1,950	$1,400
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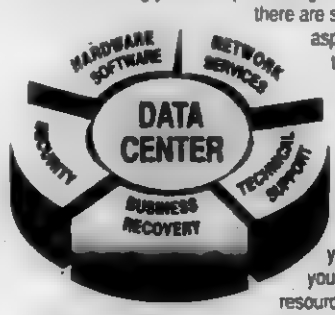

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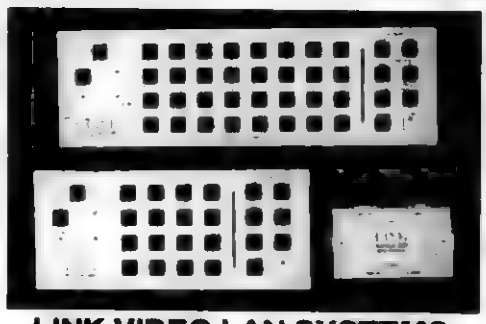

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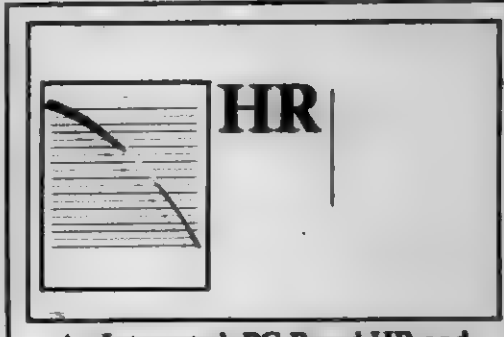

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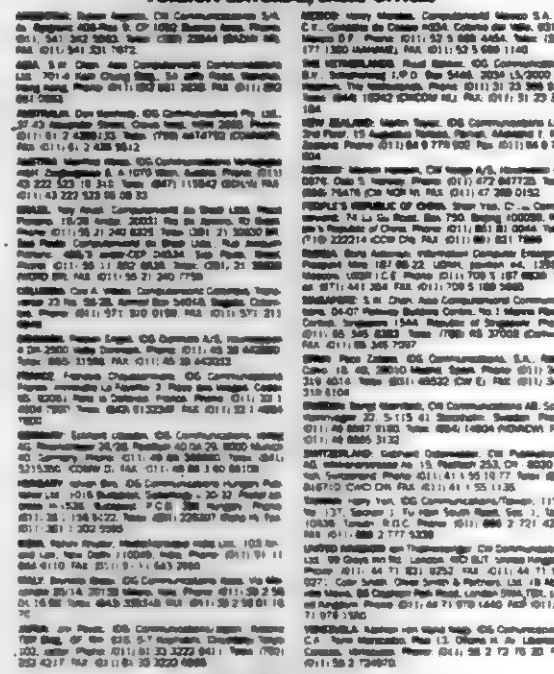

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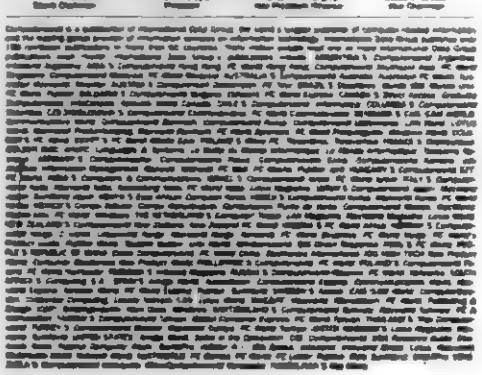

ADVERTISERS INDEX

Acer America	51
AT&T Business Communications Services	22-23
AT&T Network Cable Systems	63
AT&T Tridom	72
Avatar Corp	114
Bachman	103
Banyan	40
Borland International	60-61
British Telecom North America	64
Candle Corp	21
Cincom	24, 45, 47
Cisco Systems	C3
Cognos	117
Comdisco	80
ComNet	79
Compaq Computer Corp.	70-71, 94-95, 108
Computer Associates	5, 44
Concurrent Computer Corp	62
CW Circulation	88-89
CW Marketing	55
CW Recruitment	50, 62, 69, 79, 80, 97
Data General	29
Digital Equipment Corp	100/101
Dow Jones Services	86
EDS	118-119
Executrain Corp	73-75
Fibercom, Inc.	84
Fischer International	36
Gupta Technologies	50
Hayes Microcomputer	113
Hewlett-Packard	18-19, 42-43
IBM	30-31, 54, 85, 98-99, 108
Information Builders	92
Informix	C4
International Data Group	52-53
Intersolv	87
Knowledgeware	25
Laser Data	100
Lawson Associates	120
Lexmark	112
Lotus Development Corp	66-67
Micro Focus	11
Multi-Tech Systems	15
Napersoft	77
NEC	96-97
Novell	26-27
Oracle Corp	7, 9
Platinum Technology	76
Programart	78
Racal Datacom	48-49
Ross Systems	40/41
SAP America	105
SAS Institute	17, 111
Software 2000	10
Standard Microsystems	81
Sun Select	56-57
Sybase, Inc.	13, 34-35
Syncsort	3
3M	68-69
Texas Instruments	82-83
Unisys	107
Universal Data Systems	59
Workstation Group	110
Wyse Technology	38-39
XDB Systems	37
Xircom	46

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Pat Walker,
Traffic Manager

Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 136

A

A. T. Kearney 115
Actel Corp. 58
Addstor, Inc. 46,50
Aldus Corp. 65
Alex. Brown & Sons, Inc. 136
Allied Lyons PLC 6
Altus, Inc. 16
Aluminum Company of America 101
Amdahl Corp. 16,86,90,101
American Express Travel Related Services 28
Amoco Petroleum Co. 16
Amperif Corp. 16
AMR Corp. 1
Andersen Consulting 101
Apple Computer, Inc. 41,46,50,68,137
Arte Consultants, Inc. 118
Artisoft, Inc. 62
The Ask Cos. 16
AST Research, Inc. 12
AT&T Distributed Computing Group 77
AT&T 41,65,86,137
AT&T's NCR Federal Systems Division 68
Avcom Systems, Inc. 129
Azusa Pacific University 46

B

Bachman Information Systems, Inc. 20
Banyan Systems, Inc. 14,68
Barnett Technologies, Inc. 8
Bear, Stearns & Co. 28
Bell Atlantic Mobile Systems, Inc. 6
Berard Software Engineering, Inc. 93
Beyond, Inc. 14
Boatmen's Bancshares, Inc. 68
Boole & Babbage, Inc. 4
Borland International, Inc. 6,37,93
Boston Notes User Group 14
British Petroleum Co. 68
BrownStone Solutions, Inc. 8
BT 65,73
BT's Global Network Services 68
Business Management Consulting 59
Business Software Alliance 6
Byer California 77

C

Cabletron Systems, Inc. 6,10
Caere Corp. 46
Caliber Computer Corp. 6
Candle Corp. 4
CaseWorks, Inc. 100
Cellular Data, Inc. 6
Centocor, Inc. 115
Central Point Software, Inc. 46
Certus International Corp. 6
Cisco Systems, Inc. 6,138
CIT Group 138
Claris Corp. 41
Compaq Computer Corp. 41,137,138
Computer Associates International, Inc. 20,55
Computer Power Group. 20,93
Computer Sciences Corp. 77
Computer Systems Advisers, Inc. 97
Computer Systems Policy Project 137
Computer Task Group, Inc. 93
Computerland Corp. 6
Conner Peripherals, Inc. 137
Cooper Industries, Inc. 77
Cortex Corp. 97
Cray Research, Inc. 28,84

D

Data General Corp. 16,69
Datacomm Research Co. 59
Dataease International 37
Dataquest, Inc. 86
Dean Witter 4
Dell Computer Corp. 6
Digital Communications Associates, Inc. 137,138
Digital Equipment Corp. 15,16,24,28,69,84, 86,97,101,115,137
Dolphin Networks 68
Dow Chemical Co. 77
Dow Jones & Co. 28
Dream IT, Inc. 59
DSC Communications Corp. 101
Du Pont Co. 77
Dunkin' Donuts of America, Inc. 6

E

Eastman Chemical Co. 77
Eastman Kodak Co. 77
Electronic Data Systems Corp. 16,116
Emulex Corp. 100
Encore Computer Corp. 86
Eo 41
Eureka Software Laboratory 93
Everex Systems, Inc. 138

F

Federal Communications Commission 15
Federal Reserve Bank 4
Federal Reserve System 20
Federal Trade Commission 37
FileNet Corp. 137
Forrester Research, Inc. 37
Frame Technology Corp. 41
Frank Russell Co. 73

G

G2 Research, Inc. 101
Gartner Group, Inc. 4,10,16
GE Information Services 16
General Electric Co. 65
GigaTrend, Inc. 62
Great Expectations, Inc. 65
GTE Corp. 116
GTE Mobilenet 4
Guimarra Vineyards Corp. 129

H

Hamilton Laboratories 4
Helene Curtis Industries, Inc. 116
Hertz Technologies, Inc. 12
Hewlett-Packard Co. 4,6,8,12,15,55, 86,97,101,136,137,138
Hexcel Corp. 37
Hitachi Data Systems Corp. 16,90
Howard Rubin Associates 90
Hughes Network Systems, Inc. 68
Humana, Inc. 20
Hyundai Motor America 12

I

IBM 1,4,8,10,12,37,68,55,62,58,69, 73,77,86,90,93,97,101,137,138
IDX Technologies, Inc. 41
IMSL, Inc. 100
Infonet Services Corp. 65,86
Informix Corp. 46,50,58
InfoSpan 8
Infoworld 14
Insurance Company of the West 37
Intel Corp. 24,28,55
Intellicorp 93
Internal Revenue Service 16
International Computer Recovery Center 41
International Data Corp. 1,12,15,24, 41,84,86,137
International, Inc. 6
Interphase Corp. 16
Interport Software Corp. 16
Intersolv, Inc. 16,93
Intrico 12

J

James Martin & Co. 93
James Martin Insight, Inc. 108
JP Morgan & Co. 28,65
JWP, Inc. 6

K

Kidder Peabody & Co 12
KnowledgeWare, Inc. 8,20,93

L

Landmark Systems Corp. 4
Lawrence Livermore National Laboratory 68
Legent Corp. 4,46
Levi Strauss & Co. 20
Liant Software Corp. 97,100
Lotus Development Corp. 6,14,37,46,58

M

Madge Networks, Inc. 58
Marine Spill Response Corp. 116
Marriott Corp. 1
Marshfield Clinics 16
Marubeni 41
MasPar Computer Corp. 24,84
Matsushita 41
MCI Communications Corp. 65
Megahertz Corp. 41
Melville, Inc. 68
Memorex Telex Corp. 16
Merrin Information Systems, Inc. 129
MFS Datanet, Inc. 15
Micro Focus Group, Inc. 20
Micrografx, Inc. 58
Microsoft Corp. 4,6,14,15,37,41, 46,50,58,73,83,97,100,136
Minneapolis Star Tribune 20
Mortgage Guaranty Insurance Corp. 101
Motorola, Inc. 41,86
MTD Data Services, Inc. 6

N

NCR Corp. 28,59,86,93
NetTech 10
Network General Corp. 137
Neurogen Corp. 115
Neuron Data, Inc. 86
New York Life Insurance Co. 12
North Carolina's Department of Administration 20
Novell, Inc. 6,15,37,62,65,69,73

O

Open Software Foundation 4,93
Open Systems Interconnect 69
Optilink, Inc. 46,50
Oracle Corp. 6,28,37,41,46,50,55,58,77,101
Otis Elevator, Inc. 20
Ouellette & Associates, Inc. 121

P

Pacific Gas & Electric Co. 14
Para Technology, Inc. 101
Pensoft Corp 41
PictureTel Corp. 6
Platinum Software Corp. 41
Platinum Technology, Inc. 4
Powersoft Corp. 101
ProActive Software, Inc. 58
Productivity Management Group, Inc. 97
Proginet Corp. 69
Proteon, Inc. 58
ProtoComm, Inc. 65
Proxim, Inc. 62
Prudential Securities, Inc. 1,28
PSI Integration, Inc. 41
Pyramid Technology Corp. 77,86,137

R

Racal-Data Comm, Inc. 41
Radio Shack 41
Reltech Products, Inc. 8
Remedy Corp. 6
Repository AD/Cycle International Users Group 8
Royal Bank of Canada 4
Raytone, Inc. 50

S

Salt River Project 4
Sanwa Bank California 116
SAP America, Inc. 77
Security Pacific Automation Corp. 116
Sematech 137
Sequent Computer Systems, Inc. 86
Shey Technology Group, Inc. 1
SHL Systemhouse, Inc. 16
Silicon Graphics, Inc. 100
Society for Information Management 116
Softlab, Inc. 93
SoftSwitch, Inc. 15
Software AG of North America, Inc. 100
Software Strategies, Inc. 58
Solectek Corp. 59
Sony Corp. 46
Sprint Corp. 65
Standard Microsystems, Inc. 58
Storage Technology Corp. 16
Strategic Mapping, Inc. 46,50
Sun Microsystems, Inc. 1,4,6,16,101
SuperMac Technology, Inc. 46,50
SuperSolutions Corp. 86
Sybase, Inc. 28,46,50,58
Symantec Corp. 6,137
Synch Research, Inc. 10
Syncordia Network 68
Synergen, Inc. 115
Synon Corp. 97
Synoptics Communications Inc. 6,137

T

Tandem Computers, Inc. 69,86
Technology Investment Strategies Corp. 90
Technology Transfer Institute 118
TeleSoft 100
Teradata Corp. 90
Texaco, Inc. 8
Texas Instruments, Inc. 6,8,16,58
Textron Financial Corp. 118
The American Productivity and Quality Center 121
The Boeing Co. 69
The Department of Energy and Sprint Communications Co. 68
The Federal Home Loan Mortgage Corp. 28
The Gap, Inc. 20
The Hay Group 8
The Michigan Department of Social Services 108
The Reader's Digest Association, Inc. 116
The Santa Cruz Operation 55,97
Thinking Machines Corp. 28
Thomas-Conrad, Inc. 65
Toshiba America Information Systems, Inc. 6
Tricord Systems, Inc. 55
TRW Electronics Systems Group 68

U

U-Haul International, Inc. 55
Unilever Corp. 65
Union Bank 116
Unisys Corp. 12,55,68
Unisys Government Systems, Inc. 16
University of Pennsylvania's The Wharton School 28
Unix System Laboratories, Inc. 16
U.S. Bioscience, Inc. 115
U.S. Council on International Banking 16
U.S. Department of Agriculture 69
U.S. Navy Information Technology Acquisition Center 68
U-Top Printing Corp. 6

V

Ventura Software 41
Veritas Software 86
VM Systems Group 4
Volpe, Welty & Co. 93

W

W. Atlee Burpee & Co. 77
Wellfleet Communications, Inc. 6,138
Westinghouse Electronic Systems 6
Whirlpool Corp. 93
Winter, Wyman & Co. 121
Workgroup Technologies, Inc. 59

X

XZT Software, Inc. 106

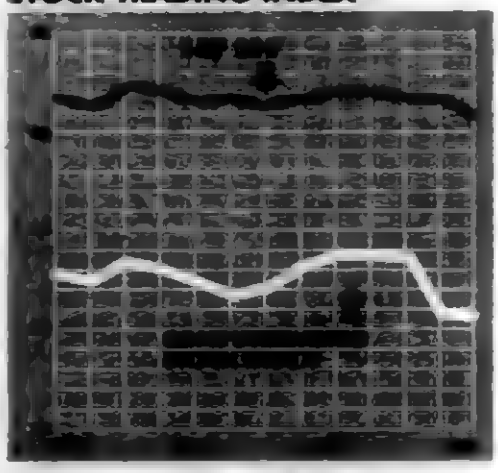
Y

Yankee Group Networks Strategies 65
Young & Rubicam, Inc. 14

Z

Zenith Data Systems 12

STOCK TRADING INDEX



Industry Almanac

RECOMMENDATION CHANGES

UPGRADED FROM HOLD TO SPECULATIVE BUY: Digital Equipment Corp. (Smith Barney, Harris Upham & Co.). According to Smith Barney analyst Shao Wang, DEC's (DEC) potential for future hardware revenue growth depends heavily on the company shifting its hardware systems to reduced instruction set computing-based Alpha technology. The impending line will make DEC more dependent on microprocessor-driven cycles, compared with the less competitive centralized systems cycles.

Wang speculated that before the end of calendar year 1992, DEC will probably introduce at least four hardware platforms based on Alpha. The first could be a personal computer-based system that is capable of running **Microsoft Corp.**'s (MSFT) Windows New Technology.

UPGRADED FROM NEUTRAL TO BUY: 3Com Corp. (Alex. Brown & Sons, Inc.). During its fiscal first quarter, 3Com (COMS) boasted very strong sequential and annual growth — $130.9 million compared with last year's $86.6 million — driven by Ethernet network interface cards and internetwork products. This acceleration of revenue and earnings growth, coupled with the impact of a new product, are two reasons why Alex. Brown has upgraded the firm's rating. 3Com's new EtherLink III line of Token Ring network interface cards will add incremental market opportunity for the company.

LISA DAVIDSON

Big dippers

Selected large system stocks that are trading at or close to year lows

	52-week low	Closing price Oct. 7
Amdahl Corp.	$3.00	$3.25
Convex Computer Corp.	$5.13	$5.38
Cray Research, Inc.	$22.75	$23.50
Kendall Square Research Corp.	$7.00	$7.00
Matsushita Electronics Industrial Co.	$88.25	$90.00
Pyramid Technology Corp.	$6.75	$7.75

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 9, 1992

TOP PERCENT GAINERS

Sierra Semiconductor	35.14
Synoptics Communications	28.38
Network General	23.91
Western Digital Corp.	20.00
Ultratech Corp.	20.00
Antel Communication Corp.	19.94
System Software Assoc.	17.39
Protexn Inc.	16.67

TOP PERCENT LOSERS

Symantec Corp. (L)	-40.48
Bachman Info. Systems	-35.85
Borland Int'l Inc. *	-28.75
Kendall Square Research (L)	-19.35
Wordstar	-18.75
Pyramid Technology	-18.18
Struct. Dynamics Research	-17.50
Mentor Graphics (L)	-14.81

TOP DOLLAR GAINERS

Synoptics Communications	10.75
IMAC Software Inc.	4.13
Intel Corp. *	4.00
Compaq Computer Corp. *	3.88
Microsoft Corp. *	3.63
Cabletron Systems	3.63
Motorola Inc. *	3.50
System Software Assoc.	3.25

TOP DOLLAR LOSERS

Borland Int'l Inc. *	-11.25
Symantec Corp. (L)	-4.25
Bachman Info. Systems	-2.38
3M Corp	-2.38
ITT Corp.	-2.38
Cray Research Inc. *	-2.38
Aldus Corp.	-2.00
Bell Atlantic Corp.	-2.00

Exch	52-Week	Range		Oct. 9 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 2.73%**			
OTC	18.63	8.38	3COM Corp. * (H)	18.63	2.13	12.89
NYS	70.63	56.25	American Info Techs Corp. *	66.00	-1.88	-2.76
NYS	46.38	32.88	AT&T *	41.75	-0.38	-0.89
OTC	4.25	0.75	Antel Communication Corp.	1.13	0.19	19.94
NYS	48.75	40.25	Bell Atlantic Corp.	46.25	-2.00	-4.15
NYS	55.50	43.38	Bellsouth Corp.	51.50	-0.63	-1.20
NYS	6.75	3.75	Bolt, Beranek & Newman	3.75	-0.25	-6.25
NYS	65.88	38.63	Cabletron Systems	62.50	3.63	6.16
OTC	31.00	17.50	Chipcom Corp.	20.25	0.50	1.94
OTC	58.25	30.25	Cisco Systems Inc.	54.00	2.75	5.37
OTC	35.25	5.50	Compression Labs Inc. (L)	6.00	0.13	2.13
OTC	3.38	0.88	Data Switch Corp.	1.63	-0.13	-7.14
NYS	23.63	14.13	Digital Comm. Assoc. *	14.75	-0.38	-2.48
OTC	15.25	8.00	Digital Systems Int'l Inc.	8.25	-0.50	-5.71
OTC	12.63	3.63	DSC Communications (H)	12.13	-0.25	-2.02
OTC	10.88	4.75	Fibronics Int'l Inc.	6.00	0.38	6.67
OTC	37.50	10.50	Fluke Corp.	15.00	1.75	13.21
OTC	3.38	1.13	Gandalf Technologies Inc.	1.88	0.06	3.42
OTC	2.25	0.88	Gateway Communications	1.88	0.06	3.88
NYS	5.50	2.38	General Datacomm Inds.	3.63	0.13	3.57
ASE	5.88	0.50	Go Video	2.25	-0.13	-5.26
NYS	35.75	28.88	GTE Corp. *	33.50	0.00	0.00
NYS	70.63	50.00	ITT Corp.	64.63	-2.38	-3.54
OTC	38.25	25.25	MCI Communications Corp.	34.88	0.00	0.00
OTC	14.50	2.25	Microcom Inc.	3.25	0.00	0.00
NYS	18.25	9.50	Network Equipment Tech. *	12.88	0.75	6.19
OTC	25.50	8.00	Network General	14.25	2.75	23.91
OTC	20.00	8.50	Network Systems Corp.	11.13	-0.38	-3.26
OTC	21.13	5.63	Newbridge Networks Corp. (H)	20.25	0.50	2.53
NYS	48.25	30.50	Northern Telecom Ltd. * (L)	30.75	-0.38	-1.20
OTC	32.50	20.00	Novell Inc. (H)*	28.38	1.00	3.65
NYS	88.38	69.13	Nynex Corp. *	82.38	0.63	0.78
OTC	37.50	18.63	Octel Communications Corp.	17.88	-0.38	-2.05
OTC	9.88	4.00	Penril Data Comm. Nwks.	4.00	-0.38	-8.57
OTC	53.00	10.25	Proxinet Corp.	13.25	0.00	0.00
OTC	18.75	7.75	Protexn Inc.	9.63	1.38	16.67
NYS	29.50	13.00	Scientific Atlanta Inc.	28.75	1.00	3.60
NYS	69.00	55.38	Southwestern Bell Corp.	66.50	-1.38	-2.03
NYS	38.38	20.75	Sprint Corp.	23.75	-0.25	-1.04
OTC	18.13	4.50	Standard Microsystems Corp.(H)	18.13	1.25	7.41
OTC	51.50	14.50	Synoptics Communications	51.50	10.75	26.36
NYS	40.00	32.88	US West Inc.	37.88	0.13	0.33
OTC	46.75	24.00	Wellfleet Communications	44.50	2.75	6.59
PC and Workstations			**Off 0.95%**			
OTC	14.50	3.50	Advanced Logic Research (L)	4.00	-0.25	-5.88
OTC	70.00	42.75	Apple Computer Inc. *	43.38	-0.38	-0.86
OTC	32.25	11.25	AST Research Inc. *	14.88	0.75	5.31
NYS	19.25	8.75	Commodore Int'l	7.00	0.00	0.00
NYS	36.50	22.13	Compaq Computer Corp. *	36.50	3.88	11.88
OTC	29.88	13.91	Dell Computer Corp.	28.00	0.38	1.36
OTC	7.75	1.00	Everex Systems Inc.	1.50	0.00	0.00
NYS	34.00	21.25	Harris Corp.	30.00	-1.13	-3.61
NYS	85.00	44.63	Hewlett-Packard Co. *	51.63	-1.50	-2.82
NYS	29.75	14.13	Silicon Graphics	18.63	-0.25	-1.32
OTC	35.88	20.75	Sun Microsystems Inc. *	27.75	-1.25	-4.31
NYS	31.25	22.25	Tandy Corp. *	28.13	-0.50	-1.75
NYS	11.13	5.13	Zenith Electronics	5.75	-0.13	-2.13
OTC	25.50	2.75	Zeos International Ltd.	3.75	-0.38	-9.09
Large Systems			**Off 4.73%**			
ASE	20.63	7.75	Amdahl Corp. * (L)	7.75	-0.75	-8.82
NYS	16.38	5.00	Convex Computer (L)	5.00	-0.38	-6.98
OTC	19.63	1.88	Cray Computer	2.63	-0.38	-12.80
NYS	52.25	22.63	Cray Research Inc. *	22.63	-2.38	-9.50
NYS	22.50	7.13	Data General Corp.	11.00	0.13	1.15
NYS	65.50	30.25	Digital Equipment Corp. *	35.75	-1.38	-3.70
NYS	104.75	75.50	IBM * (L)	78.38	-0.13	-0.16
OTC	13.25	6.25	Kendall Square Research (L)	6.25	-1.50	-19.35
NYS	119.25	88.25	Matsushita Electronics	90.50	-1.00	-1.09
OTC	17.50	6.75	Pyramid Technology	6.75	-1.50	-18.18
OTC	17.88	9.88	Sequent Computer Sys.	15.63	0.38	2.46
OTC	18.38	2.75	Sequoia Systems Inc. (L)	3.75	0.25	7.14
NYS	54.25	34.50	Stratus Computer Inc. * (L)	35.88	-1.00	-2.71
NYS	15.13	9.50	Tandem Computers Inc. *	11.13	0.63	5.95
NYS	11.75	3.63	Unisys Corp. *	8.75	0.25	2.94
ASE	7.50	0.25	Wang Labs Inc. (H)*	0.44	-0.06	-12.40
Software			**Off 1.47%**			
OTC	68.50	26.25	Adobe Systems Inc. (L)	26.25	-0.63	-2.33
OTC	13.25	2.50	Al Corp.	4.25	0.00	0.00
OTC	45.00	11.50	Aldus Corp.	11.63	-2.00	-14.68
OTC	19.75	8.00	American Software Inc.	8.63	-0.13	-1.43
OTC	20.00	9.75	Ask Computer Systems	13.13	0.00	0.00
OTC	52.00	23.25	Autodesk Inc.	48.25	3.25	7.22
OTC	37.75	4.25	Bachman Info. Systems	4.25	-2.38	-35.85
OTC	42.50	32.00	BGS Systems Inc.	37.50	0.50	1.35
OTC	79.00	37.25	BMC Software Inc.	58.63	4.13	8.01
OTC	20.50	9.50	Boole & Babbage	19.50	1.00	5.41
OTC	66.75	27.88	Borland Int'l Inc. *	27.88	-11.25	-28.75
OTC	11.00	3.63	CE Software	4.00	-0.25	-5.88
ASE	20.00	8.16	Cheyenne Software Inc. (H)	20.00	0.88	4.58
OTC	17.88	5.63	Cognos Inc. (L)	5.63	-0.25	-4.26
NYS	17.00	7.50	Computer Associates*	15.63	0.50	3.31
NYS	12.38	5.00	Computervision Corp. (L)	5.63	0.50	9.76
OTC	30.50	8.75	Comshare Inc.	8.00	-0.50	-5.88
OTC	47.88	6.50	Essel Corp.	7.13	-0.63	-8.06
OTC	25.00	11.50	Group I Software	13.50	0.50	4.00
OTC	8.63	3.50	Hogan Systems Inc.	4.50	-0.50	-10.00
OTC	38.25	16.50	Information Resources	25.75	-1.38	-5.07
OTC	24.75	4.50	Informix Corp. (H)	24.13	0.50	2.12
OTC	22.38	12.00	Intergraph Corp.	12.00	-1.50	-11.11
OTC	15.00	6.88	Interleaf Inc.	9.38	0.13	1.35
OTC	20.25	9.88	Intersolv Inc.	14.25	-0.50	-3.39
OTC	21.38	8.50	Knowledgeware Inc.	10.63	0.38	3.66
OTC	48.25	28.75	Legent Corp. *	42.50	-0.75	-1.73
OTC	36.75	16.50	Lotus Development *	16.75	-0.38	-2.19
OTC	7.38	1.88	Mace Software	2.88	0.00	0.00
OTC	22.25	6.25	Mentor Graphics (L)	5.75	-1.00	-14.81
OTC	37.25	27.25	Micro Focus	35.63	0.63	1.79
OTC	20.50	8.50	Micrografx Inc.	10.00	0.50	5.26
OTC	89.84	59.50	Microsoft Corp. *	82.38	3.63	4.60
OTC	21.13	12.00	Oracle Corp. *	19.00	-0.38	-1.94
OTC	49.75	18.50	Parametric Technology	48.25	-0.50	-1.07
OTC	11.00	3.50	Phoenix Technologies	4.25	-0.63	-12.82
OTC	25.25	11.25	Platinum Technology	14.25	-1.00	-6.56
OTC	49.00	29.00	Progress Software Corp.	47.00	1.75	3.87
OTC	28.63	4.00	Quarterdeck Office Sys.	4.63	0.00	0.00
OTC	32.75	11.75	Rainbow Technologies Inc.	20.25	2.13	11.72
OTC	22.75	4.00	Rasterops	5.50	0.50	10.00
OTC	17.25	6.00	Ross Systems (L)	6.38	0.75	13.33
OTC	12.25	8.50	Saploris USA Inc.	10.63	0.38	3.66
OTC	36.25	6.75	Software Publishing Corp. (L)	7.50	0.38	5.26
OTC	8.50	2.00	Software Toolworks Inc.	3.25	0.38	13.04
OTC	7.25	1.00	Spinnaker Software (L)	1.88	-0.13	-7.14
OTC	10.50	3.25	State of the Art	4.00	0.25	6.67
NYS	28.25	13.75	Sterling Software Inc.	16.25	2.25	14.08
OTC	30.00	8.25	Struct. Dynamics Research	8.25	-1.75	-17.50
OTC	37.50	16.00	Sybase Inc.	36.38	2.00	5.82
OTC	51.00	6.25	Symantec Corp. (L)	6.25	-4.25	-40.48
NYS	19.50	5.25	Systems Center Inc. *	8.50	0.88	15.56
OTC	34.25	13.00	System Software Assoc.	22.00	3.25	17.33
OTC	23.75	14.50	Wallop Interactive Systems	17.00	-0.38	-2.16
OTC	6.63	1.50	Wordstar	1.63	-0.38	-18.75
Semiconductors			**Up 4.95%**			
NYS	21.50	7.38	Advanced Micro Devices	11.75	0.50	4.44
NYS	11.13	7.13	Analog Devices Inc.	10.38	0.25	2.47
OTC	12.13	6.75	Atmel Corp.	12.13	0.38	3.19
OTC	14.13	3.25	Chips and Technologies	3.50	-0.13	-3.45
NYS	21.50	7.38	Cypress Semiconductor Corp	8.50	0.13	1.49
NYS	12.25	8.38	Dallas Semiconductor	11.88	0.25	2.15
OTC	68.75	39.75	Intel Corp. *	66.50	4.00	6.40
NYS	9.88	4.88	LSI Logic Corp.	6.00	0.13	2.13
NYS	22.38	12.13	Micron Technology	19.25	0.38	2.36
NYS	91.50	57.50	Motorola Inc. *	80.00	3.50	4.58
NYS	12.38	4.50	National Semiconductor*	12.25	0.63	5.38
OTC	27.00	8.25	Sierra Semiconductor	12.50	3.25	35.14
NYS	46.00	26.00	Texas Instruments*	49.88	2.50	5.04
OTC	10.50	6.50	VLSI Technology	7.13	-0.38	-5.00
OTC	7.25	2.13	Weitek	3.13	0.13	4.17
ASE	8.00	2.00	Western Digital Corp.	8.00	1.00	20.00
OTC	31.00	16.25	Xilinx (L)	17.25	0.50	2.99
OTC	11.50	6.00	Zilog Inc.	7.25	-0.38	-4.92
Peripherals and Subsystems			**Off 0.01%**			
OTC	10.00	3.25	Archive Corp.	6.75	-0.38	-5.26
OTC	28.75	13.75	Banctec Inc.	24.75	-0.63	-2.48
OTC	23.50	9.25	Caribex Corp.	10.75	-0.50	-4.44
ASE	12.25	5.16	Cognitronics Corp.	11.63	0.25	2.20
NYS	23.88	12.50	Conner Peripherals*	18.88	0.13	0.67
ASE	19.88	4.88	Dataram Corp.	5.38	-0.13	-2.27
NYS	21.63	7.38	EMC Corp. (H)	20.25	0.25	1.25
OTC	6.38	4.75	Emulex Corp.	5.38	-0.25	-4.44
OTC	23.00	13.25	Evans & Sutherland (L)	14.63	1.38	10.38
OTC	40.63	12.00	Exabyte (L)	15.00	1.63	12.18
OTC	29.50	15.75	Intelligent Info. Systems	28.38	0.63	2.25
OTC	11.25	4.75	Iomega Corp.	8.13	0.00	0.00
OTC	15.25	13.00	IPL Systems Inc.	13.25	-0.75	-5.36
OTC	21.25	10.75	Komag Inc.	15.25	0.25	1.67
OTC	15.25	4.38	Maxtor Corp. *	14.00	0.38	2.75
OTC	12.63	6.00	Micropolis Corp.	8.88	0.25	2.90
NYS	103.75	85.38	3M Co.	97.88	-2.38	-2.37
OTC	6.75	3.50	Printronix Inc.	5.50	0.13	2.33
NYS	28.75	8.88	CMS Inc. (L)	7.75	0.38	5.08
OTC	18.00	8.88	Quantum Corp.	13.00	0.13	0.97
OTC	12.75	3.75	Reduc Inc.	5.13	-0.25	-4.65
NYS	12.88	6.50	Recognition Equipment	9.63	0.00	0.00
NYS	13.13	5.38	Xerox Inc.	10.38	-0.25	-2.35
OTC	17.63	7.50	Seagate Technology*	12.25	-0.25	-2.00
NYS	78.00	21.50	Storage Technology* (L)	22.75	-1.13	-4.71
NYS	24.25	16.00	Tektronix Inc.	20.25	-0.88	-4.14
NYS	82.25	59.25	Xerox Corp.	76.50	-0.38	-0.49
Services			**Up 0.28%**			
OTC	18.75	11.88	American Mgmt. Systems* (H)	18.75	0.63	3.27
NYS	5.38	2.88	Anacomp Inc.	3.13	0.00	0.00
OTC	19.00	12.50	Analysts Int'l	17.75	-0.25	-1.39
NYS	49.00	35.75	Auto Data Processing*	45.75	-0.63	-1.35
NYS	15.50	7.06	Candlen Corp.	14.00	-0.25	-1.75
NYS	24.18	12.50	Comdisco Inc. *	15.63	0.00	0.00
OTC	13.50	7.75	Computer Horizons	8.13	-0.38	-4.41
NYS	84.88	57.00	Computer Sciences*	66.75	-0.25	-0.37
NYS	10.13	7.00	Computer Task Group	8.00	0.13	1.59
OTC	40.50	15.00	CompUSA Inc.	32.25	-1.25	-3.73
OTC	19.25	6.00	Corporate Software	7.13	-0.50	-6.56
OTC	30.75	8.50	Egghead Discount Software	8.25	-0.75	-8.33
NYS	33.06	25.25	General Motors E (EDS)*	29.50	1.75	6.31
NYS	30.38	6.25	Intelligent Electronics	10.75	0.63	6.17
OTC	14.88	4.75	Marisel	7.63	-0.25	-3.17
OTC	15.75	7.00	Microage Inc.	7.75	-0.50	-6.06
OTC	32.00	17.88	Paychex	31.25	2.25	7.76
NYS	76.50	52.25	Policy Management Sys.	73.50	-0.75	-1.01
NYS	44.75	34.88	Reynolds and Reynolds	42.00	-1.50	-3.45
OTC	32.00	21.25	SEI Corp.	34.88	-0.13	-0.50
OTC	24.38	16.88	Shared Medical Systems	21.63	0.13	0.58
OTC	30.00	13.50	Sungard Data Systems	27.00	0.75	2.86
NYS	3.63	1.13	Ultimate Corp.	1.50	0.25	20.00

KEY: (H) — New annual high (L) — New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

HP offers severance

■ **Hewlett-Packard Co.** last week said it is offering a voluntary severance package to employees in select job categories that should result in the departure of about 2,700 employees next year. The company will take a charge of about 40 cents a share in its fourth quarter, which ends Oct. 31, to cover costs associated with the program. HP also said U.S. employees will take three paid vacation days around the Christmas holidays to reduce expenses.

■ **Synoptics Communications, Inc.** posted fiscal third-quarter profits of $13.4 million, up 85% from the comparable period last year. Revenue was $108.1 million, an increase of 83% from the year-earlier period, the Santa Clara, Calif., firm said.

■ **Pyramid Technology Corp.** is taking several cost-reduction measures — including laying off 10% of its work force — that will result in a restructuring charge of between $22 million and $24 million for the fiscal fourth-quarter ended Sept. 30. The charge, combined with an operating loss, will result in a "substantial" net loss for the quarter, the San Jose, Calif., firm said.

Short takes

Symantec Corp. in Cupertino, Calif., said revenue for the second quarter, ending Oct. 2, will be about 20% less than analysts expected; many of them were anticipating sales in the $54 million to $55 million range. The company expects to report a loss for the period. . . . **FileNet Corp.** in Costa Mesa, Calif., expects revenue for its third quarter, which ended Oct. 4, to increase 27% to $37.5 million, although profits will remain flat. . . . **Digital Communications Associates, Inc.** in Alpharetta, Ga., reported that first fiscal quarter earnings fell 7% to $3.9 million on revenue of $59.8 million.

Compaq to cut 1,000 workers worldwide

Company plans reductions despite logging record-breaking third-quarter revenue and shipments

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Compaq Computer Corp. last week said it will reduce its staff by about 10%, or 1,000 people worldwide, even though it reaped record revenue and unit shipments in its recently completed third quarter.

Gian Carlo Bisone, vice president of marketing at Compaq, said the layoffs are necessary to enable Compaq to remain at the forefront of a market that has been ravaged during the past year by price cutting.

"It is better to streamline your organization on your own before you're forced to do it," he said. "We need to look at having the proper cost structure [in place] to be a leader in the '90s."

Compaq is not the only company struggling in the wake of diving personal computer prices. Everex Systems, Inc., Northgate Computer Systems, Inc. and Librex Computer Systems, Inc. have all been stung to varying degrees.

Such is the state of the PC market that some analysts are predicting a shake-out in the next 12 to 18 months [CW, Oct. 5].

Houston targeted

Bisone said the majority of affected positions will be cut in Houston. Of the 700 positions that will be eliminated this month, 600 of them will come from the Houston headquarters. He said no particular department will be targeted, with the cuts coming in pretty much across the board.

Analysts said that although the company may be shipping units in record volumes, drastically low prices demand that Compaq run as lean as possible.

"Everyone thinks that Compaq's out of the woods, but to make this work, they essentially have to triple unit [shipments], and that's not exactly right around the corner," noted Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

However, Brown added that Compaq was taking the right steps to keep it a viable company.

Bisone said the company estimates it will ship about two-and-a-half times the number of units than it did in the same period last year — when Compaq recorded its first-ever net loss of $70.2 million.

In the quarter ended Sept. 30, the company will take an approximately $85 million charge for restructuring costs, as well as those associated with the layoffs, a writedown of property, plant and equipment and a loss on early retirement of long-term debt.

However, the charges will be offset by the third-quarter gain of about $86 million from Compaq's sale of its equity in Conner Peripherals, Inc. Compaq will post results Oct. 20.

Industry CEOs push Congress on R&D funding

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A coalition of chief executive officers from the largest U.S. computer companies has published its technology and trade policy agenda for the benefit of the upcoming Congress.

The agenda was published by the Computer Systems Policy Project (CSPP) — which includes John Sculley from Apple Computer, Inc., Robert E. Allen from AT&T, Robert B. Palmer from Digital Equipment Corp., John A. Young from Hewlett-Packard Co., John Akers from IBM and eight others.

It recommends that the government reallocate $5 billion to $10 billion more annually during the next four years to research conducted in "precompetitive, generic technologies" — those basic, enabling technologies that many companies can use as a foundation for product development.

Funds reallocation

Kenneth Kay, executive director of the CSPP, said the CEOs are not asking the government to increase spending on research and development, which is now $66 billion a year.

Rather, the CEOs said that Uncle Sam should consider reallocating funds to "commercially relevant activities," such as those that foster advances in semiconductors, high-speed communications and software.

According to sources cited by the CSPP, the government spends a disproportionately small amount on semiconductor and computer R&D compared with areas such as aerospace, health care and chemicals (see chart). "The computer CEOs look at this and say, 'Wait a minute, how could their R&D priorities be so out of skew?' " Kay said.

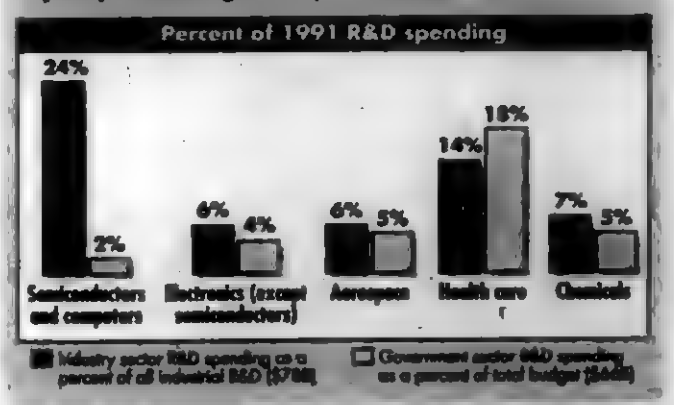
"The answer is, for the past 10 years, they haven't been talking to [the government] about what it should be doing," Kay added.

The CSPP also recommended that the government do the following:

- Make the R&D tax credit permanent.
- Expand the research agenda for the federal High Performance Computing and Communications Program — an initiative in high-speed networks and computers — to include health care, education and manufacturing, not just the so-called "grand challenges" of science such as global climate modeling.
- Create a national information infrastructure, a network of private and public data networks accessible by millions of Americans.
- Win agreement with trade partners for a reduction in European Community tariffs on computer parts and semiconductors; implement the recently negotiated North American Free Trade Agreement; and work with Japan to open its markets to foreign-made computers and semiconductors.
- Modernize and toughen antidumping laws and modernize the export licensing system to ease the export of U.S. computer hardware and software.

Short shrift

Though the semiconductor and computer industries performed 24% of all private sector R&D in 1991, the U.S. government allocated only 2% of its R&D budget to computer-related R&D



Source: National Science Foundation, *Business Week*, American Association for the Advancement of Science

Sematech wins funds

WASHINGTON, D.C. — Despite recent White House and Department of Defense threats to slash funding for Sematech, a Senate-House conference committee has passed a 1993 budget bill that retains all of the industry consortium's $100 million in federal funding.

A similar amount comes from member companies, which work together to develop advanced semiconductor manufacturing techniques.

In an unusual move, Congress said $10 million of the federal funds must go toward research in environmentally sound manufacturing techniques. Critics have charged that chemicals used in making chips pollute groundwater.

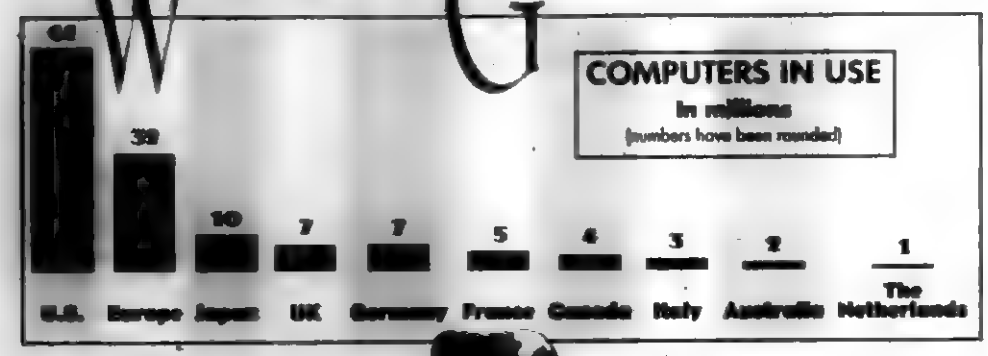
But a Sematech spokesman said the consortium already spends at least $10 million on efforts to clean up manufacturing processes. For example, he said Sematech is spending $20 million this year on a "vapor-deposition" process for etching silicon that will use gasses rather than the liquid chemicals that have caused ground pollution.

"As far as we can tell, it will be business as usual," the spokesman said.

GARY H. ANTHES

WYSIWYG

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.



Weird Software Contest

The San Diego Computer Fair's first annual weird software contest ended in a three-way tie for first place

Winners:

Bungee: A screen saver featuring a bungee-jumping cow whose cord breaks; it plunges to the ground, only to become a pile of hamburgers and steaks.

Alien: Helps you determine whether your neighbors are from outer space.

Bathroom: Tells you exactly how long you will spend in the bathroom and doing what.

Honorable mentions:

Crystal Balls: A fortune-telling program.

Poetry: Creates personalized poems.

Really Resumes

"There were a couple I can recall. One was from a person applying for a technical writer position. The resume said they had a special attention for *detial*. Another stated that the applicant had been on the winning 400-meter Olympic track team. I looked it up, and it wasn't true!"
Terry Truman, Unidata, Denver

Say goodbye now!

The Federal Communications Commission has ruled that it is OK for business travelers to use their cellular phones while planes are still on the ground, but the instant a plane becomes airborne, it's time to say goodbye or be subject to a fine. The ruling also applies to hot air balloons.

Sources: *The Computer Industry Almanac*, Runzheimer International

CW Chart: Michael Siggins

The 5th Wave

INSIDE LINES

Call to arms

➤ Cisco will officially start the revolution against IBM's Advanced Peer-to-Peer Networking (APPN) this week by announcing the APPI consortium. A band of 13 vendors (including Cisco) will announce plans to support the APPN protocol, Cisco's would-be alternative to IBM's would-be enterprise internetworking standard. Cabletron confirmed that it will be one member; a source close to Cisco hinted that HP and DEC will also be members, with Wellfleet a strong possibility.

Objects d'CASE

➤ Although there has been no official word from IBM on which object-oriented database will get the nod for its new workgroup repository, an IBM source said the field is wide open and that no partner has been chosen as IBM continues talks with a number of competitors. That declaration came despite a recent pronouncement by Versant Object Technology that it is the object-oriented database of choice for IBM's workgroup repository. Time will tell if the Menlo Park, Calif., company is correct.

Singed system

➤ One source who finally got his hands on a machine sporting Intel's scarcer-than-hen's-teeth DX2 chip says that the box is impressive — and hot. Literally. Even with the heat sink on the chip, it radiates a lot of heat. Hmmm. Maybe the reports that Intel is having trouble reducing heat on its forthcoming P5 chip have some credence after all.

Hoping for a happy Thanksgiving

➤ Dell had placed a lot of hopes, and some future products, on its 3.5-pound 320SLi notebook. But the production schedule slipped after BIOS problems and some construction issues arose. The company is now telling customers it will be Oct. 20 before they can get a system, though some think it will be well into November before Dell actually produces anything.

Greenback blues?

➤ Employees at troubled PC maker Everex must take a day off each week without pay — effectively a 20% cut in their salary — and will be expected to take a week off without pay at Thanksgiving and two weeks off without pay at Christmas. Everex isn't seeing much in the way of cash these days, as sources report it has fallen into arrears on its loan covenants with the CIT Group, a New York-based lender of last resort that holds a $70 million line of credit with Everex. Because of this, Everex distributors are now making payments directly to CIT, the sources said.. Everex declined to comment.

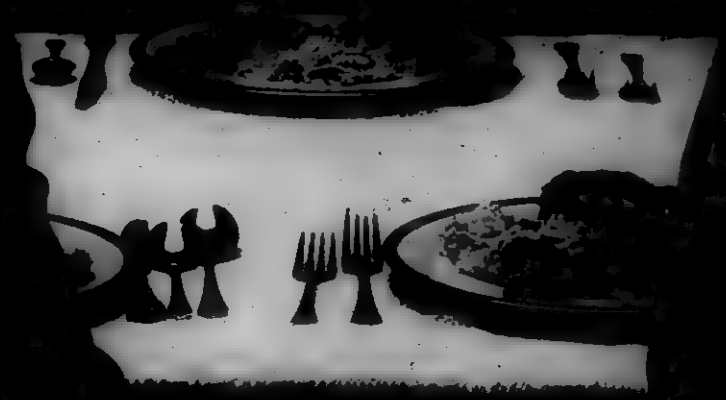
Studying on the Go

➤ Notebooks have been a standard school supply since they replaced their predecessor, "the slate." Now, Columbia University's Graduate School of Business is taking that theme a step further. Beginning in the January semester, the Ivy League grad school will require all students to purchase and use portable notebook computers. So far, 300 students, or 60% of this fall's new class, have plunked down between $1,560 to $5,200 for notebooks from Compaq Computer, the supplier selected by the university.

I want my B-T-V!

➤ Borland's Philippe Kahn may make his MTV debut sometime during Comdex/Fall '92 in November. It seems the saxaphone-toting software chief executive officer may be videoed jamming with jazz-man and Jay Leno sidekick Branford Marsalis at a Comdex concert scheduled to include at least one member of The Traveling Wilburys. Another musical celebrity joining the festivities will be Alan Parsons, who worked as a studio engineer with The Beatles before leading his own group. Parsons will help produce a multimedia extravaganza.

Remember, you read it here first: President Bush will not be re-elected. So said Cambridge, Mass.-based City Solutions Institute (CSI) last week, calling it an "announcement," not a prediction. The assertion came from an artificial intelligence program that CSI said has been extremely accurate in predicting political races. If only news were so predictable! Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



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COMPUTERWORLD

Ethernet longevity to stave off upgrade pain

BY JOANIE M. WEXLER
CW STAFF

DALLAS — Users last week saw living proof that they will be able to milk their existing Ethernet technology for a few more years, despite the growing demands already straining network performance.

Many users had expressed fear that looming, bandwidth-voracious applications and burgeoning volumes of network users might soon force them to swap out widespread investments in their network infrastructures at a time when they can ill afford it.

The higher bandwidth of 100M bit/sec. Fiber Distributed Data Interface and the switched nature of still-developing, gigabit-speed Asynchronous Transfer Mode, for example, have been much-ballyhooed candidates for more heavily burdened networks.

However, users said they were gratified by Networld '92 demonstrations of "Ethernet-extending" technologies such as full-motion video. The demos came from the likes of Kalpana, Inc., Alantec Corp., LANnet, Inc. and Fibronics International, Inc., all of which chose to run multimedia applications as an extreme example of how far Ethernet can stretch.

The vendors take slightly different approaches to dedicating

Continued on page 16

Mail boxers

While Goliaths Lotus and Microsoft duke it out to establish an industry standard for E-mail APIs, other E-mail systems pass them by in overall user satisfaction.

See Buyers' Scorecard, page 70

Product	Satisfaction rating
Notework	8.9
WordPerfect Office	8.4
CC:Mail	7.9
Microsoft Mail	7.9
DaVinci E-mail	7.6

Maximum possible score: 10

Citicorp banks on CA licensing

Deal signals shift from tiered pricing

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Citicorp and Computer Associates International, Inc. last week struck a new flat-fee, enterprisewide software agreement encompassing the bank's worldwide information systems operations. The agreement could redefine the future of software licensing policies.

The Citicorp licensing pact marks a shift away from the standard tiered-pricing model that CA, IBM and other software vendors have followed for the past decade. At a press briefing, Charles B. Wang, CA's chairman and chief executive officer, said CA will announce a new program aimed at altering the firm's tiered-pricing formula by month's end.

Analysts said that announcement will carry new initiatives aimed at providing customers with a choice of licensing options ranging from flat-fee pricing to usage-based pricing models.

Capitalizing on technology

Data from Citicorp shows the company's large IS investment, some of which will be covered by the CA licensing pact

Assets: $219.3 billion

Employees: 83,000

Number of mainframes: More than 100

IS operations: Supports locations in 90 countries

Number of PCs: Tens of thousands

Source: Citicorp

The CA/Citicorp agreement is based on pricing policies CA instituted last spring [CW, April 20].

The program Citicorp chose — CA's Enterprise Licensing program — allows Citicorp to run CA's mainframe software freely throughout its operations on any number of CPUs, regardless of CPU upgrades or computer relocation.

In addition, the flat-fee plan may be extended to allow Citicorp to run CA's personal computer and minicomputer software under similar conditions.

Under the enterprise licensing scheme, pricing is based on the number of mainframe million instructions per second of computing power required to run the the company's software. CA may extend flat-fee pricing to the CA minicomputer and PC products

Continued on page 7

Del Monte reaps fruits of IS overhaul

BY KIM S. NASH
CW STAFF

SAN FRANCISCO — Del Monte Foods has spent more than $12 million on bean counters during the past two years — asparagus, peach and corn counters, too. And the company even threw an accounting system into the pot.

Tight-lipped since a leveraged buyout in 1990, Del Monte recently finished its biggest information systems project ever. The $1.4 billion canned foods maker downsized its three most important systems — raw product tracking, grower payment and financials — to run on IBM's Application System/400.

The first phase of the project ended in June with the unceremonious shutdown of 30 lumbering, 12-year-old IBM Series/1 minicomputers in favor of a network of 24 nimbler AS/400s.

Cutting back

Maintenance costs should sink from about $3 million per year to half that...And the leaner system let Del Monte cut its IS staff from 240 to approximately 105.

The project brings Del Monte up to speed with rivals in the

Continued on page 12

William Mercer McLeod

Musso (left) and Caputo *led Del Monte's downsizing effort*

OBJECT-ORIENTED OBSTACLES

Pain first, payback later

BY JEAN S. BOZMAN
CW STAFF

At Kash n' Karry Food Stores, Inc., a $1 billion grocery chain in Tampa, Fla., the initial sprint toward object-oriented technology was extremely painful.

Learning to build object-class libraries with C++ took the company's information systems staff more than six months, and re-engineering IS operations boosted the $6 million IS budget by 12%.

"Your IS shop almost stops for six to nine months as people go through the learning curve," said Jim Stikeleather, director of systems development at Kash n' Karry. "You can't ping-pong back and forth between the paradigms. You have to go forward."

Bringing object-oriented technology into IS development can be a trying hike up a long, steep learning curve, agreed early users who have tried it. Cobol programmers often become winded during the journey, and training costs can take an IS manager's breath away. But after struggling with the software equivalent of the Boston Marathon's Heartbreak Hill, users say the rest of the trek is

Continued on page 20

INSIDE

Aligning IS with business goals is the name of the game today, and re-engineering and total quality management are key to the effort. See exclusive *Computerworld* survey, page 108.

A cooperative marketing initiative from Borland and WordPerfect could foreshadow the firms' offering of a software suite. Page 4.

LANs, groupware highlight Networld '92. See stories on pages 14, 15 and 16.

Product Spotlight — Revisiting project management software. Page 97.

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EXECUTIVE BRIEFING

October 19, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

LARGE SYSTEMS

A FLAT-FEE, ENTERPRISEWIDE SOFTWARE licensing agreement reached by Citicorp and Computer Associates last week could mark a major shift away from the tiered-pricing model that CA and many other software vendors have followed for the past decade. *Page 1*

PYRAMID TECHNOLOGY INTRODUCES a Unix screamer positioned for data center use. The company also launches a strategy with two partners, Comdisco and Integris, through which users would set up the new system in a mainframe cohabitation scheme. *Page 8*

A COMDISCO EXECUTIVE says downsizing is often not a matter of unplugging the mainframe. Rather, it entails off-loading most functions other than data storage. *Page 8*

EXTENDING THEIR RELATIONSHIP, Hewlett-Packard and minisupercomputer maker Convex last week announced plans to use each other's technologies in new products. *Page 6*

THINKING MACHINES TARGETS COMMERCIAL users with a new supercomputer, but commerical software packages will not be available for at least a month. *Page 6*

INDUSTRY

WHAT'S UP, DEC? Apparently a lot, according to CW editor in chief Bill Laberis, who examimes whether the company is headed in any direction other than down. *Page 32*

POOR DEC AND IBM EARNINGS surprise analysts as both companies struggle to re-engineer themselves. *Page 129*

MICROSOFT EARNINGS STILL LOOK ROSY, while a lack of Windows applications keeps Borland off track. *Page 129*

KNOWLEDGEWARE IS SET TO ACQUIRE a small consulting company, the first in an expected series of moves planned to boost the vendor's service business. *Page 4*

SUN'S 1991 RESTRUCTURING into individual companies has improved its market focus, particularly in the PC space, and encouraged more partnerships with outside vendors. But Sun hopes that all its users notice is better service. *Page 47*

LANS

NETWORLD '92 ATTENDEES WITNESSING full-motion video running over Ethernet are hopeful that today's technology might tide them over until their budgets blossom. *Page 1*

IN A MOVE THAT WILL MAKE multiserver LANs much more afffordable, both Novell and Microsoft will offer per-node licensing. *Page 10*

NOVELL'S HOPES FOR ENTICING corporate is with a feature-rich update of NetWare 4.0 may fall short of the mark because many users have yet to upgrade to the previous version of NetWare, and 4.0 will not include several key features sought by IS managers. *Page 15*

IBM ANNOUNCES LAN SERVER 3.0, a full 32-bit, OS/2 2.0-based implementation of its LAN operating system. *Page 14*

MICROSOFT ADDS MANAGEMENT UTILITIES as well as OS/2 2.0 support to LAN Manager. *Page 14*

ENTERPRISE NETWORKS

▶Cisco Systems announces 12 partners to help it develop APPI, a proposed alternative to IBM's Advanced Peer-to-Peer Networking protocol for routing SNA over an internetwork. *Page 10*

▶Recent announcements break some ground in the hot area of LAN-to-WAN network management, but users need more. *Page 77*

▶Upcoming products allow users to mix and match frame relay with other types of networking. *Page 10*

▶Salomon Brothers reaps big benefits from a newly automated chargeback accounting system that tracks the number of data packets run over its TCP/IP Ethernet WAN. *Page 77*

▶Network routers enter the world of supercomputing as Network Systems Corp. prepares to launch a Hippi interface for its gear. *Page 77*

▶France Telecom announces that it will incorporate Notes over its Numeris ISDN network. *Page 78*

MANAGEMENT

▶The Department of Labor revises its rules to exempt all salaried programmers from mandatory overtime pay. *Page 24*

▶Users say that while they're pleased with IS' response to day-to-day problems, they wish IS was more in tune with their specific departmental needs. *Page 114*

▶As IS gears up to align its goals with the business goals of the company, re-engineering and total quality management emerge as top priorities. *Page 108*

▶Tight central control of IS works well at Baltimore Gas and Electric, but the $2.5 billion utility is beginning to give users more say in how IS dollars are spent. *Page 107*

PROJECT MANAGEMENT

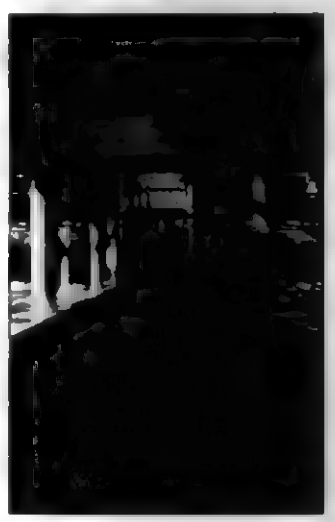
▶John Diebold recommends a technology policy that is based on the concept of "demand-pull," rather than the outmoded "supply-push" approach. *Page 33*

▶Adding soft information such as comments, opinions and predictions into an executive information system makes the EIS more useful to executives. *Page 103*

▶Avoid the beta-test blues by keeping in touch with program coordinators. *Page 122*

▶Project management software has gotten easier with the help of Windows interfaces and vendor attention to navigation aids. *Page 97*

SOFTWARE DEVELOPMENT



▶Early users of object-oriented technology say it can be used to create a new class of production systems that have quick development times and low maintenance costs. But entry into the object-oriented world can bring unexpected training costs and a steep learning curve before benefits arrive. *Page 1*

▶Burl Software announces a flexible tool for analyzing creaky old Cobol programs. *Page 92*

▶Wall Data has announced Rumba Tools for APPC, a graphical development tool for the IBM APPC interface. *Page 92*

▶Unisys used last week's Cube and Use user group conference to announce plans to port its Mapper application development environment to other vendors' Unix and open systems platforms. *Page 91*

PC SOFTWARE

▶Borland and WordPerfect's cross-marketing agreement marks a small step toward a software suite. *Page 4*

▶Microsoft's announcement that Windows NT will be delayed gives IS managers reason to wonder if they want to be among the early implementors of the new operating system. *Page 37*

▶Borland says its recently released Quattro Pro for Windows is aimed at increasing usability, not functionality. *Page 37*

▶Doctors spruce up their investigative unit with a PC-based tracking system. *Page 37*

CLIENT/SERVER

▶Del Monte cuts costs and IS staff by redesigning business processes and moving to a network of IBM AS/400s. *Page 1*

▶Interstream's new caching product is said to enable users to go on working on NFS client systems even when the server is temporarily out of whack. *Page 68*

▶ParcPlace Systems introduces a new icon-based visual programming environment for client/server applications. *Page 91*

WORKSTATIONS

▶Sun is crashing into previously off-limits 3-D graphics territory with the help of graphics pioneer Evans & Sutherland's new SPARCstation-based Freedom series. *Page 4*

▶The consortium that backs HP's PA-RISC architecture is striving to achieve shrink-wrapped software compatibility across PA-RISC brands and has turned to a rival RISC camp for testing technology. *Page 89*

▶A storage vendor and a systems integrator have joined forces to offer IBM RS/6000 customers what IBM cannot: high-availability clustering software integrated with a fault-tolerant RAID for up to 96G bytes of storage. *Page 24*

PC hardware
• Apple unveils new portable midrange models..... Page 12

Security
• Central Point Software's latest products and services target the increasingly complex problem of fighting viruses ..... Page 43

Conference roundups
• Networld '92 in Dallas features a multitude of exhibits, products, gimmicks and awards ..... Page 16
• Networld attendees flock to groupware demonstrations after discovering that the task-streamlining aspects of the technology go hand in hand with their business re-engineering goals ..... Page 14

Workgroups
• Wal-Mart Stores has deployed wireless, handheld computers in each of its 1,804 stores ..... Page 68
• Revised target dates for Lotus' Notes Version 3.0 will cause only some users to adjust their implementation plans ..... Page 47

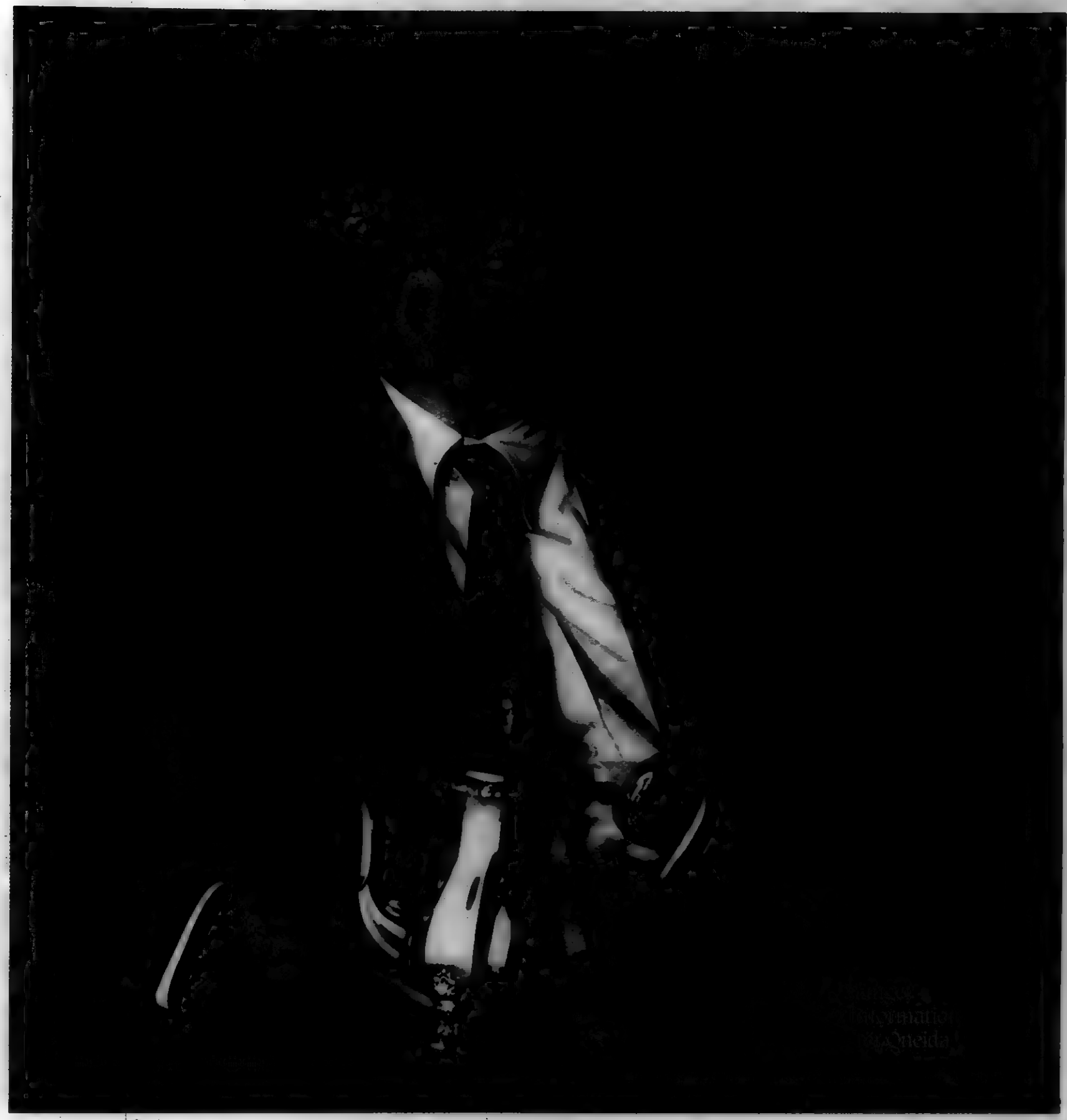
Outsourcing
• As Amoco Canada's use of mainframe MIPS plummets, the company transfers 70% of its IS staff to new outsourcing partner SHL Systemhouse ..... Page 88

Messaging systems
• Users rate their satisfaction with PC-based electronic mail ..... Page 70
• Unexpected up-front expenses and other surprises await those companies that are forced into EDI before they can do the proper planning ..... Page 82

Careers
• Robert Hargrove, an IS professional now working in the aerospace industry, writes about how to pick yourself up after being laid off. ..... Page 33

Departments

Advanced Technology	28
Application Development	91
Buyers' Scorecard	70
Company Index	127
Computer Careers	114
Computer Industry	129
Desktop Computing	37
Editorial/Viewpoint	32, 33
Enterprise Networking	77
In Depth	103
Inside Lines	130
Large Systems	83
Management	107
Marketplace	122
News Shorts	6,16
Product Spotlight	97
Regional Scope	117
Trends	130
Workgroup Computing	47



"When we decided to downsize, I was pleasantly surprised to see that CA's a leading AS/400 software vendor. The fact that they offer the leading AS/400 manufacturing and warehouse software made it much easier for us. It's always better to go with somebody you already know and trust."

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WordPerfect, Borland team up

BY CAROL HILDEBRAND and ROSEMARY CAFASSO
CW STAFF

A cross-marketing agreement disclosed last week by WordPerfect Corp. and Borland International, Inc. could be the first step for the two into software suites. But analysts said the firms will need more ammunition to give them even footing in the fray with Microsoft Corp. and Lotus Development Corp.

Both companies insisted their promotional campaign, which gives their respective users a price break on the other company's key product, is not a response to the suite packaging from Microsoft and Lotus. In fact, a Borland executive said the company is not convinced that suites will have wide appeal. A WordPerfect official, however, said the two firms are working together to strengthen the integration between the two key products.

Dan Lunt, vice president of marketing at WordPerfect, said a suite made up of Office, WordPerfect for Windows, Presentations — WordPerfect's overhauled business graphics package — and Quattro Pro, as well as some sort of database product, certainly made sense, although he said nothing was in the works yet. "There's a natural synergy there," he said.

Lunt said the two companies currently have technology teams working to tighten the integration between their products. "By the next release, the interoperability will be much better expressed," he said, adding that Object Linking and Embedding capabilities will also be in place.

Shot at the competition

Some industry analysts said they suspect the cross-marketing agreement is a first shot at the package their rivals are selling.

"It's an interesting tactic from two companies in a defensive position because of [the availability of] software suites from Microsoft and Lotus," said Bernd Harzog, program director of personal computing at Gartner Group, Inc. "But it doesn't go far enough."

Users expressed some skepticism at the long-term success of any future attempts at a two-company suite of software.

Glen Jurmann, a section manager at Baxter Healthcare Corp., currently uses a suite of Microsoft applications. Jurmann said he would be leery of moving to a Borland/WordPerfect suite because of both integration concerns and long-term strategic issues.

"They're two different vendors, so the products won't be as integrated as Lotus or Microsoft. Unless I saw a merger of the companies, I wouldn't be guaranteed that this is a long-term commitment" for WordPerfect and Borland, Jurmann said. He pointed to WordPerfect's old co-marketing agreement with Lotus, which was scrapped following Lotus' purchase of Ami Pro.

Microsoft's Office and Lotus' SmartSuite, which provide word processing, spreadsheet, graphics and electronic-mail capabilities, list for about $800 each. The suites have been attracting corporate attention for pricing and the promise of integration among a host of business applications, analysts said.

Borland and WordPerfect are also stuck playing catch-up, as Microsoft and Lotus have had their products on the market for two years and six months, respectively.

The Borland/WordPerfect agreement, dubbed the Win-Win campaign, basically consists of cross-competitive upgrades for users of Quattro Pro for Windows and WordPerfect for Windows. Borland users can get WordPerfect for $129, while WordPerfect customers can nab Quattro Pro for $99.99.

Cheaper by the bundle

Borland and WordPerfect's upgrading and suite/bundled prices

Product**	Single price	Suite/Bundled price*
Spreadsheets		
Borland's Quattro Pro	$495	$199
Lotus' 1-2-3	$595	$199
Microsoft's Excel	$495	$188
Word processors		
WordPerfect	$495	$199
Lotus' Ami Pro	$495	$199
Microsoft's Word	$495	$188

*Based on suite price divided by number of products **Windows versions

CW Chart: Janell Genovese

Both companies emphasized that the offer does not constitute their answer to SmartSuite and Office, which is a good thing: Analysts said the companies need to offer a full set of integrated products if they hope to compete.

"Essentially, what they are doing is offering the core part of a suite," said Bill Higgs, vice president of software research at Computer Intelligence/InfoCorp in Santa Clara, Calif. "Is it effective? No, I don't think so. But maybe it was the best response they could come up with at this time."

Users can purchase the cross-referenced products from computer retailers through mid-February.

Sun takes on SGI in 3-D arena

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. is launching itself aggressively this week into a market previously beyond its reach: the high-end, three-dimensional graphics space virtually owned by its neighbor, Silicon Graphics, Inc.

In a joint announcement with Evans & Sutherland Computer Corp. tomorrow, Sun will unveil what analysts agreed is now "the world's fastest 3-D graphics for workstations."

The E&S Freedom Series 1000 and 3000 combine Sun SPARCstation hardware with Evans & Sutherland's graphics accelerators. Available next month at prices from $25,500 to $85,000, the accelerators are customer-installable and connect to Sun's high-end SPARCstation Models 2 or 10 via a single S-Bus card.

The price/performance of the new Freedom series has impressed users and industry observers alike.

"The Evans & Sutherland name adds a lot of credibility, and the pricing is a lot cheaper than the equivalent Reality Engine system from SGI," said Joel Neisen, director of graphics at the Minnesota Supercomputer Center in Minneapolis, which uses about two dozen Silicon Graphics machines.

Battle of 3-D graphics giants

The Sun SPARCstation-based Freedom series from Evans & Sutherland offers better performance at lower prices than Silicon Graphics' top contender

	Freedom 3300	Silicon Graphics' Reality Engine
Memory	32M bytes	32M bytes
Disk	424M bytes	385M bytes
3-D vectors/sec.	3 million	1.2 million
Polygons/sec.	600,000*	350,000
Textured meshes/sec.	240,000*	600,000
Price	$108,295	$128,200

*Requires multiprocessor SPARCstation 10 or uniprocessor with E-cache.

Source: Evans & Sutherland CW Chart: Stephanie Faucher

Just the right hook

The Freedom series taps into Sun's open graphics hardware and software interfaces, so it is binary-compatible with thousands of third-party graphics applications already available on Scalable Processor Architecture platforms.

"Sun has done a good job in providing the right hooks and handles, so third parties like E&S can get in and make it look pretty seamless to users," said Ken Anderson, an analyst and author of a technical guide to Unix workstations published by Altus, Inc. in Santa Ana, Calif. "SGI clearly has mind share in the 3-D market, but this will give people an alternative."

The alliance offers Evans & Sutherland a lucrative opportunity to sell its graphics products on the highest volume workstation platform. But Silicon Graphics is not ready to fall on its sword just yet.

"This is clearly a threat," acknowledged Josh Mogal, Silicon Graphics' product manager for advanced graphics systems. "But it really comes down to our customers doing benchmarks and seeing how these systems compare in actual application performance."

KnowledgeWare to buy CASE consultancy

BY KIM S. NASH
CW STAFF

ATLANTA — KnowledgeWare, Inc. is expected this week to disclose the purchase of a small Detroit consulting firm, the first in an expected series of acquisitions intended to boost the consulting practice of the computer-aided software engineering (CASE) firm.

KnowledgeWare officials confirmed that Computer and Engineering Consultants Ltd. (CEC) will form the base of KnowledgeWare's new Application Development Solution Services (ADSS) Division upon approval of the deal. Financial details were not disclosed, but all 30 CEC consultants are expected to work at KnowledgeWare, which has worked closely with CEC for nine years.

ADSS' mandate is to help users plan and carry out CASE projects, providing more one-on-one guidance than KnowledgeWare has offered in the past.

About average

KnowledgeWare is not completely behind the curve in terms of adding consulting services. Some rivals, such as Intersolv, Inc., have not made much hay in this area. However, others such as Andersen Consulting and Texas Instruments, Inc. already provide extensive CASE counseling.

Users applauded the move, saying CEC will provide two elements crucial to CASE success but currently lacking in KnowledgeWare's offerings: project management tools and big-picture methodology expertise.

A product-only approach to application development "won't achieve the benefits that have been touted" by CASE proponents, said Mike Loo, director of business systems architecture at V. F. Corp., a diversified firm in Greensboro, N.C., that publishes *Vanity Fair*. The company is using more than 250 copies of KnowledgeWare's Application Development Workbench (ADW) in projects in several divisions.

KnowledgeWare tools, like those of other CASE makers, have been criticized for not delivering on promises such as increasing programmer productivity.

The company said it hopes to erase that reputation by beefing up its services, offering more extensive tool training and showing users how to use CASE in the context of larger business initiatives.

KnowledgeWare will likely see $25 million to $30 million in revenue from ADSS during the first year in operation, according to a source close to the firm.

Whirlpool Corp., a Benton Harbor, Mich.-based appliance maker, hired CEC rather than KnowledgeWare to train programmers because of Foresight, CEC's methodology, said Dick Bohanek, a senior systems analyst.

Foresight, which KnowledgeWare will sell after the acquisition, is a framework for planning and implementing software-building projects based on Information Engineering.

"We hope to see better integration of those utilities with ADW," he added.

Jonathan Harding, a former consultant at Computer Task Group, Inc. in Buffalo, N.Y., was appointed to head ADSS.

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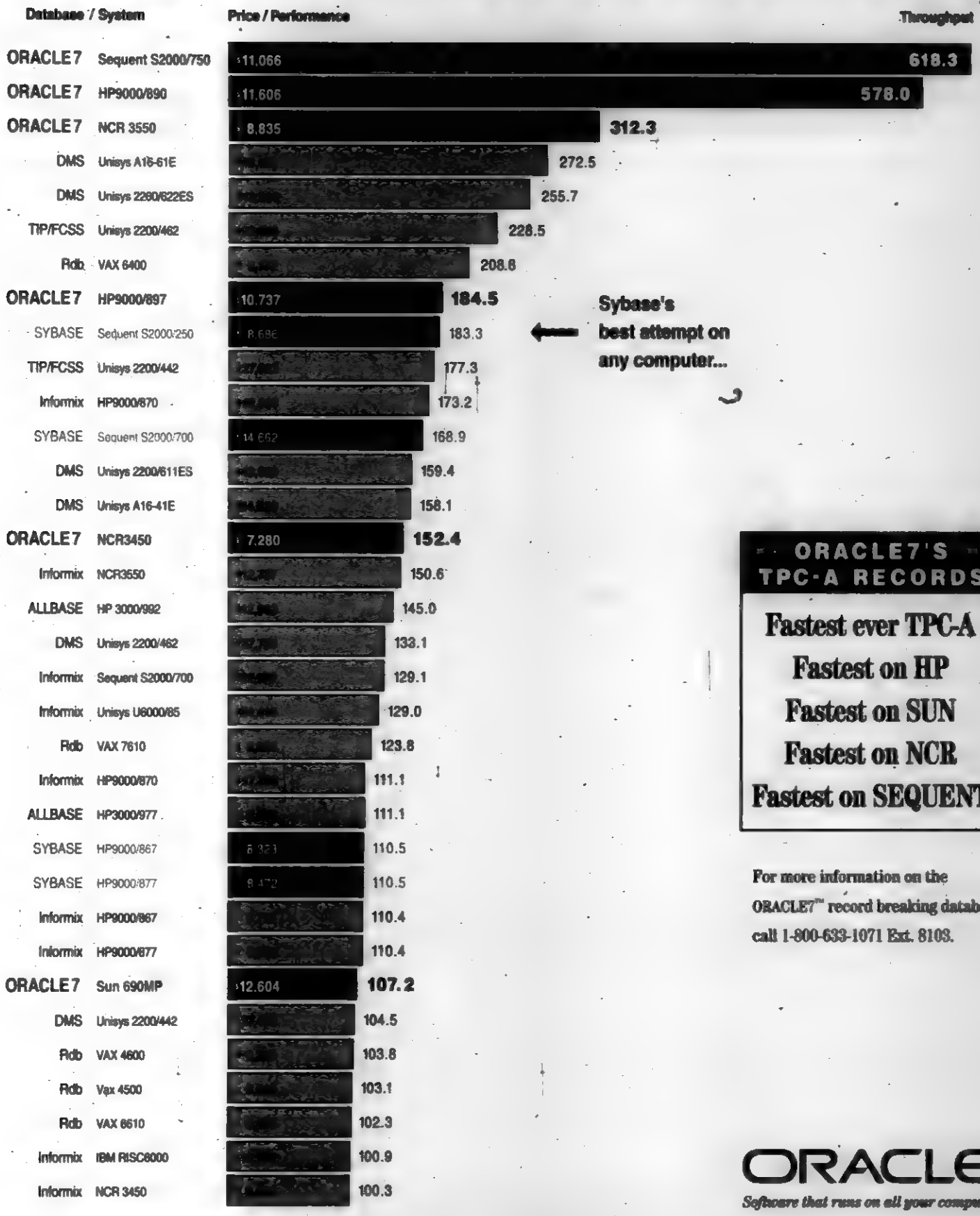

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NEWS SHORTS

Toll fraud suit settled

AT&T and Mitsubishi International Corp. have agreed to settle an outstanding dispute involving remote-access toll fraud. In June 1991, Mitsubishi charged AT&T with negligence and misrepresentation after it discovered that hackers had broken into Mitsubishi's computer system and run up a phone bill of $430,000. AT&T countersued for the money a year later. The terms of the settlement were not disclosed.

Review ordered in bundling suit

The U.S. Supreme Court last week ordered an antitrust case won by Prime Computer, Inc. (now Computervision Corp.) to be reconsidered in light of the high court's recent decision against bundling practices that harm independent service firms [CW, June 15]. Virtual Maintenance, Inc. in Rochester Hills, Mich., had accused Prime of tying software updates with computer maintenance and won a $25.3 million jury verdict in 1990, but that was overturned on appeal. Now, the federal appeals court must decide whether to reinstate the jury award for Virtual Maintenance.

U.S. says no to Inslaw investigator

U.S. Attorney General William Barr said last week he will not appoint an independent counsel to probe allegations that the U.S. Department of Justice stole software from Inslaw, Inc. and sought to drive the company out of business. The House Judiciary Committee recently demanded such an appointment as part of a three-year investigation, which cited a "high-level conspiracy" in the Justice Department to defraud Inslaw. In a statement, committee Chairman Jack Brooks (D-Texas) said the Barr decision may be a "fatal mistake . . . at a time when the public trust in the agency has been severely shaken as a result of the handling of the Iraq inquiry."

Vendors to demonstrate SMP protocol

At Interop '92 Fall next week, Hewlett-Packard Co., Digital Equipment Corp. and Hughes LAN Systems, Inc. are expected to demonstrate prototypes of the Simple Management Protocol (SMP) on their network management products in order to show that the protocol is a viable successor to Simple Network Management Protocol. A working group appointed by the Internet Engineering Task Force hopes to hammer out a final version of SMP by year's end, vendor spokesmen said.

Royal Bank building new data center

By year's end, Royal Bank of Canada will have a new data center as a backup facility, according to Vice President John Wood. On the IS agenda for next year, he said, is the possibility of consolidating the bank's nationwide array of Tandem Computers, Inc. computers and replacing some older mainframes.

Microsoft signs CD-ROM deal

Microsoft Corp. and InfoNow Corp. have announced an OEM agreement whereby Boulder, Colo.-based InfoNow will distribute Microsoft software products via its proprietary electronic distribution system. Subscribers to InfoNow's service receive a CD-ROM that contains technical information about and copies of various software. The subscriber orders packages directly from InfoNow or downloads the software from the CD-ROM.

Short takes

Component Software Corp. plans to announce its Component Workshop development tools for the Apple Computer, Inc. Macintosh this week. The Lexington, Mass., company is a spin-off of Mitch Kapor's **On Technology, Inc.**, which was originally founded to create cross-platform programming tools and interfaces. . . . Former **IBM** Great Lakes area general manager Robin W. Sternbergh has been named the first general manager of business process engineering at IBM U.S. She will report directly to IBM North America head Robert LaBant.

More news shorts on page 16

Super CPU maker widens aim

Thinking Machines targets broad commercial database applications

BY JOHANNA AMBROSIO
CW STAFF

CAMBRIDGE, Mass. — Thinking Machines Corp. last week introduced a low-end parallel processing computer targeted at new kinds of commercial database applications.

The company will continue to target its traditional scientific and technical users with the new computer but will also push harder into commercial sites, according to James Bailey, Thinking Machines' director of marketing.

"There are existing products that do a good job of on-line transaction processing and of building databases," he said. "But the machine that creates the data is not powerful enough to understand the data."

So Thinking Machines is positioning its computer as a back-end processor to mainframes. Thinking Machines' wares will chunk through massive amounts of data and find patterns among customer files, for example. "These are applications that don't exist today — applications where the answer depends on looking at all the data instead of at just pieces of it," Bailey said.

Eventually, he said, the parallel computer will replace the mainframe entirely. At that point, the computing power in an organization will consist of desktop workstations and a series of scalable, parallel processors, he said.

At the low end of Thinking Machines' family is the new CM-5 Scale 3 machine, built around Sun Microsystems, Inc.'s Scalable Processor Architecture processor, which features disks and processing nodes in one computer. Users can customize the mix of 3.5-in. disks and processors.

Pricing for the machine, which is available now and runs a variation of the SunOS Unix-based operating system, starts at $750,000. Larger members of the CM-5 family began shipping in late 1991 and are priced from $1.5 million to $3 million.

Data, no matter where it originates, can be stored in one format, the firm said, noting the machine's file server potential. A system with 384 disk-storage nodes has a capacity of 3T bytes and a transfer rate of 4G byte/sec., compared with traditional disk storage systems with transfer rates of about 90M byte/sec.

Also new from Thinking Machines is a tool that allows users to convert old Fortran-77 code into a version of Fortran that is optimized for the parallel computer. The tool, called the Convex Machine Automated Translation, or C-MAX, is bundled into a programming workbench and is not priced separately.

There are no immediate plans to introduce a similar tool to allow applications written in Cobol or C to run in a parallel environment, the company said. These tools would be more useful to commercial users than the Fortran tool.

Observers agreed that the data storage capabilities were among the most exciting features of the Scale 3 computer. "The configuration of a smaller CM-5 is not a surprise. The new disk capabilities are the most significant," said Donald Young, an analyst at Lehman Brothers, Inc.

All of the application packages that run on Thinking Machines' CM-5 family are firmly rooted in the scientific and technical arena, but that will change within the next month, according to President Sheryl Handler.

Although the new Scale 3 computer has no commercial customers yet — it was beta-tested at two universities — some older Thinking Machines customers are already doing data-intensive applications. For example, the U.S. Bureau of the Census is using a Thinking Machines computer to automatically assign code numbers to the profession descriptions that people write down on the census forms.

In addition, Bailey said, Dow Jones News Retrieval and American Express Co. use Thinking Machines iron for database tasks. He said, "We work with a lot of companies we can't talk about because of the proprietary nature of the application." The firm has about 100 customers.

Still, slugging it out in the commercial marketplace will be slow going, most observers agreed. "These machines are very good at processing large amounts of data, and it's a good move to extend the family downward," said Neena Buck, vice president at New Science Associates, Inc., a consulting firm in Westport, Conn. "But it will be a while before most of my [commercial] client base recognizes that."

Young said, "I don't think Thinking Machines will be naive enough to bank the company on the commercial market."

HP, Convex pact ties RISC boxes to minisuper systems

BY ELLIS BOOKER
CW STAFF

PALO ALTO, Calif. — Extending a business and technology pact signed in March, Hewlett-Packard Co. and Convex Computer Corp. last week introduced systems that combine parts of both product lines.

For starters, the companies announced a system that, when running "cluster" software from Convex, transforms a network of HP Apollo 9000 Series 700 workstations into a loosely coupled parallel computer.

Convex, meanwhile, announced a new platform, the Meta Series, which is said to integrate a Convex C minisupercomputer with an HP Series 700 cluster connected over a high-speed fiber or custom network.

Robert J. Paluck, chairman, president and chief executive officer of Richardson, Texas-based Convex, described the announcement as the first of many and said it was a step toward "metacomputing."

Metacomputing, Paluck explained, will comprise heterogeneous hardware connected by high-speed networks with common applications working transparently to the user.

"[Engineering] users spend 10 times as many dollars on workstations as on supercomputers," said Gary Smaby, president of Smaby Group, Inc., a high-performance computer consultancy in Minneapolis. As a result, Smaby said, it makes sense that new high-performance topologies will evolve from the desktop out.

Asked why HP needs a supercomputer vendor to plumb this opportunity, Smaby said that "companies like Convex and Cray [Research, Inc.] have been a test bed for early parallel processing efforts. He added that HP can benefit from Convex experience in compilers and applications.

An HP official suggested last week that one application of a cluster could be in financial services settings, where individual workstations could be clustered after-hours to handle chores better suited to parallel processing.

The cluster product will range in price from $70,000 for a two-CPU system to more than $400,000 for an eight-CPU configuration linked by a Fiber Distributed Data Interface local-area network.

The Meta Series, now in beta testing, will be sold exclusively by Convex, starting at $500,000. This platform will also be a stepping-stone to Convex's next-generation, massively parallel supercomputer, which will use Precision Architecture-RISC.

Both systems are slated for availability in first-quarter 1993.

Citicorp banks on CA licensing pact

CONTINUED FROM PAGE 1

the bank uses, the Islandia, N.Y., software vendor said.

MIPS-based pricing is expected to generate significant but undisclosed cost savings for Citicorp, according to Colin Crook, senior technology officer at the $219.3 billion bank holding company. Citicorp and CA executives declined to discuss financial aspects of the contract.

Crook said the deal with CA was designed to enable the bank to develop a standard technology infrastructure.

Citicorp is consolidating its data centers and moving more aggressively into distributed computing as part of a 21-month-old plan to reduce costs and restore earnings growth. The bank plans to work with all of its vendors to achieve cost savings. "We want all of our vendors to change the way they deal with products," Crook said.

> "EVERYONE AGREES that tiered pricing is ridiculous because of the cost escalation" tied to CPU upgrades.
>
> DICK KANE, ITT HARTFORD

Crook would not elaborate on the bank's consolidation efforts, nor would he outline the client/server platforms the bank has adopted.

Crook said the CA/Citicorp agreement will provide the bank with the flexibility to restructure its technology base. "There is a user-oriented view of software [built into this agreement]," Crook said.

That "user-oriented view" was heartily welcomed by CA customers and industry analysts. David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh, said the CA/Citicorp deal illustrates how CA is trying to liberalize its pricing policies.

Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc., agreed. In Loane's opinion, CA has earned a reputation as a difficult vendor for users to work with, in terms of pricing and other policies. "If they're working to solve the problem, more power to them. We've had a stormy relationship [with CA] over the years, so I hope they are addressing these issues."

MIPS-based pricing does not appeal to Loane, however, because the Fort Lauderdale, Fla.-based car rental agency is increasing its MIPS use at a 50% annual clip.

Users said they would welcome alternatives to the tiered-pricing model. "Everyone agrees that tiered pricing is ridiculous because of the cost escalation" tied to CPU upgrades, said Dick Kane, department head of technical infrastructure and support at ITT Hartford.

Kane said a flat-rate or usage-based pricing model would benefit large IS shops such as ITT Hartford because these installations rely on large or multiple CPUs to run their software and typically license systems software based on the size or number of those CPUs.

Moore said the CA/Citicorp agreement will produce a ripple effect in the software industry. "This is going to put some pressure on other mainframe software vendors" to change their licensing practices, said Moore, who added that Mellon Bank licenses software from nearly 40 mainframe software vendors.

A spokesman at IBM said the company does not plan to change its pricing policies but will instead work with customers on improving the price/value ratio.

Moore and CA have discussed changing Mellon's tiered-licensing agreement to a "seat" pricing model, under which Mellon would be charged by the number of people who use specific CA programs throughout its computing enterprise. Moore said CA is studying this arrangement for Mellon, but he added that seat pricing is a complex model that would be difficult to monitor.

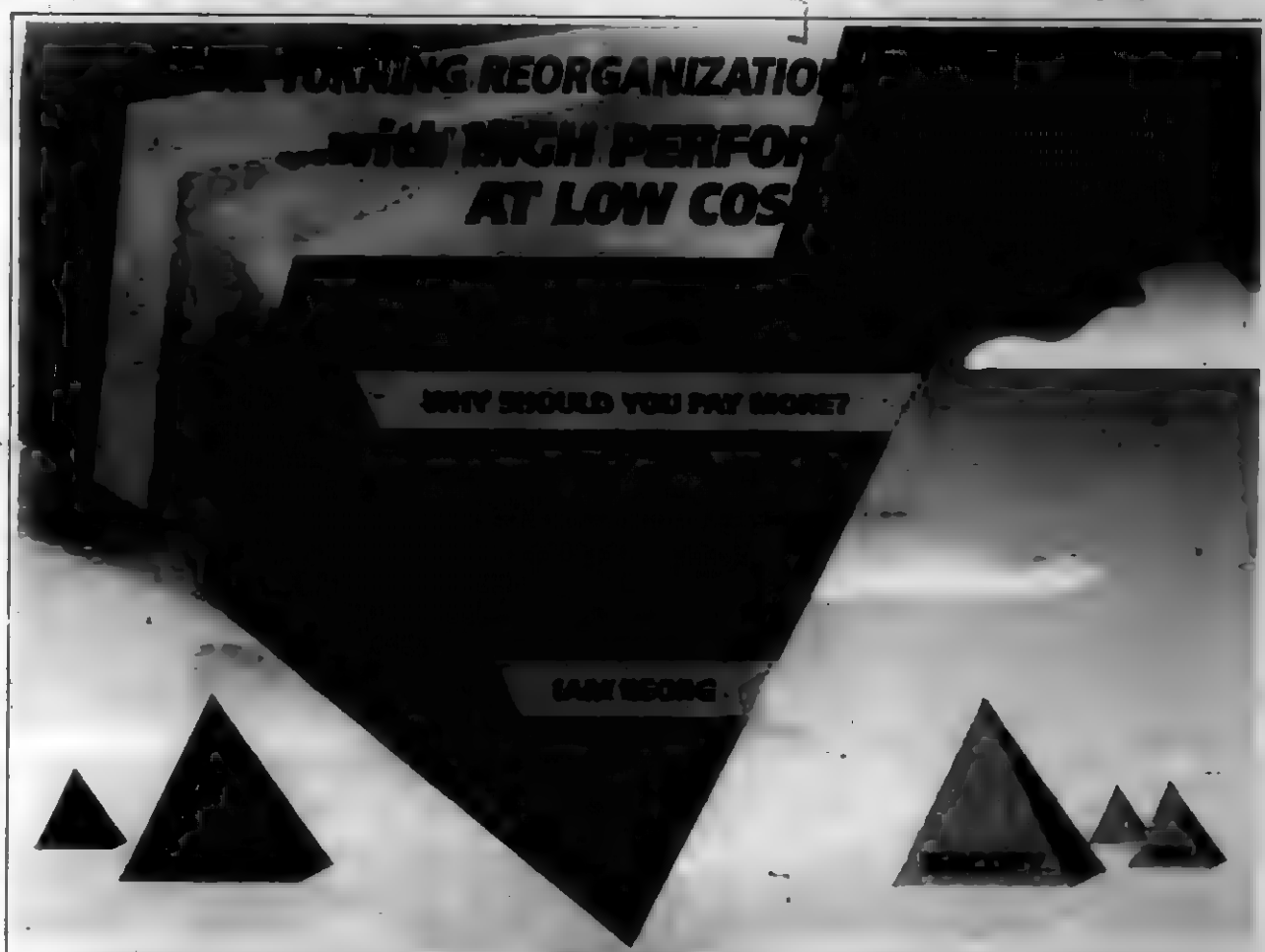
Willing to change

Moore said he is ready to abandon tiered pricing if there is a cost-effective alternative. "We'd like to understand the terms and conditions to see if [flat-fee or usage-based pricing] makes sense for us," he said.

Ed Acly, director of software research at Technology Investment Strategies Corp., a Framingham, Mass., market research firm, lauded CA's shift away from tiered pricing, calling it "a sound business move." Acly said CA's attempts to develop more flexible pricing initiatives would improve the vendor's revenue as well as its relationships with customers.

The CA/Citicorp agreement is similar to one CA reached with General Electric Co. in April. However, GE's Enterprise License covers only its IS operations in North America while Citicorp's licensing agreement is worldwide.

CA's Wang said the software firm is close to completing several enterprise licensing contracts with customers, including an unnamed federal agency.



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INNOVATION 20 YEARS

Pyramid Unix tack keeps host alive

BY MARK HALPER
CW STAFF

SAN JOSE, Calif. — Pyramid Technology Corp. last week introduced the latest entry in the race to move Unix multiuser boxes into the data center and embarked on a strategy that weans users off mainframes instead of yanking their big iron outright.

The Pyramid tactic, which draws on software and integration technology provided by mainframe industry partners Comdisco, Inc. and Integris Co., calls for users to process transactions on the new Pyramid MIServer ES Series introduced last week while holding on to their mainframe database.

As for the ES line, analysts applauded its performance and scalability. The ES Series runs up to 24 R3000-type processors — twice Pyramid's earlier limit — providing a maximum of 768 million instructions per second. Prices range from $120,000 for a two-processor version to $2.2 million for a 24-processor model with 175G bytes of storage and 256M bytes of memory.

Pyramid's mainframe coexistence approach is intended to save users the expense of running costlier mainframe transaction processing software and of purchasing expensive mainframe upgrades.

Conceding that many large information systems shops are not yet ready to abandon their DB2 mainframe database programs for relational offerings from Oracle Corp., Informix, Inc., Sybase, Inc. and others, Pyramid and its partners said users may eventually want to put more functionality on the Pyramid machine.

"That's our strategy — to take small steps and make them comfortable, as opposed to taking a step off the cliff," said Russell West, senior vice president of strategic planning at Comdisco.

"Users have so many millions of dollars invested [in mainframes] they can't just jump out the door," observed David Dearth, director of systems and technology management at Dallas/Fort Worth International Airport, which runs financial programs on Pyramid's earlier S model without mainframe support.

The approach of offloading rather than replacing mainframes is a savvy one, according to John Jones, an analyst at Salomon Brothers, Inc. in San Francisco. He said many users are not willing to migrate to new databases.

"There's a real question as to whether Sybase and Oracle are industrial-strength, with all the bells and whistles that IBM has with its database technology," Jones said.

Analysts pointed out that the shared approach differs from Hewlett-Packard Co.'s data center initiative, which, they noted, seems more intent on mainframe replacement. HP product line director Doug Gibson said last week that HP is seeking both replacement and offload sales. HP's move to port IBM's CICS transaction processing monitor to HP minicomputers [CW, Oct. 5] helps position the HP machines in a coexistence scheme, he said.

West further noted that data center cohabitation also answers IS managers' concerns that Unix still lacks the security and other features that would make it a suitable data center engine because many functions would still reside on the mainframe operating system.

That approach made sense to Pyramid users such as Dearth, who noted, "Unix is not there to the extent it needs to be so that the customers have all the security they need."

While the foundation of the new platform is the Pyramid machine, Integris and mainframe leasing stalwart Comdisco are supplying two crucial elements. Integris, a systems integration unit of Groupe Bull, is providing a Unix version of IBM's CICS, called UniKix, and Comdisco is furnishing connectivity that ties the Pyramid ES Series into the mainframe. That technology includes a multichannel line called Hyperchannel, supplied by Network Systems, Inc. in Minneapolis, which Comdisco resells.

Unplugged

Downsizing is often not a matter of just unplugging the mainframe, noted Russell West, Comdisco's senior vice president of strategic planning, at last week's Pyramid introduction. Rather, he said, it entails offloading most functions other than data storage.

Citing Computer Intelligence/Infocorp figures showing that total installed mainframe millions of instructions per second in the U.S. rose from 139,000 in 1988 to 341,000 this year, West said that despite the prevalence of mainframe doomsayers, big iron is not rusting away.

Further, he said, users these days are just as likely to ask, "Why do these LANs cost so much?" as they are to question pricey mainframes.

MARK HALPER

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Services link frame relay, X.25

Users have pick of LAN interconnections from AT&T, BT, DEC, others

BY ELISABETH HORWITT
CW STAFF

This month is seeing a bevy of introductions that promise users the chance to mix and match frame relay's high-speed networking capabilities with their local-area network router and X.25 links.

Users want to be able to install whatever network technology is most cost-effective for a site and then let those sites communicate, said Rick Malone, a principal at Dedham, Mass., research firm Vertical Systems Group.

"So for $5 to $6 an hour you send a bunch of packets at modem speeds over dial-up services to a LAN that is using frame-relay services," he said. This works well for traveling salesmen with laptops, Malone added.

Last week, AT&T announced a service that enables users to send data via dial-up modem link into AT&T's network, where it is converted first to X.25 and then to Transmission Control Protocol/Internet Protocol (TCP/IP) packets, which are delivered to the recipient's LAN via AT&T's frame-relay service, an AT&T spokesman said.

BT said it will deliver an X.25-to-frame-relay gateway service in December. Such services respond to BT customers such as Frank Russell Co., which wants to move some of its larger sites from X.25 to BT's frame-relay service. The Tacoma, Wash.-based financial services firm wants frame-relay users at large sites to be able to communicate with smaller sites that will still make use of the lower speed, lower cost, dial-up X.25 service [CW, Oct. 12].

And at the Interop '92 Fall show next week, Digital Equipment Corp. will deliver on promises made last year to add a variety of networking capabilities to its DECnis family of high-end routers. Added support will embrace Novell, Inc.'s IPX and Apple Computer, Inc.'s AppleTalk, frame relay and Fiber Distributed Data Interface (FDDI), a DEC spokesman said.

In addition, DEC plans to enhance its DECHub 90 intelligent hub with an Ethernet fiber LAN module and Simple Network Management Protocol management capabilities, according to a DEC spokesman.

DEC will also announce DECWAN Router 90, a new member of the DECHub family that will support TCP/IP, DECnet IV, DECnet V and X.25 protocols, the spokesman said. The product can be used as a stand-alone router priced at $2,300 or integrated into DECHub 90, he added. DEC intends to add Token Ring and FDDI support to its hub family early next year, with Asynchronous Transfer Mode (ATM) support scheduled for later next year, the spokesman said.

Other announcements expected at Interop include the following:

- Sun Microsystems, Inc. subsidiary **SunConnect** is slated to announce a network card that will enable Sun SPARCstations to communicate over wide-area networks using frame relay.
- **Hughes LAN Systems, Inc.** is scheduled to announce a new router combining frame relay, ATM and LAN routing.
- Cray Electronics Holdings PLC subsidiary **Cray Communications** will announce a family of frame-relay products that will support encryption, bridge routing, packet switching and voice over frame relay, the company said.

APPI Forum forms to develop SNA network

BY ELISABETH HORWITT
CW STAFF

MOUNTAIN VIEW, Calif. — Support began polarizing last week between IBM's Advanced Peer-to-Peer Networking (APPN) protocol and Cisco Systems, Inc.'s upstart Advanced Peer-to-Peer Internetworking (APPI) protocol, following the unveiling of the membership of the APPI Forum.

Founding members of the forum, the self-appointed task of which is to develop an "open, TCP/IP-oriented solution to SNA peer-to-peer networking," will meet for the first time at Interop '92 Fall in San Francisco next week.

The forum's goal is to submit a full APPI specification to the Internet Engineering Task Force (IETF) by mid-1993, Cisco said. Official approval of APPI by the task force is expected within two years, the company added. IETF is a standards body that oversees such protocols as Transmission Control Protocol/Internet Protocol (TCP/IP) and Simple Network Management Protocol.

The 13 founding members are Cisco, Digital Equipment Corp., Hewlett-Packard Co., McData Corp., Netrix Corp., BT, Proteon, Inc., Sun Microsystems, Inc.'s SunConnect division, Cascade Communications, Alcatel Co., Cabletron Systems, Inc., SynOptics Communications, Inc. and Infonet Services Corp. Cisco said it will release additional names shortly.

Hassle-free

Cisco announced in late August that it would work with industry partners to develop APPI as a way of letting users route Systems Network Architecture (SNA) traffic over internetworking backbones using TCP/IP routing protocols [CW, Sept. 7]. This would save end users the expense and trouble of implementing and supporting an entirely new routing architecture (IBM's APPN) on their networks, Cisco said.

While joining the task force does not commit a company to implementing APPI in its products, members did say that they saw APPI as a potentially more open, standards-based, customer-friendly internetworking standard than APPN.

"The APPI Forum is open to anyone who wants to join" and is oriented toward standards-based, open protocol routing, a DEC spokesman said. "APPN is providing yet another alternative [to SNA internetworking] that is less open, since IBM sells the license and retains the right to change it." DEC is "looking at how and when [it] would implement APPI," he said.

IBM said it was not yet prepared to respond to the task force announcement. However, Wellfleet Communications, Inc. and 3Com Corp. responded by reaffirming their commitments to implementing APPN in their products.

3Com is on track with plans announced last spring to release an APPN Network Node product by the end of next year, a spokesman said. 3Com expects strong demand for APPN from a growing number of customers that are implementing IBM's Advanced Peer-to-Peer Communications protocol on their personal computer local-area networks, he added.

Task force members Cabletron and Cisco announced intentions to support both APPI and APPN. HP "hopes to support APPI if it lives up to what it is purported to be," a spokeswoman said. While the company has not yet licensed APPN from IBM, HP can support APPN through its existing licensing agreement with Wellfleet, she added.

Microsoft, Novell offer flexible pricing schemes

BY MICHELE DOSTERT
CW STAFF

Targeting the large, multiserver local-area network market, Microsoft Corp. and Novell, Inc. have added per-node pricing schemes to their LAN operating system products.

However, per-node pricing can be a double-edged sword. Early reports from users indicated that Microsoft's approach has infuriated some users.

Previously, Microsoft's LAN Manager and Novell's NetWare were sold "by the server" — that is, users bought a server license at a price that escalated depending on the number of user licenses attached. For example, the price of a server license for NetWare v3.11 with 250 authorized users lists at $12,495, or about $50 per seat.

However, users wishing to add another server to be accessed by the same 250 users had to pay the $12,495 all over again. Thus, the cost per seat for the same user goes up $50 for each additional server attached.

"We have 40 servers, so we are very, very interested in a per-user license," said Karen Scott, manager of computer networks at Weil, Gotshal and Manges, a New York law firm. "Every time I add a server, I have to pay the whole price over again. We buy it as cheap as we can off the shelf from Egghead Software, but as it stands now, we're not getting any volume discount. We paid a tremendous amount to put NetWare 3.11 on all our servers."

Giving users options

Responding to pressure from customers such as Scott, Novell has said it will offer three separate pricing schemes to its large customers: traditional per-server pricing, optional per-node pricing with no penalty for adding servers and a "Gold Disk" site-license scheme, licensing NetWare to an unlimited number of users and servers at a site.

Novell has not yet announced prices for any of the new licensing schemes, but analysts said they expect the cost per seat of multiserver NetWare LANs to drop significantly.

Large NetWare users said they were excited about both new pricing options. "We would be very interested in either a 1,000-user site license or a per-user license, depending on how the numbers shake out," said Bob Tivey, director of information systems at Cadwalader, Wickersham & Taft, a New York law firm. "For one thing, paying per user rather than per server would make it easier and cheaper to segment our LAN so the whole office won't stop if a server goes down."

According to Bob Young, product marketing manager for Novell's NetWare products, large Novell customers will soon have three options: traditional server-based pricing, a per-user pricing structure that is not tied to servers and a site license, with optional direct support from Novell and upgrade protection.

"In talking to our large customers, they wanted more flexibility in the way they installed and managed their NetWare while still keeping their costs down, so we designed this pricing structure to accommodate them," Young said.

Microsoft, meanwhile, last week unwrapped a new pricing scheme for its newly announced LAN Manager 2.2 product. LAN Manager 2.2 will be priced at $1,995 per unlimited-user server license for first-time users; LAN Manager 2.1 users can upgrade for $295 per server.

Users who are willing to purchase Microsoft's forthcoming Windows for Workgroups will get the necessary client software included free of charge. DOS, OS/2 and Windows 3.1 users who do not plan to buy Windows for Workgroups must buy client software from Microsoft priced at $65 per client.

For example, a firm with 100 users on a single LAN Manager server that wishes to upgrade to LAN Manager 2.2 would pay $6,500 in client software upgrades, in addition to the $295 per server licence. This is a strong disincentive for single-server LAN Manager users to upgrade to LAN Manager 2.2.

At Microsoft's Networld announcement, one startled LAN administrator at a Midwestern bank that uses LAN Manager 2.1 said per-node pricing for his DOS and Windows clients had put the price of an upgrade way out of his reach. Microsoft seems "a lot more concerned about the people who are going to buy Windows for Workgroups than about us who have already bought LAN Manager 2.1," he said.

However, Ruth Warren, Microsoft's product manager for LAN Manager, said, "We are seeing more and more multiserver LANs; if those 100 users all attach to the same five servers and they upgrade to [LAN Manager] 2.2, the cost of the upgrade is just $43 per server per seat. And if they upgrade their desktops to Windows for Workgroups at the same time, the cost of their connectivity is almost nothing."

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Del Monte reaps fruits of IS overhaul

CONTINUED FROM PAGE 1

food processing industry that "are very sophisticated" computer users, according to David Leibowitz, senior vice president at American Securities Corp., a brokerage firm in New York.

The twisted financial past of the No. 1 fruit and vegetable processor in the U.S. had sometimes stunted the firm's technology progress. Del Monte started life as a brand name, not a company. It eventually became a subsidiary of R. J. Reynolds Industries in 1978, then merged with Nabisco Brands, Inc. when Reynolds bought Nabisco in 1983.

Del Monte wanted to revamp manufacturing systems back then, but corporate computing needs came first, said Ibrahim Mussa, director of manufacturing systems and telecommunications. However, a leveraged buyout by Merrill Lynch & Co., Del Monte managers and private investors in 1990 greased the wheels of technological change. Once Del Monte was on its own, it had more freedom to spend where management saw fit, Mussa explained.

"We [in manufacturing] had been in the backseat for so long that once we got the funding, we were more than ready to tackle" the AS/400 project, Mussa said.

The shaky shape of Del Monte's Series/1s also motivated the company to overhaul its information systems. The machines required a lot of maintenance time and personnel time because of frequent breakdowns, according to Mussa. The downsizing was "an operational necessity," he said. "We didn't want to chance not making it through the next growing season."

Staff from Del Monte's IS group teamed with integrators and software developers from Electronic Data Systems Corp. to rewrite applications and set up wide-area networks connecting facilities in 14 states. The whole shebang came in on time and within the $12 million budget, too.

Teamwork had a lot to do with the job's success. Four groups of Del Monte IS staff and EDS workers recruited users and managers at processing and cannery plants to lay down the law on what the revamped systems should look like and which new functions were to be added.

That saved much bickering and miscommunication, according to Hank Caputo, Del Monte's manager of manufacturing systems development. The two-year effort "would have taken four to five years if we didn't have teams," Caputo estimated.

IBM beat out Digital Equipment Corp. on the hardware side for a few reasons. For example, poor experience with DEC field service on VAXs used in a frozen-foods division tipped the scales in IBM's favor, as did DEC's "worrisome" financial statements, Mussa said. Plus, the AS/400 "is new technology, whereas the VAX is trailing edge," he added.

That AS/400 technology, combined with custom software designed by teams of EDS and Del Monte personnel, has paid off. For example, the accuracy of harvest forecasting — and therefore packing and finished product predictions — has improved under the new system, while processing time has decreased. Plant managers previously entered crop counts and farmers' work hours into dumb terminals connected to Series/1s, which sent the data to an IBM mainframe in San Francisco. A day or more passed as reports were generated; then another several hours or more lapsed as data was cross-checked and corrections were made.

The new setup, with System Software Associates, Inc.'s Business Planning and Control System manufacturing package at its core, sports snazzy graphical interfaces customized for Del Monte's specialized applications, such as farmer payroll.

Now all plant and cannery data processing is done locally, with only weekly summaries sent to headquarters. Users said they particularly like the AS/400's internal database.

Users are also freer now to invent better ways to do their jobs. Tasks such as what-if analyses are now possible for, say, predicting crop growth under certain weather conditions. Temperature and humidity are keyed in regularly and calculated against standard farming variables for each kind of crop. Growers can predict, within a couple of days, when a plant will be ripe and how much the crop is likely to yield.

"Before, we never had the time to think proactively. We were too concerned about whether the computers would fail and how long it would take to get our reports back," said Doral Nelson, plant controller in Crystal City, Texas, one of 32 Del Monte plants nationwide.

William Mercer McLeod

Del Monte's Mussa: *'We had been in the backseat for so long that once we got the funding, we were more than ready to tackle' the AS/400 project*

Downsizing fruits

Del Monte's switch from lumbering Series/1s to AS/400s will reduce current and long-term costs

Project budget	$12 million
Estimated savings on maintenance	$1.5 million annually
IS staff impact	Reduced by 33%, from 240 to 105
Systems	6 AS/400 Model D50s, 18 AS/400 Model C6s, C10s, B35s
Applications	System Software Associates' manufacturing and CASE software
Service	EDS integration, development
Communications	Sprint, providing 19.2K and 14.4K [illegible]

Source: Del Monte Foods — CW Chart: Stephanie Faucher

Apple set to unveil four PowerBooks

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. is slated to unveil today four slim new models in its successful PowerBook portable line, including two that can be docked to desktop machines.

The company also plans to beef up its Macintosh II mid-range offerings with the addition of the Macintosh Models II VI and II VX, both based on Motorola Inc.'s 68030 microprocessor.

However, Apple officials said that only the 33-MHz Macintosh II VX will be available domestically because the recently introduced Performa line duplicates some of the functionality of the 16-MHz Model II VI.

Apple's latest portable offerings are the PowerBook Duo 210 and 230, which feature a desktop docking mechanism. The 4.2-pound notebooks feature a backlit supertwist display with 640- by 480-pixel resolution and 16 shades of gray. Prices for the 210 and 230 begin at $2,249 and $2,609, respectively. Both also require the $1,079 Duo Dock for desktop use.

Also on the rollout schedule are the $2,429 PowerBook 160 and the $3,869 PowerBook 180. The Model 160 PowerBook features a backlit supertwist LCD screen, while the 180 offers an active-matrix design.

Worth a look

Users said the new models, particularly the dockable PowerBook Duo, will get a close look. "They sound very intriguing," said Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. Lester said the firm's salespeople now use Macintoshes, but the machines are "nailed to their desks." A dockable portable could provide the best of both worlds for work done both in the office and on the road, he said.

In the year since they were introduced, Apple has sold 400,000 PowerBooks and turned the sleek portables into a billion-dollar business, according to product manager Bruce Cooper. Unlike the way it fumbled the ball in the portable market when it delivered a late and heavy machine, Apple may have timed the PowerBook perfectly.

Sales of notebook personal computers are expected to make up more than half of the nearly 5 million mobile PCs projected to ship in 1995, according to Norwalk, Conn.-based research firm InteconCorp.

Portable lock

The portability of notebook computers also makes them a tasty target for thieves with nimble fingers, so Apple has added an extra feature to the new PowerBooks to make sure they stay in the hands of their owners.

The new machines feature a small slot built into the back of the machine in which users can install a locking device built by San Mateo, Calif.-based Kensington Microware Ltd.

Kensington's MicroSaver Security Standard features a 6-ft galvanized steel cable that can be wrapped around any immovable object while its locking end is slipped into the PowerBook slot and fastened. Removing the device without a key is reportedly next to impossible, and attempts to do so will damage the computer.

Kensington's device has gained increasing acceptance from portable computer makers in recent months and can also be found in lightweight PC models made by Compaq Computer Corp., AST Research, Inc. and Toshiba America Information Systems, Inc.

JAMES DALY

CORRECTIONS

The article "Pen computing sparks interest" [CW, Oct. 5] mistakenly referred to the Pen-based Expo in Los Angeles by the wrong name.

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A chart on Apple Computer, Inc.'s PowerBook notebook family [CW, Oct. 5] was based on information supplied by the CW Database Division.

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In a story on Digital Equipment Corp.'s strategy for massively parallel computing in the Oct. 12 issue, a sentence that said DEC will ship Intel Corp. I860-based systems should have said that DEC's Paragon-based Intel systems will ship next summer. The I860-based systems began shipping last month.

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Users look to groupware to increase business efficiency

BY JOANIE M. WEXLER
CW STAFF

DALLAS — The explanation for the steady crowds at the groupware booths at Networld '92 last week ran deeper than the free T-shirts most were giving away.

Many users said the groupware concept of sharing databases, electronic calendars, messaging systems and other services designed to streamline business tasks involving groups parallels their current missions to reorganize how they work. Their goal is to accomplish more without adding staff, and groupware may just be the ticket.

"Groupware fits our current re-engineering efforts because we're being asked to do more with the same or fewer resources," explained Roger H. Allott, an assistant district attorney in Englewood, Colo. He is also a Futurus Corp. team groupware user who heads up a data technology planning committee for prosecutor offices in the state.

Aside from Futurus, other packages drawing on groupware concepts that drew throngs at the show were Lotus Development Corp.'s Notes, Microsoft Corp.'s Windows for Workgroups and WordPerfect Corp.'s WordPerfect Office 4.0 and InForms 1.0 package for designing and maintaining business forms on a local-area network.

Part of the time-saving and streamlining strength of groupware builds on its automated updating features, a concept that first caught hold in stand-alone spreadsheet applications such as Lotus 1-2-3, which update all affected numeric values when a given value changes.

"A file stored on your machine automatically updates across the network on files you've shared," said Nan Scott, a network manager at Oregon State University in Corvallis, Ore. She is embarking on a groupware search and expressed interest in Microsoft's Windows for Workgroups. "In this economy, time is valuable: we just can't be duplicating tasks and re-entering information."

A needed boost

Greg Scott, computing services manager at Oregon State, added that packages such as InForms have probably given groupware a shot in the arm because they focus on a single groupware task, which is more understandable to decision makers trying to envision concrete benefits of the technology.

"To date, the groupware concept has been so hard to explain, it's been hard to sell to the boss," he said. "Having an application this defined allows people to get their arms around groupware and ease into it."

He evaluated Notes, for example, which he said is "too all-encompassing and still too expensive" for many organizations to turn to whole-hog. In recognition of this sales barrier, Lotus has taken steps to make smaller Notes modules available through third parties.

Hooray! Mix and match!

Users attending last week's Networld '92 Dallas applauded the beginning of a movement by messaging vendor Beyond, Inc. in Cambridge, Mass., toward mix-and-match groupware. One analyst likened the concept to a trend in network management to plug applications of choice into standard platforms.

Beyond rolled out a version of its electronic-mail system that can swap into Notes in place of Notes' integrated mail package.

Most users said they like the idea because they are unwilling to sacrifice the E-mail system they are familiar with to move to groupware. "You have to beat lawyers with a baseball bat just to turn on their computers, let alone get them to switch technologies," said Roger H. Allott, an assistant district attorney in Englewood, Colo.

Gold Bond Building Products in Charlotte, N.C., is just entering the LAN world and intends to move to groupware in one fell swoop, said Joseph A. Barretet, senior technical consultant.

JOANIE M. WEXLER

Lotus' Notes achievers lauded

Winners and presenters of Lotus' Notes awards, *announced at Networld '92, from left: Bruce Hitchcock, Lotus; Todd Hayes and John Vidolich, J & T Associates; Mike Kinkead, SandPoint Corp.; Neal David and Kevin Danehy, Millipore Corp.; Richard Werbin, Chase Manhattan Bank; Gary Beach, publisher of* Computerworld; *Dian Uher, EDS/Dallas Helps; Michael Monahan, Virtual Corp.; Terry Rogers, Lotus; David Marshak, Patricia Seybold Group. Missing from photo is Ralph Arvesen, Dell Computer Corp.*

IBM unveils 32-bit LAN Server for OS/2

BY MICHELE DOSTERT
CW STAFF

DALLAS — IBM upped the stakes in the network operating systems arena last week at Networld '92 when it unveiled a fast, 32-bit version of LAN Server for OS/2.

Better throughput comes as welcome news to large LAN Server users, such as David B. Feldman, a network administrator at MCI Communications Corp. here. "It will probably be the fall of 1993 before we convert, but we will surely need the added performance by then," he said. "We run a lot of imaging and other large applications" — many of which the firm plans to rewrite in OS/2 — "so true 32-bit performance is very important to us."

IBM's LAN Server 3.0 is only the second 32-bit local-area network operating system. The other is Novell, Inc.'s NetWare v3.11. Microsoft Corp.'s Windows New Technology-based LAN Manager operating system has yet to be released.

Fear of commitment

IBM's LAN Server line was based on LAN Manager technology jointly developed with Microsoft. In the public battles between IBM and Microsoft over OS/2 vs. Windows, many LAN Server users feared IBM would market Novell's NetWare and abandon LAN Server.

However, while IBM does resell NetWare, it has also continued development of LAN Server for use under OS/2.

According to IBM, LAN Server 3.0 has all the functionality of the Microsoft 2.1 LAN Manager and adds enhancements developed by IBM, such as the ability to be remotely installed across a network via IBM's recently announced Automated Configuration, Installation and Distribution technology. Microsoft last week announced LAN Manager 2.2 (see story at right).

LAN Server 3.0, which can support up to 1,016 concurrent users on a single LAN, comes in two packages. OS/2 LAN Server-Entry is aimed at the departmental market and includes new system management features and enhanced installation support.

LAN Server 3.0-Advanced adds a high-performance file system, support for the multiprocessing capabilities of IBM's Personal System/2 Model 295 PC and enhanced fault tolerance, which supports both disk duplexing and disk mirroring.

IBM also announced OS/2 LAN Server for Macintosh Version 1.0. Scheduled to be available in January, it will provide access to Apple Computer, Inc. AppleTalk servers and printers and will allow DOS, Windows, OS/2 and Apple Macintosh clients to access files created by one another.

LAN Server 3.0 is available now; customers who buy it before Dec. 31 can buy LAN Server-Entry for $645. LAN-Server Advanced will be priced at $1,795. Each requestor (client software) will cost $50.

LAN Man quandary

Microsoft's unveiling of LAN Manager Version 2.2, an enhanced version of its OS/2 1.3-based local-area networking operating system, got a lukewarm response from users at Networld '92.

While many were positive about the features added to the latest release, that enthusiasm was dampened in some cases by a greater interest in a 32-bit version of LAN Manager and in others by a general uncertainty over LAN Manager's future.

"We're uneasy about LAN Manager's future. Are they going to roll it into NT, and we'll end up orphans if we stay with OS/2 desktops?" one user asked.

The release adds centralized, Windows-based management and utilities that allow users to manage remote LAN Manager servers from a central site.

Some LAN Manager users said they were undecided about whether to upgrade to LAN Manager 2.2 or wait for the Windows NT-based, 32-bit version of LAN Manager, which Microsoft has promised to ship with Windows NT in early 1993.

James C. McNall, a systems coordinator at Allen-Bradley Co. in Mequon, Wis., said, "We're probably moving to Windows for Workgroups, and I like the new Windows-based management stuff in LAN Manager 2.2, so we'll probably upgrade. But what I'm really waiting for is the Windows NT version," McNall said.

MICHELE DOSTERT

Novell targets upcoming NetWare 4.0 at corporate IS

BY MICHELE DOSTERT
CW STAFF

DALLAS — Novell, Inc. is counting on the latest revision of its NetWare operating system to break through the barriers to full acceptance by corporate America.

Executives at the Provo, Utah-based vendor said the technology added to NetWare 4.0 was designed to assure large information systems departments that they can depend on NetWare local-area networks as redundant for mission-critical applications.

However, Novell will have to wait for user reaction. First, it quietly admitted at last week's Networld '92 that delivery of NetWare 4.0 will not be until early 1993. It was supposed to ship by year's end.

Second, two features sought by large network users will not be in NetWare 4.0: large LAN support and the ability to run applications in protected memory. High-level system functions such as optional pre-emption, virtual memory and asymmetric multiprocessor support will also not be in the release.

However, company officials did announce shipment of a software developer's kit for NetWare 4.0, as well as the System Fault Tolerance III product for NetWare v3.11.

Delay not a concern

The short delay is not considered significant, since about two-thirds of Novell's customers still use NetWare 2.2, observers said.

The impetus behind the changes in NetWare 4.0 can be traced to fallout from a reseller deal with IBM.

"After IBM began reselling NetWare in 1991, it opened up a two-way dialogue between corporate IS and Novell that we hadn't had before," said Darrell Miller, executive vice president at Novell.

"They told us what they needed before they would adopt our platform, and we went back and built those things into NetWare 4.0," Miller said.

Specifically, NetWare 4.0, in conjunction with other products from Novell, will add directory and naming services, fault tolerance and network and software manageability.

With the release of NetWare 4.0, Novell has promised to provide a distributed directory and naming service that can be automatically replicated and synchronized across all NetWare servers on a LAN.

"We have 15 to 20 NetWare servers, so a distributed directory is really attractive to us," said Robert Cox, a data communications analyst at Methodist Hospital of Indiana in Indianapolis.

"The ability to manage all our E-mail and so forth across the whole system is why we're looking into 4.0," Cox added.

Dealing with space

Because NetWare was originally an 8-bit system, name-space limitations enforced a 256-user-per-server limit. Novell built a work-around into Version 3.11 that would theoretically allow 500- and 1,000-user licenses. However, the work-arounds so constricted the LAN administration utilities as to be impractical.

According to Novell, it has rewritten these utilities and will offer 1,000-user versions. However, this 1,000-user version is not expected with NetWare 4.0 but with a future release.

Also slated for future release is the ability to run applications in protected memory. Currently, NetWare 3.11 applications, called NetWare Loadable Modules (NLM), run in the same space occupied by NetWare itself — ring 0 of an Intel Corp. chip.

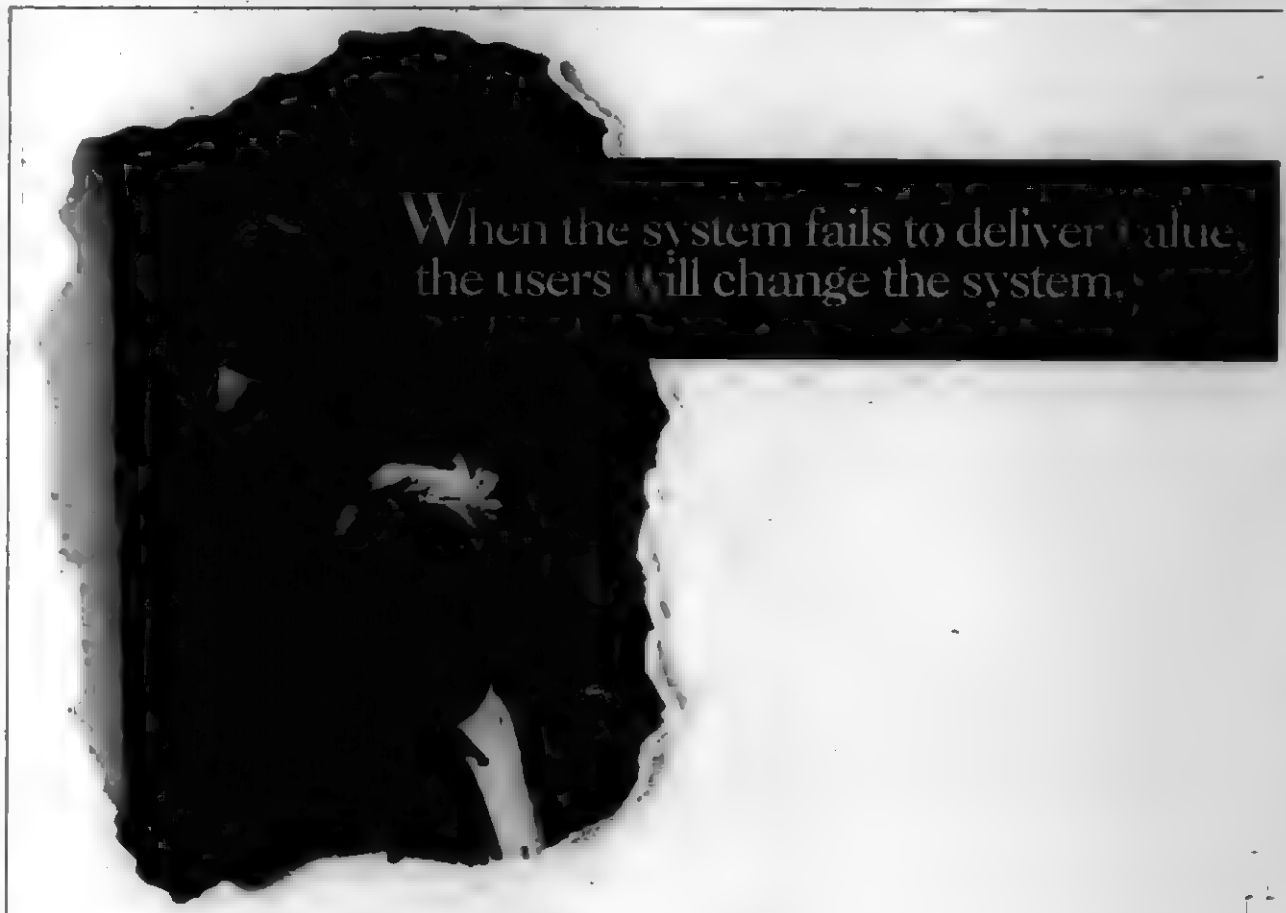
Mark Murphy, data processing manager at the Worthington, Ohio, office of Integrity Life Insurance Co., said, "About half of my server crashes are caused by NLMs, so I would love to be able to load my applications into protected memory. When that comes out, I'll probably upgrade to [that version of NetWare]."

Novell pointed to two of its products — not part of NetWare 4.0 — as keys to easing network management headaches. They are NetWare Management Service, which can report to NetView or Simple Network Management Protocol-based network management systems, and the recently released software distribution product, Electronic Software Distribution.

Willing to wait

Although large LAN users applaud the technology in the 4.0 release, they did not seem disturbed by the delay. In fact, most said they plan to wait for a few more revisions to NetWare 4.0 before they move to it.

Galen Bergthold, a LAN analyst at the Johnson County Data Services Department in Olathe, Kan., is also cautious. "I need the directory services, but from what I hear, not all NetWare 3.11 NLMs will run on 4.0. That could make for a messy upgrade, with different versions of the LAN OS and different versions of applications all over the place. I do plan to upgrade, but I'll just sit back, check the CompuServe bulletin boards to see how 4.0 is doing and let it all shake out for awhile."



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NEWS SHORTS

Lotus results off, Apple up

Lotus Development Corp. released financial results last week that speak volumes about its difficulties in the Windows applications market. Third-quarter revenue fell 6% to $218.8 million, and operating earnings totaled $7.3 million, a big drop from the $21.5 million earned in the third quarter last year. Net earnings were up, but most of the increase was from Lotus' sale of stock in Sybase, Inc. during the last three months. Meanwhile, Apple Computer, Inc. posted record results for 1992's fiscal fourth quarter, even amid a PC price war. Macintosh sales jumped 35%; PowerBook portables contributed $1 billion to Apple's coffers in their first year on the market.

ISSC gets into insurance

IBM's outsourcing subsidiary, Integrated Systems Solutions Corp., has agreed to jointly sell outsourcing services to the insurance industry with software provider The Continuum Co. in Austin, Texas. What makes this alliance especially interesting is that IBM has an equity interest in Continuum competitor Policy Management Systems Corp.

WilTel demonstrates frame relay

WilTel, a Tulsa, Okla.-based interexchange carrier, last week said it had demonstrated a frame-relay packet data connection among four regional Bell operating companies. In the test, WilTel's WilPak network linked WilTel's Technology Center in Tulsa to a Nynex Corp. lab in White Plains, N.Y., a Southwestern Bell lab in St. Louis, the US West lab in Minneapolis and the Ameritech lab in Hoffman Estates, Ill. The trial will test host-to-host connectivity, interactive sessions and transfers of large files using a variety of port connections up to T1 speeds.

Cincom delays Supra upgrade

Cincom Systems, Inc. in Cincinnati has pushed back the launch date of the new version of its Supra database management system. Version 3.0 was originally scheduled to be out by October 15. Instead, a company spokeswoman said, Cincom will introduce later this year an interim release, Version 2.4, and will try to position Supra as the "open database server of choice," she said. No other details were available.

Report criticizes productivity focus

Too much management focus on individual productivity rather than on overall business process advances has resulted in an unfairly harsh report card for investment in end-user computing, according to Nolan, Norton & Co., a Cambridge, Mass.-based consulting firm. Nolan, Norton is basing that conclusion on a recent survey of 10 major U.S.-based organizations.

Hyundai stages PC blitz

Hyundai Electronics Industries Co.'s information systems division rolled out some 60 new models of servers and desktop PCs last week. The announcement includes a new high-performance line of upgradable servers and desktops, a multimedia-capable line, two new notebooks and two new low-priced lines, called Prestige and Elite. Company President Ed Thomas told reporters that Hyundai needed only six months to create the new products and that in the future, Hyundai will refresh its product line every five to eight months.

Short takes

Banyan Systems, Inc. Executive Vice President Roger Weismann will leave on Jan. 31. The six-year Banyan veteran has decided to pursue business opportunities on his own but has not decided on his next career move, Banyan said in a prepared statement. . . . **Digital Equipment Corp.** shifted Don Zereski from his position as vice president of DEC's U.S. area to work under Jack Smith, DEC's senior vice president of operations. Zereski will be responsible for developing programs to increase revenue for the ailing company. . . . **Unisys Corp.** has been awarded a 10-year, $73 million contract to provide the New York State Department of Social Services with a wide range of hardware, software and professional services.

Varied themes at Networld '92

Election, Lotus and Microsoft products, APPI vs. APPN top the agenda

Networld '92 Dallas featured an exhibit where show attendees could not only look at Lotus' Notes applications but also cast their votes for president. At noon on Thursday, as the show was winding down, the totals stood at 30% for Clinton, 30% for Bush and 17% for Ross Perot; the balance of the voters were undecided.

.....

A Lotus Notes groupware user who received a *Computerworld*-sponsored award at Networld for his firm's creative uses of the database-oriented package confided in a reporter that Lotus is struggling to provide adequate service and support now that its products are becoming networked and mission-critical. "The company's history and experience are with supporting stand-alone applications that individually couldn't bring a business to its knees," he explained.

.....

Lotus' vice president of marketing, Frank Ingari, told *Computerworld* on the show floor that Notes' biggest challenge is Microsoft's looming object-oriented groupware package, codenamed "Cairo." Ingari said Lotus' goal is to permeate the industry with 10 million or so Notes seats before the competing product ships. That probably gives Lotus roughly 12 to 18 months to turn 150,000 users into millions because Microsoft's Bill Gates stated last month that Cairo would be first demonstrated in about a year.

.....

And speaking of Microsoft . . . Users are perplexed as to why the vendor was yet again cheerfully demonstrating its Windows for Workgroups package (rumored to be in production and shrink-wrapped already) while emphasizing the product won't be "officially announced" until Oct. 27.

.....

At least some folks around router company Wellfleet Communications seem a little on the defensive by the attention competitor Cisco Systems has received with Advanced Peer-to-Peer Internetworking (APPI), its budding alternative to IBM's Advanced Peer-to-Peer Networking (APPN) strategy for migrating Systems Network Architecture networks to distributed internetworks. A Wellfleet employee was overheard propositioning an IBM local-area network systems executive on the show floor to "link arms with Wellfleet on APPN and take over the industry" as an APPI counterstrike. Alas, the Cisco rival accosted the IBMer with responsibility for the IBM/Apple alliance, not the one in charge of APPN development.

.....

Some eyeballs were rolling over Novell's "Yes" campaign, kicked off at the show, which features the networking giant's familiar red and white logo plus the word "yes" (or equivalents such as "si" or "oui" in other languages) on packages of all products that are NetWare-compliant. First, users are not sure what it means because Novell takes the word of third-party vendors' in-house tests rather than certifying the equipment itself. The consensus is that the marketing ploy to underscore NetWare's omnipresence is probably unnecessary.

JOANIE M. WEXLER and MICHELE DOSTERT

Ethernet longevity to stave off upgrade pain

CONTINUED FROM PAGE 1

an entire 10M bit/sec. Ethernet to each video server and to individual workstations or a limited number of workstations to pump more life into today's omnipresent Ethernet adapter cards and wiring schemes.

"I'm charged with improving network design to let us keep growing without having to turn to FDDI, its copper alternatives or other technologies" that are a technologically radical, expensive departure from what is already installed, said Gordon Craig, local-area network administrator at the Texas Rehabilitation Commission in Austin. Craig is a newly signed Kalpana customer who attended his vendor's video-over-Ethernet demonstration.

Craig said he evaluated FDDI to the desktop about five months ago but did not think he needed the LAN's order-of-magnitude higher speed yet and thus could not justify its comparatively expensive costs. In addition, he said, "I don't want to have to keep starting over" with the network.

Glen M. Greenwald, network manager at trading firm Miller, Anderson & Sherrerd in West Conshohocken, Pa., echoed this worry. "We just moved into our current building two years ago and outfitted it with 10Base-T," he explained. "I have my investment in 10Base-T equipment and unshielded twisted-pair, while FDDI is still a new, unproven technology."

Answers sought

Greenwald, who also attended the Kalpana demonstration, added that "while multimedia is coming," his network is not in jeopardy of maxxing out today. However, he said he was looking to "find the answers first" in anticipation of a network traffic surge he suspects will result from his imminent upgrade to more powerful desktops — such as Intel Corp.'s 1486 and Unix-based machines — that can dump traffic onto the network faster.

"We're all tight for money," added Terry Smith, an engineer at Rockwell Shuttle Operations Co. who is orchestrating the NASA/Department of Defense's current downsizing project.

Smith said his network is being stressed by the sheer size of typically 2M-byte Microsoft Corp. Windows files being downloaded across the network.

The dedicated Ethernet scheme "would preclude my going out to FDDI," he said.

One attendee who found the Alantec demonstration intriguing said he was nonetheless disheartened by the myriad Ethernet demos. That was because his employer, the U.S. Central Credit Unit in Overland Park, Kan., is a large Token Ring shop. There were no life-extending demonstrations on the show floor for Token Ring.

"We're about to start desktop publishing and imaging applications," which will probably cause a network spurt, explained Jeff Hatfield, manager of technical services.

IBM, however, does intend to demonstrate multimedia applications on 16M bit/sec. Token Ring networks at the Comdex/Fall '92 trade show in Las Vegas next month.

"The bottom line is, contrary to popular belief, you don't need 100M bit/sec. networks or ATM for multimedia," said Charlie Robbins, director of communications research at Aberdeen Group, a Boston consultancy. "You do it with digital compressed video."

Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif., agreed. According to Howard, a recent Infonetics study revealed that many users believe they require the new-generation networks for multimedia applications.

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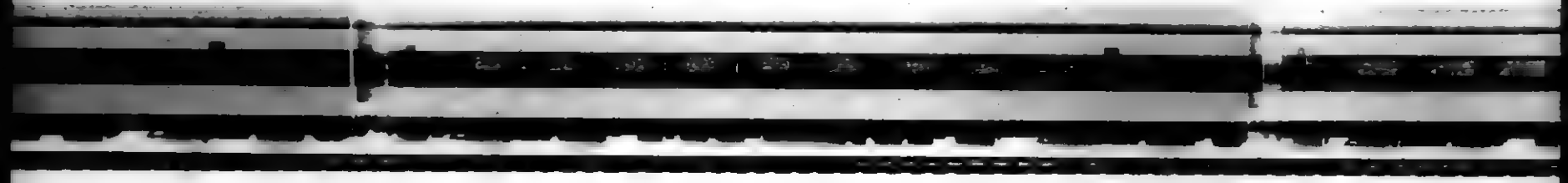

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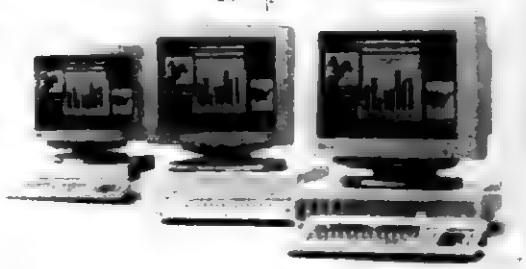

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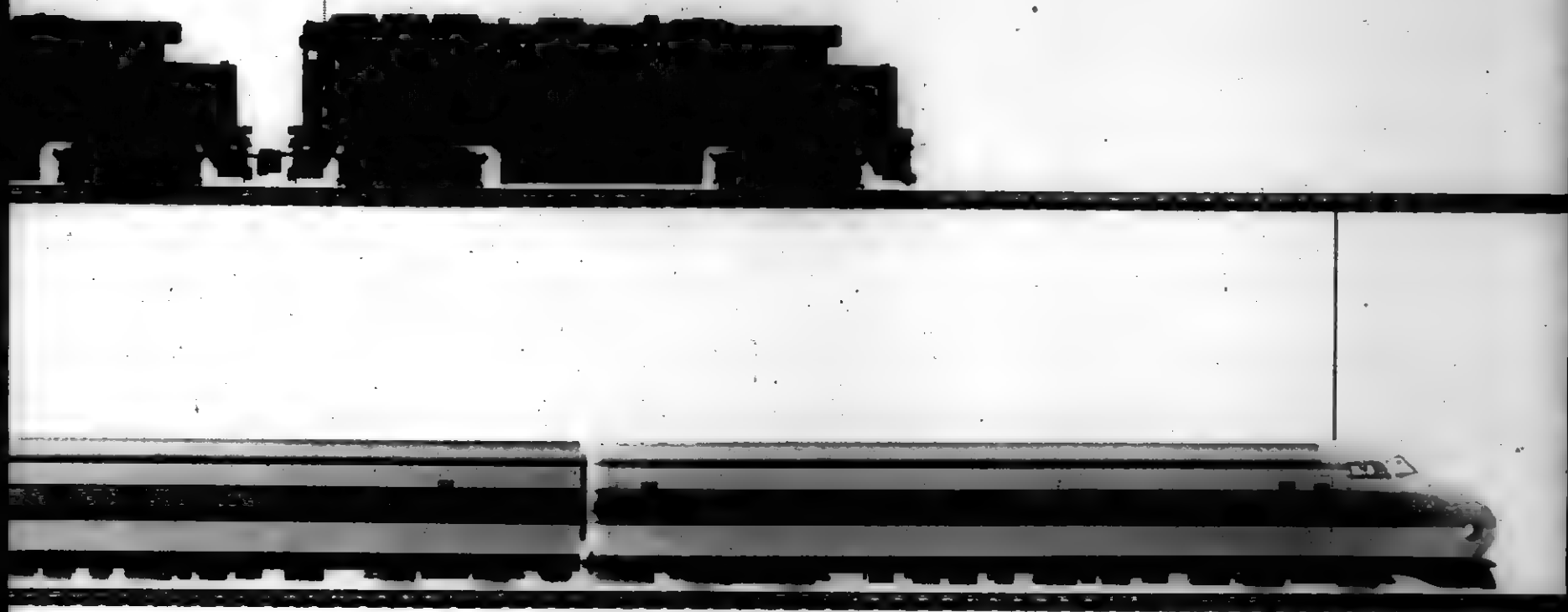

Pay first, payback later

CONTINUED FROM PAGE 1

downhill. Rewards come in the form of quick development time, reuse of code and dramatically lower maintenance costs.

Stikeleather, for example, said a pilot C++ warehouse application installed in February boosted workers' productivity 35%. "Labeling happens faster, there are fewer errors, and we have better control over activity in the warehouse," he said.

Object code also has the potential to reduce the firm's software maintenance costs from more than 60% of the software budget to less than 20%, he said.

Pilot projects

Like Kash n' Karry, early users at some of the nation's largest IS sites are fielding their first object-oriented applications on a limited basis this year. The new applications are often stand-alone, icon-based tracking systems that target one tactical piece of business. If these first attempts are successful, users said, object-oriented programs, application development tools and databases could become common by 1995.

"The technology has been there, but many organizations' corporate cultures didn't have the right kinds of skills to take advantage of it," said Mike West, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

An informal survey of 175 users attending a June 1992 Gartner Group conference showed that 47% of the respondents had already experimented with object-oriented products, West said. Another 20% had developed pilot projects, while 9% had put object-oriented systems into production.

The promise of object technology lies in its ability to mirror real-world business operations far better than does traditional procedural programming in the Cobol and C languages.

Once created, objects can be used again, reducing development and testing time for future projects by 30% or more, users said, and saving money as well.

shield the programmer from having to navigate an increasingly complex IS infrastructure. Objects may actually "creep in" to IS shops under cover of fourth-generation languages, tool kits or network operating systems.

CSX Transportation Corp., a Jacksonville, Fla., rail freight system, created a locomotive object that contains direct knowledge of a locomotive's fuel mileage and hauling capacity. Planners at CSX's operations center save valuable time when calculating systemwide fuel consumption by clicking on several locomotive objects. There is also a family of related objects in the firm's container-tracking application.

Users like CSX can get a head start on their application by buying a set of predefined objects, known as a class library. "You're building applications within a framework, using a set of software that's well-tested, wrung out and very stable," explained Art Masson, head of systems development.

"Our applications took a great turn for the better in terms of testing and stability," he said, echoing comments from other users.

There are some shortcomings to using object-oriented programming tools. Applications developed with this bold approach sometimes fit poorly with systems built using procedural languages such as Cobol and C. Early users reported having to write custom links between object-oriented applications and existing relational databases. The lack of standards for objects is another hurdle to widespread adoption but is being addressed by the Object Management Group, a standards group based in Framingham, Mass.

"We feel the quality of the product we delivered was very high," said Dennis Styles, a senior systems analyst at American Airlines' Sabre Computer Services Division. Styles led a project that developed several flight-dispatching applications at the airline's Fort Worth, Texas, operations center.

American's three object-oriented programs, used by 160 flight dispatchers to monitor 2,600-plus flights daily, were built in six months.

At Kash n' Karry, Stikeleather is also moving ahead. His firm is considering removing its IBM mainframe by 1996 and relying instead on an intelligent network of Sun Microsystems, Inc. Unix clients and servers that will shuttle objects among headquarters, warehouses and 100-plus stores.

"Our goal is to roll our system out to all our stores over the next three years," he said. "The new systems we're producing have much lower failures rates, we're producing code three times faster than we did in Cobol, and the best part is we can use the code over and over again."

Exponential growth

Sales of object-oriented technology have been growing steadily, with the most significant gains in the object-oriented DBMS market

Revenue forecasts for object-oriented products (in millions of dollars)

	1991	1992*	1993*	1994*	1995*
Languages and tools	$201	$260	$317	$369	$416
Tools for developers	$84	$121	$172	$238	$319
DBMSs	$19	$47	$96	$167	$255
CASE tools	$23	$33	$45	$61	$98
Total products	$327	$461	$630	$835	$1,088

*projected

Source: Ovum Ltd.

CW Chart: Stephanie Faucher

Some sites are using small development teams to create flexible object-oriented applications that can be altered as business conditions change. "When a traditional two-year development project is finished, the whole nature of our business has changed," said Donald Chaney, advanced research and development manager at DHL Airways, Inc. in Redwood City, Calif.

In DHL's case, objects go hand in hand with client/server technology. "One of our goals is to drive functional development out of IS and into end-user groups," Chaney said.

Because objects have these properties and act according to a predefined "behavior," they can

GLOSSARY

OBJECT: An entity containing data and programmatic behavior. Once an object type is created, it can become the foundation for others. Users can create extensions to object code through object-oriented "inheritance," reducing the need for new programming.

CLASS LIBRARY: A collection of objects that may be derived or related to one another, in specific categories called classes. Example: A pharmaceutical firm creates a class library of drug compounds, which share properties.

PERSISTENT STORE: Objects can be created by object-oriented languages but are transient. They must be stored in a persistent-store object-oriented database to be accessed by programs and users.

LANGUAGES: Object-oriented languages such as C++ support the key concepts of object-oriented programming: classes, objects, instance variables and methods. Unlike traditional languages, object-oriented languages make it possible to group variables and operations in a single entity.

Technology simulates imaginary worlds

Object technology allows computer scientists to dream up worlds that have never existed — and to simulate them electronically.

That is because complex geometric objects and complex relationships between objects can be created with object-oriented languages and stored in object-oriented databases.

Pacific Bell in San Ramon, Calif., is using ParcPlace Systems, Inc.'s Smalltalk 80 object-oriented language to define high-speed broadband network "circuits" for use in the year 2000. The 155M bit/sec. broadband line that carries the broadcast — the equivalent of 2,000 standard phone lines — does not yet exist.

But in the laboratory, icons appear on a computer screen warning of an incoming "call" that might be a videoconference, a television broadcast or a university seminar. Without objects, it would have been difficult — if not impossible — for Pacific Bell to define the prototype system and to create a visual user interface for it, technical consultant Tom Soon said.

"To do a simulation using Fortran, you have to write lots of supportive routines," Soon said. "If I started from scratch, it would go beyond the resources I have for my project."

Mark Woyna, an assistant scientist at Argonne National Laboratory in Argonne, Ill., is modeling the battlefield of the future for the U.S. Army. His object-oriented system — Visual Intelligence and Electronic Warfare Simulation Workbench — uses simulated input from battlefield sensors to map out the march of battalions and the routes of tanks across an imaginary war zone.

"Users can define [it], and the system paints radios and tanks on the screen," Woyna said. "What used to take months can now be done in a day."

JEAN S. BOZMAN

Kevin Horan

Argonne's Woyna *used OOP to develop an Army battlefield simulator (shown projected onto his shirt)*

Tom Zimberoff

Pacific Bell's Soon *says the project would have been difficult — if not impossible — without objects*

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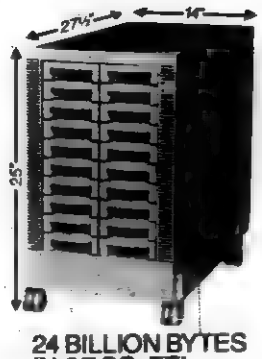

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Source: Dataquest Ledgeway, 7/92

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Feds reverse overtime ruling

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Labor, in a policy reversal, has revised its regulations so that salaried programmers are exempt from mandatory overtime pay no matter what they earn.

Last year, the Labor Department held that salaried programmers would be exempt from the mandate for 150% overtime pay only if they earned more than 6.5 times the minimum wage, or $27.63 an hour.

The change was prompted by protests from the computer industry and members of Congress, who said the Labor Department had misunderstood the intent of the 1990 law on overtime pay for software-related occupations [CW, May 6, 1991]. The law affects thousands of programmers, systems analysts and software engineers.

The two-sentence law — tucked inside a bill on American Samoa — was designed to exempt highly paid software professionals from the Fair Labor Standards Act of 1938, which requires 150% overtime pay. It was supported by the Information Technology Association of America (ITAA) and the National Association of Computer Consultant Businesses.

Under the new regulation, effective Nov. 9, there are two key provisions:

- Salaried programmers are classified as "professionals" and thus exempt from the federal mandate for 150% overtime pay.
- Programmers who are paid on an hourly basis are likewise exempt if they are paid more than 6.5 times the minimum wage.

What upset supporters of the legislation was that the Labor Department had initially mashed the two provisions together, producing a more narrow exemption, instead of treating them separately.

The ITAA said it was satisfied with the revision and argued that the elimination of mandatory overtime pay would make the industry more "price competitive and, as a result, expand the market."

The biggest critics of the law have been free-lance programmers. They argued that time-and-a-half overtime pay is needed to compensate them for the lack of medical benefits and job security inherent in their migrant work.

Michael L. Boling, an independent computer contractor in Madison, Ala., said the law would cost him $25,000 a year. By charging $35 to $40 an hour with time-and-a-half rates for overtime, free-lancers can "reach the elusive $100,000 level that is commonplace among doctors and lawyers," he said in written comments.

John Fain, an ITAA committee chairman and president of Metro Information Services in Virginia Beach, Va., said the law represents "the government's recognition that the high degree of education and skill required to perform this work merits professional status."

The Labor Department noted that the software exemption does not cover hardware engineers or computer users. Also, nothing prevents an employer from voluntarily paying premium rates for overtime.

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Forces join for RS/6000 benefit

BY MARYFRAN JOHNSON
CW STAFF

Users of IBM's Unix-based RISC System/6000 servers can add the dual option of guaranteed uptime and expanded storage capacity to their choices this week, as storage vendor Cambex Corp. and systems integrator Clam Associates, Inc. settle into a market niche left open by IBM.

At AIX Expo this week in San Jose, Calif., the two vendors will demonstrate their ability to integrate IBM's high-availability RS/6000 clustering software with Cambex's new Certainty Array/6000 fault-tolerant storage subsystem. The Certainty Array, a redundant arrays of inexpensive disks system slated to be available in January, will range in price from $50,000 for an 8G-byte array to $720,000 for a 96G-byte array.

"This will appeal to people looking to do some type of highly available midrange database server," said John Morrell, an analyst at International Data Corp. in Framingham, Mass. The Cambex disk array "is nothing extraordinary," he added. "The uniqueness comes from Clam's system integration and the [IBM high-availability] software. That offers something IBM cannot: the ability to have disk arrays with that type of fail-over scenario."

IBM's HACMP/6000 High Availability Cluster Multi-Processing software began shipping in June and has been installed in several dozen sites so far, IBM said. Cambridge, Mass.-based Clam Associates was the only outside developer to work on HACMP/6000 with IBM.

Although the high-availability software handles only a cluster of two RS/6000s now, the next version will handle multiple RS/6000 clusters and is due out next year.

"Anything that will afford large amounts of disk space is definitely welcome," said Craig Engel, vice president of information systems at a large Wall Street investment bank that prefers to remain unnamed in press accounts. With Clam Associates' help, the bank recently installed the HACMP/6000 software on an RS/6000 cluster. "We'd done a lot of overnight batch processing on the RS/6000s, but this was the first on-line system where users couldn't be down," Engel said.

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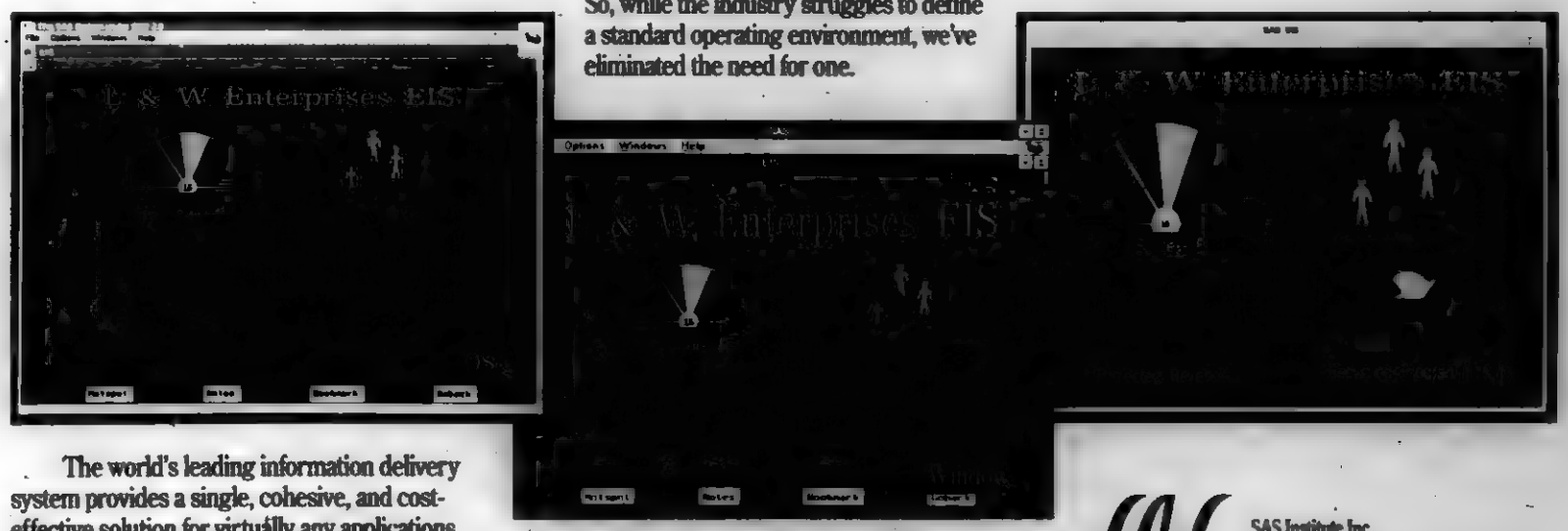

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ADVANCED TECHNOLOGY

IS roundtable: Technologies of the future

Top computer executives see wireless computing, optical discs, greater innovation and integration of tools

BY ELLIS BOOKER
CW STAFF

More than ever, information systems executives and the companies they work for are being pressed to evaluate new technologies. The reason is simple: Advanced computing and communications systems offer competitive advantage for those who figure out when and how to deploy them. Alas, this is no exact science.

A successful investment in cutting-edge technology makes the executive responsible for it a hero, praised for his boldness and daring. But the judgments are never as kind toward early adopters who fall on the proverbial "bleeding edge" of a new technology.

Computerworld recently interviewed three experienced IS executives about advanced technology — how they watch it, what they hope to see in the year 2000 and, most importantly, what figures into their decision-making when the chance arrives to use a promising but little-tried product.

Computerworld spoke with John J. Dell at St. Clair Hospital, Diana Walker at Comdisco, Inc. and consultant Sid Diamond, until recently at Black & Decker Corp.

CW: How do you keep abreast of future technologies?

Dell: Obviously, I read a lot of periodicals, attend conferences and contact specific colleagues who work for consulting firms. I spent eight years in consulting, so I've got contacts there.

Walker: We also find sharing with our customers — what they're using and what their interests are — is valuable. At Comdisco itself we have resident technology experts. People in our strategic systems area evaluate and recommend the use of new products and develop relationships with vendors. And because we offer venture leasing to start-up [technology companies], we've forged relationships with some of them.

Diamond: It's a combination of approaches: reading trade journals, maintaining a close relationship with vendors, discussing things with peers and in-house R&D. People who are successful have to do this. The life cycle for new technologies is shorter (down to two to three years), and the introduction of new products is more frequent. The business is changing, too. So we in IS can't be passive.

CW: What questions would you ask before testing or deploying a leading-edge technology?

Diamond: The first question is, what are your business needs? The second question is, what are your functional needs?

Walker: If I have a technical expert who says "This is great, we ought to use it," I ask questions that will be asked of me by the business committee: Will this solve a business need, and are there other technologies available that do the same thing?

Dell: Effectively, I try to get the vendor to share the risk. They absorb the investment, and on your end, you provide the site. Look at the short term vs. the long term. Is this a foundation for something else?

The benefit may not be in the product itself. This is the case with a network, which is a vehicle for obtaining other benefits. For instance, when we had to choose between Ethernet or FDDI, we chose the latter. A 10M bit/sec. Ethernet would certainly carry you two years, but in three or five years you might need to reconfigure. In this case, short-term costs are lower, but long-term costs are higher.

Walker: Often we'll bring in software and try it. For instance, we just prototyped our first agent software. It's from a start-up company.

Diamond: Who do you put your bets on, partner with, to take you through to the year 2000? The picture is muddied because hardware has become a commodity and because of the workstation and LAN phenomenon.

CW: Has your IS group or firm become more receptive to experimenting with revolutionary products or approaches? If so, why?

Walker: Absolutely. It's become much more focused on business issues and how technology can support them. You can't afford to have long lead times on development of applications, such as GUIs and relational databases.

Dell: Without a doubt, yes. Once you teach [the organization] what computers can do and they see operational improvements, it's easier to sell them on the next product.

Diamond: I think this is due to the ever-increasing pressure on business. Two important drivers here are continuous improvement, or total quality management, and business re-engineering, which involves wiping the slate clean and dramatically changing the way of doing business.

CW: How well do your vendors communicate their vision for advanced products?

Diamond: Fair to poor. Most are concerned with the "here and now" of their products rather than upcoming products or, more importantly, giving a vision or an architecture.

Dell: I give them a fair rating. We recently did a five-year strategic plan, and I did not find as much as I would hope from vendors in helping customers develop this. On their individual products, vendors have a vision. But it's up to people like myself to take all this, look at the needs of the institution and make an enterprise plan.

Walker: We may have a unique relationship with vendors because we're an independent lessor. Our customers come to us for technology solutions, and Comdisco's vendors know this. Comdisco sits on some strategic planning and product development committees.

CW: Looking out to the year 2000, what three technologies will have the greatest impact on your industry or on society in general?

Dell: Optical disc in health care is going to be very big. It'll change dramatically the way we do business. The amount of paper and images processed in health care organizations is phenomenal.

Wireless is the other thing. My perception is that it will make a major difference in the way health care is delivered. Also voice/data/image integration. We do voice-to-text today, we do imaging, and we do data. Integration of all that is one of my major challenges.

Walker: Being able to integrate images, voice, data and facsimile.... That's an area where we'll see tremendous growth. Ultimately, we'll be a paperless society, and a lot of that falls under telecommunications.

[There are also] rule-based systems. If you can identify all the rules for a decision, you can automate it. And you can do much of that with object orientation. We're developing a rule-based system to handle the bulk of our lease generation. It'll handle maybe 70% automatically. The remaining 30%, the complex transactions, will be routed to the correct individual. But some rules are so complex, automation isn't worth it. There will always be a reason for an individual to come in and make a judgment call.

Diamond: The workstation put vast amounts of power on the user's desk. Now that is being linked to client servers. But a third piece is the concept of distributed databases. I'm looking forward to a seamless user environment with no walls in terms of platforms or applications.

Diana Walker is assistant vice president responsible for business integration services at Comdisco, Inc. in Rosemont, Ill. Walker's role is to evaluate, select and implement new products and applications within Comdisco and between Comdisco and its customers. In December, she will graduate from the Executive Masters Program at the Kellogg School at Northwestern University.

"If I have a technical expert who says, 'This is great, we ought to use it,' I ask questions that will be asked of me by the business committee: Will this solve a business need, and are there other technologies available that do the same thing?"

John J. Dell is vice president of hospital information systems at St. Clair Hospital in Pittsburgh.

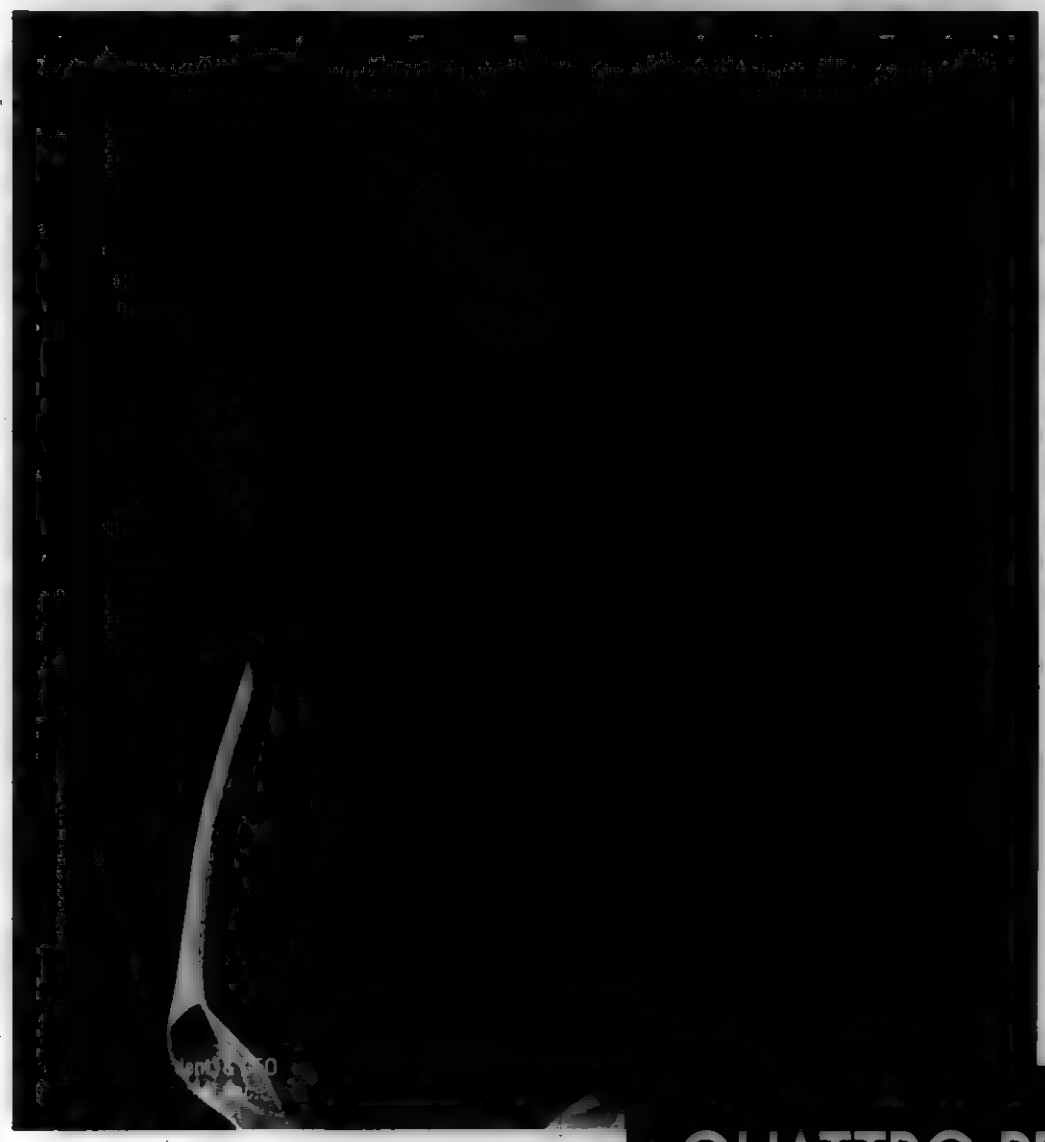
Dell's hospital IS background also includes four years as a manager at Price Waterhouse and two years as a senior consultant at Arthur Andersen & Co. Dell holds a B.S. in computer science from Point Park College in Pittsburgh.

"On their individual products, vendors have a vision. But it's up to people like myself to take all this, look at the needs of the institution and make an enterprise plan out of it."

Sid Diamond has 28 years of experience in IS, most recently as vice president of worldwide information services at Black & Decker, which he left earlier this year. Diamond has also held senior IS posts at Bristol-Myers Purolator Courier, Continental Can and Merck & Co. He is vice chairman of the Conference Board Information Technology Council and the Computer Executive Roundtable, and he is the founder and chairman of the Financial Systems Roundtable. He holds an MBA from Pennsylvania State University.

"Who do you put your bets on, partner with, to take you through to the year 2000? The picture is muddied because hardware has become a commodity and because of the workstation and LAN phenomenon."

Outrageous.



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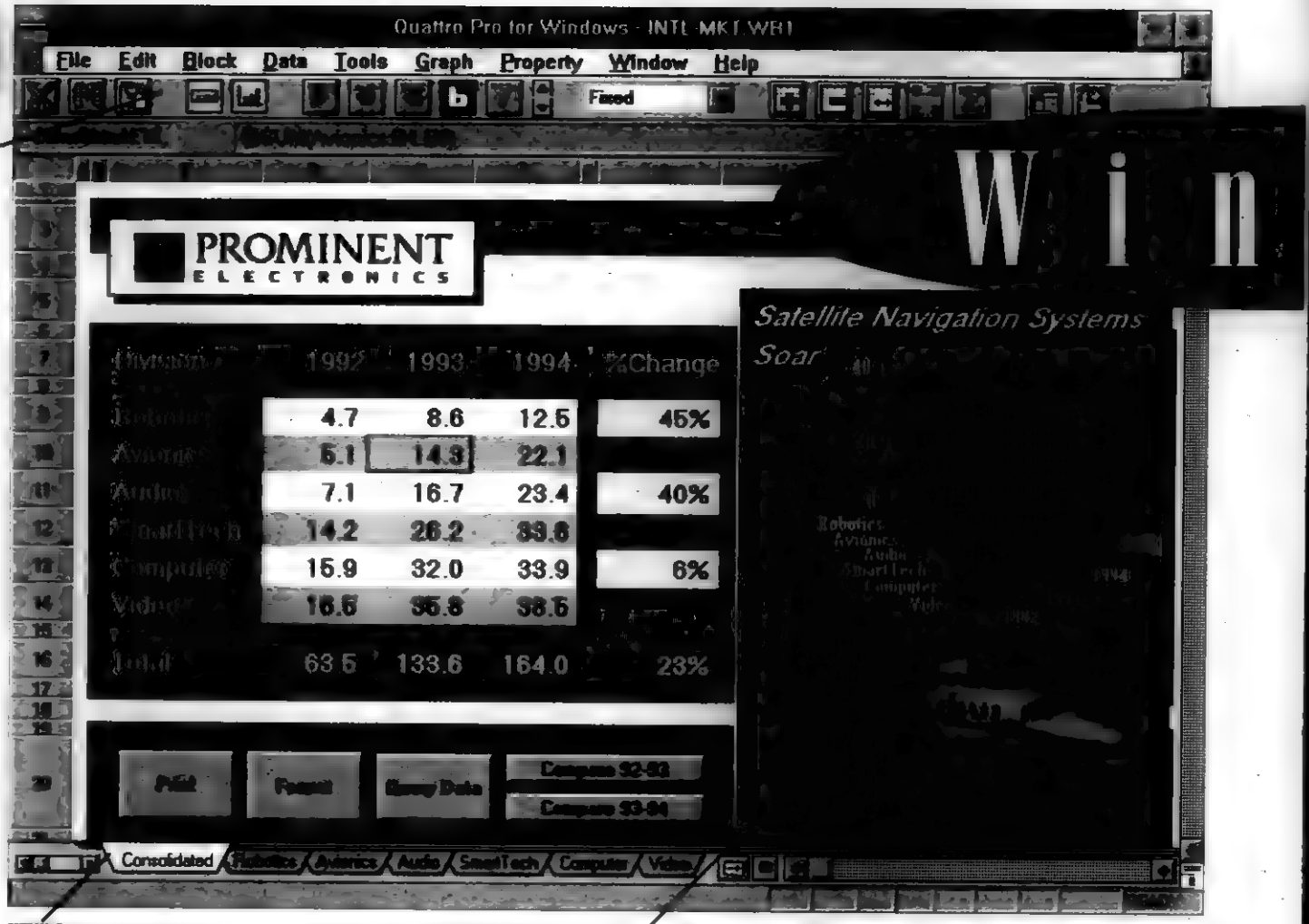

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Weather	13.2	13.9	19.6	18.9	65.6	16.4
Medical	11	12.1	13.8	11.8	48.7	12.2
Solar Research	9.8	10.2	7.3	6.9	34.2	8.6
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EDITORIAL

DEC, take 2

Last week I sat for a videotaping session for internal use at Digital Equipment Corp. A public relations agency was sampling opinions of DEC's strengths and weaknesses. They really didn't want *my* opinion but rather some reflection on the views of our readers — DEC's customers.

Other vendors have done similar things in the past, coupling these inquiries with stepped-up direct customer contact. But not DEC — not in the six-plus years I've been editor — until now.

Of all the strategy pronouncements, quasi-directional messages and talk of ax wielding coming from DEC's newly minted CEO Robert Palmer, this apparent effort to become truly customer-focused is most refreshing.

Worst case, DEC is several years late with its effort. IBM got on the Year of the Customer bandwagon five years ago. But better late than never.

What might DEC do to show there really are teeth behind its customer-driven hoopla?

- Stop blaming the weak world economy for its troubles, as it did when announcing a huge loss last week. It's the same economy every other company is operating in, and most of them are not as troubled. Blaming the world is not going to solve its problems.
- Restore the warm, fuzzy feeling that customers demand. As with employee morale, a reputation for quality service and support takes years to build and a few screwups to destroy. Clearly the user base is nervous that DEC's field support is suffering under the weight of recent and impending layoffs. There is no more salient selling feature in today's world of high-performance systems than quality after-sales support.
- While doing the above, educate users about the facts of support life in the 1990s. Heretofore, many aspects of support appeared "free," although they were hidden behind a very high hardware price tag. With hardware profit margins maybe a third of what they once were, nothing's going to be free anymore.
- Pull out all the stops internally to make OSF/1 a commercially viable operating system, thereby demonstrating to customers an abiding commitment to open systems. DEC also needs to have on-line transaction processor and full clustering support to run industrial strength transaction processing. It is clearly behind in the Unix game.
- Demonstrate that it can attract topflight talent to move the company quickly and decisively out of the proprietary world of yesterday. Legends such as Gordon Bell and Edson DeCastro helped build the DEC of the 1970s and 1980s. Will tomorrow's legends come from the DEC of the 1990s?

Without question, DEC is at the most critical juncture in its 35-year history. Whether it reverses its downward direction is still in question. But at least under Palmer's direction, DEC is starting to ask the right questions of the right people — its customers.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Hackers should land in jail, not in press

The letters you get from avowed hackers seem to glorify the virtues of hacking. I find this very disturbing for a simple reason: It completely ignores the issue of private property.

The computer systems they hack into (pun intended) and the databases they try to access, as well as the data in the databases, are private property.

An analogous argument might be that breaking and entering a jewelry store and taking off with some valuables is really a way of testing the security controls at the jeweler's establishment. They're really just doing it for the excitement and challenge.

Would they promote voyeurism based on the "logic" that "after all, if they didn't want me to look, they'd have pulled the drapes closer together?"

The fact that there's challenge or excitement involved (or even commitment, intellect or whatever) does not change the issue.

I suggest that hackers who gain entry to systems against the wishes of the systems' owners should be treated according to the laws regarding unlawful entry, theft, etc.

Alan Falk
Cupertino, Calif.

To the rescue

I read "Why PC development stinks" by David Vaskevitch [CW, Sept. 28] with great interest and empathy for personal computer developers. Back in the late '60s, I used to have similar problems on the IBM 360 with DOS.

I then discovered Unix. The silver bullets for PC developers are in flight and will soon reach their target — Intel-based PCs. System V, Release 4.2, UnixWare and Solaris 2 are but a few of the rescue possibilities for savvy PC developers.

Robert L. Kay
Integrated Network Solutions, Inc.
Boynton Beach, Fla.

Little sympathy

The lament by Carol Anne Ogdin "Different ball game for career women" [Letters to the Editor, CW, Sept. 28] regarding the plight of women in data processing is sadly typical of the viewpoint espoused by so many people today.

The author complains about the choice of words used by a manager when he said he was "critical" of women who do not demand recognition and advancement.

It seems that Ms. Ogdin is hiding behind the stereotype of the reticent female rather than accepting the fact that, in the real world, rewards and recognition do not seek out the individual but rather vice versa.

Organizations characterized by their aggressive and demanding management are more likely to be the ones that offer challenge and opportunity because of the drive and entepreneurial atmosphere so often found there.

Blaming her dissatisfaction with her lot on men and "male-dominated" institutions only masks her reluctance to come to grips with the realities of life in a positive and constructive way.

Roland Ronshausen
Coral Springs, Fla.

Industry ads not too technical

Regarding John R. Carroll's comments in "Flashy ad, but what's it trying to say?" [CW, Sept. 28], it seems that Mr. Carroll, in his obvious attempt to put down everyone in the computer industry as a bunch of techno-nerds, has demonstrated the incredible confidence possessed only by the abysmally ignorant.

Granted, a good many ads — and a significant amount of editorial material in *Computerworld* — are technical in nature. That's usually because technical details, understood by professionals, are infinitely more convincing than groundless boasting.

Just because Carroll doesn't get it shouldn't give him the right to a very expensive half-page in *Computerworld*, when there are dozens of new products, new ideas and simply news that will never see daylight because he got the chance to show how little he knows about this industry.

Steven Swartz
Advertising Assistance, Inc.
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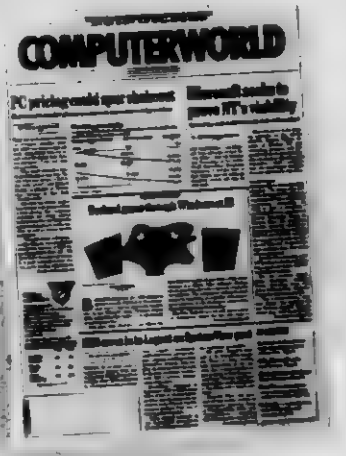

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Out of work? Keep that chin up

ROBERT HARGROVE

It may have happened to you. You get to work early and notice that you cannot log on. Then three guys with clipboards appear and ask if you've "got a minute?"

The litany is frequently the same: ". . . economic hard times . . . reduction in staff . . . nothing personal, just a numbers thing." You may be thinking, "Gee, maybe you guys wouldn't mind chipping in on my house note. After all, it's just a numbers thing." But that's it. You, perhaps with a number of other fellow employees, have just been laid off.

So what do you do now?

Contrary to popular belief, it's best just to go ahead and panic. You've got to do it sometime, so give yourself 15 minutes of good panic and get it out of your system. Just don't act on it. Don't buy five crates of peaches or nine pizzas just because you've got the coupons.

Timothy Carroll

It only gets better

Realize, too, that the scariest day is often the first day of unemployment. That's the time that you expect to see your name in the newspaper with the headline, "Computer professional laid off. Also made 'D' in art in third grade. Losing ways continue."

Also, don't dwell on it. Don't try to figure out why you got laid off when Fred "I've-Never-Written-a-Program-That-Works-But-That's-OK-Because-Someone-Always-Fixes-It" McGurk is still slinging code.

There are, however, some things you can do.

In the mornings, get up, shower and get dressed. This is not as simple as you may think. There is a tendency to sleep in to enjoy your newfound "freedom." But trudging around the house in your flannel robe yelling, "You tell 'em, Oprah," at the TV screen is not a rung up on the old career ladder.

Avoid bonding with your couch. It's easy to do, since that's where the remote control is, but getting up will help you avoid the rumored fate of a laid-off computer professional in Michigan who supposedly became grafted to his Barcalounger.

Hold on to your head

Then there is the headhunter experience. These are the people who take the flotsam and jetsam of human experience (this is now you), dress them in dark suits and recycle them back into the employment stream.

Sometimes these recruiters do not have a particularly heavy technical background, so you may get questions like, "Do you know Cobalt?" You can say that it is not your favorite heavy metal or simply correct the recruiter and continue.

You may want to reacquaint yourself with those professional organizations you've been zealously avoiding for years. Forget the fact that the speaker's overheads were unreadable or that the cuisine was less than four-star ("Is meat supposed to be blue?").

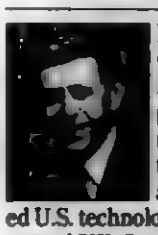
Above all, relearn job-seeking skills. Learning to interview again, or maybe for the first time, and preparing an effective resume are handy skills to have in any economic climate.

Don't despair. Being laid off is like a splinter in the toe, always painful but rarely fatal (unless untreated). It has also happened to more people than you may think.

Hargrove was laid off in September 1991 from a job he held for 10 years. Five months later, he landed a new job in a different industry.

'Demand pull' policy would top 'supply push'

JOHN DIEBOLD



In his recent column, Richard Kraft correctly pointed out some negative conditions that have adversely affected U.S. technology during recent years [CW, Sept. 14]. Kraft indicated both the difficulty and importance of undoing the damage.

I suggest an approach to what is often called "industrial policy" or "technology policy" that might move us in a positive direction.

Most industrial policy proposals are based on a "supply push" concept — direct or indirect monetary subsidies for targeted, potential growth industries, tax advantages and provision of seed money in various forms.

While tax conditions that encourage research and development and new investment are desirable, many supply push efforts have in the past led to pork barreling and frustration.

The alternative that I suggest is to establish "demand pull" in markets such as societal infrastructure.

Old-fashioned notion

Both political parties agree on the need for major expenditure to renew our infrastructure. Most of the time, however, renewal of infrastructure is viewed as a matter of refurbishing systems conceived in the late 19th or early 20th century.

This status-perpetuating approach is totally inadequate for an advanced industrial society. A more forward-looking approach is required — one that will use available technologies to satisfy the needs of the early 21st century.

Such an approach will bring two important benefits:

- A "demand-pull" for advanced technologies, systems and software that will ensure vigor in those sectors of the economy far more directly and effectively than military or space program "spin-offs" or supplier subsidies.
- Improved productivity and effectiveness of the infrastructure, which will lead to increases in business productivity and ultimately improved international competitiveness for the nations or regions pursuing such an approach.

Both "soft" and "hard" 21st century infrastructure will be changed materially by information technology. The delivery of health care and education are what I term "soft" infrastructure; and intelligent vehicle/highway systems and area communication grids are what I characterize as "hard" infrastructure.

RENEWING OUR infrastructures to satisfy the needs of the 21st century and applying the available technologies will bring important benefits.

The monitoring and response to environmental changes is, for example, one major new societal infrastructure that will be based almost entirely on information technology.

A new approach

I recommend that we build fresh thinking into the legislative process on these subjects. And when that is done, each time money is appropriated for a new project, an appropriate functional requirement should be built into the legislation. This is an alternative approach to the kind of stimulus that defense and space provided in the past.

Using the suggested market approach, we will effectively create a domestic market for technologies that compete in world markets. The great advantage I see is that this will stimulate companies to develop systems that will have growing, worldwide peacetime markets. And in doing so, rather than having to guess where to put public money, private capital is put at risk.

Diebold is chairman of Diebold Institute for Public Policy Studies, Inc., an operating foundation.

Screens exhibiting similar data show the difference between traditional applications (above) and real world applications developed using Sybase's Gain (right).

THE OBJECT IS

After all the hardware, all the software, all the megabytes and ROM and MHz, it finally comes down to a person sitting in front of a computer screen, trying to be productive. To see relationships. To make connections. To draw conclusions.

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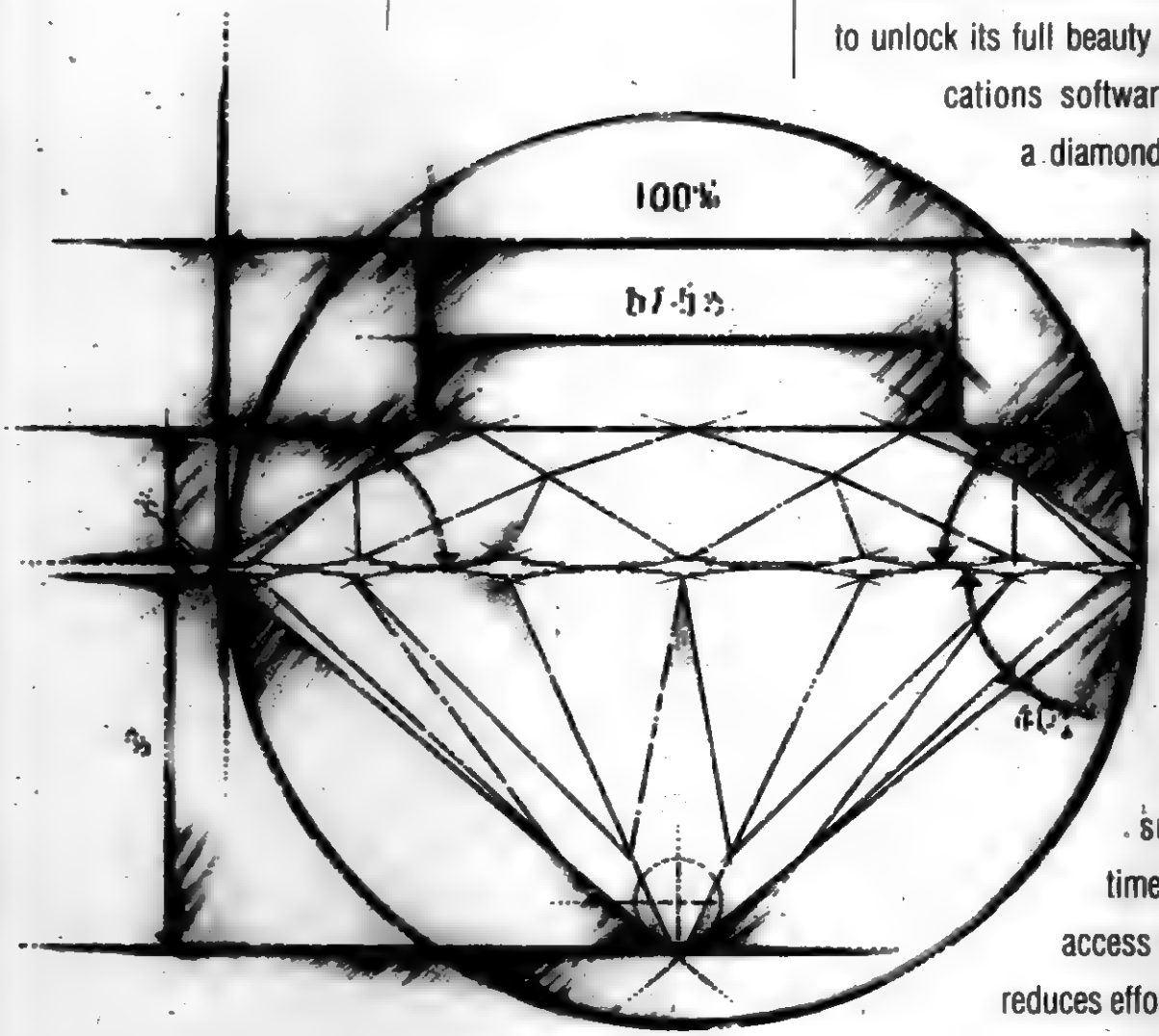

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COMMENTARY

Jesse Berst

Use caution on Windows NT

The recent announcement that Windows New Technology (NT) will be delayed is the perfect excuse to re-examine this new operating system and its impact on corporate IS.

For companies interested in testing out brand-new technology, think about installing NT code now. However, many companies will want to wait until NT is a shipping — and proven — product.

NT, as you will recall, is Microsoft's new operating system. It is designed to be "portable" — that is, to be movable to different hardware platforms — while remaining backward-compatible with DOS and Windows/DOS. If Microsoft can pull it off, corporate IS will have a seamless, scalable solution. They'll be able to move their 16-bit Windows/DOS applications onto high-end workstations running Windows NT. And they'll be able to take advantage of powerful 32-bit NT applications as they appear.

After promising that NT would be out by the end of the year, Microsoft has now changed its tune. The current target is spring 1993. My sources tell me that NT may slip even further, thanks in part to problems with achieving DOS compatibility. NT attempts to emulate DOS in software, a difficult task made even more challenging by the thousands of "nonstandard" DOS applications that have sprung up over the years.

There is a real danger to IS in these "creeping delays." You could be tempted to put off a strategic decision for a few more months until NT is out. As we've just seen, when those few months pass, NT could be delayed a few months more. It could turn out to be the computer equivalent of a carrot on a stick, with you playing the role of the donkey.

That's not to say that all IS departments should steer clear of Windows NT. During the past 10 years, we've seen more and more companies gain a competitive advantage through the application of PC technology. If your firm needs to live on the cutting edge to stay ahead, then NT should be part of your game plan.

Continued on page 40

Quattro Pro for Windows boosts usability

BY CHRISTOPHER LINDQUIST
CW STAFF

Spreadsheets and calculators have a lot in common. When they came out, users paid hundreds of dollars to get very limited functionality. But the productivity improvements per feature on a four-function calculator, or Lotus' 1-2-3 1.0, were tremendous.

Then calculators began getting more complex, but the new features appealed only to niche markets. The same has happened to spreadsheets. As they mature, the spreadsheets have few new functions that offer broad appeal.

Borland International, Inc. said it has recognized this trend and that its recently released Quattro Pro for Windows is aimed at increasing usability, not functionality. Borland has succeeded, though apparently at some cost.

Slight inconvenience

Quattro Pro for Windows uses a lot of system resources, nearly twice as much as Microsoft Corp.'s Excel, according to a resource monitor. While this would not be a problem for many users, who run only one or two applications at a time, it did cause me to close some applications in order to get Quattro Pro for Windows to load.

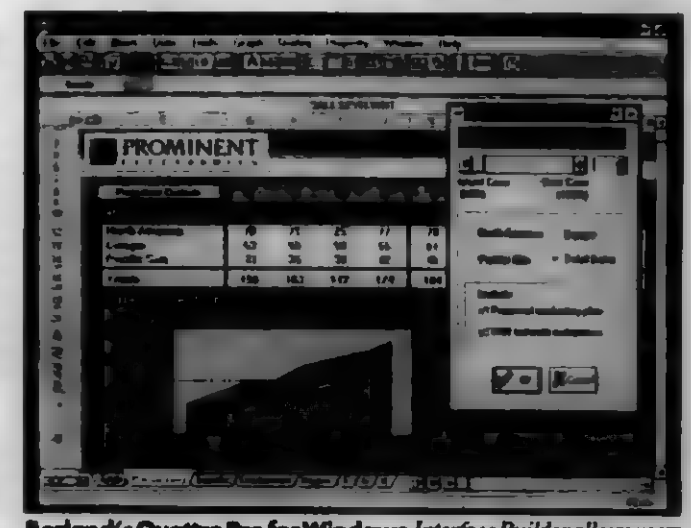
My goal in testing Quattro Pro for Windows was not to set up a feature-by-feature comparison with Microsoft's Excel or Lotus Development Corp.'s 1-2-3 for Windows. Borland itself has acknowledged that there are analysis functions, features and speed comparisons in which it loses.

My intent was to load the product and dive in blind to really test the "usability" that Borland claims to provide.

A truly usable spreadsheet, in my mind, should be one where I do not have to read the documentation to use most of the features. Under those terms, Quattro Pro for Windows is a very usable spreadsheet.

I set out to build a budget spreadsheet from scratch. Sheets are presented as notebook pages with tabs that you can click on to move from page to page. Tabs can be renamed simply by clicking with the right mouse button to call up the "object inspector" menu.

In fact, you can click the mouse's right button to display an object-specific list of variables that can be modified for nearly any object in a spreadsheet. Whether Microsoft or Borland thought of this feature first depends on who you believe, but regardless, it works well.



Borland's Quattro Pro for Windows *Interface Builder allows users to create custom interfaces to spreadsheets*

Two files

I renamed tabs "Home" and "Work" to keep separate sheets for each set of information. There is always a "Graphs" tab at the end of the notebook where all the graphs are stored.

I created the Home sheet using the SpeedFill command to insert dates and data and then SpeedFormatted it with one of Borland's preset formats, which determine color, shading and fonts for a selected range. Not once did I have to go to the Help command.

To help the novice user, all the SpeedBar icons and menu items have a short description that appears in the lower left-hand corner as you move the mouse pointer.

I then did the same for the Work page. Finally, I created a Consolidation page to keep all my totals. Everything was point and click.

The pages went together easily and looked quite presentable,

Continued on page 40

System takes doctors' orders and heals itself

BY JAMES DALY
CW STAFF

TORONTO — There are few things worse than lodging a complaint with an organization and then watching it sink out of sight into the muck of bureaucracy. That is even harder to stomach when the complaint is being made against a professional as supposedly impeccable as a medical doctor.

But bureaucracy and an antiquated complaint handling system was exactly what was ailing The College of Physicians and Surgeons of Ontario (CPSO), a 25,000-member self-regulating professional association similar to a U.S. state medical board.

Although CPSO's primary duty is to grant physician and surgeon licenses, it also has another less tasteful duty. When someone believes a CPSO member has performed unprofessionally, he lodges a complaint with the CPSO's Public Complaints and Investigations Department, which is responsible for investigating and — if prosecution is warranted — judging the case.

Typically, the CPSO has a current caseload of roughly 2,000 public complaints, plus about 100 other investigations. But in the past few years, the number of complaints lodged with the CPSO has skyrocketed. For example, between 1991 and 1992 the number of sexual harassment complaints increased 275%.

Unfortunately, the CPSO was just not getting the job done. Investigations were limited to slowly collecting written documents; progress reports were out of the question. The result was that a 1991 survey by a CPSO task force revealed widespread public dissatisfaction, an irony not lost on the staff members whose central goal was to serve the public.

"Something would eventually get done, but it could typically take years," said Keith Thomas, the CPSO's director of information services. "What was worse was that from the time the complaint was lodged until something was decided, the person who filed the complaint heard nothing."

CPSO officials rolled up their sleeves and got to work. At the end of the road, they brought out an application called Case Administration Tracking System, or CATS. The Microsoft Corp. Windows-based system uses Software Publishing Corp.'s Superbase with SQL Library to continually track the status of an investigation, the documents supporting each step and the names of all the individuals involved in the case.

The development process started with outlining goals. First, to institute a more timely investigative process, the staffers needed to create a system that would allow them to do more work on the telephone. While on the phone, they would need to quickly and easily find and record

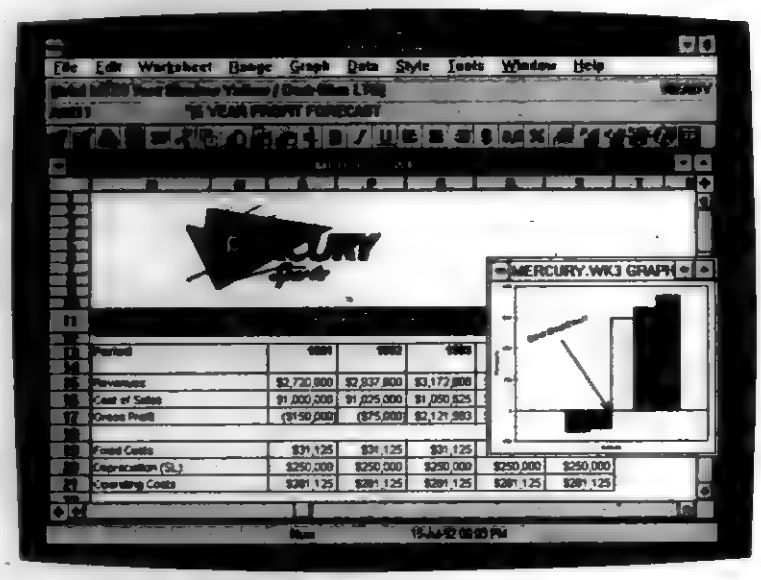
Continued on page 41

ON SITE

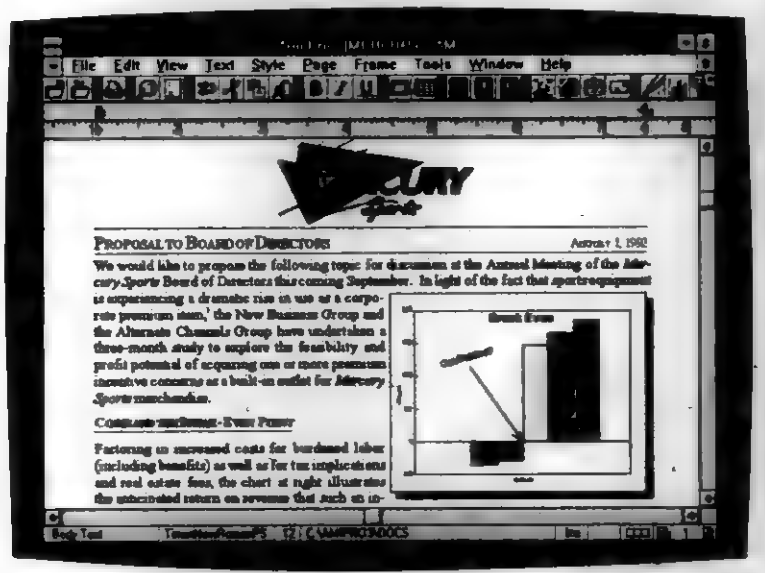
College of Physicians and Surgeons of Ontario, Canada (CPSO)

- **Challenge:** To handle growing caseload of complaints against CPSO members and public dissatisfaction with slow paper-based investigative process, without increasing support staff.
- **Strategy:** Complaint department automated with Software Publishing's Superbase. Tracking system allows CPSO's 24 investigators to closely follow each step in a case and insert images of relevant documents.
- **Results:** The dissemination of summaries and global index of names brings out more information earlier in a case's progress, resulting in quicker resolution.

Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1, the ideal choice for 1-2-3 for DOS users moving to Windows, now includes SmartPak, a disk which includes over 25 new features and usability enhancements.



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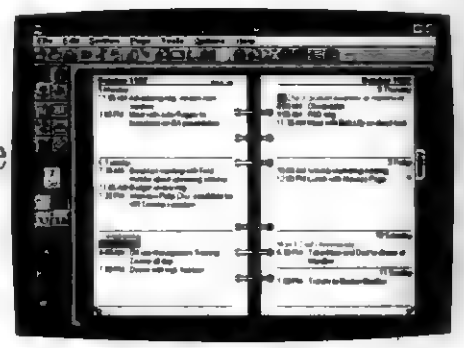

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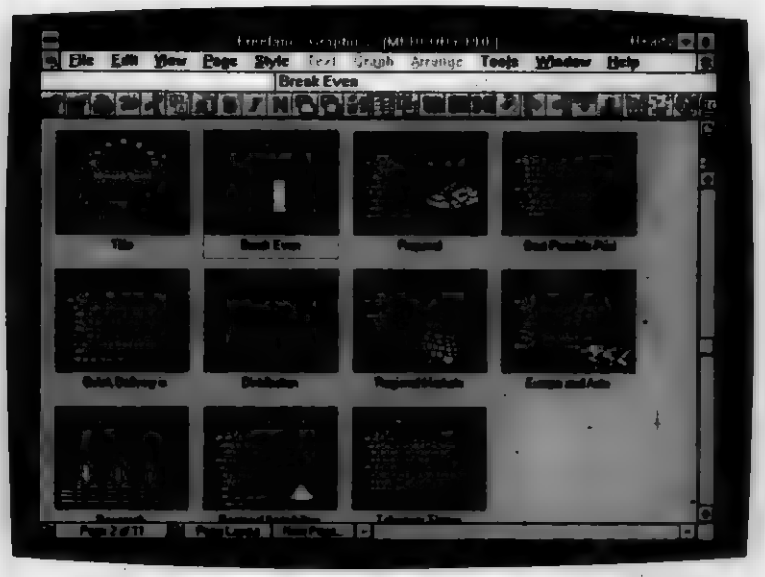

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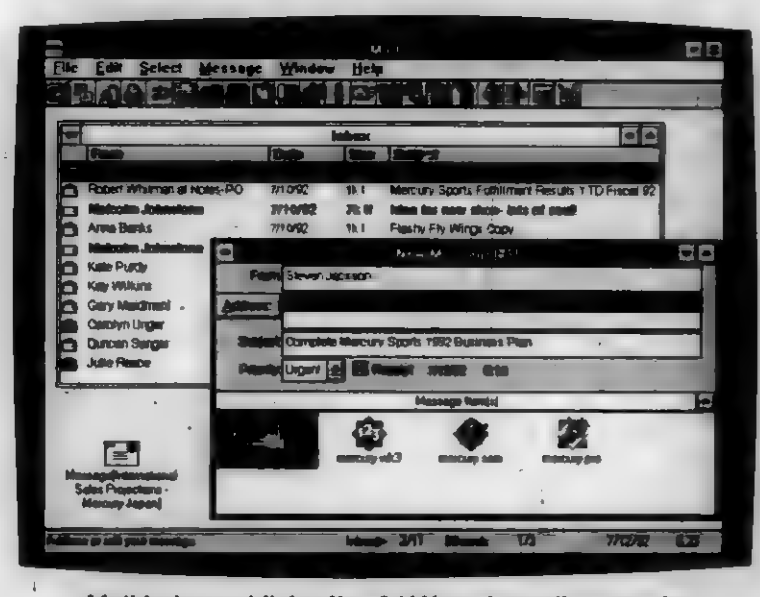

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SmartSuite applications just by clicking the icon of the application you want to open.

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Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

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Berst

CONTINUED FROM PAGE 37

This is especially true because Microsoft has an active and well-administered NT beta-test program. Beta-test users get lots of help and lots of information. NT also deserves consideration because of its technical strengths. On paper, NT looks to be the robust operating system IS needs to build line-of-business applications.

There will be plenty of time to move to NT when it gets here officially. Microsoft has been talking as if a substantial portion of the market will move to NT the day after it arrives. That's nonsense, no matter how good NT turns out to be. People don't migrate to a new operating system on the spur of the moment. The changeover will occur gradually, starting with servers. Only after a body of NT-specific software appears will people begin to move their desktops to NT. That probably won't occur until at least a year after NT ships.

What should you do in the meantime? Systems integrators or consultants would tell you to opt for "proven solutions." Today, that usually means Windows/DOS for the desktop and Unix, OS/2 or Novell's NetWare for the server.

I continue to believe that NT will ultimately be a powerful and strategically important operating system. I continue to think you should be testing NT if your company purposely pushes the envelope.

The rest of you should take the safe route and wait until NT proves itself before you make it part of your plans.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Quattro Pro for Windows

CONTINUED FROM PAGE 37

including a three-dimensional graph. Discontinuous joins, SpeedFills and SpeedFormats were all very straightforward.

I then went into some of the more interesting features of Quattro Pro for Windows, including the Interface Builder and the Database Desktop.

The Database Desktop reportedly takes advantage of the Local Interbase Engine to ensure data integrity and multiuser concurrency. That may be true, but I was more interested in taking a look at the .DBF files that contain my vendor information.

Database Desktop currently allows access only to dBase and Paradox file formats. That puts it at a disadvantage to Excel, which uses Pioneer Software's Q+E, which supports several formats, including SQL Server. However, Q+E is a separate package from Excel and lacks the integrated, all-in-one feel that Borland has achieved with the database desktop.

Custom interfaces

The Interface Builder is just what it says: a tool that allows you to create custom user interfaces to spreadsheets.

Borland has included some highly advanced examples, but I simply wanted to see how quickly I could create a dialog box with a spin control that would allow me to directly connect to data in a table and a graph. It took five minutes and no manuals. Any average spreadsheet user could do the same.

This is not to say there are not some negatives to Quattro Pro for Windows. Borland has acknowledged that it does not contain the statistical muscle of Excel. Its database access is currently limited to Paradox and dBase, and while it is easier to use than Excel, that is enough to make an experienced Excel user want to switch.

Borland is betting the farm on the "usability" theory. And while it may have the most usable spreadsheet on the market at the moment, it remains to be seen if users are willing to pay for that abstract quality.

Computer virus products debut

BEAVERTON, Ore. — Central Point Software, Inc. moved to help users fighting computer viruses by introducing the following antivirus products:

- Central Point Anti-Virus (CPAV) for Novell, Inc.'s NetWare, a $1,195 package that centralizes the administration and reporting of virus activities while affording virus protection for both servers and desktop personal computers.
- CPAV Version 1.4 for DOS, which combats viruses developed by the virus Creation Laboratory and more than 1,300 other PC viruses. It costs $129.
- CPAV for Apple Computer, Inc.'s Macintosh, a $69.95 package identical to the virus detection and eradication program found in MacTools 2.0.
- CPAV Scan-Only System, a utility that scans DOS files to determine if they are infected and alerts users if a virus is found. It is free through the firm's bulletin board.

The company also announced CentralTalk and CentralAlert, which have been incorporated into the NetWare and DOS antivirus packages. Both streamline the process of virus monitoring and alert.

In addition, Central Point announced an expansion of its Virus Protection Services Plan. It features a quick-response virus eradication team that is poised for dispatch within 24 hours of a virus attack at any subscribing site in the U.S.

JAMES DALY

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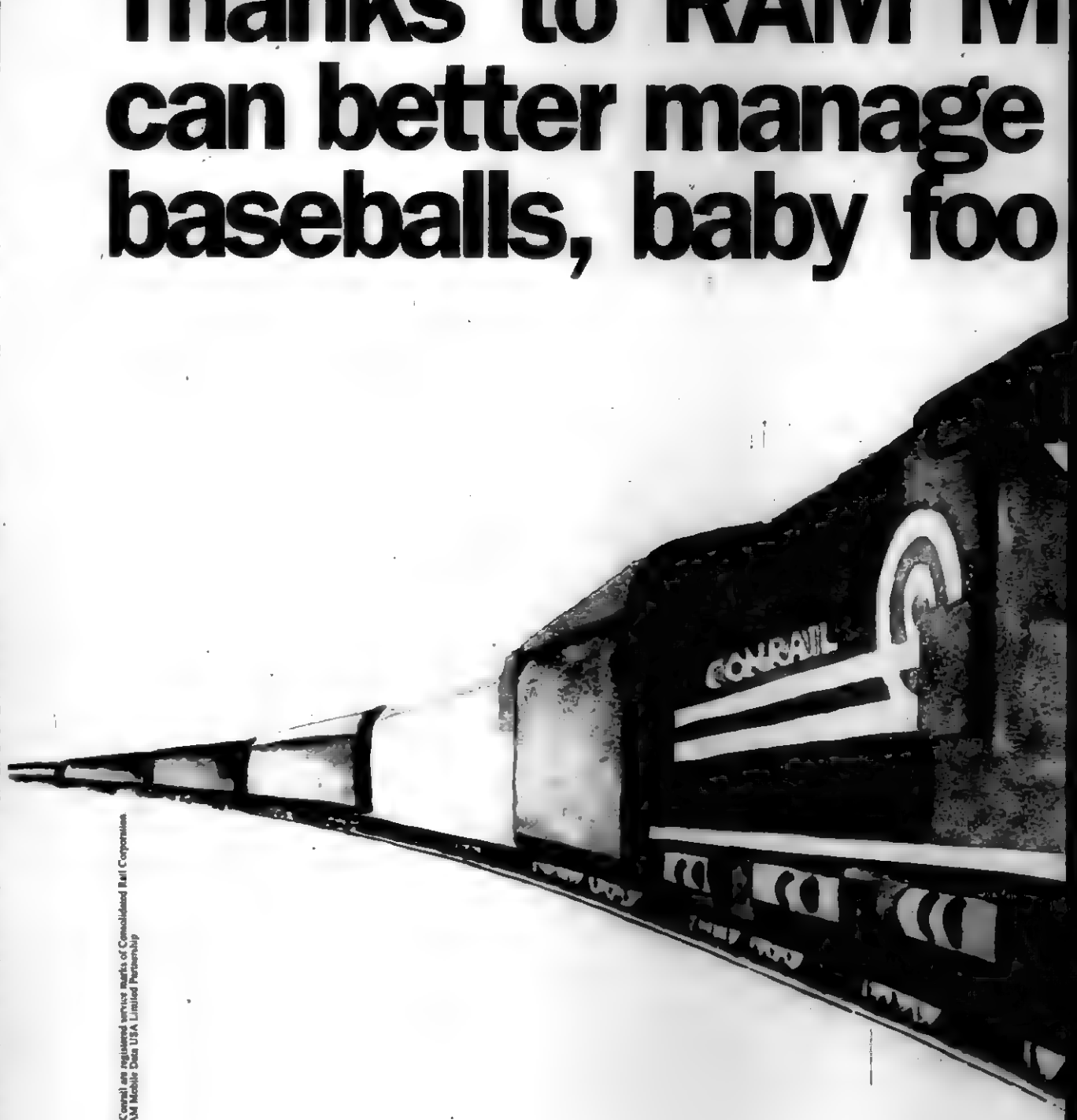

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HELP LINE

IBM OS/2

Part of a continuing series of tips from personal computer software vendors, based on questions commonly asked of customer support personnel. This week's questions focus on IBM's OS/2 2.0.

Q I accidentally shredded some objects that I want back, such as my drive object. Can I get these back?

A Yes. When you turn on your computer, it goes through a self-test. It usually beeps after this. Immediately after this beep, or right after you hit the ENTER key on a multiboot system, press and hold the ALT and F1 keys together until you hear rapid beeping. This means you have filled the keyboard buffer.

You should soon see a message that your INI file and CONFIG.SYS files have been replaced from the INSTALL directory. This will cause the system to build you a default desktop just like the one you had when it was first installed.

Q How can I stop the programs that were running when I shut down from starting when I reboot my system?

A When booting your system, watch for the Workplace Shell screen to paint the background for the first time. Watch carefully and you will see the desktop folder animation "explode" open.

As soon as you see this, press and hold the CTRL, ALT and F1 keys together until you see the Workplace objects and icons display. Then release the keys.

Q When running a DOS program in a VDM, I get the message, "Incorrect DOS Version." What can I do?

A Open the settings notebook for the object on the desktop. On the "Session" page, open the DOS settings and change the DOS_VERSION. This will allow OS/2 to make the application think it is running whatever DOS version you need.

Q I formatted a drive for FAT, but I want to make it HPFS. Can I do this?

A Yes. First, ensure you have backed up all of your data from the drive. Now, let's assume it is your E drive you want to format. Simply type:

FORMAT E: /FS:HPFS

Likewise, if you want to make an HPFS drive FAT, use /FS:FAT in the line above.

ata and Conrail

obile Data, Conrail boxcars of broccoli, d and bulbs.

Using pen-based computers and RAM's wireless data networks, Conrail's yard locomotives will be able to send and receive pick-up and delivery information, as well as other messages, from its national customer service center. What used to take hours to communicate will now take a matter of seconds.

Conrail isn't alone. MIS/DP departments in countless other companies are finding out that with RAM, deploying remote technology in the field is a reality today. Many applications that were previously desk-bound, such as E-mail, order entry and database access, can now be performed anywhere your people go.

RAM's wireless data service is based on Mobitex,® a proven technology and open international standard for wireless data communications. Other network features include: packet-switching which eliminates circuit set-up time inherent in other wireless technologies; and transparent roaming and store-and-forward capabilities so users can stay in touch with their applications wherever they go.

Today RAM is expanding and operating a series of wireless data networks to cover the top 100 metropolitan areas of the United States and the major transportation corridors — providing coverage to more than 90 percent of the U.S. urban business population. To learn more about RAM's service, call 1-800-736-9666. RAM Mobile Data, One Rockefeller Plaza, Suite 1600, New York, NY 10020.

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RAM MOBILE DATA

System takes doctors' orders and heals itself

CONTINUED FROM PAGE 37

case information. They would also need to give those who filed complaints timely updates.

They also needed a system that would save them from drowning in a sea of paper. Every CPSO case involves from five to 60 administrative steps, each requiring a summary, Thomas said.

Additionally, every case has its own supporting documentation — sometimes hundreds of documents.

IS staff members also had to work with two dozen gun-shy investigators because there was almost no automation involved in the investigative process up to that point.

"It was clear that the system had to be truly easy to use — not only easy to operate but easy to learn," systems specialist David Ikeda said.

For each investigative step, CATS inserts images of the relevant documents and attaches the text summary. Its global index provides a quick and easy look-up without the user having to know with which case the name is associated. It also retains all names and headers up to six years after case closure.

Reminders given

CATS' date and event-driven signal system also alerts support staff when action is required on a case, such as distributing summary reports. Security is based on the user's name, to which CATS assigns access privileges.

Upon logging onto CATS, users need only point and click on the graphical interface to perform searches, access records, attach documents, see action needed or print. Previously, the keyboard only entered or edited text.

Along with productivity and customer service benefits, the use of CATS running over a Novell, Inc. NetWare network provides an unexpected bonus: The dissemination of summaries and the global index of names releases more information earlier in the investigation, resulting in cases being resolved sooner.

Although CATS is still only in a production test, Thomas said it has received such positive reports that he expects the applications to be used through the investigative department early next year.

When you spend ten years designing spreadsheets, you get pretty good at filling in the rows and columns.

While this is old news to the nearly 18 million people who use 1-2-3,® it bears repeating: according to a recent ComputerWorld study for spreadsheets, Lotus® is still the company people prefer to do business with. And still the company that offers the best service and support—across all major platforms.

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Lotus. Still on the top of the charts.

ComputerWorld Spreadsheet Brand Preference Study
First Place Winners 1992

POSITION	DOS	WINDOWS	MACINTOSH
FIRST PLACE Prefer To Do Business With	Lotus	Lotus	Lotus
FIRST PLACE Best Service/Support	Lotus	Lotus	Lotus

Lotus 1-2-3

*Based on Software Publishers Association share data, May 1992 for North America. **In Canada, call 1-800-GO-LOTUS. ***While supplies last. Demo disk not available for palmtop version of 1-2-3. ©1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Incorporated. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a trademark of UNIX Systems Laboratories, Inc.

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NEW PRODUCTS

Systems

ATI Technologies, Inc. has introduced two Microsoft Corp. Windows-based graphics accelerator cards.

The Graphics Ultra+ is a high-performance, dynamic random-access memory accelerator. Its features include enhanced image data transfer performance with memory aperture architecture and support for 1M or 2M bytes of video memory.

The Graphics Ultra Pro is a high-end, video RAM accelerator that features noninterlaced, 1,280- by 1,024-dot resolution with 256 colors and a 74 Hz refresh rate. It is available in Extended Industry Standard Architecture, XT/AT bus and Micro Channel versions.

Graphics Ultra+ costs $399; Graphics Ultra Pro costs $599.

ATI Technologies
3761 Victoria Park Ave.
Scarboro, Ontario
Canada M1W 3S2
(416) 756-0718

Utilities

Modular Software Systems has introduced Bootcon for DR DOS, a boot-time configuration utility.

Bootcon for DR DOS enables users to use any combination of graphical interfaces, devices and drivers without having to reconfigure their systems. Up to 26 different user-defined configurations can be selected during boot time. Users can predefine the different system configurations needed for various tasks by booting the machine and selecting the appropriate configuration from the Bootcon menu. The user reboots when the task changes and chooses a new configuration.

The product costs $89.

Modular Software Systems
Suite 208
25825 104th Ave.
Kent, Wash. 98031
(206) 631-5781

Software application packages

Software Publishing Corp. has introduced an updated version of Harvard Draw for Windows that incorporates Adobe Systems, Inc. Type Manager and support for TrueType and Type 1 fonts.

Harvard Draw combines speed, ease of use and a set of innovative drawing tools. It is the first drawing package that lets users draw in full-color Preview Mode. What-you-see-is-what-you-get text entry is also provided, as is an integrated autotrace tool. The product requires Microsoft Corp.'s Windows 3.0 or above and was designed for IBM personal computers and compatibles.

Harvard Draw Version 1.01 costs $595.

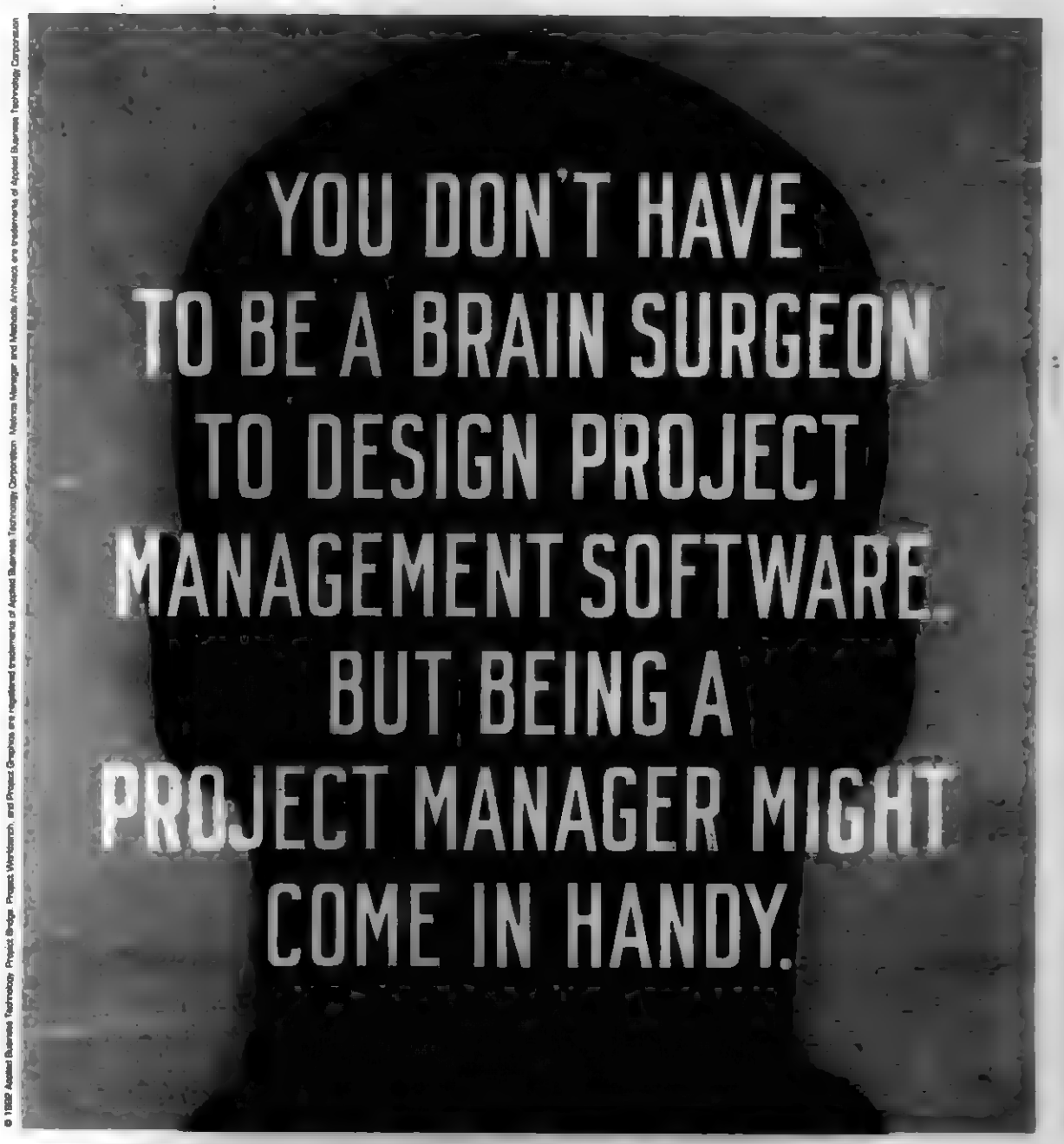
Software Publishing
3165 Kifer Road
Santa Clara, Calif. 95056
(408) 968-8000

Fifth Generation Systems, Inc. has introduced a software security bundle that combines Untouchable 1.1 antivirus software and DiskLock PC, an access restriction and encryption program.

Without requiring frequent virus signature updates, the product offers protection and detection of known and unknown viruses, including more than 1,000 known viruses, hard-to-detect "stealth" viruses and self-mutating viruses. A patented virus removal technique is included that gives 100% safe restoration of recoverable infected files. DiskLock PC locks out unauthorized users from data files and disks. The product also uses three encryption schemes.

The security bundle costs $99.

Fifth Generation Systems
10049 N. Reiger Road
Baton Rouge, La. 70809
(504) 291-7221



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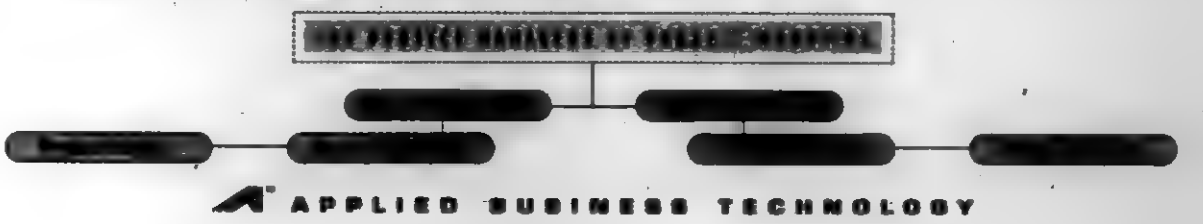

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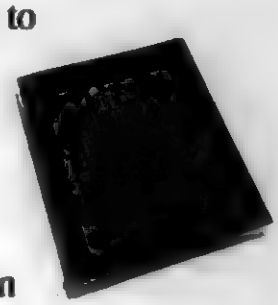

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Aftermath of reorganization: Sun sharpens market focus

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Although it was one of the most pivotal events in Sun Microsystems, Inc.'s 10-year history, the July 1991 reorganization into individual subsidiaries has gone largely unnoticed by Sun's user base.

That's precisely what Sun President and Chief Executive Officer Scott McNealy hoped would happen.

"We only want the customer to see one sales and distribution channel," McNealy said recently. That would be Sun Microsystems Computer Corp., the hardware company where the bulk of Sun's 12,500 employees still work. Some customers also deal directly with SunExpress, the subsidiary that sells workstation peripherals via mail order.

All in the family

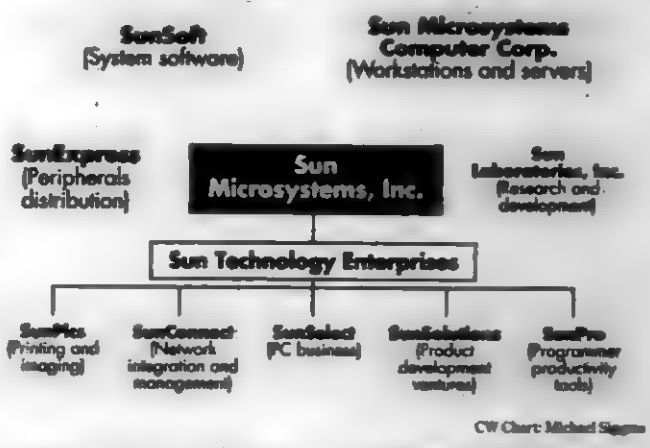
The rest of the Sun companies do business mainly with one another and with OEMs, value-added resellers and other vendor partners.

"Our goal was to avoid having our customers lose the image of Sun as a single company," said Eric Schmidt, president of Sun Technology Enterprises, Inc., which has spawned more business units than any of the other major divisions (see chart). "It has made our decisions crisper, and our competitors are more clearly in focus now."

Analysts and users — at least, the few who noticed the change — tend to agree.

Sun separation

Sun's 1991 reorganization into five major subsidiaries focused the company more aggressively on different markets



CW Chart: Michael Siggins

"Buying stuff from SunExpress is convenient, and I like a lot of the things they've done in terms of focusing on new product directions," said Mike Prince, information systems director at Burlington Coat Factory, Inc. in Lebanon, N.H. He said the individual divisions also seem to be paying closer attention "to products that are useful for their customers."

Some customers have found the reorganization more frustrating than fruitful, however.

"I've seen nothing positive and lots of negatives," said David Pensak, corporate adviser for computer technology at Du Pont Co.'s research and development division in Wilmington, Del. "It used to be there was one person you could call to find out everything. Now they have to call a bunch of other places to get the same information."

Still, industry analysts have taken a generally positive view of the restructuring. They said it has reshaped the company with a clearer business model, a tighter market focus and greater accountability from its various

Continued on page 67

Users ponder Notes delivery schedule

BY ROSEMARY CAFASSO
CW STAFF

Acknowledging some confusion surrounding the expected arrival of Notes Version 3, Lotus Development Corp. recently sketched out a shipment schedule for the workgroup software and other key products, targeting early 1993 instead of late 1992 for delivery.

The target dates will cause some users to adjust their implementation plans, but others said they were not counting on immediate delivery of either the new Notes or the next release of 1-2-3 for Windows anyway.

"Years ago, I learned that trying to work a corporate strategy based on release dates is not a good move," said Ronan McGrath, vice president of information systems and accounting at Canadian National Railways.

In an interview earlier this month, John Landry, Lotus' senior vice president of development and chief technology officer, said Notes Version 3 is not behind schedule even though at least one company executive, as well as Lotus partners and industry analysts, had indicated it would ship by year's end. Officially, the company had said Version 3 would ship sometime before mid-1993, and Landry said Lotus is well within that time frame.

Landry said Lotus "didn't have a firm, fixed target date" and had decided as recently as this summer to bundle even more features with the product. In addition, it will contain several promised enhancements, including a text search and retrieval engine, work-flow functions and support for an Apple Computer, Inc. Macintosh client.

"Obviously, we'd like to see it become available sooner," said Chris terMatt, manager of the Knowledge Exchange Group at Andersen Consulting, which, along with its affiliate Arthur Andersen & Co., signed on for 20,000 copies of Notes earlier this year. "The initial plan was to wait until Version 3 was available before rolling [Notes] out. Now so, groups will probably decide to go with Version 2 and take on the migration later."

Yet, McGrath said, "There isn't a staggeringly critical need here," for Version 3. "There are nice things in it. When the features come, we'll use them."

Landry also confirmed that 1-2-3 for Windows Release 2 is slated for an early 1993 shipment. In late summer, Frank Ingari, the company's director of marketing, had indicated it was likely that Lotus would not make the late 1992 shipment date for its Windows spreadsheet.

Release 2 will contain Lotus Chronicle technology, which will bring workgroup functions to the spreadsheet application and allow groups of workers to share a spreadsheet and contribute to it.

Improv, a financial analysis and modeling tool, is on schedule for delivery later this year, Landry added.

Jude Gartland, senior vice president of computer services at Lehman Brothers, Inc. in New York, said his staff is interested in checking out 1-2-3 for Windows Release 2.

(WHEW!)

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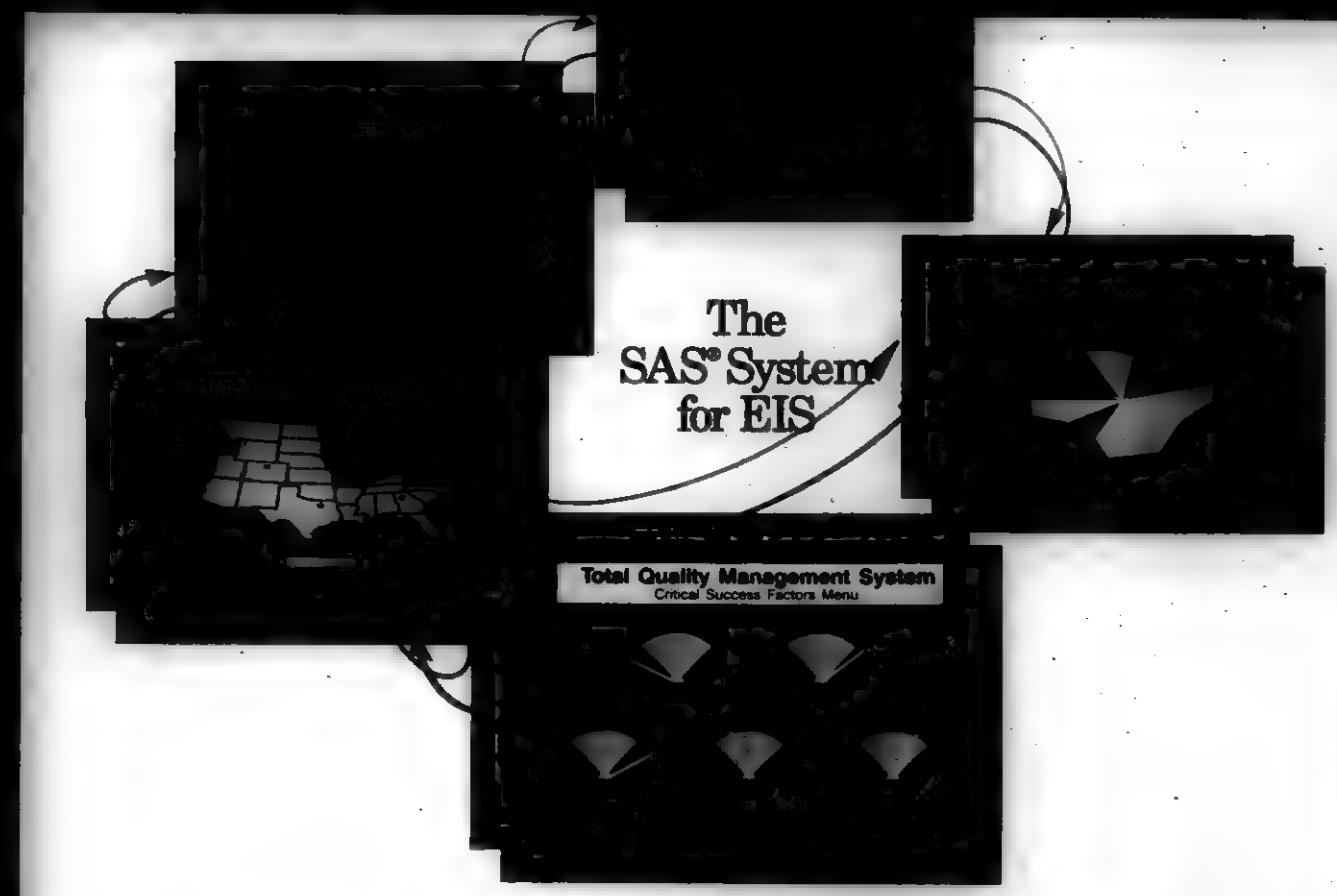

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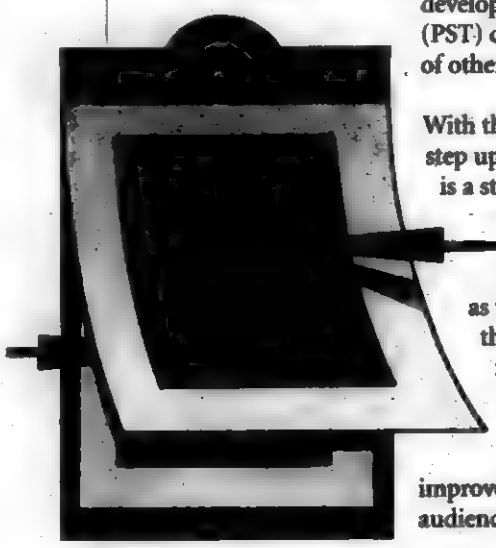
Introduction

During the 1980s, Executive Information Systems (EIS) grew in popularity as executives longed for more information at their fingertips. They wanted EIS applications that provide executive level access to predigested and preanalyzed information from corporate databases.

Survey information collected by IDC indicates that, although the market for EIS is going in new directions, the installed base remains stable. For instance, almost two-thirds of all IBM mainframe installations surveyed indicate that they run EIS applications.

Although the changing EIS market still features a strong high-end, mainframe-based segment replete with familiar vendors and products, a newer market segment is built around PC and LAN installations. It is currently experiencing strong growth — total worldwide installations doubled in 1991 — and vendors are targeting smaller companies and subexecutive levels.

IDC breaks EIS software down to three categories: EIS applications support executive information needs and decision-making activities. Packaged EIS software applications provide sophisticated EIS development tools. Professional Support Tools (PST) combine EIS software with a broad portfolio of other end-user tools such as spreadsheets.



With their user-friendly interfaces, EIS represent a step upward from spreadsheets in complexity. This is a step that an ever-growing and diverse group of users is ready to make.

EIS use is marked by top-down movement as the demand for information access grows throughout organizations. Primary users include not only CEOs, but CFOs and a variety of line managers who can work better by having better information. EIS popularity will continue to increase as improved information is made available to a wider audience of users.

This White Paper was written independently of the Computerworld *editorial department by Clare Gillan and Ken McPherson. Gillan is manager of application solutions at IDC. McPherson is a senior consultant to IDC.*

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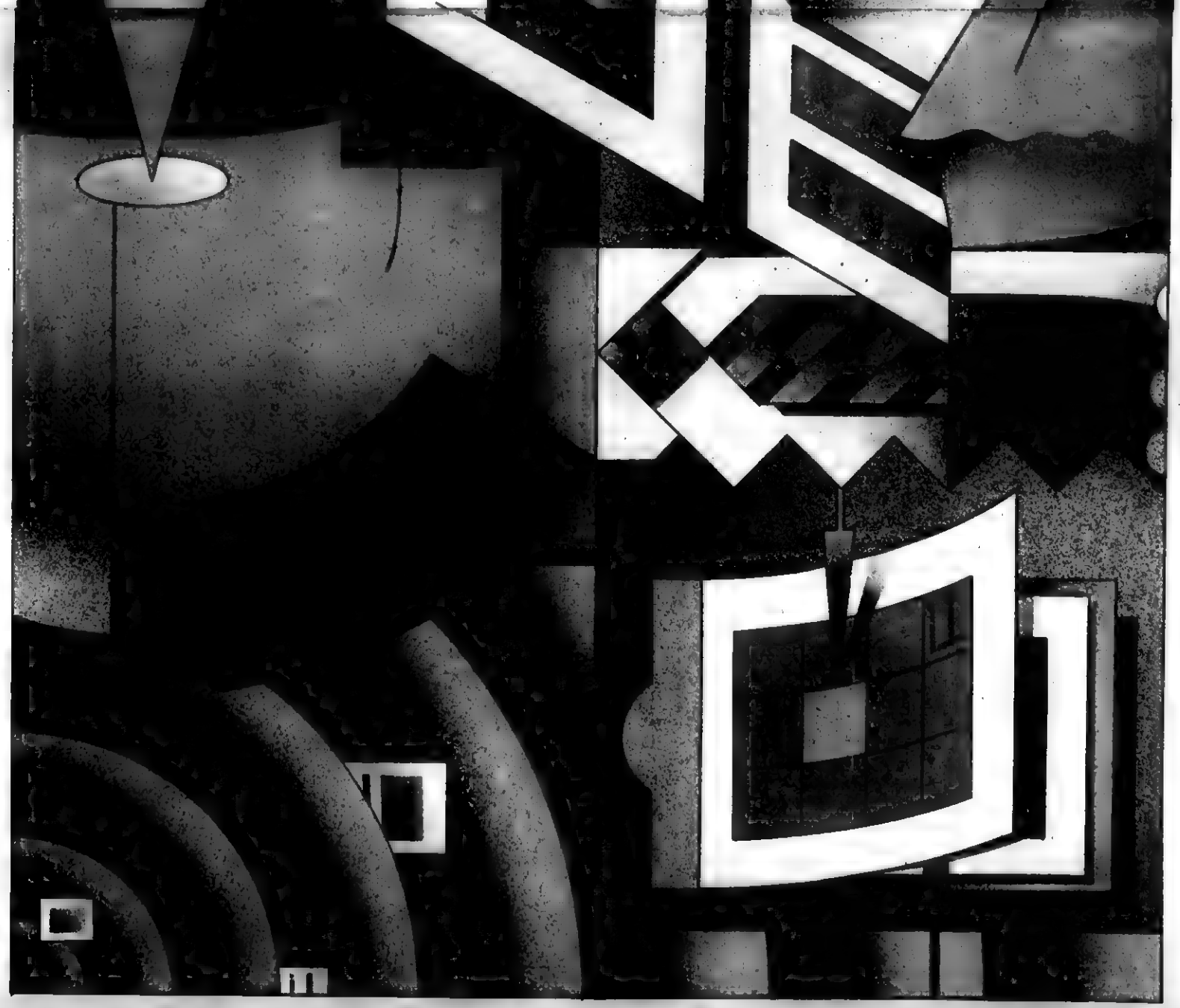


Executive Information Systems (EIS) provide executive-level access to predigested and preanalyzed information from corporate data bases. After several years of being targeted at executive suites, they are now entering the mainstream of Information Systems (IS) applications. Like many other technologies that have made the transition, EIS will become less strictly defined. As this happens, EIS applications will embrace a range of products targeted to support professional decision-making. New products from traditional vendors and new companies will offer opportunities to IS development managers.

EIS ranked highly among the technology buzzwords of the past several years and EIS vendors attracted substantial media attention. During the early 1980s, the EIS market surged in response to the demand in the executive suite for more information. The 1990s will see EIS moving from the executive suite to professional offices as enterprise

managers and analysts recognize its value.

IS managers in most large organizations have considered EIS applications carefully at one time or another during the past five years. Many adopted EIS technologies. This movement toward wider EIS implementation acknowledges that tools that effectively support top managers can gain entry in IS shops.

Software analysts at International Data Corporation (IDC) recently interviewed 200 information systems managers at IBM mainframe and large Digital Equipment (DEC) IS shops. The feedback from these interviews demonstrates that EIS applications are maintaining their importance in application development decisions. Almost two-thirds of all IBM mainframe IS installations surveyed have installed EIS applications.

EIS applications were also popular in large DEC-based shops. Almost three-quarters of all large DEC installations surveyed have evaluated EIS. And over 40% of the DEC sites installed EIS applications. In addition, many IBM and DEC sites are currently evaluating EIS.

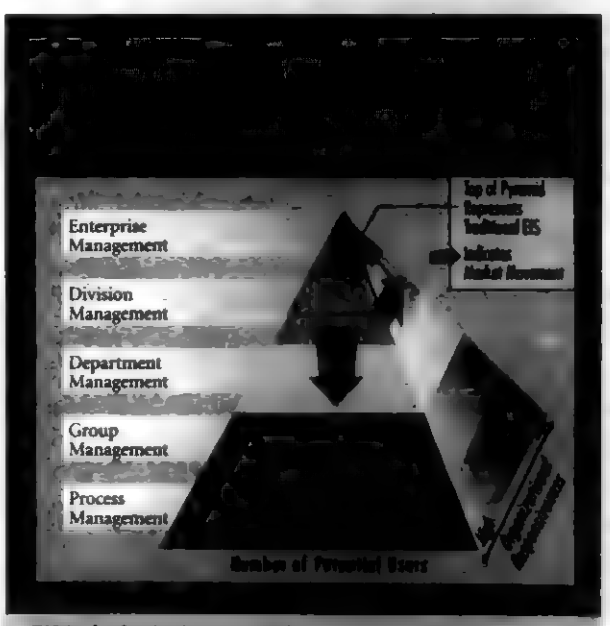
Software vendors recognized and profited from this interest in EIS systems. Annual revenues from packaged EIS software, slightly over $5 million in 1985, topped $100 million in 1991, according to IDC estimates.

THE MARKET DIVIDES

The market for packaged EIS software began to divide in the late 1980s. As a result, one segment of the market is now composed of mainframe-based flagship products such as Comshare's Commander EIS and Pilot Executive Software's Command Center. These systems, which typically involve average installed values in excess of $100,000 target executive suites in the largest corporations. The market for them is approaching saturation; not surprisingly, market growth has slowed. In response, vendors are looking for new markets to sustain their revenue growth rates.

The second market segment features a generation of products focused on PC and LAN installations. This segment is experiencing strong growth, with total installations worldwide doubling in 1991. Products represent the packaged EIS software vendors' efforts to build mass market appeal. They are targeted at smaller companies and departments within larger corporations. Potential users here recognize a need for enhanced management information, but cannot justify, either directly or indirectly, the cost of a mainframe installation.

The effort and cost of assembling and maintaining mainframe EIS applications have dissuaded many potential users from making initial EIS investments. Many others have chosen to place EIS on temporary hold or to implement simpler systems that deliver much of the value of higher cost systems while requiring far fewer IS resources.



EIS is also beginning to move beyond companies that require real time management reactions in response to changing market conditions.

PROFESSIONAL SUPPORT ENVIRONMENT

While the demand for mainframe EIS software products has slackened, IS managers still recognize the need for effective tools to deliver value-added information to senior management and others within the organization. These discerning managers are looking at a broader range of tools which IDC defines as the "Professional Support Tools" (PST).

PST software includes a portfolio of software tools designed to support professionals and managers in their daily activities. The portfolio includes data analysis and query software, financial modeling tools, as well as packaged EIS software. The growing popularity of PST demonstrates how the role of EIS is changing to meet the needs of a larger world of business professionals.

EIS: STILL EVOLVING

Software vendors, industry analysts and academics are engaged in an ongoing struggle to find appropriate terms for application software packages directed to executive and professional users. The confusion and disagreement over definitions and labels reflects a churning market; IS managers' requirements and software vendors' strategies are both moving through a period of major change and turmoil.

IDC software analysts use three different terms to classify professional and executive support applications:

- EIS applications support executive information needs and decision-making activities
- Packaged EIS software provides a sophisticated set of development tools to support EIS application development
- PST combines packaged EIS software with a broad portfolio of end-user tools. These tools include spread-

sheets, decision support and data analysis software.

Packaged EIS software includes Command Center, Commander EIS and the recently announced SAS/EIS from SAS Institute. These software packages are highly sophisticated development tools used by IS staff members to build customized EIS applications. They offer a packaged alternative to the patchwork EIS development approach used in many corporations. These software packages are marketed as "EIS systems."

Some gastronomically oriented consultants compare an EIS application to a pasta machine. The flour, eggs and other ingredients from corporate data bases enter the EIS pasta machine, emerging through the other end as linguine in the executive lunch room. The analogy might be a bit more accurate if the process began with unmilled wheat and a chicken coop, but the concept of extraction, processing and presentation is appropriate.

EIS applications typically include several features, including data extraction/navigation, rules-based logic, graphic presentation and professional workflow. Although many associate EIS applications with well-known packages from a number of software vendors, a majority of users build their own from application development tools.

Navigating through complex and non-integrated corporate data structures is often the biggest challenge for EIS developers. Some EIS include proprietary built-in access to data bases, enabling the system to get at information directly. However, most large EIS applications rely on a permanent staff of information systems data specialists to handle the extraction process, placing the processed information onto an intermediate platform accessed from the executive's EIS workstation. This process is normally termed "staging" in EIS circles.

Rules-based logic, including the basic level of exception reporting, enables systems to predigest information and highlight values that fall outside accepted ranges. Newer systems include more sophisticated analytical tools that examine overall patterns and prepare formal information reports.

EIS incorporate and build upon an individual executive's view of what is important. These views — a significant representation of the executive's management expertise — are captured in "what-if" statements, exception reports and internal calculations that are contained in the application's rules-based logic.

	Total	No EIS	EIS Installed
Favorable/Expand	21	3	28
Favorable/Maintain	17	4	28
Evaluate	32	47	19
Skeptical	10	5	14
Negative	1	1	1
Negative/Cancel	18	33	8
Unsure	1	7	0
Total	100%	100%	100%

Among EIS users, a plurality view their systems favorably and would like to expand them.

TRENDSETTING TECHNOLOGY

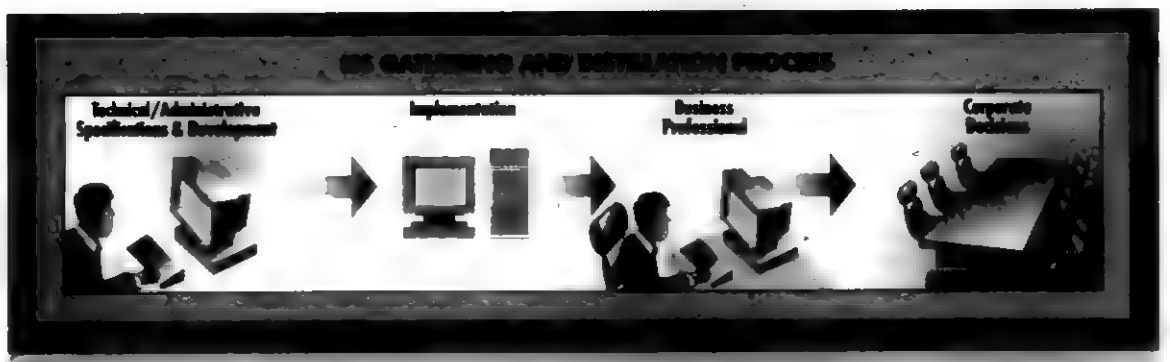
Canned EIS software helped pave the way for the introduction of graphic interfaces to the executive suite. EIS displays may use traffic-light-like screens or special color-coded matrices to report on the status of pre-identified standards of corporate performance. EIS' initial distinction as a graphic interface is changing as graphical user interface technologies become more prevalent. Nonetheless, graphic presentation, in increasingly sophisticated forms, remains a critical EIS component.

EIS software developers have incorporated the ability to mimic the normal flow of a specific executive's work pattern. An individual user might, for example, choose to first review key electronic mail messages, then examine several fundamental indices of corporate performance. That individual might then check out current stock prices through Dow Jones data bases, and finally follow up with comments to others in the group.

The EIS environment provides a natural avenue for management communications, and workgroup orientation is rapidly becoming a characteristic of mainline packaged EIS software. In a familiar EIS marketing scenario, an executive reviews a status report, enters either voice or written comments and sends the package through electronic mail to the responsible manager.

The dispersion of EIS applications among professionals in many organizations has rendered the "Executive" in Executive Information Systems an obsolete term. IS managers and corporate professionals now recognize that distributing the power of EIS applications to non-executives can substantially increase overall productivity. The distribution also helps to spread the costs of developing and maintaining a complex EIS environment across more users.

This kind of change will move the EIS market in two directions during the



EIS applications typically include data extraction/navigation, rules-based logic, graphic representation and professional workflow.

remainder of this decade.

First, applications will spread from organizations that require hands-on management toward industries that require less direct management involvement. Companies that require direct management involvement are in a position to gain the most from improved management access to operational information.

"The value of executive information systems can be truly appreciated when they are used to view operational information"

Second, applications will continue to move from the executive suite toward a less glamorous, but typically more demanding, role in group and process management.

In order to accommodate this demand, the broader category of professional support tools provides enhanced data analysis software and other tools to support professionals and line managers. IDC views PST software as the all-inclusive tool set that will be necessary to support both of these market trends.

Professionals managing financial issues continue to use decision support products, and this will remain a prime application for years to come. PST includes these decision support products, but expands the target problem set to include a broader group of job-related functions such as managing projects or quality within an organization and forecasting demand for supplies.

WHAT PEOPLE DO WITH EIS APPLICATIONS

Corporate and information systems managers build EIS applications to support several key management objectives in information-intensive organizations.

EIS applications offer a tool for generating graphic reviews of company information and for electronic mail access. An increasing number of executives and professionals are beginning to use their EIS applications to build "what-if" analyses. They can use corporate information and spreadsheets, or financial modeling packages, for example, to evaluate the impact of pricing strategies.

The immediacy of EIS information is particularly important when used to view operational information. Operational information can lead to necessary and direct management intervention. For example, a quality control manager in a pharmaceutical company can continuously review results of product sampling and machine performance. The EIS helps spot trends requiring preventive maintenance or direct intervention.

From a slightly different perspective, the EIS application can support periodic review of corporate operations. Accounting and financial reviews are typically periodic by nature. A chief financial officer (CFO) may want to view receivables weekly, using a specific technique to identify potential problem customers. Periodic reviews typically involve preparation of summary data on a regular schedule according to predetermined specifications for review.

For some organizations, the EIS becomes an integral part of ongoing operations. These EIS applications provide "Central Control" management capabilities for day-to-day operations.

EIS tools from Comshare, systems management companies such as Legent and home-built EIS applications using different components provide continuous monitoring of network operations. Highly stylized and color-enhanced displays alert systems managers to potential and actual problems in the network and suggest possible solutions. An international package delivery organization, for example, might use an EIS application to monitor air traffic patterns worldwide, diverting flights when necessary to maintain delivery schedules.

THE INTERNAL DEVELOPMENT, OR "ROLL YOUR OWN" APPROACH

Many organizations have created their own EIS applications. Some wanted to develop specific capabilities such as real-time monitoring or specialized decision-making routines. Others simply viewed internal development as a more cost-effective alternative to packaged EIS software. Overall, almost two-thirds of all EIS development activities rely on spreadsheets, word processors, graphics, third and fourth generation languages and other development tools to build their own EIS applications.

EIS application developers frequently choose office and professional software as a foundation for their EIS applications. Over 80% of all EIS developers

use packaged data access, management, analysis and presentation programs to build or complement their applications.

Data base management systems (DBMSs) are one of the most popular tools for EIS development. Developers choose the DBMS (or DBMSs) that are compatible with their other applications and are familiar to their development staff. Virtually any one of the well-known DBMS packages is likely to be used by an EIS application development team.

Spreadsheets, which have been integral to EIS for years, are the second most popular component of EIS applications. These tools provide a combination of functions, including data base navigation, financial modeling and graphics support.

Query/Data Delivery software provides developers with tools to acquire data from multiple data bases throughout the organization. Although SQL is a popular tool for multiple DBMS access, many developers prefer to use tools that read DBMS data directly without going through SQL facilities. These pipelined data access abilities can be helpful when accessing and manipulating massive corporate data bases. Fourth-generation languages and information delivery tools such as SAS System are popular query/data delivery tools.

Data analysis software is involved in EIS development at over 40% of the organizations interviewed by IDC. Typical packages in use at these sites include the SAS System from SAS Institute, and various analysis packages from Execucom — now part of Comshare — Comshare, IRI, MicroSoft and IBM. Several organizations have chosen to develop their own internal analysis packages to meet special organizational requirements. Financial modeling software takes EIS applications back to their roots. Several of the original players in the EIS market migrated from the financial modeling world. Despite this, only 36% of the EIS applications at IDC respondent sites are using financial modeling applications today. This demonstrates the distance covered by EIS applications in their migration from the financial staff. Standalone graphics software packages offer an alternative at sites that choose not to install the sophisticated graphics of packaged EIS software. This software may be the sole source of graphics at sites that choose not to use packaged EIS applications.

	All Sites	No EIS	Packaged EIS Software	Other Components Only
President/CEO	3.67	4.15	3.12	3.37
CFO	4.17	4.52	3.60	3.97
Financial Staff	3.77	3.88	3.75	3.76
CIO/VP/ MIS	3.87	4.13	3.76	3.61
IS Staff	3.40	3.43	3.56	3.38
Other Corporate Mgmt.	3.73	3.65	4.00	3.66
Other Corporate Staff	3.09	2.87	3.44	3.14
Other	1.91	1.78	2.38	2.05

Although CEOs are influential, CFOs exercise the most influence when it comes to purchasing EIS systems.

KEY ISSUES DRIVING THE EIS MARKET

Downsizing/Rightsizing

IS staff resistance to downsizing and rightsizing is eroding quickly, requiring EIS vendors to develop down-sized versions of their mainframe-based systems. Vendors have responded with a plethora of new PC and server-based systems, leaving the technology choice in the hands of IS managers.

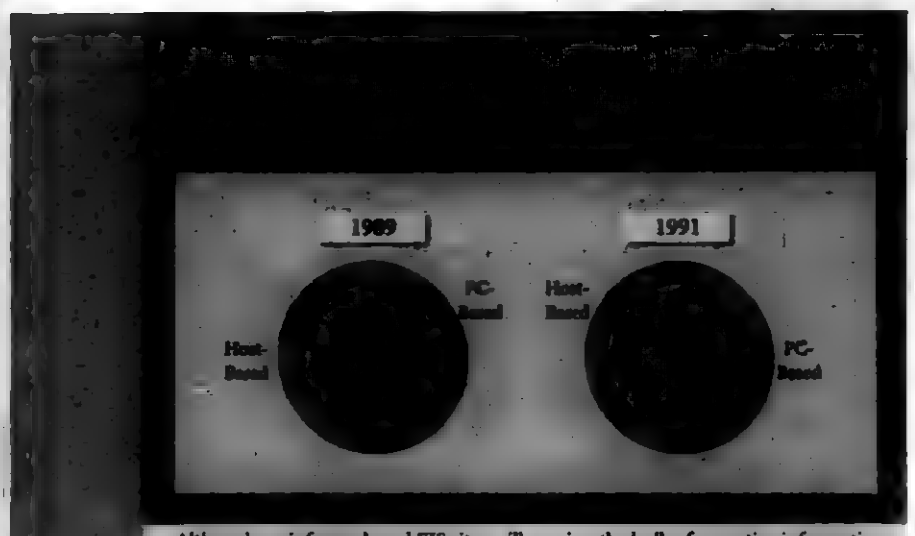
Information technology analysts recognized the critical nature of downsizing almost a decade ago. However, large IS organizations, particularly those supporting large IBM mainframe installations, resisted the drive to smaller systems, arguing that their application loads demanded the power of mainframe-based networks.

These arguments have lost their persuasiveness for many CEOs during the past several years. Downsizing is a key strategy at many IBM mainframe shops, and EIS applications, with their emphasis on graphics and access to multiple data bases on multiple platforms, are natural choices for down-sized applications.The new generation of packaged EIS software changes the basic economics of EIS application development. New products are typically priced as high-end PC software, which obviously makes them far less expensive than mainframe packages. PC software acquisition costs can be less than $1,000 per user, allowing affordable enterprise-wide installations.

PC Compromise

PC-based EIS systems still reflect some compromises relative to mainframe-based systems. EIS applications typically involve extraction and analysis of massive quantities of information, tasks that overwhelm the processing abilities of most current PCs. The difficulty of administering extraction, analysis and graphic presentation by teams of information analysts also strains some LANs. In addition, security remains a problem on more easily accessed PC platforms.

It is important to note, however, that these constraints are fading rapidly. PC-



Although mainframe-based EIS sites will survive, the bulk of executive information systems are now PC-based.

based systems continue their exponential growth in storage and processing power, while PC application vendors continue to improve the security components of their packages. LANs are also becoming more EIS-friendly as they accommodate increased bandwidth.

Platform Portability

Corporate managers are increasing their demands for open systems strategies as EIS technologies permeate their organizations. In response, EIS application developers are placing emphasis on portability — the ability of applications to run on different platforms with nothing more complex than a recompile. EIS applications built on portable software platforms, such as DBMS or query/reporting languages designed to be inherently portable, offer considerable advantages.

Vendors offering these packages are prepared to maintain ports to multiple operating system releases across multiple platforms.

IS staffs will have a difficult burden if they attempt to develop their own application portability. Alternatives, including software-based portability features generally defined as middleware, will offer important advantages as they become established in IS shops.

The Ability to Access Multiple Data Types

The IS world has seen the coming of corporate data integration for several years. Many sites are building, or preparing to build, corporate data dictionaries. They are doing this both to facilitate application development and to coordinate and integrate disparate data base environments.

This integration is a daunting task. IS managers can expect to work with a variety of data structures in realizing it. Most organizations support a variety of data base management systems. Virtually all will be accessing VSAM, legacy and proprietary data bases from older applications.

At a minimum, EIS developers should demand the ability to access multiple data types. EIS development plans should also include the ability to access repository data dictionary information.

Two Possible Directions

EIS applications tend to move in one of two directions. In some organizations, the executive information system reflects the needs of a single executive or a small group of executives. In this environment the EIS application tends to remain rooted in the executive suite. In other organizations, to a database management philosophy. These organizations find that their investment in data access and management can be leveraged across line and staff organizations.

Leveraging the EIS investment involves more than simply providing EIS screens to more people. Line and staff professionals require a more robust tool kit of professional support applications. IS managers can expect these professionals to require statistical analysis and modeling tools, word processing and electronic publishing integration.

Integration with other Applications

EIS applications frequently function as executive front-ends for other applications. The EIS graphic interface offers a logical and effective vehicle for conveying analyzed and summarized financial information. IS developers can effectively exploit the ability of EIS applications to integrate directly with other types of applications.

The American corporate drive for quality creates a new EIS application area. Statistical quality control procedures generate tremendous amounts of information — information that needs to be analyzed. For example, a typical quality control application will maintain data bases on machinery production levels, product specification variances and maintenance schedules.

Integrated with sophisticated statistical and reporting tools, EIS applications permit quality control managers to quickly reduce this tremendous volume of information. They can easily generate manageable reports highlighting current and potential problems in the production process.

The "drill-down" capability — which points to a data item when viewing underlying data — inherent in most EIS applications allows management to determine underlying causes of quality control problems. Trend analysis is based on time series data bases and analytical tools. It allows quality control managers to examine quality performance over time, ferreting out incidents of slow deterioration and increasing quality variance.

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	All Sites	No EIS	Packaged EIS Software	Other Components Only
Accounting/Financial				
Now	4.34	4.34	4.37	4.05
1996	4.45	4.44	4.50	4.16
Human Resources				
Now	3.29	3.31	3.47	2.99
1996	3.48	3.41	3.61	2.97
Quality Control				
Now	3.53	3.57	3.73	3.36
1996	3.69	3.62	3.97	3.62
Manufacturing				
Now	2.73	2.27	3.25	2.06
1996	2.94	2.50	3.46	3.11
Distribution/Transportation				
Now	3.18	3.32	3.13	3.05
1996	3.36	3.42	3.56	3.19
Sales Automation and Customer Service				
Now	3.78	3.91	3.66	3.69
1996	3.99	4.05	3.97	3.92
Industry-Specific Applications				
Now	3.75	3.85	3.56	3.74
1996	3.59	3.62	3.78	3.45

EIS' accounting/financial roots are evident when its integration with specific applications is revealed.

IS managers can also expect increasing demand for EIS applications oriented toward sales and marketing automation. IDC research into sales force automation shows a clear drive to enhance customer information data bases and sales support information. Targeted at providing immediate information to sales staff, EIS applications can offer dramatic enhancements in the overall effectiveness of these development efforts.

IS managers will be seeing more EIS-compatible capabilities from vendors who offer related software products. These vendors will address the professional software environment market from their own special niches. Enhanced graphic front-ends and stronger data navigation capabilities can transform statistical and spreadsheet packages into reputable alternatives to the traditional packaged EIS software.

Spreadsheet vendors are also strengthening their ability to access multiple data structures through SQL or pipelined techniques. Data access/query/statistical software vendors have been developing strong graphics and navigation technologies for a decade or more.

Not wanting to be left behind, traditional EIS vendors are also adding to their core EIS software. Companies with financial modeling software backgrounds are building relations with third-party application software vendors to expand their markets. Other companies are acquiring or building specialized application development capabilities to add to their existing EIS packages.

From the IS management perspective these integrated packages can offer new alternatives for supporting applications as they migrate through the organization. Different departments and different professional groups need different capabilities. A fully integrated system can allow a single corporate framework to accommodate many, if not all, of these diverse requirements.

BUILDING A VIABLE EIS STRATEGY

EIS developers will need to resolve several key issues as they begin or expand their EIS applications.

Who Will Be Using The EIS?

CEO support in large organizations remains the hallmark of mainframe packaged EIS applications. These applications typically include attention-grabbing graphics, rapid access to high-level information, access to external news sources such as Dow Jones, and action-oriented communications.

CEOs in industries such as consumer packaged goods (CPG) are likely to complement these functions with more sophisticated analytical tools. CPG industries are data-rich and their marketing strategies depend on precise measures of market share and responsiveness. CPG CEOs typically acquire strong data analysis backgrounds as they rise through the ranks. It should be noted that individual tastes dominate system selection at the presidential level.

CFOs of Fortune 100 companies drove much of the development aimed at stylized presentation of corporate information. By contrast, CFOs in smaller, less complex organizations can be resistant to change; accounting is simpler with fewer divisions and subsidiaries.

The financial staff typically requires increased data manipulation and modeling capabilities to support CFO information requests. Professional support for these staff members will reflect CFO requirements, with additional emphasis on hands-on access and manipulation.

Chief information officers or vice presidents of IS frequently play a dual role with respect to EIS applications. On the one hand, they are responsible for developing and maintaining the corporate EIS application. On the other, they use EIS applications for their own personal work.

IS staff members, like financial staff

members, typically require facilities similar to those supporting CIOs. The IS staff is typically responsible for maintaining the data extraction and analysis procedures that underlie executive and professional EIS applications. This means they need specialized tools to develop staged data bases and to perform other functions.

Other industry professionals are playing catch-up to the pacesetters in CPG marketing. Nontechnical professionals have learned to use spreadsheets and PC DBMS to solve problems. New data analysis tools using graphic user interfaces are simplifying access to statistical analysis software. These data analysis packages formerly represented a daunting challenge for some users.

Impact of User-friendly Interface

With user-friendly interfaces, it can be safely stated that EIS now represent a step upward from spreadsheets in complexity — a step that many users are prepared to make. EIS applications open up new data which was previously unavailable to these professionals. The result is "analysis creep" — the tendency for professionals to continuously demand more sophisticated tools and complex data structures.

EIS application developers must recognize the need to anticipate requirements before they actually emerge. For example, EIS developers supporting quality control applications need to monitor developments in visual data analysis. Visual data analysis is a complex graphic application currently moving from engineering workstations to business managers' desks. It provides a sophisticated way to examine data using visual models.

Other developers may need to acquire knowledge about advancing techniques in clinical trials analysis or new tools for joint analysis in market research.

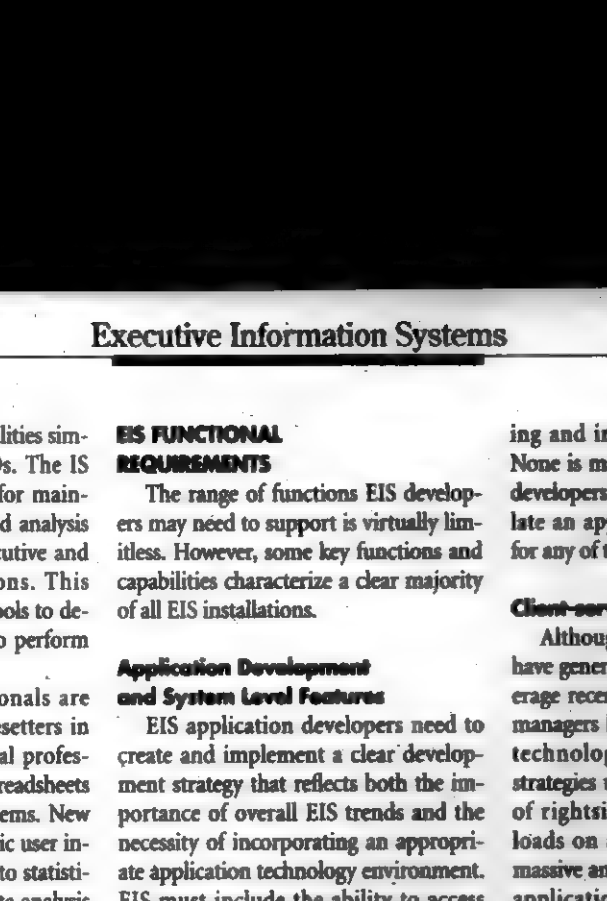
EIS FUNCTIONAL REQUIREMENTS

The range of functions EIS developers may need to support is virtually limitless. However, some key functions and capabilities characterize a clear majority of all EIS installations.

Application Development and System Level Features

EIS application developers need to create and implement a clear development strategy that reflects both the importance of overall EIS trends and the necessity of incorporating an appropriate application technology environment. EIS must include the ability to access multiple corporate data bases, direct pipeline access to multiple data base types and compatibility with existing applications. They must also include data security and integrity; rightsizing to optimize platform utilization, and the ability to front-end existing applications.

There are five important application development technologies. They include: client-server, open systems, electronic mail-enabled applications, imaging and integrated decision support. None is mandatory, but EIS application developers must be prepared to articulate an appropriate strategic direction for any of them.



Packaged EIS software applications provide a sophisticated set of development tools.

Client-server

Although client-server technologies have generated a great deal of press coverage recently, few information systems managers have a clear view of what the technology involves. Client-server strategies ultimately involve the concept of rightsizing — placing processing loads on appropriate platforms. The massive amounts of data involved in EIS applications make this optimization critical for EIS development.

Open Systems

In the recent past, open systems and UNIX were virtually synonymous. However, the emergence of middleware products and interenvironmental application development tools has significantly changed the open systems landscape.

Increasingly, IS strategists are considering software-based alternatives to UNIX portability. Some users will want UNIX port availability. For many others, the key to open systems is focusing on transportable applications capable of running on virtually all major operating platforms. In the future, there will be more movement toward multiple platforms in an effort to satisfy open systems demands. For EIS developers, the key will be to select the pathway that best conforms to their open systems strategy.

Electronic Mail

The reality of electronic mail is often less attractive than vendors promise. Despite the disapointments, electronic mail has boomed, especially within large organizations. Some electronic mail

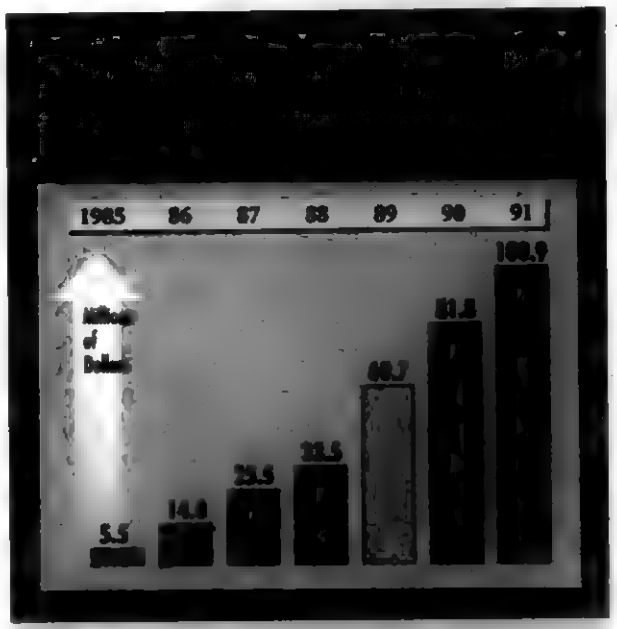
managers are now supporting 20 or more different systems within the same organization. And some IBM mainframe shops are supporting 15 or more different versions of IBM office products.

Amidst these Byzantine network tangles, users find it almost impossible to reach people on other networks. Internodal mail switching can be extremely difficult. Privately, managers recount horror stories about messages to the CEO being inadvertently addressed to stock room messengers with similar names.

But the feasibility of electronic mail-enabled EIS applications is improving. Organizations that have supported 20 or more electronic mail environments are planning to focus their support on five or six installations. As EIS grows in importance, electronic mail will complement EIS as a tool for collecting and distributing information packages throughout the organization. Spreading EIS applications into new areas requires communication support. Electronic mail can furnish the avenue for these critical communications.

Information transported as electronic mail takes advantage of the addressing, routing and security capabilities inherent in electronic mail systems. In the near future, enterprise-wide directories and user-transparent routing promise to produce seamless electronic mail systems.

Another advantage of electronic mail is its ability to appear as data within some applications. Executives facing large volumes of electronic mail can waste precious hours scanning their messages. EIS applications can incorporate the ability to review and prioritize messages, using expert systems techniques to evaluate them and bring critical items up for early attention while less important messages wait to be read at a later date.



Packaged EIS software is becoming more popular as demand grows for sophisticated EIS development tools.

Imaging

Imaging is quietly catching on as IS managers increasingly realize its benefits. Several large aerospace companies are currently building human resource management applications incorporating image management. The development of large corporate image data bases and data bases supporting multiple data types will make imaging an increasingly important part of EIS applications.

Integrated Decision Support

The trend toward enterprise EIS is creating a need for integrated decision support. Consistency between corporate decision support standards and EIS-supported decision support will make training far less of a burden. At the same time, it will eliminate the need to know several different programming languages.

USER FEATURES AND CONCERNS

Most EIS users are looking for time-sensitive solutions, regardless of the technologies they spring from. Typically, senior executives are unwilling to spend large amounts of time learning to use complex systems. The EIS, including its data access functions, must be as transparent as possible to the user. If it is not it will fall rapidly into disuse. It will also fail if plagued by slow response times. Slow response times alienate users and seriously compromise otherwise effective EIS designs.

The ability to reach into corporate data bases is critically important to EIS. Most EIS developers solve the problems of complex corporate data bases by using some combination of staged data and direct data base access. Enterprise data models, enterprise data dictionaries and repositories will open new doors for EIS application developers and IS managers.

Trend analysis also becomes increasingly important as EIS applications move beyond accounting into quality control and distribution management. Trend reporting involves both tool selection and data base design. The tools will enable development of sophisticated statistical applications designed to isolate trends from complex data streams.

Exception reporting is a fundamental element of EIS applications. The complexity of exception reporting, however, can vary significantly. At one extreme, EIS applications employ simple high/low exception reporting. Values are highlighted if they exceed an upper limit or if they fall below a lower acceptable value. At the other extreme, exception reporting becomes extremely subtle. Values may be selected if they are outside a range predicted by random variations around a predicted trend line.

Exception reporting incorporates many of the business rules that incorporate corporate knowledge into the EIS

application. Building these exception rules is alternatively one of the most complicated and interesting aspects of EIS application development.

SELECTING THE APPROPRIATE EIS PLATFORM

Selecting rightsized EIS platforms and appropriate operating environments will remain a challenge for EIS developers. While PC and LAN-based systems open the door to many new EIS applications, they also make it complicated to decide on the correct location for various EIS activities.

The mainframe will remain a viable platform for some applications. Complex extraction and analysis activities on large mainframe data bases are likely candidates. Performing the extraction and analysis on the mainframe reduces the amount of data that must be communicated, minimizing the impact on network bandwidth. Intermediate or final results can then be transmitted to workstations for further analysis and graphic presentation.

Client-server applications are appropriate in many situations. The client-server approach is particularly attractive when intermediate staged EIS data bases must serve the EIS requirements for a workgroup or department. Intermediate positioning balances speed of information access with overall communication requirements to achieve a balanced solution for EIS users.

PC-based systems offer low cost solutions which may be most appropriate for small organizations or departments and work groups in large organizations. PC applications will approach host-based systems in power and features during the next several years, as vendors add features. However, a server-based approach is likely to remain more effective for intermediate data staging, data security and centralized system management.

Meeting professional data requirements often represents the most challenging aspect of EIS application maintenance. The EIS application must be flexible enough to accommodate changing user information requirements. Therefore, EIS application development must be linked to corporate data management tools whenever possible.

	All Sites	No EIS	Packaged EIS Software	Other Components Only
Client-server				
Now	3.59	3.62	3.70	3.45
1996	4.65	4.11	4.54	3.78
Open Systems				
Now	3.53	3.40	3.70	3.59
1996	4.06	3.95	4.31	4.05
Electronic Mail-Enabled Applications				
Now	3.13	3.16	3.44	2.78
1996	3.47	3.51	3.92	3.14
Imaging				
Now	2.75	2.80	2.97	2.56
1996	3.36	3.45	3.61	3.00
Integrated Decision Support				
Now	3.XX	3.XX	3.XX	3.XX
1996	3.XX	3.XX	3.XX	3.XX
Access to Electronic Mail				
Implementing	3.30	3.40	3.35	2.97
Current	3.35	NA	3.62	3.00

Although client-server computing an open systems will experience strong growth in EIS environments, electronic mail, imaging and integrated decision support software will also be integrated to many systems.

REALIZING THE BENEFITS OF EIS GROWTH

The potential for EIS applications is immense. EIS and PST tools are adding capabilities and ease of use at a rapid rate. Corporate data modeling and repositories, electronic mail rationalization and enterprise-wide addressing all are simplifying and magnifying the ability of users to extract knowledge from corporate data bases.

As hundreds of failing banks have discovered, assets have no real value unless they can be used to build corporate revenues. EIS applications offer the critically important capability of converting corporate information assets into bottom-line revenues. EIS are, in many ways, expert systems for business managers. Their value comes not only in their use, but in their development, as the process of building and implementing an EIS teaches managers more about their organizations. Accessing information effectively generates results that build demand for more information.

EIS applications will grow in importance as they become part of mainstream IS applications. While specific styles of EIS development will wax and wane in popularity, IS developers will inevitably build increasing quantities of business knowledge into their corporate information processing systems. This increasing integration with traditional applications will, in turn, simplify information staging. This process of one development leading to another will mark the evolution of EIS.

IDC White Paper

Executive Information Systems

Sun's reorganization improves market focus

CONTINUED FROM PAGE 47

product groups.

David Card, an analyst at International Data Corp. here, said Sun's strategy to put its Solaris operating system on Intel Corp. platforms in 1993 might well have happened without the creation of SunSoft. "But it's more likely to succeed under the new structure," Card said.

"One danger Sun faces is that in speeding up the individual groups, it may put the grand strategic vision at risk," he added. "Sun has always gotten a lot of mileage out of that all-the-wood-behind-one-arrowhead schtick."

CEO McNealy argued that the "arrowhead" of client/server computing still points the Sun companies in the same direction. Sun officials note how several products are heading for the market more quickly because of the reorganization — particularly personal computer products through the SunSelect subsidiary.

Several other products were more efficiently killed off in the past year, such as a Cobol compiler that never made any money. Others were handed off to outside partners to develop further.

Analysts said the restructuring has had favorable results for the Scalable Processor Architecture clone vendors because it erased the months-long delays they often experienced in licensing and obtaining Sun technologies.

"Most customers don't have a clue [about the reorganization], but we've seen a difference because we sit on Sun's DOE [Distributed Objects Everywhere] team," said Jim Stikeleather, IS director at Tampa, Fla.-based Kash-N-Karry Food Stores, Inc. As an important commercial customer, Stikeleather provides Sun with a business-oriented view of its direction with distributed object technology.

Separation key

Separating its hardware and software businesses was particularly key in sharpening Sun's focus in both spheres, he noted. "With SunSoft selling Solaris to anybody for a price, I think that's nothing but good," Stikeleather said. "It's made Sun leaner, meaner and less parochial than in the past."

"More pragmatic" is another phrase that customers and analysts use more often now to describe Sun's attitude shift in the past year. Its 3-year-old feud with the Open Software Foundation (OSF), for example, no longer prevents Sun subsidiaries from offering customers ways — through third-party vendors — to tap into future OSF technologies such as the Distributed Computing Environment.

"I've had a lot of visits from different development groups in Sun, and these people are asking us what we think about products Sun is only thinking about developing," said Bob Vick, systems manager at Fidelity Investments, Inc. in Boston. "I'm not sure this is directly attributable to the reorg, but we have gotten very good service in the past six to nine months."

IN BRIEF

Oracle 7 sets speed record

■ **Oracle Corp.** said its new Oracle 7 relational database set a record-breaking speed of 185 transactions per second in a Transaction Processing Performance Council (TPC) benchmark of a **Compaq Computer Corp.** SystemPro/XL multiprocessor server. Price/performance of the overall system, rated at $800 per TPC-B benchmark, was computed with a 50-MHz **Intel Corp.** 1486-based Compaq machine running SCO Unix from **The Santa Cruz Operation**, Oracle said.

■ **Sun Microsystems Computer Corp.** and **Electronic Data Systems Corp.** have expanded their partnership to provide retailers with customized client/server software. EDS has developed automated software tools, based on Sun's Scalable Processor Architecture, or SPARC, platform, that can be used to create customized retail applications. One example is EDS' Incase, an automated software development tool for designing new applications or re-engineering existing mainframe software for Unix-based client/server platforms.

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The International Forum on Open Systems
30 November – 2 December 1992
The Capital Hilton, Washington DC, USA.

For further information on XTRA 92 please complete this form and return to XTRA 92 Registrations Department, X/Open Company Ltd, 3141 Fairview Park Drive, Falls Church, VA 22042-4501, USA.
Telephone: (703) 876 0044 Fax: (703) 876 0050

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Job Title/Position _____
Organization _____
Address _____
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Wal-Mart deploys handheld computers

BY ELLIS BOOKER
CW STAFF

BENTONVILLE, Ark. — As they walk down the aisles, Wal-Mart Stores, Inc. sales associates will now be able to check inventory and prices and even order merchandise in real time with a handheld, wireless device.

The giant retailer recently announced the completed deployment of wireless systems in all of its 1,804 U.S. stores.

Wal-Mart will use the Dataspan 2000, a spread-spectrum radio system from Telxon Corp. in Akron, Ohio. The value of the contract, which Wal-Mart and Telxon signed last February, was not released.

Although Wal-Mart is not the largest user of wireless in-store systems — experts said they believe Kmart Corp. in Troy, Mich., barely holds that title with systems from Bohemia, N.Y.-based Symbol Technologies, Inc. — the size of its commitment is still notable, industry analysts said.

"They tend to do the best benchmarking in the retail industry, so when they deploy, it means [the technology] has passed some very rigorous tests," said Thomas H. Friedman, editor of "Retail Systems Alert," a monthly newsletter based in Newton, Mass.

More power

Wal-Mart has relied on wireless systems in its stores since 1983. What makes the current generation of systems important, according to Wal-Mart Executive Vice President and Chief Information Officer Bobby Martin, is their increased computer power and the fact that they employ spread-spectrum radios. Spread-spectrum offers far more bandwidth than the narrowband systems of a few years ago.

"The big advantage is the ability to take all your computer capacity and give it to the mobile worker," Martin said.

For instance, in one application already in production, the mobile terminals can display a simple graphic showing five weeks of sales trends.

"We never could have done that with the narrowband systems," Martin said, adding that Wal-Mart and Telxon are working on ways of delivering actual images of goods to the portable systems.

Friedman calculated that the Top 10 retailers are using between 15,000 and 20,000 handheld wireless units. But this figure will balloon to 160,000 devices within five years, he said.

Currently, the application of wireless in retailing is generally limited to real-time price verification and inventory tracking systems.

Yet in the future, Friedman and others predicted, "large-format" stores will turn to spread-spectrum radio as a local-area network infrastructure, connecting handhelds, new generations of wireless (and possibly mobile) point-of-sale (POS) systems and even electronic shelf labels.

Wal-Mart, for example, has experimented with wireless POS systems for sidewalk sales for the past year. While these systems still need some refinements, Martin is bullish on their value. "They'll give us expandability and flexibility," he said. "We'll be able to take a cash register anywhere there's an electrical outlet."

Each Wal-Mart store will feature the following configuration:

- Telxon's Gateway Connnectivity Processor and a radio-frequency communications controller.
- Eight to 16 Telxon Portable Teletransaction Computers, integrated with laser-based bar-code scanners from Photographic Sciences Corp.
- Spread-spectrum radios from Telesystems SLW, Inc., a Telxon subsidiary.

Caching prod aids NFS users without server

BY ELISABETH HORWITT
CW STAFF

PITTSBURGH — A small company is making a big impression among Fortune 500 users who want to ensure that Network File System (NFS) local-area network users can still get the key files and software they need, even when the server becomes temporarily incapacitated.

Interstream, Inc.'s eNFS Personal File System (PFS) builds on an Interstream product, eNFS/Cache, which sets up a local disk cache that contains all the files and software a user is using on a given day, according to Bruce DaCosta, Interstream president. As a client accesses the server, "NFS caching has been keeping copies of everything you've touched on servers," he added.

Extending that concept, eNFS PFS sets up an interaction between file and server so that the cache contains "everything you've written to a server since the time you turned your system on," and the server is apprised of any changes made to the client's files, DaCosta said.

"We have a logging system so that as the user creates data on the client, it knows how to recreate that data on the server," keeping the server current, he added.

In effect, eNFS PFS "keeps a hot repository of most frequently used things you've touched [on the server], so when it is not responding, you can fill requests [for data] out of the local cache," DaCosta said.

When the server comes back up, the program automatically makes the reconnection and writes the client's changes to files into the server's files, he noted.

Jack Stanley, vice president of operations at the *Houston Chronicle*, has been asking Interstream to deliver a product such as eNFS PFS for some time, he said. The *Chronicle* has been using eNFS/Cache to "trim our requirements on new and existing local disk drives," he added. "We don't want diskless workstations, but we don't want giant drives, either."

By ensuring that relevant files and software packages are in the cache, eNFS/Cache minimizes the number of files users must keep on their local disks permanently, Stanley said.

Quicker response

The program also limits the need for clients to keep returning to the server for a piece of data or program, as is often the case with NFS client/server installations, he added.

As a result, eNFS/Cache speeds up response time for users and minimizes network traffic, Stanley said. "I may use Lotus only once a week, but when I do use it, it goes into the cache so I can use it faster."

Interstream's new offering anticipates that the market is heading toward giving "a bit more responsibility and capability to [LAN] clients," said Tom Wood, a senior analyst at Business Research Group, a Newton, Mass., research company. The product's one drawback is that it only works on Sun Microsystems, Inc. servers running NFS.

The eNFS PFS product is available for $495 per NFS client, with eNFS/Cache included, Interstream said.

The company is looking at porting its eNFS line to Hewlett-Packard Co. and IBM Unix workstations, DaCosta said.

NEW PRODUCTS

Unix

Statware, Inc. has introduced Statit 3.0, an upgrade of its graphical data analysis system.

According to the company, Statit 3.0 provides statistical quality control for Unix-based systems.

The product's menu interface uses point-and-click or command-line input and can be changed or expanded; it also offers context-sensitive Help.

Statit 3.0 features include tabular reporting, user-designed data entry forms, design of experiments and new contingency table statistics, among others. Prices start at $1,090.

Statware
260 SW Madison Ave.
Corvallis, Ore. 97333
(503) 753-5382

Mercury Interactive Corp. has announced XRunner, an automated software testing system.

According to the company, XRunner was designed for applications running on Hewlett-Packard Co.'s 9000/700 series Unix workstations. The product is a high-end testing solution for X Window System-based systems that works through the graphical user interface in a manner similar to the way in which users manually test software.

Pricing for the XRunner base package with five licenses begins at $50,000.

Mercury Interactive
3333 Octavius Drive
Santa Clara, Calif. 95054
(408) 987-0100

Workgroup software applications

Project Software & Development, Inc. has announced Project/2 Series X project management software.

Project/2 Series X offers a new graphical user interface and has multiproject and application enabling functionality. Features include open architecture and access to SQL databases. The product provides capabilities such as data manipulation, full scheduling and cost functionality, system integration and customization.

Project/2 Series X prices start at $8,000 per single user and $24,320 for a four-user local-area network.

Project Software
& Development
20 University Road
Cambridge, Mass. 02138
(617) 661-1444

The MathWorks, Inc. has started shipping Version 4.0 of Matlab for Sun Microsystems, Inc. SPARCstations.

The product was designed to provide power and performance in a seamless technical computing environment for numeric computation and visualization, the company reported. New functionality in this version includes sparse matrix support, object-oriented graphics, sound output and graphical user interface controls.

A single-seat license for the product costs $2,995.

MathWorks
Cochituate Place
24 Prime Park Way
Natick, Mass. 01760
(508) 653-1415

Corel Corp. and Unisys Corp. have announced CorelDraw for CTOS workstations.

CTOS is a Unisys system designed primarily for large business automation applications. CorelDraw is a vector-based drawing module. Running under CTOS III, the CTOS version includes such effects as the ability to add true mathematical perspective and extrusion, to envelop text and graphics in free-form shapes and to blend colors and objects.

The product has text handling, which enables the user to transform text into logos and headlines, and it includes a type library and more than 4,000 clip-art and symbol images.

CorelDraw for CTOS costs $595.

Corel
1600 Carling Ave.
Ottawa, Ontario, Canada
K1Z 8R7
(613) 728-8200

Qualix Group, Inc. has introduced SayIt, a software product.

According to the company, SayIt has a macro-building capability that enables users to operate their Sun Microsystems, Inc. workstations with voice commands. Users have the choice of activating user-definable commands such as sound, mouse, keyboard or Unix shell script functions with a single command or by keyboard or mouse.

The product costs $295. It has a limited introductory price of $195.

Qualix Group
No. 224
1900 S. Norfolk St.
San Mateo, Calif. 94403
(415) 572-0200

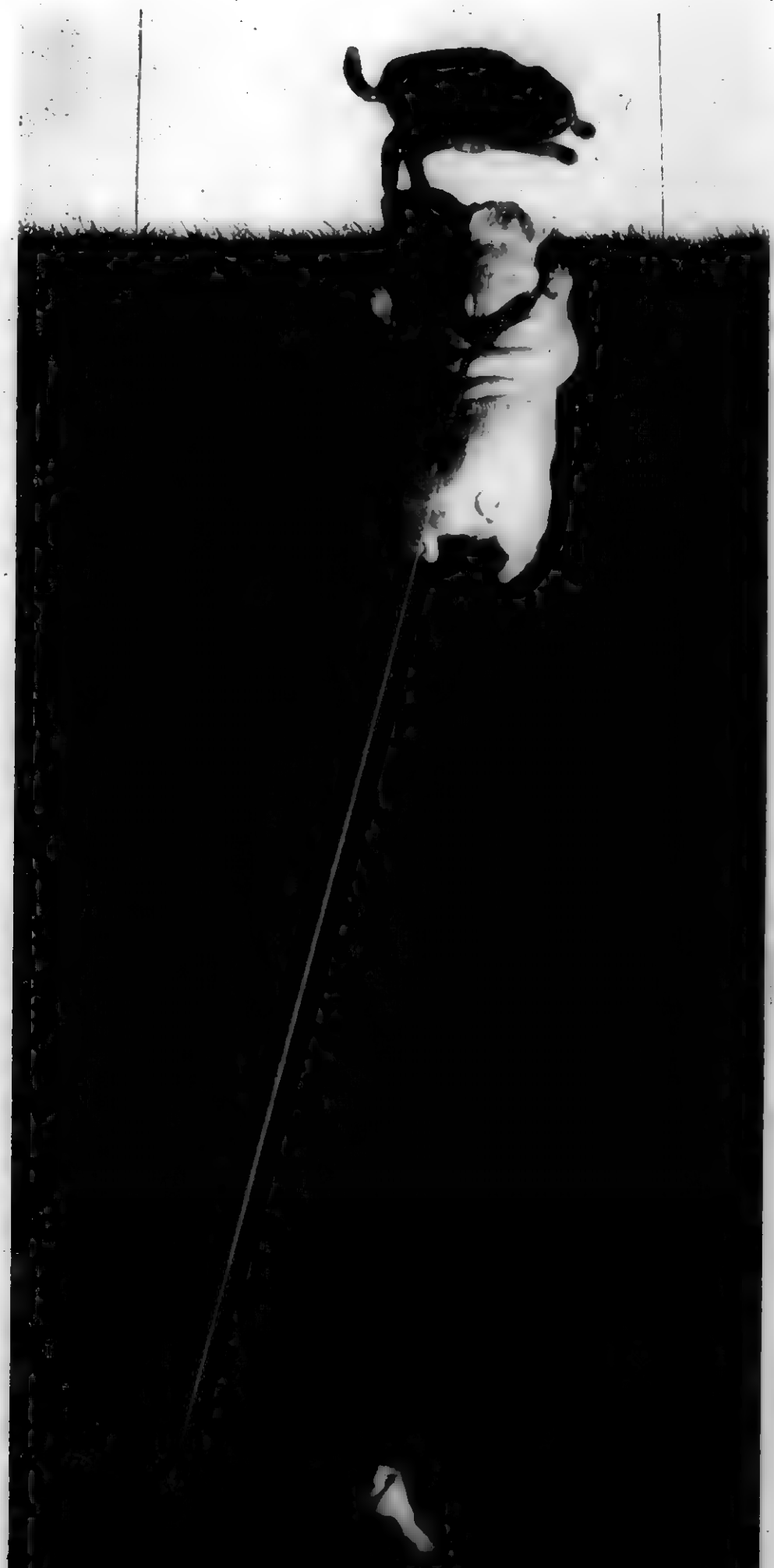
Modems

ZyXel USA has introduced the ZyXel RS-1600, a rack-mounted, modem-management system.

The product operates over dial-up lines providing users with control over hundreds of local and remote devices from a single personal computer, the company reported. Without disturbing main user data traffic, the ZyXel RS-1600 automatically monitors total network performance, managing the growth of large corporate modem networks.

The ZyXel RS-1600 costs $1,795.

ZyXel USA
4920 E. La Palma Ave.
Anaheim, Calif. 92807
(714) 693-0808



Until now, network printers have had the same fifteen-foot restriction.

With HP network-ready LaserJets, you can put your printers where your users are.

Now you can forget about tethering your printers to some faraway server. Because network-ready LaserJet printers can be placed anywhere along your network. Just plug them in as you would PCs and you're ready to roll.

Since you're putting printers by your users, it's as if you're giving them their very own personal printer. Which means they won't have to travel as far for output. Because they're closer to the printer, they can handle some of the routine maintenance tasks, such as paper loading, themselves. Best of all, you won't have to contend with extra boxes, wires or power cables.

HP Laserjet III *HP Laserjet IIISi* *HP Laserjet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,* Macintosh, and PC operating systems, call **1-800-752-0900,** Ext. 3073 for the HP Connectivity Solutions Guide.

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Notework posts top E-mail software score

BY DEREK SLATER
CW STAFF

Notework Corp.'s Notework ran away from the pack, finishing with the highest user satisfaction score in the Buyers' Scorecard on electronic-mail software packages. Notework earned an overall score of 87, keying on its ease of use.

Runner-up WordPerfect Corp.'s WordPerfect Office scored 81 overall, followed by Microsoft Corp.'s Microsoft Mail with 78, Lotus Development Corp.'s CC:Mail with 77 and Da Vinci Systems, Inc.'s Da Vinci EMail with 76.

The E-mail market race has heated up dramatically during the past two years, with industry bruisers Microsoft and Lotus jumping in with the acquisitions of Network Courier and CC:Mail, respectively. The rising interest in mail-enabled applications — which use E-mail as a medium to trade files or data updates, for example — promises further expansion for E-mail packages. Microsoft and Lotus have announced competing application programming interfaces for standardizing the development of mail-enabled applications.

One way Notework combats the marketing muscle of its larger competitors is to give users a free 30-day trial period. Notework keys on its speed, ease of installation and ease of use — three areas in which its users gave it very high satisfaction marks. The product runs on Novell, Inc. NetWare networks under both DOS and Microsoft's Windows, automatically adapting to whichever environment the user is working in. It requires 5K bytes of random-access memory. The company is based in Brookline, Mass.

WordPerfect Office earned solid scores in service and support and in messaging capabilities. The software also recorded the highest score in printing and word processing capabilities. WordPerfect Office is tightly linked to the company's namesake word processor.

Microsoft Mail scored highest in one area: storage and retrieval of messages. Users noted a relative weakness in the area of gateways for linking systems across local-area networks, which they said were difficult to use.

The installed base leader, Lotus' CC:Mail, finished in fourth place. CC:Mail's standing was hurt by low scores in price and ease of administration.

The cost of gateways to other systems was a particular sore spot.

Da Vinci EMail is produced by Da Vinci Systems in Raleigh, N.C. The Da Vinci product placed high in ease of use but earned low satisfaction scores in several areas, including service and support, mail server maintenance and security. A new version of the Windows product began shipping on Oct. 12.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their E-mail software packages in 13 specific categories. Users also rated the importance of each category. (See the methodology on page 72 for a complete description of the scoring process.) •

E-mail software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 31 users for Notework, 49 users for WordPerfect Office and CC:Mail, 41 users for Microsoft Mail and 25 users for DaVinci EMail.

Total possible score 100 Mean score 80

Product	Highest ratings	Lowest ratings
Notework's Notework SCORE 87	Ease of use Ease of installation Sending and receiving messages	Printing and word processing Gateways Storage and retrieval
WordPerfect's WordPerfect Office SCORE 81	Vendor service and support Ease of use Sending and receiving messages	Ease of installation Storage and retrieval Mail server maintenance
Microsoft's Microsoft Mail SCORE 78	Ease of use Price Sending and receiving messages	Printing and word processing Gateways Documentation
Lotus' CC:Mail SCORE 77	Sending and receiving messages Ease of use Security	Printing and word processing Documentation Vendor service and support
DaVinci Systems' DaVinci EMail SCORE 76	Ease of use Sending and receiving messages Storage and retrieval	Printing and word processing Documentation Vendor service and support

RATINGS IN ORDER OF IMPORTANCE

Notework garners the highest satisfaction rating in the five areas most important to users, with strong ratings in sending and receiving messages and ease of use

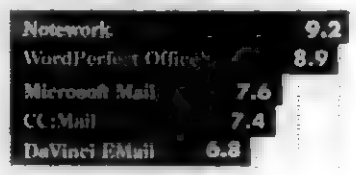
(Additional ratings on page 72)

User importance rating:

9.3 Sending and receiving messages

9.2 Ease of use

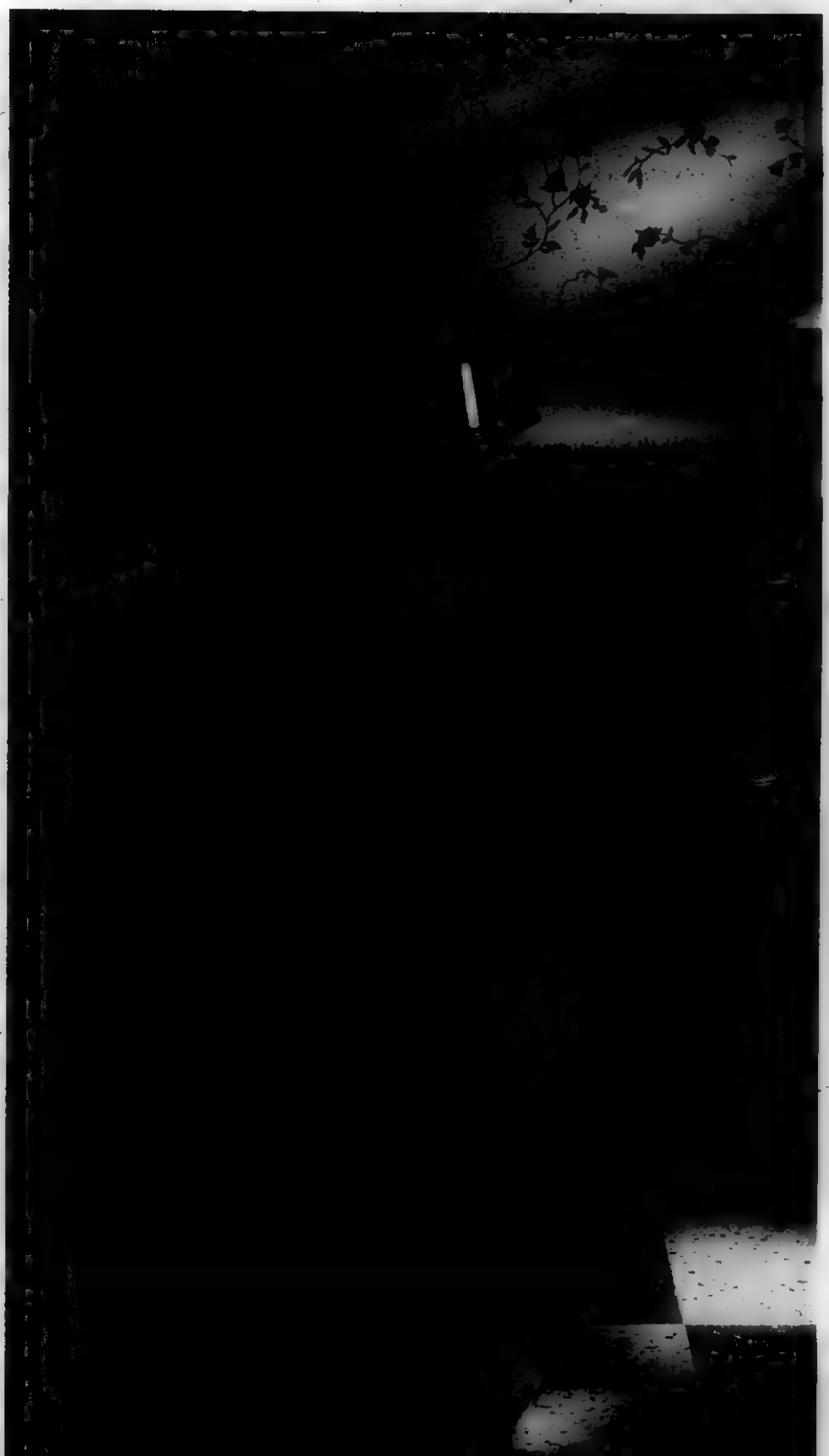
8.5 Vendor service and support



8.4 Security

8.3 Ease of administration

8.2 Storage and retrieval of messages



Until now, waiting for network printing has required the same amount of patience.

HP network-ready LaserJet printers help your users get their output faster.

With an HP network-ready LaserJet printer, your users won't go begging for fast output. Network-ready LaserJets avoid parallel bottlenecks and print up to fifteen times faster than ordinary machines. Since your file server is relieved of some print-server functions, your printing network flexibility increases almost immediately. You'll enjoy faster transaction times. Greater security. And increased speed across your entire system.

HP Laserjet III *HP Laserjet IIISi* *HP Laserjet IIID*

LaserJets become network-ready with separately purchased HP JetDirect interface cards. And now these interface cards are available for only $695-$895.*

For a how-to source that provides information on hooking your LaserJets into your mainframe, minicomputer, UNIX,® Macintosh, and PC operating systems, call **1-800-752-0900**, Ext. 3074 for the HP Connectivity Solutions Guide.

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RATINGS IN ORDER OF IMPORTANCE

(E-mail software, continued from page 70)

Notework and WordPerfect Office top the remaining categories, with Notework scoring highest in four of seven areas

8.2 Speed

8.2 Mail server maintenance

8.0 Tools/Gateways for linking systems across LANs

7.9 Documentation

7.8 Price

7.6 Ease of installation

7.6 Printing and word processing capabilities

Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer. Quotes are selected from user responses.)

Notework

Likes

Ease of learning
"Users wanted something easy to use, and this takes about five minutes to learn and use."

Dislikes

Limited features
"It has no advanced features like spell checking, and remote dial-up should be easier."

WordPerfect Office

Likes

Ease of use
"It uses the same command keystrokes as their other products."

Dislikes

Limited features
"The scheduling and administration features are not as good as they could be."

Microsoft Mail

Likes

Ease of use
"It's so simple you don't need to train people to use it."

Dislikes

Lack of options
"It lacks some features, such as forwarding, that are standard in other packages."

CC:Mail

Likes

Ease of use
"It's easy to use, and you can send documents – even CAD drawings – across it."

Dislikes

Lack of features
"It's lacking in electronic forms and templates."

DaVinci EMail

Likes

Ease of learning
"It is user-friendly – very visual."

Dislikes

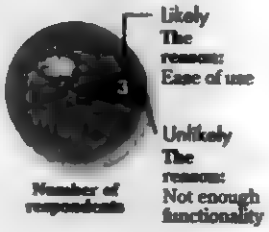
Word processing features
"The word processing functionality is virtually nonexistent."

Loyalties

Would you buy the product again?
(Reasons are based on most frequently stated answer)

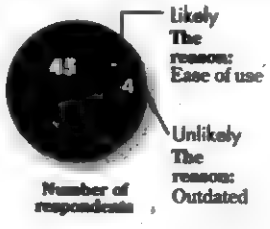
Notework

Responses: 31



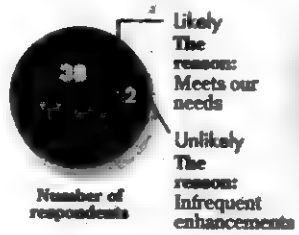
WordPerfect Office

Responses: 49



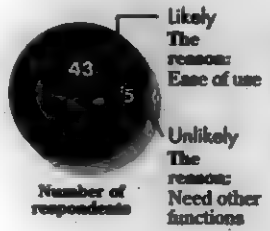
Microsoft Mail

Responses: 40



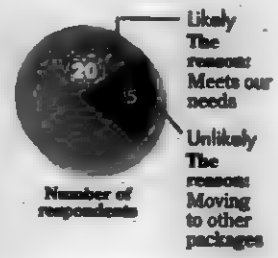
CC:Mail

Responses: 48



DaVinci EMail

Responses: 25



Vital statistics

Total number of respondents: 195

What is your title?

CIO/VP/IS director	27
IS manager	29
Network administrator	28
Systems analyst	25
E-mail administrator/Other	86

How long have you been involved with E-mail systems?

Five years or more	83
3-4 years	43
1-2 years	59
Less than one year	9
Don't know	1

How many users have access to this E-mail system?

500 or more	47
150-499	49
50-149	41
25-49	32
Under 25	25
Don't know	1

Are you using the Windows or DOS version?

Windows version	96
DOS version	99

METHODOLOGY

User names were obtained from a combination of vendor and nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 31 users for Notework Corp.'s Notework, 49 users each for WordPerfect Corp.'s WordPerfect Office and Lotus Development Corp.'s CC:Mail, 41 for Microsoft Corp.'s Microsoft Mail and 25 for Da Vinci Systems, Inc.'s Da Vinci EMail.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

Numbers were rounded off wherever necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: CW Database Division; Eric Arnum, Electronic Mail and Micro Systems.

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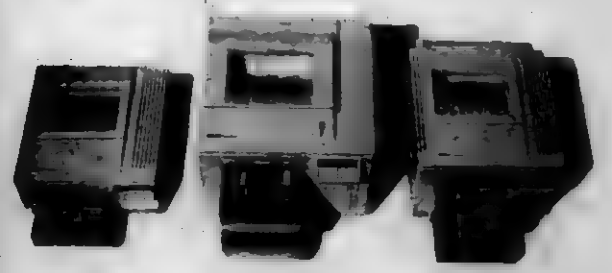

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For a how-to source that provides information on hooking network-ready LaserJets into your system, call **1-800-752-0900, Ext. 3075** for the HP Connectivity Solutions Guide.

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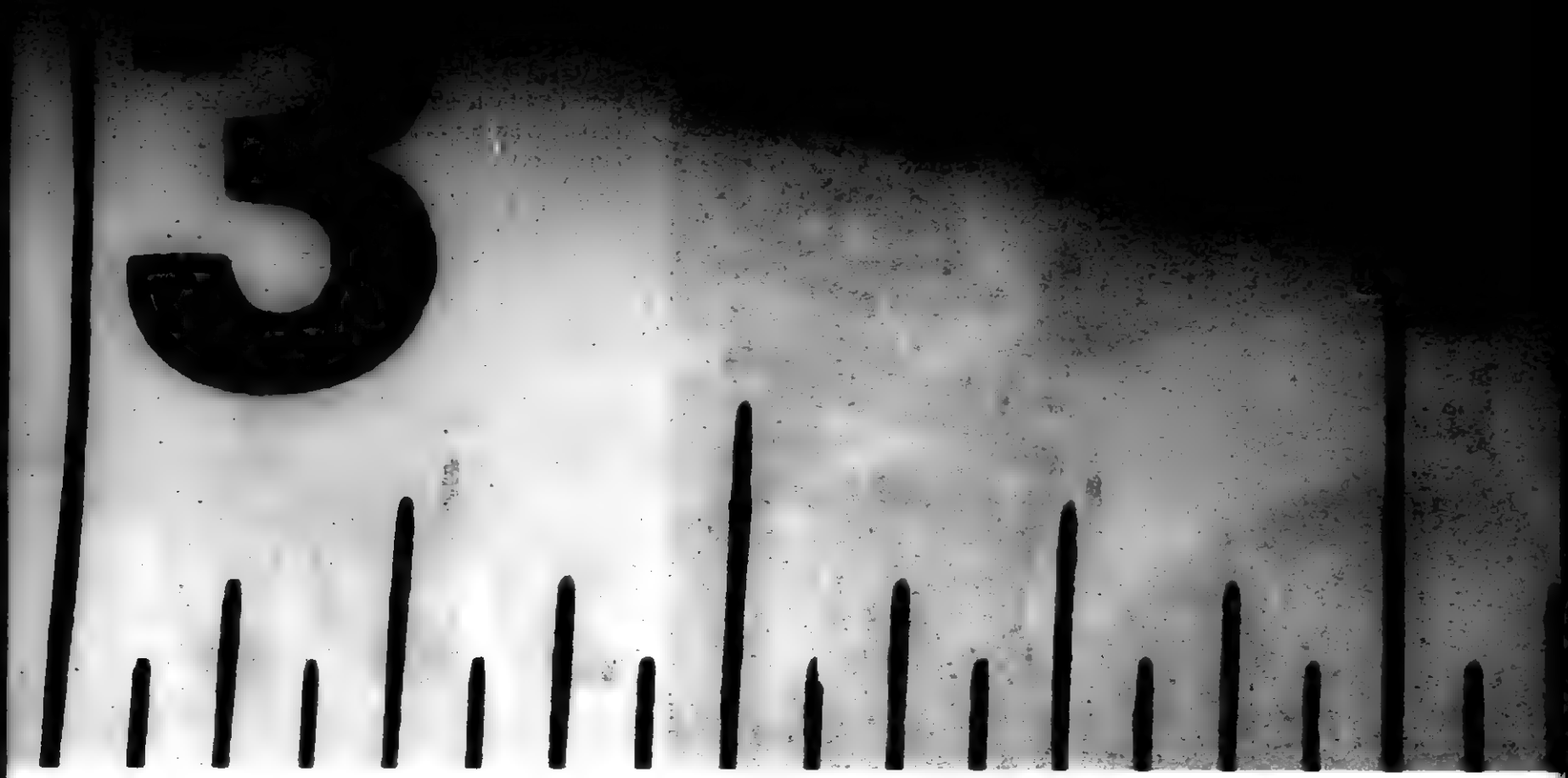
Right-sizing.



The perfect system isn't

There are trends and fashions even in the logical world of IS, and right now "down-sizing" is a hot one. You read about it all the time, usually accompanied by an obituary for mainframes.

Needless to say, this gets our attention at IBM, and not just because we make big systems.

We make systems of every size, and based on experience with real customers, we'd say that "right-sizing" is a more useful term than "down-sizing." Especially since a number of companies described as down-sizers not only keep their mainframes, they use them as actively as ever.

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what's fashionable, it's what fits.

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Meanwhile, other companies who chose mainframes ten years ago may be considering other options like AS/400®s or RISC-based networks, and we're helping them do it.

For example, while Lincoln National Life has a network of IBM RISC System/6000™s for running client/server applications, the University of Virginia Medical Center chose an ES/9000 for developing and processing medical record applications. For Royal Caribbean Cruise Lines, an IBM AS/400 is just the ticket for booking passengers. Who's right? They all are.

What's right for you? Call us, we can help you decide. Believe it or not, we aren't biased about system types. We make all types.

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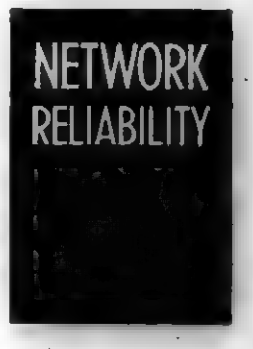
And those are pretty strong arguments. No matter how you slice it.



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Salomon Brothers puts chargebacks on-line

BY THOMAS HOFFMAN
CW STAFF

RUTHERFORD, N.J. — Salomon Brothers, Inc. is reaping big benefits from a newly automated chargeback accounting system that tracks the size, frequency and number of data packets distributed over its Transmission Control Protocol/Internet Protocol (TCP/IP) Ethernet wide-area network.

Until recently, only a handful of user companies had been able to develop such an on-line system. Earlier this month, Salomon Brothers joined those ranks.

According to Frederick Pinto, vice president of information systems security and business support at the $3.53 billion financial services firm, the company has developed an internetworking billing system combining commercially available software and proprietary systems developed in-house. Pinto said Salomon Brothers can now track its worldwide internetworking costs efficiently by department.

THE SYSTEM helps Salomon Brothers keep track of costs and forecast IS budgets.

The internet billing system is based on an IBM MVS-based software package developed by Computer Associates International, Inc. called CA-PMA/ChargeBack. It runs on Salomon Brothers' IBM 3090 using an IBM DB2 relational database management system. It was designed to process data on chargebacks for IS services ranging from CPU and direct-access storage device use to TCP/IP Ethernet WAN internet use.

Pinto said the system helps Salomon Brothers keep better track of its IS costs and forecast departmental IS budgets.

The mainframe system is linked to data-capturing devices that run on proprietary software. Pinto said these systems meter the size and number of data packets each Salomon Brothers department sends over its worldwide WAN. The data-capturing devices return internet data to the mainframe, which processes chargeback information using the CA software package. Pinto declined to elaborate.

Todd Dagres, an analyst at The Yankee Group in Boston, said he was impressed with the sophistication behind Salomon Brothers' chargeback system because he said there is a dearth of accounting packages for tracking corporate internet traffic.

However, Dagres said most users would shy away from a mainframe-based system in favor of a less expensive server- or workstation-based system. "Other users would probably prefer to run a chargeback system on a Sun SPARCstation server instead of using more mainframe MIPS. We're seeing a maturing of the internet market, and cost is becoming a major issue," Dagres said.

Pinto said Salomon Brothers may consider a client/server-based chargeback system, but he said no changes would be made until at least 1994. Besides, Pinto said, the current system will have paid for itself by then. Pinto would not elaborate on the cost to develop the system, although he did say a mainframe-based system will pay for itself in two to three years because so many of the company's applications are mainframe-based.

"I'm impressed that Salomon is looking ahead by putting the chargeback system in place before expanding its client/server environment," said Rick Villars, an analyst at International Data Corp. in Framingham, Mass.

Villars said it makes sense for Salomon Brothers to develop a mainframe-based chargeback system first, since the bulk of its financial applications are still mainframe-based. Plus, IBM Systems Network Architecture (SNA) users have increasingly expanded their IBM host connectivity beyond SNA networks to tap TCP/IP interoperability.

Salomon Brothers considered other chargeback accounting systems to govern its internet traffic when it began looking for one last year, Pinto said.

However, the closest rival in the CA-PMA/ChargeBack software package was five times more expensive and quite cumbersome, he said.

Pinto said the chargeback system has yielded several key benefits. For example, by switching from a manual billing process to an automated chargeback system, Pinto said, Salomon Brothers has reduced the number of man-hours devoted to chargeback-related technical services from 180 hours per week to 40.

Users: We want LAN/WAN link

Vendors respond with products that can ease internetwork management

BY ELISABETH HORWITT
CW STAFF

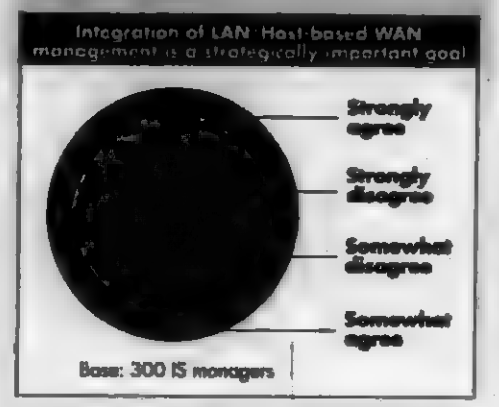
A bevy of network management vendors apparently got the same idea at about the same time: The one piece of the integrated network management pie users most want filled in right now is the local-area network/wide-area network connection.

Business Research Group recently did several studies that showed "users want management across different products on the same LAN offering, such as Novell, Inc.'s NetWare first and then management of LAN and WAN together," said Tom Wood, a senior analyst at the Newton, Mass., research firm.

"What they actually told us is, 'That's the order of priority, but we'll take anything right now.'"

Endorsement

Users are giving priority to integration of LANs and host-based WANs



Source: Business Research Group/Newton, Mass.

Improved connections

What users would like to get are products that let them perform all the key network management functions (performance monitoring and analysis, troubleshooting and capacity planning) across the bridges, routers and wiring hubs that handle LAN traffic, as well as across the WAN equipment and services that act as pipelines among sites.

Vendors have started responding in the following ways:

- **Make Systems, Inc.** recently introduced NetMaker, which is said to simulate and do capacity planning and performance analysis across long-distance LAN-to-LAN connections that involve both T1 multiplexers and bridges or routers.
- **Network General Corp.** announced Expert Sniffer Internetwork Analyzer, which is said to pinpoint LAN-to-LAN network bottlenecks and offer recommendations on how to resolve them.
- Meanwhile, **CrossComm Corp.** in Marlboro, Mass., is challenging Network General with a "Sniffer-like" protocol analysis function for its Internetwork Management System Release 5.1.

Unlike Network General's Internetwork Analyzer, which must be installed at each router-to-router link it analyzes, Internetwork Management System can analyze traffic across remote connections by making use of a "Session Capture" feature built into CrossComm's ILAN Universal Routers, the vendor said. This feature is available only to CrossComm ILAN router users.

- **Comdisco Systems, Inc.** announced last week that it has added wide-area link and multiport router modules to the physical module library for its PlanNet software.

This means network managers can simulate LAN/WAN connections, loading in traffic analysis information to figure out how to resolve network bottlenecks or

Continued on page 78

Hippi routers to debut this month

Will allow lower speed networks to access resources on high-speed devices

BY JOANIE M. WEXLER
CW STAFF

BROOKLYN PARK, Minn. — Network Systems Corp. is preparing to become the first internetworking vendor to roll out a High-Performance Parallel Interface (Hippi) for its routers.

Hippi, an ANSI standard for an 800M bit/sec. channel link, will make its debut on the company's Data Exchange (DX) line at the Interop '92 Fall show at the end of this month.

The idea is to allow lower speed networks, such as 100M bit/sec. Fiber Distributed Data Interfaces (FDDI), to access resources on high-speed computers, disk arrays and storage devices, said Kevin Collins, product support manager for technical computing at Network Systems.

For example, the San Diego Supercomputing Center has several supercomputing applications that speak Hippi among computers, explained Jay Dombrowski, manager of network engineering. "Some nice applications live on these computers, but lower speed networks need a way to access them," he said.

Information sharing

The center is involved in an engineering and scientific application-sharing project called "Casa" to link with the California Institute of Technology, The Jet Propulsion Laboratory and the Los Alamos National Laboratory over a 2.4G bit/sec. Synchronous Optical Network (Sonet). The participants plan to use Network System's DX Hippi to enable it.

The supercomputing center uses FDDI as its main backbone, on which reside several high-performance Unix workstations that need to access a file server on the Hippi network, Dombrowski said.

Hippi is specified as a point-to-point, high-speed channel that sends 32-bit-wide data in parallel between two devices at distances of up to 10 km. Network Systems also markets a Hippi switch, called the PS32, with 16 ports on each side to allow computers with Hippi interfaces to mix and match which two computers link up.

Users can substitute an FDDI or Sonet interface for a Hippi port and allow multiple computers to link down to an FDDI or up to a Sonet network, Dombrowski explained.

Network Systems said its Hippi products for routers will be available immediately after its announcement for a cost of $24,500, which Dombrowski said he considers a hefty price.

"But we're only going to have one. And when you're the only game in town, you can charge what you want," he said.

Users: We want LAN/WAN link

CONTINUED FROM PAGE 77

reconfigure a network to get the most out of their networking budgets and devices.

While Make Systems concentrates on the inter-LAN connections, PlanNet meshes the internetworking simulation with a preexisting ability to simulate traffic within LANs, such as Fiber Distributed Data Interface and 10Base-T, Comdisco said. The modules are available now.

•Also last week, **Racal-Datacom, Inc.** announced integrated management across its line of modems, digital access devices, T1 multiplexers and internetworking devices. Support of the Simple Network Management Protocol (SNMP) gives the Racal Management System the ability to manage other vendors' SNMP-compatible internetworking devices.

The one area none of the above products tackles is the carrier link. Indeed, few products exist that can do real-time monitoring and troubleshooting across the whole LAN-to-WAN connection because there is no network management standard for both the LAN and WAN worlds.

CUSTOMERS CAN use SNMP-based network management systems to trace traffic paths.

"The router vendors are going SNMP, while the carriers are going [Common Management Information Protocol]; the mux vendors are right in the middle, so they don't know which way to go," Wood said. MCI Communications Corp., however, recently stepped up to the plate with an SNMP-based management system that is said to collect and display service performance and monitoring information on demand, from MCI's Virtual Private Data Service frame-relay service.

As a result, customers can use SNMP-based network management systems to trace traffic paths and pinpoint problems across links that stretch from SNMP-compatible routers across MCI's frame-relay links to the router on the other side.

If MCI and other carriers follow this lead with SNMP-based management for other types of network services, users may finally be able to get complete information about what causes the bottlenecks and the glitches on their intersite data links.

Notes added to FT's Numeris

IDG NEWS SERVICE
EUROPEAN BUREAU

PARIS — France Telecom and Lotus Development Corp.'s French subsidiary recently announced a memorandum of understanding to offer services that incorporate Lotus' Notes groupware development tool and run over the carrier's Numeris integrated services digital network (ISDN).

The agreement marks the first time that a European carrier will incorporate Notes over ISDN, according to the companies.

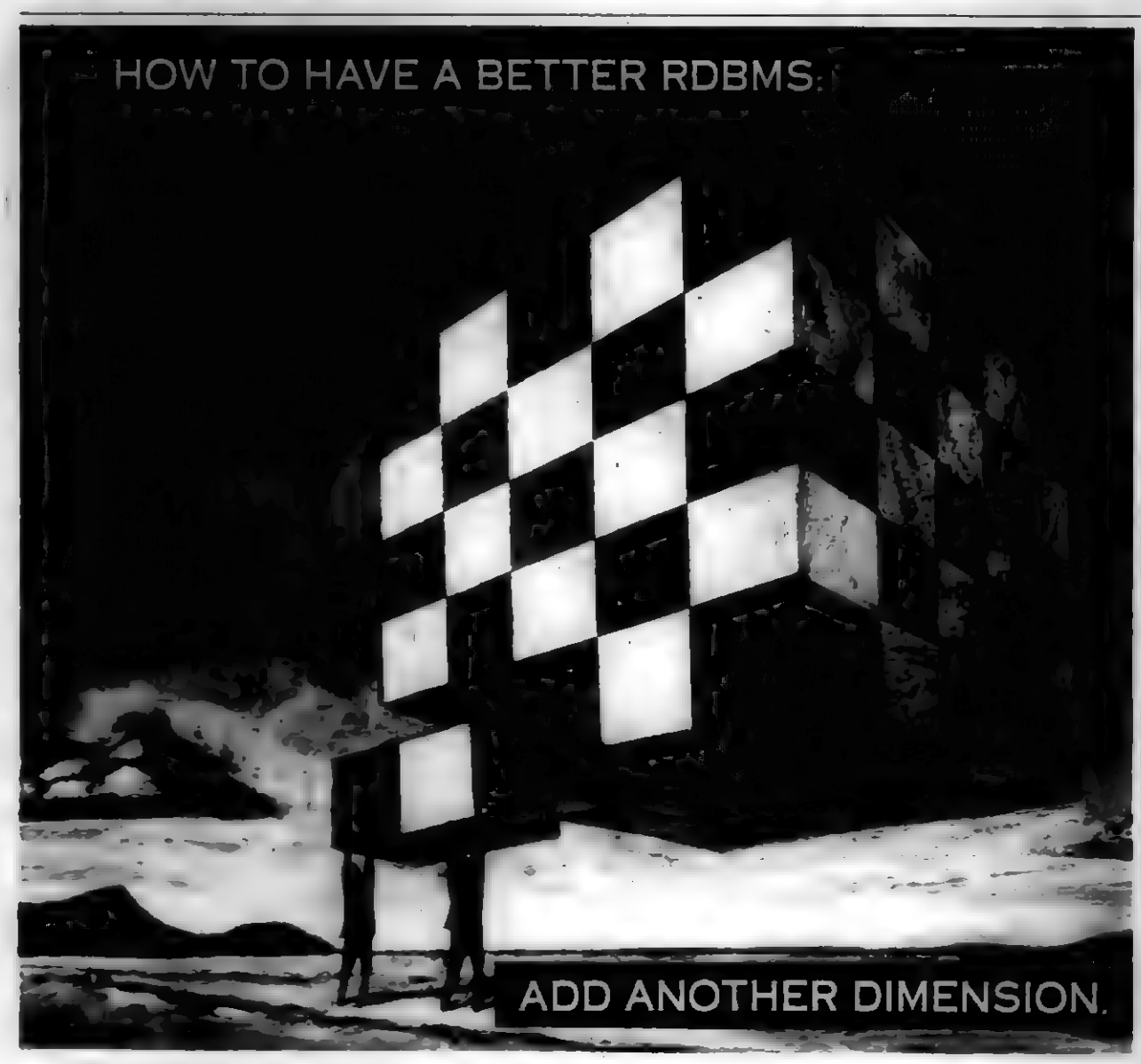
Postal Telephone and Telegraph (PTT) authorities in Scandinavia offer public electronic-mail services that use Lotus' CC:Mail E-mail software but not over ISDN, according to Mark Tompsett, Lotus business partner program manager at Lotus Development European Corp. in Stains, England.

Announced in 1990, Notes is Lotus' Windows-based software that was designed to let users build graphical applications for distributing data and coordinating workgroups over local- or wide-area networks.

At the recent Sicob 1992 trade fair here, France Telecom demonstrated two applications of Lotus' Notes on Numeris: a catalog of products with graphics from which users can order electronically and a database of customers, prospects and leads for commercial users.

Specific terms of the agreement have yet to be ironed out. However, applications such as those shown at Sicob are already available from France Telecom, according to the carrier.

The memorandum of understanding will also involve building Notes applications that will be integrated into France Telecom's Minitel videotex service and joint development of future products in areas such as voice integration.



There are a lot of relational data base management systems running on UNIX. Unfortunately, all have one thing in common: They were based on a mathematical premise, not a business premise.

But business needs to manipulate its data differently. Businesses require extra dimensions of flexibility and ease of use.

And only one RDBMS has those extra dimensions: uniVerse by VMark.

UniVerse is a relational database management system that literally redefines the meaning of relational. It gives users greater access to and control over the data they need to deal with.

But there's more to uniVerse than its database. As an application development and execution environment, uniVerse is by far the easiest to program and to operate of any open system environment. Ported to virtually every popular open system platform in the world, uniVerse allows you to "plug in" nearly 4,000 proven business solutions, making it possible for users to be up and running in hours, rather than months.

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IN BRIEF

HP opens telecom unit

■ With the European Economic Community getting ready to deregulate telecommunications markets in 1993, **Hewlett-Packard Co.** has set up a business group to chase the anticipated bonanza.

"You'll see a lot of turmoil in Europe in telecom, and it will be good for us to be in the middle of it," said Andre Meyer, who was named to head the new Telecommunications Systems Business Unit based in Grenoble, France, with operations also in Singapore and Sunnyvale, Calif. The unit is part of the Integrated Systems Division of HP's Computer Systems Organization.

■ **IBM** and **Premenos Corp.** have entered a strategic business partnership to develop an electronic data interchange (EDI) translator for the IBM RISC System/6000. The IBM Information Network now offers the translator, EDI/E, as a package for accessing its own expEDIte Datainterchange services.

■ Five companies have formed the Fax Response Industry Association to promote fax on demand, a computer application that allows users to call up and demand a particular fax by entering their requests on the telephone keypad. The companies are **Dialogic Corp.** in Parsippany, N.J., **FaxBack, Inc.** in Beaverton, Ore., **GammaLink** in Sunnyvale, Calif., **Ibex Technologies, Inc.** in Placerville, Calif., and **AudioFax** in Atlanta.

■ **Cabletron Systems, Inc.** has signed an agreement under which **Northern Telecom, Inc.** has become an authorized distributor of Cabletron hubs in Australia, Canada, Europe and the U.S. The products will complement Northern Telecom's line of twisted-pair and fiber-optic wiring products, the vendors reported.

■ **NetManage, Inc.** has launched Kanji Transmission Control Protocol/Internet Protocol for Windows, the first product the Cupertino, Calif., company has developed for the Japanese networking market.

■ The **International Communications Association** and **Comnet West** shows are combining into one conference that will be held in Dallas the week of May 17, 1993.

■ **Human Designed Systems** in King of Prussia, Pa., has cut prices of its X Window System terminal products by between 30% and 50%.

■ Two recently published books tackle different aspects of the problem of building networked systems. *Distributed Databases, Cooperative Processing, & Networking* (McGraw Hill, Inc.) by Shaku Atre covers technology, products and implementation strategies for companies setting out to put together distributed networked computing installations.

Mastering Internetworking (Numidia Press) by V. C. Marney-Petix is a "self-paced learning series" that covers internetworking devices such as bridges, repeaters, routers and network management systems.

■ **Unisys Corp.** has been awarded a three-year, $11 million facilities management contract to provide computer facilities and telecommunications services support to the U.S. **Department of Energy's** Bonneville Power Administration (BPA) in Portland, Ore. Under the contract, Unisys' government support subsidiary will manage BPA's computer facilities and provide telecommunications support to its local- and wide-area network configurations. The deal builds on Unisys' contract with BPA, which provides for software development and maintenance services.

■ An alliance between systems integrator **HFSI** in McLean, Va., and **PaperFree Systems, Inc.**, a Washington, D.C., EDI applications supplier, aims at helping businesses set up EDI connections among applications on heterogeneous computer systems. The alliance will use PaperFree's EDI mapping tool, which translates between standard EDI formats, the partners said.

■ UK-based **Cray Electronics Holdings PLC** has acquired the Information Technology Division of **Dowty Group PLC** from **TI Group**, a UK-based aerospace firm that recently acquired Dowty. Dowty's information technology group includes Dowty Communications, which sells LAN/WAN networking equipment both in the U.S. and overseas.

■ **Southwestern Bell** has proposed Service Assurance Warranties that guarantee customers a service credit if the local exchange carrier does not install or repair a data line within the time period it has agreed on.

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Firms must do up-front EDI planning

Successful implementation demands cooperation among corporations, departments, personnel

BY ROBERT M. KNIGHT
SPECIAL TO CW

NASHVILLE — Victor Brungart said he was there when it happened. His client, a printer employing roughly 20 people, was told on Sept. 15 that it would have until Nov. 2 to comply with a chemical conglomerate's electronic data interchange (EDI) requirements if the printer ever hoped to do business with the giant again.

"My client has been doing 50%, maybe 60%, of its business with the chemical company," Brungart said at a recent meeting of the Electronic Data Interchange Association. "They knew nothing about EDI."

Brungart, director of the Small Business Development Center at Southwest Virginia Community College in Richlands, Va., said the printer suddenly found out that up-front costs could run as high as $20,000, counting travel expenses to the chemical company's headquarters.

Familiar problem

This is not an uncommon dilemma for a small supplier to a large company, according to EDI veterans attending the conference. The information systems manager should have been able to present executives with a full array of alternatives, complete with the up-front and long-term costs of each.

In addition, the printing company should have involved its marketing function in what is patently not an IS decision, these veterans said.

The more experience a company has with EDI, the more exacting its requirements from IS, according to Marcia Hollatz, OEM EDI program manager at the Home and Building Control Division of Honeywell, Inc. in Golden Valley, Minn.

> "YOU'VE GOT TO build a team for EDI — a permanent team, as opposed to resource people each department throws at you and you send back when the project is over."

"We need them to have a clear understanding of the business systems we have in place and their interdependencies," Hollatz said. She cited the order management system: "How does it tie in with production planning and scheduling and with financial systems? I'm very fortunate. Our IS people do everything they can for me."

Something as important as EDI requires the absolute cooperation of all departments affected by a company's relationships with other companies, customers and suppliers, she said. That includes virtually every department.

"You've got to build a team for EDI — a permanent team, as opposed to resource people each department throws at you and you send back when the project is over," Hollatz said. "There's not a lot of EDI expertise out there, so you can't start each transaction with a new team. The learning curve's too long."

For initial end-to-end communications, the learning curve might not have to be so long.

The interconnections that occur when one company wants to shorten the cycle of orders, acknowledgements and delivery of goods can be complex, according to International Data Corp. in Framingham, Mass.

But a basic communications hookup, designed simply to eliminate data entry and paperwork, still involves EDI software.

Most often it includes translation software from vendors such as GE Information Services in Rockville, Md.; IBM Information Network in Tampa, Fla.; Premenos Corp. in Concord, Calif.; Sterling Software, Inc. in Dublin, Ohio; or TSI International in Wilton, Conn.

The hookup needs data transport or network services, usually in the form of a value-added network.

For such a communications-only gateway, TSI announced a series of "kits" at the conference. They were designed around the particular requirements of each of the roughly 35 large companies.

The Wal-Mart Kit, for example, interacts with TSI's translation software residing on the trading partner's personal computer, so the end user need not learn the transaction sets and other idiosyncracies that retailer Wal-Mart Stores, Inc. might require.

The use of a kit might diminish demands on the IS department by simplifying communications hookups and integrating data with mainframe-based applications.

Betsy Smith, deputy director at the U.S. Defense Personnel Support Center (DPSC) in Philadelphia, said her requirements are more complex. For example, her department works with more than 250 trading partners supplying food, clothing, textiles and medical supplies to the nation's armed services.

In addition, DPSC has reached the level of EDI sophistication in which the link is not just for communication but for the integration of computer systems between the agency and each trading partner.

"A lot of programming has to be done just for the integration of systems," Smith said. "We have to depend on IS not only to purchase and install translation software, but to ensure that each new release of the software is installed for X12 [the de facto umbrella standard for EDI] and UCS standards [tailored to the retail industry]."

DPSC processed 12.8 billion orders in the year ended July 1991. Those orders totaled an estimated $3.9 billion, she said.

Ben Milbrandt, a systems analyst at Consolidated Freightways in Portland, Ore., which boasts 6,000 trading partners, noted: "The biggest thing we need from IS is a system that will provide information from the application that is easily tailored to the customer's needs.

"On a freight invoice, there are lots of numbers, and customers should be able to pick out what numbers they want. We each have a 'magic number' — it might be a purchase order number or a bill of lading number — and it's up to IS to make sure that there's an accurate match between their magic number and ours, so the order can be processed correctly," Milbrandt said.

Knight is a Chicago-based writer.

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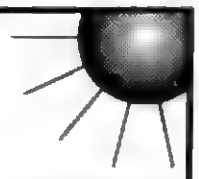

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NEW PRODUCTS

Network management

NCR Corp. has introduced Version 3.5 of StarSentry Systems Manager network management software.

According to the company, the product was designed to give users control of networks consisting of multivendor devices.

Features include Discovery, which checks the networks periodically for new systems and inactive old systems, and alarm forwarding, which enables users to monitor and maintain networks with a full-featured management station.

StarSentry Systems Manager has an SQL database interface and a management gateway that offers wide-area access for managing resources on remote local-area networks.

StarSentry Systems Manager 3.5 costs $15,000.

NCR
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Hewlett-Packard Co. has announced enhanced versions of HP OmniBack, a network backup management system, and HP OpenSpool, a print management system.

The products were designed for Sun Microsystems, Inc. workstations. HP OmniBack products support SPARCstations running Versions 4.1.1 or 4.1.2 of Sun's operating system. The software enables users to perform central file system backup and the recovery of their Sun workstations over a network to an HP Apollo Domain or HP/UX-based system, the company reported.

With HP OpenSpool, shared printers and plotters can be accessed transparently across networks of HP/UX-based workstations, Sun SPARCstations and multiuser systems.

Prices start at $400.

HP
19091 Prune Ridge Ave.
Cupertino, Calif. 95014
(408) 725-8900

General Software, Inc. has introduced the EtherProbe Network Analyzer.

The product was designed for Novell, Inc. NetWare and Microsoft Corp. LAN Manager networks. The company said the product is bilingual and has the ability to decode multiple protocols simultaneously in real time.

The software included with EtherProbe installs directly onto any DOS-based personal computer, either AT- or 386/486-based. Protocol support is provided with Microsoft LAN Manager protocols, IBM LAN Server protocols and Novell NetWare 286 and NetWare 386 file-sharing protocols.

The EtherProbe costs $995.

General Software
Suite A3
15600 N.E. 8th St.
Bellevue, Wash. 98008
(206) 391-4285

Gateways, bridges, routers

Cisco Systems, Inc. has introduced the Cisco Multiport Token Ring Card.

According to the company, the product is a four-port Token Ring interface card designed for Cisco Systems' AGS+ router/bridge. Users can build large distributed Token Ring internetworks with up to 16 Token Ring local-area networks.

Support is provided for all Cisco IBM internetworking features such as Synchronous Data Link Control to Token Ring media, translational and source-route transparent bridging between Token Ring and Ethernets and local termination of Token Ring sessions.

The Cisco Multiport Token Ring card costs $9,500 for a two-port configuration and $15,000 for a four-port configuration.

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Fortunately, there is a company that understands what you're going through. KnowledgeWare, the acknowledged leader in integrated CASE for business application development, has the technology and the know-how to help you sort through a dizzying array of options. And select the software and services that produce real-world solutions for enterprise information management.

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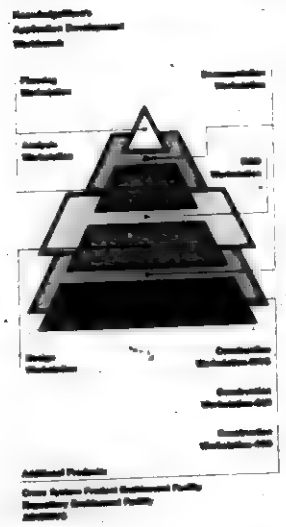
KnowledgeWare's Application Development Workbench: integrated CASE for the real world.



The superbly flexible ADW® tool set covers the full lifecycle of application development from planning through code generation. ADW empowers your development team to generate mainframe-, midrange-, and PC-based applications using common design logic. Applications driven by your business requirements, not technical issues. Applications that can quickly and easily adapt as your needs change.

An application development process, in short, that frees you to concentrate on what really matters. Capturing requirements and business processes, analyzing and automating the highest priority systems. All of which lets you become a more active and creative contributor to your company's success.

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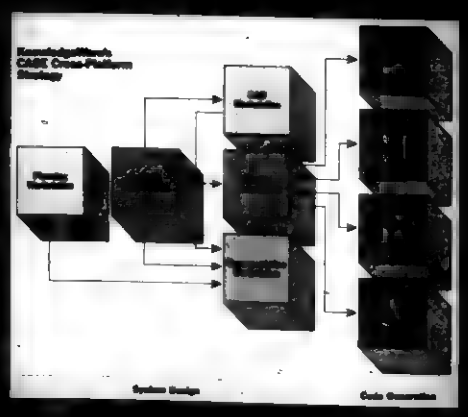
One of the most complex technological challenges facing information management professionals today is client/server processing. The advantages of this technology are obvious. Not only does client/server optimize your company's hardware investment, it also promises fantastic improvements in user productivity and accuracy.

But the technical problems in application development remain formidable. Development can involve unacceptably long lead times. And the costs involved in hiring or training

Application development for multiple target platforms.



developers to deal with this complex technology can be astronomical.

KnowledgeWare is ideally positioned to help you realize the full potential of this important, but complex new technology. We not only offer key products to help you, but back them with consulting services, training and support to ensure your success.

Our ADW/Construction Workstation-GUI delivers all the benefits of integrated CASE development to client/server applications. Equally important, CWS-GUI can ease the pain of transition by allowing your developers to work in a familiar context as they create applications for this new environment.

Many of the user productivity advantages of client/server processing can be achieved without abandoning your existing mainframe applications if you use KnowledgeWare's Flashpoint.™ Flashpoint allows you to construct graphical user interfaces for your current COBOL programs in days, with a minimum commitment of programming resources.

The transition to a client/server environment isn't easy. But KnowledgeWare's unique combination of products and expertise can make it possible. And you can do it within budget and staffing constraints.

YOUR MAINTENANCE BACKLOG IS CONSUMING A LOT MORE THAN TIME.

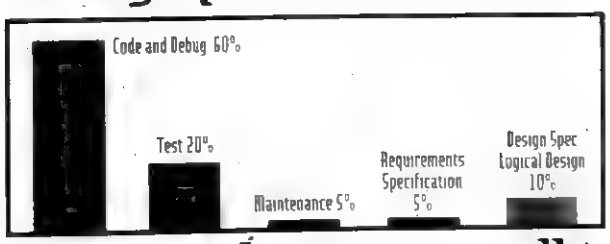
No one denies the importance of maintaining and enhancing existing systems. They represent an enormous investment of time and money. And remain critical to the operation of most companies. But many IS departments devote so much talent and time to maintenance that they are unable to schedule and staff new application development.

Lots of suppliers offer piecemeal solutions, but only KnowledgeWare has a comprehensive strategy to help you streamline maintenance.

KnowledgeWare offers tools designed to dramatically increase your productivity. That allow each programmer to maintain many more applications, whether developed with integrated CASE or traditional methods. And to help you optimize investments in existing applications by extending their useful life.

The first steps are ADW/Inspector,™ Pinpoint™ and Recoder.™ ADW/Inspector efficiently reads and analyzes the code of your current COBOL applications.

How developers think they spend their time.



How developers actually spend their time.

Source: Pittiglio Rabin Todd & McGrath, management/consultants, **Electronic Business,** June 1992

ADW/Pinpoint documents the code, charts processing paths, and highlights potential trouble spots. And ADW/Recoder dramatically improves program quality by automatically restructuring problem code.

Many IS departments are also being asked for state-of-the-art user interfaces. KnowledgeWare's Flashpoint allows you to add graphical user interfaces to existing COBOL applications. Quickly and easily. This Windows™-based development tool makes your existing inventory of mainframe and midrange programs more accessible to users and much more efficient. Flashpoint is an excellent step toward client/server technology.

These KnowledgeWare products constitute the foundation of our redevelopment strategy. The end result will be a solution that not only improves the speed and efficiency of your maintenance process, but allows you to use high-level logic as building blocks for new applications developed with our Application Development Workbench.

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KnowledgeWare is the industry's premier provider of powerful integrated CASE development tools and superior point solutions for GUI development, maintenance, code restructuring and business system planning. These products represent the most comprehensive solution to enterprise information management challenges available.

But technology by itself cannot deliver a total solution for the needs of business today. That's why we back this product offering with complete and sophisticated consulting, training and support services.

And because we know that no one vendor has all the answers, we have established alliances with other key suppliers to make sure we can offer you the most comprehensive solution to whatever business challenges you face.

We help you carefully analyze your real-world business requirements. Then recommend the exact mix of technology and training to get the job done as quickly and efficiently as possible. Our experts understand our products. And, more importantly, how they apply to the challenges you face every day.

KnowledgeWare offers training classes throughout the United States. And we can bring our expertise to your site when that is more convenient.

Our orientation is strictly customer-driven. We make every effort to understand and work within your business environment. We measure our success by your success.

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KnowledgeWare enjoys a long-term strategic partnership with IBM that includes marketing, development and technology sharing. As KnowledgeWare's largest customer, IBM shares our focus on delivering effective solutions as defined by our customers' needs. This kind of teamwork among industry leaders leads to platforms, tools and services that solve our customers' real-world application development challenges. Together with our customers, KnowledgeWare and IBM are making significant investments to advance the state of the art. We are establishing AD/Cycle standards and roadmaps to success. IBM has made workgroup computing a top AD/Cycle priority, and we are actively supporting that initiative. The result of this rich collaboration is a spectrum of solutions wider and more effective than either company could deliver independently.

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Users await 'official' launch of Alpha

If DEC can find new markets, technology may put firm back on its feet

BY MELINDA-CAROL BALLOU
CW STAFF

Some users are eagerly awaiting the Alpha workstations and servers that Digital Equipment Corp. is expected to officially introduce next month, while others will "wait and see."

But, according to Forrester Research, Inc. senior analyst Bill Bluestein, merely introducing the Alpha platforms will not be enough to guarantee revitalization for DEC. The company, which last week reported a $260 million quarterly loss, needs not only to facilitate the transition to Alpha successfully but must also find new markets.

Demonstrated at DECworld last spring but yet to be officially unveiled by the company are five platforms ranging from the low to the high end. DEC's earlier Alpha-ready machines covered a similar span (CW, June 15).

Mixed anticipation

Some users contacted last week said they can hardly wait for the machines to be delivered.

Robert Ayr, data center manager at Pacificare Health Systems, a health maintenance organization based in Cypress, Calif., said he is eager for the added CPU power of the 64-bit systems, which DEC has said it will deliver shortly.

The majority of DEC's installed VMS base will at least initially forbear switching, however, according to Steve Widen, an analyst at WorkGroup Technologies, Inc., a market research firm based in Hampton, N.H.

For example, David Tanimoto, a programmer at Lockheed Missiles and Space Co. in Sunnyvale, Calif., said his colleagues will investigate the new systems but will wait before switching architectures.

Expected to be included in the announcement are a desktop workstation that will exceed 100 SPECmarks and offer 16M to 128M bytes of memory and a graphics deskside workstation that will exceed 125 SPECmarks for upgrading from the VAX 4000 60 series. The products are code-named Sandpiper and Flamingo, respectively.

DEC officials said pricing is not yet fixed for the platforms, but it will be "competitive." They refused to comment on system details.

Two servers, code-named Cobra and Ruby, are also expected to be announced. Cobra, a departmental machine, is expected to offer one or two processors with approximately 135 SPECmarks per processor and 2G bytes of memory for upgrading from the VAX 4000 series. Ruby, a data center machine, is expected to offer up to four CPUs and 14G bytes of memory for upgrading from the VAX 6000 and 7000 series, sources said.

DEC will also announce the 10000 Alpha mainframe with up to 48G bytes of storage.

Analysts said it is high time that DEC came out with the platforms, and the company must ramp up manufacturing and delivery quickly if it is to have any impact on the market.

> "THEY UNDERSTAND THE stakes and that they have to make this work quickly because the company depends on it."
>
> JUDITH HURWITZ
> HURWITZ CONSULTING

High stakes

"My understanding is that they will announce aggressive delivery schedules. They understand the stakes and that they have to make this work quickly because the company depends on it," said Judith Hurwitz, president of Hurwitz Consulting Group, a market research firm in Newton, Mass.

Signaling DEC's push into the personal computer arena, a PC local-area network server and a low-end Alpha PC are well under way, according to sources.

Although DEC will not be able to ship the PCs until Microsoft Corp. ships Windows New Technology (probably not until late in 1993), analysts said the ramp-up of the Alpha systems could benefit the company in a variety of ways.

AS/400 switch helps laundry chain clean up

BY KIM S. NASH
CW STAFF

PHILADELPHIA — Dirty laundry is a nice business for Solon Automated Services, Inc.

The $105.3 million, employee-owned firm runs coin-operated laundry services in 13,100 U.S. apartment buildings, dormitories and military bases.

However, new building construction has stagnated during a poor economy, so the need for new laundry rooms is mighty slim.

Swapping 5-year-old IBM System/36 minicomputers for an Application System/400 Model B50 has enabled Solon to find ways to attract new business and keep customers squeaky clean and smiling.

"The new system gives us some interesting competitive advantages," including more accurate accounting and faster response to machine breakdowns, said Jim McDonnell, vice president of information systems and human resources. The B50 replaced 12 remote System/36 models.

Some $398,000 was spent on initial hardware, software and development costs, along with $72,000 for maintenance fees for leased lines and $90,000 per year for lease of the AS/400. Still, Solon expects to save at least $200,000 per year as a result of the new setup.

Layoffs expected

A good portion of that surplus will come from eliminating several IS positions in remote locales, McDonnell said.

With most processing now centralized on the AS/400, "we're not going to need all 12 system coordinators at our regional sites, so we'll lay off some or redeploy part of their time," McDonnell explained.

Among the competitive leg-up that McDonnell cited was the fact that Solon has virtually eliminated accounting data errors with a bar-coding system that tracks the number of quarters taken in by each washer and drier. Previously, money in each of the machines was counted manually and then deposited at a local bank.

ON SITE

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Philadelphia

- **Challenge:** To replace old IBM System/36s, centralize data for better control and allow wider remote access.
- **Technology:** IBM AS/400, MCI leased lines.
- **Results:** Reduced data error rate; company plans to cut IS staff and save money on salaries and hardware maintenance.

To page 84

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EcoSystems tools take network pulse

Unix-based system monitors track client/server network performance statistics, response time

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Client/server systems depend on the condition of the network that separates the two cooperating computers. A Silicon Valley start-up firm has built system monitors that will take the "temperature" of such network connections of database servers — and alert users to breakdowns or slowdowns that require human intervention.

EcoSystems Software, Inc. recently introduced its EcoSphere systems management software and EcoTools administrative management software.

The two software packages, which run on Oracle Corp. relational database management system servers, as well as on personal computers and workstation "clients," are priced from $6,000 for an eight-user system. Additional server packages are $2,000 each.

The 2-year-old firm, staffed by former Hewlett-Packard Co. and Oracle managers, expects to port its Unix server software to most major RDBMSs. The intent is to help end users tune their business-unit RDBMS servers for efficiency.

Missing link

"The whole premise of client/server computing is that you didn't need an IS department," explained John Howorth, EcoSystems' marketing vice president. "But while users had software to manage their systems and their network, the administrative functions were missing."

EcoSystems' software creates hundreds of software "agents" that check on various system parameters and report back to a central console.

Users can view statistics about server I/O, memory use, response time and other indicators of performance. Consoles must be programmed when installed, Howorth said, but end users can operate them in daily use.

Some industry analysts said they believe the small firm has an early entry into an emerging market.

Without such tools, users are left to puzzle why memory is being used too quickly or why response time is slowing in a healthy local-area network.

"They've built a proxy agent that tracks database performance and puts it in a neutral format their management console can understand," said John Rymer, a vice president at the Patricia Seybold Group in Boston. "Until you have statistics about how a database is being used by an application, you don't have a complete picture."

AS/400 helps laundry chain clean up

CONTINUED FROM PAGE 83

Deposit slips and other records were then reconciled at the regional offices. Any errors were combed through and corrected by hand.

Now each machine has a bar-coded card associated with it that is scanned at the regional office, which automatically enters the data in the AS/400 at headquarters. The bar code pinpoints exactly how much money specific machines collect each day.

Skirting several manual steps has cut down on errors. The method "may or may not be faster than the old way, but better accuracy is what we want," McDonnell said.

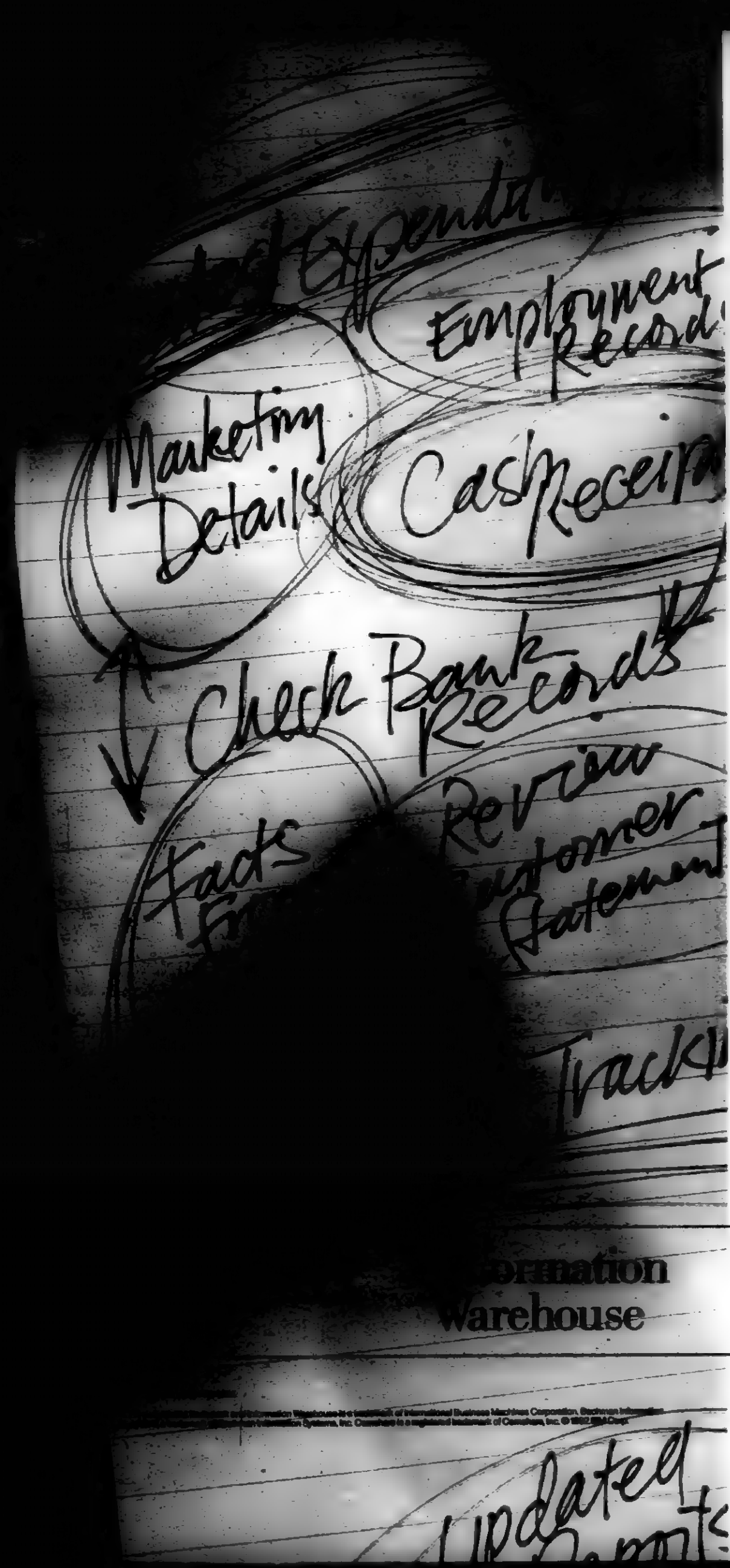
A preventive maintenance program is in the works that he said he hopes will set Solon apart form rivals. By monitoring the frequency of broken washers and driers and measuring those averages against data compiled on typical usage in that area, Solon can better plan machine checkups and, with a bit of luck, avert breakdowns.

So far so good

To determine which AS/400 was most appropriate, Solon used a product from IBM that analyzes operations. McDonnell said he is happy with the recommended B50 so far, but he will likely buy a larger processor after next year as more users and data are added to the system.

This month, Solon will throw the switch on what will grow into a network of a dozen IBM personal computers linked via leased lines from MCI Communications, Inc. to an AS/400 Model B50 at headquarters.

Aside from a couple of "minor" problems, setting up the AS/400-centered network was trouble-free, according to Bob Page, director of MIS projects. For example, a cabling problem with a modem jumbled and sometimes prevented transmission of data. IBM field service jumped in, isolated the problem and suggested a fix. "IBM gave us a lot of assistance. Their communications people were great," Page said.



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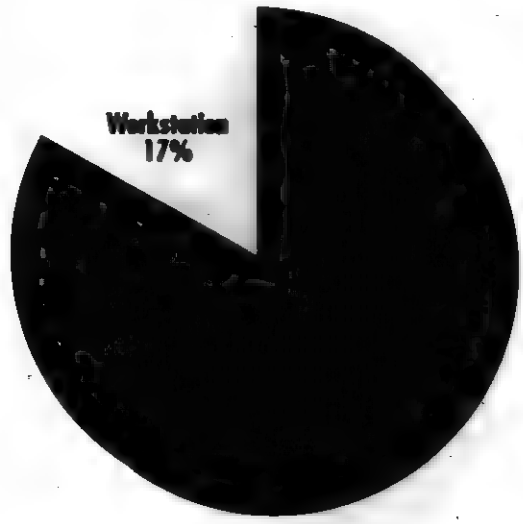
HOW DO WE KEEP

August 3, 1992
Editorial Profile



August 10, 1992
Editorial Profile

August 31, 1992
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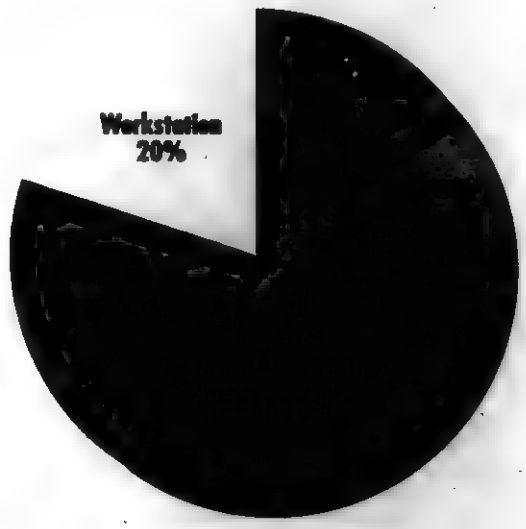

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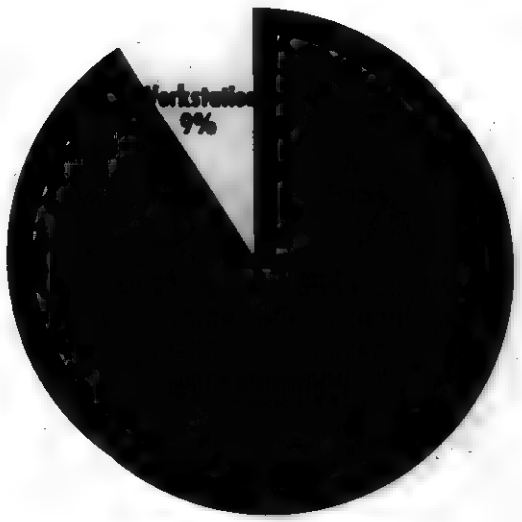

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The Newspaper of IS

Amoco Canada chooses SHL Systemhouse as outsourcer

Mainframe lease expirations provide opportunity for saving

BY JOANIE M. WEXLER
CW STAFF

CALGARY, Alberta — Spurred by a corporatewide mandate to reduce budgets by 30% to 40%, Amoco Canada Petroleum Co.'s information systems group this month teamed with Ottawa-based SHL Systemhouse, Inc. on a five-year data processing and network operations outsourcing project, the company said.

The $70 million to $90 million deal resulted in part because the leases on Amoco's three mainframes — an IBM 3090-400S and 300J and a Hitachi Data Systems Corp. EX90 — are expiring at the end of this year, affording the company "a window of downsizing opportunity," said Wayne Bester, manager of IS.

The $4 billion oil and gas producer is targeting a 15% to 20% reduction in data center operations alone, Bester said. The network side of the contract calls for SHL Systemhouse — which recruited a large number of Amoco's network-savvy IS staff — to manage, plan and support the company's local- and wide-area network operations.

Amoco also considered Electronic Data Systems Corp. and parent company Amoco Corp. for the outsourcer role. The project has three main goals underlying the cost-savings theme, Bester said:

•To gain the flexibility to decrease financial commitments over time as mainframe use diminishes. Amoco's current 210 million instructions per second (MIPS) will drop to 120 MIPS next year and is expected to fall between 60 MIPS and 80 MIPS within five years, Bester said.

•To provide a career path for Amoco IS staff members by moving them over to SHL Systemhouse, which will leverage their expertise to provide services to other customers.

•To allow Amoco's computing infrastructure to be designed and managed as a single entity by outsourcing both the data center and network operations to one outfit.

While no network savings are targeted for the first contract year, a major network project will be for SHL Systemhouse to lead Amoco into usage-based network pricing "so that departments are aware of exactly what their costs are to get their processing done," said Bill Trafford, president of computer services at SHL Systemhouse. Usually, he said, companies take the total cost and divide it evenly among users.

"With each department getting its own bill and paying in real money, users can look for networking alternatives and understand the financial implications" of their decisions, he explained.

About 95 of Amoco's 130-person IS staff transferred to SHL Systemhouse; 23 people remained in the central IS department to manage the contract and provide planning, Bester explained. The remainder were terminated or left voluntarily.

AS ONE MAJOR project, SHL Systemhouse will lead Amoco into usage-based network pricing.

"With an increased pressure to decrease our data center budget, there wasn't much of a career path left for our people," Bester explained.

Bester's own job has evolved into a type of corporate "IS ambassador" to Amoco's business units, with whom he meets and helps set technology directions for the entire company. To that end, he also chairs a corporatewide technology management committee.

The business units are moving to client/server technology "because we believe it will be cheaper over time," he said.

Evidence of Amoco's downsizing exists in the company's attitude toward more mature platforms.

For example, Amoco believes there is a role for midrange systems, such as its Digital Equipment Corp. VAXs and IBM Application System/400s, "but we're doing no more development on them." Amoco will run only off-the-shelf applications for those platforms, Bester said.

The company is also moving its messaging systems from IBM's mainframe-based Professional Office System to LANs.

While he expects cost savings with the downsizing, Bester said he also expects surprises. "I don't think we fully appreciate or understand how we're going to manage distributed data on multiple servers all over the country," he acknowledged.

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PA-RISC group licenses tools

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — The consortium that promotes development around Hewlett-Packard Co.'s Precision Architecture-RISC has turned to a rival group to help it achieve shrink-wrapped compatibility among PA-RISC platforms.

The Precision RISC Organization (PRO) said it has licensed compatibility testing tools from the 88open Consortium Ltd. Neither party revealed financial terms of the accord, through which PRO will make the tools available to its hardware and software members. 88open backs Motorola, Inc.'s 88000 family of reduced instruction set computing (RISC) microprocessors and has used the suite to test compatibility among 88000 systems.

For users, the accord will help assure that software written for one PA-RISC machine will run on other PA-RISC platforms, said Jim Bill, president of PRO.

Although the PA-RISC hardware world consists overwhelmingly of HP-brand workstations and minicomputers, more brands are expected to emerge in the marketplace over the next year.

PA-RISC licensees Sequoia Systems, Inc. and Stratus Computer, Inc., for instance, both plan to introduce PA-RISC versions of their high-availability systems.

Bill said the test suite is intended to assure compatibility from the ground up before the new machines hit the market. "It's much easier to design in compatibility than to retrofit it," Bill said.

Shrink-wrapped compatibility across brands of the same RISC platform has been an elusive goal for some vendors of RISC and its companion multiflavored operating system, Unix. For example, vendors in the Sun Microsystems, Inc. Scalable Processor Architecture (SPARC) RISC camp have fallen short in achieving compatibility, Bill observed.

"I don't think you have to make too many inquiries in the SPARC community to find out that you don't have complete compatibility," he said.

Bill said the PRO test suite will check for compatibility with a single Application Binary Interface (ABI). That ABI will be based largely on the ABI in HP's installed base and will eventually include support for functions such as multiprocessing and kanji character recognition, he said.

PRO is licensing 88open's AVS/88 system for testing hardware and operating systems and its ACT/88 for testing applications.

Tom Mace, president of 88open, said the move is not indicative of any intentions to cede market share to PA-RISC, although he acknowledged that some 88open software vendors may add PA-RISC support.

IN BRIEF

Firms join tools, DBMS

■ **Cincom Systems, Inc. and Intelligent Environments, Inc.** in Tewksbury, Mass., announced that they are integrating Cincom's Supra, a mainframe relational database management system, with Intelligent Environments' client/server development tools.

■ **Baltimore Bancorp** said it will outsource its data processing, resulting in the elimination of 50 to 90 jobs. David Spilman, treasurer of the bank holding company, said an outsourcing vendor had been selected from a field of eight companies, but he would not name the winning firm. He said the contract will kick in toward the end of the year.

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NEW PRODUCTS

Database management

Management Information Technology, Inc. has introduced a full-featured version of the company's DBA Master.

The product is an automated relational database management system monitoring and tuning tool that runs on Microsoft Corp.'s Windows. According to the company, users can perform reporting, analysis and tuning activities for multiple databases on mixed platforms from a desktop machine.

DBA Master for Windows has an assortment of features, including the ability to develop a tool for monitoring the full corporate data system and the ability to generate graphics from DBA Master reports.

Prices start at $2,500.

Management Information Technology
2895 Temple Ave.
Long Beach, Calif. 90806
(310) 424-4399

Gupta Technologies, Inc. has announced commitment to Microsoft Corp.'s Open Database Connectivity (ODBC) application programming interface and connectivity to Application System/400 and Informix Corp. databases.

This is achieved through Gupta's SQL Router connectivity. The interoperability strategy was designed to provide the benefits of the company's Windows-based graphical tools and client/server technology together for all industry-standard SQL database users. Gupta's interoperability strategy includes the ability for Gupta's SQL Windows and Quest tools to connect to Informix, AS/400 and ODBC-enabled databases.

SQL Router for the AS/400 and for Informix are both priced at $250 per client.

Gupta Technologies
1060 Marsh Road
Menlo Park, Calif. 94025
(415) 321-9500

Platinum Technology, Inc. has announced enhancements to its Platinum products for OS/2.

Platinum RC/Migrator is a tool for DB2 designed to completely automate the process of alternating and migrating DB2 data, objects and security. Platinum RC/Update is a DB2 object and data management tool. RC/Update enables users to create and maintain all DB2 objects, drop and optionally recover objects, browse, edit and copy DB2 data.

The product can also test embedded SQL in programs and execute SQL in batch or on-line mode, the company reported.

Prices for mainframe versions of the products range from $17,250 to $87,297.

Platinum Technology
555 Waters Edge Drive
Lombard, Ill. 60148
(708) 620-5000

Information Builders, Inc. has announced Enterprise Data Access server software.

The software was designed for Hewlett-Packard Co.'s HP MPE/IX operating system on HP 3000 Series 900 business systems and servers. The product is client/server software that allows third-generation language and SQL-based tools on the HP 3000 to access databases such as Turbo/Image and HP flat files, the company reported.

Prices for the EDA/SQL server software range from $8,000 to $118,500.

Information Builders
1250 Broadway
New York, N.Y. 10001
(212) 736-4433

Software application packages

Advanced Software Products Group, Inc. has introduced the RMT/MVS Toolkit, a mainframe software program designed for MVS and VM environments.

According to the company, the product is a decision-support tool that provides users with answers to management questions about system capacity and utilization. Reports regarding key resource use can be made, addressing questions such as the effect of combining two work loads onto one CPU.

Output is then provided in three forms: hard copy, graph files ready for Software Publishing Corp.'s Harvard Graphics and report files in personal computer format.

Prices range from $9,900 to $35,500.

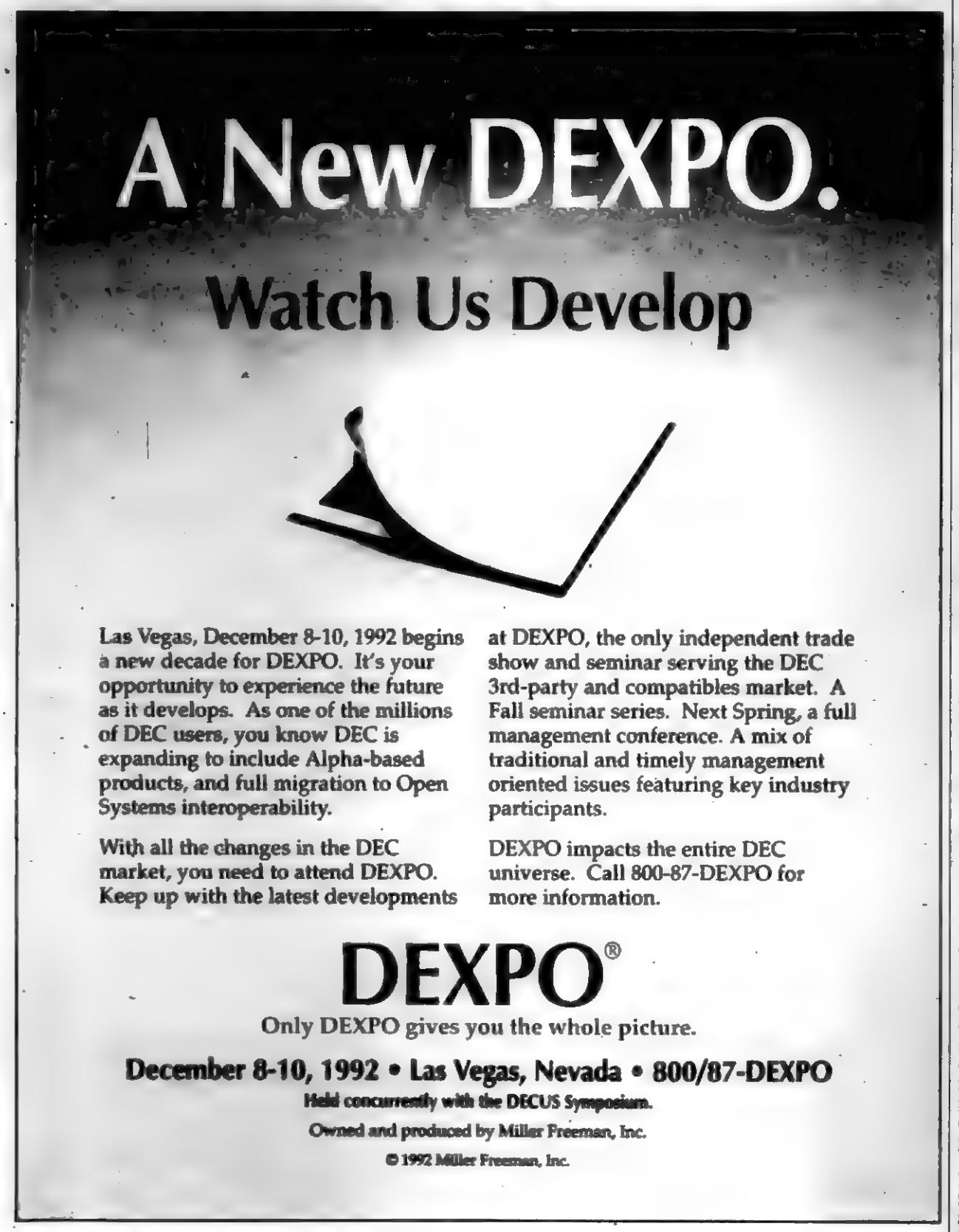
Advanced Software Products Group
995 8th Ave. South
Naples, Fla. 33940
(813) 649-1548

Pritsker Corp. has introduced Version 5.2 of its Factor Finite Capacity Management System.

According to the company, Factor is an integrated software system that has a full range of capacity management applications. Factor includes finite capacity scheduling, engineering analysis and accurate operations planning. Enhancements to Version 5.2 of Factor for the Application System/400 include the addition of several new output reports, a schedule development module that incorporates a new work and results capability and 50% or more increased speed of data transfer from the AS/400 host to the company's personal computer-based graphical Gantt chart schedule display and adjustment application.

Prices start at $15,000.

Pritsker
Suite 500
8910 Purdue Road
Indianapolis, Ind. 46268
(317) 879-1011



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In search of CASE standards

Bevy of government, industry proposals makes choosing more difficult

BY GARRY RAY
CW STAFF

The quest for computer-aided software engineering (CASE) standards has, if nothing else, produced an array of acronyms, models and implementations that may prove confusing to anyone following recent developments in the field. Part of the problem is the growing number of government and industry standards organizations that are submitting proposals that supersede and overlap one another.

CASE vendors and users agree almost universally that CASE tools should "plug and play" with one another. That requires a CASE framework with widely disclosed integration interfaces.

Such a framework should support a variety of analysis and design tools, compilers, languages and utilities such as editors, debuggers and software metrics analyzers — all from different vendors. Moreover, these tools should be able to communicate within the CASE framework via a messaging system, send and receive data and start and stop other tools in the framework.

For tools developers and users, open CASE requires a set of standard protocols and interfaces within a development framework.

Advocates of "open CASE" agree on three levels of tool integration. The first is visual integration, which is currently provided by IBM's Common User Access standards for graphical menuing systems and by the Open Software Foundation's Motif graphical user interface and Sun Microsystems, Inc.'s Open Look.

The second level, control integration, provides a means for tools to send messages and commands to one another. Current proposals and implementations of control integration include the following:

•**Broadcast Message Server** (BMS) — Allows tools to "register" with the BMS for certain classes of messages and operations. When BMS receives those messages, it sends them to registered tools. BMS is used in Hewlett-Packard Co.'s HP Softbench, Digital Equipment Corp.'s DEC Fuse, Sun's ToolTalk and IBM's SDE Workbench/6000.

•**Common Object Request Broker Architecture** — CASE entities are represented as objects and classes. Tools can recognize messages from CASE entities of specific class types.

•**A Tool Integration Standard** (ATIS) — Developed by Atherton Technologies, Inc., ATIS provides interfaces and services for both control and data integration through the company's Backplane framework. ATIS is under consideration as a standard by the American National Standards Institute's (ANSI) X3H6 CASE committee and is being used in DEC's CDD/Repository.

Data integration is the third level of the open CASE model. It allows one tool, such as the output of a debugger, to be transferred to another tool, such as an editor. Dominant data integration proposals include the following:

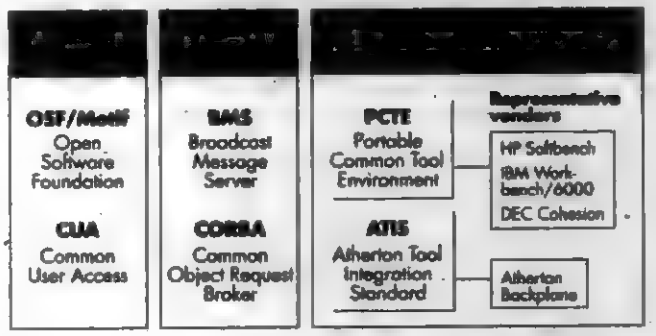
•**Portable Common Tool Environment** (PCTE) — A proposal from the European Computer Manufacturer's Association, PCTE establishes a common mechanism for storing and sharing data among different tools at the file level. Public support for PCTE has been expressed by DEC, IBM and a host of CASE tool vendors.

•**CASE Data Interchange Format** (CDIF) — A proposal from the Electronic Industries Association, CDIF defines how CASE tools might transfer and share data within a CASE environment. CDIF includes a common syntax to identify the content and meaning of shared CASE data.

•**Information Resource Dictionary System** (IRDS) — A proposal from the International Standards Organization and ANSI, IRDS describes a number of services to be provided for CASE repositories.

Standards drive software engineering frameworks

Tools vendors are rallying around a number of standards to integrate CASE and other software development tools



CW Chart: Stephanie Faucher

Unisys to port Mapper

BY THOMAS HOFFMAN
CW STAFF

ATLANTA — Unisys Corp. last week detailed its plans to port its Mapper application development tool set to several multivendor platforms, including IBM's RISC System/6000, Sun Microsystems, Inc.'s Scalable Processor Architecture (SPARC)-based systems and The Santa Cruz Operation's SCO Unix System V/386.

Utilizing the Cube and Use, Inc. combined user group conference as a platform, Unisys executives said the first ports would be made to the Sun platform by the second quarter of 1993. Follow-on ports to IBM's AIX and SCO Unix would begin shipping by the third and fourth quarters next year, respectively.

Reto Braun, Unisys president and chief operating officer, said the Blue Bell, Pa., computer maker was responding to customer requests for Mapper ports to multivendor environments.

Fits the bill

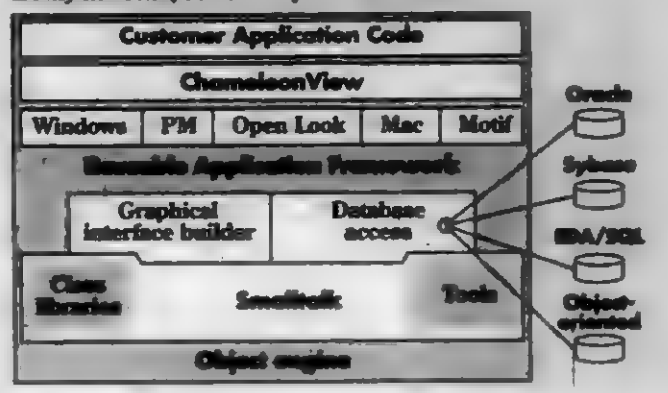
One of the conference attendees, Richard H. Miller, assistant director of technical support at Baylor College of Medicine in Houston, said the Mapper ports fit into the university's strategic plans.

Baylor currently develops Mapper-based applications on a Unisys 2200/423 mainframe. However, Miller said the school wants to integrate these applications with its Sun SPARC hardware environment and a Sybase, Inc. database engine. Miller said the planned ports will enable the university to do this.

"We're ecstatic about these Mapper ports," Miller said. "This will help us in our goal to develop a common system for all university users."

Portability

Automatic cross-platform portability and access to varied databases are key elements of ParcPlace Systems' VisualWorks



Source: ParcPlace Systems, Inc.

VisualWorks from ParcPlace debuts

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — ParcPlace Systems, Inc. said last week that it will address user demands for ease of use and quick development with a new product, the VisualWorks developer's environment for client/server applications.

The package can be used as an upgrade to the firm's Objectworks/Smalltalk language.

VisualWorks supports multiple graphical user interfaces (GUI) and allows programmers to deploy a single Smalltalk client/server application on diverse desktop systems without revising the GUI support. Early users said they shortened development time by building on predefined GUI objects and gateways to database servers.

VisualWorks is an attempt by ParcPlace to break away from its image as a technology company that is insulated from user needs by providing quick training and user-friendly features. Smalltalk users have said it takes six months to become adept at its object-oriented style of programming.

Right the first time

One early user, the Snohomish Public Utility District in Everett, Wash., built a prototype power grid map in six weeks using a beta-test copy of VisualWorks.

"We needed a tool that would allow us to develop an application once and then let the application look like the native environment on many different platforms," said Dave Tovrea, a technical consultant. The firm accesses a Digital Equipment Corp. VAX database from IBM-compatible personal computers, Apple Computer Inc. Macintoshes and Unix workstations.

The VisualWorks developer's environment contains an icon-based "palette" that lets users select GUI elements and copy them onto a working "canvas," ParcPlace said. A function called ChameleonView automatically adapts the underlying Smalltalk code to several GUIs, including Microsoft Corp.'s Windows, the Apple Macintosh, the Open Software Foundation's OSF/Motif, IBM's OS/2 Presentation Manager and Sun Microsystems, Inc.'s Open Look.

All inclusive

"Depending on the complexity of your application, you might be able to do the whole thing with this new [VisualWorks] environment," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "You can do interactive prototyping and jump into Smalltalk when you need to."

But users will need to use a companion C tool kit to link their new Smalltalk applications to other Microsoft Windows applications.

VisualWorks can also act as the glue that links object-oriented applications on client machines with back-end relational database servers. It contains a $495 server gateway that connects with Oracle Corp. and Sybase, Inc. relational databases. The ParcPlace tool kit has a $995 module that supports Information Builders, Inc.'s EDA/SQL gateway.

Pricing for the VisualWorks system is $5,000 for Unix computers and $2,000 for IBM-compatible PCs and Apple Macintosh computers. The system is available for immediate shipment, ParcPlace said.

Revolve analyzes Cobol code

CARY, N.C. — Burl Software Laboratories, Inc. has begun shipping beta-test copies of Revolve, a tool for analyzing Cobol source code and associated CICS and DB2 commands and job control language.

Using Microsoft Corp.'s Windows or IBM's OS/2 Presentation Manager, users can write custom queries — such as, "Show in red the paragraphs with GOTOs that do not lead to an EXIT" — to analyze a single program or dozens of programs at once, according to Burl. It comes with user-modifiable canned reports and a flexible query language, called REQL, for building custom reports.

Ken Romley, a vice president at Burl, said Revolve offers three advantages over some competitive products:

- It is not limited to a finite set of predefined queries. Any information contained in the source code can be analyzed.
- It can take a very wide view of a complex set of programs and then drill down to "the three or four pinpoints" you need.
- It is not necessary to preprocess programs to build in codes or mechanisms that allow the tool to work.

Romley said Revolve will be most useful when used with old, or poorly written and maintained software. "Typically, old code does not have good modularity and structure," he said. "We design it, we build it, it works fine. But then we fix some bugs, our business changes, and the software changes a piece here, a piece there. Pretty soon it's out of control."

Revolve allows multiple views of the source code on one screen. For example, one view might give a bird's eye view of an entire program while another shows a flow chart of the calling hierarchy and another displays a dynamic data dictionary. Different views and levels can be chosen by clicks on the mouse, and information requested is highlighted in color.

Romley said Revolve will be available Jan. 1, and beta-test copies can be obtained now. He said pricing will be announced in 30 days and is likely to be less than $5,000 per workstation.

GARY H. ANTHES

Graphical tool for IBM APPC

REDMOND, Wash. — Wall Data, Inc. has announced Rumba Tools for APPC, a graphical development tool for the IBM Advanced Program-to-Program Communications (APPC) interface.

Rumba Tools for APPC reportedly allows developers to write Microsoft Corp. Windows-based APPC transaction programs without being APPC experts. The developers can use the VerbTalk scripting language to script between transaction programs. VerbTalk scripts, created using a point-and-click interface, can be called from a Windows program or the logic can be ported to C, Cobol or PL/1 applications.

Windows Dynamic Link Libraries are included and give support to APPC/LU6.2 communications and an interface to Microsoft's Visual Basic.

Rumba Tools for APPC can be used individually or with other Rumba software for IBM mainframes or the Application System/400.

The tools are scheduled for availability in the fourth quarter of this year for a license fee of $495.

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IN BRIEF

Software firms license HP

Objectivity, Inc., based in Menlo Park, Calif., and **Micro Focus, Inc.** in Palo Alto, have licensed Hewlett-Packard Co.'s SoftBench application development framework for development of Unix-based applications. Objectivity plans to incorporate SoftBench's Broadcast Message Server, a standard for getting development tools from other vendors to work together, into Objectivity/DB, an object-based database management system that runs under Unix. Micro Focus users will be able to use tools available under SoftBench when building Cobol applications.

West Coast firms using tools from Providence, R.I.-based **Cadre Technologies, Inc.** to do computer-aided software engineering (CASE) can learn to use the products at a new training center in San Francisco. Separately, Cadre expanded a joint development pact with **Ingres**, a division of The Ask Cos. in Los Altos, Calif., to let developers use Cadre's DB Designer to build Ingres databases and applications and re-engineer existing databasea.

Popkin Software and Systems, Inc. in New York unveiled System Architect 2.4, an enhanced version of its personal computer-based CASE workbench. Among other features, the new version sports editing capabilites to add information about the relationships between record types in the data dictionary, the company said. The product is free to users with annual support contracts.

NEW PRODUCTS

Application development tools

Berard Software Engineering, Inc. has announced A Completed Object-Oriented Design Example.

The product was designed for users who are considering using an object-oriented approach to software development. According to the company, the 350-page example includes design documentation, more than 2,000 lines of C++ source code and more than 1,000 lines of SmallTalk source code. The product also includes copies of 170 slides from the company's design course.

The object-oriented design example costs $50.

Berard Software Engineering
Suite 360
101 Lake Forest Blvd.
Gaithersburg, Md. 20877
(301) 417-9884

Liant Software Corp. has upgraded its C-scape User Interface Management System, an object-oriented C development tool.

According to the company, the product was designed for rapidly creating portable text and graphics-based user interface applications.

Version 4.0 offers users the ability to create professional-grade screens using new Common User Access borders for graphics and text mode, menus, scroll bars, minimize/maximize buttons and other advanced windowing functions.

An improved and expanded five-volume documentation set is included, as well as new date and time functions.

Prices start at $499.

Liant Software
959 Concord St.
Framingham, Mass. 01701
(508) 872-8700

Champs Software, Inc. has introduced Champs/Case, an advanced development tool.

According to the company, the product enables users to quickly create, implement and maintain high-integrity applications at a low life-cycle cost. Champs/Case is a VAX Rdb/VMS layered product that generates 100% of the C source code for complex applications. The product is distributed in three modules: a Dictionary Development and Maintenance Module, an Application Development and Maintenance Module and an Object Dependency Tracking Module. Champs/Case integrates with Digital Equipment Corp.'s DECforms product.

Prices start at $9,000.

Champs Software
1255 N. Vantage Point Drive
Crystal River, Fla. 34429
(904) 795-2362

Computer-aided software engineering

Pacific Gold Coast Corp. has released the Enhanced Version of PGC Computer-Aided Software Engineering Graphics.

According to the company, this version includes quicker editing, offering the ability to simultaneously move and update symbol objects, associated labels and connections.

Other enhancements include three levels of style selection, portable tools and the capability to define image size, the company said.

Multiple design tools are provided in the software and information systems development process, and the product supports most analysis and design tools, including Object-Oriented Analysis and Data Flow Diagram.

The package costs $149.95.

Pacific Gold Coast
Suite 201
15 Glen St.
Glen Cove, N.Y. 11542
(516) 759-3011

Code libraries

Aladdin Publishing, Inc. has introduced three versions of ClipSQL libraries that support Microsoft Corp./Sybase, Inc. SQL Server, the Oracle Corp. SSQL server and Gupta Technologies, Inc.'s SQLBase Server.

Users can utilize the libraries to create portable applications with the ClipSQL. In order to port an application, users relink the application with the correct ClipSQL library without making any source-code changes.

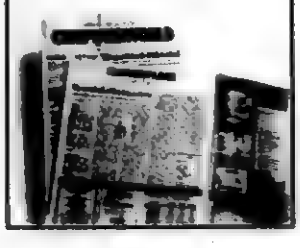
According to the company, the product supports all SQL commands and allows users to create or delete tables and retrieve and update or delete rows.

Some of the product's functions include SQLLogin, which allows applications to log in to the database server, SQLUse and SQLQuery.

The ClipSQL libraries cost $495 each.

Aladdin Publishing
126 S. Helberta #4
Redondo Beach, Calif. 90277
(310) 798-6488

Check out the Marketplace Pages on Page 122.



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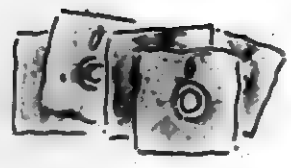
Nothing worked. Everybody had different  .

And we had and and everywhere, so it

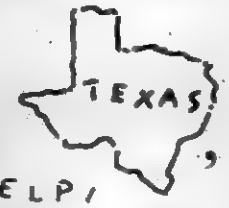
was next to impossible to share . Very depressing.

What's more, the we had sometimes didn't to

each other. And forget about the rest of our offices throughout

the . Our people in couldn't communicate

with our people in . They, in turn, were cut off

from . And nobody could talk to the guys in  ,

but that's another story. Our PC managers were .

No one knew what to do.

Then, at a big , someone had a great .

"Let's put in charge of everything!" he exclaimed.

Everyone at the meeting because they knew **IS** would

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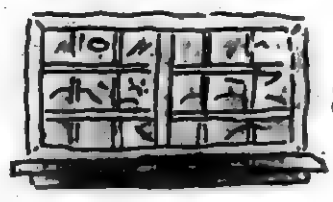
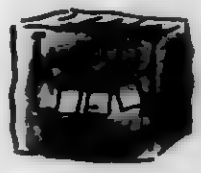
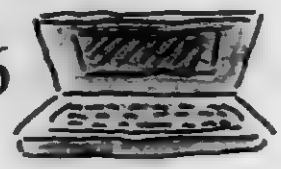
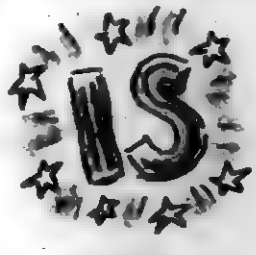
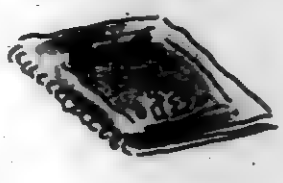
see the big and bring order to the . And so they did. They created a client/server architecture with Microsoft  as the GUI,  as the communication medium, and core applications that on both. They also replaced our old 286's with snazzy new 486  , and trained local people to provide and service.

Now, everything works. We can even talk to the guys in now, although we still don't understand what they're saying. But like we said, that's another . For the whole story on  , write us or 800-343-6474 and ask for our  , **"The Book on IS."** It'll answer all your about IS. And tell you why **it's the biggest computer market in the** .

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PC MAGAZINE, September 29, 1992

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Kent Anderson, 3M Corporate Quality & Manufacturing Services

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Project management gets easier

BY DANIEL YAHDAV

If you haven't looked at project management software lately, you might want to get reacquainted. It has changed: It's easier to use and better suited to the multifaceted job of software development, and it very well may help you rein in your development projects.

Not only were past packages plagued by poor integration of the major functions required by developers, project managers and senior information systems managers, but they were also considered unnecessarily complex to navigate.

But with the introduction of Microsoft Corp. Windows-based packages and high-end personal computer versions, this software category is heating up to the extent that even mainframe versions are using PC interfaces.

As a result, the question is not so much *whether* you can benefit from using the software but rather the extent to which you can contain budget overruns and improve management of day-to-day activities.

Selecting a system is a tremendous job, and your success depends primarily on how well you analyze your needs and how much time you spend learning what's on the market.

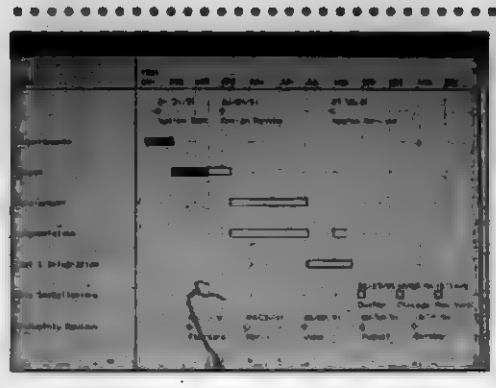
Packages range from simple schedulers to enterprisewide solutions. Some are single-user, and a growing number permit distributed project management with a centralized repository. There are many PC-based products, several mini and mainframe systems and a few that let you combine platforms.

You can also customize the look and feel of off-the-shelf products or standardize on software with just the basics.

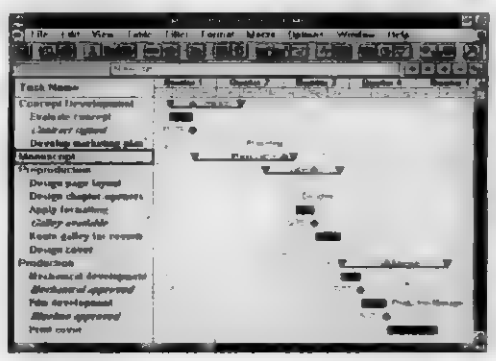
We've chosen to look at the new, easy-to-use packages as well as those that are geared specifically for the IS job. Also impressive are the very high-end PC packages that are becoming as functional as the mainframe.

MAINFRAME-BASED PACKAGES
IS-specific programs are traditionally character-based mainframe systems and take the most time to learn. However, not only are they increasingly available in PC versions, but they are also establishing interfaces to PCs and providing GUI-based interfaces. Often based on data repositories, these programs are better integrated and more functional than classic programs and are still the best suited for IS.

DOS-BASED PACKAGES
The majority of DOS packages have roots in classic project management software. They are more flexible than most IS-specific programs in the area of scheduling. In addition, the menus are more advanced, graphics are easier to customize and more interactive features are offered.



GRAPHICAL DOS-BASED PACKAGES
Graphical DOS-based packages have all the advantages of DOS-based packages, plus the ability to use everything in full graphics mode. The major difference is that they allow a bit-mapped mode of the screen to be addressed vs. a character mode. These programs come closest to Windows without having to standardize on that environment.



WINDOWS-BASED PACKAGES
Most of these packages are classic, although more and more are IS-specific. These programs are the most user-friendly and interactive. Screens include more detail, selected fonts and enhanced characters. The only requirement is that Windows-based programs have more hardware resources.

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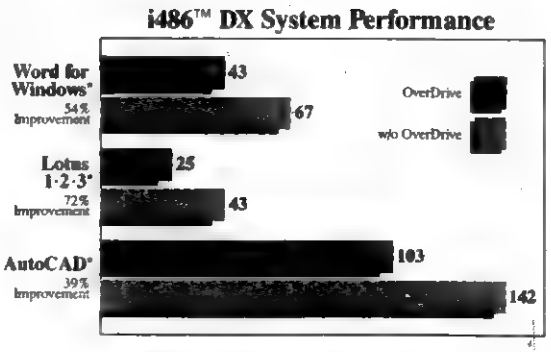

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Steps toward usability

AFTER ALL THE YEARS OF BEING DIFFICULT TO USE, project management software has just gotten easier. Until the late 1980s, power and versatility in a package also meant that it was extremely difficult to learn and operate. But lately, vendors have been concentrating on making project management more efficient, more automated and just plain easier to navigate. A prime agent in all this has been Microsoft's Windows, which is making PC and even mainframe-based pro-grams less intimidating to use.

To understand how much better the software is, it's important to know your full range of choices. There are essentially two distinct types:

•The modular method.
The longest-standing types of project management software (typically mainframe and DOS platforms) are really groups of individual modules. Sometimes they are built by the same developer and packaged as an entire "solution."

An extremely full suite of modules would include the following:
- ➤ Project template design.
- ➤ Estimating methodologies.
- ➤ Scheduling functions.
- ➤ Resource and cost management.
- ➤ Tracking of actuals.
- ➤ Time reporting and chargeback.
- ➤ Work request systems.
- ➤ Common facility.
- ➤ Computer-aided software engineering interfaces.

Generally, each module was quite easy to use and learn, but the lack of integration among them was problematic.

Today, some of these scheduling and control programs are offering more (and better) integrated modules (especially through the use of Windows Dynamic Data Exchange, or DDE) as well as better user interfaces. Vendors whose packages are more integrated than ever before include **Applied Business Technology** (Project Workbench in DOS version), **Computer Associates International, Inc.** (CA-SuperProject for DOS) and **Lucas Management Systems** (Prestige for Windows).

•The database approach.
The second type of project management software does not have the integration problems exhibited in the first type of package because it was originally developed on top of a database. The database acts as a central repository for data integration and can be customized.

But while this makes data more integrated, these types of packages are generally more difficult to learn. Many even resemble the old mainframe interface with character-based graphics. Recently, however, some of these programs have become more interactive, with more advanced graphics, better on-line Help and a friendlier user interface, especially the ones running under Windows.

Some examples include **AGS Management Systems, Inc.**'s firstCASE, **LBMS, Inc.'s** Project Engineer, **POC-IT Management Services, Inc.**'s Microman II and **Multitrak Software Development Corp.**'s Enterprise-Wide Work Management System, which offers a distributed solution where project planning can be performed on the desktop and all other tasks on the mainframe.

Now here's a look at what both groups of vendors have been doing to overcome their prime shortcoming: ease of use.

DANIEL YAHDAV

Better learning tools

One way vendors are making systems easier to use is to improve the Help facilities, thereby shortening the time it takes to learn the system and helping the user work through unfamiliar territory.

Good on-screen tutorials are essential for those learning a project management program. These aren't too difficult to come by because more vendors are including tutorials than before, especially in Windows-based products. Tutorials are better and more complete today than in the past, explaining not only major program functions but also exemplifying the actual screens, charts and menus.

However, it is no longer enough to provide on-screen, context-sensitive Help on request. The ante has been upped, now that a few programs have come out that don't wait until you ask for help; they can sense the exact question you have, based on where you place your cursor.

The best example of this is **CA**'s CA-SuperProject (both DOS and Windows versions). As you move your cursor, the program displays short explanations of what data you can enter in a field; as you point to a menu command, it tells you what your command options are. You can turn on the Assist mode, which displays a four-line window with more complete Help. This feature is also available in **Scitor Corp.**'s PS5.

Perhaps second-best to CA-SuperProject (in terms of the depth of help and the level of detail) is the context-sensitive Help initiated by user requests and offered by most programs today, such as **Symantec Corp.**'s Time Line and **Microsoft**'s Project (both for Windows).

Another unique Help tool is The Planning Wizard, which so far only Microsoft offers. It allows you to select from a menu a problematic issue. The program then shows you the necessary steps in slow motion so that you can learn them.

This tool is great for learning a function you have never tried before or for semiautomating what you already know. Although it currently covers only a small number of issues, in a full-blown form it may eliminate the need for tutorials and user manuals as well as make some of your jobs easier.

The easiest to use

There are scheduling and control programs. While comprehensive in their functionality, they lack some of the important functions that IS people require.

	Microsoft Corp. (800) 426-9400 Microsoft Project 3.0 for Windows $695	Scitor Corp. (415) 570-7700 Project Scheduler $695	Symantec Corp. (415) 898-1919 Time Line for Windows $695
Context-sensitive Help	■	■	■
Tool bar icons	■	■	■
Macros	■	■	
Self-guided functions, tutors or Help	■	■	■
Artificial intelligence capabilities			■
Interactive graphics	■	■	■
Interactive PERT charts	■	■	■
Interactive Gantt charts	■	■	■
Interactive resource histograms	■	■	■
Platforms	Windows, Macintosh	DOS, Macintosh, OS/2	Windows

Once you've mastered the system

Once you've learned how to navigate the program, you will want functions that a) save you keystrokes and b) free you from memorizing the steps needed to perform a complex task. The following features help in both areas:

•Tool bars. Most Windows programs and a handful of DOS ones, such as **Computer Aided Management**'s PARISS Enterprise, offer extraordinary tools to minimize keystrokes; among these, tool bars are the best example.

Tool bars offer handy buttons that you can invoke with a single click of a mouse to implement a certain job that would otherwise take several keystrokes to perform.

•Macros. A macro facility allows you to program a set of keystrokes. **Microsoft**'s Project, for instance, does an outstanding job. It not only lets you define any set of repetitive commands that you expect to use frequently but can also prompt the user for questions about the specific run and add it to the tool bar icons for later use.

•Multi-item editing. With this tool, you can add, edit or post progress of the same nature for multiple tasks, resources or assignments as if they were a single item. The best implementation can be found in Microsoft's Project, where updating a set of tasks to 100% done can be accomplished in one shot.

•Screen customization. Users are more productive when they can change screen items from one spot. A unique screen customization function is available in **Applied Business Technology**'s Project Workbench for Windows. With the click of a button, a screen layout window pops up and allows you to customize up to three synchronized views at one time.

•Incremental zooming. With the click of a button, you can zoom in on details such as a Gantt chart or Program Evaluation and Review Technique, or PERT, or zoom out to see the big picture. A powerful capability of this kind can be found in Project Workbench and Time Line.•

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Maximizing efficiency

Some of the available efficiency functions can save you and your company more time than all other facilitating tools combined. There are two major efficiency enhancers: those that help you create accurate project models and those that automate complex processes.

•**Modeling accuracy.** Some packages contain features that help users reduce logical errors and improve modeling accuracy. **Symantec**'s Time Line for Windows offers such a feature, called Co-Pilot, that evaluates user input and, if more than one interpretation is possible, lists all options for you to choose from.

For example, when you graphically schedule a new task on a Gannt chart just after another task ends, the program alerts you to the ambiguous situation. You can decide if a link to the other task should be made or if the new task will be scheduled relative to that date. **Symantec**'s low-end program, OnTarget for Windows, offers a similar function.

Another helpful function is one that alerts you to any circular logic (widely known as logical loops) that you might input. However, most programs are not able to give you an immediate, interactive warning of these loops, or they don't usually list all affected tasks.

CA's CA-SuperProject is one of the few programs to offer a clear view of both the project logic and task durations on a single, easy-to-read and fully interactive chart, named the Logic Barchart. This chart has been known to offer complete answers to many scheduling questions, including questions about circular links; unfortunately, it is interactive only in a handful of programs. Perhaps this is because it is too complex to program and not as useful to represent under DOS as it is under Windows.

Other products that include this capability include **Computer Aided Management**'s PARISS Enterprise (DOS) and **Symantec**'s Time Line and OnTarget (Windows versions).

PRIME BENEFITS TO IS will become evident once different project management modules or programs support OLE.

•**Process automation.** Automating a process always saves you time; so does moving separate databases to integrated ones. Data integration means better information is passed along with less human error and effort. Also, the fact that it is automatic means you'll save time whenever you need to do this job again. Another way to save time is to automate specific processes that you don't currently automate, such as your work request system.

There are many examples of process automation features. For instance, Windows programs using Dynamic Data Exchange and Object Linking and Embedding (OLE) offer a new standard of automating processes. Unlike import/export, DDE helps you dynamically link any two data items between different projects (to establish cross-project links, as in Microsoft's Project) or between two different programs (such as your project management software or word processor).

Why would this come in handy? A link can be established between the project management software to a spreadsheet program to allow further analysis or better charting.

Or you may want to automate the link between timesheeting and progress reporting, when the two modules can otherwise be interfaced only through import/export functions.

OLE is another form of interapplication linking that can save you time. It was designed to link different applications and to embed documents of different types and file formats in your current application. For example, you can display a live copy of your PERT chart in your word processor.

In this case, the available technology is a bit ahead of the application because very few programs support it. Prime benefits to IS will become evident once different project management modules or programs support OLE. For example, IS managers will eventually be able to review the reasons for some cost overruns in a project while writing a status report in a word processor to a project sponsor or client.

Some process automation tools available only in IS packages are integrated prefix and suffix functions. The prefix is composed of sophisticated front-end modeling tools, and the suffix is a set of comprehensive tracking and control tools.

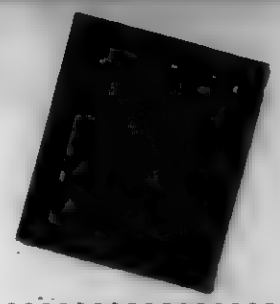
The front-end modeling contains templates that provide prepackaged estimates based on the type of projects being planned. It also contains a module to estimate project size based on various methodologies, such as the industry-standard function point analysis or experience-based knowledge.

These prefixes are intended to make the planning process less tedious and more accurate.

The tracking and control tools let you track work hours, automate project accounting and chargeback, track the status of work requests and evaluate the quality and efficiency with which projects are performed. They are intended to increase the productivity of both the project managers using the program and all others involved in the process. •

Yahdav is an expert in the field of project management software. He is president of 1 Soft Decision, Inc., a San Raphael, Calif.-based consulting firm specializing in helping organizations standardize on project management software.

Voices of Experience



"I heavily recommend training. We went to class to see what we needed to buy. We had an idea of what our needs were but didn't have all requirements nailed down."

User: Mike Dorough, systems consultant, First Interstate Bank NA, Portland, Ore.

Product selected: POC-IT Management Services, Inc.'s Microman II.

"I put together an evaluation team comprised of a few people who are going to be users but are not computer-literate; a few who are computer-literate but who are not familiar with project planning; and a few who are computer-literate and knowledgeable in project planning. I let these groups individually evaluate a product I am considering to get critiques at different levels, on everything from the interface to how intuitive it is and its project management capabilities."

User: Don Lewis, director of manufacturing, Sperry-Sun Drilling Services, Houston.

Product selected: Micro Planning International, Inc.'s Instaplan Version III.

Source: Alice Brodin, free-lance writer in New York

High-end functions

Once you begin testing a few chosen products, refine your evaluation by asking how well the products handle critical, high-level functions. Vendors may not give complete answers, but they can bring you one step closer to your goal.

- If the program offers planning templates, how easy is it to customize them for different methodologies?
- How easy is it to update and customize an experienced-based estimating?
- When a program supports a given estimating methodology, does it include the entire methodology guideline on screen?
- Does the estimating algorithm offer an automatic correction mechanism?
- If it does, how can it be applied toward the future portion of an ongoing project?
- To what extent are the estimating and scheduling systems integrated?
- Do they use a common database?
- In the capacity of project sizes and number of projects you expect to handle, how long does it take to schedule and resolve conflicts with the number of resources you have with your desired platform?
- How well is the resource-leveling function compared to other programs (does it produce shorter schedules)?
- If the system supports a time reporting function, does it reflect the same calendars as in the scheduling module?
- What sorts of rules can an administrator set to establish accepted input during users' reported time?
- How easy is it to customize the project accounting and chargeback functions?
- How do you access project and work requests and obtain status on previous orders?
- Which parts of the entire system components can include user comments?

PC-based, high-end project management programs:

These packages are characterized by sophisticated scheduling, tracking and control capabilities and have the most comprehensive cost accounting functions.

Computer Aided Management, Inc.
Scottsdale, Ariz.
PARISS Enterprise

Lucas Management Systems
Fairfax, Va.
Prestige for Windows

Primavera Systems, Inc.
Bala Cynwyd, Pa.
Primavera

Project Software & Development, Inc.
Cambridge, Mass.
P/X for Windows

Welcom Software Technology
Houston, Texas
Open Plan

Tailored for IS

AN IMPORTANT ISSUE IN YOUR QUEST FOR project management software is whether you need an industry-specific or a classic program. What complicates matters is that some classic packages have started to incorporate IS functions or can link to a single IS module, thereby blurring the lines between the two. It is possible, however, to specify which features are generally stronger in an IS or a classic package. Below are the main features that distinguish the two.

IS-specific

•Front-end modeling: Provides a mechanism to plan and estimate the size of projects. Plans are established through customized templates.

Estimates may be based on either an experience-based database or an estimating methodology such as the function point analysis.

A classic package that has added a front-end modeling module is **Computer Associates International, Inc.**, whose EstiMax and EstiPlan add modeling capabilities to its CA-SuperProject (DOS).

There is also a module that allows you to incorporate front-end modeling into a variety of classic packages. **Kapur International, Inc.**'s ProjectBase can be used in conjunction with **Microsoft's Project for Windows, Symantec Corp.**'s Time Line, **Applied Business Technology**'s Project Workbench, **CA**'s CA-Superproject and **Computer Aided Management**'s PARISS. It accommodates most estimating methodologies.

Partial product list:

AGS Management Systems' firstCASE, which uses function-point analysis.

POC-IT Management Services, Inc.'s Microman II and Microman Esti-Mate, which include complete, integrated front-end modeling based on function point analysis and a correction mechanism.

LBMS' Project Engineer, which incorporates a complete estimating module.

Multitrak Software Development Corp.'s Multitrak Enterprise-Wide Work Management System, which offers a distributed solution, where project planning can be performed on the desktop and all other tasks on the mainframe. It integrates the entire range of IS needs under the same repository.

Applied Business Technology's Project Workbench (DOS and Windows) and Project Bridge, which offer a complete front-end modeling system including templates and a complete implementation of function point analysis.

•Time reporting: This is similiar to the "tracking" capability in classic programs (see below) but is a more intense and accurate reflection of when and how project and non-project-related duties (e.g., training and meetings) are conducted.

Partial product list:

Lucas Management Systems' Prestige for Windows.

POC-IT Management's Microman II and Microman Esti-Mate.

Multitrak Software's Multitrak Enterprise-Wide Work Management System.

•Chargeback: Allows information to be taken from a time reporting module to charge a client or sponsor. This shows a client how much a project's tasks cost at any given time.

Partial product list:

POC-IT Management's Microman II and Microman Esti-Mate.

Multitrak Software's Multitrak Enterprise-Wide Work Management System.

PlanView, Inc.'s The Intelligent Planner.

•Work request: Allows new job orders, such as maintenance requests, to be initiated and tracked until complete.

Partial product list:

Multitrak Software's Multitrak Enterprise-Wide Work Management System.

•Project accounting: A link between time reporting and chargebacks. Here, sets of accounts are established, and tasks are linked to specific accounts to show who is accountable for each project.

Partial product list:

Multitrak Software's Multitrak Enterprise-Wide Work Management System.

POC-IT Management's Microman II and Microman Esti-Mate.

Classic

•Scheduling: Produces a timetable for all the tasks required to complete a project. (For a list of classic packages, see chart page 101.)

•Resource management: Allocates people, equipment and other resources using some kind of a manual adjustment or automatic procedure to all projects. This helps minimize resource over- and under-loads.

•Costing: Establishes budgets and cost estimates. Evaluates expenditures in every project.

•Tracking: A record-keeping process in which actual start and finish dates are collected for different tasks in a project.

DANIEL YAHDAV

IS-specific project management software

These programs integrate the entire set of tools required by IS groups of all levels

	Platform	Function point analysis	Automatic correct mechanisms	Multiuser accessibility	Client/server architecture	Record locking	OOP-based
Applied Business Technology (800) 477-6532 Project Workbench/ Project Bridge $5,000	DOS, Windows	■	■	■			■
AGS Management Systems, Inc. (215) 265-1550 firstCASE 3.0 $19,500 (mainframe license) $6,000 (manager workstation) $3,500 (developer workstation)	DOS, Windows, OS/2	■		■	■	■	■
LBMS, Inc. (713) 623-0414 Project Engineer 1.1 $2,500 starting price	Windows under DOS, OS/2	■					■
Multitrak Software Development Corp. (617) 482-0077 Multitrak Enterprise-Wide Work Management System $40,000 starting price	MVS			■		■	■
POC-IT Management Services, Inc (310) 393-4583 MicroMan II $2,895 starting price	DOS, OS/2	■	■	■		■	
PlanView, Inc. (512) 346-8600 Intelligent Planner 1.3 $2,200-$3,200 per concurrent user	DOS, Windows, OS/2	■	■	■	■	■	■

Peer groups

The following associations and consortiums offer publications, seminars and other support to their members:

Boston University Center for Project Management
72 Tyng Road, Tyngsboro, Mass. 01879
Contact: Dennis Woodruff, director (508) 649-9731

A corporate membership includes access to research studies, advisory board participation and complimentary seats at special events. Other features include consulting, seminars, computer simulation courses and "CPM Bulletin," the center's newsletter. The center also offers the public the monthly Certificate Program in Project Management.

The Center for Project Management
1 Annabel Lane, San Ramon, Calif. 94583
Contact: Raj Kapur (510) 275-8000

The membership program includes program and project management consulting, research, publications and training seminars. The center also publishes a quarterly newsletter, which includes interviews and articles from leaders in the project management field.

Project Management Consortium
Sponsored by The Center for Project Management (see previous listing)

Part of an industrywide effort to share and refine a professional IS knowledge base. Member organizations receive access to Project Central (a tactical methodology office and IS information center), research archives, life-cycle and task-effort data, standards publications and project management training seminars. International memberships are also available.

Project Management Institute (PMI)
P.O. Box 43, Drexel Hill, Pa. 19026
Contact: Karen Condos, marketing manager (215) 622-1796

A nonprofit professional association dedicated to raising the level of excellence in project management through research, monthly periodicals, local charter memberships in North America, Europe and Africa, handbooks and Project Management Professional certification.

The institute has established an Information Systems Special Interest Group and will be presenting a special meeting and technical track devoted to IS project management at the 1993 PMI Annual Seminar/Symposium in San Diego Oct. 1-6.

Soften up!

Adding soft information such as comments, opinions and predictions to your EIS may sharpen decision-making

BY HUGH J. WATSON, CANDICE G. HARP, GIGI G. KELLY and MARGARET T. O'HARA

No manager wants to be accused of making "soft" decisions, but truth be told, soft information plays a key role in many executive choices. Currently, most executive information systems (EIS) include primarily hard information that focuses on internal operations and relies heavily on financial data.

But if EISs are going to be valuable to top executives, they must include soft information such as predictions, opinions, news, ideas and even rumors, say EIS managers who took part in a recent survey. That's because while hard information provides the facts, soft information enhances the facts, enriching the decision-making process.

Hard data, such as financial statements, statistics and historical information, is a natural part of many EISs because their designs are based on reviews of existing reporting systems. However, these systems stop short of providing truly useful information, the kind top chiefs get from networking, having chance conversations, making phone calls, attending meetings and reading.

A change is coming, however, and more EISs are incorporating soft information. Hard and soft information is being combined on a single screen. When a chief company officer can see an explanation (soft) about why actual cash flow (hard) is below budget — perhaps an expected payment arrived the day after posting the month's financials — he can plan more effectively.

Soft information helps executives spot trends and raise questions, thus avoiding problems. Consider how the following organizations surveyed say they use soft information in their decision-making:

- State senators use one EIS that delivers constituent opinions on pending legislation. Such soft data helps lawmakers measure public attitude and decide how to cast their votes.
- A petroleum firm's EIS provides information about important visitors each day. Consequently, the firm's executives are well-informed about customers who come to visit and can greet them by name. Some EISs even provide an electronic version of personal data forms for account executives, enabling them to track personal information about their clients — birthday, hobbies, etc. This information is useful when a customer calls and the executive wants to add a personal touch to the conversation.
- For several major manufacturing companies, soft data about foreign countries helps executives determine whether to ship a major purchase. The information can answer such questions as "Will the country's financial difficulty or political unrest mean slow payment?"
- One pharmaceuticals company plans to incorporate the opinions of experts in its drug research. It will do so by making internal and external opinion papers available through its EIS.

Scott Baldwin

Soft info at work at Pratt & Whitney, Conoco and Lockheed. Page 105.

Who's got what?

According to the study of 32 EIS managers, the amount of soft information included in EISs varies from company to company.

The most popular class of soft information, used by 78% of respondents, includes speculations, forecasts, estimates and predictions. For instance, one financial investment firm in-

Continued on page 104

SOFT TALES

Some people don't think beyond facts and figures and thus miss the big picture.

One of the auditors at Joseph E. Seagram & Sons, Inc. came back from Venezuela, where he was checking the expenses of a subsidiary, and he ran into his boss at the Montreal head office.

"How's business in Venezuela?" asked Sam Bronfman, Seagram's founder.

"I don't know, Mr. Sam. I was there to look at the books."

This reply astonished Bronfman: "Imagine going all the way to Venezuela and never asking how business was!"

Source: *The Book of Business Anecdotes* by Peter Hay (Facts on File).

Continued from page 103

cludes predictions about market prices for better planning. Competitor information includes data not only from external databases but also from internal sources, such as sales representatives, who are an executive's eyes and ears in the field.

For one pharmaceuticals firm, learning that a competitor was about to launch a similar new drug allowed the firm to pour additional resources into its drug production and successfully beat the competition to market, the manager in charge of the EIS says.

This type of information is so important that those respondents who are considering adding soft information to their systems indicate that competitor information is a key area for the future.

Explanations, justifications, assessments and interpretations are included in 66% of the EISs, according to the survey. Usually, this soft information is in the form of commentaries.

Most EIS software enables users to make annotations to displays, either directly or on accompanying screens. Many executives favor the on-screen approach because information is all in one spot.

Within this category, the most popular application of soft information is explanations. One manager says hard information, such as sales and shipments, provides no analysis. The hard data becomes useful only when others add text to explain why something was late or ahead of schedule.

At some firms, users can add personal comments and notes to explain any screen. In certain cases, however, these additions are not shared with others. They act as electronic Post-It notes, serving only as reminders for the executives.

The ability to scan news reports and have access to external news databases is available to 63% of the survey respondents. For one major oil company, the ability to monitor developments during the Persian Gulf war by watching CNN in a window on the screen led to several critical pricing and buying decisions.

Companies currently using external news databases are grappling with effective and efficient ways to scan and filter such information. They want to help executives avoid information overload.

Some companies rely on an external news service, such as Dow Jones News Retrieval, to work off predefined user profiles, automatically screening news and sending it to an executive. Other EISs depend on a separate department to review, filter and scan in interesting items. Still others have someone, typically a public relations department, prepare news summaries and enter them into the system.

Those who don't have news reports in their EIS say it is one of the first soft information items they would like to add.

Approximately 16% of the firms surveyed said they include opinions, feelings and ideas in their EISs, while 9% said they include rumors, gossip and hearsay. Typically the information is displayed as an electronic bulletin board accessible to all EIS users.

In one case, a manufacturing firm's executive entered a rumor about a customer's financial trouble, explaining that he thought the client might not be able to pay for a large order. This information resulted in a "slip" in the delivery schedule until the company could clearly establish that its customer could pay.

Not everyone buys in

Even with soft information's apparent benefits, in some instances, companies choose to minimize certain kinds of soft information by necessity. It might expose the firms to legal risk, it might be considered too sensitive, or it might compromise competitive plans.

A hospital EIS, for example, intentionally contains no soft information to explain reported mortality figures; the potential for a lawsuit is too great. Several companies are cautious about including human resources information about hiring/firing decisions because of Equal Employment Opportunity Commission and confidentiality concerns. Others protect executive steering committee reports, stating that the information is too sensitive.

One financial institution intentionally excludes rumors and gossip from its EIS, noting that executives are reluctant to make any remarks that might pinpoint them as gossips. In addition, other companies say they fear that displaying a rumor on a screen (in effect, "putting it in writing" and legitimizing it) could cause negative feedback and perceptions. Others worry about the security of sensitive or controversial information.

None of the companies currently including rumors and gossip in their EIS say they have run across such problems.

Worries such as these may fade as executives get used to having soft information in their EIS. In fact, as EISs become more mature, they tend to include more soft information. EIS managers say requests for soft information are increasing as executives discover that their EIS is capable of delivering it. In the study, there was a positive correlation between users' perceived value of the EIS and the amount and variety of soft information.

Those companies falling short in supporting the ways executives work and providing the information they need should come up to speed. They must create information sources and feeds that are new and different — access to external news databases, the ability to provide explanations and interpretations to screens and easy access for executives who want to share their thoughts.

It's not going to be easy: Support requirements may increase, given the extra effort required to add commentaries and opinions to hard data screens. But when soft data becomes a vital part of an EIS, it will enhance executives' ability to enter and access more meaningful soft information. The result is better decision-making based on a rich assortment of material. •

Watson is the C. Herman and Mary Virginia Terry Chair of Business Administration at the University of Georgia in Athens. Harp is a Ph.D. candidate in MIS at the school and has her own training consultancy. Kelly is a Ph.D. candidate in MIS and was previously a senior consultant at Andersen Consulting. O'Hara is a Ph.D. candidate in MIS and the former IS director at Averitt Express, a transportation company in Tennessee.

SOFT TALES

Useful information doesn't come only from surveys and financial numbers. Asking the right questions — even of strangers — can be very telling, as can reading pertinent articles.

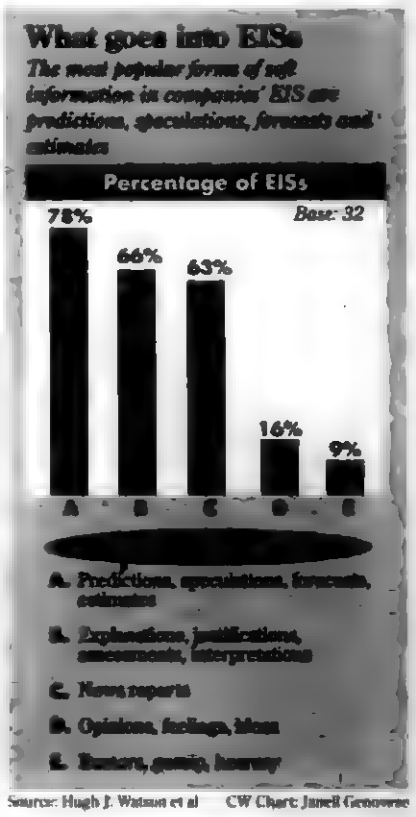
Robert Hazard is chairman of the board at Choice Hotels International, Inc. in Silver Spring, Md., parent company of Quality Inns and Econolodge. He revolutionized the lodging industry in the 1980s with his concept of "market segmentation" — a three-tiered range of standardized rooms at various prices.

Hazard formed this breakthrough idea from front-line information gathering: interviewing a barber. While in Phoenix on business, Hazard struck up a conversation by asking, "So, where do you go on vacation?" He got an earful. In small towns, the barber stayed in moderately priced motels. He refused to pay more than $20 or $25 a night. But when he hit the big cities — Las Vegas or San Francisco — he always stayed in style; price wasn't a consideration.

By leading with questions, Hazard obtained key information — information his formal marketing research hadn't revealed. "I get an outsider's view of my industry. That kind of information is invaluable."

Hazard keeps a small box labeled "lodging trends" on his desk. From his reading, he writes down pertinent information on index cards, which he reviews every evening after work. When he comes across an article he senses may be useful, he clips and files it. He and his team of executives constantly fire articles of interest back and forth with accompanying notes: "Hey, Jerry, did you see this? How does it relate to your area?" In this way, they share information.

Source: *Winning the Innovation Game* by Denis E. Waitley and Robert B. Tucker (Berkely Books).



Source: Hugh J. Watson et al CW Chart: Janell Genovese

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A bunch of softies

Companies such as Pratt & Whitney, Conoco and Lockheed Aeronautical play hard with 'soft' data

BY LORY ZOTTOLA DIX

"EISs that have just financials and historical information in them are the ones that fail," says Walt Dempsey, manager of systems integration and customer support at Pratt & Whitney's Commercial Engine Business in East Hartford, Conn.

Dempsey, who oversees the company's 100-user EISs, isn't alone in his view. Other EIS professionals agree that an EIS gains value when it includes information such as suppositions, commentaries, outside reports and so on.

The types of "soft" information incorporated from company to company varies. Here's what three firms include on the softer, more context-enhancing side of the spectrum:

What distinguishes soft information?
Characteristics of hard and soft information

Characteristics	Hard	Soft
Perceived accuracy	High	Depends on source
Source	Machine-resident; often internal	Human; often external
Subject to interpretation	Generally accepted	Individually assessed
Timeliness	Historical	Current
Perceived value	Low	High
Availability	Regular	Ad hoc
Standardization	High	Low
Richness	Low	High
Existence	Generally known	Often unknown
Ownership	Generally available	Often tightly held
Lifetime	Long	Short
Communication channel	Formal	Informal

Source: Hugh J. Watson et al

CW Chart: Janell Genovese

SOFT TALES

Decision-making can be enriched by keen observation.

Frank Bettger, a star insurance salesman in the period after World War II (he made enough money by the age of 40 to retire), could deduce from a few clues what was going on around him.

He was lunching one day at Philadelphia's exclusive Union League Club when he noticed three men at a nearby table. He knew them: a father and son who were prominent industrialists in the community and their lawyer.

He went over to greet them and later that afternoon phoned the father to make an appointment. Within a few days, Bettger sold both father and son a very large insurance policy on their business.

How did Bettger know the men were discussing the reorganization of the company and that they were in the market for insurance? He had never called on them before.

"I could not know, of course, what exactly {they} were discussing, but when I see two partners having lunch with their lawyer, what is more obvious than that something is under way?"

Source: *The Book of Business Anecdotes* by Peter Hay (Facts on File).

Pratt & Whitney: Express yourself

Pratt & Whitney's EIS is very much geared to gathering as much information on competitors and customers as possible, Dempsey says. This helps in formulating business plans, landing new clients and servicing existing accounts.

The intelligence comes from people in the field, news reports and the executives themselves.

The aircraft engine company uses an internal filter group to collect and input external material for the 100 executive users.

Every executive has access to screens of "competitive highlights." These are weekly tallies of contracts won or lost vis-a-vis competitors. "For example, they might see we competed five times and won twice," Dempsey explains.

Additionally, competitive highlights include information such as news or a rumor that a competitor's chief executive officer is stepping down.

Customer profiles in the EIS are also heavily laden with soft information that might impact an executive's handling of an account. The executive identifies key issues at the customer site (say, a problematic engine), identifies a plan, puts together a schedule and adds any comments (perhaps noting that the spare parts delivery schedule could improve).

To encourage easy input of soft information by users, Dempsey and his team have dabbled with voice/data integration using the phone. The effort, dubbed "executive concern exchange," is based on the premise that top executives don't have time to type and feel more comfortable expressing their opinions, thoughts and concerns vocally.

"We felt we could do it through the phone, append what was said to the screen or graphic and distribute the information like E-mail, except it would come out of your EIS," he says. Until the cost of outfitting personal computers with voice boards comes down enough to enable this capability to be available on a widespread basis, however, the voice system remains in prototype.

Pratt & Whitney's EIS, which was first implemented in 1988, has become a showcase. Dempsey says the company gets visits from outside executives interested in the setup. It recently played host to Pitney Bowes, Inc.'s CEO and executive staff and a team of executives from General Motors Corp.

Lockheed Aeronautical Systems Co.: Tell it like it is

One of the granddaddies of all EIS systems, Lockheed's Management Information and Decision Support System has been in operation since 1979. While the system is currently getting a face-lift — it's moving off a mainframe and onto a server-based PC network — some things will stay the same.

"We wouldn't think of taking out the executives' ability to add comments to screens," says Frank Padula, financial system supervisor (a.k.a. EIS chief) at the aerospace company in Marietta, Ga. "The executives wouldn't let us."

Padula says that data preparation staff from the accounting and forecasting departments key in explanations and comments to hard financial data right on the screen. "The executives want to know why this went up, why this went down. They don't want to have to pick up the phone or call someone into the office to explain every report."

Conoco, Inc.: Staying in touch

"Successful senior executives have great intuition and vision. They assimilate a lot of information from lots of sources, primarily other members of the management team," says Lloyd Belcher, EIS manager at the Houston-based petroleum company. Belcher is concentrating on strengthening soft information exchange among his managers.

To that end, he has created an EIS application in which the company's approximately 45 key decision makers can post brief messages.

But Belcher wants to make it very clear that this is not a glorified electronic-mail function. "I don't want those messages mixed in with the other 30 messages they get per day. When they access these messages, they know they're from other senior management team members and contain ideas, plans or events considered extremely important."

The application got a workout during Hurricane Andrew, which threatened two of Conoco's facilities in the Gulf of Mexico. A plane flew over the sites, and the executive in charge of those facilities posted reports to the management team regarding the safety of personnel, any environmental impact and the condition of the rigs.

Although the evacuated employees, the environment and the equipment came through the storm fine, the immediacy of the information would have enabled a rapid emergency response, had one been necessary.

Belcher's future ideas for the 5-year-old PC system include on-screen comments as well as voice and full-motion video annotation. "We must have a closer match to the way executives work." •

The information continuum
Information ranges from very hard to very soft

Hard						Soft
Financial statements	News reports	Schedules	Explanations	Predictions	Opinions	Rumors
Statistics	Industry trends	Formal plans	Justifications	Speculations	Feelings	Gossip
Historical information	Survey data		Assessments	Forecasts	Ideas	Hearsay
			Interpretations	Estimates		

Source: Hugh J. Watson et al

CW Chart: Janell Genovese

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Dix is senior editor, in depth

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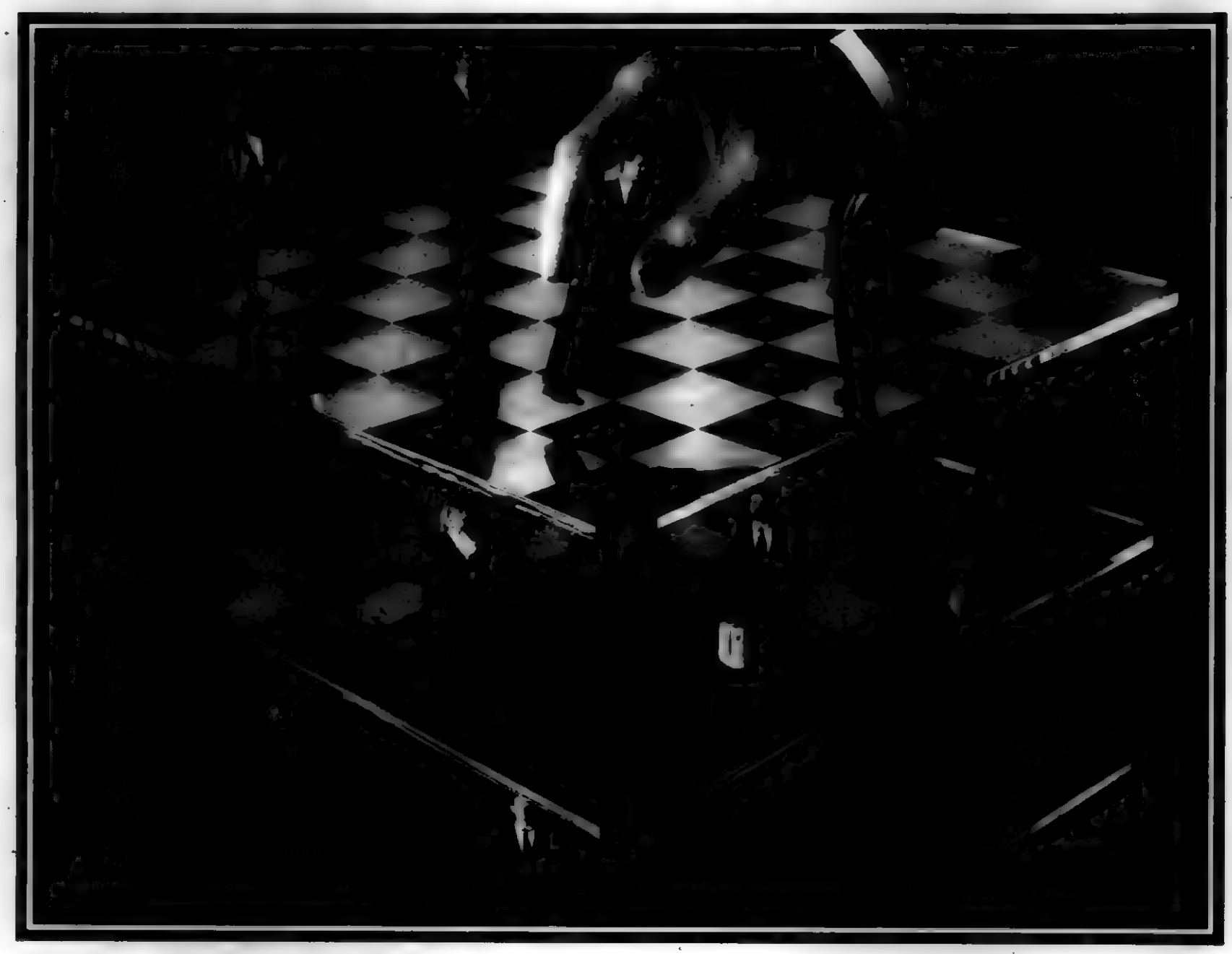

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IF IT

Ain't Broke...

After decades of tight IS control, Baltimore Gas and Electric is moving toward letting users call some shots – but it's not rushing. Why? Because the traditional way works.

BY GARY H. ANTHES
CW STAFF

At Baltimore Gas and Electric Co., information systems are run by the book. Three books, actually: the Computing Architecture Plan, the Computing Policies Manual and the Computer Product Catalog.

The $2.5 billion utility's financial books are pretty strict, too. There are two entries for IS: a $30 million budget this year for operations and maintenance and a $30 million capital budget, all controlled by a central IS department.

Senior managers in the user departments cannot buy so much as their own personal computer software.

"If they do, the purchasing people will catch them," says Joseph E. Hunter Jr., manager of the IS department, known as ISD.

But while users complain about occasional red tape, they are surprisingly content — even grateful — to let ISD call the shots where information technology is concerned.

"ISD has virtually absolute control over hardware and software purchases," says S. Edward Hargest, manager of the economic research department, which has its own staff for maintaining PC applications developed by the department. "We have to go through them, and that sometimes causes delays that are hard to understand.

"But it's a good checks and balances system," Hargest adds. "My computer people would like a freer hand, but we can't be aware of all the things ISD knows. I think central oversight is necessary."

Such tight central control may seem a bit passe in an era of distributed computing and technologically empowered end users, but Hunter says the IS manuals — which are updated frequently, with user input — help keep ISD/user relations on an even keel (see story page 111). "We give them enough information to allow them to make business decisions and still stay within corporate standards," he says. "And it's understood that in some cases, exceptions [to IS policies] may have to be made."

AT A GLANCE

Baltimore Gas and Electric

1991 FINANCIALS
$2.5 billion in revenue; $253 million profit

ASSETS
$7.1 billion

EMPLOYEES
9,000

IS
Staff of 341
1992 budget of $62.9 million

SERVES
Baltimore and parts of nine central Maryland counties; 2,300 sq miles and 2.5 million residents

Even as central control of IS is widely supported at Baltimore Gas and Electric, the utility has for some time been moving toward a budgeting mechanism that puts user departments more in the IS driver's seat. In the new model, ISD retains control over IS policies, practices and procurements but encourages and helps users go to bat for their own pet projects.

"It used to be if we went to ISD and they didn't have the budget, they'd just tell us to wait until next year," says Gregory C. Martin, customer accounts department manager. It is his job to oversee the utility's largest and most mission-critical applications — those that support meter reading, billing, accounts receivable and service order processing for 1 million customers.

Now, according to Martin, if users can demonstrate a healthy return on investment for their projects, they can petition top management for a budget supplement.

For example, Martin says, ISD recently told him it lacked the funds to support one of his initiatives: a plan to automate the routing and scheduling of customer service representatives, for which he projected a one-year payback. But Martin did not give up. He worked with ISD to prepare a proposal to management, and the president approved it.

Katherine Lambert

Baltimore Gas and Electric's Hunter *says user departments at the utility will soon get their own small PC budgets, but IS will still review their purchases*

"It's a cooperative venture now," Martin says. "ISD looks to the user organization to justify and support the cost savings, but they supply the expert knowledge. This basically opens the door to decentralized budgeting."

Nevertheless, Martin sounds a caution: "I came from an IS background, so I'm comfortable taking on more IS responsibility," he says. "But some managers wouldn't be comfortable with that."

Indeed, managers in user departments at Baltimore Gas and Electric say they like having a central group dedicated to giving them service. "We're concerned as a corporation about letting everyone do their own thing," says Wayne G. Thompson, manager of the electric system engineering department. "If we just said, 'Let the good times roll,' we'd spend 16 times as much on [electrical and gas] distribution automation and get one-tenth as much out of it."

That concern notwithstanding, next year the utility will more formally recognize the user's right to choose. For the first time, user departments will get their own small IS budgets for PCs and peripherals and PC software. Their purchases will be executed — and scrutinized for compliance with the utility's three IS bibles — by ISD, Hunter says.

That will allow users to make some trade-offs between IS expenses and operating expenses, Hunter says.

In addition, users will be able to fund from their own operating budgets IS needs that come up during the year that were not included in the original ISD budget.

Eventually, Hunter says, users will get the whole IS budget except for infrastructure and cross-company projects such as the corporate network.

That will not sit well with all users, predicts Dale Kutnick, president of Meta Group, Inc., a Westport, Conn.-based firm that consults with two dozen utilities, including Baltimore Gas and Electric.

"For some, it's just an additional responsibility. It's much easier to just throw it over the transom and then complain to ISD when it's not getting done," Kutnick says.

Despite the effort to give users more say over IS outlays, a move to complete user autonomy is not in the cards, Hunter says. The corporate architecture, the policies, the standards, the approved products list — those will remain ISD property.

CW special survey

Marching Orders

An exclusive CW poll shows that aligning IS with the business mission is more important than ever. Here's what, how and who really matters, based on interviews with 108 CIOs.

BY NELL MARGOLIS
CW STAFF

Only recently, industry observers were poised to toss off re-engineering and total quality management (TQM) as buzzwordy fads, but the concepts are anything but, according to the findings of a recent *Computerworld* survey of 102 top information systems executives. To the contrary, TQM and the "R" word are emerging as the key strategies on which IS is aligning its priorities with those of the firm's business.

In fact, according to many survey respondents, business process re-engineering is quickly moving beyond the top agenda item to become the agenda itself.

"The dynamic business change currently taking place" at virtually every U.S.-based company "is coming to be *the* critical issue in IS," says John Herman, vice president of IS at Chicago-based retailer HartMarx Corp.

If re-engineering is the name of the game, TQM is the playbook, says Thomas Charbonneau, manager of corporate information services/business administration at Natick, Mass.-based Bose Corp. The IS department was in the vanguard of the audio equipment manufacturer's surge into TQM, Charbonneau says, "because it helps us identify who our clients are and what they're looking for."

In addition, he says, applying the rigorous TQM methodology ferrets out "weaknesses in serving them that have long been hidden under bushel baskets." In short, "it does for us with respect to our [internal] clients just what it does for them with respect to [their external] customers."

Decentralization and globalization are taking a relative backseat on the IS/business alignment bandwagon, several survey respondents said, not because they are unimportant but because they have been largely accomplished. Application downsizing may pale in the ratings because it is just beginning to take off.

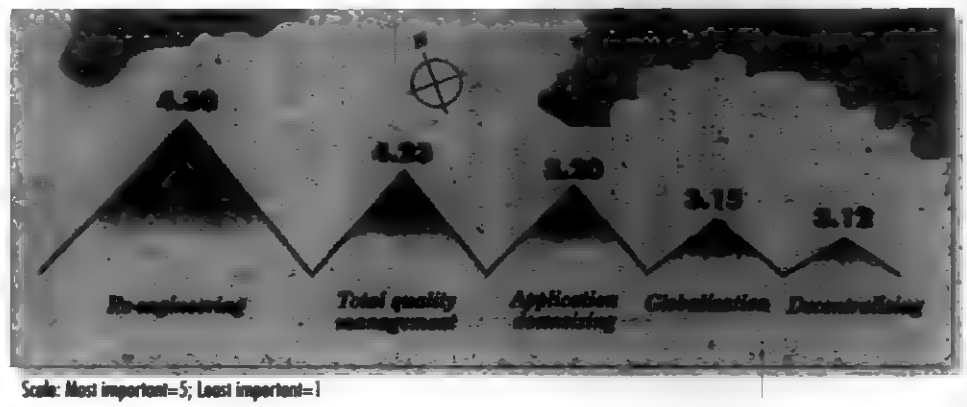
Of nine technologies frequently mentioned by the surveyed IS leaders, high-speed networking was targeted as the one most likely to impact their respective firms' business strategies during the next five years. Closing in on the network was client/server computing, followed closely by graphical user interfaces (see chart).

On the other hand, noted one IS director who asked not to be identified, discounting any technology as irrelevant to the cause of facilitating the business of the business is likely to be a mistake. "Even the so-called dinosaurs are still needed," he pointed out.

The IS team's new-age mission is still running into some age-old interference, many respondents reported. "For the past seven years, we've been trying to get management to listen to our ideas," said Pacific Telesis IS manager Rudy Crespo. "We're just beginning to get some good news."

The missions

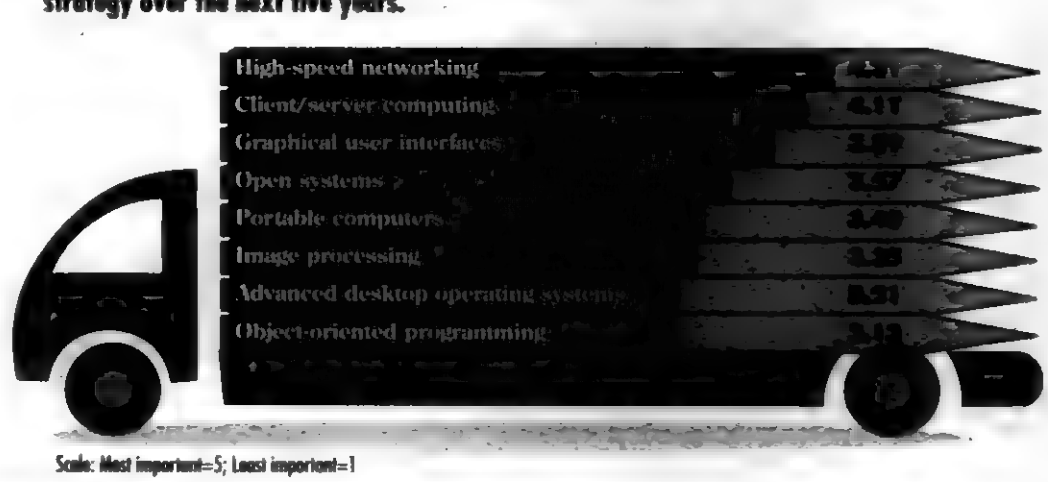
"Rate the importance of the following activities to your company's business strategy."



Scale: Most important=5; Least important=1

The weapons

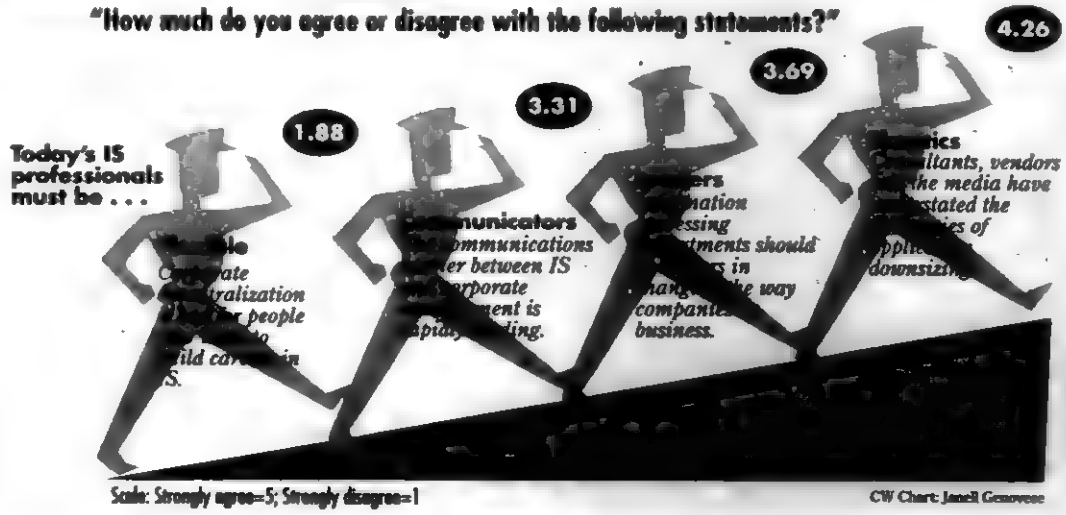
"Rate the following technologies on expected degree of impact on your company's strategy over the next five years."



Scale: Most important=5; Least important=1

The troops

"How much do you agree or disagree with the following statements?"



Scale: Strongly agree=5; Strongly disagree=1

CW Chart: Janell Genovese

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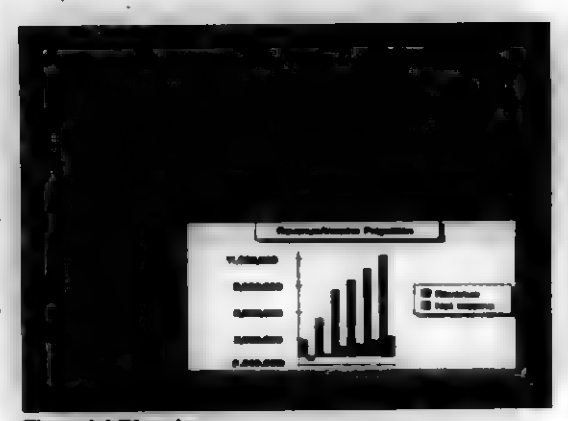
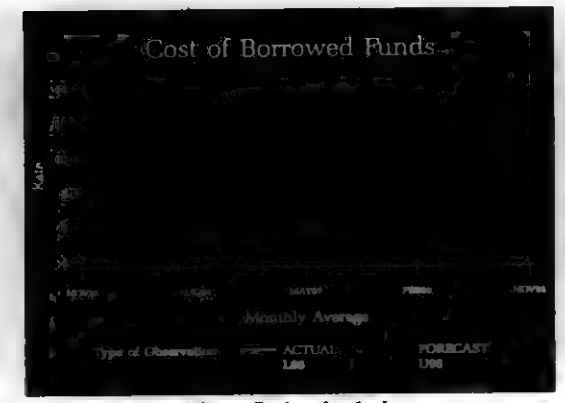


Financial Planning



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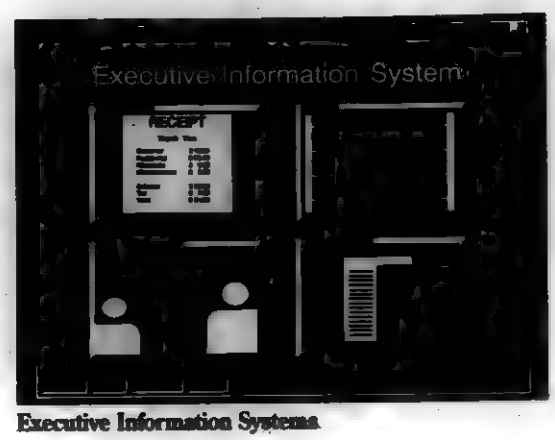
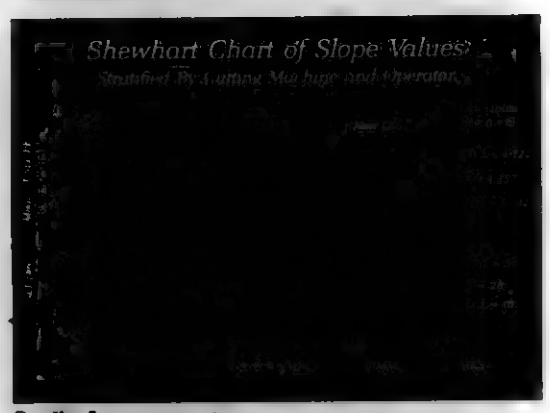
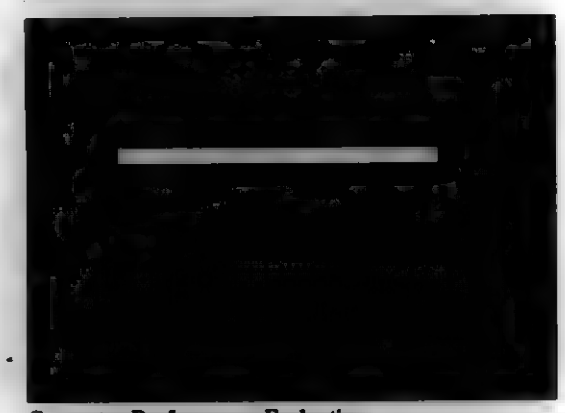


Executive Information Systems



Quality Improvement



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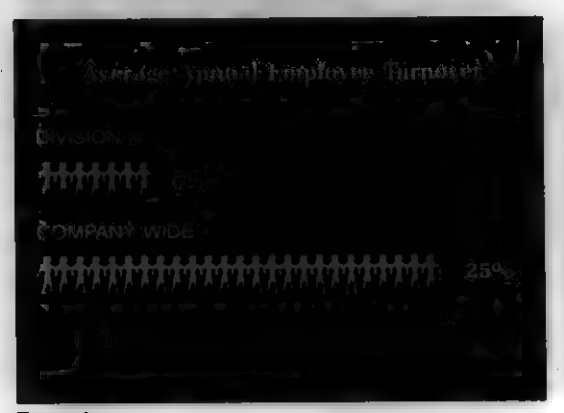
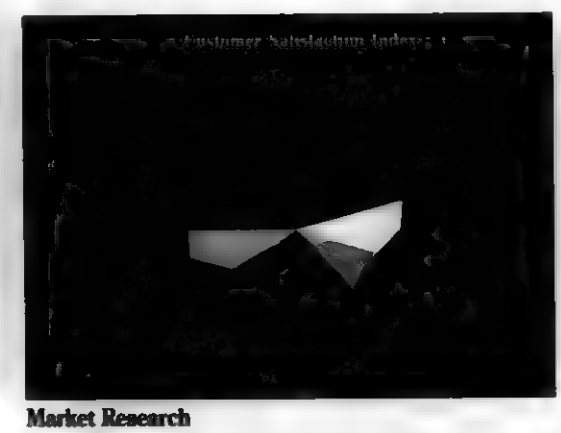


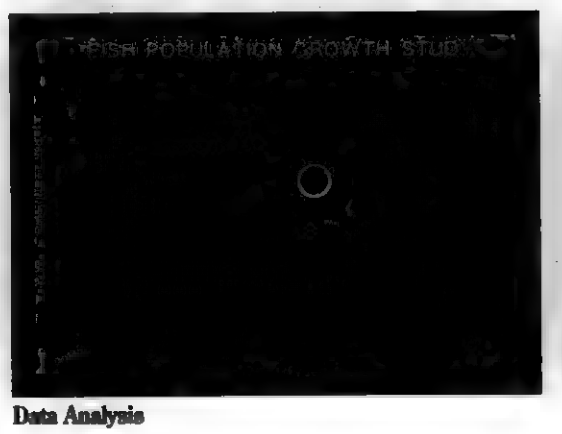
Reporting



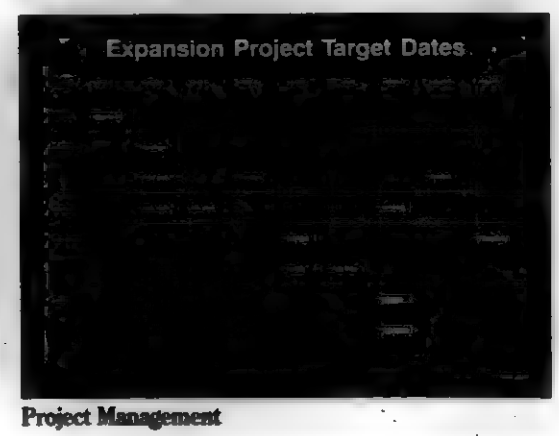
Market Research

Business Graphs

Visualization



Data Analysis



Project Management

Baltimore Gas' IS gospel

"What struck me years ago was that people were making big decisions without necessarily realizing they were big decisions," says Joseph E. Hunter Jr., information systems chief at Baltimore Gas and Electric. "We didn't have the context, the big picture."

Now they can look it up. A trio of manuals tells users and IS people that they must run new disks through a virus-check program, that the relational database management system from Oracle Corp. is the RDBMS of choice for midrange computers, that implementation plans should contain a data risk analysis and that the corporate data network shall not be subject to a single point of failure.

The Computing Architecture Plan is the strategic IS blueprint for the utility. It starts with a single fundamental tenet: that the company will move to "a fully distributed computing environment with all computer nodes integrated as cooperative peers using a standards-based corporate data network."

The plan then goes on to lay out supporting principles in three areas: data and information; applications; and infrastructure, including networks, hardware/software support and facilities. Some are motherhood-and-apple-pie — "data redundancy will be minimized" — and some are very specific — Method/1 from Andersen Consulting is the preferred development tool for PC applications.

THOSE WHO FIND a book on computer use policy a bit dull can view "Computing Policies Manual — The Movie": a humorous video narrated by an Albert Einstein look-alike from The Office of Smart Things to Do.

"Their planning is rigorous and well-documented, and they are constantly fine-tuning it," says Dale Kutnick, president of consulting firm Meta Group, Inc. "They are in the vanguard of utility companies."

The utility has found some unconventional uses for its Computing Architecture Plan: For instance, excerpts make their way into company requests for proposals. "It's so vendors won't bid what we're not interested in," Hunter explains.

The Computing Policies Manual is a user-oriented tactical document, developed and maintained jointly by the utility's central IS department, or ISD, and users. It covers application development, data security, physical security, acquisition, maintenance and modifications, legal/regulatory requirements and training.

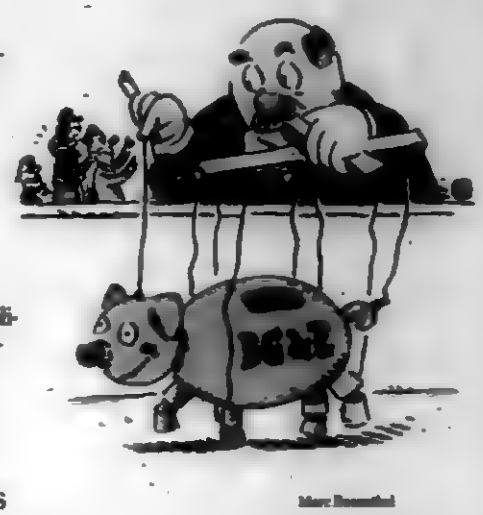
Those who find a book on computer use policy a bit dull can view "Computing Policies Manual — The Movie": a humorous, 14-minute video narrated by an Albert Einstein look-alike from The Office of Smart Things to Do.

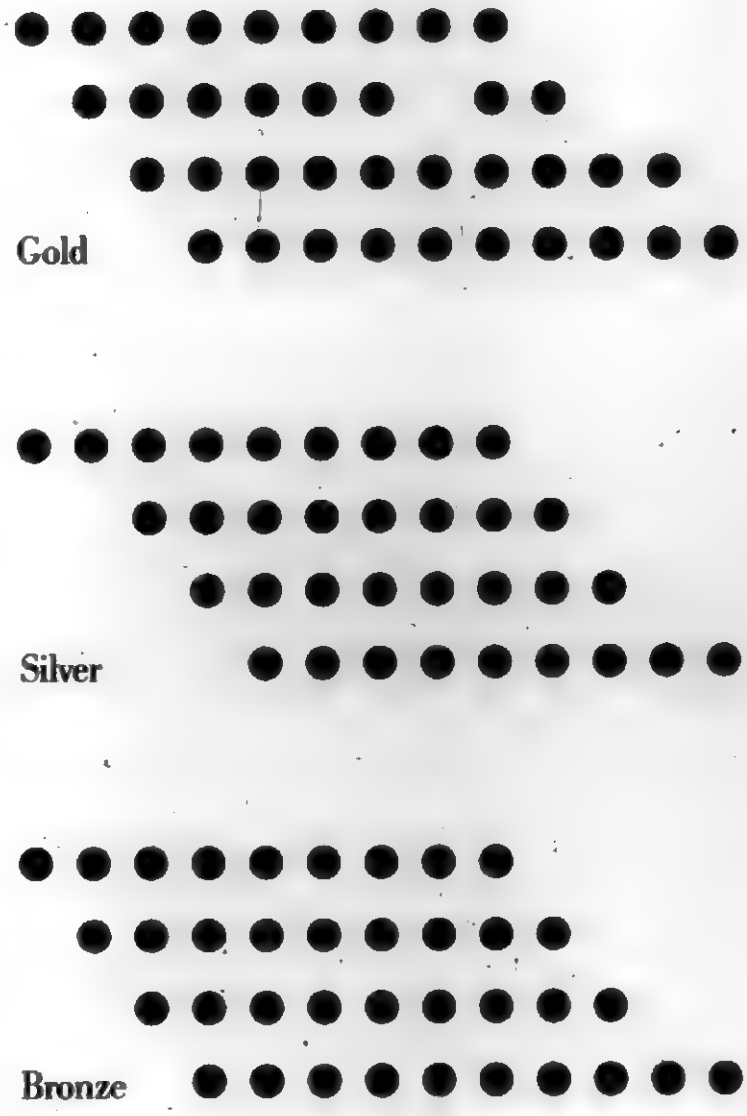
"The manuals say what the central IS group will support," Hunter says. "But if [users] need to go outside of the manuals, we will help them make it work, usually by finding a contractor."

By all accounts, the manuals are widely used and respected at the utility. "As we get into more decentralized processing, unless we follow the policies and prescriptions, we're at risk of losing our investment," says Richard M. Bange, accounting department manager. "The more information becomes decentralized, the more important this is."

"If nothing else, the Computing Policies Manual brings up a lot of good questions. It's a good checklist for users," says Ken Thomas, principal engineer in the electric system engineering department. "It says, 'Hey, ISD is not doing everything for you anymore.'"

GARY H. ANTHES





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*PC Week, October 5, 1992. **J. Henry, P. Blum, E. Salloway, "The Impact of Lotus Notes on Productivity," 1992.

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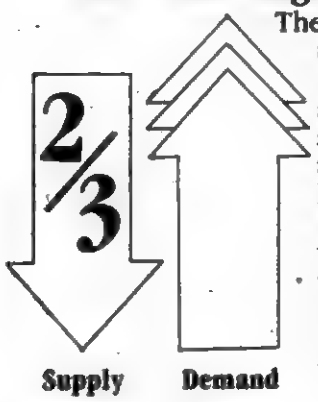
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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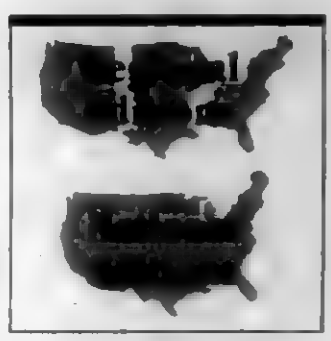

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Computerworld costs no more than local papers

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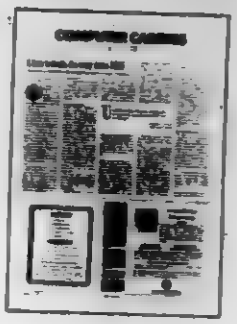

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What users want, expect from you

BY LESLIE GOFF
SPECIAL TO CW

Do you know what your end users say about you when you're not around? Well, we talked to a few — not a scientific sample, just a random handful — to find out how things are going out there on the information systems/user front. Don't worry, nothing unprintable was said. The comments weren't always glowing, but they won't singe your ears.

Overall, the end users we spoke with said they are fairly satisfied with the response of their IS staffs to day-to-day problems, but they wish IS staff members were more in tune with the criticality of unique departmental applications. On the other hand, users — especially those in larger companies — acknowledge that IS is under pressure from all directions and that resources can only be stretched so far.

Given that reality, users say they'd like to be able to do more for themselves and lean on IS for training and guidance but not for total sustenance. Not only would they be able to solve more problems, they say, but when they did need to request an enhancement or a new application, their requests would be better informed and more realistic.

For instance, at J. B. Hunt Transport Services in Lowell, Ark., Jeff Franco, senior vice president of marketing, said he would like his company's IS staff to be more involved in helping users understand the capabilities of their systems. "As users, we've had to try to recognize opportunities and make requests for changes to the system" that would have been easier for IS staff members, who are better aware of systemwide capabilities, to recognize from the outset.

'One-on-one'

The trucking company is rewriting major mainframe-based marketing and operations applications that Franco says will result in dramatic productivity increases. While IS support during the project has been good, Franco says he would like to have an IS staff member "come up here and sit with us and spend time watching the [current] application and the person who uses it, asking them things like, 'Why do you have to do that?' "

Although the users at J. B. Hunt understand that the IS staff has been under pressure with the inherent problems of phasing in a new application while still running the old one, they have been frustrated by the two years it's taken to rewrite the application, Franco says.

"The plans are clear, but the timetable isn't," Franco says, although completion of the project appears to be near.

Susan DeLuca, a librarian serving some 30 research analysts at The Meta Group, Inc., a Westport, Conn.-based consulting firm, has other frustrations. While IS staff members do help her, they often aren't able to provide her with solutions. DeLuca's function is so dependent on computers that she has three IBM-compatible personal computers and another about to be delivered, an Apple Computer, Inc. Macintosh, two compact disc/read-only memory devices, a modem and subscriptions to myriad on-line services.

What makes users happy

- Being allowed to do more for themselves, with information systems supplying training and guidance.
- Having an IS staff that is available to assist with troubleshooting and is interested in answering questions.
- Having an IS person either stationed in the department or in regular contact to observe day-to-day operations and work processes.

What makes users mad

- When IS staff members aren't in tune with the criticality of unique departmental applications.
- When the IS staff doesn't warn users of system downtime.
- When it takes IS two years to implement a new application.

Despite the investment in her department, the three-person IS staff doesn't seem to understand how critical the library is to the firm's business of generating and disseminating information.

Typical of her dilemma is the fact that her modem and fax machine share the same phone line; if she dials into an on-line service such as Dialog and a fax starts to come through, she gets thrown off-line. "They say it's too much money to put another line in," she says. "They don't understand how much I need both."

Even though the IS staff is helpful with questions about companywide software, when a technical problem arises with specific departmental software, DeLuca says she goes directly to the vendor. "I place a call to IS first because I don't want to step on toes, but they don't call back or don't know, and the vendor knows exactly what's going on," she says.

Troubleshooting

At The Washington Post Co. in Washington, D.C., which owns the *Washington Post*, *Newsweek* and Stanley H. Kaplan Educational Centers, the IS staff's expert troubleshooting capabilities saved the day for Kathy Kraus, treasury assistant.

Not only did IS provide her with a critical application that enables her to automatically retrieve deposit data from all of the firm's banks twice every morning, but when problems occur, she is able to quickly assess whether fault lies with the local-area network, the modem, the bank or the host network.

"That's critical because if I don't have the numbers, we have no idea how much money we've got to invest and it's millions of dollars a day," Kraus says.

IS has made troubleshooting a priority, she adds, because it recognizes how essential the application is. Kraus also has an IS person who is assigned to sit in her department and observe day-to-day operations. Consequently, Kraus is getting a customized database and report generator.

Is there such a thing as a user with no complaints at all? Not really. Even the happiest user can find something to improve. Cynthia Durham, manager of the Kansas City, Mo., office of GoGo Tours, a division of Ramsey, N.J.-based LibGo Travel, says her IS staff is nearly perfect. Her only wish is for less system downtime. The company's record? Three systemwide outages in the eight years she's worked there.

"I'd like them to have a forewarning system," she says. "I'd like them to put a message out over the system when a particular program isn't working. They do that 50% of the time, but if they could do it the other 50%, it could save us a lot of aggravation and them a lot of time."

Goff is a New York-based free-lance writer.

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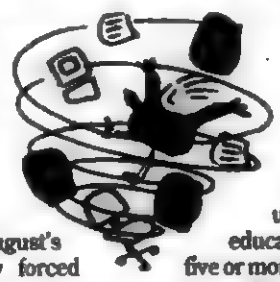
JOB CLOSE-UP

Disaster recovery managers: Prepared for unexpected

BY KATHLEEN A. GOW
SPECIAL TO CW

Disaster recovery manager: It has a heroic ring to it. Sometimes people in this position are called on to perform heroic feats, but mostly they spend their time putting out small fires and trying to ensure that, even if all hell does break loose, their company's operations won't falter.



This is a big job. It's particularly daunting when something like a hurricane or a flood hits.

For example, August's Hurricane Andrew forced Bruce Johnston at Levitz Furniture Corp. in Boca Raton, Fla., to put his firm's disaster recovery plan to the test when one of the company's warehouses was hit.

And Judith Spencer at the Chicago Board of Trade Clearing Corp. spent four days camped at the board's hot site, making sure the board's disaster recovery plan worked as planned when a broken water main caused a flood in April (see story at right).

But even on an average day, a disaster recovery manager has to juggle many complex tasks.

At MCA Universal Studios, Inc. in Universal City, Calif., the disaster recovery manager grew up with CICS and MVS and has experience as a high-level data center manager. This kind of experience is necessary, says George Brenner, director of corporate information services and a vice president at Universal, because a disaster recovery manager must be skilled at handling negotiations with vendors and internal groups and be knowledgeable about data center requirements.

"They need to make sure that scripts get rehearsed, that audit processes are followed, that we can do tests with disaster recovery vendors, that deals are made with off-site storage sites and that they are accessible and maintainable," Brenner says.

Disaster recovery managers usually have various educational degrees and five or more years' experience doing disaster recovery planning, auditing or contingency planning. If they come from the technical side, they are usually from the data center or computer operations, says Geoffrey H. Wold, national director of information systems and technology consulting at the accounting and consulting firm of McGladrey & Pullen in the Minneapolis/St. Paul area.

Those from the business side were most often involved in business operations, such as an assistant plant manager or supervisor at a manufacturer, Wold says.

What it takes

Not all companies demand extensive technical knowledge, but most do demand strong communication skills.

Good writing skills are almost a necessity — not only to write and update the disaster recovery plan but also to document it correctly so it will be read and used, Wold says.

Disaster recovery managers also need heavy project management skills, along with a good working knowledge of how vital applications interrelate, says Fred Luevano, manager of systems management at Northrup Corp. in Hawthorne, Calif.

Salaries for disaster recovery managers vary widely, based on the size of the disaster recovery operation, the industry and whether the disaster recovery role is dedicated or part of a broader job responsibility.

Titles vary as widely. Of the 148 conference attendees who responded to *Disaster Recovery Journal*'s survey at the fall 1991 Disaster Recovery Symposium in Atlanta, most listed their titles as disaster recovery planner or coordinator, with salaries of $50,000 to $60,000.

The next most mentioned title was disaster or business recovery manager, with salaries of $70,000 to $80,000.

Disaster recovery managers say there is still no advancement track for the position. Depending on the company and the individual's skills, managers can move into operations, security or applications areas at their companies.

But pay and advancement aren't the whole story for many.

Take Joe Spence, data security administrator at the Dade County School Board in Miami. Even though Hurricane Andrew hit six miles south of his data center's bunker-like building, Spence says the center would have been ready even if the hurricane had hit head-on because the center sends daily backups to an off-site storage facility 15 to 20 miles away.

"You hope you never have to implement your disaster recovery plan," Spence says. But he says he gets great satisfaction knowing he's prepared.

Gow is a free-lance writer based in Medford, Mass.

Earning those combat stripes

When disasters strike, disaster recovery managers need to be prepared to act quickly. When a Chicago water main broke April 13, taking out electricity at the Chicago Board of Trade Clearing Corp. (CBOT), Judith Spencer had less than an hour to pull her company's disaster recovery plan together. In that time, her job as manager of quality assurance was to get people and tapes out of the building, schedule work shifts and transport staff to the hot-site facility of Sungard Recovery Services, Inc. in Northbrook, Ill.

"My role as coordinator was to get communications established right away and keep people up to date on decisions being made," Spencer says. With the exchange floor closed, the only way for board-of-trade members to reach CBOT was to call the hot site. So Spencer set up a communication desk of roughly a dozen phones at the hot site and scheduled staff to answer them.

"In the midst of a disaster, all you do is coordinate," Spencer says. "You get data flowing, book transportation and hotels, make sure people have food around the clock. I had to keep track of all people at all times because you never knew when you would need extra people. We utilized just about everyone we had.

"All new development stops, so we used applications programmers to do things like set up terminal links and administrative assistants or people from accounting to assist in data entry. We gave some crash courses, for instance, on trade entry for member firms and customers."

Spencer hired limos to deliver reports to board-of-trade firms and chartered helicopters and planes. She and a few others were up around the clock for about three days before making it home to change their clothes. "It was a once-in-a-lifetime opportunity to see how well our planning pulled together," Spencer says. "The executives were panicked, but the people who had been testing on a regular basis were calm."

KATHLEEN A. GOW

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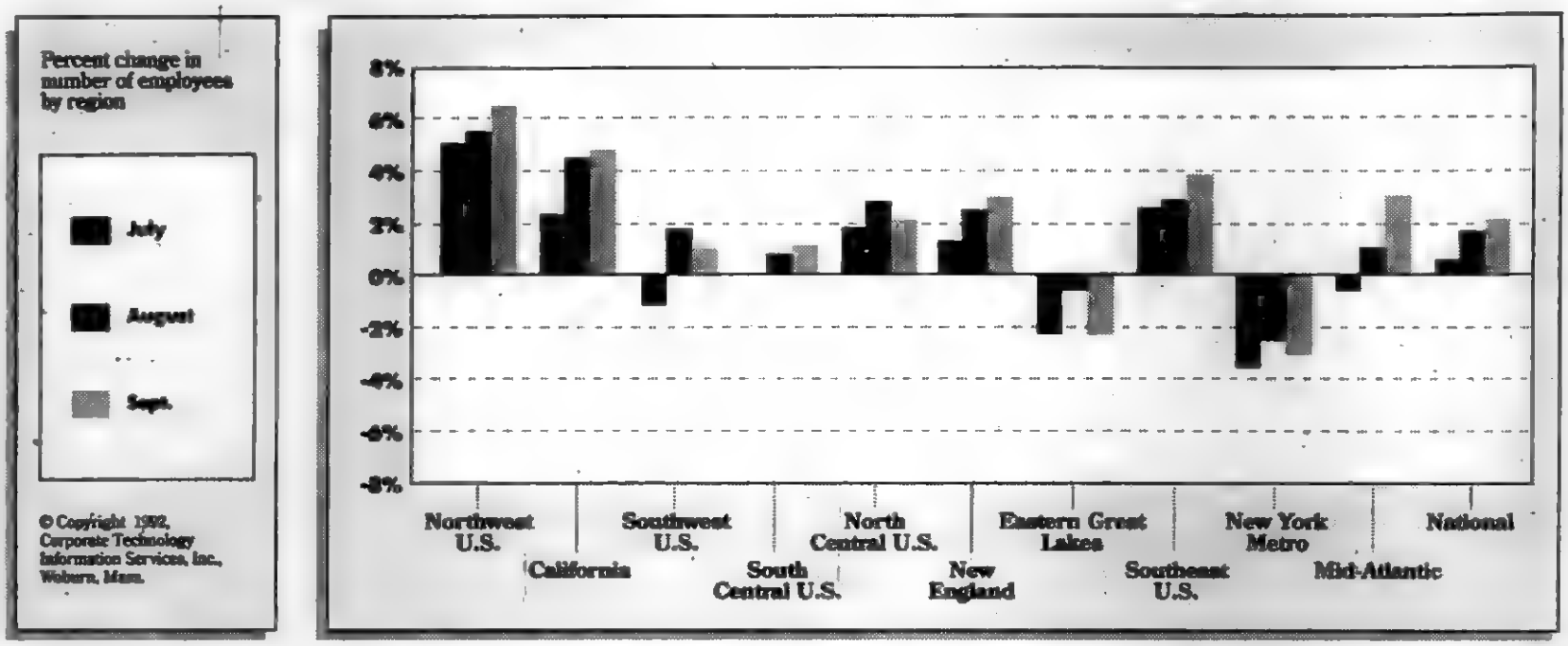

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SPECIAL TO CW

The Twin Cities have a split personality. If you are an Application System/400 programmer or a local- and wide-area network specialist, you'll probably find this a very warm and friendly place. However, if you hit the pavement with operations experience in your background, you'll probably experience Minneapolis/St. Paul as chilly and discouraging.

The preponderance of healthy corporate mainstays in the area have kept the area from experiencing some of the lowest lows of the recession.

"This marketplace is historically noted as having a diversity of industries," says Jim Kwapick, director at placement firm Robert Half International, Inc. in Minneapolis. "We have a strong agricultural and foods base with General Mills, Inc. and Pillsbury Co. Our financial services sector is disproportionately large compared to our population, and the presence of companies like 3M Co. boosts our manufacturing sector."

Jeff Lofgren, manager of group development for financial systems at Carlson Cos., a $9.3 billion privately held company involved in travel, hospitality and marketing, agrees. "We are not a one-industry area; we have strong companies in several industries."

Staffing for projects

Information systems hiring managers are cautiously confident about the future. In fact, some new IS projects are carefully being selected and initiated, and companies are staffing accordingly.

For example, Carl Wilson, senior vice president at Grand Metropolitan Food Sector and International Retailing at Pillsbury, says he has been doing selective hiring for positions such as programmers, programmer/analysts, systems analysts, application specialists and project leaders. But, he adds, "like many other companies, we are being cautious and picking projects that are critical to the company's strategic direction."

Despite what recruiters say are hard times for different industries, there are some strong companies in the Twin Cities that are bucking the trend by hiring. For example, Lofgren has been hiring during the past year, looking for people with skills in client/server technologies and database know-how, particularly DB2. "I just hired a senior-level person in PC LAN development, and the vast majority of our hires have been at the senior programmer/analyst level," he says.

Wally Haton, assistant vice president and director of IS operations at ITT Consumer Financial Corp. in Minneapolis, has been filling posts. For example, Haton recently hired several LAN/WAN and personal computer technologists.

"PC growth is phenomenal in our corporation. Not that the mainframe is dead, but there is a lot of opportunity combining the mainframe world with smaller intelligent workstations through LANs," he says. The irony is, Haton's data processing-trained wife, who has a similar background in operations, has been looking for a position for six months after being laid off.

The insurance industry has escaped such hardships. "The insurance industry certainly has pressures. But we have been adding to our development staff and hiring people — primarily those with AS/400 skills," says Gregory Erickson, vice president of IS at Northland Insurance Co. in St. Paul.

This is not to imply there aren't many well-qualified people pounding the pavement in Minneapolis and St. Paul. The contrary is true — the area has been hit with dramatic layoffs, mergers and downsizing of former big employers such as Control Data Corp., Unisys Corp. and Northwest Airlines.

"There are less business expansions, which means fewer openings across the board. The result [is] that companies can be very selective when searching for candidates for their firm," says Steven Wolf, assistant branch manager at placement firm Source EDP in Minneapolis.

Just as employers are selective about the projects they initiate, so are they very choosy about getting the skills they want. Huge salaries are not in the picture.

"When I have looked for candidates, I have had no trouble finding people who are willing to work at 20% or 25% less money than they were used to," says Richard Nesbitt, chief of information resources management at The Veterans Affairs Medical Center in Minneapolis.

IS professionals in the area confirm that certain technology skill sets, particularly at nonmanagement levels, are in high demand in the Minneapolis/St. Paul area. First among those are AS/400 technologists. Jim Erickson, vice president of MIS at NordicTrack, has hired 18 people this summer and is looking for more. All are AS/400 technologists with applications experience.

"This is a big AS/400 town. There are a lot of small- and medium-size manufacturing and distribution companies, and those areas are where you find most of the software for the AS/400," he explains.

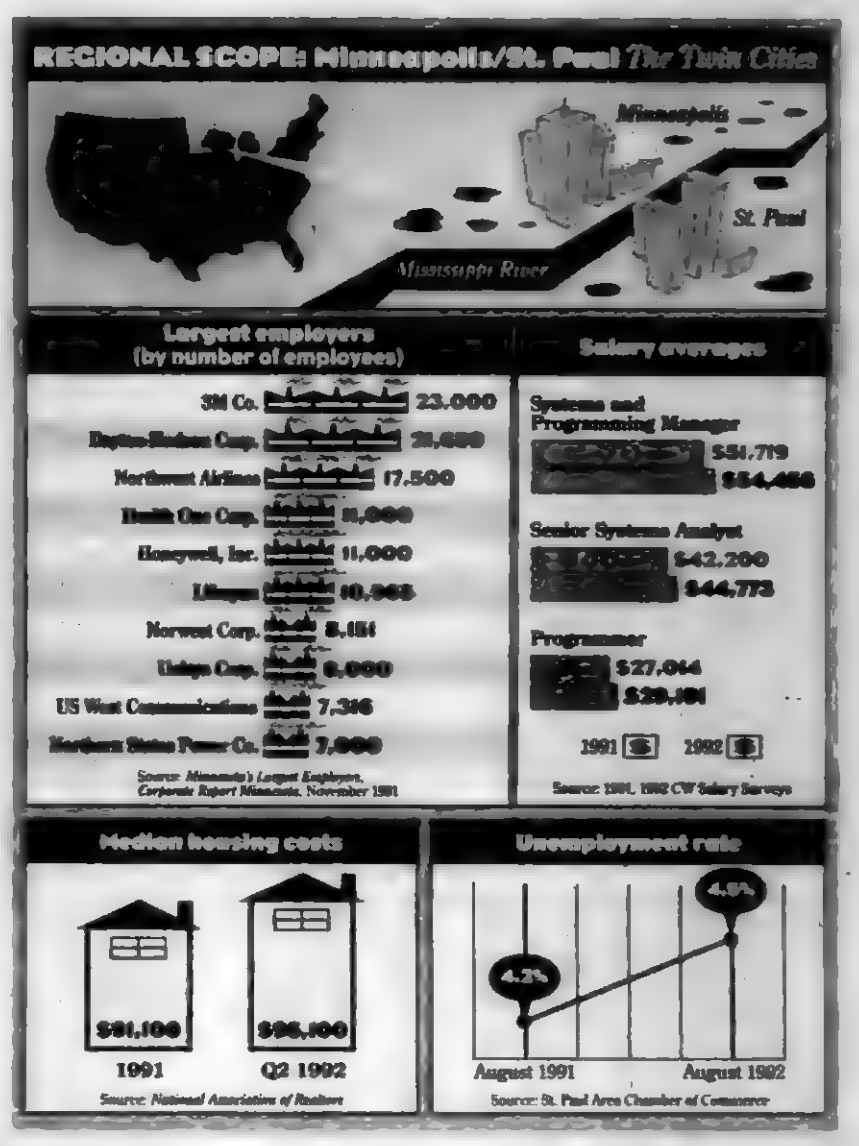
Skills needed

Like the kind of professionals that Lofgren recently hired, opportunities also exist for individuals with skills in client/server technologies, database savvy and integration talents, he says. "There are still skills needed in mainframe technology, databases like DB2, and increasingly with development methodologies such as computer-aided software engineering," he says.

Wolf also sees opportunities in those areas. "The jobs that are around are for PC, client/server and networking positions because companies are distributing data and trying to move information closer to the customer," he says.

IS professionals agree that upper level IS directors will find it much harder to get viable employment due to an across-the-board flattening of management. For example, a few years ago Pillsbury typically had a ratio of five or six employees to each manager, now it averages about 10 to 12 workers per manager, Wilson says.

Leinfuss is a free-lance writer based in Sarasota, Fla.



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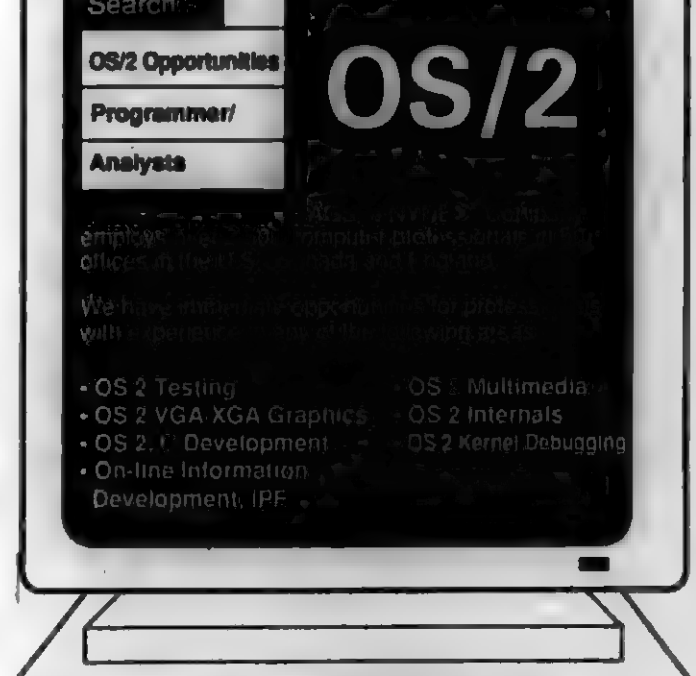

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Government Federal/State/Local	107,915
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SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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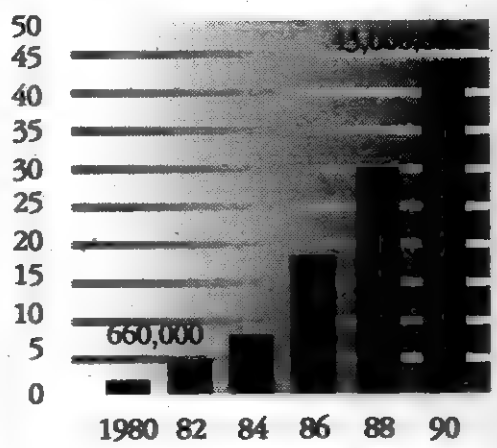
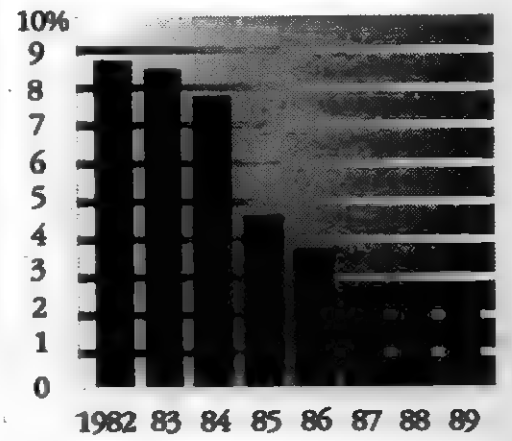


Fewer campus freshman are choosing computer careers**



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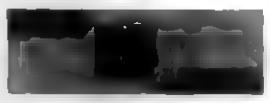
To beta-test or not to beta-test

BY RANDALL KENNEDY
SPECIAL TO CW

It is hard to resist a sneak preview, especially if the early knowledge might gain you a strategic edge. That's probably why more and more information systems shops are tempted to beta-test unreleased products—to get a taste of the new technology and check out systems compatibilities.

But for as many advantages as beta testing offers, it's not just a look-and-run venture. Anyone who volunteers his shop for a testing ground should know that he is about to launch a project that's not only time-consuming but can be fraught with frustrations as bugs are encountered and slowly isolated and corrected. Just ask those brave souls who have already jumped on the beta-test bandwagon. There's a lot to learn!

So let the beta-buyer beware when testing the waters. And remember, a little common sense goes a long way.



➤ Make frequent backups of your data.

It sounds obvious, but many sites don't make backups. This is even more critical when testing new operating system software. Because of their low-level system functions, operating systems can completely obliterate a mass-storage device's contents. So don't take any chances.

➤ Isolate beta-test software from production installations of shipping software.

Beta-test software often features an upgrade mechanism for bringing older versions of the software up to date. Using this to upgrade production applications can only invite disaster. Instead, install the software in an isolated manner.

➤ Stay in contact with the beta-test program coordinators.

Most vendors administer their beta-test programs through an electronic data network such as CompuServe. Through these forums, sites can exchange electronic mail, download bug fixes and new software revisions and receive support from the development team.

Program coordinators also post programwide announcements about critical bugs and new developments. Most vendors pay for these (Microsoft Corp. does in its beta-test forums), so don't miss critical announcements. Check in weekly.

➤ Intermix beta-test software from multiple vendors.

One of the quickest ways to lock up a system and lose data is to mix beta-test software from different vendors. This makes it difficult to diagnose and isolate errors. For example, during the beta testing of Microsoft's Windows 3.1, many users mixed beta-test memory managers and the prerelease Windows code, often with disastrous results.

➤ Assume that features you see in the prerelease product will make it into the shipping version.

If a feature set is not a fundamental part of the product's architecture, don't count on its being implemented exactly as it is in the prerelease code. This applies more to large-scale testing of first-generation products but can be equally valid in lesser testing programs as well.

➤ Make performance evaluations based on prerelease software.

Beta-test software is usually filled with debugging code, which slows down performance. So wait for the final code before making performance evaluations. Vendors often include disclaimers, but a number of testers still complain about performance in early beta-test code.

➤ Talk about the software outside of your company.

Many beta testers don't realize that the nondisclosure agreements they sign are legal and binding. Even mentioning your participation in a program can be considered a violation.

Kennedy is vice president of service at MicroServ Corp., a consulting firm in Hyannis, Mass. He can be reached via CompuServe at 76437,1041.

You are seriously thinking about doing some beta testing but aren't sure of the implications. Before jumping in, ask yourself these questions:

➤ Do you have considerable time to spend on the project? Beta testing requires a commitment that goes beyond just installing the software. Vendors often want prerelease software tested in a production environment, which requires considerable time and effort as bugs and incompatibilities are navigated.

➤ Do you have the hardware and software to support the prerelease product? It makes little sense for a user with a stand-alone system to beta-test network software. Testing in the wrong environment also compromises data integrity.

➤ Are you prepared to learn about the internal workings of the prerelease product? Most beta-test installations do not go smoothly, and vendors often ask the tester to manually edit system configuration files, expand and copy program files from disks and even apply debug patches to executable code.

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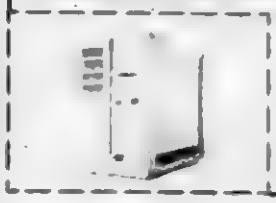

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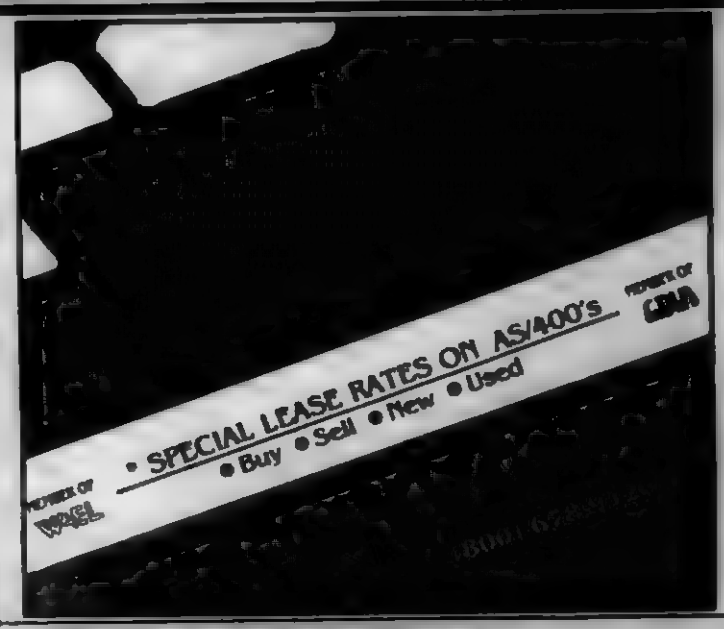

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PS/2 Model 55SX	$850	$900	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model P70	$1,650	$1,900	$1,200
PS/2 Model 80	$1,200	$1,400	$900
PS/2 Model 90	$3,100	$3,500	$2,700
Compaq Portable II	$445	$500	$375
Portable III	$500	$600	$250
Portable 386	$950	$1,100	$800
SLT-286	$700	$900	$400
LTE-286	$800	$900	$500
Deskpro 386e	$900	$1,000	$700
Deskpro 386/33	$1,700	$1,950	$1,400
Apple Macintosh Classic	$750	$875	$500
SE	$725	$775	$500
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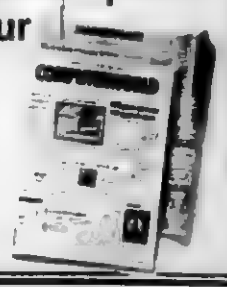

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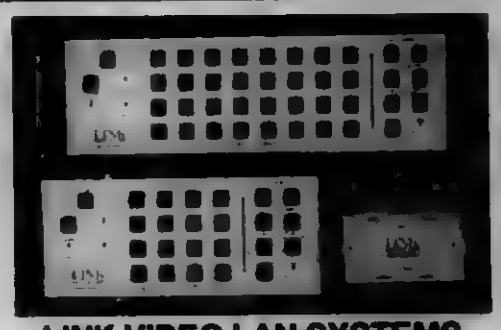

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ADVERTISERS INDEX

Applied Business Technology	43
AT&T Business Communications Services	48-49
AT&T Tridom	104
Borland	29-31
Bull Worldwide Information Systems	C4
Chipcom	76
Cincom	79, 81
CornNet	67
Compaq Computer Corp	26-27
Computer Associates	3, 5
Concurrent Computer Corp	89
Corporate Software	80
CW Circulation	86-87
CW Marketing	47, 94-95
CW Recruitment	43, 67, 80, 88, 93, 111
Data General	21
Dexpo	90
Dysan International	92
Encore Computer Corp	60
Fibercom, Inc.	84
Fischer International	83
GE Advanced Systems	105
Hewlett-Packard	18-19, 69, 71, 73
IBM	22-23, 74-75, 88, 93, 111
Information Resources	15
Information Builders	106
Informix	C3
Innovation Data Processing	7
Intel	58-59
IPL Systems	9
Knowledgeware	82/83
Lotus Development Corp	38-39, 42, 112
Lucas Management Systems	109
Micro Focus	11
NCR	44-45
NETEC International	82
Oracle Corp	5
Powersoft	96
Programart	46
Q-Star Technologies	17
Ram Mobile Data	40-41
SAP America	26
SAS Institute	25, 52, 61, 110
Sterling Software	24
Sybase, Inc.	13
Sybase	34-35
VMark	78
WHITE PAPER	51-66
Xerox	88
X/Open	87

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Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 10
3M Co. 117
88open Consortium Ltd. 89

A

Aberdeen Group 16
Adobe Systems, Inc. 43
Advanced Business Technology 100,102
Advanced Logic Research, Inc. 129
Advanced Software Products Group, Inc. 90
AGS Management Systems, Inc. 100,102
Aladdin Publishing, Inc. 93
Alantec Corp. 1
Alcatel Co. 10
Alex. Brown & Sons, Inc. 128,129
Allen-Bradley, Inc. 14
Altus, Inc. 4
Amdahl Corp. 129
American Airlines 16
American Express 6,16
American Securities Corp. 12
Ameritech 16
Amoco Canada Petroleum Co. 88
Amoco Corp. 88
Andersen Consulting 4,47,111
Apple Computer, Inc. 6,10,12,16,47,114
Arthur Andersen 47
Ashton-Tate Corp. 129
Associated Grocers, Inc. 12
AST Research, Inc. 12
ATI Technologies, Inc. 43
AT&T 6,10

B

Baltimore Bancorp. 89
Baltimore Gas and Electric Co. 107
Banyan Systems, Inc. 16
Baxter Healthcare Corp. 4
Berard Software Engineering, Inc. 93
Beyond, Inc. 14
Boeing Computer Services 16
Booz Allen & Hamilton, Inc. 130
Borland International, Inc. 4,37,128,129
Bose Corp. 106
BT 10
Burl Software Laboratories, Inc. 92
Burlington Coat Factory, Inc. 47
Business Research Group. 68,77

C

Cabletron Systems, Inc. 10,80
Cadwalder, Wickersham & Taft 10
Cambex Corp. 24
Canadian National Railways 47
Carlson Companies, Inc. 117
Carnegie Mellon University 68
Cascade Communications 10
Central Point Software, Inc. 40,128,129
Champs Software, Inc. 93
Chicago Board of Trade Clearing Corp. 115
Chipcom 130
Choice Hotels International, Inc. 104
Cincom Systems, Inc. 16,89
Cisco Systems, Inc. 10,16,82
Citicorp 1
Clam Associates, Inc. 24
Comdisco, Inc. 8,77
ComNet West 80
Compaq Computer Corp. 12
Component Software Corp. 6
Computer Aided Management 100,102
Computer and Engineering Consultants Ltd. 4
Computer Associates International, Inc. 1,77,100,102
Computer Intelligence/Infocorp. 4
Computer Sciences Corp. 130
Computer Systems Advisers, Inc. 92
Computer Technology Group 4
Computervision Corp. 6
Conoco, Inc. 105
Control Data Corp. 117
Convex Computer Corp. 6
Corel Corp. 68
Cortex Corp. 92
Cray Communications 10
Cray Electronics 80
Cray Electronics Holdings 10
CrossComm Corp. 77
CSX Transportation Corp. 16

D

Da Vinci Systems, Inc. 70
Dade County School Board 115
Del Monte Foods 1,12
Dell Computer Corp. 130
Department of Defense 16
DHL Airways, Inc. 16
Dialogic Corp. 80
Digital Equipment Corp. 6,10,12,16,32,83,91,92,93,129,130
Dow Jones News Retrieval 6
Dowty Group 80
Du Pont Co. 47

E

EcoSystems Software Inc. 84
Egghead Software 10
Electronic Data Interchange Association 82
Electronic Data Systems Corp. 67,88
EMS Professional Shareware 93
Evans & Sutherland Computer Corp. 4

F

FaxBack, Inc. 80
Fibronics International, Inc. 1
Fidelity Investments, Inc. 47
Fifth Generation Systems, Inc. 43
First Boston Corp. 92
France Telecom 78
Frank Russell Co. 10
Futurus Corp. 14

G

GammaLink 80
General Mills, Inc. 117
General Motors Corp. 105
General Software, Inc. 82
GOGO Tours 114
Gold Bond Building Products 14
Groupe Bull 8
Gupta Technologies, Inc. 90

H

HartMarx Corp. 106
Hewlett-Packard Co. 6,8,10,66,80,82,84,89,90,92,130
HPSI 80
Hitachi Data Systems Corp. 86
Houston Chronicle 68
Hughes Aircraft Co. 16
Hughes LAN Systems, Inc. 6,10
Human Designed Systems 80

I

Ibex Technologies 80
IBM 1,10,16,24,43,77,80,82,83,88,91,92,114,129,130
Infonet Services Corp. 10
Infonetics Research, Inc. 16
InfoNow Corp. 6
Information Builders, Inc. 90
Informix Corp. 8,90
Instaw, Inc. 6
Inteco Corp. 12
Integrated Device Technology 8
Integris Co. 8
Integrity Life Insurance Co. 15
Intel Corp. 16,129,130
Intelligent Environments, Inc. 89
International Communications Association 80
Internet Engineering Task Force 6
Intersolv, Inc. 4
Interstream, Inc. 68
IPX 10
Isocore 16
ITT Consumer Financial Corp. 117

J

J. B. Hunt Transport Services 117
Johnson County Data Services Department 15

K

Kalpana, Inc. 1
Kapur International, Inc. 102
Kash n' Karry Food Stores, Inc. 1,47
Kensington Microware Ltd. 12
Knowledge Ware, Inc. 4

L

LANnet, Inc. 1
LBMS, Inc. 100,102
Legent Corp. 129
Lehman Brothers 6,47
Levitz Furniture Corp. 115
Liant Software Corp. 93
LibGo Travel 114
Lockheed Management Information Decision Support System 106
Lockheed Missiles and Space Co. 83
Lotus Development Corp. 14,16,37,47,68,70,78,129
Lotus Management Systems 100,102

M

Make Systems, Inc. 77
Management Information Technology, Inc. 90
MCA Universal Studios, Inc. 115
McData Corp. 10
McGladrey & Pullen 115
MCI Communications Corp. 14,77,83
Mercury Interactive Corp. 68
Merrill Lynch & Co. 12
Meta Group, Inc. 107,114
Methodist Hospital of Indiana 15
Metro Information Services 24
Micrografx, Inc. 128
Microsoft Corp. 4,6,10,14,16,37,43,47,70,82,83,90,92,100,102,122,128,129,130
Miller, Anderson & Sherrerd 16
Minnesota Supercomputer Center 4
Mips Computer Systems, Inc. 89
Mips Technologies 130
Mitsubishi International Corp. 6
Modular Software Systems 43
Monsanto 16
Motorola, Inc. 89
Multitrak Software Development Corp. 100,102

N

Nabisco Brands, Inc. 12
NASA 16
NCR Corp. 6,82
NetManage, Inc. 80
Netrix Corp. 10
Network General Corp. 77
Network Systems, Inc. 8
Nolan, Norton & Co. 16
NordicTrack 117
Northern Telecom, Inc. 80
Northland Insurance Co. 117
Northrup Corp. 115
Northwest Airlines, Inc. 117
Notework Corp. 70
Novell, Inc. 8,10,14,16,40,68,77,82,93
Nynex Corp. 16

O

Oracle Corp. 67,84,111
Oregon State University 14

P

Pacific Bell 20
Pacific Gold Coast Corp. 93
Pacific Telesis 106
Pacificare Health Systems 83
PaperFree Systems, Inc. 80
ParcPlace Systems, Inc. 20,91
Patricia Seybold Group 84
Photographic Sciences Corp. 68
Pillsbury Co. 117
Pioneer Software 37
Pitney Bowes 105
PlanView, Inc. 102
Platinum Technology, Inc. 90
POC-IT Management Services, Inc. 100,102
Policy Management Systems, Corp. 16
Pratt & Whitney 105
Precision RISC Organization 89
Premenos Corp. 80
Pritsker Corp. 90
Productivity Management Group, Inc. 92
Project Software & Development, Inc. 68
Protem, Inc. 10
Prudential Securities, Inc. 128,129
Pyramid Technology Corp. 8

Q

Qualix Group, Inc. 68

R

Racal-Datacom, Inc. 77
Ram Mobile Data 16
R. J. Reynolds Industries 12
Robert Half International 117
Rockwell Shuttle Operations Co. 16

S

Science Applications International Corp. 130
Scitor Corp. 100
Seer Technologies, Inc. 92
Sequoia Systems Inc. 80
SHL Systemhouse, Inc. 86
Silicon Graphics, Inc. 4
Simsby Group, Inc. 6
Small Business Development Center 82
Software Publishing Corp. 37,43,128
Solon Automated Services, Inc. 83
Source EDP 117
Southwestern Bell 16,80
St. Clair Hospital 28
Statware, Inc. 66
Stratus Computer, Inc. 89
Sun Microsystems, Inc. 4,6,10,16,47,67,68,77,82,91
Sun Microsystems Computer Corp. 47,67
Sun Technology Enterprises, Inc. 47
SunConnect 10
SunExpress 47
Sungard Recovery Services, Inc. 115
SunSelect 47
SunSoft, Inc. 130
Sybase, Inc. 8,16
Symantec Corp. 100,102,128
Symbol Technologies, Inc. 68
Synon Corp. 92
SynOptics Communications, Inc. 10
System Software Associates, Inc. 12

T

Telesystems SLW, Inc. 68
Telxon Corp. 68
Tesseract Corp. 16
Texas Instruments, Inc. 4
Texas Rehabilitation Commission 16
The Advanced Computing Environment 130
The Continuum Co. 16
The MathWorks, Inc. 68
The Santa Cruz Operation 91,92
The Veterans Affairs Medical Center 117
The Washington Post Co. 114
Thinking Machines Corp. 6
TI Group. 80
Toshiba America Information Systems, Inc. 12

U

US West 16
Unisys Corp. 16,68,80,91,117,130
U.S. Bureau of the Census 6
U.S. Central Credit Unit 16
U.S. Department of Energy 80
Unz and Cohe, Inc. 130

V

Vertical Systems Group 10
V. F. Corp. 4
Virtual Maintenance, Inc. 6

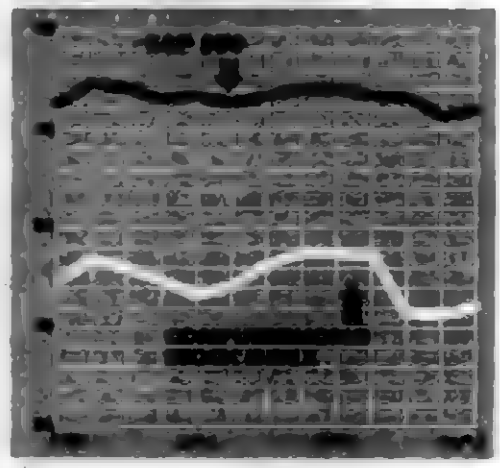
W

Wall Data, Inc. 92
Weil, Gotshal and Manges 10
Wellfleet Communications, Inc. 10,16,129
Whirlpool Corp. 4
WilTel 16
WordPerfect Corp. 14,70

Z

ZyXel USA 68

STOCK TRADING INDEX



Industry Almanac

WINDOWS TRANSITION

Industry watchers say the fast acceptance of Microsoft Corp.'s Windows environment has buoyed the financial fortunes of some personal computer software vendors but left others struggling to catch up.

MICROGRAFX, INC. (MGXI)
Will Fastie and Karen B. Gage
Alex. Brown & Sons, Inc.
Oct. 1, 1992

Micrografx is well-positioned to take advantage of the continuing surge of Windows use. The firm offers no DOS-based products and thus will not be burdened by the declining sales associated with applications on that platform. Micrografx also benefits from the rapid growth of desktop processing power, as souped-up PCs can handle the needs of graphic-intensive programs more easily.

➤ Investment conclusion: BUY

SYMANTEC CORP. (SYMC)
Gibbs Moody and David M. Thomas
Prudential Securities, Inc.
Oct. 8, 1992

Symantec has announced that results for the quarter just concluded — and for the next two quarters — will yield an operating loss. Approximately 65% of Symantec's revenue comes from DOS-based software, and new competition for the company's Windows products may emerge from Central Point Software, Inc. Revenue from current and upcoming Windows products should begin to offset declining DOS sales by the middle of fiscal 1994.

➤ Investment conclusion: HOLD

SOFTWARE PUBLISHING CORP. (SPCO)
Will Fastie and Karen B. Gage
Alex. Brown & Sons
Oct. 15, 1992

Harvard Graphics is the top gun among presentation graphics programs for DOS, but it faces heavy competition as users migrate to Windows. Software Publishing's shortfall in revenue for the fourth fiscal quarter is attributed directly to this pressure. Furthermore, Software Publishing's more entrenched Windows product, Superbase IV, faces pressure from upcoming Windows products from Microsoft, Borland International, Inc. and others. Prospects may improve as the company refocuses its marketing on Windows.

➤ Investment conclusion: NEUTRAL

DEREK SLATER

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 16, 1992

TOP PERCENT GAINERS	
Symantec Corp. (L)	42.00
Cray Computer	38.10
Corporate Software	38.04
Picturetel Corp	35.85
Compression Labs Inc.	31.25
Seagate Technology*	28.57
State of the Art	25.00
Pyramid Technology (L)	22.22

TOP PERCENT LOSERS	
Evertek Systems Inc.	-37.47
Micrografx Inc.	-17.93
Spinnaker Software	-15.38
Printronix Inc.	-13.64
Mesa Software	-13.04
Cray Research Inc.* (L)	-11.80
Sequoia Systems Inc.	-10.00
Micropolis Corp.	-9.86

TOP DOLLAR GAINERS	
Synoptics Communications (H)	6.00
Dell Computer Corp. (H)	5.63
Apple Computer Inc.*	5.63
Wellfleet Communications	5.38
Picturetel Corp	4.75
BMC Software Inc.	4.63
Parametric Technology	4.50
Matsushita Electronics	4.25

TOP DOLLAR LOSERS	
IBM*	-7.63
Intel Corp.*	-3.25
Cray Research Inc.* (L)	-2.63
Micrografx Inc.	-1.75
Chipcom Corp.	-1.63
Digital Equipment Corp.*	-1.38
Xilinx (L)	-1.25
Scientific Atlanta Inc.	-1.25

Exch	52-Week High	52-Week Low		Oct. 16 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**Up 4.58%**
OTC	19.13	9.38	3COM Corp.* (H)	17.88	-0.75	-4.03
NYS	70.63	56.25	American Info Techs Corp.*	68.63	2.63	3.98
NYS	45.38	32.88	AT&T*	42.25	0.50	1.20
OTC	4.25	0.75	Ariel Communication Corp.	1.25	0.13	11.11
NYS	49.75	40.25	Bell Atlantic Corp.	47.75	1.50	3.24
NYS	55.50	43.38	Bellsouth Corp.	52.63	1.13	2.19
NYS	6.75	3.63	BolR, Beranek & Newman (L)	3.88	0.13	3.33
NYS	68.63	38.63	Cabletron Systems	66.63	4.13	6.60
OTC	31.00	17.50	Chipcom Corp.	24.63	-1.63	-6.19
OTC	56.88	21.38	Cisco Systems Inc.	56.88	2.88	5.32
OTC	35.25	5.50	Compression Labs Inc.	7.88	1.88	31.25
OTC	3.38	0.88	Data Switch Corp.	1.88	0.05	3.85
NYS	23.63	14.00	Digital Comm. Assoc.*	14.00	-0.75	-5.08
OTC	15.25	7.75	Digital Systems Int'l Inc. (L)	8.50	0.25	3.03
OTC	13.63	3.63	DSC Communications	13.63	1.50	12.37
OTC	10.88	4.75	Fibronix Int'l Inc.	5.75	-0.25	-4.17
OTC	37.50	10.50	Fibronix Int'l Inc.	16.25	1.25	8.33
OTC	3.38	1.13	Gandalf Technologies Inc.	1.88	0.00	0.00
OTC	2.25	0.88	Gateway Communications	1.63	-0.06	-3.73
NYS	5.50	2.38	General Datacomm Inds.	4.13	0.50	13.79
ASE	5.88	0.50	Go Video	2.31	0.06	2.60
NYS	35.75	28.88	GTE Corp.*	34.38	0.88	2.61
NYS	70.63	50.00	ITT Corp.	65.75	1.13	1.74
OTC	38.25	25.25	MCI Communications Corp.	35.75	0.88	2.51
OTC	14.50	2.25	Microcom Inc.	3.00	-0.25	-7.69
NYS	18.25	9.50	Network Equipment Tech.*	13.50	0.63	4.85
OTC	25.50	8.00	Network General	14.50	0.25	1.75
OTC	20.00	8.50	Network Systems Corp.	12.75	1.63	14.61
OTC	22.75	5.63	Newbridge Networks Corp. (H)	22.75	2.50	12.35
NYS	48.25	30.50	Northern Telecom Ltd.*	31.00	0.25	0.81
OTC	32.50	21.25	Novell Inc. (H)*	29.63	1.25	4.41
NYS	88.38	69.13	Nynex Corp.*	85.25	2.88	3.48
OTC	37.50	15.00	Octel Communications Corp. (L)	19.00	1.13	6.29
OTC	9.88	3.75	Penril Data Comm. Ntwks. (L)	3.75	-0.25	-6.25
OTC	53.00	10.25	Picturetel Corp.	18.00	4.75	35.85
OTC	18.75	7.50	Protecon Inc. (L)	9.50	-0.13	-1.30
NYS	29.50	13.38	Scientific Atlanta Inc.	27.50	-1.25	-4.35
NYS	69.13	55.75	Southwestern Bell Corp. (H)	68.75	2.25	3.38
NYS	28.38	20.75	Sprint Corp.	24.50	0.75	3.16
OTC	19.50	4.50	Standard Microsystems Corp. (H)	18.63	0.50	2.76
OTC	57.50	14.50	Synoptics Communications (H)	57.50	6.00	11.65
NYS	40.00	32.88	US West Inc.	39.00	1.13	2.97
OTC	49.88	24.00	Wellfleet Communications	49.88	5.38	12.08
PC and Workstations						**Up 2.98%**
OTC	13.75	3.50	Advanced Logic Research	4.00	0.00	0.00
OTC	70.00	42.75	Apple Computer Inc.*	49.00	5.63	12.97
OTC	27.00	11.25	AST Research Inc.*	16.50	1.63	10.92
NYS	19.25	8.75	Commodore Int'l	7.50	0.50	7.14
NYS	38.75	22.13	Compaq Computer Corp.* (H)	36.75	2.25	6.16
OTC	33.63	13.91	Dell Computer Corp. (H)	33.63	5.63	20.09
OTC	7.75	0.94	Everex Systems Inc.	0.94	-0.56	-37.47
NYS	34.00	21.25	Harris Corp.	30.63	0.63	2.08
NYS	85.00	44.63	Hewlett-Packard Co.*	55.88	4.25	8.23
NYS	29.75	14.13	Silicon Graphics	20.75	2.13	11.41
OTC	35.88	20.75	Sun Microsystems Inc.*	29.00	1.25	4.50
NYS	31.25	22.25	Tandy Corp.*	26.75	0.63	2.39
NYS	11.13	5.50	Zenith Electronics	5.75	0.00	0.00
OTC	25.50	2.75	Zeos International Ltd.	3.50	-0.25	-6.67
Large Systems						**Up 5.23%**
ASE	20.63	7.75	Amdahl Corp.* (L)	7.88	0.13	1.61
NYS	16.38	4.75	Convex Computer (L)	6.00	1.00	20.00
OTC	19.63	1.88	Cray Computer	3.63	1.00	38.10
NYS	92.25	20.00	Cray Research Inc.* (L)	20.00	-2.63	-11.60
NYS	22.50	7.13	Data General Corp.	12.25	1.25	11.36
NYS	66.50	33.25	Digital Equipment Corp.*	34.38	-1.38	-3.85
NYS	101.38	70.75	IBM*	70.75	-7.63	-9.73
OTC	13.25	5.50	Kendall Square Research (L)	7.13	0.88	14.00
NYS	119.25	98.25	Matsushita Electronics	94.75	4.25	4.70
OTC	17.50	6.00	Pyramid Technology (L)	8.25	1.50	22.22
OTC	17.88	9.88	Sequent Computer Sys.	15.50	-0.13	-0.80
OTC	18.38	2.75	Sequoia Systems Inc.	3.38	-0.38	-10.00
NYS	84.25	34.50	Stratus Computer Inc.*	37.00	1.13	3.14
NYS	15.13	9.50	Tandem Computers Inc.*	11.63	0.50	4.48
NYS	11.75	3.63	Unisys Corp.*	8.75	0.00	0.00
ASE	7.50	0.25	Wang Labs Inc. (H)*	0.44	0.00	0.00
Software						**Up 3.55%**
OTC	88.50	25.25	Adobe Systems Inc. (L)	28.63	2.38	9.05
OTC	44.25	10.25	Aldus Corp. (L)	13.25	1.63	13.99
OTC	19.75	7.88	American Software Inc.	7.88	-0.75	-8.70
OTC	20.00	9.75	Ask Computer Systems	13.63	0.50	3.81
OTC	50.75	23.25	Autodesk Inc.	50.50	2.25	4.66
OTC	37.75	4.13	Bachman Info. Systems	4.13	-0.13	-2.94
OTC	42.50	22.00	BDS Systems Inc.	37.50	0.00	0.00
OTC	78.00	37.25	BMC Software Inc.	60.25	4.63	8.31
OTC	20.50	10.25	Boole & Babbage	19.00	-0.50	-2.56
OTC	88.75	25.25	Borland Int'l Inc.* (L)	29.00	1.13	4.04
OTC	11.00	3.63	CE Software	3.88	-0.13	-3.13
ASE	21.75	8.88	Cheyenne Software Inc. (H)	21.75	1.75	8.75
OTC	17.00	5.63	Cognos Inc.	5.75	0.13	2.22
NYS	17.00	8.00	Computer Associates*	16.88	1.25	8.00
NYS	12.38	5.00	Computervision Corp.	5.13	-0.50	-8.89
OTC	20.00	8.75	Comshare Inc.	7.75	-0.25	-3.13
OTC	47.88	8.13	Easel Corp. (L)	6.50	-0.63	-8.77
OTC	25.00	11.50	Group I Software	14.00	1.00	7.69
OTC	8.63	3.50	Hogan Systems Inc.	4.75	0.25	5.56
OTC	36.25	18.50	Information Resources	27.25	1.50	5.83
OTC	27.25	4.75	Informix Corp. (H)	27.25	3.13	12.96
OTC	22.38	11.50	Intergraph Corp. (L)	13.25	1.25	10.42
OTC	15.00	7.00	Interleaf Inc.	10.63	1.25	13.33
OTC	20.25	10.25	Intersolv Inc.	13.75	-0.50	-3.51
OTC	21.38	9.50	Knowledgeware Inc.	10.50	-0.13	-1.18
OTC	48.25	38.75	Legent Corp.*	45.00	2.50	5.88
OTC	38.75	15.50	Lotus Development*	17.50	0.75	4.48
OTC	7.38	1.88	Mace Software	2.50	-0.38	-13.04
OTC	22.25	8.25	Mentor Graphics	8.13	0.38	5.52
OTC	37.25	27.25	Micro Focus	36.00	0.38	1.05
OTC	20.50	8.50	Micrografx Inc.	8.25	-1.75	-17.50
OTC	89.84	58.50	Microsoft Corp.*	85.38	3.00	3.64
OTC	21.13	12.00	Oracle Corp.*	20.63	1.63	8.55
OTC	50.75	18.38	Parametric Technology	50.75	4.50	9.73
OTC	11.00	3.50	Phoenix Technologies	4.38	0.13	2.94
OTC	25.25	11.25	Platinum Technology	16.25	2.00	14.04
OTC	49.00	28.00	Progress Software Corp.	48.50	-0.50	-1.02
OTC	28.63	4.00	Quarterdeck Office Sys.	5.00	0.38	8.11
OTC	32.75	11.75	Rainbow Technologies Inc.	20.50	0.25	1.23
OTC	22.75	4.00	Rasterops	6.25	0.75	13.64
OTC	17.25	5.00	Ross Systems	6.00	-0.38	-5.88
OTC	12.25	8.50	Sapiens USA Inc.	10.88	0.25	2.35
OTC	35.25	6.75	Software Publishing Corp.	7.50	0.00	0.00
OTC	8.50	2.00	Software Toolworks Inc.	3.44	0.19	5.78
OTC	7.25	1.00	Spinnaker Software	1.38	-0.25	-15.38
OTC	10.50	3.25	State of the Art	5.00	1.00	25.00
NYS	35.25	13.75	Sterling Software Inc.	16.38	0.13	0.69
OTC	30.00	8.00	Struct. Dynamics Research (L)	10.00	1.75	21.21
OTC	38.00	16.25	Sybase Inc.	38.00	1.63	4.47
OTC	51.00	5.88	Symantec Corp. (L)	8.88	2.63	42.00
NYS	15.50	6.25	Systems Center Inc.*	6.25	-0.25	-3.85
OTC	34.25	13.00	System Software Assoc.	21.88	-0.13	-0.57
OTC	13.25	2.50	Trimeс Corp.	3.88	-0.38	-8.82
OTC	22.75	14.50	Walker Interactive Systems	16.38	-0.63	-3.68
OTC	8.63	1.50	Wordstar	1.75	0.13	7.69
Semiconductors						**Up 2.98%**
NYS	21.50	7.38	Advanced Micro Devices	13.00	1.25	10.64
NYS	11.13	7.13	Analog Devices Inc.	10.25	-0.13	-1.20
OTC	12.38	6.75	Atmel Corp.	12.38	0.25	2.06
OTC	14.13	3.25	Chips and Technologies	3.75	0.25	7.14
NYS	21.50	7.38	Cypress Semiconductor Corp	8.38	-0.13	-1.47
NYS	12.88	8.38	Dallas Semiconductor (H)	12.00	0.13	1.05
OTC	68.75	39.75	Intel Corp.*	63.25	-3.25	-4.89
NYS	9.88	4.88	LSI Logic Corp.	8.50	0.50	6.33
NYS	22.38	12.13	Micron Technology	18.00	1.75	10.77
NYS	94.13	57.50	Motorola Inc.*	94.13	4.13	4.58
NYS	12.38	4.88	National Semiconductor*	12.13	-0.13	-1.02
OTC	27.00	8.25	Sierra Semiconductor	11.50	-1.00	-8.00
NYS	45.50	26.00	Texas Instruments* (H)	45.00	1.13	2.56
OTC	10.50	6.00	VLSI Technology	7.25	0.13	1.75
OTC	7.25	2.13	Weitek	3.50	0.38	12.00
ASE	6.38	2.00	Western Digital Corp. (H)	6.38	0.38	6.25
OTC	31.00	16.00	Xilinx (L)	16.00	-1.25	-7.25
OTC	32.75	13.75	Zilog Inc. (H)	32.00	3.00	10.34
Peripherals and Subsystems						**Up 4.38%**
OTC	10.00	3.25	Archive Corp.	7.13	0.38	5.56
OTC	28.75	13.75	Banctec Inc.	24.00	-0.75	-3.03
OTC	23.50	10.00	Cambex Corp.	10.25	-0.50	-4.65
ASE	13.00	5.41	Cognitronics Corp. (H)	13.00	1.38	11.83
NYS	23.88	12.50	Conner Peripherals*	21.75	2.88	15.23
OTC	15.50	14.50	DATA RACE Inc.	15.25	-0.25	-1.61
ASE	19.88	4.88	Dataram Corp.	5.88	0.50	9.30
NYS	22.25	8.25	EMC Corp	22.25	2.00	9.88
OTC	8.38	4.75	Emulex Corp.	5.50	0.13	2.33
OTC	23.00	13.25	Evans & Sutherland	14.50	-0.13	-0.85
OTC	40.63	12.00	Exabyte	16.13	1.13	7.50
OTC	29.50	15.75	Intelligent Info. Systems	28.88	0.50	1.76
OTC	11.25	4.75	Iomega Corp.	8.38	0.25	4.08
OTC	15.25	12.25	IPL Systems Inc. (L)	13.50	0.25	1.89
OTC	21.25	10.75	Kornag Inc.*	18.25	3.00	19.67
OTC	15.25	4.38	Maxtor Corp.*	14.13	0.13	0.89
OTC	12.63	6.38	Micropolis Corp.	8.00	-0.88	-9.86
NYS	103.75	85.38	3M Co.	98.88	1.00	1.02
OTC	8.75	3.50	Printronix Inc.	4.75	-0.75	-13.64
NYS	28.75	8.88	QMS Inc.	7.88	0.13	1.61
OTC	18.00	8.88	Quantum Corp.	14.88	1.88	14.42
OTC	12.75	3.75	Radius Inc.	5.00	-0.13	-2.44
NYS	12.88	8.50	Recognition Equipment	10.00	0.38	3.90
OTC	13.13	5.63	Rexon Inc.	11.13	0.75	7.23
OTC	17.63	7.88	Seagate Technology*	16.75	3.50	26.57
NYS	78.00	21.50	Storage Technology*	24.63	1.88	8.24
NYS	24.25	16.00	Tektronix Inc.	20.50	0.25	1.23
NYS	82.25	60.25	Xerox Corp.	78.38	1.88	2.46
Services						**Up 4.57%**
OTC	20.38	11.88	American Mgmt. Systems* (H)	20.13	0.38	1.90
NYS	5.38	2.88	Anacomp Inc.	2.75	0.63	20.00
OTC	19.75	12.50	Analysts Int'l	19.75	2.00	11.27
NYS	49.00	35.75	Auto Data Processing*	46.13	0.38	0.82
NYS	15.50	7.08	Candies Corp.	14.88	0.88	6.25
NYS	24.16	12.50	Comdisco Inc.*	15.13	-0.50	-3.20
OTC	13.50	7.13	Computer Horizons (L)	7.75	-0.38	-4.62
NYS	84.88	57.00	Computer Sciences*	83.25	1.50	2.25
NYS	10.13	7.00	Computer Task Group	7.88	-0.13	-1.56
OTC	40.50	16.00	CompuUSA Inc.	34.75	2.50	7.75
OTC	19.25	6.00	Corporate Software	8.75	2.63	36.84
OTC	30.75	8.00	Egghead Discount Software	9.00	-0.25	-3.05
NYS	33.00	25.25	General Motors E (EDS)*	29.38	-0.13	-0.42
OTC	30.38	8.25	Intelligent Electronics	12.00	1.25	11.63
OTC	14.88	5.88	Merisel	8.00	0.38	4.92
OTC	15.75	7.00	Microage Inc.	9.00	1.25	16.13
OTC	33.50	17.88	Paychex (H)	33.50	2.25	7.20
NYS	76.88	54.00	Policy Management Sys.	73.50	0.00	0.00
NYS	44.75	28.13	Reynolds and Reynolds	42.25	0.25	0.60
OTC	32.00	21.25	SEI Corp.	24.63	-0.25	-1.01
OTC	24.38	16.88	Shared Medical Systems	21.38	-0.25	-1.16
OTC	30.00	15.50	Sungard Data Systems	27.25	-0.25	0.93
NYS	3.63	1.13	Ultimate Corp.	1.38	-0.13	-8.33

KEY: (H) = New annual high (L) = New annual low
* Companies tracked in Computerworld Stock Index

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IN BRIEF

Intel enjoys strong Q3, I486 sales

■ Citing strong I486 sales, **Intel Corp.** last week reported third-quarter net earnings of $241 million, up 19% from the year earlier period. Revenue increased 20% to $1.43 billion. I486 sales exceeded 80386 sales for the first time, the Santa Clara, Calif., company said.

■ Reacting to a slowdown in demand for its 5995M IBM-compatible mainframe, **Amdahl Corp.** will reduce its 9,700-member work force by 9%, effective next month. The $1.7 billion Sunnyvale, Calif., company expects to post a one-time charge of more than $15 million in the third quarter ended Sept. 27. Last month, the company said it would report a loss for its fiscal third quarter. The firm's results will be disclosed tomorrow.

■ **Wellfleet Communications, Inc.** reported fiscal first-quarter earnings of $4.9 million, an increase of 44% from the comparable period last year. Revenue rose 54% to $32.7 million, the Bedford, Mass., company said.

■ Following its disclosure of an expected fourth-quarter loss, **Advanced Logic Research, Inc.** last week said it will lay off approximately 15% of its worldwide work force. The Irvine, Calif., firm will also impose salary reductions ranging from 5% to 30% for all employees making more than $50,000.

■ **Central Point Software, Inc.** in Beaverton, Ore., said it has raised $17.85 million in private financing, including $8.5 million from Legent Corp. in Vienna, Va. A spokesman at Legent said the companies will exchange technical information, enabling Legent to "get closer to the shrink-wrap desktop" market, a business segment that Legent has "not yet entered."

DEC, IBM post poor financial showing

BY JOHANNA AMBROSIO and MELINDA-CAROL BALLOU
CW STAFF

The computer industry's two largest vendors, Digital Equipment Corp. and IBM, last week reported lower than expected results for their most recent quarters as both struggle to re-engineer their businesses.

Wall Street reacted negatively to IBM's financials (see chart), as the company's stock price slid from $78 to $73 the day of the announcement. "I was surprised," said Sam Albert, a consultant in Scarsdale, N.Y. "The results were not as strong as I thought they would be."

IBM Chairman John Akers said in a prepared statement that he was "disappointed" with the results and that business was hurt by "economic turmoil" in Europe, as well as "economic weakness" in the U.S. and Japan. Hardware profits, especially in the personal computer line, were hit by price pressures, he added.

Nor is IBM out of the woods yet. Although the company has completed the lion's share of its restructuring with its breakup into 14 lines of business, IBM's success in 1993 will depend largely on how well it executes its new business strategy and on the economy, analysts said.

DEC pointed to continuing weakness in the global economy for its fiscal first-quarter loss of $260 million (see chart). Analysts had expected a quarterly loss of $150 million to $250 million.

"I think [this loss] implies that Bob Palmer's got his work cut out for him," noted John Jones, a senior analyst at Salomon Brothers, Inc. in San Francisco, in reference to DEC's new chief.

Company officials, however, were cautiously optimistic that the firm's ongoing cost-cutting would pay dividends by the second half of the fiscal year.

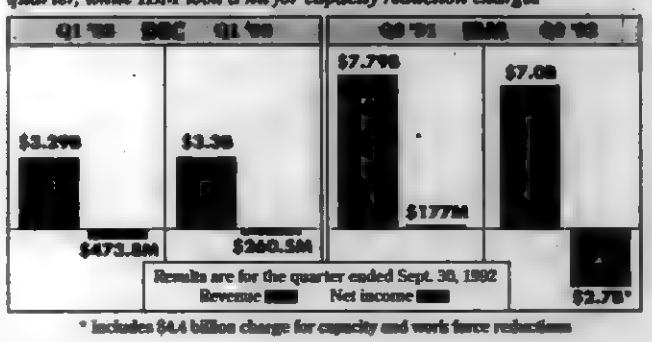
"The restructuring actions and expense reductions have not yet yielded the return to profitability that we're working on, but we expect progress in that direction in the next few quarters," said Bill Steul, vice president of finance at DEC. And Wall Street seemed to react favorably to a clearer statement by DEC officials about plans to downsize: DEC shares rose 1¾ on 37¹⁄₈ on consolidated New York Stock Exchange volume of 751,200.

DEC's restructuring included a decline in the employee population by 5,300 — 4,300 were laid off, while 1,000 positions were cut by attrition, he said. The rate of the "involuntary separations" will increase during the next few quarters as the firm seeks to prune its ranks by an additional 20,000, said Jack Smith, senior vice president of operations.

The officials were also cautious in their assessment of the effect DEC's upcoming Alpha line would have on revenue growth. Though the erosion of VAX sales has now been stemmed via the Alpha-ready program, according to Smith, actual revenue increases from new Alpha product introductions are expected to "click in during the next fiscal year."

Black and blue

DEC's net income continued to be below expectations in the first quarter, while IBM took a hit for capacity-reduction charges



* Includes $4.4 billion charge for capacity and work force reductions

Sources: DEC and IBM

Microsoft's Windows edge pays big dividend

BY CHRISTOPHER LINDQUIST
CW STAFF

Last week's quarterly reports from Microsoft Corp. and software rival Borland International, Inc. make it clear, analysts said, that Microsoft's dominance in the Windows market is paying off handsomely, while Borland struggles to catch up because of its later entry into the market.

Microsoft reported net income of $209 million, a 45% increase over the same quarter last year. Borland, meanwhile, posted a net income of $5.4 million, compared with a net loss of $103 million in the same quarter last year because of a $110 million charge from its acquisition of Ashton-Tate Corp. (see chart).

Analysts said Microsoft has continued to demonstrate that it can make hay even while the sun is not shining on the software industry. Microsoft's early investment in its Windows technology continues to pay healthy dividends as users move to that platform and find Microsoft applications ready to buy.

Ahead of the field

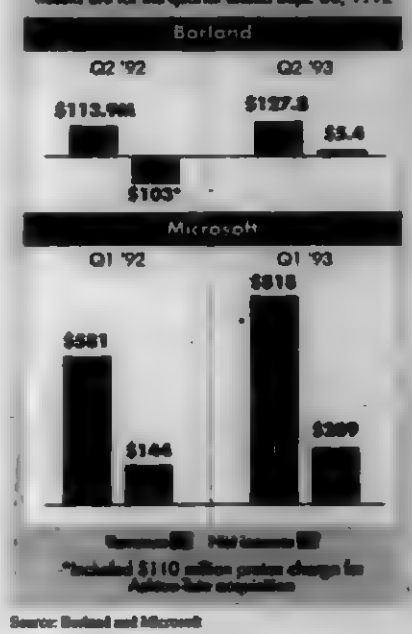
Gibbs Moody, an analyst at Prudential Securities, Inc., noted that some 70% of installed personal computers are not truly Windows-capable machines, and as such, Microsoft may still have considerable breathing room in that market.

Borland, on the other hand, is still trying to get some seeds planted. With the DOS market dwindling and its Windows applications slow to move out the door (see story at left), Borland has some catching up to do. "This really is a critical juncture for [Borland]," said Will Fastie, an analyst at Alex. Brown & Sons, Inc. He noted that while the recent release of Quattro Pro for Windows will help the company, if rumors of slippage in Paradox for Windows' scheduled year-end ship date prove true, they could negate any improvements.

Meanwhile, Borland's loss could be Microsoft's gain as it seeks to ship its own Windows database, Access, about the time of Comdex/Fall '92 next month.

Quarterly contest

Despite its competitive product positioning, Borland's revenue and net income are not growing nearly as fast as Microsoft's



Source: Borland and Microsoft

Off to a slow start

The long-awaited Quattro Pro for Windows has shipped, but early indications are that it may fall slightly short of the "best-of-breed" goal Borland had set for the product. A recent review in *Infoworld* placed it a close second behind Microsoft's Excel and Lotus' forthcoming 1-2-3 for Windows Release 2.0, which is reported to be much improved and will feature "Chronicle," the first workgroup technology built into an application.

In addition, while sales have been good, according to Borland, recent reports from Wall Street analysts indicated that they may not be as good as expected. "Initial orders have been OK," said David Weiss, director of advanced technology at Merisel/Softsel Computers, a large reseller. But it "certainly did not have the kind of initial impact that something like Excel did."

Borland said analysts were prematurely knocking Quattro Pro for Windows, noting the product entered the distribution channel only three weeks ago.

CHRISTOPHER LINDQUIST

DASD sales

According to respondents:

- More than two-thirds of the sites have acquired DASD within the past year.
- More than 50% of the acquisitions reported were second-hand devices.
- Most DASD is purchased from either the manufacturer or from a broker.

Average number of months since last DASD acquisition: **12.5**

Units

	1990	1991	1992
IBM	470	833	1,338
HDS	10	253	239
Amdahl	128	55	122
Storage Tek	23	25	87
Memorex Telex	12	29	55
Comparex	–	29	43
EMC	13	13	35

Percentage of sites

	All IBM	All PCM
Bought from broker	39%	12%
Bought from manufacturer	26%	58%
Operating lease from other lessor	19%	24%
Operating lease from IBM Credit	8%	0%
Finance lease from other lessor	4%	6%
Finance lease from IBM Credit	4%	0%

1991	1992
24%	28%

Base: 597 U.S. mainframe sites and 315 international sites

Source: Xephon/WPWS, Oviedo, Fla.

Stephanie Faucher

The 5th Wave

"I WISH SOMEONE WOULD EXPLAIN TO PROFESSOR JONES THAT YOU DON'T NEED A WHIP AND A LEATHER JACKET TO FIND A LOST FILE."

INSIDE LINES

Not on deck — yet

➤ DEC is expected this week to disclose drastic overhauls of its business practices that will result in price reductions of about 45% for a range of products, including imaging and video, printers, networking and storage, according to sources close to the company. Volume discounts and fixed pricing are expected to be part of the announcement.

Advisory moves

➤ IBM this week will formally launch a unit designed to provide a single point of contact for IBM consulting services clients. IBM Consulting Group will be headed up by Bob Howe, who joined Big Blue from Booz Allen & Hamilton last year.

Sharing the RISC

➤ Hewlett-Packard next week will launch a client/server solutions program that will enlist two integrators — Computer Sciences and Science Applications International — to help implement enterprisewide client/server gear from HP and other vendors. HP intends to provide users with pretested, preloaded hardware and software through a single provider. The program includes 35 products revolving around a PA-RISC server and supports clients running MS-DOS, Windows, New Wave and Macintosh System 7.0.

Clearing the smoke

➤ The hazy air around the IBM/Chipcom smart wiring hub alliance cleared a bit last week at Networld '92, as executives from both companies offered a glimpse into their plans. Don Haile, an IBM LAN systems director, said the companies are developing an Asynchronous Transfer Mode (ATM) switching module in a wiring hub that would interface to IBM/Chipcom-developed ATM workstation adapters. The module would also link to other vendors' stand-alone ATM switches for internetworking over wide areas or with other populations of ATM networks in wiring hubs. Meanwhile, Dave Fowler, Chipcom's vice president of marketing, said his firm is equipping its hubs with per-port networking, where each network port is a dedicated network that can bridge to ATM.

Multiple reasons

➤ Dell, meanwhile, acknowledged at Networld that operating system delays have made it impossible for the firm to meet an internal goal of offering multiprocessor servers by the first half of next year. Richard Brown, Dell's manager of advanced systems marketing, said his firm had expected SunSoft to deliver Solaris with multiprocessing support on the Intel architecture by year's end. "That's [since] moved out in time," he said. Microsoft's delay of Windows NT well into next year is also a setback for multiprocessing, he said.

Still hoping for an ACE

➤ The Advanced Computing Environment (ACE) initiative may be many months in the grave, but for Sunnyvale, Calif.-based Mips Technologies, the goal of standardized RISC platforms running Windows NT is still alive and kicking. Within the next several weeks, a multivendor committee that calls itself the Mips ABI Group (for Application Binary Interface) will announce a new set of software specifications. These specs will reportedly allow applications to run on several hardware platforms — without modification — as long as they comply with ACE's RISC standards.

What a difference a year makes! At the Fall '91 Cube and Use Unisys user group conference in Denver, attendees moaned about the Blue Bell, Pa., firm's shaky financial status while Unisys executives were busy dodging slings and arrows. But last week, at their Fall '92 conference in Atlanta, attendees and Unisys executives were practically elated, given the computer firm's return to profitability. This week, Unisys will report its fourth straight profitable quarter, according to Reto Braun, the company's president and chief operating officer. To celebrate the good news, Braun donned an Atlanta Braves T-shirt and cap and joined Cube and Use attendees in a round of the "Tomahawk chop," a ritual performed by Atlanta's baseball fans. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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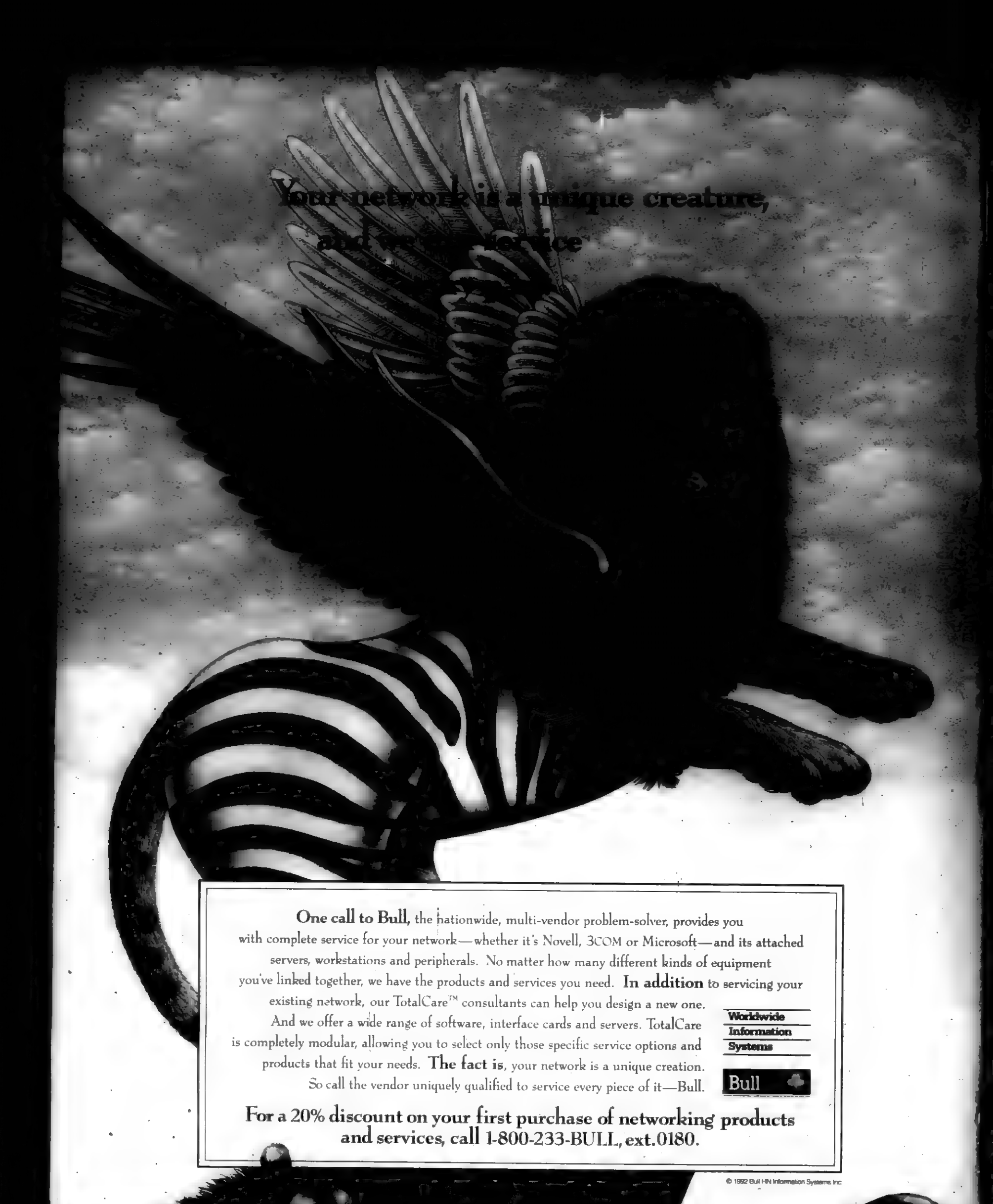

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COMPUTERWORLD

Lotus faces reality on 1-2-3/W sales

But Notes still can't fill spreadsheet's shoes

BY ROSEMARY CAFASSO
CW STAFF

CAMBRIDGE, Mass. — When it comes to defining its Windows spreadsheet success, Lotus Development Corp. last week said it hopes to own about half the market, a notion that would have been inconceivable in the heady days of DOS.

However, this plan shows the company's acceptance of the competitive realities in the Microsoft Corp. Windows-based spreadsheet market as well as its desire to pull away from its reliance on spreadsheets and draw a bigger chunk of revenue from its workgroup and communications products. "We will never have in Windows what we have in DOS," Robert Weiler, Lotus' senior vice president in charge of North American operations, said of the company's spreadsheet business.

Lotus' Robert Weiler

Taking its share

Lotus is now shooting to eventually grab 45% to 50% of the Windows spreadsheet market and will consider that a "very healthy business," Weiler said. Since early 1992, its Windows market share has been hovering in the 30% range. By comparison, it still holds about 80% of the DOS spreadsheet market on a revenue basis; it launched that product in the early 1980s.

Instead, Lotus is increasingly counting on future business from its Notes, CC:Mail and workgroup-enabled applications efforts. While most analysts are

Continued on page 6

E-mail to go wireless

Service to ease remote messaging to mobile users

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — Beckoning to the fast-growing portable PC market, the first wireless electronic messaging service is expected to roll out today at the annual Electronic Mail Association conference.

Wireless network service provider RAM Mobile Data will announce a messaging service over its nationwide radio-based packet data network, as well as a two-way mail service with a wired-mail service provider, according to a source close to RAM Mobile. Twelve to 15 E-mail application and service providers, including Lotus Development Corp., will co-announce wireless communications links for the portable versions of their products, the source added.

Users agreed that wireless messaging is a natural fit with today's growing number of mobile individuals who want to work in real time. A wireless mail network would allow traveling users to send and receive messages and participate in mail-enabled applications without having to plug into a data port. They could

Continued on page 12

IBM pilot reduces outsourcing costs

Plan offers short-term contracts, flexible prices

BY MARK HALPER
CW STAFF

DALLAS — IBM has launched a pilot outsourcing program that gives users lower-cost and shorter-term options than the company currently offers, in part by charging on a flat-fee rather than usage basis.

The program could make it easier for users to selectively outsource various tasks.

In addition, under the fledgling Term Capacity plan, information systems departments would retain greater control over their shops by continuing to run their own staff operations rather than working for IBM.

In an approach falling somewhere between time-sharing and classic outsourcing, Term Capacity calls for IBM to dedicate a designated amount of computing power — including processors, storage and software — to each customer at a remote site.

Fixed pricing

One of Term Capacity's defining elements is a flat-fee pricing structure in which the company charges a fixed rate determined by the off-site configuration.

In contrast, IBM and other outsourcing vendors typically price deals on a per-use basis, by which users sometimes end up paying more than they anticipated as their processing demands exceed predetermined baseline amounts.

Term Capacity contracts would not include the notoriously expensive above-baseline fees

Continued on page 16

Campaign '92

High tech agrees on issues, not candidates

BY GARY H. ANTHES
CW STAFF

Top concerns

IS ranks key tech issues

Investment in IS education and training	1.6
R&D tax credits/ incentives	3.7
Opening global technology markets	3.8
Industrial policy	5.4

Ranked on a scale of 1 to 10, where 1 is most important and 10 is not at all important. Weighted average (base: 200)

Source: CW Database Division

With a week to go before the presidential election, users and suppliers in the information systems sector are divided on whom they want to see in the White House next year.

The lack of consensus is attributed in part to an IS community torn between a desire for change and a fear of the unknown. However, users and vendors are generally united in their desire to have a government that will aid without intruding, improve the economy, reduce the budget deficit and adopt trade, tax and technology policies that will strengthen U.S. competitiveness in global markets.

There also appears to be a strong sentiment, felt even by stalwart Republicans, that President George Bush is an idea whose time has passed. Even so, some support for Gov. Bill Clinton and Sen. Al Gore is clearly tinged with reservations, mostly because of fears that they may erect regulatory roadblocks to innovation and trade.

A *Computerworld* survey of users showed IS professionals soundly endorsing Ross Perot. However, PC users and vendors polled at two recent

Continued on page 24

Software makers fear downsizing toll

Lower profit margins, higher development costs slow client/server shift

BY JEAN S. BOZMAN
CW STAFF

COLORADO SPRINGS — A double whammy of high development costs and low profit margins is making it hard for many IBM large-scale software vendors to make the transition to client/server and Unix environments. Traumatic pricing issues for vendors could result in higher support costs for users.

Mike Johnson, head of information technology at $40 billion Unilever PLC in London, urged vendors during his keynote address at the Information Technology Association of America meeting last week to make the switch. "Why are you guys so slow in moving to open systems?" he asked.

Noting that Europe was far ahead of the U.S. in adopting open systems, Johnson said Unilever has a global open systems architecture built on industry standards.

One vendor who did not wish to be identified said many of his colleagues had miscalculated by staying exclusively in the IBM world too long. "Now they're being brought up short," he said. "They're being driven to do this by their own customer base."

But the issue for some audience members seemed to be the cost of migration, the loss of mainframe-level profits and increased support costs.

"A company that needs to

Continued on page 15

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INSIDE

Chris E. Bleasmer, CEO of Fireman's Fund of New Jersey, credits outsourcing with taming a "very hostile" business environment. See The CEO View. Page 133.

PaineWebber plays outsourcer. Page 4.

EXECUTIVE BRIEFING

October 26, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

CAMPAIGN '92

THERE IS LITTLE CONSENSUS among IS users and vendors as to who should occupy the White House next year, but the desired result is summed up by Intel official Michael Maibach: "We need desktop, user-friendly, 800-number government, not mainframe, top-down, bureaucratic government." *Page 1*

OBSERVERS SAY A CLINTON ADMINISTRATION would have a strong high-tech agenda, including tax breaks for R&D and closer government/industry collaboration. *Page 24*

ELECTRONIC TOWN MEETINGS could empower the citizenry, but lots of tricky issues — such as who controls the agenda — must be worked out first. *Page 25*

SOFTWARE EXECUTIVES at last week's ITAA meeting were interested in a policy that would encourage investment tax breaks, protect software copyrights and broaden access to overseas markets. *Page 25*

SHOULD GOVERNMENT get more involved with the high-tech industry? Ponder that as you vote next week, executive editor Paul Gillin suggests. *Page 32*

OUTSOURCING

IBM LAUNCHES a pilot outsourcing program that offers users lower cost and more flexible, shorter term options, in part by charging on a flat-fee basis. *Page 1*

PAINEWEBBER'S first attempt as an outsourcer succeeds; now it's seeking other customers. *Page 4*

FIREMAN'S FUND OF NEW JERSEY uses outsourcing to grow in 18 months from a dead stop to a flourishing business with 30,000 policyholders. CEO Chris Bluemer says farming out claims processing helped his insurance subsidiary grow. *Page 133*

PC SOFTWARE

MICROSOFT WILL ANNOUNCE a Windows for Workgroups card. *Page 6.* Microsoft and Novell are reportedly arguing over the unexpected inclusion of some NetWare code in the product. *Page 8*

A LOTUS OFFICIAL says the company will be happy if it gets less than half the Windows spreadsheet market, showing how Windows has altered the competitive landscape. *Page 1*

THE BULLETIN BOARDS have been buzzing with talk of Quattro Pro for Windows, Microsoft Word and Gateway 2000, according to bulletin board watcher Chris Lindquist. *Page 37*

A NEW MICROSOFT PRODUCT is aimed at making EIS creation easier with Excel. *Page 37*

PC HARDWARE

LET THE PRICE WARS begin — again. IBM introduces inexpensive ValuePoint line just as Compaq chops prices on its own machines. *Page 8*

DEALERS SELLING CHEAP PCs often try to pass off their goods as more expensive systems by using highly questionable methods. Learn how to avoid some of these common tricks. *Page 146*

HYUNDAI REVAMPS its product line but has a hard fight ahead of it in the PC marketplace. *Page 37*

DELL AND ALR bring out new server products in an effort to strike back at Compaq. *Page 73*

WORKSTATIONS

▶A new crop of hardware from Sun, DEC and HP will arrive on the workstation scene in two weeks, powered by new versions of advanced RISC chips. *Page 10*

▶Creativity and donated computer equipment are key for the IS staff at the Massachusetts Society for the Prevention of Cruelty to Animals as they embark on a transition to a networked PC environment. *Page 37*

CLIENT/SERVER

▶Software vendors at the ITAA conference worry about having to re-engineer their products for client/server systems and Unix environments. Many are concerned about how quickly they can recoup high re-engineering costs with the lower priced products. *Page 1*

▶Microsoft announces a new application programming interface that supports more than 100 services used in IBM's SNA. *Page 119*

▶Sterling Software is readying a suite of enterprisewide storage management software modules in anticipation of demand for client/server products. *Page 112*

▶Hewlett-Packard teams up with integrators CSC and SAIC and a host of software vendors to offer prepackaged client/server products. *Page 108*

MANAGEMENT

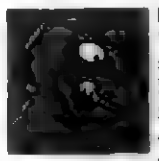
▶Chase Manhattan Bank is about to embark on a multiyear project designed to provide a common computing architecture for more than 350 regional branches. *Page 4*

▶IBM formally unveils the IBM Consulting Group, whose charter is to help customers apply information technology investments toward business strategies. *Page 16*

▶Joshua Hammond, president of the American Quality Foundation, reflects on the hard truths about quality improvement that U.S. businesses are reluctant to face. *Page 33*

▶Management guru Peter Drucker says IS people should focus on providing data, not information. MIT Sloan School Dean Lester Thurow advises CIOs to start thinking more about Europe. *Page 136*

▶The federal government sets up an electronic bulletin board with information for the nation's small businesses. *Page 105*



▶A former "mainframe dinosaur" tells about how he is unable to find work because all of his microcomputer skills are self-taught. *Page 138*

▶Do your users refuse to leave you alone? Do they keep pestering you about things like "competitive advantage" systems? Mike Cohn shares some insider secrets about how to stall, sidestep and otherwise avoid these nags. *Page 33*

WIRELESS NETWORKING

▶The first wireless messaging service, expected to roll out today from RAM Mobile Data and several partners, will provide electronic mail to users on the go. *Page 1*

▶Motorola introduces the first wireless communications card in the tiny PCMCIA format. It is the first of what analysts expect will be many I/O cards for the PCMCIA standard. *Page 20*

▶Wireless LANs make headway as Motorola beefs up Altair's performance and brings it into the SNMP management fold. *Page 50*

LOCAL-AREA NETWORKS

▶Univel, the Novell/USL joint venture, has many customers excited about building mixed Unix/PC LAN networks. *Page 83*

▶A PC LAN market report predicts that Fiber Distributed Data Interface over copper will help replace Ethernet as the network of choice. *Page 50*

INTERNETWORKING

▶Router maker Wellfleet Communications forms a consulting partnership program aimed at optimising router network design and health. *Page 85*

▶DEC maps out its transition strategy to high-speed ATM networks, which includes router and hub interfaces within a year. *Page 49*

ELECTRONIC MAIL

▶The messaging industry will make strides toward resolving the interface wars at this week's Electronic Mail Association conference. The moves should allow users to get on with their mail-enabled applications. *Page 12*

▶IBM offers a gateway between its host-based E-mail products and LAN-based E-mail systems. *Page 12*

OBJECT-ORIENTED DEVELOPMENT

▶Object-oriented databases are not widely used in commercial settings — yet. Coming standards for interfacing them with conventional relational databases could make them more attractive. *Page 28*

▶A new development environment includes a C++-compatible incremental compiler, an application framework and class libraries. *Page 122*

▶Object-oriented database management is strutting its stuff as increasing use of complex data types play to its strong point. *Page 122*

Application development
• Here's some advice from battle-scarred CASE users: Think big, know your vendor, attack the right problems and bone up on project management. ..... Page 119
• A newly updated Cobol development tool allows computer programmers to analyze their CICS programs for maintenance or redeployment on other types of platforms. ..... Page 119

Notebook PCs
• The notebook market is splitting into performance and pricing segments, with users eager for the advantages of both. ..... Page 8

Careers
• Demand for professionals skilled in managing large LANs is strong and may be a career opportunity for people with mainframe and enterprise networking backgrounds. ..... Page 47

Videoconferencing
• Group videoconferencing is gaining a foothold as travel-saving benefits mount, a report says. ..... Page 88

Services
• Unisys tries to make some inroads in the network services arena. ..... Page 83
• Texas signs a $10 million software and consulting deal after carefully planning its RFP. ..... Page 107

Net management
• SNMP will make way for SMP at this week's Interop show. ..... Page 83

Mainframe software
• Tesseract improves the performance of its human resources software by about 30%. ..... Page 106
• DEC furthers its EDI support and offers new integration software for IBM mainframes. ..... Page 113

Security
• Cryptography and access controls can prevent foreign governments from tapping into faxes, cellular phone conversations and electromagnetic emissions. ..... Page 129

Industry
• Some big names in the computer industry racked up losses this quarter and blamed their troubles on the economy. ..... Page 153

Midrange computing
• DEC seeks to woo customers with lower pricing on commodity items. ..... Page 20

Departments

Advanced Technology 28
Application Development 119
Calendar 136
Company Index 151
Computer Careers 138
Computer Industry 153
Desktop Computing 37
Editorial/Viewpoint 32, 33
Enterprise Networking 83
Friday Stock Ticker 152
In Depth 129
Inside/Lines 154
Large Systems 107
Management 133
Marketplace 146
News Shorts 6, 16
Workgroup Computing 47
WYSIWYG 154

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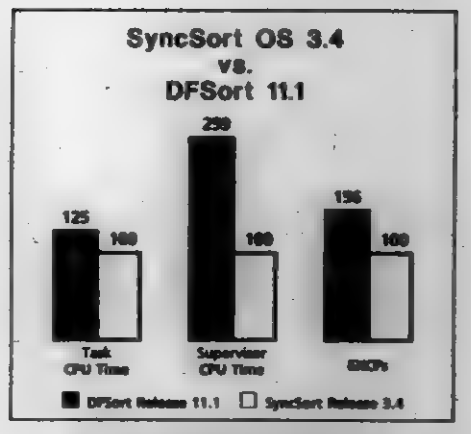

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Chase Manhattan to unify IS infrastructure

Multimillion dollar plan will link 350-plus branches to provide better customer service

BY TOM HOFFMAN
CW STAFF

NEW YORK — The Chase Manhattan Bank NA will soon announce a multimillion dollar information systems project aimed at laying a common IS foundation for its 350-plus regional banking branches. Anticipated results include improved customer service and greater efficiencies.

The $97 billion bank holding company will name a primary contractor within the next month to help Chase carry out the multiyear effort, according to Philip M. Giaquinto, senior vice president of retail bank operations and systems. Giaquinto would not reveal the name of the contractor or the size of the contract.

Philip M. Giaquinto: *'What we want to develop is a common customer file across the enterprise'*

The project will provide Chase's regional branches with a common computing architecture so that Chase's one million branch customers can walk into any branch and receive the same services regardless of location, according to Michael A. Levine, a Chase vice president.

Chase's plans include linking all branches in New York, Connecticut, Maryland and Arizona to one another through a Chase data center in Lake Success, N.Y.

"What we want to develop is a common customer file across the enterprise," Giaquinto said. "Customer service is driving everything we're doing. What we want to develop is a seamless interface for customers no matter what branch they walk into."

Giaquinto said the architecture will be designed to help Chase improve branch efficiencies by shortening waiting lines and teller efficiencies by providing on-line customer information at all branches.

In addition, Giaquinto said, the common platform will help Chase simplify its computing requirements as it acquires branches in other regions. Without specifying the acquisitions Chase is pursuing, Giaquinto said Chase plans to open an additional 400 to 500 branches, primarily in the Northeast, during the next few years.

Chase's goal to develop a common platform for its regional branches is admirable, noted Diogo Teixeria, a banking analyst at Ernst & Young in New York. "Not many banks have been able to do that because of technological factors and the cost involved," he said, counting Society Bank in Cleveland as one of the few banks making such an effort.

One decision down

Chase has already decided on one common element for its branches: Microsoft Corp.'s DOS-based financial applications developed by MicroBuilt-OnLine Corp., an Atlanta software developer, which were designed to run on IBM Personal System/2 workstations.

Chase's recent branch automation efforts have helped lay the foundation for the common architecture, Levine said. The bank has spent between $25 million and $30 million during the past three years in branch automation technologies ranging from 4,000 new Intel Corp. 1486-based IBM PS/2 workstations to image-based signature-verification check processing systems, Giaquinto added.

During the past year, Chase has rolled out a pilot program to 30 regional branches in downstate New York as part of a program called MetroLAN. Giaquinto said the pilot project will serve as the foundation to unify the other branches under a common operating environment. The MetroLAN project currently comprises IBM's OS/2 2.0 local-area network operating environment, but Levine said the bank has not yet decided whether it will use OS/2 or Novell, Inc. LANs to serve as the common LAN environment for all branches.

Chase's Brooklyn, N.Y., branch at its Metrotech facility was one of the first branches to operate under the pilot program. Kenneth Madison, the branch manager in Brooklyn, said the common computing environment and branch automation upgrades have helped improve teller efficiency and reduce customer waiting lines at the branch.

"The tellers say the menu-driven screens are much easier to use than the character-based screens we used to have here," Madison said.

Madison mentioned a prototype "proofing" system that the Brooklyn branch and other pilot branches have been using. The proofing system, based on proprietary software developed by Chase, captures each transaction that every teller conducts throughout the course of each business day. The system enables Chase to keep an accurate assessment of every transaction its branches process.

Most Chase branches are currently supported by IBM 4700 banking systems that rely on the LU0 protocol for host-to-branch communications. Levine acknowledged that LU0 is a dated protocol but said the bank intends to stick with it, at least through the transitional phase-in of the common architecture until the bank eventually upgrades to LU6.2 peer-to-peer connectivity sometime in 1994.

Giaquinto said the IBM 4700 systems have been in place for 15 years and are nearing the end of their life cycle.

He also said Chase expects to extend the common platform to 60 branches in downstate New York 1993. He said the remaining branches would be connected by the end of 1995.

Branching out

➤Chase maintains approximately 180 branches in downstate New York — including New York City and its five boroughs — 120 branches in upstate New York, 55 branches in Connecticut, 8 branches in Maryland and 3 in Arizona.

In the past, Chase developed separate computing architectures for each region. Under a common platform, the branches will be able to communicate with one another and provide identical services to Chase customers.

PaineWebber takes on new outsourcing role

Success inspires plan to take on more customers

BY JOHANNA AMBROSIO
CW STAFF

WEEHAUKEN, N.J. — Sometime in mid-1991, Gerry Higgins, PaineWebber, Inc.'s senior vice president of technology, looked around the data center and saw lots of empty space. After some thought, the firm entered an unusual user-as-outsourcer role six months later; now it is searching for additional clients.

In fact, both PaineWebber and its first outsourcing customer — Englehard .Corp., a specialty chemical manufacturer in Iselin, N.J. — consider the deal so cost-effective for both sides that they are now talking about expanding the relationship.

The excess capacity was in part because of changing requirements from internal PaineWebber customers and also because of technology advances that allow mainframes and disk drives to take up less space. But rather than "turn the empty space into a bowling alley," Higgins said, "I decided to put it to good use."

Stephen Pook, Engelhard's director of information services, approached Higgins in late 1991 after hearing that PaineWebber had excess capacity, and the deal was struck.

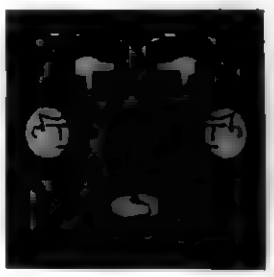
No grandiose scheme

Still, PaineWebber is not seeking to become "another Electronic Data Systems," Higgins said.

Under the deal, PaineWebber houses its client's IBM 3090 mainframe and software. This has allowed Englehard to close its own data center, thus far saving about 20% of the costs of operating its own facility, Pook said.

Other benefits have been more indirect. "Because of the business that PaineWebber is in, they have far higher standards for reliability, security and availability than we had," Pook said. "We can now take advantage of those. And we now have access to technology we couldn't have afforded before."

PaineWebber, for its part, has received a "modest" fee, Higgins said. Although he would not provide financial specifics, he said, "It allows me to reduce the costs of providing technology services to my internal PaineWebber clients."



It was largely for that reason — cutting overhead — that Higgins said he began thinking of providing outsourcing services at all. "We had already implemented several successful programs to reduce expenses," he said, including making the communications network more efficient. "But at a certain point, you flatten out on the cost-reduction curve because you don't want to impact services. By accommodating somebody else, you get another drop on the curve."

Chris Disher, a senior manager at consulting firm Nolan, Norton & Co. in Chicago, said there are only about 20 to 30 such relationships where end-user companies provide outsourcing services to other users.

Engelhard and PaineWebber are now talking about possibly allowing PaineWebber's information systems staff to handle the operations and some technical support for the Engelhard machine. About 30 Engelhard staff members have been doing those jobs remotely.

In addition, Higgins said, PaineWebber is looking for a "few" more customers, perhaps up to five more. "We can offer a price advantage over a traditional outsourcing vendor because we don't have a marketing staff or brochures, and we don't give out hockey tickets," he said. PaineWebber is offering a broad array of services, including operations, systems programming and communications.

The only area not up for grabs is applications programming. "Our developers are focused on PaineWebber's business," Higgins said.

Although Higgins said getting into the outsourcing business is something other large companies should consider, Disher disagreed. "Getting into outsourcing can be pretty treacherous," he said. "You need the expertise and the discipline to provide services to another organization. That's very different from providing for internal needs."

In fact, he said, users considering this option should primarily focus on it as a corporate strategy rather than doing it because of excess capacity.

Higgins said the jump into outsourcing did not require a tremendous change in corporate culture at PaineWebber because the company already provides some services to external brokerage clients that run jobs on PaineWebber computers.

The Engelhard deal did, however, represent the first time that another company's computer had been brought into the PaineWebber data center.

"It required a reorientation," Higgins said. "But it's a good thing to inject into the culture because we should all treat our internal customers the same way we treat the external ones."

DATABASE INTEGRITY SYBASE VS. ORACLE7

SYBASE:
PROGRAMMATIC AND PROPRIETARY
MORE THAN 200 LINES OF CODE*

ORACLE7:
AUTOMATIC AND STANDARD
ONLY 7 LINES OF SQL

```
/*    Make sure deleted manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*    Make sure deptno column of inserted emp rows is either null
      or specifies an existing department. Also make sure that
      mgr column of inserted emp rows is either null or specifies
      an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*    check "emp.deptno <--> dept.deptno" foreign/primary
            key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*    check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

```
CREATE TABLE DEPT
    (DEPTNO NUMBER(2) PRIMARY KEY,
    DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
    (EMPNO NUMBER(4) PRIMARY KEY,
    MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
    DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES DEPT);

CREATE TABLE PROJ
    (PROJNO NUMBER(4) PRIMARY KEY,
    BUDGET NUMBER(7,2),
    DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES DEPT
        ON DELETE CASCADE);
```

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NEWS SHORTS

IBM slates trimmed-down OS/2

IBM officials confirmed last week that the company will ship a streamlined version of OS/2 2.0 early next year designed to run more efficiently on 4M-byte systems. IBM plans to reduce the size of OS/2 by rewriting some code and eliminating other redundant code. Although users can run OS/2 on 4M-byte machines, IBM admits that without a 6M-byte or higher configuration, users are not able to run several applications in multitasking mode.

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PRC wins big defense job

PRC, Inc., a unit of Black & Decker Corp., won a U.S. Department of Defense systems integration job that could be worth as much as $2.5 billion over nine years. McLean, Va.-based PRC will supply minicomputers and servers from Hewlett-Packard Co., workstations from Everex Systems, Inc. and software from Oracle Corp. and Uniplex Integration Systems, Inc. PRC beat out Control Data Systems, Inc. for the job.

. . . . . .

DiNardo joins Coopers

George DiNardo, formerly chief information officer at Mellon Bank Corp. in Pittsburgh, has gone east. After working as an independent consultant and college educator, he is now a partner at Coopers & Lybrand in New York, heading up the information systems portion of the company's newly reorganized financial industry consulting practice.

. . . . . .

Network help desk tools released

Employees and products from Boeing Computer Services' now-defunct Network Management Systems and Services venture have resurfaced as Networx, Inc., a Bellevue, Wash., purveyor of network help desk and inventory management software. Unix-based Paradigm is said to correlate network alerts and user complaints as well as help desk managers' responses to them, all the way through to resolution. Priced at $9,950, it is scheduled to ship in December.

. . . . . .

Equifax outsources to ISSC

Equifax, Inc., which earlier this year was victimized by hacker break-ins [CW, April 27], is negotiating with IBM's Integrated Systems Solutions Corp. outsourcing subsidiary to contract out portions of its data processing operations. Separately, AMR Corp.'s AMR Information Services, Inc. unit recently won a contract to replace Electronic Data Systems Corp. as the reservation systems provider to Alaska Airlines. The 10-year deal kicks off in April.

. . . . . .

Short takes

American Management Systems, Inc., the systems integrator and software company based in Arlington, Va., made its succession plan clearer last week by promoting Paul Brands to vice chairman and Philip Giuntini to president of the corporation...**Apple Computer, Inc.** has knocked **IBM** out of its traditional spot as the biggest PC maker, according to **International Data Corp.** In the second quarter of this year, Apple shipped some 617,000 units worldwide, while IBM sent 581,000 units out the door.... **KnowledgeWare, Inc.** rebounded from a $4.9 million quarterly loss in the comparable period last year with profits of $743,000 for its fiscal 1993 first quarter, and reported a 36% sales increase to top $29.4 million.... **Borland International, Inc.** topped two categories in the J. D. Power & Associates end-user satisfaction survey on software with its Paradox database management system and Quattro Pro spreadsheet, while **Software Publishing Corp.**'s Professional Write was the top-rated word processor.... **IBM** announced a new way for employees to get their voices heard through IBM Ideas, which provides bonuses typically ranging up to $5,000 for ideas that please customers, speed product cycles, reduce energy costs or improve quality. "Outstanding" ideas that save the company a lot of money may be worth $150,000.

More news shorts on page 16

Microsoft targets workgroups

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp.'s Windows for Workgroups is slated to hit the water tomorrow, and the splash that it will make is expected to ripple throughout the user and vendor communities.

But while analysts and users have long indicated that there is interest in the product, it will be the applications that will float or sink the peer-to-peer environment for Windows.

The product's success could also be affected by a licensing spat with Novell, Inc. Windows for Workgroups incorporates client code for NetWare, a fact that reportedly came as a surprise to Novell, which fields a rival package (see story page 8).

Kits coming

At its recent strategy day, Microsoft said it will provide low-cost, workgroup-enabling tool kits for several of its own products, including Excel and Word. The kits are expected to be available six to 12 months after the Windows for Workgroups announcement.

Such add-ins will provide links to the mail and file-sharing capabilities of Windows for Workgroups, which is a peer-to-peer network version of Windows. Several Microsoft applications were built with Windows for Workgroups in mind and already take advantage of some features, such as Network Dynamic Data Exchange.

Other vendors will have to provide their own links to the environment. And while several vendors have announced support, not all are going willingly.

When it ships, a starter kit for Windows for Workgroups will cost about $800 and will include two network cards, a Microsoft Mail client, group scheduling package and a variety of data- and peripheral-sharing features.

A server version of the Mail and Schedule products, which will allow Windows for Workgroups to connect to outside mail systems, will be available for $495. Windows for Workgroups requires a 386 or higher processor to run, as it demands enhanced mode operation.

While these features were not previously available as part of Windows, they, and other enhanced functions, are available in Lotus Development Corp.'s Notes groupware application.

Lotus has said future versions of its products, including 1-2-3 for Windows and Ami Pro, will have support for Windows for Workgroups.

However, a recent "internal" memo distributed by Lotus likened Windows for Workgroups to a "Trojan horse" that is "very dangerous for customers" who plan to use it as a base for workgroup computing or electronic mail. Lotus claimed that the product's applicability will be limited to very small workgroups in homogeneous Windows environments.

And Borland International, Inc., which has been more than reticent about its own workgroup plans, is not exactly brimming with support for Windows for Workgroups.

A Borland spokeswoman said the company has yet to make public any workgroup plans, but will support Windows for Workgroups.

Seizing opportunity

Other vendors are more eager to take advantage of what they see as a potentially large expansion of the number of networks in the world.

One such company is Shiva Corp., which will release a Windows for Workgroups extension for its NetModem/E remote networking package.

Shiva's product allows remote users to access a network as if they were an actual node. Scott Sandler, business alliance manager at the company, said that the addition of peer-to-peer networking into Windows should help feed a move toward building networking capabilities directly into PC hardware.

Lotus faces reality on 1-2-3/W sales

CONTINUED FROM PAGE 1

upbeat about this strategy, they also said these businesses have to grow substantially before Lotus can fully offset its smaller market share in Windows spreadsheets.

Analysts estimate that Notes' and CC:Mail's contribution to current revenue is between 10% and 15%, and spreadsheets still account for about half of Lotus' business.

"The strategy now is banking on the future, which is somewhat risky," said Bill Kesselring, a PC software analyst at Dataquest, Inc. in San Jose, Calif.

There are no guarantees that Lotus will acquire 45% of the Windows spreadsheet market, and in fact, these could prove to be the hardest additional 15 percentage points Lotus has ever worked for, analysts said. Besides Microsoft's Excel, the Windows spreadsheet competition now includes archrival Borland International, Inc., which keeps coming up with unusual promotions, such as the two-for-one deal with the purchase of a DOS and Windows version of Quattro Pro.

Lotus lowdown

Lotus holds line on profits despite slowing revenue

	Revenue	Net income
1991		
Q3	$218.8M	$21.5M
Q4	$249.2M	$5.8M
1992		
Q1	$227.1M	$20.8M
Q2	$220.3M	$14.9M
Q3	$206.7M	$30.1M

Source: Lotus Development Corp.

Secondly, while Lotus has improved 1-2-3 for Windows over last year's version, many users are waiting for Release 2.0, which is supposed to provide a big functional boost. Yet Lotus recently confirmed it would delay shipment from later this year until sometime during the first quarter of 1993.

The competition, combined with Lotus' struggles to deliver, could make the hold on its customer base all the less secure, analysts added.

"If you are now looking at Excel and Quattro Pro for Windows, and Lotus is showing you something but can't say when they'll be getting it out, well, I think Lotus is setting itself up for defections," said Will Fastie, a PC software analyst at Alex. Brown & Sons, Inc. in Baltimore.

However, Fastie and other analysts said that while the company has had its share of lost customers — including some high-profile ones such as Price Waterhouse — it can still count on a large block of users to stick with 1-2-3 in order to avoid the pain of conversion.

"If you are a heavy-duty Lotus customer — and there are a lot of them — converting is a problem," he added. "And that is good news for Lotus. Those IS directors are willing to give Lotus time."

That is what Canadian National Railways is doing. "The reality is we've got a pretty big installed base. We tend to be sticky about moving unless there is a really strong reason," said Ronan McGrath, vice president of IS and accounting.

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Features juicing up plain-vanilla notebooks

BY MICHAEL FITZGERALD
CW STAFF

Cutthroat competition in the notebook market has vendors fighting to escape the plain-vanilla system rut. Judging by the variety of designs and features available or upcoming, one could almost think Baskin-Robbins is about to enter the market.

"We're leaving the era of vanilla notebooks because vendors can't compete unless you have some added value," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. in Santa Clara, Calif. "Notebooks are clearly the hottest segment of the industry, so you have to add features if you want any attention."

"There's going to be an enrichment of features coming that will let vendors create wrinkles of differentiation," said Bruce Stephen, a program director at International Data Corp. in Framingham, Mass. Stephen said he thinks additional features may largely have a cosmetic effect because "everyone is dipping into the same component pool."

Still, there looks to be plenty of mixing and matching on features. Current advances in features include the following:

•PCMCIA cards (AST Research, Inc., NCR Corp. and others). Otherwise known as flash memory, these credit-card-size integrated circuits were initially touted as replacements for hard drives. Instead, the ability of flash to be turned into a modem or an Ethernet adapter card looks to give add-in board flexibility to notebook computers.

•Built-in connectivity (Zenith Data Systems). Lets users automatically plug their notebooks into a network without having to use an expansion station.

•486 power (Toshiba America Information Systems, Inc., Texas Instruments, Inc. and others). Microsoft Corp.'s Windows slows 386SX-based notebooks down, and the imminent appearance of low-volt 486s from Intel Corp., plus low-volt, lower cost alternatives, should see a shift in the notebook market to the 486.

•Color screens (numerous vendors). Soon to be a de rigeur part of a portable maker's product line, prices on passive-matrix screens will fall to near those of monochrome models, and active-matrix prices will continue to drop in the next six months.

•Power management (numerous vendors). Vendors are experimenting feverishly with power-saving techniques, such as turning off the system between keystrokes, to help boost battery life.

•Removable hard drives (AST, IBM, Epson America, Inc. and others). Allow several people to use one notebook, keeping their data on separate hard drives. Can be a security measure as well.

•Chip upgradability (AST, Advanced Logic Research, Inc.). Investment protection for the mobile masses, though it may have no more impact than it now has on the desktop.

•Removable floppies (Panasonic Communications and Systems Co.). Make room for an extra battery for longer life.

•Integrated pointing devices (numerous vendors). The move to Windows and the inconvenience of using a mouse on airplanes is driving this feature.

"The question is, will people pay money for [things like] a finger joystick?" asked Amy Wohl, editor of the "TrendsLetter" newsletter in Bala Cynwyd, Pa.

IS managers contacted generally seemed pleased with the new features.

"The features are important for us here," said Michael Henderson, PC coordinator at James River Corp.'s Neenah Technical Center in Neenah, Wis. Henderson cited his shop's interest in using Windows, which made color, longer battery life and integrated pointing devices particularly useful.

"A lot of the notebooks I was originally going to buy have transmuted into high-powered desktops," said Chad Pearce, network administrator at Miller, Mason & Dickenson's Philadelphia office. Pearce said he meant to buy only notebooks with docking stations for his office this year but said Windows and its power-hungry applications made 386SX notebooks seem underpowered.

Other users cited upgradability and removable hard drives as valuable features. One IS manager said he is skeptical of the push to add more features.

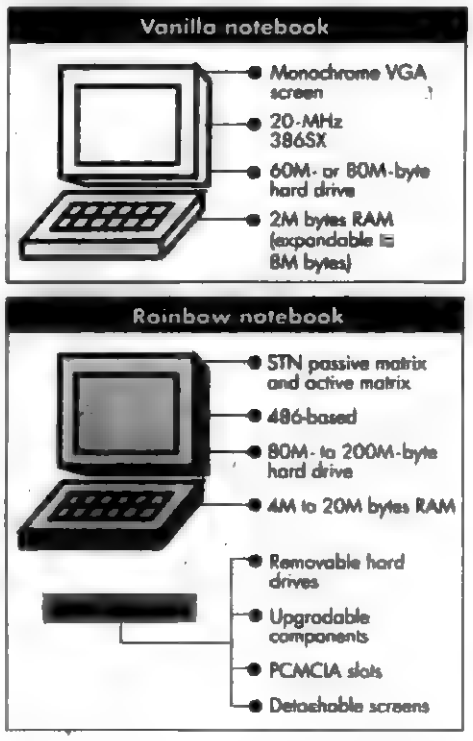
"If [your notebook is] not your only [computing] resource, some of those bells and whistles are superfluous," said Paul Nelis, a network administrator at Caisse Nationale De Credit Agricole's U.S. headquarters in Chicago.

But vendors said technology will not be the thing that differentiates notebooks in the future. Officials said the market would be largely differentiated based on package design, size and improved usability.

High-volume vanilla systems are expected to fall from just below $1,500 to the $1,000 price level by early next year.

Notebook scoop

There is more than just a price difference between high- and low-end notebooks



CW Chart: Stephanie Faucher

IBM unveils PS/ValuePoint machines

Hopes that line will follow Compaq's lead in booming low-cost PC arena

BY MICHAEL FITZGERALD and KIM S. NASH
CW STAFF

NEW YORK — Hoping to follow Compaq Computer Corp. down the low road to success, IBM Personal Computer Co. last week announced its long-expected, low-cost Personal System/ValuePoint line. The machines debuted just as Compaq said its low-cost products, out since June, propelled it to record quarterly sales.

Already, IBM has been strikingly aggressive on pricing, even lowering prices on its new systems the day they were released in response to a small cut Compaq made in its pricing.

Although IBM's success rides on how well it executes now that the machines are finally out, pent-up interest in the firm's low-cost machines could spark sales.

"For the first time ever, we're interested in IBM for PCs," said William Lodge, project leader at Turner Corp., a construction firm in New York.

Jon Holman, director of technology at Brobeck, Phleger & Harrison, a large San Francisco law firm, agreed, saying his company will consider IBM PCs for the first time in two years.

The ValuePoint line starts at $1,299 for a unit based on a 386SLC chip and including a Video Graphics Array monitor. The 425SX, based on the 25-MHz I486SX from Intel Corp., costs $1,629, and the 433DX, based on Intel's 33-MHz 486DX, costs $1,999. The 486-based systems include Super VGA. The models come in a variety of configurations, some of which are bundled with OS/2.

> "THEY'RE ABSOLUTELY for real. They've taken the shackles off and are going to be as competitive as they can possibly be."
>
> ROSS COOLEY
> COMPAQ

Compaq's success with its Prolinea, DeskPro/I and Contura lines is evident in record quarterly revenue of $1.07 billion and profit of $49 million. Sales were up 50% over Compaq's dismal 1991 third quarter. Demand was so hot that Compaq experienced a huge jump in sales, remaining backlogged despite moving 200,000 units last month alone. IBM's PC sales, meanwhile, stayed flat.

"They're absolutely for real," said Ross Cooley, Compaq's vice president of marketing for North America. "They've taken the shackles off and are going to be as competitive as they can possibly be."

IBM is offering seven-day, 24-hour telephone support. Users who buy from the firm's direct-response line will receive on-site service within four hours. ValuePoint looks like a winner, analysts said, but IBM could still stumble.

"These new price points will require IBM to merchandise these products, get out to non-IBM customers and build up a market presence, not take out ads in magazines," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

Microsoft, Novell quarrel over licensing question

BY MICHELE DOSTERT
CW STAFF

When Microsoft Corp. executives briefed press and analysts on its forthcoming Windows for Workgroups package, one of the features they touted was its interoperability with Novell, Inc.'s NetWare local-area network operating system.

Microsoft's demonstration of the product pointed out that it had included the client code for NetWare as well as an icon on the screen that could access NetWare servers.

According to Novell sources, all of this came as a complete surprise to Novell, which had allowed Microsoft free use of NetWare client software in Windows 3.1.

However, the company did not expect to see that code show up in Windows for Workgroups, which, with its peer-to-peer networking capabilities, is a direct competitor to Novell's NetWare Lite peer-to-peer LAN operating system.

Novell spokesmen said only that the two companies were "amicably discussing" the NetWare client in Windows for Workgroups licensing issues and "hoped to have the matter resolved quickly, so Windows and NetWare customers won't be affected."

It remains to be seen whether the issue will be resolved before Microsoft's announcement of Windows for Workgroups, scheduled for this week (see story page 6).

Microsoft, meanwhile, said it is shipping the product despite the dispute and claimed it has a legal right to do so.

Serious business

Analysts familiar with both companies said the dispute is hardly a friendly quarrel and that Novell will demand either that the client software be removed or that it receive a substantial royalty for its use.

Novell sources also indicated that they did not receive a copy of Windows for Workgroups until last week in order to test the product with NetWare.

Staff writer Christopher Lindquist contributed to this report.

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SYBASE VS. ORACLE7

SYBASE
PROGRAMMATIC AND PROPRIETARY
MORE THAN 90 LINES OF CODE

```
/* reset the counter for build of third table */
se
wh
be
    CREATE PROCEDURE la_qty
    /* for use on WESTCOAST server */

    /* returns count for one part only */
    @partno char(6),
    @la_count int output
    AS
/*  SELECT @la_count =
    (SELECT qty FROM la_parts
/*  WHERE partno = @partno)

    DECLARE @cnt int
    DECLARE @counter int
/*  DECLARE @la_count int
    DECLARE @partno char(6)
    SELECT @cnt = COUNT(partno) FROM ny_parts

en  /* ny_parts is the parts master; need count
/*  for sequential comparison with la_parts
*/  to simulate a distributed join */
DR  SELECT @counter = 0
DR
pr  /* create temporary table for part numbers
se  and quantities from ny_parts */
wh  CREATE TABLE #allparts1
be     (partno char(6) NULL,
se     ny_qty int null)
se
EX  /* create temporary table for row numbers
@p  for sequential call of la stored procedure */
@l  CREATE TABLE #allparts2
up     (seq int)

en  /* create temporary table for
    sequential build from first two temp tables */
/*  CREATE TABLE #allparts3
SE     (partno char(6) NULL,
       ny_qty int null,
       la_qty int null,
       seq int)

    /* build sequence numbers for each ny row */
    while @counter 1> @cnt
    begin
       select @counter = @counter + 1
        insert into # all parts 2 (seq) values ( @ counter )
    end

    /* populate temp table with ny parts and quantities */
    insert into #allparts1 (partno, ny_qty)
    select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7
AUTOMATIC AND STANDARD
ONLY 3 LINES OF SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

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Vendor rollouts heat up workstation wars

BY MARYFRAN JOHNSON
CW STAFF

The competitive fires in the workstation market will burn even brighter two weeks from now, when Sun Microsystems, Inc., Hewlett-Packard Co. and Digital Equipment Corp. all roll out new hardware ranging from low-end color workstations to high-end multiprocessor servers.

Expected on Nov. 10 are announcements that will usher in more powerful systems based on new generations of reduced instruction set computing (RISC) chips: HP's Precision Architecture-RISC 7100, DEC's long-awaited Alpha and both the low-end MicroSPARC and high-end SuperSPARC chips co-developed by Sun and Texas Instruments, Inc.

Among the product highlights will be the following:

- A completely revamped line of HP workstations, priced at close to the current lineup but with performance boosted two to three times by the 100-MHz PA-RISC 7100 chip. The chip will also goose the performance of HP's graphics workstations, strengthening the three-dimensional solids modeling capability of that line. A range of multimedia tools for collaborative workgroup computing will also debut.
- At least four new Alpha platforms from DEC, including desktop workstations, deskside and departmental systems and a mainframe-class, four-processor system. Pricing is expected to range from $15,000 for the workstation to $300,000 for the data center machine. Except for the high-end system, the Alpha boxes are slated to ship within 30 days of the announcement.
- A pair of low-end color workstations from Sun, based on the 50-MHz MicroSPARC processor, are slated to ship before year's end. Pricing is expected to run from $4,000 to $8,000. On the high end, Sun will bring out a SuperSPARC-based multiprocessor server with five to 20 CPUs and new Xbus technology that improves I/O throughput. Analysts said they do not expect deliveries until spring 1993.

Sources close to Sun said it will also offer a host of new customer integration services designed to make IS executives feel more comfortable working with Sun. "As they move into this more conservative kind of market, the question is whether they're still viewed as being too brash," said Marc Schulman, president of Technology Strategies Group, Inc. in Stamford, Conn.

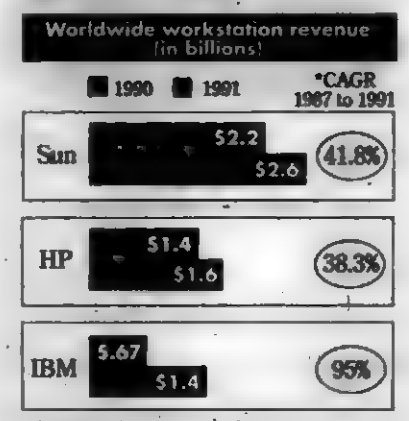
Pressure mounts

This upcoming round of announcements will intensify the pressure on Sun as the workstation leader, several analysts said. "What I don't see out of Sun are the truly innovative, leading-edge, push-the-technology type of products," said Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif. "That's not true of HP or IBM, who consistently keep warring on price/performance leadership."

The DEC and HP machines are powered by chips with 100-MHz clock speeds, while Sun's SuperSPARC chip is only now reaching volume production of 40-MHz versions. Still, some customers and analysts noted that performance comparisons are becoming increasingly confusing, with vendors such as DEC quoting SPECmark ratings from the 1989 standard and Sun quoting the newer 1992 SPECmarks.

Playing catch the leader

Sun still holds its leadership spot, but IBM and HP are gaining



*Compound annual growth rate

Source: Dataquest, Inc. CW Chart: Stephanie Faucher

"I don't care what the vendor says [about performance ratings]. It only means something to users when it's running their data and their programs in their environment. Then how fast is it?" said Pat Thomas, MIS director at Hickory White, Inc., a furniture manufacturer in Highpoint, N.C., that will install a Sun 630MP machine in a few months.

Sun's multiprocessor strategy will reach another key goal in December, with the release of Solaris 2.1, which can handle the symmetric multiprocessing necessary to scale up to several processors.

Sun officials said they expected volume shipments of the MicroSPARC-based color workstations to ramp up quicker than the SPARCstation 10 line has with its complex SuperSPARC "Viking" chips. The catch with the MicroSPARC machines, however, is that they run Solaris 2.0 only. Currently, the SPARC application base can only be run under 2.0 through an emulation feature called Solaris 1 compatibility.

Senior writer Melinda-Carol Ballou also contributed to this report.

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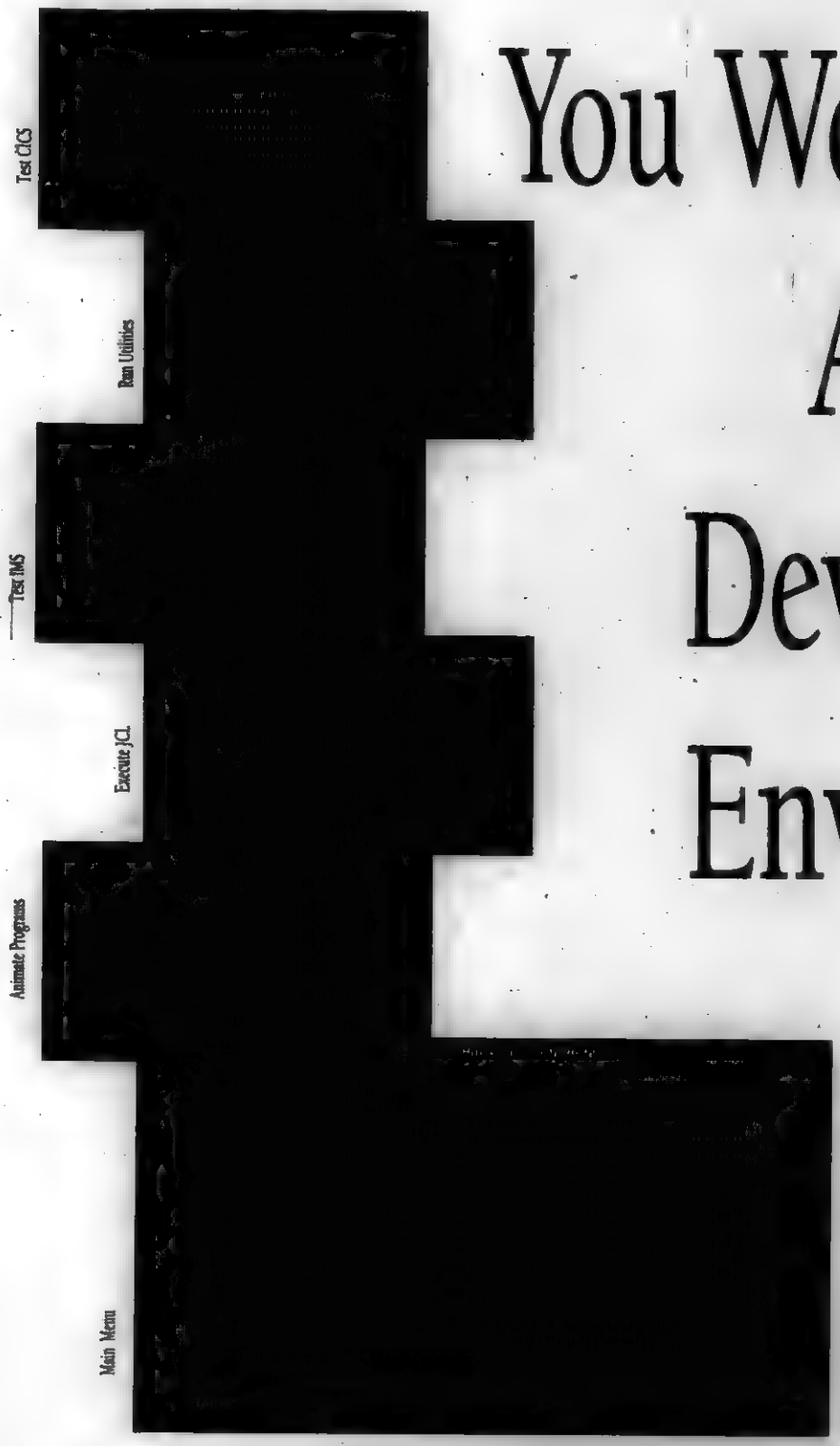

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Lotus to embrace MAPI specs

Truce nears in interface wars; VIM firms unite to accept MAPI calls

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — The political struggles that have stunted the progress of mail-enabled applications will reportedly wane at this week's Electronic Mail Association (EMA) conference, with standards proposals by the X.400 Application Programming Interface Association (XAPIA) and a welcome announcement from Lotus Development Corp. President Jim Manzi.

According to two sources close to Lotus, Manzi will announce increased Lotus support for Microsoft Corp.'s Messaging Application Programming Interface (MAPI) during his keynote address. Manzi is expected to say that the nine companies in a Lotus-led camp, backing what is known as the Vendor-Independent Messaging (VIM) interface, will integrate components of MAPI to ease development of Microsoft's Windows applications.

This is good news for users who have been disgruntled by the 18-month mail API gridlock, in large part because users see mail-enabled applications as a way to get interoperability among mail systems.

"The slowness in the industry in getting to standard APIs is really a concern to us," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. "There are a lot of small vendors out there whose technology we'd like to use, but they have to write to multiple standards." This can be too large an effort for a small vendor.

"Maybe [Manzi] is realizing that this isn't the place for the battle on Lotus' part," said David Coursey, editor of "P.C. Letter," a newsletter published in San Mateo, Calif. "We need better applications, not better fights over APIs."

To date, discussion about integrating the two specs has been at an impasse because each camp has staunchly stood by its own interests, observers noted.

"Technically, it's not a big problem; MAPI and VIM specs map one to one," with a few exceptions, said Jack Skinner, chairman of the XAPIA technical steering committee. "But the loss of face has been politically too much to expect."

Toward a truce, the XAPIA will present a set of common, standard APIs for basic send, receive and directory functions to the EMA this week, Skinner said. He explained that the XAPIA's work was extended from its original charter to develop just X.400 APIs after a plea last year from the EMA for an independent source to resolve the interface conflict.

Skinner said the common calls would make about 70% to 75% of a developer's work common across applications to be mail-enabled.

VIM's vigor

History and future of the mail interface wars:

- **1991 to present:** Users and programmers infuriated by stalled mail-enabled application development because of political wars between the Lotus and Microsoft camps over a standard mail interface.
- **December 1991:** The XAPIA accepts challenge from the EMA to serve as an independent source for developing an industry-standard interface.
- **August 1992:** XAPIA proposes simple send common mail call; EMA decides more common calls are needed.
- **October 1992:** Lotus President Jim Manzi expected to announce during his EMA keynote that the VIM companies will integrate MAPI calls into VIM — a major coup for the industry.
- **October 1992:** XAPIA to propose three common mail calls at EMA that would span competing Lotus-led VIM and Microsoft-led MAPI mail interfaces.
- **June 1993:** Target date for final approval of XAPIA independent messaging spec.

JOANIE M. WEXLER

IBM offers host/LAN E-mail system gateway

BY ELISABETH HORWITT
CW STAFF

TAMPA, Fla. — With its OfficeVision electronic-mail product for local-area networks a clear failure, IBM is now linking its host-based E-mail products to the successful LAN-based mail offerings of Lotus Development Corp.

IBM Mail LAN Gateway/2, announced last week, is an OS/2-based package that will support mail exchange between Lotus' CC:Mail and Notes and between IBM's OfficeVision/VM and Systems Network Architecture Distributed System (SNADS) E-mail systems, IBM said.

Customers can use Mail LAN Gateway/2 either as a standalone system to connect their E-mail users over a private network or as a gateway to IBM Mail Exchange, an intercompany E-mail service offered by IBM's Information Network, an Information Network spokesman said. "As the world moves from host to LAN office systems, we want to connect those LANs quickly and easily."

Duracell International, Inc. has tested Mail LAN Gateway/2 and is now using the product in a production environment, said Mike DeLuca, manager of communications. The battery manufacturer, which uses Information Network as its overseas network provider, needed a way to link CC:Mail users at headquarters with OfficeVision/VM and OfficeVision/400 users throughout the company, DeLuca said. Headquarters is moving from OfficeVision/MVS to CC:Mail as it moves from a mainframe- to a LAN-oriented computing environment, he added.

IBM's product was easy to implement and has "great throughput and wonderful translation" between different types of messages, DeLuca said.

Soft-Switch, Inc. in Wayne, Pa., offers a competing SNADS-oriented E-mail gateway product but on a Unix platform that Duracell had no interest in, DeLuca said.

IBM Mail LAN Gateway/2 runs on any Personal System/2 with a 386 or 486 processor running OS/2 1.3 Extended Edition. The initial version, linking CC:Mail to SNADS and OfficeVision/VM, is slated to ship in December and is priced at $10,000 per Personal System/2 for unlimited clients. Lotus' Notes support is scheduled to ship by midyear. The current version runs on IBM LAN Server with support for Novell, Inc.'s IPX LANs slated for January 1993 delivery, IBM said.

E-mail to go wireless

CONTINUED FROM PAGE 1

thus receive notification of important messages while on a plane or in a far-flung meeting, explained David Coursey, editor of "P.C. Letter," a newsletter published in San Mateo, Calif.

Southern California Edison, a CC:Mail shop in San Clemente, Calif., has "a large population of laptops, and I suspect our users would like to [optimize their time by] getting mail in a taxi or in-flight," said Bill Lawrence, a network engineer. "If the pricing is reasonable, wireless messaging will become tomorrow what remote dial-up access is today."

"I don't think there's any question that over time, wireless messaging will be more and more of a requirement for corporate America," added Pete Donaghy, manager of computer services and support at Hughes Aircraft Co. in Long Beach, Calif.

Greg Scott, computing services manager for the college of business at Oregon State University, said he thinks there is a "tremendous advantage in wireless vs. dialing up, which is cumbersome. It's just not realistic to be stopping at phone booths."

Users also noted that filtering and message prioritization features such as those included in Beyond, Inc.'s rules-based Beyond Mail package would be important to them in a wireless messaging situation. The reasons for this are that users on the go would likely be interested in handling only top-priority communications, and some portables have limited memory, explained Michael Cavanagh, EMA's executive director.

Not involved yet

Beyond said it is not a part of this week's announcement, but it is anxious to jump on the wireless bandwagon. A wireless version of CC:Mail Remote is slated for availability in the first quarter of 1993, according to an analyst who obtained a copy of Lotus' press release. Lotus declined to comment on any wireless activities.

Other mail vendors will have products available as early as this week, the source close to RAM Mobile said, and vendors will implement the wireless capabilities in different ways.

For example, some will provide a direct RAM link, while others will require gateway services; some will give each wireless user his own mailbox, while others will include portable directory services to keep addresses consistent, he explained.

Sun's first-quarter earnings plunge 82%

BY MARYFRAN JOHNSON
CW STAFF

Delivery delays on the high-end models of its new line of SPARCstation 10 workstations had a wrenching effect on Sun Microsystems, Inc.'s bottom line last week, as the Mountain View, Calif.-based vendor reported an 82% drop in fiscal first-quarter earnings.

For the quarter ended Sept. 25, Sun reported net income of $4.8 million, compared with $26.8 million during the same quarter last year. Analysts said Sun has had to drop prices on older models while struggling to meet an unexpectedly high demand for the new workstations.

The complexities of producing the SPARCstation 10's SuperSPARC Viking chip, which Texas Instruments, Inc. manufactures for Sun, slowed down the introduction of the SPARCstation 10 line, while demand for newer technology built up in the user base.

"It's been clear for a long time that Sun was behind schedule," said Ted Krum, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "It became increasingly clear that they were biting off a lot all at once and really betting the ranch on the Viking chip."

Analysts said Sun's stock might wobble but would likely rebound quickly because the second fiscal quarter is expected to be strong. Revenue from the first quarter rose 13% to $855.9 million from $754.9 million last year.

Sun has managed to ship thousands of the SPARCstation 10 Model 30s this fall, but the more powerful Model 41 has been several weeks behind in volume shipment [CW, Oct. 12]. Although limited numbers of Model 41s were arriving at customer sites late last month, volume shipments are not expected to hit full stride until December.

SPARCstation 10 Model 52 multiprocessor workstations are also scheduled to ship in December. That model requires the Solaris 2.1 operating system with full symmetric multiprocessing capabilities, which Sun officials said last week would be ready in December.

The lack of symmetrical multiprocessing in the first release of Solaris 2.0 has hobbled Sun's multiprocessor strategy, analysts said.

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PC MAGAZINE

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support is relatively light, SQLBase is a good choice for companies without an existing database.

platforms, and Novell's NetWare SQL is especially well suited for companies

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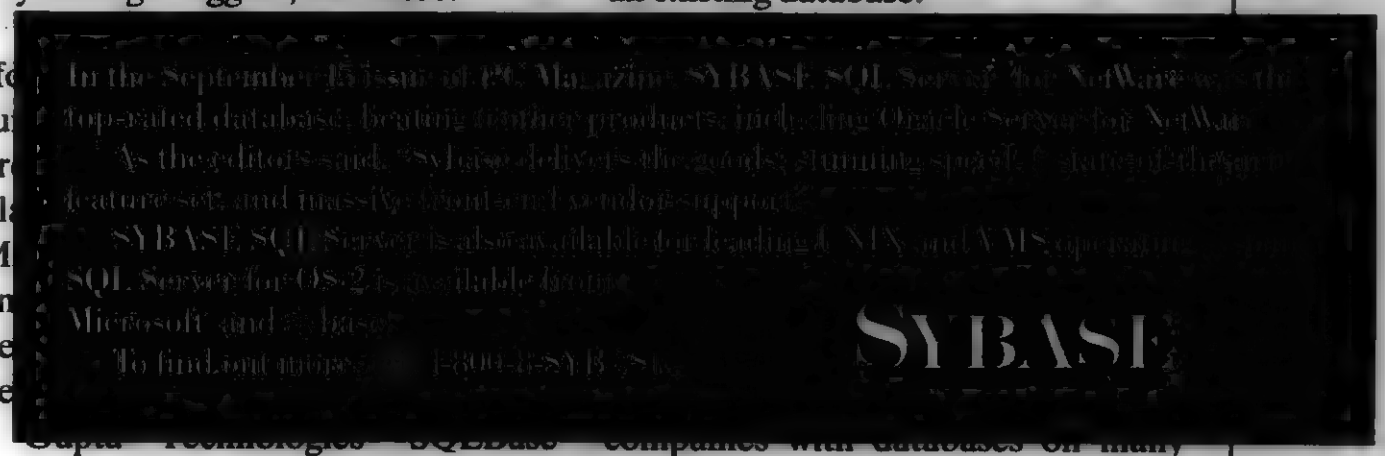

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Software makers fear downsizing toll

CONTINUED FROM PAGE 1

maintain software on 60 or 80 platforms can find it costs more to support the software than they're getting back from revenues," noted Roy Sanford, a business development executive at Bull HN Information Systems, Inc. in Billerica, Mass. "That's why there are incentives to reduce the cost of support."

Vendors attending the ITAA meeting said they recognize the need to port their software but worry about the impact on profits of selling cheaper client/server versions.

For small vendors, the challenge can be particularly daunting. "It's going back to square one in terms of re-engineering the product," said Roger Davis, president of Cambar Software, a $10 million firm in Charleston, S.C., that sells applications for the IBM Application System/400. "Our development people are just totally consumed with the re-engineering effort."

Give and take

The reward for forking over the upfront costs of development is a drop in price for client/server software, said Frank Jackson, Cambar's marketing vice president. "It's very different than charging $500,000 to $750,000 for a mainframe application," he said. "The client/server software costs just a fraction of that, and there's a question of how much support you can give for the price."

Revenue from software licenses for Unix and client/server versions should fall on a per-unit basis, as vendors make the transition from platform pricing to per-user pricing, they said.

Other vendors said they plan to split maintenance, providing dial-up bulletin boards at little or no cost for low-end systems and phone support for a fee.

Large vendors have already experienced the loss in pricing altitude as a result of users opting for client/server versions of mainframe packages. Fred Cutler, vice president of business development at $1.18 billion Oracle Corp. in Redwood City, Calif., said revenue from the firm's database products for IBM mainframes and Digital Equipment Corp. VAX machines plummeted by about 50% from 1990 to 1992.

Oracle's IBM mainframe revenue dropped from more than $45 million to about $20 million, he said. The firm's DEC/VAX revenue dropped from nearly $300 million to less than $150 million. "This has been very significant for Oracle from a profit point of view," Cutler said.

Oracle was able to recoup from the shift to client/server computing by instituting per-user pricing for Unix, a product category that grew in sales from $250 million in 1990 to $350 million in 1992.

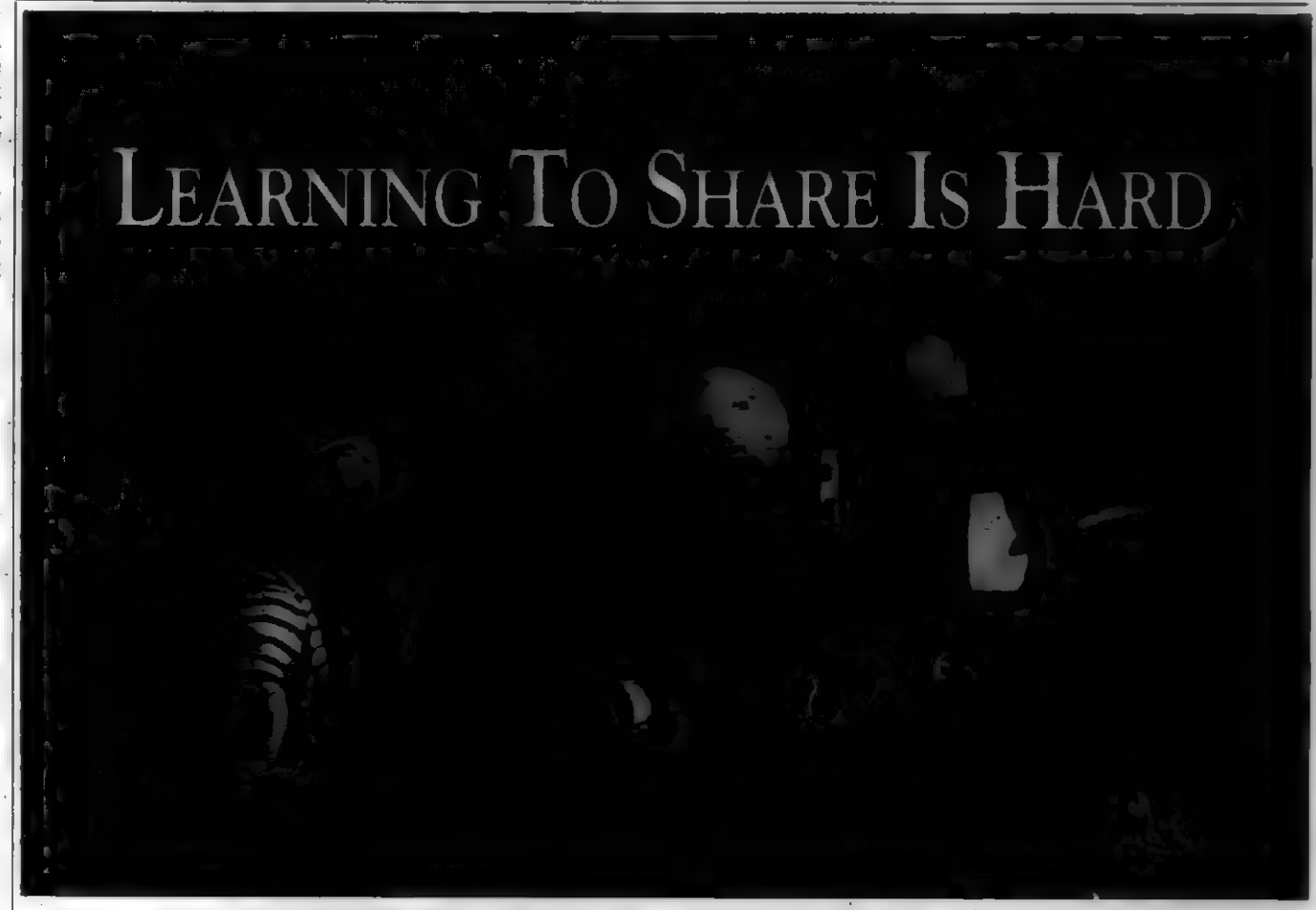
Spreading itself thin

But Oracle also has to support 45 combinations of Unix hardware and software, making management of client/server software more complex, Cutler said.

Reports given at the ITAA meeting showed that the trend to develop applications on client/server platforms will accelerate. Michael Blair, chief executive officer of Cyborg Systems, Inc. in Chicago, cited a Computer Intelligence survey of 500 U.S. sites showing that 41% planned to deploy new applications on local-area networks, compared with 16% of new applications to be deployed on IBM-compatible mainframes.

One vendor that made the transition from proprietary software to Unix said there are rewards when the re-engineering is over.

"I have a sense of the effort involved in making the move away from mainframes," said Bruce Reynolds, executive vice president of Datatel, Inc., a $25 million Fairfax, Va., vendor of university management software. "But we are getting business now from many mainframe sites that are switching to Unix to reduce costs."



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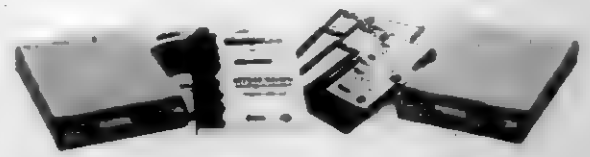

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NEWS SHORTS

Fusco steps down at Sequoia

Bowing to the combined pressures of lower earnings and an investigation by the Securities and Exchange Commission, Sequoia Systems, Inc.'s chief executive officer, Gabriel Fusco, resigned last week, as did Sequoia's vice president of international sales, Keith Johnson. Fusco will stay at the company as chairman, and two Sequoia officials, Francis Hughes Jr. and Richard Goldman, will serve as interim CEO. Sequoia lowered its financial results for fiscal 1992 earlier this month because it said revenue for first-quarter 1993 will come in below forecasts.

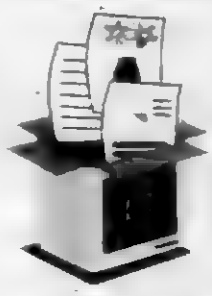
CA, Postal Service in accord

The U.S. Postal Service signed a five-year, fixed-price software licensing agreement with Computer Associates International, Inc. The Postal Service contract follows on the heels of a similar accord CA reached with Citicorp [CW, Oct. 19]. According to Jerome Doniger, general manager at the technical support division of the Postal Service, similar agreements being negotiated with several vendors will help the service reduce costs as it consolidates operations in its six data centers.

CA revenue, profits climb

Meanwhile, CA announced that its second-quarter revenue increased 30% over the same period last year. The Islandia, N.Y., software firm reported $431.9 million in revenue for the period ended Sept. 30, compared with $332.8 million in revenue for the same period last year. Pretax income during the period rose 23%, from $61.6 million to $75.7 million.

Wang image offered for IBM hosts



Wang Laboratories, Inc. unveiled a version of its imaging software for IBM mainframes. Priced between $21,200 and $128,200, Open/Image for CICS is a set of tools designed to make it easier to build image functions into IBM CICS applications. Wang, which must submit a Chapter 11 reorganization plan by Dec. 16, also announced enhanced versions of Open/Image Workstation for 3270 and Open/Image Virtual Workstation to support PC and IBM RISC System/6000 platforms.

Cuts planned at Computervision

Computervision Corp. said last week that it will lay off 700 workers, resulting in a $25 million onetime charge. That charge, paired with recapitalization costs, fueled an $88 million loss for Computervision's first quarter as a public company.

Intel sees busy year ahead

Pentium, the newly renamed Intel Corp. 586 chip, will ship late in the first quarter of 1993, concurrent with systems that use it, according to Intel President Andrew Grove. In a speech to the New York PC User Group, he also revealed plans to ship 25 new 486-class processors in 1993, all 3.3V products that support Intel's Smart Power Management scheme, and hinted at multimedia software products. Analysts said Intel was likely to show at Comdex/Fall '92 a new software product that will let users play back video messages more easily.

Short takes

Tandem Computers, Inc. said it has reached an agreement with **Chorus Systems, Inc.** in Beaverton, Ore., to jointly develop a fault-tolerant "micro kernel" to enable building of client/server applications for **Unix System Laboratories, Inc.**'s System V, Release 4. . . . **Comdisco, Inc.** announced a new master lease that lets customers sublease equipment to other leasing companies, reconfigure machines and return systems with parts that do not necessarily have the same serial number as when they were first shipped.

IBM unveils Consulting Group

Plans to recommend technology of all hues — not just Blue — to firms

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Looking to expand its presence in the fast-paced information services field, IBM last week formally unveiled the IBM Consulting Group and vowed the group would base its recommendations on the best technology for the job — regardless of where it comes from.

The 1,500-member staff is led by IBM General Manager Robert M. Howe, who joined the company 18 months ago after directing Booz Allen & Hamilton, Inc.'s financial services practice. He said the new consulting group will remain "objective" by offering its customers technologies from a wide range of vendors. "None of us in the room are connected to [IBM's] hardware business," Howe noted.

In addition, the consulting group will not compete against IBM's outsourcing unit — Integrated Systems Solutions Corp. (ISSC) — because it will not be providing outsourcing services. Instead, Howe said, the consulting group and ISSC will have a synergistic relationship.

The consulting group will focus on two major areas: management consulting and "functional" consulting, or information technology-specific areas such as applications development, networking and information systems management.

The 600-plus consultants in the group's management consulting practice will report to Howe, while Stephen A. Mucchetti, a former senior partner at Coopers & Lybrand and now an IBM general manager, will direct the 900 consultants attached to the group's functional consulting efforts.

Howe said the consulting unit has been operational for the past year but IBM waited to build up a sizable client base before publicly introducing the division.

Busy with contracts

Howe and other IBM executives would not disclose specific data on any of the 150-plus contracts that the unit said it has been awarded thus far. Howe did, however, mention several recent contracts, including a business process re-engineering project the group helped conduct for a large UK-based insurance firm.

The consulting unit will target vertical markets including financial services, banking, insurance, transportation, health care and manufacturing.

Oliver Pflug, a principal at G2 Research, Inc. in Mountain View, Calif., placed the consulting group's revenue at $175 million for the first year.

Overall, the IBM Consulting Group will provide consultation in 12 specific areas, including business transformation, information technology strategy and planning and manufacturing logistics.

Julie Schwartz, associate director of professional services at Dataquest/Ledgeway Group, a Framingham, Mass., services research firm, said IBM will compete against firms such as Electronic Data Systems Corp., CSC Index, Inc. and Big Six accounting/consulting firms.

"They're not positioned in the high end of the market like a Booz Allen or a McKinsey [& Co.]," Schwartz said. Instead, she said, the group will focus on providing "implementation" services.

IBM pilot program reduces outsourcing costs for users

CONTINUED FROM PAGE 1

associated with standard outsourcing accords. While IBM would not provide pricing details, Denny McGuire, a consultant familiar with the program and a principal at Technology Partners, Inc. in Houston, described the pricing schedule as "very competitive."

Term Capacity deals would also commit clients to shorter time periods. Instead of the five- to 10-year duration of traditional outsourcing deals, Term Capacity contracts would typically run one or two years, IBM said.

An IBM spokesman said the company is offering Term Capacity "to several customers in the Southwest area." He declined to identify the clients.

Term Capacity solutions will be implemented by the IBM Information Network (IIN) group, rather than by IBM's Integrated Systems Solutions Corp. (ISSC). IIN is scheduled to become part of ISSC early next year.

IIN, which recently joined forces with Sears, Roebuck and Co. to form Advantis, a joint network outsourcing venture, is scheduled to become part of ISSC in January.

McGuire said Term Capacity marks a shift in the outsourcing paradigm toward "selective outsourcing" because it makes it easier for IS shops to farm out portions of their operations. "It moves more toward the MIPS-in-the-wall approach, where you buy mainframe processing like it's electricity," he said.

A study in contrasts

IBM's Information Network (IIN) is piloting cheaper outsourcing for

	New plan [Term Capacity]	Existing plan
Pricing	Flat fee	Per-usage charge*
Duration	Typically 1 to 2 years	Typically 5 to 10 years
Staff	Stays with client	Works for IBM or loses job
Logistics	Dedicated processors at IIN sites	Shared processors using ISSC resources, on site or off site

*The new Term Capacity approach would usually show baseline processing fees

CW Chart: Janell Genovese

The IBM spokesman said Term Capacity is aimed at the following three types of clients:

- Those that are out of capacity and do not want to make capital investments in new hardware.
- Those that are migrating from hosts to smaller platforms and require interim mainframe solutions.
- Those that have predictable peak processing periods.

The long-term deals are becoming less popular. "The economics beyond the third year becomes voodoo economics," noted Ray Manganelli, chief executive officer at Gateway Informations Services, Inc. in New York. "We believe no major long-term deal signed in 1992 will run its full course."

McGuire noted that Term Capacity poses a threat to plug-compatible vendors such as Amdahl Corp. and Hitachi Data Systems Corp. because it gives users a less expensive alternative to buying new mainframes. "If you have the choice of buying incremental capacity from IBM, you could just keep your current machines and lower your incremental costs," he said.

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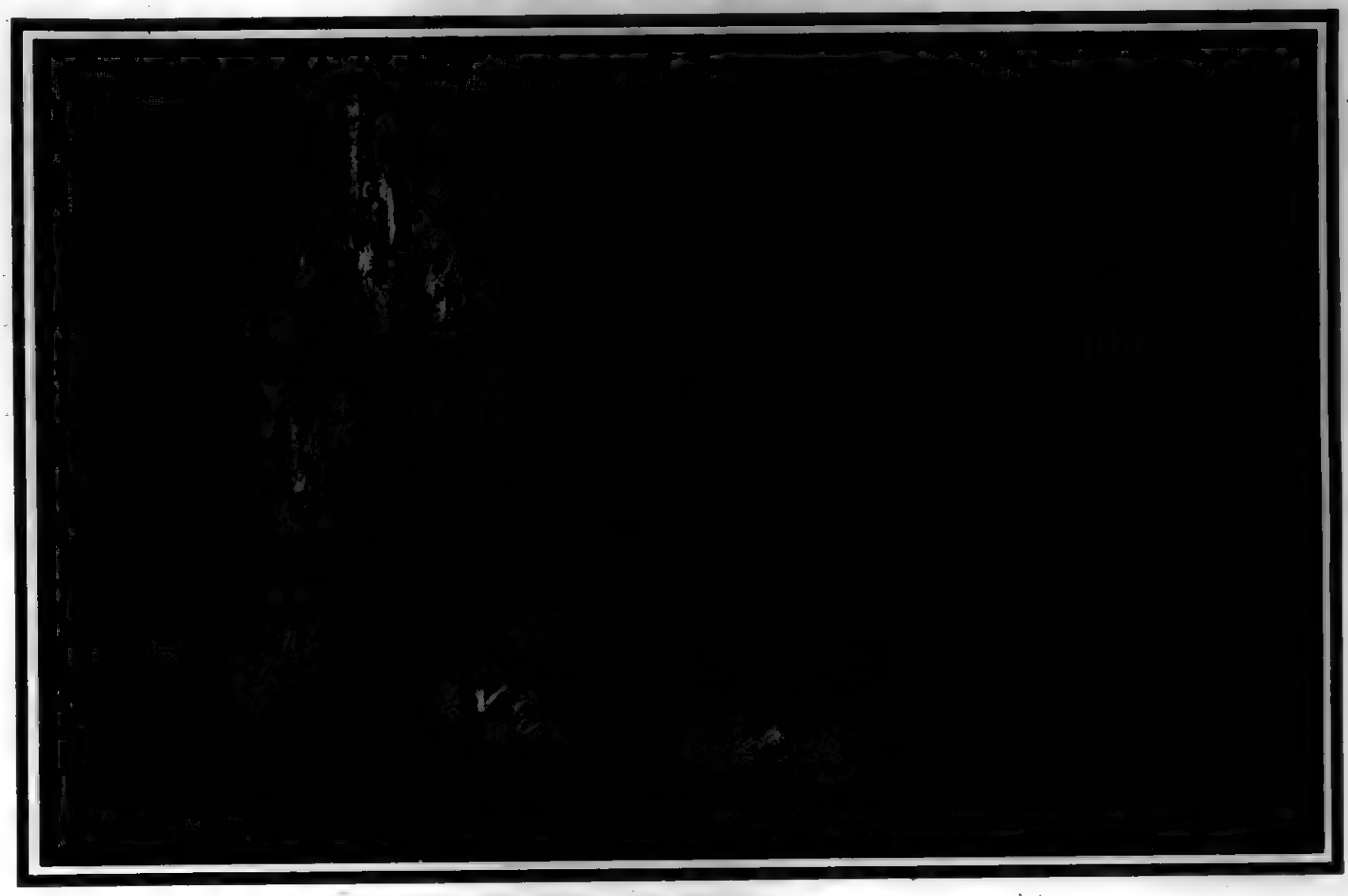

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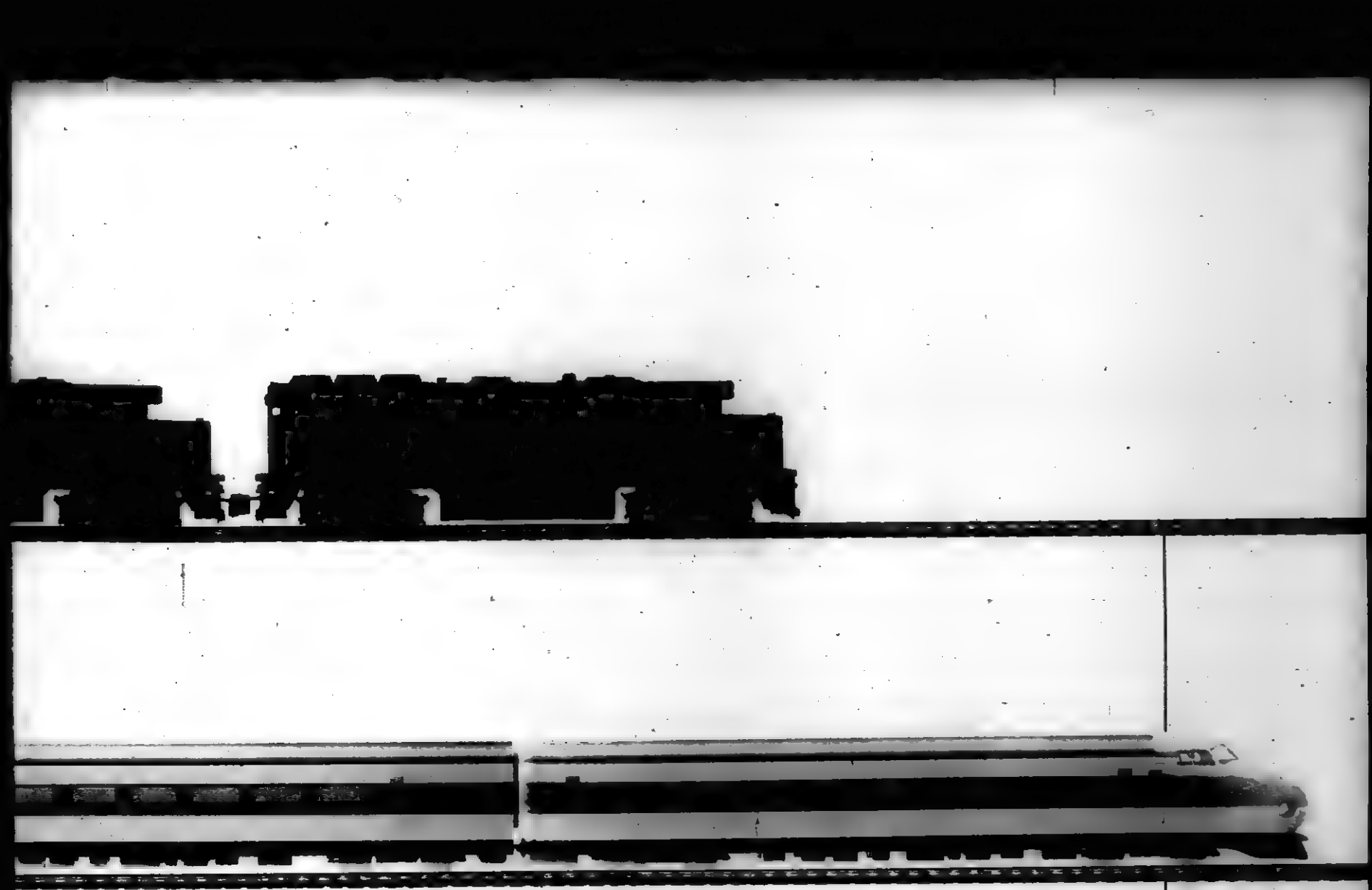


DEC price cuts could benefit smaller customers

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp.'s more flexible business practices announced last week — including price cuts of up to 47% on commodity items such as printers, terminals and memory products — offer discounts to smaller DEC customers that were previously available only to resellers and larger sites, according to DEC officials.

The company is eliminating a cumbersome practice of yearly discounts on all products for large purchasers and replacing it with discounts for the aforementioned commodities. Users will no longer have to haggle with DEC, and the new, discounted list prices will bring costs down to levels comparable to the yearly discounts. In addition, DEC will offer quantity discounts for large orders of specific products, the company said.

"The products will now be priced much more competitively for the market, and this will reduce procurement costs since customers won't have to negotiate for lower prices," said Frank Brown, corporate pricing program manager at DEC.

At least one user seemed generally pleased by the news.

"We buy several million dollars worth of equipment a year from DEC, and any kind of significant price cuts like this add up quickly for us," said Earl Cory, systems manager at Health Net, a Woodland Hills Calif.-based health maintenance organization.

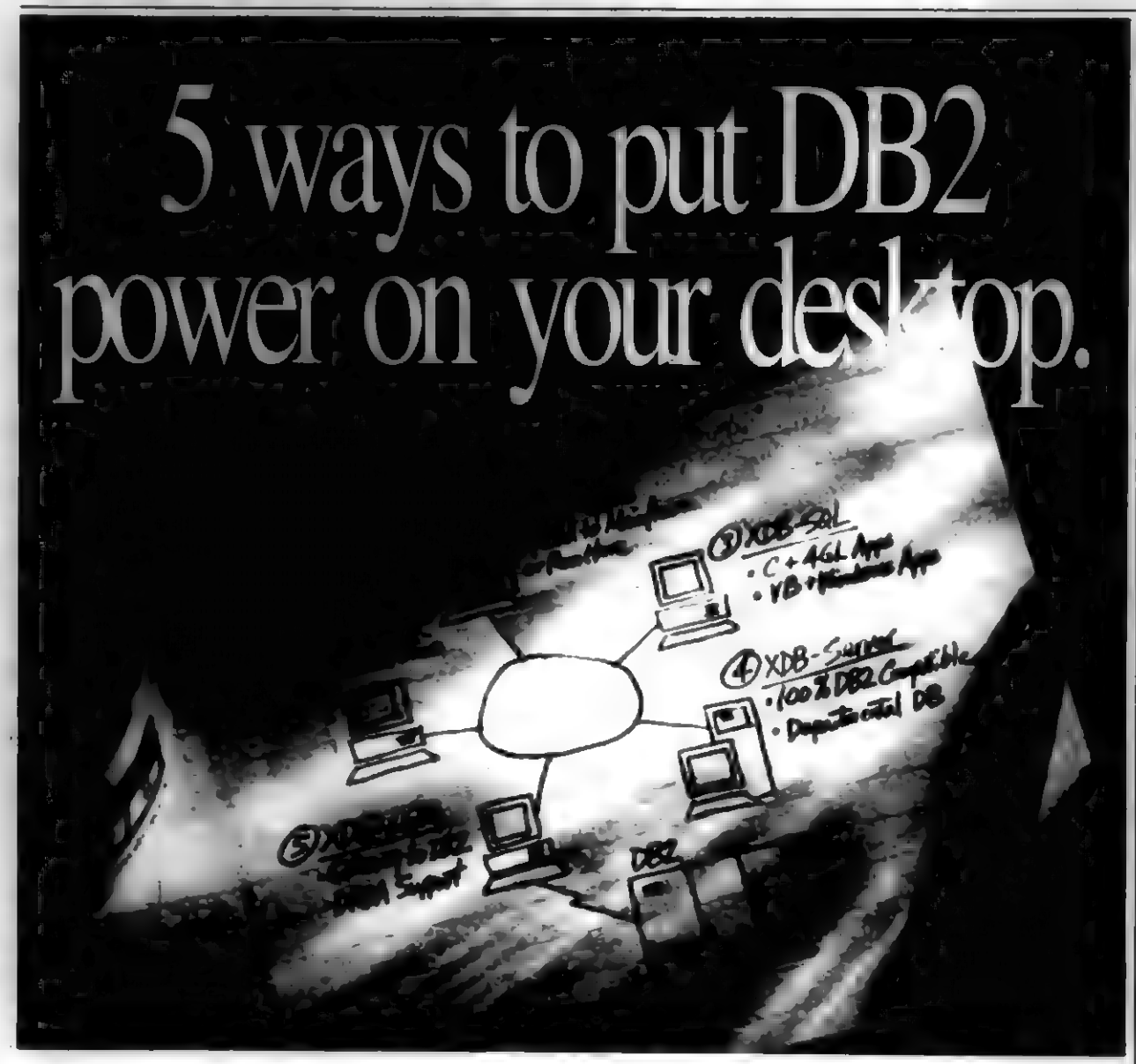
This sharpening of DEC's business strategy foreshadows sweeping managerial changes that are expected to be announced early next month, according to sources close to the company.

"We're trying to become easier to do business with through more competitive, predictable pricing and increased use of channels to bring those products to market," Brown said.

The new pricing structure may well be applied to other products, Brown added. He said new pricing had been dictated to DEC by its customer base.

The price cuts are "extremely significant because it's the beginning of a trend that DEC's pricing will start to correspond to industry pricing," said Rikki Kirzner, principal at Dataquest, Inc., a market research firm that is based in San Jose, Calif. "I expect to see other price decreases as [Alpha AXP] chips start shipping [next month]."

"They're into survival mode — this is the absolute bare bone of what they could do. They couldn't go lower," added Michael Goulde, a senior consultant at the Seybold Office Computing Group, a market research firm based in Boston.



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Wireless PCMCIA device introduced by Motorola

BY ELLIS BOOKER
CW STAFF

BOYNTON BEACH, Fla. — Motorola, Inc. last week introduced what it called the industry's first receive-only wireless frequency device to use the PCMCIA format.

The PCMCIA standard, developed by the Personal Computer Memory Card International Association, specifies credit card-size devices and a standard interface for adding extra memory, communications and custom applications to PCMCIA-compatible laptops, palmtops and an emerging class of Personal Digital Assistants.

Motorola's NewsCard, which will be demonstrated next month at Comdex/Fall '92 in Las Vegas, will be able to work with a variety of one-way paging and wireless messaging networks.

According to sources close to Motorola, the NewsCard will sell for less than $400. Commercial distribution is scheduled for the second quarter of next year.

Sweeping presence

Analysts said communications cards in the PCMCIA format — including wireless and conventional fax/modems, local-area network adapters and other I/O devices — will sweep the market in the next year or two.

Andrew M. Prophet, president of AP Research in Cupertino, Calif., said he expects flash cards to initially sell for $60 to $90 per megabyte, compared to $4 to $5 per megabyte for rotating media.

The NewsCard builds on Motorola's currently available NewsStream Advanced Information Receiver. Both products work with a variety of wireless nationwide networks, as well as Motorola's Embarc electronic-mail network.

Hot on Motorola's heels will be AT&T. A spokesman at AT&T Paradyne Corp. last week confirmed that the company's first "Keep in Touch" card, a data/fax modem with speeds up to 14.4K bit/sec., will be followed early next year with a 7.2K bit/sec. cellular modem card.

Motorola said last week that it is working with Hewlett-Packard Co., IBM and Apple Computer, Inc.'s Newton Group to incorporate the NewsCard with present and future PCMCIA-compatible devices.

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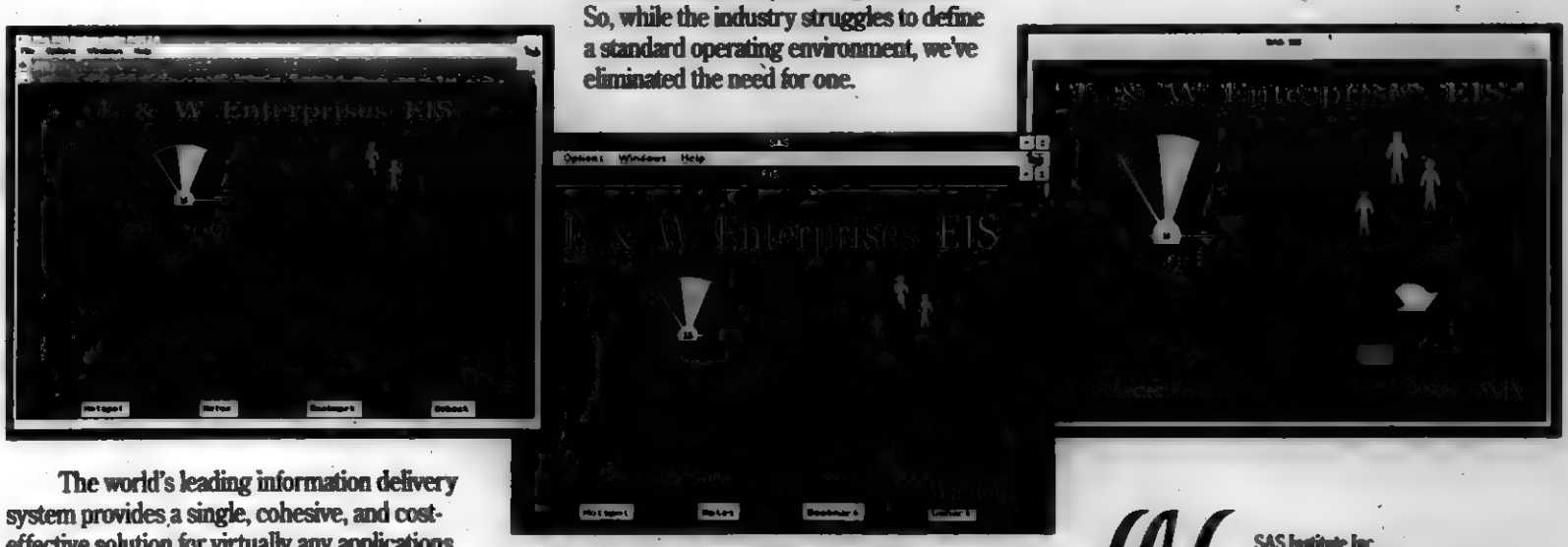

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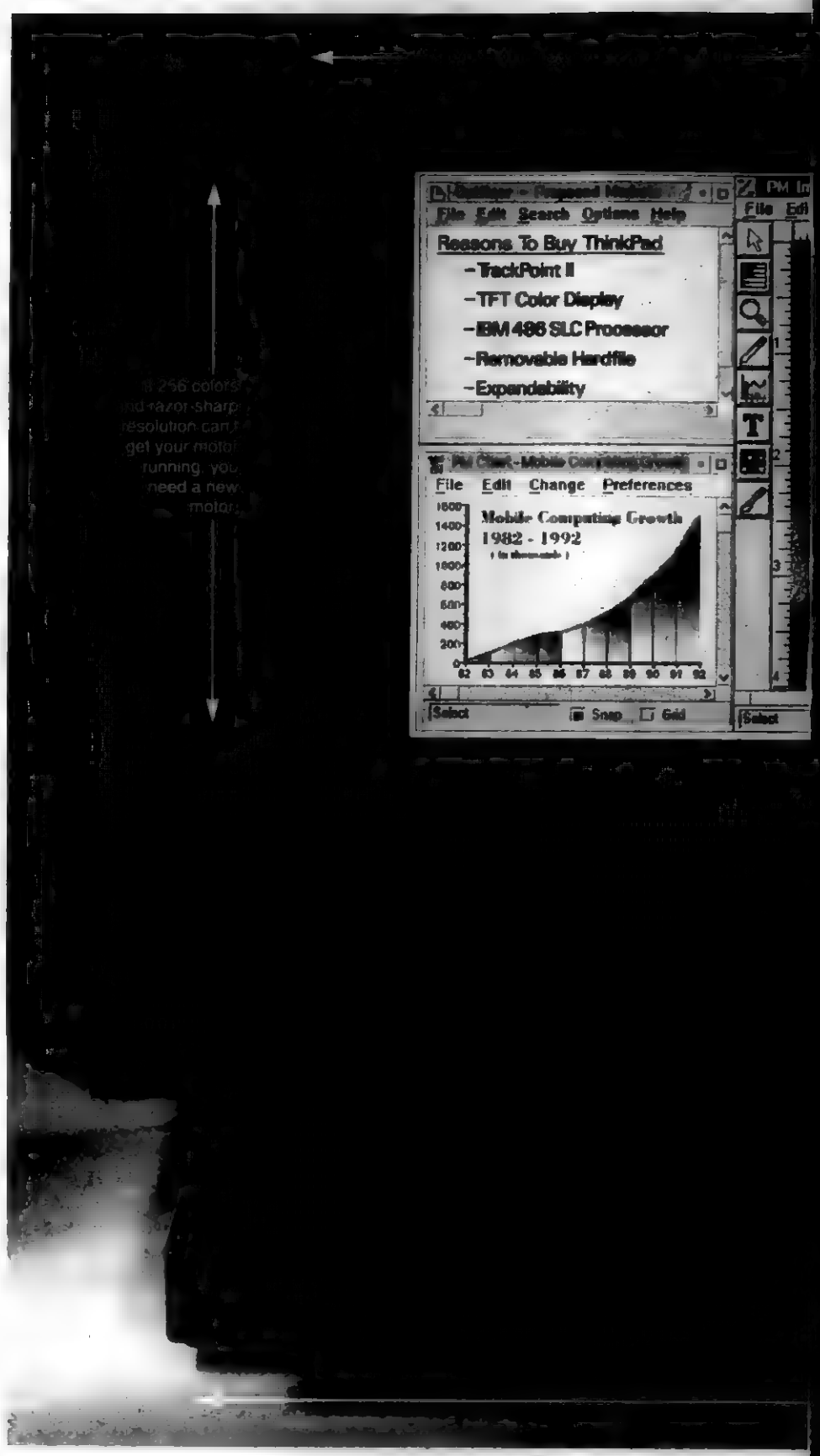

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High tech agrees on issues, not candidates

CONTINUED FROM PAGE 1

industry conferences preferred Bill Clinton, and in an updated American Electronics Association membership survey, a majority of chief executive officers backed George Bush.

Adding to the confusion, Bush and Clinton have succeeded in lining up support from major cliques of computer industry notables. In at least two cases, senior executives in a single company have publicly taken opposing stands.

What stands out clearly is that IS professionals do not make up an identifiable voting bloc. Users have told *Computerworld* that they base their political choices on ideology and personal experiences, not their IS work. But some are keeping an eye on the election's impact on their businesses.

Bush backer Rex Schemerhorn, manager of IS at Diamond Star Motors Corp. in Normal, Ill., said his firm's biggest concern is the flat economy, which is holding production down. This in turn makes it harder to justify new IS projects, he said.

Clinton supporter Tom Jones, software manager at Weyerhaeuser Co., a paper maker in Tacoma, Wash., said, "Most of the money Bush and Reagan spent on high-tech was devoted to defense spending rather than information technology. That I just don't agree with."

"The Democrats have it all over the Republicans, mostly because of Gore," said Joel Diamond, technical director of the 4,800-member Windows Users Group Network. In particular, Diamond said, users in his group are impressed with Sen. Al Gore's aggressive plans to move technology into universities and into the hands of the public via high-bandwidth data networks.

And on those electronic highways, in fact, Clinton seems to be doing well. Peter Salus, executive director of the Sun Users Group, said he has seen a lot of activity on the Internet showing support for Perot, but even more for Clinton. He said users support Clinton in part because they believe he will ease restrictions on computer exports. This is "a user issue because if we're selling less, we need fewer advanced technology people," Salus said.

Asked about poll results that suggest IS professionals support Perot in far greater numbers than does the population as a whole, Diamond explained, "Perot was the original Bill Gates [the founder of Microsoft Corp.], and he created the terms 'computer consulting' and 'third-party software development.' A lot of his values and philosophies are built into a lot of people in the industry."

Where the high-tech community may be intrigued by Clinton's technology proposals and may empathize with Perot's background, there is much impatience with Bush. "The problem with Bush is no one thinks he will really change," said Michael Maibach, director of government affairs at Intel Corp. and a Republican candidate for Congress earlier this year.

Maibach said Intel's top priorities for a new administration are to reduce the federal budget deficit, open Japanese markets to the U.S. and craft tax and fiscal policies that are "promanufacturing, proexport and pro-R&D."

Bush's critics in the IS community fault him not so much for his stand on in-

High tech, Clinton-style

If, as poll after poll is suggesting, Bill Clinton is elected president next week, observers say the high-tech community will enjoy a stature in Washington it has not had in 12 years.

"We will see a significant escalation of the science and technology functions in government," predicted Arvid Larson, chairman of the U.S. Activities Board of The Institute of Electrical and Electronics Engineers, Inc. "I think there will be a technology policy or industrial policy that will help government and industry cooperate in ways that we've never seen before."

Larson said he would expect to see a major technology policy blueprint during the first 100 days of a Clinton administration and perhaps a plan to reorganize the science and technology units of the government as well.

For example, he predicted Clinton will seek to elevate and beef up the U.S. Department of Commerce's nascent Advanced Technology Program, now funded at $68 million.

A Clinton aide said President Clinton would immediately, by executive order, sweep away regulations that make close government/industry collaboration difficult. He said Clinton would modify the Bush budget for fiscal 1994, to be submitted in January, to make major shifts in funding from defense research and development to civilian R&D. Another high priority would be to submit to Congress his proposal for a new investment tax credit targeted at incremental investments in new plants and equipment, the aide said.

Will Congress go along? "If Bill Clinton stands up in front of the country and says, 'We're goin' that-a-way,' the Congress will follow," said Michael Maibach, director of government affairs at Intel. "We're finally going to get rid of divided government, and the Democrats are going to have to either put up or shut up."

In a statement of his national technology policy, Clinton said he would do the following:

- Shift $7 billion over three years from defense R&D to civilian R&D, double the budget of the National Institute of Standards and Technology, earmark 10% to 20% of the budgets of the national laboratories to joint ventures with industry and establish a civilian technology agency to foster the development of high-risk, high-payoff technologies in the private sector.
- Build a "technology infrastructure," including an advanced national data superhighway that would enable collaboration in manufacturing, medicine, education and basic science.
- "Increase dramatically" the percentage of the government's $76 billion annual R&D outlays going to generic industrial technologies such as information technology and advanced materials.
- Encourage the establishment of consortia such as Sematech, which is funded 50% by the government.
- Establish a technology extension program for small businesses and double the size of the Small Business Innovation Research Program.
- Make various tax incentives for private investment, such as the R&D tax credit, permanent. Offer a 50% tax exclusion for long-term investments in new businesses.

GARY H. ANTHES

High-tech backing

With technology looming ever larger as the key to the country's competitive future, both Bush and Clinton have eagerly sought high-tech endorsements.

Clinton led the way by pulling together a coalition of 30 Silicon Valley chief executive officers, including the heads of Apple Computer, Inc., Oracle Corp., Tandem Computers, Inc., Silicon Graphics, Inc. and Hewlett-Packard Co. The benefits could be mutual. Rumor has it Clinton might tap HP CEO John Young as secretary of commerce.

The Bush camp responded with support from "over 75 leaders in the high-tech industry," including executives at about two dozen computer firms. These included HP Chairman David Packard, Oracle Chairman James A. Abrahamson, IBM Chairman and CEO John Akers, Information Technology Association of America Chairman Robert B. Laurence and Computer and Business Equipment Manufacturers Association President John Pickitt.

Endorsing Clinton "is a very difficult thing for me to do as a lifelong Republican. But I see this ideological roadblock in the Republican Party that's preventing government activism in any area of technology that departs from the party's free-market philosophy."

* * * * * * *

LARRY ELLISON
Oracle

"As a lifelong Republican, I [think] Clinton understands business and technology and the need for a motivated, highly skilled work force. I was heartened by the serious [talks] I had with Clinton and his economic advisers about what is needed to get our economy moving."

* * * * * * *

JOHN YOUNG
Hewlett-Packard

"I like the president. But it became clearer and clearer to me that it takes much the same to lead the country as it takes to lead a high-tech company — it's led with ideas, with vision and by taking bold moves. But those are not the characteristics of President Bush."

* * * * * * *

JOHN SCULLEY
Apple Computer

A registered Republican, McCracken "supports the Clinton/Gore ticket and endorses its national technology policy. This policy will create more jobs in America's high-technology sector and will ensure that American companies remain more competitive."

* * * * * * *

ED McCRACKEN
Silicon Graphics

Electronic town meetings a safe vote?

BY MITCH BETTS
CW STAFF

After each televised presidential debate, thousands of couch potatoes in the San Francisco area were able to register their opinions on issues raised during the debate by punching buttons on a $199 control unit. The interactive TV system's computers then compiled the results and flashed them back to the control unit's little screen.

The electronic poll, run by Interactive Network, Inc. in Mountain View, Calif., gave Americans a sneak preview of what futurists say will be the age of "teledemocracy."

The idea got a big boost from presidential candidate Ross Perot, who has repeatedly called for electronic town meetings whereby experts would electronically offer three proposals for fixing some public problem and then the public would vote them "up or down or sideways."

It is not clear which technology will prevail, but teledemocracy could involve voting by telephone, interactive TV, computer bulletin boards and/or on-line information services. Already, the presidential campaigns have been disseminating position papers and answering voter inquiries on the Prodigy, CompuServe and Genie networks.

The promise of electronic town meetings is that they could improve citizen access to the levers of power and bypass special-interest lobbyists.

But experts said they also raise a lot of tricky issues, such as who controls the agenda and how to prevent ballot-box stuffing, that must be addressed first.

"It could easily turn into an electronic tyranny, depending on who controls the system," said Jeffrey Chester, co-director of the Center for Media Education in Takoma Park, Md.

For that reason, Theodore Becker, a political scientist at Auburn University in Auburn, Ala., said he supports a multilayer web of decentralized electronic meetings run by an independent, private commission and not by the White House or any government agency.

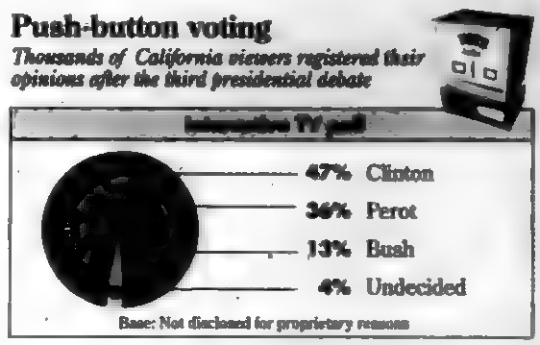
But there are many other issues, such as how to ensure the meetings have a representative sample of the population and access for the poorest citizens and the philosophical question of whether push-button democracy might lead to a "mob-ocracy." The Markle Foundation in New York is assembling a team of scholars to study these issues and to experiment with different sorts of electronic town meetings next year.

Becker speculated that electronic ballot-stuffing could be thwarted by having participants key in an access code such as their Social Security number. He acknowledged, however, that voting fraud would still be possible, just as it has been throughout U.S. history.

The hottest question of all is whether the electronic votes should be binding or just advisory. Becker is on the side of a binding national referendum, which would require a constitutional amendment to establish. Charles M. Firestone, director of the Aspen Institute's program on communications and society in Washington, D.C., said he leans toward electronic town hearings that help legislators make better decisions.

Push-button voting

Thousands of California viewers registered their opinions after the third presidential debate



Source: Interactive Network, Inc.

dividual issues but for a perceived lack of an overall coherent technology policy and for a lack of enthusiastic leadership in areas important to industry.

Meanwhile, some Clinton "support" amounts to little more than weariness with the Bush administration. Computer scientist/entrepreneur Gordon Bell, a former division director at the National Science Foundation and former head of research and development at Digital Equipment Corp., said he favors Clinton very reluctantly. That is because Clinton and Gore are more likely to use government intervention — for worthy goals such as protection of U.S. jobs and the environment — in ways that would hamper global expansion and introduction of new products.

Fellow Republican Riley Repko, director of government affairs at Oracle Corp., conceded that a Clinton/Gore administration would breathe new life into federal high technology. He gave the two men high marks for actively seeking the views and support of the computer industry.

Some of those CEOs won over by Clinton — especially Hewlett-Packard Co.'s John Young, Apple Computer, Inc.'s John Sculley and Oracle's Lawrence Ellison — were instrumental in helping Clinton lay out his technology manifesto (see story page 24).

Staff writer Kim S. Nash contributed to this story.

Are you in synch with your voting peers?

Bellwether polls from around the industry record a wide divergence of political opinion

	CW Database Division poll	American Electronics Association poll	Info World Agenda '93 poll	Networld Showcast poll	Society of Information Management poll
People polled	IS professionals	Senior industry executives	PC industry executives	Show attendees (U.S. voters)	IS executives
Bush	27%	40%	25%	29%	41%
Clinton	20%	23%	46%	32%	37%
Perot	38%	33%	29%	27%	17%
Date of poll	10/15	10/5	9/21	10/15	10/20
Number of respondents	209	505	301	1,148	292

Where percentages do not total 100%, remaining voters either chose undecided, other or none of the above.

Do we need a tech plan?

Software executives attending last week's ITAA meeting in Colorado Springs stopped short of seconding the Clinton/Gore proposal for a national technology policy, but they did express interest in a formal policy that would encourage tax breaks for investments, protect software copyrights and broaden access to overseas markets.

That was the general tenor of the comments emanating from an Information Technology Association of America (ITAA) "town meeting," where attendees viewed two high-tech proposals from the Bush and Clinton campaigns.

A hands-off policy could deepen the current recession, some warned. Speaking against a laissez-faire approach, Bernard Goldstein, an executive at Broadview Associates in Fort Lee, N.J., which consults on mergers and acquisitions, said the U.S. is losing market share, its intellectual property is improperly protected, and its markets cannot see beyond next quarter.

However, some warned that a high-tech policy might end up going too far.

"The government should be protecting our proprietary rights in software, but it shouldn't try to steer the industry," said Kurt Seibert, a vice president at Computer Associates International, Inc. in Islandia, N.Y. "I don't think our industry should become the pork-barrel projects of the 1990s. There are no more [hydroelectric] dams to build."

Microsoft Corp. Executive Vice President Mike Maples went the furthest in asking for a non-intrusive government policy. "I'm a free-market person," said Maples, who oversees worldwide distribution of Microsoft products. "In fact, we need open markets, not reams of regulations."

Some ITAA members said they would like a borderless software market that encircles the planet, unencumbered by high tariffs. "The IT industry is a national asset that needs to be protected by a nonintrusive, well-informed government," said ITAA Chairman Robert B. Laurence.

Others echoed the need for support as the market expands. "I think we need a policy that does whatever is required to make sure that the software and services industry is competitive on a worldwide basis," said Ross Systems, Inc. Chairman Dennis Vohs.

JEAN S. BOZMAN

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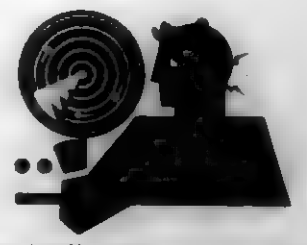

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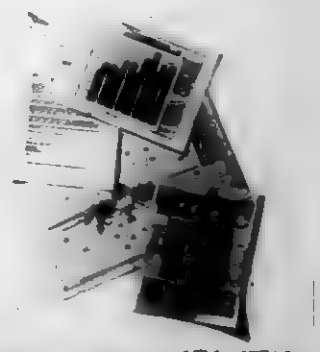

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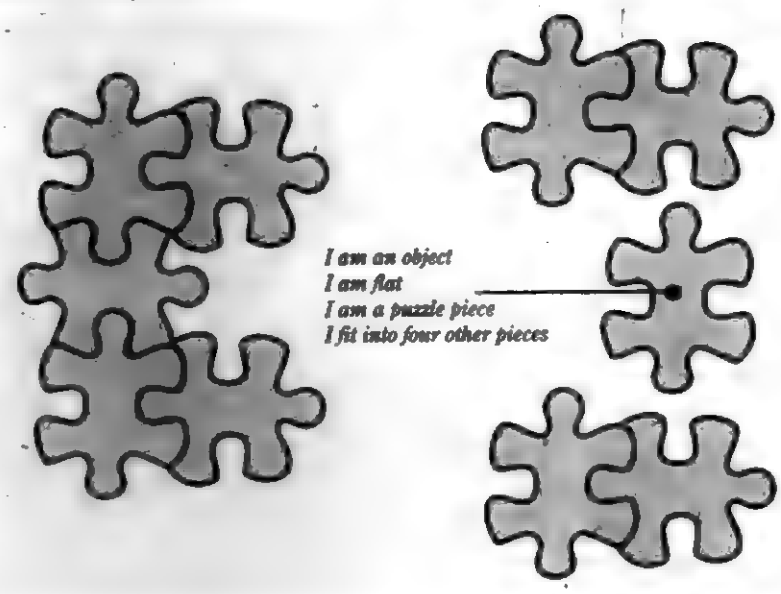
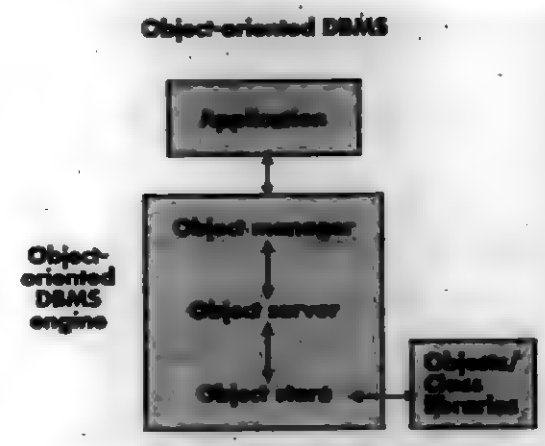
A new approach to data management catches on

The object-oriented database puzzle

What an object is:



How the DBMS works:



An object-oriented DBMS is commonly used for:
- Command and control applications, transportation and telecommunications.
- Holding "odd" data types such as chemical, pharmaceutical and geometric data.
- Shared by many databases.

Pieces in place:
- Unique identification of each object. Objects have self-knowledge of data and programs.
- Reusability of class libraries, which are collections of similar objects.
- Quick development of applications.
- Better performance than a RDBMS in some applications, such as handling geometric data and images.
- Low-cost maintenance. Once defined, objects can be stored in a "persistent-store" database, preserving them for future use. Once tested, objects can be reused as is.
- Hardware/software independence.
- Compatibility with object-oriented languages, such as C++ and SmallTalk.

Pieces still missing:
- Many links to industry-standard RDBMSs.
- Standard query languages for object-oriented DBMSs.
- A short learning curve for programmers.
- Many preprogrammed class libraries that can be used for quick starts. Exception: Class libraries for GUIs.
- Widespread industry standards, although Object Management Group and ISO are among the groups working to define them.
- Low up-front cost of entry to object-oriented technology, due to high training costs and length of learning curve to work with object-oriented DBMS data models.
- Enough storage memory/network bandwidth to take full advantage of object-oriented DBMS capabilities.

CW Chart: Janell Genovese

BY JEAN S. BOZMAN
CW STAFF

Object-oriented databases are like cookie jars that can store a lot of goodies: They are good for storing shapes, molecules, maps and other complex data. But despite their appeal, these handy receptacles are relatively rare at corporate sites.

Analysts said they believe several factors have kept object-oriented database management systems out of information systems shops, even as object-oriented development languages are becoming popular for business reengineering.

The worldwide object-oriented database market has been held to just $30 million by a lack of standard interfaces, a steep learning curve for Cobol and C programmers and the proprietary features of the products, analysts said.

"The main inhibitor is the unfamiliar nature of the paradigm," said Steve McClure, a senior consultant at International Data Corp., a research firm in Framingham, Mass.

Despite five years of effort, vendors have placed relatively few object databases outside of universities, corporate research and development labs and bleeding-edge user sites. Object-oriented DBMS vendors include Servio Corp., Versant Object Technology, Inc., Ontos, Inc., Object Design, Inc. and Objectivity, Inc. One vendor, UniSQL, Inc., has a hybrid relational/object database, and two systems vendors — Hewlett-Packard Co. and Digital Equipment Corp. — have object-oriented DBMSs.

Seeking wider success, some of the small vendors signed joint development agreements this year that will link their products with those of relational database vendors. A Gartner Group, Inc. survey of 175 corporate users confirmed user resistance to object-oriented DBMSs: Nearly 50% of the users surveyed planned to buy object-oriented development tools, but fewer than 10% planned to buy object-oriented DBMS products.

Object databases hold collections of user-defined objects or class libraries. The objects have both properties and behaviors. A chemical molecule object could know its own properties, as well as what application accesses it and how to store itself in a database.

Some end users have defined "jet" and "locomotive" and "package" objects for tracking the movement of these objects' real-life counterparts. Clicking on a jet icon in a real-time tracking application will reveal its speed, altitude and destination.

Relaying messages

While each object is unique, a group of objects can be orchestrated for applications by passing messages back and forth. Complex relationships among data objects that do not map well to the tables and rows of relational databases can be reflected in object databases. Engineering programs, for example, run better with object-oriented DBMS engines than with flat-file or relational databases.

Reusable objects also save development time — and make maintenance of databases easier. Still, analysts said many object-oriented DBMS products are not friendly enough to invite widespread user interest.

Even when object databases work well, the objects inside them may not be easily transferred between different vendors' database engines. "So far, these [class] libraries are not good corporate citizens," said Stuart Woodring, director of software research at Forrester Research, Inc. in Cambridge, Mass. "They're not portable across different environments."

If predefined class libraries were to become prevalent, along with a set of object standards, the use of object-oriented DBMSs might accelerate, analysts predicted. The availability of class libraries could improve by the late 1990s, as IS shops try to recoup their development costs by selling their objects to other users.

By then, there should be standards for object-oriented languages and query languages.

950-

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EDITORIAL

Decision time

From Ross Perot's electronic town meetings to Sen. Albert Gore's information superhighways, this has been the most technology-focused presidential campaign ever. Technology is only one of the issues you'll take into the voting booth next Tuesday, but it's a topic on which the two major candidates (I'm regarding Perot as a protest vote) have clear differences. I won't tell you how to vote, or even how I'm going to vote, but here are three areas to consider:

•**Investment in training.** A survey of information systems managers conducted by the CW Database Division last week found this was the No. 1 technology issue facing corporate America. Our education system is a worldwide embarrassment in mathematics and science. Bush proposes measured steps consisting largely of teacher retraining and a modest increase in science scholarships. Clinton wants to create a national college fund and require employers to spend money on training. The Bush proposal won't cost much; the Clinton program will sting your wallet. Is it worth the investment?

•**Competitiveness.** Under the Bush administration's hands-off trade policy, offshore competition has led to the most frantic hardware price cutting in history. The result has been a windfall for computer users, but the jobs the industry has created are increasingly moving to Taiwan and Malaysia. Clinton promises to keep manufacturing jobs here through tax incentives and a more aggressive trade policy. That'll mean higher prices. Bush thinks markets take care of themselves and job losses are unavoidable. Whom do you believe?

•**Technology policy.** Although Clinton won't say it, his technology policy amounts to picking winners. That's not necessarily bad. Look what happened when the Japanese government decided that Japan should be the world's electronics leader. On the other hand, look at that country's current high-definition television debacle. That's what happens when the government picks losers.

The president would argue, truthfully, that market forces create winners and losers. But free markets also chase profits at the expense of strategic choices. One reason this country doesn't have the communications infrastructure of Japan or Singapore is that no one is willing to swallow the investment to create it. Should Washington take that plunge?

A Clinton administration will take an active role in setting technology goals and guiding industry toward them. These goals will cost plenty of money, and it's not clear from where those funds will come. A Bush administration will wait for economic rebound and count on market forces and good ol' American ingenuity to get us ahead. That's safe, but is it enough? It's your choice. But at least you have one.

Paul Gillin, *Executive editor*

LETTERS TO THE EDITOR

A contract to consider before customization

Of course a contract needs to be written between the parties, spelling out the obligations of both. However, a more efficient and satisfying process would be to contract for the work on a time and materials basis, not a two-stage, fixed-price deal as suggested in Joel Gilman's article, "Sidestep customization pitfalls" [CW, Sept. 21].

The reason for a time and materials contract is to avoid the pitfalls of premature precision on the part of the buyer, who usually cannot specify the requirements precisely, and on the part of the seller, who should be experienced enough to know that change is a way of life in the world of software development and thus may pad the price to cover contingencies.

Prototyping is a great way to be sure that the needs of users are really met.

We use a prototyping methodology called KRISP, or Keane Rapid Iterative System Production, together with computer-aided software engineering tools that produce usable production code (not scaffolding).

We recommend several iterations during the prototyping process to be sure that system subtleties are thoroughly explored.

The result is a system that meets users' needs and is delivered rapidly and cost-effectively in a cooperative atmosphere between buyer and seller. Oh, there's one more benefit: lower attorneys' fees.

Ray E. Becker
Vice president and general manager
Information Services Division
Keane, Inc.

Name-calling inappropriate

"Technical dysfunction in system professionals" [CW, Oct. 5] caught my attention as a light piece with some humor until the author, Sheryl Kay, decided to do some name-calling by including the Data Processing Management Association (DPMA) as an example in her story line, which lent nothing to the article whatsoever.

If she was or is a member of DPMA, the Association for Systems Management, AFCOM or any other professional organization, she is part of a group that does not get involved but complains that the organization does not do anything for it.

Most information systems professionals are just too busy trying to keep an edge in this ever-changing business environment to worry about people with a negative attitude of an organization, company, person or location.

This "can-do" attitude of an IS professional is what sets him apart.

Alex M. Kelso III
Nashville

Movie review gets two thumbs down

I was very disappointed that you chose to review *Sneakers* ["High-tech movie highlights realistic security concerns," CW, Sept. 14]. Because you indicated there was an endless parade of "cyberpunks," I chose to see it. Now, does your reporter know what a cyberpunk is, or was it your "hacker" friend who told him — because there was no evidence of any type of cyberpunk in the film. I personally found it to be no more advanced than *War Games* with a touch of "Mission Impossible." I saw nothing new.

Cyberpunk, on the other hand, is a razor-edge technology of hard wiring computer chips into flesh resulting in some exciting possibilities. It is part of the latest genre in science fiction that peaked in the mid-'80s, my favorite author being Bruce Sterling.

I would prefer you leave movie reviewing to the professionals.

Madeline Jobe
Atlanta

Fix it!

Regarding the letter from Lynne Gregg [CW, Sept. 14]: There are valid arguments on both sides of the downsizing question. Many of these indicate the fear felt on the mainframe side of the issue, but the "if it's not broken, don't fix it" comment is unrealistic.

This has been translated in the world of automobiles as "never change the oil and see what happens."

Donald G. Crawford
Phoenix

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 69. Sys. Integrators/ VARs/Consulting Mgt.

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- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

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- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
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- 99. Other Titled Personnel

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- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
- 99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)

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- 19. Chief Information Officer/Vice President/Asst. VP IS/ MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 69. Sys. Integrators/ VARs/Consulting Mgt.

CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 89. Educator, Journalists, Librarians, Students
- 99. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/ communications systems? (Please check only one)

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Hard and fast truths about quality

JOSHUA HAMMOND

Quality has become something of a holy grail for U.S. business, and that's appropriate. Achieving quality in products and services is critical.

The problem is that many companies are chasing this goal without a clear sense of where they are trying to go or how difficult a journey they should expect.

Here are some of the hard truths about quality improvement in America:

•**Quality is no longer a competitive strategy.** The quality gap between American, European and Japanese products has narrowed so dramatically in the past few years that the days when companies could win the lion's share of a market through superior quality are history.

Quality today is simply the minimum requirement for staying in the game.

•**Quality is not a quick fix.** It took the Japanese 20 years of saluting statistical process control, praising Pareto, touting Taguchi and other obsessions to see significant payoffs on a global scale. With restive boards and stockholders breathing down their necks, most American CEOs don't feel they have the luxury of waiting long for results. They are right, which is another good reason for viewing quality improvement as simply a fundamental and enduring part of a larger "breakthrough" strategy.

•**Quality is not an easily formed habit.** For the first time, we have a broad quality study that tracks behavior, not just opinions, about quality. Our International Quality Study with Ernst & Young documents the use of 945 management practices across four industries (automotive, banking, computer and hospital) and four countries (Canada, Germany, Japan and the U.S.).

Stephanie Faucher

Not a single management practice has reached the "habit" level — which we define as doing something at least 90% of the time — in any industry. Most practices are used either "occasionally" (less than half the time) or "usually" (51% to 90% of the time). This is true even for widely espoused (and frequently advertised) practices such as responding to customer complaints, integrating the voice of the customer into the design of new products and services, partnering with suppliers and using quality tools.

•**Quality isn't a program; it is an attitude.** Too many chief executives believe that all they need to do to demonstrate commitment to quality is appoint a team, designate a pinch hitter, make an occasional visit to the mound and show up for the seventh-inning stretch.

They fail to grasp the fact that quality is not a program but a fundamental way of doing business every day. It's time to stop managing *for* quality and start managing *by* quality.

•**Quality puts people before technology.** People in general, and Americans in particular, cannot be retrofitted into a process.

Eighty-eight percent of Americans say they can make a difference (more than half say a big difference) in the quality of products and services, but two-thirds of employees in companies with quality programs report that they are not satisfied with the slow progress of the improvement process.

The greatest untapped potential for improvement lies not in technology or better processes but in the underutilized energy and resourcefulness of the American people.

Quality improvement is a slow and difficult journey. It would be a tragedy if we let our impatience and our appetite for the next quick fix smother the most promising idea to come along in a decade.

Hammond is president of the American Quality Foundation.

How to rid yourself of those pesky users

MICHAEL B. COHN

These days, most folks are kind enough to stay far away from the IS department. They know we're in a world of hurt. We're short on head count. Our DASDs are at capacity. Our backlog grows faster than the national deficit.

And yet, some users haven't gotten the message. They're being horribly unreasonable. They want systems. They want information. They spew out this drivel about competitive advantage.

We don't have time for all that stuff. But to stay in control, we do need to appease the aggressive types and hold them off for a fiscal year or two.

Here are some tactics I suggest:

•**Call a meeting.** Users love meetings. They love hearing agendas. They love taking minutes. They don't care about Gantt charts, specs, action plans or any of that postmeeting stuff. They think they're making progress just by going to meetings. And really important users think they're making progress just by *skipping* meetings.

So, the next time you're buried, call a meeting. Don't prep. Don't do any work. Odds are fairly good that no one who matters will show up at the meeting anyway.

•**Deliver hardware.** Applications are tough. Hardware is easy. Who needs requirements, time lines and all that other tiresome stuff? You could get stuck with months of work. Just drop off a few PCs. Even though they have nothing to run, the users can look at their hardware and listen to it beep.

Somehow, this makes users happy, and you've bought yourself some time.

•**Build a prototype.** Eventually, one or two users may get wise. They may claim they've been waiting for months and haven't received so much as minutes from a meeting.

That's when you come up with a prototype. Nothing pacifies like a prototype; you should have a generic one on hand at all times. Just don't let the user fixate on the fact that every screen is titled "Small Appliance Inventory: Idaho and Wyoming."

•**Conduct a work-flow analysis.** There's always at least one really persistent user. But this type can be handled, too. All you have to do is tell him you need to see "how things work today" and schedule a work-flow analysis.

NOTHING PACIFIES LIKE a prototype; you should have a generic one on hand at all times. Just don't let the user fixate on the fact that every screen is titled 'Small Appliance Inventory: Idaho and Wyoming.'

First thing on a Monday morning, in front of his whole department, make this renegade pretend he is a piece of paper. Then, for the next nine hours, drag him through what happens as he is processed through a department. Cram him in the mailcart. Feed him through the copier. Fold, staple and collate the guy until he winds up in a wastebasket at about 5:30. By that time, he'll be glad just to go home and take a shower . . . and he probably won't call again for a month and a half.

•**When time has run out.** Eventually, there may come a time when users won't be put off any longer, when they decide they want a system NOW and come looking for you waving the blade from the paper cutter.

Here's what to do if that happens. Claim that a system has been installed for months. Tell them that you've been using yours all morning.

Boast that the system has no cumbersome keyboard, no confusing screen, just 12 easy-to-use function keys, a small footprint, voice recognition and response features and unlimited, open connectivity.

Then, if you have any vacation days left, take them quickly, before anyone figures out what the system really is. (And be sure to leave yours off the hook.)

Cohn works at a very large computer company in Atlanta.

We make the most complete And we stand behind

T6400DX

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(Although our spec sheets do make excellent reading.)

T2200SX

For example, we thought you might like to know that in the sometimes here-today, gone-tomorrow world of personal computer companies, Toshiba is the market leader in portables—part of a $33 billion company with an R&D budget larger than most companies' annual revenues.

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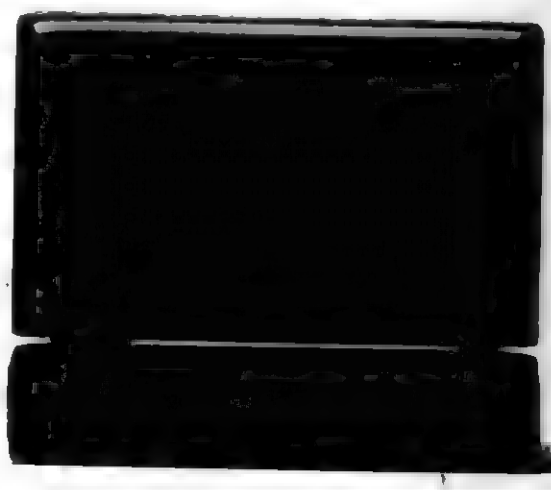

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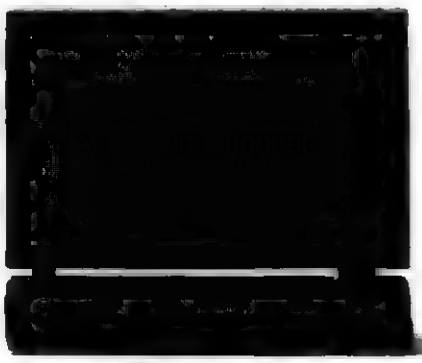

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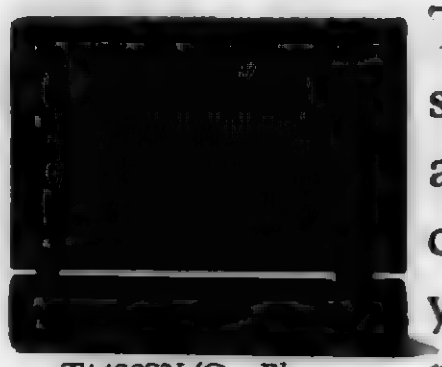
T6400SX

We also offer a 7-day/24-hour electronic bulletin board, providing access to Toshiba technical support as well as to utilities that can enhance your computer's performance.



T4400SX/Gas Plasma

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T4400SX/LCD

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Which, after everything we've told you, does seem like the logical next step.

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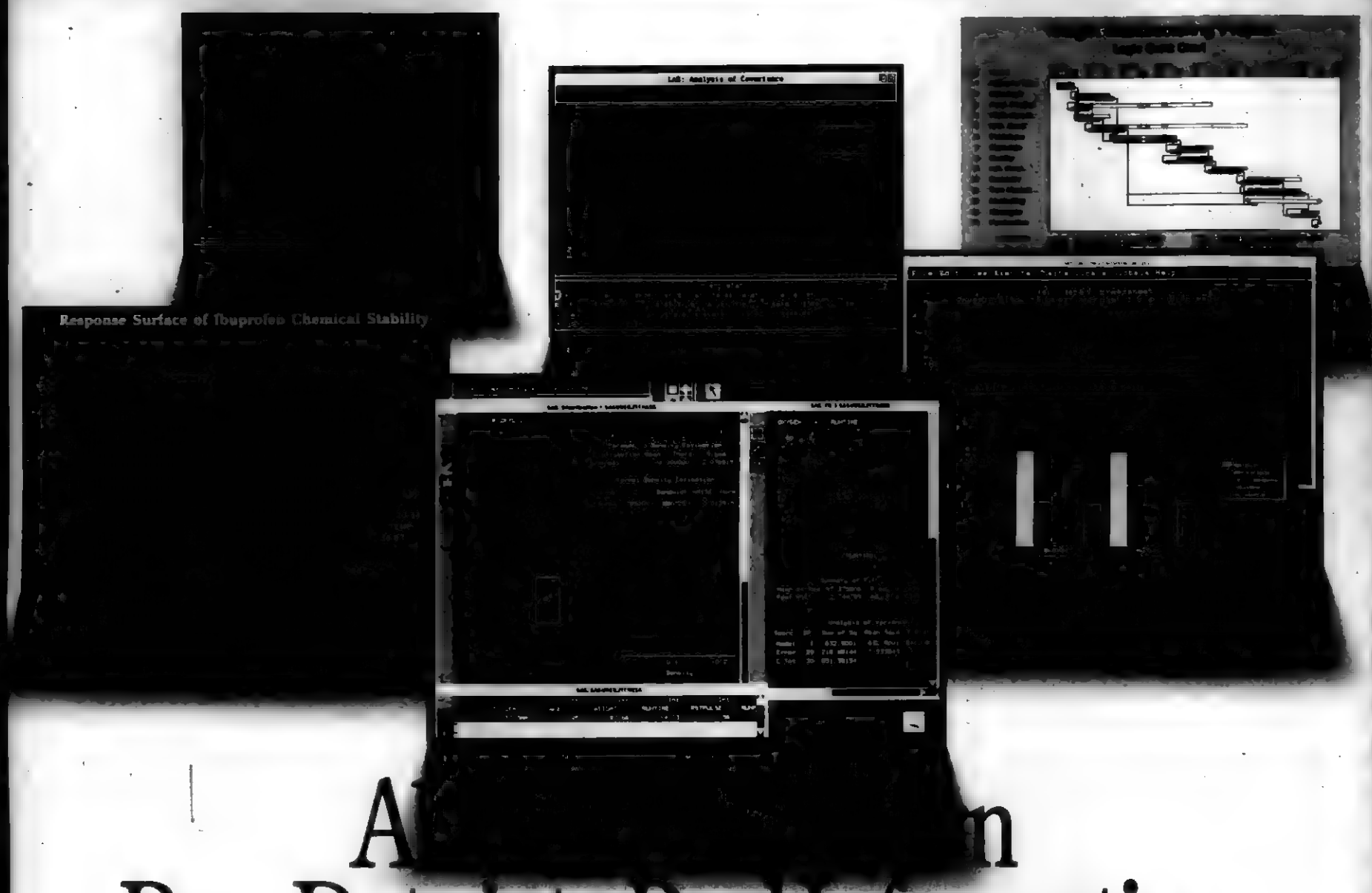
TOSHIBA



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Boardwatch

Christopher Lindquist

Snips and snipes

I finally made it to Mecca. I didn't even have to brave car bombs or camels to do it.

Mecca to the computer faithful is a superstore called Fry's Electronics, and it dots the landscape here and there around San Jose, Calif. Fry's is something you'd expect to see in a *Saturday Night Live* skit on computer geeks, but it's real. Computers, software, books, VCRs and televisions line the numerous aisles. Then, on your way out, they hit you with magazines, junk food and Jolt cola. I like it.

You can buy anything there, maybe even something to shield your PC from cosmic rays of the ilk some users were describing on one bulletin board recently. Seems a user thought such rays were flipping some bits in his system every so often. Another user replied that for those rays to go through his house and PC and hit the chip, he had to be living in the geographic equivalent of a microwave. Or maybe, he added, the ozone hole is bigger than we think.

It appears that Quattro Pro for Windows may be bigger than Borland thinks, too. Some users are still complaining that the re-

Continued on page 42

Microsoft pushes Excel-based EIS

CHRISTOPHER LINDQUIST
CW STAFF

You want to build an executive information system (EIS). Where do you start? You could buy a customized EIS package, but it might be expensive. Or you could build your own, but that would be time-consuming. Now Microsoft Corp. hopes it has come up with a third alternative.

The Open EIS Pack is a set of tools, including manuals, software and a training video, aimed at helping IS departments create what Microsoft is calling "enterprise information systems" using its Excel spreadsheet as the engine. The package also includes four sample EISs that can be used as models for creating your own.

According to users, the advantages of using a spreadsheet such as Excel as the basis for an EIS are many. For starters, many users are comfortable with the spreadsheet concept and prefer it to moving to a proprietary interface. Excel also includes many of the functions necessary to create robust EISs, including a statistical engine, an interface builder and data access tools.

Another important factor is that products such as Excel often already exist on user workstations, minimizing the additional investment necessary to build a system from scratch or to buy a proprietary system.

Early users indicated that the Excel package makes the EIS development process considerably easier under Excel than previously. Jim Kraft, vice president and director of systems at Bennington Capital Management in Seattle, used an early version of the product to create the Alloset asset allocation system, which helps users determine the optimal mix for a portfolio. Kraft said Excel allowed him to build an application that was very sophisticated under the hood, but "we wanted to present it in a very simple way."

Kraft's application uses the history of a mutual fund, combined with analyst information on the future of the market, to determine the fund's profitability over time.

The EIS is used both for determining the proper mix in a portfolio and for training users on how to achieve such a mix. Once the mix is determined, it "comes out with a pie chart to tell the investor how much to invest in stocks, bonds, etc."

Steve Garfein, a consultant at RPM Systems Corp. in Irvine, Calif., has been working with the product for several months and has created several EISs under Excel, including one that ships as an example program with the pack. Garfein said building EIS applications with Excel before the pack existed required "some sophisticated skills." However, with the pack, "regular spreadsheet users will now be creating their own graphical information systems."

Garfein indicated that Excel makes an excellent EIS platform because of its integrated spreadsheet, charting, Object Linking and Embedding, Dynamic Data Exchange and SQL capabilities.

The Open EIS Pack is slated to be available next month for a list price of approximately $99.

MSPCA on-line plan for the dogs (and cats)

BY ROSEMARY CAFASSO
CW STAFF

BOSTON — Its customer base may be made up of cats, dogs and the occasional bird, but the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) still needs to automate its operations to better serve them.

So the privately funded organization is on a campaign to put animal records on-line and link its various divisions, including its shelters and hospitals, as well as automate the parent group's efforts such as law enforcement.

The catch is an information systems budget that is less than 2% of the MSPCA's overall operating budget, said Helen Steven, director of MIS. So Steven and her staff of five rely heavily on donated hardware and software to put their plan in place.

"I think we are extremely creative with some really old equipment," Steven said.

When Steven arrived at the MSPCA two years ago, the organization was using a System/38 for some of its headquarters operations, including its main hospital, the Angell Memorial. But its efforts to manage its animal adoption, complaint investigation and shelter operations involved little more than pen and paper.

Information sharing

Steven is working with a plan that will take at least two years to implement. Eventually, she said, the MSPCA's statewide operations will be running PCs networked to share information. Data sharing is key for the MSPCA to improve its current level of service.

The first phase of automation is under way. Hospitals and shelters are receiving stand-alone PCs, including some "8088 hand-me-downs." Borland International, Inc. has donated dBase and Paradox database software, which the shelters are using to automate animal records.

The two satellite hospitals, one on the Massachusetts island of Nantucket and the other in Western Massachusetts, are running Intel Corp.-based 80386 PC clones with an IBM AIX-based animal hospital management system from Professional's Software, Inc. in Effingham, Ill. The Nantucket hospital went on-line earlier this month.

The second phase will focus on networking these groups, which Steven said will take place in 1993 or 1994.

When completed the system will allow MSPCA groups to swap information on adoptions, spaying and neutering programs, complaints and hospital visits to better track what is happening to the animals.

As an example, the law enforcement group, made up of 11

officers, could use more information from shelters and the hospitals — as well as quicker access to that data — when following up on a complaint. Last year, the group investigated more than 5,000 reports of animal cruelty.

Steven said another goal is to track pet adopters to identify those who do not live up to some basic rules and to ensure they do not continue adopting pets. In some cases, adopters may return pets that do not work out after only a few weeks and then visit another shelter to try again.

She said it is also not unheard of for some people to shop the shelters, pick up pets and then sell them.

Hyundai playing to get off PC bench

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Hyundai Electronics Industries Co.'s Information Systems Division has made a gambit to separate itself from the pack of what its president, Ed Thomas, called "bottom-feeding, no-name clones" last week.

Thomas said the company hopes to boost its presence in the PC business through aggressive product development cycles of five to eight months, which it established with a sweeping revamp of its product line.

Though analysts praised Hyundai's overall product thrust, they noted that Hyundai remains a marginal player in the PC market; while most of its technology is at the front end of the market, some lags behind.

For instance, its passive-matrix color notebook features screen technology that has been outstripped by offerings from vendors such as AST Research, Inc. and Toshiba America Information Systems, Inc.

"I'm impressed by where they are in the market at the moment, but what's puzzling to me is how they'll support the cost structure," said Kimball Brown, an analyst at International Data Corp.

Hyundai walked the path chosen by IBM and Compaq Computer Corp., splitting its product lines into premium and lesser products. Hyundai will try to establish itself largely based on price. A new Hyundai 33-MHz 386SX-based PC, for instance, will cost $1,299 — $350 less than a comparably configured system from Dell Computer Corp.

Hyundai aimed its new lower-priced lines at different customers. The Prestige line was designed for dealers and value-added resellers, while the Elite line targets the mass merchant channel. These products will sell for $200 to $300 less than the premium line.

Analysts said Hyundai's service offerings could score points. In addition to offering seven-day, 24-hour support, Hyundai has established a beginner's line that will answer questions for anyone.

"This is a great idea, and it means that they could capture somebody else's customers down the road," said Andrew M. Seybold, editor of the Brookdale, Calif., newsletter "The Outlook on Professional Computing." "It may pay off for them, if they can afford to do it."

Forum offers preview of future chips

BY MICHAEL FITZGERALD
CW STAFF

BURLINGAME, Calif. — The Microprocessor Forum that met here recently featured engineering machismo and some insight into future chips.

Drawing the most attention was Intel Corp.'s 32-bit P5 processor (since renamed Pentium), the follow-on to its 32-bit I486 based chip.

Intel provided some technical details on how the processor will work but dodged questions asked at the conference. The company did say it expects to see systems based on the P5 concurrent with the chip's announcement in the first quarter of 1993.

Motorola, Inc. also showed some of the technical workings of its next-generation processor, the 68060. Unlike Intel, which is currently shipping samples of its P5, Motorola said it does not expect to produce silicon for another year.

It does expect to have customers for the chip, despite Apple Computer, Inc.'s planned move to the PowerPC architecture. Motorola said Apple may be a 68060 customer.

Texas Instruments, Inc. and IBM also gave details on their MWave digital signal processor (DSP), which was designed to improve multimedia performance on systems. IBM said it will use the MWave DSP in its entire line of Ultimedia multimedia PCs in 1993.

The forum also featured discussion of future directions. Michael Slater, editor of the "Microprocessor Report," which sponsored the forum, cited reduced instruction set computing vendors' new focus on reducing chip costs as a major short-term development. He called personal digital assistants "an important emerging market, and it's an unknown in terms of what processor might prove dominant."

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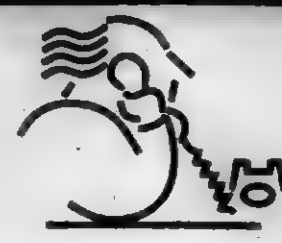


Part of a series of tips columns drawing on questions commonly asked of vendors' customer support centers. This week's questions focus on Lotus Development Corp.'s Ami Pro.

Q What is the best way to customize a short and long directory of style sheets (and macros) to reduce them to manageable proportions for everyday use?

A Make a new directory underneath the c:/amipro/styles directory. Name it c:/amipro/styles2, and then move all the style sheets except your favorite ones into it. They're still available but do not clutter up the screen. To access the style sheets in the /styles2 directory, choose Tools/User Setup/Paths and specify c:/amipro/styles2 for the style sheet path. (The same procedure will work for macros.)

Q How can I determine the location of the graphics file I imported into my document?

A If you did not use the "copy image" option to store the graphic inside your Ami Pro file, you can choose View/View Preferences and turn off the "Pictures" option by removing the X from the check box. Each frame in the file will display with an "X" instead of the picture, and the path/filename of the graphic will display at the top of the frame.

Q Several of the Ami Pro 3.0 style sheets supplied are automated with a macro. Do these style sheets all use the same macro? How can I determine which macro is used with a certain style sheet?

A Most style sheets use the same macro, AUTOSTY.SMM, but some use different macros. For example, the calendar style sheet uses a macro called AUTOCAL.SMM.

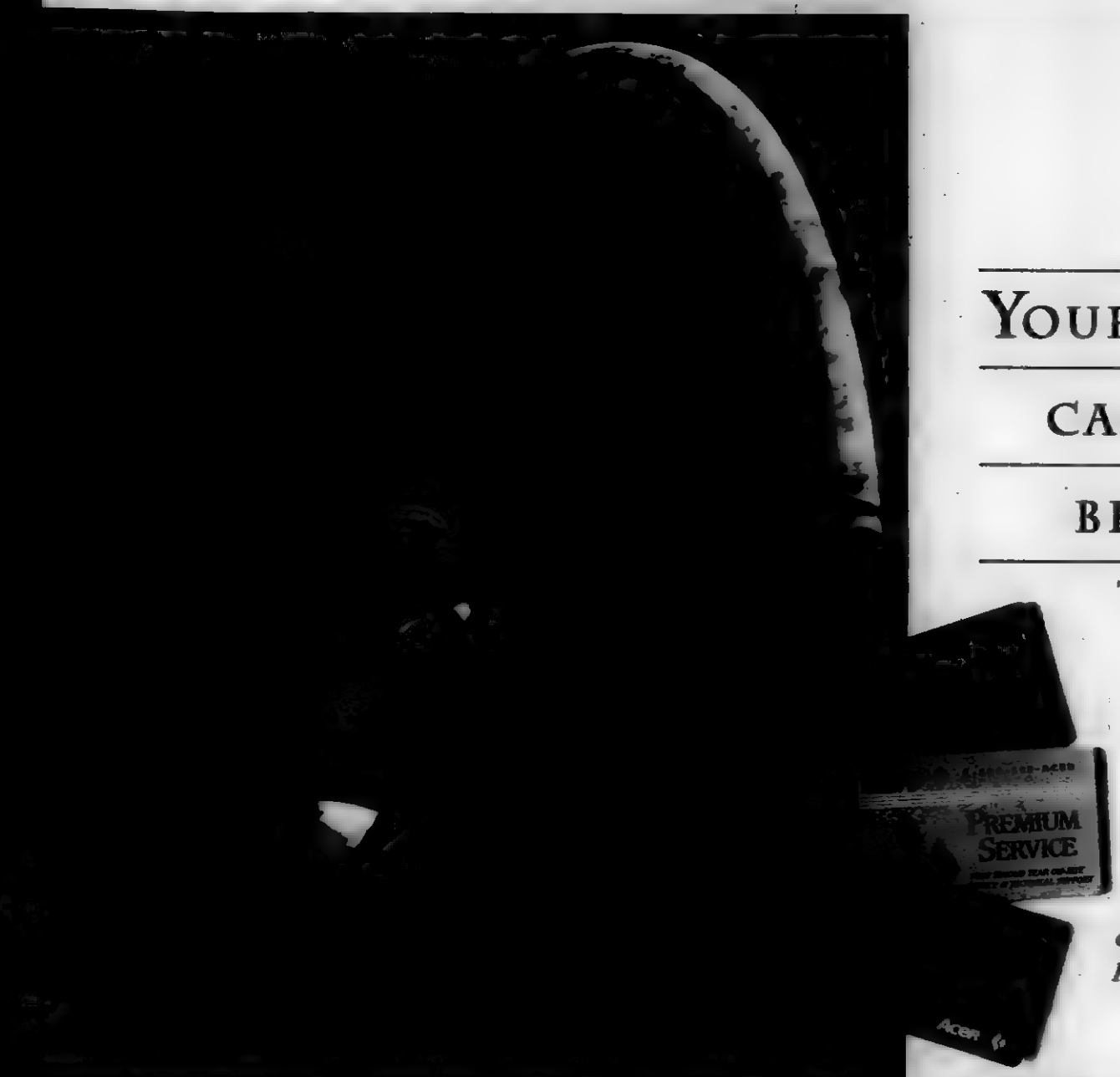
The quickest way to figure out which macro is used with a style sheet is to open the style sheet (File/New), With Contents. Then go to the Style/Save A A Style Sheet dialog box and look at the Run Macro edit box for the name of the macro that is saved with the style sheet.

Cancel out of the dialog box, unless you want to save any changes you made to the style sheet.

Q What's a good application for the notes feature in Ami Pro 3.0?

A Before quitting a project in Ami Pro for the day, use notes to remind yourself where you left off and where you want to go next. It will make it that much easier to resume your work the next day.

To find the location of the note when you resume work, choose Edit/Go To/Note. Remember to delete the note after you begin work.



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Monitor	UVGA-NI	No	UVGA15-NI	UVGA-NI
Hard Drive	210MB	210MB	230MB	340MB SCSI
Expansion Slots	(8) 5 EISA/2 ISA/1P	4 EISA	6 EISA	8 EISA
Local Bus/Flash BIOS	Yes/Yes	Yes/Yes	No/No	No/No
MSRP*	$3,299	$3,695	$3,469	$3,595

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Panasonic refocuses on notebooks

BY MICHAEL FITZGERALD
CW STAFF

SECAUCUS, N.J. — While some conglomerates have shed their computer businesses, Panasonic Communications & Systems is retrenching by reorganizing and releasing innovative products.

Panasonic, a division of Japan's Matsushita Electric Industrial Co., split its notebook segment off from its Office Products Group. Panasonic officials said the company's ability to sell notebooks was hurt by the Office Products Group's focus on copiers and other higher revenue products. The new Computer Division will initially focus on trying to sell into Fortune 1,000 accounts through a direct sales force. The division will have new notebooks to sell, as Panasonic introduced the CF-1000, the CF-480 and the CF480C.

The CF-1000 is the most notable of the three; it weighs 5 pounds and comes as close to being an entire 3.3V system as any in today's market. A 1.25-in. thick notebook, it uses Advanced Micro Devices, Inc.'s 3.3V 25-MHz AM386SXLV as well as a low-volt system controller from VLSI Technology, Inc. and a low-volt LCD Video Graphics Array controller from Cirrus Logic, Inc.

THE NEW Computer Division will initially focus on trying to sell into Fortune 1,000 accounts through a direct sales force.

Panasonic claimed the notebook has a base battery life of six hours. Users can remove the floppy drive and put in a second battery to gain up to five more hours of battery time. Panasonic said it would ship the CF-1000 next month for $2,299 with a 60M-byte hard drive and $2,699 with a 120M-byte hard drive.

The 6-pound CF-480 and CF-480C use Intel Corp.'s 25-MHz 80386SL and come preinstalled with AddStor, Inc.'s SuperStor compression utility. The CF-480 is available now and will cost $2,699 with an 80M-byte hard drive and $2,999 with a 120M-byte hard drive. The CF-480C with an active-matrix color screen is to ship next month and sell for $4,999 or $5,299, depending on its hard drive.

The Computer Division will be based in Fort Worth, Texas.

Friday the 13th, other viruses near

BY JAMES DALY
CW STAFF

November's chill will bring the usual assortment of DOS nuisance viruses, as well as some new additions with a more pernicious intent. The month will also contain a Friday the 13th — a date that seems to delight virus writers. Several Jerusalem virus variants are slated to activate on that bewitching day.

As with all viruses, the activation dates cited are for general awareness and are not exclusive. Many a skilled programmer can do a little tinkering under the hood to change a few lines of code and make the virus go off whenever he desires. Experts advise scanning any new disk before using it, as well as following the three basic rules of virus protection: backup, backup, backup.

New November viruses include the following:

Maltese Amoeba is a rare, destructive virus that will activate on Nov. 1, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La.-based developer of data security software. At that time, it will overwrite the first four sectors of cylinders 0 through 29 of the hard drive and any disk drives. Then it will display a bright flashing screen that leaves the system in a loop. Once the system is rebooted, the following poem will be displayed and the system will hang: "To see a world in a grain of sand/And heaven in a flower/Hold infinity in the palm of your hand/And eternity in an hour/The Virus 16/3/91."

The **November 17th** virus, slated to strike Nov. 17, was first discovered in January. Since then, there have been widespread reports of it in Europe. The virus is a memory infector of .COM and .EXE programs, including COMMAND.COM. Infected programs will have their file length increased. No visible change will occur to the file's date and time in the disk directory. One common text string can be found in the viral code of all infected programs: "SCAN.CLEAN.-COM.EXE."

The slightly sick **Kennedy** virus is a generic infector of .COM files, including COMMAND .COM. It has three activation dates: June 6, the assassination of Robert Kennedy in 1968; Nov. 18, the death of Joseph Kennedy Sr. in 1969; and Nov. 22, the assassination of John F. Kennedy in 1963. Upon activation, the following message will be displayed: "Kennedy is dead; long live 'The Dead Kennedys.'" The Dead Kennedys were a punk rock band in the early 1980s.

Infected systems will experience a cross-linking of files, lost clusters and file allocation table errors that include messages saying the file allocation table is bad.

The **RAM** virus is one of a handful of viruses that is based on the **Jerusalem** virus and activates on Friday the 13th. It is a memory-resident infector of .COM, .EXE, COMMAND.COM and overlay files. After the RAM virus has been memory-resident for 30 minutes, a black box will appear on the screen, and the system will slow down by about 30%.

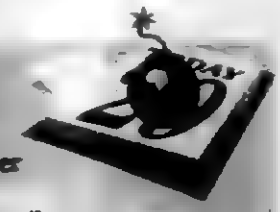
Westwood is another **Jerusalem B** virus variant that infects .COM, .EXE and overlay files. It is similar to the RAM virus in that a black box will appear on the screen after the virus has been memory-resident for 30 minutes. **Hybrid** is a nonresident infector of .COM files, including COMMAND.COM. It also activates on Friday the 13th, overwriting the current drive's boot sector every time an infected file is opened.

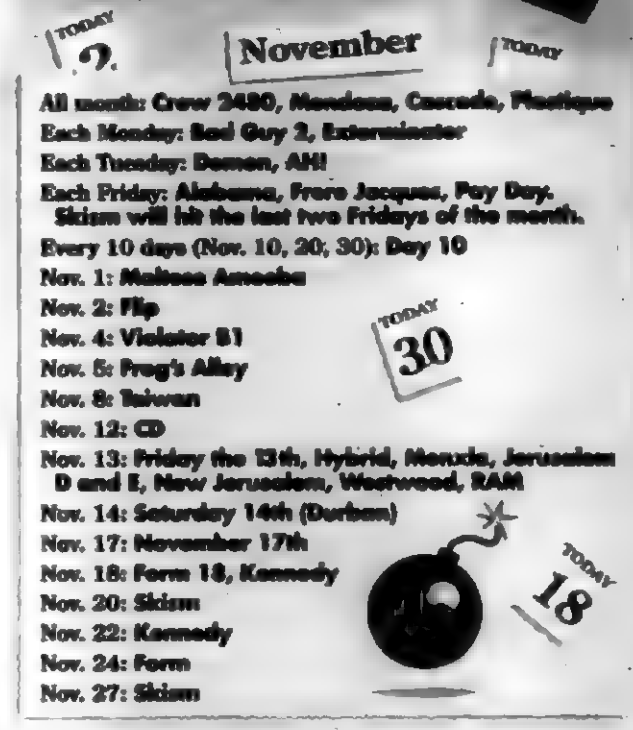
The **Saturday 14th**, or **Durban**, virus infects .COM, .EXE and overlay files but not COMMAND.COM. Infected files will increase by between 669 and 684 bytes. The virus also overwrites the first 100 logical sectors of the A:, B: and C: drives, and it destroys the hard disk boot sector, partition table and file allocation table.

Two other viruses that can activate on any day until the end of the year are **1554** and **1704**. The 1554 strain is a memory-resident virus that renders .COM, .EXE and COMMAND.COM files inoperable. The 1704 virus is a memory-resident .COM file infector that causes the infected file size to increase by 1,704 bytes. When activated, 1704 also reformats the hard disk.

Dangerous days

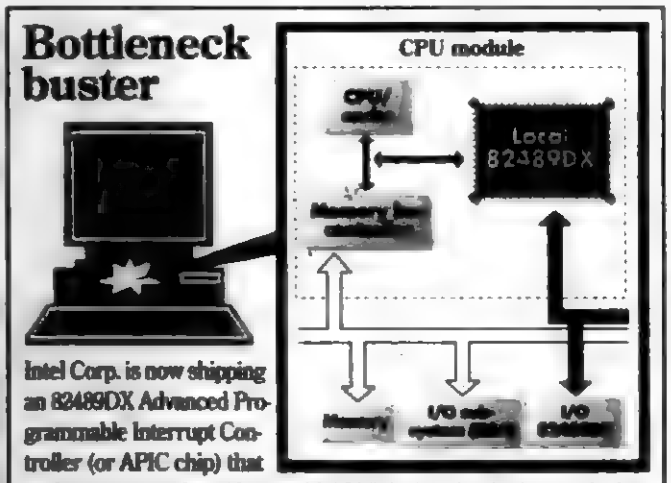
A list of the viruses scheduled to strike during the month of November





Source: Fifth Generation Systems, Inc.

Bottleneck buster



Intel Corp. is now shipping an 82489DX Advanced Programmable Interrupt Controller (or APIC chip) that replaces a more than 10-year-old APIC design that had proved a bottleneck in processing operating system instructions. The new APIC will let users take advantage of 32-bit multiprocessing systems and improve single-chip system performance by five times when it appears in systems early next year.

Source: Intel Corp. CW Chart: Michael Stadler

Dell moves toward reselling

BY CAROL HILDEBRAND
CW STAFF

Dell Computer Corp. took another step in its evolution from pure hardware manufacturer to one-stop shopping organization with the introduction of DellWare.

According to Rob Howe, vice president and general manager of Dell's direct sales, "Dell has become a giant reseller," with the exception being that the hardware components are all Dell machines. However, analysts pointed out that many Dell products, such as the Dimension line, are not actually manufactured by Dell, so the concept of Dell as value-added reseller may be closer to reality than the company acknowledges.

Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., said Dell has actually been moving in this direction for a while. "They've been kind of a reseller for some time," he said. "Once you develop relationships to preload applications, for example, you might as well leverage them any way you can."

The DellWare program consists of several catalogs aimed at different market niches, Howe said. Offering about 650 software packages and assorted peripherals, the catalogs will come out nine times a year and offer next-day delivery after the order has been placed by phone. Howe said prices will be comparable to computer stores such as Egghead Discount Software and PC Connection.

The idea of Dell as a superstore is not as strange as it may seem. Founder and Chief Executive Officer Michael Dell has publicly stated that he aims to eventually move his Austin, Texas-based concern away from strict PC manufacturing. Instead, he wants to create a world-class marketing organization that sells whatever its customers need.

Analysts said diversifying out of the razor-thin margins of desktop hardware is a logical move. "The question is, what else can you make money on?" Zwetchkenbaum asked. "Dell is playing out their strengths to the max."

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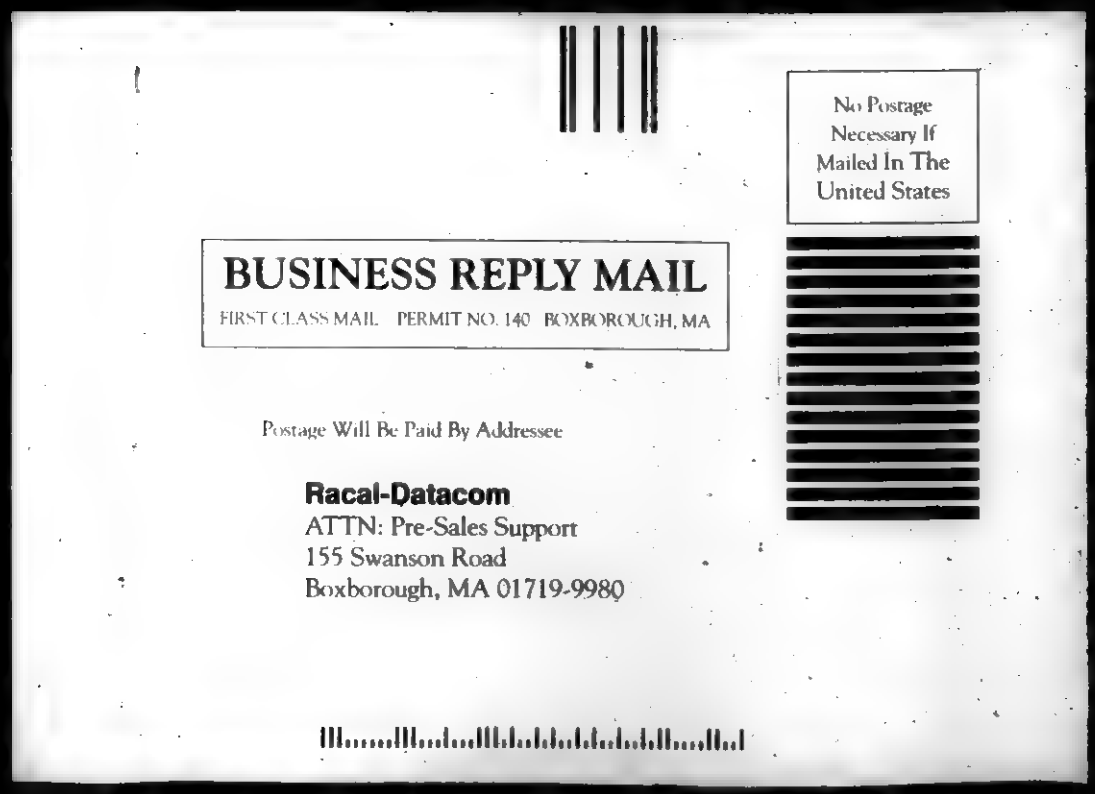

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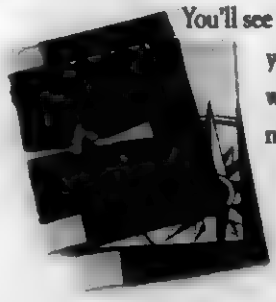

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NEW PRODUCTS

Systems

International Open Systems has introduced the VS1000, a desktop videoconferencing system.

According to the company, the product allows point-to-point, full-motion video and audio communications from a 386/486 PC. Real-time audio and visual can be compressed and decompressed at low bandwidths because the product is based on CCITT's H.261 international algorithm for video compression.

The VS1000 is accessible to networked environments such as Token Ring, Ethernet, Novell, Inc.'s NetWare and Integrated Services Digital Network lines. The product operates under Microsoft Corp.'s Windows 3.0 or above.

The product costs $25,000 per seat.

International Open Systems
Suite 306
100 Corporate Place
Locust St.
Peabody, Mass. 01960
(508) 535-2080

Peripherals

Fargo Electronics, Inc. has introduced the Primera Color Printer.

The product provides full-color page printing from all IBM PCs running Microsoft Corp.'s Windows 3.0 or 3.1 and can print a full page with 100% coverage in two minutes. The Primera Color Printer was designed for Windows users who work with graphs, pie charts, diagrams and illustrations.

A software driver for Windows 3.0 and 3.1 is included, and a monochrome ribbon is available for text-only printing. A wax-based thermal ink ribbon is used for color applications.

According to the company, the printer, priced at $995, costs three times less than the current least expensive thermal transfer color printer.

Fargo Electronics
7690 Golden Triangle Drive
Eden Prairie, Minn. 55344
(612) 941-9470

Continued on page 44

Lindquist

CONTINUED FROM PAGE 37

cently released spreadsheet uses an unnecessary amount of system resources and, worse, tries to prove that you can take it with you by not returning all the memory after the program closes. Reports indicate that Borland is working to make Quattro Pro for Windows, which wins user raves on usability, less greedy.

Microsoft, however, wasn't taking too much but rather sending too little. Seems a few Word for Windows upgrade packages were missing disk No. 2, making installation a bit difficult. Microsoft is correcting the problem.

Meanwhile, the wonderful world of computer hardware is fast becoming as exciting as deciding which color stapler to buy (unless you're buying an Intel Pentium-upgradable VESA local-bus system, which is about as exciting as bungee jumping off a 90-ft bridge with a 100-ft cord).

But that doesn't stop some companies from sniping. Seems a rumor was beginning to float that Gateway Computer was filing for Chapter 11, and one message hinted that "probably one of their competitors started it." That was followed by an immediate reply from a Zeos rep, who said, "We didn't start it."

Of course, no one had suggested they had in the first place. Maybe their ears were burning.

If you've been having hearing problems recently, maybe it's your HP HP95LX. Seems that the little suckers have a voltage converter that ups the flow to the screen and voila, you get a slight buzz that'll follow you wherever the palmtop does. One user reports you can even control the pitch by plugging and unplugging the AC converter.

Here's another reason your ears may be having problems: They may be feeling a bit warm if this message is about you. Under the subject line of MIS Woes, a user complained: "And remember, my company's MIS group is the one that wants to standardize on WordPerfect for Windows, if they ever get off their duffs and decide. The company standard now is Multimate. Need I say more?"

Not a word.

Lindquist's phone bill for data calls is currently being considered for the Guinness Book of World Records. If you want to help him reach this goal, send a message via MCI Mail at 549-8464, CompuServe at 72360,2005 or Internet under chris1@unix-land.natick.ma.us.

Lindquist is a *Computerworld* West Coast correspondent.

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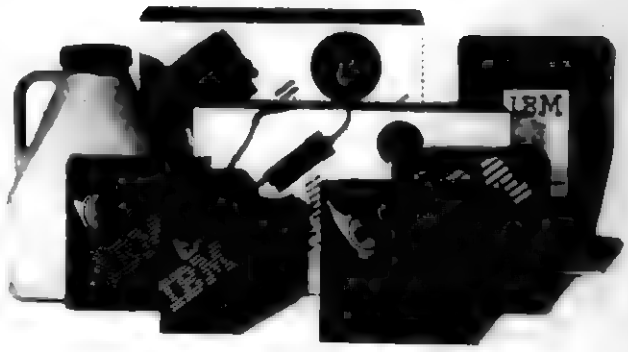

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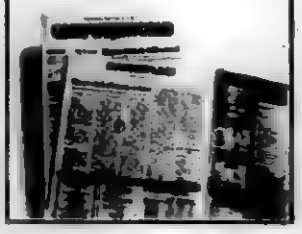
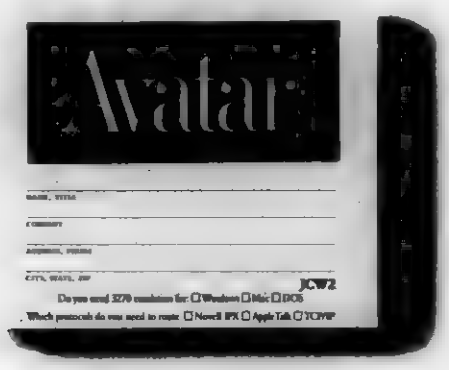
Check out the Marketplace Pages on Page 146.



(What is it?)

It's an SNA gateway. (That's nothing new.) **It's also a local router.** (Excuse me?) **It's an SNA gateway *and* a local router** (You mean in one product?) **in one product. So it provides you with two solutions in one:** (Let me guess; the functionality of a gateway along with the performance of a router.) **the functionality of a gateway combined with the high-performance of our router's SPARC processor.** (I was close.) **Since this new product** (I think it should be called a gateway-router.) **performs two functions at once, it offers unprecedented levels of administrative convenience and manageability.** (But does it access multiple LANs?) **It also accesses multiple LANs, including Token-Ring, Ethernet, and LocalTalk,** (Ask a stupid question...) **and supports mixed PC environments such as Windows, Mac, and DOS.** (Holy Toledo.) **Naturally, our Netway gateway-router** (Hey, that's *my* name for it.) **can route Novell IPX and AppleTalk protocols,** (And?) **and comes complete with powerful 3270 services like terminal and printer emulation.** (I wonder who came up with this thing.) **As you might have guessed by now, the company behind this revolutionary product is Avatar,** (I should have known.) **leaders in SNA connectivity for over a decade.** (Must be about time for the obligatory 800 number.) **For more information, and our free "Gateway-Router Guide to Network Manageability," send in the coupon or call 1-800-AVA-3270.** (A free gateway-router guide? You must have read my mind.)



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Come see us at Interop, Booth #5170

Continued from page 42

Image Network Technologies, Inc. has introduced its 3-in. INT/128 rewritable optical drive.

A magneto-disk using both magnetic and optical technologies enables the drive to store up to 128M bytes of rewritable data. The product is a 3,000-rpm rewritable optical drive that has optical read-only memory for secure data distribution, the company reported.

The INT/128 conforms to International Standards Organization standards and features a Small Computer Systems Interface-2 interface. Compatibility is provided with DOS, Sun Microsystems, Inc., OS/2, Apple Computer, Inc. Macintosh and Digital Equipment Corp. systems. The INT/128 supports RISC System/6000, Unix and local-area networks.

The product costs $1,950.

Image Network Technologies
9661 Telstar Ave.
"A"
El Monte, Calif. 91731
(818) 454-1617

General Parametrics Corp. has introduced Spectra Star Q10, a color thermal printer.

According to the company, the product includes Pantone, Inc.'s certified color matching, 6M bytes of random-access memory and 20 fonts. Users can produce up to 99 additional copies of any image stored in the printer by pushing a front panel button.

An autosense feature enables the printer to automatically select either a serial, parallel or an Apple Computer, Inc. port. Spectra Star Q10 supports PC, Macintosh and shared environments.

The product costs $4,999.

General Parametrics
1250 Ninth St.
Berkeley, Calif. 94710
(510) 524-3950

Software application packages

TTG, Inc. has introduced Starmanager Advanced 3.1, sales territory design and mapping software for IBM PCs and compatibles.

New features include complete compatibility with files from Lotus Development Corp.'s 1-2-3 spreadsheets and Borland International, Inc.'s dBase III or dBase III Plus database files, as well as True Type fonts found in Microsoft Corp.'s Windows 3.1. True what-you-see-is-what-you-get display of text is provided, and the product now offers improved flexibility in font selection, according to the company.

Starmanager Advanced 3.1 costs $995.

TTG
10 State St.
Woburn, Mass. 01801
(617) 932-6500

Slate Corp. has introduced Day-Timer Pen Scheduler software.

According to the company, the product uses the power of pen-based computers to give users familiar tools such as a prioritized To Do list, a multiple view calendar, a notepad and an address book.

Day-Timer Pen Scheduler has a pen-centric design and offers organization and retrieval capabilities including flexible sorting, gallery view for quick information access, on-the-fly indexing and a capability called Slate Tiny Text that lets users zoom in on any page and write information.

Support is provided for Microsoft Corp.'s Windows for Pen Computing and Go Corp.'s PenPoint.

The product costs $195.

Slate
15035 N. 73rd St.
Scottsdale, Ariz. 85260
(602) 443-7322

Macintosh products

Claris Corp. has announced FileMaker Pro 2.0 software for the Apple Computer, Inc. Macintosh.

FileMaker Pro 2.0 is database management software that has 50 new features including more powerful scripting through ScriptMaker, a new scripting facility, and extensive System 7.0 capabilities with Apple Events, Quicktime and Data Access Manager support.

Ease of interoperability with the Microsoft Corp. Windows-based version enables one file format to be shared by both versions. This allows for databases created on the Macintosh or PC to run on either platform without modification or translation, the company reported.

FileMaker Pro 2.0 costs $399.

Claris
5201 Patrick Henry Drive
Santa Clara, Calif. 95052
(408) 987-7000

Virginia Systems, Inc. has introduced Version 1.0 of Sonar Image, a document imaging system designed for the Apple Computer, Inc. Macintosh.

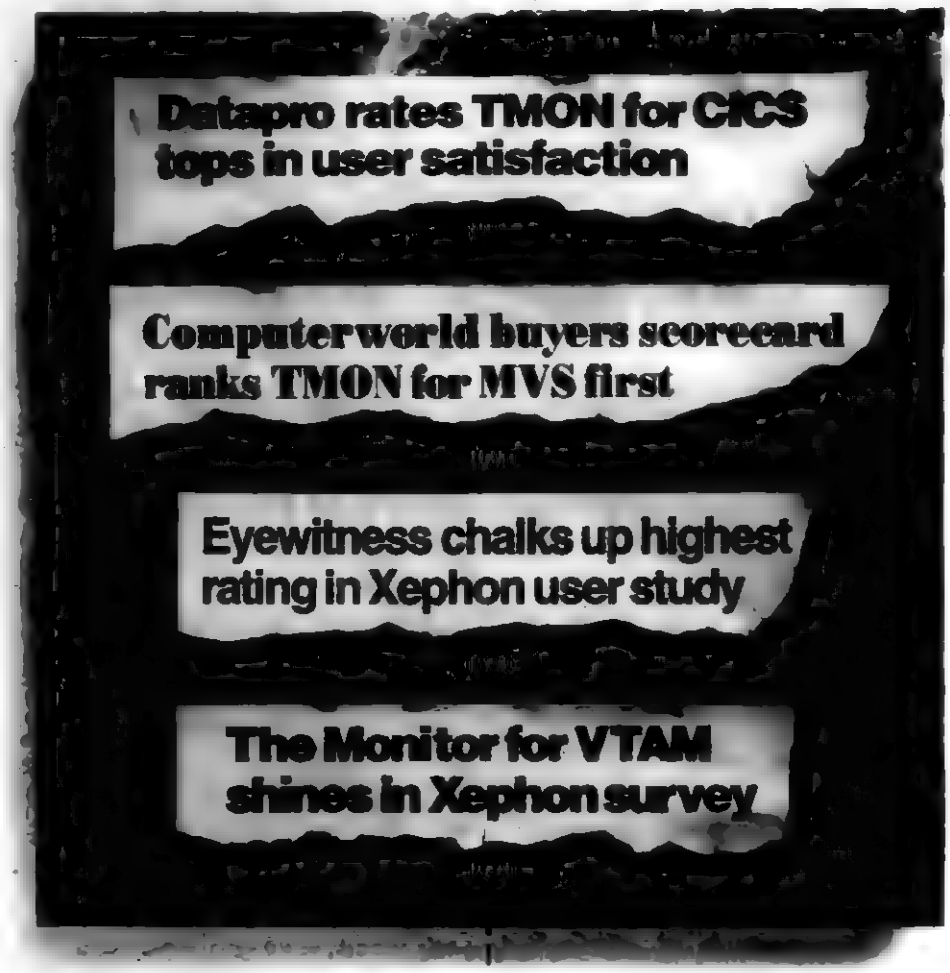
Users can scan items such as letters, articles, depositions and briefs and recover the scanned documents at a future time, the company reported.

An automatic optical character recognition feature enables users to search for anything in the scanned documents. Users can then view or print the original image of the page or the recognized text in the document.

Sonar Image provides a choice of three image resolutions, support for a variety of scanners, simple image input and an enhanced retrieval system.

Sonar Image costs $2,195.

Virginia Systems
5509 West Bay Court
Midlothian, Va. 23112
(804) 739-3200



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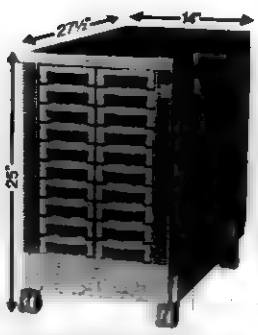

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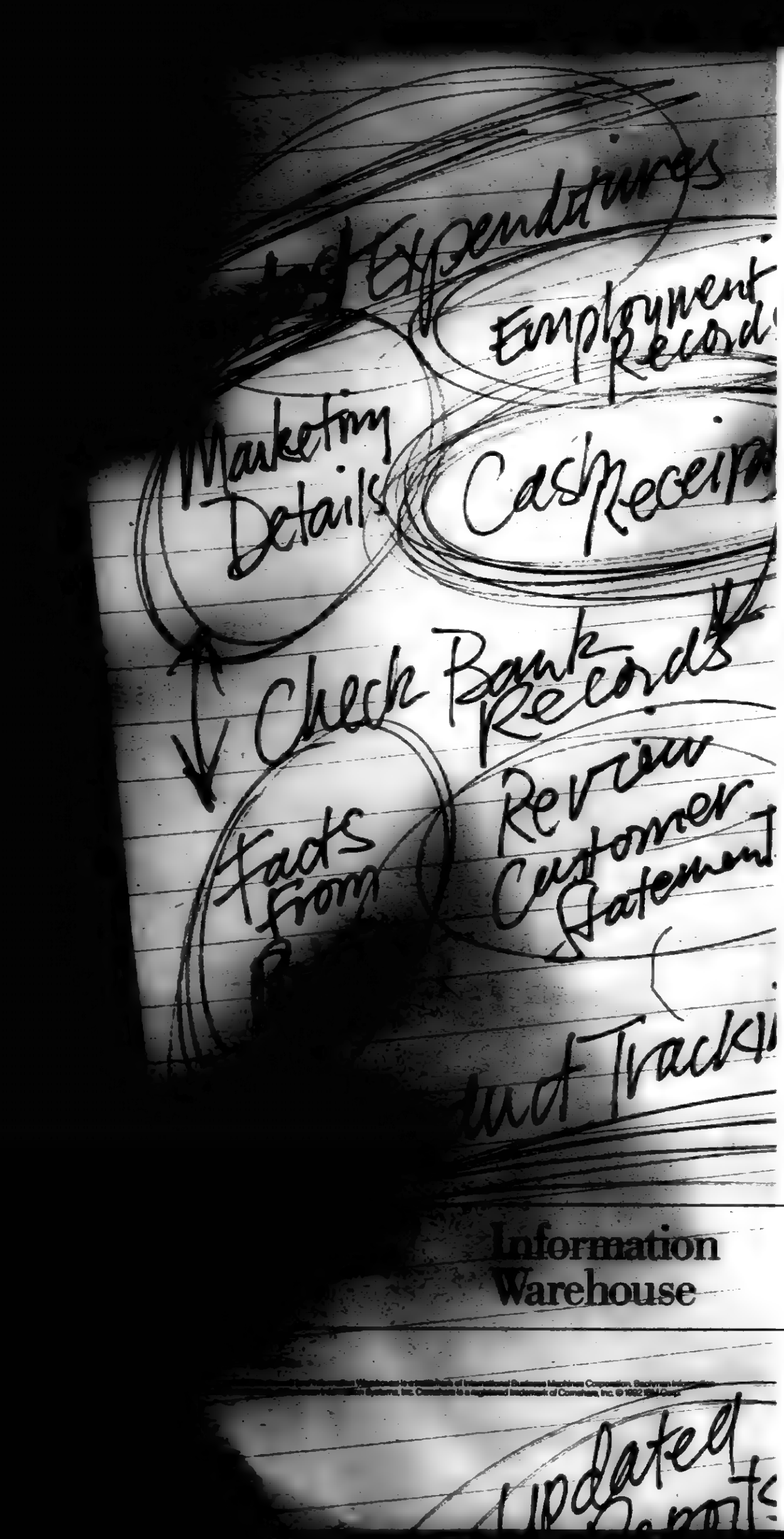

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IBM

High demand for experienced LAN personnel

BY MICHELE DOSTERT
CW STAFF

When Karen Scott tried to hire another local-area network administrator, she did not expect to spend two months looking for one.

According to Scott, manager of computer networks at New York-based law firm Weil, Gotshal and Manges, a newspaper ad brought in 60 responses — all from people who had managed 20-node networks. "I needed someone who had experience with large LANs; ours has 1,200 nodes, and the whole firm depends on the LAN," she said.

In the end, Scott found her employee through sheer luck. "I heard that one of our system integrators was laying off some people, and I grabbed one of their employees right away. I tell you, large-LAN people are really hard to find."

Scott's experience is not unique; in fact, it could have been worse. "I've had to search as long as six months to find a LAN expert who fit my requirements," said John Good, director of information technology at New York-based Turner Corp., a nationwide construction firm.

Although information systems employment in general is falling off rapidly, experienced LAN personnel — especially those with connectivity and large-LAN experience — are still in strong demand, according to corporate hiring managers and recruiters.

Turnover dilemma

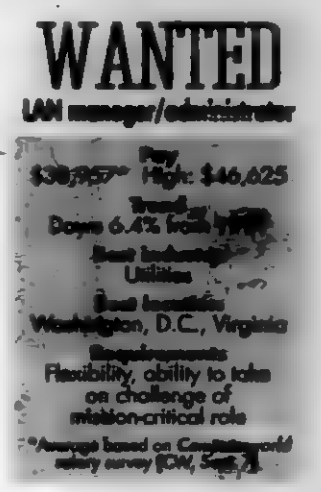
As more businesses move from mainframes and minicomputers to PC LAN environments, the demand for LAN administrators, managers and programmers is increasing, recruiters and corporate IS managers said. They maintained it is just as hard to keep, as it is to find, experienced LAN personnel.

"I trained one of my guys as a Certified NetWare Engineer, and two weeks later he was gone," lamented Donald Sternfeld, IS director at the international law firm of Morgan, Lewis, & Bockius.

Given this shortage and the current rage for downsizing, IS personnel looking to change jobs might want to consider networking. For example, employers strongly recommend that mainframe personnel acquire as much PC LAN experience as possible.

"Mainframe people should take advantage of any training they can get in PC LANs and distributed database and processing. Just knowing the MVS environment is not enough anymore," warned Peter Wolfe, a regional manager at Source EDP, a recruitment firm in Cincinnati.

LAN personnel who can install and maintain LAN-to-mainframe gateways, bridges and routers and who understand wide-area and remote connectivity are in high demand. As more corporations add LANs to their mainframe environments, personnel experienced in both environments can command a premium.



CW Chart: Michael Siggins

What they look for

Interviews with corporate managers turned up several key qualifications they typically look for when reviewing LAN applicants' resumes. These include the following:

•**Broad knowledge.** Companies hiring a departmental LAN manager are looking for someone to maintain the entire network.

"The broadest demand we see is for people who can set up the hardware, know the LAN operating system and have a strong knowledge of shrink-wrapped PC applications," said Fred Whisser, manager of IS placement at Rob-

Continued on page 73

LAN recruitment methods

Network managers typically turn to any of four approaches to find the LAN specialists they need: advertising, recruitment specialists, retraining current personnel and personal contacts. Many employers said they have found their best source of new employees to be personal contacts from user groups and the LAN community.

"We don't like to raid other companies, so we don't use recruiting firms," said Jack Atwater, president of The Trellis Group, a Banyan Systems, Inc. integrator and add-on vendor in Hopkinton, Mass. "We find most of our people through the grapevine."

"We advertise in the papers, but the people who tend to respond to those ads tend to be entry-level gofers, whereas we really need experienced people," said John Good, director of information technology at Turner Corp., a nationwide construction firm.

As a result, Good said, he relies mostly on personal contacts, trade shows and user group meetings. As a precaution, "to make sure people really know the stuff that's on their resume, we've developed an informal little test that we give new applicants," he said.

Retraining current personnel is the option of choice at most Fortune 1,000 companies. "Companies would rather hang onto their people, who are proven commodities and know their business, and retrain them; it's cheaper in the long run," said Peter Wolfe, a regional manager at recruiting firm Source EDP.

Once companies have located LAN specialists, the question of money is sure to arise. A recent salary survey conducted by *Computerworld* [CW, Sept. 7] showed LAN salaries dropping 6%, more than for other IS specialists. However, recruitment firms said the apparent decline is caused by the proliferation of LANs and entry-level LAN administrators.

According to John Allred, Kansas City, Kan.-based region manager at Source EDP, entry-level LAN personnel with six months to one year of experience can start at salaries of $25,000 per year in the Midwest and about $33,000 in the Northeast, while veteran LAN personnel can command from $45,000 in the Midwest to $55,000 in the Northeast.

However, most employers listed job satisfaction, not salary, as the key to keeping good LAN personnel. "People like to learn new things, get excited about new projects. Keeping people involved and excited about their jobs has been our key to keeping our good LAN people," said Peter Gallagher, a system engineer at Turner.

MICHELE DOSTERT

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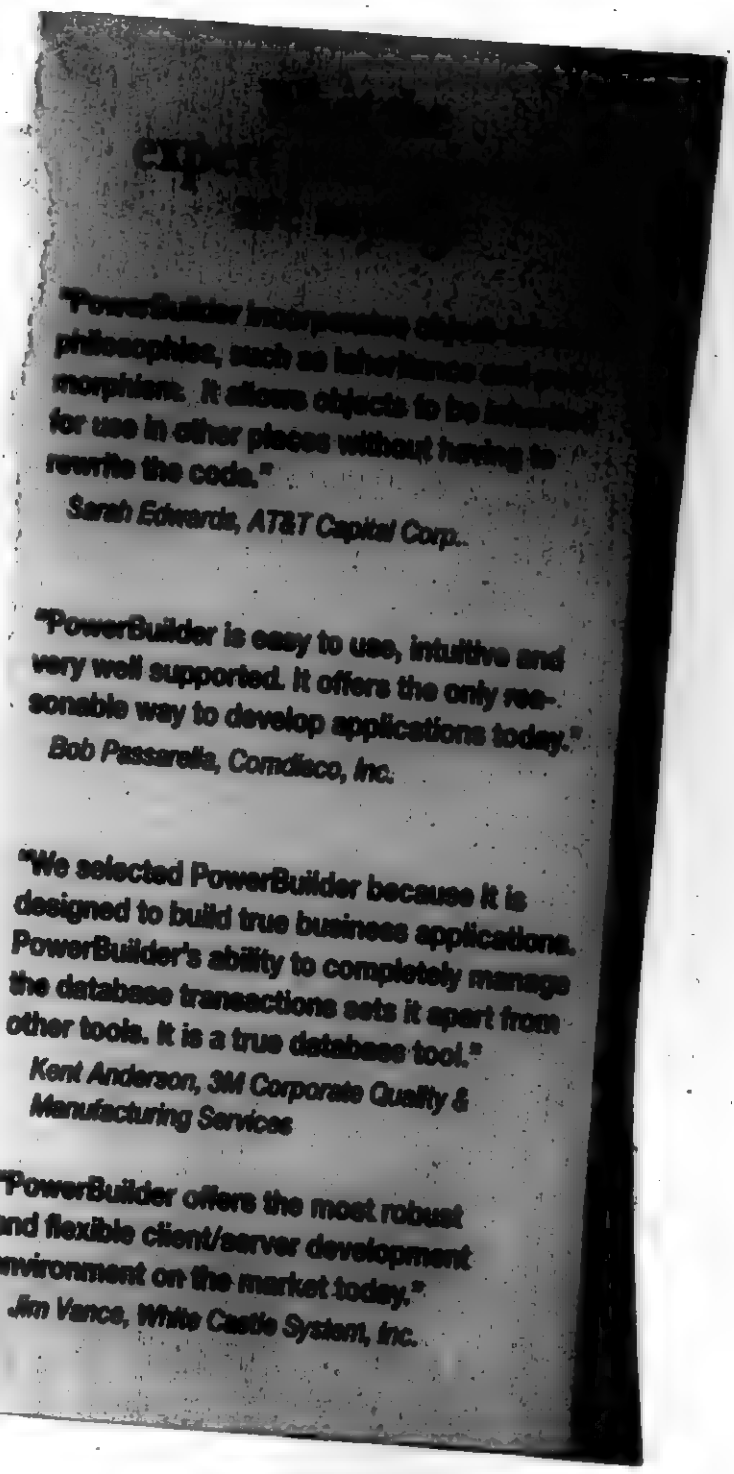

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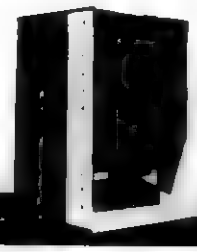

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DEC offers plans for ATM-based LANs

BY JOANIE M. WEXLER
CW STAFF

LITTLETON, Mass. — Not one to be left out of the Asynchronous Transfer Mode (ATM) limelight, Digital Equipment Corp. last week revealed its own rough plans for migrating users of today's shared-medium local-area networks to the high-speed, switched networks of the future.

ATM is an emerging network technology that will eventually afford computer-to-computer communications into the 2G bit/sec.-speed range.

The predictable-delay characteristics associated with ATM's transfer of equal-length cells have also put the technology on the lips of many users looking to soon run multimedia applications, which cannot tolerate voice and video packets arriving at random intervals.

What to expect

Like most vendors, DEC said it intends to start rolling out ATM products on LAN gear and will do so "within the next year," said Jeff Low, DEC's director of network marketing.

First, DEC will provide ATM interfaces to its DEC NIS 600 multiprotocol router, smart wiring hub and an as-yet unannounced Gigaswitch product, which provides 100M bit/sec. dedicated Fiber Distributed Data Interface (FDDI) switching, he said. The Gigaswitch was demonstrated at DECworld '92 in May, but no formal announcements have followed.

A stand-alone DEC ATM switch, which would accept existing LAN traffic such as Ethernet, FDDI and Token Ring on one side and translate it into ATM format on the other, would follow the ATM interfaces, Low said. A prototype of the DEC ATM switch is currently in place at the University of Kansas.

With ATM technology, ATM LANs supported within a switch would be able to communicate with one another via pure ATM technology, allowing user connections to set up virtual network connections on the fly, electronically cut and paste user connections from one LAN to another without physically moving devices and to mix and match appropriate desktop speeds within the ATM network.

ATM networks would also eventually be able to integrate directly with ATM networks in the wide area, which are slated to one day preclude the necessity of routers and other interconnection devices between LANs and wide-area networks.

DEC said it does not intend to support FDDI-II, an emerging version of FDDI intended to carry data, voice and video.

IN BRIEF

SCO, DEC sign training pact

■ Unix software vendor **The Santa Cruz Operation** in Santa Cruz, Calif., recently announced a worldwide training agreement with Maynard, Mass.-based **Digital Equipment Corp.** The deal enables DEC's training centers to also become SCO authorized education centers, offering courses on SCO Open Desktop and the SCO Unix operating system.

SCO also teamed up with **Compaq Computer Corp.** in a global distribution agreement under which Compaq will distribute SCO products in Compaq's European, Asia/Pacific, Latin American and selected U.S. major accounts.

■ Storage vendor **Exabyte Corp.** in Boulder, Colo., has been selected by Huntsville, Ala.-based **Intergraph Corp.** as the tape subsystem vendor in Intergraph's new automated 8mm Tape Jukebox.

The product features Exabyte's 5G-byte EXB-8500 8mm cartridge tape subsystem.

■ **SysKonnect, Inc.** in Saratoga, Calif., has announced a new series of high-performance Fiber Data Distributed Interface (FDDI) workgroup concentrators, which when sold with SysKonnect's FDDI network interface products, reportedly provide better performance and tighter security for workgroup environments.

The SK-FDDI Contractor is priced at less than $19,000 and is available now.

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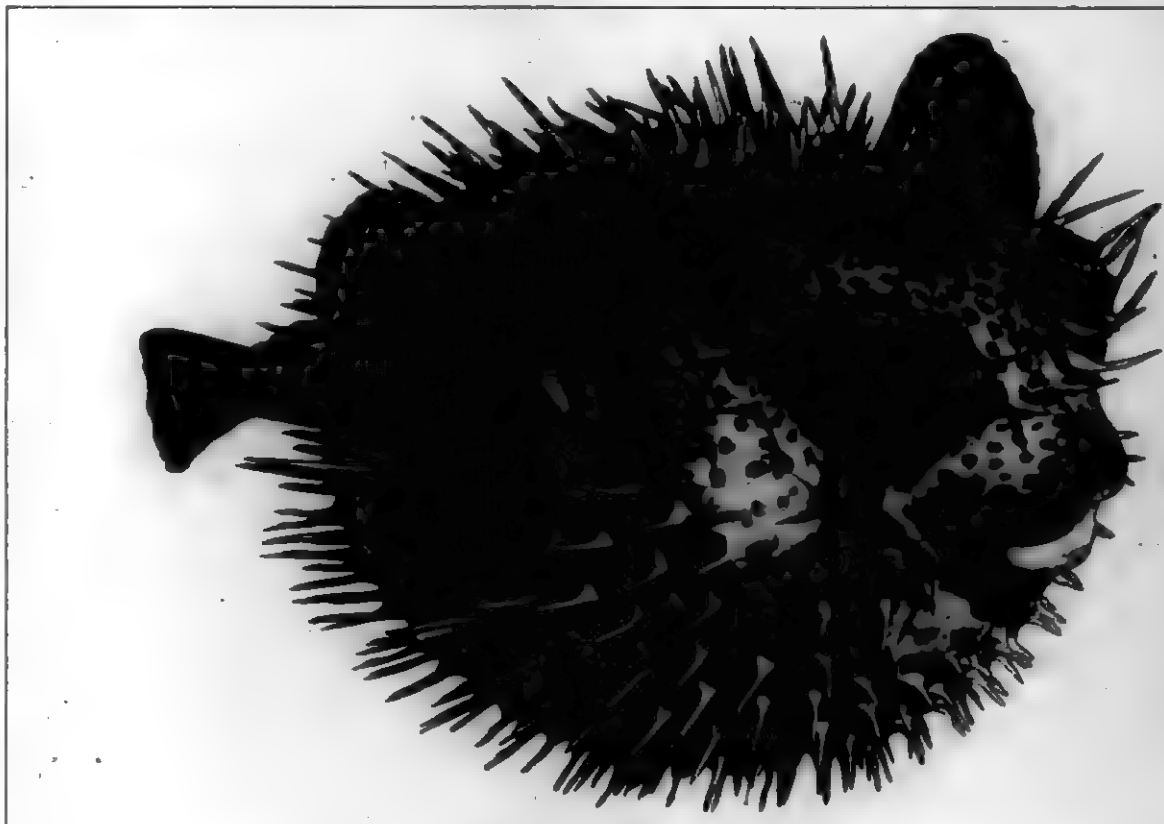

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FDDI over copper will shake down Ethernet, study predicts

BY LYNDA RADOSEVICH
CW STAFF

Fiber Distributed Data Interface (FDDI) networks operating over copper at 100M bit/sec. will help throw traditional Ethernet and Token Ring networks from their current leading market positions by 1997, a recent study on PC local-area network sales predicted.

Spurring the takeover are faster PCs and resource-hungry applications such as imaging and full-motion video. The study revealed that technological advancements of FDDI over copper during the next two years and drooping prices will move the market from 10M bit/sec. Ethernet and 4/16M bit/sec. Token Ring adapter cards to FDDI over copper.

The American National Standards Institute (ANSI)-accredited committee has been working on FDDI over copper standards since June 1990. Although several major components of the standard have been hammered out and vendors are developing products, an ANSI standard is not expected until next year.

"If ANSI can get a standard out there, CDDI [Copper Distributed Data Interface] should blossom," said Merry Stubbins, an independent analyst who authored the report for Market Intelligence, a market research firm based in Mountain View, Calif.

FDDI over copper is attractive to some communications managers because it offers fast transmission over existing copper cabling. Some users see a need for 100M bit/sec. However, many are unwilling to commit to the technology yet.

FDDI over copper "will probably be in high demand because it is cheaper than fiber, and most people have copper already," said Lt. Commander Amy L. Hughes, a former associate director of data communications at the U.S. Naval Academy in Annapolis, Md., who is currently being assigned to a new post. "But we don't have a need for it now."

Other findings include the following:

- LAN users spent $4.1 billion on servers in 1991 and will spend $5 billion in 1992.
- The number of networked PCs will jump from 20 million in 1991 to 100 million by the end of the decade.
- Growth in portable computers will increase the need for remote LAN access.
- Recession-driven corporate downsizing is increasing opportunities for and competition among LAN vendors, pushing prices down and creating demand for greater standards compliance.

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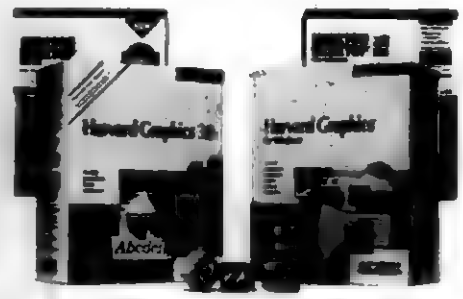

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Motorola beefs up wireless LAN

BY JOANIE M. WEXLER
CW STAFF

ARLINGTON HEIGHTS, Ill. — Progress toward legitimizing wireless local-area network technology continued last week when Motorola, Inc. said it intends to ship a faster version of its Altair Plus radio-based LAN next month that adds Altair-specific Simple Network Management Protocol (SNMP) functions.

To date, most wireless LANs are not as fully developed in the network management arena as cabled LANs, said David Kerr, an analyst at BIS Strategic Decisions, a Norwell, Mass.-based research and consulting firm. With Motorola's SNMP Management Information Base extensions, users can now plug an Altair-specific application into their overall SNMP corporate network management system.

"SNMP has not been a prevalent feature with wireless" to date, Kerr explained. This means that companies with SNMP-based management platforms such as Hewlett-Packard Co.'s OpenView or Sun Microsystems, Inc.'s SunNet Manager that are tacking wireless LANs onto internetworks have had to manage the LANs separately or not at all.

Alex Alavi, marketing manager at Altair's Product Operations Group, also said Ethernet-compatible Altair Plus II extends the performance of the company's existing 3.3M bit/sec. Altair Plus to 5.7M bit/sec. He said an eight-user LAN running Novell, Inc.'s NetWare saw an 83% performance improvement over Altair Plus, and one customer running Microsoft Corp.'s LAN Manager network saw a 100% improvement.

Altair Plus II costs approximately $425 to $505 per user; current Altair users can upgrade for $750 per control module (a central omnidirectional routing antenna) and $150 per user module.

Other recent developments include an announcement from Proxim, Inc. in Mountain View, Calif., last month of an industry-standard, credit-card-size wireless adapter for notebooks. The RangeLAN/PCMCIA allows traveling users using portables as stand-alone computers to return to the office and connect to their local network wirelessly, without fussing with cabling.

BIS Strategic Decisions expects wireless LAN revenue in the U.S. to double to $86 million between 1992 and 1993 and hit $228 million in 1995, Kerr said.

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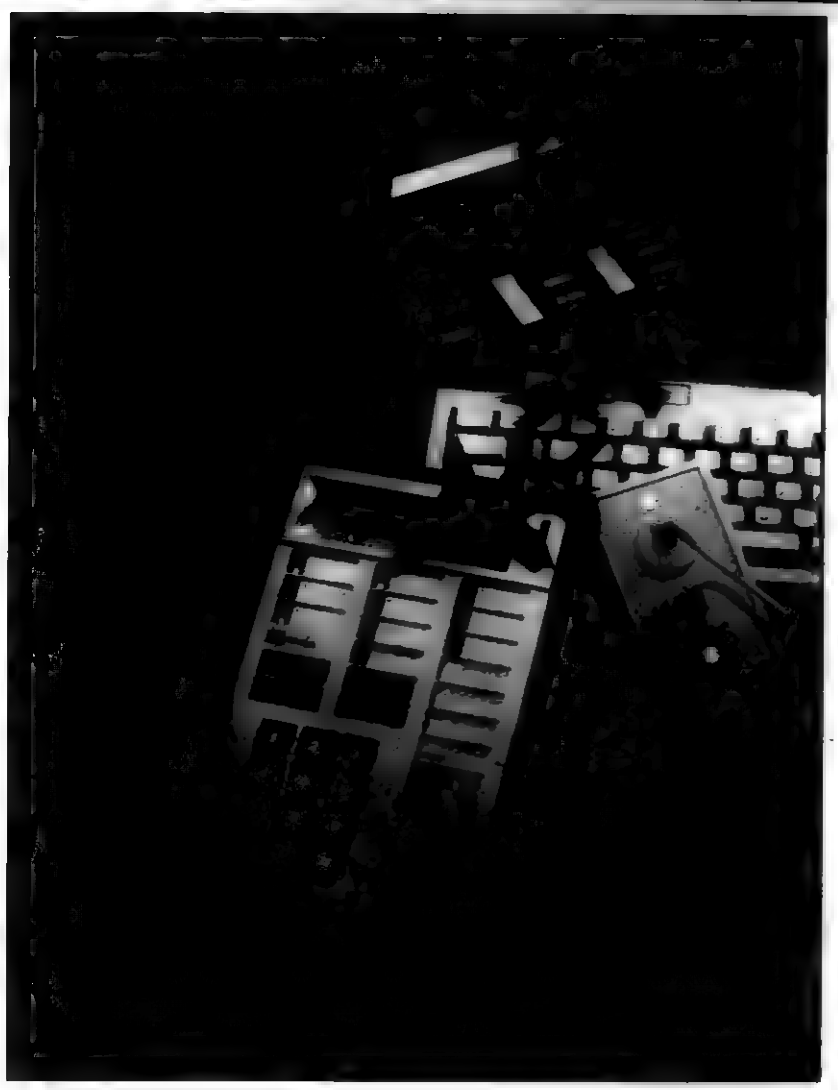


PUTTING THE 'N' IN ISDN

Once confined to islands or linked by private lines, ISDN is finally becoming a national digital network

CAROL WILSON

Bob Meldrum saw the early failure of ISDN from the inside. The current manager of marketing for U S West Communications was part of the team that made an ambitious effort to launch basic and primary rate ISDN in 1988 in six of the company's major markets. Despite the limited customer premises equipment and applications available for this new digital technology, the company was attracting interest from large corporations. But most of that interest withered in the harsh light of one major limitation: the absence of national ubiquity.

"In our territory, the major influencers were in corporations that did business across state lines," says Meldrum. "For them to embrace ISDN was very difficult."

Six years after the first trials, there is still no national ISDN, but there are the beginnings of such a service. On Nov. 16, as part of TRIP '92, a 22-node national network of digital switches running industry standard software and connected via standard signaling system 7 links will be turned up. Eleven switches outside the network will run standard software for open houses at which ISDN applications will be displayed.

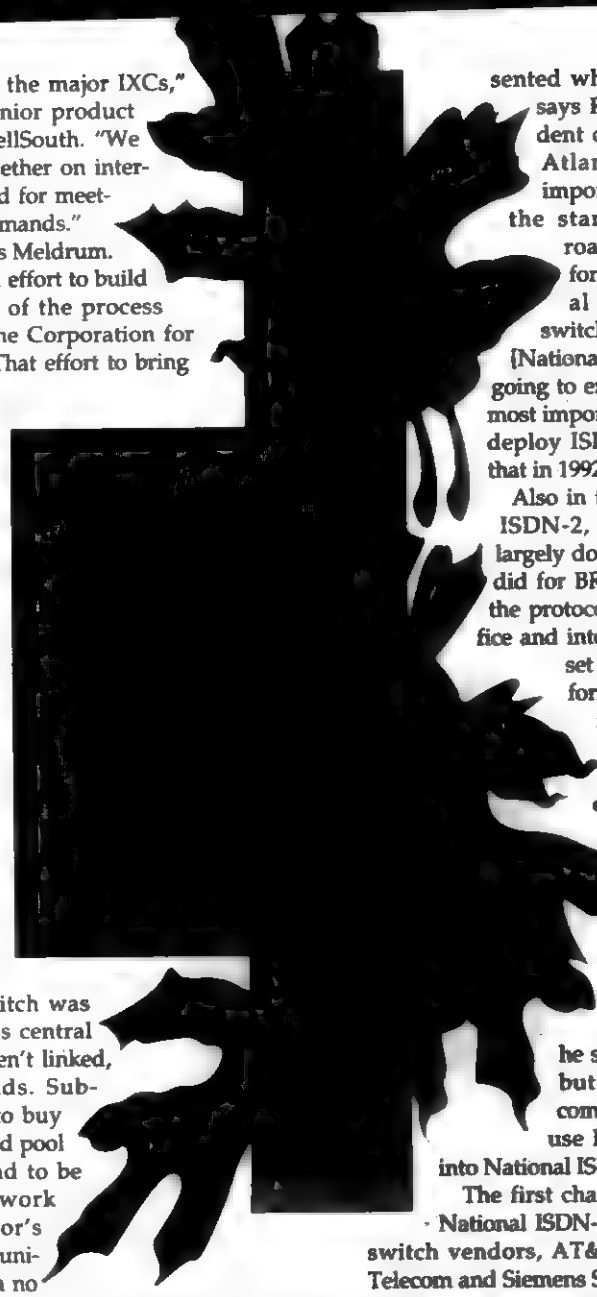
More important than the size of the network, however, is the indication that local exchange carriers, interexchange carriers and manufacturers of both CPE and network equipment are committed as a group to building on that humble start to make ISDN the first widely available digital access service for business and residential customers nationwide.

ISDN deployment rates still vary widely among LECs, according to schedules announced in 1991. Interconnection schedules, meanwhile, are being based on the methodical process of linking LEC and IXC networks on a CO-by-CO, and LATA-by-LATA basis, and then testing those links. This won't happen overnight.

"Given that this is the first time we've offered a national service in the U.S. since divestiture, we still have a long way to go and a lot to learn," says Joe Colson, vice president of switching systems for AT&T Network Systems. "But this is an opportunity we are determined to take advantage of."

In fact, there is an extraordinary level of industry cooperation under way, not only among manufacturing competitors and carriers who compete for customer control, but also among the seven largest LECs, the Bell regional holding companies. Having long since abandoned the lock-step with which they marched into the future, the seven local giants are coming together on the issue of a national ISDN, and particularly in planning for TRIP.

"TRIP has brought together in a closer working relationship each of the Bell companies, Bellcore and Bell



Canada, to work with the major IXCs," says David Collins, senior product manager of ISDN at BellSouth. "We have been working together on interconnection for TRIP and for meeting customer service demands."

"It's about time," says Meldrum.

TRIP and the focused effort to build ISDN are outgrowths of the process launched in 1990 by the Corporation for Open Systems (COS). That effort to bring industry players together produced an agreement in February 1991 for the major players to accept the Bellcore-driven standards for ISDN.

Prior to that time, IXCs such as AT&T, MCI and Sprint were offering primary rate interface service to their customers, who were connected to the long-distance network via dedicated facilities. LECs offered BRI ISDN, largely on a custom-tariff basis, in some cities. The services varied, however, depending on what vendor's switch was deployed in the LEC's central office. These COs weren't linked, creating ISDN islands. Subscribers were forced to buy new CPE from a limited pool of equipment that had to be built or adapted to work with a specific vendor's switch and so wasn't universally portable. With no real volume market available, both ISDN CPE and applications software were scarce and often expensive.

These obvious marketing problems depressed demand for ISDN. When the carrier didn't see demand, they were slow to deploy the service. "It was fairly classic chicken and egg," says Bob Puissant, director of business development at Ameritech Services. The core problem, however, was the lack of a single standard.

The first step in the standardization process was the major players' agreement to adopt National ISDN-1, a set of essential requirements for BRI ISDN. In addition to defining a single network interoffice interface and network CPE interface, the standard established a minimum set of BRI services and data capabilities, both packet- and circuit-switched.

Although it scaled back some of Bellcore's existing ISDN technical requirements, National ISDN-1 represented what the industry could handle, says Ray Albers, assistant vice president of technology planning for Bell Atlantic Network Services. More importantly, he adds, in announcing the standard, "we laid out certain roadmaps and certain mileposts" for the process of building a national network. "We said that the switch vendors were going to do the [National ISDN-1] software, and we were going to encourage CPE development, and most importantly, the carriers were going to deploy ISDN," he explains. "We've seen that in 1992."

Also in the initial game plan is National ISDN-2, due out late this year, which largely does for PRI what National ISDN-1 did for BRI, including more uniformity in the protocol for call control and in interoffice and internetwork interfaces, and a basic set of PRI services, including a uniform approach to switched T-1 and fractional T-1 over PRI.

National ISDN-3 is currently being shaped under the influence of the National ISDN Users Forum, says Dick Aloia, assistant vice president of ISDN and data communications technology for Bellcore. "Many of the characteristics of National ISDN-3 will involve making ISDN easy to use for things like videoconferencing," he says. "ISDN is incredibly flexible, but that flexibility translates into complexity. There are a lot of ease-of-use kinds of things we want to put into National ISDN-3."

The first challenge in the implementation of National ISDN-1 fell to the LECs' three primary switch vendors, AT&T Network Systems, Northern Telecom and Siemens Stromberg-Carlson. All three have been heavily involved from the outset in the COS push toward a standard ISDN, and all stand to benefit considerably from any push by LECs to upgrade thousands of COs with new software.

"We have probably, with the RHCs, the largest investment in bringing these service to the national level," says AT&T's Colson. "For us, it's not so much of a challenge as an opportunity."

But the vendors also were under pressure to produce new software generics that could be deployed and tested in time for this fall's festivities. The challenge was largely one of combining software capabilities into a National ISDN-1 package, since all three vendors had been working to develop software to meet the more rigorous demands of Bellcore's ISDN Phase 1.1 technical references, the broader standards that preceded National ISDN-1.

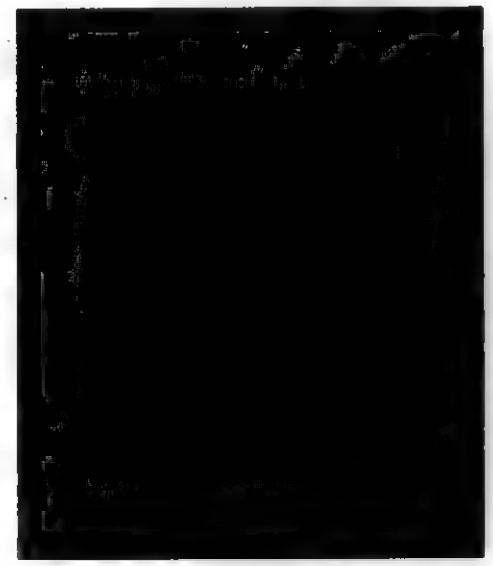
"We really had a good head start," says Eve Aretakis, vice president of product line management-switching at

Siemens Stromberg-Carlson. "We had already set into motion the development of ISDN 1.1. But as they got to National ISDN-1 standardization, they realized that certain things that were defined in 1.1 needed to be changed. There were redefinitions of things that were already out on the market."

This past summer, the vendors produced their first software generics with National ISDN-1 capabilities. "There were some slips [in vendor schedules]," says Albers. "We had hoped to have it a little bit earlier in 1992 than we did. But we knew this was a challenge for them. On the whole they delivered, and the stuff is working."

"We expect some delays—that's part of the process," comments Collins of BellSouth. "It was a lot of hard work on everyone's part. All three vendors committed a large amount of resources to making the deadline."

The new software generics had to be loaded individually into each of the 33 switches that will be involved in the TRIP demonstration next month. The complexity of that effort, however, pales in comparison with the long-term prospect of upgrading digital switches nationwide.



"We are talking about upgrading half of the 6000 switches nationwide by the end of 1994—that's a tremendous amount of work," says Bellcore's Aloia. Each RHC is expected to develop an ISDN implementation team, that leverages the implementation team created for TRIP, he adds. Switch vendors also will be tied in, says Aloia, and are expected to strengthen their field support teams during this process.

In areas where LECs have not yet upgraded to digital switching, ISDN will be much slower in coming. For example, Nynex, the RHC with the highest percentage of older switches in its network, is projecting ISDN availability for 34% of its access lines by 1994, in contrast to neighboring Bell Atlantic, which aggressively replaced analog switches in the late 1980s, and now projects 87% access by 1994.

The real switching challenge, once TRIP has passed, will be to keep the projected deployment on schedule, while development of National ISDN-2 and National ISDN-3 proceeds.

"The difficulty will be keeping everybody on the same schedule," admits Albers.

"It is certainly important to deliver on that commitment," says Jennie Godwin, senior manager of ISDN market development for Northern Telecom. "It is critical that the telcos deliver on the schedule as committed."

Putting switches and software in place is only the first step in meeting that commitment, however. To offer full ISDN voice and data connectivity, LECs must interconnect their SS7 networks with those of IXCs within each LATA and at each ISDN CO. In addition, there is an incremental step beyond SS7 to make some trunks capable of handling the 64 clear-channel transmission required for ISDN, as opposed to traditional 56 kb/s for payload, plus signaling.

"Since no carrier will, overnight, make all of their trunk groups 64-clear capable, the ones that are 64 clear must be earmarked," says Aloia.

The LECs already are under the gun to fully deploy SS7 and to interconnect their networks with the IXCs under the Federal Communications Commission Docket 8610 covering 800 service number portability. Under equal access provisions, they must offer all IXCs the opportunity for interconnection in each LATA they serve and hold lotteries to select the order in which carriers are served. As each LEC-IXC connection is made, it must be thoroughly tested.

"Obviously, everyone is very sensitive about SS7 networks," says Albers. "We want to thoroughly test the interface before hooking up the networks."

In the early stages, the process of setting up links, testing and making business arrangements took 14 weeks, he adds. "With experience, we've got that down to four to six weeks."

There are many complicating factors. Although manufacturers of switches and SS7 gear such as signal transfer points (STPs) build their equipment to standards, there is ample room for interpretation. When an LEC begins connecting its Northern Telecom DMS-100 switch and its DSC Communications Corp. STP to an AT&T 4ESS switch and AT&T STP on the AT&T long-distance network, the possibility of problems multiplies.

"The multivendor component is part of it," says Aloia. "But in working through the routing and translation that is necessary for calls to be processed and passed appropriately to various interexchange carriers, carriers uncover errors in routing and translation entries within the switches."

Working through those kinds of problems on a CO-by-CO basis "is more tedium than any kind of technical challenge," says Ameritech's Puissant.

The extensive testing does get easier with experience, says BellSouth's Collins, "but in many areas you are working with a whole new group of people, who have to be trained in this process."

With the TRIP '92 plans in place, most LECs are building interconnection plans around customer demand for ISDN. "We'll push interconnection in response to a customer demand, or where we expect to see customer demand," says Collins.

One chief accomplishment of the TRIP process was that it spurred the RHCs to file ISDN access tariffs, which are currently before the FCC and in the 45-day public comment period. Comments from the IXCs are

expected, and all tariffs may not be finalized before TRIP. That could force some segments of the TRIP network to be classified as trial networks, and not permanent facilities, says Aloia. "Under the FCC's rules, trial links must be taken down—we're hoping to avoid that."

The IXCs, which have been offered ISDN services and operating SS7 networks for some time, already have the process down pat. "We are ordering facilities from an LEC, just like we do with anything else," says Bill Bailey, TRIP '92 network project manager at AT&T. "The only specialty about the ordering is that these are 64 clear-channel facilities. To our processes, the test and turn-up are no different."

The business relationships for this new national service are the real challenge, says Colin Beasley, staff director of network planning at Nynex.

"The industry's way of doing business is changing," he says. "TRIP has given us a forum for getting down to brass tacks on how we do provisioning and maintenance."

Widespread deployment of ISDN presents an operational challenge to LECs, who have largely treated it, both in their tariffs and in staffing, as a customized offering.

"In our company, like a lot of companies, we handled ISDN as a specialized technology, and there was a special group of people who handled it," says Ken Goodgold, member of technical staff at Southwestern Bell. "When you tariff something, it puts it into the mainstream of operations. Now all the business offices have to be up-to-date and able to handle order entries, and technical matters have to be resolved on a normal operations basis. It's the difference between a SWAT team and the regular crew."

The leap from customized service to mass market offering is a tricky one, and is another aspect of ISDN deployment that won't happen overnight. LECs don't yet have the operations support systems necessary to allow them to pass ISDN service orders through their automated operations, administration, maintenance and provisioning systems.

"ISDN is not ready at this point in time for mass market application," states Aloia. "It requires a level of sophistication both on the part of the end user and on the part of the telephone company staff that isn't there yet."

The service order process alone involves major new variables. Where residential phone service may have up to 50 different parameters for consideration and analog Centrex has as many as 100, an ISDN line can have 260, says Albers.

One approach to this new complexity has been the work of Bellcore, the carriers and the National ISDN Users Forum in developing parameter groupings, which would be uniform industrywide.

These groupings will carry simple names, while combining a set of features to support specific applications such as videoconferencing. With nationwide uniformity, CPE intended to support that application could come with information about the necessary parameter group.

"The idea is to make it as easy as possible for a user to call up and order ISDN service," says Beasley. "You actually make the service transparent to the customer—instead of ordering ISDN, they are ordering service XYZ."

Northern Telecom's Godwin believes there should be greater uniformity in other areas, namely product names and tariffs. "What we hear all the time is that people don't know what to order when they are ordering ISDN—Nynex calls it Intellipath, U S West calls it PCPhone and other carriers call it other things," she says. "Also the tariffs need to be more uniform and easier to understand. The idea is to make it easier for the users to understand the benefits."

Making ISDN easy to order is one part of the new marketing approach, but there is industrywide agreement that much more is needed. Among sophisticated users, there is widespread cynicism about the service, given the hype of the late 1980s. Less sophisticated users are less aware of the service.

Puissant puts it bluntly. "The biggest challenge for the industry is [to get] users to believe us this time."

Aloia is encouraged by developments in the third piece of the connectivity puzzle—ISDN CPE—although he admits there will not be a torrent of commercially available CPE in time for TRIP.

"We know of more than 50 pieces of CPE from a variety of manufacturers," he says. "The only issue that we are struggling with right now is that some of these will not be commercially available in time for TRIP '92."

Value-added resellers (VARs) are a critical part of the ISDN sales puzzle, say Aloia and others. The LECs need to improve their internal technical and marketing skills to mass market the services. But given the restrictions of the Modified Final Judgment, the Bell companies are limited in packaging services with applications and equipment. Users will look to VARs and systems integraters to help construct more complex offerings that capitalize both on ISDN's potential cost efficiencies and its network capabilities.

Even without VARs, the presence of commercially available CPE and of a growing library of applications software could help defeat ISDN's image as a technology without a solution. Most of those involved in TRIP believe this nationwide event will do much to increase market awareness.

"This is a wonderful marketing event," says Carol Knauff, director of applications services for AT&T Communications. "It creates an opportunity for business users to see what ISDN is doing."

"It certainly has generated—or maybe regenerated—an enormous amount of interest," says Godwin. "People are starting to think that this is really going to happen."

Carol Wilson is Editor of *Telephony*.

PRICING STRATEGIES SHAPE UP

Many information technology products have foundered due to lack of standards. ISDN, in contrast, may suffer because of an overemphasis on standards. Indeed, ISDN was originally designed as a set of standards, not as a network service and certainly not as a solution to specific business problems.

Its usage tends to be confined to large accounts such as government entities, hospitals, large corporate locations and universities. These high-end users purchase it not as a tariffed service but under customer-specific pricing plans, and typically have 1000 lines or more under contract. To the extent that ISDN tariffs are available, they are provisioned as a Centrex service option, the local exchange carriers' sophisticated central office-based business communications service.

MARK WINTHER

In the mean time, the small-business and residential market demand for digital communications is being amply satisfied by standard dial-up telephone lines and modems. At the rate with which modem technology is increasing in speed, decreasing in price and improving in reliability, it appears to have offset any dissatisfaction with POTS.

But before counting ISDN out as a mass-market service, the public network industry is making a concerted effort to establish national uniformity in ISDN products and services and to accelerate its deployment. Telephone companies are planning to reposition their individual ISDN programs toward the mass market—including small-business, work-at-home and residential users—and most significantly, to price them attractively for one- and two-line telephone customers.

Currently, two types of ISDN access have been defined. Basic rate interface provides two B channels and one D channel. The B channels can support circuit-switched voice or circuit-switched data at speeds up to 64 kb/s. The D channel is a signaling channel used to establish B channel links, but up to 9.6 kb/s may be optioned for end user packet-switched data transport. Up to eight terminal devices—such as personal computers, facsimile machines and telephones—can be supported via BRI access, making it suitable for small-business units and the residential market.

The second type of ISDN access, primary rate interface, provides 23 B channels and one D channel at 64 kb/s. PRI tariffs average $1000 or more per month and are suitable for large businesses with complex equipment such as large PBXs, host computers and local area networks.

In states such as California, BRI tariffs are competitive with analog Centrex services. These tariffs are approaching the costs of comparable channel capacity in standard business lines in Texas and Illinois, for example.

Of course, users must have ISDN-compliant telephone equipment or terminal adapters for non-ISDN equipment. Such equipment is not widely available and tends to cost more than standard telephone sets, fax machines or PCs. As ISDN usage increases, terminal costs probably will decline from the current $750 to $1000 range for each ISDN set. When the cost of ISDN equipment drops to around $200 the added functionality combined with the elimination of modems should attract the mass market.

The most typical ISDN offering from local telephone companies is bundled with Centrex. By provisioning it as a Centrex option, customers in effect pay two premiums in addition to basic exchange service. In some cases, particularly for larger customers, this increased price can be justifed because ISDN provides three channels on a single line. Because the service is digital, modems are not needed for data

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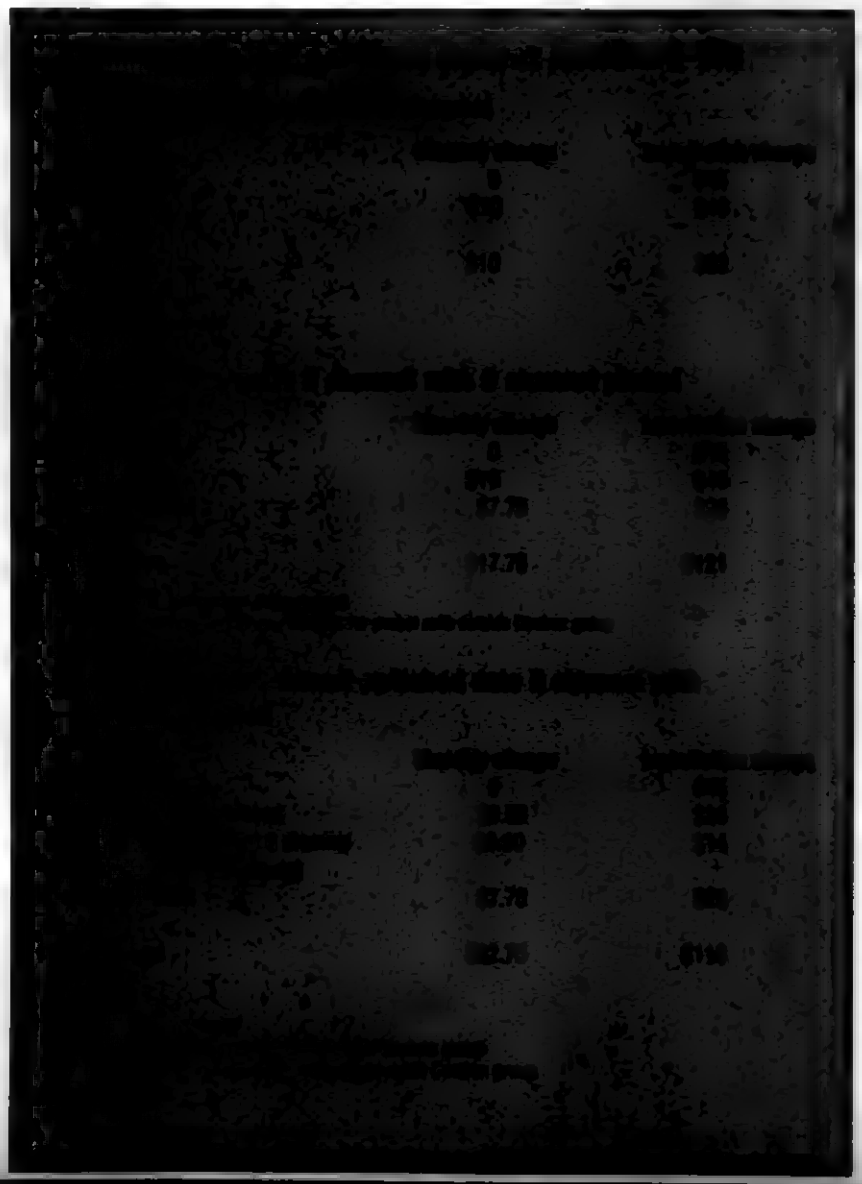
Pacific Bell — Centrex IS

Package A. ISDN Voice "Starter" Package, minimal electronic key features

Package B. Full-featured voice on B channel plus packet data on D channel

Package C. Dual B channels with D channel packet

Rate elements	Monthly charge	Installation charge
Package A	$1.85	$100
Package B	$10.35	$120
Package C	$13.85	$150
Users also incur: Two-line Centrex charges	$31.30	$440



transmission. And ISDN lets users take advantage of advanced electronic telephone features such as conferencing, bridging and call transfer without expensive hardware investment.

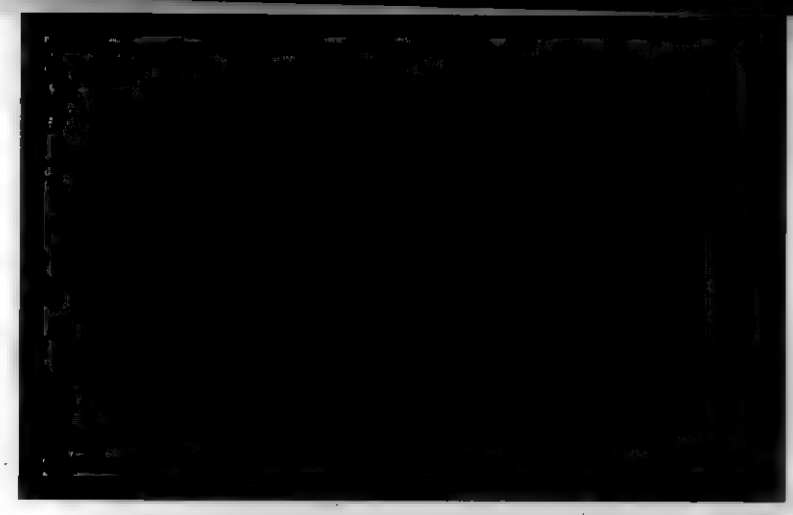
The configuration of the three BRI channels may be prepackaged by the telco, or users may select the features that best fit their needs, depending on the tariff. Some tariffs position Centrex ISDN as an intraswitch offering only and have limited connectivity with non-Centrex services such as local packet networks.

Pacific Bell offers three Centrex IS packages that cannot be configured by customers. The D channel on Centrex IS is merely a packet handler and does not provide access to the company's local packet service.

A two-line Centrex offering for Pacific Bell customers is available for $31.30 per month, plus an installation fee of $440. Total minimal costs for ISDN from Pacific Bell range from $33 to $45 a line each month with installation costs of $540 or more. These charges compare to a standard Pacific Bell business line charge of $13 per month with an installation fee of $70.75. ISDN clearly is competitive for current Centrex customers, but for non-Centrex customers the greater channel capacity and feature richness of ISDN are out of reach. Centrex customers that select the ISDN option usually apply it to back up data lines.

C&P Telephone Co. of Virginia was the first Bell Atlantic company to file IntellilinQ-BRI rates in November 1991. Since then, IntellilinQ-BRI tariffs have been filed by all Bell Atlantic operating companies. The company plans to offer single-line ISDN access in the next 12 months.

Part of the Centrex tariff, IntellilinQ is provisioned over the same two-wire cable pair as its associated Centrex line. At C&P Telephone of Maryland, for example, Centrex lines cost between $11 and $18 a month. The smallest Centrex configuration available from C&P Telephone is Centrex Bus Pac, a service that offers between two and seven lines. C&P has more than 7000 small business Cen-



trex package subscribers, but so far the company has not marketed ISDN to them.

ISDN is primarily used by C&P's largest Centrex customers for voice applications. The government uses a lot of voice-only IntellilinQ, which is called Featured Voice IntellilinQ-BRI Access. This service uses a single B channel to provide electronic key features such as call waiting, repeat dialing and call holding. Featured Voice IntellilinQ costs $10 per month per Centrex line.

IntellilinQ-BRI may also be ordered as one B channel plus one D channel, or two B channels plus the D channel. The B channels provided can be used for any combination of circuit-switched voice and circuit-switched data.

Customers that only require a few special ISDN lines do not need Centrex features. Moreover, if users can obtain ISDN access unbundled from Centrex packages, the cost reflects only one premium. This unbundled offering is known as single-line ISDN and is currently tariffed and available in Illinois and Texas and is planned for many other regions in the next 12 months.

Southwestern Bell has used ISDN since 1987 to develop a new generation of Centrex service called Plexar. Since 1991, the telephone company has provided Digiline, a single-line ISDN offering outside of the Centrex tariff under interim approval from the Public Utility Commission of Texas.

Digiline is attractively priced but has limited intra-switch capability. User locations that are not directly served by the ISDN-equipped switch pay an additional $68.75 per month for a line to get to the ISDN switch. Additionally, the D channel packet carrier is merely a packet handler and does not provide access to Southwestern Bell's local packet network. This limitation reduces the offering's market appeal for intraoffice applications.

Ameritech subsidiary Illinois Bell has had a single-line ISDN offering since early 1991. Called Ameritech ISDN Direct, the service has benefited from marketing efforts to support corporate work-at-home programs. Ameritech reports that several Chicago-area corporations have purchased ISDN Direct to develop work-at-home programs, and cost-effective telecommunications is a key reason those programs will be expanded next year.

Illinois Bell's single-line ISDN offering ranges from about $22 to $35 per month depending on the configuration. One option is a single voice line with full electronic key features and packet-switched data on the D channel; another is two B channels that both carry circuit-switched data.

ISDN Direct costs compare to Illinois Bell's standard business line rate of about $10 per month. Call charges are distance-sensitive, and are cheapest in downtown Chicago. One voice line and one data line costs $22.59 a month under ISDN Direct, compared to two standard business lines priced at about $20 a month.

The current direct line charge of $13.09 reflects costs for downtown Chicago locations. This charge increases in proportion to a company's distance from the downtown business district. The telco says, however, that it will provide single-line ISDN for $13.09 per month to anyone in Illinois by early 1993.

Pricing for single-line ISDN is clearly moving in the right direction. The functionality of the offering makes it a winner in solving the small users' need for integrated voice, data and video communications.

Illinois Bell ISDN Direct — Single-line BRI ISDN

A. Full-featured voice B channel with D channel packet

Rate elements	Monthly charge	Installation charge
Ordering charge	0	$64
ISDN Direct line	$13.09	$30.50
Voice with electronic key	$3	
D channel packet	$6.50	
Total charges	$22.59	$94.50

B. Dual B channel circuit-switched data

Rate elements	Monthly charge	Installation charge
Ordering charge	0	$64
ISDN line	$13.09	$30.50
Circuit-switched data (2X)	$8	$4
Multi-use charge	$6.50	
Total charges	$35.59	$102.50

Mark Winther is Vice President of LINK Resources Corp., an International Data Group company.

USERS HARVEST A VARIETY OF APPLICATIONS

ANN H. LINDSTROM

Although many people remain convinced that the disadvantages of ISDN outnumber its advantages, there is a growing army of folks who think the technology provides their businesses with a competitive edge. While years of bad press haunted ISDN, many companies were finding ways to use it to save money and increase productivity.

It's been a long evolution. The digital technology that boasted such promise has had a tough time finding its place in an analog world. A lack of clear standards and the competitive backlash of divestiture worked behind the scenes against ISDN, making it—at least on the surface—appear to be the problem itself. Only a few brave businesses saw its potential clearly enough to gamble on it long before industry players began to address the issues of ubiquitous connectivity and interoperability, arguably the heart and soul of the technology and the key to its true capabilities.

But the cloud that has been raining on ISDN for so long is about to be pushed aside for good. TRIP '92 will showcase the technology at work today and examine its future applications.

The event also will celebrate the industry's ability to put its differences aside long enough to establish a battleground, according to Jim Jacobson, TRIP '92 co-chair and supervisor of institutional telecommunications and office automation for Jet Propulsion Laboratory. This accomplishment alone should be enough to convince any doubters that industry players are serious about making ISDN a viable technology useful and available to everyone.

TRIP '92 will kick off with the connection of a national ISDN, but the remainder of the week will focus on applications, which are the future of the technology. In addition to open houses demonstrating 21 applications at work in 115 locations worldwide, TRIP '92 will feature two days of presentation theaters sponsored by vendors and the Bell regional holding companies at the Hyatt Regency in Reston, Va.

In the theaters, experts will discuss and demonstrate telecommuting, education, medicine, government/military and business/imaging applications. Another theater will explore the financial side of developing new applications.

Industry observers have long contended that the success of the technology depends on the discovery of a "killer application." As it turns out, several exciting applications have been developed, but no one has yet to claim the "killer" distinction.

Instead, the technology's flexibility, enabling users to create unique applications, has slowly come to be recognized as ISDN's killer quality. In the age of the sound bite, that comprehensiveness unfortunately has been a hard sell. The need to save money and increase productivity without having to rewire the world is probably a major reason ISDN is still hanging on and attracting an audience.

"ISDN's major benefit is really its ability to provide incremental improvements in a lousy network environment," says Tom Miller, vice president and director of home office research for LINK Resources Corp. "Users are ready to take the next step. They want to move forward."

LINK Resources recently completed a three-year study examining ISDN use in the home office, which Miller will discuss during Northern Telecom's presenta-

tion theater on telecommuting.

Telecommuting is more accurately characterized by the words "extended office," says Miller. Most telecommuters rely on their extended office tools such as laptop computers, modems and facsimile machines two or three times a week, he says, and it is a trend that has become widespread, he adds. In fact, LINK Resources reports, the number of home office households was 38 million in 1991, more than 3 million of which were involved in formal telecommuting.

ISDN gives home workers an advantage because of its speed and simplicity, says Miller. Without ISDN, workers have been accessing their companies' local area networks using regular or high-speed modems with data compression—less elegant solutions than ISDN, he adds.

"ISDN adapter boards for personal computers are becoming more attractive than modems because they sidestep the need for leased lines, bridges and routers," Miller says. "The price isn't bad, but it's not great either, and ISDN is not yet ubiquitously available."

However, he says, in regions like those served by Bell Atlantic, Ameritech and Pacific Bell where ISDN is becoming widely available, an adapter board would be a smart purchase.

Users instantly recognize the value of ISDN for telecommuting applications, and implementing it in the workplace would save most companies money and time, says Miller. However, bottom-up demand, budget pressures and the politics of merging corporate voice and data departments are making it difficult for users and telecom managers in large companies to convince their bosses to join the telecommuting revolution. Therefore, telcos should concentrate on marketing their ISDN telecommuting applications to small businesses, office campuses and government institutions, and remote work support users because they are the most eager and willing to change, he notes.

LINK Resources found that the ISDN applications most commonly used by extended office workers are workstation/telephone integration, high-speed file transfer, remote LAN access, multiscreen sharing and voice-annotated document transfer. Videoconferencing is further down the list, but there are pockets of excitement about this application, adds Miller.

Eastman Kodak, Rochester, N.Y., is especially enthusiastic about ISDN's videoconferencing capability. The company uses it regularly to hold conferences with its international offices and customers, according to Jim Briggs, the company's telecom manager.

"ISDN is perfect for videoconferencing because it gives you the cost of access for half the cost of two switched 56 lines. It reduces the wiring, local exchange charges and the number of boxes required in the video cabinet," Briggs says.

ISDN videoconferences also can be established easily with customers who are using switched 56 instead of ISDN, he adds.

"You don't even have to ask the other end if they are using a terminal adapter," Briggs notes. Price is also a factor—ISDN videoconferences cost just 25% of traditional videoconferences made on leased lines, he says.

Jet Propulsion Laboratory, Pasadena, Calif., uses 300 basic rate interface ISDN lines and is beta testing IBM's Person-to-Person and Northern Telecom's VISIT desktop videoconferencing systems. Engineering design teams that work in various locations are using the systems for face-to-face meetings and file transfer, says Jacobson.

ISDN lines are also used for remote access to LANs and to link those LANs. The lab expects to someday install ISDN on all of its 13,500 lines. Once National ISDN-1 has been deployed nationwide, NASA centers will be able to take advantage of the technology's functionality, he adds.

"ISDN's greatest advantage is that it provides a high-speed 64-kb/s link that can be used for various applications," he notes. "ISDN provides extended office functionality without the cost of extending Ethernet to each individual user, and it does so at a substantially reduced cost."

The City of Los Angeles recently completed an 18-month telecommuting trial that was not supported by any high-tech equipment. The trial proved the value of telecommuting, so the city installed a few ISDN lines in its telecommunications department, according to Carl Holt, assistant general manager for the department.

"As telecommuting comes on more and more, we need to provide workers with access to our host database. We see ISDN as an economic alternative that provides us with both voice and data capabilities," says Holt.

The city's decision to use ISDN today will allow telecom engineers to get a jump-start on the technology as deployment increases. It also opens the door to digital technology, Holt says.

"We see signaling system 7 as the surviving portion of ISDN, which we expect to be relatively short-lived. But ISDN is a stepping stone to the digital network. Users need a stepping stone, too. The primary reason we installed ISDN is to prepare ourselves for the future," he adds.

One of society's biggest concerns for the future is education, and ISDN is playing a major role in this area. AT&T will host the education theater at TRIP '92 as well as the business/imaging theater. The education theater will include a presentation by Jim Strom, vice chancellor for university development at Appalachian State University in Boone, N.C.

The university launched a distance learning project earlier this year in conjunction with AT&T, BellSouth and Compression Labs Inc. Appalachian State is linked via basic rate ISDN lines to two grade schools and one high school, all of which are using NCR personal computers and AT&T and Compression Labs video gear for interactive voice, video and data applications.

"This is truly a corporate partnership, not a demonstration and not a trial. We are paying our own way," emphasizes Strom.

ISDN provides rural areas with a tremendous advantage, he says, noting that most telcos cannot yet afford to deploy fiber in such areas.

"By combining ISDN technology with the education process, we can get to places we probably would not reach for a very long time if we had to wait for fiber deployment. We want to prove and show that this technology can enhance K-12 education in a rural environment cost-effectively," says Strom.

The university is using ISDN to link teachers and student teachers for videoconferences that would otherwise involve travel for face-to-face visits. The conferences center on entries the student teachers have made in their daily diaries, which are transmitted via the same ISDN line.

ISDN also allows teachers to instruct two classes from one location. Multimedia stations at both ends scan and send documents such as handouts and tests and allow teachers and students to pull up data, says Strom.

In addition, the schools' computers are networked into a file server at the university. Appalachian State has purchased site licenses for software that is stored on the file server. Teachers can download the software they need, so the school no longer has to purchase and distribute software to each teacher, he notes.

Plans include purchasing equipment to use ISDN in a multipoint environment, connecting community colleges to teach adult literacy; LAN interconnection; and purchasing multiplexers that will allow the schools to get three lines for the price of one, Strom says. He hopes to expand the same basic system into other school districts. Eventually those separate school districts connected by ISDN will be hubbed together via fiber. A link from Boone to Charlotte, N.C., is already in the works, he notes.

Medical providers are looking to ISDN for advantages as well. Siemens Stromberg-Carlson is hosting the medical applications theater, which will feature a keynote address by Dr. Robert Gold, chief radiologist at the Memphis Medical Center.

State-of-the-art imaging over high-bandwidth dedicated circuits is overtaking ISDN in instances when doctors must make a crucial diagnosis, according to a Siemens Stromberg-Carlson spokeswoman. But as national ISDN becomes more widely deployed, medical applications such as teleradiology, electronic transfer of patient information, electronic claims processing, videoconferencing and remote consultations will provide medical agencies with immediate cost savings, according to an Arthur D. Little study on the role of advanced telecommunications in health care.

Some of these ISDN applications are already at work in Huntsville, Ala., which became 100% ISDN-capable this summer. Ira Denton, a neurosurgeon with the Alabama Back Institute, recently used an ISDN videoconference to oversee a patient examination conducted by a nurse practitioner in a remote location. The neurosurgeon watched the exam on a Macintosh computer screen that also contained the patient's medical record, according to Judy Denton, president of Capmed, a medical software company.

Capmed is preparing to launch its Orchids software, which allows medical offices to keep patient files on-line. With it, nurses and doctors can access patient charts on a Macintosh computer, says Judy Denton. Files can be transferred slowly using modems, but the speed of ISDN and its public network accessibility truly enhance the product, she says.

"We previewed the software at a medical convention in April, and it got a fabulous response," she says.

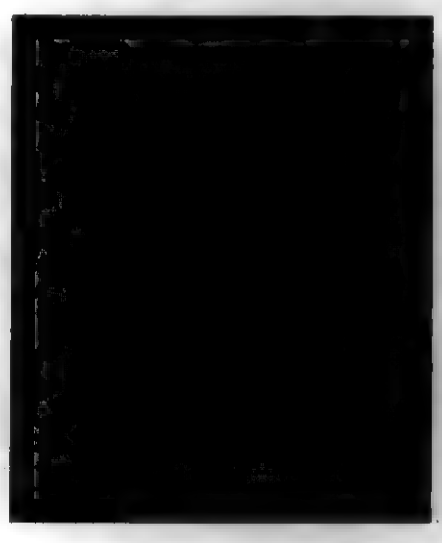
Software such as Orchids could allow all the agencies involved with a patient's records—the hospital, clinic, pharmacy, insurance company and patient—to decrease the paper flow and save time transferring information.

Ira Denton has used ISDN's videoconferencing capabilities to broadcast an operation to the U.S. Army's Redstone Arsenal in Huntsville, another big ISDN user. A physician on the arsenal's premises observed the

operation from the viewpoint of a camera mounted on a surgical microscope, and the two physicians consulted with one another during the operation.

ISDN has many such distance learning possibilities that will allow doctors to demonstrate techniques to several people without traveling, according to the Siemens Stromberg-Carlson spokeswoman. It is perfect for many medical applications because it doesn't force users to separate voice from data and it is available, or will be soon, on the public network, so all potential players in the medical marketplace will have access to it, she says.

One of the most promising ISDN markets—the government and military—will be explored during a presentation theater hosted by Bell Atlantic. Internetworking, imaging and videoconferencing, and LAN-to-LAN access are top applications sought by government users, according to Cathy Pollock, Bell Atlantic's marketing manager for the military. Imaging applications allow the military to easily transfer personnel and medical records and orders of mobile troops. The ability to provide training via videoconferencing helps cut travel expenses, she adds.



Government users currently are using ISDN primarily in campus environments, but interconnection of the nation's military bases and interrelated government agencies will produce obvious benefits as ISDN becomes more widely deployed.

The technology's cost-effectiveness and the fact that it is an open systems standard make it attractive to government users, says Pollock.

"A lot of procurements are moving toward open systems," she notes. Open systems are favored because they allow government agencies to establish direct links with suppliers, which makes it possible for those agencies to receive the billing and do their ordering electronically.

"The government is open to new technology because there is a new emphasis on cost reduction and most departments must increase their productivity since their budgets have been reduced," says Pollock.

ISDN also has a natural advantage in military markets because it adheres to the military communications standards, she adds. City and state governments like ISDN because it allows them to interconnect their dispersed networks without rewiring their buildings.

Redstone Arsenal, the army's missile command headquarters, has used ISDN for three years, and currently uses 1000 basic rate lines, according to Wayne Fleming, manager of BellSouth's ISDN lab on the base.

The top applications are ISDN's voice and electronic call handling features, says Fleming, who likes the electronic base directory stored on his PC. The arsenal also uses the two-for-one line capability to solve pair gain problems by putting two phones on one line in buildings where copper capacity has been used up by data services.

"ISDN solves the problem and makes it unnecessary to install a full T-1 carrier with channel banks or lay new copper to accommodate the need for additional phones," says Fleming.

The arsenal also uses ISDN to obtain host computer access using packet service and for modem pooling, he notes.

The technology is turning heads and capturing the attention of general business managers, too. The American Automobile Association uses ISDN's automatic number identification capability to assist travelers who are stranded outside of their local club areas, according to Bob Galovic, AAA's director of telecommunications information systems. Members requiring roadside assistance used to call an 800 number to be referred to the local club. The calls were sent to an office in Heathrow, Fla., where a AAA operator would look up the number and give it to the motorist, who then had to hang up the phone and make another call.

For the past two years, however, AAA has used a system that employs primary rate ISDN and BRI. The system uses automatic number identification to locate the number for the motorist and either provides the number to the caller or connects the call. If the call comes in and there is no match, the call is then transferred back to a live operator with the customer's file, says Galovic.

ISDN saves AAA money by handling calls in half the time it used to take, he notes. It also helps minimize frustration for stranded motorists.

Since the system was installed, call volumes have increased by 20%—from 800,000 to 1 million—but AAA has not hired more operators. ISDN is saving the company nearly $120,000 a year, and it cost $300,000 to install, says Galovic.

AAA plans to use ISDN to enhance some of its operations with long-distance companies, he adds. The association would also like to provide ISDN links to its headquarters-owned facilities.

These applications and many more will tell the new and improved ISDN story at TRIP '92. If ISDN ever had a chance to make it, that time is now. The biggest advantage of ISDN is that it allows more natural communication.

"ISDN is allowing telecom to catch up to what Mother Nature has always let human beings do naturally," says Irwin Waxburg, manager of strategic business relationships for AT&T Network Systems. "Now telecommunications is basically audio. Multimedia more closely resembles the way we are used to communicating."

Ann H. Lindstrom is Assistant Editor-News of *Telephony*.

With the explosive proliferation of local area networks, LAN interconnection has emerged in the past 24 months as one of the most critical of user demands. As a result, ISDN may get something of a coattail effect from the heightened interest in frame relay and other wide area network technologies such as cell relay and asynchronous transfer mode (ATM).

But access is just the starting point. ISDN's data potential gives users a chance to integrate remote locations—from branch offices to employees who work at home—into the office data network.

Aside from its role as a near ideal link from desktop to WAN, the digital platform opens the door to easier, less expensive ways to do high-speed, but bursty, personal computer-to-mainframe functions such as on-line transaction processing through the public switched network.

"We've been doing some work with running 64 kb/s into the BNS-2000 using ISDN," says Dave Schriftgiesser, director of data networking at AT&T Network Systems. The BNS-2000 is AT&T's broadband switch, which can handle frame relay and switched multimegabit data services (SMDS). "If you're a service provider, you may want to bundle and deliver [primary rate interface ISDN] for computer access," he says.

Tekelec, a network test equipment manufacturer, is already combining ISDN and frame relay. The company uses frame relay to connect LANs at its Calabasas, Calif., headquarters with a facility in Raleigh, N.C., says Ross Kocen, marketing product manager at Tekelec, and chairman of the testing/interoperability group at the Frame Relay Forum. ISDN, he adds, is used as a LAN gateway for small regional sales offices with five to 10 people.

The technology can also bring the benefits of data communication networks to the individual user at home.

"We really see National ISDN-1 as data connectivity," says Bob Puissant, director of business development at Ameritech Services. "We think that Centrex ISDN will continue [moving] forward, but as we look at the marketplace, we see a host of applications focused on data."

THE (MIX-AND-)MATCH GAME

ISDN has immense potential as a gateway to LANs

STEVEN TITCH

One is the expanding demand to accommodate employees who want or need to work at home, he says. Traditional POTS lines were limited when it came to file transfer and PC-to-PC interactivity. "With ISDN and [attractive] price points, it really does stimulate that market," he adds.

Rob Capell, assistant vice president of data services at BellSouth Telecommunications, says the technology extends the interoffice WAN, including high-speed services such as video and image transport to the user at home.

The single-line virtues of ISDN also extend to data-intensive applications such as on-line transaction processing, a traditional packet-switched application. Such applications, most of which are at T-1 speeds or below, are ideal for a WAN/ISDN marriage, most agree.

"Predominantly, data subscribers are still at low speeds, 64 and 56 kb/s," says Eve Aretakis, vice president of product line management-switching at Siemens Stromberg-Carlson. "Traditional X.25 was cost-prohibitive. But with the way telcos are positioning ISDN now, X.25 comes free of charge. The market is still there for 64 kb/s or less. The issue was cost of entry."

"We're seeing ISDN tariffs that are pretty attractive," says Bruce Wootton, senior manager-market development of advanced data services at Northern Telecom.

Northern Telecom is going so far as to assist telephone companies in creating tariffs that would encourage users to go with ISDN for switched access to other WAN offerings, Wootton says. Such applications include ISDN offerings to individual remote locations such as a home or small office or an ISDN line that connects a modem pool in a large office to a frame relay port.

And telcos can structure tariffs against private-line rates in various ways to take advantage of the LAN

interconnection market. This would include dial-up, usage-sensitive tariffs vs. flat-rate tariffs. "In either of those cases," says AT&T's Schriftgiesser, "the ISDN call might be lower."

The irony in all this is that while ISDN withered on the telco vine for five years, frame relay was an instant hit—chiefly because it offered something that users felt ISDN lacked—a definite application.

"With ISDN, there's no application you have *got* to have," says Tekelec's Kocen. "Frame relay, on the other hand, provides an alternative to private lines."

"The services are complementary, although there's some overlap," says Aretakis. "More than one service can be suitable as the same solution, but generally they are complementary."

The ISDN D channel, offering 16-kb/s packet-switched data in basic rate and 64 kb/s in primary rate, lends itself particularly well to frame relay access.

AT&T has worked with X.25 access to both frame relay and SMDS, Schriftgiesser says, treating it as a clear-channel connection in both cases. But he cautions that, even though X.25 access is technologically feasible, some interconnectivity questions remain. "I'm not sure how telcos would treat it as an access protocol, but it's imminently doable—we've done it," he says.

And work with the D channel can pay off for both business users and consumers. "As [carriers] get more and more into information services they will use the D channel to offer electronic white pages and Minitel-like services," suggests Kocen. "Narrowband ISDN is feeder, but it's part of a hierarchy of bandwidth."

Most important, ISDN, especially PRI, follows through on frame relay's bandwidth-on-demand concept, ostensibly becoming a frame relay port. Users, as in Tekelec's example, can use ISDN to dial-up a digital line in 64-kb/s increments and completely avoid leased-line charges. "If [ISDN] tariffs are favorable, users wind up saving a lot of money," says Bryan Long, product line manager at StrataCom.

The tariff issue itself remains sticky as telephone companies try to price ISDN offerings at levels that will attract users. For many of the telcos, particularly the Bell regional holding companies, this means a new approach to pricing that encourages users to migrate to a service that offers a better cost-benefit equation than existing alternatives.

Southwestern Bell ran aground with its first attempt at PRI pricing earlier this year. J.C. Penney Co. Inc., which has had considerable interest in ISDN since the technology's introduction, rejected a PRI tariff from the St. Louis-based telco because it didn't offer a substantial cost savings over existing private lines.

More recently, J.C. Penney signed an $11.2-million telecommunications services contract with Southwestern Bell that includes PRI. Separately, J.C. Penney Business Services is using ISDN D channels for point-of-sale transaction processing.

Although frame relay poses considerable promise as a narrowband ISDN driver, most feel that because cell relay services—particularly SMDS—are based on much higher speeds, they might already have eclipsed current ISDN platforms.

"Frame relay originated from ISDN standards. Both are based on the [high-level data link control] format, and from that stance ISDN can be an access method," says Steve Starliper, director of SMDS at Pacific Bell and a member of the SMDS forum. "But SMDS is aligned with ATM standards and with broadband technology. You would not use narrowband ISDN as an SMDS access vehicle."

Schriftgiesser agrees. "If you want higher speeds," he says, "you'll have some other fabric, like ATM."

Though the potential is good that frame relay will increase ISDN usage, work continues on compatibility and standards issues. ISDN connectivity may have fallen behind because of the perceived lack of enthusiasm—which events like TRIP '92 are intended to counter.

"There has been a lack of user interest in ISDN," says Steve Sazegari, a data communications market analyst and consultant, "and vendors have put it on the back burner."

But the technology should get a further boost from frame relay once vendors agree on how to provision frame relay over switched virtual circuits (SVCs). These standards are not expected to be ironed out until 1993 or 1994.

Since private virtual circuit (PVC) frame relay serves immediate user needs, the Frame Relay Forum wants to be sure any problems are sorted out with PVCs before proceeding to new flavors of service.

"There isn't the driving demand for frame relay SVCs that there is for PVCs," says Long. "There are a lot of substitutes for SVC frame relay, including modems and Federal Express." But Long adds that ISDN could be an ideal interface for both PVC and SVC frame relay, he adds.

"Right now, frame relay supports PVCs only," says Aretakis of Siemens Stromberg-Carlson. "Once SVCs become standardized, you'll get more adaptability. But it won't be a long-term issue."

Like most data connectivity services, many think ultimately ISDN—particularly as a gateway to WANs—will be one of many user options. Cost, speed and data requirements are the factors that will decide whether users will choose ISDN.

"People want a wide range of options, primarily for speeds," says Schriftgiesser. "They care about bandwidth—getting their data to where they want it to go."

Steven Titch is News Editor of *Telephony*.

SIEMENS

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High demand for LAN experience

CONTINUED FROM PAGE 47

ert Half International, Inc. in San Francisco.

•Experience. The old "you need a job to get experience and you need experience to get a job" catch-22 holds true for LAN personnel. IS managers moving critical corporate applications to a LAN environment are seeking proven track records in the people they hire.

"I've hired entry-level LAN people before, and I don't think I'll do it again," Sternfeld said. With seven domestic and four international offices to support, he said he needs people who can solve a problem and keep the system running without a lot of handholding.

One place that LAN novices can go to get experience is the testing laboratories of LAN vendors. "We hire a lot of recent college graduates and entry-level people to work in our test labs," said Bob Gohn, a product manager at Hauppauge, N.Y.-based network interface card vendor Standard Microsystems, Inc.

"Setting up servers, setting parameters, running tests and troubleshooting — these things may be boring to our experienced engineers, but they are exactly what LAN beginners need to learn. A lot of people start with vendors, then go to resellers and finally end up managing LANs for end users," Gohn said.

•Heterogeneous environment communications skills. LAN personnel who can install and maintain LAN-to-mainframe gateways, bridges and routers, and who understand wide-area networking and remote connectivity, are in demand.

Mark Dodge, telecom department manager at United Parcel Service, Inc.'s Mahwah, N.J., corporate IS shop, said, "The people who really understand communications between the LAN and other systems are the ones who are hard to find. Experienced, talented people in this field are rare — and expensive."

•Business understanding. Companies are looking for employees who not only understand LANs but who also have experience in their business area, whether it be retailing, health care, insurance or whatever.

Joe McCarthy, IS manager at USG Annuity and Life in Des Moines, Iowa, noted that when he hired his LAN personnel, he was looking for people who understood insurance, Cobol and LANs. "The business fit was important to me, which is why it took a while to find the people," he said.

"Companies who come to us are very specific in their requirements," Whisser agreed. "They want applicants with experience in their specific business [segment] and their specific application environment."

The emphasis on a business fit may benefit applicants with many years of experience who are trying to make the move from mainframes to LANs. "If I got a candidate who had just retrained himself on the LAN platform but who knew my business and my applications, I'd certainly consider him," Dodge said.

Although highly trained LAN people may be in demand, their absence is not holding downsizing projects back, according to IS planners, nor is it causing firms to outsource their LAN support.

Instead, as soon as they establish their downsizing timetable, most companies immediately begin retraining their people.

According to Brian Biesecker, network manager at Reston, Va.-based Dynecorp, a facilities maintenance company, "When people first downsize, they're probably going to need some outside consultants' expertise during the transition, like we did. But from then on, if they've trained their people right, their internal people should be able to handle any problems."

Scott agreed that outsourcing LAN support is not necessary if you have managed to find talented LAN folks. "We have a very strong technical group in-house, and I'd rather depend on them than an outside firm. But you have to get that in-house expert team in place, and that can take some time."

Certification helps

Being a certified LAN expert can help you land a job sooner and at a substantially larger salary, according to recruiters. "Right now, Certified [Novell, Inc.] NetWare Engineers are in very high demand," said Fred Whisser, manager of IS placement at Robert Half's San Francisco office. "We have also had a couple of requests in the last year for Banyan-certified engineers." He said he hasn't seen any demand for Microsoft Corp. LAN Manager-certified technicians.

Mark Whitcomb, a recruiter in Robert Half's Des Moines, Iowa, office, estimated that being a Certified NetWare Engineer (CNE) can add $5,000 annually to an employee's starting salary.

However, both employers and recruiters emphasized that certification programs, while helpful, were only one step to becoming a LAN expert. "Sure, I'd like to see a Certified NetWare Engineer entry on someone's resume," said Donald Sternfeld, IS director at Morgan, Lewis, "but I'd be more impressed with down-in-the-trenches experience."

According to Novell, it has certified 16,000 NetWare engineers and is shipping CNE student kits at the rate of 20,000 a month. "Our figures tell us that 30% of the CNEs are in our sales channel; most of the other 70% are going into end-user sites, so there must be strong demand for CNEs on-site," said Richard King, Novell's vice president of service and support.

Novell's CNE course is offered at almost 700 NetWare Education Centers worldwide. Network experts can also get the student kit and take the CNE test at a NetWare Education Center.

Novell also recently added two new NetWare certification levels: Certified NetWare Administrator, designed for nontechnical personnel who must manage a LAN; and Enterprise CNE, which includes training in heterogeneous connectivity areas such as Transmission Control Protocol/Internet Protocol, the Unix Network File System, NetWare for Systems Application Architecture and network analyzers.

Banyan also offers training and certification for its Vines network operating system. A three-day Certified Banyan Specialist course is offered at Banyan sales sites. A Certified Banyan Specialist may then go on to complete a three-day Certified Banyan Engineer course offered at Banyan headquarters in Westboro, Mass.

Microsoft offers training and certification on its LAN Manager network operating system through Microsoft University (MSU) in Redmond, Wash., and through authorized MSU training centers. Trainees may choose from a five-day Network Administrators course or a five-day System Engineers course.

Networld '92: T-shirts, red tape, APPI, no piles of pate

The casual atmosphere at Apple seems to be having a limbering, let-down-your-hair effect on business partner IBM. At a one-year birthday party update of the famous alliance announcement, IBM executives brought forth a T-shirt that was designed shortly after the two rivals told the industry they were teaming up on such projects as enterprise networking, multimedia and object-oriented system software. The T-shirt displayed an adorable member of the porcine species sporting wings, with the caption "IBM and Apple: When pigs fly."

Needless to say, the media was sorely disappointed that the favors given out were conservative black button-down T-shirts with a small birthday cake tastefully stitched near the shoulder instead of the clever Porky.

And it seems the traditional IBM red tape is starting to lose even more of its stickiness, at least where Apple projects are concerned. "Apple-IBM meetings are a helluva lot less bureaucratic than those we have in-house," said Ed Daniels, IBM's LAN systems manager.

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Street corners near the convention center featured people carrying large signs announcing that Jesus was returning and that the end of the world was coming on Oct. 28, 1992. However, there was no indication that the deadline was having any effect on product delivery schedules being discussed inside.

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Wellfleet declined Cisco's invitation to join the Cisco-driven Advanced Peer-to-Peer Internetworking vendor consortium, whose charter members (mostly Cisco business partners) were announced last week.

Wellfleet issued a statement that it believes the parallel development of APPN and APPI could confuse the industry, but it said it would support the protocol should it become a de facto industry standard.

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IBM voiced similar opinions on APPI, although Don Haile, networking systems director of IBM LAN Systems, said, "We don't know that much about APPI yet. If it becomes eminently successful, we'll support it. But I don't think it will." IBM said it will take a more definitive stand on APPI at the Interop trade show this week.

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Food at this year's vendor receptions leaned heavily toward ethnic cuisine, primarily Chinese and Mexican. Gone are the sumptuous slabs of smoked salmon and piles of pate that were the highlights of former Networlds. Vendors are either more health-conscious or more cost-conscious than in former years. You decide.

MICHELE DOSTERT

Dell, ALR answer Compaq

BY MICHAEL FITZGERALD
CW STAFF

DALLAS — Networld '92 saw Dell Computer Corp. and Advanced Logic Research, Inc. (ALR) respond to Compaq Computer Corp.'s recent server announcements with new products and aggressive pricing.

Austin, Texas-based Dell released a $7,635 high-end server based on Intel Corp.'s 33/66-MHz I486DX2 processor and introduced the Dell SCSI Array (DSA), a new Small Computer Systems Interface (SCSI) drive array that it claimed will outperform Compaq's device by 80% to 170%.

Dell said the DSA is its way of handling server I/O bottleneck. Dell said it performs as much as 200% better than Dell's current drive array product. DSA was designed to work with desktop servers as well as tower models. Dell said it will pursue OEM deals for the $3,255 product.

Claims disputed

Dell's performance claims drew a strong rebuttal from Compaq, which charged that Dell compared its products to Compaq's Intelligent Drive Array-driven servers, instead of its new servers that will use Fast SCSI-2.

Dell also released the EMS 753, a drive cabinet that supports up to 14G bytes of storage. The base cost is $5,999 with 1.3G bytes of storage.

Users reacted favorably to Dell's new systems.

"I like the pricing a lot, and it sounds like pretty good stuff," said Michael Stonecipher, office systems manager at United Missouri Bank in Kansas City. Stonecipher said he was less interested in the storage devices. "We haven't seen a real application for drive arrays," he said, adding that using distributed servers and practicing good backup habits seemed to take care of the needs at his shop.

ALR, meanwhile, undercut Compaq on the pricing end, releasing a new line of servers. The 18-member ProVEISA line will start at $2,495 for a server with a 33-MHz I486DX chip and 4M bytes of random-access memory. The ProVEISA line replaces the PowerPro server family and comes in single- and dual-processor configurations.

ALR, based in Irvine, Calif., also unveiled a proprietary disk controller, Multus, that performs comparably to SCSI but costs less, according to ALR. However, Multus will support only 4G bytes of storage.

IBM opens multivendor service center

BY MARYFRAN JOHNSON
CW STAFF

DALLAS — IBM last week opened its U.S. Open Systems Center, vowing to concentrate more service and support offerings on customers who need help integrating multivendor hardware and software environments.

Mark Morin, assistant general manager of software marketing at IBM U.S., said the 120-member staff at the national center expects to work with roughly 100 large customers in the first year of operation, at fees to be negotiated by the job involved.

The new center will be a neighbor of IBM's Dallas-based Support Facility and National Software Systems Center. It will have access to resources at other IBM labs specializing in networking, benchmark testing and application development. The center will offer prototyping services across multiple vendor platforms, and special briefings on subjects such as methods for building distributed client/server applications.

"What IBM is doing is really usability testing, to convince people the products really work and to watch AIX do its stuff," said Gary Donnelly, director of membership and business development at the National Information Technology Center (NITC) in Rockville, Md. The NITC — a 6-month-old consortium of large information systems shops in academia, government and industry — does similar product testing in end-user environments.

"This shows that a lot of users are becoming less enchanted with technology and really want to see it working," Donnelly added. "The problem with seeing products at trade shows is that the stuff is all scattered around. No one pulls it all together."

> "WHAT IBM IS doing is really usability testing, to convince people the products really work."
>
> GARY DONNELLY
> NITC

The sheer complexity of mixed environments is escalating customer need for this kind of help, said William H. Anderson, chief information officer at Prudential Securities, Inc. in New York, one of IBM's largest commercial RISC System/6000 sites.

"Whether you're integrating OS/2 with the Unix world or with the AS/400, all this stuff ultimately ends up having to be integrated into a system supporting users," Anderson said.

IBM officials said they hope the center will convince doubters of the sincerity of their commitment to open systems.

"The idea of the open systems center isn't to convert everyone to IBM," said Morin, who recently served as IBM vice president of image solutions. "Clearly, we have a lot of knowledge of our own products, but what we really want to do is solve problems on what the customers' needs are."

Some areas of the country already have service centers dedicated to IBM's Unix-based RS/6000 and AIX operating system, but this national center will focus strictly on "the multi-integration aspect of open systems," Morin said.

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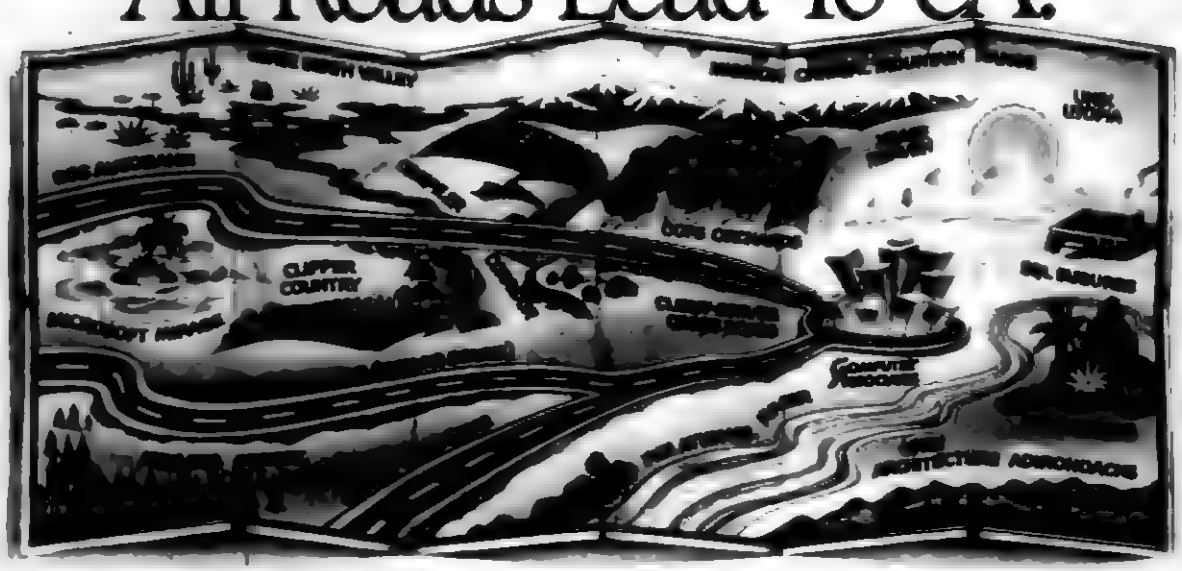

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- Linking or augmenting existing applications on a client/server basis
- Building new distributable applications based on the CDD/Repository information gained from existing applications.

All six steps rely on the COHESION family of tools. These tools span the entire software development cycle, from analysis and design, to project management, to documentation — and include communication tools that can be used throughout the development process. In addition, since certain types of software development require more tightly integrated environments than others, COHESION tools can be integrated to the degree that best meets your needs.

CDD/Repository: Key Support for Reengineering

The CDD/Repository is the integrating factor for the products and reengineering procedures used in the COHESION environment. Simply put, the CDD/Repository collects information about existing systems, manages the process of change to these systems, and provides the information base to guide new development. The CDD/Repository supports the entire process of reengineering — from "reverse engineering" or evaluation of the existing application, to "forward engineering" or re-implementation. This support benefits the application reengineering process by:

- Reducing data redundancy
- Increasing data consistency
- Increasing tool integration
- Promoting high-quality software.

The comprehensive and flexible nature of the CDD/Repository offers you the degree of data integration you require, with a choice of tools appropriate to your development needs.

Application Browser Serves as Your Guide

The COHESION Solution for Maintenance and Reengineering includes a powerful product for automating the analysis of existing applications — helping you dramatically reduce the time required to understand control and data flow relationships. This product is a reverse-engineering tool called Application Browser from Hypersoft Corporation.

Application Browser automatically analyzes COBOL applications and provides you with both graphic and text modules of the application's control logic and data structures. Once these modules are completed, you are free to navigate through each module interactively, to identify areas needing changes, and to analyze the impact of changes quickly. These differing views serve as an interactive road map — helping to guide you through your application quickly and easily.

Our COHESION Solution serves as your map through the application jungle — enabling you to easily redesign existing applications.

DECset Tools Complement Application Browser

The tools contained within DECset — including the Source Code Analyzer (SCA) and the Language Sensitive Editor (LSE) — work in conjunction with Application Browser. You can use SCA to sort out the complexities of a large application by making queries about the symbols used in the source code. LSE offers you interactive edit capabilities, integrated access to SCA for cross-referencing, and language-specific source code templates.

Redesign with DECdesign

DECdesign helps you avoid "starting from scratch" when redesigning your applications by enabling you to utilize input from Application Browser. This tool allows you to see and modify not only the data, but the application's structure and source code as well. The benefit? You can work with the physical design of the application — rather than bits and pieces of the application — to modify or reengineer it to accommodate new computing paradigms, including client/server platforms, object-oriented techniques, or new technology, such as Alpha.

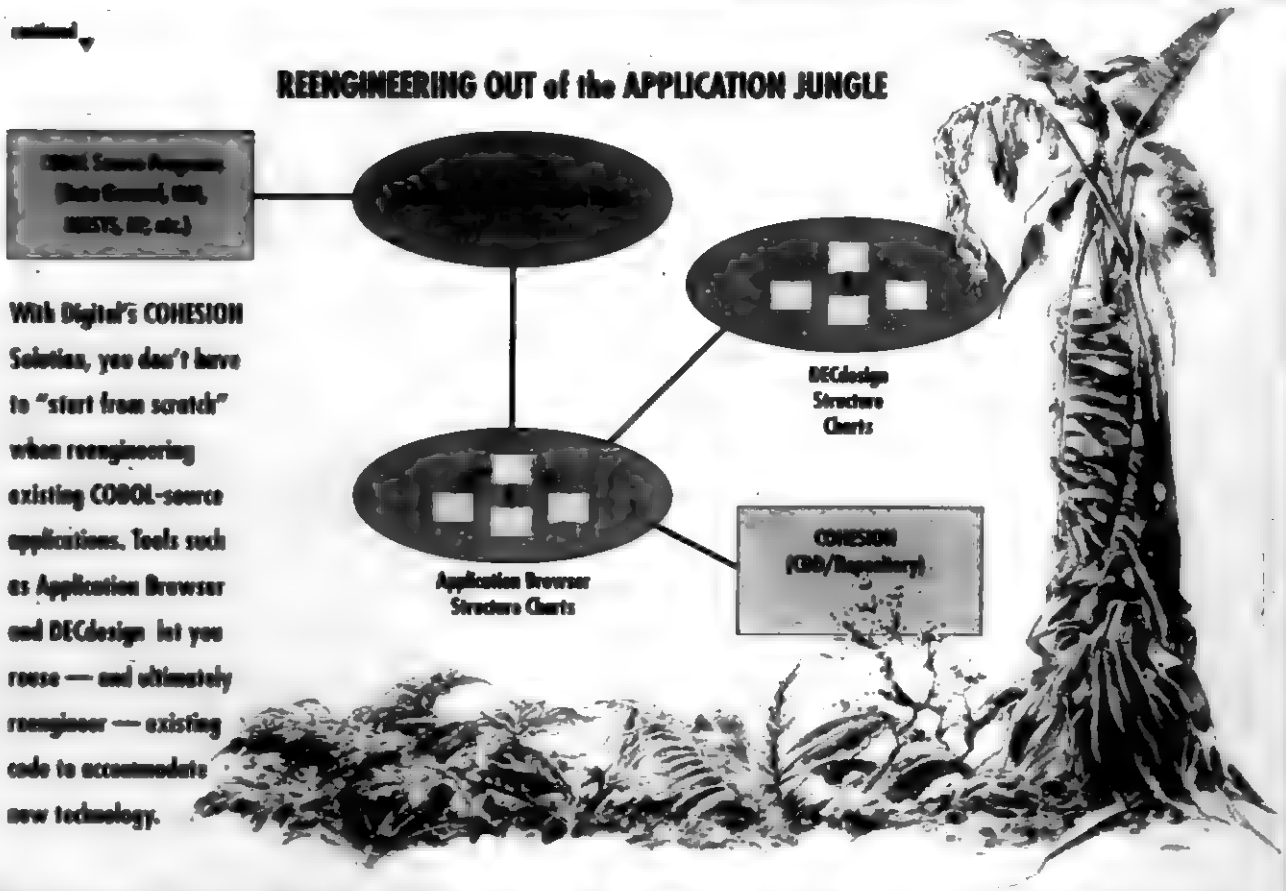
ARAM Services Offer a Wide Range of Support

Digital's ARAM Services can help you pave a clear path through the application jungle. We provide a full range of services — from strategic business process reengineering, to application assessment and redesign, through to re-implementation. In addition, our consulting, training, and implementation services supplement your staff's existing expertise.

Plus, your reengineering success is ensured by our own successful experience. After all, not only do we provide you with a solution, but we also use it ourselves. Application Browser, DECdesign, the CDD/Repository, and DECset are all a part of Digital's own application reengineering strategy.

Learn More at a COHESION Seminar

Inquire today about a seminar in your area on Digital's COHESION Solution for Maintenance and Reengineering. For information, call 800-DIGITAL (800-344-4825), press 2, and reference ext. COHESION.



PHONE IN THE LEASE, FORGET THE PAPERWORK

Via Digital's DESKTOP DIRECT Leasing Program

You may already be familiar with the many advantages offered through Digital's leasing program. Your decision to lease rather than own:

- Helps you maintain adequate working capital levels
- Protects you against the risk of technological obsolescence
- Allows you to upgrade in your own time frame
- Provides you with a convenient and flexible way to acquire today's technology.

In addition, leasing affords you no down payment. You can put advanced computing technology to work for you right away — and at the same time protect and maintain your cash flow by making predictable monthly payments. All in all, leasing helps you keep pace with the latest technological developments without the usual investment risks.

Leasing: Even Better by Phone

With all these advantages, how could the process of leasing get better? The answer is one phone call away.

Our DESKTOP DIRECT Leasing Program allows you to arrange a lease of up to $25,000 worth of equipment — without so much as signing a paper. The entire leasing agreement can be handled quickly and conveniently over the phone. Of course, for any lease over that amount, we simply send you lease documentation to sign and return prior to the processing of your order.

One major benefit to leasing over the phone? All the features of DESKTOP DIRECT are at your disposal. Whether you opt to lease or buy items from the DESKTOP DIRECT catalog, you get:

- A full year of free on-site service (fast Return-to-Factory Service for DECpc Notebooks)
- Technical support
- Free shipping
- One-stop shopping for all your personal computing needs, such as hardware, software accessories, and an array of services, including installation, insurance, training, and more.

Plus, once you choose to lease, that lease can be customized to suit your needs in terms of upgrade opportunities, end-of-lease options, and length of term. Finally, no matter how your lease is structured, you get DESKTOP DIRECT's 30-day money-back guarantee.

For more information on Digital's DESKTOP DIRECT Leasing Program, call 800-PC BY DEC (800-722-9332), Monday through Friday, 8:30 a.m. to 8 p.m.

DIRECT QUESTIONS — DIRECT ANSWERS *on DESKTOP DIRECT Leasing*

Q. *How do I qualify for a DESKTOP DIRECT lease?*

A. Call 800-722-9332 and speak with a DESKTOP DIRECT technical representative, who will ask you some simple questions and then coordinate the approval process. You will be notified upon approval.

Q. *What lease terms are available?*

A. Two-, three-, and four-year lease terms are available.

Q. *What equipment can I include in the lease?*

A. As long as a DECpc is included in the order, your lease can include any item found in the DESKTOP DIRECT catalog. These items include peripherals, options, application software, warranty options, and more.

Q. *When do my payments start?*

A. You will receive your first monthly invoice within days of receipt of your system. No down payment is required.

Q. *What are my options at the end of the lease?*

A. You have three options:

- You can return all the equipment to Digital (except application software)
- You can renew the lease on a month-to-month basis
- You can buy the system for its Fair Market Value.

Q. *Who can take advantage of the DESKTOP DIRECT Leasing Program?*

A. The DESKTOP DIRECT Leasing Program is available to commercial customers, nonprofit organizations, public and private schools, and state and local governments.

NEWS FLASH

DECtouch: Screen Input at the Touch of a Finger

Imagine adding touch screen capabilities to your computer monitor — regardless of its manufacturer or monitor size. Digital's DECtouch makes these capabilities real by bringing the simplicity of touch input to any 12- to 19-inch monitor.

A low-cost, low-profile device that fits directly beneath your computer monitor, DECtouch provides the most intuitive and easy-to-use interface for many computer applications — a simple touch with your finger or any other stylus you prefer. In fact, DECtouch is installable under MS Windows as a pointing device. It is also installable directly under MS-DOS and has built-in device emulation for two of the more popular protocols.

Not only is DECtouch easy to use, but it also takes just minutes to install — with no manufacturer's integration required. When it's time to replace your old monitor, just place the new one on the DECtouch base, run the calibration routine, and let the internal force measurement sensors do the rest.

DECtouch offers timely solutions for healthcare, retail, and manufacturing industries, plus any industry utilizing computer-based interactive training and learning applications.

Order Number	Product	Price
[illegible]	DECtouch	$895

To order DECtouch, call 800-DIGITAL (800-344-4825) and press 1.

[illegible] Option

Digital offers low-cost [illegible]

If you own an older RAID disk drive, Digital Assisted Service has an offer that might be for you. Our Customer Return Center is accepting RAID MDAs in any revision level M6 for exchange. In return, you get an MDA of equal or greater revision.

These refurbished MDAs — complete with working RAID disk drives — have undergone a certification and test process, including a 24-hour exercising. What's more, Digital guarantees them for a full year.

Order Number	Product	Price
[illegible]	[illegible]	$[illegible]
[illegible]	[illegible]	$[illegible]

Note: Digital's fully refurbished product [illegible] is available in exchange for [illegible] or earlier RAID revisions.

For information, or to order refurbished MDAs, call Digital's Customer Return Center at 800-225-5385.

THE Alpha ANGLE

Digital's Alpha Applications: ON TIME AND ON TARGET

Digital's Alpha Seed Unit Program is the next step in our effort to make leading software applications available to a broad base of industries. It involves the large-scale distribution of quality Alpha seed units to application suppliers throughout the world. By December of this year, thousands of industry-leading developers will not only have Alpha units in their shops, but they will also have the field test software and tools needed to successfully port applications — applications focusing on the OpenVMS, OSF/1, and Windows NT environments.

Concurrent Engineering Approach

In order to facilitate timely and successful Alpha application development, Digital has sought input from industry developers from the start — beginning with initial Alpha product design and including the design of prototype Alpha systems, application migration tools, and development software.

The success of Digital's early migration efforts — giving our leading partners the opportunity to work with prototype hardware and migration software — was evidenced by the 24 working applications displayed at DECWORLD '92, including:

- EMS/ABB Systems Control Company
- CADRA III/Adra Systems
- MANMAN/ASK Computer Systems
- MIMI/Chesapeake Decision Sciences
- PowerHouse/Cognos
- HABITAT/ESCA Corporation
- FIDAP/FLUID DYNAMICS INT.
- ABAQUS/Hibbitt, Karlsson & Sorensen
- FOCUS/Information Builders
- ANVIL/Manufacturing & Consulting Systems
- EUCLID/Matra-Datavision
- RDBMS/SQL/Oracle Corporation
- Pro/ENGINEER/Parametric Technology Corporation
- S/36 Transpiler/The Parkside Organization
- Arbor Logic/Pattern Recognition Systems
- Ultra Planner/Productivity Solutions
- PROMIS/Promis Systems Corporation
- General Ledger/Ross Systems
- SAS System/SAS Institute
- ANSYS/Swanson Analysis Systems
- SYBASE/SQL/Sybase
- UniData/Unidata
- WORKVIEW/ViewLogic Systems
- WIN/TCP/The Wollongong Group

Since DECWORLD '92, 34 Application Migration Centers (AMCs) — staffed with trained migration service personnel and Alpha systems, software, and porting tools — have helped to increase the number of applications being ported to Alpha. Finally, it is the Seed Unit Program that will boost application development from an initial focus to a large-scale, broad-based operation. What does all this mean for your business? Your company can plan today for industry-leading Alpha applications that are real and on schedule.

What's New for Windows NT?

You can't talk about Windows NT without mentioning Digital's up-and-coming line of Alpha personal computers — a prototype of which will be running NT applications at COMDEX, Nov. 16–20, in Las Vegas.

These PCs will allow you to run existing Intel-based Windows 16, and DOS applications — along with Windows 32 native applications — unmodified on Alpha. In fact, because the implementations for Windows NT for Alpha and for Intel are the same, migration from one version of NT to another is an easy process.

To date, more than 800 software developers have committed to and are porting more than 1,400 applications to Alpha. But the applications don't stop there. Digital is now targeting thousands of developers in all major industries.

Our current line of Intel-based PCs and new line of Alpha PCs — coupled with a growing partnership with Microsoft Corporation — allows Digital to become your leading supplier for Windows NT solutions. In addition, Digital is planning a full suite of layered products for Windows NT, including PATHWORKS, eXcursion, Desktop ACMS, and DECmessageQ.

Digital's line of Alpha PCs will give you the power of a super computer running Windows NT applications — right at your desktop. This capability will allow Alpha to become the platform that drives Windows NT into the future.

Free Applications Listing Available

To get your FREE copy of the Alpha-ready "Wall of Fame" — a list of third-party Digital partners who have committed to migrate their product(s) to Alpha — call 800-DEC-INFO (800-332-4636) and reference ext. 40.

New Software Capabilities Get the Alpha *BOOST*

You can run software applications that use emerging technologies — like multimedia, object-oriented programming, and interactive video — on today's workstations or personal computers. But it is Digital's Alpha technology that will make these applications fly seamlessly, while maximizing their performance capabilities.

Alpha will play a significant role in enhancing applications, providing complex problem-solving capabilities, and making sophisticated tools available to a broad base of industries. For example:

◆ Healthcare Industry

Alpha technology will significantly enhance image resolution — allowing X-rays, MRIs, and CAT scans to be digitized and sent over a network. Physicians located in different parts of the world could then consult on a patient's condition quickly and with more diagnostic accuracy.

◆ Insurance Industry

It can take weeks for companies to complete today's actuarial analysis. With Alpha, an insurance analyst will be able to bring whole databases into virtual and real memory at once. Alpha will allow analysts to study more complex data in significantly less time.

◆ Pharmaceutical Industry

Today, there are problems that are uniquely difficult to solve due to system constraints. For instance, pharmaceutical research and drug development involves the study of molecular structures. However, current compute power limits scientists in their attempts to model more complex molecules over longer periods of time. Alpha technology will eliminate these constraints — enabling scientists to draw more precise solutions, and enabling pharmaceutical companies to reduce research and development time.

Developers Are Talking about Alpha *(and the News Is Good)*

Pushing the Boundaries

"We're really pushing, as many customer sites, the boundaries of existing mid-range machines and their power. Alpha really moves those boundaries. I think it's going to make a very significant difference."

Mike Potter, CEO
Cognos, Inc.

Porting Is Easy

"In most respects, it's fair to say that the port from the OpenVMS to the Alpha VMS environment has been one of the easiest. The software development tool set for Alpha is extremely rich and extremely powerful."

Tom Cole, Manager of VMS Development
SAS Computer

Offering the Highest Computing Performance

"Cray Research has been dedicated to designing the most powerful computational tools there are. Our objective was to find a platform or computational device that we could put into the machine to provide the highest computational performance there is. We believe Alpha does that."

John Rollwagen, Chairman and CEO
Cray Research

Delivering the Promise of Imaging

"A typical system that does image analysis today will grab probably 30 to 60 frames of image per second. That means the time it takes to process each frame has to be extremely fast. The Alpha chip will be able to support those types of applications — where it grabs the data, analyzes it, makes a decision, and performs some operation within a 30th or a 60th of a second. That has, for the most part, not been possible with commercially available processors."

Allen Cunningham, Engineer
Auton Systems

Digital's PrintServer 32

Expanding Our Leadership in Network Printing

Building upon Digital's departmental printer leadership, the PrintServer 32 increases the throughput offered by most other departmental printers — and can be managed right from your desktop. A powerful alternative to costly dedicated printer solutions, the PrintServer 32:

- Prints up to 32 pages per minute
- Offers ideal migration from centralized to distributed printing environments
- Supports the DECnet and TCP/IP protocols simultaneously
- Provides printing support for OpenVMS, ULTRIX, UNIX, DOS, Apple Macintosh, and OS/2 platforms
- Allows you to specify N-Up, duplex, paper size selection, and input and output trays
- Features built-in security features, such as password protection for system managers.

The versatile PrintServer 32 is ideal for departments with a variety of printing requirements. It can handle plain paper, transparencies, or corporate letterheads — and can even "tell" you when your print jobs are ready. In addition, the PrintServer 32 allows for duplex printing (printing on both sides of a page) and number-up printing, enabling you to specify the number of page images printed on each side of the page.

Full Control for Systems Managers and Users

The PrintServer 32 hands you control. As a systems manager, you have full control over all the departmental printers in your organization. As a user, you have full control of your own print jobs.

You can easily load the PrintServer 32 with resources such as PostScript logos, letterheads, forms, and soft fonts — eliminating the need to purchase preprinted material and lowering the overall cost of printing. The PrintServer 32 can also ease administrative tasks by allowing you to:

Digital's PrintServer 32 has more performance — at 150,000 pages/month — and more features — like the ability to print on recycled paper — than most departmental printers.

- Track, monitor, and bill for PrintServer usage
- Allow only authorized users access to the system
- Set printer defaults from anywhere on the network
- Change printer and queue setups
- Re-queue jobs to different printers
- Retain queues until jobs are "actually" completed.

Digital's PrintServer 32 puts the control in your hands by offering centralized accounting and access control. Most important, you can diagnose printer problems remotely — from anywhere on the network.

For more information on Digital's PrintServer 32, call 800-DIGITAL (800-344-4825), press 2, and request literature #EC-F1983-56.

UNIX Systems Can Take Advantage of Digital Print Power

PrintServer Software for SPARC Systems Version 4.1, enables SPARC and Sun4 systems to access Digital's powerful, high-speed PostScript laser printers — without the need for other Digital hardware on site. Easy to load, the PrintServer Software for SPARC Systems V4.1:

- Reduces downtime by connecting directly to Ethernet networks
- Offers 29 resident PostScript typefaces from Adobe Systems, Inc.
- Allows the printing of multiple page images per side
- Features easy-to-use default settings
- Installs without requiring modifications to existing system programs.

Our PrintServer Software provides you with remote monitoring of job and printer status from a UNIX system, plus simultaneous support for both TCP/IP and DECnet. What's more, it automatically loads soft fonts, soft forms, and other PostScript resources as permanent printer capabilities.

For more information on Digital's PrintServer Software for SPARC Systems V4.1, call 800-DIGITAL (800-344-4825), press 2, and request literature #EC-F1564-56.

UNDERSTANDING THE POWER OF CBR

"Content-Based Retrieval Systems: A Market and Technology Overview" — a White Paper coauthored by Digital and Delphi Consulting Group — offers you an in-depth look at the power of Content-Based Retrieval (CBR) technology and the booming market. Plus, a comprehensive view of Digital's CBR solutions portfolio.

CBR is an electronic document management "search/access" technology that allows you to find information based on textual content or description (such as words, phrases, concepts) — without needing to know who created the information, when it was created, or where it's located on the network.

Of paramount importance to the CBR selection process is the choice of a system and platform that support and promote open architecture solutions. Digital offers such an infrastructure and provides an environment that supports many industry-leading CBR solutions. Equally important is Digital's established perspective and strategy for document management.

In an effort to provide you with up-to-date information and a better understanding of the growing CBR market and evolving CBR technology, we have teamed with Delphi Consulting Group in developing a White Paper titled "Content-Based Retrieval Systems: A Market and Technology Overview."

In it, you'll find a discussion of the CBR market and technology directions, Digital's CBR solutions portfolio, and Document Management Solutions Strategy — plus an appendix of Digital's CBR product overviews, Digital's Complementary Solutions Organization (CSO) applications, and other CBR solutions that run on Digital platforms.

Delphi Consulting Group, recognized as one of the most qualified consultants in the industry, is the leader in seminars, research, publications, and consulting for EDMS, including CBR, imaging, multimedia, and workflow. As a joint developer of the CBR White Paper, Delphi Consulting Group offers you a clear understanding of the benefits and applications of CBR technology — an understanding that will help you make better, more informed business decisions.

A Wide Range of CBR Solutions

A White Paper segment on Digital's CBR Solutions Portfolio includes discussion of Digital's CBR offerings, such as:

- ALL-IN-1/TRS
- Team Document Library (TDL) Solution from Digital and Information Dimensions, Inc.
- VTX Text Retrieval System (VTR).

In addition, detailed information is offered on third-party CBR products running on Digital platforms, including:

- BASISplus from Information Dimensions, Inc. (IDI)
- GESCAN from GESCAN International, Inc.
- PixTex/EFS from Excalibur Technologies Corporation
- TOPIC and TOPIC Real-Time from Verity Inc.

CBR and Digital Architecture: A Perfect Match

According to a 1992 Delphi Consulting Group survey, respondents ranked client/server architecture and multi-platform availability as the two most important CBR functionalities. In other words, companies are looking for scalable solutions — capable of running in several tiers and across platforms — seamlessly and transparently.

With its ongoing commitment to open systems, evidenced in architectural components such as Network Application Support (NAS) and Compound Document Architecture (CDA), Digital's environment is ideal for maximizing the capabilities of CBR solutions.

To get your FREE copy of the Digital/Delphi Consulting Group CBR White Paper, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 64C.

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NEW PRODUCTS

Workgroup software applications

PaperClip Imaging Software, Inc. has upgraded PaperClip 2.0, its document image/management software.

Also included in this release is PaperMover, a rules-based, work-flow processor that automates PaperClip functions such as creating, deleting, updating and routing documents and folders, the company reported. Support for Intelligent Character Recognition has been added, and PaperClip 2.0 has the ability to connect to Novell, Inc. wide-area networks. To optimize storage of documents to either the image server or network file server, the product uses dual magnetic/optical file systems.

PaperClip 2.0 prices range from $1,995 to $10,850.

PaperClip Software
1 University Plaza
Hackensack, N.J. 07601
(201) 487-3503

Modems

Racal-Datacom, Inc. has announced the Racal-Datacom ALM 3226 fax-cellular-data modem. The product was designed for laptops and PCs and can handle data requiring speeds of 75 bit/sec. to 14.4K bit/sec.

Features for the modem include V.42 error correction and V.42 bis compression for asynchronous data transmission for up to 57.6K bit/sec., Microcom Networking Protocol-10 error correction protocol for cellular data transmission and fax Group 3 Class 1 and 2 data transmission over a standard or cellular telephone line.

The product costs $750.

Racal-Datacom
1601 North Harrison Pkwy.
Sunrise, Fla. 33323
(305) 846-1601

LAN hardware

Interphase Corp. announced a line of networking and storage interface adapters.

The adapters work with high-end systems that use an industry-standard architecture called VME64 bus for data handling. The V/FDDI 5211 Peregrine-II network adapter connects systems to 100M bit/sec. Fiber Distributed Data Interface fiber-optic networks.

The V/Ethernet 4221 Condor network adapter provides up to four Ethernet network connections. The 16-bit, 20M byte/sec. Fast and Wide Small Computer Systems Interface (SCSI)-2 Daughtercard for the V/SCSI-2 4220 Cougar adapter series provides data exchange.

Prices range from $595 to $5,995.

Interphase
13800 Senlac
Dallas, Texas 75234
(214) 919-9000

Digital Products, Inc. has released SprintTalk/25T.

SprintTalk/25T is the first high-performance print server that allows Apple Computer, Inc. LocalTalk printers and peripherals to be connected to industry-standard 802.5 Token Ring networks, according to the company.

The product provides Apple Macintosh users with access to LocalTalk printers and devices on any 4/16M-byte Token Ring network without needing a dedicated Macintosh or router.

Support for up to eight LocalTalk-compatible printers is provided. SprintTalk/25T has capabilities similar to a router, enabling it to support other LocalTalk devices such as modems.

SprintTalk/25T costs $1,095.

Digital Products
411 Waverly Oaks Road
Waltham, Mass. 02154
(617) 647-1234

Maynard Electronics has introduced the MaynStream 10L-HS system.

The product is a high-capacity tape backup autoloader that can be used for "lights out" operation in Novell, Inc. networks.

It consists of a 50G-byte 8mm tape autoloader system that has one 5G-byte tape drive, XT/AT bus/Extended Industry Standard Architecture, IBM Personal System/2 Micro Channel Architecture controller cards, MaynStream Autoloader NetWare Loadable Module (NLM) software and a fully loaded 10-cartridge tape magazine.

An integral robotic device automatically loads and unloads the individual cartridges, which allows users to schedule up to 50G bytes of independent backup and restore operations.

According to the company, the random-access capabilities of the product are used with MaynStream NLM Autoloader software, allowing users to rapidly select data and start restoring files in minutes.

The MaynStream 10L-HS costs $18,995.

Maynard Electronics
36 Skyline Drive
Lake Mary, Fla. 32746
(407) 263-3500

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THE COST OF CONFIGURING MAY BE MORE THAN YOU'RE FIGURING.

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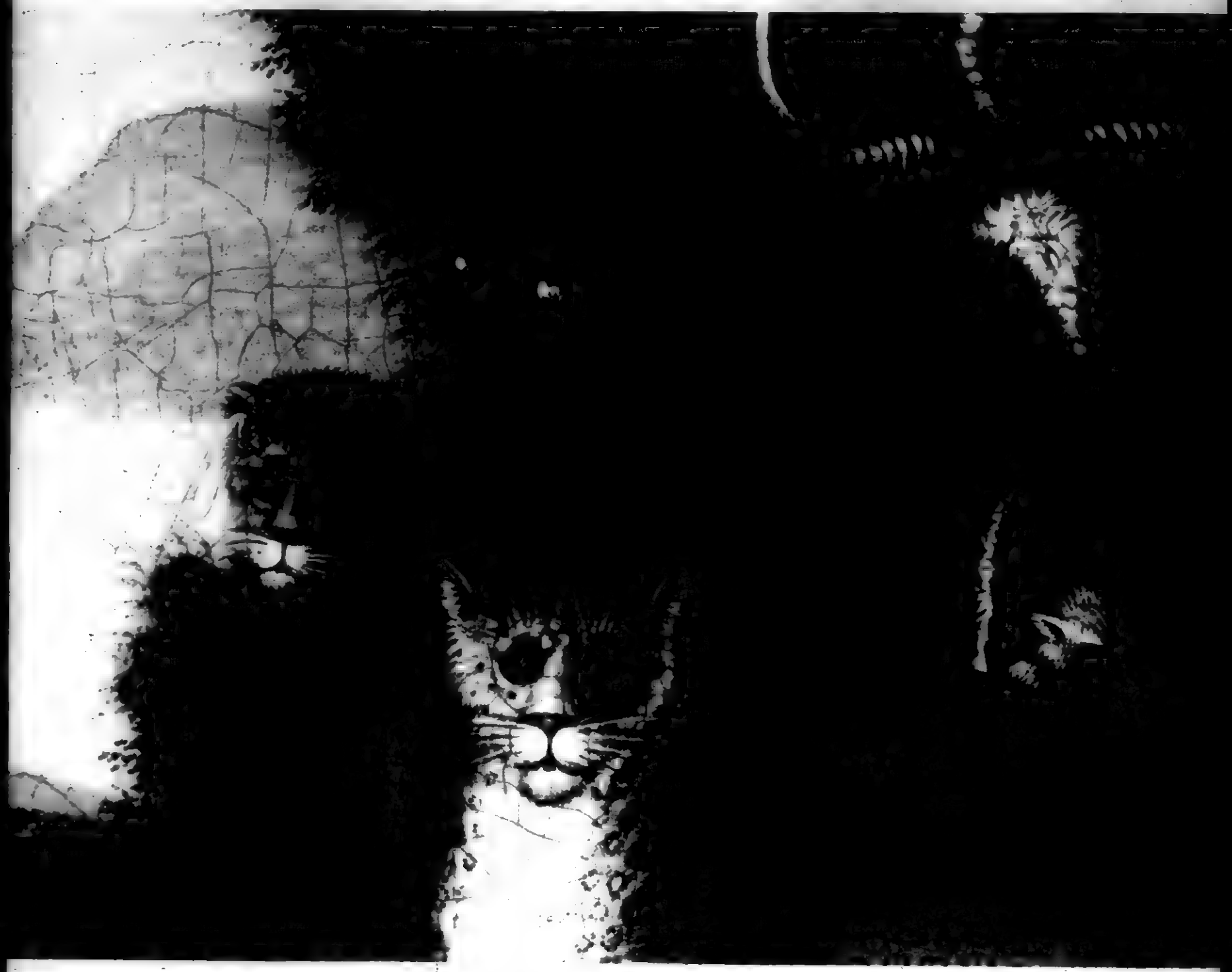
Multivendor networks.



Getting all the beasts to

The trouble with computer networks is they come in so many different species, which, as you may know, don't always get along. Conflicts between networks can turn your business into a real zoo.

Things got this way because networking products evolved on separate paths, for reaching different goals. But today's goal is to pull things together, and nobody can help you do it better than IBM.

We've not only built more networks than anyone (over 200,000), we've built all kinds. And we support all the leading standards, not just with words, but with solid products and services. (Ironically, while some

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behave takes real expertise.

still think of TCP/IP as a "non-IBM" standard, we offer as many TCP/IP products as anybody.)

So if you have a DEC® system in one department, Appletalk® in another, IBM checkout lines in your stores, and a supplier using UNIX® workstations, we can make them all work together. And not by patchwork, either. IBM's new router technology is straightforward and fits naturally with your existing investments.

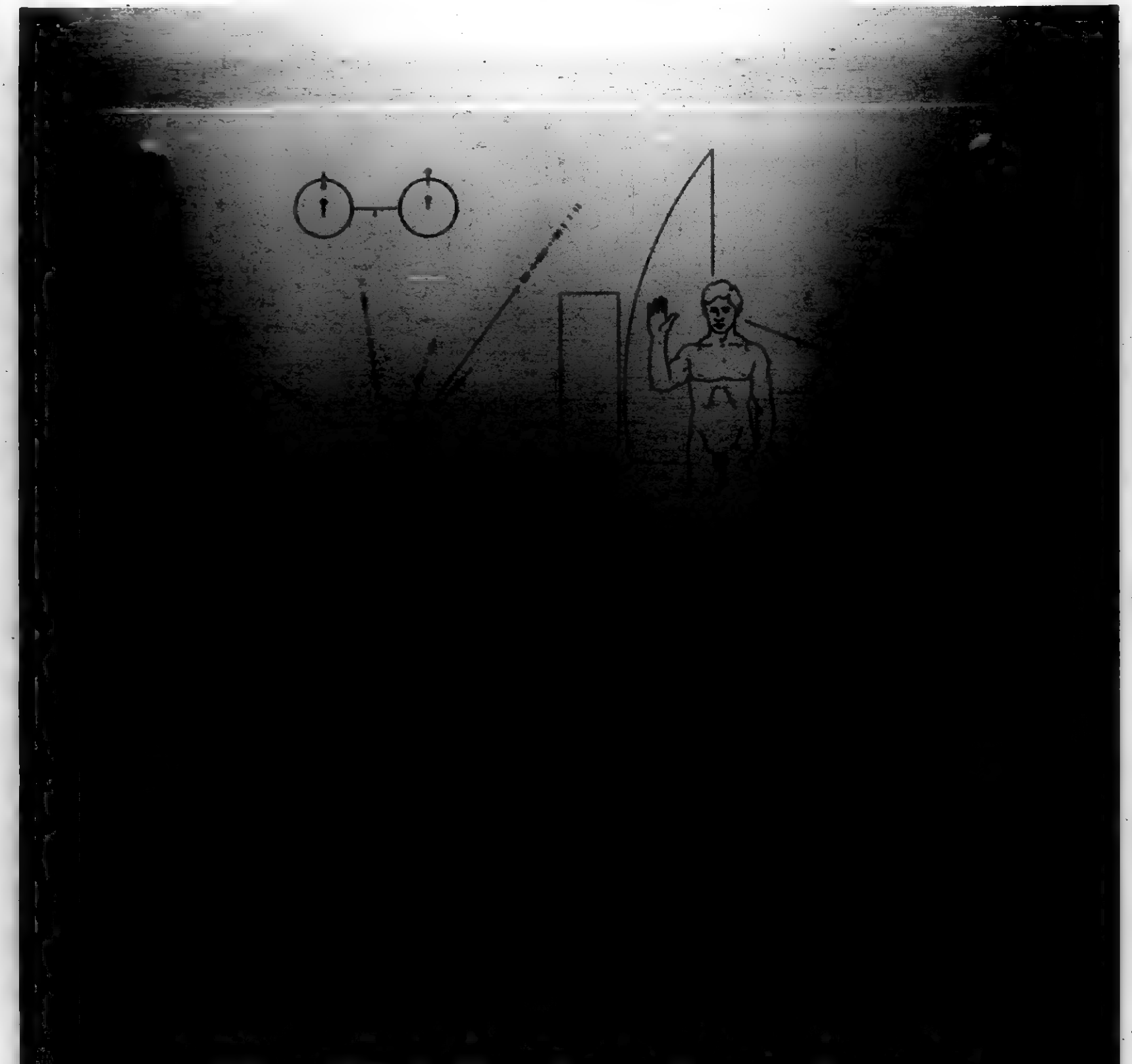
And to give you more freedom in the future, we're forming numerous alliances with our competitors. You want products that communicate after you buy them, so we're talking to each other now.

What's more, we'll not only integrate your networks, we'll stay on to manage them for you, if you like.

For Caterpillar, IBM NetView™ is managing *fifteen* different kinds of networks as if they were one. And for ADC® Telecommunications, we're designing a network of IBM mainframes, PS/2®s, Mac®s and DEC VAX®s, plus Sun® and HP® workstations, using such diverse protocols as SNA, TCP/IP and Appletalk, all connected over Ethernet and Token-Ring.

We can perform similar feats for you, but only if you call us. At 1 800-IBM-6676, extension 725.

IBM



Why Didn't They Just Put A Cisco Router On Board?

Nothing bridges space and time quite like a Cisco router. With over 40,000 routers installed, we're in all this world's biggest internets. Operating at as close to light speed as you could ever hope to get. And we support any link of any type. T1/E1. T3/E3. SMDS. Frame Relay. ISDN. You name it. Call 1-800-859-2726 to learn more. You'll see there really is intelligent life out there.

CISCO SYSTEMS

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Unisys turns attention to LAN/WAN integration

Network services group lands contract

BY THOMAS HOFFMAN
CW STAFF

BLUE BELL, Pa. — Although it has never been perceived as a premier network services provider, Unisys Corp. is starting to turn some heads. The firm last month launched a unit focused on providing networking services.

The unit, called Enable, was designed to help Unisys address two critical customer needs: local- and wide-area network integration and workstation maintenance.

According to John Drew, vice president of Enable, Unisys' restructuring efforts helped it develop the model for the network services unit. Like other companies, Unisys is trying to replace its organizational hierarchy with a workgroup-intensive focus.

Using its own reorganizational experiences as a foundation, Enable tries to help customers improve their workgroup productivity.

Enable is already starting to show benefits. Two weeks ago, Unisys landed a five-year, $15 million contract with Nationwide Mutual Insurance Co. to provide network support services.

The contract calls for Unisys to service Nationwide Mutual's network of Unisys CTOS workstations used at 4,400 of Nationwide Mutual's sites around the U.S.

Drew said Unisys' network consulting services will help the Columbus, Ohio, insurer save tens of thousands of workgroup productivity man-hours.

> THE COMBINED integration and network management markets are expected to grow 34% annually, from $4.5 billion in 1991 to $19.6 billion in 1996.
>
> MARK HODGES
> G2 RESEARCH

Drew said the contract was rewarding to Unisys because Nationwide Mutual had replaced the vendor as its workstation service provider three years ago for pricing reasons.

Drew said Unisys sees substantial opportunity in the fast-paced network services market. The combined network integration and network management

Continued on page 84

SMP a rising star at Interop

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — While Simple Network Management Protocol (SNMP) will figure prominently in network management demonstrations and introductions at this week's Interop '92 show, a quiet — but officially sanctioned — revolution is going on to depose SNMP in favor of the more functional Simple Management Protocol (SMP).

Created by four prominent SNMP developers and officially unveiled last summer, SMP is said to fill several long-standing functional gaps in SNMP.

University of California Lawrence Livermore National Laboratory is one organization that hopes SMP will provide the management that the current SNMP lacks, according to David Osterman, chairman of Lawrence Livermore's network advisory group. "SNMP does monitoring, not management," he said.

Hewlett-Packard Co., Digital Equipment Corp. and Hughes LAN Systems, Inc. are expected to demonstrate prototypes of SMP on their network management products in order to show that the protocol is a viable successor to SNMP

DEC will demonstrate SMP's much-vaunted security features, as well as interoperability between SMP and SNMP — a key concern for companies such as Lawrence Livermore that already have SNMP systems.

Hughes will demonstrate how SMP allows two network management systems to communicate, a company spokesman said.

HP will demonstrate an SMP implementation on its LANprobe II local-area network monitoring and analysis product, HP spokesman Michael Waters said. Using a prototype application developed by Carnegie Mellon University, the SMP system will interrogate a LANprobe device and get information back, Waters said.

None of the demonstrators have committed to a time frame for commercial SMP products, however.

Spokesmen indicated that their companies will bring out products as soon as the protocol becomes an official Internet Engineering Task Force (IETF) standard.

A working group appointed by IETF hopes to hammer out a final version of SMP by year's end, a vendor spokesman said. After that, the protocol goes to the Internet Engineering Steering Group and Internet Advisory Board for approval as a standard.

Also at Interop, the Desktop Management Task Group will present its work to develop application programming interfaces by which workstation hardware and software components can send management information and alerts to a network management system.

"This defines a technological base for managing components with a consistent interface," said Marshall Rose, president of Dover Beach Consulting, Inc.

The advantage of such a standard is that software and hardware vendors do not have to write new code to support each network management system on the market, he added. This in turn makes it far more feasible for leading vendors to make their workstations, network boards, applications, tape drives, or terminal devices manageable by standards-based network management systems.

SMP

Standard bearer

SMP is being touted as a successor to SNMP and is said to do the following:

- Protect links between managing and managed devices against unauthorized intrusions.
- Pass information between two network management systems.
- Perform bulk data collection, such as when the management system wants to access an entire server directory.
- Run across local-area network connections other than TCP/IP.
- Have managed devices send alerts and other information to the management station as soon as an event happens — instead of waiting to be polled.

UnixWare promises PC LAN integration

Users impressed with tool's capabilities as multiprocessing application development platform

BY MICHELE DOSTERT
CW STAFF

Users considering mixed environments of PC local-area network and Unix machines have another arrow in their quiver with the long-awaited release of UnixWare, a client/server Unix operating system from Univel, the joint venture company founded by Novell, Inc. and Unix System Laboratories, Inc.

Announced at Networld '92, UnixWare was designed for seamless integration with Novell's NetWare: NetWare clients will be able to access UnixWare servers and vice versa.

Joel Applebaum, president and chief executive officer of Univel, claimed that users have NetWare and Unix at the top of their lists when they plan a downsizing effort. With UnixWare, users retain the familiarity of NetWare, the ease of a graphical user interface and the power of a Unix server, he said.

The initial release of UnixWare has three core products: a client (UnixWare Personal Edition), a server (UnixWare Application Server), and a software development kit.

The Personal Edition client, a single-user Unix system, offers a choice of two graphical environments: the Open Software Foundation's Motif and Sun Microsystems, Inc.'s OpenLook.

The UnixWare Application Server provides multiuser access to Unix applications. Because it incorporates both Unix Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell's IPX/SPX transport protocols, it provides seamless integration to other Unix or native NetWare servers.

"A lot of people have both Unix and PCs, and they need to have them work together [sharing resources] on the same network," said Jamie Lewis, a senior analyst at The Burton Group, a Salt Lake City-based LAN research firm. "But more importantly, both developers and users see Unix as a strong, tested, multiprocessing application development platform."

UnixWare could provide the Wright-Patterson Air Force Base in Dayton, Ohio, with a migration path. "We are already integrating our 3,000 NetWare users with our Unix hosts by running both TCP/IP and SPX/IPX in the client, along with Novell's LAN Workplace for DOS product in the clients and NetWare NFS in the servers," said Maj. Jack Stackhouse, systems manager at the base. "It works well, but it doesn't conform to the [Government Open Systems Interconnect Profile] that we need to follow. We need to get off DOS to a Posix-compliant, secure operating system; UnixWare will give us that."

Another user was enthusiastic about UnixWare as an application development platform.

"Our shop is looking to develop a communications server for our entire corporate network," said Cliff McCartney, a supervisor/systems analyst at Delta Airlines in Atlanta. "So far, we're very impressed with UnixWare as an application development platform, and it performs very well — both stand-alone and on

Continued on page 84

AT A GLANCE

Univel UnixWare

- Designed to link PC-based LANs with Unix systems.
- Initial release includes the UnixWare Personal Edition client software, UnixWare Application Server software and a software development kit.

Unisys turns attention to integration

CONTINUED FROM PAGE 83

markets are expected to grow 34% annually, from $4.5 billion in 1991 to $19.6 billion in 1996, according to Mark Hodges, a consultant at G2 Research, Inc. in Mountain View, Calif.

Jeffrey Kaplan, director of networks and communications at Dataquest/Ledgeway Group in Framingham, Mass., said Unisys has moved into the second tier of network services providers behind IBM, Hewlett-Packard Co., Electronic Data Systems Corp. and Digital Equipment Corp.

Unisys is doing more than relying on its installed base to ensure network services revenue, Drew said. During the past two years, Unisys has trained 170 certified network engineers to handle users' integration issues and other needs.

Overall, Unisys devotes 650 staff members to network integration and workstation support services.

Drew would not reveal the company's network integration service revenue but said it doubled last year.

The Enable program is basically a restructured version of a network services program Unisys once ran called Unisys Connect. Mickey Hilton, a Unisys Connect customer and MIS director for Catawba County in Newton, N.C., said the network services his organization received from Unisys were outstanding.

The county contracted Unisys to run unshielded twisted-pair wiring throughout a new government building to link the various departments to a Unisys A5 mainframe over an Ethernet LAN.

UnixWare promises Unix ties

CONTINUED FROM PAGE 83

the network."

More importantly for us, we've been able to port our custom-built applications, originally written for Sun Unix, over to UnixWare very easily."

McCartney said Delta has ported tools such as compilers, development tools and a network management system from Unix-based Internet systems.

> "SO FAR, WE'RE very impressed with UnixWare as an application development platform."
>
> CLIFF McCARTNEY
> DELTA AIRLINES

"We've tested a lot of Intel-based Unix, and so far, UnixWare is the best," McCartney said. "Plus, we're a NetWare shop, so the NetWare interoperability is an added plus."

Because Unix System V, Release 4 has a set of binary-compatible application programming interfaces in it, developers can now write applications once and be assured that they will run on all Unix System V, Release 4-based operating systems on the Intel Corp. platform. This is expected to speed the development of both shrink-wrapped and custom-built Unix applications.

If Unix does find a home on corporate desktops, such speedy third-party application development will help put it there.

Lewis noted that there are strong Unix applications, such as databases, electronic publishing systems and design packages, that users may want to access from their desktop PCs.

"The high-end application development market is also where IBM's OS/2 and [Microsoft's] Windows NT are being targeted," Lewis said. "But right now, Unix has a considerable head start on both of them in terms of application development."

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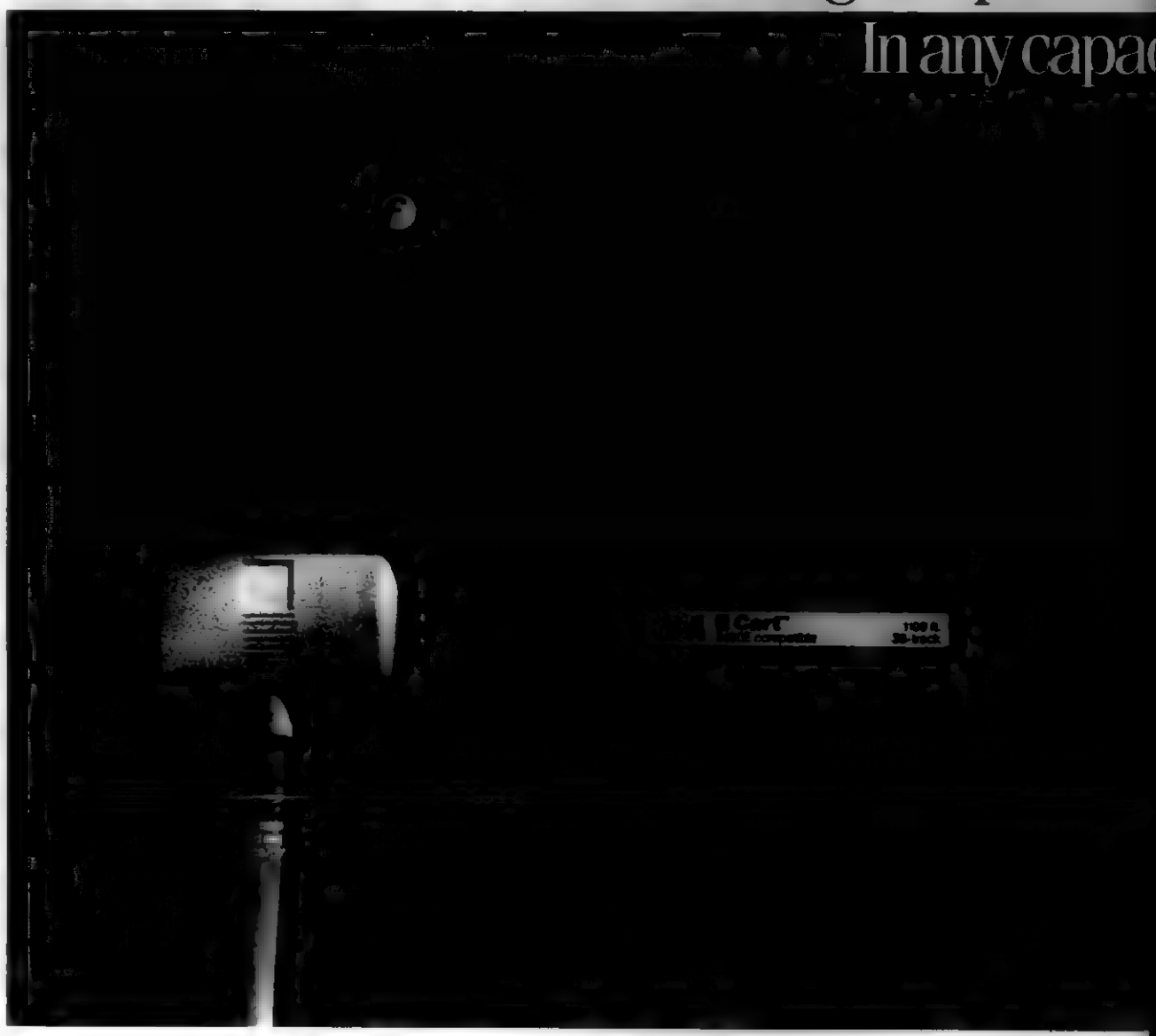

Wellfleet program to provide network advice

BY JOANIE M. WEXLER
CW STAFF

BEDFORD, Mass. — Routers are becoming increasingly complex devices forming the cornerstone of corporate internetworks. Their heightened clout has spurred vendors such as Wellfleet Communications, Inc. to beef up their postsales consulting to help users plan, design, implement and maintain networks for optimum use and health.

Wellfleet this month announced the Professional Services organization, a Wellfleet team independent of the vendor's field systems engineers intended to provide Wellfleet shops with an experienced partner for the life of the network, said Carolyn Watson, marketing analyst of customer support at Wellfleet.

Most companies bundle a degree of free consulting in their pre- and postsales support. Wellfleet, however, aims to evolve the ad hoc phone call for help into a more formalized process to assist users in determining their requirements and deciding on network details, such as what size routers to put where, what local-area networks to connect to them for optimizing bandwidth use and how to implement security.

"Users get to draw on design expertise that would otherwise be achieved through trial and error" by their own staffs, Watson said.

Users are bullish on the concept. "We absolutely are looking to partner more closely with individual network device vendors," said Plato Demos, manager of telecommunications planning at Union Carbide Corp. in Danbury, Conn., which runs a Wellfleet network spanning nearly 40 sites in the U.S.

"We're no longer building mostly hardware-oriented networks as with the old SNA [Systems Network Architecture] networks. Software now plays an important role, and there are many more variables to take into account."

Team approach

Wellfleet will form partnerships with users to ensure that Wellfleet routers will interoperate with other vendors' devices on the network and will suggest other network equipment purchases when appropriate. However, the vendor will have no formal reference sell program in place and will focus on the router portion of the network.

The program "sounds like something I would definitely use, depending on the particulars," said Steve Cover, manager of information technology at time clock equipment maker Kronos, Inc. in Waltham, Mass., which runs a 20-location nationwide Wellfleet network.

"I need help in optimizing my design; if that's not available from Wellfleet, I talk to different vendors and get a confusing variety of points of view — all generally skewed to that vendor's product," he added.

Wellfleet, which is starting out with an eight-person team, will charge an hourly consulting fee, priced according to the project, the vendor said.

Wellfleet rival and market leader Cisco Systems, Inc., which emphasizes smart network design for fault tolerance as opposed to high-availability equipment, has a 14-person worldwide consulting team organized more as an on-the-fly help shop. The Cisco Network Consulting price list ranges from $150 to $250 per hour for labor, depending on time of day and day of week, and about $750 for first-unit installation.

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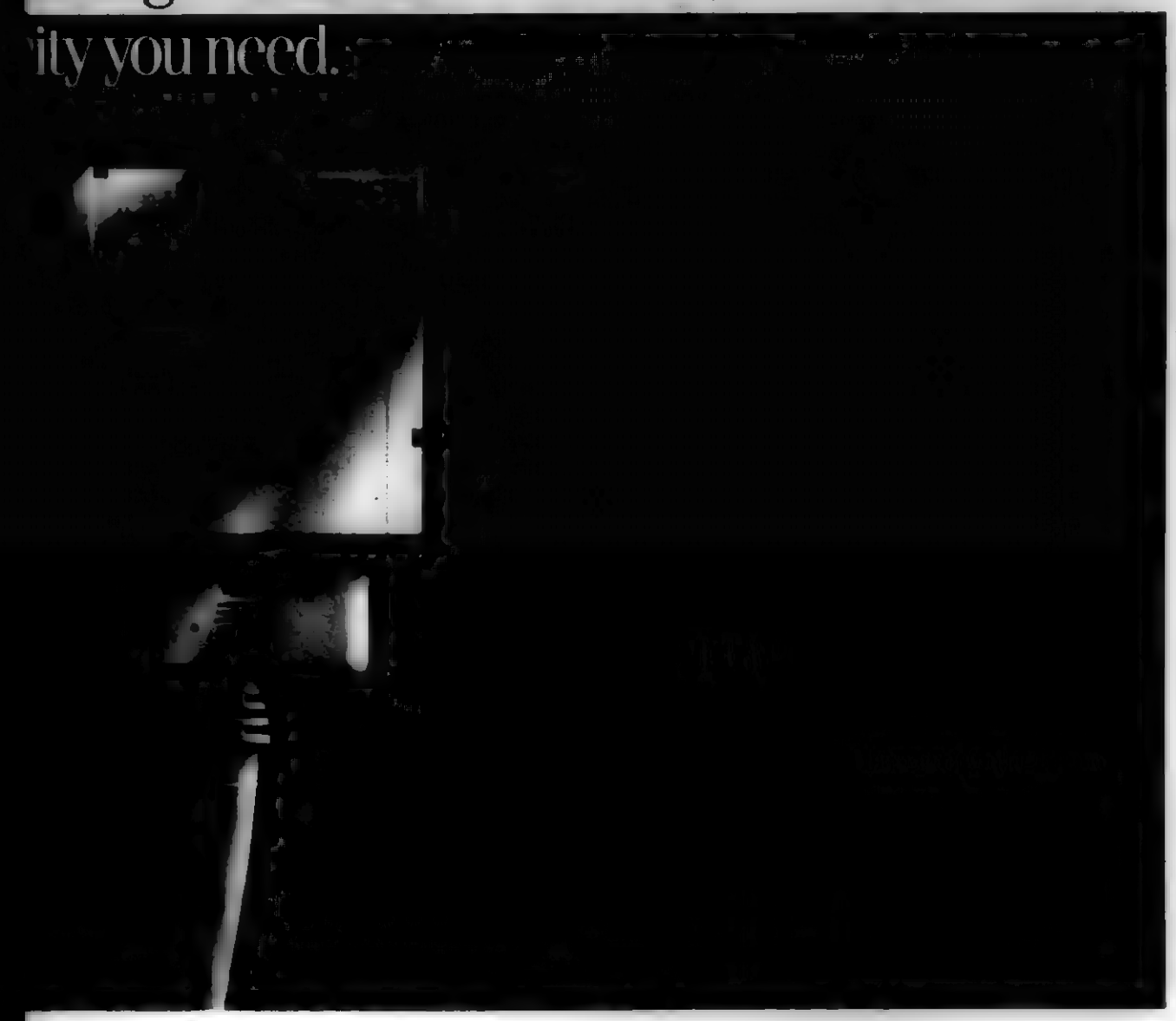

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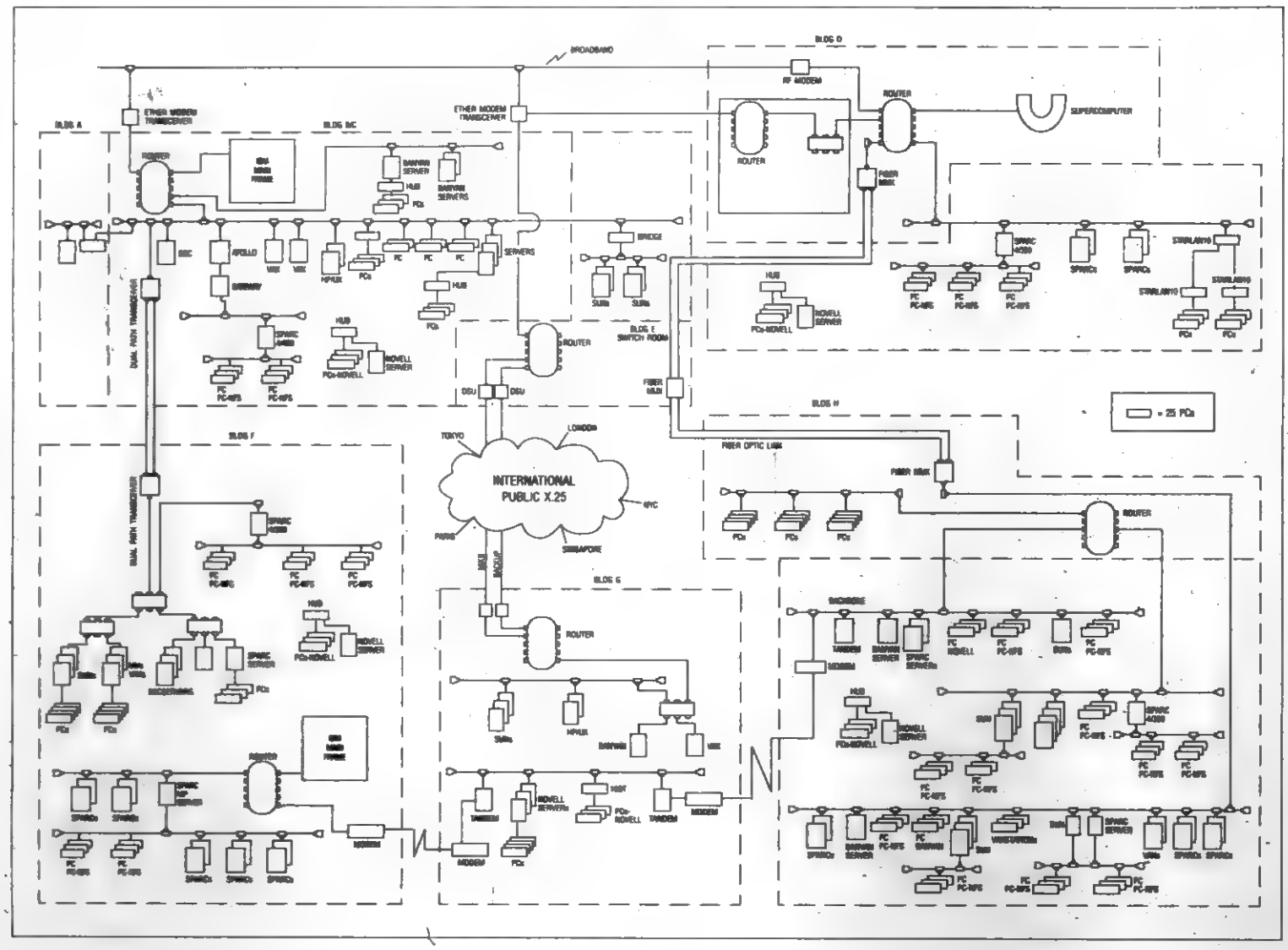

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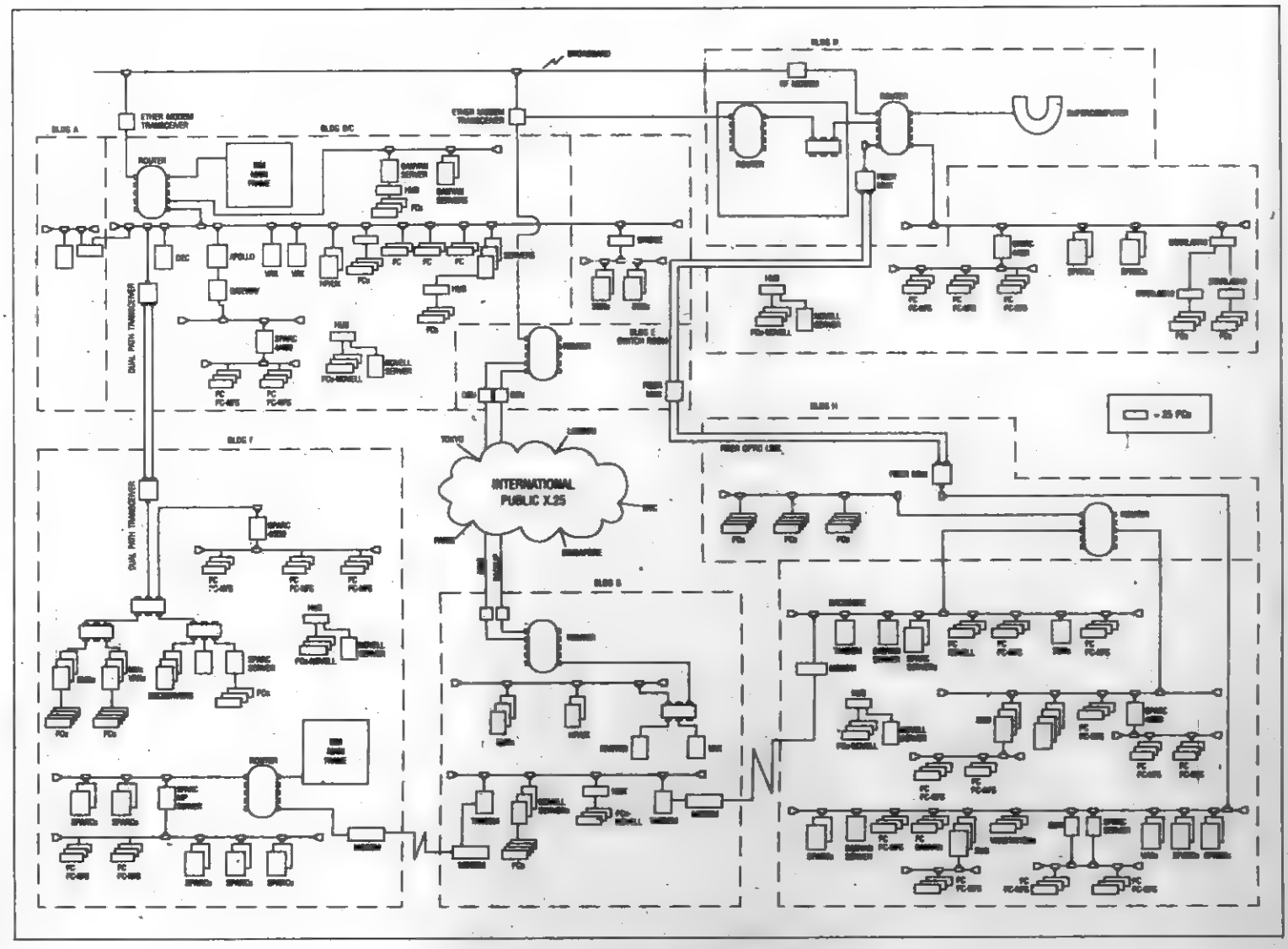
Reality.



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Savings in time, dollars spur growth of videoconferencing

BY LYNDA RADOSEVICH
CW STAFF

Group videoconferencing — the technology of holding real-time meetings over video — is gaining a foothold in Fortune 1,000 companies but not as fast as some analysts and vendors expected, according to a recent report from Forrester Research, Inc., a technology research company based in Cambridge, Mass.

The report says that worldwide revenue from group systems, such as those sold by Picturetel Corp. in Peabody, Mass., and Compression Labs, Inc. in San Jose, Calif., is expected to grow from $380 million in 1992 to $780 million in 1997. As is typical with expensive new technologies, dropping prices are expected to attract new users and prompt current users to expand and upgrade their systems, and then growth will slow.

"Group systems are going to grow from 1992 to 1995, but their revenues are not going to do as well as people think," said Paul Callahan, the report's author and a senior analyst for the network strategy service at Forrester Research.

Callahan cited increased competition among group videoconferencing vendors, a shift toward desktop systems and saturation among the largest 3,000 companies as factors in the technology's anticipated slowing growth rate in the late 1990s.

Early users of videoconferencing generally gave the technology a favorable review, the study said. Users said videoconferencing has saved employees travel time and allowed them to hold meetings that would not have been possible before.

For example, Boston-based Fidelity Investments has been using broadband videoconferencing since May to enable portfolio managers to talk to 5,000 branch representatives in Salt Lake City, Dallas, Cincinnati and Boston each month.

Face to face

"A face-to-face meeting is the most expensive way for people to meet," said Clifton Rice, director of Fidelity Images. "The savings are difficult to measure because these types of meeting were not held before."

The Dial Corp. in Phoenix has used group videoconferencing in its consumer products division for a year to connect managers in seven field locations, including St. Louis and Briston, Pa.

Dial likes videoconferencing so much that it wants to expand it internationally, said Alice Hemauer, Dial's telecommunications specialist.

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It shows in the 1992 *Users' Choice* survey conducted by *Data Communications* in which AT&T Tridom was voted the *Best Overall VSAT Vendor* with the *Best Technology.*

And it shows by what industry analysts are saying. A recent *Yankee Group* report lauded AT&T Tridom's shared hub service capability, technical superiority, and facility for combining VSAT technology with terrestrial data services.

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IN BRIEF

Siemens uses Rolm name

■ **Siemens AG** consolidated all of its private telecommunications units in the U.S. under the Rolm name at the beginning of this month. Rolm President and Chief Executive Officer Peter Pribilla also announced his management team and outlined the company's focus, which will continue to be on basic voice switching technology and business networking, Pribilla said. The Siemens family of companies employs more than 30,000 people in the U.S. and has annual U.S. sales of more than $4.5 billion, the company said.

■ **Lannet Data Communications, Inc.** in Huntington Beach, Calif., has allied with **Next, Inc.** to work on networked video, Asynchronous Transfer Mode and high-speed server networking products, the companies said. The firms will also sell cooperatively.

■ **DeskTalk Systems, Inc.**, a Torrance, Calif., network systems integrator, has formed the SunNet Manager Users Group for users of Sun Microsystems, Inc.'s standards-based network management platform. The group's first meeting will be at Interop '92 in San Francisco this week.

■ **Sprint Corp.** has extended its International Clearline private line service to Brazil, Chile, Italy and Spain. Clearline is a digital, private leased-line circuit service supporting up to 2M bit/sec.

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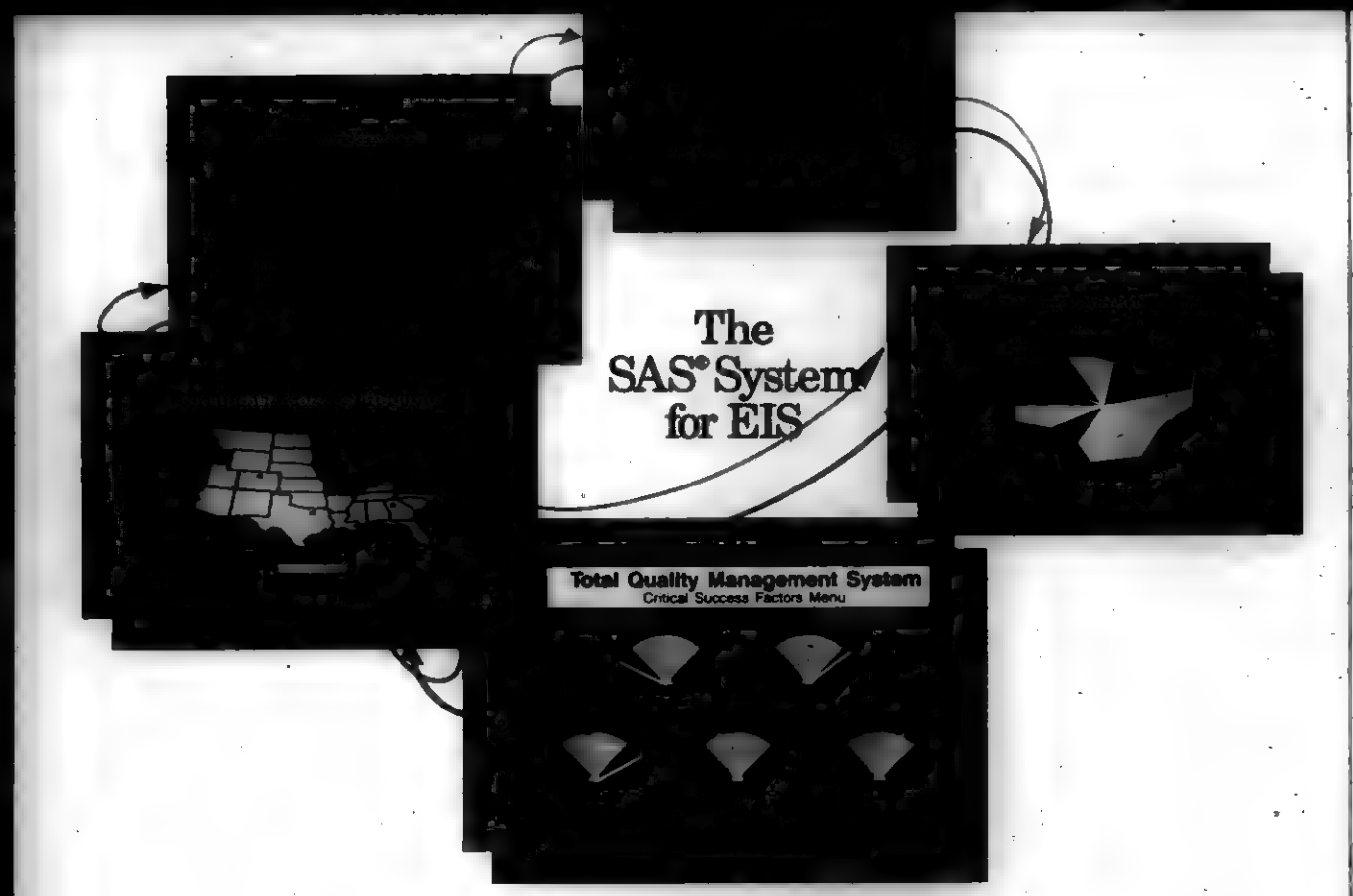

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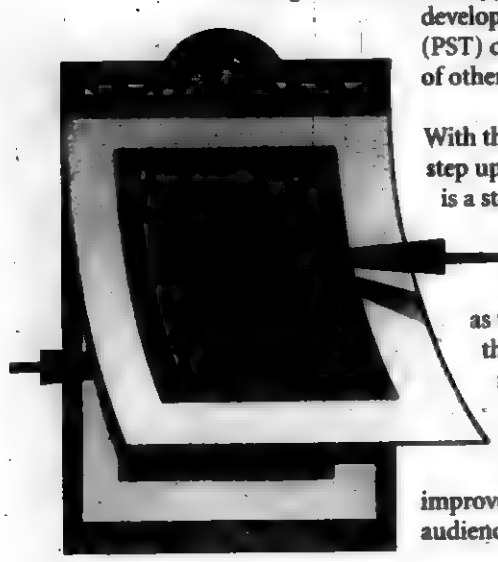
Introduction

During the 1980s, Executive Information Systems (EIS) grew in popularity as executives longed for more information at their fingertips. They wanted EIS applications that provide executive level access to predigested and preanalyzed information from corporate databases.

Survey information collected by IDC indicates that, although the market for EIS is going in new directions, the installed base remains stable. For instance, almost two-thirds of all IBM mainframe installations surveyed indicate that they run EIS applications.

Although the changing EIS market still features a strong high-end, mainframe-based segment replete with familiar vendors and products, a newer market segment is built around PC and LAN installations. It is currently experiencing strong growth — total worldwide installations doubled in 1991 — and vendors are targeting smaller companies and subexecutive levels.

IDC breaks EIS software down to three categories: EIS applications support executive information needs and decision-making activities. Packaged EIS software applications provide sophisticated EIS development tools. Professional Support Tools (PST) combine EIS software with a broad portfolio of other end-user tools such as spreadsheets.



With their user-friendly interfaces, EIS represent a step upward from spreadsheets in complexity. This is a step that an ever-growing and diverse group of users is ready to make.

EIS use is marked by top-down movement as the demand for information access grows throughout organizations. Primary users include not only CEOs, but CFOs and a variety of line managers who can work better by having better information. EIS popularity will continue to increase as improved information is made available to a wider audience of users.

This White Paper was written independently of the Computerworld *editorial department by Clare Gillan and Ken McPherson. Gillan is manager of application solutions at IDC. McPherson is a senior consultant to IDC.*

For more information on the White Paper Program, please call 508-879-0700.

Executive Information Systems (EIS) provide executive-level access to predigested and preanalyzed information from corporate data bases. After several years of being targeted at executive suites, they are now entering the mainstream of Information Systems (IS) applications. Like many other technologies that have made the transition, EIS will become less strictly defined. As this happens, EIS applications will embrace a range of products targeted to support professional decision-making. New products from traditional vendors and new companies will offer opportunities to IS development managers.

EIS ranked highly among the technology buzzwords of the past several years and EIS vendors attracted substantial media attention. During the early 1980s, the EIS market surged in response to the demand in the executive suite for more information. The 1990s will see EIS moving from the executive suite to professional offices as enterprise

managers and analysts recognize its value.

IS managers in most large organizations have considered EIS applications carefully at one time or another during the past five years. Many adopted EIS technologies. This movement toward wider EIS implementation acknowledges that tools that effectively support top managers can gain entry in IS shops.

Software analysts at International Data Corporation (IDC) recently interviewed 200 information systems managers at IBM mainframe and large Digital Equipment (DEC) IS shops. The feedback from these interviews demonstrates that EIS applications are maintaining their importance in application development decisions. Almost two-thirds of all IBM mainframe IS installations surveyed have installed EIS applications.

EIS applications were also popular in large DEC-based shops. Almost three-quarters of all large DEC installations surveyed have evaluated EIS. And over 40% of the DEC sites installed EIS applications. In addition, many IBM and DEC sites are currently evaluating EIS.

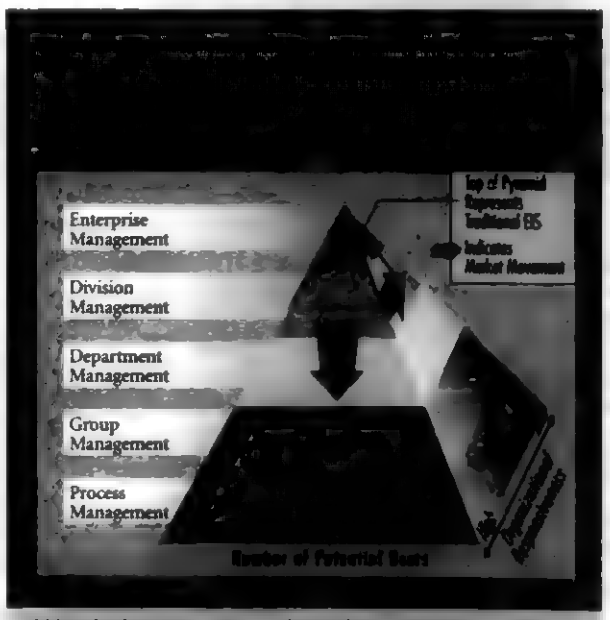
Software vendors recognized and profited from this interest in EIS systems. Annual revenues from packaged EIS software, slightly over $5 million in 1985, topped $100 million in 1991, according to IDC estimates.

THE MARKET DIVIDES

The market for packaged EIS software began to divide in the late 1980s. As a result, one segment of the market is now composed of mainframe-based flagship products such as Comshare's Commander EIS and Pilot Executive Software's Command Center. These systems, which typically involve average installed values in excess of $100,000 target executive suites in the largest corporations. The market for them is approaching saturation; not surprisingly, market growth has slowed. In response, vendors are looking for new markets to sustain their revenue growth rates.

The second market segment features a generation of products focused on PC and LAN installations. This segment is experiencing strong growth, with total installations worldwide doubling in 1991. Products represent the packaged EIS software vendors' efforts to build mass market appeal. They are targeted at smaller companies and departments within larger corporations. Potential users here recognize a need for enhanced management information, but cannot justify, either directly or indirectly, the cost of a mainframe installation.

The effort and cost of assembling and maintaining mainframe EIS applications have dissuaded many potential users from making initial EIS investments. Many others have chosen to place EIS on temporary hold or to implement simpler systems that deliver much of the value of higher cost systems while requiring far fewer IS resources.



EIS is also beginning to move beyond companies that require real time management reactions in response to changing market conditions.

PROFESSIONAL SUPPORT ENVIRONMENT

While the demand for mainframe EIS software products has slackened, IS managers still recognize the need for effective tools to deliver value-added information to senior management and others within the organization. These discerning managers are looking at a broader range of tools which IDC defines as the "Professional Support Tools" (PST).

PST software includes a portfolio of software tools designed to support professionals and managers in their daily activities. The portfolio includes data analysis and query software, financial modeling tools, as well as packaged EIS software. The growing popularity of PST demonstrates how the role of EIS is changing to meet the needs of a larger world of business professionals.

EIS: STILL EVOLVING

Software vendors, industry analysts and academics are engaged in an ongoing struggle to find appropriate terms for application software packages directed to executive and professional users. The confusion and disagreement over definitions and labels reflects a churning market; IS managers' requirements and software vendors' strategies are both moving through a period of major change and turmoil.

IDC software analysts use three different terms to classify professional and executive support applications:

- EIS applications support executive information needs and decision-making activities
- Packaged EIS software provides a sophisticated set of development tools to support EIS application development
- PST combines packaged EIS software with a broad portfolio of end-user tools. These tools include spread-

sheets, decision support and data analysis software.

Packaged EIS software includes Command Center, Commander EIS and the recently announced SAS/EIS from SAS Institute. These software packages are highly sophisticated development tools used by IS staff members to build customized EIS applications. They offer a packaged alternative to the patchwork EIS development approach used in many corporations. These software packages are marketed as "EIS systems."

Some gastronomically oriented consultants compare an EIS application to a pasta machine. The flour, eggs and other ingredients from corporate data bases enter the EIS pasta machine, emerging through the other end as linguine in the executive lunch room. The analogy might be a bit more accurate if the process began with unmilled wheat and a chicken coop, but the concept of extraction, processing and presentation is appropriate.

EIS applications typically include several features, including data extraction/navigation, rules-based logic, graphic presentation and professional workflow. Although many associate EIS applications with well-known packages from a number of software vendors, a majority of users build their own from application development tools.

Navigating through complex and non-integrated corporate data structures is often the biggest challenge for EIS developers. Some EIS include proprietary built-in access to data bases, enabling the system to get at information directly. However, most large EIS applications rely on a permanent staff of information systems data specialists to handle the extraction process, placing the processed information onto an intermediate platform accessed from the executive's EIS workstation. This process is normally termed "staging" in EIS circles.

Rules-based logic, including the basic level of exception reporting, enables systems to predigest information and highlight values that fall outside accepted ranges. Newer systems include more sophisticated analytical tools that examine overall patterns and prepare formal information reports.

	Total	No EIS	EIS Installed
Favorable/Expand	21	3	38
Favorable/Maintain	17	4	29
Evaluate	32	47	19
Skeptical	10	5	14
Negative	1	1	1
Negative/Cancel	18	33	0
Unsure	1	7	0
Total	100%	100%	100%

Among EIS users, a plurality view their systems favorably and would like to expand them.

EIS incorporate and build upon an individual executive's view of what is important. These views — a significant representation of the executive's management expertise — are captured in "what-if" statements, exception reports and internal calculations that are contained in the application's rules-based logic.

TRENDSETTING TECHNOLOGY

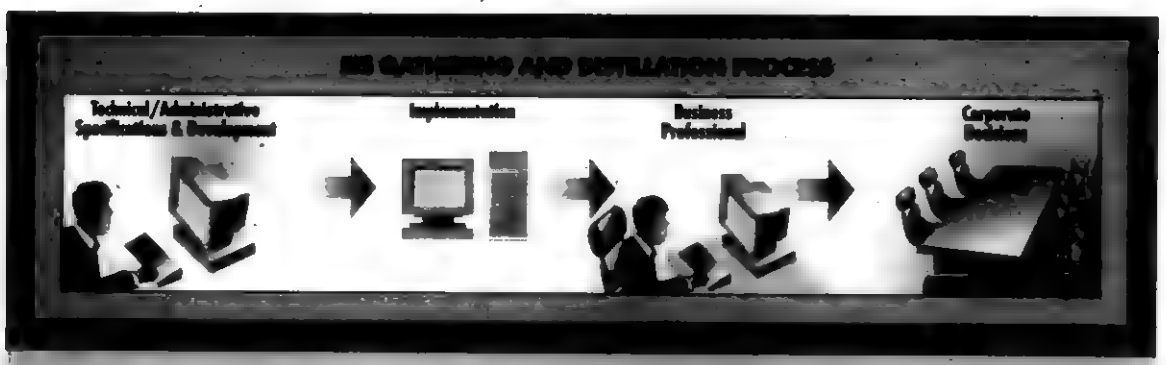
Canned EIS software helped pave the way for the introduction of graphic interfaces to the executive suite. EIS displays may use traffic-light-like screens or special color-coded matrices to report on the status of pre-identified standards of corporate performance. EIS' initial distinction as a graphic interface is changing as graphical user interface technologies become more prevalent. Nonetheless, graphic presentation, in increasingly sophisticated forms, remains a critical EIS component.

EIS software developers have incorporated the ability to mimic the normal flow of a specific executive's work pattern. An individual user might, for example, choose to first review key electronic mail messages, then examine several fundamental indices of corporate performance. That individual might then check out current stock prices through Dow Jones data bases, and finally follow up with comments to others in the group.

The EIS environment provides a natural avenue for management communications, and workgroup orientation is rapidly becoming a characteristic of mainline packaged EIS software. In a familiar EIS marketing scenario, an executive reviews a status report, enters either voice or written comments and sends the package through electronic mail to the responsible manager.

The dispersion of EIS applications among professionals in many organizations has rendered the "Executive" in Executive Information Systems an obsolete term. IS managers and corporate professionals now recognize that distributing the power of EIS applications to non-executives can substantially increase overall productivity. The distribution also helps to spread the costs of developing and maintaining a complex EIS environment across more users.

This kind of change will move the EIS market in two directions during the



EIS applications typically include data extraction/navigation, rules-based logic, graphic representation and professional workflow.

remainder of this decade.

First, applications will spread from organizations that require hands-on management toward industries that require less direct management involvement. Companies that require direct management involvement are in a position to gain the most from improved management access to operational information.

"The value of executive information systems can be truly appreciated when they are used to view operational information"

Second, applications will continue to move from the executive suite toward a less glamorous, but typically more demanding, role in group and process management.

In order to accommodate this demand, the broader category of professional support tools provides enhanced data analysis software and other tools to support professionals and line managers. IDC views PST software as the all-inclusive tool set that will be necessary to support both of these market trends.

Professionals managing financial issues continue to use decision support products, and this will remain a prime application for years to come. PST includes these decision support products, but expands the target problem set to include a broader group of job-related functions such as managing projects or quality within an organization and forecasting demand for supplies.

WHAT PEOPLE DO WITH EIS APPLICATIONS

Corporate and information systems managers build EIS applications to support several key management objectives in information-intensive organizations.

EIS applications offer a tool for generating graphic reviews of company information and for electronic mail access. An increasing number of executives and professionals are beginning to use their EIS applications to build "what-if" analyses. They can use corporate information and spreadsheets, or financial modeling packages, for example, to evaluate the impact of pricing strategies.

The immediacy of EIS information is particularly important when used to view operational information. Operational information can lead to necessary and direct management intervention. For example, a quality control manager in a pharmaceutical company can continuously review results of product sampling and machine performance. The EIS helps spot trends requiring preventive maintenance or direct intervention.

From a slightly different perspective, the EIS application can support periodic review of corporate operations. Accounting and financial reviews are typically periodic by nature. A chief financial officer (CFO) may want to view receivables weekly, using a specific technique to identify potential problem customers. Periodic reviews typically involve preparation of summary data on a regular schedule according to predetermined specifications for review.

For some organizations, the EIS becomes an integral part of ongoing operations. These EIS applications provide "Central Control" management capabilities for day-to-day operations.

EIS tools from Comshare, systems management companies such as Legent and home-built EIS applications using different components provide continuous monitoring of network operations. Highly stylized and color-enhanced displays alert systems managers to potential and actual problems in the network and suggest possible solutions. An international package delivery organization, for example, might use an EIS application to monitor air traffic patterns worldwide, diverting flights when necessary to maintain delivery schedules.

THE INTERNAL DEVELOPMENT, OR "ROLL YOUR OWN" APPROACH

Many organizations have created their own EIS applications. Some wanted to develop specific capabilities such as real-time monitoring or specialized decision-making routines. Others simply viewed internal development as a more cost-effective alternative to packaged EIS software. Overall, almost two-thirds of all EIS development activities rely on spreadsheets, word processors, graphics, third and fourth generation languages and other development tools to build their own EIS applications.

EIS application developers frequently choose office and professional software as a foundation for their EIS applications. Over 80% of all EIS developers

use packaged data access, management, analysis and presentation programs to build or complement their applications.

Data base management systems (DBMSs) are one of the most popular tools for EIS development. Developers choose the DBMS (or DBMSs) that are compatible with their other applications and are familiar to their development staff. Virtually any one of the well-known DBMS packages is likely to be used by an EIS application development team.

Spreadsheets, which have been integral to EIS for years, are the second most popular component of EIS applications. These tools provide a combination of functions, including data base navigation, financial modeling and graphics support.

Query/Data Delivery software provides developers with tools to acquire data from multiple data bases throughout the organization. Although SQL is a popular tool for multiple DBMS access, many developers prefer to use tools that read DBMS data directly without going through SQL facilities. These pipelined data access abilities can be helpful when accessing and manipulating massive corporate data bases. Fourth-generation languages and information delivery tools such as SAS System are popular query/data delivery tools.

Data analysis software is involved in EIS development at over 40% of the organizations interviewed by IDC. Typical packages in use at these sites include the SAS System from SAS Institute, and various analysis packages from Execucom — now part of Comshare — Comshare, IRI, MicroSoft and IBM. Several organizations have chosen to develop their own internal analysis packages to meet special organizational requirements. Financial modeling software takes EIS applications back to their roots. Several of the original players in the EIS market migrated from the financial modeling world. Despite this, only 36% of the EIS applications at IDC respondent sites are using financial modeling applications today. This demonstrates the distance covered by EIS applications in their migration from the financial staff. Standalone graphics software packages offer an alternative at sites that choose not to install the sophisticated graphics of packaged EIS software. This software may be the sole source of graphics at sites that choose not to use packaged EIS applications.

	All Sites	No EIS	Packaged EIS Software	Other Components Only
President/CEO	3.87	4.13	3.11	3.37
CFO	4.17	4.52	3.60	3.97
Financial Staff	3.77	3.80	3.75	3.76
CIO/VP/ MIS	3.87	4.13	3.76	3.61
IS Staff	3.40	3.43	3.36	3.38
Other Corporate Mgmt.	3.73	3.65	4.00	3.66
Other Corporate Staff	3.09	2.87	3.44	3.14
Other	1.94	1.71	1.30	2.05

Although CEOs are influential, CFOs exercise the most influence when it comes to purchasing EIS systems.

KEY ISSUES DRIVING THE EIS MARKET

Downsizing/Rightsizing

IS staff resistance to downsizing and rightsizing is eroding quickly, requiring EIS vendors to develop down-sized versions of their mainframe-based systems. Vendors have responded with a plethora of new PC and server-based systems, leaving the technology choice in the hands of IS managers.

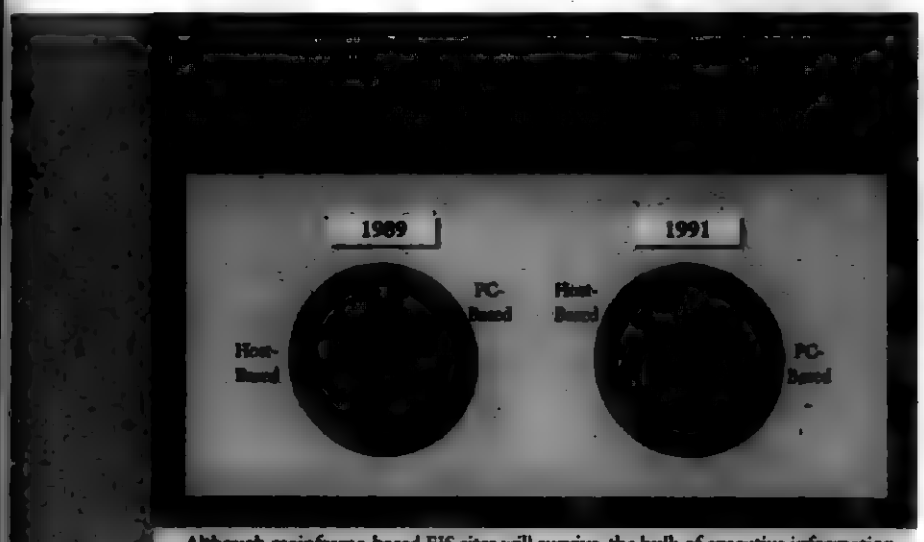
Information technology analysts recognized the critical nature of downsizing almost a decade ago. However, large IS organizations, particularly those supporting large IBM mainframe installations, resisted the drive to smaller systems, arguing that their application loads demanded the power of mainframe-based networks.

These arguments have lost their persuasiveness for many CEOs during the past several years. Downsizing is a key strategy at many IBM mainframe shops, and EIS applications, with their emphasis on graphics and access to multiple data bases on multiple platforms, are natural choices for down-sized applications.The new generation of packaged EIS software changes the basic economics of EIS application development. New products are typically priced as high-end PC software, which obviously makes them far less expensive than mainframe packages. PC software acquisition costs can be less than $1,000 per user, allowing affordable enterprise-wide installations.

PC Compromise

PC-based EIS systems still reflect some compromises relative to mainframe-based systems. EIS applications typically involve extraction and analysis of massive quantities of information, tasks that overwhelm the processing abilities of most current PCs. The difficulty of administering extraction, analysis and graphic presentation by teams of information analysts also strains some LANs. In addition, security remains a problem on more easily accessed PC platforms.

It is important to note, however, that these constraints are fading rapidly. PC-



Although mainframe-based EIS sites will survive, the bulk of executive information systems are now PC-based.

based systems continue their exponential growth in storage and processing power, while PC application vendors continue to improve the security components of their packages. LANs are also becoming more EIS-friendly as they accommodate increased bandwidth.

Platform Portability

Corporate managers are increasing their demands for open systems strategies as EIS technologies permeate their organizations. In response, EIS application developers are placing emphasis on portability — the ability of applications to run on different platforms with nothing more complex than a recompile. EIS applications built on portable software platforms, such as DBMS or query/reporting languages designed to be inherently portable, offer considerable advantages.

Vendors offering these packages are prepared to maintain ports to multiple operating system releases across multiple platforms.

IS staffs will have a difficult burden if they attempt to develop their own application portability. Alternatives, including software-based portability features generally defined as middleware, will offer important advantages as they become established in IS shops.

The Ability to Access Multiple Data Types

The IS world has seen the coming of corporate data integration for several years. Many sites are building, or preparing to build, corporate data dictionaries. They are doing this both to facilitate application development and to coordinate and integrate disparate data base environments.

This integration is a daunting task. IS managers can expect to work with a variety of data structures in realizing it. Most organizations support a variety of data base management systems. Virtually all will be accessing VSAM, legacy and proprietary data bases from older applications.

At a minimum, EIS developers should demand the ability to access multiple data types. EIS development plans should also include the ability to access repository data dictionary information.

Two Possible Directions

EIS applications tend to move in one of two directions. In some organizations, the executive information system reflects the needs of a single executive or a small group of executives. In this environment the EIS application tends to remain rooted in the executive suite. In other organizations, to a database management philosophy. These organizations find that their investment in data access and management can be leveraged across line and staff organizations.

Leveraging the EIS investment involves more than simply providing EIS screens to more people. Line and staff professionals require a more robust tool kit of professional support applications. IS managers can expect these professionals to require statistical analysis and modeling tools, word processing and electronic publishing integration.

Integration with other Applications

EIS applications frequently function as executive front-ends for other applications. The EIS graphic interface offers a logical and effective vehicle for conveying analyzed and summarized financial information. IS developers can effectively exploit the ability of EIS applications to integrate directly with other types of applications.

The American corporate drive for quality creates a new EIS application area. Statistical quality control procedures generate tremendous amounts of information — information that needs to be analyzed. For example, a typical quality control application will maintain data bases on machinery production levels, product specification variances and maintenance schedules.

Integrated with sophisticated statistical and reporting tools, EIS applications permit quality control managers to quickly reduce this tremendous volume of information. They can easily generate manageable reports highlighting current and potential problems in the production process.

The "drill-down" capability — which points to a data item when viewing underlying data — inherent in most EIS applications allows management to determine underlying causes of quality control problems. Trend analysis is based on time series data bases and analytical tools. It allows quality control managers to examine quality performance over time, ferreting out incidents of slow deterioration and increasing quality variance.

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	All Sites	No EIS	Packaged EIS Software	Other Components Only
Accounting/Financial				
Now	4.36	4.56	4.57	4.05
1996	4.43	4.44	4.50	4.16
Human Resources				
Now	3.29	3.51	3.47	2.89
1996	3.60	3.61	3.61	2.97
Quality Control				
Now	3.53	3.57	3.73	3.36
1996	3.69	3.62	3.97	3.63
Manufacturing				
Now	2.73	2.27	3.25	2.86
1996	2.94	2.50	3.46	3.11
Distribution/Transportation				
Now	3.18	3.32	3.13	3.05
1996	3.36	3.42	3.56	3.19
Sales Automation and Customer Service				
Now	3.78	3.91	3.64	3.69
1996	3.99	4.05	3.97	3.92
Industry-Specific Applications				
Now	3.75	3.83	3.56	3.74
1996	3.59	3.62	3.78	3.45

EIS' accounting/financial roots are evident when its integration with specific applications is revealed.

IS managers can also expect increasing demand for EIS applications oriented toward sales and marketing automation. IDC research into sales force automation shows a clear drive to enhance customer information data bases and sales support information. Targeted at providing immediate information to sales staff, EIS applications can offer dramatic enhancements in the overall effectiveness of these development efforts.

IS managers will be seeing more EIS-compatible capabilities from vendors who offer related software products. These vendors will address the professional software environment market from their own special niches. Enhanced graphic front-ends and stronger data navigation capabilities can transform statistical and spreadsheet packages into reputable alternatives to the traditional packaged EIS software.

Spreadsheet vendors are also strengthening their ability to access multiple data structures through SQL or pipelined techniques. Data access/query/statistical software vendors have been developing strong graphics and navigation technologies for a decade or more.

Not wanting to be left behind, traditional EIS vendors are also adding to their core EIS software. Companies with financial modeling software backgrounds are building relations with third-party application software vendors to expand their markets. Other companies are acquiring or building specialized application development capabilities to add to their existing EIS packages.

From the IS management perspective these integrated packages can offer new alternatives for supporting applications as they migrate through the organization. Different departments and different professional groups need different capabilities. A fully integrated system can allow a single corporate framework to accommodate many, if not all, of these diverse requirements.

BUILDING A VIABLE EIS STRATEGY

EIS developers will need to resolve several key issues as they begin or expand their EIS applications.

Who Will Be Using The EIS?

CEO support in large organizations remains the hallmark of mainframe packaged EIS applications. These applications typically include attention-grabbing graphics, rapid access to high-level information, access to external news sources such as Dow Jones, and action-oriented communications.

CEOs in industries such as consumer packaged goods (CPG) are likely to complement these functions with more sophisticated analytical tools. CPG industries are data-rich and their marketing strategies depend on precise measures of market share and responsiveness. CPG CEOs typically acquire strong data analysis backgrounds as they rise through the ranks. It should be noted that individual tastes dominate system selection at the presidential level.

CFOs of Fortune 100 companies drove much of the development aimed at stylized presentation of corporate information. By contrast, CFOs in smaller, less complex organizations can be resistant to change; accounting is simpler with fewer divisions and subsidiaries.

The financial staff typically requires increased data manipulation and modeling capabilities to support CFO information requests. Professional support for these staff members will reflect CFO requirements, with additional emphasis on hands-on access and manipulation.

Chief information officers or vice presidents of IS frequently play a dual role with respect to EIS applications. On the one hand, they are responsible for developing and maintaining the corporate EIS application. On the other, they use EIS applications for their own personal work.

IS staff members, like financial staff

members, typically require facilities similar to those supporting CIOs. The IS staff is typically responsible for maintaining the data extraction and analysis procedures that underlie executive and professional EIS applications. This means they need specialized tools to develop staged data bases and to perform other functions.

Other industry professionals are playing catch-up to the pacesetters in CPG marketing. Nontechnical professionals have learned to use spreadsheets and PC DBMS to solve problems. New data analysis tools using graphic user interfaces are simplifying access to statistical analysis software. These data analysis packages formerly represented a daunting challenge for some users.

Impact of User-friendly Interface

With user-friendly interfaces, it can be safely stated that EIS now represent a step upward from spreadsheets in complexity — a step that many users are prepared to make. EIS applications open up new data which was previously unavailable to these professionals. The result is "analysis creep" — the tendency for professionals to continuously demand more sophisticated tools and complex data structures.

EIS application developers must recognize the need to anticipate requirements before they actually emerge. For example, EIS developers supporting quality control applications need to monitor developments in visual data analysis. Visual data analysis is a complex graphic application currently moving from engineering workstations to business managers' desks. It provides a sophisticated way to examine data using visual models.

Other developers may need to acquire knowledge about advancing techniques in clinical trials analysis or new tools for joint analysis in market research.

EIS FUNCTIONAL REQUIREMENTS

The range of functions EIS developers may need to support is virtually limitless. However, some key functions and capabilities characterize a clear majority of all EIS installations.

Application Development and System Level Features

EIS application developers need to create and implement a clear development strategy that reflects both the importance of overall EIS trends and the necessity of incorporating an appropriate application technology environment. EIS must include the ability to access multiple corporate data bases, direct pipeline access to multiple data base types and compatibility with existing applications. They must also include data security and integrity; rightsizing to optimize platform utilization, and the ability to front-end existing applications.

There are five important application development technologies. They include: client-server, open systems, electronic mail-enabled applications, imaging and integrated decision support. None is mandatory, but EIS application developers must be prepared to articulate an appropriate strategic direction for any of them.

Packaged EIS software applications provide a sophisticated set of development tools.

Client-server

Although client-server technologies have generated a great deal of press coverage recently, few information systems managers have a clear view of what the technology involves. Client-server strategies ultimately involve the concept of rightsizing — placing processing loads on appropriate platforms. The massive amounts of data involved in EIS applications make this optimization critical for EIS development.

Open Systems

In the recent past, open systems and UNIX were virtually synonymous. However, the emergence of middleware products and interenvironmental application development tools has significantly changed the open systems landscape.

Increasingly, IS strategists are considering software-based alternatives to UNIX portability. Some users will want UNIX port availability. For many others, the key to open systems is focusing on transportable applications capable of running on virtually all major operating platforms. In the future, there will be more movement toward multiple platforms in an effort to satisfy open systems demands. For EIS developers, the key will be to select the pathway that best conforms to their open systems strategy.

Electronic Mail

The reality of electronic mail is often less attractive than vendors promise. Despite the disapointments, electronic mail has boomed, especially within large organizations. Some electronic mail

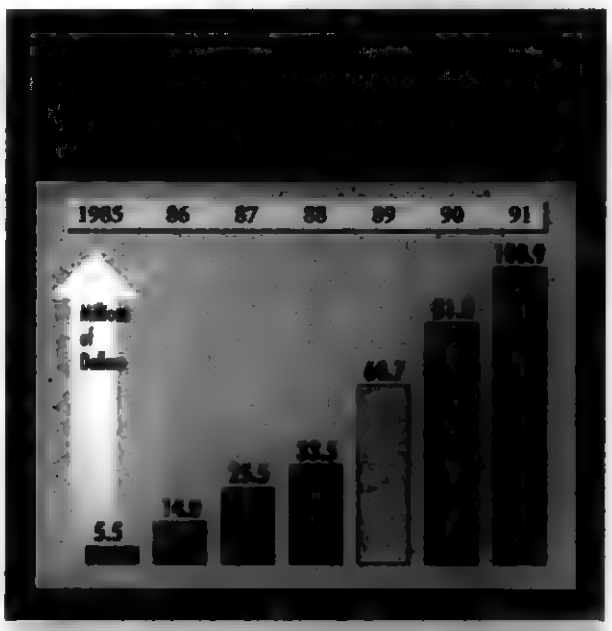
managers are now supporting 20 or more different systems within the same organization. And some IBM mainframe shops are supporting 15 or more different versions of IBM office products.

Amidst these Byzantine network tangles, users find it almost impossible to reach people on other networks. Internodal mail switching can be extremely difficult. Privately, managers recount horror stories about messages to the CEO being inadvertently addressed to stock room messengers with similar names.

But the feasibility of electronic mail-enabled EIS applications is improving. Organizations that have supported 20 or more electronic mail environments are planning to focus their support on five or six installations. As EIS grows in importance, electronic mail will complement EIS as a tool for collecting and distributing information packages throughout the organization. Spreading EIS applications into new areas requires communication support. Electronic mail can furnish the avenue for these critical communications.

Information transported as electronic mail takes advantage of the addressing, routing and security capabilities inherent in electronic mail systems. In the near future, enterprise-wide directories and user-transparent routing promise to produce seamless electronic mail systems.

Another advantage of electronic mail is its ability to appear as data within some applications. Executives facing large volumes of electronic mail can waste precious hours scanning their messages. EIS applications can incorporate the ability to review and prioritize messages, using expert systems techniques to evaluate them and bring critical items up for early attention while less important messages wait to be read at a later date.



Packaged EIS software is becoming more popular as demand grows for sophisticated EIS development tools.

Imaging

Imaging is quietly catching on as IS managers increasingly realize its benefits. Several large aerospace companies are currently building human resource management applications incorporating image management. The development of large corporate image data bases and data bases supporting multiple data types will make imaging an increasingly important part of EIS applications.

Integrated Decision Support

The trend toward enterprise EIS is creating a need for integrated decision support. Consistency between corporate decision support standards and EIS-supported decision support will make training far less of a burden. At the same time, it will eliminate the need to know several different programming languages.

USER FEATURES AND CONCERNS

Most EIS users are looking for time-sensitive solutions, regardless of the technologies they spring from. Typically, senior executives are unwilling to spend large amounts of time learning to use complex systems. The EIS, including its data access functions, must be as transparent as possible to the user. If it is not it will fall rapidly into disuse. It will also fail if plagued by slow response times. Slow response times alienate users and seriously compromise otherwise effective EIS designs.

The ability to reach into corporate data bases is critically important to EIS. Most EIS developers solve the problems of complex corporate data bases by using some combination of staged data and direct data base access. Enterprise data models, enterprise data dictionaries and repositories will open new doors for EIS application developers and IS managers.

Trend analysis also becomes increasingly important as EIS applications move beyond accounting into quality control and distribution management. Trend reporting involves both tool selection and data base design. The tools will enable development of sophisticated statistical applications designed to isolate trends from complex data streams.

Exception reporting is a fundamental element of EIS applications. The complexity of exception reporting, however, can vary significantly. At one extreme, EIS applications employ simple high/low exception reporting. Values are highlighted if they exceed an upper limit or if they fall below a lower acceptable value. At the other extreme, exception reporting becomes extremely subtle. Values may be selected if they are outside a range predicted by random variations around a predicted trend line.

Exception reporting incorporates many of the business rules that incorporate corporate knowledge into the EIS

application. Building these exception rules is alternatively one of the most complicated and interesting aspects of EIS application development.

SELECTING THE APPROPRIATE EIS PLATFORM

Selecting rightsized EIS platforms and appropriate operating environments will remain a challenge for EIS developers. While PC and LAN-based systems open the door to many new EIS applications, they also make it complicated to decide on the correct location for various EIS activities.

The mainframe will remain a viable platform for some applications. Complex extraction and analysis activities on large mainframe data bases are likely candidates. Performing the extraction and analysis on the mainframe reduces the amount of data that must be communicated, minimizing the impact on network bandwidth. Intermediate or final results can then be transmitted to workstations for further analysis and graphic presentation.

Client-server applications are appropriate in many situations. The client-server approach is particularly attractive when intermediate staged EIS data bases must serve the EIS requirements for a workgroup or department. Intermediate positioning balances speed of information access with overall communication requirements to achieve a balanced solution for EIS users.

PC-based systems offer low cost solutions which may be most appropriate for small organizations or departments and work groups in large organizations. PC applications will approach host-based systems in power and features during the next several years, as vendors add features. However, a server-based approach is likely to remain more effective for intermediate data staging, data security and centralized system management.

Meeting professional data requirements often represents the most challenging aspect of EIS application maintenance. The EIS application must be flexible enough to accommodate changing user information requirements. Therefore, EIS application development must be linked to corporate data management tools whenever possible.

	All Sites	No EIS	Packaged EIS Software	Other Components Only
Client-server				
Now	3.59	3.62	3.78	3.45
1996	4.88	4.11	4.34	3.73
Open Systems				
Now	3.53	3.49	3.74	3.39
1996	4.86	3.95	4.31	4.05
Electronic Mail-Enabled Applications				
Now	3.13	3.26	3.44	2.78
1996	3.47	3.51	3.92	3.14
Imaging				
Now	2.75	2.80	2.97	2.56
1996	3.36	3.45	3.61	3.00
Integrated Decision Support				
Now	x.xx	x.xx	x.xx	x.xx
1996	x.xx	x.xx	x.xx	x.xx
Access to Electronic Mail				
Implementing	3.38	3.68	3.35	2.97
Current	3.56	NA	3.62	3.08

Although client-server computing an open systems will experience strong growth in EIS environments, electronic mail, imaging and integrated decision support software will also be integrated to many systems.

Therefore, EIS application development must be linked to corporate data management tools whenever possible.

REALIZING THE BENEFITS OF EIS GROWTH

The potential for EIS applications is immense. EIS and PST tools are adding capabilities and ease of use at a rapid rate. Corporate data modeling and repositories, electronic mail rationalization and enterprise-wide addressing all are simplifying and magnifying the ability of users to extract knowledge from corporate data bases.

As hundreds of failing banks have discovered, assets have no real value unless they can be used to build corporate revenues. EIS applications offer the critically important capability of converting corporate information assets into bottom-line revenues. EIS are, in many ways, expert systems for business managers. Their value comes not only in their use, but in their development, as the process of building and implementing an EIS teaches managers more about their organizations. Accessing information effectively generates results that build demand for more information.

EIS applications will grow in importance as they become part of mainstream IS applications. While specific styles of EIS development will wax and wane in popularity, IS developers will inevitably build increasing quantities of business knowledge into their corporate information processing systems. This increasing integration with traditional applications will, in turn, simplify information staging. This process of one development leading to another will mark the evolution of EIS.

IDC White Paper

Executive Information Systems

Feds set up BBS for small businesses

Small Business Administration says SBA On-Line service gives high-tech help to owners

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Entrepreneurs around the country can now make a free trip to the nation's capital using nothing more than a PC and a modem. While "in town," they can tap into a multifaceted database of information about how to start and grow a business.

SBA's Saiki: *'It's free, it's fast, it's easy'*

Two weeks ago, the U.S. Small Business Administration (SBA) turned on SBA On-Line, a national electronic bulletin board from which users can query and download information about SBA loan programs, financial management services, government procurement services, publications, training, a calendar of events and much more (see chart).

"This is high-tech help for small business owners when and where they need it," said Patricia Saiki, an SBA administrator. "It's free, it's fast, it's easy — and it's a government service that never sleeps."

According to Saiki, SBA On-Line is not expected to replace the 20,000 or so voice telephone calls that come into the SBA daily from the nation's 20 million small businesses, which are those with fewer than 500 employees.

However, it will fill a void by enabling people to get information at hours when SBA phones are not staffed and by allowing them to download detailed information for local processing in spreadsheets and word processors.

At the heart of the bulletin board is a Dell Computer Corp. PC with an Intel Corp. 1486 processor, a 600M-byte hard drive and The Bread Board System (TBBS), a DOS-based bulletin board package from Esoft, Inc. in Aurora, Colo.

TBBS consists of communications software and its own relational database management system; it runs unattended 24 hours a day at SBA headquarters.

TBBS also logs statistics so bulletin board managers can analyze use patterns in order to see which files, menus, capabilities and times of day are popular with users and which are not.

"We'll see what small businesses need and don't need," George Solomon, acting deputy administrator for business development, said, describing the initial setup as a pilot program.

Attached to the PC are 20 modems and telephone lines fed by two 800 circuits provided to the government free by Sprint Corp. One number provides 2,400 bit/sec. access while the other gives 9.6K bit/sec. service.

Just days after announcing the service, all 20 lines were in use, according to Solomon. He said capacity will be added.

Good for you

Daniel O. Hill, associate administrator, said SBA On-Line was set up for less than $50,000. He noted that the SBA had wrestled with a cost/benefit analysis but found it difficult because most of the benefits will accrue to the public, not to the SBA.

"We think this will just extend our reach," he said. "The definition of a small-business person is one who gave up an eight-hour job for a 16-hour job. We think a lot of people will be using the system late at night."

Users without a PC and modem can get into SBA On-Line by going to one of the SBA's new Business Information Centers in Seattle and Atlanta. The SBA plans to have a business center in each of the agency's 10 regions by the end of next year.

The Business Information Centers will have 10 or so PCs, some fitted with modems for accessing SBA On-Line and other remote services. The PCs will also contain their own local databases — some accessible by CD-ROM devices — and will have software geared to such tasks as writing business plans and doing financial projections and cost/benefit analyses.

A number of companies, including Microsoft Corp., Lotus Development Corp., Apple Computer, Inc. and Sony Corporation of America, are donating software or hardware to the Business Information Centers.

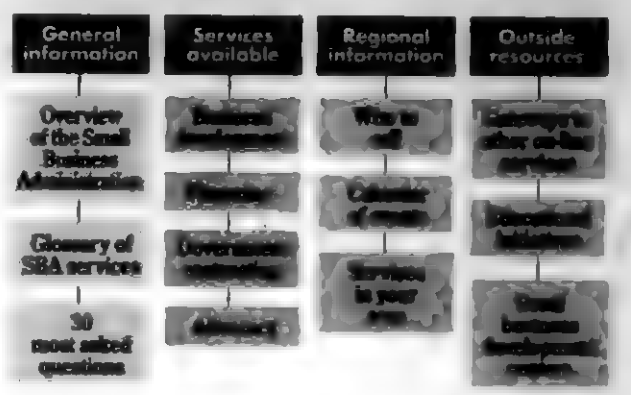
"Under the SBA Act, we can accept gifts," Hill said. "Given tight budgets and the current fiscal problems in Washington, we accept as many gifts as we can."

Currently, SBA On-Line offers access only to SBA data, but Hill said it will later open gateways to other bulletin boards and government and commercial databases. For example, it could let users with overseas sales aspirations tap into the U.S. Department of Commerce's database of export promotion data, he said.

Hill said the SBA may also add electronic-mail capability to SBA On-Line. That would allow users to obtain electronic counseling from SBA staff and its Service Corps of Retired Executives. "But a problem with that is it could overload the system. We're not sure we could handle that," he said.

For more information about how to use SBA On-Line, call (800) 827-5722.

Small Business Administration bulletin-board system



Source: U.S. Small Business Administration — CW Chart: Stephanie Faucher

NEW PRODUCTS

Network management

Cylink Corp. has introduced an end-to-end packet-switched network encryption system.

According to the company, the system consists of the SecureX25L encryptor and the Security Management System (SMS).

The encryption system was designed to protect sensitive information that is transmitted over private or public X.25 packet-switched networks. Up to 19.2K bit/sec. data rates can be operated. Support is provided for both switched and permanent virtual circuits.

The SMS is a Unix-based system that communicates with all SecureX25L units over the X.25 network. It can download a new software version to all units in the network.

The SecureX25L costs $2,750, and the SMS software costs $5,950.

Cylink
310 North Mary Ave.
Sunnyvale, Calif. 94086
(408) 735-5800

Digitech Industries, Inc. has introduced the Digitech Series 900 wide-area network and local-area network analyzer.

According to the company, the product was designed for high-performance protocol testing of frame relay, bridge/router and other high-speed WAN/LAN interconnect products and networks.

The 900 series can be used for developing, certifying, troubleshooting and analyzing frame relay, X.25, High-Level Data Link Control Point-to-Point Protocol and other high-speed WAN/LAN networks. Logical network management traffic can be viewed separately from user data traffic with a two-window display option.

The product costs $16,500.

Digitech Industries
66 Grove St.
Ridgefield, Conn. 06877
(203) 438-3731

WAN software

Teleglobe Communications, Inc. has introduced the 9800 Frame Relay/X.25 Concentrator.

According to the company, the 9800 Frame Relay/X.25 Concentrator enables users to take advantage of frame-relay network services that are offered by a variety of telecommunications carriers. This includes equipment such as High-Level Data Link Control, Synchronous Data Link Control and Token Ring bridge/routers.

Each port is individually configurable. The company's implementation of frame relay supports ANSI standards T1.618 and T1.617, 1988 CCITT X.25 and Local Management Interface.

Prices start at $6,000.

Teleglobe Communications
40 High St.
North Andover, Mass.
01845
(508) 681-0600

Gateways, bridges, routers

StarNine Technologies, Inc. has started shipping a 2.0 upgrade to the Mail Link Message Handling Service (MHS) for CE Software, Inc.'s QuickMail and Microsoft Corp.'s Mail for AppleTalk Networks.

Through Novell, Inc.'s MHS, the product connects Microsoft Mail or Apple Computer, Inc. Macintosh QuickMail users with PC mail users. Compatibility is provided with MHS 1.5, which offers streamlined configuration options and a single point of administration, the company said. Other enhancements include new enclosure handling options and support for multiple enclosures per message. Strict incoming address verification for QuickMail mail centers and System 7.0 support for virtual memory and 32-bit mode are additional features.

Prices start at $95.

StarNine Technologies
Suite 112
2550 Ninth St.
Berkeley, Calif. 94710
(510) 649-4949

Newport System Solutions, Inc. has announced the LAN 2 LAN/Multiprotocol Router (MPR), a high-performance PC-based product designed for multiple local-area network operating systems.

According to the company, the LAN 2 LAN is able to meet low-, medium- and high-end routing requirements for local- and wide-area networks. The LAN 2 LAN/MPR supports many protocols including Transmission Control Protocol/Internet Protocol and IPX for interconnecting remote computing devices on IEEE 802.3 Ethernet networks. Support is provided for High-Level Data Link Control and the standard Simple Network Management Protocol interfaces.

Prices start at $995.

Newport System Solutions
Suite 103
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

X Window Systems

Quality Software Products has released Exclaim V.1.1, an X Window System/Motif spreadsheet program.

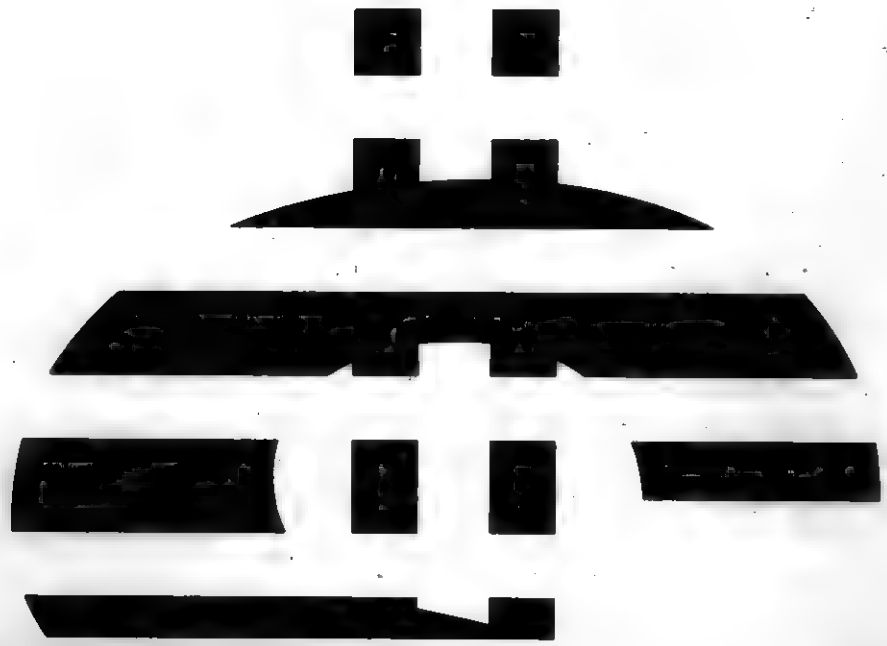
This release offers an SQL connection to the Ingres Products Division's database system. The Ingres add-in enables users to connect to existing Ingres databases.

According to the company, this provides users with the ability to analyze, graph and report on data. When the product is used as a data-entry tool for Ingres, data previously extracted from a database can be modified and updated.

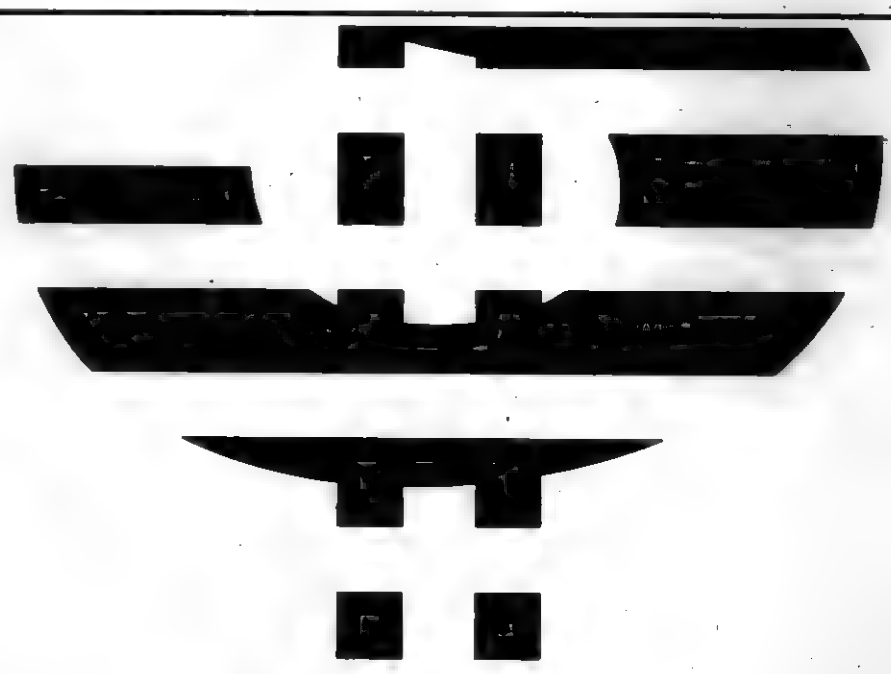
Exclaim can type or construct SQL queries with a few mouse clicks and save sessions for repeated use. Multiple windows are offered, and Exclaim is fully compatible with Lotus Development Corp.'s Lotus 1-2-3.

Single licenses start at $695.

Quality Software Products
Suite 240
5711 W. Slauson Ave.
Culver City, Calif. 90230
(310) 410-0303

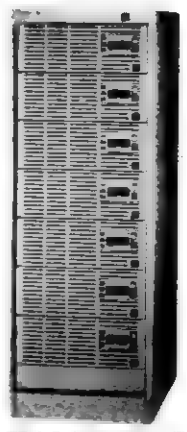


No wonder they call it Big Blue.
Just look at the cost of their AS/400 upgrade.



Inevitably, IBM says the only way to get increased AS/400 performance is to upgrade your CPU. And every time you upgrade, it means you're looking at new hardware, new software, additional memory, additional disk space, and greater service costs on an annual basis. (Ouch.)

Good for IBM. Not so good for you. Especially when EMC's Harmonix™ Series of Integrated Cached Disk Arrays (ICDA™) offers increased system level performance at a lower total system cost.



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To see how others have benefitted from Harmonix and learn more about upgrading your overall system performance, call 1-800-424-EMC2, extension M274. And save some big green by not buying Big Blue.

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THE STORAGE ARCHITECTS

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Clinic parent ports to Alpha with ease

BY MELINDA-CAROL BALLOU
CW STAFF

ROCHESTER, N.Y. — While many users of Digital Equipment Corp.'s VAXs are still waiting for hardware shipments before migrating their applications to the Alpha architecture, early users at the Mayo Foundation found the porting process easier than they had expected.

The foundation ported 141 applications with more than 400,000 lines of code in roughly three man-weeks with minimal effort, according to Brian Shamblin, computer systems manager at the site, which completed its migration more than a year ago. He added that the time required could have been as little as one man-week with the improvements to the tools that DEC has now instituted.

The Mayo Foundation, the parent organization of the Mayo Clinic, operates a VAXcluster with 19 platforms and a number of Unix workstations networked via Transmission Control Protocol/Internet Protocol and DECnet.

The foundation uses an in-house-developed computer-aided design (CAD) application and a third-party graphics package to design high-speed computer chips and multichip modules.

But simulation applications are time-consuming, so the foundation brought in Alpha platforms to boost performance and increase development speed.

"Our electromagnetic simulations are taking many, many days — the turnaround time is just too long," Shamblin said. "We're hoping to increase efficiency [by bringing in Alpha platforms] — to be able to run a suite [of simulations] in hours rather than taking weeks."

ON SITE

Mayo Foundation
Rochester, Minn.

- **Challenge:** To port VMS applications to Open VMS to run on DEC's upcoming Alpha machines with the goal of gaining performance benefits.
- **Strategy:** Use DEC's GEM compiler and migration tools.
- **Results:** Application porting was accomplished with less effort than expected; significant performance gains for simulation applications were achieved.

VMS capabilities

To start with, Shamblin's group is looking at Alpha machines running Open VMS because the in-house tools run VMS. But the group may eventually consider Alpha machines based on DEC's implementation of the Open Software Foundation's OSF/1 operating system, if that becomes standard.

In the meantime, Shamblin discovered that the porting process from VAX/VMS to Open VMS on Alpha was not nearly as complicated as he had expected.

DEC supplies translation tools to supplement its GEM cross-compiler, which has language-specific front ends for high-level languages such as C and Fortran. A single back-end engine then generates machine code targeting a specific CPU.

Shamblin: *Mayo seeks higher efficiency with Alpha*

This lets users port applications written in high-level languages to Open VMS and OSF/1, for instance. DEC's Macro compiler handles applications written in low-level languages.

Shamblin used DEC's GEM compiler for porting the in-house CAD program and said he was pleased with it.

"It was transparent — you didn't realize that there was a whole different underlying architecture since it still looks like VMS and the compilers feel like the old compilers with the same debugger," he said.

Porting basically consisted of recompiling the CAD package, fixing minor problems or VAX-specific dependencies and recompiling.

"Once we got through with the compiler we linked the application and ran it with no problems," Shamblin said. The CAD package had more than 400,000 lines of code, mostly in C with some in Fortran.

Shamblin also participated in an early beta test of DEC's translation tools, including VAX Executable Software Translator (VEST) and Translated Image Environment (TIE). With VEST, users without access to source code can create executable Alpha code from VAX instructions. TIE then provides a virtual VAX machine for the Alpha platform to process those instructions.

However, the translated executable code can slow performance compared with a straight porting job, according to DEC officials. Shamblin said he experienced no serious performance problems.

"We wanted to evaluate the interaction between translating and recompiling, so the third-party graphics package was run through VEST. We linked the resulting shareable image with our ported [CAD] code and it worked fine," Shamblin said.

The total time required to port 140 in-house CAD applications and the single graphics package was about three man-weeks, but Shamblin said much of that was due to the "early nature" of the tools.

"If we were to do it today, it would probably take about one week" because the DEC tools

Continued on page 113

RFP review helps Texas consolidate HR systems

BY KIM S. NASH
CW STAFF

AUSTIN, Texas — The state of Texas just began a $10 million project to consolidate human resource functions in all 140 state agencies, some of which are currently automated.

After about 18 months of planning the massive overhaul, dubbed Uniform Statewide Payroll/Personnel System, the state issued a request for proposals (RFP) designed to garner quick, well-targeted responses. Several innovative steps helped the state get the kind of bids it wanted.

Unlike the RFP for a like-size accounting system revamp begun in 1990 that was largely a closed affair, groups of end users, managers and information systems staff members judged vendor presentations this time around, said Andy Stack, personnel system project manager.

One reason for this was to ensure that the vendors were on the same wavelength with the state, from both IS and end-user angles.

Countering resistance

Another reason was buy-in. Because the new human resources system will be centralized, Stack said, he expects some resistance from agencies that have been doing things their own way for the past several years and are unwilling to move to a centralized system.

By giving end users a voice early on, Stack said he hopes to receive their cooperation as the project progresses.

The controller's office "didn't want people to feel we're making decisions for them. There are a lot of cowboys out there who wouldn't like that," Stack explained.

Armed with a list of specific criteria and goals, the evaluation teams sat in on oral presentations, demonstrations and site visits.

Such careful orchestration went a long way toward helping users, managers, IS and vendors visualize project goals and understand the difficult steps required to reach them, he added.

Mix and match

The state reserved the right to break apart RFP-respondent liaisons to form vendor teams to the state's liking. For example, the chosen pair, Dun & Bradstreet Software and Andersen Consulting, did not apply together.

The two firms beat out rival applicants for the job for a few reasons, including product functionality and an experienced, deep labor pool, according to Stack.

Letting vendors know up front in the RFP that the state did not regard proposals as carved in stone empowered Stack's teams. They switched bids around and came back to respondents with proposals of their own.

Problem: Managing and controlling printing and distribution costs

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Full documentation or free 30-day trial available. Group Price: $9600, $4800/yr, or $480/mo. BIM has over 40 system software products for improving productivity and use of DOS/VSE, OS/MVS, and CICS and also performs systems programming consulting.

Tesseract revamps human resources tool

BY JOHANNA AMBROSIO
CW STAFF

Tesseract Corp. has made available the newest release of its human resources mainframe software, but some large customers will wait before installing it, despite the 30% performance improvements.

"The contents of this release don't solve any burning issues for us," said Tom Klein, manager of personnel data center systems at General Mills, Inc. in Minneapolis. "We have a whole lot of other projects we have to get done." Those that take priority, he said, are related to his company's acquisition of some Nabisco cereal brands.

Likewise, Dave Smits, a senior systems analyst at Deere & Co. in Moline, Ill., said he will wait until next spring to install the new release. "We're too close to year-end processing, so we'll wait until after the W-2 forms are done in the spring." Smits said that although the release has some benefits, most of the performance improvements do not impact the payroll part of the system he uses.

Tesseract's software runs on IBM mainframes under MVS and includes modules for payroll, personnel and other functions. The 1992 General Enhancement Release is the first major new release in two years.

Among the performance-related enhancements are the following:

- Using IBM's XA and Enterprise Systems Architecture to run on-line programs in a different part of memory, thus freeing up resources for applications that need to share regions. Most of the benefit here would be for DB2 users, not IMS customers, a Tesseract spokeswoman said.
- Caching, or putting frequently accessed information into a special buffer zone, to reduce the time it takes to retrieve the information.
- Filtering, or the ability to run a job on a subset of the data. Users could run a payroll for 100 employees instead of having to do it for all 10,000 people at once.

Klein said he will likely install the 1992 release sometime next spring or summer. That schedule could be moved up, he added, if Tesseract makes available its workstation-based Retirement Plan Manager software.

Smits said the features of the 1992 release in which he is most interested include the ability to track vacation and sick days and the ability to calculate taxes for people who live in one state and work in another.

Neither shop plans to downsize its human resources system anytime soon.

HP forms client/server division

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. may be trying to sell its high-end minicomputers to data centers as mainframe replacements, but it is willing to concede that not all mainframe shops are ready to entirely cut over to smaller platforms.

That will become obvious this week when HP launches a new group aimed at providing users with prepackaged client/server solutions that, where needed, tie into existing mainframe environments.

HP has enlisted the aid of systems integrators Computer Sciences Corp. and Science Applications International Corp. (SAIC) [CW, Oct. 19], as well as a bevy of software companies including Information Builders, Inc., Pacer Software, Inc., Saros Corp. and Verity, Inc.

HP's new Cooperative Computing Systems Division will implement solutions with the assistance of HP's Professional Service Organization. CSC and SAIC will also serve as implementers, depending on the customer, according to Sridhar Ramanathan, product marketing manager at the new HP division.

HP, which taps systems integrator Electronic Data Systems Corp. for other integration work such as project management, did not use EDS as a client/server partner because "typically, they have not mapped well with our client/server solutions bundle," Ramanathan said.

A spokesman for EDS said he was surprised by that statement because EDS uses HP products in key client/server projects such as a $10 million fingerprinting project in Los Angeles.

Ramanathan said the HP program includes products from 50 vendors.

Information Builders is providing its Enterprise Data Access/SQL query program, which permits access across disparate databases. Pacer is providing networking software for Apple Computer, Inc. environments; Red Brick Systems is giving data warehousing software for HP 9000 Unix minicomputers; Saros is supplying document management software; Verity is providing document retrieval software.

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COMPAQ ProSignia disk-configured models come standard with an all-new 32-Bit Fast-SCSI-2 Controller that performs twice as fast as old SCSI technology. As well as a preinstalled, COMPAQ 32-Bit NetFlex Controller that works with Ethernet or Token Ring. And for those who require truly

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IN BRIEF

ViewStar signs fed pact

■ Document imaging vendor ViewStar Corp. in Emeryville, Calif., made its move into the federal arena with an exclusive distribution agreement with systems integrator Federal Data Corp. Federal Data has created a new division, Dorsys, under its systems group to handle ViewStar products.

■ Electronic Data Systems Corp. has acquired a 2% equity interest in mainframe software maker 4th Dimension Software Ltd. in Costa Mesa, Calif.

■ Two European imaging customers of Wang Laboratories, Inc. received awards at IMC Imaging '92, a trade show in Berlin. Western Provident Association, a UK-based private insurance company, won the 1992 European Imaging Excellence Award sponsored by BIS Strategic Decisions in Norwell, Mass. Germany's federal agency for flight security also won the IMC Award of Excellence from the IMC board of directors.

■ Unisys Corp. has won a $5 million order from the Shenzhen Posts and Telecommunications Bureau in the People's Republic of China for a Network Applications Platform 16 system. Unisys also won a $4.7 million contract from Loevenskiold-Vaekeroe in Oslo for a distributed Unix-based network system. In addition, Wemco, Inc., a New Orleans necktie manufacturer, inked a $1 million contract with Unisys for a network manufacturing system. The distributed client/server environment will consist of Unisys mainframes with Apple Computer, Inc., IBM-compatible and Unisys PCs over an Ethernet local-area network.

■ Walnut Creek, Calif.-based Integral Systems, Inc. will resell and support Gentran 400, an electronic data interchange package from Sterling Software, Inc., made for the IBM Application System/400 line.

Sterling moves to client/server

BY JEAN S. BOZMAN
CW STAFF

SAN BERNARDINO, Calif. — The Eagle has landed, and so have Viking and Galil. The three packages are key elements in Sterling Software, Inc.'s move to adapt its product line for client/server systems in 1993, and they will debut later this year, according to the company.

Jacob ben-Zvi, president of the Sterling Software Labs Division, said recently that the three products will address the need for consistent management of scattered storage resources.

"The storage management console of the future will be sitting on a PC," ben-Zvi said. "The system will watch over the network and will try to prevent failures by taking automatic actions."

Eagle is a workstation console, he said. Viking is a mainframe storage monitor, and Galil will automatically handle backup for disk drive data storage on PC local-area networks.

The three products are part of the $220 million firm's attempt to remake its line of IBM-compatible mainframe and desktop software products [CW, July 20]. The storage software re-engineering project is part of Sterling's Corporate Storage Management Initiative.

Sterling said earlier this year that the first modules of the Galil product would be introduced this month.

Mainframe-level features

Werner Frank, president of Sterling's Systems Software Group, said Galil will "provide the level of automation, security, consistency and visibility now taken for granted in mainframe environments."

Viking is being developed in Stavanger, Norway, and enterprise storage management is being tested in Palo Alto, Calif.

The first Galil module, called the IB/Server, is said to be compatible with Novell, Inc.'s NetWare network software. The product was developed by Sterling's software lab in Tefen, Israel, in the region of Galilee, for which the product is named. Dallas-based Sterling acquired the 20-person Israeli software unit two years ago.

Industry analysts said Sterling will have to scramble to keep up with larger competitors, such as Computer Associates International, Inc., Legent Corp. and Candle Corp., all of which are adapting their products to support client/server and Unix environments.

"The clock is ticking in this product area, and CA already has a commanding lead in distributed systems management," said Fred Joy, a senior research analyst at Meta Group, Inc. in Westport, Conn.

"They, like many other mainframe software providers, realize that the real growth in computing is going to be in distributed environments," Joy added. "There will be a premium placed upon suites of software that interoperate."

Ben-Zvi promised a formal announcement of Sterling's vision for enterprisewide data management by the end of the year. However, he did not set any formal introduction dates for specific products.

According to ben-Zvi, Galil has been tested for more than two months and has been demonstrated at 10 large customer sites. But there are no early delivery sites as yet, he said.

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Mayo ports to Alpha

CONTINUED FROM PAGE 107

have better compatibility between the C language version used in VAX code and that used in the ANSI-standard version of C, Shamblin said.

Not ANSI-standard

The foundation's software included code that was VAX C-specific and not ANSI-standard. The VAX C mode of DEC's ANSI C compiler will support those VAX C extensions and now handles them better than when the foundation completed its port last year, Shamblin said.

"Overall, there were few obstacles. As far as the user is concerned, they'll see the same VMS interfaces. Our code now runs absolutely on Alpha, and we're in the process of putting the money together to purchase a few Alpha machines. We will be replacing our [VAX] 8650," Shamblin said.

Since the Mayo Foundation completed its port, DEC has opened 34 migration centers to assist end users and third parties with the porting and re-engineering of applications to Alpha. Ten of those centers are in the U.S.

DEC offers more EDI application software

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. expanded its electronic data interchange (EDI) family of products recently with new integration software for IBM mainframes, a new version of DEC/EDI software and a series of third-party products.

HostBridge for DEC/EDI Application Services offers an EDI gateway for transferring information between IBM's MVS-Batch and VSE-CICS, building on the support for MVS-CICS clients previously available, DEC officials said.

"You can think of HostBridge as an intelligent data-transfer capability, which pulls information out of IBM environments, offering tracking and routing management. The data is fully logged, monitored and auditable," said Mark Hayward, DEC marketing manager for EDI. "Then, using our FileBridge table-driven mapper, you can take file formats and transform them into industry-standard EDI structures."

DEC also announced a new version of DEC/EDI that offers improved archiving and more reporting capabilities, support for remote system management tools and multinational character sets, performance improvements and electronic-mail integration with support for beepers, company officials said.

High praise

Users spoke well of the capabilities of DEC's EDI products and the new features available with DEC/EDI Version 1.2.

Pat McGinn, project manager in the battery group at Johnson Controls, Inc. in Milwaukee, is using DEC/EDI to integrate data transfer between OEMs such as Ford Motor Co., Chrysler Corp., Nissan Motor Corp. and Honda.

"We do just-in-time contracts and use EDI to link ourselves with our customers and to ensure information transfer," McGinn said. "Used properly — integrated with applications — [EDI] becomes almost interactive and keeps us all informed about what's going on at all times. Application integration isn't easy, but it's where the payback is, rather than merely treating EDI as a $200,000 fax machine."

He added that DEC/EDI Version 1.2 automates archiving on the VAX, allowing users to access more data and to "go back further for customers."

"The throughput is nice — FileBridge builds data in an ordered fashion and pushes the data through the system at breakneck speed with a converter," he said.

> "USED PROPERLY — integrated with applications — [EDI] becomes almost interactive and keeps us all informed about what's going on at all times."
>
> PAT MCGINN
> JOHNSON CONTROLS

DEC also announced a series of nine "EDI-ready" applications from third-party vendors. Ross Systems, Inc. in Redwood City, Calif., is offering its financial accounting Renaissance Series, Promix manufacturing and Ross Distribution software for EDI. Other distribution software now available includes: DCS/Logistics from Andersen Consulting, Modis from Mancos Computers and MDS from Distribution Architects International; health care Administrative Data Systems software from Shared Medical Systems; transportation PowerDoc EDI from Fraser Williams Group; and customs brokerage Alliance software from ASA International in Salem, N.H.

DEC/EDI Version 1.2 and HostBridge are both shipping and are priced starting at $10,000 and $36,000, respectively.

Additional clients for IBM mainframes are priced at $10,000 for VSE applications and at $18,000 for MVS.

Linus Press, an EDI analyst at Dofasco, Inc., a Hamilton, Ontario-based steel manufacturing firm, is moving the firm's EDI applications from an IBM mainframe to DEC/EDI because the costs of upgrading the mainframe were prohibitive.

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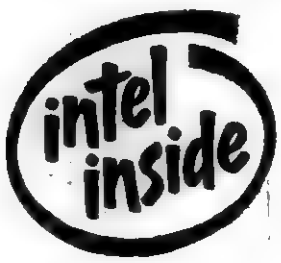

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NEW PRODUCTS

Database management

BMC Software, Inc. has released Version 3.2 of Copy Plus, a copy utility.

The product was designed for the IBM DB2 database management system. Individual table spaces can be copied with an option that lets users manually select an I/O access method. External packages such as BMC's Data Packer can be used to compress output copy data sets. A data integrity feature that catches table spaces with error ranges is also included, and the new version has added an Empty No option to make sure incremental copies are made and registered even when change pages are not found, the company said.

Version 3.2 of Copy Plus prices start at $12,000.

BMC Software
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Quadrant Corp. has released Version 3.0 of KeepTracker, a computer asset management product.

According to the company, KeepTracker 3.0 helps users who need to follow the status, reliability and location of software, hardware and other system components throughout an organization. The product has the ability to maintain data on software, purchases, service contracts and warranties. Users can define and store report formats with a true multifile report writer.

Version 3.0's features include data entry keystrokes, cascading menus and automated batch cycling. The product installs on any VAX/VMS CPU.

Prices start at $9,600.

Quadrant
340 Front St.
Marion, Mass. 02738
(508) 748-1283

Allen Systems Group, Inc. has introduced PageFix.DM, an interactive, menu-driven facility that displays and modifies Computer Associates International, Inc.'s CA-IDMS database pointers.

According to the company, the product resolves database abends caused by corrupted or broken pointer chains. Full-screen display and update capabilities for pointers are provided, with corresponding data in alphanumeric and hexadecimal format. Users can locate the source of broken chains when the product displays the associated line index and database page number. PageFix.DM also has the ability to display line indexes, data and pointers on separate formatted menu screens.

Pricing starts at $17,600.

Allen Systems Group
750 11th St. South
Naples, Fla. 33940
(813) 263-6700

Utilities

BlueLine Software, Inc. has introduced CACHE/VSE, a direct-access storage devices (DASD) caching product.

According to the company, the product was designed to increase the performance of every site running the VSE operating system. The software reduces DASD I/O by maintaining high-use records in real storage buffers, and the repetitive I/O to those records is eliminated. The product can be used for an assortment of files, including SAM and VSAM data sets, label areas and the files from any database management system.

CACHE/VSE prices start at $440 per month. Permanent license prices start at $13,000.

BlueLine Software
Suite 690
5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

Data storage

System Industries, Inc. has introduced an upgraded chassis for its Raider's Edge series of disk subsystems.

According to the company, the product eliminates the power supply as a failure point and adds battery backup. Raider's Edge subsystems are based on redundant arrays of inexpensive disks technology and consist of five disk arrays offering 1.8G or 3.3G bytes of total storage capacity.

Upgraded subsystems have individual drives that are hot-swap removable and keyed, electromechanical interlocks to prevent accidental drive removal, the company said.

The subsystems were designed for Sun Microsystems, Inc., Digital Equipment Corp. and networked environments.

Prices start at $41,500.

System Industries
1855 Barber Lane
Milpitas, Calif. 95123
(408) 432-1212

Digital Equipment Corp. has announced an option to its StorageServer 100 file server.

According to the company, the option provides a maximum on-line capacity of 342G bytes in formatted capacity. The StorageServer 100 system was designed to extend and enhance Network File System capabilities. The system combines a standard DECsystem reduced instruction set computing server with hierarchical file server software and rewritable optical disc technology.

The 85G-byte option for the StorageServer 100 system costs $119,500.

DEC
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

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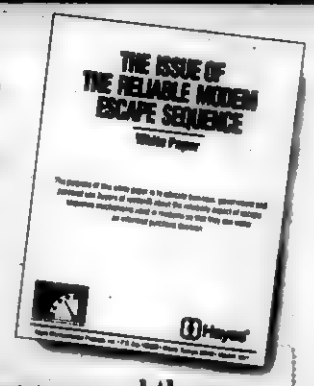

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IN BRIEF

Unisys to extend 4GL

■**Unisys Corp.** plans to extend Linc II, a fourth-generation language, by reselling a set of application development utilities from London-based **Advanced Business Solutions PLC**. ABS Kit, which runs on Unisys A series and 2200 series mainframes, provides version control, quality assurance and cross-referenced inquiries.

■Information Engineering (IE) methodology maven James Odell recently joined **Intellicorp, Inc.**, an object-oriented computer-aided software engineering (CASE) tools maker in Mountain View, Calif. Odell will work with JM & Co., one of CASE notable James Martin's companies, to develop an object-oriented version of IE.

■**Borland International, Inc.** announced Paradox SQL Link for **Novell, Inc.**'s NetWare SQL 3.0, a tool designed to let Paradox 4.0 users query applications built in Btrieve, Novell's record manager. The $395 product translates Paradox's query language and menu commands to the right dialect of SQL.

■SuiteDome, an object-based development workbench from San Diego-based **Suite Software, Inc.**, is available on HP 9000 Series 700 and 800 machines from **Hewlett-Packard Co.** Prices range from $700 to $12,000.

■**Pacific Gold Coast Corp.**, a PC application development tools maker in Glen Cove, N.Y., has enhanced PGC CASE. The new version, priced at $150, lets users combine editing reqfiesta, choose from three icon and font styles and resize graphs.

■Unix application development tool maker **Pure Software, Inc.**, based in Los Altos, Calif., and **Mercury Interactive, Inc.**, based in Santa Clara, Calif., plan to merge and cross-market their product lines starting early next year.

Words from the CASE-wise: Think big, know your vendor

Battle-scarred development tool veterans offer advice to potential users

BY KIM S. NASH
CW STAFF

Computer-aided software engineering (CASE) veterans have words of wisdom as well as specific caveats for potential or new users of the development tools.

Pre-CASE steps — vendor evaluation and very early implementation — are particularly important, they said. Before plunking down a fat check for products from Texas Instruments, Inc., Intersolv, Inc., KnowledgeWare, Inc. or any other CASE bigwig, measure your shop against the following criteria:

Is CASE the answer?

•**Multiple problems.** One of the most oft-cited warnings from those in the know is that CASE for a single project or in limited development use is a waste of time and money.

"It's a big commitment, not something to be taken lightly," said Randy Dougherty, engineering technical director at Martin Marietta Corp. in Dayton, Ohio.

•**Flexible problems.** Do not underestimate the cultural and organizational upheaval that accompanies CASE. Users advocate giving project teams plenty of leeway. That means that although you want to get rolling with the new tools, choose projects that are flexible enough to allow movable deadlines. The Chase Manhattan Bank NA in New York, for example, tested Easel Corp.'s products in several pilots for more than a year before starting formal use.

•**Open access to data.** Possessive users or staunch hierarchical management won't take kindly to the integrated systems that are the goal of most CASE projects. Yet buy-in from these troops can be critical to the ongoing use of a new technology.

Rapid application development modules that are part of several CASE workbenches are getting people involved at companies such as Chemical Banking Corp. and The Royal Trust Co.

Rapid application development calls for developers to meet with users to "spec out" the system in question and to build and test quick prototypes together. Users know their voices are heard and programmers are spared much back-and-forth niggling that can bog down development efforts.

•**Be ready to relearn.** Thorough programmer training that incorporates a gradual change in how traditional mainframe developers work is a must. It is overwhelmingly cited by CASE pioneers as the most critical step to getting the most out of CASE tools [CW, Oct. 12].

Business skills needed

CASE pointed up skill base deficiencies at Levi Strauss & Co., which has been doing serious CASE since 1989. Besides learning the ins and outs of the particular CASE tool and methodology, Levi's staff needed to increase business acumen.

"Design in the 1970s was really just replicating manual tasks. Now we have to figure out how to make automated tasks better for the business," explained Donna Rund, director of information engineering.

•**Talk, talk, talk.** Get the scoop on different tools by meeting with current users in similar industries — and not just the ones the vendor uses as standard references. User conferences can be a good place to find them, but call industry associations, too.

•**Easy instruction.** Make sure training, consulting and other hand-holding are available either from the CASE vendor or a third party experienced with your tool choice.

Before diving in

You have the nifty CASE workbench installed. Now what? Don't touch that dial. First, install project management tools. Users said CASE efforts grow quickly, which can make tracking completed work and scheduling future tasks troublesome.

Plus, project management software, which is available from third parties and Big Six firms, can foreshadow hurdles down the line and help staff prepare.

Next, devise metrics to judge software quality, time or money savings to measure the success (or failure) of a finished system. Metric devices are a personal thing.

Some shops, such as General Electric Co., support function points, while others like to track man-hours spent on software maintenance.

Any technique will do as long as there is some way to measure procedure pre- and post-CASE. How else will you know how far the tools have taken you?

New API rallies support for SNA standardization

BY GARRY RAY
CW STAFF

Developers who support IBM's Systems Network Architecture (SNA) in their applications will be able to use Microsoft Corp.'s Windows Open System Architecture (WOSA) to write Windows applications with embedded SNA services. In addition, more than 20 vendors of SNA services, including IBM, announced plans to comply with a single application programming interface (API) to access SNA service from within Windows programs.

Microsoft said in its recent announcement that the new set of more than 100 APIs will support common SNA services such as High Level Language API, Advanced Program-to-Program Communications and Logical Unit 0. Previously, corporate and commercial software developers needing access to those SNA services were obliged to use a variety of vendor-specific APIs.

Prior to the announcement, "it was harder for developers to use SNA services because there were multiple APIs to pick from," said Mike Fritz, group marketing manager of systems marketing at Microsoft. Developers "want to write to a standard set of APIs and choose from a lot of back-end SNA environments," he added.

Microsoft previously had announced that its WOSA architecture would also support communication standards including Unix sockets and the Open Software Foundation's remote procedure calls. WOSA specifications also provide data access APIs through Open Database Connectivity and messaging services through the Messaging API. Both are Microsoft protocols.

"Over time, corporate developers have come to us and want-

Continued on page 122

PC tool supports CICS

BY GARRY RAY
CW STAFF

A PC-based Cobol development tool has been updated to support programs that use IBM's CICS.

The tool, Cobol Analyst/CICS 1.5 from SEEC, Inc. in Pittsburgh, can analyze Cobol programs to provide information such as system flow and relationships between CICS programs, company officials said. Such information is useful in maintenance or in analysis before redeployment of applications on other platforms, they added.

The Microsoft Corp. Windows-based tool includes its own data dictionary for analysis and storage of Cobol programs, CICS data models and CICS screen definitions. Information from other SEEC products that analyze IBM's IMS and VSAM programs are also stored in the dictionary.

Once a data dictionary has been created and relevant Cobol programs have been imported and analyzed by Cobol Analyst/CICS, programmers can navigate through one or more program modules by specific variables, I/O screens or other program entities.

Added options

The tool provides a variety of program representations, including full CICS data entry screens, program flow charts and data model and structure diagrams. Various standard programming metrics are also provided.

Although it is not a programming workbench, Cobol Analyst/CICS includes editing and notation capabilities that can be used to alter an existing program.

These entries can be exported as updated program modules and used in a traditional Cobol development environment on a mainframe or PC, company officials said.

Available immediately, Cobol Analyst/CICS is priced at $750 and includes the company's Care Data Dictionary.

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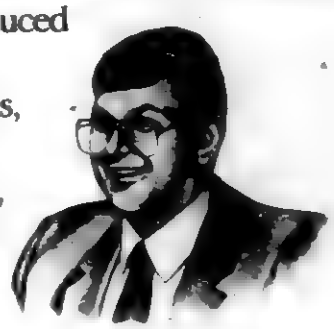
Richard Nelson, Director of Operations, Canadian Technology Services, Canadian Airlines International Ltd., said, "It (the IEF) has brought the airline tremendous benefits in staff and operating cost efficiencies." In the end, Canadian Airlines International, with the help of the IEF, produced an outstanding frequent flier program. Customers get better service and Canadian Airlines International has increased passenger count.



Richard Nelson
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Hybrid environment may ease app development

Sports C++ incremental compiler, framework, libraries

BY GARRY RAY
CW STAFF

A hybrid programming environment may make it easier to develop applications for the Apple Computer, Inc. Macintosh, Microsoft Corp.'s Windows and various Unix platforms.

Component Workshop, a C++ development environment from Component Software Corp. in Lexington, Mass., was announced last week for the Macintosh, with a Windows version expected by the end of this year, company officials said. Unix versions will be delivered later in 1993, they added.

In contrast to the slate of development environments and class libraries released in recent months, Component Workshop contains an internal incremental compiler similar to that used in SmallTalk. Incremental compilers generate application code as programs are entered into a development environment, which allows coders to rapidly prototype and test their applications.

However, similar to interpreted programming environments such as Basic, the incrementally compiled code executes only within the development environment. Another tool, which Component Software calls the Extruder, converts application code in the environment into C++ source code. That source code, which the company said is compatible with AT&T's C++ Version 2.1, can be compiled with a standard C++ compiler.

According to the company, Component Workshop also includes a class library, an application framework and preprogrammed "components" to speed program construction.

Among the integrated development tools are three browsers, a "composer" to create and edit classes, debugging tools and a program editor. A class library and application framework handle the standard functions and behaviors of an application, while components similar to Unix "widgets" can be used to add editing, list management and object network diagramming to an application.

Slated for shipment in November, the Macintosh version of Component Workshop is priced at $2,495. Introductory pricing will be available for a limited time.

New API

CONTINUED FROM PAGE 119

ed different services," said Michael Callahan, manager of product marketing at Wall Data, Inc., a Redmond, Wash.-based provider of the Rumba connectivity software.

Developers "may be satisfied with [the new services], but if their needs change, they'll have a problem" using enhancements made by one vendor, but not supported by others. The SNA APIs will reduce that problem and make it easier for independent software vendors and corporate developers to make use of a consistent standard, he added.

A 300-page Windows SNA API specification describing the more than 100 API funtions will be made available on the CompuServe computer network within the next 60 days, according to Microsoft.

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COMMENTARY

Doug Barry

When to use object DBMSs

Amid the hype over object-oriented programming, one area of the technology may be on the threshold of providing real gains to users: the lesser-known technology of object-oriented DBMSs.

Object-oriented DBMSs will generate $500 million in revenue by 1996, according to International Data Corp. — up from virtually nothing at the start of this decade.

This is largely because object-oriented DBMSs support the use of "complex data." How do you know if your data is complex? Some guidelines follow. Also, see Advanced Technology (page 28) for a more complete description of object-oriented DBMSs.

Let's say you are designing a RDBMS using the proper design techniques for relational technology. You have complex data if you find yourself making one or more of the following statements:

- "I'll need to 'de-normalize' if I want to get any performance."
- "The number of relational joins I'm going to need for most uses will kill the system."
- "I'm going to need different relational views for each type of data so I do not show all the null fields."
- "Different types of data have the same field or attribute name. The names have different meaning depending on the type of data."
- "My program needs to use graph data structures such as binary trees. I'll need to transform trees to relational tables and vice versa to provide graphic support."

Commonly, you hear of complex data in computer-aided design and engineering software. But that's not the only place you'll find it. I encountered complex data when I designed a RDBMS for a personnel system in the mid-1980s. It left me with all of the above laments, except the last one. I didn't need graphics. Yet today, that system would likely also have hypertext or multimedia.

Even without graphical environments and applications, complex data is all around you. Simple human concepts, such as "a robin is a type of bird," are difficult to put into relational and predecessor (i.e., flat file) DBMSs.

For example, my personnel database system contained exempt employees and nonexempt employees. Sometimes these two types of employees were treated differently by the system (as exempt and nonexempt). Other times they were treated in the same manner (as employees). I could easily have represented this in an object-oriented DBMS because it recognizes classes and subclasses of data.

Furthermore, with an object-oriented DBMS, I could create different procedures to handle these two cases (procedures are called "methods" in object terms). I could use the name "pay" for each method. Each would calculate pay in the manner appropriate for each class of data. The duplicate name, "pay," would not confuse the system because methods stay with the data and not with the application.

The relational joins that concerned me earlier now either go away because of the object data model or are replaced with data references. And traversing a data reference is considerably faster than a join.

Should you be considering an object-oriented DBMS? The technology is still new. It does not have the breadth of third-party tools made available during the last decade of predecessor or relational technology. That may deter all but the experimental. Nevertheless, my advice is that if the laments that I listed earlier are becoming a problem, users might do well to consider an object-oriented DBMS.

I do not believe object-oriented DBMSs will replace relational technology. But most RDBMSs handle only a relatively small percentage of database problems. The remaining data is the target for object-oriented DBMSs.

No technology provides the ultimate solution, and object-oriented DBMSs are not panaceas for all that ails today's database administrators.

As object-oriented DBMS technologies are tested and implemented, other database problems will no doubt arrive that will tax their capabilities. Object-oriented DBMSs are simply the next stage in the evolution of DBMSs.

Barry is co-founder and chief technical officer at Itasca Systems, Inc. in Minneapolis.

Versant updates DBMS C++ tool set

MENLO PARK, Calif. — Versant Object Technology Corp. last week expanded its line of application development tools for its object-oriented database management system with the addition of a report generator and industry-standard SQL.

The Versant C++ Application Toolset Release 2.0 includes Versant Report, which the company claimed is the first report generator available for an object-oriented DBMS. Versant Object SQL is intended to allow developers to leverage their experience with SQL in a Versant environment.

Graphical help

Release 2.0 also features enhancements to Versant Screen, a C++ based graphical application development tool.

The tool kit is available for Sun Microsystems, Inc. SPARCstation computers, although versions for other computers are scheduled for release by the end of the year.

Versant also announced that it has signed agreements to integrate the Versant Object Database Management System with five leading object-oriented development tools.

The agreements were signed with the following companies: Intellicorp, maker of the Prokappa CASE front-end development tool; Lucid, Inc., which offers the Energize Programming System; STEP, provider of the STEP Toolkit for manufacturing applications; Protosoft, maker of the Paradigm Plus design tool; and Persistence Software, Inc. for integrating applications developed for the Versant Object Database Management System with DBMSs from Oracle Corp. and Sybase, Inc.

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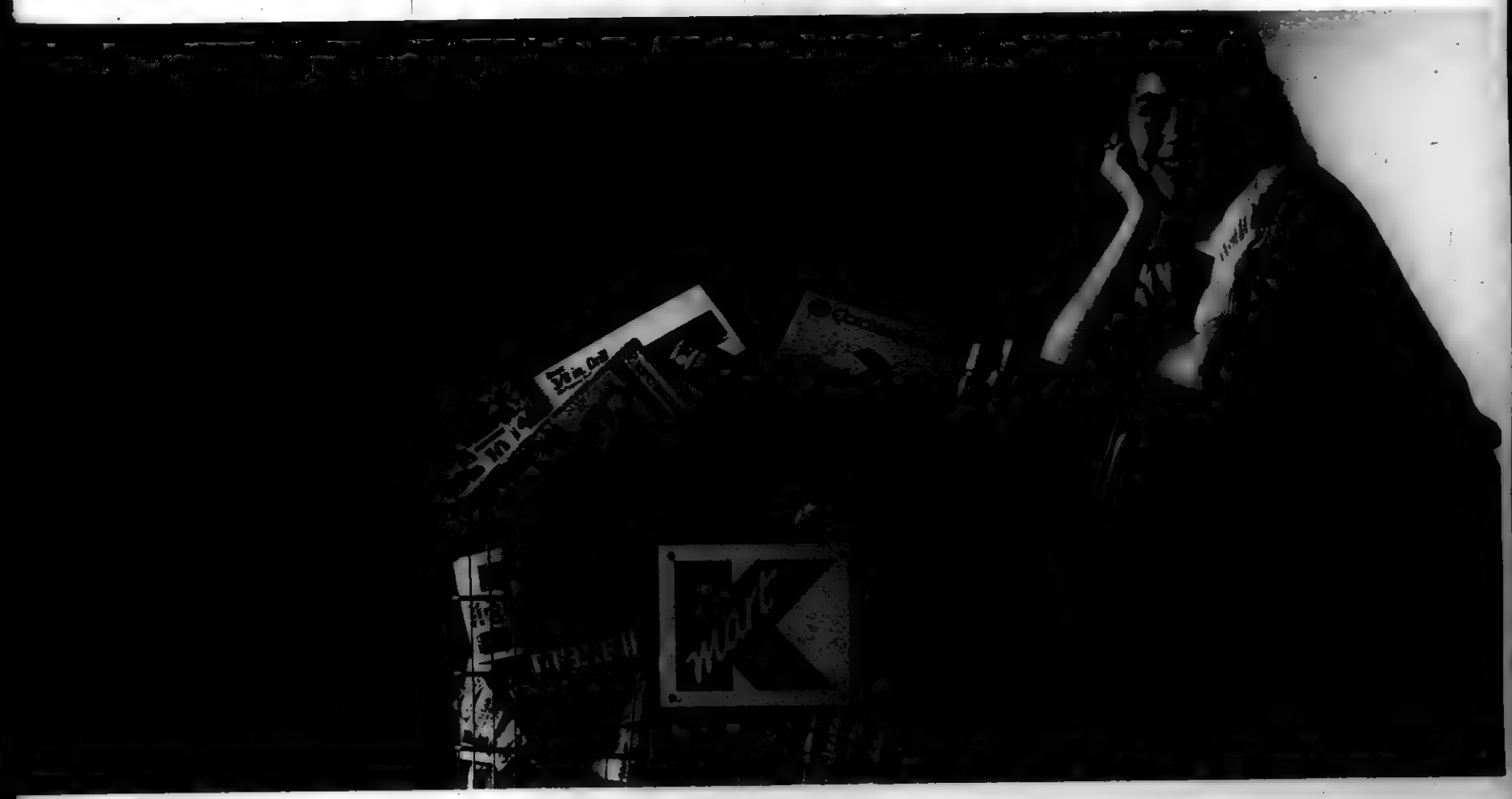

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NEW PRODUCTS

Code libraries

EMS Professional Shareware has started shipping the NW Utility Library on CD-ROM.

The library consists of a collection of 567 Public Domain and Shareware products designed exclusively for Novell, Inc. NetWare local-area network users. A database index and search program is included, and the contents of product documentation files can be read and printed as the database is browsed, the company reported. The library includes Btrieve, Backup, Boot, Groupware, OS/2 Print, Remote and Tutor plus a variety of other types of products.

The library costs $99.50.
EMS Professional Shareware
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

Born Software Development Group has announced Guide/400, a Dynamic Linked Library.

More than 30 C routines are provided that offer record-level access and management of data files that are on a Distributed Data Management (DDM) target such as an IBM System/36 or Application System/400, the company reported. Under OS/2 or Microsoft Corp.'s Windows, users can write an application that can be opened, accessed, modified, locked and unlocked, and users can close files on a DDM target system.

Pricing ranges from $80 to $195 per copy. A development kit costs $2,000.
Born Software Development Group
Suite 120
445 E. Lake St.
Wayzata, Minn. 55391
(612) 449-4993

Computer-aided software engineering

Visible Systems Corp. has released Version 5.0 of the Visible Analyst Workbench I-CASE tool.

Visible Analyst Workbench is an integrated computer-aided software engineering (CASE) tool set. The product is a fully adapted application for Microsoft Corp.'s Windows operating environment with both forward- and reverse-engineering capabilities. Visible Analyst Workbench supports a variety of development techniques and generates Cobol source code, SQL database schemas and C source code from designs developed in the system.

New Windows features have been added, including pop-up and pull-down menus and support for device drivers, color sets and fonts.

The Visible Analyst Workbench Version 5.0 costs $1,895.
Visible Systems
950 Winter St.
Waltham, Mass. 02154
(617) 890-2273

Application development tools

Nu-Mega Technologies, Inc. has started shipping Version 2.0 of Bounds-Checker, an MS-DOS memory protection tool.

The product was designed to automatically detect common memory problems. Illegal memory access outside a program and code overwrites can be located, and the product handles array overrun detection. A new Smart Mode feature has been added that uses a built-in knowledge base of predefined heuristics, eliminating any complex decisions from the user by automatically deciding the legitimacy of memory access, the company reported.

Bounds-Checker 2.0 costs $199.
Nu-Mega Technologies
102 Perimeter Road
Nashua, N.H. 03063
(603) 889-2386

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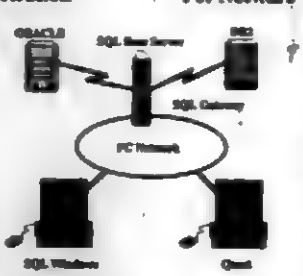

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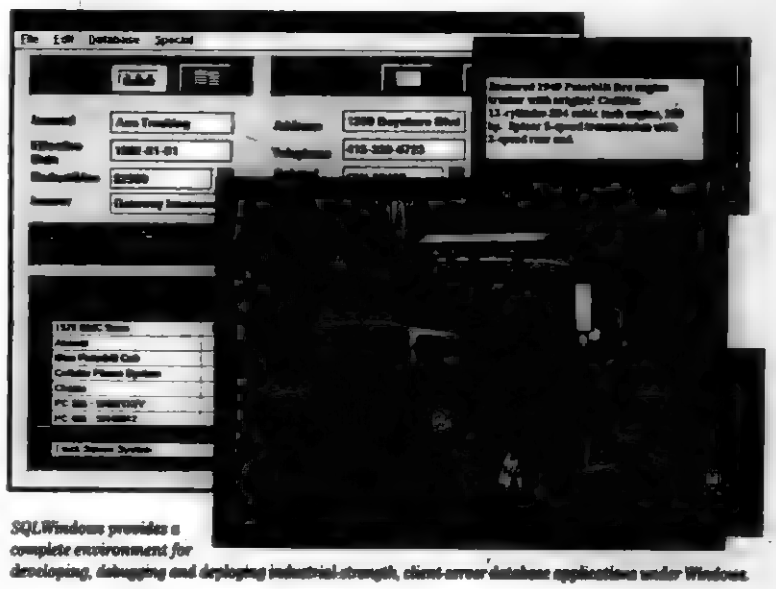

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LAS VEGAS, NV (MGX)—Anybody not playing "the event" of COMDEX 1992 obviously had plans they couldn't change. Because this concert will be remembered as the year that Hollywood and Silicon Valley converged in a spectacular fusion of entertainment and technology. Presented by Micrografx and produced by the Walt Tucker Group, the Grand Scientific Musical Theater combines great performers with the future of modern production. This event sets the standard for multimedia entertainment. Best of all, the proceeds will go to the National Center For Missing & Exploited Children (NCMEC).

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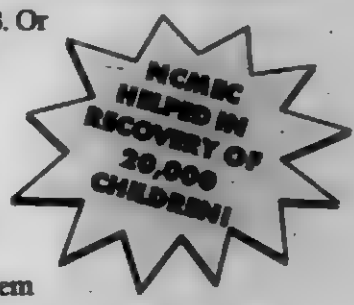
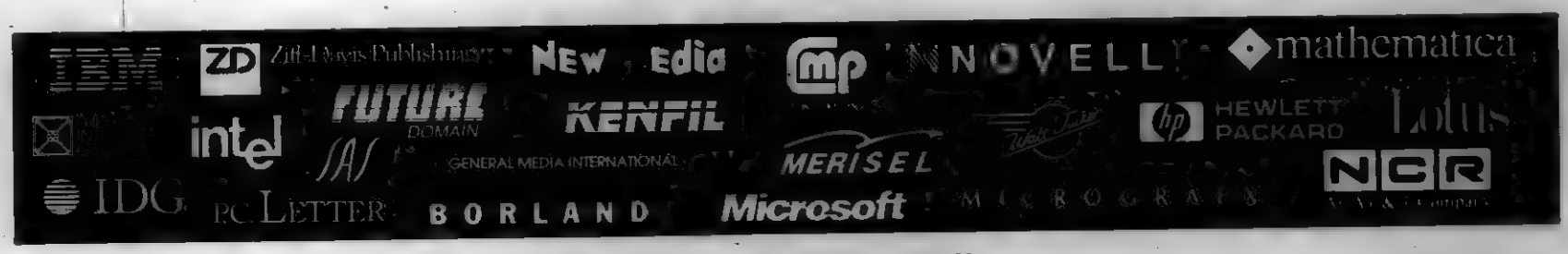
To make sure you don't miss out on this incredible extravaganza, get your tickets as soon as possible. For advance tickets, call (703) 516-6158. Or come by booth #7062 at the Las Vegas Convention Center during COMDEX. If you don't get them there, you might be able to buy them the night of the event. But don't count on it. Because with a line-up like this one and a price of only $50, tickets will be mighty scarce. Remember, almost anyone could be performing. Well, except the guy with the sideburns. He was busy.





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i SPY

Foreign governments are out to steal your company's secrets. Is your information protected?

BY GEOFF TURNER

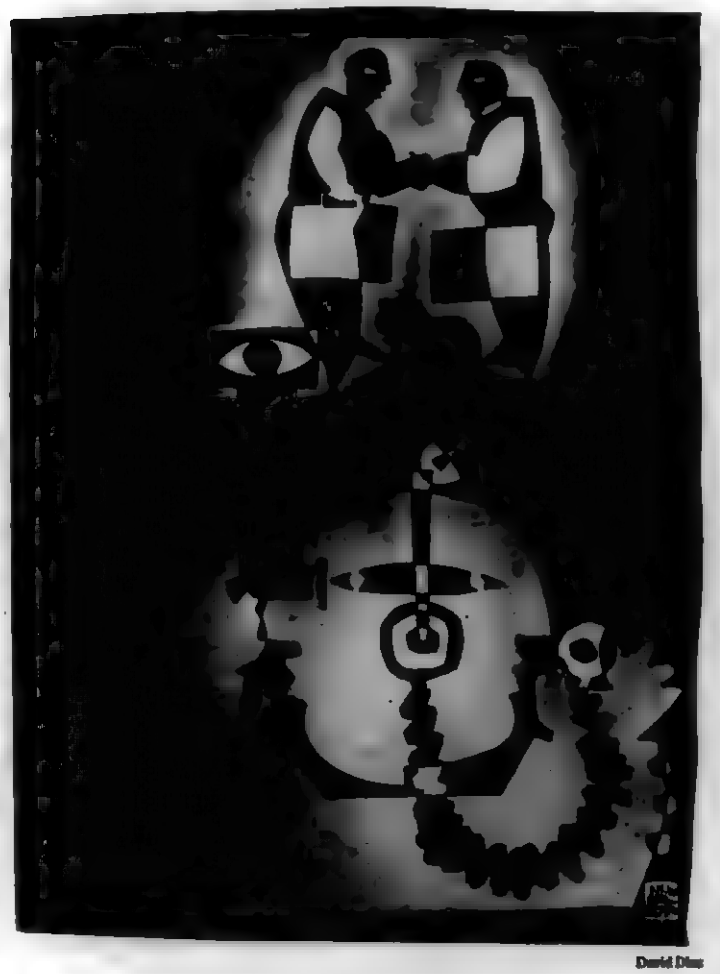
Precision Tools USA's Marketing Vice President Bill Smith finished his memo and punched the key that would send it to a fax server on the first floor of the firm's chrome-and-glass high rise and then on to the company's European operations manager. The memo was the go-ahead on a long-discussed plan for Precision's first major product launch in Europe. D-day, the document confirmed, would be next month.

As Smith sent the memo on its way, the thought occurred to him that faxing might be risky, but he shrugged off his doubts. "James Bond stuff, ha!"

In its journey to Europe, the fax traveled up to a satellite, back down to an earth station and through the telephone system to its destination.

But the fax went on another, secret journey. It was picked up by an antenna belonging to the European country's national intelligence agency and was routed to the agency's computers. After recognizing the key words "Precision Tools," the computer automatically routed the fax to an intelligence analyst, who realized it would be of immense value to one of the country's state-owned companies. He promptly sent the missive to the company's president.

Upon reading the intercepted fax, the president moved his own new product launch date up, beating Precision to market with a lower priced product. Precision's marketing team chalked the incident up to bad luck. The espionage continues undetected.



David Diaz

U.S. companies today believe that advanced economic espionage techniques would never be directed against them.

They see economic espionage — spying done by national governments to get company secrets — as rare and exotic. But these incidents are happening more frequently than companies think. In fact, CIA director Robert Gates says that nearly 20 nations are actively involved in intelligence collection activities directed against U.S. businesses (see partial list at left). What they're after are U.S. corporate trade secrets, advanced technology ideas, product data, business plans and other proprietary data.

Unlike a business competitor, intelligence services employ resources of great scale and sophistication. For example, while an unethical competitor might illegally wiretap a specific office phone line, a foreign intelligence agency would have the ability in its country to legally tap every phone line a U.S. company uses. In this way, it could monitor every conversation or transmission over those lines, both local and international. It also could — and does — intrude into corporate information systems and intercept business messages in commercial and private networks.

IS managers cannot sit idly by while foreign national intelligence agencies pick U.S. companies' pockets. Corporate data is in danger as global competition becomes heated. And the quickening pace of technology innovation is adding fuel to the fire; technologies such as portable information systems, cellular telephony, wireless networks, electromagnetic emissions and digital telephony may substantially increase firms' vulnerability to spies.

Who's doing it?

As the Iron Curtain parts and the Cold War thaws, the dynamics of what is important has shifted from military one-upmanship to economic advantage. Former Soviet bloc nations as well as our allies and Third World nations are using sophisticated technical intelligence collection resources to get the kind of information that will help them compete more effectively on a global plane.

For their part, the former Soviet bloc nations place high national priority on becoming more effective business competitors with the market economies of the West.

They honed their intelligence-gathering skills during the time they were concentrating on acquiring Western military technology from U.S. defense contractors and duplicating it to remain competitive. Their methods included intercepting voice, fax and data communications from satellites, marine cable, land line, microwave, etc.; intruding into corporate networks; bugging office automation equipment; and detecting and interpreting computer electromagnetic emissions, among other methods.

Now these methods are being directed at corporate information.

Even our Cold War allies are turning their intelligence agencies against U.S. corporate interests. With the lessened threat of a catastrophic nuclear war, national relationships

Continued on page 130

Culprit countries

Nations active in economic espionage

China: The most aggressive.

Former Soviet Union: The most active.

France: The most notorious.

Japan: The most overt.

Israel: The most diverse.

Sweden: Up-and-comer.

Switzerland: Up-and-comer.

UK: The most successful.

Turner is technical director at ManTech Strategic Associates Ltd. in Fairfax, Va., where he consults on information security, cryptography and operational security for corporations and government. He is a former naval intelligence officer.

Continued from page 129

previously defined in terms of military alliances change significantly when viewed in terms of economic competition. Allies become competitors.

For instance, the French equivalent of the CIA, known as the Direction Generale de la Securite Exterieur, has targeted IBM and Texas Instruments, Inc. The agency infiltrated IBM and TI European branch offices, and a French consular officer was caught sifting through an electronics company executive's trash in Houston.

Never given much credit for technical sophistication, Third World intelligence agencies have in fact received training from East and West intelligence agency partners. Freed from Cold War obligations, their interest has turned to bolstering local markets and seeing that their companies thrive. Unlike more advanced governments, Third World agencies tend to have fewer restraints against spying methods and are thus known to be more reckless in their methods and selection of targets.

Fighting the crime

Combating the ecooomic espionage problem is tough because, when successful, such espionage goes undetected. No physical evidence exists when an intelligence agency intercepts a commercial communication. Furthermore, when such incidents are discovered, they are rarely reported. Having a public squabble with a host nation's intelligence agency is generally not going to help a U.S. business with overseas operations.

U.S. companies must practice "safe communications," taking precautionary measures to avert a possible breach of sensitive corporate information. First and foremost, companies should refine their information security policies to identify which corporate information is sensitive and requires protection. They should expand logical security coverage, particularly access controls, to include all applications, systems environments and networks wherever sensitive information is processed or stored.

Stronger and more broadly applied cryptography is one of the most important and effective defenses against economic espionage.

Commercially available encryption technologies include the Data Encryption Standard (DES) and Rivest Shamir Adleman, or RSA, a mechanism for generating cryptographic digital signatures. The banking industry has adopted DES to protect the trillions of dollars transferred electronically every day. The only way to break into a DES-encrypted message is to try each of more than 70 quadrillion secret keys, an effort measured in terms of years.

But what of emerging new technologies, whose widespread use will drastically increase the vulnerability of sensitive corporate data to economic espionage? Even these technologies can be protected:

Technology

Portable information systems.

Threat

Portable and laptop computers are placing sensitive corporate information ever further from basic security controls that protect data in large systems or local-area network environments. Small computers can easily be stolen, and it doesn't take much effort to copy hard drives or floppy disks. Furthermore, automated remote log-ons to electronic-mail systems provide a door into a corporation's E-mail system as well.

Couple the ease with which such portables can be tampered with and the fact that intelligence agencies (especially those in France and Hong Kong) routinely search visiting executives' hotel rooms, and you've got an explosive situation.

In a recent *Computerworld* article [Oct. 12], for example, the former security director for the Senate Intelligence Committee claimed French intelligence agents took two laptops containing corporate secrets from the Paris hotel room of NCR Corp. executives. (NCR denies the incident.)

Defense

When going abroad, encrypt all sensitive data on the portable's internal hard drive and on any floppy disks so a thief cannot access the sensitive information. Macros used to remotely log-on to networks shouldn't contain user IDs or passwords to prevent unauthorized use.

Technology

Cellular telephony.

Threat

Cellular conversations can be intercepted, as Princess Diana discovered when private citizens, using scanners, plugged into and recorded some personal conversations said to be between Di and a male friend via a cellular phone. There are now commercially available products that can target specific cellular phone numbers.

National intelligence agencies with access to national Postal Telephone and Telegraph (PTT) authorities can just as easily intercept a full cellular session. They can monitor cellular calls from within the PTT's cellular switches without having to track calls over the air as they transfer between cells.

But the problem goes beyond just voice conversations. As corporations begin to use cellular communications to link laptops, faxes and other information technology into networks, they increase their volume of sensitive data.

When global cellular systems such as Motorola, Inc.'s Iridium become operational in a few years, intelligence agencies can deploy intelligence collection satellites that monitor cellular calls worldwide.

Defense

The best option is to avoid discussing or transmitting sensitive data over a cellular telephone. While encryption may prove valuable, it is not yet effectively incorporated into cellular systems.

When logging on to networks over cellular links, employ user authentication methods, such as security tokens or challenge-response systems, that don't depend on fixed passwords.

Technology

Wireless networks.

Threat

Many dismiss wireless networks as a security problem, citing their limited range and use of spread spectrum transmissions as a barrier to interception. Such obstacles do make interception difficult for most amateurs, but intelligence agencies have land- and space-based resources that enable them to intercept and exploit very weak signals at ranges measured in hundreds of miles, let alone hundreds of feet.

Defense

Encryption offers a solid defense.

Technology

Electromagnetic emissions.

Threat

Intelligence agencies have been able to obtain useful information from the incidental electromagnetic emissions of information processing and communications equipment for decades. The KGB used this method to monitor the U.S. embassy in Moscow several years ago.

Think of the repercussions if an intelligence agency read the emissions from a cryptographic device encrypting sensitive information. It could determine which secret cryptographic keys were used, subsequently enabling it to read all communications encrypted by that secret key.

Defense

Government systems processing and communicating classified information have long had security controls to suppress electromagnetic emissions to defeat spies. Under a certification program called Tempest, equipment has to meet very exacting design and shielding requirements before it can process sensitive data.

Unfortunately, such controls greatly increase the cost of the equipment, a cost many corporations could not justify in the past. With foreign intelligence agencies now focusing their collection resources on business, however, this cost/benefit equation is changing. Companies should consider shielding either the equipment or rooms in which "sensitive" equipment operates.

Technology

Digital telephony.

Threat

Congress is considering legislation requiring digital telephony equipment operators (including private-branch exchange operators) to provide remote access to communications carried by the equipment. The reason is to make life easier for law enforcement agencies that need to conduct court-ordered wiretaps.

Unfortunately, this Digital Telephony Amendment, which the FBI supports, does not include any provision for security controls over the new wiretapping facility to be designed into all digital telephony equipment. Should this legislation pass unmodified, the wiretapping capability could leave digital communications equipment vulnerable.

Defense

IS managers and their telecommunications people should closely monitor the progress of the legislation and seek to build and support a more appropriate accommodation between industry and law enforcement.

.....

Information technology managers need to begin to consider that highly sophisticated espionage techniques may be directed against their corporations.

It is reasonable and prudent to plan security controls to defend against this threat. These controls don't have to be excessively costly or exotic; in many cases they need only consist of beefing up existing controls. Just do it. •

Foreign intelligence agencies

What they target

- Proprietary technology: Production methodologies and product data.
- Production data: Schedules, costs, margins.
- Financial data: Profits/Losses, margins, stock issues.
- Personnel data: Salaries, performance reports.
- Security controls: Passwords, cryptographic keys.
- Research and development: Breakthroughs.

Who they target

- Companies in direct competition with government-owned companies.
- Companies vital to the national security of another nation.
- Companies with advanced proprietary technology not produced in a nation interested in developing that technology (e.g., former Soviet states).
- Companies perceived as being too dominant in local markets.

Real life

Government agencies really target U.S. businesses. That point is harder to get people to accept than convincing them that intelligence agencies use advanced technical collection methods.

The case of stolen information.

Recon Optical, Inc. in 1986 had a contract to develop a photo-reconnaissance system for the Israeli government that involved having three Israeli Air Force officers monitoring the company's progress at Recon's facilities in Illinois. When a contractual dispute between the company and the Israeli government reached an impasse, Recon halted work and ordered the Israeli officers to leave the building.

The officers did so but were apprehended attempting to walk out with boxes of proprietary technical documents and plans to steal Recon's proprietary technology. Recon subsequently claimed that someone had already provided restricted data to an Israeli competitor, El Op Electro-Optics Industries Ltd.

A panel from the American Arbitration Association, called in to resolve the dispute, ordered Israel to pay Recon Optical $3 million in compensation.

While the arbitrators ruled that the Israeli officers did steal Recon proprietary data, they did not conclude that this action was officially sanctioned. But they did say the Israeli government attempted to cover up the situation and disciplined the officers not for the theft but for allowing the theft to be discovered.

The arbitrators chided Recon for its "slipshod" protection of sensitive data.

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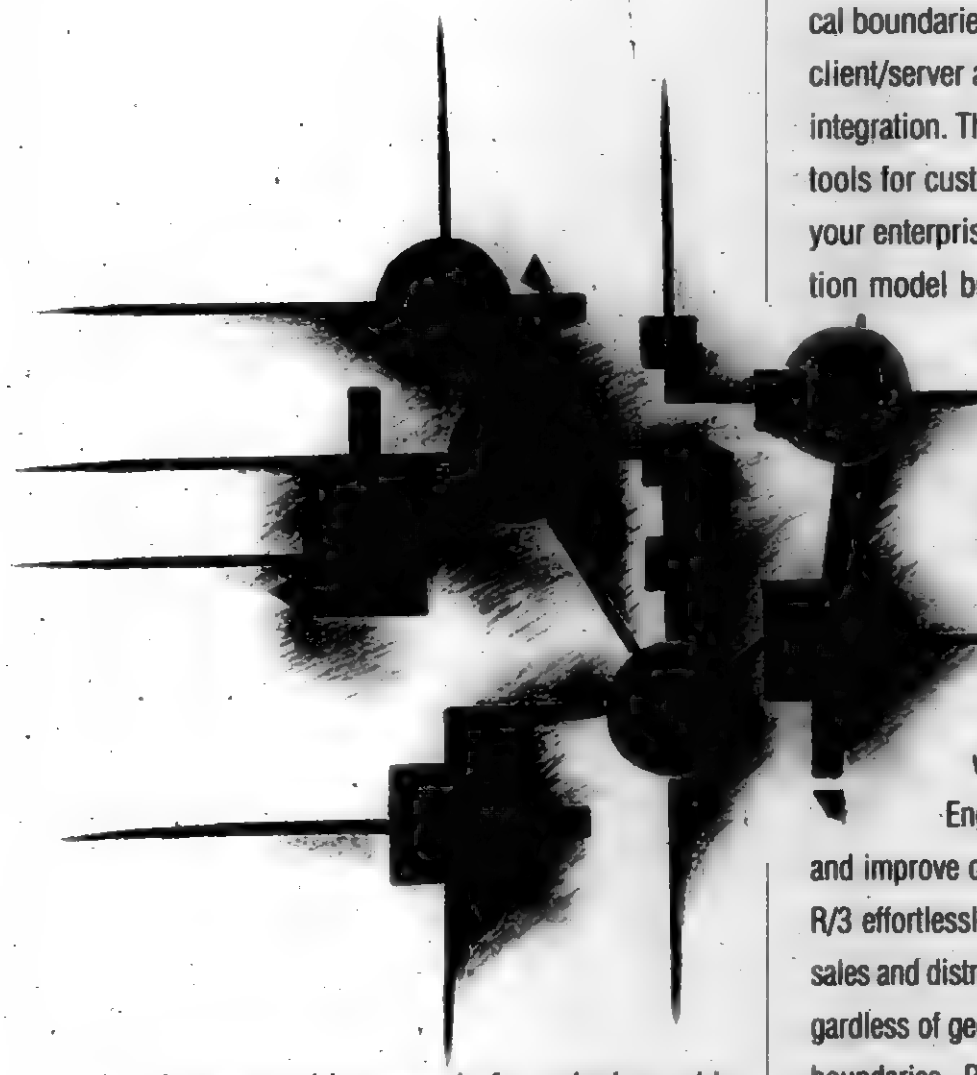

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THE CIO VIEW

Mr. Fixit

Chris Bluemer has tamed the waist-high alligators and turned around insurer Fireman's Fund of New Jersey — without in-house IS. "We outsource a ton of stuff," he says.

BY JOSEPH MAGLITTA
CW STAFF

Chris E. Bluemer likes to joke that his resume is very short. On one side, deadpans the 51-year-old president and chief executive officer of Fireman's Fund of New Jersey (FFNJ), are three words: "Chris Bluemer — Fixer." On the other, a single sentence: "The last five guys I worked for made chairman." Then his phone number. Later, laughing, he hands out buttons asking, "Why be normal?"

A well-traveled turnaround troubleshooter and outsourcing advocate, Bluemer has reason to smile. His upbeat humor, clear talk and low-key but unflinching focus on the bottom line have helped Bluemer (pronounced Blee-mer) transform the battered subsidiary of Fireman's Fund, Inc. into a shiny new contender in the Garden State's crack-'em-up insurance game — all in just 18 months.

Consider this: In mid-1991, FFNJ had one employee — Bluemer. Auto insurance policies, once totaling 80,000, had shrunk to 16,000. Tired of fighting local regulators, the parent company had pretty much given up on doing business in the state. Today, the plucky Jersey offshoot boasts more than 30,000 policies, 28 employees and annual revenue of $40 million.

Bluemer, a genial optimist who is fond of quoting e. e. cummings and his own motivational poetry, says he hopes the same turnaround skills honed at four previous positions will help his new firm's sales grow another 50% in 1993.

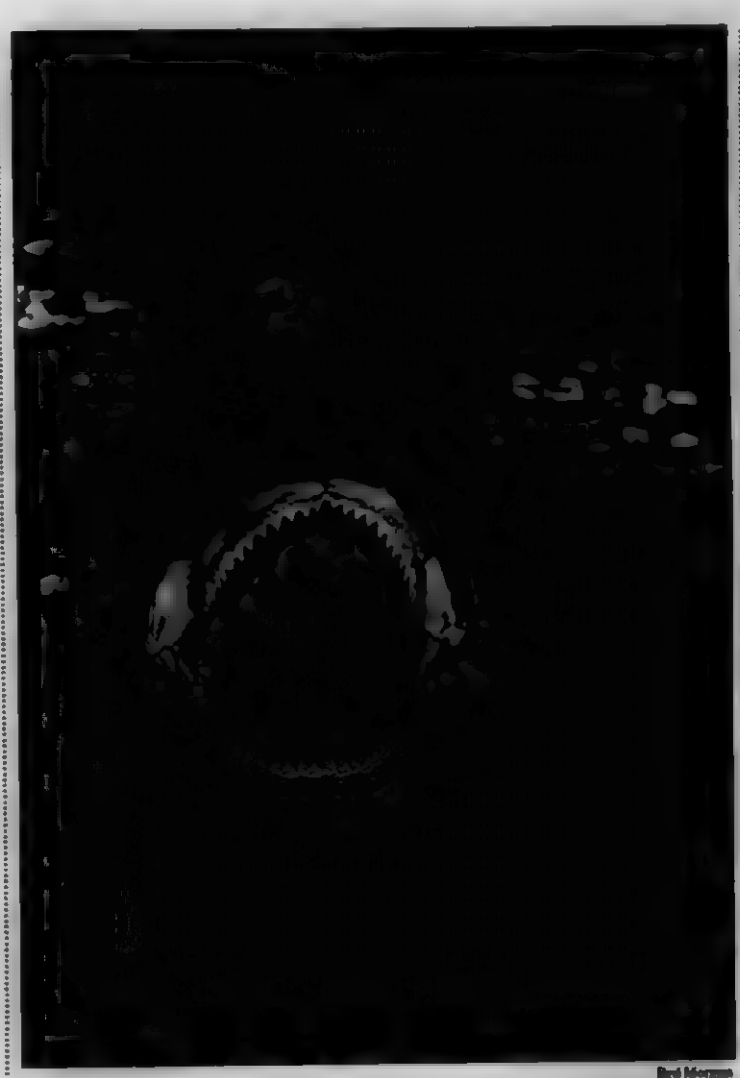
FFNJ's wall-less organization is strictly 1990s. To keep staff lean and low-risk, all computing is outsourced. "My information officer is Cigna," Bluemer explains. "My claims manager is Robert Plant [in Somerset, N.J.]."

The arrangement has worked so well, in fact, that Bluemer says Fireman's Fund used the New Jersey unit as a test case for outsourcing its national data processing operations.

Not that there haven't been bumps. Like the time it took several months to reconcile technical differences of two different reporting systems. (The problem was eventually solved when Bluemer stepped in only a few weeks before a critical deadline.)

But overall, Bluemer says he is sold on outsourcing. He sees it as the smartest way to get a business up and running quickly and cheaply. "We take the position that we outsource everything we can, except sales agents," he says. "With 25 people, we outsource a ton of stuff."

In a recent interview and speech, Bluemer shared his views on technology and outsourcing.



Rod Morgan

The CEO: Chris E. Bluemer, president and CEO of Fireman's Fund of New Jersey. 1963 graduate of the University of Connecticut with a bachelor's degree in accounting.

The career: Worked at Industrial Indemnity Financial Corp., serving as executive vice president from 1986-1991. Joined Aetna Insurance Co. as vice president, 1979-1986. Served as Smyth Manufacturing Co.'s president and CEO between 1972 and 1976. Joined Arthur Andersen & Co. as audit manager from 1966-1972. Served as U.S. Army finance officer from 1964-66.

Accomplishments: 'Being missed by my staff when I'm out of town.'

Why outsource?

The automobile industry in New Jersey is a kind of unique event. I guess the word "crisis" is not overused. The industry has been fighting with the government and trying to downsize. The state said: "You're going to get 40,000 cars or you're not going to be able to play here."

Let me give you a true picture of my job description: out in the Everglades. Surrounded with alligators. They gave me a sign that said, "Drain the swamp." There are people who thought that I was absolutely stark raving mad — my wife among them.

To do all these things internally would have been possible. Fireman's Fund certainly has the capacity. And they have decent systems — very good systems. But they didn't have the right momentum. They said, "No, we don't want to throw resources at you because we want this to be separate, and we are downsizing."

If your mission is to ultimately sell something, you want to modularize it right from the get-go. Our operation is dealing with one product in one state. So our need to generate the regulatory classes of different states and all those kinds of Rubik's Cube equations don't interest us.

The parent company said, "OK, we're going to watch you closely. You have to keep your expenses down." The capital you need to start a company in this business from scratch is one thing. The time element is another.

When we started, we were already behind the eight ball. We couldn't have done these things without having tremendous amounts of capacity. Fortunately, the capacity was out there.

I did my 1993 budget in two days. Here it is, five pages, bang bang bang bang bang. This contract for losses, this contract for policy issuance and bookkeeping, this contract for personnel services. It's easy.

Dealing with outsourcers

My operations guy might be a vendor, but he knows he's my partner. He's president of a different company, but he knows he's not subservient to me. When you're in my office, you're just like my employee. I know you're a vendor, I respect you as a vendor, and I know you have other agendas. But when you're with me, we're partners. We solve [problems] often by putting everybody in the same room. It doesn't work perfectly.

In controlling outsourcers, test 'er, don't pester. I don't have weekly meetings with these people. I don't call them at odd hours of the night. We both have a fax machine. He knows where I live, I know where he lives. We all have the same paycheck, and I funded it.

Continued on page 134

Chris Bluemer is Fireman's Mr. Fixit

CONTINUED FROM PAGE 133

Payoffs from outsourcing

The insurance business is the second largest user of computer capacity, after the Department of Defense, so there's a tremendous ability to use an asset of technology.

We take the position that we outsource anything we can, except dealing with the sales agents. All of our outsource contracts are long-term. We get more effective control by leveraging outsourcing companies.

[Outsourcing] gives us the ability to unplug, to unbundle automobile services from the rest of the business. Outsourcing has increased our capacity to use people. If we had to start from scratch and build a technology organization, we'd need 200 people. We've been able to hitch rides very quickly, with limited capital.

Fear of outsourcing

The information officer who says "I don't like outsourcing" ought to just feel his shirt and ask: "Who made this for me?" His quality of life has been enhanced by outsourcing. He does it every day.

Maybe the IS person ought to look at it this way: You're in charge of the business of information. Your customer may have found a source outside of your monopoly. The first source outside the monopoly was the personal computer. Now he's finding other vendors out there who have excess capacity, which you may not have had yesterday, but if you don't watch out, you will have tomorrow.

What are you doing about that? How are you planning to use your potential future excess capacity? Maybe you don't have to use it. Maybe it's been funded and paid for and you can just let it sit and gather dust and work in a downsized arena. Is being big important? Can you spin off some of that capacity and help other companies?

I give to my officers a little card that has a saying by Aesop. It says: "Be wary. Do not lose the substance by grasping at the shadows."

Bluemer's rules

The following are guidelines for dealing with outsourcing vendors and other humans, according to Chris Bluemer.

1) Ask only those questions that need answers.
2) Insist on getting answers to the questions you ask.
3) Ask for short follow-up times. These lend to positive reactions.
4) Make every answer a 10-second answer.
5) Keep the data honest.
6) Forgive mistakes. When someone errs, give him a can of Coca-Cola. Bluemer says it's a positive reminder that even though a mistake was made, the fix can be unexpectedly great.
7) Use the "Art Linkletter approach." Ask outsourcing vendors: "What would you ask if you were me?"
8) Don't guess when you can avoid it.

Red Morgan

Bluemer asks: *'Your customer may have found a source outside your monopoly. What are you doing about that?'*

Changing role of IS

The information systems professional has been a monopoly. He was encouraged to be the monopoly, he was told to be the monopoly, he was funded to be the monopoly.

They didn't let you in; they're in there talking about halon or whatever. Invisible shield. And 1990s are saying, "No no no no, that's the Soviet Union. We've got to break you into economies." And [IS people] are scared.

The information officer in my business, and probably in a lot of businesses, has a tremendous ability to impact cost and analyze potential problems before they occur.

And maybe he should devote some time to understanding them and ask: "What are the opportunities to provide better service in my organization? Can I help the controller function the financial plan? Can I help the strategic planning function? Can I identify problems with my database before they exist? Can I, in the positive sense, be the central intelligence operation?"

What got you here may not be what gets you into tomorrow.

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IS advancement
Information officers will succeed as senior managers when they promote themselves as businessmen who have a background in information processing and information technology.

An information officer can't say, "Look at me! Look at me! Look at me! I'm really senior management." Yes, they are recognized at many companies as one of them.

But I think [IS people] have the same dilemma that accountants have as bean counters. They have the same dilemma that human resources people have, and they're all talked about as touchy-feelies.

But human resources officers make it to the top. Accountants make it to the top; actuaries and lawyers make it to the top.

I think information officers that are perceived as good businessmen will make it to the top.

User relations
Information officers are human beings. They aren't as appreciated as they should be, and as a result, they become whipping boys and they become very defensive. They've been trained to do that and they've accepted that as their way of life. But we're in a different era.

Users can't be jerking the chain of the computer people. Clearly, information officers have had to suffer. People say, "You're the keeper of the keeper of the information. Give me my stuff." But it works both ways.

A lot of IS problems may come from inherited adverse relationships, and they ain't going away until you folks start taking out the trash. Success comes down to good human relations.

> INFORMATION OFFICERS ARE human beings. They aren't as appreciated as they should be, and as a result, they become whipping boys and they become very defensive.

IS ethics
Electronic mail is great until you realize that somebody out there has a copy of everything that went on it.

Why? Didn't business learn with Nixon and the Watergate tapes that's not smart to do, even if now and then you ferret out somebody who's using electronic mail for improper use?

If the [IS person] is perceived as being the person who captures data and he's the KGB of the company, he's not going to be accepted into the senior management ranks because he's the guy who knows all the dirt.

If he's perceived as the guy who has the information and keeps it honestly and allows people the educational ability to format it, then I think the road to acceptance is a lot better.

Personal technology use
When I lived in California, I had a PC at home. The application I had on it was my wine collection. It was something I used. I didn't want to crawl around in the cellar, so I put [the information] in the computer.

In the office, basically the information that I need to run the business for me today as president is not so much computer-driven as people-driven. I answer the phone. I open the mail.

We generate these newsletters to the field agents on the PS/2. We just started using a fax modem network to send them out.

Advice
Lighten up, information officers.

EXECUTIVE TRACK

Deborah A. Coleman, vice president of information systems and technology at **Apple Computer, Inc.** in Cupertino, Calif., announced her intention to leave the post effective Nov. 1. She has held numerous senior positions at Apple since 1981.

.....

Bud Howey, 39, was named senior vice president and chief information officer at New York-based **Sony Music Entertainment**, a unit of Tokyo-based Sony Corp. Howey comes to his newly minted position from **Price Waterhouse**, where he was a partner in the management consultant group.

.....

James Zucco has been appointed to the newly created position of senior vice president of future network and systems architecture at Washington, D.C.-based **MCI Communications Corp.** An eight-year veteran of the $9.5 billion telecommunications player, Zucco formerly served as vice president of advanced product development in the systems engineering organization.

.....

In Strongsville, Ohio, **Mark S. Fleishour** has been promoted to the position of director of MIS development at **Central Reserve Life Insurance Co.**

Fleishour joined the small business-oriented accident and health insurance company in 1990 as manager of MIS development; at his new position, he will be responsible for developing and implementing the company's computing strategy.

.....

Also on the rise at Central Reserve is **Phil Hodge**, who moves from director of MIS to assistant vice president of MIS. His responsibilities include development and maintenance of all corporate information processing systems, user computing and field computing.

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Gurus offer pearls for IS pilgrims

Drucker: Focus on data, not automation

BY NELL MARGOLIS
CW STAFF

UNIVERSAL CITY, Calif. — If you are among the many information systems leaders who believe information is your job, corporate management guru Peter Drucker has a couple of words for you: You're wrong.

"Most of you mistakenly think information is your job, but your job is data," the noted author and Claremont Graduate School professor told the 500 people gathered last week for the Society for Information Management's annual conference. "Information is the user's job — you can only provide the raw material.

"The problem," he added, "is most users also believe that information is the IS manager's job."

This role confusion, Drucker said, is one of several key misperceptions shackling U.S. companies competively — and a major reason why firms spending an estimated 35% to 40% of their capital budgets on information technology are getting minibang for their megabucks.

Drucker advises: *'Put emphasis on how to make your output, not your people, more productive'*

According to Drucker, driving true productivity may require the IS leader to shift gears. "Put emphasis on how to make your output, not your people, more productive," he advised.

Asking the right questions

Helping users ask the right questions, he continued, is a giant step in the right direction. "Too few ask or answer, accurately, the question 'What information do I need?' A computer printout isn't it." Even fewer pose the follow-up query: "What information do I owe?"

He suggested a third critical question: "What information does this whole organization need? And the moment you ask it, you're up against a very unpalatable discovery: 99% of it doesn't come out of the information system. Most of what the company needs comes from outside."

So does most of the future customer base, Drucker pointed out: "The great weakness — and you [IS directors] aggravate it, my good friends — is that most businesses concentrate on their customers. But 70% of your potential customers don't shop with you, don't bank with you, don't buy from you — and this 70% is your future."

Building up productivity also involves paring down. "Always ask, what can we simplify? What can we abandon? Do we really have to do this? And if so, do we have to do it in such magnitude?" The answer to the latter, he added, is frequently no.

"Total inventory control is madness," Drucker said. "With small samples, you have control. Beyond that, you have paper."

The commonsense themes that marked Drucker's address echoed as well in the words of others who took the stage at the three-day conference, aimed at focusing IS leaders on competing through technology.

Software reuse. "We've had the technology for reuse for about 20 years," said Vaughan Merlyn, a partner at Ernst & Young's Center for Information Technology and Strategy. He disagreed with the suggestion that productivity gains through reusable software are being stymied by technological shortfalls.

"What we don't have is the methodology or psychology needed to make reuse viable." Will we get the 180-degree turnaround in corporate culture that Merlyn sees as a prerequisite to such unglamorous, pragmatic approaches as reuse?

"Absolutely," he said. "The places where we see the most interest are IS shops that think they're about to be outsourced. It's amazing what the urge to survive will motivate."

Total quality management won overwhelming endorsement as a necessary means to productive ends — but don't dive in indiscriminately, cautioned Susan Swenson, PacTel Cellular's president and chief operating officer.

"Tailor your program to your own corporate culture," she advised. "The worst thing you can do is just take what some other company is doing and overlay it on your own." And, "if you don't have the whole team together, don't do it," Swenson warned. "You need complete buy-in, or it can be a complete disaster."

Thurow: Build fast, nimble teams

BY JOSEPH MAGLITTA
CW STAFF

BOCA RATON, Fla. — Chief information officers take heed: Information systems organizations seen more as ballast than sails for their corporations face unprecedented danger of being heaved overboard.

That was the quiet warning sounded to 600 or so IS professionals at the seaside "CIO Perspectives" conference earlier this month.

While approaches and advice differed, the two dozen or so speakers agreed that technology organizations must find better ways to become relevant — and fast — or risk going down again.

"We need to put IT back on the radar screen," said DuWayne J. Peterson, an independent consultant who chaired a blue-ribbon panel trying to develop a new model for IS.

Solutions offered at the three-day event ranged from re-engineering, open systems, Machiavellian politics, building a corporate architecture and implementing client/server.

Here's a rundown of key speakers and their ideas:

David Leifer

Thurow warns: *'You haven't seen anything yet'*

Lester Thurow, dean of MIT's Sloan School of Management and best-selling author of "Head to Head: The Coming Economic Battle Among Japan, Europe and America."
IS managers in U.S. firms would do well to learn European-style football (soccer), Thurow advised.

Unlike American football, he noted, soccer encourages nonstop, fast-paced team play needed to beat strong European and Japanese foes in machine tools, biotech, aviation, software, microelectronics and other key industries.

Noting that "technology has turned the get-rich game into a very different game," Thurow predicted that short-sighted, individualistic nations, companies and departments are doomed to fail in the next decade.

"If you think you live in a competitive world now, you haven't seen anything," Thurow added.

DuWayne J. Peterson, chairman, DuWayne J. Peterson Associates.
Merrill Lynch & Co.'s former "million-dollar man" presided over the first public debate of the new "Power Station" model unveiled last spring. The project's goal, he explained, is to find new ways of pulling technology into the mainstream of business and to close what Peterson called "the gap between [IS] credibility and performance."

The basic idea: Create a tight spiral between computing and customer know-how with business processes, systems, organizations and tools.

The bottom line, developers said, is that IS departments must move from being reactive penny-pinchers to become a proactive, need-driven force intimately intertwined with the business.

Easier said than done, according to panel members from American Express Travel Related Services Co., United Services Automobile Association, Booz Allen & Hamilton, Inc. and others who debated the model. Reaction among IS attendees appeared lukewarm; Peterson conceded that more work was needed and promised a fuller development by next spring's conference.

Douglas A. Nagan, president, International Resource Management, a consulting and outsourcing company.
Re-engineering is doomed to fail unless IS masters the political dimensions of managing change, according to Nagan, a former CIO at publisher John Wiley & Sons, Inc. who now heads a consulting and outsourcing company.

"There are not going to be any supporters for cutting costs and improving performance," he observed.

To help sharpen political skills, IS chiefs would do well to read Niccolo Machiavelli's classic, *The Prince*, Nagan said. Such basic tactics as enlisting help even if it is not needed, identifying foes and supporters and avoiding battles wherever possible can help change efforts, he said.

"We have more technology than we could possibly use," Nagan said. "If you're going to re-engineer, you need to look beyond what's on paper and see how things really work."

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MacIS '92 Conference. New Orleans, Nov. 8-11 — Contact: Managing Apple Computers in Information Systems, Chicago, Ill. (312) 644-6610.

Share '92. Tampa, Fla., Nov. 8-11 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

James Martin World Seminar with Dr. Carma McClure's Corporate CASE Tutorial. New York, Nov. 9-13 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Synergy '92. Anaheim, Calif., Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

U.S. Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 652-3888.

Autofact '92. Detroit, Nov. 10-12 — Contact: Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Society of Motion Picture and Television Conference and Equipment Exhibit. Toronto, Nov. 10-13 — Contact: Technology Solutions, New York, N.Y. (212) 505-9900.

Voice '92. Atlanta, Ga., Nov. 10-13 — Contact: Voice '92, Houston, Texas (713) 974-6637.

Virus Research Conference. Washington, D.C., Nov. 11-13 — Contact: Virus Research, International Computer Security Association, Washington, D.C. (202) 364-8252.

Twelfth Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalen, Tinius Olsen Testing Machine Co., Willow Grove, Pa. (215) 675-7100, Ext. 216.

NOV. 15-21

Guide's 1992 Conference. Atlanta, Nov. 15-20 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

Information Industry Association 1992 Annual Conference: 'Knocking Down Info Walls.' San Francisco, Nov. 15-19 — Contact: Information Industry Association, Washington, D.C. (202) 639-8262.

Troubleshooting, Maintaining, Upgrading PCs Seminar. Fort Lauderdale, Fla., Nov. 16-17 — Contact: Quest, Spotswood, N.J. (908) 251-3217.

19th Annual Computer Security Conference and Exhibition. Chicago, Nov. 16-18 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2200.

C++ World Users Conference. New Jersey, Nov. 16-20 — Contact: C++ World, New York, N.Y. (212) 274-0135.

Comdex/Fall '92. Las Vegas, Nov. 16-20 — Contact: Comdex/Fall, The Interface Group, Needham, Mass. (617) 449-6600.

ISDN/Broadband '92. Reston, Va., Nov. 16-20 — Contact: Information Gatekeepers, Inc., Boston, Mass. (617) 232-3111.

Transaction Processing Networks Conference. Washington, D.C., Nov. 17-18 — Contact: Telecommunications Reports, Conference Dept., Washington, D.C. (202) 842-0520.

Unicom '93. Washington, D.C., Nov. 17-19 — Contact: North American Telecommunications Association, Washington, D.C. (202) 296-9800.

Conferon. Orlando, Fla., Nov. 19-20 — Contact: Conferon, Chicago, Ill. (312) 938-3500.

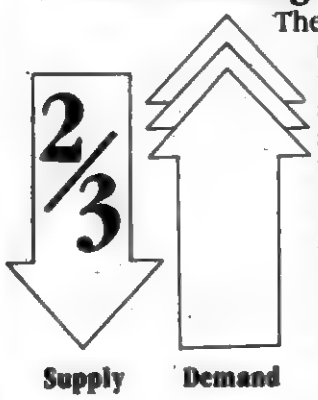
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely.unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

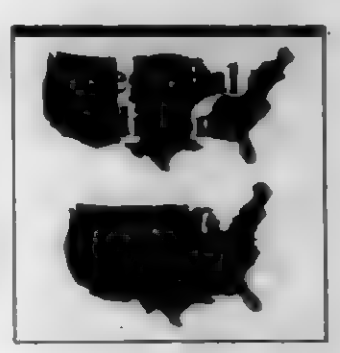
In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions



A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

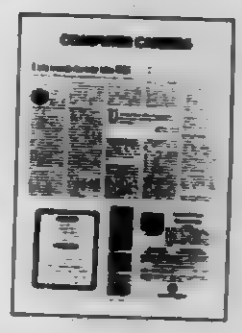
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $182.95 per inch, your cost-per qualified candidate reached is better than any newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Mainframe programmers look to avoid fate of the dinosaur

FIRST PERSON

BY WILLIAM R. ROUZER
SPECIAL TO CW

For the past two years, I have been "underemployed." I managed to work 10 months last year as a programmer converting systems from a CDC Cyber 830 (a machine I'd never seen before) to an IBM 4381 running MVS. But, for the past year, I've been totally unemployed.

I've become part of a growing and expendable population of "mainframe dinosaurs."

Five years ago, an associate and I were discussing the cost-per-MIPS ratio between mainframes and micros. It was obvious that if I wanted to stay in a profession I loved despite the politics and frustrations, I would have to learn to program micros and how to fit them into an information management strategy.

I've learned C, C++ and Pascal. I program under both Microsoft Corp.'s DOS and Windows. None of my prior employers required these skills or appreciated that they might soon need them, and I have no "paid experience" using these languages so I can't get anyone to hire me.

Thankfully, things weren't quite this bad when I was starting out. My first programming job was in 1980. I had learned Basic and Fortran at night school but had to learn Cobol for this job. My employer told me that I was on probation and if I could learn GCOS and Cobol in 90 days, I could keep the job. I managed that with no problems.

With more than a decade in the field I thought I was past the "no experience, no job, no experience" paradox. I guess paradoxes are eternal.

We are trainable

There are so many of us dusty, worthless dinosaurs out here that human resources departments are really being tough. They're being so particular that they're saying things such as "must have C++ and object-oriented programming experience." The pounding of countless rejections has made me so punchy that the first time I read that sentence, I took it seriously.

I know I can do the job, and I know these firms are spending more money recruiting people than they'd spend paying me for the few days it would take me to come up to speed. In a fit of frustration, I once told that to a headhunter in New York, who then castigated me for my attitude. That's a problem with programmers: We tend to be logical.

Sometimes I soothe my fears by telling myself I'm not alone. Many programmers I know are unemployed, fearful for their jobs or getting stressed out because of all the extra work they've been doing since their firm "rightsized." Being logical people, they're somewhat bemused by the apparent contradiction between having been "rightsized" and their current work load. But they're tenacious; they'll eventually figure it out. I just hope they rationalize it before this new paradox blows their logic circuits.

Speaking of logical contradictions, do you remember a survey that *Computerworld* ran last year [CW, Sept. 9, 1991] in which "data processing professionals" reported they were being worked hard but "underutilized." I pray I'm not the only one who thought about that!

Programming gave me pride and made me a good living. New applications and problems held my interest.

But I could have done a better job, a more comprehensive job, if it weren't for time constraints and financial (or political) considerations.

Users often used the phrase "quick and dirty" to describe what they wanted. Quick and dirty was usually what I gave them, albeit reluctantly. My managers often didn't have the time to listen

Michael Siggins

to my reasoning that although what the user wanted was really simple, he didn't fully appreciate what the technology and our data structures allowed.

The user was usually happy for the moment with what information systems gave him but he would come back later, usually within a few months to a year, with a new request that could have been easily anticipated (and cost less) in the original design.

As time passed, these requests became backlogged. With significant frequency, different users would make requests that were mutually exclusive or repetitious of requests that had been made before (and never done). In a manner of speaking, we'd painted ourselves into a corner.

Enhanced for the user

On occasion I overstepped myself. I enhanced systems beyond the user's requirements because, having watched how the user worked and what he did, I just knew one little "extra" would make the system more flexible and/or the user more productive.

These systems, as it turned out, were my "master works." They worked, saved money and made people more productive. Users loved them. Ironically, they also earned me a reputation as a "loose cannon."

So I became a chastened programmer. I'm too old to risk it anymore. This makes me sad because I really loved watching users' hands flash across their keyboards and their faces light up when they saw what they could do with a new tool we created.

Rouzer is a programmer/analyst with 11 years of experience in government agencies and direct marketing firms. He lives in Chula Vista, Calif.

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Do research to justify need of AS/400

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Steven B. Fogle, a managing director at The Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q I work at a small business with a System/36 that we've had for seven years. I feel my computer talents are becoming very stagnant. How do I persuade upper management to upgrade to an Application System/400?

A Persuading management to make a significant investment will take research, analysis and sometimes pressure from you and your company's competition. Survey businesses of similar size in the industry to learn more about their current systems and future plans. This will be valuable information in educating your company management. You need to prove that an investment in an AS/400 will improve the way your company does business.

Q I'm a director of computer services who has 10 years of experience with an IBM System/36 and 30 years' experience in the health care field. I don't program or do the concentrated work of a computer specialist, but I'd like to be a director/coordinator/manager of a health-related computer environment. Where do I start?

A Contact all of the health care organizations in your area and introduce yourself to the senior information systems executive. Agencies are not always the answer to changing jobs, especially when you have specific interests. Ask your peers how they best see your skills utilized. Hospitals, managed-care organizations and numerous other health service organizations need talented, experienced IS managers.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I am a programmer with seven years' experience, which includes Basic, Cobol and Oracle on DEC/VAX and Sun/Unix. I can't stand graphics and graphical user interfaces, but I love programming. Will there be a place for my programming skills where I won't have to do graphics?

A Talented, flexible programmers are and will be in great demand for years to come. I suggest you gain as broad experience as possible in your field so that you can change as the industry changes. Graphics experience is valuable, but by no means is it exclusive to the needs of large IS environments. Successful programmers who aren't interested in the management track are needed in most companies.

Q I have been involved in data processing since 1986. I have worked on various platforms (IBM, VAX, Prime), coding in Cobol and Natural Adabas. While IBM is using Natural Version 2.1 or 2.2 in the real world, our VAX is running on Natural 1.4. How can I get potential employers to look at me after they realize my Natural background is not the version they are running?

A Remember that employers are also interested in the *individual* they hire, along with his technical skills. Continue pursuing any opportunities that come your way and present yourself as flexible, intelligent and able to develop and enhance your development skills quickly. Also, continue your education to acquire development skills for future career growth.

Sure that you've being undervalued? Stressed out? Feeling discriminated against? We want to hear about these and other issues that affect your career. Call your questions in using the Fast Track line at (508) 820-8522, or send them by fax to Kelly E. Sewell at (508) 875-8931. If we use your question, we'll send you a gift.

What to do when a project you've been working on for six months gets canceled

➤ Go to the department head of the user group the project was for and rally his support. Or cut your losses and take a look at the technology developed for that project and see where else in the company it might be applied. It depends on why it was canceled. If it was going to cost more than what management thought its value was, I wouldn't try to override management.

Mike Cunningham, MIS supervisor
The Dr. Pepper/Seven-Up Cos., Dallas

➤ First ask why the project was canceled and what are the reasons — basically just for your personal understanding. Then try to focus on what you have learned and the experience you have gained that you could apply to the next project. If you feel the project is worth fighting for and could see it would benefit the company in the long term, try to persuade management to continue with the project.

Tony Nation, programmer
Mirage Resorts, Inc., Las Vegas

➤ We try to anticipate when it might happen, but when we can't, we try to get the project reinstated or scale it back. If there were multiple people on the project, we try to reposition them in other places in the company. Obviously, it's disappointing, but it happens a lot.

Amy Lutz, senior consultant
Integrated Systems Consulting Group
Wayne, Pa.

➤ There's always a project backlog. Just move on to the next item of priority. These things are really the dictates of management because management sets priorities. So if they cancel a project, you have to assume it's because the next project in sequence is a higher priority.

Ray Proctor, manager of distributed systems
Dow Jones & Co., Chicopee, Mass.

Compiled by Leslie Goff, a free-lance writer based in New York.

SENIOR PROGRAMMER ANALYSTS

The South Florida Water Management District is a regional agency headquartered in West Palm Beach, FL, responsible for the environmentally sound administration of surface and groundwater resources in South Florida, encompassing 16 counties and five million people. We are currently seeking experienced professionals to perform a variety of software application tasks including software development, systems analysis, application implementation and software maintenance.

A minimum of a Bachelor's degree in Computer Science and two years of demonstrated applications/analysis experience required. Experience with VAX/VMS and/or UNIX operating systems, Oracle database and C, COBOL or FORTRAN programming also required. One position requires experience with American Management Systems' Local Government Financial System (LGFS) or ROSS System in a DEC environment.

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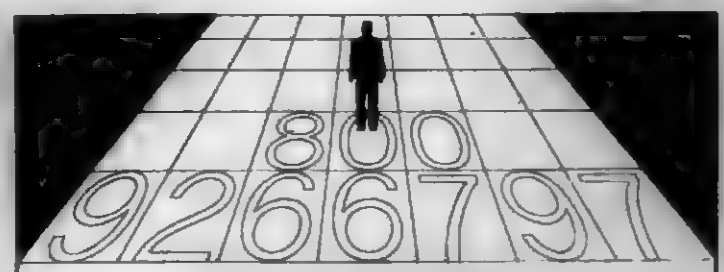

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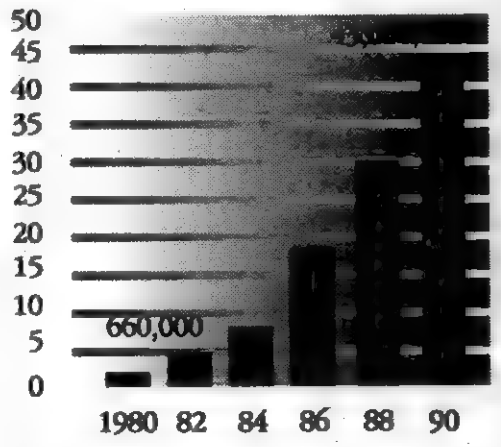
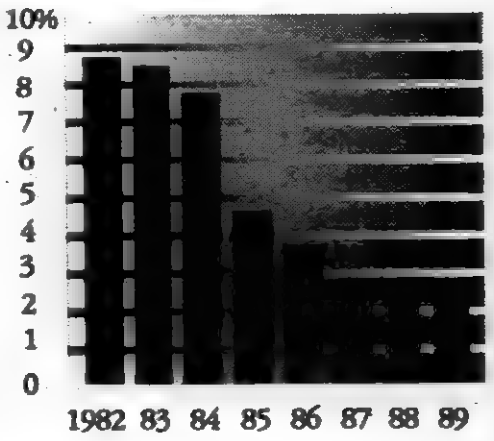


Fewer campus freshman are choosing computer careers**



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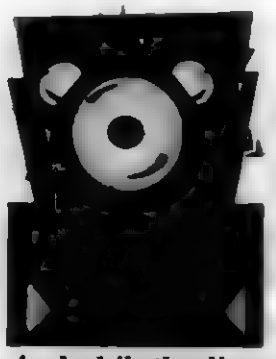
Avoiding PC purchase scams

BY TODD HENSCHELL
SPECIAL TO CW



Cheap sub-ins, bait-and-switch tricks, misleading advertising — you name it and I've seen it while buying and selling PCs for my clients. Although it is impossible to stay on top of every unethical practice, you can become more familiar with them. And while the dirty dealers are in the minority, your chances of detection are better if you treat every purchase like a used car: Kick the tires and look under the hood.

Good as new?

■On system orders where an enhanced small device interface (ESDI) disk is installed, some value-added resellers will ship systems with "refurbished" hard disks.

While this is not illegal, prices on remanufactured drives are 15% or so lower than new drives, and those cost savings are not passed on to the buyer.

To ensure that you're getting what you pay for, it's best to have the vendor stipulate on the invoice that all components used are new and guaranteed as such.

ESDI drives are a particular target because of their scarcity; manufacturers are phasing them out as they change their production lines over to Small Computer Systems Interface and more common integrated drive electronics types of drives.

Hacking for profit

■To get around licensing (and paying royalties for) BIOS firmware, certain clone manufacturers are making their own BIOS chips. This doesn't harm the computer or its operation, but in the course of hiding this, these manufacturers may alter the code in the read-only memory (ROM) just enough to prevent the end user from finding out which revision it is.

One of the tell-tale signs of a hacked BIOS chip is a "zeroed" out revision number. The system may boot and report a BIOS type that is uncommon, and the revision number may be all zeros.

If you need a BIOS upgrade to run OS/2, for instance, there's no easy way to determine what you have. If you've purchased a system ROM with a blanked revision number, you've bought bogus firmware.

Henschell is a PC consultant and free-lance writer based in Burbank, Calif.

Come across any questionable selling practices? We want to hear about them. Call in your experiences to Jodie Naze at (800)343-6474 x727 or fax them to (508) 875-8931.

The bait-and-switch trick

■An old practice among unscrupulous wholesalers is to pass off a cheaper, slower chip for a faster, more expensive one. To conceal the chip switch, these vendors cover the CPU with a heat sink — a cast metal piece with fins used to absorb and radiate heat. Then, they either install a faster oscillator crystal and drive the CPU at a speed faster than its rated speed, or they try to pass off the DX/2 50-MHz chip as a full 50-MHz DX.

When the heat sink is bonded with epoxy, it's impossible to determine anything about the processor. Vendors attempting this fraud will also usually place a sticker or other notice on the heat sink or edge of the CPU, stating that removal of the heat sink will void the warranty.

Don't buy a system unless you can read the silk screen on the CPU, which should state the manufacturer, the chip type and the clock speed of the chip.

Offshore chips

■Poor quality control in offshore facilities has resulted in high failure rates in some low-priced 1M-byte by three-chip single in-line memory modules (SIMM). These fail about two to three times more often than the nine-chip type. You pay about $10 less for the cheaper modules, but the question is whether your company can tolerate a higher downtime potential.

The cheaper SIMMs also fail some tests at their rated access speed and will cause parity errors on systems that rely on speed accuracy.

What's in a name?

■Just because it says "name-brand video board" doesn't mean it is. Some clone manufacturers purchase chip sets from the mainstream video board builders and then assemble a lesser quality board with them.

When these boards are used with DOS, it's rarely a problem. However, for Microsoft Corp.'s Windows and OS/2 users, who often need new and bug-fixed video drivers, there could be trouble getting usable display drivers.

To know whether your system has a genuine name-brand video board in it, check to see if the system includes a manual for the board and the original driver disks from the board manufacturer. If the system doesn't have these, driver headaches might be coming your way.

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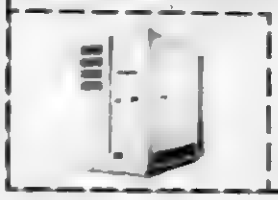

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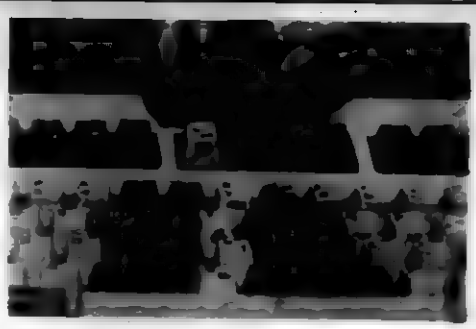

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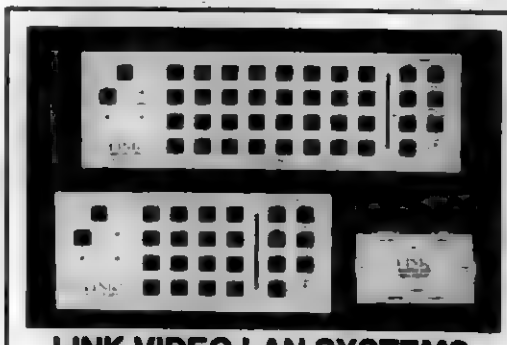

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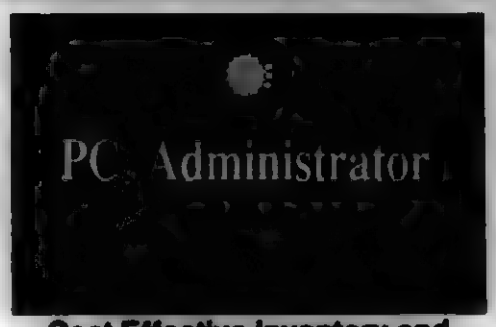

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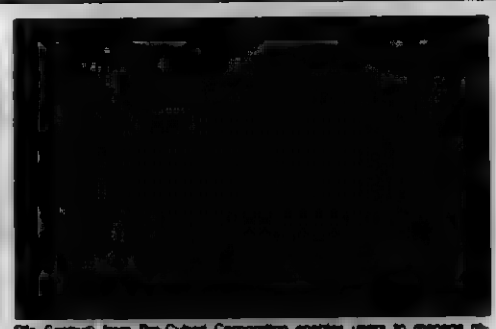

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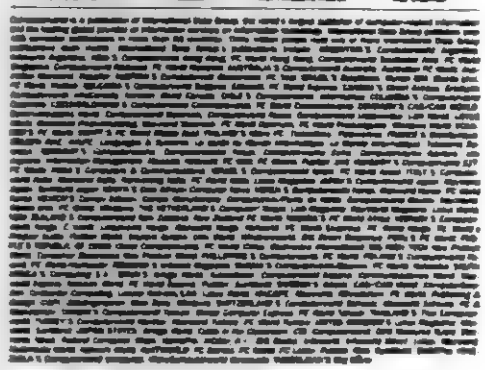

ADVERTISERS INDEX

Acer America	30
Ascom/Timeplex	14
AT&T Tridom	89
AT&T Business Communications Systems	28-31
AT&T Network Cable Systems	53-54,109
Avatar Corp.	43
Bachman	166
Banyan	51
B.I. Moyle	107
Cisco Systems	82
Comdisco	49
Compaq Computer Corp.	26-27,110-111,132
Computer Associates	74
Corporate Software	80
CW Marketing	47
CW Recruitment	42,48,74,79,86,98,124
Data General	45
Digital Equipment Corp.	75-76,128
EMC Corp.	108
Encore Computer Corp.	116
Fibercom, Inc.	108
Gupta Technologies	124
Hayes Microcomputer	118
Hewlett Packard	18-19, 96-97
IBM	22-23,46,80-81,
IDC WHITE PAPER	89-104
Information Builders	17
Informix	123
Intergraph	79
Intersolv	62
ITAA	117
Landmark Systems	44
Lanmark	42
Micro Focus	11
Microgate	126
Mold-Tech Systems	15
Northern Telecom	61-62,
Oracle	8,9
Powersoft	48
Racal Datacom	41
Rose Systems	10
SAP America	131
SAS Institute	21,35,53,60,
Siemens-Stromberg-Carlson	72
Software Engineering of America	106
Sun Microsystems 112-113,134-135	
Sun Select	126-127
Sybase	13
Syncsort	3
System Center	7
3m	84-85
Technology Update	53-73
Texas Instruments	120-121
Toshiba	34-35
Unisys	114-115
Workstation Group	122
XDB Systems	20
Xtree	38

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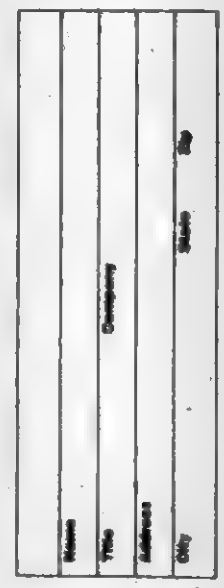

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Computerworld Company Index

▶ *Page numbers refer to the page on which the story begins.*

A

Adobe Systems, Inc. 42
Advanced Business Solutions PLC 119
Advanced Logic Research, Inc. 8,73
Aeroflot 112
Alex. Brown & Sons, Inc. 6,152
Allen Systems Group, Inc. 117
Amdahl Corp. 16,153
American Airlines 112
American Arbitration Association 130
American Electronics Association 24
American Express Travel Related Services Co. 136
AMR Information Services, Inc. 112
Andersen Consulting 107,113
AP Research 20
Apple Computer, Inc. ....3,6,16,20,25, ...42,44,73,79,105,108,122,135
ASA International 113
Aspen Institute 25
AST Research, Inc. 8,154
AT&T 20,129
Auburn University 25

B

Banyan Systems, Inc. 73
Bear, Stearns & Co. 152
Beyond, Inc. 12
BIS Strategic Decisions 50,112
BlueLine Software, Inc. 117
BMC Software, Inc. 117
Boeing Computer 6
Boole & Babbage, Inc. 153
Booz Allen & Hamilton, Inc. 16,136
Borland International, Inc. ..6,44,119,153,154
Broadview Associates 25
Brobeck, Phleger & Harrison 8
Brown Brothers Harriman & Co. 152

C

Caisse Nationale De Credit Agricole 8
Camber Software 15
Canadian National Railways 6
Candle Corp. 112
Carnegie Mellon University 83
CE Software, Inc. 105
Central Intelligence Agency 129
Central Reserve Life Insurance Co. 135
Chemical Banking Corp. 119
Chipcom Corp. 153
Chorus Systems, Inc. 16
Cigna Corp. 133
Cisco Systems, Inc. 73,85,154
Citicorp 16
Claris Corp. 44
Comdisco, Inc. 16,152
Compaq Computer Corp. 8,49,73,153,154
Component Software Corp. 122
Compression Labs, Inc. 88
Computer Associates International, Inc. 16,25,112
Computer Exports 24
Computer Intelligence 15
Computer Professionals for Social Responsibility 129
Computer Sciences Corp. 16,108
Control Data Systems, Inc. 6
Coopers & Lybrand 6,16
Cray Research, Inc. 152,153
Cyborg Systems, Inc. 15
Cylink Corp. 105

D

Dataproducts Corp. 42
Dataquest, Inc. 10,20
Dataquest/Ledgeway Group 83
Datatel, Inc. 15
Deere & Co. 108
Dell Computer Corp. 73,105,154
DEC Users Society 20,107,154
DeskTalk Systems, Inc. 88
Digital Equipment Corp. 10,15,20,25,49,44,83, ...107,113,117,129,152,153
Digital Products, Inc. 79
Digitech Industries, Inc. 105
Distribution Architects International 113
Dover Beach Consulting, Inc. 83
D & B Software, Inc. 107
Duracell International, Inc. 12
DuWayne J. Peterson Associates 136

E

Easel Corp. 119
Electronic Data Systems Corp. 4,83,112
Electronic Frontier Foundation 129
Electronic Mail Association 1,12
Electro-Optics Industries Ltd. 130
EMC Corp. 153
Englehard Corp. 4
Epson America, Inc. 8
Ernst & Young 4
Esoft, Inc. 105
Everex Systems, Inc. 6
Exabyte Corp. 49

F

Fargo Electronics, Inc. 42
Federal Data Corp. 112
Fidelity Investments 88
Forrester Research, Inc. 28,88
Fireman's Fund, Inc. 133
Fraser Williams Group 113

G

G2 Research, Inc. 83
Gain Technology, Inc. 153
Gartner Group, Inc. 28
Gateway Information Services, Inc. 16
General Datacom Industries, Inc. 153
General Electric Co. 119
General Mills, Inc. 108
General Parametrics Corp. 44
Go Corp. 44

H

Hewlett-Packard Co. 6,10,20,25,50,83,108
Hickory White, Inc. 10
Hitachi Data Systems Corp. 16
Hughes Aircraft Co. 12
Hughes LAN Systems, Inc. 83

I

IBM Consulting Group 16
IBM ....1,4,6,8,12,15,16,20,42,73, ...74,79,83,112,117,119,129,152,153,154
Image Network Technologies, Inc. 44
Information Dimensions, Inc. 112
Information Builders, Inc. 108
Information Technology Association of America 1,25
Informix Software, Inc. 153
Ingres Corp. 105
Institute of Electrical and Electronics Engineers, Inc. 24
Integral Systems, Inc. 112
Integrated Systems Solutions Corp. 16
Intel Corp. 4,24,83,105
Intellicorp, Inc. 119,122
Interactive Network, Inc. 25
Intergraph Corp. 49
International Data Corp. 6,8,28,122
International Open Systems 42
International Resource Management 136
Interphase Corp. 79
Intersolv, Inc. 119
Itasca Systems, Inc. 122

J

James River Corp. 8
JM & Co. 119
John Wiley & Sons, Inc. 136
Johnson Controls Inc. 113

K

Kendall Square Research Corp. 153
Kidder, Peabody & Co. 153
Knowledge Ware, Inc. 6,119
Kronos, Inc. 86

L

Lannet Data Communications, Inc. 88
LaserData, Inc. 112
Lawrence Livermore Laboratory 83
Legent Corp. 112
Levi Strauss & Co. 119
Lotus Development Corp. ....1,6, ...12,44,105,153,154
Lucid, Inc. 122

M

Mancos Computers 113
Market Intelligence 50
Markle Foundation 25
Martin Marietta Corp. 119
Maynard Electronics 79
MCI Communications Corp. 135
McKinsey & Co. 16
Mellon Bank Corp. 6
Mercury Interactive Corp. 119
Merrill Lynch & Co. 136
Meta Group, Inc. 112
MicroBuilt-OnLine Corp. 4
Microsoft Corp. ....4,6,8,12,24,25, ...42,44,50,73,79,83,105,119,129,153,154
MIT Sloan School of Management 136
Morgan Lewis, & Bockius 47
Motorola, Inc. 30,50,129

N

National Information Technology Center 74
National Institute of Standards and Technology 34
National Science Foundation 25
Nationwide Mutual Insurance Co. 83
NCR Corp. 8,129,154
NetFrame Systems, Inc. 153
Network Equipment Technologies, Inc. 153
New York Stock Exchange 152
Newport System Solutions, Inc. 105
Next Computer, Inc. 88
Nolan, Norton & Co. 4
Novell, Inc. ..4,8,12,42,50,73,79,83,105,112

O

Open Software Foundation 83
Oracle Corp. 6,15,25
Oregon State University 12

P

Pacer Software, Inc. 108
Pacific Gas & Electric Co. 12
Pacific Gold Coast Corp. 119
PaineWebber, Inc. 4
Panasonic Communications and Systems Co. ..8
Pantone, Inc. 44
Persistence Software, Inc. 122
PictureTel Corp. 88
PRC, Inc. 6
Price Waterhouse 135,154
Proteon, Inc. 153
Protocraft 122
Prusim, Inc. 50
Prudential Securities, Inc. 74,153
Pulse Engineering 79
Pure Software, Inc. 119
Pyramid Technology Corp. 152

Q

Quadrant Corp. 117
Quality Software Products 105

R

Racal-Datacom, Inc. 79
Racore Computer Products, Inc. 79
RAM Mobile Data 1
Recon Optical, Inc. 130
Retix 153
Robert Half International, Inc. 47,73
Robert Plant 133
Ross Systems 26,113

S

Saros Corp. 108
Science Applications International Corp. 108
Sears, Roebuck and Co. 16
Securities and Exchange Commission 16
SEEC, Inc. 119
Sequoia Systems, Inc. 16
Servio Corp. 28
Shared Medical Systems 113
Shiva Corp. 6
Siemens AG 88
Slate Corp. 44
Soft-Switch, Inc. 12
Software Publishing Corp. 6,153
Sony Corp. 105,135
Source/EDP 47
Southern California Edison 12
Sprint Corp. 88,105
Standard Microsystems, Inc. 47
StarNine Technologies, Inc. 106
Sterling Software, Inc. 112
Stratus Computer, Inc. 153
Suite Software, Inc. 119
Sun Microsystems, Inc. ....6,10,16, ...44,50,83,117,122
Sun Users Group 24
SunNet Manager Users Group 88
Sybase, Inc. 153
Symantec Corp. 153
Synoptics Communications, Inc. 83
SysKonnect, Inc. 49
System Industries, Inc. 117

T

Tandem Computers, Inc. 16
Technology Partners, Inc. 16
Teleglobe Communications, Inc. 105
Tesseract Corp. 108
Texas Instruments, Inc. 8,10,119,139
TGI Technologies Ltd. 44
The Ask Cos. 108
The Burton Group 83
The Center for Media Education 25
The Chase Manhattan Bank NA 4,119
The Dial Corp. 88
The Royal Trust Co. 119
The Santa Cruz Operation 49
The Trellis Group 47
Toshiba America Information Systems, Inc. 8
TTG, Inc. 44
Turner Corp. 8,47

U

Unilever PLC. 1
Union Carbide Corp. 85
Uniplex Integration Systems, Inc. 6
UniSQL, Inc. 28
Unisys Corp. 83,112,119,152,153
United Missouri Bank 73
United Parcel Service, Inc. 47
United Services Automobile Association 136
University of Kansas 49
Unix System Laboratories, Inc. 16,83
Unum Corp. 6
U.S. Coast Guard 135
U.S. Department of Commerce 34
U.S. Department of Defense 6
U.S. Naval Academy 50
U.S. Postal Service 16
USG Annuity and Life 47

V

Verity, Inc. 108
Vermont Object Technology, Inc. 28,122
ViewStar Corp. 112

W

Wall Data, Inc. 119
Wang Laboratories, Inc. 16,112
Weil, Gotshal and Manges 47
Wellfleet Communications, Inc. 73,85,153
Western Provident Association 112
Weyerhaeuser Co. 34
Windows Users Group Network 34
WorkGroup Technologies, Inc. 8

Z

Zenith Data Systems 8

Bear facts

Selected semiconductor companies rated by Bear, Stearns & Co.

	Rating
Advanced Micro Devices, Inc.	Hold
Chips and Technologies, Inc.	Avoid
Cypress Semiconductor Corp.	Hold
Intel Corp.	Buy
Motorola, Inc.	Hold
Western Digital Corp.	Avoid

Source: Brokerage firm reports

Industry Almanac

MINING BIG IRON FOR GOLD

With downsizing the hottest buzzword and **IBM** (IBM), **Digital Equipment Corp.** (DEC) and **Cray Research, Inc.** (CYR) all shaving their payrolls, prospects for the high end of the hardware industry may not seem bright. However, Wall Street looks favorably on several investment opportunities in large systems companies.

UNISYS CORP. (UIS)

William J. Milton Jr., a financial analyst at Brown Brothers Harriman & Co. in New York, said the Blue Bell, Pa., computer firm is a terrific investment opportunity. Unisys, which posted its fourth consecutive profitable quarter last week, is yielding a 16% dividend on its preferred stock, Milton said. Compare that with IBM's dividend, which is hovering around 7%.

Unisys shares closed at 8¾ on the New York Stock Exchange Thursday. Unisys preferred stock stood at 35¾.

KENDALL SQUARE RESEARCH CORP.

Alex. Brown & Sons, Inc. tagged Kendall Square Research (KSRC) with a rating of Strong Buy. Kendall Square Research produces the massively parallel KSR1 system. In an Oct. 8 report by analysts Joseph Payne and Ellen Kempler, Alex. Brown cited growing market acceptance of parallel systems and the rapidly maturing KSR1 operating system technology as factors promising the company's continued growth.

The vendor's over-the-counter stock has been hovering around its 52-week low of 5½ recently; it closed Thursday at 7½. Kendall Square Research's initial public offering was in March 1992.

PYRAMID TECHNOLOGY CORP. (PYRD)

Pyramid Technology carried a Buy rating in an Oct. 16 report issued by Clifford Friedman and Neil Cooper at Bear, Stearns & Co. Pyramid Technology's restructuring charge of $22 million to $24 million in its fourth fiscal quarter will result in long-term savings of as much as $12 million per year. The company has also announced new systems and software products and a reseller agreement with **Comdisco, Inc.** (CDO).

Over-the-counter trading for Pyramid Technology closed Thursday at 8½.

DEREK SLATER

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 23, 1992

TOP PERCENT GAINERS

Everex Systems Inc. (L)	58.91
Archive Corp	47.37
Wang Labs	46.43
Zaxo International Ltd.	39.29
Symantec Corp.	32.39
Fibronic Int'l Inc.	26.09
State of the Art	25.00
Ask Computer Systems	22.02

TOP PERCENT LOSERS

Proteon Inc.	-16.42
Spinnaker Software (L)	-16.18
Chipcom Corp.	-16.75
IPL Systems Inc.	-16.67
Ross Systems	-16.67
Conner Peripherals	-13.79
Quantum Corp.	-10.92
Stratus Computer Inc. (L)	-9.80

TOP DOLLAR GAINERS

Progress Software Corp.	6.50
CompUSA Inc.	4.75
3M Corp	4.25
Intel Corp.	3.88
Texas Instruments (H)	3.75
Intelligent Info. Systems (H)	3.63
System Software Assoc.	3.50
Archive Corp.	3.38

TOP DOLLAR LOSERS

Chipcom Corp.	-4.13
Stratus Computer Inc. (L)	-3.63
American Info Techs Corp.	-3.38
Southwestern Bell Corp. (H)	-3.13
Conner Peripherals	-3.00
Nynex Corp.	-3.00
US West Inc.	-2.25
IPL Systems Inc.	-2.25

Exch	52-Week High	52-Week Low		Oct. 23 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 1.92%**			
OTC	19.13	9.63	3 COM Corp.	18.63	0.75	4.20
NYS	70.63	56.25	American Info Techs Corp.	65.25	-3.38	-4.92
NYS	45.38	32.88	AT&T	43.00	0.75	1.78
OTC	4.25	0.75	Ariel Communications Corp.	1.50	0.25	20.00
NYS	48.75	40.25	Bell Atlantic Corp	46.13	-1.63	-3.40
NYS	55.50	43.38	Bellsouth Corp.	51.13	-1.50	-2.85
NYS	6.75	3.63	Bolt, Beranek & Newman	3.88	0.00	0.00
NYS	68.00	39.63	Cabletron Systems (H)	68.00	1.38	2.06
OTC	31.00	17.50	Chipcom Corp	20.50	-4.13	-16.75
OTC	59.75	21.88	Cisco Systems Inc. (H)	58.50	1.63	2.86
OTC	35.25	5.50	Compression Labs Inc.	9.25	1.38	17.46
OTC	3.38	0.88	Data Switch Corp	1.94	0.25	14.81
NYS	23.63	13.75	Digital Comm. Assoc. (L)	15.25	1.25	8.93
OTC	15.25	7.75	Digital Systems Int'l Inc.	8.63	0.13	1.47
OTC	15.63	3.63	DSC Communications (H)	14.50	0.88	6.42
OTC	10.88	4.75	Fibronic Int'l Inc.	7.25	1.50	26.09
OTC	37.50	10.50	Fibronic Corp	16.88	0.63	3.85
OTC	3.38	1.13	Gandalf Technologies Inc.	1.81	-0.06	-3.31
OTC	2.25	0.69	Gateway Communications	1.56	-0.06	-3.82
NYS	5.50	2.38	General Datacomm Inds.	3.88	-0.25	-6.06
ASE	5.88	0.50	Gio Video	2.38	0.06	2.88
NYS	36.75	28.88	GTE Corp.	33.38	-1.00	-2.91
NYS	70.63	50.00	ITT Corp.	65.00	-0.75	-1.14
OTC	38.75	25.25	MCI Communications Corp. (H)	38.25	0.50	1.46
OTC	14.50	2.25	Microcom Inc.	3.38	0.38	12.50
OTC	18.25	9.50	Network Equipment Tech.	12.25	-1.25	-9.26
OTC	25.50	9.00	Network General	14.50	0.00	0.00
OTC	20.00	8.50	Network Systems Corp.	13.00	0.25	1.96
OTC	23.75	5.63	Newbridge Networks Corp. (H)	23.75	1.00	4.40
NYS	48.25	30.50	Northern Telecom Ltd.	34.25	3.25	10.48
OTC	32.50	21.38	Novell Inc.	31.00	1.38	4.64
NYS	88.38	69.13	Nynex Corp	82.25	-3.00	-3.52
OTC	37.50	14.50	Octel Communications Corp. (L)	19.00	0.00	0.00
OTC	9.88	3.38	Penril Data Comm. Netwks. (L)	3.88	0.13	3.33
OTC	53.00	10.25	Picturetel Corp.	19.25	1.25	6.94
OTC	16.75	7.50	Proteon Inc.	7.75	-1.75	-18.42
NYS	29.50	13.63	Scientific Atlanta Inc.	28.75	1.25	4.55
NYS	70.50	56.25	Southwestern Bell Corp. (H)	65.63	-3.13	-4.55
NYS	26.38	20.75	Sprint Corp.	25.13	0.63	2.56
OTC	20.63	4.88	Standard Microsystems Corp. (H)	19.13	0.50	2.68
OTC	60.25	14.50	Synoptics Communications (H)	57.50	0.00	0.00
NYS	40.00	32.88	US West Inc.	36.75	-2.25	-5.77
OTC	50.50	24.00	Wellfleet Communications (H)	50.38	0.50	1.00
PC and Workstations			**Up 11.37%**			
OTC	13.50	3.50	Advanced Logic Research	4.50	0.50	12.50
OTC	70.00	42.75	Apple Computer Inc.	48.75	-0.25	-0.51
OTC	24.50	11.25	AST Research Inc.	18.50	2.00	12.12
NYS	19.25	6.75	Commodore Int'l	7.38	-0.13	-1.67
NYS	42.38	22.13	Compaq Computer Corp. (H)	38.50	-0.25	-0.65
OTC	34.88	13.91	Dell Computer Corp. (H)	34.63	1.00	2.97
OTC	7.75	0.88	Everex Systems Inc. (L)	1.50	0.56	58.91
NYS	34.00	21.25	Harris Corp.	33.75	3.13	10.20
NYS	85.00	44.63	Hewlett-Packard Co.	55.13	-0.75	-1.34
NYS	29.75	14.13	Silicon Graphics	23.63	2.88	13.86
OTC	35.88	20.75	Sun Microsystems Inc.	32.00	3.00	10.34
NYS	31.25	22.25	Tandy Corp.	28.75	0.00	0.00
NYS	11.13	5.50	Zenith Electronics	5.88	0.13	2.17
OTC	25.50	2.75	Zaxo International Ltd.	4.88	1.38	39.29
Large Systems			**Off 0.14%**			
ASE	20.63	7.75	Amdahl Corp.	7.88	0.00	0.00
NYS	16.38	4.75	Convex Computer	6.13	0.13	2.08
OTC	18.38	1.88	Cray Computer	3.50	-0.13	-3.45
NYS	52.25	19.50	Cray Research Inc. (L)	20.38	0.38	1.88
NYS	21.88	7.13	Data General Corp.	11.88	-0.38	-3.06
NYS	85.50	33.25	Digital Equipment Corp.	33.88	-0.50	-1.45
NYS	101.38	67.75	IBM (L)	69.00	-1.75	-2.47
OTC	13.25	5.50	Kendall Square Research	7.75	0.63	8.77
NYS	119.25	88.25	Matsushita Electronics	93.63	-1.13	-1.19
OTC	17.50	6.00	Pyramid Technology	9.00	0.75	9.09
OTC	17.88	9.88	Sequent Computer Sys.	15.63	0.13	0.81
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.13	3.70
NYS	54.25	29.50	Stratus Computer Inc. (L)	33.38	-3.63	-9.80
NYS	15.13	9.50	Tandem Computers Inc.	11.13	-0.50	-4.30
NYS	11.75	3.63	Unisys Corp.	8.50	-0.25	-2.86
ASE	7.60	0.25	Wang Labs Inc. (b)	0.44	0.00	0.00
Software			**Up 6.23%**			
OTC	68.50	25.25	Adobe Systems Inc.	30.50	1.88	6.56
OTC	44.25	10.25	Altsys Corp.	14.50	1.25	9.43
OTC	19.75	7.00	American Software Inc. (L)	8.13	0.25	3.17
OTC	20.00	9.75	Ask Computer Systems	16.63	3.00	22.02
OTC	63.00	23.25	Autodesk Inc. (H)	51.00	0.50	0.99
OTC	37.75	3.75	Bachman Info. Systems (L)	4.50	0.38	9.09
OTC	42.50	22.00	BGS Systems Inc.	37.50	0.00	0.00
OTC	79.00	37.25	BMC Software Inc.	58.38	-1.88	-3.11
OTC	20.50	10.75	Boole & Babbage	19.88	0.88	4.61
OTC	86.75	25.25	Borland Int'l Inc.	32.00	3.00	10.34
OTC	11.00	3.63	CE Software	4.00	0.13	3.23
ASE	24.00	8.88	Cheyenne Software Inc. (H)	24.00	2.25	10.34
OTC	17.00	5.63	Cognos Inc.	5.75	0.00	0.00
NYS	18.00	8.63	Computer Associates (H)	17.50	0.63	3.70
NYS	12.38	4.75	Computervision Corp. (L)	5.00	-0.13	-2.44
OTC	20.00	6.75	Comshare Inc.	9.00	1.25	16.13
OTC	47.88	6.00	Easel Corp. (L)	6.75	0.25	3.85
OTC	25.00	11.50	Group I Software	14.25	0.25	1.79
OTC	5.63	3.50	Hogan Systems Inc.	5.00	0.25	5.26
OTC	36.25	18.50	Information Resources	27.75	0.50	1.83
OTC	30.00	5.88	Informix Corp. (H)	27.38	0.13	0.46
OTC	22.38	11.50	Intergraph Corp.	13.00	-0.25	-1.89
OTC	18.00	7.00	Interleaf Inc.	11.75	1.13	10.59
OTC	30.25	10.25	Interactiv Inc.	15.75	2.00	14.55
OTC	21.38	9.50	Knowledgeware Inc.	12.00	1.50	14.29
OTC	48.25	28.75	Legent Corp.	43.13	-1.88	-4.17
OTC	36.75	14.75	Lotus Development	19.25	1.75	10.00
OTC	7.38	1.88	Mace Software	2.75	0.25	10.00
OTC	22.25	5.25	Mentor Graphics	7.25	1.13	18.37
OTC	37.25	27.25	Micro Focus	36.63	0.63	1.74
OTC	20.50	8.50	Micrografx Inc.	8.90	0.25	3.03
OTC	89.75	58.50	Microsoft Corp. (H)	88.63	3.25	3.81
OTC	23.13	12.00	Oracle Corp. (H)	23.13	2.50	12.12
OTC	53.25	19.00	Parametric Technology (H)	49.50	-1.25	-2.46
OTC	11.00	3.50	Phoenix Technologies	4.50	0.13	2.86
OTC	25.25	11.25	Platinum Technology	18.25	2.00	12.31
OTC	53.00	29.00	Progress Software Corp.	53.00	6.50	13.98
OTC	28.63	4.00	Quarterdeck Office Sys.	5.75	0.75	15.00
OTC	22.75	11.75	Rainbow Technologies Inc.	22.00	1.50	7.32
OTC	22.75	4.00	Rasterops	5.75	-0.50	-8.00
OTC	17.25	5.00	Ross Systems	5.00	-1.00	-16.67
OTC	12.38	6.50	Sapiens USA Inc.	12.38	1.50	13.79
OTC	26.25	6.75	Software Publishing Corp.	8.38	0.88	11.67
OTC	8.50	2.00	Software Toolworks Inc.	3.38	-0.06	-1.83
OTC	7.25	0.75	Spinnaker Software (L)	1.13	-0.25	-18.18
OTC	16.50	3.25	State of the Art	8.25	1.25	25.00
NYS	25.25	13.75	Sterling Software Inc.	18.13	-0.25	-1.36
OTC	30.00	6.00	Struct. Dynamics Research	10.75	0.75	7.50
OTC	41.25	16.25	Sybase Inc. (H)	39.88	1.88	4.93
OTC	51.00	5.88	Symantec Corp.	11.75	2.88	32.39
NYS	15.50	5.25	Systems Center Inc.	7.00	0.75	12.00
OTC	34.25	13.00	System Software Assoc.	25.38	3.50	16.00
OTC	13.25	2.50	Trinzic Corp.	3.63	-0.25	-6.46
OTC	23.75	14.50	Walker Interactive Systems	19.00	2.63	16.03
OTC	5.63	1.50	Wordstar	1.88	0.13	7.14
Semiconductors			**Up 7.85%**			
NYS	21.50	7.38	Advanced Micro Devices	14.38	1.38	10.58
NYS	11.50	7.13	Analog Devices Inc.	11.50	1.25	12.20
OTC	13.13	6.75	Atmel Corp. (H)	12.75	0.38	3.03
OTC	14.13	3.25	Chips and Technologies	3.88	0.13	3.33
NYS	21.13	7.38	Cypress Semiconductor Corp	6.63	0.25	2.99
NYS	12.88	6.63	Dallas Semiconductor	12.38	0.38	3.13
OTC	68.75	39.75	Intel Corp.	67.13	3.88	6.13
NYS	9.88	4.88	LSI Logic Corp.	7.00	0.50	7.69
NYS	22.38	12.13	Micron Technology	13.25	1.25	6.94
NYS	97.38	57.50	Motorola Inc. (H)	65.25	1.13	1.20
NYS	13.13	4.88	National Semiconductor (H)	13.13	1.00	8.25
OTC	27.00	8.25	Sierra Semiconductor	13.25	1.75	15.22
NYS	48.75	26.00	Texas Instruments (H)	48.75	3.75	8.33
OTC	10.50	6.00	VLSI Technology	7.25	0.00	0.00
OTC	7.00	2.13	Wafertech	5.13	1.63	46.43
ASE	6.75	2.00	Western Digital Corp. (H)	6.50	0.13	1.96
OTC	31.00	14.50	Xilinx (L)	17.50	1.50	9.38
OTC	33.00	13.75	Zilog Inc. (H)	30.25	-1.75	-5.47
Peripherals and Subsystems			**Up 3.25%**			
OTC	10.50	3.25	Archive Corp.	10.50	3.38	47.37
OTC	28.75	13.75	Banctec Inc.	24.63	0.63	2.60
OTC	23.50	9.25	Cambex Corp. (L)	12.00	1.75	17.07
ASE	14.13	5.88	Cognitronics Corp. (H)	14.00	1.00	7.69
NYS	23.88	12.50	Conner Peripherals	18.75	-3.00	-13.79
OTC	15.88	14.25	Data Race Inc. (H)	14.50	-0.75	-4.92
ASE	19.88	4.72	Datarem Corp.	6.00	0.13	2.13
NYS	23.75	6.38	EMC Corp. (H)	22.88	0.63	2.81
OTC	8.38	4.75	Emulex Corp.	6.25	0.75	13.64
OTC	23.00	13.25	Evans & Sutherland	15.75	1.25	9.62
OTC	40.63	12.00	Exabyte	16.25	0.13	0.78
OTC	32.50	15.75	Intelligent Info. Systems (H)	22.50	3.63	12.55
OTC	11.25	4.75	Iomega Corp.	6.25	-0.13	-1.96
OTC	15.25	11.25	IPL Systems Inc.	11.25	-2.25	-16.67
OTC	21.25	10.75	Komag Inc.	19.25	1.00	5.48
OTC	15.63	4.38	Maxtor Corp. (H)	13.13	-1.00	-7.08
OTC	12.63	6.38	Micropolis Corp.	8.13	0.13	1.56
NYS	103.75	88.38	3M Co.	103.13	4.25	4.30
OTC	6.75	3.50	Printronix Inc.	5.00	0.25	5.26
NYS	24.38	6.88	QMS Inc.	8.13	0.25	3.17
OTC	18.00	8.88	Quantum Corp.	13.25	-1.63	-10.92
OTC	12.75	3.75	Radius Inc.	5.25	0.25	5.00
NYS	12.88	6.50	Recognition Equipment	11.00	1.00	10.00
OTC	13.13	5.63	Rexon Inc.	10.75	-0.38	-3.37
OTC	17.63	7.75	Seagate Technology	14.88	-0.88	-5.56
NYS	78.00	21.50	Storage Technology	25.50	0.88	3.55
NYS	23.88	18.00	Tektronix Inc.	21.13	0.63	3.05
NYS	82.25	60.25	Xerox Corp	77.25	-1.13	-1.44
Services			**Up 2.42%**			
OTC	20.88	11.88	American Mgmt. Systems (H)	20.88	0.75	3.73
NYS	5.38	2.88	Amscomp Inc.	3.50	-0.25	-6.67
OTC	20.50	12.50	Analysts Int'l (H)	20.00	0.25	1.27
NYS	48.00	36.75	Auto Data Processing	47.50	1.38	2.99
NYS	15.50	7.88	Ceridian Corp.	15.13	0.25	1.68
NYS	23.56	12.50	Comdisco Inc.	14.75	-0.38	-2.48
OTC	13.50	7.13	Computer Horizons	7.25	-0.50	-6.45
NYS	84.88	57.00	Computer Sciences	66.50	-1.75	-2.56
NYS	10.13	7.00	Computer Task Group	8.00	0.13	1.59
OTC	40.50	16.00	CompUSA Inc.	39.50	4.75	13.67
OTC	19.25	6.00	Corporate Software	10.63	0.88	8.97
OTC	30.75	7.75	Egghead Discount Software (L)	8.00	0.00	0.00
NYS	33.00	25.25	General Motors E (EDS)	28.63	-0.75	-2.55
OTC	30.38	6.25	Intelligent Electronics	11.75	-0.25	-2.08
OTC	14.88	5.88	Manpel	9.00	1.00	12.50
OTC	15.75	7.00	Microage Inc.	9.00	0.00	0.00
OTC	36.00	17.88	Paychex (H)	35.00	1.50	4.48
NYS	77.00	54.75	Policy Management Sys. (H)	75.00	1.50	2.04
NYS	44.75	26.25	Reynolds and Reynolds	44.13	1.88	4.44
OTC	32.00	22.00	SEI Corp.	27.63	3.00	12.18
OTC	24.38	16.88	Shared Medical Systems	22.13	0.75	3.51
OTC	30.00	16.00	Sungard Data Systems	28.75	1.50	5.50
NYS	3.63	1.13	Ultimate Corp.	1.38	0.00	0.00

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Spinnaker stock dips

■ The resignation of **Spinnaker Software Corp.**'s independent auditor, **Deloitte & Touche**, triggered a drop in stock price from 1⅜ to 1⅛ in NASDAQ trading last Thursday. The week before, Chief Financial Officer E. Ronald Goldfuss had stepped down. He was replaced by Patrick J. Burns.

■ **Cray Research, Inc.**, whose quarterly profits were up while its profits were down from 1991, said it intends to save $50 million next year by mandating a companywide wage freeze, consolidating certain manufacturing operations and laying off 650 workers by Nov. 30. Top executives will also forego 1992 bonuses.

■ **Storage Technology Corp.**, which is due to deliver the Iceberg redundant arrays of inexpensive disks system in 1993, is using a hiring freeze to remain profitable and will cut salaries in January. Its third-quarter earnings dipped to $4.1 million, down from $24.4 million a year ago. Revenue of $387.1 million was nearly even with the $387.3 million of a year ago. Chief Executive Officer Ryal Poppa said deferred orders had placed additional stress on the $1.5 billion firm.

■ **Archive Corp.** revised its estimate of fiscal fourth-quarter revenue to $98.8 million, up from the Oct. 1 estimate of $97 million.

Short takes

Ottawa-based **Corel Systems Corp.** is offering 2 million common shares priced at $14.75 per share via a public offering in the U.S.... Filing initial public offerings were **Networth, Inc.** (1.1 million shares at $14 to $16 each) and **Brooktrout Technology, Inc.** (1.6 million shares at $10 each).... **Autodesk, Inc.** acquired **Micro Engineering Solutions, Inc.**, a developer of computer-aided design and manufacturing software.

Mainframe firms feel downsizing heat

As big iron heavyweights struggle to regain momentum, some PC software vendors are gaining

BY DEREK SLATER
CW STAFF

It is the heat, not the humidity. While mainframe vendors in particular blamed the economic climate for poor third-quarter showings, analysts said fiery competition from downsizing platforms and difficult business model transitions were the real culprits.

"Every company is feeling some effects of slow worldwide economic growth, but that's compounded by pretty massive secular issues for some companies," said Laura Conigliaro, a computer analyst at Prudential Securities, Inc.

Downsizing and the transition from DOS to Microsoft Corp.'s Windows environment are two key competitive issues that are buoying Microsoft and several mainframe productivity software vendors, while leaving some heavyweight mainframe hardware and PC application software vendors struggling to regain momentum.

Good times, bad times

Large systems software vendors stand to gain ground as those mainframe shops that are not downsizing seek to get the most they can out of installed hardware, often by upgrading and improving their software. For example, utilities vendor Boole & Babbage, Inc. expects to tally record revenue and profits for the quarter.

"In cycles where people are hesitant to buy big-ticket items, productivity-improving software seems to be where the dollars are going," said Terence Quinn, a senior technology analyst at Kidder, Peabody & Co. "The attitude seems to be, 'Let's make do with what we have.'"

Despite significant losses posted by IBM, Amdahl Corp. and Digital Equipment Corp., not all was bleak in the computer industry this quarter. Other hardware vendors, including Unisys Corp., Stratus Computer, Inc. and Compaq Computer Corp., managed good showings, as did a number of software firms such as Microsoft and networking suppliers such as Wellfleet Communications, Inc.

> "EVERY COMPANY IS feeling some effects of slow worldwide economic growth."
>
> LAURA CONIGLIARO
> PRUDENTIAL SECURITIES

For IBM and DEC, profitability may not return in the next two quarters. Analysts were hesitant to pin down a specific time frame. "There are so many big variables, I'd rather just sit on the sidelines and watch how those variables play out," Conigliaro said.

With IBM's woes at the high end of the hardware spectrum, some of its future hopes rest ironically on the desktop, where the newly independent Personal Systems division — its liberation process behind it — may be able to compete more effectively in coming quarters.

Last week IBM Personal Computer Co. announced its Value-point line of low-cost products (see story page 8). Compaq's solid showing for the quarter proved that the strong can not only survive a price war but also flourish.

A number of desktop applications vendors reported disappointing results as they grappled with their own set of competitive challenges.

Aside from Microsoft, which is uniquely positioned to take advantage of ongoing Windows market growth, tough times will likely continue for the PC software companies. "The last two quarters have [wreaked] carnage on the desktop," Quinn said.

Borland International, Inc., Software Publishing Corp., Lotus Development Corp. and other companies with entrenched DOS market share find Microsoft clawing at their heels as users move to Windows.

Difficult quarters still lie ahead for desktop software companies — particularly DOS-heavy applications vendors Software Publishing and Symantec Corp.

Bucking the trend

Quarterly results rolled in last week from all sectors of the industry. Networking companies reported the most consistently positive news, though other technology sectors had their share of glad tidings.

- **Unisys** continued its resurrection with its fourth consecutive profitable quarter. Revenue increased from $2 billion to $2.1 billion, while profits were $68 million compared to last year's loss of $76 million. Unisys also reduced its debt by $275 million, leaving the company with roughly $2 billion in debt — its lowest level since its establishment via a merger in 1986.
- **Amdahl** reported a $30.7 million loss, as anticipated. Revenue was up over 1991's third quarter. Amdahl sustained an operating loss and tacked on a $19 million pretax charge to cover layoffs.
- **Cray Research, Inc.** earned $6.5 million on $220 million in revenue. Revenue was up but profits were down from 1991, and Cray's recently announced restructuring will mean red ink for the fourth quarter.
- News was better for Hopkinton, Mass.-based **EMC Corp.**, a manufacturer of storage subsystems for midrange and mainframe systems. EMC revenue jumped 59% over the year-ago quarter to $94 million, cranking net income up 119% to $7.3 million.
- **Stratus** rode a new line of reduced instruction set computing-based products to increased revenue, which improved by 10% to $123.8 million. Profits were $14.9 million, up from $13.9 million last year.
- In the database market, **Sybase, Inc.** and **Informix Software, Inc.** chalked up strong results. Sybase pulled in $67 million in revenue, up 63%. Net income was $5.8 million, up over last year despite a charge for the acquisition of multimedia applications developer Gain Technology, Inc. Informix posted net income of $12 million, up from $5 million, and revenue of $68 million, up from $48 million.
- PC makers also fared well. The revitalized **Compaq** led the charge, with record revenue and solid profits (see story page 8). **Tandy Corp.** revenue rose 10.3% to $1.2 billion, with net income falling 23% to $32.1 million. **AST Research, Inc.** also showed increased revenue but lower profits, as did software company **Aldus Corp.**
- Profits with increased revenue came from networking companies **Network Equipment Technologies, Inc., Retix, General Datacom Industries, Inc., Chipcom Corp., Proteon, Inc.** and **NetFrame Systems, Inc.**

DEREK SLATER

Round 3

The third financial quarter left some high-tech giants battered and bowed, while others stood tall

Winners	Revenue	Profit	Notes
Apple	$1,770	$98	Spurred by PowerBook sales
Compaq	$1,067	$49	Record PC shipments
Stratus	$124	$15	Steady gains
Microsoft	$818	$209	Profits up 45% over Q3 1991
Informix	$68	$12	Profits up 58% over Q3 1991
Chipcom	$60	$6	Profits up 146% over Q3 1991

Losers	Revenue	Loss	Notes
IBM	$7,000	$2,780	Claimed market problem
DEC	$3,300	$261	Laying off 20,000 more employees
Amdahl	$589	$31	Laying off 9% of work force
Esasel	$8	$3	Operating loss and Enfin acquisition
Mentor Graphics	$78	$46	Restructuring charges
RasterOps	$25	$4	Declining revenue

CW Chart: Janell Genovese

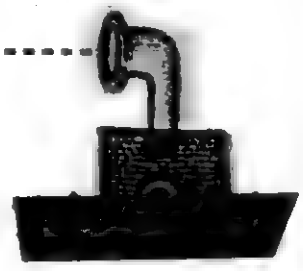
Wysiwyg

A DIFFERENT KIND OF RIGHTSIZING

The Boston Computer Society is holding its first demolition derby on Oct. 29 in Cambridge, Mass. For $5, participants get to take their frustrations out on old mainframes and minis by smashing them with a sledgehammer for five minutes. Proceeds go to the BCS Public Service Committee, whose volunteers help nonprofits with computer consulting.

ACHTUNG BABY

There's a new movie in Germany about the troubles the country is having teaching former East Germans how to turn on their computers. It's called **DOS Boot.**



KING 'IM

Marion Franklin Tinsley, the world checkers champion, beat the Chinook supercomputer in 15 out of 17 games.

OUR FAVORITE SAYINGS

Life's a batch

What kind of spool am I?

I think, therefore I LAN

Send in the clones

Pardon me, modem

Someday, my prints will come

BLOCK THAT METAPHOR

"Marilyn Quayle is more than Dan Quayle's wife; she is, to put it in terms that every computer user can understand, his back-up system, his fixed disk and (now) his spell-checker." — From *Working Woman*, October 1992

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

◆

CW Chart: Michael Siggins

The 5th Wave

"THERE! THERE! I TELL YOU IT JUST MOVED AGAIN!"

INSIDE LINES

As the disk turns

Microsoft Executive Vice President Mike Maples and IBM's Colin Powell Sr., who oversees OS/2 technical development, faced off at last week's ITAA software conference. "Mike's boss did promise last spring that when we made 2 million [units] in sales, he'd have all the applications there," needled Powell, who noted that IBM — Microsoft's former OS/2 partner — was halfway there with one million OS/2 sales. Maples said a "relevant" number would be 500,000 daily users of OS/2. "The fact that someone sells a lot of machines and bundles a lot of operating systems on it does not a relevant market make," Maples shot back. "That happens only when people power it on and use it and walk to their store and ask for copies of applications that'll run on it," he said. "When that happens, we will be there."

Promises, promises

IBM is still sticking to its promise that 1,000 OS/2 2.0 applications will be delivered by third parties by year's end, even though only 300 have shipped so far. That means 700 need to ship during the next 10 weeks. Lotus still plans to ship 2.0 versions of its applications by year's end, but some of the other big-name application suppliers are still noncommital. At the OS/2 Developers Conference last week in New York, Borland Chairman Philippe Kahn said that we can "expect some database engines" for 2.0, but he did not mention any plans for Quattro Pro.

Counting the code

IBM last week disclosed a mega-operating system deal with Price Waterhouse that calls for it to supply the accounting firm with about 15,000 copies of OS/2 2.0. This is the latest megadeal for Price Waterhouse, which earlier this year signed an agreement with Borland to supply it with multiple thousands of licenses of its software, including Quattro Pro for Windows.

Peanut butter in chocolate?

Larry Lang, Cisco's product manager for Asynchronous Transfer Mode (ATM), has confirmed that the router giant will make a statement of direction for its ATM interface at Interop next week and will aim to ship product by mid-1993. Cisco last summer said it intended to build a new router architecture based on ATM cell-switching technology [CW, June 29] but did not offer any milestone development dates. Lang, however, quelled former indications that a full-blown ATM switch is in the works, though he said a router card within an ATM switch has been broached within Cisco walls. "It's the Reese's Peanut Butter Cup discussion," he said. "Do you put the router in the switch or the switch in the router?"

When enemies are friends

IBM is said to be aggressively pursuing OEMs for its SLC chip. Even Compaq was tempted to go with the chips from its longtime rival but leveraged a darling deal from Intel to stay put, one source said. Others rumored to have significant interest in the SLC: Dell, AST Research, NCR and DEC.

Will they or won't they?

An IBM official last week said the company is "not sure" it will support Microsoft's Windows for Workgroups. It may instead come out with its own "native OS/2 2.0" workgroup offering. Details are few, but IBM said that if released, it would be "an add-on to the OS/2 environment."

No tricks, but plenty of treats

Toshiba is reported to be about to expand its T4400 high-end product line, adding two models with PCMCIA slots and passive-matrix color screens. It will also show its first pen system and some enhanced expansion station technology.

As massive internal changes occur at DEC, the company is trying to keep a tight lid on press leaks. Earlier this month, DEC security forces climbed up to the third-story apartment of free-lancer Kimberly Patch, who had written a story for The Boston Globe *that included information contained in "internal documents," and demanded that she return them. "I said that there was nothing to give back. They were obviously trying to be intimidating," Patch said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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BACHMAN

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TRMS - Report Management and Distribution.

JES-MASTER - Interactive JES Spool Analysis, Control, Viewing and Management.

ODDS/MVS - Unattended Operations, Master Console Management.

WALDO - For Automatic and Remote IPL of the Mainframe from a PC, using ODDS/MVS.

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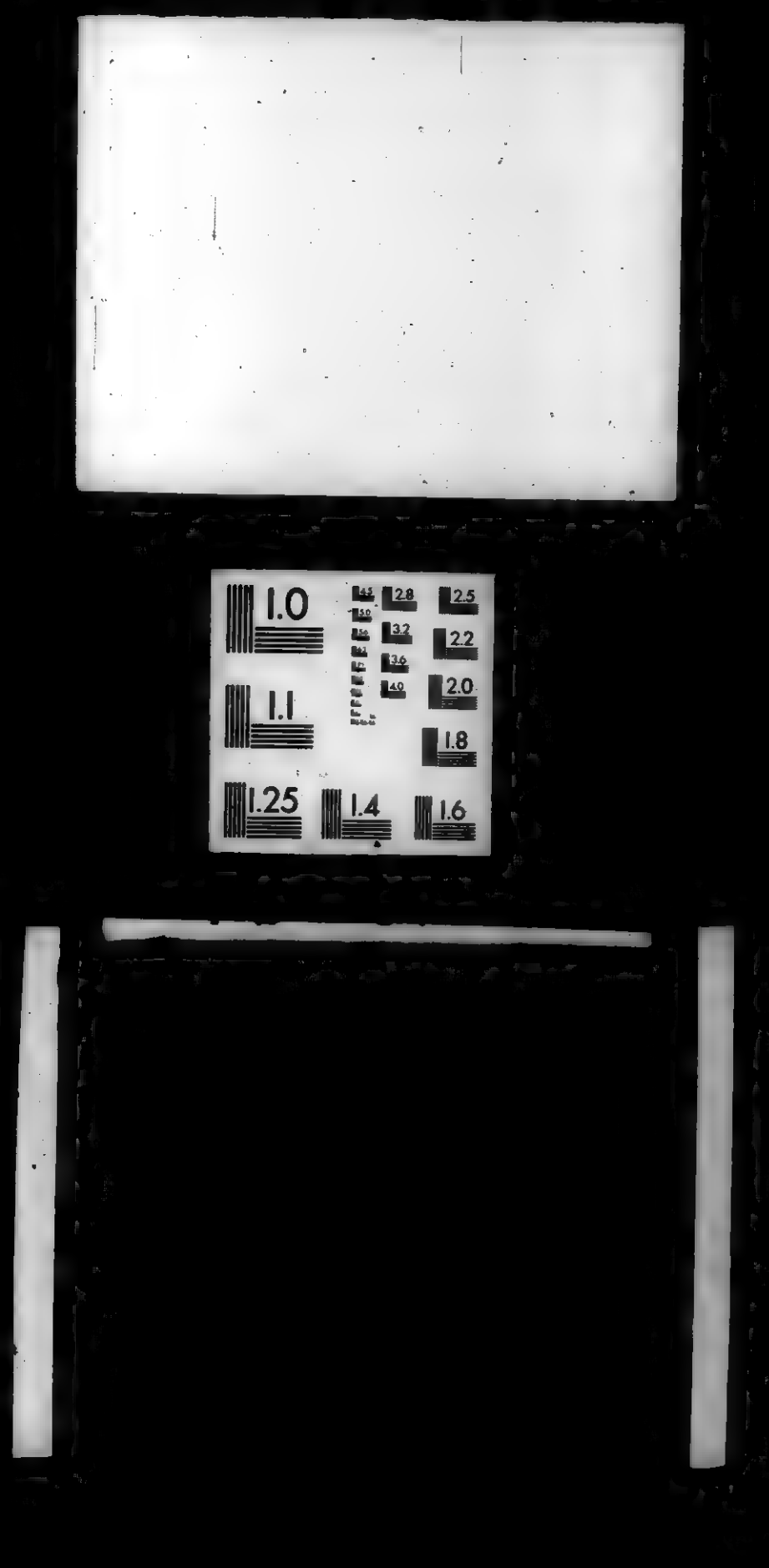
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COMPUTERWORLD

DEC restructuring takes form

Plan to focus on vertical industries, products and service business units

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is expected later this week to offer a glimpse into horizontal product, sales and services groups as well as vertical business units that it hopes will bolster its sagging fortunes, sources close to the company said.

DEC is said to be structuring product-specific business units along the lines of components, storage products, PCs and multivendor systems integration.

Industry-specific customer business units in the offing include discrete manufacturing, process engineering, natural resources (oil and gas), financial and professional services and consumer retail and communications groups.

Control services

Both types of organizations would be serviced by a horizontal group that is likely to include engineering, manufacturing, sales and services.

DEC has attempted to create industry-related business groups in the past, but they included a mishmash of products driven by engineering rather than customer concerns.

At least theoretically, the new structure will enable the business units to go outside DEC for products or distribution channels if that seems feasible or to use the services of horizontal groups within the company.

Chief Executive Officer Robert Palmer may discuss elements of the restructuring — in addition to accelerating layoffs and plant closings — at the company's annual meeting this week in Boston, sources said.

DEC announced last week that it will close plants in Bur-

Continued on page 20

USL closes in on distributed view

BY MARYFRAN JOHNSON
CW STAFF

SUMMIT, N.J. — As users grow increasingly impatient waiting for the Open Software Foundation's technologies to yield workable products for managing distributed networks, Unix System Laboratories, Inc. is quietly preparing to jump ahead of the competition.

Although no product has been announced, USL officials said last week that they plan to deliver, by next fall, source code to their Unix System V vendors for building a suite of system management tools called Distributed Manager for Unix System V, Release 4 (see story page 7).

End-user products built by USL licensees such as Siemens/Nixdorf Information Systems, Inc. are expected before the end of 1993 — some months ahead of the anticipated early 1994 delivery of the OSF's Distributed Management Environment.

"As long as [USL and OSF] stay compatible, this is great news for users. This is competition for DME where there's never been any before," said Norton Greenfield, director of Unix services at Computer Intelligence/Infocorp in Acton, Mass. "Talk about high drama — I think this will shake up the whole market."

OSF founding members IBM, Hewlett-Packard Co. and Digital Equipment Corp. are incorporating DME-based software components into future versions of

Continued on page 7

IS ponders fit for workgroup Windows

BY ROSEMARY CAFASSO
and CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — Microsoft Corp.'s first big pitch to the workgroup computing market could go far with small businesses and end users, but it was not scoring many hits with corporate information systems executives last week.

While several IS managers said Windows for Workgroups is compelling enough to deserve a closer look, they also said they were not yet sure how it would mesh with or add value to their networks and productivity tools.

"We are looking for workgroup technology, but we want to find something we could use companywide," said Joseph Herrin, director of systems development at Joseph E. Seagram & Sons, Inc. in New York. "This seems to be geared toward smaller workgroups."

Noting the concerns raised by some IS executives, a Microsoft official said the company was not surprised because "the benefits of the product are not that well-known yet."

"People are going to take some time to evaluate it," said Russell Siegelman, Windows for Workgroups product manager, adding that Microsoft

Continued on page 8

Slow motion

GUIs can make the desktop computing environment a friendlier place to work, but users gave their GUI products mediocre satisfaction scores in providing speedy performance

See Buyers' Scorecard, page 48

Product	Score
Sun's OpenLook	7.5
IBM's OS/2	7.3
Microsoft's Windows	6.9
OSF's Motif	6.9

Maximum possible score: 10

Bank revs outsourcing pact

BY MARK HALPER
CW STAFF

ATLANTA — Stung by bad commercial real estate loans and changes in processing costs, Bank South Corp. has restructured its 10-year outsourcing pact with IBM subsidiary Integrated Systems Solutions Corp.

The move is another indication that long-term mega-outsourcing deals signed in the late 1980s are bending to pressure from business changes brought on by the recession and corporate restructuring.

Another client, Hibernia National Bank of New Orleans, has restructured its accord to give IBM additional responsibility for software applications.

In addition, Eastman Kodak Co. and IBM are rapidly approaching a four-year marker calling for them to consider major changes — up to and including parting ways.

Bank South's case is typical of the hardship facing banks. Assets have fallen from about $5.5 billion to $4.8 billion over the course of the ISSC contract. In this time, it has also replaced top

Continued on page 20

A new world

Some changes at Bank South that prompted a restructuring of its IBM outsourcing deal:

- Processing has increased even though the size of the bank has decreased.
- Cost-of-living increase projections were too high.
- Bank is implementing distributed processing and wanted to tap other vendors for products and services.

Standards fights vex users

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — With the words "openness" and "standards" on their lips and competition in their hearts, vendors last week sallied forth to win users' approval at the Interop '92 and Electronic Mail Association conferences.

Openness and standards mean different things to different industry sectors. There is one thread of consistency, however: Every vendor that professes to support open standards wants its own approach to dominate.

–For example, the Internet, minicomputer, mainframe and PC local-area network communities have their favorite network protocols and are ill-disposed "to play, technology-wise and business-wise, with each other," said Craig Burton, president of The Burton

Continued on page 15

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INSIDE

Wayne Bell of Dr Pepper/Seven-Up pushes portables, groupware to speed sales and better track inventory depletion. Page 6.

Unix CASE to get boost via Andersen/HP client/server accord. Page 4.

Lotus' Jim Manzi outlines E-mail coexistence. Page 14.

Product Spotlight — There's more than one kind of work-flow software. Page 85.

EXECUTIVE BRIEFING

November 2, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

DISTRIBUTED COMPUTING

COMPETITION HEATS UP in distributed systems management, where **Unix System Laboratories** is vowing to help its Unix System V, Release 4 vendors get to market with standardized products ahead of **Open Software Foundation** founders **IBM, HP** and **DEC**. *Page 1*

IBM'S MAINFRAME CUSTOMERS are looking elsewhere for distributed database solutions, citing corporate strategies that require answers that are not based on big iron and the lack of third-party support for IBM's distributed database architecture. *Page 4*

OUTSOURCING

BANK SOUTH, a charter **IBM** outsourcing customer, has renegotiated its 10-year deal to lower costs and give it more leeway to use non-IBM gear as it launches its own re-engineering project driven by a distributed computing design. *Page 1*

SUPER ENGINEERS

"SUDDENLY, SOMEBODY SAID, 'Hey, what if we tried this . . . ?' " That comment, by **Novell** chief scientist **Drew Major**, describes the moment of discovery scientists experience in the course of their careers — if they're lucky. Major and five other scientists from **Apple, IBM, TI, NCR** and **Sun** are driving the breakthrough thinking in vendor companies. Their work targets virtual reality, nanotechnology and intelligent networks, among other areas. *Page 93*

MANAGEMENT

IS HEADS FED UP with skyrocketing software purchase and maintenance costs are pressuring vendors to adopt new pricing schemes. Many are also practicing software asset management and other techniques to keep software costs down. *Page 99*

THE U.S GENERAL ACCOUNTING OFFICE is debating when the plug should be pulled on an IS project that is clearly failing. *Page 103*

IS MANAGER Jeff Olszewski considers the difficulty of managing staff stress in these tough times. Let people vent a certain amount of frustration, and don't make your stars shoulder all of the burden, he advises. *Page 33*

INFORMATION SECURITY PROFESSIONAL Howard Glassman cautions downsizing enthusiasts not to forget that applications running on smaller platforms also need to be secured and supported. *Page 33*

TO BE SUCCESSFUL IN IS, get out of it for a while, advises Gerry Long of **Summit Information Systems**. He says you can gain a better cross-functional perspective by playing the role of the user. *Page 109*

PC HARDWARE

HAVING FOUND a name for its next-generation chip, **Intel** outlines its plans for 25 power-efficient 1486 models. *Page 37*

NATIONAL SEMICONDUCTOR aims at the business market with a multifunction communications card. *Page 38*

ASKING THE RIGHT QUESTIONS when ordering by mail saves more than money. Tops on the list: Does the advertised price buy a complete system? How quickly are replacements sent? Will it use generic parts? *Page 114*

ENTERPRISE NETWORKING

▶Users' dreams of interoperability remain distant as vendors escalate standards wars at Interop '92. *Page 1*

▶**IBM** moves toward a more open, affordable and TCP/IP-friendly version of its Advanced Peer-to Peer-Networking. *Page 14*

▶Financial services firm **J. P. Morgan** fills in the domestic LAN interconnect portion of its telecommunications outsourcing plan with frame-relay services from **CompuServe**. *Page 57*

▶Users get their choice of methods for integrating TCP/IP and SNA installations. *Page 57*

▶Banks continue to invest heavily in telecommunications projects, although they're beginning to reallocate how much they spend on leased-line vs. public networking. *Page 60*

▶Sun adds ISDN, frame relay and PPP products for its SPARCstations. *Page 64*

▶Systems managers are ready to implement integrated network management systems despite a lack of standards. *Page 64*

▶**MCI** announces what is said to be the first SMDS offering from a long-distance carrier. *Page 16*

ELECTRONIC MAIL

▶**Lotus** Chairman Jim Manzi grudgingly moves closer to **Microsoft**'s E-mail spec but buries the good news in a scathing indictment of Microsoft. *Page 14*

▶Users at last week's **Electronic Mail Association** conference were encouraged that the warring E-mail API camps are calling a truce but cited other messaging hurdles as more relevant. *Page 14*

▶Wireless global messaging kicks off for mobile users, and **Lotus** reveals some of its plans for a wireless CC:Mail gateway. *Page 16*

What is this man doing?
See page 12

▶Work-flow software can reduce the application backlog, minimize requests for changes and give you a voice in your company's business. *Page 85*

PC OPERATING ENVIRONMENTS

▶Some IS executives are not sure Windows for Workgroups will be a good fit with their networks and productivity tools. *Page 1*

▶**IBM** says it is considering an OS/2 for workgroups for release next year. *Page 8*

▶Windows goes to Wall Street to drum up some support from the financial community, indicating **Microsoft**'s increasing desire to be taken seriously in vertical markets. *Page 8*

▶Sun's OpenLook tops user satisfaction ratings of GUIs, while Windows and OS/2 receive virtually the same overall score but have strengths in different areas. *Pages 48, 49*

▶Users seem to like **IBM**'s concept of a streamlined OS/2 2.0 but only if the operating system is losing fat, not function. *Page 37*

PORTABLE COMPUTING

▶Under pressure, **Toshiba** pushes to regain the lead in the 486 notebook market and plans a pen-based machine. *Page 12*

▶**Dr Pepper/Seven-Up** aims to arm its field personnel with groupware-equipped laptops to protect its shelf and tap new turf. *Page 6*

▶Olivetti will use Comdex/Fall '92 to show a subnotebook that lets users record voice messages. And **Toshiba** may show notebooks with built-in paging capability. *Page 39*

▶**Gateway's** Nomad and **Compaq's** LTE Lite/25 PC notebooks receive generally good reviews with minor criticisms of Nomad's use of plastic and the LTE's battery life. *Page 44*

▶**AT&T** is pushing low-power, high-performance chips aimed at mobile voice and data systems. *Page 41*

APPLICATION DEVELOPMENT

▶**Andersen Consulting** and **HP** enter the Unix CASE ring with the first module of an integrated workbench for building client/server applications. *Page 4*

▶**Sybase** creates a tools division, tries to forge a new generation of object-oriented products. *Page 75*

▶**Microsoft's** Visual Basic deserves a closer look from professional programmers, columnist Jesse Berst says. *Page 41*

▶A new **Smartstar** client/server development tool reduces SQL coding by up to 90%, users say. *Page 75*

▶Tool-maker **Centerline Software** has added C++ and other features to its ObjectCenter workbench. *Page 77*

▶An automated library for reusable software is now available for the commercial sector. *Page 76*

Mainframe software
• Legent outlines plans to make its desktop products more flexible and interoperable. ..... Page 12
• Information Builders unveils a smaller, less expensive way to start an information warehouse. ..... Page 70
• Stratus holds firm — for now — with product transitions, as the fault-tolerant market softens. ..... Page 67

Unix
• Pacific Gas & Electric develops an integrated set of disaster management applications on Unix workstations, including some tentative plans to roll them out on both X Window System PCs and Unix servers. ..... Page 51
• A new tool designed to port AS/400 applications to Unix is not expected to lure many migrators. ..... Page 68
• MathWorks and a German vendor of real-time hardware have joined forces to take some of the risk and uncertainty out of mechanical design. ..... Page 52

LANs
• The Canadian elections agency served up 295 LANs in seven days while preparing for last Monday's elections. The trick was superior organization and stable LAN technology. ..... Page 10
• Novell's System Fault Tolerant NetWare makes IS managers more comfortable about NetWare for strategic systems. ..... Page 51

Midrange computing
• IBM midrange software maker Marcam takes control of Mapics, IBM's top-selling but faltering manufacturing system. ..... Page 4
• Concurrent comes back from a painful restructuring with nearly four dozen new fault-tolerant products. Its users say they like what they see. ..... Page 24
• While they charge into the open systems world, with Unix, Hewlett-Packard officials are taking great care not to alienate the loyal HP 3000 users. ..... Page 67
• Wang Labs' annual users conference allows presentations from non-Wang vendors for the first time, while the bankrupt firm pushes imaging technology. ..... Page 70

Industry
• DEC closes two factories and brings together plans for structural changes and better focus. ..... Page 1
• HP's Lew Platt takes the helm this week looking to maintain mini and workstation momentum while pumping up PCs. ..... Page 121
• The Ask Co.' new CEO becomes president of the Ingres database division and says he wants to speed up a makeover of Ingres' sales and marketing. ..... Page 24
• Editor in chief Bill Laberis examines the Computer Associates enigma. ..... Page 32

Departments

Advanced Technology 28
Application Development ... 75
Buyers' Scorecard 48
Calendar 103
Company Index 119
Computer Careers 107
Computer Industry 121
Desktop Computing 37
Editorial/Viewpoint 32, 33
Enterprise Networking 57
Friday Stock Ticker 120
In Depth 93
Inside Lines 122
Large Systems 67
Management 99
Marketplace 114
News Shorts 6, 16
Product Spotlight 85
Technology Analysis 44
Health Watch 122
Workgroup Computing 51

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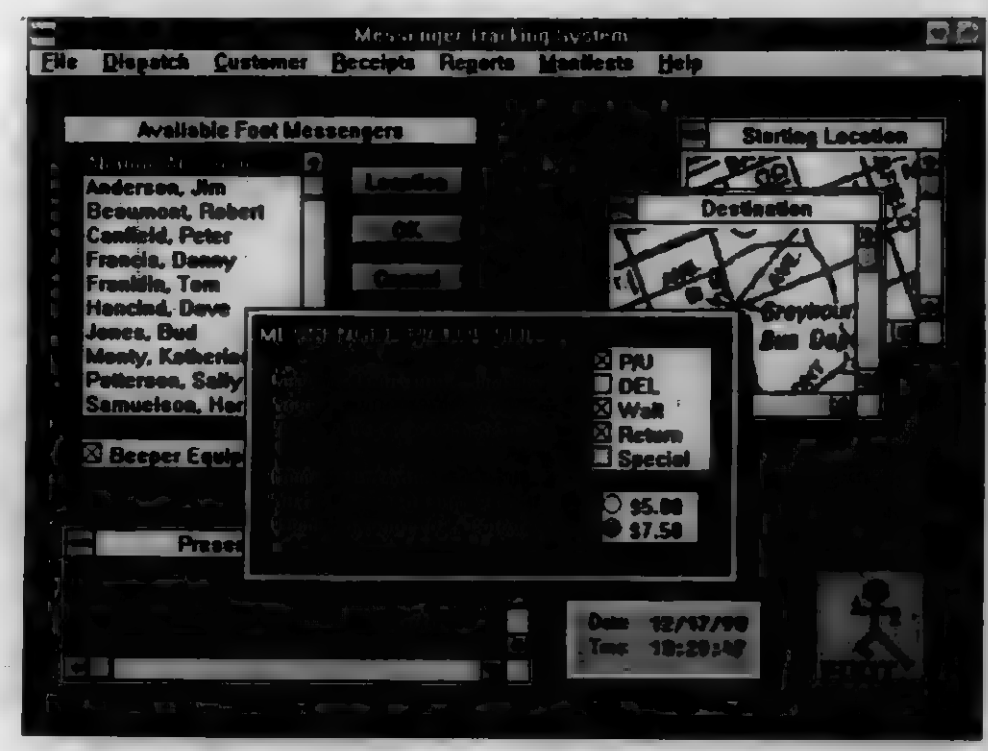

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Marcam to market IBM Mapics

BY KIM S. NASH
CW STAFF

HYANNIS, Mass. — Big-time IBM midrange software maker Marcam Corp. is about to get bigger, but the expansion could be pricey and could come at the expense of corporate control.

The $70 million company last week agreed to give IBM 20% of its 8 million outstanding shares of stock in return for worldwide responsibility for the midrange version of Mapics, IBM's market-leading manufacturing package.

Marcam will have to make additional payments to IBM of undisclosed sums based on Mapics' future profits. Plus, IBM gets a seat on Marcam's six-member board.

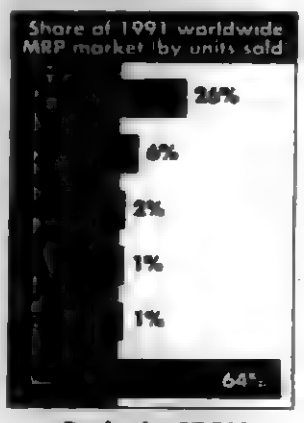
"The question is whether Marcam has bitten off more than it can chew," said Bill McSpadden, chief executive officer at Plantwide Research Group, a manufacturing market research firm in North Billerica, Mass. More than 20,000 users worldwide run Mapics, and Marcam "isn't used to dealing with an installed base that large," he said.

Marcam already peddles its own package, Prism, which is aimed at the process manufacturing market, such as chemical and pharmaceutical firms. Mapics, meanwhile, caters to industrial companies such as consumer goods makers.

Mapics users aren't likely to be affected immediately, as IBM will continue to support them. However, Marcam will take over further development of the decade-old product line, likely adding process-oriented features.

Blue's image

IBM's Mapics commands 26% of a market that's divided by nearly 500 vendors



Jerry Goldman, computer-integrated manufacturing project leader and MIS director at Sybron Chemicals, Inc., was enthusiastic about the deal, which is subject to Marcam stockholder approval. Extensive process manufacturing tasks could be worked into future versions, Goldman said.

Right now, the Birmingham, N.J.-based company relies on a third-party firm to add process tasks to Mapics, but Marcam's expertise in this area might materialize in Mapics down the road, he explained.

Marcam Chairman Paul Margolis agreed, saying, "We're going to drive [Mapics] as a strategic offering."

IBM drew $60 million in Mapics license fees last year, but profits from the line have dropped off significantly during the past few years, according to analysts. "There are tons of other smaller software makers that are continuously adding features to their products. IBM couldn't keep up," said John Borelli, computer-integrated manufacturing analyst at Gartner Group, Inc. in Stamford, Conn.

Bob Williams, vice president of IBM's worldwide industrial sector division, said Mapics "customers will be better served" under this setup, with Marcam in charge of development.

The package fills a hole in Marcam's product line that prevented it from competing with other System/3X and Application System/400 software makers, including System Software Associates, Inc. in Chicago and Pansophic Systems, Inc., which is now part of Computer Associates International, Inc.

HP, Andersen offer CASE tools for Unix

BY KIM S. NASH
CW STAFF

CHICAGO — Hewlett-Packard Co. and Andersen Consulting confirmed plans to announce this week a computer-aided software engineering (CASE) workbench designed to build client/server applications for commercial Unix systems.

Unix CASE is already jumping, with companies such as Intersolv, Inc. in Rockville, Md., and Smartstar Corp. in Goleta, Calif., recently rolling out client/server generators for Unix platforms.

"This is the next big wave, and it's a wave users want," said Tony Picardi, an analyst at International Data Corp. in Framingham, Mass. Many traditional CASE vendors are trying to reposition themselves as the number of pioneers gutsy enough to adopt the first round of Cobol-oriented CASE products shrinks, he said.

Not the last deal

Andersen and HP officials said last week that the joint development and marketing deal is the first of several such partnerships. The company said it will team with other Unix systems vendors, including Digital Equipment Corp., in agreements soon to be announced.

The new product line is not based on HP's Softbench framework for Unix development but is anchored by Andersen's Foundation for Cooperative Processing (FCP) tool set. Andersen has several client/server success stories under its belt with FCP, "so it makes sense for HP to want to take advantage of that," Picardi said. The state of North Carolina, for example, is using FCP to construct several statewide systems to run in client/server mode [CW, Sept. 28].

Florida Power Corp. is beta-testing Foundation HP/UX Server Option, the first module in the line, due to ship in first-quarter 1993. Server Option was designed to generate client/server applications for HP 9000 Series 800 servers. The St. Petersburg, Fla.-based utility is almost one year into a three-year, $48 million project to migrate 20-year-old mainframe-based applications to a client/server platform.

A starter kit with the product and training will be priced at $50,000.

Companies such as The Brick Warehouse Corp. may be interested in the tool set. The furniture retailer in Edmonton, Alberta, has been looking for months for an integrated workbench for building Unix systems, according to Robert Gauf, manager of MIS research and planning.

Gauf said he has experimented with Teamwork from Cadre Technologies, Inc. and Software through Pictures from Interactive Development Environments, Inc. but ran into trouble integrating them with existing IBM PL/1 and Oracle Corp. systems. If he decides to halt that effort and rebuild applications from scratch, "any tool we choose will have to have a global repository and be able to generate applications from the bottom up. If not, it's not worth anything to me," he added.

Lack of DRDA support sends IBM users elsewhere

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — Some of IBM's mainframe customers are looking elsewhere for distributed database solutions, citing corporate strategies that require answers not based on big iron, as well as the lack of actual third-party support for IBM's distributed database architecture.

That architecture — the Distributed Relational Database Architecture (DRDA), introduced in June 1990 — was intended to allow people to access relational database management systems from IBM and others. Some 25 third-party vendors have promised to support DRDA, although only a handful have actually implemented it. Four IBM database products — DB2, SQL/DS and the database managers in OS/2 and OS/400 — support DRDA in implementations delivered this year.

But DRDA does not appear to be catching on in all 5,500 or so DB2 shops. "We have no need for DRDA because all our new database development will be on Unix platforms," said Monica Simpson, database manager at BASF Corp. in Parsippany, N.J. "Open systems is our direction." At this point, IBM lacks an RDBMS for its AIX version of Unix.

Although some of BASF's corporate data will continue to reside in DB2 for a while, "most of our major production systems are in IMS and VSAM," Simpson said. She said the search is on to replace the corporate decision support system, now under DB2, with a Unix-based product.

Likewise, the Salt River Project in Phoenix is looking for DRDA alternatives, said John Chatfield, senior principal analyst. "The issue is that only a couple of vendors have any real products that use DRDA. We have Oracle and Sybase and other products that we need access to, and some of the other distributed database architectures, including Microsoft's, have some real products that meet these needs."

That is an issue for other customers as well, observers said. "The power tools that people are using to develop database applications are all on Windows," said Chris Bird, president of Model Systems Consultants, Inc. in Stamford, Conn. "IBM is hurting because they didn't foresee that clearly enough," and DRDA is losing steam as a result.

At a glance

IBM's Distributed Relational Database Architecture (DRDA)

Introduced: June 1990

Goal: To help users access relational data in IBM and other databases.

Status: Some 25 vendors have promised to support DRDA, with 10 actually licensing the technology, but so far only one has introduced a product that incorporates the architecture. IBM began delivering DRDA functionality in some database releases this year.

CW Chart: Janell Genovese

Stick to their guns

But IBM managers defended the tack they are taking with DRDA, saying it is becoming better accepted and that it is technically superior to other available database connections.

Some 10 vendors including Ingres Corp., Oracle Corp., Novell, Inc., Borland International, Inc. and Informix Software, Inc. have licensed DRDA and have promised to build the specifications into their products. So far, however, only XDB Systems has delivered a DRDA product. But Object Technology International, Inc. is slated to do so later this month.

About 15 other software vendors have said that they will introduce applications that are DRDA-capable, although these vendors have not licensed DRDA.

"Major players have said they will adapt our protocols," said Don Haderle, IBM's director of strategy and architecture in the enterprise database solutions group. "If this thing had fallen flat, we'd be having a different conversation."

He added, "It's not just about database access. You can already buy gateways to connect into DB2 from the workstation, but the question is the overhead that those gateways require. We're trying to provide a standardization, a common protocol, so customers have fewer things to manage rather than more."

Still, Chatfield said, "The question is: What is real, and what is real in the near time frame?"

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY
MORE THAN 50 LINES OF CODE

```
/* as before if anyone fails then abort all, otherwise commit */
two-phase()
{
/* open up two servers and a commit service */

   dbproc_server1 = dbopen(login, databasename1);
   dbproc_server2 = dbopen(login, databasename2);
   dbproc_commit = open_commit(login, NULL);

/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/

   commid = start_xact(dbproc_commit, application, "my_xact", 2);

/*
** build transaction name and begin transactions on different
** servers
*/

   build_xact_string("","" commid, xact_string);
   dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s",
   xact_string);
   dbsqlexec(dbproc_server1);
   dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s",
   xact_string);
   dbsqlexec(dbproc_server2);

/* perform various updates and then.... */

/* if there is a failure on one abort all of them */

   if (return_code == FAIL)
   {
      abort_xact(dbproc_commit, commid);
      dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server1);
      dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
      return_code = dbsqlexec(dbproc_server2);
      if (return_code != FAIL)
      {
         remove_xact(dbproc_commit, commid, 1);
      }

   dbexit();
   exit(ERREXIT);
   }

/* otherwise prepare to commit */
dbcmd ( dbproc_server 1, "PREPARE TRANSACTION");
dbsqlexec (dbproc_ server 1);
dbcmd (dbproc_ server 1);
dbcmd ( dbproc_server 2, "PREPARE TRANSACTION");
dbsqlexec ( dbproc_ server 2 );
```

SYBASE code example from A Guide To SYBASE and SQL Server by D. McGoveran with C.J. Date. ©1992 Addison-Wesley Publishing Co., Inc. Reprinted with permission.

AUTOMATIC AND STANDARD
ONLY 7 LINES OF SQL

```
UPDATE SAVINGS
SET S_BALANCE = S_BALANCE - 250.00
WHERE S_DEPOSITOR = 'JONES';

UPDATE CHECKING
SET C_BALANCE = C_BALANCE + 250.00
WHERE C_DEPOSITOR = 'JONES';

COMMIT WORK
```

It may sound incredible, but, some early client/server databases, like SYBASE, don't automatically ensure the consistency of distributed transactions.

With SYBASE, when a single transaction must update related data on multiple servers, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications. It's costly and it's risky.

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NEWS SHORTS

Confirm suit goes to mediation

A Texas judge last week assigned one of the lawsuits in the Confirm reservation system debacle to mediation. The suit, brought

by AMR Information Services, Inc., was assigned to Dallas-based mediator Harlan Martin. The judge set an Oct. 4, 1993 trial date in case mediation fails. AMR's suit alleges that its partners in the bungled Confirm project — Marriott Corp., Hilton Hotels Corp. and Budget Rent A Car Corp. — withheld funds, missed deadlines, made poor staffing assignments and, in some cases, withdrew from the project in violation of their contract. Meanwhile, the lawsuits keep flying around Confirm's remains. Last week, a former Amris employee, Rob Geller, sued AMR, AMR Chairman Robert Crandall, AMR information systems chief Max Hopper, former Intrico Vice President Charles Biebighauser, and the Intrico partners, for defamation. Geller claims the defendants smeared his name and made disparaging remarks to his new employer, MCI.

Ex-IBM exec joins Synon

Former IBM general manager Richard Goldberg is expected to join Synon Corp. this week. He will oversee daily operations worldwide. Goldberg, who took advantage of IBM's early retirement program in July, comes to Synon two months after IBM took a 10% equity stake in the $50 million Larkspur, Calif.-based application development firm. William Grabe, a partner in venture capital firm General Atlantic and a former marketing executive at IBM, will become co-chairman along with Chris Herron, a Synon founder.

Microsoft to use CDDI

After 18 months of industry talk about putting 100M bit/sec. Fiber Distributed Data Interface technology over copper wiring, Microsoft Corp. has announced plans for a significant "Copper-DDI" network. The vendor said last week that it will leverage Crescendo Communications, Inc. adapter cards and concentrators to link desktops to critical Intel Corp. 1486-based servers clustered in the corporate data center.

Mac gains network connections

Apple Computer, Inc. announced pricing and availability for products that connect the Macintosh over a wide range of networks. AppleTalk Connection for Macintosh is said to include data link drivers for LocalTalk, Ethernet, Token Ring and AppleTalk networks. TCP/IP Connection for Macintosh is said to provide all software needed to put a Macintosh on a Transmission Control Protocol/Internet Protocol network. Both products include an agent that enables them to be managed by Simple Network Management Protocol systems, Apple said. Availability is scheduled for spring 1993.

Short takes

Oracle Corp. late last week revealed that it had shipped initial copies of its next-generation relational database management system, Oracle 7. The product, which debuted June 15, had been expected at select customer sites in October. Volume shipments are expected early next year.... **Northgate Computer Systems, Inc.** will offer a five-year warranty on its new line of servers and disk arrays.... **AT&T and Go Corp.** said Go Mail users will now be able to link to AT&T Mail through AT&T EasyLink Services.... **NEC Technologies, Inc.** lowered prices on several of its UltraLite notebooks and PowerMate Express desktop systems by up to 41%.... **AST Research, Inc.** cut prices by up to 31% on its Bravo line of low-cost PCs. Base price is now $1,400 for a 486-based system with a 120M-byte hard drive and a monitor.... **Advanced Logic Research, Inc.** introduced the PowerFlex Flyer/SmartLine family of low-end desktop computers starting at $799. The line is aimed to compete with **Compaq Computer Corp.**'s ProLines and **IBM**'s Personal System/ValuePoint lines.... **NCR Corp.** shipped its first low-cost PC, the 3225. Based on the AT bus and a 25-MHz 80386SX processor from Intel, a base model including an 80M-byte hard drive will cost $967. The machine represents the first in NCR's line of low-cost PCs.

More news shorts on page 16

Adding portables to the pop

Dr Pepper/Seven-Up hopes to beef up selling time with groupware, laptops

BY JOANIE M. WEXLER
CW STAFF

DALLAS — The Dr Pepper Co./Seven-Up Co. has set its sights on becoming the first soft-drink maker to equip its entire field sales and marketing staff with portable PCs sporting customized groupware applications.

The project is aimed at beefing up the amount of time field personnel spend selling and allowing them to resolve inventory depletion and other issues immediately in the high-turnaround industry, said John G. Stevenson, vice president of information systems.

John Stevenson *hopes reps will be more responsive*

The project will center around a suite of customized groupware applications jointly produced by Dr Pepper/Seven-Up and either Lotus Development Corp. or Data One. The soft drink maker has already done preliminary development work with both vendors for a prototype presentation to be made to a Seven-Up automation committee in December.

While the project's green light still hinges on the prototype, high-level backing means "the chances are very good" that an eight-person pilot will roll out early next year. The pilot will involve sales reps running the gamut of computer literacy, said Wayne L. Bell, manager of information services. The full 280-user project is slated to kick in by year-end 1993.

The Seven-Up side of the $620 million company has gained the sponsorship of Seven-Up Chief Operating Officer Francis Mullin and Senior Vice President of Bottle/Can Sales Robert Quirk for a pilot laptop program to begin early next year, Bell said.

Support from top executives is apparently driving many large information systems projects. A recent study of 150 companies by Houston-based consultancy Currid & Co., for example, determined that nearly all successful IS projects are championed by non-IS high-level executives, noted Currid President Cheryl Currid.

Mike Cunningham, MIS supervisor at Dr Pepper/Seven-Up, said his staff examined other soft drink companies, and "we saw a lot of handheld units used by full-time auditors for gathering trucking route information. But there wasn't much automation for the reps."

Dr Pepper/Seven-Up has a big incentive to strive for technical innovation with laptops and other technologies such as electronic data interchange (see story below): It is a middle-size soft drink player without the marketing clout of the cola kings to guarantee its presence on store shelves and restaurant taps.

To protect its turf, Stevenson said he intends for the program to "turn the stacks of paper reps carry around in the trunks of their cars into Shake 'n' Bake analysis tools," allowing sales reps to be more responsive and inciting distributors and bottlers to continue doing business with them.

Currid, who was formerly director of applied information technology at Coca-Cola Foods, said "it sounds like Dr Pepper is doing this right."

Currid noted that the soft drink industry is "traditionally slow on the technology wave because of its distribution model. You can't manage what you can't measure."

She explained, for example, that because soda is purchased from local distributors instead of directly from sales representatives, it is difficult for an individual rep to know what he has sold.

Emphasis on action

Some groupware applications under construction at Dr Pepper/Seven-Up are aimed at allowing salespeople to act on information while a promotion is in progress instead of reacting later. For example, "sales managers are saying their people are continually getting hammered on an out-of-stock condition during a promotion. That's like death for a field guy," Cunningham said.

One time-relieving goal is the automation of about 200 reports that salespeople currently have to deal with manually, Bell said.

Paperwork is a common productivity-inhibitor for sales representatives in the consumer products industry, Currid said. "It is not uncommon for a salesperson in this industry to spend 20% of his time on administration," she said. "In fact, many will take Fridays off just to do their reports."

After the Seven-Up rollout, "we'll tackle the Dr Pepper side," Bell said. He explained that both companies continue to be run as separate operations despite their late-1980s merger.

Cunningham would like to see the solidification of laptop standards for form factors, external bus, docking stations, batteries and adapters before deciding on a hardware vendor.

"We need to protect the company's investment; we see about a 20% turnover in PCs each year," he said. "The soft drink maker is considering pen-based technology because of its ease of use for spot checking bottles and recording information on the fly."

Sign on the dotted line

Dr Pepper/Seven-Up is facing a possible legal glitch with one of its most strategic technology projects today: getting electronic data interchange (EDI) procedures in place with its 700 bottlers and other distributors.

An issue surrounding the validity of electronic signatures on credit-card-like receipts for deliveries is confounding the currently 5% EDI-ready company as it embarks on a major expansion of its electronic exchange of business documents, said Wayne L. Bell, manager of information services.

"We need to find a mechanism to make that electronic document as legally binding as that signature on the paper document," he said.

The issue is imminent for the major EDI initiative that Dr Pepper/Seven-Up has undertaken with Pepsi, one of its distributors, that is slated to kick in next month.

The two companies intend to automate roughly 400,000 paper transactions a year, Dr Pepper/Seven-Up said. Currently, the company is recruiting the assistance of its legal department to help resolve the signature validity issue, Bell said.

Dr Pepper/Seven-Up said it intends to be up on EDI with distributors in 21 sales territories by the end of the first quarter of 1993 with about 30%, or 2.5 million, transactions on-line. John G. Stevenson, vice president of information systems, said the quicker cash flow and rebate system EDI documents afford will give distributors extra incentive to continue doing business with the company.

STEFANIE MCCANN

USL closes in on distributed view

CONTINUED FROM PAGE 1

products, such as IBM's NetView/6000, HP's OpenView and DEC's MCC Director.

"We expect to be delivering real products and applications before OSF, but we are looking to be sure we don't split the industry," said Richard Bevis, a USL marketing manager. "The work OSF is doing is ground-breaking and will help everyone."

Compatibility is clearly the crucial factor for users, said Steven Jenkins, a member of the OSF's end-user steering committee and a software architecture engineer at the Jet Propulsion Laboratories in Pasadena, Calif. "If this USL product is going to be DME-compliant, then that's great. The last thing we need is competing de facto standards."

Based on Tivoli Systems, Inc.'s Management Environment, USL's Distributed Manager will offer an integrated set of applications for managing basic system resources such as licensing, system and storage device monitoring and network distribution of software updates. The USL licensees — none of which have yet publicly committed to the product — will have the option of offering either various pieces of Distributed Manager or the entire package.

"What USL is doing is getting a product that works to market sooner," said Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif. "At least it's something people can start building on."

A coherent, standardized approach to systems and network management has long topped the wish list in the open systems user community. Yet even the most ardent supporters of the OSF's efforts are weary of waiting for useful products.

"You can only talk about how neat something is going to be for so long, and then you have to deliver something," Jenkins said.

Analysts said USL, a onetime rival Unix camp and now a cordial ally of the OSF, is taking a different approach to the same problems DME hopes to solve. As long as USL adheres to the specifications and standard interfaces that define DME, analysts said, there should be no problems connecting with future DME products.

However, the OSF views the rival product as nothing more than "a step toward DME," said Jon Gossels, a business area manager at the Cambridge, Mass.-based OSF. "They're getting to market with a different product. It's not multivendor, heterogeneous integrated management like DME."

An initial drawback to Distributed Manager will be its capability to manage only System V, Release 4 Unix systems instead of a mixture of Unix and non-Unix platforms. However, USL officials stressed that they will "actively pursue" opportunities to port the software to other platforms. The reference platform for Distributed Manager is an Intel Corp.-based PC running System V, Release 4 Unix.

Bevis said USL also plans to ensure integration of Distributed Manager with management software applications and network operating systems already in place at information systems shops.

A significant difference between Distributed Manager and DME is that USL's offering does not require installation of the OSF's Distributed Computing Environment (DCE) as an underlying platform. DCE can be thought of as basic network plumbing, while DME is more like the sink and cabinets that make use of the underlying pipes.

"We're both addressing the same user problems: how to manage distributed systems and get user service levels to where they should be, at an acceptable cost," Bevis said. Gossels cautioned that the lack of a DCE base means Distributed Manager cannot interoperate with DME. Bevis agreed but stressed that USL plans to add DCE support (and thus DME compatibility) to a later release of Distributed Manager.

One-upmanship

USL's Distributed Manager for Unix System V, Release 4 will integrate applications from several partners:

Host management: Tivoli Systems

License management: Gradient Technologies, Inc.

Distributed software installation: Unisys Corp.

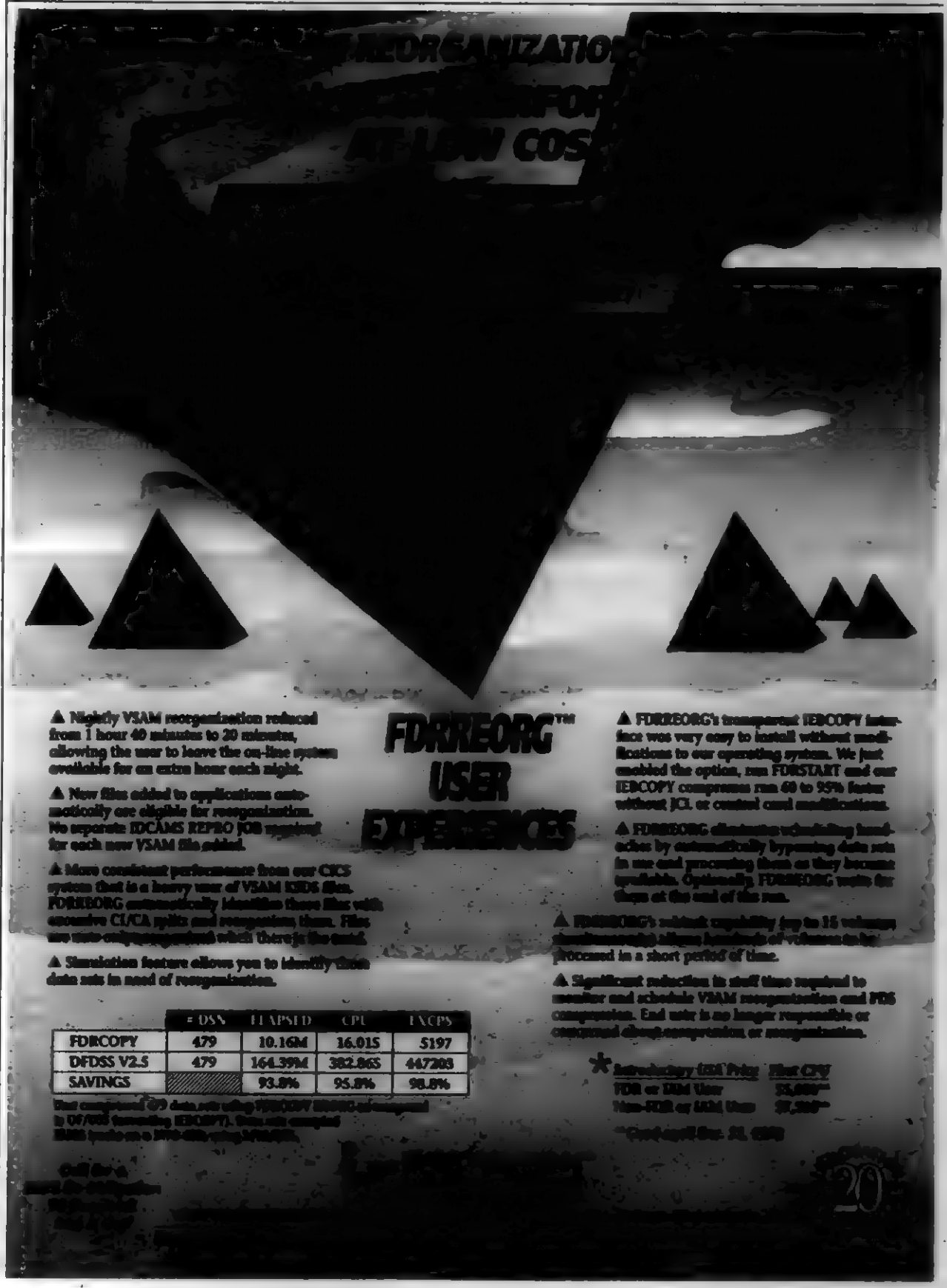
Print spooling and management: Siemens/Nixdorf Information Systems, Inc.

Storage device management: Pyramid Technology Corp.

User and group management: Pyramid Technology

Backup/restore: No partner yet

- Source code available to USL licensees next fall, with end-user products expected by the end of 1993.
- Pricing expected at about $30,000 for midrange systems.



IS ponders fit for workgroup Windows

CONTINUED FROM PAGE 1

expects a typical evaluation process to last six to nine months. "It is a new concept," Siegelman added. "It doesn't easily fit into a category like other products."

Microsoft appears to be taking a two-pronged approach to marketing the product, both as an entry-level network environment for small businesses and as an easy way for larger companies to attach Windows workstations to existing networks. Customers with such networks would also gain the benefit of features such as Network Dynamic Data Exchange, according to Microsoft.

At first glance, Windows for Workgroups — with its basic peer-to-peer networking functions, low upgrade prices and the everything-in-one-box packaging — seems targeted primarily at small groups or individuals. The starter kit includes 25 feet of cable to create a Windows for Workgroups network.

Ann Palermo, director of workgroup and messaging systems research at International Data Corp., said that while Microsoft is aggressively pursuing corporate business, Windows for Workgroups seems more "a good product for a small office."

"If you have an electronic-mail system installed, or you're networked already or your workgroup is beyond a handful of people, and you have multiple LANs and sites, the Windows for Workgroups alone is not for you," Palermo said.

"Would a Novell user dump their LAN? No," Palermo added. "Would a CC:Mail user dump their E-Mail? No. It is an option for mail and networking in some situations, particularly small workgroups."

Some IS executives said they already have a number of the functions that Windows for Workgroups offers. The software, based on Microsoft's Windows 3.1, provides basic peer-to-peer networking functions, Microsoft Mail and several workgroup functions, such as calendaring and scheduling, in one package.

"The obvious market is the people who aren't networked," said Jude Gartland, a senior vice president at Lehman Brothers in New York. "I'm thinking of using it at home. Small groups that haven't really been touched by LANs and WANs will eat this stuff up."

However, Gartland said he wonders if Windows for Workgroups "is different enough to bring in" at Lehman Brothers, which already runs Novell, Inc. local-area networks. In addition, "we already have a mail system, common drives and common areas to put things out to people," he said.

Jim Lisiak, a systems analyst at Chevron, Inc., said he believes Windows for Workgroups could likely first pop up in smaller offices at companies that do not want to invest in a server or network administrator but do want the peer-to-peer functions. Eventually, it may become more widely used.

"I think this is going to be a grass-roots thing," Lisiak said.

> **"THE OBVIOUS MARKET is the people who aren't networked. I'm thinking of using it at home. Small groups that haven't really been touched by LANs and WANs will eat this stuff up."**
>
> JUDE GARTLAND
> LEHMAN BROTHERS

Product lowdown

Windows for Workgroups, basic stats:

- Preinstalled on 40 hardware manufacturers' systems, including Compaq Computer Corp., Hewlett-Packard Co., Gateway 2000, Inc. and Zenith Data Systems. Microsoft estimates 1 million copies will be shipped with desktop and laptop systems within the year.
- Many software providers also plan support, including Wordperfect Corp., Beyond, Inc. and Dun & Bradstreet Software.
- Several pricing schemes, including a starter kit containing all hardware and software for two PCs for a list price of $849.95. Windows for Workgroups software alone lists for $249.95. Windows 3.1 users can upgrade for $99.95, and Windows 3.0 users can upgrade for $149.95. In addition, Microsoft announced the availability of the Workgroup Connection for MS-DOS, which allows DOS users to access Windows for Workgroups machines, without file sharing, and send and receive E-mail. It has a list price of $79.95

IBM mulls an OS/2 for workgroups

BY ROSEMARY CAFASSO
CW STAFF

As Microsoft Corp. ships initial copies of Windows for Workgroups, IBM said it is evaluating the possibility of releasing a similar product based on OS/2 2.0 sometime next year.

IBM also said it is unsure whether it will support Windows for Workgroups as it now supports Microsoft's Windows operating platform under OS/2 2.0.

A workgroup version of OS/2 may include an integrated version of Lotus Development Corp.'s CC:Mail as well as other workgroup utilities, such as calendaring, said Joseph Damassa, manager of IBM local-area network systems marketing.

Several OS/2 users contacted last week said they would not want to see workgroup functions built into the basic OS/2. Instead, they would like to see an optional OS/2 with workgroup features.

"I don't care for a bundled operating system," said Joseph Herrin, director of systems development at Joseph E. Seagrams & Sons, Inc. in New York. "If I wanted that, I'd get an AS/400. I prefer a more open approach that lets you mix and match components."

IBM claims to now have the components necessary to provide OS/2 for workgroups. The company resells Lotus' CC:Mail and Notes.

"What we are working through now is how we package it," Demassa said. "The decisions are being made, and we'd like to have them surface as products next year."

One lingering question is peer-to-peer networking, Demassa said. While some customers have expressed interest in including peer-to-peer networking capabilities in OS/2, it is "not a common request."

Microsoft eyes Wall Street with Windows applications

Conference on financial tools draws 650 execs

BY CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — Microsoft Corp.'s Windows on Wall Street conference last week was the latest example of its increasing desire to be taken seriously by vertical corporate markets. And while the attendees may not have seen anything particularly new, they did have a chance to meet other financial professionals and discuss the prospects of Microsoft's making significant headway in this important market.

"There was a lot of hallway conversation going on," said Michael Packer, managing director of technology and planning at Bankers Trust Co. He gave a presentation on "Rightsizing on Wall Street."

The conference was perhaps more interesting in terms of what it said about Microsoft's desire to move into vertical markets than for its content, Packer noted.

Whether Microsoft's struggle to gain credibility in such markets is succeeding is still an open question, but the company's sheer pervasiveness in the PC software market across all segments forces customers to keep at least one eye on the Redmond, Wash.-based company.

Force to reckon with

"I don't think anybody who wants to work in the computer industry on this planet can't take Microsoft seriously," said David Readerman, an analyst at Shearson Lehman Brothers, Inc. in San Francisco.

Readerman also noted that Windows and its applications are making a decisive move into the financial sector, further ensuring Microsoft's future importance. "For office applications, you have to work with Microsoft," he said.

According to Microsoft, more than 650 banking and financial executives, consultants and analysts attended the conference to see their peers give presentations of financial applications based on Windows.

Attendees also saw several independent software vendors and integrators demonstrate financial applications based on Microsoft platforms.

Financial apps

Representatives from several large financial organizations, including Barclays Network Services and Merrill Lynch Research, gave presentations of applications used in their companies, such as Merrill Lynch's Mutual Funds Analysis System, which is based on Microsoft's Excel.

Among the other announcements was one from Teknekron Software Systems, Inc. in Berkeley, Calif. The software subsidiary of systems integrator Teknekron Corp. unveiled plans to develop Windows and Windows New Technology-based financial applications in conjunction with Microsoft Consulting Services. Teknekron Software Systems' applications currently run under Unix.

Other products demonstrated included The Perfect Hedge by Glasco Park, Inc. in Surrey, British Columbia, and a set of branch banking applications created by York, Pa.-based Ampersand Corp.

CORRECTIONS

A photo in the Oct. 26 issue was not of Edward McCracken of Silicon Graphics, as was indicated.

.....

Contrary to information contained in a story in the Oct. 19 issue, Novell, Inc. officials said 1,000-user licenses and protected-memory application space will both be available in Novell's initial release of its upcoming NetWare 4.0 product.

.....

A reporting error in "KnowledgeWare to buy CASE consultancy" [Oct. 19] caused V. F. Corp. to be incorrectly identified. It is a Wyomissing, Pa.-based apparel maker.

.....

An editing error in "Quattro Pro for Windows boosts usability" [CW, Oct. 19] altered the meaning of a sentence. The sentence should have read ". . . while it is easier to use than Excel, it is questionable whether that is enough to make an experienced Excel user want to switch."

.....

A chart in the Oct. 12 issue showing the installed bases of various electronic-mail packages listed a package called "Right Hand Man." The package, from Futurus in Atlanta, has been renamed "Futurus Team."

.....

Because of an editing error, "Marching orders" [CW, Oct. 19] failed to credit the CW Database Division for conducting the survey.

.....

Because of a writer's error, an In Brief item in the Oct. 26 issue implied that application development tools makers Pure Software, Inc. and Mercury Interactive, Inc. plan to merge. In fact, they plan to merge their product lines early next year.

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Canada casts vote for LAN deployment

Agency uses automated system to handle voter registration for recent national elections

BY LYNDA RADOSEVICH
CW STAFF

OTTAWA — An automated voter enumeration system received a thumbs-up from Canadian election officials, who put the system to the test while preparing for Canada's referendum vote last Monday.

Elections Canada, the agency in charge of running Canadian elections, deployed local-area networks in each of the 295 electoral districts to help the district officers automate the production of voter lists. The system was not used to poll the voters on election day. That process still involved paper ballots and wooden boxes. But the system did speed up the creation of lists of eligible voters.

In prior elections, the officers hired people to go door to door, writing down the names and addresses of eligible voters and typing the lists at night on typewriters. The officers made photocopies of the lists for candidates, Elections Canada and record files. By law, fresh lists had to be prepared before each election.

The automated approach made the process easier to control, said Frank Ching, a returning officer based in Brampton, Ontario.

"For one thing, I could track the information coming in. If a pair of enumerators weren't doing their jobs, I knew it. Previously, I didn't know" what they were doing until the typed lists came in, he said. Other advantages include having all the voter data available for analysis, he said.

The problem with using networked computers was that no one knew when the next election would be called or where the local district leaders would establish headquarters. In Canada, elections are not held at regular intervals. The Parliament of Canada can call for elections at any time during its five-year term.

Elections Canada needed mobile LAN systems that, like military units, could be set up to attack whenever Canada's Parliament called an election.

"A lot of people asked, 'Why didn't you do this sooner?' " said Harry Neufeld, director of information technology at Elections Canada. "But there is tremendous risk in dropping technology into offices that aren't there until elections are called."

A vote for SHL

Elections Canada chose network integration giant SHL Systemhouse, Inc. in Ottawa to coordinate the $15 million project in June. By August, SHL Systemhouse had 2,791 PCs, 614 printers, 306 preconfigured LANs and 10 disaster recovery LANs packaged and waiting in warehouses.

In addition, 4,000 systems administrators, data entry clerks and other personnel were ready to set up shop across Canada within seven days of a call for an election.

> ELECTIONS CANADA needed mobile LAN systems that, like military units, could be set up to attack whenever Canada's Parliament called an election. In Canada, elections are not held at regular intervals.

"This system will save the taxpayers $10 million," Neufeld said. Most of the savings will happen next time an election is called because rather than starting from scratch, enumerators can simply update existing lists.

The system was not flawless. Neufeld said there were "hundreds" of problems with uninterruptible power supplies, hard disk failures and, in one case, a machine literally going up in smoke. But "we foresaw most of the problems," he said, "and Systemhouse had the resources in place to handle them."

Democracy in motion

When the call for elections went out in early September, Elections Canada swung the system into place.

First, on-call administrators in each district set up the LANs, and the return officers approved them in seven days. Then the return officers in each of the 295 districts hired enumerators to survey all the adults in their district and prepared a voter list within 36 days.

Data entry clerks stationed at the networked PCs in the district office keyed the handwritten survey information into a customized database program called ECAPLE, or Elections Canada Automated Production of Lists of Electors, which was developed by ISM Information Systems Management Corp. in Regina, Saskatchewan, using Computer Associates International, Inc.'s CA-Clipper. The LANs ran Artisoft, Inc.'s LANtastic network operating system.

After the elections, the entire system will be back in boxes in 22 warehouses, waiting for the next Canadian election.

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GSA Number GS00K9AGS5251PS02

System crash

Stella Johnson

A mainframe basher *exercises his frustration with big iron at a demolition derby sponsored by the Boston Computer Society (BCS) in Cambridge, Mass., last week. Participants paid $5 for five minutes of beating up old computers that were not fit for the landfill. Proceeds went to a BCS committee that serves nonprofit organizations.*

Legent increases options, flexibility in desktop line

Pacts with independents boost interoperability

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp. last week announced agreements with two independent software vendors that will enable it to build flexibility and user choices into its family of desktop products.

Legent will use the Galaxy Application Environment from Visix Software, Inc. in Reston, Va., to develop distributed systems management products with multiple graphical user interface (GUI) options. A Legent product with the Galaxy capability embedded would allow users of workstations and PCs to set a runtime option to select a "look and feel" standard such as Open Look, the Open Software Foundation's Motif, Microsoft Corp.'s Windows or OS/2 Presentation Manager GUI.

"This allows us to develop the application once for a platform and give the user a choice of the look and feel he would like on that platform," said Murray Berkowitz, director of enabling technology at Legent.

Legent will also incorporate Pipes Platform from PeerLogic, Inc. in San Francisco in its products to give users greater interoperability in heterogeneous environments. Pipes is a communications tool that can span dissimilar operating systems, processors and network protocols.

As with the Galaxy implementation, Legent products incorporating Pipes will use a standard application programming interface across all platforms. Combined with a built-in "naming service," Pipes-fitted applications will be able to transparently find and access diverse servers in the network, whether they run under MVS, OS/2, Unix, DOS/Windows or Novell, Inc.'s NetWare, Legent said.

> "THE OPEN systems planning arena is one where users are crying for planning directions and products. These things let Legent write and maintain one set of code and then say, 'Let many blossoms bloom.'"
>
> PETER KASTNER
> ABERDEEN GROUP

Pipes also provides a "context bridge" that will enable Legent products to employ protocol-independent messaging so users can transparently access internetworks employing diverse protocols such as Transmission Control Protocol/Internet Protocol, NetBIOS and Systems Network Architecture/LU 6.2. "It will give end users a broader reach in terms of what they can bring to the desktop," Berkowitz said.

Legent did not say which products will first have the capabilities enabled by Galaxy and Pipes, but he said development work is under way in products for software management, data center management, production control and resource management.

Blind faith

David Gruzeski, senior systems programmer at General American Life Insurance Co. in St. Louis, where a number of mainframe Legent products are used, said he welcomes Legent's move to distributed computing but knows little of the details. "I have justified a PC on my desk because I know these things are coming from them, and we want to be positioned for that," he said.

"The open systems planning arena is one where users are crying for planning directions and products," said Peter Kastner, a vice president at Aberdeen Group in Boston. "These things let Legent write and maintain one set of code and then say, 'Let many blossoms bloom.'"

"Legent is actually making it possible to restrict the number of options users have to consider. It gives them the certainty that they are not going to have to face complex choices," said Peter Burris, director of commercial systems research at International Data Corp. in Framingham, Mass.

Toshiba turns up heat in 486 market

New notebooks, pen system highlight activity

BY MICHAEL FITZGERALD
CW STAFF

IRVINE, Calif. — Toshiba America Information Systems, Inc. today will battle back against competition in the notebook market by releasing two new multifeatured 486 notebooks and announcing its first pen system for the U.S. market. Toshiba also cut prices 15% to 25% across much of its product line.

The pen-interface system, the Dynapad T100X, a 3.3-pound, notebook-size system, will be available in January. New monochrome and color notebooks are available now.

Toshiba has seen its notebook market share figures fall from 19.4% in 1990 to a projected 13.6% this year, according to BIS Strategic Decisions, a market research firm in Norwood, Mass. Apple Computer, Inc. surpassed Toshiba, becoming No. 1 in notebook sales, thanks to its hot-selling PowerBooks, and Compaq Computer Corp. is threatening to make it No. 3, according to BIS.

Bounce potential

Toshiba is not slipping quietly and may bounce back strongly because of its push into the 486 notebook market, analysts said.

"I'm impressed by the new products," said Chris Vasko, an analyst at BIS. "They're already the leader in the 486 market, and they've done a lot of work on its display and made it lighter, which is the key success factor."

"People are looking for the next level of performance out of the notebook; they're ready for the 486," said Janet Cole, an analyst at Dataquest, Inc. in San Jose, Calif.

Cole said applications for Microsoft Corp.'s Windows environment were driving the market toward the 486.

Marshall Fernholz, network control manager at the American Medical Association (AMA) in Chicago, said his company uses Toshiba notebooks and that the new products "look like great stuff, but it's hard to justify the price" for the color screens. Even so, Fernholz said, the AMA will probably soon buy at least a couple of color notebooks.

Features galore

The new T4500 steps beyond the existing T4400 line by being more than a pound lighter and offering up to an extra hour of battery life, thanks to a low-volt Intel Corp. processor.

The T4500 series also features a display that gives more information about the state of various system components, such as the battery.

The existing T4400C features faster 486SX and 486DX chips and is expected to offer a 200Mbyte hard drive in December. It also has a larger screen — 9½ in., compared with 8½ in. for the T4500C.

The 3.3-pound Dynapad is based on a low-volt chip from Advanced Micro Devices, Inc.

"It's a nice system, has a good feel and [Personal Computer Memory Card International Association] cards, and at that low weight, it's much more the kind of thing people are going to need in the field than something like the ThinkPad," an IBM product that weighs more than 7 pounds, Cole said.

What should help is a street price near $3,000, which is low in the current pen hardware market. The system's light weight in a full-size notebook is also distinctive.

Getting serious

Toshiba's new notebook line includes its first pen-based system marketed in the U.S.

	Dynapad T100X (pen-based)	T4500 (notebook)	T4500C (color notebook)
Weight	3.3 pounds	6.4 pounds	6.6 pounds
CPU	AMD 25-MHz 386SXLV (3.3V)	Intel 20-MHz 486SX (3.3V)	Intel 20-MHz 486SX (3.3V)
Size	10.6- by 8.3- by 1.6 in.	11.7- by 8.3- by 1.8 in.	11.7- by 8.3- by 2 in.
Slots	2 PCMCIA slots	PCMCIA slot	PCMCIA slot
Storage/ memory	40MB-byte hard drive 4MB bytes RAM	80MB- or 120MB-byte hard drive 4MB bytes RAM	80MB- or 120MB-byte hard drive 4MB bytes RAM
Power	2-3 hour battery life	3-4 hour battery life	3-4 hour battery life
Availability	January 1993	Now	Now
Price	$3,499	$2,799 (80MB-byte drive) $2,999 (120MB-byte drive)	$4,399 (120MB-byte drive)

CW Chart: Michael Siggins

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Concerns go beyond E-mail API

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — Many users taken aback by the mudslinging keynote speech that Lotus Development Corp. President Jim Manzi delivered at the Electronic Mail Association's (EMA) annual conference last week said more imminent messaging challenges are on their minds than the long-controversial mail-interface issue Manzi grudgingly tried to resolve.

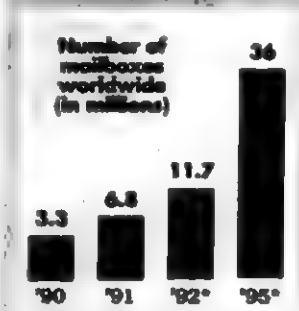
Somewhere amid his ranking of competitor Microsoft Corp., Manzi managed to break down a major barrier to the proliferation of mail-enabled applications by announcing a partial truce in the long-standing mail interface dispute (see story at right). The move should help fuel the development of mail-enabled applications.

But users and developers cited issues such as mail-engine interconnectivity, public electronic-mail network interoperability, messaging-oriented business reorganization hurdles and the need for global mail directories as concerns they want to resolve before they embark on groupware development.

"Common APIs are necessary for groupware but worrying about them now is putting the cart before the horse," said the E-mail administrator of a large networking company who asked not to be identified. "We first need to get our different mail platforms to talk to each other without the loss of functionality that happens when you communicate through a gateway."

Delivering the mail

The LAN-based E-mail market is expected to grow dramatically over the next several years



Includes LAN-based workgroup and E-mail software products (not service)

*Projected

Source: International Data Corp.

Forrest Conrad, manager of system programming at Teradyne, Inc. in Boston, agreed. "Getting E-mail platforms to talk to each other is the biggest issue, particularly from an administrative point of view. Once a message leaves our [Digital Equipment Corp.] All-In-1 mail system for another system, I have no way to track that message," he said.

Mail application programming interfaces (API) will eventually figure into the equation, observed Joseph Caruso, director of corporate systems and technology at American Express Co. in New York. "But we need to knock down organizational barriers in enterprise business process re-engineering first," he said.

Caruso, who is involved with in-house development, acknowledged that common mail interfaces under development by an industry group as well as the move to integrate Microsoft's and Lotus' competing mail APIs "at least give us a place to start" with groupware.

Global firms wishing to electronically communicate with outside business partners face an interoperability problem among value-added network (VAN) providers, according to Donald M. Gilbert, director of information systems at the American Petroleum Institute. "At this point, you simply can't send a message overseas to a VAN that isn't yours."

Gilbert said he understands this is because of a lack of contractual arrangements among the network providers.

Consistent, enterprisewide directory services continued to be a frequent topic of discussion at EMA. Some companies, such as New York-based global advertising agency Young & Rubicam, Inc., are leveraging Lotus's Notes database-oriented groupware platform to build their own.

Senior editor Elisabeth Horwitt contributed to this report.

Manzi miffs Microsoft with VIM, MAPI plans

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — In a scathing keynote address at last week's Electronic Mail Association's annual conference, Lotus Development Corp. President Jim Manzi trounced competitor Microsoft Corp., saying it embodies the reasons users are frustrated over the plentiful lip service being paid to "openness."

In using the dais to denigrate Microsoft's efforts with competing groupware standards and products, Manzi demonstrated that vendor politics are continuing to stall user progress toward harmonious networking.

Manzi's tone succeeded in burying the good news he had to deliver: that Lotus will tweak its messaging interface specification for mail-enabled applications, also backed by six other large industry players, to work with a competing interface from Microsoft [CW, Oct. 26].

The announcement followed Manzi's descriptions of Microsoft's new Windows for Workgroups and its Windows-oriented application programming interface (API) as "proprietary" and "a Trojan horse that will cause confusion and prevent users from committing to other products and operating systems."

Lotus embraced Microsoft's specification by allowing applications written to the Lotus-backed Vendor-Independent Messaging (VIM) interface to work with Microsoft's Messaging Application Programming Interface (MAPI) applications.

Users and developers have encouraged such API blending to fuel mail-enabled application availability. The combined APIs will offer richer functionality than those that will come out of the Common Mail Call set under construction by the X.400 Application Programming Interface Association (XAPIA), analysts said.

John Owens

Jim Manzi called Windows for Workgroups 'a Trojan horse that will cause confusion'

"Since Microsoft hasn't written VIM interfaces for MAPI, we're going to do it for them, free of charge to everyone," Manzi said.

"Manzi's presentation made it unclear whether the VIM companies will support the common calls from the XAPIA," said Joseph Caruso, director of corporate systems and technology at American Express Co. in New York. Manzi "seemed to just create more confusion" over the whole API issue, he said.

Similarly, Robert Forhertz, an electronic-mail project engineer at Monsanto Co. in St. Louis, said, "What we thought was coming together is falling apart. We wanted Lotus and Microsoft to work together [for one API]. With what Lotus is proposing, you'd have APIs calling APIs; we want one set of calls."

Daniel Petre, vice president of Microsoft's Workgroup Division, said, "[Manzi] does not understand the concept of extending the operating system to provide workgroup capabilities to a wide range of users."

Dave Whitten, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn., added: "Bottom line, Manzi said that we've come to a conclusion on the API and we're not going to be rolled over by Microsoft."

IBM users show preference for pure TCP/IP over APPN

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — Strenuously denying that it is responding to the threat of the Advanced Peer-to-Peer Interconnect (APPI) Forum and its SNA-over-TCP/IP scenario, IBM made some major concessions last week toward a more open, affordable and TCP/IP-supportive version of its Advanced Peer-to-Peer Networking (APPN) protocol.

Even so, IBM's peer-to-peer version of Systems Network Architecture (SNA) seemed to be losing rather than gaining ground, with users and vendors at last week's Interop '92 show demonstrating a marked preference for pure Transmission Control Protocol/Internet Protocol (TCP/IP).

There was also a strong interest in APPI, the budding de facto standard proposed by Cisco Systems, Inc. as a way to let IBM SNA and APPN devices communicate over a TCP/IP backbone.

While IBM is positioning APPN as a migration path to peer-to-peer environments for SNA users, it also sees the protocol as a de facto standard for high-speed, multiprotocol, local-area network-to-LAN connections, IBM spokesmen said.

"We are demonstrating APPN over TCP/IP on the floor now and will ship it shortly, so why do you need APPI?" asked IBM general manager Ellen Hancock.

Releasing all specs

Addressing recent allegations that it would keep control of APPN Network Node and charge hundreds of thousands of dollars for the use of APPN Network Node source code, IBM announced that it would publish all specifications needed to build APPN Network Node in the next few months, at a nominal cost.

In addition, IBM said it would publish the management information base for managing APPN resources via Simple Network Management Protocol.

However, companies that built APPN-based products would still have to pay patent fees priced in the tens of thousands of dollars, said Rick McGee, director of architecture and telecommunications at IBM.

IBM will sell a fully tested set of core APPN code for $400,000.

Rather than lose major customers to TCP/IP, IBM has begun to work aggressively with customers to integrate their TCP/IP and SNA networks.

For example, IBM is working with Boeing Computer Services to implement SNA applications on a TCP/IP network, Hancock said. A Boeing spokesman confirmed that the project was under way.

A later release of APPN, APPN+, will be optimized to make use of the 1M- to 45M-byte bandwidth of frame relay, while a later version will converge with the Asynchronous Transfer Mode standard, according to McGee.

Working out details

Last week Cisco handed over responsibility for the standard to the APPI Forum, which met last week to set up a game plan for delivering a working APPI protocol by mid-1993.

Uphill fight

IBM must work hard to convince IS managers that its APPN protocol is worth implementing in heterogeneous environments

200 IBM mainframe sites in the U.S. were asked which of the following statements best described their attitude toward APPN:

- **Important because it meets all networking needs — 7.5%**
- **Just for IBM networks — 8%**
- **Interested, but not sure — 37.5%**
- **Not interested — 20%**
- **Happy with SNA — 27%**

Source: International Data Corp.

While Cisco has proposed the initial APPI protocol, the final version will incorporate the best of all members' suggestions, a Cisco spokesman said.

Wells Fargo Bank's Wholesale Services is using both TCP/IP and LU6.2, according to Roy Camblin, a senior vice president. But "my personal choice is TCP/IP," Camblin said.

One comany already committed to APPI is Chevron Corp. Nancy Mason Vandell, a senior communications analyst for technical services, said at the forum meeting that she is leading her firm to implement APPI across all of its Cisco routers.

User quest

Interop attendees searched the conference floors for two types of solutions to their multivendor networking problems. One group sought broad vendor support for one common networking standard; the other wanted products that provide application and systems interoperability across a broad range of protocols.

Roy Camblin, a senior vice president at Wells Fargo Bank's Wholesale Services business, is in the latter group. "We have a combination of TCP/IP and [IBM] LU6.2, and I tell a group when they ask for an either/or decision, 'You'd better support both.'" Not counting on IBM's "many promises" in terms of a peer-to-peer, standardised version of SNA, "I'm seeing standards more as a list of options," Camblin added.

Boeing Computer Services currently supports seven networking protocols and is "urging users to go to TCP/IP," said Darwin Perkins, a network manager at the company. A "major driver" for this move: Boeing is going to a centralised network management system and has found nothing that can handle a broad range of network protocols, Perkins said.

Great West-Life Assurance Co. in Manitoba, Canada, is one of many companies using multiprotocol routers to handle a broad mix of TCP/IP, Novell, Inc. IPX and SNA, according to Nick Van Der Zweep, an assistant technical support manager.

However, the company is still working out some glitches in Cisco Systems, Inc.'s IBM Synchronous Data Link Control implementation on its router, according to Van Der Zweep.

Another area of user disappointment has been with the most promising of the stagnating Open Systems Interconnect protocols, X.400 and X.500, for E-mail and corresponding directory services. Gordon Craig, vice president of the Houston NetWare Users Group and LAN administrator at the Texas Rehabilitation Commission in Austin, Texas, explained, "Novell said it has no intention of supporting X.500 because it is too slow."

Without that option from Novell, he said, he is weighing Banyan Systems, Inc.'s StreetTalk directory service for NetWare, which was recently announced, against waiting for NetWare Version 4.0, slated to ship early next year.

One area in which cooperation seemed to be budding was network management. DHL Worldwide Express communications architect John Payne said that increasingly, standards-based application interfaces of IBM's NetView/6000 and Hewlett-Packard Co.'s OpenView will let DHL implement the network and Unix systems management applications on either platform, depending on user preference.

Standards fights vex users

CONTINUED FROM PAGE 1

Group, a consulting firm in Salt Lake City.

Meanwhile, users "don't want to hear APPN vs. TCP/IP vs. IPX;" they just want their applications to communicate transparently, Burton said.

Users echoed that sentiment. Monsanto Co. in St. Louis, for example, is struggling to interconnect a broad range of workgroup-enabled applications in the absence of a truly standard electronic-mail application programming interface (API) with broad vendor support, said Robert Forhetz, project manager for E-mail.

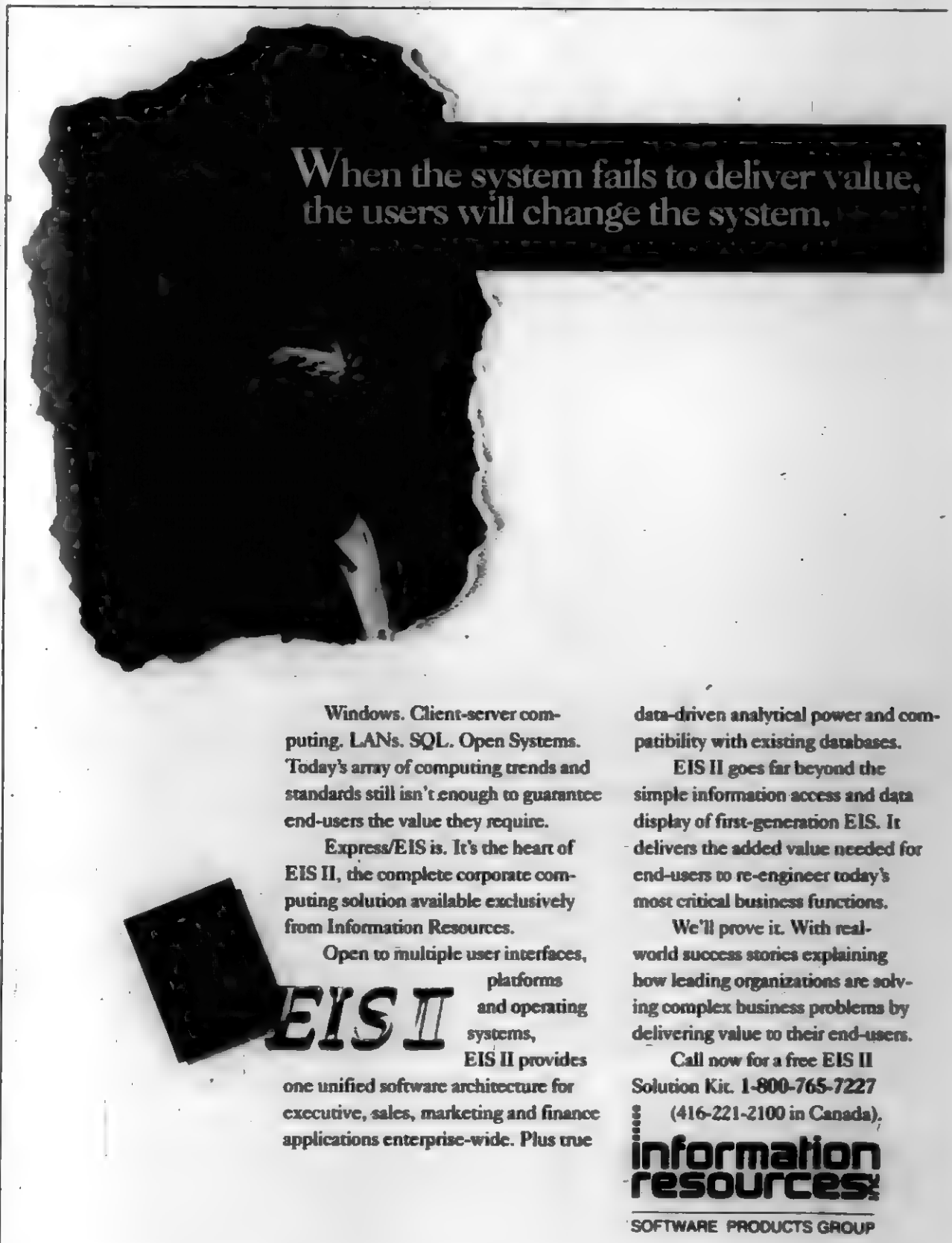
Vendor behavior at last week's show was not calculated to raise user hopes of future harmony and interoperability. Among the more notable fracases were the following:

- Lotus Development Corp. Chief Executive Officer Jim Manzi, while bad-mouthing rival Microsoft Corp., announced that Lotus would translate both its own E-mail API and that of Microsoft (see story page 14).
- IBM and the Advanced Peer-to-Peer Internetworking Forum, while taking potshots at each other's efforts, both promised to let users mix and match IBM's Systems Network Architecture and Transmission Control Protocol/Internet Protocol.
- MCI Communications Corp. announced the first long-distance Switched Multimegabit Data Service product and criticised AT&T and Sprint Corp. for refusing to "give users a choice" (see story page 16).

The spectacle of vendors criticizing one another in the name of standards sickened information systems and network managers, who had come to the conferences looking for help in their struggles to integrate multivendor computing and networking environments.

"It was like a barroom brawl," according to one attendee of the Lotus/Microsoft fracas.

Senior editor Joanie M. Wexler contributed to this piece.



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NEWS SHORTS

HP replaces best-selling printer

Hewlett-Packard Co. replaced its market-leading LaserJet III printer with the LaserJet 4 and LaserJet 4M, 600 dot/in. printers, priced at $2,199 and $2,999, respectively. The new 8 page/min. printers can work six times faster than the LaserJet III. They can also handle up to 850 pages of paper. The redesigned printers are smaller and lighter than the LaserJet III. HP also cut prices on older LaserJet models.

Piracy takes a dive

The Software Publishers Association (SPA) reported a huge decrease in software piracy last year but also noted that the industry still lost more than $1 billion to stolen software and illegal copying. The SPA said the drop — a 41% decrease from 1990, to $1.2 billion — resulted because of changing market trends, industry enforcement and education. Nonetheless, the SPA also said that today, one in five PC software programs is an illegal copy.

Low-volume discounts from Lotus

Lotus Development Corp. expanded its licensing options last week to include more discounts for low-volume purchases. A License Pack program is targeted at current users and will give them a discount of up to 20% when they license more copies of the currently installed software. A Reseller Sales Volume Purchase Plan provides discounts of 20% and higher when a customer purchases a minimum of 50 copies of a Lotus application. Previously, these discounts were provided to users who bought "in the thousands," a company spokesman said. The spokesman said the industry will "probably see more" discount programs coming from Lotus.

Quattro users unite

A Quattro Pro users' group was launched in Southern California last week, and it claims it is the first major group in the U.S. focused on providing support and information on the Borland International, Inc. spreadsheet. The group's acting president is Wolf Kadavanich at Motek Information Systems. The kickoff meeting with be held Friday in San Diego.

Microsoft, Borland recast tools

Microsoft Corp. has been demonstrating Visual Basic 2.0 in preparation for its release early this month. The updated development tool reportedly produces code that averages 35% faster execution speeds than Version 1.0 and creates 30% smaller files for larger applications. Not to be outdone, Borland International has unveiled Borland Pascal with Objects 7.0 and Turbo Pascal 7.0, the latest versions of the company's popular Pascal development tool line.

Price signs OS/2 commitment

IBM last week officially announced its deal with Price Waterhouse that calls for it to act as the accounting firm's worldwide operating systems provider. The deal covers 35,000 PCs throughout Price Waterhouse and involves the purchase of more than 20,000 copies of OS/2 2.0. IBM will also provide Microsoft's MS-DOS and Windows to the company.

Short takes

Sequent Computer Systems, Inc. in Beaverton, Ore., is scheduled to announce today clustering capabilities for its Symmetry line of multiuser systems with support for the parallel server option in **Oracle Corp.**'s forthcoming Oracle 7.... **Mips Technologies, Inc.** today will unveil its newest reduced instruction set computing chip, the 64-bit, 150-MHz R4400 microprocessor.... Retail chain **Software Etc.** and information network **Prodigy** last week began offering free access to Prodigy's political databases to visitors at any one of Software Etc.'s 265 stores nationwide.... **Red Brick Systems, Inc.** in Los Gatos, Calif., unveiled its data warehouse software for HP's HP/Apollo 9000 Unix servers.... **NCR Corp.** has announced the release of StarPro Enterprise Messaging, an enterprisewide electronic-mail and messaging system. The system runs on a Unix platform and interconnects with other vendors' mail systems via the X.400 E-mail and X.500 directory standards, the company said.... Former **Timeplex, Inc.** President Dewaine L. Osman has returned to **Unisys Corp.** as vice president of corporate planning.

Wireless E-mail to span U.S.

RAM Mobile Data, Lotus show plan for hooks to packages such as CC:Mail

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — RAM Mobile Data last week filled in some details of its pioneering effort to bring electronic messaging to travelers who want to stay productive when a telephone jack does not happen to be handy.

The company announced that wireless commercial electronic mail services are now available on its nationwide packet radio network [CW, Oct. 26] and said it plans to provide the service to 90% of the U.S. urban population by June 1993.

RAM Mobile Data also announced a Premier Partners program with several vendors, including Lotus Development Corp., to develop wireless hooks to existing E-mail-based packages and services.

Two of the partners, Performance Systems International, Inc. (PSI) in Reston, Va., and RadioMail Corp. in Menlo Park, Calif., said their network access services are already available for hooking into the radio network. PSI's PCILink, which bridges users into networks such as the Internet, CompuServe, MCIMail, AppleLink, SprintMail and AT&T Mail, is available in 50 U.S. cities, the company said.

RadioMail's gateway service assigns users a radio mailbox and address; when mail arrives at the address, it is translated into such receiving formats as X.400, Internet, Lotus' CC:Mail and public mail systems.

Other Premier Partners in various stages of linkage development are AT&T EasyLink Services; Ericsson GE Mobile Communications, Inc., which makes the key radio modem component of wide-area wireless communications; Go Corp.; SimWare, Inc.; and WordPerfect Corp.

Digital Equipment Corp. and Hewlett-Packard Co. previously announced wireless messaging development efforts.

Most users said they are generally bullish on the idea that technology breakthroughs will make remote users more productive.

"I'm interested in anything that would grow and incent our population of telecommuters," said Peter Brown, director of technical services at Electronic Arts Canada, an entertainment products maker based in Burnaby, British Columbia. "The simple benefit is creating more available work time."

But, as with any new technology, availability of service is an issue for some users. For example, Gordon Craig, local-area network administrator at the Texas Rehabilitation Commission in Austin, a government entity with agencies throughout Texas, noted the general scarcity of communications services in Western Texas.

"If something can't cover the entire state, then it's not a solution for us. This makes nonwired solutions difficult." For example, he currently cannot get simple paging services from Austin to El Paso. "If I can't get paging, how can I expect messaging?" he asked.

Meanwhile, Lotus detailed some of its plans for bringing wireless communications to its mail-oriented products. Lotus' CC:Mail Remote, whose desktop version is installed on more than 2 million desktops today, will hook into the RAM Mobile Data network "sometime in 1993," said Glenn Kaufman, business development manager at Lotus' portable computing group. In addition, the company is "looking toward Notes for wireless links," he said.

Lotus will tweak CC:Mail for wireless users by equipping it with filtering capabilities. Such features, which exist today in sophisticated desktop mail packages such as Beyond, Inc.'s rules-based BeyondMail, would allow users with limited time and laptop memory to be selective about the volume of electronic information they download.

Kaufman also said Lotus will equip CC:Mail Remote with encryption as an added measure of security to that now embedded in the RAM Mobile network. He noted that the RAM Mobile partnership is likely to be the first of such efforts with other wireless network providers.

MCI breaks new ground with SMDS offering

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — MCI Communications Corp. last week announced what is said to be the first Switched Multimegabit Data Service (SMDS) offering from a long-distance carrier.

MCI's Virtual Private Data Service HyperStream reportedly supports SMDS' "connectionless" networking, which enables users to interconnect with those at other sites and companies on a casual basis, MCI spokesman Paul Weischelbaum said.

In contrast, frame-relay services require defining a permanent, point-to-point connection between communicating sites, according to Weischelbaum.

Compared with MCI's switched T1 and T3 services, which take three seconds to set up a call, HyperStream provides instantaneous, on-demand call setup, Weischelbaum said.

MCI's announcement potentially expands SMDS from a regional offering limited to the territory of individual local-exchange carriers to a transnational networking service, MCI said.

Not in the cards

Sprint Corp. said it has no plans to offer SMDS but will provide gateways to interconnect users' SMDS equipment over its frame-relay and Asynchronous Transfer Mode services.

AT&T said it will provide a similar gateway if customer demand warrants.

Both carriers pointed out that SMDS is a U.S.-only standard, while frame relay is an international standard.

Scheduled for general release in mid-1993, HyperStream will support data rates of between 64K and 45M bit/sec.

Pricing will be on a usage-sensitive basis, with a price cap of 120% of a fixed-rate monthly price, MCI said.

Customers can send data over existing T1 lines without special equipment as long as they are transmitting at speeds less than 1.5M bit/sec., MCI said.

MCI can then allocate some of that T1 bandwidth to HyperStream and some to other types of service that are currently available.

Bandwidth on demand

The NASDAQ hopes to use HyperStream as a way to provide 56K bit/sec. bandwidth on demand to users throughout its network, the exchange said in a prepared statement.

The technologies will allow NASDAQ to add capacity automatically for "temporary use during peak periods," the exchange said.

NASDAQ plans to have contract negotiations and pilot testing of MCI's service completed by January, according to the exchange.

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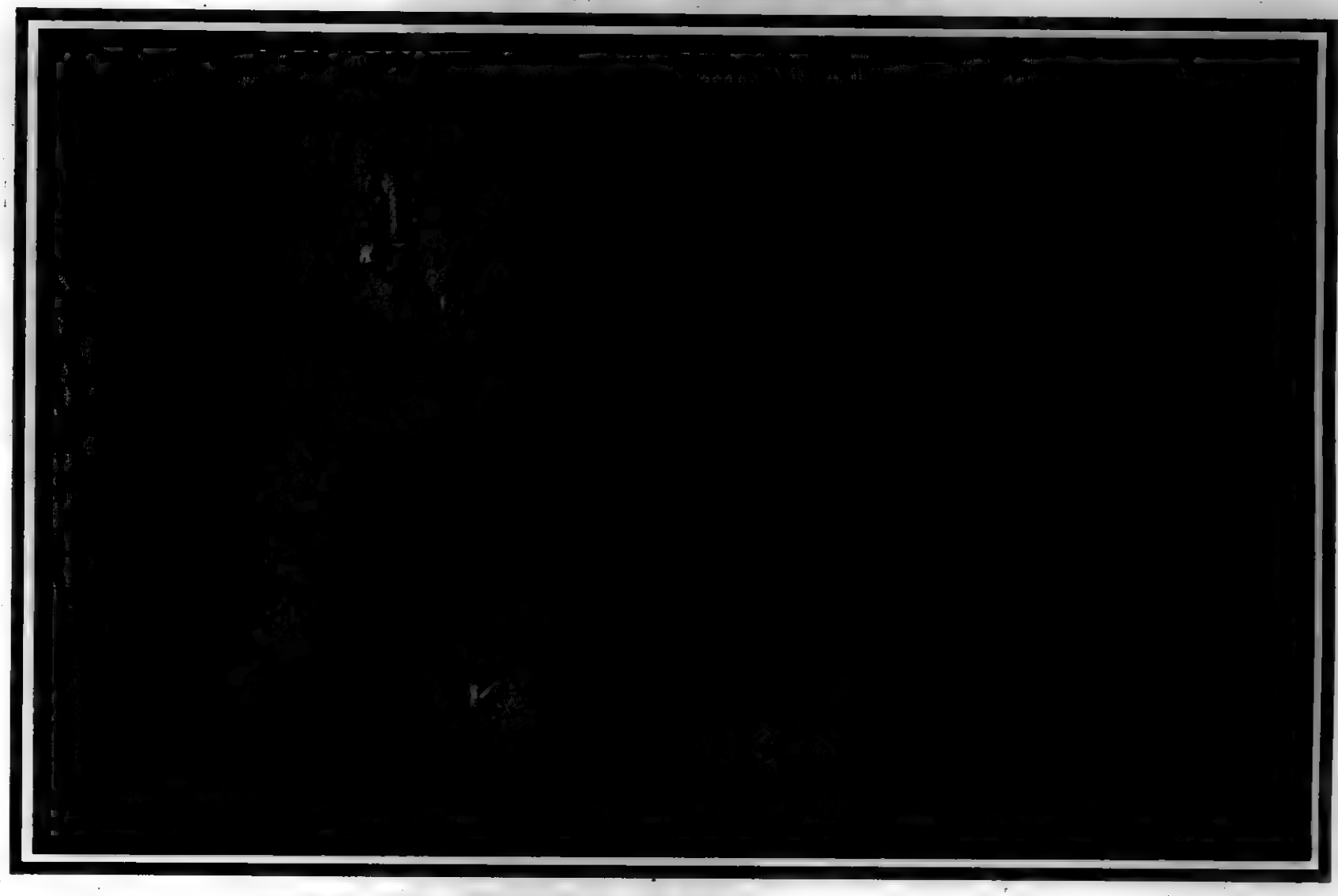

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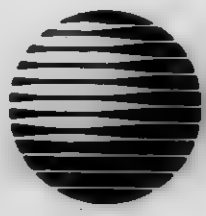

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Bank reworks outsourcing pact

CONTINUED FROM PAGE 1

management in an effort to right itself.

Fred Cisewski, the bank's MIS director and senior vice president, declined to reveal specific price cost values implemented in what he termed a "refinement" of the contract. Merrill Lynch & Co. analyst Steve McClellan has estimated the original deal at $120 million, and a source close to Bank South "characterized the cost savings as modest."

A spokeswoman at ISSC said she could not comment on the details of the contract.

What Cisewski did say was that the changes touched largely on "some of our pricing parameters." Those changes were necessitated by a number of factors, chief among them the following:

- The bank shrunk, but its processing needs increased.
- The Cost of living did not go up as much as anticipated.
- The bank is moving to a distributed processing architecture.
- Now that the bank is recovering, it has less ambitious growth plans.

The enormous transaction volume generated by loan analyses increased the bank's processing needs "more than if the bank had grown," Cisewski said. "When you have asset-quality problems, you have to do a lot of portfolio analysis that requires manipulating a lot of data."

What is not clear is whether this turn of processing events played in the bank's or IBM's favor. If the agreement was made less expensive, as the source indicated it was, the old formula most likely had worked for IBM.

Ladd Willis, executive vice president of First Manhattan Consulting Group, a New York-based bank consultancy, pointed out that bank outsourcing deals are typically priced by CPU use or a predetermined rate tied to certain activities, such as loan processing or direct deposits.

Contracts can get out of whack for the client or supplier if usage runs into areas not accounted for originally, or if the supplier's costs unexpectedly change from factors such as technology changes, he said.

"That's what happens in these bank outsourcing contracts — the charging algorithms might end up overcompensating or undercompensating the supplier," Willis observed. He said he "can only speculate" that it was this type of imbalance that threw the Bank South deal off kilter.

"There was an invalid assumption on both sides about what our processing requirements would be based on our business size," Cisewski said. "We tried to tie processing to the growth of the bank, but that was invalid."

If the bank had been paying on a CPU use basis, not only did it then end up paying for more processing than it had anticipated, but it was doing so from a weaker financial position.

Cisewski said IBM and Bank South have "changed some of the pricing parameters," including introducing measures that accommodate "some processing alternatives that didn't exist three years ago," such as factoring in more PC-oriented activity.

Those changes were not tied into transactions per se, he said, declining to elaborate on what they were tied into.

A distributed system under development at the bank will draw data from the mainframe and shuttle it via a Systems Network Architecture network through local-area networks and servers among employees who will be able to get more timely information on client activity, Cisewski said.

The restructured deal also gives Bank South back some money that it had paid because of overestimates of how high the cost of living would rise. It is common in outsourcing deals for the vendor to tie its cost/price formula into its projections for the consumer price index.

One source said Bank South had earlier this year explored a radically different set of options that would have broadened the scope of IBM's responsibilities by giving the computer giant control of PC maintenance, training and purchases. A Bank South policy committee of the bank's five top executives decided against those measures in August because the new management team, led by Chairman Robert Guyton, wanted to focus on developing a strategic plan for the bank's core business, the source said.

Cisewski said the change disproves a theory promulgated by outsourcing doomsayers that long-term deals lock a customer into rigid parameters. The original contract contained provisions for changes, he said.

Customer sues IBM for support lapse

BY JOHANNA AMBROSIO
CW STAFF

ATLANTA — Just as IBM is attempting to make its mark as a premier services organization, a customer has filed a $150 million lawsuit alleging that IBM did not provide adequate staffing to finish a project on schedule.

The customer, First Financial Management Corp. (FFMC) in Atlanta, provides data processing and other services to some 800 small and midsized banks through a subsidiary called Basis Information Technologies, Inc.

The lawsuit, filed in U.S. District Court on Oct. 5, alleged that FFMC and IBM contracted in December 1989 to jointly build a banking software system that would be rolled out to FFMC's 800 customers. IBM "has failed to deliver" the new system, court documents said.

An IBM spokesman declined to comment on the matter.

Donald Sharp, an FFMC senior vice president, said, "IBM has not fully conformed to the original agreement. But we're not interested in the money. We're just trying to get the project completed."

According to the FFMC complaint, "IBM caused the project to fall behind schedule almost immediately by failing to assign adequate numbers and quality of personnel to the project." The development part of the project was supposed to have been completed by December 1990.

Also, the lawsuit alleged, because the new system is not fully operational and the old Unisys Corp.-based software cannot be run on the new IBM mainframe, FFMC will need to extend the lease on its old Unisys computer. Further, "IBM now insists that FFMC must purchase additional hardware from IBM beyond the equipment specified in the contract," the suit said.

DEC restructuring takes form

CONTINUED FROM PAGE 1

lington, Vt., and Springfield, Mass. The moves will result in the layoff of 670 workers.

Internal sources said final details of the restructuring are still being ironed out, though the company is under pressure to resolve organizational issues soon. "The structure alone won't do it — what's important is being more responsive to customers and figuring out whether we're building the right things in the right order and that it fits together with existing products," said one internal source familiar with the discussions.

The new structure is expected to go into effect in January.

A DEC spokesman confirmed details of a new model for industry business units, but said it is a work in progress. He refused to speculate as to when and how such a model might be made public by the company or when it might go into effect.

"The general reaction is that if DEC can execute this, it will be good for the customer — the individual business units will be driving the development of products rather than engineering," said Jeff Killeen, national local user group chairman of the Digital Equipment Computer Users Society.

But the new structure may also mean greater limits on resources out in the field. Since the vertical business units will be responsible for their own profitability, costs for support will come out of each group's sales pocket.

Field expertise will be planned and budgeted according to perceived need, but there may be unforeseen technical demands for which the resources may not be immediately available, according to Lynn Berg, program director of midrange computing services at Gartner Group, Inc., a market research firm based in Stamford, Conn.

Another potential impact for customers is the increasing pressure to move products through indirect channels, as opposed to the DEC sales force.

Last month, DEC began restructuring the way its sales force is compensated, and some sales units had their projections increased by $1.5 million, to $3.5 million.

"When one of us goes to the [DEC] office, the salespeople swarm around us," said Tony Corrato, a consultant at Mile High Information Systems, Inc., a Denver reseller. "They can't physically get to all the accounts themselves and have to focus on the highest paying ones, which means they have to push [the rest] off onto someone else."

The competitive pressure is also creating greater responsiveness on the part of some DEC sales representatives servicing larger accounts. "DEC is realizing that there are other manufacturers that have products that we need, and has become much more cost-competitive," said Robert Cyr, data center manager at PacifiCare Health Systems, Inc., a health maintenance organization based in Cypress, Calif.

"They always said they wanted to be partners in our business; it seems that they may now be trying to achieve that," Cyr added.

A $150 million outsourcing prize

Systems integration and consulting services figure prominently in DEC's proposed restructuring plans.

To drive home the point, the company last week trumpeted a recent $150 million outsourcing win from TransAlta Utilities Corp. in Calgary, Alberta, an $800 million utility.

DEC is running TransAlta's data center of four VAX 9000s and roughly a dozen VAX systems on several VAXclusters. The five-year outsourcing deal with DEC is part of TransAlta's overall plan to outsource the parts of the business that others can operate more efficiently, according to Tony Anadell, director of information systems at TransAlta. Although the company will save a "nontrivial but not enormous amount" of money from the deal, the major objective was to bring in DEC's expertise, he said.

"With the speed of change going on in information technology, we were struggling to keep up with it and wanted to bring in someone who knew it well," Anadell said.

Most of the 70 data center employees are now employed by DEC, and others were placed elsewhere within TransAlta. The equipment will stay on TransAlta books, and DEC will pay the systems' rental fees. In turn, DEC will charge users for CPU time.

"We're still in the teething problem area. We're trying very hard to work out a partnership rather than a supplier/customer relation, which means that we are making joint decisions," Anadell said.

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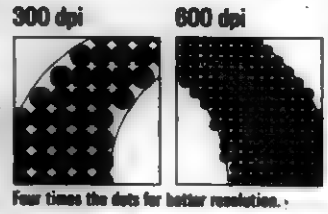

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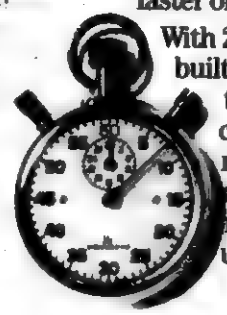
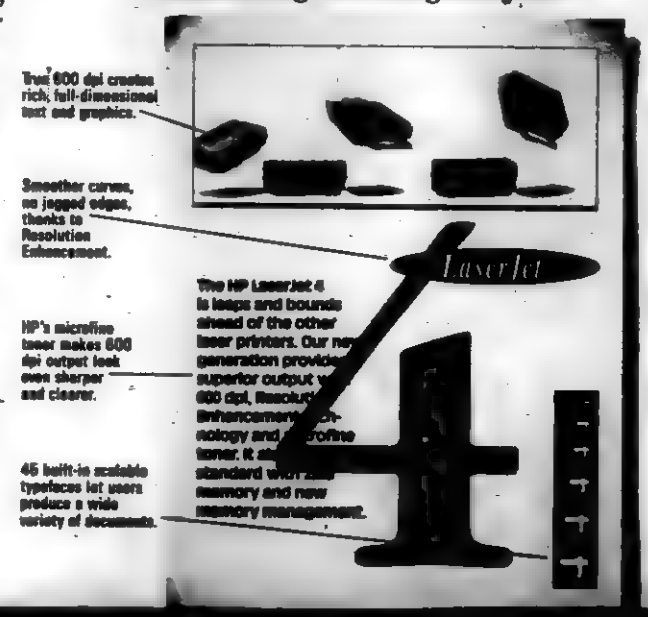
Thanks to a new RISC processor, tuned vector graphics and faster I/Os, the HP LaserJet 4 also sets new standards for speed. It even prints many 600 dpi graphics at a true 8 pages per minute. It's faster on networks, too.



With 2 MB of memory built in and new internal memory compression algorithms, virtually all 300 dpi and many 600 dpi documents print from standard memory. Two standard paper trays, with a total capacity of 350 sheets, and an optional 500-sheet tray let users keep printing without constantly reloading different sizes and types of paper. And the optional 75-capacity power envelope feeder saves them from manual feeding. Or dealing with jams.



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The LaserJet 4 is very much at ease with most languages and personal computing platforms. Automatic switching lets it switch between HP's PCL 5 printer language and optional PostScript Level 2 software from Adobe. Hot I/Os allow different hosts to be connected simultaneously.

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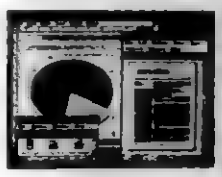

Several popular software drivers are included: Windows, WordPerfect and Lotus. As well as the new HP Explorer PC utility software, which provides a printing tutorial to guide your users through set-up and operation of the printer's new features.

All this makes the HP LaserJet 4 printer supremely simple to plug-and-play. As you'd expect, it also offers complete document and software compatibility with the HP LaserJet III printer.

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ASK CEO takes helm at Ingres division

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — Trying to infuse Ingres Products Division's U.S. operation with the spark of his recent European successes, The Ask Cos.' chief executive officer last week took the reins of the relational database division.

Pier Carlo Falotti, who joined Ask last summer after building Digital Equipment Corp.'s European unit into a $7 billion business, told *Computerworld* he needs to restructure Ingres' management to boost the firm's lagging U.S. market share.

"They have been losing market share in the U.S. in license revenue for the last 12 months," even though Ingres sales rose slightly, said Charles Phillips, a vice president of research at SoundView Financial/Gartner Group, Inc. in Stamford, Conn.

The U.S.' lag in Ingres business is noticeable. Ingres' U.S. business grew by just 3% last quarter, compared with 47% worldwide revenue growth since last year's first quarter, said Kenneth Burke, a principal at Pacific Growth Equities, a San Francisco brokerage firm. "In six quarters, they haven't made meaningful progress in getting the North American business cranked up," Burke said.

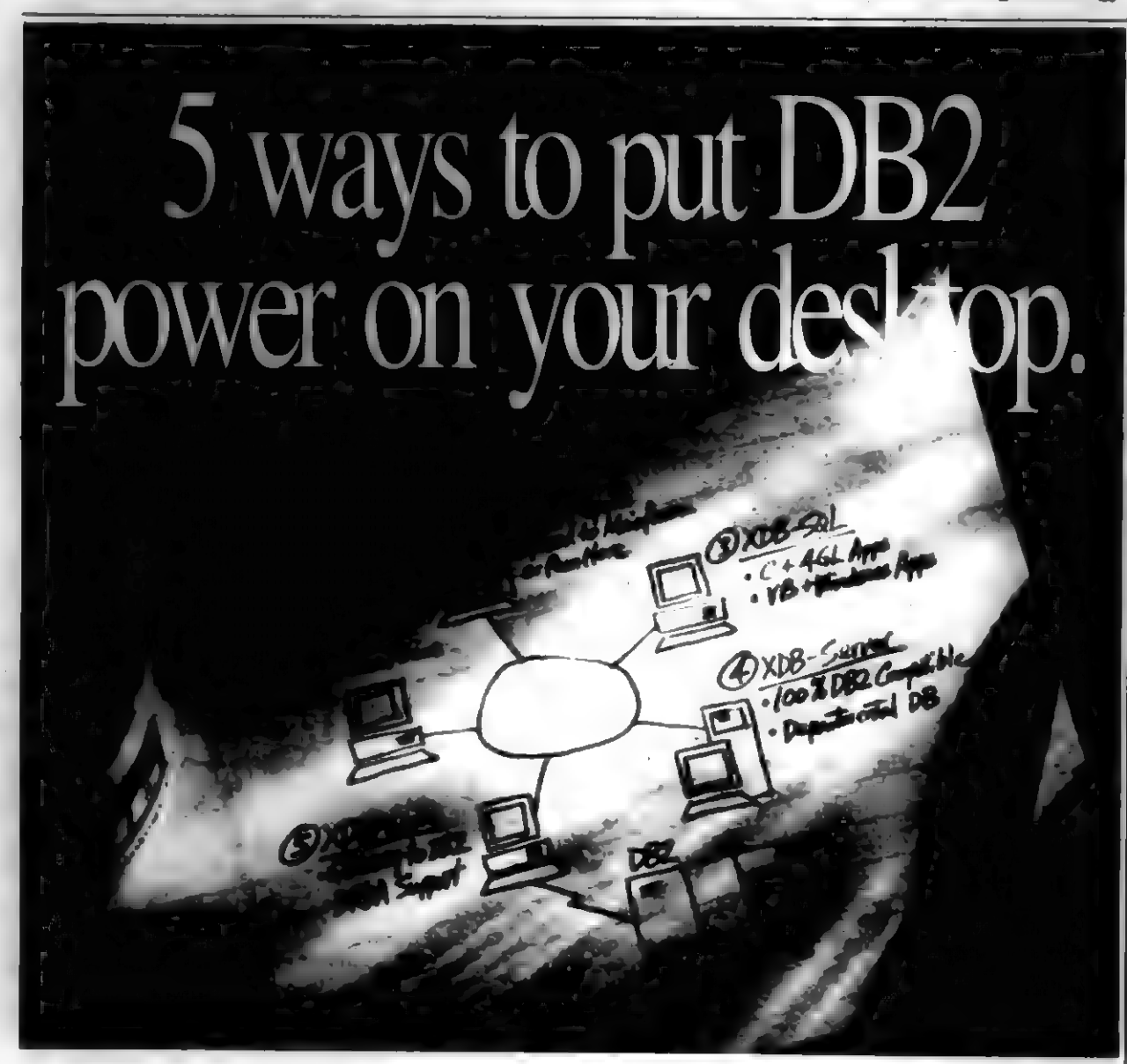
Falotti did not say how long he would remain president. Dennis McGinn, Ingres' president since 1991, was reassigned as executive vice president of strategic partnerships and business development.

Fast attack

Current and past presidents of the North American Ingres User Association (NAIUA) were critical of the speed with which Ingres has attacked its long-standing weakness in marketing.

"It's hard to see what the grand strategy is or should be," said NAIUA President Dwight Coles, who is slated to attend a planning meeting with Ingres executives in mid-November. "Users are starting to express concern about using Ingres because they don't see the market share or the advertising," he said. Coles also said product introductions have slowed to a trickle.

Users have faulted senior Ingres management for failing to convince managers at the largest U.S. corporations that Ingres could be a strategic product. "We've seen some improvement over time, but the change hasn't been as rapid as we would like," said Eric Palmer, former NAIUA president and chief executive officer at Palmer and Associates, Inc., a consulting firm in Atlanta.



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Concurrent restarts engine

BY MARYFRAN JOHNSON
CW STAFF

OCEANPORT, N.J. — After a lengthy silence in the marketplace and a painful financial face-lift, Concurrent Computer Corp. resurfaced last week with a revitalized strategy and nearly four dozen new products for its real-time, crash-proof computers.

"They've done quite a credible job of recovering," said Terry Bennett, an Infocorp analyst in Portland, Ore. That recovery is relying on expanded software and service offerings as well as a dual hardware direction — assuring the future of its proprietary 3200 series line while beefing up its Unix-based Series 7000 line.

During the past two years, the $225-million vendor cut costs by $75 million, shrunk its employee count from 3,500 to 1,900 and managed to turn the past three quarters into profitable ones after a string of money-losing ones.

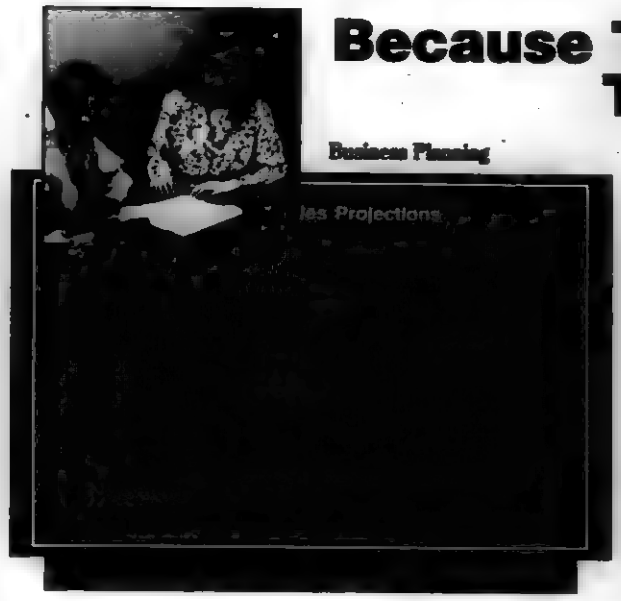
Back on its feet

"We're relieved to see that they're viable again," said John Baris, president of Concurrent's Interchange Users Group and director of computer systems and software at Yale University's experimental nuclear physics laboratory, which uses three of the 3200 series machines.

Concurrent's niche is real-time, fault-tolerant computing in life-and-death applications, such as nuclear power simulation and missile guidance, or financially critical operations, such as state lotteries and stock trading systems. During the past 25 years, Concurrent has built up an installed base of 32,000 systems.

At prices ranging from $5,000 to $150,000, the new products include a family of Motorola, Inc. 68040-based systems for the Series 7000 real-time Unix minicomputers, two new models in its proprietary Series 3200 line and new graphics display subsystems. The company also unveiled a host of productivity tools, networking and communications products and a broader array of services.

"We feel very strongly that they are moving in the right direction," said Tony Pastore, principal systems engineer at the radar systems division of Electronic Warfare Associates in Marlton, N.J., which purchased four Series 7000 systems a year ago.



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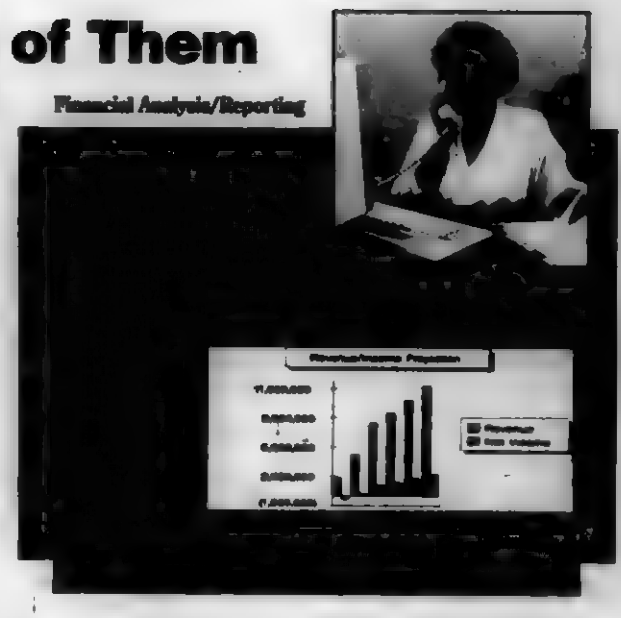

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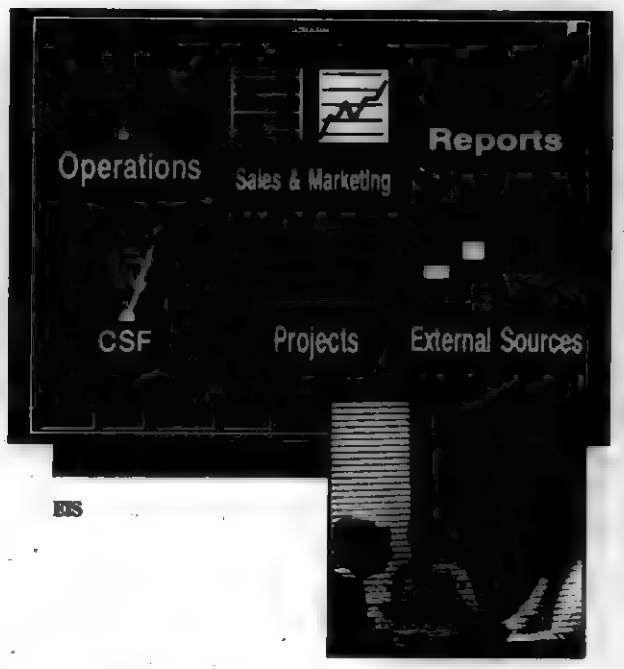

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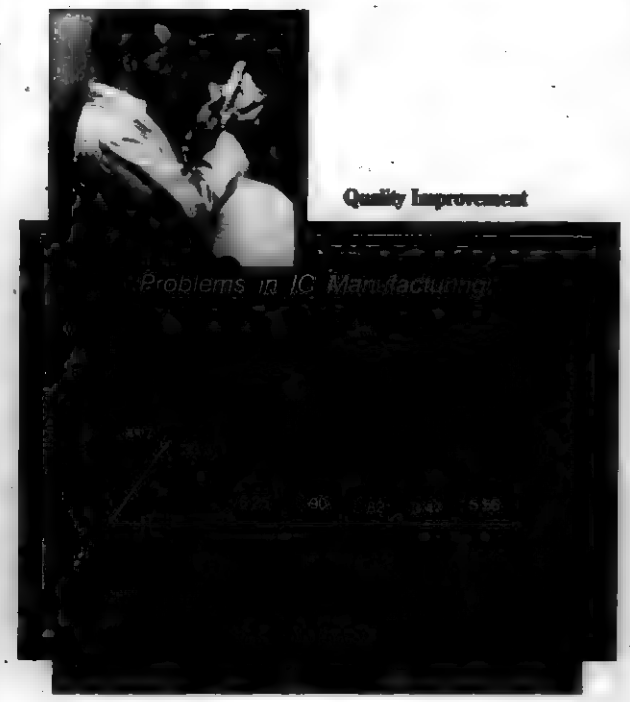

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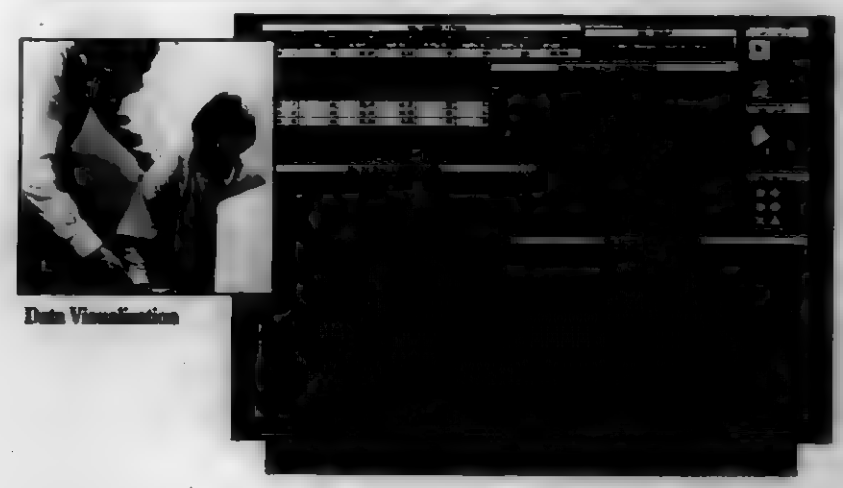

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Introducing

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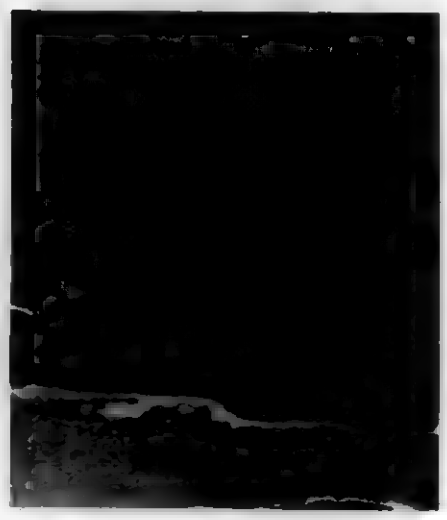

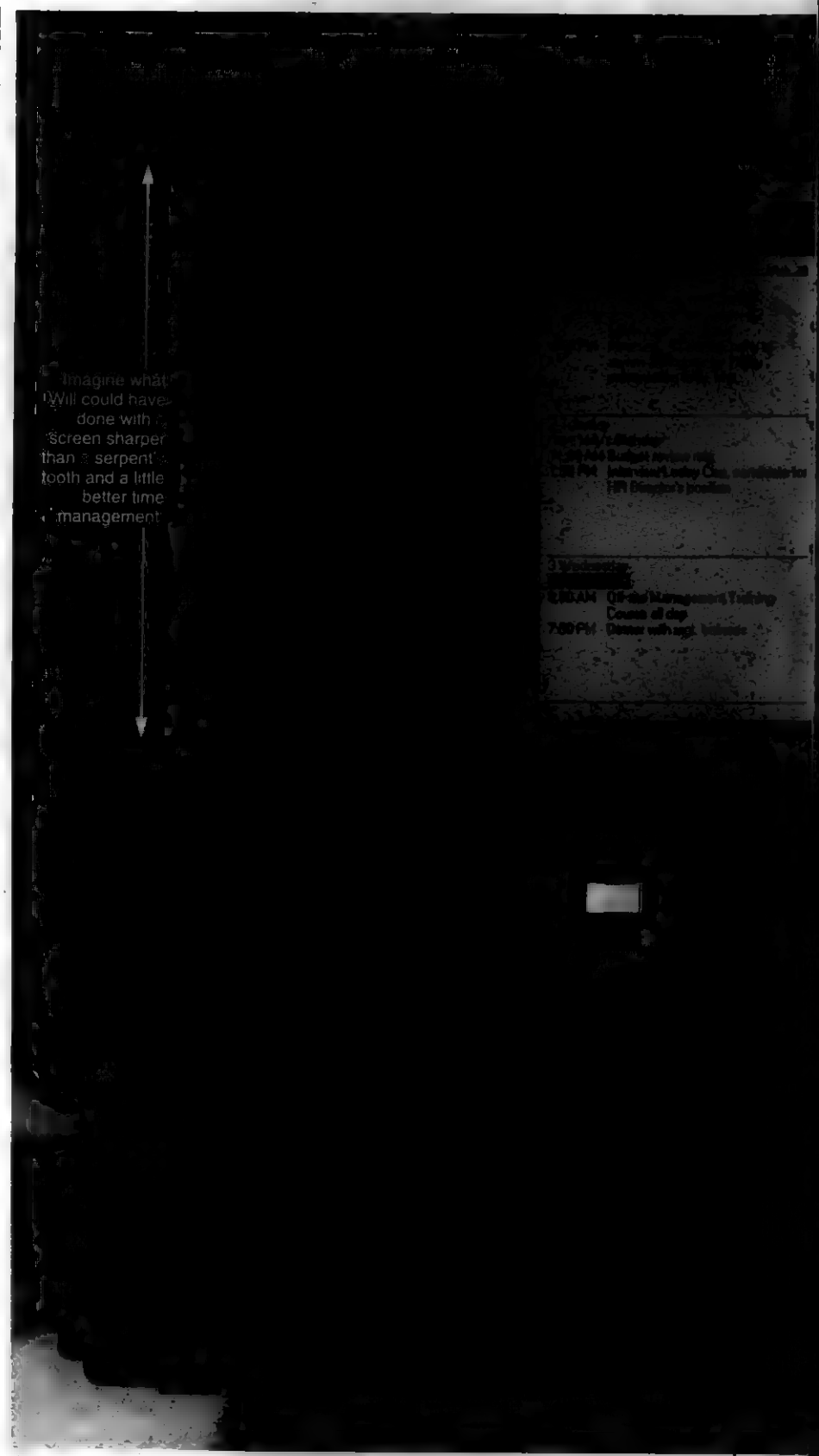

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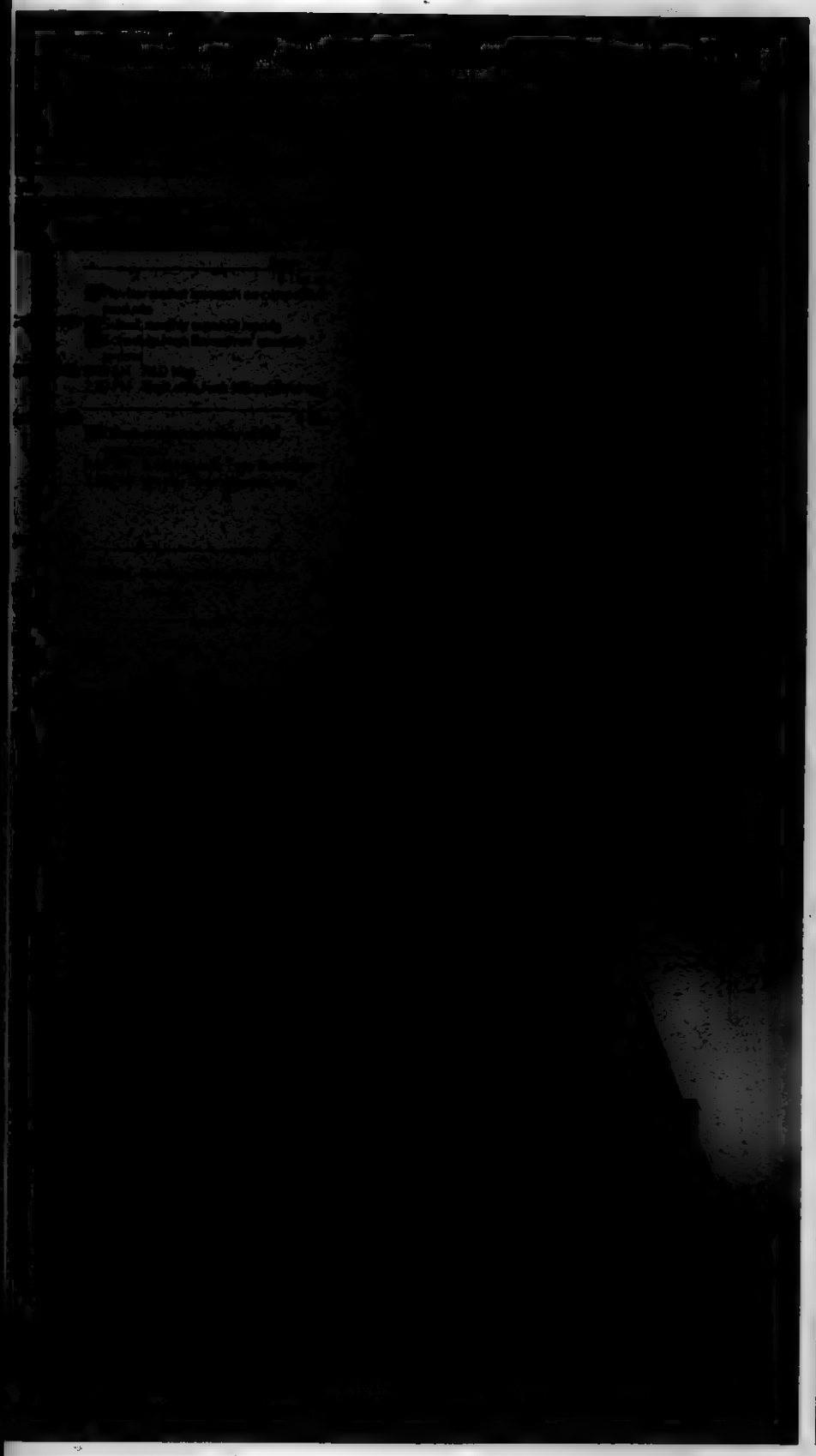

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intel inside

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Display	9.5" Monochrome Display 64 Grayscale Screen
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ADVANCED TECHNOLOGY

TECH TALK

Grand challenges

■ The National Science Foundation in Washington, D.C., has awarded its first set of grants for research on the nation's "grand challenges." One of the grants went to Robert Berwick at MIT, who will coordinate a team of researchers trying to design high-performance computers that can "see, move and speak." The multidisciplinary team will include biologists, mathematicians, computer scientists and engineers.

Full-size flat panel

■ Canon, Inc. is expected to release next month what it calls the world's first commercial ferroelectric liquid crystal display (FLCD). The 15-in. flat-panel FLCD offers a medium-resolution monochrome display, but Canon said it will release high-resolution monochrome and color 15-in. panels later in 1993. Canon is promoting the FLCD as a more practical alternative to the expensive, hard-to-produce thin-film-transistor (TFT) active-matrix LCDs currently used in high-end color notebook PCs. An FLCD offers high resolution and comparable contrast to a TFT display while featuring a simpler electrode structure that promises relatively low-cost, high-yield mass production, according to Canon.

Setting its sights

■ In the spirit of Star Trek, supercomputers at NASA's Ames Research Center in Mountain View, Calif., will try to seek out and analyze sounds no one has heard before. Starting last month, the laboratory began its search for faint radio signals that might indicate life on other planets. The decade-long survey of 400 billion stars will use radio telescopes in Southern California and Puerto Rico. Started on the 500th anniversary of Columbus' voyage to the New World, the project continues the 1960s Search for Extraterrestrial Intelligence. Organizers said they hope the computers hear something by 2001.

Technology firms look homeward

Three industries join forces to get a foot in the door of the home multimedia market

BY ELLIS BOOKER
CW STAFF

Shooting at the same target over the years, telephone, cable television and computer companies have independently explored ways to bring multimedia into the home.

These efforts hint at a shared belief that mass-market, multimedia information and entertainment services are an enormous business opportunity. To date, however, none of the sectors has managed to crack the home market.

Recently, representatives from the three industries formed a group to develop a common architecture for delivering multimedia services over a variety of communication networks. Called First Cities, the project is being organized by Microelectronics and Computer Technology Corp. (MCC), an Austin, Texas-based research and development consortium.

Analysts called the move a significant step toward the creation of multimedia network standards and infrastructures.

"It's what amounts to a game plan for where multimedia is going, and it's the first time I've seen it spelled out as succinctly by a group of players," said David Palmer, a senior consultant at Grassroots Research, a San Francisco, Calif.-based market research firm specializing in telecommunications.

The MCC project will be a test bed for various multimedia information and entertainment products.

"Originally, the focus of [this] program was how to build infrastructures in cities, making them into the information hubs for the next century," said Bruce Sidran, MCC vice president and executive director of First Cities. "Now the focus is the applications for creating the marketplace."

Besides MCC, the 11 participants in the group are: Apple Computer, Inc.; Bellcore; Bieber-Taki Associates; Corning, Inc.; Eastman Kodak Co.; IBM and Apple's joint venture, Kaleida Labs, Inc.; North American Philips; Southwestern Bell Technology Resources, Inc.; cable company Sutter Bay Associates; Tandem Computers, Inc.; and US West.

MCC officials contend that First Cities is seeking a common architecture for multiple network media — fiber optics, cable and telephone lines — and that it may also develop "hybrid" services using two or more transmission facilities.

Yet for now, a large cable TV or entertainment provider is notably absent from the group's roster.

"Right now, there isn't a lot of incentive to involve the cable companies because [their networks] don't offer the appropriate bandwidth, and the installed base is the same that the telcos have," Palmer said.

But Sidran argued that the group is definitely not a "telephone company" project.

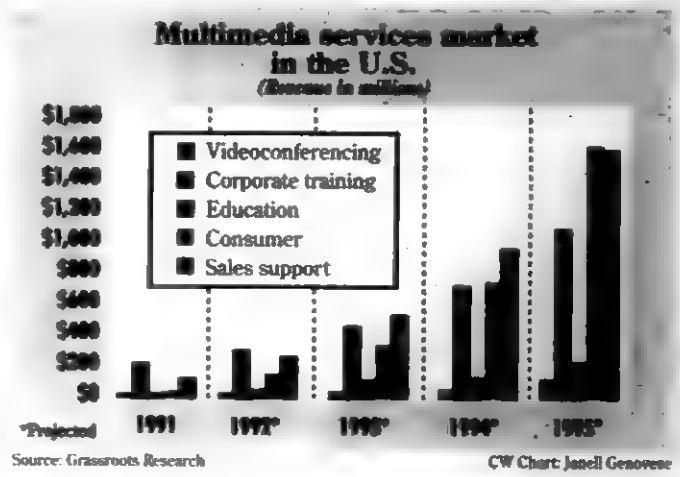
"I've been espousing the belief that we don't want to pick winners and losers between the cable and the phone industries; [instead] we need some kind of comprehensive architecture," Sidran said. He added that First Cities fully expects to add members from major entertainment and cable companies in the future.

For Apple, which has been investigating home delivery of multimedia for some time, participation in First Cities means it will be able to build equipment and applications to the group's multimedia network standards as they evolve.

"Without network services, we can't build network devices," said Mike Liebhold, manager of media architecture research at Apple's advanced technology group.

The creation of multimedia networks, he added, will require the input of many interests — networking and computer companies, as well as providers of transaction and entertainment services, will all need to be involved.

MULTIMEDIA



Source: Grassroots Research

CW Chart: Janell Genovese

Fuzzy borders

"No one or two companies have the depth or breadth of expertise to pull something like this off," said Liebhold, who predicted the arrival of a host of new products that "blur the definition of computers, telephones and TVs."

The first set of applications that First Cities will consider will be multimedia teleconferencing, interactive games, entertainment on demand, shopping and transaction services, customized multimedia information, distance learning and health care.

The First Cities project will be implemented in three phases: a business plan; development of an architectural framework and experimental pilots, slated for early 1993 to December 1994; and the licensing or sale of First Cities technology and concepts to local information and network providers for commercial services in early 1995.

IBM's multimedia universe

Through its Kaleida Labs multimedia joint venture with Apple, IBM will share in the results of the MCC/First Cities initiative. But, quietly, IBM has also made substantial investments of its own in networked multimedia and is reportedly close to forming a new company to provide interactive information to businesses and homes.

Published reports put IBM's commitment in the new company at more than $100 million and indicate IBM is seeking cable TV, telecommunications and media partners for the venture, which would provide video, software and interactive games and services.

At the heart of IBM's plans are its technologies for managing and distributing various data types over networks. IBM refers to these technologies as the Planet architecture. IBM has specified two implementations of Planet: Orbit for fiber-to-fiber networks and Comet for fiber-to-coaxial networks.

In conjunction with Rogers Communications, Inc., Canada's largest cable operator, IBM is testing Orbit at banks in Toronto. A second fall trial, with BellSouth Corp. as a partner, will provide services to Tennessee schools and offices.

Ultimately, services for home subscribers are planned, although IBM said it will target business applications first.

ELLIS BOOKER

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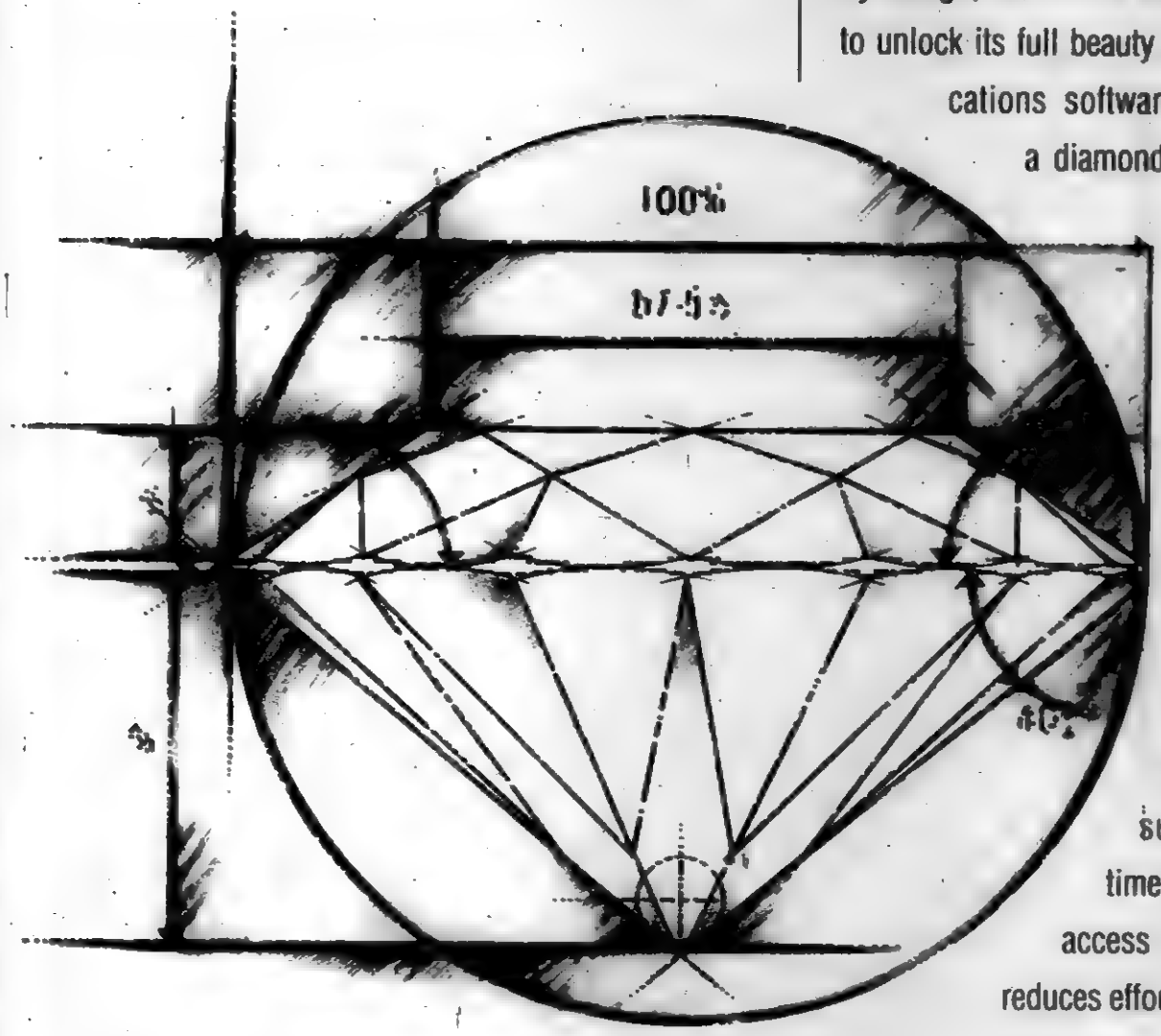

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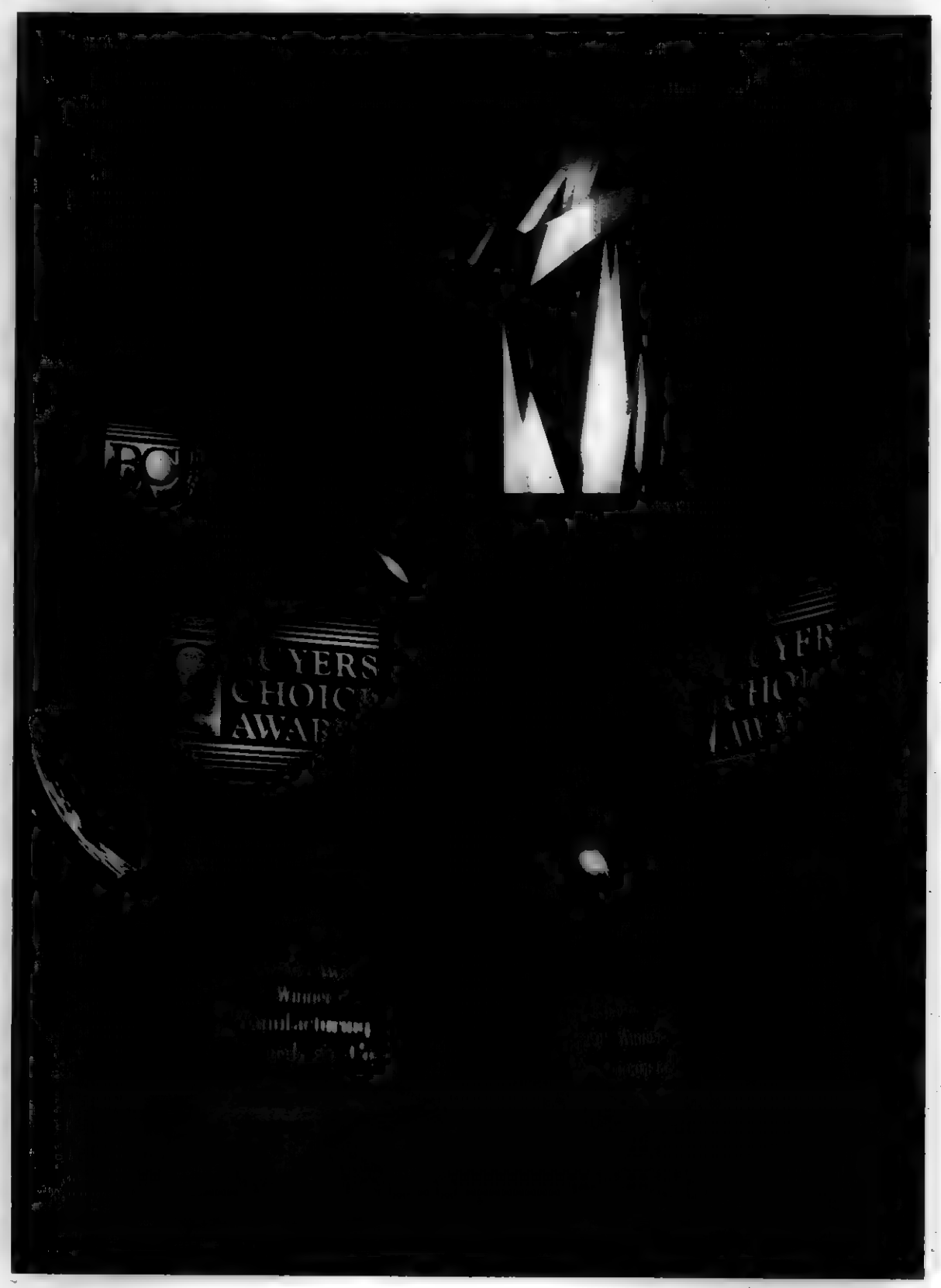

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EDITORIAL

Change agent

It took me roughly three years to set up a tete-a-tete with Computer Associates Chairman Charles Wang a couple years back. For a gift, I bought him a satin warm-up jacket of the Boston Red Sox — a team that hasn't won a World Series in more than 70 years.

"This," I said, handing him the box, "represents the only thing I've waited for longer than an appointment with you."

Thankfully, he had a sense of humor and grace in accepting the present. As he showed in that and subsequent meetings, he also has a temper, a keen and shrewd intellect and an extraordinary drive — characteristics that could be turned on and off without a segue or without what we in the journalism business call a transition. In summary, he is somewhat enigmatic.

Thus, it is not surprising that the giant software company he directs can also reflect a mercurial nature. CA at times has angered some of its biggest customers to the point where some have been very outspoken with their dissatisfaction. This tendency has been noted in this paper and other publications, as well as in market analysts' reports.

On the other hand, other customers swear by the company and its products. Charles Wang is one of the more visible software executives at customer sites, and this attention is what customers increasingly demand.

Earlier this year, we picked up on a lot of unhappiness and anger in the user community about CA's pricing and licensing policies. The company insisted our stories were off the mark and that we'd asked the wrong questions of the wrong people.

Then, in the spring, CA reached a dynamic and innovative domestic licensing scheme with a major customer, paving the way for the announcement last month [CW, Oct. 19] of a flat-fee worldwide agreement with Citicorp. That deal, as well as a fixed-price deal struck last month with the U.S. Postal Service, portend a major pricing and licensing overhaul planned for next week that will put CA clearly ahead of its competition in liberal licensing agreements.

CA's actions on this very critical issue have drawn only applause from its customer base — even from some users who have been dissatisfied with the company. CA is now the risk taker in a market of risk-averse vendors.

Moreover, the company is acting from a position of strength. It has strung together several strong financial quarters in terms of sales and profit. Prudent companies have long been characterized as not being lulled by success but rather as being nervous that it will recede and acting aggressively to avoid that situation. This is what CA has done with the key licensing issue.

Is this the CA of the '90s: aggressive and proactive, tough and customer-driven? Certainly the user base would hope so.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

There's no such thing as a good virus

The article "Can a 'good' virus be a bad idea?" [CW, Oct. 5] was misleading. It stated that the user community was "divided" over the issue. To the contrary, after doing computer security work with more than 100 organizations, I can tell you the user community is emphatically opposed to viruses.

From a secure systems design perspective, it is undesirable for unknown pieces of software to be doing things behind the scenes without the knowledge and acquiescence of both users and systems designers. Otherwise, the number and seriousness of potential side effects are just too great to tolerate.

A well-managed change control process requires that all changes to software and related system files be specifically approved prior to execution in a production environment. To promote "good" viruses is like promoting "good" nuclear weapons. . . .there is no security without stringent control.

Charles Cresson Wood
Sausalito, Calif.

Coverage of candidates lacks objectivity

Your editorial about technology in the election is a perfect example of the media's abuse of power during this year's election [CW, Oct. 26]. Using your position to influence public opinion while pretending to be objective is precisely why people distrust the press.

I find it very suspicious that you consider a vote for Perot to be a protest vote when a survey by your own publication shows him favored. Strange that an editorial on technology omits the only candidate who made his fortune in the computer industry.

Sometimes, what you don't say can be just as important as what you do say. In the future, if someone on your staff doesn't like a candidate, perhaps they should just say it directly.

David E. Long
Englewood, Colo.

Editor's note

Last week, my electronic mailbox was stuffed with letters from readers irate over the fact that Andre Marrou, presidential candidate from the Libertarian Party, was omitted from our presidential poll of IS managers [CW, Oct. 26]. Ordinarily I'd just plead "convention" in that the Libertarian Party is not included in any major polls. But given the response to our omission, our polls in the future will have the Libertarian choice on the ballot as well. — Bill Laberis

Why a monopoly?

Although I wholeheartedly agree with the conclusion of "Gimme access" [CW, Sept. 28], I want to suggest that Paul Gillin reconsider the answer to his opening question.

As he indirectly points out, the reason we have a local telephone monopoly to "bust up" is because of big government's prohibition of private carrier competition!

Bruce M. Hobbs
Alhambra, Calif.

Stick to the subject, not politics

Regarding "Clinton's civilian DARPA idea criticized" [CW, Oct. 5]: The facts presented are simple and indisputable: Gov. Bill Clinton proposed an idea, and his election opponent, President George Bush, attacked it.

The article devoted one paragraph to the proposal, and the other seven paragraphs, the lead sentence and the headline were devoted to Bush's attack on it.

Was the news the proposal, which you noted "computer companies generally supported," or was it Bush's attack?

Regardless of my — or the reporter's — political leanings, the article shows either reporting strongly biased toward Bush or a desire to accentuate the negative.

Each detracts from the story's news value, which would have been enhanced by more details of what Clinton actually proposed.

Gabriel Goldberg
Chantilly, Va.

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Don't let stress get the best of your staff

JEFFREY OLSZEWSKI

The polls are in. Stress on the IS professional is up in a big way this year, and the light at the end of the tunnel is pretty dim. This means that those of us who are managers are under pressure to show exactly what kinds of leaders we are.

It's pretty clear what is causing the increase in stress levels. What is less obvious is how to fix it. A "rightsized" IS force is being barraged with urgent requests from a "rightsized" user community that has to do more with less. Deadlines are tight, and systems now get an unnerving amount of management attention.

IS professionals, managers and technicians have always flourished under a certain amount of stress. But there is a big difference between the kind of stress that keeps adrenaline flowing and makes the day exciting and the type of relentless stress that is the result of unrealistic expectations.

It is the responsibility of middle management (what's left of us, that is) to reduce the bad stress while maintaining the good stress.

I first saw this kind of stress management in action several years ago, when I was working as a programmer on a high-pressure project. The way our manager dealt with the stresses of that project helped all of us do a better job. It wasn't until later, after having worked on a number of other projects for a number of other managers, that I realized how rarely attention is paid to this issue. Now that I'm a manager myself, I try to follow the lead of that first good teacher.

Here are some of the lessons I learned from him:

•Distinguish between venting and griping. A certain amount of venting should be expected. Venting allows people to get things off their chests, so they feel ready to attack the task at hand once again.

Griping and bickering are different. These kinds of continuing negativity are damaging to morale and cannot be tolerated.

•Be sensitive to the effects of stress on various personalities. Every staff member is an individual and will have both a different tolerance for stress and a different way of expressing feelings. It's up to us as managers to make sure that we find out how high-stress situations are affecting everyone.

I can clearly recall one instance that brought this home to me. After several weeks of heavy overtime, I was approached by a model employee. She barely made it into my office before the tears began to flow.

This wasn't a person who voiced complaints easily, and I hadn't sensed the frustration she was feeling. I should never have let the situation get that far without noticing what the situation was doing to her.

Wayne Vincent

•Don't let your best performers shoulder the whole burden. A balanced effort is important. It can be very damaging to have star performers overloaded while everyone else is leaving on time.

•Don't let overload become a way of life. A colleague of mine once told me that when overtime begins to seem like the normal way to operate, you're in trouble. Overtime should be an occasional measure invoked when extra effort is required to get a particular job done.

•If expectations are unrealistic, say no. If the due dates that are being imposed are unrealistic, we owe it to ourselves and to our staffs to let upper management know. This isn't necessarily a great career enhancer, but neither is losing half your staff to burnout.

If it turns out that there really is no cause for alarm, you'll be able to get out from under some of the stress you've been carrying around.

And even if a problem does exist, but you are overruled, the fact that you tried to do something may improve morale among your staff members. Nobody likes to see the manager strike out, but it's a lot better — and less stressful — than working for someone who doesn't understand your reality.

Olszewski is data processing manager at Beloit Corp. in Lenox, Mass.

Think twice before you topple the control tower

HOWARD GLASSMAN

There once was a manager assigned to reduce his firm's travel costs.

To get started, the manager visited the company airport. His first view was of all the big iron parked along the ramp. "Do we really require something so big, complex and expensive in order to travel?" he asked himself. "What if we could fly in smaller planes that were just as fast and just as well-constructed?"

The executive listed the cost factors that go into operating big planes. In doing so, he discovered a large and sophisticated infrastructure had evolved to ensure that planes were properly maintained and tested, crews were properly trained, schedules were met and so on. Much of this struck him as wasteful excess.

In the end, the executive reported to his management that travel expenses could be cut by implementing a fleet of departmental planes. Departmental pilots could be hired for less, and the company could avoid the expense of complying with all of the bureaucratic regulations imposed by the guys in the control tower. In fact, the manager added, most of the people in the control tower could probably be fired when departments began handling their own transportation.

Lack of coordination might involve a little more risk, but the company could afford to lose a plane and its passengers every now and then — unless of course the passenger was a mission-critical member of the staff.

Sound foolish? Sound familiar?

Worth the risk?

Downsizing from mainframes to midrange or PC LAN environments can reduce costs and give users some freedom from the bureaucracies that have, for so long, controlled the glass house. But has the risk been adequately evaluated? Have the necessary compensating controls been put into place?

Moving an application from one environment to another is not, in and of itself, justification for reducing controls — just as flying a small plane does not justify noncompliance with federal flight regulations.

Downsizing is going to occur, and it should. Smaller machines are gaining power, and there is an upper limit to how much power most organizations require. If this upper limit drops into the envelope of small system capability, then sustaining a mainframe environment makes little sense.

Consider this

Before the move is made, explicit decisions must be made to safeguard company resources.

- If you need and have a backup and recovery methodology on the mainframe that can guarantee recreation of your organization's source code to any date in the past five years, then you must make sure you can do this in the downsized environment as well.
- If you have a 24 to 7 user support ratio in the data center, then you must continue to provide that level of service.
- If you have an operations staff whose function it is to ensure that all required processing occurs in proper sequence and on schedule, and that information is available to users within a certain amount of time, you must continue to meet those commitments in the downsized environment.

Organizational structures and operational procedures that have evolved in the mainframe environment are generally well-tuned to this task. A less structured, more ad hoc user-operated environment may not be.

A recent article in *Computerworld* mentioned an insurance company that was downsizing [CW, Aug. 24]. One of the enticements listed was, "Batch jobs, like posting premium payments, can be activated by programmers from a PC at home."

Knowing as I do the kinds of controls that are required for posting programs in a bank, I have to wonder if the person who made this statement would like to be on a flight through stormy weather, knowing that the navigation was being handled by someone dialing in from home.

Glassman has been involved in the information security field for nine years and is currently manager of information security at Pacific First Bank in Seattle.

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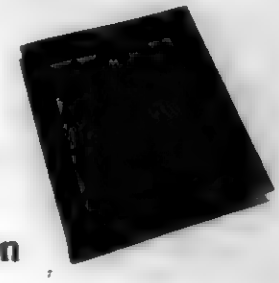

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IN BRIEF

Apple ships System 7.1

■ **Apple Computer, Inc.** has announced the shipment of System 7.1, the latest version of its operating system for the Macintosh line.

System 7.1 includes WorldScript, which allows it to be used with "double-byte" languages such as Japanese and Chinese, which require two bytes for each character of text. System 7.1 also comes with a fonts folder for type integration, modular support for new Macintosh models, integrated TuneUp support and a bundled version of QuickTime 1.5.

■ **Austin Computer Systems** said it will ship PCs that use the Video Electronics Standards Association (VESA) VL-Bus local-video bus. Austin will use the VESA standard in its high-level desktop PCs. The systems were designed to accept VL-Bus adapter cards that will provide local-bus Small Computer Systems Interface and local-area network interfaces.

The Austin 486/DX2-66 VLB system with a 200M-byte integrated electronics hard drive, 4M bytes of random-access memory and a 14-in. Super VGA monitor will cost $3,190.

Users eyeball OS/2 slimdown plan

BY ROSEMARY CAFASSO
CW STAFF

IBM's concept of a streamlined OS/2 2.0 is good news for users, although some customers said they were a little unclear about what IBM would do to make this concept a reality.

"It depends on what they take out," said George Oliver, manager of information delivery technology at the Royal Bank of Canada. "If it's functions, no, we're not interested."

IBM plans to release the slimmer OS/2 in early 1993 and said the product will operate more effectively on a 4M-byte system.

Before OS/2 2.0's arrival last year, IBM had discussed a plan to introduce a so-called Lite version of the operating system with fewer features. This time, however, the goal is to rewrite some of 2.0's code and remove code redundancies so functions remain the same but the operating system takes up less space in memory.

With the smaller version, OS/2 would also become a more realistic choice for portable and laptop computers.

While IBM currently states that OS/2 2.0 requires only 4M bytes of memory, the company also says that to run it with several applications and to use the multitasking feature, a user would really need at least 6M bytes and, in some cases, up to 8M or 12M bytes.

"We are not fully addressing the problem we have at 4M bytes," said Lois Dimpfel, IBM's Personal Systems director at the OS/2 Programming Laboratory in Boca Raton, Fla.

Yet Ronan McGrath, vice president of information systems and accounting at Canadian National Railways, was a little uncertain about the 4M-byte goal because "the PCs coming in now are coming in at 8M bytes anyway."

Dimpfel said 4M-byte machines "are still the sweet spot of the industry, especially in the laptop and notebook environments. They are delivering at 4, and when you deliver them preloaded [with 2.0], you want them preloaded with software that works well."

Dimpfel said IBM will not remove features from OS/2 but instead plans to fine-tune it by recoding portions and getting rid of redundancies. She also said the goal is not simply to cut the 3 million lines of code but to write many of them better.

All in good time

"Sometimes, you can make code better just by thinking harder," said Paul Pignatalli, an OS/2 2.0 reseller and owner of The Corner Store. "With time, you can always do a better job."

Oliver said an IBM official told him two years ago that programmers who wrote 2.0 had done "a good job of shrinking the kernel." At that point, IBM said it could do more shrinking but stopped because the code was pretty good. "So, maybe they are revisiting it now," Oliver added.

IBM will also tune performance to improve system response time. These fixes started shipping with the Service Pack that was released last week. Additional boosts will come by year's end with the point release of 2.0, Dimpfel said.

The streamlining, however, focuses on the actual operating system mechanics. Reducing 2.0's size means more programs and files can be stored along with it in main memory. That requires fewer trips to disk to fetch things — tasks that are now bogging down the system.

Intel outlines chip plans: 'Pentium' to ship in Q1

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — "Pentium" was probably not the other name Shakespeare had in mind for his rose, but Intel Corp. liked it well enough for the chip that has been otherwise known as the 586 and the P5.

Intel recently said Pentium is due to hit the market late in the first quarter of 1993, concurrent with systems that use it. The Pentium plan was one piece of an Intel strategy that Intel President Andrew Grove outlined to the New York PC Users Group recently.

The company plans to unveil 25 new I486-class processors next year, all 3.3V products that support Smart Power Management — Intel's scheme for reducing power consumption on its chips. Grove said the chips would range from the high-end DX2 processors down to 486SL products that would run in subnotebooks. These chips will also be aimed at desktop systems for power-conscious PC buyers, he added.

Industry sources said they expect the first processor, a 486SL, to appear next week, although Grove would not confirm those reports.

Pentium, a 32-bit chip that will run at 66 MHz, is expected to go into servers initially, where its near 100 million instructions per second performance will have more attractive price/performance than desktop machines. IBM, Compaq Computer Corp. and Digital Equipment Corp. are likely to announce systems that use Pentium when it is introduced.

Previously, Intel said it would avoid the 586 moniker for its 486 follow-on processor because numbers cannot be trademarked. Grove charged that when competing chip makers such as Advanced Micro De-

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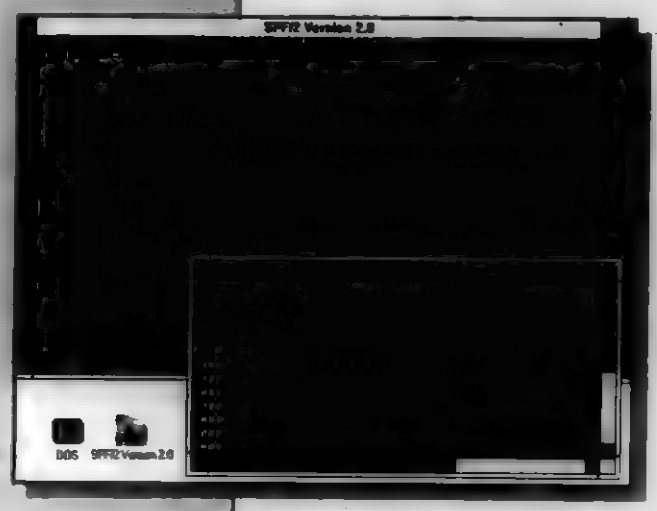

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Integrated card hits fax/modem market

BY CHRISTOPHER LINDQUIST
CW STAFF

SANTA CLARA, Calif. — National Semiconductor Corp. is slated to hit the PC communications retail market this month with an integrated card that includes data, fax, "business audio" and voice capabilities.

At a list price of $279, the TyIN 2000 card drops squarely into the standard fax/data modem market and undercuts competing integrated cards, such as The Complete PC's Complete Communicator, which lists for $499 and does not include the voice annotation features of National Semiconductor's product.

What differentiates TyIN 2000 from the competition, for the moment, is the business audio feature, which allows users to add spoken comments to Microsoft Corp.'s Windows documents and then transfer these files via fax, modem, network or disk.

The audio can be input with either a microphone or a standard telephone handset and can be played back through the integrated speaker, external speakers or the handset.

However, fancy hardware specifications do not guarantee success in a market where leapfrogging standards tend to leave products that are even a few months old in the dust. To help ward off quick obsolescence, National Semiconductor has designed the TyIN 2000 to be software upgradable — meaning that as standards change, users will be able to download software to upgrade the card.

Upgrade-conscious

That feature caught the eye of industry analyst Julie Groll at Dataquest, Inc. in San Jose, Calif. "One thing that caught my attention was commitment to upgrade users to any standards that come out," she said.

The TyIN 2000 also allows users to turn a PC into a voice-mail system, including multiple mailboxes. Mailboxes can be password-protected and accessed remotely via a Touch-Tone phone.

In addition, the card includes 9.6K bit/sec. send and receive fax capability, a 2,400 bit/sec. data modem and automatic call sensing to determine whether an incoming call is voice, data or fax. A scanner can also be attached to the card.

Groll noted that while National Semiconductor has a lead in the integrated communications market for the moment, other products will arrive soon. "At this point, it is fairly unique and the price is low," Groll said. But, "I would expect to see other products similar to this to follow."

Intel outlines its strategy for 486 chip successor

CONTINUED FROM PAGE 37

vices, Inc. used the number 386 in product names, it damaged Intel and "misled" the market.

Grove told the New York user group that IBM has a license to make the Pentium chip for its own use, as it does with current Intel microprocessors. IBM has used this right to build custom versions of Intel's 386SX and 486SX processors, although IBM would not comment on what it might do with Pentium.

Grove also hinted at a new product for Intel.

"For video computing 1.1 we need to have the ability to have software playback — to bring video playback to all computers," Grove told the audience.

Analysts said Intel is likely to show at Comdex/Fall '92 a software product that will let users record and manipulate sound and motion video images and create enhanced electronic mail and other applications.

SX in the works?

Intel officials denied reports that the company is working on an SX version of Pentium that will make it easier for systems vendors to build Pentium-based systems. Paul Otellini, Intel's vice president and general manager of the microprocessor products group, said, "Pentium will be a family over time, but I was very surprised to read about this product since it doesn't exist."

Sources close to the company said Intel is working on a Pentium OverDrive processor that will allow chip-level upgrades from the 486DX to the Pentium processor when it becomes available. Several vendors, including DEC, Compaq and AST Research, Inc., have already designed the new Pentium OverDrive socket into their existing OverDrive-ready systems.

In response to an audience question, Grove denied persistent rumors that Intel has been unable to meet demand for its 486 processors, forcing it to parcel them out to select vendors. Spot prices on the chip gray market have jumped $100 recently due to these reports.

Securities analysts who attended a briefing with Grove earlier in the day said he had conceded that Intel was close to being unable to meet demand.

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Olivetti, Toshiba to unveil notebooks at Comdex/Fall '92

BY MICHAEL FITZGERALD
CW STAFF

Bells and whistles are a staple of the PC industry, but some notebook advances look like they will bring a whole orchestra into play.

For instance, Toshiba Corp. is working to build paging capabilities into future notebook products, according to sources close to the company. The technology may be shown at the Comdex/Fall '92 show later this month, according to industry observers, although Toshiba declined to comment on those reports.

Toshiba is negotiating with PageMart, Inc. in Dallas for the pager technology — said to be dubbed ReadyMessage — that would allow the user to have paging system alerts ring through the laptop system and appear on the notebook screen.

The one-way messaging from this unit could allow voice-mail messages to be handled the same way and could eventually lead to two-way page-and-respond systems.

Sources said Toshiba is close to bringing these ReadyMessage-capable systems to market. The systems are said to use Intel Corp.'s soon-to-be-announced I486SL processor.

Decisions, decisions

Toshiba is said to still be weighing whether to build in the pager unit or handle it as a Personal Computer Memory Card International Association (PCMCIA)-based add-in device. Toshiba refused to comment, and PageMart did not return phone calls.

Sources also said Olivetti Office USA will use Comdex to mark the U.S. debut of Olivetti's Quaderno, a 2.25-pound, 4- by 6-in. combination notebook and voice-processing system.

The Quaderno, which shipped in Europe in midsummer, records voice messages on its hard drive and allows for voice annotations to files.

Keys on the system record, rewind, play and fast-forward as on a tape recorder. The product also has a built-in microphone and speaker and uses a digital signal processor from Analog Devices, Inc.

The hard drive holds 20M bytes of data, and the system uses a NEC Corp. V30 processor, an Intel 80286-class product. Four AA batteries power it. Pricing may be below $1,000 in the U.S., a source said.

An Olivetti spokeswoman confirmed that Quaderno will be at several booths at Comdex, including the PCMCIA booth, where some models will be given away to show attendees.

She said Olivetti has not decided if it will announce U.S. availability for the product at Comdex.

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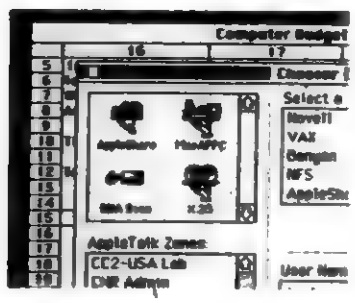

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TI, Grid color new portables

BY MICHAEL FITZGERALD
CW STAFF

Vendors continue to add color to their notebook product palettes.

The past two weeks saw Texas Instruments, Inc. and Grid Systems Corp. add their names to the list of vendors with color notebooks.

TI in Temple, Texas, brought out two color notebooks among its four new notebooks. All four TI products bundle Microsoft Corp.'s Windows 3.1 and are based on 486-class processors.

The TM4000 WinDX2/40 Color features a 20-MHz/40-MHz 486DX2 processor, 8M bytes of random-access memory and a 200M-byte hard drive. The price is $4,499.

The TM4000 WinSX/25 Color has 4M bytes of RAM and a 120M-byte hard drive. It costs $3,699. Both color notebooks weigh 6.3 pounds.

The 5.6-pound monochrome units include the TM4000 WinDX2/50, which features Intel Corp.'s 25-MHz/50-MHz 486DX2 processor, 8M bytes of RAM and a 200M-byte hard drive for $3,899. The TravelMate WinSLC uses TI's 25-MHz 486SLC and costs $1,999.

Grid, which is moving to Dallas from Fremont, Calif., introduced a 6.9-pound, 25-MHz Intel 80386SL-based notebook, the 1660C, with an active-matrix color screen, a built-in trackball pointing device and an optional docking station.

It will cost $4,495 with 4M bytes of RAM and a 125M-byte hard drive.

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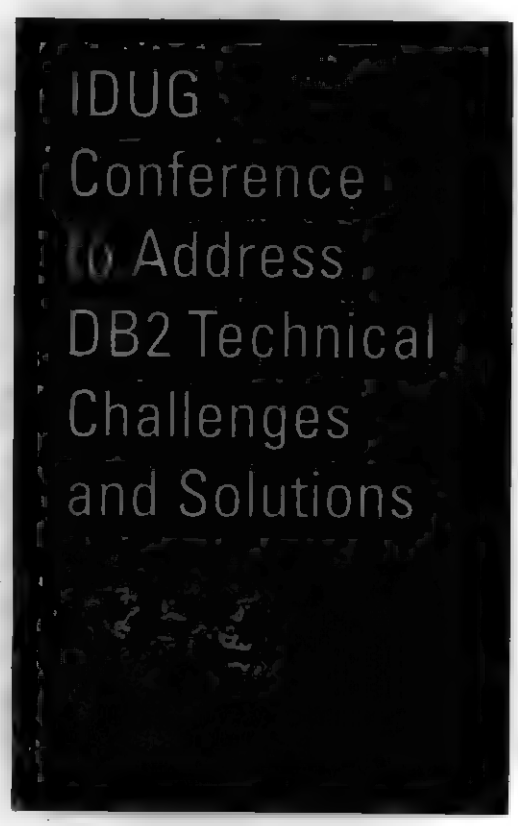

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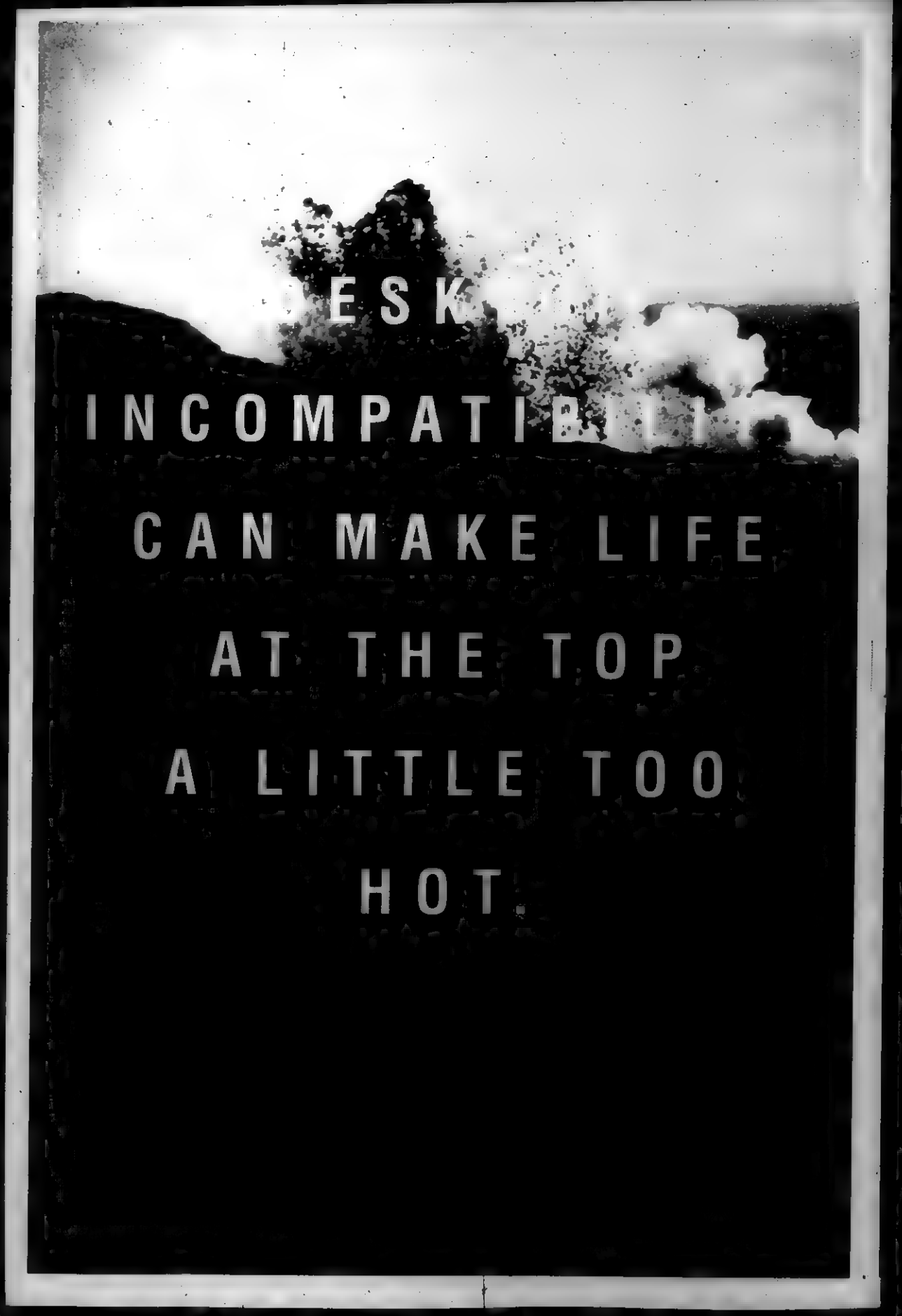
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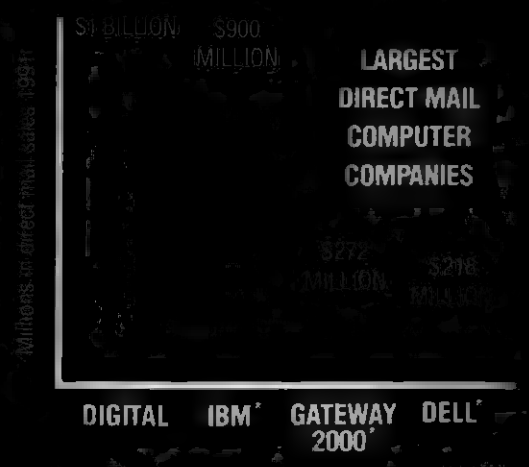
A LITTLE TOO
HOT.

MAYBE THAT'S WH

SO MANY PEOPLE WANT DIGITAL ON THEIR DESKTOP.

"Digital Equipment Corporation racked up $1 billion in catalog revenue last year, toppling Dell Computer as the computer industry's top mail-order seller."

—*USA Today*, August 7, 1992



digital

EVERYTHING WORKS TOGETHER. AND WE MEAN EVERYTHING.

"Network Certified by Digital." More than a seal of approval. It's a statement of fact. Pure and simple. It's what separates Digital from the crowd.

Even today, when most companies are building products that can connect, Digital builds to a higher standard: *Integration*. The only standard that saves *you* from

"...Digital had the combination of engineering expertise, experience in systems integration, and worldwide quality control standards that we were looking for. Equally important was the assurance Digital could give us on maintenance. We can't risk anything going wrong in the middle of a trading session."

— Richard Heckinger, Hong Kong Stock Exchange

unhappy users and lost time and money when your LAN goes down.

In these headline making days of PC company cost-cutting maneuvers and substandard components, only Digital continues to have the technology, alliances and commitment to guarantee integration in today's complex multi-vendor environments — and tomorrow's .

Some people tell us we're too obsessed with integration. Too much the engineers. So be it. At Digital we still believe in taking the heat — so you'll never have to.

DECpc 333sx LP
i386SX 33MHz System
• 64KB Cache • 4MB RAM
• 122MB Hard Drive
• 14" VGA Color Monitor
• 3.5" 1.44MB Floppy Drive
• Keyboard and Mouse
• MS-DOS 5.0 & Windows 3.1
$1,549

We take the heat. So you'll never have to.

In the real world not everyone calls Digital for *all* their desktop product needs (yet). We recognize you buy servers from here, math coprocessors from there and entirely somebody else's PCs—somewhere else.

Which is why we built our own labs to test interconnectivity back in 1985. Since then, every Digital desktop product is network tested with every other industry standard machine available, from IBM PS/2® and OS/2® to COMPAQ®, Sun Workstations® and Macintosh®. We operate a 70,000+ node network that runs our company—and tests our PCs. We even test applications between different networking configurations.

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Every Digital PC Includes:

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- **Leasing Now Available**
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can network
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Which is
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data highway

DECpc 425
i486SX 25MHz
• 4MB RA
• 122MB Hard
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(14", 0.29m
• 3.5" 1.44MB Flo
• Keyboard and
• MS-DOS 5.0 & W
• Fully Upgrad
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We've ev
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ilds PCs better. No PC effortlessly unless it can distin- an incredible standalone. why Digital uses the *best* vailable. Like *high-volume* rs to keep microprocessors up to speed.

Writeback cache instead of standard cache (Writeback is the most advanced memory-catching strategy in the industry). *Built-in GUI accelerators* to make Windows™ run at speeds four times that of standard VGA. And VRAM instead of DRAM in our new for speeding up video

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WEEK

"DECPC BESTS COST 486DX FIELD. PERFORMANCE, DABILITY AND DESIGN STAND OUT... l Equipment Corp.'s system the verall winner in C Week Labs tests..."

***PC Week*, October 5, 1992**

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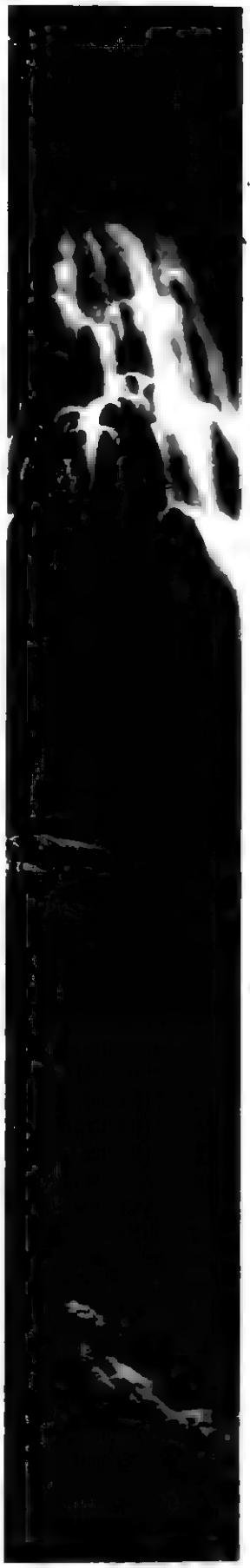

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i486DX 33MHz System
• 128KB Cache • 4MB RAM
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• MS-DOS 5.0 & Windows 3.1
$2,299
Call for availability!

An integration strategy only Digital can deliver.

"Experience in networking" are three words most commonly associated with Digital. That's because our passion for integration never allowed us to settle for mere compatibility.

Which is why when it comes to developing solutions for making the right information available to the right people at the right time in the most useful form — regardless of geography, hardware or software — Digital should be your first choice.

And with Digital, you don't have to pay for solutions you may never need. We can customize our services to your environment and your needs.

No matter how complex— or how simple.

"I think they're a winner."

— Andrew Seybold, Editor-in-Chief
The Outlook on Professional Computing
August 24, 1992

Even if Digital doesn't manufacture it, our service makes it work.

Take these three basic examples of Digital's integrated service thinking:

Our Multi-vendor Service Plan gives you expert coverage for more than 8,000 hardware and software products from 800 different manufacturers.

Our Hardware Service Plan puts the expertise of more than 40,000 technical experts worldwide at your fingertips — whether you're using Apple®, IBM®, COMPAQ®, (or Digital), to name a *very* few of the vendors it covers.

Our Software Support for more than 100 popular applications from Microsoft®, Banyan™, Ashton-Tate™, Novell® and many others — thanks to our alliances.

To order or for more information, call.

Don't forget to ask about our complete line of printers, software, accessories and peripherals–and our special offer on Lotus® software!

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One more word about networking from the people who made it happen.

PATHWORKS : What makes PATHWORKS the last word in networking? Choice, for one thing. Other networking operating system vendors say they offer "choice." They do —as long as it's theirs. But no one matches PATHWORKS choice of servers, clients and even security. PATHWORKS works wherever *and* with almost whatever PCs, servers, network operating systems, local and wide area network applications you're using. PATHWORKS brings them *all* together — seamlessly. Making growth in an integrated environment not just painless but *possible*.

PATHWORKS also works on a few other tough problems better than *they do* including:
• Security • Network Management • Access to Data at the Source • Enabling True Peer-to-Peer Networking.

Our network *service* is just as flexible and distinctive. From installation of a single package to a single point of contact for a global multi-vendor environment. It's just another advantage of dealing with a company that has 40,000 technical experts worldwide: DIGITAL.

"Ben & Jerry's networks its PCs via DEC PATHWORKS... We're happy with our architecture. It meets our current needs and can expand to meet future ones."

— LAN Magazine, March 1992

NEW!

Point and go with Vivace for Windows.

Digital has a solution for anyone who has ever had to go searching through long forgotten subdirectories to find a missing file: Vivace.

Vivace lets you control desktop services, documents and folders via a graphical interface that puts the focus on how *you* work — instead of how the computer works. You can organize by task, by customer, by anything.

Vivace frees you from the tyranny of directories, subdirectories and sub-sub-directories. Just point your mouse and go — right to what you need.

To order Vivace, or for more information, call our Technical Consultants at 1 800 DIGITAL. Ask for our special limited time offer of 30% off list price!

List Price: $145. **Now: $102**

DECPCI Forum on CompuServe!

Now, access DECPCI Forum on CompuServe for answers, announcements, tech tips and more for any Digital PC or PC integration product.

It's available 24 hours a day, 7 days a week for configuration recommendations, interoperability information, up-to-date information on known bugs, software drivers or downloadable software patches. Just enter GO DECPCI at the ! prompt.

Special notice to our Government customers.
For current prices, technical support and order placement for the new GSA-BC Schedule just call: 1 800 DIGITAL. Ask for the Government Contract Group and reference GSA Contract Number GSOOK92AGS6158.

For networking products, pre-order information, call. Press option 2.

1 800 DIGITAL

Please reference AXT when you call Monday to Friday 8:30 AM To 8:00 PM (ET).

DECdirect

AT&T announces line of personal communicators

BY ELLIS BOOKER
CW STAFF

SANTA CLARA, Calif. — Bilbo Baggins could have used one on his adventures in Middle Earth: a tiny, lightweight gadget able to exchange voice, fax and electronic mail.

AT&T Microelectronics recently announced the first of its Hobbit processors, a family of high-speed, low-power microprocessors targeted at pen-based, mobile devices — what AT&T calls "personal communicators."

According to Dean McCarron, an analyst at In-Stat, Inc., a market research firm in Scottsdale, Ariz., AT&T's interest in the handheld/personal digital assistant market is matched by Intel Corp., VLSI Technology, Inc., Vadem and Chips and Technologies, Inc.

"It's fair to assume that every major semiconductor company is going to go after this market," McCarron said. He estimated that within five years, 20 million of these devices — using either chip sets or highly integrated single chips — will be sold annually. In 10 years, In-Stat predicted, 70 million of these systems will be sold annually.

The first Hobbit chip, the ATT92010, operates at 3.3V and achieves a performance level of 13.5 VAX million instructions per second (MIPS), AT&T said. This performance reportedly works out to 37 VAX MIPS per watt.

The Hobbit will be shown this month at Comdex/Fall '92, where AT&T promises to have several equipment manufacturers who will voice support for the new line. To date, only EO, Inc. in Mountain View, Calif., has publicly announced that it plans to use the AT&T chip set in a future pen-based system.

Other members of the Hobbit family include a system and power management controller for all devices in the chip set, a Personal Computer Memory Card International Association controller for memory and I/O and a peripheral controller and a display controller supporting both LCD and CRT-type displays. The Hobbit CPU costs $35 in quantities of 10,000, with the chip set costing less than $100, AT&T said.

WINDOWS VIEW

Jesse Berst

The Quiche Factor

We work in a very technical profession. Yet many decisions are still based on emotion.

Consider Microsoft's Visual Basic. By any measure, Visual Basic earns a spot on the list of serious corporate development tools. In many cases, however, Visual Basic isn't considered because of the emotional baggage it carries.

I call this the Quiche Factor, after the book *Real Men Don't Eat Quiche*. In this case, however, the phrase is "Real programmers don't use Basic." (Yes, I know there are many fine women programmers. But you get the point.)

The Quiche Factor certainly hampered Walt Wikman, director of global delivery technology at A. C. Nielsen, the market research firm. Wikman is a fan of Visual Basic as a corporate development tool. "The toughest thing we've had to overcome with Visual Basic is the perception that it's not for real programmers," Wikman said. "People who've spent time learning C don't think a switch to Basic is a career-enhancing move."

That's too bad, because Wikman believes Visual Basic is "great for small, targeted apps." His firm has built an "engine" in C called the Nielsen Workstation. His programmers use Visual Basic to build applets on top of the engine, tailored to clients' special needs. Visual Basic fits their requirements "like a glove" because of its ability to create reusable custom controls.

I first woke up to the value of Visual Basic when I was a judge at the Windows World Open, *Computerworld*'s Custom Applications Contest. Many of the finalists built their applications in whole or in part with Visual Basic, leading me to conclude it was more than a hobbyist's tool.

Now is a good time to take another look at Visual Basic because Microsoft has just released Version 2.0. This new release comes in two flavors: the $199 standard edition and the $495 professional edition.

Microsoft has enhanced Visual Basic to answer the leading requests from customers. I visited the Visual Basic team recently and saw tapes of the focus groups they conducted. Here are a few of the things Microsoft added after listening to users:

- New debugging tools.
- Improved interface and a handy Tool Bar.
- Better support for development teams and third-party CASE tools.
- Improved performance. "We took a reasonably sized app and converted it to Version 2.0 in about a half hour," Wikman said. "We didn't do anything else and we got it to run about 30% faster immediately."

The professional edition has been further enhanced with IS needs in mind, including additional tools for workgroup and database access applications.

What's the verdict on Version 2.0? Based on his work with the beta-test version, Wikman said he is pleased. "It's not as powerful as the C environment," he cautioned. "If you're a commercial developer who wants to build a spreadsheet, you wouldn't use Visual Basic. But it's a great way to prototype or to put small apps together in a hurry because it's so easy to use."

What about the Quiche Factor? Wikman said he solved it by making his people compete against nonprogrammers. "If a nonprogrammer using Visual Basic could put together an app faster than the professionals, then it obviously meant that they needed to take a look."

Most in-house development shops should give Visual Basic a look. In addition to the reasons cited above, the Basic language appears to have an important future. Access, the soon-to-be-released database from Microsoft, uses Basic as its programming language. What's more, Microsoft is building a new "Object Basic" that will appear in all of its products and will also allow you to create cross-application solutions — that is, to create custom solutions with Windows products as the building blocks and Object Basic as the glue.

I'm not saying every in-house developer needs Visual Basic. But I am suggesting it deserves serious consideration for corporate development projects. Letting programmers ignore Visual Basic because of the Quiche Factor is a half-baked idea.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

NEW PRODUCTS

Software

Pilot Software, Inc. has started shipping Version 3.2 of LightShip. The product is a PC version of the company's visual information access system and runs under Microsoft Corp.'s Windows.

According to the company, LightShip 3.2 includes a more powerful and simplified menuing environment for building and implementing pull-down and cascading menus. Objects can be named on the systems screen, allowing them to locate and group related objects.

LightShip 3.2 costs $19,000.

Pilot Software
40 Broad St.
Boston, Mass. 02109
(617) 350-7035

Systems

Altima Systems, Inc. has introduced the Altima 325XL and the Altima 325SL notebook computers.

According to the company, the Altima 325XL is powered by Intel Corp.'s 80386SXL processor; the 325SL uses the Intel 80386SL chip. The 325SL offers advanced power management and 64K cache memory. Both models include 25-MHz speed, 2M bytes of random-access memory expandable to 4M or 6M bytes, a 3½-in., 1.44M-byte internal floppy disk drive and an 80M-byte hard drive.

The 325XL costs $2,399, and the 325SL costs $2,699.

Altima Systems
Suite 1050
1390 Willow Pass Road
Concord, Calif. 94520
(510) 356-5600

Sigma Designs, Inc. has introduced WinStorm, a Microsoft Corp., Windows-based video accelerator board.

WinStorm offers True Color video and 16-bit CD-quality sound. According to the company, the product includes interfaces for high-performance Small Computer Systems Interface CD-ROM, full duplex Musical Instrument Digital Interface, an internal 20-voice stereo synthesizer, several popular multimedia applications, standard IBM joystick and Sigma Designs' proprietary MultiMode Control Panel software.

The WinStorm multimedia display adapter comes with 1M byte of memory and costs $429.

Sigma Designs
47900 Bayside Pkwy.
Fremont, Calif. 94538
(510) 770-0100

Macintosh products

Virginia Systems, Inc. has introduced Version 1.0 of Sonar Image, a document imaging system designed for the Apple Computer, Inc. Macintosh.

Users can scan items such as letters, articles, depositions and briefs and recover the scanned documents at a future time, the company reported. An automatic optical character recognition feature enables users to search for anything in the scanned documents.

Users can then view or print the original image of the page or the recognized text in the document. Sonar Image provides a choice of three image resolutions, support for a variety of scanners, simple image input and an enhanced retrieval system.

The single-user price for Sonar Image is $2,195.

Virginia Systems
5509 West Bay Court
Midlothian, Va. 23112
(804) 739-3200

Peripherals

Dataproducts Corp. has introduced Jolt PS, a solid ink color printer.

The product incorporates Adobe Systems, Inc.'s PostScript Level 2 page description language and has a throughput rate of 2 page/min. for text.

According to the company, Jolt PS uses a Dataproducts engine and has a 24-MHz Weitek 8220 processor. A Small Computer Systems Interface port for hard drive connection is included, along with concurrent Apple Computer, Inc. AppleTalk/LocalTalk and RS-232 serial interface ports as a standard configuration.

Jolt PS costs $6,695.

Dataproducts
6219 De Soto Ave.
Woodland Hills, Calif. 91365
(818) 887-8000

Digital Equipment Corp. has announced the DECLaser 1152 desktop laser printer.

Standard interfaces are included that attach directly to Apple Computer, Inc. Macintosh and PC systems, or the printer can be configured in LAT networks, the company reported.

The 4 page/min. printer also includes Hewlett-Packard Co. LaserJet II and Adobe Systems, Inc.'s PostScript Level 2 protocols, 17 scalable PostScript fonts and parallel, serial and AppleTalk ports.

The DECLaser 1152 laser printer has 300 by 300 dot/in. resolution, a 6,000 page/month duty cycle and the ability to print on a variety of items, including envelopes and transparencies.

The introductory price for the product is $999.

DEC
146 Main St.
Maynard, Mass. 01754
(508) 493-5111

Software application packages

SalesLink Systems has announced Version 1.2 of SalesLink for Windows.

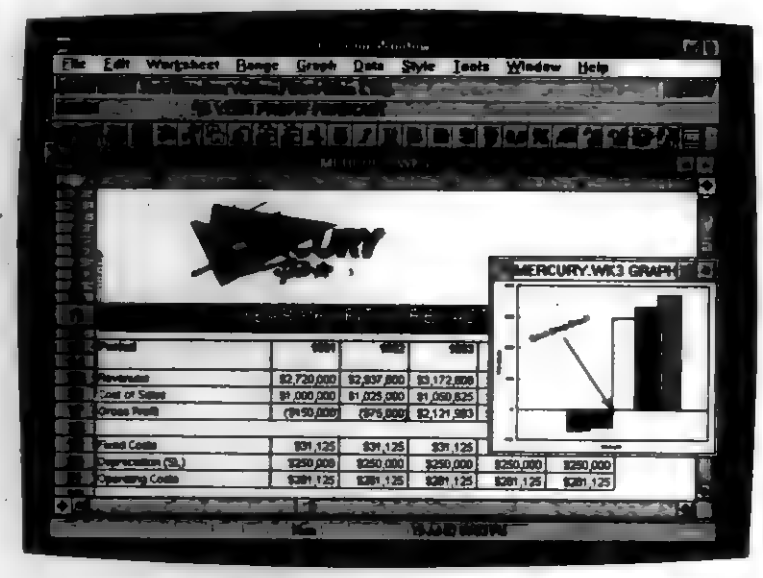
The product is a sales force automation software that has compliance with Microsoft Corp. Windows for Pen Computing.

According to the company, SalesLink for Windows incorporates an enhanced personal-information-management module that includes an agent capability designed to automate various tasks.

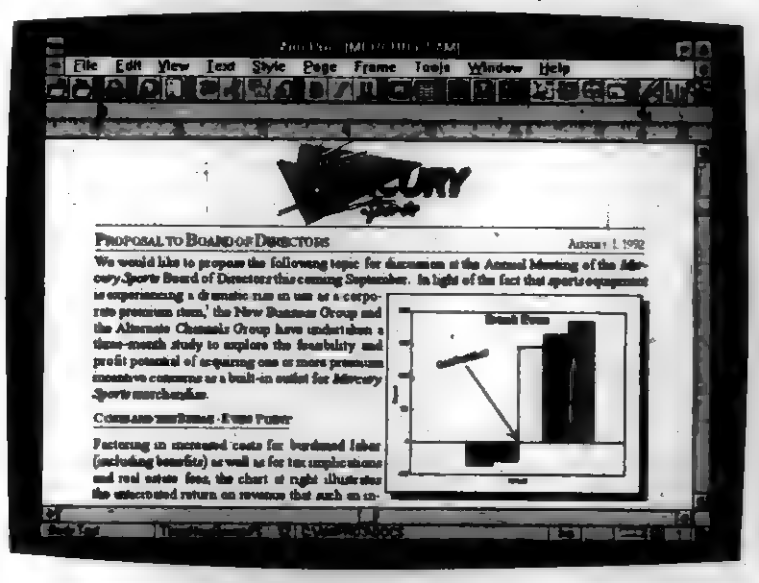
SalesLink for Windows costs $895 per user.

SalesLink Systems
1840 Oak Ave.
Evanston, Ill. 60201
(708) 866-0400

Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.

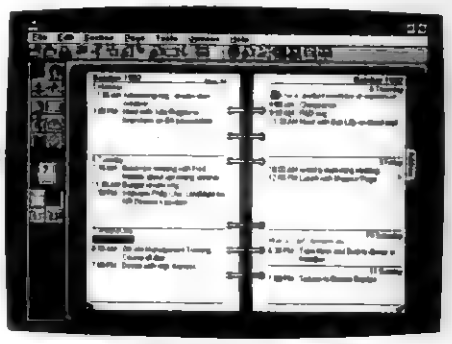


Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows™ desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite™ and Microsoft® Office include full-featured products. But SmartSuite has been recently updated to include 1-2-3® for Windows Release 1.1 with SmartPak™ and the newly released Ami Pro® 3.0, as well as Freelance Graphics® and cc:Mail.™

All four of these award-winning products share a common interface as well as our innovative SmartIcons.™ So when you've learned one, you've learned them all.



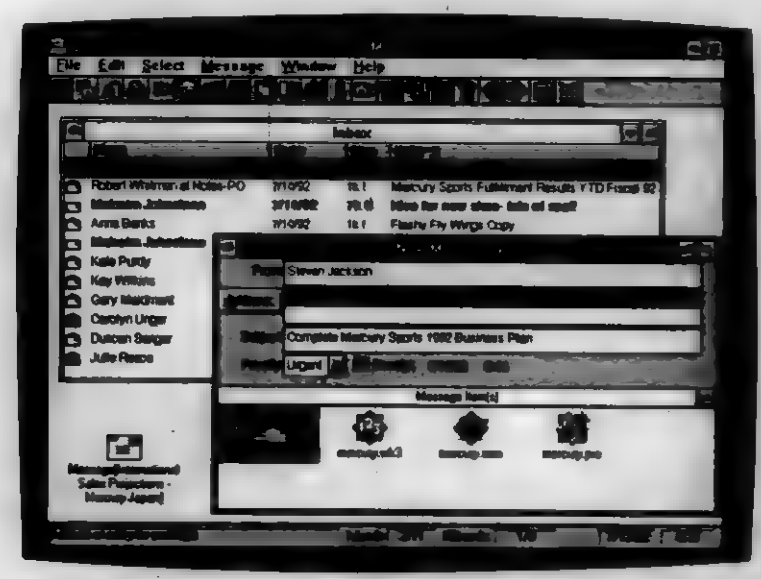
For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products, for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint.® You can even move

*Offer expires 12/31/92 or while supplies last. **Suggested retail value. ***In Canada, call 1-800-GO-LOTUS. When you purchase 10 SmartSuite packages, you'll get a free cc:Mail for Windows Platform Pack (a $495 value).
SmartMasters and Working Together are trademarks of Lotus Development Corporation. cc:Mail is a trademark of cc:Mail, Incorporated, a wholly-

tus SmartSuite, s more like a cubicle.

Award-winning Freelance Graphics is the easiest, fastest way to create a stunning presentation.



cc:Mail, the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

quickly between SmartSuite applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

For one thing, you just can't beat the total value. In fact, for a limited time,* **when you buy SmartSuite, we'll give you Lotus Organizer™ (a $149 value**) absolutely free.** It includes an on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder that are all fully integrated. Plus if you're upgrading from any version of 1-2-3, Symphony, any Lotus word processor or graphics product, or cc:Mail, you'll save even more. So do the smart thing. Visit your Lotus Authorized Reseller or call **1-800-872-3387, ext. 7165*** for a free demo disk.

Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

To find out more about Lotus and Working Together™ in Windows, visit Booth #2842 at Comdex.

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Gateway's Nomads: Powerful, well-keyed

Technology Analysis — A roundup of expert opinions about new products. Summaries written by new products writer Lisa Davidson.

The Gateway 2000, Inc. Nomad series has three monochrome notebooks: an entry-level system based on Advanced Micro Devices, Inc.'s 25-MHz AM386SXL chip and higher end models based on Intel Corp.'s 20-MHz I486SX and 25-MHz I486DX processors. Reviewers raved about Nomad's power supply but were not too keen on its construction.

Performance: The machines cranked out high scores through processing and memory tests. However, all three lagged behind the competition in video performance.

Ease of use: Ergonomically correct, the Nomad keys were described by reviewers as both crisp and pleasingly responsive.

Power supply: The 425DXL model lasted just over four hours; other models lasted about three hours.

Design: Reviewers said one minor drawback was Nomad's flimsy case contruction. Under normal use, its plastic doors and ports bent easily.

Service and support: Toll-free technical support and one-year parts-and-labor warranty are offered.

Overall value: Prices start at $2,095 for the 325SXL model with an 80M-byte hard drive.

Gateway 2000 Nomad

Reviewers	Performance	Ease of use	Power supply	Design	Service and support	Overall value
PC Magazine 8/92	Quality performance	Disappointing keyboard	Excellent battery life	Flimsy construction	Toll-free support	Highly competitive price
PC Computing 9/92	Cranked through processing tests	Large, high-contrast screen	Impressive	5.8 pounds	Outstanding support	Outstanding
PC Week 8/10/92	Excellent performance	Keyboard layout mishmash	2.5 hours	Bulk	NC	Surprisingly low price
PC Sources 9/92	Enough power for any task	Great typing feel; fine video	Up to 6 hours	Manufactured by Texas Instruments	Typical support policies	Uncompromising power
Users						
Bruce Chanin, The Goodyear Tire and Rubber Co.	■	▙	■	▙	■	Very good value
Bill Cecil, St. Luke's Hospital of Kansas City	■	■	■	▙	■	Tremendous value
Analysts						
Chris Vanden, IDC Strategic Database	■	▙	▙	▌	▌	Has a lot of power
Margaret Jacobs, Datapro Information Services Group	■	▙	▙	■	■	Many extra features
Mark Hansen, Kodak, Inc.	▙	▙	▌	■	■	Next generation more usable

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Gateway 2000 reported revenue of $249 million for the quarter ended June 30, a 5% increase over the previous quarter. "They aren't growing as fast as they have been, but they're doing well," said Bruce Stephens, an analyst at International Data Corp. "Let's say they've reached a cruising altitude."

Gateway responds

Mike Schmith, marketing manager:

Ease of use: We have actually found that having the shorter key travel allows some users to type faster. The lack of dedicated Ctrl keys is actually a blessing in disguise. By having to hit two keys, we avoid hitting the Pg Dn key instead of the Enter key.

Design: This product stands up very well. We are currently looking at a redesign on the port doors.

Compaq's LTE Lite/25 works fast, long

Compaq LTE Lite/25

Reviewers	Performance	Ease of use	Power supply	Design	Service and support	Overall value
PC Magazine 8/92	Among the fastest	Sharp, crisp edge-lit screen	2 hours, 17 minutes	Up to 10M bytes of memory	Toll-free support added	Compaq quality, Compaq price
Infoworld 7/20/92	Excellent	Very good keyboard	Excellent; more than 4 hours	Well-designed	Good	Fine expandability
PC Computing 8/92	Steamed through video tests	16 levels of gray in VGA	Revamped power management	NC	NC	Great news
Users						
Robert Brock, Rails Inn	■	▙	▙	■	■	Extremely good value
Glen Wilkens, Dunn Construction	▙	■	■	■	■	Value great
Dennis Theriesault, United Technologies Corp.	■	■	■	■	NC	Very, very versatile
Analysts						
Chris Vanden, IDC Strategic Database	▙	■	▙	■	▙	It gets better and better
Margaret Jacobs, Datapro Information Services Group	■	■	■	■	▙	Very good power management
Mark Hansen, Kodak, Inc.	■	■	▙	▙	▙	Could improve disk storage and pricing

Key: ■ Very good ▙ Good ▌ Fair ▪ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor background information

Compaq reported record revenue of $1.1 billion and profits of $49 million for the quarter ended Sept. 30. Revenue was up 50% over the comparable 1991 quarter when the company recorded a $70 million loss.

Compaq responds

Andrew Watson, director of portables marketing:

Performance: Compaq has not compromised battery life. We have included extremely powerful conservation features that are disabled during the reviewers tests.

Ease of use: We focused our attention on making alphanumeric features compatible to the full-size keyboard on the desktop.

Compaq Computer Corp.'s LTE Lite/25 surpasses its competition in performance. Until recently, it was priced on the high end; however, Compaq's recent price cuts of more than $1,000 now make the LTE an attractive buy.

Performance: Based on Intel Corp.'s 25-MHz 80386SL chip, the LTE Lite/25 boasts enhanced processing speed — it is 19% faster than its 20-MHz Intel 386SX-based sibling.

Ease of use: Reviewers noted the notebook's undersized function keys. However, the keyboard possesses a short stroke and has the added benefit of an inverted T cursor key layout, which was not the case in some earlier Compaq notebooks.

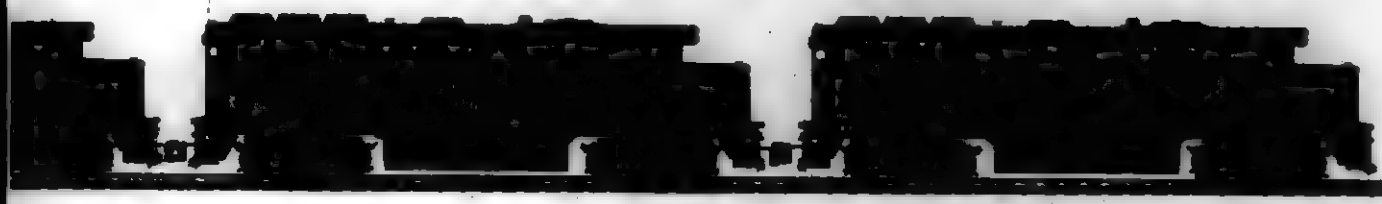
Power supply: The nickel hydride battery lasted 2 hours, 17 minutes in battery rundown tests. That score increased to 3 hours, 26 minutes when power conservation was enabled. However, *PC Magazine* noted that battery performance has been compromised for a lower weight.

Design: The 6-pound LTE Lite/25's dimensions are 8½ - by 11 - by 1¾ - in.

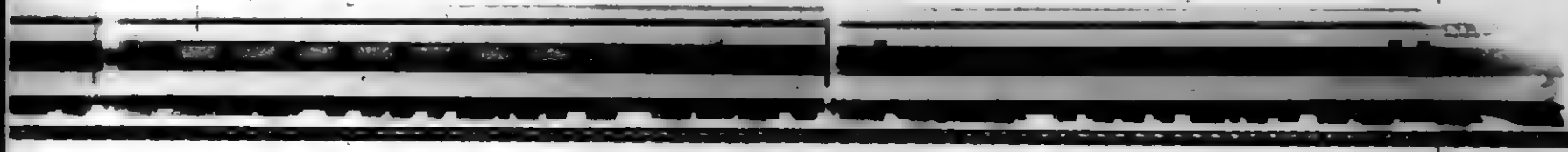
Service and support: On-site service and support are provided for one year. Service policies include a one-year warranty and toll-free support from 7 a.m. to 7 p.m. Central time.

Overall value: LTE Lite prices start at $2,799. Users will have to decide whether it is worth its weight.

Why combine a number of SPARCstations,



when a network of HP workstations and X stations operates for less?



It just stands to reason. The more engines, the more cost. Not only in initial purchase price, but system administration, backups and OS updates. That's why more and more people are getting on board with an HP workstation/X station network. A powerful engine that carries plenty of passengers.

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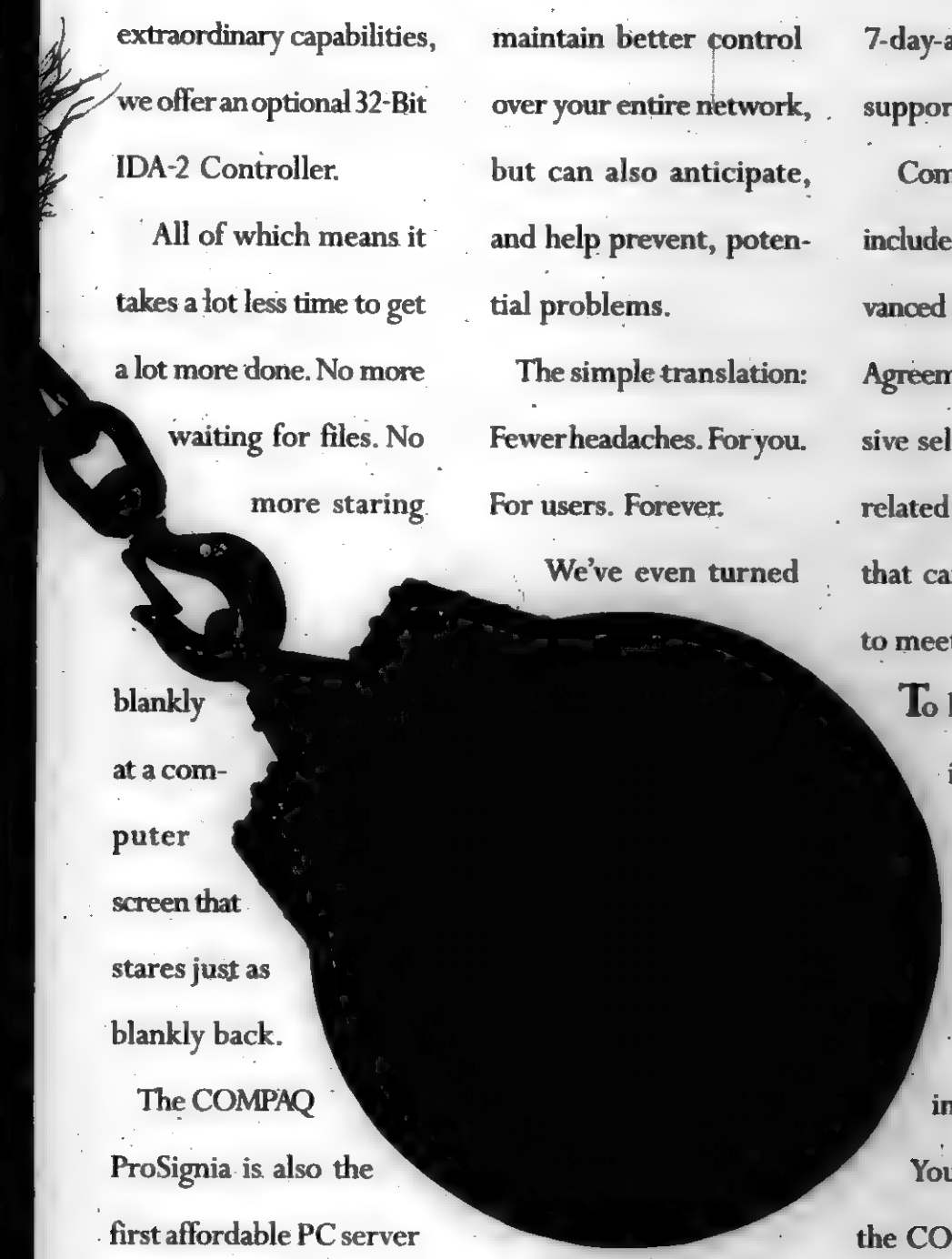

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intel inside

With only industry-standard technologies and an easy-to-upgrade processor path, the COMPAQ ProSignia provides a cost-effective way to meet today's needs today. And tomorrow's tomorrow.

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by Contracted Service Providers, in specific to hardware products and may not be available in certain geographic locations. Consult the Compaq Customer Support Center for details. †Suggested retail price, reseller price may vary; price indicated is for non-disk-configured COMPAQ ProSignia 486/33 Model 1/EL, not pictured here; monitor, NetFlex Controller not included. Models including hard drive and NetFlex Controller start under $4500. The Intel Inside logo is a registered trademark of Intel Corporation.

BUYERS' SCORECARD

OpenLook scores highest in GUI satisfaction

BY DEREK SLATER
CW STAFF

Hearing all the talk of Microsoft Corp.'s Windows New Technology (NT), desktop system users might get the impression that powerful graphical user interfaces (GUI) have not yet hit the market and that they must wait until NT is finally delivered next year.

But there are already numerous choices among desktop GUIs that present end users with a visual desktop computing environment. The five market leaders on Intel Corp. and Unix workstation platforms are Intel PC-based IBM's OS/2, Microsoft's Windows and Desqview/386 from Quarterdeck Office Systems and Unix workstation-based Sun Microsystems, Inc.'s OpenLook and the Open Software Foundation's (OSF) Motif.

User ratings of these top GUIs established Sun's OpenLook interface with the highest overall satisfaction with a score of 76.8. The rating placed it ahead of OS/2 and Windows, which were in a virtual tie, scoring 73.5 and 73.1, respectively. The OSF's Motif trailed the pack with an overall score of 72.4. Quarterdeck's Desqview was not included in the overall ratings because of an insufficient response base.

Choosing among these interfaces also necessitates a choice of operating system. The Buyers' Scorecard criteria focus on GUI attributes but include some operating systems functions.

In the Unix arena, OpenLook runs exclusively on Sun workstations, while Motif supports hardware from a number of different vendors. (Motif can also be run on top of DOS and OS/2, although this is less common.)

OpenLook topped Motif in most ratings areas, and it earned higher ratings than either of the Intel PC-based products in categories such as local-area networking capability, performance (where its workstation platform may provide a speed advantage) and documentation.

Motif users gave it higher ratings in the area of compatibility with installed hardware and software; it also rated higher than OpenLook in ease of installation. The $1,000 price tag for Motif includes a tool kit, an application programming interface and a description language/compiler, allowing users to develop their own Motif applications.

Despite the closeness of the Windows and OS/2 overall scores, satisfaction ratings indicate differing strengths for the two products. OS/2 comfortably topped Windows in the area of multitasking; Windows enables DOS users to open several applications simultaneously and cut and paste between them, but it does not allow the user to simultaneously perform two computing tasks (a functionality promised for Windows NT).

OS/2 also earned higher ratings in service and support and in memory and file management. Both products are known for being fairly resource-intensive; OS/2 placed higher in performance. Windows, on the other hand, placed higher in ease of use and installation and in value for the dollar.

Buyers' Scorecard records users' satisfaction with their installed products. Users assigned 1-to-10 ratings based on their satisfaction with their GUIs in 12 specific categories. Users also rated the importance of each category. (See the methodology on the following page for a complete description of the scoring process.) •

Graphical user interfaces

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 50 users for each product.

Total possible score **100** Mean score **74**

Product	Highest ratings	Lowest ratings
Unix-based GUIs		
Sun's OpenLook — SCORE 76.8	Multitasking; Local-area networking; Value for the dollar	Ease of installation; Memory management; File management
OSF's Motif — SCORE 72.4	Local-area networking; Multitasking; Ease of use	File management; Memory management; Utilities
Intel PC-based GUIs		
IBM's OS/2 — SCORE 73.5	Multitasking; Value for the dollar; Vendor service and support	Ease of installation; Documentation; Utilities
Microsoft's Windows — SCORE 73.1	Value for the dollar; Ease of installation; Ease of use	Multitasking; File management; Memory management

RATINGS IN ORDER OF IMPORTANCE

In the Unix comparison, Motif earns the highest score in compatibility, the area users rated as most crucial. However, OpenLook gets higher marks than Motif in the remaining key ratings categories. Windows tops OS/2 in most areas on Intel platforms but fares poorly in multitasking.

User importance rating:

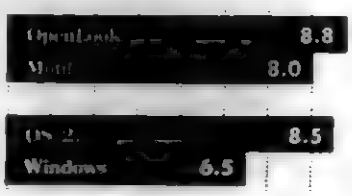
(Additional ratings on next page)

8.3 Compatibility

8.3 Local-area networking capabilities

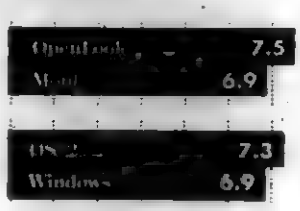
8.1 Ease of use

8.0 Multitasking



8.0 Value for the dollar

7.9 Performance

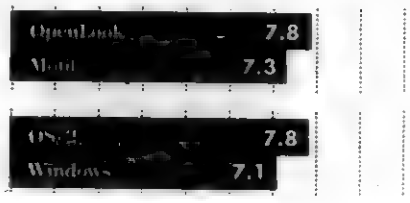


RATINGS IN ORDER OF IMPORTANCE

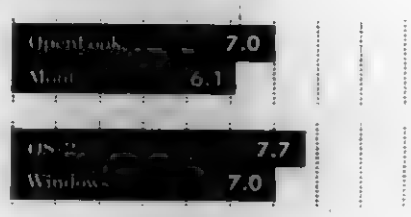
(Graphical user interfaces, continued from previous page)

OpenLook again passes Motif in most categories, with the exception of ease of installation. On the PC platform, OS/2 and Windows divide top honors in the remaining six areas.

7.8 Vendor service and support

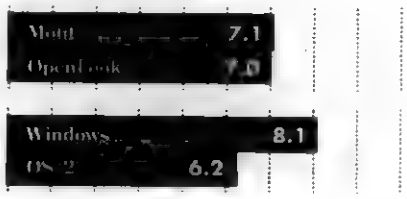


7.6 Memory management

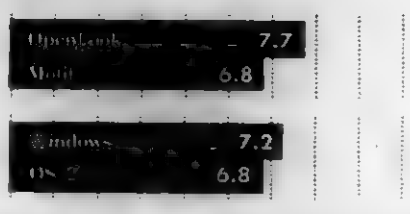


7.3 Documentation

6.8 Ease of installation



6.8 Utilities



6.7 File management

Loyalties

Would you buy the product again?
(Reasons are based on the most frequently stated responses.)

OpenLook
Responses: 50
Likely — The reason: Runs our applications
Unlikely — The reason: Difficult for new users
Number of respondents

Motif
Responses: 50
Likely — The reason: Industry standard
Unlikely — The reason: Need to evaluate others
Number of respondents

OS/2
Responses: 46
Likely — The reason: It is powerful
Unlikely — The reason: Better tools on Windows
Number of respondents

Windows
Responses: 50
Likely — The reason: Ease of use
Unlikely — The reason: No need for GUI
Number of respondents

Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answers. Quotes are selected from users' responses.)

OpenLook

Likes

Ease of use
"It's very customizable and is visually appealing."

Dislikes

Poor performance
"The performance is weak — it's not too good as far as resource usage goes."

Motif

Likes

Ease of use
"Having the common, graphical interface gives us more productivity."

Dislikes

Poor performance
"It's relatively slower and uses a lot more bandwidth than a command-line interface."

OS/2

Likes

Multitasking
"It has true multitasking — the operating system stays up when an application crashes."

Dislikes

Resource consumption
"It needs a lot of memory and a huge hard drive."

Windows

Likes

Ease of use
"It helps get our users over technophobia."

Dislikes

Poor performance
"Performance is slow due to the overhead of Windows."

Vital statistics

Total number of respondents: 200

What is your position?

CIO/VP/IS director	11
IS manager	28
Network/LAN administrator	15
Operations	13
Systems analyst	42
Other	91

What is your responsibility for GUIs?
(Multiple responses allowed)

Evaluate or recommend vendors	171
Determine need	145
Select vendors	131
Set standards for organization	123

How many PCs/workstations at your location use GUIs?

More than 500	9
101-500	21
51-100	19
50 or less	151

Desqview/386 results

With a response base of 18 users, Quarterdeck Office Systems' Desqview earned the following scores in these key categories:

Compatibility	7.6
Local-area networking capabilities	7.5
Ease of use	7.5
Multitasking	8.2
Value for the dollar	8.2
Performance	7.4

In verbatim responses, users lauded Desqview for low overhead and good memory management capabilities. On the downside, they mentioned some compatibility problems with new applications.

METHODOLOGY

Products included in this Buyers' Scorecard are the market share leaders among graphical user interfaces (GUI) for desktop computing, including both workstations and PCs.

The response base was 50 users each for IBM's OS/2, Microsoft Corp.'s Windows, Sun Microsystems, Inc.'s OpenLook and the Open Software Foundation's Motif as well as 18 users for Quarterdeck Office Systems' Desqview.

Desqview was not included in the overall score because the number of respondents rating the product was below the required minimum of 30 respondents. Respondents reported using the following platforms to run their GUIs:

- Intel Corp. 80386 PCs (34%).
- I486 PCs (24%).
- Workstations running Sun Microsystems, Inc.'s Solaris (13%).
- Workstations running Unix variants from other major vendors (13%).
- Other (16%).

User names were obtained from nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The survey was conducted by telephone over a two-week period last month.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance rating is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following for their assistance in preparing the Buyers' Scorecard: Lew Brentano, Computer Intelligence/Infocorp; CW Database Division; Forrester Research, Inc.; International Data Corp.; and Earl Rich, Faulkner Technical Reports.

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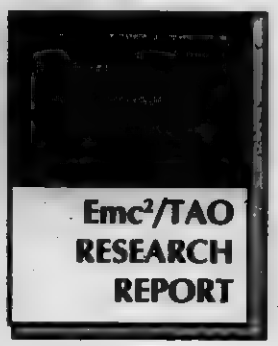

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Utility looks to STAR to find answers

Distributed trouble-analysis system links service and field crews to help speed crisis response time

BY MARYFRAN JOHNSON
CW STAFF

SAN FRANCISCO — When an earthquake or some other disaster knocks out electricity in Northern or Central California, the same fate often befalls the communication between Pacific Gas & Electric Co.'s (PG&E) corporate mainframes and its regional divisions.

So at a time when customers and the press are clamoring for information — "When will the lights go back on? What areas are out of service? How many people are affected?" — the regional divisions of the nation's largest gas and electric utility find themselves unable to come up with those answers.

Enter the STAR project.

The System Trouble Analysis and Restoration (STAR) project seeks to untether the computing needs of the 25 regional distribution offices from the corporate mainframe via a distributed network of PCs and Unix servers.

Now under development on a half-dozen Sun Microsystems, Inc. workstations, STAR will be an integrated set of five applications linking customer service, dispatchers, field crews, system operators and construction personnel. The applications, developed in C to ensure portability, will reside on Sun database servers in the division offices and will run under X Window System emulation on desktop PCs or on Sun workstations on a local-area network.

Dave Hawkins *hopes STAR will improve service*

The pilot project, partly installed now in the Santa Cruz, Calif., division, will be evaluated in June for a possible rollout to the other two dozen divisions, said Dave Hawkins, manager of distribution computer applications.

"The key thing is that each division group needs to know what the others are doing," he said. "Our current outage information application is on the mainframe, and when those links are broken, it can't be used. With a distributed system, the applications can be self-contained within each division."

Today, there is no reliable, convenient way for the customer service representatives and electric operations groups to share information about outage identification, repair and restoration, he said. Even in nonemergencies, better coordination between field and office workers should boost customer service, he added.

Trial period

"The goal is to have all the STAR software delivered by the end of this year, with pilot testing next year," Hawkins said. "We need to run the pilot for three to six months before we're really confident it will produce all the results that we want."

In PG&E's Santa Cruz division — covering several cities with more than 100,000 customers — STAR will start out by providing crew monitoring information to customer service representatives. When outages occur, customers who call the company will talk to someone with fresh, detailed information.

"The customer service rep essentially will be able to tell the customer that the outage problem has been identified, that the crew is estimating another two or three hours to fix it and so forth," Hawkins said.

Eventually, PG&E plans to put mobile data terminals in its trucks so crews on the scene of an outage can enter information into the system from the field. Currently, they use telephones or radios to contact a dispatcher.

With more than 20,000 PCs in use on the corporate network, PG&E's investment in training and office applications is too vast to consider replacing the PCs with Unix-based workstations, Hawkins noted.

"Ultimately, the STAR applications have to run on Intel-based machines," he said. "Obviously, we will need a multitasking operating system for it, but we're still debating whether that will be [SunSoft, Inc.'s] Solaris or [Microsoft Corp.'s] NT."

Nice niche

Unix workstations have carved themselves a comfortable niche at PG&E, with 70 to 80 workstations used across the company in a variety of engineering and development projects. About 45 Sun Unix servers are connected to LANs, acting as database servers for the individual divisions.

STAR's functions will include managing customer calls, scheduling service calls, monitoring crews, identifying locations of power failures, calculating repair costs, generating storm reports and producing graphics of circuit configurations.

Among the other benefits of STAR, Hawkins said, are the near-elimination of "lost" customer complaints, automated outage reporting and provision of accurate, up-to-date information to system operators about fault locations. Productivity is expected to increase for the so-called T-Men (T for Trouble) because of reduced travel time, instant access to equipment locations and less paperwork overall.

"One of the advantages you get is knowing as you go along what the real cost of fixing the problem is," Hawkins said. "The work will be estimated as it goes along."

ON SITE

Pacific Gas & Electric
San Francisco

- **Challenge:** To share information during electrical emergencies between various groups involved in outage repair and restoration, thus improving customer satisfaction. Links to the current mainframe-based system frequently collapse during disasters such as earthquakes.
- **Technology:** The System Trouble Analysis and Restoration pilot project is being developed on Sun Unix workstations for eventual deployment (pending June 1993 evaluation) on Intel-based PCs and Unix servers.

SFT III NetWare debuts — finally

ANALYSIS

BY MICHELE DOSTERT
CW STAFF

It has taken a long time, but local-area network managers worried about running mission-critical applications on fallible PC servers can relax a little: System Fault Tolerant III (SFT III) NetWare, in the works for more than five years, has finally arrived.

Last month, Provo, Utah-based Novell, Inc. announced a limited-availability release of its SFT III NetWare v3.11 LAN operating system. "We are only releasing it to customers that we know have the expertise to properly install and maintain SFT III," said Jan Newman, executive vice president of the NetWare Systems Group. "Although SFT III NetWare is simple to install, it's a complex product, and we want to make sure it's used correctly before we put it in wide release."

Beta-test users and early adopters of SFT III NetWare said they are pleased with the product. "It lets me sleep a lot better at night," said Ed Wilk, network manager at WHDH television in Boston. "My only criticism is that it shouldn't have taken anywhere near this long to come out."

While there may not be many mission-critical applications currently running on NetWare LANs, analysts said they see SFT III NetWare as an important product in Novell's quest to establish itself as the platform of choice in large information systems groups. "There are a few people who have been desperately waiting for SFT III and will grab it as soon as they can get it," said Bob Gill, a vice president at Gartner Group, Inc., a market research firm in Stamford, Conn. "But I think SFT's real impact will come as downsizing picks up steam. Within the next 18 months, probably all of the Fortune 500 will have a copy of SFT III running somewhere in their organizations."

Backup role

SFT III NetWare works by "mirroring" two servers in software. Whatever runs on one server also runs on the other. If the primary server goes down, the backup server automatically and instantaneously takes over. Users should be unaware of the mirrored server, both when it is running in the background and when it takes over for the primary server, the company said.

In order for the two servers to remain in the same state, communication between the two must be almost instantaneous.

To accomplish this, network interface card vendors such as Thomas Conrad Corp. in Austin, Texas, and Eagle Technology in San Jose, Calif., are marketing special "server-to-server" cards and drivers that provide server-to-server throughput of 100M to 1.2G bit/sec. over coaxial, shielded twisted-pair or fiber-optic cable.

SFT III NetWare was designed to protect users from server failures caused by hardware. "The two most common server failures are either in the hard disk or in system memory; SFT III NetWare protects against both," said James Shipp, an MIS engineer and SFT III user at WordPerfect Corp. in Orem, Utah. "Also, if you physically separate the servers, [which usually requires a fiber-optic link], it provides you with disaster protection; if a building floods or burns down or whatever, a mirrored server at a different site will automatically take over."

Not fail-safe

SFT III cannot protect users against system or application errors in software. "If you have a driver or whatever that's chewing up memory and corrupting data on one server, that will also happen on the mirrored server," Shipp said.

Using SFT III degrades LAN performance slightly. "The algorithms required to mirror the server obviously create some additional server overhead, but I don't think the performance drop was noticeable to the users," said Gregg Scott, network manager at Oregon State University in Corvallis, Ore. "For people running mission-critical applications, the gain in reliability would be well worth the cost in performance."

Users are also enthusiastic about using SFT III to simplify

Continued on page 52

Can do and can't

Novell SFT III NetWare CAN protect against:

- Server memory failures.
- Server hard disk failures.
- Disaster/Destruction, if mirrored server is physically distant from primary server.

Novell SFT III NetWare CANNOT protect against:

- Server failures caused by system software.
- Server failures caused by applications (NLMs).

SFT III NetWare

CONTINUED FROM PAGE 51

the managing and upgrading of their servers. "With a 24-hour newsroom on NetWare servers, it's hard to schedule downtime," Wilk said. "SFT III lets me switch to the backup server, do whatever I need to on the primary server, then switch back to do maintenance on the backup server, and my users never notice."

Some users were enthusiastic about the product but are unable to adopt it because of their server configuration.

"We use high-end servers, $100,000 PowerFrames from Tricord Systems, Inc.," said Jim Queen, LAN manager at Enron Gas Services Corp., a natural gas company in Houston. "We can't afford the space or the money to buy another one," he added. "We're pressing Tricord and Novell to come up with a superserver version of SFT that would let us run mirrored systems in a single box."

The first general SFT III release will be SFT III Version 4.0, which will follow Novell's high-end NetWare 4.0 when it is released in the first quarter of 1993.

Product may ease mechanical design

BY MARYFRAN JOHNSON
CW STAFF

A marriage of convenience in the world of mechanical design has produced a new breed of hardware and software systems for the design and use of real-time control and embedded systems.

Natick, Mass.-based MathWorks, Inc. joined forces last week with Dspace GmbH in Paderborn, Germany, to give users a no-code-writing, plug-and-play approach to real-time design.

"What they're doing takes the risk and uncertainty out of mechanical design, which is very attractive to businesses like car manufacturers," said Kathey Hale, a senior analyst at Dataquest, Inc. in San Jose, Calif. By bridging the MathWorks software and Dspace digital signal processing hardware, Hale added, the companies could carve out a profitable niche in the $2 billion mechanical design market.

The integrated product includes MathWorks' Matlab numerical software package, its Simulink and Simulink C Code Generator and Accelerator, plus the Dspace hardware. It will be available by the end of the year, priced at $30,000 on a Sun Microsystems, Inc. SPARCstation.

Dspace hardware includes plug-in boards for PCs, expansion boxes with bus interfaces and Ethernet-compatible expansion boxes for lab or vehicle use.

MathWorks' new Simulink C Code Generator automatically produces C code for continuous, discrete-time and hybrid systems modeled as Simulink block diagrams. Users will be able to interface the code directly to hardware for real-time testing.

Previously, engineers had to write C code manually, a time-consuming and usually bug-generating process. The direct linking of code into real-time testing environments was either too expensive or too difficult to attempt.

One beta-test user is Arvin/Calspan Corp. in Buffalo, N.Y., which operates experimental aircraft for in-flight simulations of aircraft design.

"We've always been Matlab and Simulink users for our design process. Now we can design flight control systems in Simulink and use the code-generation product to generate code to run on the Dspace hardware," said Paul Deppe, a senior pilot and electrical engineer.

DEC introduces intelligent POS terminal

BY ELLIS BOOKER
CW STAFF

After six years of selling customized retailing systems, Digital Equipment Corp. introduced its first open architecture, intelligent point-of-sale (POS) terminal recently.

The DECpos is 386SX-based and can run third-party software under DOS, OS/2 and Unix. In its basic configuration, the disk-based DECpos costs $3,500; a diskless version is priced at $3,000.

Explaining why retail customers have gravitated toward general-purpose PC-based POS systems, DEC's retail industry manager for in-store systems, Herb Cline, said, "Prices for PC platforms have dropped from $8,000 to less than $2,000 over the past five years, but dedicated POS prices have held steady."

In addition, Cline said, open systems are easier to mix and match — an important consideration given the firestorm of acquisitions and mergers in the retail industry.

DEC will continue to sell its nonintelligent POS, the DEC-cashier, as well as in-store processors, a network management product for retailers and integration services.

DEC made its introduction at the Riscon retailing conference in New Orleans. Also showing its wares at Riscon was NCR Corp., which announced a portable purchase-order system based on its NotePad pen-based computers.

Running Portable PO software, the NotePad screen becomes a purchase-order form. As a buyer fills in the blanks on the form, the NotePad changes these handwritten entries into text and shapes. In addition, Portable PO can store customer lists as well as pop-up sketches and photographs of products.

Developed jointly with San Diego-based JDS Solutions, the Portable PO software ranges in price from $1,000 to $2,000, depending on quantity.

Of course,

your applications run on Sun.

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Massive image storage aids publisher

BY ELLIS BOOKER
CW STAFF

ENGLEWOOD, Colo. — Information Handling Services, Inc., the world's largest republisher of industrial documents and catalogs, has been steadily growing its electronic document databases since 1988, when it deployed its first imaging system.

Indicative of this progress, Information Handling Services this summer upgraded the capacity of that imaging system. The new system, which comes from IA Corp. in Alameda, Calif., has a storage capacity of 2T bytes.

"We've got 8 million images in currently, and that can grow, with the hardware we have in place today, to 2T bytes," said Dan Denkin, Information Handling Services' senior manager of microfilm/electronic imaging. Denkin added that the IA system was designed to grow much larger.

Information Handling Services collects, archives and distributes, with indexes, technical reference information from a host of places, including military, federal, industrial, manufacturing and environmental sources. The company then outputs this information in a variety of formats — CD-ROM, microfilm and so on — to its 15,000 customers in 80 countries.

The advantage of imaging, Denkin said, "is pages come in once, we index them and check them for quality and then we can output them in different formats."

Dan Denkin: *8 million images and more*

With the imaging system and its homegrown indexing application, Information Handling Services can also rapidly create customized publications.

The new imaging system replaces the one the company deployed in 1988 from Integrated Automation, a Litton Industries company.

Integrated Automation was renamed IA Corp. in August after it was purchased from Litton by a management team.

The new, $5 million imaging system comprises four servers. Three Sun Microsystems, Inc. servers — two for output and one system controller — are connected on a Fiber Distributed Data Interface (FDDI) 100Mbit/sec. local-area network. Another server is used for input and receives the scanned images prior to having them written to optical disc.

The FDDI LAN features a Network Systems Corp. router that links to a 10M byte/sec. Ethernet LAN containing terminals, PCs, printers and scanners.

On a busy day, Information Handling Services can scan a whopping 35,000 pages into the imaging system. It can output 250,000 images in the same time frame.

Even so, Denkin pointed out that scanning paper documents is a bottleneck. "If we could get documents electronically, it would help," he said, noting that republishers such as his company have for years been able to receive text electronically in ASCII form. The catch, he said, is getting machine-readable raster images from publishers.

Reflecting this publishing reality, in fact, Information Handling Services produces three kinds of electronic products: Full-text publications with no images, text with indexes that point to raster graphics and compound documents, which put the text and graphics on the same page.

Large-scale imaging

Technical reference publisher Information Handling Services combines a Unix-based document imaging system with its own mainframe-based indexing scheme.

The index sits on Amdahl Corp. and Digital Equipment Corp. VAX platforms. It allows workers at PCs and dumb terminals to create custom reference documents.

Indeed, with the Information Handling Services image system, most of the work can be done directly from the index. Workers rarely need to dip into the 8 million images maintained on the company's four optical jukeboxes from Cygnet Systems, Inc. in San Jose, Calif.

IN BRIEF

Mac apps on RS/6000

■ **IBM users interested in running Apple Computer, Inc. Macintosh applications on their RISC System/6000 workstations should be able to do so next year, once San Diego, Calif.-based Xcelerated Systems, Inc. finishes the port of its Liken software to the IBM platform. Liken enables users of Unix workstations with the X Window System environment to run shrink-wrapped Macintosh applications without modification.**

■ **3M Co. announced Magnus 1.2 GB, a 1.2G-byte ¼-in. data cartridge that works with IBM's latest RS/6000 workstation models. The workstations feature 1.2G-byte, ¼-in. tape drives for software loading and fixed-disk backups. The tape is available now for $57.**

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NEW PRODUCTS

LAN hardware

Eagle Technology, Inc. has announced the NetWare Mirror Server Link, a high-speed communications card.

The product was designed for Novell, Inc.'s NetWare System Fault Tolerance (SFT) Level III Servers, and it supports NetWare SFT III server-to-server communications at an actual data rate of 128M bit/sec., the company reported.

The product allows for a second network server to mimic the activity of a primary server. The second server becomes the active server instantaneously and transparently if the primary server goes off-line.

The NetWare SFT III has 32-bit shared-memory architecture that allows 32-bit packets to be transferred between the network interface card and the host CPU at a low latency rate.

Prices start at $1,095.

Eagle Technology
1160 Ridder Park Drive
San Jose, Calif. 95131
(408) 441-7453

FiberNet Research, Inc. has introduced the FR1140 fiber-optic Fiber Distributed Data Interface (FDDI) network interface adapter.

The product was designed for the IBM PC/AT, XT/AT bus. The FR1140 is an ANSI-compliant FDDI card that features on-board 128K-byte random-access memory, Advanced Micro Devices, Inc.'s Supernet 2 chip set, a Single Attachment Station and a 4M byte/sec. data transfer rate onto the XT/AT bus, the company reported.

The adapter costs $995.

FiberNet Research
1 Tara Blvd.
Nashua, N.H. 03062
(603) 891-2600

LAN software

LaserData, Inc. has introduced two LaserView document imaging software products.

According to the company, LaserView Optical Storage for NetWare and LaserView Integrated Printing for NetWare were designed to make it easier for users to implement high-performance imaging applications on Novell, Inc. NetWare networks. LaserView Optical Storage for NetWare is a high-capacity storage that supports write-once read-many 5-in. and 12-in. optical discs. The product is optimized for the NetWare V3.11 network operating system and can handle millions of document images. LaserView Integrated Printing for NetWare is a high-performance print service.

Prices start at $4,495.

LaserData
300 Vesper Park
Tyngsboro, Mass. 01879
(508) 649-4600

Workgroup software applications

Online Computer Systems, Inc. has started shipping the NetWare Loadable Module (NLM) version of its Opti-Net CD-ROM networking software.

The product was designed to allow local-area network users to share information contained on a CD-ROM. Up to 100 users can simultaneously share Small Computer Systems Interface (SCSI) CD-ROM drives on a Novell, Inc. NetWare 386 LAN. The Opti-Net NLM includes integrated features such as SCSI Bus Disconnect and Reconnect and caching and data prefetch. The monitor has a memo-driven management console that enables users to configure, monitor and control the CD-ROM server at the same time that it is serving users.

The product costs $1,495.

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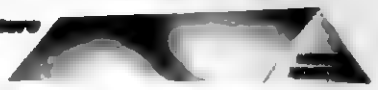

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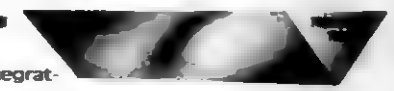

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J. P. Morgan chooses CompuServe for frame relay

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Forging ahead with its year-old telecommunications outsourcing plan, J. P. Morgan & Co. recently signed on with CompuServe, Inc. for frame-relay services that will interconnect its domestic local-area networks.

J. P. Morgan joins about 100 other U.S. companies as a customer of public frame-relay services, according to analysts. The global financial services firm has five sites up on CompuServe's Frame-Net and plans to add eight more by the end of the year, said Thomas Hynd, vice president of network services.

Frame relay is a "fast" form of packet switching made possible by today's more reliable communications links. While frame relay has been the subject of many seminars and trade press articles during the past 18 months, actual user experience to date has been limited as telecommunications managers take time to familiarize themselves with it and evaluate it against other emerging high-speed wide-area services.

Overall price was the main factor in J. P. Morgan's signing a five-year, $3 million frame-relay contract with CompuServe earlier this month, Hynd said.

In fact, "CompuServe's service tends to be the least expensive overall because of the granularity of its committed information rate," said Richard Malone, principal at Vertical Systems, Inc., a consultancy in Dedham, Mass. He explained that CompuServe will allow users to slice their guaranteed bandwidth requirement down to as little as 4K bit/sec., while other vendors, such as AT&T and WilTel, only go as low as 32K and 64K bit/sec., respectively.

CompuServe's scheme addresses "networks in the 10- to 20-node range for a fully interconnected mesh network at the low rate," Malone said.

Third outsourcer

The CompuServe contract brings the firm's network outsource provider tally to three. The company kicked off the outsourcing of its major telecommunications components last February with a $20 million deal with BT North America, Inc. for international terminal-to-host traffic [CW, Feb. 17].

Shortly thereafter, J. P. Morgan signed up with AT&T for an international router-based LAN internetwork with no domestic links other than to its New York headquarters.

Explaining the company's outsourcing strategy, Hynd said, "As we saw our business and needs growing rapidly in terms of capacities and quality, we saw players emerging with public services that could reliably meet our needs."

Thomas Hynd *says price won CompuServe the $3 million pact*

The financial services firm is mixing and matching vendors because it is evaluating each telecommunications function that it wishes to outsource as an independent module with individual criteria, Hynd explained.

He acknowledged, "We considered the finger-pointing issue, which always arises to some degree any time one has diverse technologies and platforms. But so far, we don't see any increase because of the different networks."

Staying with Cisco

CompuServe is meeting the company's key needs such as high-speed LAN-to-LAN connectivity supporting a variety of LAN protocols via Cisco Systems, Inc. multiprotocol routers. Because J. P. Morgan is a Cisco shop, Cisco support was part of its criteria, Hynd said.

This was not because of potential interoperability problems among different vendors' routers but because "we already have expertise with Cisco," Hynd said.

Even when using a public service, he said, "as you're interacting with LANs locally, there's a certain amount of device expertise you need."

BT expands service

Telecom service provider BT announced two new frame-relay customers last week and said it has extended its ExpressLane service to several new international locations. New customer Proteon, Inc., a networking vendor in Westboro, Mass., will retain its year-old WilTel Wilpak domestic frame-relay network while hooking into BT's international service, primarily for LAN-to-LAN electronic-mail traffic, said Richard Weeks, manager of network systems at Proteon.

Weeks explained that moving E-mail "off of slow, unreliable analog lines" and putting it on fast digital lines that provide real-time communications 100% justified the move.

"We're basically paying the same price but getting several orders of magnitude greater service," he said. Proteon will expand to Paris, Frankfurt and Munich, Germany, in 1993, he said.

Meanwhile, Maxtor Corp., a magnetic storage device maker, signed on with BT to link LAN users in the UK, France and Germany to corporate headquarters in San Jose, Calif. The company is primarily helping to decentralize Maxtor's order management systems, said Dan Gentile, a network manager.

BT, which plans to cover 11 countries and 400 cities with frame-relay service by year's end, expanded the service last week to Brussels, Toronto, Frankfurt, Hong Kong, Tokyo, Amsterdam, Singapore, Stockholm and Sydney, Australia.

International service becomes important to LAN-oriented customers expanding globally. For example, BT X.25 customer Pitman-Moore, Inc. in Lake Forest, Ill., currently runs mostly terminal-to-host traffic, but off-the-shelf LAN applications could change that, said Bill Westrick, manager of distributed technology.

"At that point, the international component of frame relay would become important. We first roll out applications to regions globally. From there, they branch out to individual sites."

JOANIE M. WEXLER

Users seek cheapest way to move to TCP/IP, SNA

BY ELISABETH HORWITT
CW STAFF

While many users have already interconnected their Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM Systems Network Architecture (SNA) installations, they are always on the lookout for more cost-effective, functional ways to do it.

"There is a huge installed base of IBM mainframes that need to be accessed by distributed client/server systems, and TCP/IP is becoming the protocol of choice for enabling any sort of PC to access [multivendor] computing resources and peripherals," said Joe Gottlieb, a program director at Westport, Conn.-based research firm Meta Group, Inc.

Business Research Group expects TCP/IP traffic to exceed SNA traffic on the enterprise network in three to four years.

Amoco Production Co., for example, expects to move all of its mainframe applications down to Unix systems by the end of next year, but in the meantime, its Unix users must be able to access mainframe applications and exchange mail with mainframe users, said Jon Tankersley, a research scientist at the Tulsa, Okla., Amoco Corp. division.

Right now, Amoco is trying to find ways to minimize the overhead its mainframes experience running TCP/IP applications, Tankersley said. The company is "not experiencing outrageous overhead at the moment," but it knows from past experience that the right mix of TCP/IP applications can "bring an IBM 3090 to its knees," he said.

Targeting TCP/IP overhead is the LinkMaster 6200 Network Gateway, announced last week by McData Corp. in Broomfield, Colo. While IBM's 3172 is said to offload about 30% of TCP/IP overhead from a mainframe, McData's 6200 offloads 100% of both TCP/IP protocols and applications, McData said.

In addition, the 6200 is the only communications controller besides the 3172 to take advantage of IBM VTAM 3.4's dynamic table update capability, a McData spokesman said.

This is an important feature

Continued on page 64

Integration issues

There are three typical flavors of SNA and TCP/IP integration:

•LAN-to-host gateway:

McData's LinkMaster 6200 Network Gateway supports TCP/IP, DECnet and IBM Open Systems Interconnect. The SNA platform is Unix on an Intel Corp. 1486 with an Extended Industry Standard Architecture bus. LANs supported are Token Ring, FDDI and Ethernet. LinkMaster offloads 100% of the TCP/IP processing from the host and features dynamic reconfiguration of LAN devices.

Availability and pricing: Ships this month, priced at $21,000 to $42,000.

•Simultaneous TCP/IP, SNA sessions on Windows:

IBM's TCP/IP Version 2.1 for DOS supports as protocols Telnet, 3270, Digital Equipment Corp.'s VT 220 and TCP/IP Sockets. It can redirect NetBIOS packets over TCP/IP networks and supports up to 255 sessions.

Availability and pricing: Scheduled to ship Jan. 29 with a base price of $230.

•SNA sessions over TCP/IP:

Network Software Associates' Elite line supports DOS and Windows-based workstations. Protocols supported include IBM 3270, Advanced Peer to Peer Communications and High Level Language Application Programming Interface.

Availability and pricing: Scheduled to ship this month, $395 for the 3270 product; $3,995 for the high-end gateway.

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Banks continue to invest big in telecommunications

BY JOANIE M. WEXLER
CW STAFF

SALISBURY, Md. — Banks with assets of more than $5 billion will collectively invest $330 million in telecommunications products and systems in 1992 — about $600,000 apiece — according to a consulting firm specializing in technology trends in the financial services industry.

Primary areas of investment include expanding and upgrading backbone facilities and network management, according to Mentis Corp., which conducts an annual survey of more than 2,000 banks.

Communications expenses now make up 20% to 25% of banks' total technical operating costs, according to the firm. Financial institutions continue to make telecommunications investments even in a sparse economy "because the sheer size" of their myriad connection points reaps operational savings, said Mary Donadoni, a research associate at Mentis.

She said banks are the biggest vertical buyer of telecommunications services, second to health care organizations.

The study revealed that leased lines continue to account for the largest chunk of the telecommunications budget — about 25% (see chart). However, in three to five years, "there will be a significant redistribution of dollars to public networking vs. private," Donadoni predicted. The rate of the shift depends on how quickly new technologies roll out, she said.

Bruce Redington, director of communications at the Federal Reserve Bank of Atlanta, said that while leased lines currently account for 20% to 25% of his telecommunications budget, "dial-up networking is growing much faster than leased lines."

He noted that his organization still runs — and will likely continue to run — its steadily flowing transaction-oriented traffic across dedicated lines.

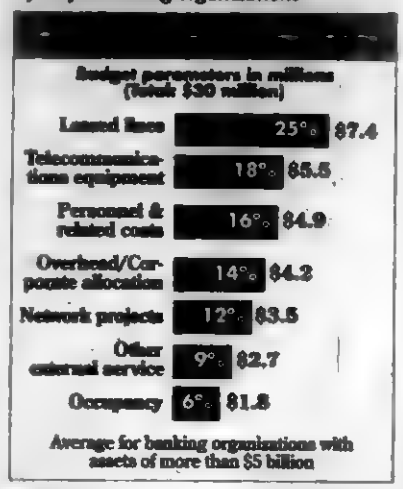
"But there are things we'll be offering in the future that lend themselves to high-speed dial-up, such as large files that don't flow all day long but are time-critical," he said. "Frame relay has potential here."

Redington said he anticipates that his organization's T1 network will remain in place. The redistribution of budget funds from private to public networking will be largely accounted for by new, public network segments as opposed to replacements of dedicated lines, he said.

However, the decision will be based on cost numbers, which are currently hazy for many fledgling telecommunications technologies, Redington noted. "There is a threshold of users that the leased line fits best, and I don't see that changing in this industry at least until the latter part of the decade," he said.

Carrying costs

The biggest single networking expense is that of leased lines, according to a survey of major banking organizations



Source: Mentis Corp. CW Chart: Michael Siggins

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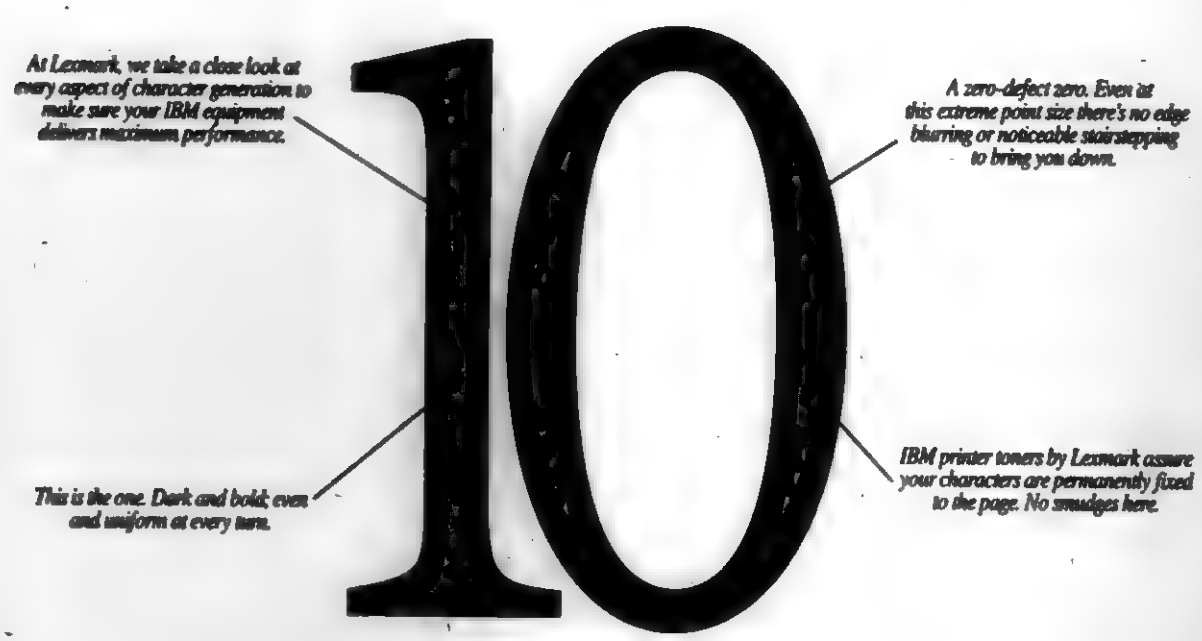

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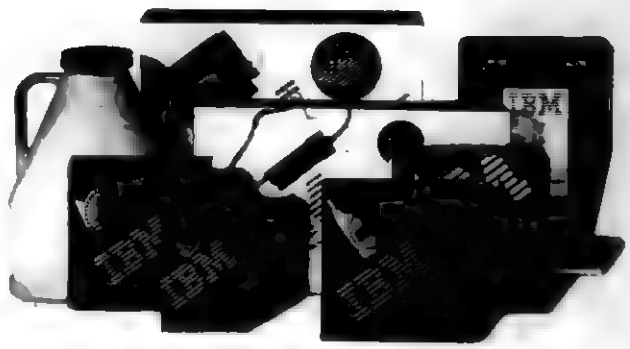

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IN BRIEF

EDI a must for Medicaid bills

■ **The U.S. Health Care Financing Administration** has warned state **Medicaid** agencies and doctors that they must implement electronic data interchange systems for billing transactions by 1995 if they expect to get federal funds. Driving toward paperless claims processing, the agency described its plans to develop a uniform billing format with standard data elements and an ANSI X12 transaction standard.

■ **Data General Corp.** announced that it is the first vendor to implement **IBM**'s Common Program Interface for Communications (CPIC) protocol on an "open" platform: DG's Unix-based Aviion. CPIC is a programming interface that aims at making applications interoperable and portable across a variety of networking protocols, including IBM's Systems Network Architecture, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect.

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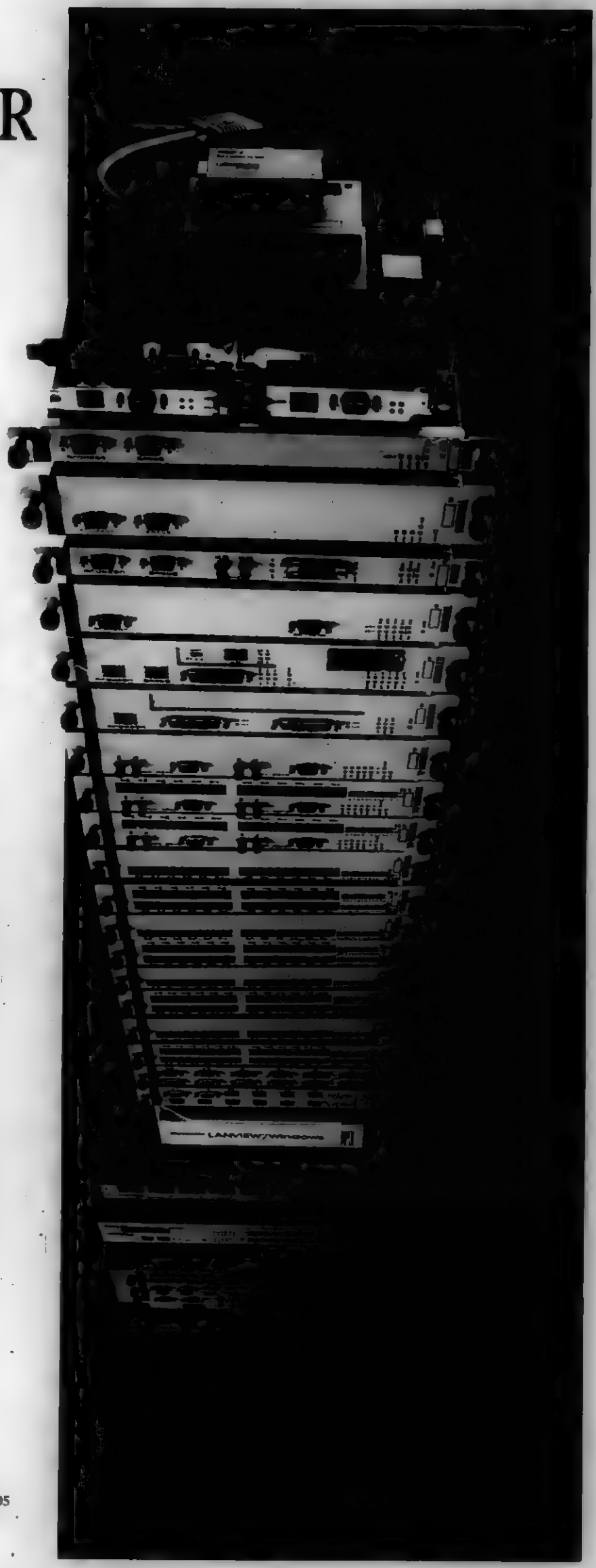
Graham Morrison
Network Design & Engineering
Blue Cross Blue Shield



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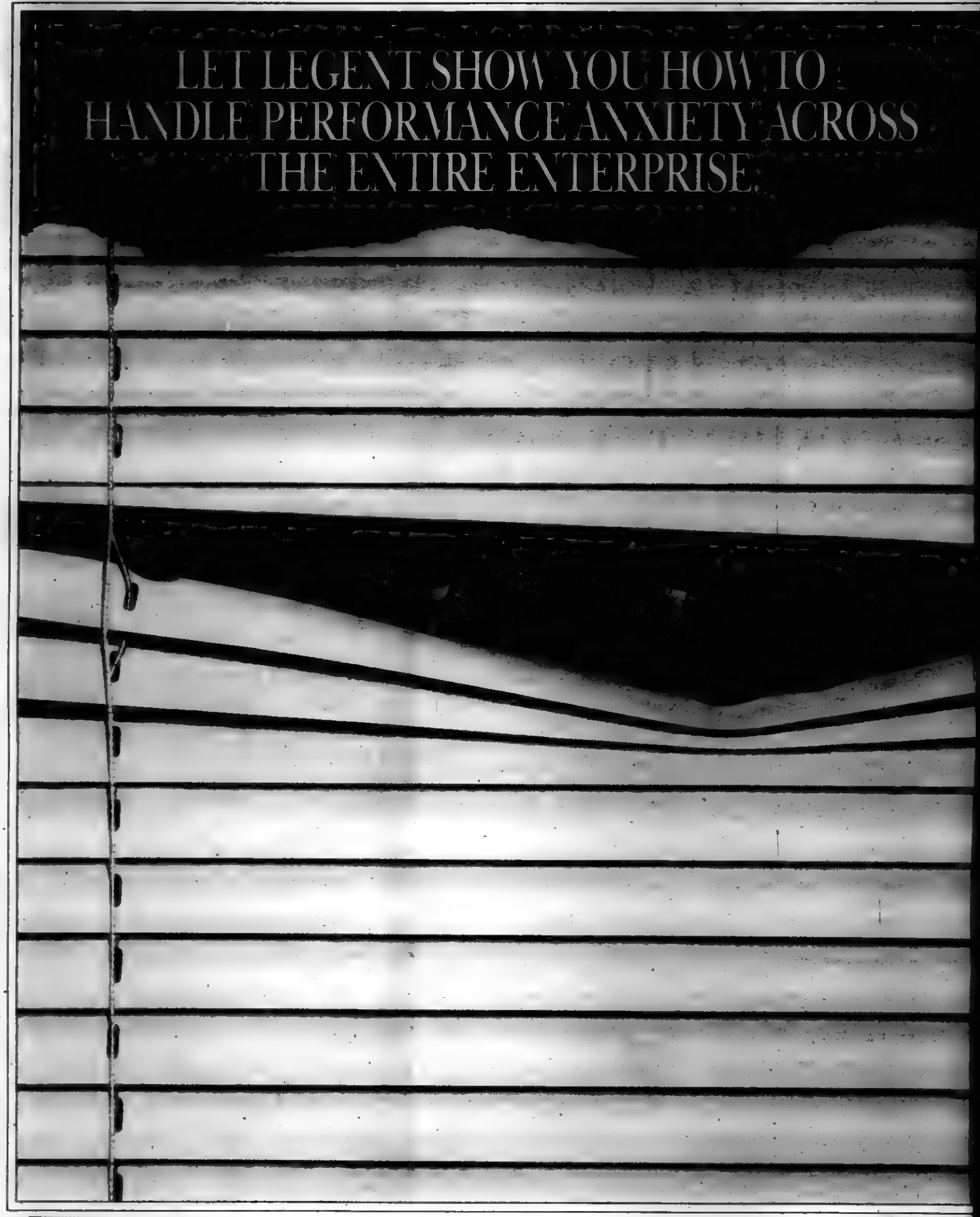

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LEGENT

Management solutions needed

Lack of net integration tools stymies some, but not all, downsizing plans

BY LYNDA RADOSEVICH
CW STAFF

The tide of companies that are downsizing critical applications from mainframes to PC local-area networks is being stemmed by a shortage of enterprise network management solutions, according to a recent report.

"The top issue is a lack of integration between management packages of all types," said Tom Wood, a senior industry analyst at the Business Research Group (BRG) in Newton, Mass., and author of the report. "Users want to put what used to be on the mainframe onto the LAN. The problem is that the LANs and internetworks aren't well-managed, and the management pieces are not well-integrated."

Despite this lack of products, 80% of users do plan to implement integrated network management during the next 24 months, according to the BRG survey. BRG surveyed 400 enterprise and systems managers in organizations of 1,000 or more employees.

The users will insist that new network and systems management packages work with networks and network management systems that they already have in place — many of which are based on Transmission Control Protocol/Internet Protocol and IPX transport standards — the report said.

Among the benefits users expect from network management systems is the ability to monitor entire systems from one console. Other benefits include greater reliability, less downtime, improved communication, total view of the network, higher performance and lower personnel costs.

Although managers want standards-based integrated systems management, they do not want to wait while vendors hash out their differences, the report said.

"Standards are the only thing that will make a more comprehensive environment possible," said Bill Lawrence, a network engineer at the San Onofre, Calif., branch of the Southern California Edison Co. "But that can take a long time and be so all-encompassing that no one can use them. True standards will evolve and be ratified by the fact that people use them."

Two such protocols already used in network management software — IBM's NetView and Simple Management Protocol (SMP), the successor to Simple Network Management Protocol — are emerging as make-due standards, according to users contacted.

"The only way we could have made our system work is by insisting on SMP standards from the vendors," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Wilmington, Del.

Some of the blame for the troubles integrating network management systems lies in the user community.

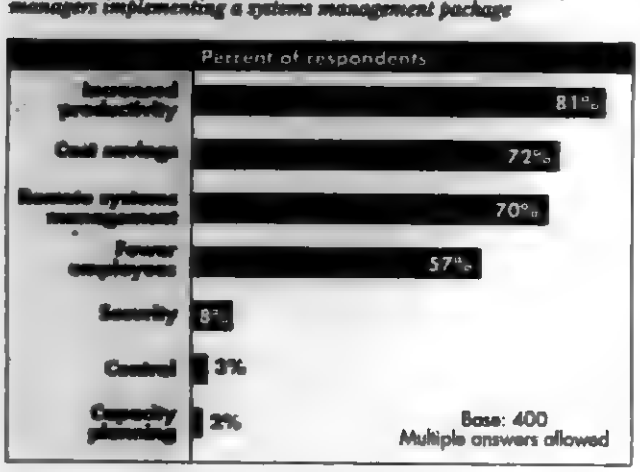
One of the biggest inhibitors to integrating network management is internal company politics, Wood said. Specifically, turf battles between information systems management and LAN administrators cause confusion over who is in charge and what needs to happen.

Until enterprisewide network management solutions exist, some users are maintaining a philosophical attitude.

"It took the mainframe people a long time to get it. It'll probably take five or 10 years before distributed network management becomes routine," Scoggin predicted.

More for less

Productivity gains and lower costs top the list of benefits cited by managers implementing a systems management package



Source: Business Research Group — CW Chart: Stephanie Faucher

NEW PRODUCTS

Gateways, bridges, routers

Cayman Systems, Inc. has introduced GatorLink, an AppleTalk Remote Access (ARA) server that supports Apple Computer, Inc.'s ARA Protocol.

According to the company, GatorLink is the first ARA server that allows up to three remote PowerBook or Macintosh users to simultaneously dial into a network. It can also connect directly to an Ethernet.

The product features enhanced access control; a Motorola, Inc. 68302 CPU optimized for serial performance that provides three integrated reduced instruction set computing engines to handle all serial I/O duties; and support for Security Dynamics' SecurID Ace/Server security system.

GatorLink costs $1,899 per unit.

Cayman Systems
University Park at MIT
26 Landsdowne St.
Cambridge, Mass. 02139
(617) 494-1999

NetPro Computing has introduced OmniWay, a product that provides Banyan Systems, Inc. Vines users with interoperability to almost any PC local-area network or host system.

Batch-oriented interoperability is offered with an assortment of platforms, including Microsoft Corp.'s LAN Manager, Novell, Inc.'s NetWare, Digital Equipment Corp's PathWorks and 3Com Corp. platforms. Users can design and develop custom interoperability solutions by using third-party utilities and simple batch scripts. OmniWay requires an IBM PC or compatible, 640K random-access memory and PC/MS-DOS 3.0 or higher.

The introductory price of OmniWay is $2,995 per gateway.

NetPro Computing
Suite E155
8655 E. Via de Ventura
Scottsdale, Ariz. 85258
(602) 998-5008

Network management

Synernetics, Inc. has announced Release 2.0 of its Viewplex Network Management System.

According to the company, the product can now operate as an application under SunNet Manager from Sun Microsystems, Inc.'s SunConnect division. Users can manage their networks and consolidate multivendor network information by using Viewplex and SunNet Manager together from a single platform.

The product has the ability to continuously learn and display updated topology maps of network devices and provides a variety of graphical displays, such as logical network devices and front-panel equipment views for the company's network devices. New tools have been provided to help users locate devices and interpret hardware addresses.

Viewplex Release 2.0 costs $5,000.

Synernetics
85 Rangeway Road
North Billerica, Mass. 01862
(508) 670-9009

Sun unveils ISDN frame-relay products

Sun Microsystems, Inc.'s SunConnect division recently announced SunLink Integrated Services Digital Network (ISDN), frame-relay and Point-to-Point Protocol (PPP) products for Sun SPARCstations.

The ISDN software supports two 64K bit/sec. ISDN channels on a Sun SPARCstation 10. It is scheduled to ship in the first half of 1993, with the station's built-in ISDN board.

The frame-relay product will enable a variety of SPARCstation models to directly communicate over frame-relay links or for one SPARCstation to act as a frame-relay gateway for other stations on the local-area network, Sun said. All three products support Transmission Control Protocol/Internet Protocol, Sun said. Availability is slated for this month.

Meanwhile, The Point to Point Protocol Consortium met to adopt a charter and elect a chairman. The organization now has 30 vendors dedicated to ensuring interoperability of multivendor routing and networked systems via PPP.

ELISABETH HORWITT

Cheapest way to TCP/IP

CONTINUED FROM PAGE 57

for companies such as Delmarva Power & Light Co. that do not want to have to take down the SNA network every time they add new TCP/IP local-area network users that want to access the mainframes, according to John Scoggin, supervisor of network operations at the utility.

Another fast-growing niche in the TCP/IP-SNA integration market is software that lets a PC handle TCP/IP and SNA terminal-emulation sessions simultaneously. Last week, IBM announced TCP/IP Version 2.1 for DOS, which allows a Microsoft Corp. Windows workstation to support up to 255 sessions. The software is said to support 3270, VT220 and Telnet terminal-to-host sessions.

IBM's product also supports Sockets, a multivendor application programming interface that now supports a wide variety of terminal-emulation, electronic-mail and database applications across a wide range of operating environments, IBM said.

The new version also supports NetBIOS networking protocols over TCP/IP, IBM said.

Vendors such as FTP Software, Inc. in North Andover, Mass., and Novell, Inc. also offer products that enable a Windows workstation to set up IBM host sessions over TCP/IP, Gottlieb said. FTP Software currently offers NetBIOS over TCP/IP and plans to offer Sockets support for its PC FTP (File Transfer Protocol) product early next year, a company spokesman said.

Some Delmarva users run FTP Software's Windows-based product over Banyan Systems, Inc.'s Vines LANs, Scoggin said. The utility uses TCP/IP to connect Vines servers and will also use it to link users to a soon-to-be-installed Tandem Computers, Inc. host, he added.

TCP/IP enabled

As a potential stopgap for Cisco Systems, Inc.'s Advanced Peer to Peer Internetwork, Network Software Associates, Inc. in Laguna Hills, Calif., recently announced that its Elite line of SNA PC-to-mainframe connectivity products will run over TCP/IP links. The AdaptSNA LAN Gateway supports TCP/IP-based links among hosts and Token Ring, Ethernet and Arcnet LANs.

The gateway saves companies from having to install a bridge or router to do 802.2 logical link control encapsulation of SNA packets so the packets can go over a LAN, a Network Software Associates spokesman said. And Elite's 3270 over TCP/IP connection gives users more full-function to mainframe resources, such as printers, than would a straight TCP/IP connection to the host, he added.

And on the flip side, Systems Strategies, Inc. will announce Express IP Router/LU6.2, which allows TCP/IP transmissions to be routed over an existing SNA connection, the company said. IBM already offers a similar product, called SNA Link, an IBM spokesman said.

Impact on productivity shown actual size.

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IBM Business Partner

Stratus still rock solid as it moves CISC users to RISC

BY MELINDA-CAROL BALLOU
CW STAFF

MARLBORO, Mass. — Fault-tolerant systems vendor Stratus Computer, Inc. seems to be holding solid in a weak economy.

According to financial figures announced by the company last month, third-quarter revenue grew 7%, though that was less than investment analysts expected.

While other large-systems vendors are experiencing financial distress, Stratus is growing (albeit modestly) and providing its user base with a smooth transition from its complex instruction set computing (CISC)-based platforms to its current line of Intel Corp. 1860-based reduced instruction set computing (RISC) systems.

The company will make yet another move, however, to Hewlett-Packard Co.'s Precision Architecture-RISC within the next two years, which it will also have to handle skillfully.

In addition, competitor Sequoia Systems, Inc. will come out with PA-RISC-based systems in 1993, so Stratus will have to expedite its product rollout schedule. Release of Stratus' PA-RISC-based systems is slated for 1994 at the earliest.

"The real question is how successful they will be in making a third major technology transition in five years," said Chris Christiansen, a senior analyst at International Data Corp. (IDC), a market research firm in Framingham, Mass.

"Stratus right now is in a state of transition; on the product side, the company is moving to a wide range of RISC-based products on both its proprietary VOS and Unix System V, Release 4 operating systems," said Peter Kastner, a vice president at Aberdeen Group, a consulting firm in Boston.

Bigger shake-up

But company officials said that moving to PA will be less of a transition than the current shift from traditional CISC architectures to RISC.

"Because of the way we designed the architecture to decouple the software as much as possible from the underlying architecture, it's relatively easy to migrate to the new systems," said Bill Ledingham, product manager at Stratus. "The process from CISC to RISC has gone well, and we expect that as we ultimately move from our current systems to HP that it will be more straightforward than our current move."

Users said the current migration can be a direct one. Tom Donaghey, manager of distribution systems at The Gillette Co. in Andover, Mass., ported applications easily, as did Ray Knapp, vice president of data processing at Concord EFS, Inc. in Memphis.

"Using the Stratus Link, we were able to link the machines. The data files were on one machine.... We recompiled the programs, pulled it through the link and brought it all back up," Knapp said.

Stratus officials said they have shipped about 250 of the RISC systems. About half of the company's new business is RISC-based, and half is CISC-based.

Industry analysts, however, said Stratus may have difficulty maintaining growth at a time when the company's corner of the market may be shrinking.

"Stratus is coping with increasing competition from the rest of the industry, which is catching up on overall systems availability and pushing Stratus into a smaller and smaller fault-tolerant corner of the market," Kastner said. "Where fault tolerance is absolutely required, Stratus is a standout leader, but the company will be experiencing greater difficulty in reaching a wide section of the market."

Technologies that raise availability include clustering, redundant arrays of inexpensive disks storage and data replication on multiple servers.

But Stratus officials said that while those options offer "high availability," they do not offer "continuous" availability. Stratus can offer a system with no downtime at a lower cost to users than it would take to create such a system by cobbling other technologies together, according to Ledingham.

"We don't see the market shrinking; we see the overall need for availability growing as an increasing number of applications are brought on-line," he said.

According to figures from IDC, however, maximum growth for the fault-tolerant market will remain at about 3% to 4% during the coming year, compared with earlier, higher growth rates of 29% to 30%.

"It will never again be as dramatic as it was," said Steve Josselyn, a senior analyst at IDC.

CLOSER LOOK at Stratus

No. 2

Stratus ranks behind Tandem but well ahead of the pack in fault-tolerant system sales

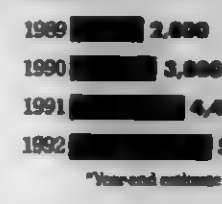
Worldwide product revenues for fault-tolerant vendors for calendar year 1991

Tandem	$1.2 billion
Stratus	$368 million
Sequoia	$59 million
DEC	$58 million
Integrated Microproducts	$4 million

Source: International Data Corp.

Growth track

Stratus' installed base is on its way to a level twice that of three years ago



Source: Computer Intelligence/Infocorp

Satisfied folks

Stratus users speak well of the company's fault-tolerant systems and its ability to handle their needs:

➤"We feel that the current RISC machines will do well for most of the rest of this decade," said Tom Donaghey, manager of distribution systems at The Gillette Co., a division of Gillette's North Atlantic Group. "We have those systems in our distribution centers to control shipment of customer orders and inventory so that we know where everything is."

➤"Fault tolerance is key for us," said Bill Morgan, assistant vice president at the Philadelphia Stock Exchange. "Even though we do a lot of support applications on Sun workstations, our main [mission-critical] engines are on the Stratus machines, including equity, trade, order and quote processing. We're bringing in the RISC platforms to improve capacity and get more power for our dollar."

➤"We're a credit-card authorization company, and we [use Stratus] to control purchases and capture data for companies, giving the information back to them in daily reports," said Ray Knapp, vice president of data processing at Concord EFS, Inc. in Memphis. Regarding future plans for PA-RISC platforms, he said, "We try to keep current, but we won't be the guinea pig."

MELINDA-CAROL BALLOU

HP's MPE still a contender

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — A cautionary flag that reads "don't throw the baby out with the bathwater" could well hang in the office of Hewlett-Packard Co.'s Wim Roelandts.

The baby, in this case, is more like an agile grandfather: the proprietary MPE operating system that drives the widely installed but maturing HP 3000 minicomputer series.

Roelandts, who replaces new Chief Executive Officer Lew Platt as head of HP's entire computer business, and new minicomputer chief Rich Sevcik have a careful balancing act to maintain.

While they lead a charge into the open systems world with the HP/UX Unix operating system running on HP 9000 minicomputers, they must be careful not to alienate the hordes of loyal users running information systems shops on the HP 3000.

While the two hardware platforms are virtually the same, there is a world of difference in operating systems and related software on which IS shops spend millions of dollars to run their businesses.

Roelandts makes no bones about the fact that HP's minicomputer future lies with Unix. "For our Unix strategy, the No. 1 objective is to grow," he said. "For our MPE strategy, our No. 1 objective is to maintain the installed base."

He went so far as to say an MPE phaseout "is something that could happen over time" but added that "it won't happen in the foreseeable future," meaning the next five years.

Typical HP/UX users, he said, are more interested than MPE users in adopting the latest "hot boxes" and aggressively moving to new technology that they install on their own. MPE users tend to look for solutions that the vendor installs, he said.

Analysts said HP will hit a crossover point this year when 9000 sales will outpace 3000 sales. Roelandts noted that the current split is about 50/50, but "in the last couple of months, there were more 3000s sold."

He also noted that about 20% of MPE orders are for new accounts. While the 9000 Unix business grew 44% during fiscal year 1992, the MPE business nudged up only 5%, he said.

Standing firm on MPE

Many MPE users have no intention of migrating to Unix. With MPE well entrenched throughout their companies, they have no interest in going through the costs and headaches of conversions. Furthermore, users' intense loyalty to MPE has much to do with MPE simply being, in the minds of many users and analysts, a better operating system and one that is better optimized than HP/UX to the Precision Architecture-RISC chip that drives both the 3000 and the 9000.

"I believe in the genetic history of an operating system," observed Eric Fisher, a principal at Fisher Systems Consulting in Groton, Mass. He noted that for 20 years, MPE has evolved from the ground up to serve the multiprogramming and transaction processing needs of minicomputer users.

"HP/UX is a robust implementation of Unix, but it's still Unix," he said. Users said one weak HP/UX feature is security. "It's kind of an add-on in HP/UX," Fisher said.

"Unix has fewer safeguards than MPE," agreed Rodger Lindquist, manager of business systems development at Bio Rad Laboratories in Hercules, Calif., which uses both 3000s and 9000s. "The way you open and close files, you can get hurt."

Continued on page 70

Tool converts AS/400 apps to Unix

BY KIM S. NASH
CW STAFF

ANAHEIM, Calif. — Attendees of Common, a large IBM midrange user group that held its annual meeting recently, saw the unveiling of a conversion tool designed to take IBM Application System/400 applications to Unix.

System Software Associates, Inc. (SSA), a large third-party software maker in Chicago, unveiled AS/Set WDK-U, which lets AS/400 users "factor Unix into their long-term strategy without measurably increasing development time or cost," claimed J. V. Franch, SSA's director of technology.

But the catch is that the product will translate only those applications that were originally built with AS/Set, SSA's application development workbench. SSA applications and tools are installed at about 6,700 sites worldwide, according to SSA.

"If it was truly universal, it would be hard for me to imagine not buying it," said Paul Mitnick, president of Computech Systems, the information systems arm of The Equity Group Investments, Inc. in Chicago.

Mitnick is in the midst of migrating financial applications from IBM System/38 and AS/400 boxes to dual RISC System/6000s, but WDK-U is not useful to Equitable because its software has been customized in-house. "But I bet it makes some people feel better that they have more doors open to them," he said.

Limited need

"It's nice to be able to tell [AS/400 users] that they can run their applications on Unix in the future, but I don't think very many people will do it," agreed David Andrews, an analyst at ADM Consulting, Inc. in Cheshire, Conn.

AS/400 shops generally choose the machines over Unix boxes for specific reasons and are not inclined to shift strategies now, Andrews explained.

SSA is "hedging its bets" with this product, according to Andrews, and is using the Unix angle as an insurance chip against losing potential new sales to users who are unsure of which platform they will be on a few years from now.

Larkspur, Calif.-based Synon Corp., a rival on the AS/400 computer-aided software engineering front, is expected to release a similar tool soon.

AS/Set WDK-U regenerates C code for Unix machines from IBM and The Santa Cruz Operation. It is priced at $15,000 for a single-user version and $50,000 for the multiuser edition.

IN BRIEF

CA consultant program grows

■ **Computer Associates International, Inc.** has expanded its Consultant Relations Program. The three-tiered program consists of registered consultants under a base-level service under CA's Consultant Relations Agreement. Under the midlevel program, called service providers, CA field personnel are now available to book service business directly, relying on third-party providers from within the Consultant Relations Program. The top tier in the program, called certified consulting partners, is open only to those customers with "long-term business relationships with CA" or those who have participated in Pansophic Systems, Inc.'s Certified Business Associates program.

■ CA has also extended its CA-Unicenter for Unix systems management package to **Pyramid Technology Corp.**'s MIServer systems. The port is expected to be available for general release sometime next year. CA had previously announced CA-Unicenter for Unix ports to Hewlett-Packard Co., Sun Microsystems, Inc. and Sequent Computer Systems, Inc. Unix-based computing platforms.

■ **Andersen Consulting** has introduced usage-based pricing for its MAC-PAC IBM Application System/400 software package as an option to tiered pricing for the software products.

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Information Builders plots step-by-step DBMS linking

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — If universal data access is your goal, Information Builders, Inc. has introduced a new way of getting there, one small step at a time.

Information Builders' older product set, called EDA/SQL and installed at 300 sites, lets customers link front-end tools, including Lotus Development Corp.'s 1-2-3, with more than 50 database management systems, such as DB2 and Oracle Corp.'s Oracle. The product promises virtually any-to-any connectability.

But now, Information Builders has introduced a way for customers to link just a couple of databases instead of committing to the full-blown implementation. These EDA/SQL gateways will link 50 front-end tools to IBM's DB2 and SQL/DS DBMSs.

At $40,000 to $70,000 per gateway, this approach costs about half as much as an entire EDA/SQL, according to John Senor, a company vice president. Also, a copy of EDA/Link for $175 per copy is required on every workstation. "A lot of users require an incremental approach to data integration," Senor said. "This has been brought on by the blossoming of the client/server market, where a specific set of users need access to a specific set of data. The application may be downsized, but the data is much harder to downsize."

In the first half of 1993, he added, "we will announce gateway solutions for other database products that do not necessarily reside on the mainframe, including Unix, VAX and Hewlett-Packard." Information Builders will also sell the gateways through alternate distribution channels to be announced later, Senor said.

EDA/SQL users said the gateway approach sounds like a good idea, although not necessarily for them. "We're already committed to the full-blown implementation," said Wally Estes, a program manager at the U.S. Postal Service in Washington, D.C. "But the gateway facility might appeal to those who need a lower-cost solution."

Les Bain, manager of data resources at Del Monte Foods in San Francisco, said, "It's a change in marketing, not in strategy. The all-at-once approach is intimidating to a number of people; point-to-point is a lot more focused."

These customers said their data access strategies are proceeding apace. At the Postal Service, a corporate executive information system (EIS) is being used by approximately 15 senior executives, with a total of 1,000 users scheduled.

The Postal Service is using EDA/SQL to connect Information Builders' Focus DBMS to Lotus' 1-2-3 on PCs. Also connected in the mix are OS/2 and Digital Equipment Corp. VAX servers. At the moment, the EIS comprises data on revenue, budget, number of employees, service indicators and performance.

Still to be added to the system are marketing and customer data, Estes said.

At Del Monte, Bain said, the goal is to enable 80% of end users to access all corporate data by the end of next year. "We have the classic situation at a large company: a real mix of databases because of acquisitions," he said. These include DB2, Supra, Total, Adabas and Nomad.

By the end of this year, Bain said, Delmonte will have EDA/SQL in production and will have all the MVS DB2 data available to users.

Blue Cross/Blue Shield of Minnesota is using EDA/SQL as a decision-support tool for actuarials. "We will expand this into the claims division for 1993," said Dan Schultz, senior IS consultant. "The whole concept of sharing data is very new."

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Wang launches imaging tools

Firm continues product announcements, tries to stay afloat

BY KIM S. NASH
CW STAFF

LOWELL, Mass. — Attendees at next week's Technetron '92, a conference for Wang Laboratories, Inc. users, will for the first time see non-Wang-specific vendors hawking plans for moving VS users to Unix platforms.

Meanwhile, an August filing for Chapter 11 bankruptcy protection has not staunched Wang's flow of product announcements. It has introduced software and hardware in keeping with Office/2000, an office automation strategy pegged on the Wang Integrated Imaging System.

But it is too soon to tell whether the survival gambit is working. Wang has taken on the posture of a duck: It appears to sit serenely on the pond, while underneath the surface, feet are paddling furiously to propel it forward.

Forward, in this case, means toward Office 2000, which must incorporate hardware from other vendors to be at all successful, according to analysts. Wang itself has said IBM's RISC System/6000, which Wang resells, is the centerpiece of the framework. Toward that end, Wang recently unveiled the following products:

•**Open/Image for AIX**, introduced in June, began shipping last month. It is a three-piece package: imaging systems software, priced at $1,600 per node; application programming interface software, priced between $4,300 and $29,900; and Wang RISC Series hardware — relabeled IBM RS/6000s — priced from $19,500 to $97,500.

•**Open/Image for CICS** is a set of tools designed to make it easier to build image functions into IBM CICS mainframe applications. Prices fall between $21,200 and $128,200, depending on platform.

Remaining products in the planned 37 new VS-related wares due out this year are on schedule, according to Wang.

It's show time

A financial reorganization plan is due to U.S. Bankruptcy Court in Boston by Dec. 16, and Wang has slated its annual shareholders' meeting for a week later.

But before then, the company will have to convince its installed base of approximately 19,000 users worldwide that it is still viable. Technetron '92 will likely be key to reinforcing that message. The company must keep VS users confident while remaking itself into a software and service provider.

Among those scheduled to demonstrate Unix products at the show are Hewlett-Packard Co. and Sun Microsystems, Inc. Microsoft Corp. — a member, along with IBM, of a creditors' committee appointed to oversee Wang's restructuring — will also attend. Next, Inc. honcho Steve Jobs will deliver a keynote address, as will Wang Chairman Rick Miller, Technetron officials said.

Third-party product and service suppliers catering to VS customers will also be on hand. And they, unlike Wang, are thriving. Companies such as MacSoft, Inc. in Bakersfield, Calif., and GF Consulting Services, Inc. in Langhorne, Pa., offer parts and support for systems at discounts to Wang's prices. They have also seen an upswing in interest in migration services to Unix systems and PC local-area networks.

HP's MPE still a contender

CONTINUED FROM PAGE 67

Users also lauded MPE for its relative ease of use.

"The commands are not as cryptic as the commands in Unix," said Mike Meinz, principal technical consultant at General Mills, Inc. in Minneapolis, which once began porting a distribution system to an HP 9000 but reverted back to MPE and the 3000. "Unix was originally designed for one person in the AT&T labs. That's why there's a 'Uni' in the name."

He further noted that MPE has a simple directory structure, "whereas in Unix's directory structure, you can have multiple levels."

Users also pointed out that MPE comes with a database, while HP/UX does not.

Future challenge

So HP's challenge is to continue to support the installed base still committed to MPE, to advance the operating system and to assuage users' concerns of being deserted.

"The feeling of the MPE crowd at times is that HP has been neglecting their bread and butter in their infatuation with all this new stuff," Fisher said.

One move that may have restored user confidence recently was the appointment of Sevcik to head the minicomputer business. Sevcik was formerly the head of HP 3000 operations.

HP is also continuing to open the MPE operating system by including Posix hooks. In fact, it now calls the product MPE-IX to reflect its Posix characteristics, although the company has not yet delivered full Posix functionality. A new release, 4.5, is due this month, which HP said will be 80% Posix-compliant. Roelandts said full compliance will come by mid 1993.

HP also boasts of the ease with which software can be ported to MPE, a process that Meinz attested to.

"Today, you can take Unix software and port it to MPE with the same degree of difficulty as if you were porting it to another version of Unix," Roelandts said.

Showdown

Hewlett-Packard's MPE shows strength on usability issues when pitted against Unix

Double standards

MPE advantages vs. HP/UX (Unix)*
- Better security and integrity.
- Less arcane instructions.
- Optimizes to HP's PA-RISC processor.
- Comes packaged with a database.
- Better batch processing.

MPE customer profile vs. HP/UX**
- MPE: Looking for total solution installed for them, not looking for latest technology.
- Unix: Early adopters of new technology and "hot boxes"; more inclined to install themselves; price aggressive; downsizing.

Source: * Users and analysts, **Hewlett-Packard Co.

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PC MAGAZINE

EDITORS' CHOICE

• Sybase SQL Server for NetWare

For its state-of-the-art feature set and blinding speed, Sybase SQL Server for NetWare wins our Editors' Choice. The product supports on-line back-up, stored procedures with control logic, server-based referential integrity through triggers, and more.

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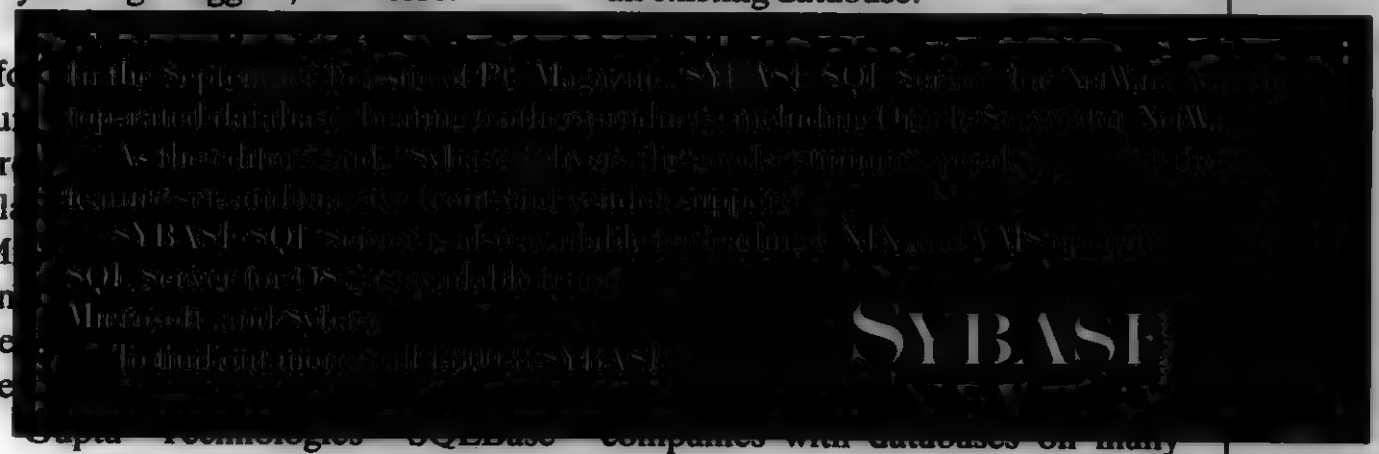
Server NLM earns an honorable mention. Though it lacks some of SQL

support is relatively light, SQLBase is a good choice for companies without an existing database.

platforms, and Novell's NetWare SQL is especially well suited for companies



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NEW PRODUCTS

Database management

Micro Data Base Systems, Inc. has started shipping Object/1 Professional Pack for Oracle Corp.'s relational database management system.

Automatic data transfer to or from windows painted in Object/1 speeds applications development, the company reported. With Oracle's SQL language, applications can query and update data. Two interface levels are offered. Direct calls to the Oracle RDBMS are provided by the low-level interface.

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Object/1 costs $995.

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Utilities

BlueLine Software, Inc. has introduced the Network Performance PowerPak, a consolidated offering of software performance monitoring tools.

According to the company, PowerPak enables users to measure response time as seen by the user. All of the key elements affecting that response time can be viewed through a complete menu-driven interface. Interactive viewing of historical data for problem resolution is provided by a Recall facility, and full report writing is available for historical analysis and management planning.

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Programart Corp. has announced the APMPower application performance analysis system.

According to the company, APMPower is a software product that lets users interactively analyze the performance of IBM MVS applications at their OS/2 workstations. It works with Programart's Strobe Application Performance Measurement System.

Data collected by Strobe is downloaded from the mainframe to the workstation. The data is then interpreted and followed while it is being displayed in histograms and graphs.

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Software application packages

Multiview Corp. has introduced Multiview Fixed Assets, a fixed-assets management system designed for the Hewlett-Packard Co. 3000 computing environment.

According to the company, the system helps users perform comprehensive tax, risk and financial management and helps them effectively manage property and maintain accurate asset inventories.

The product also has the capability to track assets from acquisition through retirement.

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Processors

EMC Corp. has announced the EMC ES/9121 memory cards designed for IBM Enterprise System/9121 processors.

The memory cards use 65-nsec, 4M-byte dynamic random-access memory. According to the company, state-of-the-art technology provides maximum reliability and response time improvements for I/O-bound users.

The ES/9121 product line is made up of memory cards with 16M- and 32M-byte capacities that are installed in sets of four and eight. Memory can run either in the ES/9121 system exclusively or with IBM memory.

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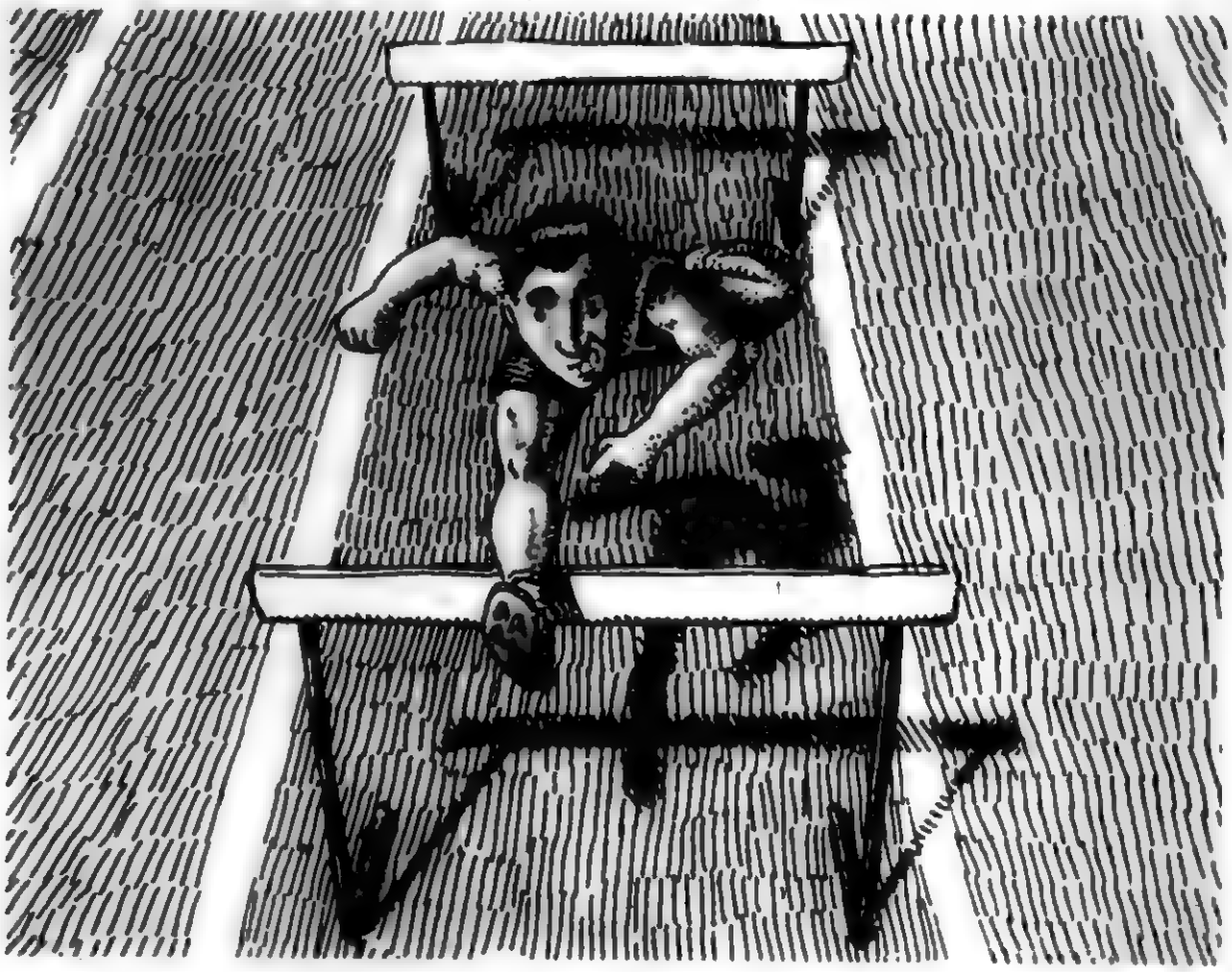

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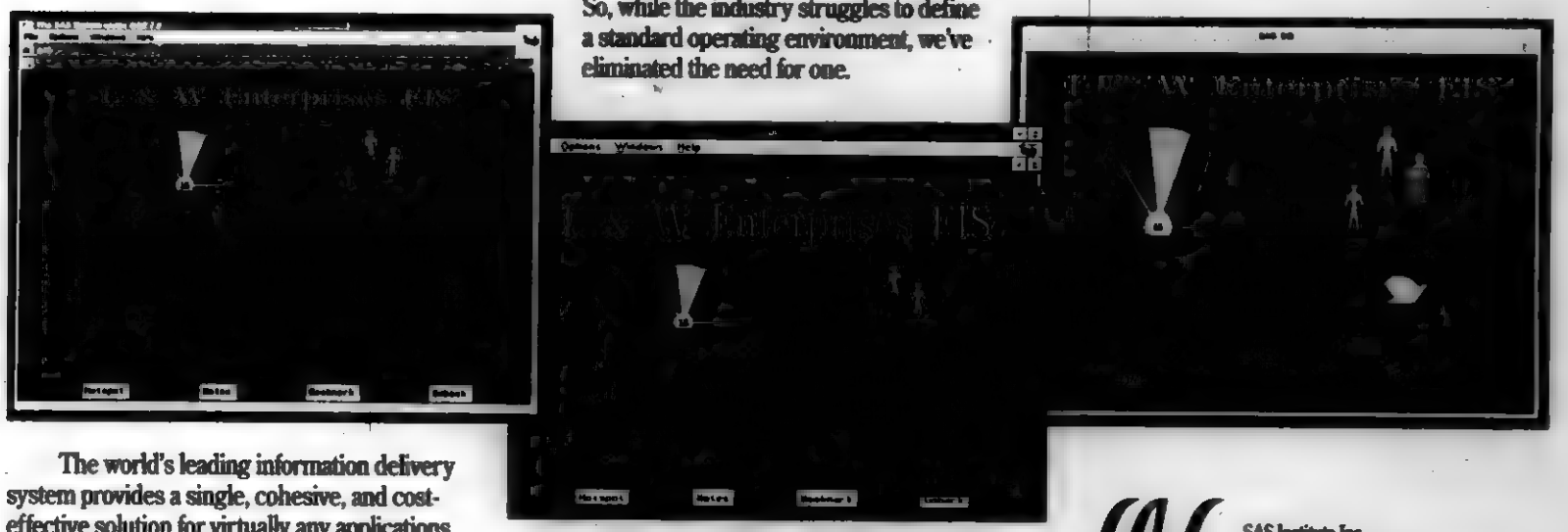

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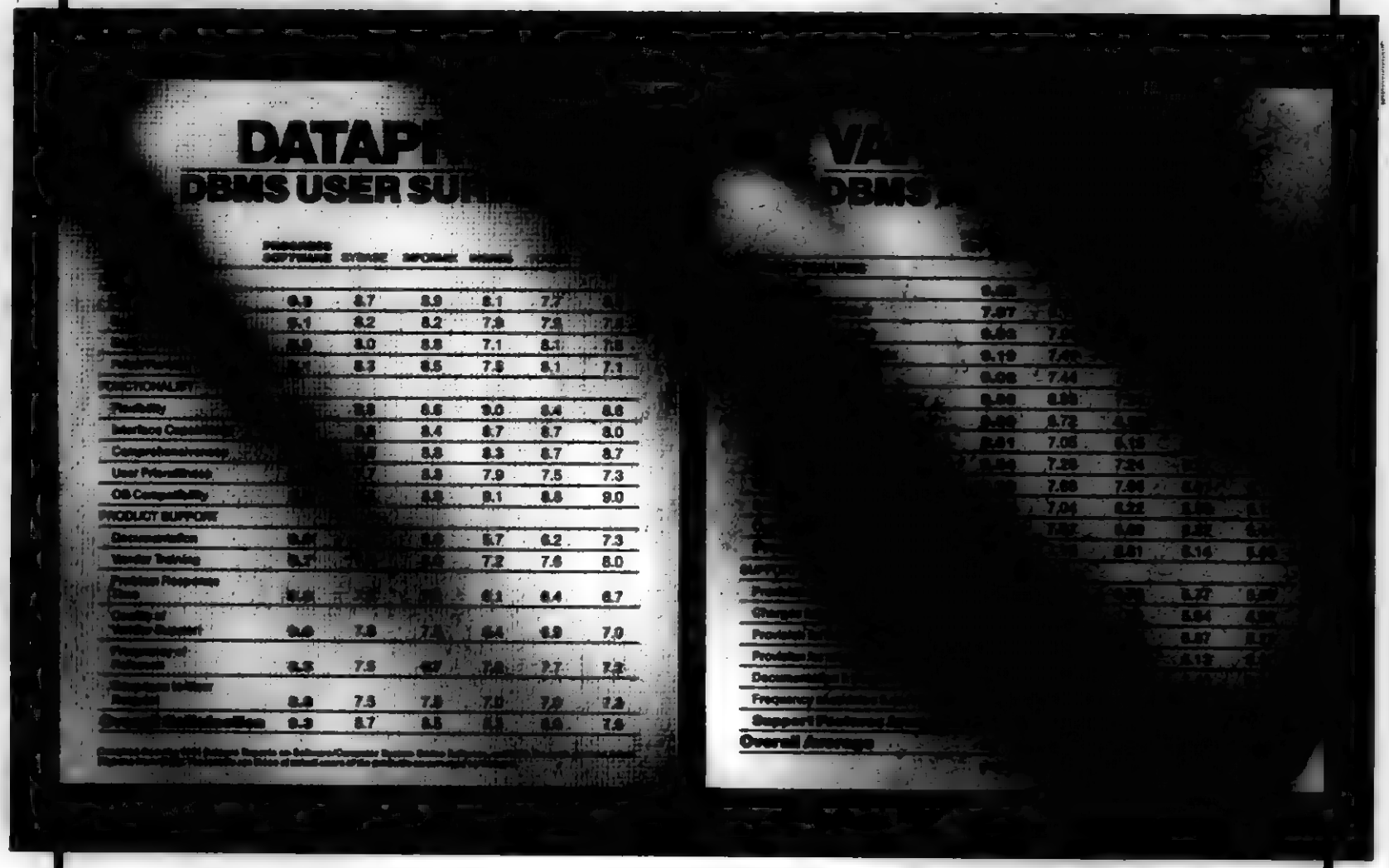

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Tool provides database objects for development

BY GARRY RAY
CW STAFF

GOLETA, Calif. — Client/server application developers can reduce hand-coding of SQL statements with a new tool from Smartstar Corp.

Smartstar Vision provides a visual programming environment in which programmers and users can rapidly develop database applications using object-oriented techniques and facilities, according to officials at the company.

Currently available for Sun Microsystems, Inc.'s SPARCstation and Digital Equipment Corp.'s Ultrix and VMS, Smartstar Vision comprises a collection of database objects that provide most of the functions typically found in a SQL database application, Smartstar President John Markel said. "What we've developed is a complete SQL application development system that requires minimal coding," he said.

Support is provided for the Unix CISAM and VMS RMS databases, as well as Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, The Ask Cos.' Ingres and DEC's Rdb on an optional basis.

Standard functions

Included in the Smartstar Vision developer facility are objects that can query, sort, format and update database information. The objects also support standard SQL database functions such as table joins, keys, data types, scaling and referential integrity, Markel said.

Although programmers need not write any additional code to support these functions, Markel said, an interactive SQL facility is provided to add complex queries to an application or to access stored procedures.

Database operations are performed through a logical database dictionary (LDB), which Markel described as a "layer" of Smartstar Vision software that resides between an application and physical databases. The LDB dictionary stores metadata about all available databases and is used by the development facility and by completed applications to access physical databases residing on a system, Markel said.

Update routine

"You don't have to know anything about the physical database," said Keith Therrien, a Reading, Mass.-based independent consultant working at Arkwright Mutual Insurance Co. in Waltham, Mass. "Whenever the physical database changes, our database administrators have a routine, which goes out and updates the [Smartstar Vision] LDB dictionary."

Therrien, who has been using a prerelease version of the software since April, said the 600-employee Arkwright will soon use it in the company's Massachusetts headquarters and in 10 regional offices, primarily because the tool provides "a major leap from hard-coding SQL statements" with only "10% of the coding we used to do." With those savings, "the rest of the [development]

Continued on page 76

Sybase fights for developer loyalty

Hopes to lure back customers with a new generation of graphical tools

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

During its five-year history, Sybase, Inc. has created a smorgasbord of application development tools to complement its relational database management system. But users who bypassed Sybase tools in favor of third-party products several years ago seem generally happy with their choices.

Now, industry analysts said, Sybase's challenge is to entice such users back into the fold with a new generation of graphically oriented programmer tools.

Well aware that its tools have taken a backseat to its relational database, $160 million Sybase reorganized its product divisions last month. A Tools Technology Group, headed by Sybase cofounder Robert Epstein, will integrate a wide variety of character-based and graphical development tools (see chart). The Sybase RDBMS engine and connectivity software will be developed separately.

"It's a challenge for them to catch up and to be seen as a leader in both database and tools," said Tony Percy, a vice president at Gartner Group, Inc.'s Software Management Strategies Service. "Their tools are not state of the art, and many of their best sites in fact use third-party tools. It will be tough to leap over vendors who specialize in portable tools."

Percy cited Uniface Corp. in Alameda, Calif., as one of the strongest suppliers of portable software tools to Sybase users.

Still, some longtime users of Sybase's aging APT Workbench are happy to use it as is because they have little or no need for graphical user interfaces (GUI). "Our environment is 90% terminal-oriented," said Doug Rainey, a systems analyst at a Jackson, Mich., location of Aeroequip Corp., which makes components for the airline, aerospace and automotive industries. "It fits our environment. It's unfair to compare it to a tool that's for GUIs only. This thing runs on terminals and in a graphical mode, and to compare it with something that's only for GUIs isn't fair."

Many other Sybase users veered to third-party tools because they were unhappy with APT Workbench's lack of GUI support or with its limited functionality. To address those needs, Sybase shipped APT Workbench 5.0, a revised version that provided emulation of some GUIs and support for several foreign languages.

But in 1990, when Textron Financial Corp. in Providence, R.I., wanted to build Microsoft Corp. Windows applications, APT Workbench did not support GUIs at all. Instead, the leasing division of Textron, Inc. chose Powersoft Corp.'s PowerBuilder, along with Sybase's EasySQR report writer. The 300-person division has a network of local Unix servers running the Sybase RDBMS and accessing IBM mainframe data over a long-distance network.

"By choosing third-party tools, we've given up simplicity in terms of support, problem resolution and even design," said Paul Hamel, vice president of systems and planning at Textron. However, another round of client/server development, beginning in 1993, may come in time for a new generation of Sybase graphical

Continued on page 77

Sybase toolbox

Character-based; some GUI support	Multiplatform	$1,000 to $120,000
Object-oriented multimedia	Sun workstations	$20,000 to $150,000
Graphical upper-CASE	Apple Macintosh	$3,900 to $8,900
Fourth-generation language and report writer	Multiplatform	$595 (single user) to $128,000
Operations-control package	Sun Unix; DEC VAX/VMS	$8,250 to $51,250

CW Chart: Stephanie Faucher

By the end of this week Computerworld readers will have spent over $68.5 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

Reusable software library now available

Allows coders to 'check out' software modules

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C.— Westinghouse Electric Corp. is betting that the same automated software library it has used to manage reusable code for defense contracts will be a productivity booster in the commercial sector, too.

The Westinghouse Electronic Systems Group in Baltimore recently introduced its Reusability Search Expert (ReuSE) for use in transportation, law enforcement and commercial information systems.

The ReuSE software allows a company to create a fully cataloged library of its custom software so software engineers can "check out" modules of software for reuse, Westinghouse officials said at a press conference last week.

Like any public library, ReuSE allows an administrator to decide what homegrown software will be accepted by the library and then catalog it. Software engineers can undertake key word searches and browse through abstracts or actual source code.

Browsers can also find out the "pedigree" of the software, including who wrote it, the software's limitations and any legal or licensing constraints, Westinghouse officials said. The library includes all of the associated documentation, including user manuals.

REUSE TRACKS all users of a software version and notifies the users when the library is updated with a new version.

When a library patron finds something to check out, the code can be transferred to computer-aided software engineering (CASE) products using the IEEE CASE Data Interchange Format, according to Eric Beser, a senior software engineer at Westinghouse.

Perhaps the most important feature is in the area of version control. ReuSE tracks all users of a software version and automatically notifies the users when the library is updated with a new version. The software also keeps track of those users who still have old versions.

ReuSE is available now and costs about $36,000. The software currently runs on Digital Equipment Corp. VAX VMS systems and Sun Microsystems, Inc. systems. It uses its own hypertext database engine, so ReuSE does not require a third-party database management system to work.

Beser said the closest competitor is a software library product from SofTech, Inc. in Waltham, Mass., which requires Oracle Corp.'s database system.

One of the emerging markets for ReuSE is defense contractors who need a place to stash software written for projects that have been "mothballed" by budget cuts, Beser said. If a use for the software develops many years later, the library will have the critical information.

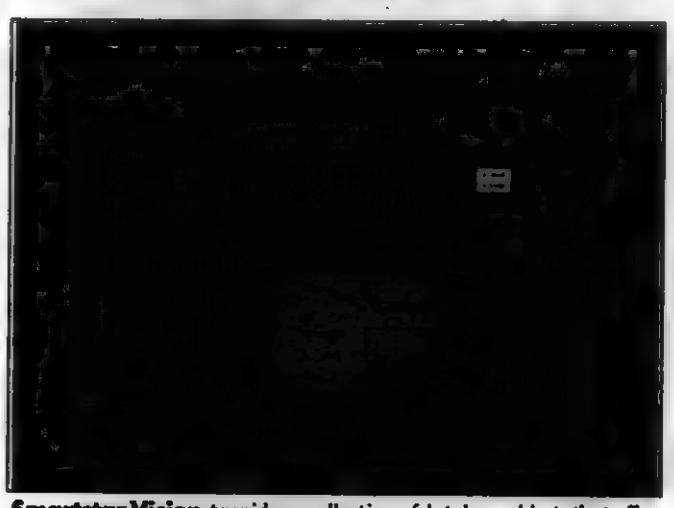
Tool provides database objects

CONTINUED FROM PAGE 75

time is spent with users to get information about their applications or to have them actually build the [application] windows they want."

Arkwright's users will run completed client applications on Microsoft Corp. Windows-equipped PCs under Xcursions, a Windows program that translates X Window System-based applications, such as those created using Smartstar Vision, for use in the Windows environment, according to Therrien.

Despite the small size of Smartstar compared with other software companies dominating the client/server tools wars, analysts said Smartstar Vision will create a new benchmark for other software vendors to note. "It's a civilized approach to SQL access," said Rikki Kirzner, principal analyst for Unix and open systems computing at Dataquest, Inc., a market research firm in San Jose, Calif.



Smartstar Vision *provides a collection of database objects that offer most of the functions found in an SQL database application*

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Sybase fights for developer loyalty

CONTINUED FROM PAGE 75

tools, said Hamel, who has participated in Sybase customer councils on future product requirements.

Sybase has tried to leapfrog database competitors by acquiring small vendors and their new technologies. It acquired SQL Solutions, Inc., a Burlington, Mass., database consulting firm with rights to the SQR report writer, several years ago.

In March 1991, Sybase acquired Deft, Inc. in Toronto, which had an upper-CASE tool and data repository for use on Apple Computer, Inc. Macintosh computers. Sybase is still working to port Deft onto Unix and PC desktop platforms, and it provides a "bridge" to IBM-compatible OS/2 machines running Sybase relational databases.

This year, Sybase invested more than $60 million to acquire Gain Technology, Inc. in Palo Alto, Calif. The target, analysts said, was a flexible object-oriented applications development framework capable of creating multimedia applications.

"The database engine is going to be the cash cow for Sybase," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "But now, you are going to have the Trojan horse, which is a beautiful graphical development environment for rapid application development and prototyping."

Industry analysts noted that Gain Technology is wired to support multiple relational databases, including the Oracle Corp. database and at least one object-oriented database from Objectivity, Inc. That would give Sybase an edge over larger database vendors such as Oracle.

SYBASE HAS tried to leapfrog database competitors by acquiring small vendors and their new technologies.

Flexibility possible

Gain's technology can be used to create flexible applications, users said. "We've used Gain as an advanced interface to complex simulation software," said Herbert Lichtman, manager of Advanced Simulation Technology at government contractor General Research Corp. in Nashville.

"You can connect an application to two [relational] databases simultaneously and switch back and forth between them," he said.

Sybase executives hinted that a strategic announcement next week would include forthcoming object-oriented tools.

Centerline revises Objectcenter workbench

BY GARRY RAY
CW STAFF

Centerline Software, Inc., the Cambridge, Mass.-based developer of a variety of C and C++ application development tools for Unix, recently introduced Version 2.0 of its Objectcenter C++ programming workbench.

The workbench, which provides facilities for C and C++ programming, includes a number of revisions to existing tools, along with a C++ compiler, which was not available in earlier versions of the product.

According to Centerline, Objectcenter 2.0 provides a C and C++ mixed language capability that allows for incremental shifts to C++.

Among the enhancements made to Objectcenter are precompiled header files that were designed to reduce compilation time, support for C++ templates and user-selectable support for the Open Software Foundation's Motif interface or Sun Microsystems, Inc.'s Open Look. Also included in the enhancements are and an improved debugger that provides runtime error detection and source-level debugging of object code.

ObjectCenter 2.0 is available on Sun Microsystems, Inc.'s SPARCstations and Hewlett-Packard Co.'s HP Apollo 9000 Series 700 workstations for $3,995, the company said.

IN BRIEF

SHL to sell Bachman tools

■ Outsourcer SHL Systemhouse, Inc. in Ottawa plans to use and resell tools from Bachman Information Systems, Inc. SHL Systemhouse also joined Bachman's Development Partner Program, which means SHL will help define new products for the Burlington, Mass.-based computer-aided software engineering firm.

■ Integris, an independent unit of Bull HN Information Systems, Inc., said it will use tools from Easel Corp. and Wall Data, Inc. to tack graphical user interfaces onto IBM CICS mainframe applications. Integris also plans to support an interface builder for X terminals connected to Unix systems and Microsoft Corp. Windows-based PCs in December.

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NEW PRODUCTS

Application development tools

Integrated Systems, Inc. has started shipping Version 3.0 of SystemBuild, an integrated graphical model editor and simulator.

When used in conjunction with the company's Matrixx math and analysis software, SystemBuild accelerates the design and debugging of linear and nonlinear dynamic systems.

New features added to this version include Interactive Simulation; QuickSim Integration, a fixed-step integration algorithm that allows linear and nearly linear systems to be simulated; a Minstep feature for Variable-Step Integration that allows enhanced performance for "switch-event" problems; improved Trim Function; and Enhanced Licensing-Floating Display, the company reported.

Pricing for SystemBuild Version 3.0 starts at $8,000.

Integrated Systems
3260 Jay St.
Santa Clara, Calif. 95054
(408) 980-1500

Statistical Sciences, Inc. has announced Version 1.0 of S+Interface.

According to the company, the tool kit was designed to assist users who use custom versions of S+ data analysis software on Unix workstations.

Custom menu-style interfaces can be created, and from another C application, users can call an assortment of proven data analysis functions of S+, the company reported. Modifications can be made to application-specific programs that need advanced statistics and data analysis, and the product provides access to S+ functions from another application as if S+ were a subroutine library.

The perpetual license fee for S+Interface is $1,350.

Statistical Sciences
Suite 500
1700 Westlake Ave. North
Seattle, Wash. 98109
(206) 283-8802

Rational has introduced Insight, a reverse-engineering and browsing tool.

According to the company, the tool was designed to make Ada software easier to understand, build, re-engineer and maintain. Information is gathered about the code and then Insight creates and displays diagrams on a workstation.

The product is integrated with a software engineering environment for the development of complex applications known as the Rational Environment. As a client/server application, it runs concurrently on the Rational Environment and a workstation.

Insight provides module diagrams that can be interactively browsed, printed or included in documentation.

Insight costs $3,000 per user.

Rational
3320 Scott Blvd.
Santa Clara, Calif. 95054
(408) 496-3600

XVT Software, Inc. has announced support for Microsoft Corp.'s Windows New Technology (NT) with the latest version of the XVT Portability Toolkit.

According to the company, users can build a single C or C++ application and recompile to every major graphical user interface (GUI) without rewriting code. A 32-bit linear-memory model is used for applications built with the product.

Complete memory protection for each application is provided by the XVT Portability Toolkit when used in conjunction with NT's preemptive multitasking system.

For faster and easier GUI development, the product can abstract numerous low-level native calls into single XVT calls, the company reported.

Pricing for the Portability Toolkit for NT costs $1,450 on Intel Corp.'s I486-based systems and $4,400 on workstations.

XVT Software
4900 Pearl East Circle
Boulder, Colo. 80308
(303) 443-4223

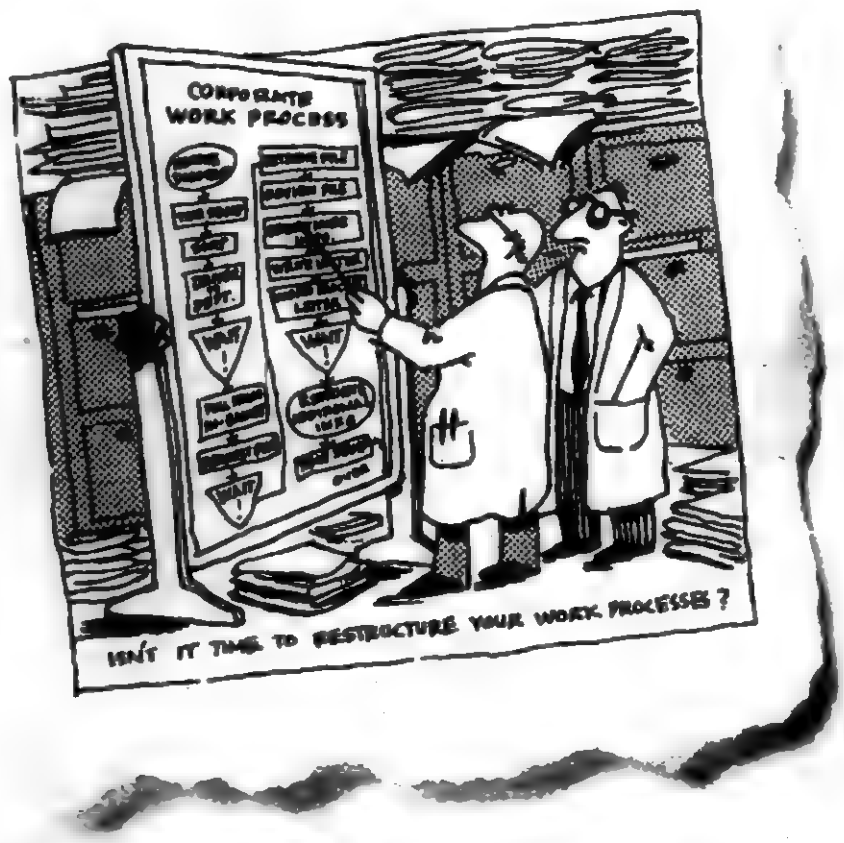
Languages

American Interface Computer, Inc. has announced IF/Prolog Version 4.0 for fault-tolerant systems from Sequoia Systems, Inc. and Hewlett-Packard Co.

The company has ported Version 4.0 to the HP 9000 Series 1240 and the fault-tolerant Series 400 systems from Sequoia. The systems use up to 64 Motorola, Inc. 68040 processors with a fault-tolerant Unix version, the company reported.

For either machine, the fault-tolerant IF/Prolog costs $12,500.

American Interface Computer
Suite 200
1705 Capital of Texas Hwy. South
Austin, Texas 78746
(512) 327-5344



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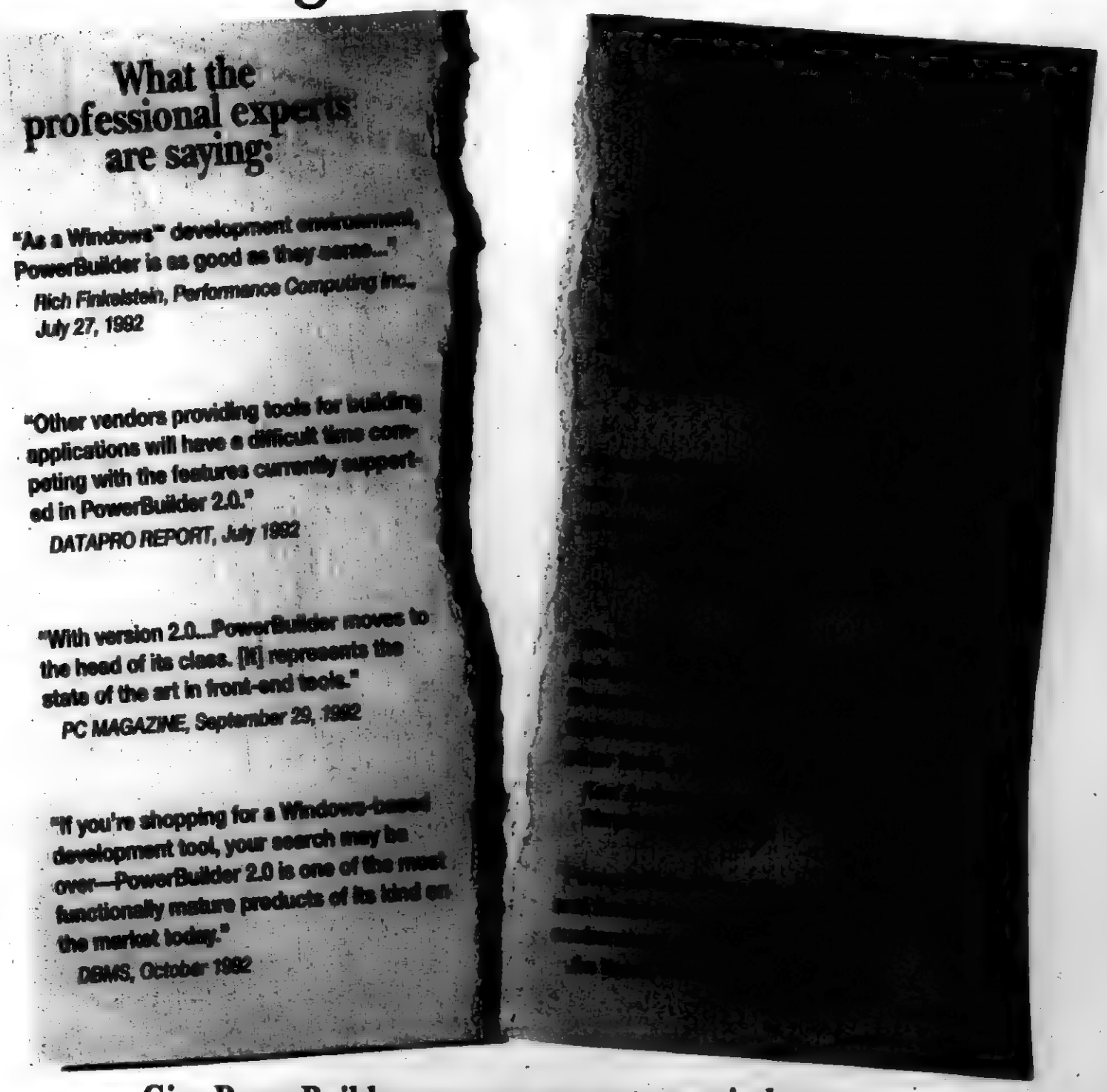

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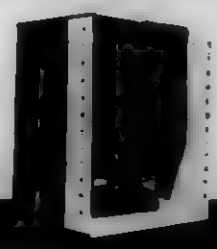

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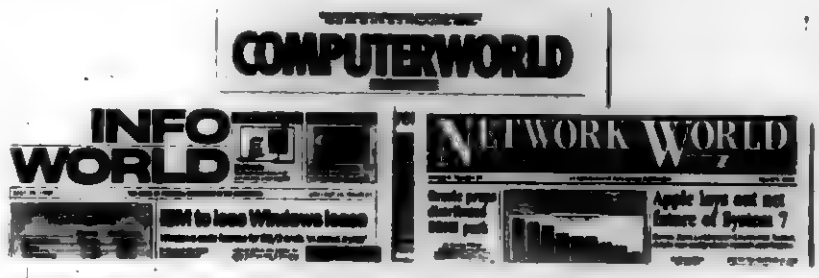

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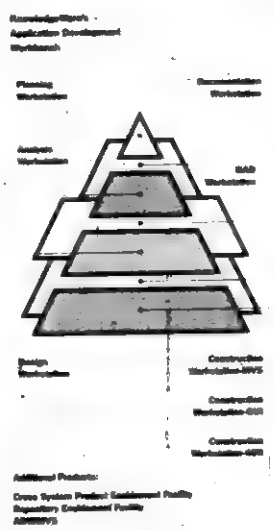

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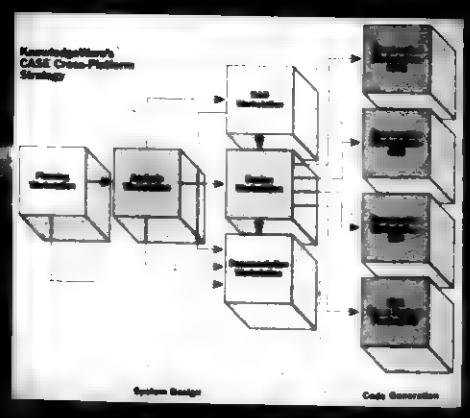

developers to deal with this complex technology can be astronomical.

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[illegible]

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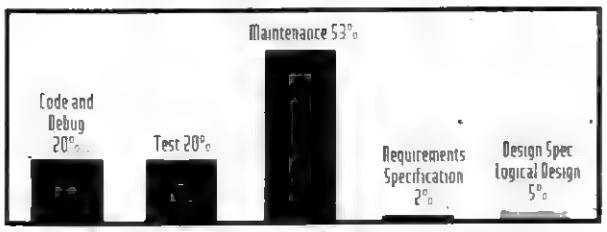

Source: Pittiglio Rabin Todd & McGrath, management/consultants, **Electronic Business,** June 1992

ADW/Pinpoint documents the code, charts processing paths, and highlights potential trouble spots. And ADW/Recoder dramatically improves program quality by automatically restructuring problem code.

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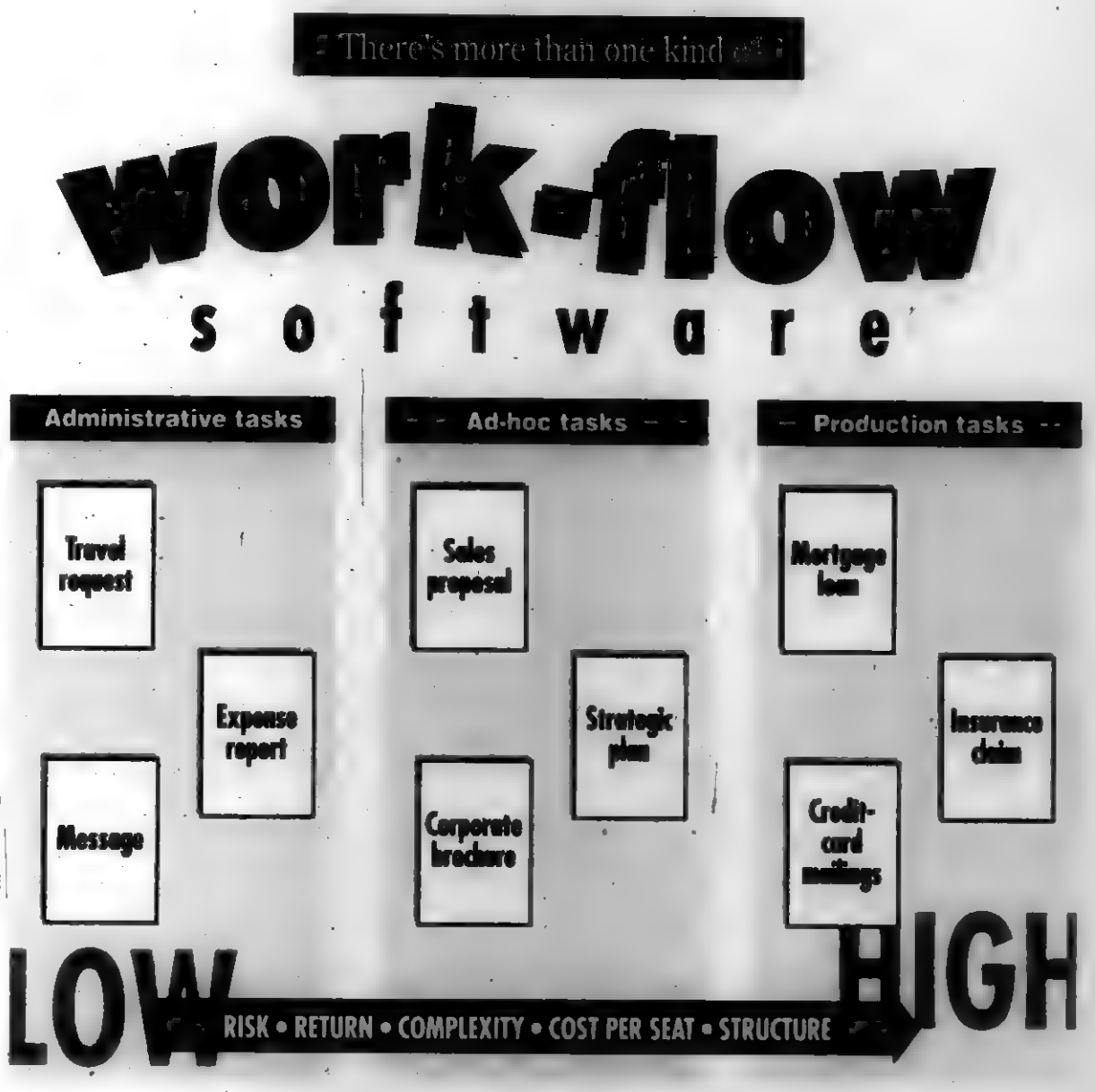
PRODUCT SPOTLIGHT



BY SCOTT C. McCREADY

In these days of fiscal conservatism, limited information systems resources and questionable financial returns on IS investments of the past, you're probably wondering, "Why should I care about work-flow software?" You may even be wondering what the heck it is. It might be best to explore what work-flow software is *not*; with "work-flow" reaching the same popularity level as "re-engineering," definitions are getting vaguer and more diverse.

Some vendors say work-flow software allows you to route work from one person to the next, a capability known as "programmic control." A popular example is a travel request form that is electronically and automatically routed through the approval process. The benefits include reduced delay of in-baskets and the fact that workers can stop worrying about where the work should go next or where it has been before.

This definition is partially true, but work-flow software is much more than simply routing work from one desk to the next in a rational manner. It also involves a development environment that allows you to detail a series of events and triggers for any structured or unstructured business process.

In fact, the hard part of implementing a work-flow system tends to focus more on the operations that take place once a case is being worked on at any one desk. This generally has much more to do with forms, user interaction and procedural development than the flow of work.

You can actually learn a lot about work flow by looking at what the imaging vendors have done in this area, although work flow and imaging do not necessarily go hand in hand.

Imaging origins

Imaging was the first technology to make people see the irrationality and inefficiency of some of their business processes. Implementors realized they needed a product that could make proposed changes in the way electronic — rather than paper — documents flowed.

It wasn't long before these companies realized that the people who best understood the business process were in user departments, not in IS. They then wanted a development environment that end users could interact with.

The idea of processing electronic images, or documents, in parallel rather than the old serial, paper-based process fostered the need for placing the flow of work under programmic control.

The imaging vendors, such as **FileNet Corp., Sigma Systems, Inc.** and **Plexus Software, Inc.**, realized that today's development environments were simply too low level for those types of requirements. Consequently, they developed higher level development environments that are critical to work-flow software.

Continued on page 86

McCready is a principal at IDC/Avante Technology, a market research firm in Framingham, Mass. The company recently completed a four-part report on work-flow software, "Work-flow software: The challenge for the '90s."

Work-flow software

CONTINUED FROM PAGE 85

Given enough time and money, C, Cobol or even PL/1 can do exactly the same as work-flow software. But they are not optimal for the following reasons:

- The business process is typically owned by the line-of-business manager, who must convey a detailed understanding of the flow of work to the person ultimately responsible for development. Commonly, something gets lost in the communication, and the development process becomes iterative and lengthy.
- By hard-coding the application every time there is a change in procedure or in business needs, IS has the burden of making application updates.
- Current development tools require processes to be specifically defined and capable of being reduced to an algorithm. Many business processes are not easily defined.

Work-flow software, which is typically a fourth-generation language (4GL) environment, is the first software to lend itself to undefinable business processes. It also normally has a good forms capability associated with it. Unlike older languages that require you to specify "edit," "debug" and "test" phases, work-flow software allows you to run and test and change the application all at the same time.

WORK-FLOW software can be used to automate any application, from processing expense forms to underwriting insurance policies.

Three types

Work-flow software can be used to automate any application, from processing expense forms to underwriting insurance policies. Certainly you can use it for mortgage loan processing, putting together a sales proposal or product documentation. Some companies are even using it to distribute software.

But don't believe any vendor that claims its work-flow software can automate *all* your business processes and place them under programmic control. That is a hyperbole: While current offerings may be able to automate all your applications across the board, they probably cannot automate any of them particularly well.

That's because the applications in your business have very different work flows based on, among many other factors, the volume of transactions involved and the number of people involved in the process.

The differentiating factors are numerous, but in our research, we've found that there are only two key ones that determine the type of application you're working with and, therefore, which kind of product you should select: the complexity of the business process and how structured or unstructured the business process is.

We believe there are three categories of work flows and three flavors of work-flow software to serve them (see stories this page):

- Production work-flow environments, which are both very structured and very complex.
- Ad-hoc work flows, which are less structured and less complex.
- Administrative processes, which are unstructured and not at all complex.

Each requires different things of a work-flow software product, especially in the development environment, whether it's an easy-to-use graphical user interface-based environment or a document management capability.

Big interest

So why the sudden interest in work-flow software? First of all, it is not so sudden: Work-flow software in its current form has been around since 1985.

But it is only more recently that companies have become aware of the business benefits: reduced costs, higher quality and faster service, increased capacity utilization, better use of information, increased management control, organizational flexibility, differentiation in the marketplace and work elimination.

In terms that IS can appreciate, work-flow software can reduce the application backlog, minimize user requests for minor application changes and, at the same time, give you a voice in the business of your company. It won't necessarily get IS out of the development process, but it will provide a suitable environment for IS and users to co-develop work-flow applications rapidly. Plus, it will allow the user to maintain the application over time, freeing IS resources for new development efforts. Like any new market, work flow will continue to evolve. But even now, there are a few very good products that are allowing companies to get started implementing right away.•

Uphill flow

Work-flow software will make big gains in popularity, with revenue expected to more than triple by 1996

Source: IDC/Avante Technology

CW Chart: Janell Genovese

Ad-hoc work flow

There are activities within all corporations that defy definition and thereby limit the use of policies and procedures to govern their outcome. Some examples include developing a strategic plan, reviewing a new product design or simply developing a new corporate brochure.

Certainly, all these tasks involve an identifiable group of people, but this is a *project* environment as opposed to a business *process* that continues day in and day out.

Today, most people use spreadsheets, word processors and document managers to complete this type of work. What's missing is an overall method of managing the project. Therefore, in its simplest form, work-flow software in this case adds a layer of coordination over and above the familiar productivity tools.

In its final form, it also provides some discipline in the form of a time — or deadline — factor and a satisfaction or acceptance factor. That way, each individual on the project knows what effect lateness will have on himself and the rest of the team.

These aspects — time and satisfaction factors — are missing in conventional groupware offerings such as **Lotus Development Corp.**'s Notes. However, Lotus does plan to add Action Buttons and Periodic Macros and improve the formula language, which will make Notes a suitable work-flow platform.

In fact, Notes has a good opportunity to define the ad-hoc work-flow software category.

Bear in mind that workers involved in ad-hoc work flows are normally white collar, and although PCs and local-area networks may be in place, they do not have an extensive information systems structure in many cases.

Add the fact that we are automating a project that may last only a matter of weeks, and one can quickly understand the need for a graphical user interface development environment.

Because the final product in ad-hoc applications is a document, you also need excellent document management capabilities. The software should also be based on a client/server, not a front-end database so that you can replicate the database from one group of people to another.

VITAL STAT

Business process:
Ad hoc, project-oriented.

Development process:
Little IS support.

Environment:
Version control.

Users:
White collar.

Integration:
Desktop interoperability, ability to access foreign databases, host.

Software attributes:
GUI development environment, client/server-based, document management-oriented.

Production procedures

Production work-flow software is used in highly structured and complex business processes that are governed by a series of explicit policies and procedures. Examples include mortgage loan processing, insurance underwriting, claims processing and credit-card correspondence.

The established policies and procedures allow the activity to occur in a manner of acceptable business risk and return. There are some other common characteristics:

- There is a financial exposure associated with the transaction; therefore, an audit trail and financial balancing procedures are required.
- The process is often driven by parties external to the organization, such as consumers, in the case of mortgage loans. A paper form is often used as the data collection metaphor — hence the early success of image-related work-flow software in these types of functions.
- Because these applications are complex, you need a robust development environment rather than a GUI-oriented one. Since they will generally be built and maintained by traditional developers, they can require extensive 4GL programming.

For this type of application, look for the following:

- A robust environment that will enable you to determine whether a transaction took place, when it took place and where it stands now.
- Rollback or recovery processes.
- The ability to queue documents on a variety of criteria.

VITAL STAT

Business process:
Highly structured, repetitive, formal.

Development process:
IS involvement is justified.

Environment:
Transaction-based.

Users:
Clerical.

Integration required:
Desktop interoperability, ability to access host.

Software attributes:
Imaging, RDBMS-based, audit trail, financial balancing.

What is and is not

Like re-engineering, work-flow software has its own set of misconceptions and exaggerations

MYTH: Imaging is, by default, part of any work-flow solution.
There is an image component to some applications, but work flows by their very nature do not require images to be present.

MYTH: Work-flow software is merely the process of routing work from one desk to the next.
It actually has much more to do with forms, user interaction and procedural development.

MYTH: One work-flow product can automate all business processes.
Beware the vendor that tells you that its product can automate all business processes. Chances are it can, but it probably will not automate any of them particularly well.

MYTH: Work-flow software does things that are unachievable with conventional languages.
Given enough time and money, C, Cobol and even PL/1 can do exactly the same things as work-flow software. The trouble is, they assume that a process can be reduced to an algorithm, which most business processes cannot.

Source: IDC/Avante Technology

CW Chart: Janell Genovese

Administrative processes

Administrative business processes are normally simple and somewhat unstructured. Examples include expense form processing and travel requests. These may not be killer applications, but they are simple and cheap to automate.

The best software in this case is electronic-mail-based, with no robust database management system environment.

To the traditional E-mail environment, work-flow software adds the following:

- A consistent user interface.
- Application connectivity, assuming the work-flow environment provides a user interface that inherently has some form of data exchange facility.
- Folder management to allow some degree of structure to exist.
- Forms-based routing.

Some vendors claim that E-mail as a base architecture is not the way to go because it's not robust enough. Instead, they will try to sell you a "de-tuned" ad-hoc or, worse yet, production offering.

I strongly believe E-mail is the way to go in this area. For one, it offers a degree of scalability that is not possible in a DBMS-based product. Secondly, administration work flows are simple and can be developed most rapidly using a forms-based environment.

The cost per seat in an E-mail environment should be $300 to $500, which is not feasible with a DBMS-based product.

Finally, using E-mail leverages an existing environment, and the support structure is already there.

Who's who in work flow

Diversity is the name of this game

At last count, there were 26 vendors of existing work-flow software and 53 vendors with products in development. What is striking about these vendors is their widely diverse origins.

Systems vendors

The systems vendors, including **IBM**, **NCR Corp.**, **Wang Laboratories, Inc.** and **Digital Equipment Corp.**, are beginning to get very serious about this market. Beware the system vendor that is simply content to sell third-party software that runs on its hardware.

Imaging vendors

Many of the image vendors have been early proponents of work-flow software. **FileNet Corp.**, **Plexus Software, Inc.** and companies such as **Sigma Systems, Inc.** have substantial offerings. Beware: Almost all of the imaging companies claim to have work-flow software, but much of that software has only simple routing capabilities.

PC software vendors

Certainly, the PC software vendors will get into this market, including **Lotus Development Corp.**, **Borland International, Inc.** and **Microsoft Corp.** Although Lotus' Notes has many of the elements a work-flow product requires for the ad-hoc area, it has no work-flow capabilities right now, although I believe these will be in a future release. Its early start does give Lotus the opportunity to define this market segment, however. Borland has some exciting development occurring in Paris, while Microsoft will announce an administrative product by year's end. Windows for Workgroups is a good base platform for the ad-hoc area.

You've got to be wary about the PC software vendors, however. They are staging a winner-take-all price war for their traditional products, which makes it tempting for them to intimate a great development in the works for work-flow software to effectively freeze the market. Make sure you know what is real before signing on for anything.

Work-flow-only vendors

There are also companies solely in the business of developing work-flow software. These companies are typically less tied to the underlying hardware, which is key for a companywide implementation. Understand that some of these companies do not sell to users but instead sell their products as the back-end services to third parties, such as **Action Technologies** licensing to **Da Vinci Systems, Inc.** Other work-flow vendors include **Reach Software Corp.**, **Saros Corp.**, **Computron Technologies Corp.**, **Workflow Systems, Inc.** and **Sunrise Software Systems, Inc.**

E-mail vendors

Lastly, the E-mail vendors are seeing the necessity to offer work-flow products. **DEC** has already announced TeamLinks; **Verimation, Inc.** has a deal with Action Technologies; and the next version of **Hewlett-Packard Co.**'s Open Mail will have work-flow facilities.

AND ANOTHER THING...
By the end of 1992, all computer systems suppliers whose products are used in the office will have added a work-flow capability to their products, according to Ovum Ltd., a London-based research company.

Three types of work-flow software

Production	Ad hoc	Administrative
FileNet Corp. Workflo Business System Costa Mesa, Calif.	**Keyfile Corp.** Koala Nashua, N.H.	**Reach Software Corp.** MailMan Alameda, Calif.
Plexus Software, Inc. FloWare Dallas	***Lotus Development Corp.** Notes Cambridge, Mass.	***Action Technologies** (Unreleased) Alameda, Calif.
Sigma Imaging Systems, Inc. RouteBuilder New York	***Action Technologies** (Unreleased) Alameda, Calif.	***Beyond, Inc.** Cambridge, Mass.
Computron Technologies Corp. EPIC Rutherford, N.J.	**Portfolio Technologies** Walnut Creek, Calif.	**Digital Equipment Corp.** TeamLinks Maynard, Mass.
***Microsoft Corp.** (Unreleased) Redmond, Wash.	***Microsoft Corp.** (Unreleased) Redmond, Wash.	***Microsoft Corp.** (Unreleased) Redmond, Wash.
IBM FEF, WAF, Workflow Builder White Plains, N.Y.	***IBM** (Unreleased) White Plains, N.Y.	***IBM** (Unreleased) White Plains, N.Y.
NCR Corp. Process IT Columbus, S.C.	***NCR Corp.** (Unreleased) Dayton, Ohio	***Da Vinci Systems Corp.** (Unreleased) Raleigh, N.C.
Information Management Consultants, Inc. Image Mover Vienna, Va.	***Borland International, Inc.** (Unreleased) Paris	***Verimation, Inc.** (Unreleased) Rockleigh, N.J.
Image Business Systems, Inc. New York, N.Y.		***Hewlett-Packard Co.** Caspian Pinewood, UK
Unisys Corp. Event Manager Blue Bell, Pa.		
Wang Laboratories, Inc. Computron's EPIC, IMC's Image Mover Lowell, Mass.		
ViewStar Corp. Berkeley, Calif.		
Digital Equipment Corp. Echo Holland		

* In development

Source: IDC/Avante Technology

CW Chart: Janell Genovese

HOW DO WE KEEP

September 7, 1992
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September 14, 1992
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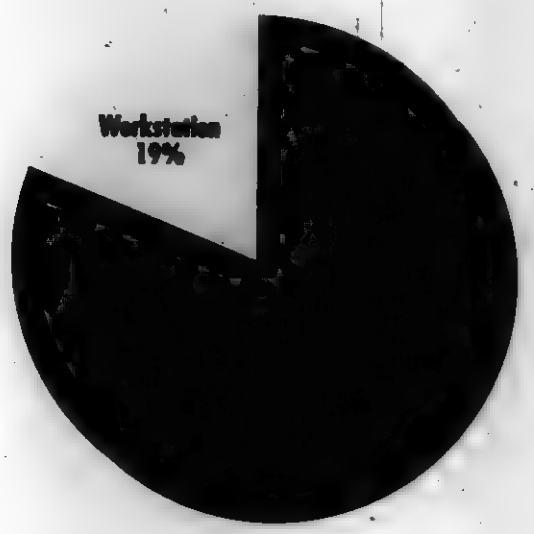
October 5, 1992
Editorial Profile



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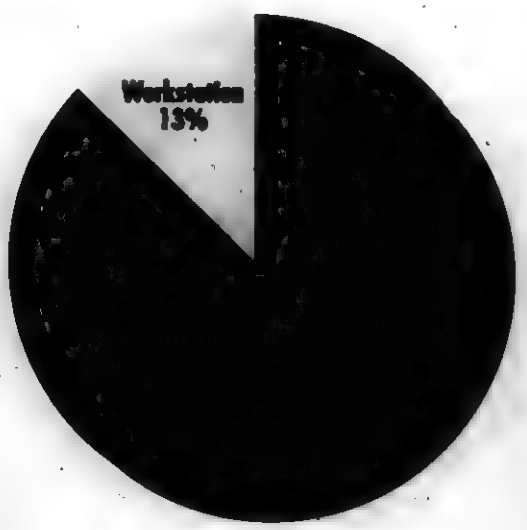
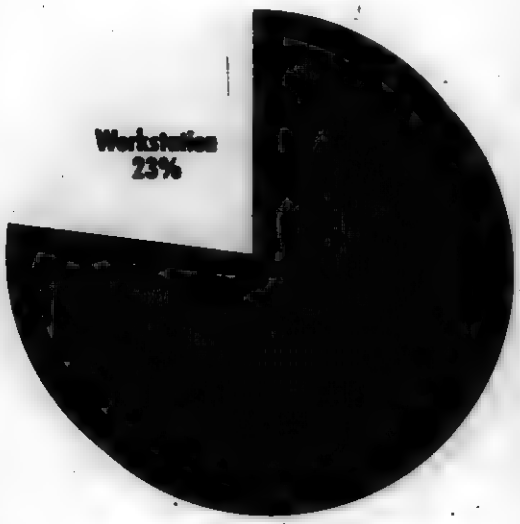


September 21, 1992
Editorial Profile

September 28, 1992
Editorial Profile



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The Newspaper of IS

Getting started . . .

So where do you start on your work-flow implementation? That depends on what kind of risk you're willing to take. If your company is risk-averse, administrative work flow is the best place to start, especially since the financial investment is relatively minor.

One danger with this approach is that early and relatively easy success in this area could lead to unrealistic time and financial expectations as you move into the more complex activities, such as ad-hoc and production work flow.

Starting with production work-flow software environments will provide the highest level of financial return, but it will also require the greatest change and financial investment. On the bright side, you will learn a great deal that is immediately transferrable to the ad-hoc and administrative areas of your company.

Bear in mind that your choice at this time is likely to depend on which vendor you choose, since no one vendor has a work-flow software product for all three environments. Therefore, adopting work-flow software requires a number of decisions:

- Do you select a best-of-breed vendor for each of the three areas?
- Do you select a vendor based on feature/function capability?
- Do you select a vendor based on hardware platforms supported?
- Do you select a vendor that is committed to having products for all three types of work-flow software environments?
- Is there a need for integration between production work flows, ad-hoc environments and administrative functions? If so, what is an adequate level of integration: file-exchange services or folder-level integration?

The consensus seems to be to get an early win, show management the benefits and then begin to formulate a companywide approach. Trying to answer all the questions up front tends to leave users in a "paralysis by analysis" mode; however, keep these questions in the back of your mind at all times.

SCOTT C. McCREADY

VOICES EXPERIENCE

"If we buy work-flow software, it will be to distribute updates and releases of software to 20,000 PCs in the company. Our update crews who do installation never stop.

"Reach's product could be the engine for that distribution."

User: *Art Beckman, manager of information technology services, Pacific Gas & Electric Co., San Francisco.*

Possible purchase: *Reach Software Corp.'s MailMan.*

"We were facing the need to invest in microfilm or microfiche technology for storage, disaster recovery and document retrieval. It made sense for us to leapfrog microfilm tech into imaging because imaging provides the benefits associated with work flow, such as simultaneous retrieval of documents by multiple users and improved reporting and inventory tracking.

"It was relatively easy to cost-justify because the company was already committed to buying something, and we showed significant staffing and [photocopying] savings, as well as soft-dollar value savings.

"We will pay off our $1.5 million investment in savings in 2½ years."

User: *Arthur Southam, chief operating officer, CareAmerica Health Plans, Chatsworth, Calif.*

Product selected: *FileNet Corp.'s Workflo Business System.*

"We were consolidating lending and deposits into one location, and work flow let us connect mainframes from across the country in one workstation and do imaging. We can use regular fax machines and send images that appear at other locations as though they were created there. These documents are then automatically routed to the next workstation.

"We can also look at every document that accompanies that image and see how a decision was made. Now you can come to us and get a car loan that used to take all day to process. Now it can be processed in less than an hour and a half."

User: *Allen Cournyer, senior vice president in charge of data center operations, Texas Commerce Bancshares, Houston.*

Product selected: *ViewStar Corp.'s WorkBench.*

Reported by Alice Bredin, a free-lance writer in New York.

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Send to: Avatar, 65 South Street, Hopkinton, MA 01748-2212. © 1992 Avatar Corporation. All trademarks are the property of their respective companies.

Any Rock Star Missing From This Event Had Other Plans.

LAS VEGAS, NV (MGX)—Anybody not playing "the event" of **COMDEX 1992** obviously had plans they couldn't change. Because this concert will be remembered as the year that Hollywood and Silicon Valley converged in a spectacular fusion of entertainment and technology. Presented by **Micrografx** and produced by the **Walt Tucker Group**, the **Grand Scientific Musical Theater** combines great performers with the future of modern production. This event sets the standard for multimedia entertainment. Best of all, the proceeds will go to the **National Center For Missing & Exploited Children (NCMEC)**.

Recent additions to the cast include **Alan Parsons**, creator of the Alan Parsons Project and engineer of **Pink Floyd's** *The Dark Side of the Moon*, and **John Entwistle** of The Who. With **JBL** building a custom system, combined with 3D Virtual Audio, it'll sound like nothing you've ever heard before! On top of that, add a house band with members of **Steely Dan, Pink Floyd, Tower of Power** and the **Traveling Wilburys**. Then sprinkle in an assortment of headline performers. (You have to show up to find out who. But you won't be disappointed.) And for good measure, throw in leaders of technology such as **IBM, Silicon Graphics** and **Pacific Data Images (PDI)** to create the visual experience. If that doesn't sound like a recipe for audio and video nirvana, then nothing will!

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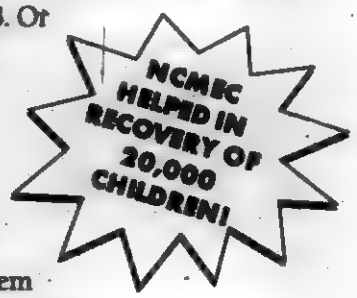

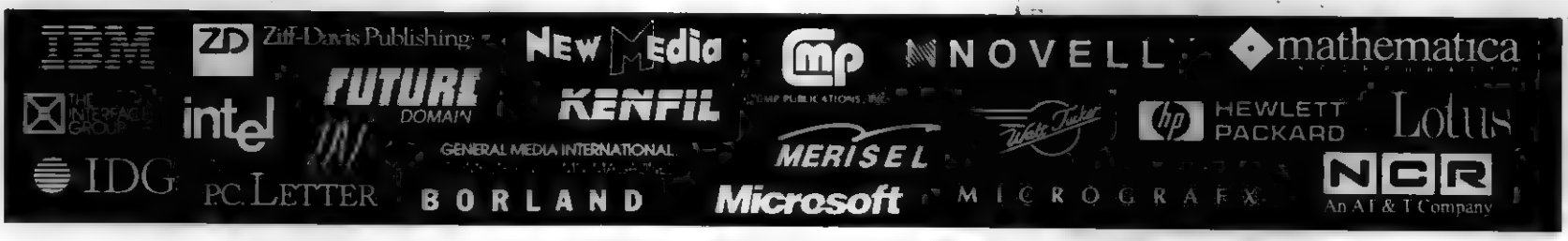

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Randall Enos

the Eureka CREW

Innovation has always been at the heart of the computer industry. On the next couple pages, we'd like to introduce you to the scientists driving the breakthrough thinking in vendor companies. What they're working on today is shaping what you'll buy tomorrow.

Philip M. Neches
NCR

Don't call Philip M. Neches a head-in-the-clouds scientist. NCR Corp.'s senior vice president, chief scientist and executive committee member takes pride in blending his technical know-how with sensitivity to business imperatives. He brought both these skills to bear in 1979, when he founded Pasadena, Calif.-based Teradata Corp. and developed the DBC/1012, a massively parallel database server. Neches joined Dayton, Ohio-based NCR in 1989, and two years later, NCR acquired Teradata. (1991 was a busy year for NCR; it was also the year AT&T acquired the company for $7.5 billion.)

Neches holds bachelor's and master's degrees in engineering from the California Institute of Technology; he returned to Cal Tech and received his Ph.D. in computer science in 1983. For his graduate work, Neches focused on parallel computing architectures and data management and quips that he formed Teradata afterward "because I didn't want to be accused of not implementing my thesis."

CW: Why is head-in-the-clouds research wrong-headed?
PN: Increasingly, your hit rate is low. It's [incumbent] upon us to get out there. And then, when you go back [to the labs], you go back with a much better understanding.

CW: What are you working on now at NCR?
PN: I'm working on the top-of-the-line family of open, microcomputer-based cooperative computing systems.

CW: Will the NCR System 3700 be a massively parallel processor (MPP)?
PN: We're going after the commercial marketplace first, where the major applications are reports and on-line transactions. So we've learned how to push parallelism into the systems software.

CW: What's the benefit of MPP in commercial settings?
PN: If you let a business get its full set of detailed information on-line, it lets people re-engineer key business processes. Companies like AT&T, Wal-Mart, Kmart and Citibank have been doing this with this kind of equipment. But these customers tell us the applications are so critical to the way they run businesses, they don't want to discuss the details.

CW: No details?
PN: Well, Wal-Mart has the most powerful commercial retail system anywhere on the planet. They have something approaching 10,000 VAX MIPS in one system image, using a massively parallel scheme.

CW: What about future research?
PN: One exciting thing resulting from the AT&T/NCR merger is [working closely with Bell Laboratories].

One area that will have immediate impact is compression technology, which is key to bringing multimedia to market. Wireless is another area of collaboration, specifically fundamental technologies for digital wireless technologies.

CW: How are customers faring?
PN: My perception is that customers are way ahead of the vendors. Think about it: The computer business is 30 years old; people who are entering business have been educated on computers. Even people rising to senior positions have lived in the Computer Age.

CW: What's the next step in computing technology?
PN: To handle other forms of information digitally: voice, motion video and so on. The key news is that in the last few years, these applications that have been dreamed about are now technically demonstrable. The next threshold is [making them] cost-effective.

If you look into the 21st century, you see a change from electronic to photonic information systems. When we were graduate students, the hot processor was the Intel Corp. 8080, and the 8085 was just coming out. This was state of the art, with 6,500 transistors [on a chip]. We were asking then about what to do with one million or 10 million transistors . . . and here we are.

Interview by Ellis Booker, Midwest bureau chief.

INSIDE

Dave Nagel, Apple
Michael Deering, Sun
Pallab Chatterjee, TI
Drew Major, Novell
Phaedon Avouris, IBM

David C. Nagel
Apple

Dave Nagel is an impatient man. He'd rather invent the future than wait for it to arrive.

As senior vice president at Apple Computer, Inc.'s Advanced Technology Group, he often gets that chance. Apple's 1984 introduction of the Macintosh PC was pivotal in making the PC the ubiquitous item it is today.

Nagel is no stranger to such startling leaps of technology. For 17 years, he served as a research scientist and head of the Aerospace Human Factors Research Division at NASA Ames Research Center in Sunnyvale, Calif. While there, he worked on an early project that explored the concept of virtual reality. His team also did research on computer graphics.

If anyone could follow up the masterstroke of the Macintosh, it's Nagel. His technical schooling is certainly unimpeachable, with undergraduate and graduate degrees in engineering from the University of California at Los Angeles.

Perhaps more importantly, he owns something few other leading scientists do: a Ph.D. in experimental psychology. Nagel knows not only how to build technically complex objects but also how people will approach and use these objects.

CW: What are your chief responsibilities at Apple?
DN: My job is to make sure that the capabilities of our machines are greater than ever, while making them even easier to use. If I'm doing my job right, the user won't even notice our work.

CW: What technologies are you working on to facilitate that?
DN: Mostly research into wireless communications. We've got a project in the works that will provide wireless networking at 10M to 20M bit/sec. data transfer. Soon we'll see the proliferation of mobile products about the size of [a small] tape recorder. The last thing you want is a cable stretching out the back to plug into the wall.

So wireless technology is very important.

CW: How far away is the widespread use of such technology?
DN: I think you will probably see commercial products in the next year or two. It would foster what we call "spontaneous networking." Several users would be able to walk into a room, turn on their PCs and start transferring all sorts of data immediately. Each PC would be able to send and receive the data, eliminating the need for a network administrator.

Another interesting thing about it is the distance we could transfer data: up to 150 feet. That includes going though doors and walls. And the signal wouldn't require much power. Typical operating power would be less than one watt, possibly as low as one-tenth of a watt.

In fact, Motorola and other companies are already beginning to deliver those kinds of products, but they generally are low data-rate products. We are very interested in very high-speed, multimegabits per second kinds of products.

CW: Why high speeds?
DN: One of the trends is multimedia — computing pictures and video and sound and so forth. Those represent a much richer type of information than simple text, which typically is for messaging and cellular data transmission.

So if you're going to be shipping pictures around from one system to another, you don't need 10K bit/sec. capability; you need million bit per second kinds of speeds. High speed is where a great deal of promise is.

CW: How has work in handwriting recognition been progressing?
DN: Well, there are problems. Systems that recognize printed characters work pretty well today. The challenge in handwriting is to recognize the sort of handwriting that you are doing, which often is a mixture of printed characters, cursive characters and things that aren't classifiable.

It's not until you get this more general capability that you will throw away your notebook and use one of our systems.

Interview by James Daly, senior West Coast correspondent.

Pallab K. Chatterjee
TI

When Pallab K. Chatterjee came to Texas Instruments, Inc. in Dallas, he had to bridge a language gap. The native of India spoke English well enough, but he had the wrong accent. "They told me I wouldn't make it — I talked funny."

They might have questioned his drawl, but no one ever questioned Chatterjee's ability to think. He brought to TI a bachelor's degree in electronics and communications engineering from India as well as a background in solid-state research and master's and doctorate degrees in electrical engineering from the University of Illinois. He went to Illinois for two reasons: The school guaranteed him a full scholarship, and he could study and work with John Bardeen, a revered scientist who had won the Nobel prize twice — for inventing the transistor and for his work on superconductivity.

The 42-year-old Chatterjee is now a respected name in his own right and has

Michael F. Deering
Sun

The third dimension grabbed Michael F. Deering back in high school, when a Scientific American *article on three-dimensional graphics rendering sparked his interest in computer graphics. He began cranking out programs to generate 3-D images with dial-up access to his high school district's IBM 370 mainframe.*

His first summer job was working on a Digital Equipment Corp. GT40 graphics computer at the Smith-Kettlewell Eye Research Institute in San Francisco. The $5.25-an-hour salary from his part-time programming work there helped pay his way to undergraduate and graduate degrees in computer science at the University of California at Berkeley.

A seven-year hitch in Schlumberger Ltd.'s Palo Alto Research facility in California preceded his arrival at Sun Microsystems Computer Corp. (SMCC) in 1988. Deering, 36, is currently senior staff engineer in Sun's virtual reality group.

CW: Has any of your work ended up as a commercial product?
MD: Yes, but only one was a major product: the GT version of the SPARCstation 2, which is our high-end graphics machine.

CW: What sort of work are you doing at Sun?
MD: Aside from the SPARCstation 2GT and SPARCstation 10GT, I've been working on more sophisticated graphics engines and next-generation graphics languages. I've always been interested in not just pure research but putting things out as products.

In our virtual reality research, we're doing a new system based on the SPARCstation 2GT, where we're using a high-resolution CRT screen and head-tracked LCD stereo shutter glasses to put together a Virtual Holographic Workstation prototype.

CW: What kind of uses do you see for virtual reality technology?
MD: Anything where human perception of space is needed, like auto design, molecular modeling, animation design, architectural design. For anything like that, virtual reality at the right price will sell.

Another area where virtual reality will be large is in entertainment, with

companies building theme parks. And virtual reality for training is becoming more attractive, like using flight simulation to train pilots.

CW: What are the business uses for virtual reality technology?
MD: Information visualization. There's already people spending a lot looking at how to use virtual reality to present information on markets in a more fluid form. One example I've seen shows dynamically how the stock market works, with pieces of paper representing stocks floating from above and landing on the floor. When those stocks are bought, the piece of paper gets yanked under the floor.

CW: How does Sun's philosophy about advanced research and development and its business enter into the work you do?
MD: A lot of what I do is flying several years ahead of real products, but that's not to say I don't make emergency customer visits when that's important or help out with trade show demos. With virtual reality in particular, those demos are a very good way to show what our hardware and software is capable of.

CW: Are there still technical hurdles to virtual reality?
MD: Yes. For years, we couldn't draw the images fast enough. That's going better now, but we want to improve it.

Another hurdle is tracking: As you move your head, the rest of the virtual reality universe takes a while to catch up to you. It's like the universe on Quaaludes.

But the biggest remaining hurdle is the display. CRTs are not the best way to represent virtual reality. People want a bigger field of view, so we need lightweight displays that can be worn on the head. This would look like a pair of sunglasses.

CW: What are the research directions for virtual reality at Sun?
MD: I can't comment on some of them, but I can say we've had requests from people who want to put a virtual reality system on the factory floor, so a nonexpert can pull up a hologram of what the part is supposed to look like.

CW: How does Sun's R&D group relate to the company's business?
MD: The way we are organized, we have Sun Laboratories, Inc. as a group chartered to support all the operating companies within Sun. They have a little longer term charter than some of the advanced development groups, but they're not the only ones chartered with research.

We also have research going on within the operating companies, which have somewhat shorter term charters. I'm actually working with a particular product group within SMCC.

All of this has to do with technology transfer. Sun is conscious of getting ideas to the market as real products.

Interview by Maryfran Johnson, senior editor, workstations.

become vice president of the corporate staff and director of TI's semiconductor process and design center.

CW: What is your role at TI today?
PC: Right now, my role is sort of a coach and cheerleader, and I do philosophy part of the time. I also play another part — you might call it investment banker: I figure out where to invest our money, in what research.

CW: What kind of research are you investing in today?
PC: I can't really talk about that.

CW: Well, hasn't TI said that it licensed the Cyrix Corp. microprocessor to start integrating more functions onto a chip?
PC: We are in a position to start going toward an entire system on one piece of silicon. The integration of microcontroller functions has a lot of possibilities, for example in the auto industry. The BMW 800 series has 68 processors inside it; we're in a position where the automobile is becoming a sophisticated distributed computing environment.

Almost everything is in a digital format. If you look at the design diagram for a computer and for, say, a stereo, there's not a lot of difference there. The underlying technology is blending.

So we see ourselves in the middle of this huge transition. Why think of it as computers equal workstations, and consumer electronics equal playstations? We feel the underlying technology is not going to be much different.

CW: Has any of your research appeared in actual products?
PC: A whole bunch of things I worked on have made it to market, such as specific [dynamic random-access memory], ASICs and so on. Of course, not everything has. As far as a research lab is concerned, if you get 100% of your projects to market, you're not being aggressive enough. If you're batting 70% or 80%, you're probably doing fine.

CW: What kind of projects are you working on now?
PC: Since 1986, we've been looking at the next generation of manufacturing technology. The biggest crisis facing the semiconductor industry is to address manufacturing costs.

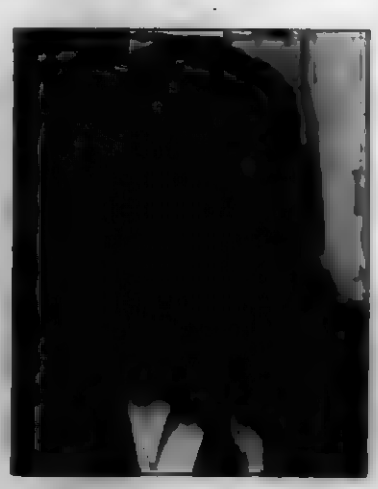
In 1984, we spent $100 million on a [chip fabrication plant], and management said, "We're not going to do that again." So they put us on a project to look at what the next generation of manufacturing was going to look like, and we came back and said, "You're right, you're not going to spend $100 million; you'll spend a lot more." And they almost fired the lot of us.

After they calmed down a bit, they said, "Alright, if you're worth your salt, go solve some of this process problem."

We've discovered that 75% of the cost of a fabrication plant is equipment, and there was no reuse of anything; there is very little modularity in the system. So the first thing we went after was modularity, and we've designed a flexible, object-oriented factory system that controls the scheduling process.

We're on schedule to demonstrate a factory working on that principle in January. Where the average factory runs on 35% to 40% utilization, we think we'll get 70% with this system.

Interview by Michael Fitzgerald, senior writer.



Phaedon Avouris
IBM

Phaedon Avouris was supposed to be a physicist but for "a silly mistake": He and a friend got lost on their way to a university physics entrance exam in his native Greece. "I had to settle for chemistry," says Avouris, who received an undergraduate degree in chemistry from the University of Thessaloniki in Greece. He also has a Ph.D. in physical chemistry from Michigan State University.

His mistake was a stroke of luck for IBM. Today, Avouris is manager of the Chemical Physics of Surfaces Group, a branch of materials research at IBM's Thomas J. Watson Research Laboratory in Yorktown Heights, N.Y. The Watson research facility, with more than 2,400 employees, is by far the largest of the five IBM research laboratories.

The soft-spoken 45-year-old received an internal IBM award several years back for inventing new ways of working with a special microscope to create atomic structures. These structures could someday be used to create extremely tiny electronic circuits that are 1,000 times smaller than today's comparable devices. This would allow faster and less expensive computers. The trick is learning how to work with devices that small; this is the area on which Avouris is concentrating.

CW: What kind of work are you doing now?
PA: We're using the scanning-tunneling microscope, which basically has a very sharp tip, to move atoms of silicon around. We can move and remove atoms with a high degree of precision. We're trying to understand how to do this movement — how to break the chemical bonds and the properties of the structures we make with the atoms once they are moved. It's essentially atomic-scale construction.

CW: What's the commercial impact of your work?
PA: IBM's primary interest is nanotechnology: building very small devices, including electronic circuits. These will not be scaled-down versions of the electronic devices of today. The principles will be different, so the devices will have to be as well.

Building any new technology takes time. Once you start building things that small, the properties of materials change dramatically. We have to figure out ways of handling nanodevices and to understand the laws of physics that apply. We're starting to understand these things, to make new structures and study them and then make new devices. But it will take some time.

CW: Were you disappointed that you didn't pursue physics as your field of study?
PA: I don't regret it because it taught me a different mode of thinking. Chemists are a lot more intuitive. They have to be because what they study is very large. Physicists study simple systems, which they analyze qualitatively. In surface chemistry, we think in complex terms. So it prepared me for what I'm doing now. Degrees don't mean much anyway; what counts is what you do in the laboratory.

CW: What attracted you to surface science?
PA: It was a new phenomenon. I read a paper and realized that no one had really looked at how excited states interact with surfaces. It was a whole domain of science that was untouched. A colleague of mine had a tool to help facilitate this, so the two of us paired up and started to look at this. It is still an open field.

Interview by Johanna Ambrosio, senior editor, systems & software.

Drew Major
Novell

When talking about computer technology, Drew Major sounds like the Thoreau of Utah; he is a man focused on making his products "smaller, simpler and faster." As chief scientist at Novell, Inc., Major was part of the three-man team that originally developed the company's NetWare local-area network operating system. A graduate of Brigham Young University with a double major in mathematics and computer science, Major continues to oversee the design and implementation of NetWare.

CW: How did you come up with your original idea for NetWare?
DM: Kyle Powell, Dale Neibauer and I had been doing some consulting work while still in college and kept on after we graduated. In October 1981, a local company called Novell Data Systems hired us to come in and hack CPM so a hard disk could be shared by many users. Our deadline was Comdex — six weeks away!

[Disk sharing technology] was considered hot at the time. Other companies that were doing it were partitioning the hard disk into a number of assigned floppies. We figured that was the easy way to do it, but it was the wrong way.

We thought coming at the problem at a higher level, specifically file sharing rather than disk sharing, would be faster and more efficient.

That wasn't what Novell Data Systems wanted us to do, of course, so we worked on hard disk sharing for them and continued to work on file sharing on our own time.

Our basic concept was, instead of having lots of people time-sharing on one big machine, let's connect lots of little machines and turn them into a system. As soon as we saw the IBM PC, we knew they were the machines we should be linking up.

CW: What are you currently developing?
DM: I spend a lot of time thinking about where NetWare needs to go — specifically, the fully distributed, object-oriented file system.

I'm always trying to make things smaller, simpler, faster — with every revision of NetWare, our core operating system usually gets smaller.

CW: How do you go about tackling tough problems?
DM: Most great solutions are simple and blindingly obvious. Look for the simple way first.

But tough problems like how to do the software for the server-mirroring that we have in our new System Fault Tolerant III product — we worried at that thing for a long time without getting anywhere.

So in 1986, Dale, Kyle and I decided to drive to Las Vegas rather than fly and see if we could talk the thing out during the eight-hour drive. And we did.

Suddenly, somebody said, "Hey, what if we...?" We worked it out on the drive, and the problems just fell away.

CW: How do you envision the networks of the future?
DM: First, we're going to have a global system based on logical, not physical attributes. The software will be much smarter than it is now; it will remember what servers you need, what applications you use, what data you access, then automatically go get the resources and bring them to you wherever you happen to be.

Next, I expect to see fully distributed processing across clients and servers — the "network as system" paradigm. To do that, we're going to need a lot of work done in heuristics, so the system can anticipate growth and change and be scalable. The network is just going to have to get a lot smarter.

Interview by Michele Dostert, West Coast correspondent.

These interviews with leading computer scientists kick off a new series appearing in the Advanced Technology section. Our reporters will on occasion talk with top researchers about their leading-edge work and what their discoveries mean for your business. Look for our Nov. 9 interview with Ravi Sethi, director of the Computing Science Research Center at AT&T Bell Laboratories.

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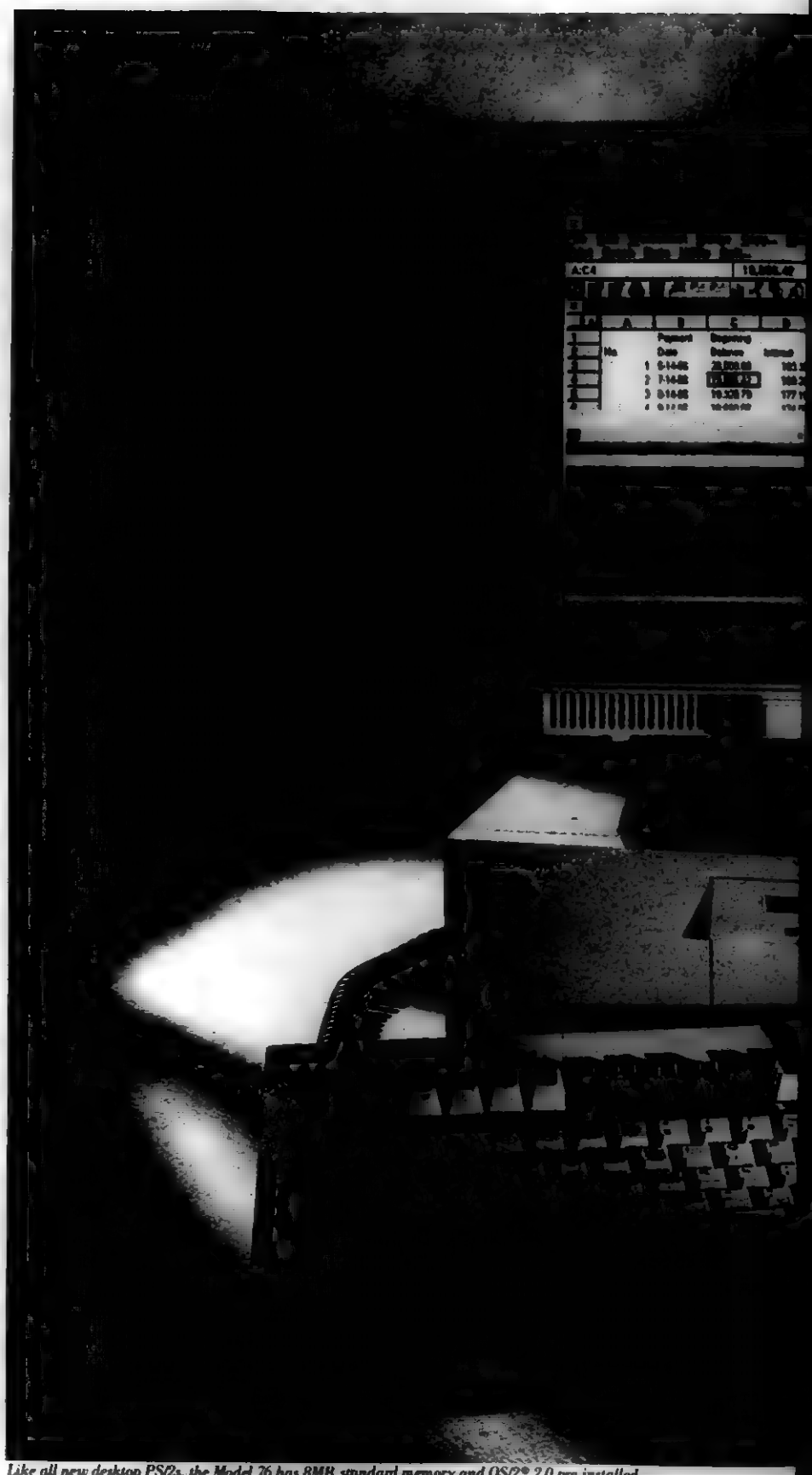

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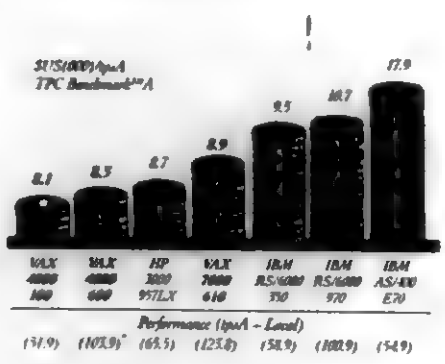

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Bella McGrail

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BY G. BERTON LATAMORE
and JOSEPH MAGLITTA

There are days when Darrell Ackmann, like thousands around the country, must wonder if a software license hasn't become a license to steal. "A general-ledger package may cost $300,000, and you could spend $3 million implementing it without blinking," says Ackmann, manager of contracts at Motorola, Inc. in Schaumburg, Ill. Increasingly, angry companies are rallying to force a tier-drop that will lower the heartbreaking cost of buying, installing and maintaining software, especially for larger systems and local-area networks.

Although hardware prices have nose-dived in recent years, software costs have risen rapidly. In fact, runaway software spending now represents *the* major budgetary headache for many information systems organizations, most of which are under knuckle-whitening scrutiny from chief executive officers eager to see payoffs from huge technology investments.

Add maintenance fees and "nuisance" charges such as transfer fees (often levied when software is moved from one system to another), and the pain worsens. While suffering and frustration are widespread, IS managers are starting to fight back in the $38 billion software industry:

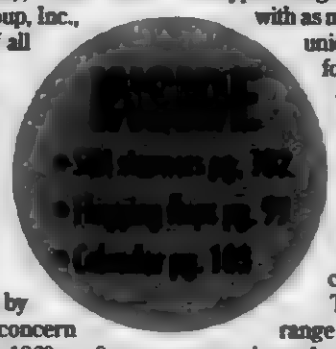
•Earlier this month, the Society for Information Management (SIM) announced it was making software pricing reform a top priority (see story page 102). In a recent survey, nearly 100% of SIM's membership polled said battling high software costs was crucial.

•Another coalition of 80 large corporate computer users has been meeting two or three times a year to discuss software issues. The SoftWare Asset Management Interest group (SWAMI), which comprises large clients of Gartner Group, Inc., claims to represent 10% to 15% of all U.S. software dollars spent.

•Two weeks ago, a Texas-based organization of leading IS executives lauded Digital Equipment Corp.'s new software-licensing policies. The Profit-Oriented Systems Planning Program gave DEC the first "vendor honor roll" award in its 25-year history.

These groups, as well as efforts by individual companies, reflect the concern and anger many feel over having 1960s software pricing policies drag into the 1990s.

"Too often, tiered pricing has little relationship to the real value of the software to the user," Ackmann complains. "For instance, we are down to two or three users on one VM application. When we upgraded the system it was running on, the vendor wanted more money. But our use of that application had not changed."



Old approach, new problems

How did software become such a dollar-munching monster? Experts say several reasons underlie the problem.

For starters, each software vendor has its own tier definitions and schedule of charges. Because the typical large information systems group works with as many as 100 suppliers — each with a unique tier schedule — it is impossible for users to track and predict many of the charges. Thus, many data centers are often surprised by unexpected tier-upgrade fees.

Years of neglect when software was inexpensive and hardware was the focus of information technology management has complicated the situation in many shops.

The burgeoning growth of midrange servers and PCs, each with its own expensive software and unique asset-management challenges, has only worsened the problem.

Tiered pricing, never intended for a nonmainframe world, simply does not adequately cover client/server and other new computing models. The reason is simple: In these new approaches, comput-

Continued on page 100

Riding the software pricing skyrocket

CONTINUED FROM PAGE 99

ing loads and some applications may shift from one system to another across the enterprise network.

All these factors add up to a major nightmare for IS. In fact, the problem has become so severe that some organizations are postponing hardware upgrades simply because of the high cost of associated software charges.

But Len Charney, who runs the data center at ISM Information Systems Management, a $370 million outsourcing firm in Winnipeg, Manitoba, notes a more serious consequence.

"[Software] costs have become so high that they, rather than technology or business needs, are driving the information technology industry," he says. "There are good, useful technologies out there that will never be used because of costs."

Vendors seem to hear the rumblings. Computer Associates International, Inc. last April instituted new pricing policies, marking a clear shift away from the traditional tiered model. The idea seems to be catching on: In mid-October, Citicorp and CA announced a flat-fee, enterprisewide software pact that analysts say could reshape industry licensing policies [CW, Oct. 19]. Other vendors, notably DEC, also have been active in this area.

While reforms evolve, many IS managers are taking matters into their own hands. They are using a variety of tactics, from simple bargaining with vendors to complex software asset management programs, to cut costs.

"We recommend that users adopt a four-point, bare-bones plan to gain control of software costs during this time of chaos in pricing," says Bill McNee, a program director at Gartner Group who heads up the consultancy's software asset management business as well as SWAMI.

Following are brief accounts of successful approaches used by several companies to tackle the problem.

Software asset management

The practice of "software asset management" is emerging as a favored tactic. Basically, this involves doing a systematic, ongoing review of a corporation's entire software portfolio.

"Often software prices creep up over the years," says Dick Pasman, an administrator at The Upjohn Co.'s administrative computing center in Kalamazoo, Mich. "Without a thorough audit, those increases often go unnoticed until the user is paying much more than the software is worth to that user's operation."

Audits also can uncover redundant software, underused systems or different versions of the same software running on various systems throughout the enterprise.

Possible cost savings

Proponents say that moving all users to the latest version also lets IS consolidate operations, eliminating redundant software while improving service.

The approach seems to work. Upjohn, to name one, says it will save about 10% of its data center budget this year through careful management of software assets, Pasman says.

"We put together a set of spreadsheets, using Lotus' 1-2-3 on a PC, that let us look at our entire mainframe software inventory at any given point in time," he explains. "When we checked our inventory over, we realized that we could consolidate our 300E and 3084QX onto a single 600E that is still a Group 40 system and eliminate a great deal of redundant software."

Today, Pasman estimates the company is saving "a minimum of $450,000" on IBM software and $150,000 on third-party products. "And," he adds proudly, "we bought the 600E used at a good price. The payback will take less than a year."

But the company isn't quitting there. Upjohn has spotted another potential saving in changing IMS monitors from one costing $40,000 a year to a new one priced at $13,600.

Similar cost-savings programs are yielding impressive results elsewhere.

Price caps at Petro-Canada

Petro-Canada in Calgary, Alberta, began its inventory efforts after realizing that maintenance prices were out of hand, says Joan Gallaway, a company specialist in software management.

"Invoices that grew by more than 10% annually sparked talks with vendors to discover why the costs were rising so quickly," he explains.

Then, Petro-Canada negotiated maintenance price caps for many legacy software products, as well as for new purchase agreements. The company also conducted a thorough software audit as part of a data center consolidation, which Gallaway says eliminated about 15% of its inventory over a period of 18 months.

Centralize purchasing

Another winning tactic, according to IS managers and consultants, is to consolidate all of an organization's software dealings into a single team.

"Centralize negotiations of all terms and conditions with software vendors," says Randy Prickett, vice president at Systemantics Information Services, Inc. in Little Rock, Ark., a large outsourcing company.

"Pick a standard product and stick with it across data centers. That lets you standardize training, terms and conditions and gets you volume discounts from vendors."

Savvy IS managers note that software vendors are more likely to offer incentives if they know the team making the initial deal is likely to buy more products for the whole corporation over time.

"We have reaped incredible dividends by putting things like transferability, which lets us transfer software to a new site during data center consolidations, and multiple-client clauses in our contracts," Prickett says.

Physical condition a key

Experienced hands add that it's an excellent idea to keep good physical software contract files. Once old contracts are lost, they warn, IS is vulnerable to vendors who might try to reinterpret or change contracts — particularly after the original supplier has been bought out by another firm.

"Just having someone on your staff who pays attention to software management issues is half the battle," Prickett concludes. "Once your company decides to enforce centralized software, you are 80% there."

Tracking software — hard enough on the mainframe — is regarded by many shops as impossible in the huge population of desktop systems.

Yet Mike Starke, the manager responsible for PC software at US West Communications in Bellevue, Wash., has devised a method to make the assignment a bit more manageable.

"We work off an approved list of vendors and products endorsed by our advanced technology people," he explains. "Since we record everything that we purchase in a database, we know what we have."

Not every product is tracked, but those that are get handled by a vendor contracted for the chore. "We have the best of both worlds," he says. "The distributor and software publisher are satisfied that the application is being used according to the agreement. And we do not have to maintain a large staff just to keep track of it."

Denver-based US West has direct relationships with publishers of its standard software but buys through distributors, in part to get local support.

The firm also was one of the first buyers to negotiate a "master disk" arrangement, which lets distributors make copies of software for the company as the need arises. Documentation is supplied under a separate process. "We find that on average we need one set of documentation for every 20 licenses," Starke says.

The overall result, Starke says, is an orderly arrangement that is far preferable to maintaining a warehouse full of unopened boxes of software bought in anticipation of expected demand.

Get close to your vendor

Now that traditional pricing models are breaking down, experts say it is more important than ever to pick the right software vendor and work closely with it. The reason?

You might be able to have a bigger impact on future pricing policies than you imagine.

New technologies such as Network License Manager and other technical licensing software packages have begun to enter the market.

Thus, suppliers are looking for new ways to price software, giving IS a unique chance to work with them in creating new pricing models.

Making friends beneficial

Forging close relationships with strategic vendors can be rewarding in several ways, says Richard L. Johnson, financial analyst in the Software Asset Management Group at Phillips Petroleum Co. in Bartlesville, Okla.

Johnson created the software asset management function at Phillips seven years ago, making him one of the most experienced people in this area today.

"By partnering with strategic vendors, we can get a better sense of the direction of the technologies and pick those that match direction," he says.

Once such relationships are established, Johnson continues, contract time periods for all software from a vendor can be made "co-terminous," creating less administrative cost for both user and vendor.

"I can renew all our software from a particular vendor at one time," he explains. "It all comes on one invoice to one address and is processed once. The vendors seem to like that better because they have a central contact for all contractual questions. They pass some of their savings in administration back to us."

Bargaining

Finally, IS managers say not to underestimate what a little old-fashioned wrestling with vendors can accomplish.

At ISM, for example, Charney successfully bargained with software vendors during a recent systems expansion.

"We upgraded from our IBM ES/9000 Model 620 to the 720 when we moved a customer's computer operations off their systems onto ours," he explains. "The vendors were willing to listen to my argument that since the partition under which their software ran was no larger than the 620 and served the same population of users, we should not have to pay a tier upgrade charge."

The result? An estimated savings of $643,000.

But there's more. By talking another vendor out of charging both a transfer fee and two tier upgrades, and by prepaying maintenance fees on five products, ISM also staved off other fees totaling $93,000. Other miscellaneous deals, Charney says, brought total savings to nearly $800,000.

At Motorola, Ackmann adds that it's important to look beyond purchase costs when negotiating contracts.

"We try to look at the total cost of using something, not just the license fee," he says. "People try to get the price down and forget that they can probably get a lot of free help from the vendor in implementing the package — and get the savings in cost back twentyfold."

Latamore is a free-lance writer and laptop publisher based in Burlington, Vt. Magiitta is a senior editor, management.

Fare's fair

Software pricing schemes based on number of users and type of CPU were judged to be fairest by 1,245 worldwide sites

	Fairest	Neutral	Least fair		Fairest	Neutral	Least fair
Based on users	34%	51%	15%	Based on operating system	21%	56%	23%
Based on CPU	31%	43%	26%	Single-level	20%	21%	59%
Usage metering	25%	61%	14%	Based on tiered pricing	11%	73%	16%

Source: Xephon

CW Chart: Michael Siggins

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Top IS execs: The price ain't right

BY NELL MARGOLIS
CW STAFF

Urged by the lion's share of its information systems leader membership, the Society for Information Management (SIM) is poised to take a public position on the issue of software pricing. The Chicago-based professional organization plans to bring IS managers and software vendors together on — and hopefully beyond — the incendiary issue in a major position paper, according to SIM publicity chairman Alan Singer.

The formal paper is the first in a series that the 2,500-member group is contemplating in its quest for clout as the collective voice of U.S.-based IS heads. It is planned for release in April, said Singer, senior vice president and worldwide director of information technology at Burson Marsteller.

Last month, SIM formally solicited input from some 100 software vendors, including market leaders such as Legent Corp., Dun & Bradstreet Software, Microsoft Corp. and Computer Associates International, Inc., according to Singer.

That call came in the wake of results of a SIM membership survey in which 94% of the approximately 800 respondents targeted software pricing as an issue for which they want their representative organization to go to bat.

Software licensing for local-area networks was ranked as the highest concern, followed by client/servers and mainframes, as well as midrange computers.

"Darned right it's on my mind — just about every day," one industrial IS member who requested anonymity said at SIM's annual conference last week.

Recession-tightened budgetary constraints and rapidly changing computing paradigms, he said, have joined to make traditional tiered pricing unpalatable to many user companies, his own included.

"But what really brought it home to me," he said, "is all the mergers and acquisitions in the software industry. Realistically, we're left with very few places to turn."

Believe it when I see it

Signs that controversial software giant CA is backing away from reputedly rigid tiered pricing and could even emerge as a role model of customer-tailored license pricing arrangements offered the IS director scant comfort.

"We are a big CA shop, and we have yet to see that flexibility," he said. "We'll believe it if we hear it in our next negotiations with them."

In the meantime, he applauded SIM's move to enter the fray, which he said he voted for in the survey.

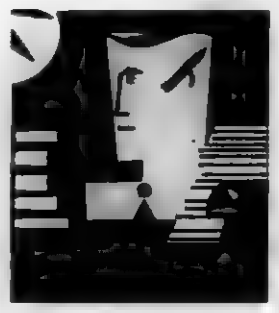
Respondents tagged three issues as musts for the position paper to address: tying cost to type of use, controlling increasing maintenance costs and providing the flexibility to move licensed software to a different platform.

The latter has proved a particular bone of contention in outsourcing situations.

Bill Zeitz, SIM software licensing task force co-chairman, said that wish list will be heeded — and with both sides engaged in the debate.

"Developing fair and equitable software licensing methodology is a critical cost factor to many corporations," said Zeitz, who is also director of the IS agricultural group at Wayne, N.J.-based American Cyanamid Co.

"Establishing a good working relationship with vendors is key to success on both sides."



➤The SoftWare Asset Management Interest Group. Contact via Gartner Group, Inc. (203) 964-0096.

➤Open Users Recommended Solutions. A coalition of vendors and users. Contact Lee Bickmann (203) 325-4528.

➤Society for Information Management. International group of high-level IS officials. Contact Dave Laurenzo (312) 644-6610.

➤The Profit-Oriented Systems Planning Program. A worldwide organization of information technology executives. Contact Ellen Snoyer (214) 965-1846.

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Feds debate handling of failing IS projects

WASHINGTON, D.C. —When an information systems development project starts to veer off track and is headed for disaster, should management try to steer it back on track or slam on the brakes?

That is the classic management question being debated in the nation's capital after the U.S. General Accounting Office (GAO) criticized a federal agency for failing to hit the brakes. The target was the U.S. Department of Health and Human Services (HHS), which provides oversight and 90% of the funding for the development of child-support enforcement systems in the 50 states [CW, Dec. 2, 1991]. In a recent audit, GAO investigators complained that the development of three "severely flawed" state systems continued for a period ranging from three to eight years, at a total cost of more than $32 million in federal funds, before the projects were stopped and redirected.

Rather than ordering the states to stop and take corrective action when the problems were first identified, HHS officials informed the states of the deficiencies and then continued to fund the systems based on the states' assurances that the problems would be addressed, the GAO report said. The GAO auditors suggested that funding of the three problem-plagued systems should have been suspended until they were fixed. Eventually, the systems had to be scrapped, and the states started over.

However, HHS officials firmly disagreed with the GAO's conclusion. Jo Anne B. Barnhart , assistant HHS secretary for children and families, said HHS prefers a "more constructive" and cooperative approach that emphasizes technical assistance to help states fix their problems. In a few cases, HHS has "judiciously" used its authority to suspend state projects, she said.

Rather than merely accepting state assurances of better days to come, the GAO argued, federal officials must act more decisively. The question remains, however, of how to decide whether an IS project needs a trip to the repair garage or a trip to the junkyard.

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NOV. 15-21

Guide's 1992 Conference. Atlanta, Nov. 15-20 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

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Troubleshooting, Maintaining, Upgrading PCs Seminar. Fort Lauderdale, Fla., Nov. 16-17 — Contact: Quest, Spotswood, N.J. (908) 251-3217.

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.

19th Annual Computer Security Conference and Exhibition. Chicago, Nov. 16-18 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2200.

C++ World Users Conference. Secaucus, N.J., Nov. 16-20 — Contact: C++ World, New York, N.Y. (212) 274-0135.

Comdex/Fall '92. Las Vegas, Nov. 16-20 — Contact: Comdex/Fall, The Interface Group, Needham, Mass. (617) 449-6600.

ISDN/Broadband '92. Reston, Va., Nov. 16-20 — Contact: Information Gatekeepers, Inc., Boston, Mass. (617) 232-3111.

Transaction Processing Networks Conference. Washington, D.C., Nov. 17-18 — Contact: Telecommunications Reports, Conference Department, Washington, D.C. (202) 842-0520.

The International Computer Training Association. Orlando, Fla., Nov. 17-19 — Contact: International Computer Training Association, New York, N.Y. (212) 355-6048.

Comdex/Fall '92. Orlando, Fla., Nov. 19-20 — Contact: Comdex/Fall, Chicago, Illinois (312) 932-3500.

NOV. 22-28

Openforum '92. Utrecht, The Netherlands, Nov. 23-27 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

NOV. 29-DEC. 5

Technical Marketing 2000: Opportunities and Strategies for a Changing World. Washington, D.C., Nov. 30-Dec. 1 — Contact: Technical Marketing Society of America, Torrance, Calif. (310) 534-3922.

European Conference on Hypertext '92. Milan, Italy, Nov. 30-Dec. 4 — Contact: Association for Computing Machinery, New York, N.Y., (212) 869-7440.

Comm '92. Dallas, Dec. 1-4 — Contact: Comm, Boulder, Colo. (303) 449-4430.

The Open O/S Conference. San Francisco, Dec. 2-3 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

EO/IR Sensors Seminar. Orlando, Dec. 3-4 — Contact: Advanced Technology International, Dept. EO/IR, Washington, D.C. (202) 223-8848.

Corporate Information Management Conference (CIM). San Diego, Dec. 3 — Contact: Susan Miguel, IMS, Tiverton, R.I. (401) 683-5760.

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14th ACM Symposium on Operating Systems Principles. Asheville, N.C., Dec. 5-8 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Comm '92. Dallas, Dec. 1-4 — Contact: Comm, Boulder, Colo. (303) 449-4430.

Improving Employee Performance Using Technology. New York, Dec. 2-4 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

The Migration to Client/Server Computing. Dallas, Dec. 3 — Contact: Informart, Dallas, Texas (214) 746-3500.

DEC. 6-DEC. 12

Software Support '92. Monterey, Calif., Dec. 6-9 — Contact: United Publications, Inc., Yarmouth, Maine (207) 846-0600.

Supporting and Troubleshooting Windows 3.1 Seminar. Seattle, Dec. 7-8 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Wireless Data Expo '92 Exposition and Conference. Boston, Dec. 7-9 —Contact: Communications Events, Norwalk, Conn. (203) 847-5131.

Computer Measurement Group (CMG) '92. Reno, Nev., Dec. 7-11 — Contact: CMG '92, Department 77-5165, Chicago, Ill. (312) 527-6652.

Image World Atlanta. Atlanta, Dec. 7-11 — Contact: Benita Roumania, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

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Notes is integrated. Its competitors are patchworks.

Recently, Microsoft® Corporation announced its plans to enhance the Windows® operating system with Windows for Workgroups. We're glad to see another major software vendor follow our lead in serving workgroup needs. But in promoting their announcement, Microsoft presented Windows for Workgroups as an equal to Notes. The facts don't support this claim.

"More than any one technology, the value of Notes is in how it is all presented. Simply mail-enabling a bunch of applications will not equal Notes."[1]

Stuart Bloom, Vice President, Distributed Systems Solutions

Specifically, Microsoft claimed that Windows for Workgroups in combination with their database

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g, Lotus Notes has no peer.

query tool, Access, and their rudimentary development environment, Visual Basic, comprise a functional equivalent to Notes. There is no comparison. Lotus Notes is optimized to handle the vast amount of commonly unstructured information that's normally buried in business forms, proposals and procedures. And its unique "replicated object store" technology slashes the system overhead for sharing that information. Notes is substantially more ambitious than simple send/receive messaging. Microsoft simply has no equivalent.

Microsoft has touted Access, its database query product, as a peer to Notes' data query facilities. However, Microsoft suggests that Visual Basic be used as an adjunct. The fact is, Access with Windows for Workgroups and Visual Basic will provide only a fraction of Notes' workgroup capabilities, in a far more complex and less maintainable package.

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Want to succeed? Get out of IS for a while

Summit IS VP Gerry Long says you can't really understand applications until you have to use them

Want to know how to go far in information systems? Meet Gerry Long, vice president of Summit Information Systems, the IS subsidiary of Roadway Express, and a 1993 winner of a Society for Information Management Partners in Leadership award (for successful collaboration between a chief information officer and a chief executive officer). Long has some strong ideas about what IS professionals need to do to build successful careers and make a real difference in their companies. He recently spoke with Computerworld *assistant researcher Stefanie McCann about the future of careers in the computer industry.*

Q What kinds of IS people do companies need? What will their needs be?

A What we are looking for are bright folks who really have a focus on the customer. One type of person we don't need is someone who is focused on the technology and thinks of himself as strictly an IS professional.

Q You didn't even think you'd be in this field 10 years ago, did you? Hadn't you moved away from IS, after starting out there?

A Yes. Ten years ago, I thought my career was in manufacturing and my goal was to be a plant manager. I changed because the company I was with was downsizing manufacturing efforts. In 1983, they basically went through the company and took everyone that could spell computer without a K and put us on that project team. Within the next couple of years, I was running the systems organization.

Q So how did you get into IS to begin with?

A In 1963, everyone took computer aptitude tests, and if you looked like you were able to become a programmer, then you were sent to programming school. Pan Am, where I worked at the time, gave those tests to everyone.

Programming back then was a high-demand but very low-availability skill. People were trained, and you would generally stay with a company for a while and move on because you got your training. Then you went out and tried to leverage that into a bigger job.

I passed the aptitude test, so that's how I got into programming.

Those days don't exist anymore; it's a lot tougher for people getting out of school now.

Q You didn't like programming very much, though, did you?

A I found out very quickly that I wasn't very good at it. I did enjoy the business analysis part and the business management part.

Q What key skills do IS professionals need now? In the future?

A Basic business analysis and interpersonal skills are needed now — desperately. In the future, we need to enhance those basic skills with cross-functional understanding of business functions. If your background has been in IS and accounting functions, you are able to sit down with the transportation department and understand where logistics fit in and what kind of impact the accounting function may have on logistics — so you can start to see where the opportunity for improvement across the functions will be.

Q How did you go about gaining cross-functional perspective?

A I spent eight years as a materials manager. I was the user of computer systems, rather than a developer. That gave me a very different perspective on what role IS ought to be playing.

Q Where do you see the future of programmers?

A I think programmers will be around a lot longer than many people think. As long as I have been in this business, I've heard people talk about eliminating programming as a function. I don't see that happening. I think there is going to be a continual need for the human/machine interface, and that role will be filled by programmers. I do expect that they'll become less technically oriented and perhaps become more dispersed out in the business functions.

Gerry Long: *'Basic business analysis and interpersonal skills are needed now — desperately'*

Q What kind of advice could you offer to people wanting to climb the IS ladder?

A Learn the business — whichever function you have the most interest in other than information technology. You assume people in IS who have selected it already like the technology piece and are going to learn that part, but they need to select another part of the business and to learn to support it.

If they like the financial arena rather than just understanding what it takes to put together general-ledger programs or cash-management programs, they ought to understand the theories of cash flow, cash management, what the difference is between finance and accounting and where auditors are looking for data.

Q Doesn't developing an application teach you as much as you really need to know about the business function?

A Not really. Right after completing a new inventory control system, I was named manager of inventory control. That is a very sobering event for someone in systems; I had to run a system that I developed and designed. You find out where your weak spots are. It was an excellent learning experience.

Q What pitfalls would you say IS professionals should avoid?

A Avoid a narrow, bigoted adherence to a particular technology. Bigoted is a strong word, but you find people who are distributed systems bigots, or microcomputer bigots, whose minds are closed to all other possibilities. These people generally don't get too far.

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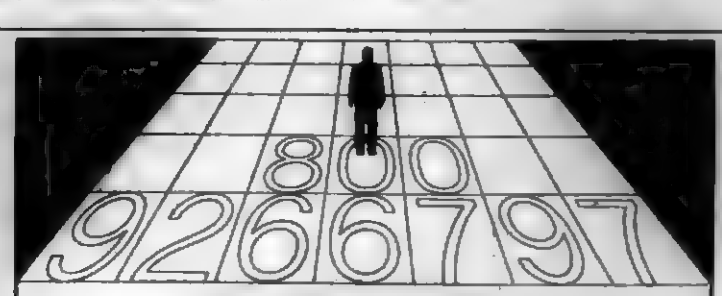

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INDUSTRY CURRENTS

Client/server, integration skills R_x for success in health care

BY EMILY LEINFUSS
SPECIAL TO CW

Some information systems professionals in the health-care field are having the plug pulled on their careers, but those with up-to-date skills are getting a healthy shot in the arm.

"There are the same number of jobs available, but companies are laying off people with old skill sets and hiring new ones," says Suzanne Fairlie, president of Pro-Search, Inc., an IS recruitment firm in the Philadelphia area.

IS managers say they want people who can take mainframes, PCs, image processing and voice response systems and integrate them into one system, Fairlie says.

Diversity is key

This push for integrating departmental islands calls for a diverse set of skills. Requirements range from the business analysis, liaison and data modeling abilities that Fairlie emphasizes to the PC local-area network and client/server know-how that John Cooper, director of data processing at Hillcrest Medical Center in Tulsa, Okla., says is essential.

J. Peter Thielen, manager of systems and programming at the University of Minnesota Hospitals, says he needs people with networking experience. "Health-care administrators are starting to understand the value of having a medical chart on-line so health-care practitioners, medical records people, billing people and private doctors' offices can simultaneously have access to it," he says.

Hospitals, health-maintenance organizations (HMO) and home-care providers are using technology to improve the loop between providers and insurers by developing systems that can simultaneously access on-line patient information. This improves patient care because it results in speedier access to more accurate information. It also enables claims to be processed faster and more efficiently.

Home-care providers offer the best IS opportunities in the health-care industry. Although they represent a much smaller market overall than HMOs and hospitals, these companies are expanding their systems development efforts and are actively seeking to fill IS positions.

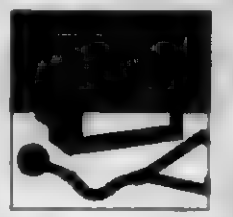
Until now, "home-care companies have not invested much in systems. As a result, we seem to be climbing the curve as our company starts to invest more heavily in systems development," says Jim McCloud, IS director at Homedco, Inc., a home-care provider in Fountain Valley, Calif.

Allan Crommett, director of MIS at home-care provider Care Enterprises, Inc. in Tustin, Calif., is also looking to fill IS slots.

But Crommett stresses the human side of the job. "All things being equal in technical skills, we will take someone with less experience but more enthusiasm for dealing with people," he says.

All the right skills

Fairlie recently placed three people in senior positions in health care. Their backgrounds illustrate the industry's needs. One had a very strong financial systems development background. Another had materials management savvy that could translate well to hospital materials management, and the third knew integrated systems.



The story is slightly different for HMOs than hospitals because hospitals had a head start in developing crucial systems. HMOs are trying to catch up and therefore have more development work to accomplish, says David Hamilton, director of applications at Harvard Community Health Plan in Boston.

"We are hiring programmer/analysts and project managers, and they are either in traditional mainframe Cobol arenas or in relational database areas," Hamilton says.

HMOs are also beginning to develop clinical information systems.

"As an industry, we have not done a lot in terms of clinical information systems, and there is not much offered by vendors. That makes a lot of opportunity, either with vendors of health-care systems or the HMO directly, to develop those systems," says Bill Reed, senior vice president of operations at Geisinger Systems Services in Danville, Pa.

A person with a health-care background will go far in this industry, even in systems development. Knowledge of health care is even more important than knowledge of new technologies, according to Reed.

He says it's easier to teach a nurse to be a systems analyst than to instruct systems analysts on everything they need to know about nursing.

However, Reed says, taking a course in hospital administration, any clinical specialty or attending industry-specific conferences can help IS professionals break into the health-care industry.

Leinfuss is a free-lance writer based in Sarasota, Fla.

The pulse of the industry

Best opportunities: While IS professionals agree that major metropolitan areas offer the majority of IS employment opportunities in health care, more than one says that if he lost his job, he would try Texas.

In fact, J. Peter Thielen, manager of systems and programming at the University of Minnesota Hospitals, earmarks Chicago, Pennsylvania and the South as hot spots for health-care jobs because colleagues in those areas say they are launching new IS projects.

Salaries: Mid-level programmer analysts, systems analysts and project managers with three to five years' experience can expect to earn somewhere between $35,000 and $48,000 at HMOs and home-care providers, depending on their skills and geographical location. Hospitals pay less, with a range from $20,000 to $40,000.

Hottest job titles: The hottest job title in health care is applications development programmer, says Richard Taylor, president of ExecSource, Inc., an IS placement firm in Arlington, Texas. Other hot jobs in health care are client/server manager, database manager and systems integrator.

Technical skills needed: Client/server skills are in great demand. So are DB2 and relational database skills and PC LAN experience. Also, people with any kind of clinical systems experience will go far.

EMILY LEINFUSS

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Guilford County seeks an Application Software Services Manager responsible for managing and supervising the application services division. Responsibilities include: consulting with user departments, assisting with strategic planning of information systems to support business functions; managing the downsizing of applications to smaller platforms; allocating resources; and monitoring quality and progress on various projects. Applicants must be highly service-oriented with demonstrated experience in performing and managing all phases of application systems implementation, including problem analysis, feasibility studies, alternatives analysis, project planning, application development, system testing, implementation, maintenance and quality assurance. Required: B.S. in Computer Science, Information Systems, or related field; 6 yrs of progressively responsible system design, development, and implementation experience; and 4 yrs proven experience in management of application software services. Excellent oral and written communication skills required. Must have considerable knowledge of COBOL, CICS, IMS/DLI, DB2, SQL, IBM utilities, MVS JCL, ISPF, project management tools, PC/LAN technology, CASE tools, and PC development software. Experience downsizing mainframe applications preferred. Salary negotiable. Drug testing is a condition of employment.

Guilford County offers an attractive, competitive compensation and benefits package. Please send your resume and salary history to confidence to: Guilford County Personnel Department, P.O. Box 3427, Greensboro, NC 27402. (919) 373-3324.

(919) 373-3324 EEO/AA Employer

DIRECTOR OF EDI

Alco Health Services Corporation, the nation's fourth largest pharmaceutical distribution company, is looking for a Director of EDI. Position will be responsible for interfacing with large customers, pharmaceutical manufacturers, and internal data centers in an effort to make Alco an industry leader in EDI. A minimum of three years experience in EDI and three years of overall computer system experience are required. Candidate must have an excellent knowledge of ANSI X.12 standards. Experience with Gentran software, IBM midrange computers, and personal computers is preferred. A degree is also preferred, but not required. The successful candidate will have strong communication skills, be a self starter, and will be willing to travel extensively. Pre-employment drug screen required. Please send resume with salary requirements to:

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Candidates meeting the above requirements, please send resume by Fax 011-966-1-464-1424. Attn: Mr. A. Morad.

SENIOR TECHNICAL TRAINING SPECIALIST

Behind every best-selling book and magazine that Reader's Digest publishes is a staff of expert professionals. To help support our continuing success, we have an immediate challenge for a Senior Training Specialist with the business and technical skills to provide first-rate in-house MIS training for all employees.

Working out of our Training & Development Department in Westchester County, you will develop, maintain, present, administer and evaluate classroom training and self-study materials. You'll identify training issues, conduct training needs analysis, implement solutions, source training vendors and analyze effectiveness of overall training. Position involves technical training to MIS organization and end-user training to business community. A BA/BS degree (Master's preferred) is required together with 3-5 years' previous training experience, proven presentation/platform skills and knowledge of business systems, hardware and software. Prior experience in technical MIS/mainframe training is required.

We offer a competitive salary, relocation assistance, plus an excellent benefits package. For confidential consideration, please submit a letter of application detailing previous experience, qualifications and salary history to: Human Resources, Dept. MW, Reader's Digest, Pleasantville, New York 10570. NO PHONE CALLS PLEASE. An Equal Opportunity Employer M/F/H/V.

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Software Engineer; 40 hrs./wk.; 8:30 am-5:30 pm; $37,050/yr. Job requires: Master's degree in Computer Science and 6 months experience as a Software Engineer or Computer Consultant (on-campus employment acceptable). Job also reqs.: 1) Exp. must include exp. implementing software using C language in a SUN UNIX operating system; 2) Exp. must include exp. in SUN UNIX system administration; 3) 2 grad. courses in software development; 4) 1 grad. crse. in artificial intelligence; 5) 1 grad. crse. in computer graphics; 6) 1 grad. crse. in computer networks; & 7) 1 grad. crse. in database. Special reqs. 1) & 2) may be met concurrently during the same 6-month period. Job duties: Analyze, design, & implement computer software for geographic information systems evaluating marketing decisions involving site location & network analysis. Design software involving concepts & methods of spatial-relational databases including creation, access, & manipulation operations with object-oriented extensions. Implement efficient statistical/optimization algorithms. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref. #71192. Employer Paid Ad.

SYSTEMS ANALYST (SENIOR CONSULTANT) For computer consulting firm with branch office in Dublin. With minimal supervision, will provide systems analysis services in project design, development and implementation of communications, financial management information, and commercial systems. Analyze business data and transactions, financial data, statistics, and/or accounting operations to design efficient user-friendly applications. Design, analyze, develop, test and implement data base systems and develop both hardware and software modifications. Duties entail work with C, COBOL, UNIX RDBMS, TCP/IP, Distributed Database Transaction Processing, Embedded SQL, UNIX Internals. Must have Master's or completion of all requirements in Computer Science or Engineering or Math. Experience required is six months in job described or six months in research assisting or teaching assisting or programming analysis involving the use of C, COBOL, UNIX RDBMS, TCP/IP, Distributed Database Transaction Processing, Embedded SQL, UNIX Internals. M-F; 40 hrs./week, 8:00-5:00; Salary $38,000/Year; Dublin, Ohio Location. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate (no calls) to L. Ellison, J.O. #1333227, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216. EOE

Programmer Analyst, 40 hrs/wk., 8:00am - 5:00pm, $48,295/year. Design, develop, implement, manage and test comprehensive business information and data communication systems. Development of distributed information systems. Analysis of user requirements. Performance monitoring for networks. Tools: C, Pascal, CASE tool, EDI, UNIX, DBMS, SYBASE SNMP management tools; CLIENT/SERVER development tools; simulation tools. M.S. in Computer Science or Electrical Engineering as well as one year experience as a Programmer Analyst or Consultant required. Previous experience must include: SNMP tools; development of performance monitoring tools for management of local and wide area networks; interfacing of network peripherals from different operating systems; development with Sybase. Graduate education must include one project on user needs analysis as well as one course on Queing Models for Computer Communication. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention: Maxine Counts, Reference #V-IL-6180-C. NO CALLS. An Employer Paid Ad.

System Analyst to consult on business system design and development, providing computer systems consulting services to our clients in order to ascertain specific system requirements; utilize programming language applications software and operating systems including DB2, IMS DB/DC, PARADOX, Assembler/BAL, PLI, Cobol, JCL and IBM utilities, and CICS in design, development and modification of systems on an IBM mainframe including employee database, payroll, personnel analysis, human resource activity report and system security; also utilize PARADOX on IBM-PC; prepare technical reports and memoranda as required. Master of Science degree in Computer Science required as well as 3 months experience in job offered or 3 months experience as Computer Science Lab Supervisor. Experience and/or academic program must have included DB2, IMS DB/DC, PARADOX, Assembler/BAL, PLI, Cobol, JCL and IBM utilities, CICS and both IBM mainframe and IBM PC for compatible hardware environments. Must have proof of legal authority to work permanently in the U.S. 40 hours, 7:40am to 4:10pm, $35,000/year. Send 2 copies of resume to Illinois Department of Employment Security, 401 S. State-3 South, Chicago, IL 60605. Attn: Maxine Counts, Ref. #V-IL-6183-C. No Calls. Employer Paid ad.

SENIOR SOFTWARE ENGINEER -40 hrs./wk., 8am-5pm, $47,000.00 per yr. To analyze, design and develop various software application systems on IBM 3090 and PS/2 utilizing CICS, DB2, ADW and WITT software, COBOL II, REXX, SAS languages and MVS/XA, OS/2 operating systems. Supervise analysts and programmers. Requires Bachelor's Degree in Computer Science, Engineering, Math, or Physics (will accept 2 years experience and 2 years of college in lieu of Bachelor's degree), 4 years experience in job offered or 4 years experience as Systems Consultant. Must have experience with IBM 3090, PS/2, DB2, CICS, ADW and COBOL II. "Employer paid ad". Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 74782.

PROGRAMMER ANALYST required. Full life-cycle development including analysis, design, coding, testing, implementation & maintenance of systems & database software using current versions of NATURAL & ADABAS as well as JCL, COBOL, CICS & VSAM with special emphasis on real-time, batch & report processing systems, database management systems & inventory tracking systems. Bachelors degree preferred, but no degree specifically required. Two years experience required in the job duties described above. Salary: $42,000/year for a 40-hour work week. Interested applicants send 2 copies of resume to Dennis Address in the Racine Job Service Office, 411 7th St., Racine, WI 53403. Ad paid by an equal employment opportunity employer.

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It's easy. All the information you need is right here. Just fill out the form and send it in. Or call Lisa McGrath at (800) 343-6474 (in MA, (508) 879-0700). (You can even fax the form to us at (508) 620-7739).

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COMPUTER SCIENTIST/ APPLICATIONS DEVELOPER

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The NBME is currently seeking a computer scientist/applications software developer. Position requires theoretical knowledge and actual experience in Finite State Machines, Turing Machines, State Translation applications, etc. Mathematical skills in algorithm development, implementation, and logical function analysis essential. Ph.D in appropriate Computer Science area with three years or more solid programming experience in C or C++ necessary.

Object oriented skills and experience desirable, along with relational data base skills (particularly Oracle and Oracle tools) also desirable. Experience in DEC VAX/VMS, UNIX and DOS environments benefited. Statistical background with SAS or SPSS also a plus.

Applications with curriculum vitae and salary requirements should be sent to the Personnel Department, National Board of Medical Examiners, 3930 Chestnut Street, Philadelphia, PA 19104.

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PROGRAMMER/SCIENTIFIC. Research, design, code, test, implement and maintain real time computer operating systems and peripheral for use in scientific research and other technical applications. Bachelor's degree in physics or chemistry required with at least 5 years experience in programming scientific application computer software. In depth knowledge of operating system development required as well as demonstrated skill in the use of "C" programming language. 40 Hrs./wk., $28,000/yr. Must have proof of legal authority to work in the United States. Send your resume to Job Service of Iowa, 150 Des Moines Street, Des Moines, Iowa 50309. Refer to Job Order #A1100153. This advertisement is paid for by the employer.

SYSTEMS ANALYST wanted. Duties: Analysis & design of retail & wholesale picking system for major perfume manufact. plant incl. coding on-line programs using XQBN, 4th gen. lang. (version 2.7) & coding, designing, implementing, testing, debugging & user training of batch programs using XQBN on Unisys A series mainframes. Need Bachelor's in Computer Sc, Eng, Bus Admin or Sys Anal and 2 yrs exp in job offered or as Sys Anal, Prog Anal, Software Eng or Consultant. RELATED EXP: design, code & implement on-line programs & using COBOL, XQBN, CMS II, COMS, & UNIX on Unisys A-series computers. Pay is $42,000/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #70782. Employer Paid Ad.

Director, Networking Services & Technical Support

Magee-Womens Hospital, a nationally acclaimed facility dedicated to the needs of women and infants, is seeking a Director of Networking Services & Technical Support. Reporting directly to the Chief Information Officer, the incumbent will be responsible for developing and managing tactical action plans for all computer resources necessary to satisfy the medical and business needs of the hospital. Functionally responsible for data center operations, networking services, telecommunications and resource utilization. Qualified candidates will have a B.S., a minimum of 10 years progressive experience in data processing. Management experience in data center and/or networking operations necessary.

Magee-Womens Hospital is a corporate affiliate of the University of Pittsburgh offering an advanced professional setting, opportunities for career growth, a competitive salary, flexible benefits, and on-site day care. For consideration, send or fax resume, cover letter and salary requirements by November 15th to: MWP, Office of Human Resources, Magee-Womens Hospital, 300 Halket Street, Pittsburgh, PA 15213-3180. FAX #412-641-1328 (EOE employer)

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Systems Engineer for Automotive Design Engineer and Computer Services company. Duties include design, program, implement and support application of software to company clients using the following tools: C, UNIX, MS-DOS, FORTRAN, R BASE, MS-WINDOWS, Software development kit, graphics, image processing, circuit analysis and design. Software and hardware maintenance and support. Trouble shooting computer consultation. Requires a Bachelor's degree in Electrical Engineering. Applicant must have at least one course each in: image processing, expert systems, and real time control and robotics. Requires two years experience in the job offered or as software engineer to include designing user-interface systems C, UNIX, Graphics, Image Processing, and FORTRAN. Hours are from 8:00 am to 5:00 pm, forty per week. Salary is $38,500 per year. Send resume to 7310 Woodward, Room 415, Detroit, Michigan 48202. Refer to #70782. Employer paid ad.

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Atlanta, GA 30361
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1-800-992-5360
Box 8074

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Manager of Application Programming

First Federal Savings Bank of Cleveland is seeking a results-oriented individual to serve as Manager of Application Programming in an IBM VM/SP environment using Systematics software. A 4-year degree in Computer Science or equivalent, training/experience is required. Knowledge of JCL, COBOL, and ASSEMBLER is essential. Minimum of 5 years experience with financial applications programming required. Previous supervisory experience strongly preferred. First Federal offers a competitive salary and benefit package. Qualified applicants please send resume to First Federal Savings, P.O. Box 627, Sioux City, IA 51102. E.O.E. M/F

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The proper candidate will have personal knowledge of the latest software engineering techniques and concepts. You should have a BSEE or BS in Computer Science or Engineering and a strong background in programming in C or C++ under DOS or Unix. Solid experience in developing Windows or Xwindows applications is necessary plus experience with communications drivers and protocol. A candidate with Windows Drivers, Protected Mode Assembler and hardware/firmware experience would be preferred.

Amano Cincinnati Inc. offers an environment that enables each person to fully participate, a competitive salary and extensive benefits package. If you are interested in this exciting career opportunity, please send your resume to: Stay Gratz, Vice President-General Affairs, Amano Cincinnati Inc., 1730 Gantral Avenue, Cincinnati, OH 45214. An equal opportunity employer, m/f/d/v.

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We do not want people who will not measure up now or over the long term. Our Technical Recruiter Team Leader must have strong marketing acumen, five or more years in exempt IS recruiting, will maintain and manage to goals and deadlines, and knows how to bring in the best employees who share our mission and philosophy. The successful candidate will be self-motivated, client focused and dedicated to organizational, professional and personal growth. We want the proactive leader who can make timely decisions and then take swift, effective action. *If this is you, then respond now, we cannot wait, for we are moving ahead into the future!*

CW-94730, Computerworld, Box 9171
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FIELD ENGINEER

University Microfilms International is the recognized leader in the development of systems to manage, preserve and disseminate multi-media information. We are currently seeking an innovative professional to act as the primary technical liaison for installation of our image database networking products.

This high profile position works closely with both our clients and our sales, R&D, product development and field support teams on the design, planning, and installation of systems. Qualified candidates will have a BSEE, BSCE, or related degree. Relevant experience may be considered in lieu of a degree. Emphasis on technical skills with demonstrated communication skills. An extensive background in multiple hardware/software platforms (PC, DEC, IBM, UNIX and telecommunication/networking experience) should be supported by 3 years experience in technical support/systems design and PC system design. Effective interpersonal/communication/customer-service skills and industry-proven problem solving abilities are essential. Field support experience is preferred. This position is travel intensive.

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Sr. Systems Analyst CA PRMS Financials

The Ensign-Bickford Company, a manufacturer of diversified high technology products, is seeking a Sr. Systems Analyst to support its financial module implementation for the CA PRMS software.

The individual selected will follow all phases of the Systems Development Life Cycle and act as an internal consultant to The Ensign-Bickford Company financial community to design solutions to its business needs. The position will supervise project team members and delegate assignments as well as lead those projects to completion.

The ideal candidate will have at least five (5) years experience with Financial Systems in a manufacturing arena on an AS/400 or S/38 and two (2) years CA PRMS financial application experience. The position also requires demonstrated project leader proficiency in the implementation of packaged software solutions to meet business needs and a strong customer service orientation.

Ensign-Bickford Industries, Inc. offers a very competitive salary and benefits package (including relocation). Interested applicants should submit a resume to:
Mark J. Donahue, Human Resources
Ensign-Bickford Industries, Inc.
10 Mill Pond Lane, P.O. Box 7
Simsbury, CT 06070.
EOE/H/V/F/M

Ensign-Bickford Industries, Inc.

SENIOR SOFTWARE ENGINEER - 40 hrs./wk., 8am-5pm, $45,000.00 per yr. To analyze, design and develop application systems to enhance COPICS manufacturing applications on the IBM 4381, utilizing CICS, COPICS, IMS (DL/I) and COBOL. Requires Master's Degree in Computer Science, Mechanical Engineering or Industrial Management, 3 years experience in job offered or 3 years experience as Analyst/Programmer, Assistant Engineer or Software Engineer. Must have experience with IBM mainframes, COPICS, CICS, IMS and DB2. "Employer paid ad". Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 74892.

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- Software Engineering
- Software Programming
- Technical Writer
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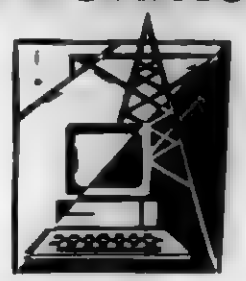

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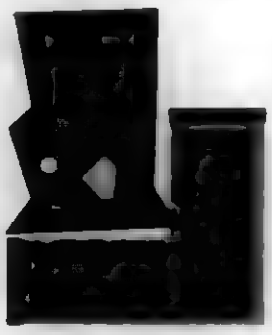

BY TODD HENSCHELL
SPECIAL TO CW

When purchasing PCs and related peripherals by mail, it pays to ask the right questions before placing the order. While there are hundreds of questions to ask, some basic ones are important in any purchase.

Q Does a system advertised at a low price have the functions to meet my business needs?

A Mail-order ads often list prices for a basic system, so it pays to ask about things such as memory capacities, disk space, types of video boards and monitor quality.

"We make sure that the price the vendor quotes is the price of the entire system," says Ben Chiu, president of Jensen Gema-Volstatic, a designer of turbochargers. "A mail-order vendor might charge $2,300 for a complete CAD system, but you can't successfully use the system without adding some things."

Q What happens if the system arrives broken or in otherwise poor condition?

A Every vendor has different return policies, and it's up to you to ask. Some will never return your money. Others will take their system back within a reasonable period and quickly refund the purchase price.

If a dealer chooses to fix the system rather than replace it, find out how long it will take. For a more realistic turnaround time, double the figure the dealer gives you.

When prodded, some vendors will ship a replacement unit before you ship back the broken one. If they send you one on time, consider yourself blessed.

The same goes for problems with missing components or incorrectly shipped items. The vendor should send out repair or replacement parts within 24 hours.

Whatever the terms are, have the vendor fax you a copy of the return and repair policy before you plunk down money.

Q What kind of product and technical support does the vendor offer?

A The better mail-order vendors have 24-hour, toll-free support. If it's a local firm, this may not be important, but if it's 2,000 miles and three time zones away, technical help during your work day is priceless.

Call the vendor prior to placing the order to find out how well-staffed its support lines are: Call once during normal business hours and again during nonpeak hours. Some firms cut corners by having fewer support technicians during off hours.

If you can't get through during a test call, chances are you'll be stuck later when you really need help.

Q What happens if I want to expand or upgrade my system with an add-in board?

A You may find your options limited if the system you purchase does not use generic parts.

This can be particularly troublesome with laptops. Some manufacturers use generic parts but alter them just enough so the standard parts won't work.

If your firm typically keeps systems for more than three years or upgrades them often, you may want to ask whether you can replace parts with standard equipment.

Q Does the vendor offer a hardware upgrade path?

A Some mail-order companies offer a built-in upgrade path; however, the proprietary components used by certain manufacturers are sometimes so costly that the upgrade option isn't worthwhile.

Other firms have priced their CPU modules and local bus boards very aggressively, making them attractive for a growing company. Look for systems with Intel Corp.-compliant local bus designs and reasonably priced CPU modules.

The disk subsystems, memory and monitor are the majority of the cost of a PC, so a fairly priced option to upgrade a 386 to a 486 or a P5 and beyond can save you money.

Generous manufacturers may even give you a discount for returning your old CPU modules or boards when you upgrade, if you ask for it.

Q Does the company make substitutions when it is short of stock?

A Certain product features may not match those in the advertisement. Changes are usually limited to minor features such as equipment cases, but important items such as the brand of tape drive, floppy drive or video board can also be swapped. For example, Cathryn Jaymes, owner of Jaymes & Company Management in Los Angeles, ordered PCs with a certain video board and "ended up with a much slower board instead."

A safe bet is to pin down the fine details before filling out the order form.

Henschell is a PC consultant and a free-lance writer based in Burbank, Calif.

Don't forget to. . .

- Put the purchase on a company credit card if you can. If you have a problem with maintenance or a missing part that isn't easily resolved, the credit card company can stop payment while it investigates the problem; it may even reimburse you.
- Ask for a brand-name item if you want it. Mail-order vendors may throw it in even when it is not normally part of its product line. Commonly swapped brand-name items include hard disks, video boards and floppy and tape drives.
- Find out how much the vendor charges for extra memory or a bigger hard disk. A common practice of little-known vendors is to sell stock systems with practically no memory and make it up on after-sale purchases.
- Ask whether the warranty will be void if you add anything to the system or open the case during installation.

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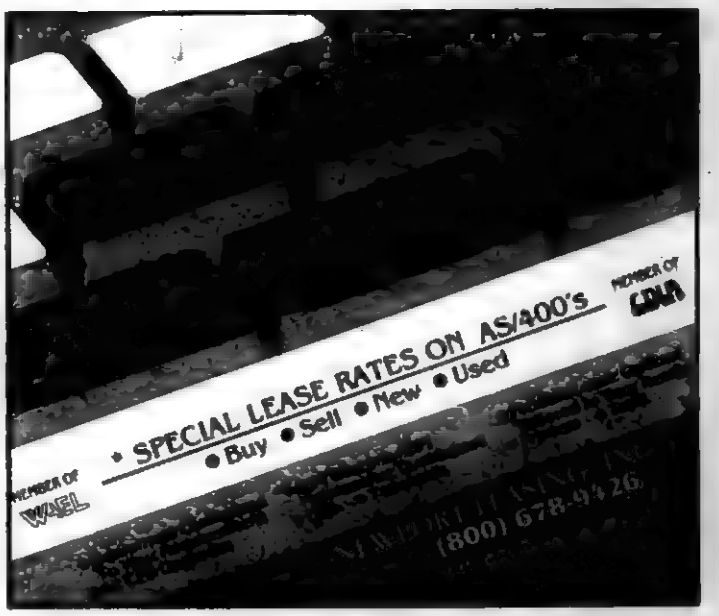

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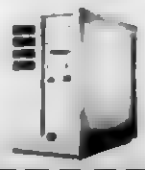

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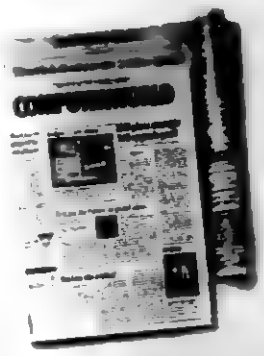

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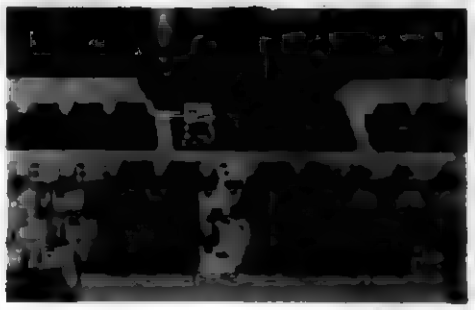

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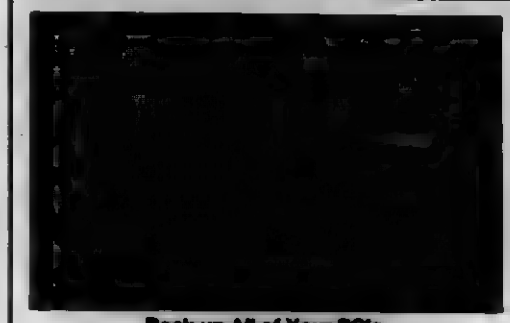

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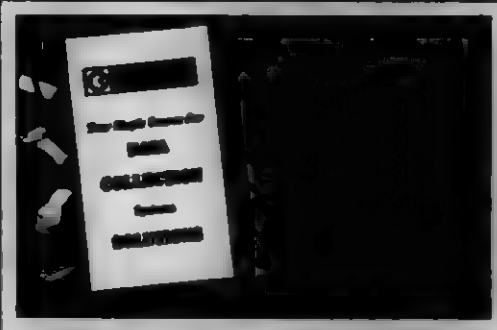

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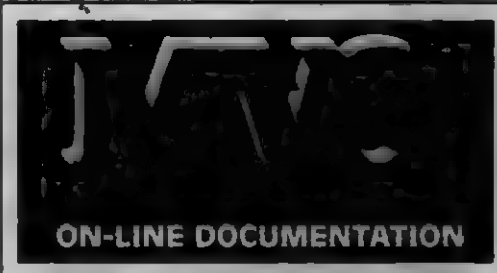

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ADVERTISERS INDEX

Andersen Consulting	66,72
Apple Computer	38-39
AT&T Business Communications Services	18-19
Avatar	91
Bachman	106
BMC Software	66
Borland	124
Cabletron Systems	61
CANAC Telecom	90
Cincom Systems	69
Cognos	101
Command Technology	37
Compaq Computer Corp.	46-47,
Computer Associates	3
Concurrent Computer Corp	54
CW Circulation	88-89
CW Classified	39,54,68,72,80,
CW Marketing	75
Digital Equipment Corp.	98
EDS	102-103
EMC Corp.	123
Planet	90
Fischer International	50
Hewlett-Packard	22-23,45
IBM	26-27,55,68,78-79,96-97
IDUG	40
Information Resources	15
Information Builders	17
Informix	13
Innovation Data Processing	7
International Data Group	82-83
J.D. Edwards	30-31
Legent Corp.	62-63
Lexmark	60
Lotus Development Corp.	36,42-43,58-59,104-105
Micro Focus	11
Micrografx	92
NCR	34-35
Network World	84
Oracle	6
Powersoft	81
Progress Software	74
Q-Star Technologies	21
Ross Systems	10
SAP America	29
SAS Institute	25,73
Software Engineering of America	9
Sun Microsystems	52-53,76-77
Sybase	71
WellFleet Communications	56
Workstation Group	70
XDB Systems	24

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Companies in this issue

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 64
3M 53

A

Action Technologies 87
Adobe Systems, Inc. 41
Advanced Logic Research, Inc. 6
Advanced Micro Devices, Inc. 54
Aeroequip Corp. 75
Altima Systems, Inc. 41
Amdahl Corp. 53
American Cyanamid Co. 102
American Express Co. 14
American Interface Computer, Inc. 80
American Medical Association 12
Amoco Production Co. 57
Ampersand Corp. 8
AMR Information Services, Inc. 6
Analog Devices, Inc. 39
Andersen Consulting 4
Apple Computer, Inc. ..... 6,12,28,37,41,64, ... 75,94,120,122
Arkwright Mutual Insurance Co. 75
Artisoft, Inc. 120
Arvin/Calspan Corp. 52
AST Research, Inc. 6,37
AT&T Bell Laboratories 93,95
AT&T Microelectronics 41
AT&T 1,6,15,57,67,93,122
Austin Computer Systems 37

B

Bachman Information Systems, Inc. 77
Backcare Corp. 122
Bank of America 121
Bank South Corp. 1
Bankers Trust Co. 8
Banyan Systems, Inc. 15,57,64
Barclays Bank PLC 37
Barclays Network Services 8
BASF Corp. 4
Basis Information Technologies, Inc. 20
Bear, Stearns & Co. 120
Beyond, Inc. 16
Bio Rad Laboratories 67,121
BIS Strategic Decisions 12
Blue Cross/Blue Shield of Minnesota 70
BlueLine Software, Inc. 72
Boeing Computer Services 14,15
Borland International, Inc. 4,16,87
BT 57
Budget Rent A Car Corp. 6
Bull HN Information Systems, Inc. 77
Burson Marsteller 102
Business Research Group 57,64

C

Cadre Technologies, Inc. 4
Care America Health Plans 90
Cayman Systems, Inc. 64
Chevron Corp. 1,8,14
Chips and Technologies, Inc. 41
Cisco Systems, Inc. 14,15,57
Citibank 93
Citicorp 99
Coca-Cola Foods 6
Comdisco, Inc. 122
Common 68
Compaq Computer Corp. 6,12,37,44
CompuServe, Inc. 57
Computech Systems 68
Computer Associates International, Inc. 4,68,99,102
Computer Intelligence/Infocorp 1,7,24
Computer Sciences Corp. 121
Computron 87
Concord EFS, Inc. 67
Concurrent Computer Corp. 24
Corning, Inc. 28
Crescendo Communications, Inc. 8
Cygnet Systems, Inc. 52
Cyrix Corp. 94

D

Data General Corp. 57,121
Data One 6
Dataproducts Corp. 41
Dataquest, Inc. 1,7,12,39,52,75
DaVinci Systems, Inc. 87
Deft, Inc. 75
Del Monte Foods 70
Delmarva Power & Light Co. 57,64
DHL Worldwide Express 15
Digital Equipment Corp. ..... 1,4,14,16,20, ... 24,37,41,52,54,64,75, ... 76,87,94,99,121
Digital Equipment Computer Users Society 1,20
Dr Pepper Co./Seven-Up Co. 6
Dryers Brand Ice Cream 121
Dupace Gmbh 52
Duff and Phelps, Inc. 120
Dun & Bradstreet Software 102

E

Eagle Technology, Inc. 54
Easel Corp. 77
Eastman Kodak Co. 1
Elections Canada 10
Electronic Arts Canada 16
Electronic Warfare Associates 24
EMC Corp. 72
Enron Gas Services Corp. 51
EO, Inc. 41
Ericsson GE Mobile Communications, Inc. 16
Escape Ergonomics 122

F

Federal Reserve Bank of Atlanta 60
FiberNet Research, Inc. 54
FileNet Corp. 85,87,90
First Financial Management Corp. 20
First Tennessee Bank 1
Fisher Systems Consulting 67,121
Florida Power Corp. 4
FTP Software, Inc. 57

G

Gain Technology, Inc. 75
Gateway 2000, Inc. 44
General American Life Insurance Co. 12
General Atlantic 6
General Mills, Inc. 67
General Motors Corp. 121
General Research Corp. 75
GF Consulting Services, Inc. 70
Gillette Co. 67
Glasnco Park, Inc. 8
Go Corp. 6,16
Goal Systems International, Inc. 121
Great West-Life Assurance Co. 15
Grid Systems Corp. 39

H

Hambrecht & Quist, Inc. 121
Hewlett-Packard Co. ..... 4,15,16,41,67, ... 68,70,72,80,87,121,122
Hibernia Bank 1
Hilton Hotels Corp. 6
Hogan Systems, Inc. 20

I

IA Corp. 53
IBM ..... 1,4,6,8,15,20,28,37,48,51,68, ... 70,72,87,95,122
Information Builders, Inc. 70
Informix Software, Inc. 4
Ingres Products Division 4
In-Stat 41
Integrated Systems, Inc. 80
Intel Corp. 41,44,48,93
Interactive Development Environments, Inc. 4
Intersolv, Inc. 4

J

J. P. Morgan & Co. 57
JDS Solutions 52
Jet Propulsion Laboratories 1,7
Joseph E. Seagrams & Sons, Inc. 8

K

Kmart Corp. 93
KVT Software, Inc. 80

L

LaserData, Inc. 54
Legent Corp. 12,102,121
Lehman Brothers 1,8
Lotus Development Corp. 1,6,8,14,15,16,86,87

M

MacSoft, Inc. 70
Marcam Corp. 4
Marriott Corp. 6
Mathworks, Inc. 52
Maxtor Corp. 57
McData Corp. 57
MCI Communications Corp. 1,15,16
Mentis Corp. 60
Mercury Interactive, Inc. 8
Merrill Lynch & Co. 1,8,20
Micro Data Base Systems, Inc. 72
Microelectronics 28
Microsoft Corp. ..... 1,6,8,14,15,16,39, ... 41,48,51,64,70,75,80,87,102,120
Mile High Information Systems, Inc. 1,20
Mips Technologies, Inc. 16
Monsanto Co. 1,14,15
Motorola, Inc. 24,64,94,99
Multiview Corp. 72

N

NASA Ames Research Center 94
NASDAQ Exchange 16
National Semiconductor Corp. 38
NCR Corp. 6,16,52,87,93
NEC Technologies, Inc. 6
NetPro Computing 64
Network Software Associates, Inc. 57
Network Systems Corp. 53
Next, Inc. 70
North American Philips 28
Northgate Computer Systems, Inc. 6
Novell, Inc. 1,4,8,15,51,54,57,64,95

O

Object Technology International, Inc. 4
Objectivity, Inc. 75
Olivetti Office USA 39
Online Computer Systems, Inc. 54
Open Software Foundation 1,48,49
Oracle Corp. 4,16,72,75

P

Pacific Gas & Electric Co. 51,90
PageMart, Inc. 39
Palmer and Associates, Inc. 24
Panaophic Systems, Inc. 4,68
PeerLogic, Inc. 12
PeopleSoft, Inc. 121
Pepsi 6
Performance Systems International, Inc. 16
Petro-Canada 99
Phillips Petroleum Co. 99
Pilot Software, Inc. 41
Piper Jaffray, Inc. 120
Pitman-Moore, Inc. 57
Plant-wide Research Group 4
Plexus Software, Inc. 85,87
Powersoft Corp. 75
Price Waterhouse 6
Programart Corp. 72
Proteon, Inc. 57
Prudential Securities, Inc. 120
Pure Software, Inc. 8
Pyramid Technology Corp. 7,68

Q

Quarterdeck Office Systems 48,49

R

RadioMail Corp. 16
Reach Software Corp. 87,90
Red Brick Systems, Inc. 16

S

Salomon Brothers, Inc. 120
Salt River Project 4
Saros Corp. 87
Schlumberger Ltd. 94
Science Applications International Corp. 121
Sesc, Inc. 80
Sequent Computer Systems, Inc. 16,68
Sequoia Systems, Inc. 67,80,122
Shearson Lehman Brothers, Inc. 8
SHL Systemhouse, Inc. 10,77
Siemens/Nixdorf Information Systems, Inc. 1
Sigma Designs, Inc. 41
Sigma Systems, Inc. 85,87
SimWare, Inc. 16
Smartstar Corp. 4,75
Smith-Kettlewell Eye Research Institute 94
Society for Information Management 99,102
SoftTech, Inc. 76
Software Etc. 16
Southern California Edison Power Co. 64
Southwestern Bell Technology Resources, Inc. 20
Sprint Corp. 1,15,16
Statistical Sciences, Inc. 80
Stratus Computer, Inc. 67
Sun Microsystems Computer Corp. 94
Sun Microsystems, Inc. ..... 1,48,49,51, ... 52,53,64,68,70,75,76
Sunrise Software Systems, Inc. 87
Sunsoft, Inc. 51
Sutter Bay Associates 28
Sybase, Inc. 75
Sybron Chemical 4
Synernetics, Inc. 64
Synon Corp. 6,68
System Software Associates, Inc. 4,68
Systematics Information Services, Inc. 99

T

Tandem Computers, Inc. 28,57,121
Tekmekron Corp. 8
Teradata Corp. 93
Teradyne, Inc. 14
Texas Commerce Bancshares 90
Texas Instruments, Inc. 39,75,94
Textron, Inc. 75
The Ask Cos. 24
The Brick Warehouse Corp. 4
The Burton Group 1
The Complete PC 39
The Corner Store 37
The Equity Group Investments, Inc. 68
The Santa Cruz Operation 68
The Upjohn Co. 99
Thomas Conrad, Corp. 51
Tivoli Systems, Inc. 7
Toshiba America Information Systems, Inc. 12
Toshiba Corp. 38
TransAlta Utilities Corp. 20
Tricord Systems, Inc. 51

U

Uniface Corp. 75
Unisys Corp. 16
University of California 93,94
Unix System Laboratories, Inc. 1
US West 28,99

V

Vadem 41
Verimation, Inc. 87
Vertical Systems, Inc. 57
Virginia Systems, Inc. 41
Visix Software, Inc. 12
VLSI Technology, Inc. 41

W

Wall Data, Inc. 77
Wal-Mart Stores, Inc. 93
Wang Laboratories, Inc. 70,87
Wells Fargo Bank 14,15
Westinghouse Electric Corp. 76
WHDH Television 51
WilTel 57
WordPerfect Corp. 16,51
Workflow Systems, Inc. 87

X

Xcelerated Systems, Inc. 53
XDB Systems 4

Y

Young & Rubicam, Inc. 14

Street talk

How will tomorrow's election affect computer industry stocks?

"Short term, the effect on computer stocks will be directly related to the effect on the overall stock market. Long term, certainly one of the candidates seems to be saying more positive things about technology than the others, but we'll see how that goes."
Laura Conigliaro
Prudential Securities, Inc.

"Most of the effect is in the anticipation. People say this or that will change if Clinton is elected, but based on past history, things don't change as fast as people anticipate."
Marty Restinger
Duff and Phelps, Inc.

Industry Almanac

STEAMROLLER

Analysts blitzed Wall Street with glowing reports following **Microsoft Corp.**'s (MSFT) excellent quarterly results announcement: Revenue went up 41% over the year-ago quarter, and earnings per share rose 40%. The Redmond, Wash., software giant's momentum should continue, though analysts mentioned several significant obstacles it faces in the courtroom and in the marketplace:

•Piper Jaffray, Inc. Vice President David Rothschild said he expects Microsoft's continued growth to be fueled by "business momentum" rather than by specific application releases. An Oct. 15 report awarded Microsoft a Buy rating.

Piper Jaffray expressed doubt that the Federal Trade Commission's investigation of Microsoft will find violations of antitrust laws. Microsoft's leadership on the **Apple Computer, Inc.** Macintosh platform indicates that Microsoft can dominate application sales on operating systems it did not create.

•Analyst Lucianne Painter at Salomon Brothers, Inc. also rated Microsoft as a Buy in a report issued Oct. 16. Salomon Brothers said it expects five key products to drive further revenue growth in the coming year: Windows for Workgroups, the forthcoming Access database system, FoxPro 2.5 for Windows, DOS 6.0 and Windows New Technology.

•A study by Bear, Stearns & Co. of 2,000 computer managers in the U.S. found 90% of the respondents using Windows in some fashion. Windows adoption is causing most of these firms to reevaluate their applications software, giving Microsoft another opportunity for sales. Analyst Louis Giglio gave the stock a Buy rating in an Oct. 16 report.

However, Microsoft's competitors are strongly positioned in some areas. Windows for Workgroups, announced last week, may find tough sledding against **Artisoft, Inc.**'s (ASFT) LANtastic peer-to-peer networking product. Giglio noted LANtastic's technological advantages, including lower resource requirements than Windows for Workgroups, and awarded Artisoft's stock a Buy rating as well.

DEREK SLATER

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 30, 1992

TOP PERCENT GAINERS	
Cray Computer	50.00
Sequoia Systems Inc.	42.86
Datatrm Corp	33.33
Spinnaker Software	33.33
Data Race Inc.	30.17
Boole & Babbage (H)	28.30
Sapiens USA Inc. (H)	27.27
Convex Computer	26.53

TOP PERCENT LOSERS	
Microage Inc.	-22.22
Gandalf Technologies Inc.	-17.26
Zeos International Ltd.	-15.38
System Software Assoc.	-14.29
Wordstar	-13.33
Cognitronics Corp. (H)	-12.50
Ariel Communication Corp.	-12.47
Evanex Systems Inc.	-12.47

TOP DOLLAR GAINERS	
Boole & Babbage (H)	5.63
Adobe Systems Inc.	5.13
Northern Telecom Ltd.	4.50
Data Race Inc.	4.38
Storage Technology	4.13
Apple Computer Inc.	3.75
Chipcom Corp.	3.75
Synoptics Communications	3.50

TOP DOLLAR LOSERS	
System Software Assoc.	-3.63
Xerox Corp.	-3.00
Matsushita Electronics	-2.63
IBM (L)	-2.13
Microage Inc.	-2.00
Cognitronics Corp. (H)	-1.75
Group I Software	-1.25
Sierra Semiconductor	-1.13

Exch	52-Week High	52-Week Low		Oct. 30 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 2.07%**			
OTC	21.00	9.63	3 COM Corp. (H)	21.00	2.38	12.75
NYS	70.63	58.25	American Info Techs Corp.	68.75	1.50	2.30
NYS	45.38	32.88	AT&T	43.63	0.63	1.45
OTC	4.25	0.75	Ariel Communication Corp.	1.31	-0.19	-12.47
OTC	22.00	18.25	Banyan Systems Inc.	20.13	0.63	3.21
NYS	49.75	40.25	Bell Atlantic Corp	47.63	1.50	3.25
NYS	55.50	43.38	Bellsouth Corp.	51.75	0.63	1.22
NYS	6.75	3.63	Bolt, Beranek & Newman	4.00	0.13	3.23
NYS	88.25	35.63	Cabletron Systems (H)	68.00	0.00	0.00
OTC	31.00	17.50	Chipcom Corp.	24.25	3.75	18.29
OTC	60.00	23.38	Cisco Systems Inc. (H)	60.00	1.50	2.56
OTC	35.25	5.50	Compression Labs Inc.	10.25	1.00	10.81
OTC	3.38	0.88	Data Switch Corp.	2.00	0.06	3.20
NYS	23.63	13.75	Digital Comm. Assoc.	16.75	1.50	9.84
OTC	15.25	7.75	Digital Systems Int'l Inc.	8.13	-0.50	-5.80
OTC	17.25	3.63	DSC Communications (H)	17.25	2.75	18.97
OTC	10.88	4.75	Fibronics Int'l Inc.	6.50	-0.75	-10.34
OTC	37.50	10.50	Fiserv Corp.	16.00	-0.88	-5.19
OTC	3.38	1.13	Gandalf Technologies Inc.	1.50	-0.31	-17.26
OTC	2.25	0.69	Gateway Communications	1.38	-0.19	-12.03
NYS	5.50	2.38	General Datacomm Inds.	4.00	0.13	3.23
ASE	5.88	0.50	Go Video	2.38	0.06	0.06
NYS	35.75	28.88	GTE Corp.	34.13	0.75	2.25
NYS	79.63	50.00	ITT Corp.	65.13	0.13	0.19
OTC	38.75	25.25	MCI Communications Corp.	38.38	0.13	0.34
OTC	14.50	2.25	Microcom Inc.	3.38	0.00	0.00
NYS	18.25	9.50	Network Equipment Tech.	11.38	-0.88	-7.14
OTC	25.50	8.00	Network General	14.38	-0.13	-0.86
OTC	20.00	8.50	Network Systems Corp.	13.63	0.63	4.81
OTC	24.25	5.63	Newbridge Networks Corp. (H)	23.13	-0.63	-2.63
NYS	49.25	30.50	Northern Telecom Ltd.	38.75	4.50	13.14
OTC	32.50	22.19	Novell Inc.	30.50	-0.50	-1.61
NYS	68.38	59.13	Nynex Corp.	63.88	1.63	1.96
OTC	37.50	14.50	Octel Communications Corp.	20.00	1.00	5.26
OTC	9.88	3.38	Penril Data Comm. Nwks.	4.25	0.38	9.68
OTC	53.00	10.25	Picturetel Corp.	20.63	1.38	7.14
OTC	16.75	7.00	Proteon Inc. (L)	8.25	0.50	6.45
NYS	30.09	13.88	Scientific Atlanta Inc. (H)	29.88	1.13	3.91
NYS	70.50	56.25	Southwestern Bell Corp.	66.75	1.13	1.71
NYS	26.38	20.75	Sprint Corp.	25.63	0.50	1.99
OTC	21.13	4.88	Standard Microsystems Corp (H)	19.38	0.25	1.31
OTC	61.00	14.50	Synoptics Communications	61.00	3.50	6.09
NYS	40.00	32.88	US West Inc.	37.25	0.50	1.36
OTC	52.63	24.00	Wellfleet Communications (H)	32.63	2.25	4.47
PC and Workstations			**Off 1.08%**			
OTC	13.50	3.50	Advanced Logic Research	4.00	-0.50	-11.11
OTC	70.00	41.50	Apple Computer Inc.	52.50	3.75	7.69
OTC	24.50	11.25	AST Research Inc.	18.25	-0.25	-1.35
NYS	19.25	6.75	Commodore Int'l	7.25	-0.13	-1.69
NYS	42.38	22.13	Compaq Computer Corp.	40.50	2.00	5.19
OTC	35.63	13.81	Dell Computer Corp. (H)	34.13	-0.50	-1.44
OTC	7.75	0.88	Evanex Systems Inc.	1.31	-0.19	-12.47
NYS	34.00	21.25	Harris Corp	33.88	0.13	0.37
NYS	65.00	44.63	Hewlett-Packard Co	58.88	1.75	3.17
NYS	29.75	14.13	Silicon Graphics	24.75	1.13	4.78
OTC	35.88	20.75	Sun Microsystems Inc.	35.25	3.25	10.16
NYS	31.25	22.25	Tandy Corp	28.50	-0.25	-0.93
NYS	11.13	5.50	Zenith Electronics	5.75	-0.13	-2.13
OTC	25.50	2.75	Zeos International Ltd.	4.13	-0.75	-15.38
Large Systems			**Up 7.26%**			
ASE	20.63	7.75	Amdahl Corp.	8.13	0.25	3.17
NYS	16.38	4.75	Convex Computer	7.75	1.63	26.53
OTC	17.88	1.88	Cray Computer	5.25	1.75	50.00
NYS	52.25	19.00	Cray Research Inc. (L)	21.25	0.88	4.29
NYS	18.13	7.13	Data General Corp	10.75	-1.13	-9.47
NYS	66.50	32.88	Digital Equipment Corp. (L)	33.75	-0.13	-0.37
NYS	101.38	65.00	IBM (L)	88.88	-2.13	-3.08
OTC	13.25	5.50	Kendall Square Research	7.75	0.00	0.00
NYS	119.25	88.25	Matsushita Electronics	91.00	-2.63	-2.80
OTC	17.50	6.00	Pyramid Technology	8.75	-0.25	-2.78
OTC	17.88	9.88	Sequent Computer Sys.	14.63	-1.00	-6.40
OTC	16.38	2.75	Sequoia Systems Inc.	5.00	1.50	42.86
NYS	54.25	28.50	Stratus Computer Inc.	32.63	-0.75	-2.25
NYS	15.13	9.50	Tandem Computers Inc.	13.13	2.00	17.99
NYS	11.75	3.63	Unisys Corp.	8.38	-0.13	-1.47
ASE	7.50	0.25	Wang Labs Inc. (b)	0.44	0.00	0.00
Software			**Up 4.78%**			
OTC	68.50	25.25	Adobe Systems Inc.	35.63	5.13	16.80
OTC	44.25	10.25	Aldus Corp.	16.00	1.50	10.34
OTC	19.75	7.00	American Software Inc.	8.25	0.13	1.54
OTC	20.00	9.75	Ask Computer Systems	18.13	-0.50	-3.01
OTC	53.00	23.25	Autodesk Inc.	50.75	-0.25	-0.49
OTC	37.75	3.75	Bachman Info. Systems	5.50	1.00	22.22
OTC	42.50	32.00	BGS Systems Inc.	38.50	1.00	2.67
OTC	78.00	37.25	BMC Software Inc.	60.00	1.63	2.78
OTC	25.50	11.88	Boole & Babbage (H)	25.50	5.63	28.30
OTC	66.75	25.25	Borland Int'l Inc.	34.25	2.25	7.03
OTC	11.00	3.63	CE Software	3.75	-0.25	-6.25
ASE	27.25	8.88	Cheyenne Software Inc. (H)	27.25	3.25	13.54
OTC	13.38	5.63	Cognos Inc.	5.88	0.13	2.17
NYS	18.13	8.63	Computer Associates (H)	17.50	0.00	0.00
NYS	12.38	4.75	Computervision Corp.	6.00	1.00	20.00
OTC	39.00	6.75	Cornerstone Inc.	10.25	-1.25	13.89
OTC	47.88	6.00	Essel Corp.	6.75	0.00	0.00
OTC	25.00	11.50	Group I Software	13.00	-1.25	-8.77
OTC	6.63	3.50	Hogan Systems Inc.	5.88	0.88	17.50
OTC	36.25	16.50	Information Resources	27.75	0.00	0.00
OTC	31.00	5.88	Informix Corp. (H)	28.75	1.38	5.02
OTC	22.38	11.50	Intergraph Corp.	13.00	0.00	0.00
OTC	15.00	7.00	Interleaf Inc.	11.63	-0.13	-1.06
OTC	20.25	16.25	Intersolv Inc.	14.88	-0.88	-5.56
OTC	21.38	9.50	Knowledgeware Inc.	13.25	1.25	10.42
OTC	48.25	28.75	Legent Corp.	44.50	1.38	3.19
OTC	38.75	14.75	Lotus Development	20.13	0.88	4.55
OTC	7.38	1.88	Mesa Software	2.75	0.00	0.00
OTC	22.25	6.25	Mentor Graphics	7.25	0.00	0.00
OTC	37.38	27.25	Micro Focus (H)	36.63	0.00	0.00
OTC	20.50	6.50	Micrografx Inc.	9.75	1.25	14.71
OTC	90.25	60.50	Microsoft Corp. (H)	88.75	0.13	0.14
OTC	23.38	12.00	Oracle Corp. (H)	22.25	-0.88	-3.78
OTC	53.25	18.63	Parametric Technology	51.00	1.50	3.03
OTC	11.00	3.50	Phoenix Technologies	4.00	-0.50	-11.11
OTC	25.25	11.25	Platinum Technology	19.25	1.00	5.48
OTC	55.50	23.00	Progress Software Corp. (H)	53.50	0.50	0.94
OTC	28.63	4.00	Quarterdeck Office Sys.	5.88	0.13	2.17
OTC	32.75	11.75	Rainbow Technologies Inc.	23.25	1.25	5.68
OTC	22.75	4.00	Rasterops	6.25	0.50	8.70
OTC	17.25	3.63	Ross Systems (L)	5.13	0.13	2.50
OTC	15.75	6.50	Sapiens USA Inc. (H)	15.75	3.38	27.27
OTC	26.25	6.75	Software Publishing Corp.	8.13	0.75	9.96
OTC	8.50	2.00	Software Toolworks Inc.	4.00	0.63	18.52
OTC	7.25	0.75	Spinnaker Software	1.50	0.38	33.33
OTC	16.50	3.25	State of the Art	5.75	-0.50	-8.00
NYS	25.25	13.75	Sterling Software Inc.	19.50	1.38	7.59
OTC	39.00	8.00	Struct. Dynamics Research	11.00	0.25	2.39
OTC	41.75	16.25	Sybase Inc.	41.75	1.88	4.70
OTC	61.00	6.88	Symantec Corp.	12.63	0.88	7.45
NYS	15.50	5.25	Systems Center Inc.	6.88	-0.13	-1.79
OTC	34.25	13.00	System Software Assoc.	21.75	-3.63	-14.29
OTC	13.25	2.50	Trinzic Corp.	3.88	0.25	6.90
OTC	23.75	14.50	Walker Interactive Systems	18.63	-0.38	-1.97
OTC	5.88	1.50	Wordstar	1.63	-0.25	-13.33
Semiconductors			**Up 2.57%**			
NYS	21.50	7.38	Advanced Micro Devices	16.50	2.13	14.78
NYS	12.00	7.13	Analog Devices Inc. (H)	12.00	0.50	4.35
OTC	13.75	6.75	Atmel Corp. (H)	13.50	0.75	5.88
OTC	14.13	3.25	Chips and Technologies	4.00	0.13	3.23
NYS	19.63	7.38	Cypress Semiconductor Corp	9.38	0.75	8.70
NYS	12.88	6.75	Dallas Semiconductor	12.00	-0.38	-3.03
OTC	68.13	39.75	Intel Corp. (H)	67.50	0.38	0.56
NYS	9.88	4.88	LSI Logic Corp.	8.00	1.00	14.29
NYS	22.38	12.13	Micron Technology	19.38	0.13	0.65
NYS	67.75	57.50	Motorola Inc. (H)	65.00	0.75	0.78
NYS	13.63	4.88	National Semiconductor (H)	12.25	-0.88	-6.67
OTC	27.00	8.25	Sierra Semiconductor	12.13	-1.13	-8.49
NYS	50.50	26.00	Texas Instruments (H)	48.13	0.38	0.77
OTC	10.50	6.00	VLSI Technology	7.50	0.25	3.45
OTC	7.00	2.13	Weitek	4.88	-0.25	-4.88
ASE	7.25	2.00	Western Digital Corp. (H)	5.88	0.38	5.77
OTC	31.00	14.50	Xilinx	18.75	1.25	7.14
OTC	33.50	15.00	Zilog Inc. (H)	30.50	0.25	0.83
Peripherals and Subsystems			**Up 5.30%**			
OTC	11.13	3.50	Archive Corp. (H)	10.63	0.13	1.19
OTC	26.75	13.75	Banctec Inc.	24.75	0.13	0.51
OTC	23.50	9.25	Cambex Corp.	14.75	2.75	22.92
ASE	14.50	5.88	Cognitronics Corp. (H)	12.25	-1.75	-12.50
NYS	23.88	12.50	Conner Peripherals	19.75	1.00	5.33
OTC	18.88	14.25	Data Race Inc.	18.88	4.38	30.17
ASE	19.88	4.75	Datatrm Corp.	8.00	2.00	33.33
NYS	24.00	8.38	EMC Corp. (H)	23.38	0.50	2.19
OTC	8.38	4.75	Emulex Corp.	6.25	0.00	0.00
OTC	23.00	13.25	Evans & Sutherland	17.25	1.50	9.52
OTC	40.63	12.00	Exabyte	15.13	-1.13	-6.92
OTC	34.00	15.75	Intelligent Info. Systems (H)	33.63	1.13	3.46
OTC	11.25	4.75	Iomega Corp.	7.50	1.25	20.00
OTC	34.75	10.25	IPL Systems Inc.	12.50	1.25	11.11
OTC	21.25	10.75	Komag Inc.	19.00	-0.25	-1.30
OTC	15.63	4.38	Maxtor Corp.	14.38	1.25	9.52
OTC	12.63	6.38	Micropolis Corp.	7.25	-0.88	-10.77
NYS	105.13	86.38	3M Co. (H)	102.88	-0.25	-0.24
OTC	8.75	3.50	Printronix Inc.	4.75	-0.25	-5.00
NYS	24.38	6.88	QMS Inc.	7.75	-0.38	-4.62
OTC	18.00	6.88	Quantum Corp.	13.00	-0.25	-1.89
OTC	12.75	3.75	Radius Inc.	6.00	0.75	14.29
NYS	12.88	8.00	Recognition Equipment	12.63	1.63	14.77
OTC	13.13	5.63	Reson Inc.	10.88	0.13	1.16
OTC	17.63	7.75	Seagate Technology	14.88	0.00	0.00
NYS	78.00	21.00	Storage Technology	29.63	4.13	16.18
NYS	23.38	16.00	Tektronix Inc.	21.13	0.00	0.00
NYS	82.25	60.25	Xerox Corp.	74.25	-3.00	-3.88
Services			**Up 1.45%**			
OTC	21.75	11.88	American Mgmt. Systems (H)	21.75	0.88	4.19
NYS	5.38	2.88	Analogic Inc.	3.75	0.25	7.14
OTC	21.25	12.50	Analysts Int'l	21.25	1.25	6.25
NYS	48.00	36.13	Auto Data Processing	48.38	0.88	1.84
NYS	16.38	7.08	Ceridian Corp. (H)	16.38	1.25	8.26
NYS	23.44	12.50	Comdisco Inc.	15.13	0.38	2.54
OTC	13.50	7.00	Computer Horizons (L)	7.50	0.25	3.45
NYS	84.88	57.00	Computer Sciences	69.75	3.25	4.89
NYS	10.13	7.00	Computer Task Group	7.75	-0.25	-3.13
OTC	40.50	15.00	CompUSA Inc.	39.25	-0.25	-0.63
OTC	19.25	6.00	Corporate Software	10.88	0.25	2.35
OTC	30.75	7.75	Egghead Discount Software	10.00	2.00	25.00
NYS	33.06	25.25	General Motors E (EDS)	29.00	0.38	1.31
OTC	30.38	6.25	Intelligent Electronics	10.75	-1.00	8.51
OTC	14.88	6.63	Marisel	10.13	1.13	12.80
OTC	15.75	7.00	Microage Inc.	7.00	-2.00	-22.22
OTC	35.75	17.88	Paychex (H)	34.00	-1.00	-2.86
NYS	77.25	58.00	Policy Management Sys. (H)	75.00	0.00	0.00
NYS	45.38	27.88	Reynolds and Reynolds (H)	45.38	1.25	2.83
OTC	32.00	22.00	SEI Corp.	27.25	-0.38	-1.36
OTC	24.38	16.88	Shared Medical Systems	21.63	-0.50	-2.26
OTC	30.00	18.00	Sungard Data Systems	29.00	0.25	0.87
NYS	3.69	1.13	Ultimate Corp.	1.25	-0.13	-9.09

KEY: (H) — New annual high (L) — New annual low

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IN BRIEF

EDI profits up 15%

■ Spurred by growth in its non-General Motors Corp. business, **Electronic Data Systems Corp.** last week posted third-quarter net income of $167.3 million, a 15% increase from the year-earlier period. Revenue at the Dallas company rose 19% to $2.06 billion in the quarter ended Sept. 30.

■ Reversing two consecutive losses, **Data General Corp.** reported a fiscal fourth-quarter profit of $2.7 million, compared with a $9.9 million loss for the same period last year. Revenue for the quarter, however, was off 2% from the fourth quarter of 1991 but up 11% from the previous period.

■ **Legent Corp.** posted fourth-quarter operating profits of $27.7 million, up 67% from the year-earlier period. A onetime charge of $34.5 million to cover the acquisition of **Goal Systems International, Inc.** turned the profit into a $7.6 million net loss, however. Revenue for the period grew 20% to $124.4 million in the period ended Sept. 30. For the full year, the Vienna, Va., company posted profits of $27.7 million on revenue of $426 million.

■ **Tandem Computers, Inc.** reported fiscal fourth-quarter profit jumped 89% to $27.2 million on revenue of $576.3 million — a 13% hike from the same period last year. The quarterly profit reduced the Cupertino, Calif., firm's fiscal 1992 loss to $41.2 million, compared with profits of $35.2 million last year. Tandem took a $106 million first-quarter pretax charge to cover restructuring costs.

■ Client/server applications upstart **PeopleSoft, Inc.** in Walnut Creek, Calif., filed for an initial public offering last week of 2.7 million shares, to be priced between $12 and $14 each. PeopleSoft booked $32 million in sales for fiscal 1992, up from $17 million last year.

Myriad challenges face new HP CEO

Platt must maintain minicomputer and workstation momentum while pumping up PC business

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — It seems fitting that the Hewlett-Packard Co. executive chosen to take over for 14-year Chief Executive Officer John Young spent his first official day in office en route to Amsterdam. Europe, after all, has been a recent trouble spot for HP, as the company has blamed the Continent in part for the uncharacteristic financial softening that has set in during the last couple of quarters.

But Lew Platt's challenges go well beyond getting HP's European house in order. The 52-year-old arrives as the company approaches a landmark juncture in a corporate history rooted in analytical products but branched predominantly in computers.

Lew Platt *must maintain a smooth management transition*

Platt's most fundamental challenge is to maintain a smooth management transition, a process begun in August. "I feel a lot more comfortable taking over the reins now than I would have three months ago," he said.

Platt takes over following a soft third quarter, during which earnings declined 1% to $191 million on revenue of $4 billion. HP recently instituted a voluntary severance program aimed at cutting 2,700 jobs.

But HP has outperformed its competitors through an industry retrenchment, a feat that has not gone unnoticed among rivals. "One of the problems of being one of the leaders is everyone goes after you," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Platt, who is HP's first CEO to come out of the company's computer operations sector, takes over a business that includes three success stories — minicomputers, workstations and printers — and two enigmas — PCs and New Wave.

To help keep a grip on the company's computer operations, Platt is believed to have played a key role in a reorganization that officially took hold yesterday and that eliminated a layer of management between the CEO's office and computer operations.

Platt must now figure out how to sell computers more effectively to a corporate world swept up in downsizing fever. HP has for a long time lived with a gap between high acceptance among eager information systems shops and less impressed corporate executives who sign on the dotted lines.

Rich Sevcik, vice president in charge of HP's minicomputer operations, noted that Platt, who headed HP's computer group, is different from Young, who came out of HP's test and measurement unit. Platt "is a lot more knowledgeable on the intricacies of the computer industry," Sevcik said.

Many users said Platt must improve HP's top-down selling approach. If HP is to successfully take on IBM in the data center, it is up against a formidable opponent — albeit one that is also in the throes of change.

"If they're going to sell directly against IBM, they have to do what IBM does," said Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass. "They have to develop high-level relationships and do top-down selling. Lew Platt has to take the chairman of Bank of America to lunch."

> "IF THERE'S ONE thing that Mr. Platt understands, it's CEO selling. He brings an aggressiveness and sharp suits."
>
> ROBERT HERWICK
> HAMBRECHT & QUIST

Herwick agreed and said he is optimistic that Platt will strengthen HP's sales savvy. "If there's one thing that Mr. Platt understands, it's CEO selling. He brings an aggressiveness and sharp suits."

By the same token, users pointed out that HP must also raise its profile.

Rodger Lindquist, manager of business systems development at Bio Rad Laboratories, Inc., a Hercules, Calif., maker of diagnostic equipment and reagents, recalled a time while he was IS manager at Dryers Brand Ice Cream when IBM nailed a sale to Dryers. After an initial round of contacts, Lindquist said, IBM "sent in this closer guy" with all the polish and persuasiveness it took to consummate the deal.

New direction

Platt steps in as HP embarks on a mainframe alternative initiative built around Corporate Business Systems, the company's new line of high-end minicomputers introduced in May. The company is marketing the line in two forms: its proprietary MPE operating system and its HP/UX Unix implementation.

As Platt oversees that program, he must continue to maintain a fine balance between promulgating the company's fast-growing Unix line and not alienating HP's traditional MPE customer base (see story page 67). Already, Platt has to cope with product delays. The new systems were to have shipped in the summer, but HP delayed delivery until this month. Platt must drive the company to have the systems ready soon, lest protracted delays hit HP's credibility or sway corporate purchasers to pick a more readily available brand.

At the same time, observers noted, Platt must set realistic goals for the data center assault. Platt said that in "most cases, we will co-exist with mainframes."

To help sell into the data center — and to help move total solution packages into large corporations — HP must also improve its service, integration and support offerings, observers said.

To that end, the company recently announced agreements with integrators Computer Sciences Corp. and Science Applications International Corp. as part of a client/server initiative that also includes dozens of software vendors (CW, Oct. 19). Sources said Platt was the impetus behind that move.

Meanwhile, users and analysts agreed that Platt must shift HP's PC business into high gear. Platt has already formulated a plan to improve PC sales. He has authorized the company's direct-sales force to offer PCs, marking a switch from the company's indirect-only approach.

The company's New Wave, likewise, has an unclear future as well as an unstable past. A product that HP originally introduced as an operating environment, New Wave is essentially positioned — or at least perceived — as a desktop utility.

"Unless they can find a way to make it an irresistible alternative to people, it's pretty much a dead issue," Fisher said.

HP closes on No. 2

With relatively little notice, HP, Silicon Valley's largest technology company, has grown close to becoming the second largest computer vendor in the U.S.

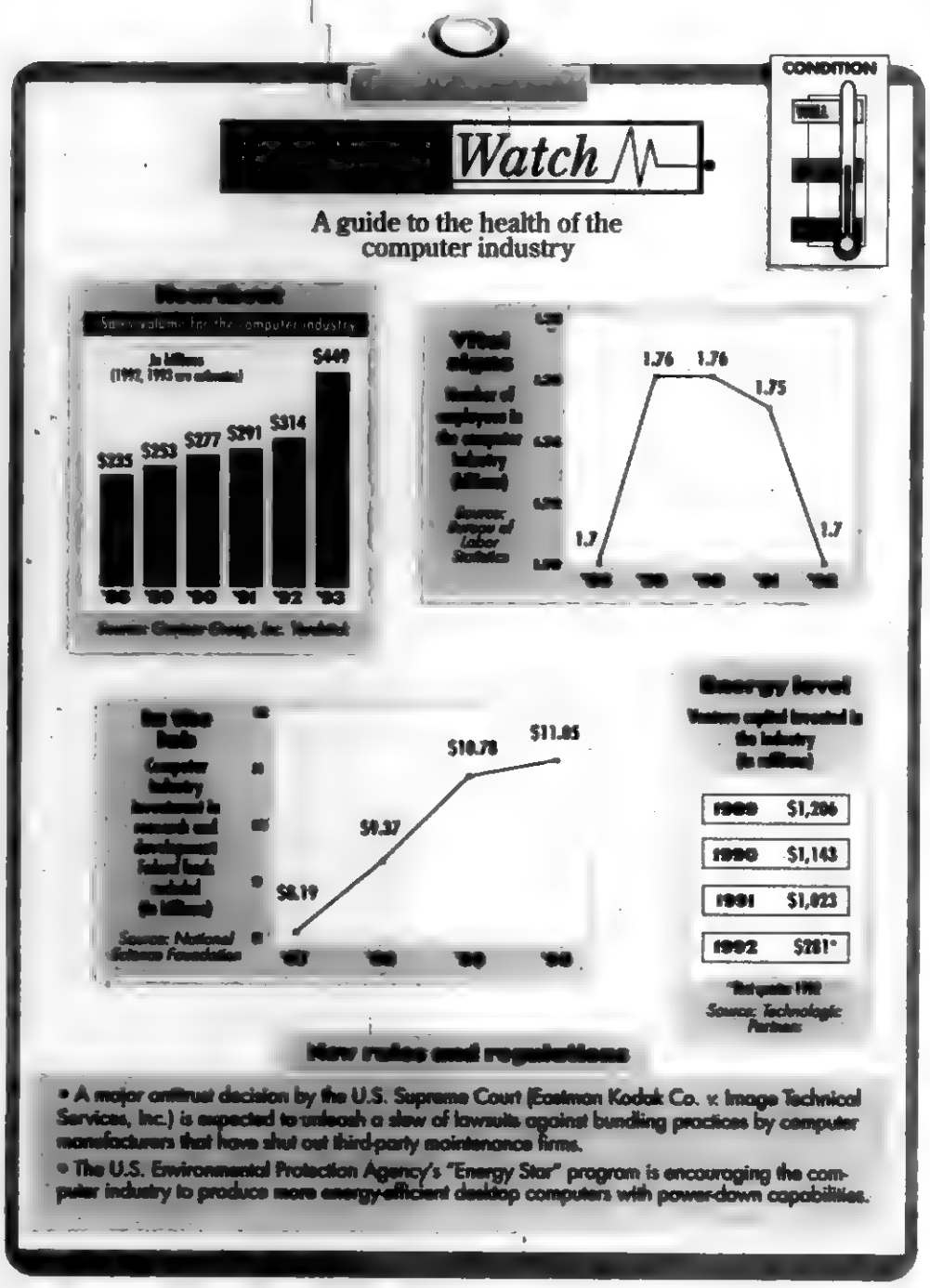
It may be a bitter pill for the proud denizens of the East Coast to swallow, but this means Digital Equipment Corp. — with 108,000 employees compared with HP's 90,000 — could slip to No. 3.

Is this really happening? It depends how you measure it. HP and DEC are on different fiscal years, with HP's ending Oct. 31 and DEC's ending June 30. Hambrecht & Quist analyst Robert Herwick estimated that on a July 1992 to July 1993 basis, about $13.4 billion of HP's estimated $17.9 billion will come from sales of computers and computer services. For the same period, DEC will tally about $14.3 billion, Herwick predicted.

But in that period, HP will sell more computer products than DEC, which derives 47% of its revenue from services and systems integration, Herwick said. He added that HP's service and integration component is about 33%.

On an overall scale of products and services, Herwick said HP "stands a good chance" of passing DEC in 1994. Herwick estimated that HP will tally $16.4 billion in revenue for the year that just ended, and it will report earnings of about $960 million, up from $755 million the previous year.

MARK HALPER



The 5th Wave

INSIDE LINES

The wait continues

Delivery of IBM's AIX DBMS has been delayed until sometime next year, confirmed Don Hederle, director of strategy and architecture at IBM's enterprise database solutions group. The AIX data manager, which IBM had originally promised by last February, "is taking a little longer because we want it to be right," he said. Part of the reason for the delay was because product development was moved from the Personal Systems line of business to the Programming Systems group. Some things don't change, though: Plans are still on for the AIX data manager to have a "common code base" with the OS/2 database manager, Hederle added.

Can't beat 'em, join 'em

Apple has System 7.0 up and running on Intel chips in its labs, one source says, and may finally be serious about getting a piece of the operating system software market in the IBM-compatible world. The source says Apple is still trying to discern the impact such a move would have on its own sales.

High test or unleaded?

AT&T Systems Leasing in Bloomfield Hills, Mich., is getting ready to introduce a new kind of leasing program based on a negotiated per-MIPS rate that would allow customers to quickly add processing power. "You'd lease functionality, not the computer itself," a company spokesman explained. "It's like leasing the mileage instead of the car." Competitor Comdisco already has a similar program.

Working on the railroad

Burlington Northern earlier this year appeared headed toward an outsourcing deal with Perot Systems and then switched tracks to an internal IS overhaul led by consultant Charles Feld. But the story may not be over. Last week, the Fort Worth, Texas-based railway giant held preliminary discussions with former Compaq CEO Rod Canion and his partner, Ron Fisher, both principals at Insource Management Group. Neither party last week would discuss how an Insource deal — if one indeed materialized — would affect or complement Feld's role.

Ahoy, OSI starboard!

DEC is expected to release its long-awaited OSI-based DECnet (also known as Advantage) for VMS in the next couple of weeks. One user said he would just as soon stick with the proprietary DECnet Phase IV except that his network is running out of addresses and the OSI version provides virtually unlimited addressing.

Couldn't be faulted for selling

As fault-tolerant vendor Sequoia Systems struggled with a management shuffle and financial problems, rumors multiplied that the company could soon to be acquired by Hewlett-Packard. HP owns 8% of Sequoia's stock and remarkets Sequoia's systems. Internal sources at Sequoia confirmed that such an acquisition is likely before the end of the year, a statement that was denied by spokesmen at both companies.

Shades of Dan Quayle

If you look closely at OSI documents put out by the International Standards Organization, you will notice that *routing* is spelled *routeing* every time. No, Dan Quayle did not write the ISO's documentation; the story is that one version of the Oxford English Dictionary had the misspelling, and by the time the mistake was corrected, the ISO had already adopted that version of the word as gospel.

Is your aching back helping you forget about your carpal tunnel syndrome? Computer ergonomics resource centers such as Chicago's Backcare Corp. have latched on to the Computer Health Break from Escape Ergonomics in Sunnyvale, Calif. Computer Health Break is a 16K-byte terminate-and-stay-resident program that will pop up on-screen at user-specified intervals and run through several exercises from a list of 70. The product runs on IBM and compatible PCs with DOS 3.1 or higher and costs $79.95. A caveat if your problem is deeply ingrained: The product only helps prevent stress-related body dysfunction; it doesn't cure it. Cure News Editor Alan Alper's need for news tips. Phone, fax or CompuServe him at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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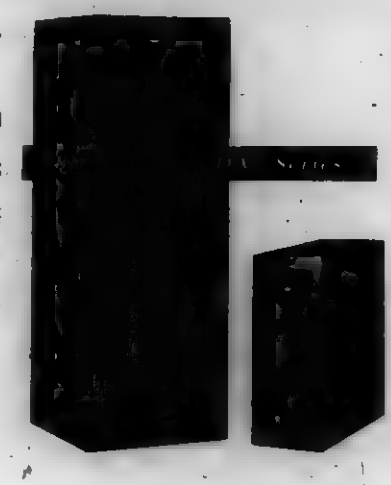

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COMPUTERWORLD

Downsizing pushes IBM DBMS revamp

Distributed DB2, AIX systems to debut in spring

BY JOHANNA AMBROSIO and MARYFRAN JOHNSON
CW STAFF

SANTA TERESA, Calif. — IBM will attempt to shore up its position in the database market with a spring announcement of its overdue AIX database manager and a major new version of DB2.

Yet whether IBM's defensive database strategy can turn the downsizing tide to its advantage is likely to be a critical question in 1993, observers said. Many industry watchers said they believe IBM has waited too long to catch all but the most dedicated IBM customers who are leaving their mainframe-based software behind.

Among the announcements expected in the May time frame are Version 3.1 of DB2, which will allow mainframes to distribute database processing among several different machines, and IBM's first foray into the AIX database world.

The AIX software, as yet unnamed and based at least partly on the database manager in OS/2 Extended Edition, will be delivered about a year later than IBM originally planned. Likewise, Version 3.1 of DB2 will not be delivered until 1994, sources said.

Users already in production with an Oracle Corp. or Sybase, Inc. database manager on their RISC System/6000s are unlikely candidates for the AIX database. Sybase, however, will offer a competing view of distributing databases across the enterprise

Continued on page 14

PRODUCT EVALUATION
USL's Unix V 4.2 (Destiny)

NEW PRODUCT IN-SITE

Easy PC Unix

Unix System Lab's Unix System V Release 4.2 for Intel architecture PCs scored above expectations in ease of use but only about average in performance on the 486, and below par on the 386

(See New Product In-Site, page 40)

Ease of use	4.8
Ease of installation	4.5
Reliability	4.5
Ease of conversion	3.3
Performance	3.0

Ratings are based on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations

Launch links ISDN 'islands'

BY JOANIE M. WEXLER
CW STAFF

RESTON, Va. — In keeping with the current spirit of political change, there is a chance that the tired definition of ISDN as "I still don't know" could metamorphose next week into "It's starting delivery now."

The long-anticipated first-phase launch of a nationwide Integrated Services Digital Network will represent links of many heretofore ISDN "islands."

This means organizations restricted by the current limited geographic availability of ISDN's dial-up, single-circuit voice, data and video service will see their potential with the technology expand significantly.

ISDN could solve a range of networking problems while emerging technologies such as frame relay and Switched Multimegabit Data Service suffer from some of the hurdles ISDN faced. Although high-speed SMDS handles voice and video well, for example, it is in the "island" stage right now.

And while packet-oriented frame relay is fairly ubiquitous, it falls short in the area of voice and video, analysts said.

For the celebratory kickoff of the National ISDN-1 public-switched digital network — dubbed Transcontinental ISDN Project '92 — 70 companies using ISDN in nearly 150 locations worldwide are hosting ISDN open houses all week to allow would-be users to view their live ISDN applications.

Many of the open house host companies said the value they are finding in ISDN is twofold: cost savings through piggybacking data and video-oriented applications on top of telephone service,

Continued on page 10

Brave new world

More than half of U.S. network access lines are slated to be ISDN-accessible by 1994

Percentage of lines planned to be National ISDN-1-accessible

	1992	1993	1994
Ameritech	24%	51%	70%
Bell Atlantic	49%	58%	87%
BellSouth	25%	41%	52%
Nynex	16%	24%	31%
Pacific Bell	44%	57%	69%
Southwestern Bell	16%	19%	21%
US West	36%	54%	59%

Source: Bellcore — CW Chart: Michael Siggins

WHERE EAGLES DARE

CIM worries don't stall USAF overhaul

BY ELISABETH HORWITT
CW STAFF

The U.S. Air Force Materiel Command is nearing the mop-up phase of a massive multiyear campaign to consolidate, modernize and centralize the information systems that support weapons systems throughout the Air Force.

However, many of the fruits of this Herculean labor may well be subsumed by Corporate Information Management, a series of U.S. Department of Defense-wide initiatives that are expected to consolidate and standardize computer systems

Continued on page 20

At A Glance

U.S. Air Force

Postmerger look at combined Systems and Logistics Commands

Paul Sielaff, assistant deputy chief of staff

Size of IS department: About 300 at headquarters and field operation agencies.

Annual budget: 52% of total Air Force budget, $52 billion; IS budget (excluding personnel salaries): $425 million.

Number of employees: 126,000 (military and civilian).

Number of sites/bases served: 14 bases, each of which has a computer/communications director.

Source: U.S. Air Force — CW Chart: Michael Siggins

Justice widens probe into IBM/ISSC tie

Akers orders look into Big Blue's compliance with 1956 Consent Decree

BY MARK HALPER
CW STAFF

WASHINGTON, D.C. — A lingering charge that IBM's outsourcing business violates antitrust grounds is gaining attention. While the U.S. Department of Justice escalates its investigation, IBM is conducting its own probe under orders from Chairman John Akers.

The Justice Department's case has risen from the staff attorney level to the hands of antitrust Deputy Assistant Attorney General Mark Gidley, who, according to one industry executive, had given IBM until last Friday to respond.

Action could range from dismissing the case to moving forward with civil or criminal charges. The allegation, however, is one that has weighed on the minds of users wondering about the long-term efficacy of an IBM outsourcing deal.

"Our clients say, 'Is there a concern here that [IBM] may be out of the business?,' " said Robert Zahler, a partner at Shaw Pittman Potts & Trowbridge, a Washington, D.C., law firm that negotiates outsourcing contracts. "We tell them [IBM] responds that this is not a concern."

At issue is whether IBM's outsourcing practice breaches a 1956 Consent Decree in which the Justice Department ruled that IBM could engage only in the service bureau through a sep-

Continued on page 12

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INSIDE

Andy Freeberg

Wells Fargo's Roy Cramblin champions the bank's move to client/server computing. Page 6.

DEC's Robert Palmer confirms a plan to establish a separate PC unit. Page 4.

Del Monte, Hertz talk outsourcing with EDS and IBM, respectively. Page 14.

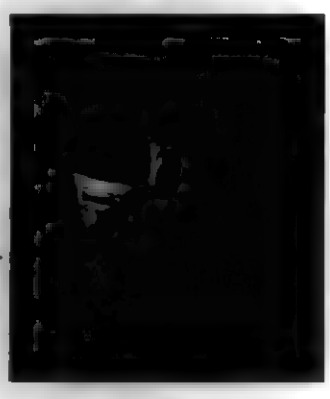
EXECUTIVE BRIEFING

November 9, 1992

A COMPREHENSIVE GUIDE TO THIS WEEK'S NEWS

RE-ENGINEERING

AIR FORCE MATERIEL COMMAND is in the throes of major IS consolidation and modernization projects that it hopes will be adopted as "best in class" prototypes for broader, Defense Department-wide modernization and downsizing efforts. However, DOD projects could supersede Materiel's work. *Page 1*



COLUMBIA UNIVERSITY'S Mike Marinaccio says constant user involvement is the key to a five-year re-engineering project that ties together the school's 15 colleges with client/server, imaging and TCP/IP technology. Also included is an outsourcing relationship with **American Management Systems.** *Page 71*

COMPAQ COMPUTER founder Rod Canion, who now heads a consulting firm, warns companies tackling re-engineering to be careful not to give too much control to outsourcing vendors. *Page 73*

TELECOMMUNICATIONS

WHILE THE INDUSTRY now knows ISDN will never be networking nirvana, next week's kickoff of the first phase of nationwide ISDN has users citing many viable uses of the digital telephone infrastructure finally starting to take shape. *Page 1*

USERS GAIN a little help with telecommunications planning from the heads of the **ATM Forum, Frame Relay Forum** and **SMDS Interest Group** at **Interop '92.** *Page 49*

DBMS

IBM WILL ATTEMPT to shore up its position in the database market with its overdue AIX database manager and a major new version of DB2. *Page 1*

CINCOM SYSTEMS revamps its Supra database management system to run under Unix and PC LANs in an attempt to play in the distributed world. *Page 15*

LEGAL ISSUES

CHARGES THAT IBM'S outsourcing business violates antitrust regulations are back in the spotlight, as the **Department of Justice** ramps up its investigation and IBM conducts its own probe as ordered by chairman John Akers. *Page 1*

ANTIDUMPING TARIFFS against Korean dynamic random-access memory should not raise prices on U.S. products, but small vendors and end users may have to shop carefully. *Page 97*

AN IBM SUIT stemming from the discovery of counterfeit cards in IBM 3174 controllers should serve as a warning to users to be certain their systems contain legitimate parts. *Page 60*

LARGE SYSTEMS

DEC OFFERS MORE flexible licensing to pave way for Alpha adoption by users. *Page 4*

DEC PRESIDENT AND CEO Robert Palmer preaches profitability through reorganization and service focus. *Page 4*

OUTSOURCING

▶**Del Monte** signed over its entire IS operation to **EDS** in a 10-year, $150 million outsourcing deal, reversing an earlier decision to keep control of its systems. *Page 12*

▶**Hertz** confirms earlier reports that it plans to outsource some of its computer operations to IBM's **ISSC** subsidiary. *Page 12*

CLIENT/SERVER

▶**Phelps Dodge** mines application development technology to position itself for client/server computing. *Page 65*

▶The move to client/server computing has been paved with a few pleasant surprises for **Actmedia.** *Page 43*

▶**Wells Fargo Wholesale Services** makes its first moves toward client/server after overcoming entrenched IS resistance. *Page 6*

▶**Sybase** is expected to outline a wide-ranging product plan for next year to alert IS managers to new client/server technology. *Page 14*

▶**Oracle** tried to get closer to Microsoft Windows users last week by uncorking Oracle Glue. *Page 14*

SOFTWARE

▶Industry pundits have mixed views on the recent **CA/Citicorp** flat-fee, enterprise software licensing agreement and its effect on future licensing practices. *Page 59*

▶**GM, Ford, Alcoa** and other heavy hitters are delving into desktop manufacturing. The process — going from CAD data to a part in just hours — can reduce product development cycle time and costs by up to 95%. *Page 77*

▶Warehouse management and logistics is a hot application area as manufacturers upgrade old systems. *Page 59*

▶Preprogrammed software agents are helping companies to accomplish tasks such as automatically responding to customer inquiries. *Page 62*

ENTERPRISE NETWORKS

▶**The Pacific Stock Exchange** would like to leapfrog most emerging high-speed networking technologies next year and leverage Asynchronous Transfer Mode to create a "virtual trading floor." *Page 16*

▶Users like **Legent's** host-based LANSpy product but say centralized LAN management does have drawbacks. *Page 49*

▶Researchers have to be thinking about how the high-speed networks of the future will change the computing infrastructure. *Page 28*

APPLICATION DEVELOPMENT

▶Developing for NT isn't much of a chore — if you already know Windows. *Page 65*

▶**Coca-Cola Enterprises** takes a PC-based decentralized approach to developing new production and materials planning applications. *Page 65*

▶**CA** last week showed its Aspen development tool at CA Technicon '92. *Page 8*

▶**Slate** ships tool kit for building pen-based programs. *Page 66*

UNIX

▶The latest version of **USL's** Unix System V Release 4.2 scores well in user evaluations on the Intel 486 platform, but it is reportedly too slow on the 386. *Page 40*

▶**Sequent** positions its Symmetry line of Unix systems as a database server in both stand-alone client/server and mainframe coexistence schemes. *Page 62*

PC HARDWARE

▶**IBM** acknowledges that the PS/ValuePoint may take sales from the PS/2 line but says that's fine as long as people keep buying Blue. *Page 35*

▶**Cyrix's** upgrade to turn a 386 into a 486 draws corporate interest. *Page 8*

This is the last issue of *Computerworld* you'll ever see — in this format. Stay tuned for our new look next week.

▶Users welcome the 486SL, despite industry grumbles. *Page 8*

▶Portable computers make their mark at **Eaton Corp.**, drawing kudos from even the general manager. *Page 37*

MANAGEMENT

▶At **Corning,** CIO Harvey Shrednick says it is time to do what he is asking managers and supervisors to do — reshape his operational mode from controlling, managing and directing to mentoring, coaching and delegating. *Page 33*

▶A recent study has found that small centers have suffered the most from cuts in staff and spending. The study notes that IS shops have found legitimate efficiencies in storage and other areas. *Page 62*

▶Vendors often say 'We can't do that' during deal negotiations. But if you haven't heard a 'no' when doing a deal, you've left something on the table. *Page 90*

▶IS managers who shy away from spending $10,000 for a VDT ergonomics study may want to consider a new $300 service. *Page 74*

▶If you feel your job is getting stagnant, perhaps you should look at what you do in your free time. It could have a real impact on your job success. *Page 83*

▶Think it's easy being married to an IS professional? Think again. How many other people computerize the signing and sending of their Christmas cards? *Page 33*

GROUPWARE

▶Will IS management string garlic around its doors when workgroup software comes a-knocking? Editor-in-Chief Bill Laberis says it could be a case of deja vu all over again. *Page 32*

▶**Lotus** ditches plans to merge its CC:Mail electronic mail and Notes groupware software packages. *Page 43*

▶Meanwhile, the question arises whether **Lotus** needs to redesign Notes for the long haul. *Page 43*

▶**DEC** is bringing its Network Application Support environment to Sun platforms in hopes of bridging the DEC and Sun worlds. *Page 44*

Storage
- Researchers are experimenting with high-capacity data storage techniques that use laser beams to read data — much like a phonograph. ..... Page 28

LANs
- Start-up **MicroAccess** in San Jose, Calif., is first to market with LAN hardware for 100M bit/sec. transmission. The announcement fell a week before today's IEEE meeting to discuss developing standards. ..... Page 16
- A graphical LAN-based electronic software distribution system promises to help save companies thousands of dollars in software installation costs. ..... Page 52
- **Novell** has announced new versions of its LAN WorkPlace for DOS Unix terminal emulation package. .. Page 44
- A new version of **Microsoft's** LAN Manager for Unix targets the same market Novell is chasing with NetWare. ..... Page 45

E-mail
- Mail interconnectivity vendor **SoftSwitch** forges ahead with building enterprise links. ..... Page 54
- In a quest to become an enterprisewide mail provider, **Microsoft** plans a mail gateway to **Lotus'** Notes workgroup software package. ..... Page 4

PC software
- Users are interested in software suites for reasons beyond price. ..... Page 35
- **SAS Institute** unveils SAS for Windows and other desktop products. ..... Page 24
- **Lotus'** Improv for Windows, an advanced spreadsheet for modeling and analysis, is scheduled for rollout tonight. ..... Page 8

Departments

Advanced Technology 28
Application Development ... 65
Calendar 75
Company Index 95
Computer Careers 83
Computer Industry 97
Desktop Computing 35
Editorial/Viewpoint 32, 33
Enterprise Networking 49
In Depth 77
Inside Lines 98
Intelligence Files 75
Large Systems 59
Management 71
Marketplace 90
New Product In-Site 40
News Shorts 6, 16
Workgroup Computing 45

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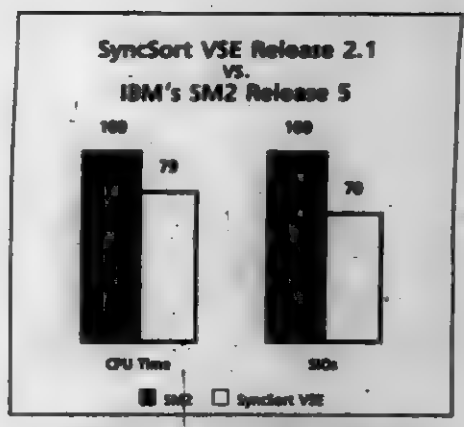

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DEC restructuring plan includes separate PC unit

BY MELINDA-CAROL BALLOU
CW STAFF

BOSTON — Digital Equipment Corp. President and Chief Executive Officer Robert Palmer confirmed last week that DEC will be reorganized around vertical and horizontal business units, including one dedicated to PCs.

The company is resolving details for eight to 10 business units, each with its own profit and loss responsibility [CW, Nov. 2]. The specifics will be made public before year's end.

"In the case of the PCs, it's a well-defined unit — they aren't manufacturing anything else," Palmer said at the company's annual meeting.

"DEC's PC business has caught fire this year, growing from 2% to 3% to close to 10% [of DEC's overall revenue] — generating sales if not profits," said Peter Kastner, vice president at the Aberdeen Group, a market researcher in Boston. It is unclear how profitable DEC will be in the face of "suicidal" price cutting.

All the business units would be serviced by horizontal product and service groups within DEC, assuming that those groups "are competitive"; if not, the units could go outside of DEC for products and services, Palmer said.

DEC's ability to service PC products nationwide under a single contract was a plus, but "DEC in the past was unable to respond quickly to PC market changes," said Gary Hensley, manager at Basic American Foods. "We're hoping they will be able to do so [with the new business unit]."

Microsoft to link Notes to its Mail

BY ROSEMARY CAFASSO
CW STAFF

BELLEVUE, Wash. — In a quest to become an enterprisewide mail provider, Microsoft Corp. is even pulling rival Lotus Development Corp. and Lotus' Notes workgroup package into its plans.

Microsoft last week disclosed that it is working with a small third-party company to develop a gateway to link Microsoft Mail with the mail component of Lotus' Notes. The gateway has not been beta-tested, although Microsoft and its partner, Phoenix Systems in Arlington, Va., expect it to be available early next year.

According to interviews with several Notes users last week, the initial market for the Microsoft Mail-to-Notes gateway may be limited. Some Notes users either do not have Mail installed or use other tools to link various electronic-mail systems together.

How many users?

There are about 1.7 million Microsoft Mail users and 150,000 Lotus' Notes users, according to "Electronic Mail & Micro Systems," a bimonthly newsletter published in Washington, D.C. However, Lotus estimated that its Notes installed base is closer to 225,000.

"My sense is that there are probably a select few who will find this really interesting," said Kevin Brown, president of the Boston Notes Users Group.

The Chase Manhattan Bank NA, for example, has several mail systems, including Microsoft Mail, but is currently linking them with Soft-Switch, Inc.'s mainframe-based connectivity software.

"We don't need it," Michael Mandelbaum, a vice president at Chase, said of the Microsoft gateway. "We don't need a direct connect."

Industry analysts said Microsoft is promoting the gateway to help further its image of linking Microsoft Mail to most other mail systems.

"It's important for Microsoft to do the politically correct thing," said Krystyna Filistowicz, director of business applications research at Dataquest, Inc. in San Jose, Calif.

Connection important

Bill Sornsin, a Microsoft product manager for Mail gateways, said the company had "not come across enough Notes installations in general ... but it is still important. It doesn't matter if you have five users or 5 million users. If people can't talk, it's important that we connect with them."

Lotus, meanwhile, was at first miffed that it was not included in Microsoft's announcement because it had worked with Phoenix Systems also.

"It would have been appropriate for them to have included us as well," said Arlene Greene, director of business development for Notes. "The issue here is this is a customer-driven product [from] people with Microsoft Mail who are adopting Notes."

John Casey, director of the advanced systems group at Phoenix Systems, said "the reason [the announcement] seemed slated toward Microsoft is they volunteered to co-fund" the development.

Alpha line ready to roll

Company's software licensing offers easier migration to new line

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. last week shifted its licensing practices to make it easier for users to maintain their technology investments when migrating from VAXs to the new Alpha systems, which officially debut tomorrow.

The new software licensing makes it possible to move applications that run on a single operating system across different hardware platforms. Previously, users would have to change and pay for new licenses if they switched platforms.

"You can move between hardware platforms at will, as long as you maintain the same number of users," said Mary Welch, marketing manager for DEC's corporate business practices group. "If you want to configure a cluster differently, [by] incorporating Alpha boxes, for instance, you can."

Range of systems

Users said this shift in licensing practices will make it easier to purchase Alpha hardware but probably will not prove decisive for those who were not already committed to Alpha.

"This [cross-platform licensing] is potentially a differentiating factor for DEC, but whether it is sufficiently [so] to win business that DEC would otherwise not have gotten is a real open question," said Bill Mayhew, a chairman at the Digital Equipment Computer Users Society.

DEC's Alpha platforms range from the low-end desktop and deskside systems DEC 3000 Models 400 or 400S AXP and Models 500 or 500S AXP, with workstation and server options, to the high-end DEC 10000 AXP mainframe (see chart).

A raft of software products, applications, tools and networking software from third parties and from DEC are also expected to be immediately available.

While Hewlett-Packard Co. and Sun Microsystems, Inc. are also scheduled to announce Unix workstation products tomorrow, DEC's broader strategy with Alpha allows multiple operating systems to run on the company's 64-bit reduced instruction set computing architecture — Open VMS, the Open Software Foundation's OSF/1 and Microsoft Corp.'s Windows New Technology (NT), when Microsoft ships NT next year.

Except for the DEC 10000 AXP mainframe, the systems will be immediately available running Open VMS and developer's versions of OSF/1.

Mixed options

Of 14 DEC sites contacted by *Computerworld*, five were ready to order boxes, eight were waiting to evaluate, and one was opting for a DEC competitor.

"We're very interested in Alpha both as an upgrade path for VAXs and as a platform for NT in the future," said Stanley Rose, a vice president at Bankers Trust Co., a commercial bank in New York.

"We will begin using one for basic number-crunching immediately but will wait for full VAXcluster support before moving over our production data," he said.

Alpha's arrival is too late, however, for Bill Gippa, who is manager of technical and customer support at Labatt Breweries of Canada Ltd.

"It's pretty exciting that they've got boxes running that fast, but we're not seriously considering them," Gippa said. "They're not shipping the software that I need to use right away, and we have short-term, immediate concerns which we must meet. It would have been better if they had been here six to 12 months ago." He declined to specify which system he is choosing instead.

The majority of users are interested but waiting to see what the systems offer.

"We're probably not as anxious as some people for the performance benefits of Alpha since we're not that large of an operation at the moment," said Gordy Hunt, systems operation manager at Crane Plastics, based in Columbus, Ohio. "But Alpha is the way DEC is moving, and we will ultimately move with them," Hunt said.

Alpha, here – go

DEC's Alpha line is ready or soon, a sampling of what's on tap:

Model	Pricing**	Memory	SPECmarks
	$15,000	128M bytes	110
	$77,000	512M bytes	135*
	$168,000	2G bytes	165*
	$316,000	2G bytes	NA

The DEC 4000 AXP offers one or two processors; DEC 7000 AXP and DEC 10000 AXP offer one to six processors. All systems except the DEC 10000 AXP will be available this week on Open VMS and in a developer's version for OSF/1; end-user OSF/1 versions for all systems and the DEC 10000 AXP will be available by the end of the first quarter, 1993.

*Single processor, **Approximate

CW Chart: Stephanie Piscitelli

Babcock joins CW as technical editor

FRAMINGHAM, Mass. — *Computerworld* has appointed Charles Babcock to the newly minted position of technical editor.

Charles Babcock *was* Digital News' *editor in chief*

Operating out of the Burlingame, Calif., office, Babcock will boost *Computerworld*'s efforts to identify and report on the most pivotal technologies shaping the information systems environment. Babcock's role will put him on the road every week, traveling to bellwether user sites, information technology vendors, conferences and trade shows.

"Charlie will become an information sponge, soaking up the relevant trends and technology directions and reporting his findings to the editors here," said Bill Laberis, editor in chief of *Computerworld*. Babcock will also write a weekly technology column.

Babcock most recently was editor in chief of *Digital News*, a position he held for the past four years. Prior to that, he worked at *Computerworld* as Mid-Atlantic correspondent, senior software editor and assistant news editor.

He also worked for several daily newspapers prior to his trade press experience.

"Charlie is a journalist of first-rate integrity and quality, and we couldn't be more happy to have him back on staff," Laberis added. "He has that perfect blend of curiosity, instinct and technical understanding that this job will demand."

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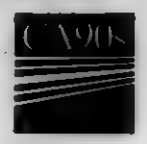

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NEWS SHORTS

WordPerfect upgrade set to ship

WordPerfect Corp. plans to ship WordPerfect 5.2 for Windows at the end of this month. The upgrade includes Reference Software International's Grammatik 5 grammar checker and support for Adobe Systems, Inc.'s Adobe Type Manager. Other features include 13 new WordPerfect fonts, a quick indexing and text-retrieval feature, electronic-mail capabilities, new macros and support for Object Linking and Embedding. Existing users can upgrade for $39.95.

Eo pen systems target mobile users

Eo, Inc. in Mountain View, Calif., last week announced the 2.2-pound Personal Communicator 440 and the 4-pound Personal Communicator 880. Measuring 8½ by 11 in. or less, the devices have fax, E-mail, cellular phone and computing capabilities in one small package. Go Corp.'s PenPoint operating system and nine applications are bundled into read-only memory. Prices start at $1,999 with shipments due in the first half of 1993.

Microsoft ships Win32S interface

Microsoft Corp. said last week the Win32S application programming interface (API) shipped with the October beta-test release of the Windows New Technology (NT) software development kit. Win32S allows programmers to write applications that take advantage of Windows NT's 32-bit properties but still run on Windows 3.1. However, Windows NT developers who were contacted said the API is too late for them to use it.

Virus detection goes on a chip

Western Digital Corp. will today unveil a microprocessor-based technology that it claims will alert users to the presence of computer viruses on 386- and 486-based PCs. Immuniser takes control of write-protect operations over hard disk areas containing the executable code to which viruses typically attach themselves and monitors the disk for suspicious activity.

Desktop standard proposal issued

The Desktop Management Task Force (DMTF) has distributed a draft specification of its API architecture to participating members and hopes to release a free reference document to the public at the Interop '93 Spring show. The DMTF is a consortium of more than 40 vendors that formed earlier this year to address desktop management issues. The draft Desktop Management Interface is said to define management links for video cards, network interface cards, fax modems, storage devices, application software and operating systems.

IBM, Harris eye federal market

IBM and Harris Corp. in Melbourne, Fla., last week announced an alliance aimed at federal customers under which they will develop real-time functions for the IBM RISC System/6000 line of Unix workstations and servers. Harris will also incorporate the upcoming PowerPC architecture into its Night Hawk line of highly secure, real-time systems.

Short takes

Cyrix Corp. is expected today to announce a processor that is plug-compatible with Intel Corp.'s 1486SX and outperforms Intel's fastest 33-MHz version of that chip. The CX486S2/50 is the first in a family of pin-compatible 486 imitators Cyrix intends to produce.... Lotus Development Corp. started shipping an upgraded release of 1-2-3 for the Apple Computer, Inc. Macintosh last week. Ease-of-use improvements in Release 1.1 include an automated installer that allows users to launch the application with a series of mouse clicks.... Apple subsidiary Claris Corp. is slated to unveil its second product for the Windows market tomorrow. ClarisWorks for Windows is an integrated package that last year stole the top position in the integrated software category from Microsoft's Works.... Concurrent Controls, Inc. in San Francisco signed an agreement with Novell, Inc. to develop and distribute Novell's DR Multiuser DOS product line, which enables many users to share a single DOS-based PC.

More news shorts on page 16

Bank eschews client/server risk

Wells Fargo's wholesale unit expects 10-to-1 price/performance benefits

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — The success of a client/server risk management application that recently went into production at Wells Fargo Wholesale Services will have a major impact on future rightsizing plans within the business unit and indeed the entire bank, spokesmen said. First, however, the unit's chief rightsizing champion, Senior Vice President Roy Camblin, had to persuade veteran information systems managers to let go of their mainframe bias.

Wholesale Services officially went client/server in August, when a client/server risk management system running Oracle Corp. database software on Unix-based Sun Microsystems, Inc. workstations went into production.

The application, which may be the industry's first automated risk management system, has so far met expectations in reducing risk because of customer default and bad debt — a hot button for federal regulators — and in realizing price/performance benefits on the order of 10-to-1, according to Alan Holroyde, the unit's group chief.

Andy Freeberg

Wells Fargo's Roy Camblin *gave client/server pep talks to resistant mainframe-minded IS managers at the bank*

Big breaks

Major cost savings are expected from the unit's ability to offload and thereby prolong the life of depreciated hosts, eliminating the need to regularly move up to IBM's current top-of-the-line model, Camblin noted.

Client/server systems will also help the bank realize 10-to-1 improvements, at a minimum, in areas such as programmer productivity, Camblin estimated. "Payback in a matter of months, not years, is expected," he added.

Indeed, no incremental budget has been allocated to the client/server systems; they are expected to pay for themselves by offsetting the costs of mainframe CPU cycles, which the unit buys from Wells Fargo's internal service bureau, Camblin explained.

Wholesale Services is far from throwing out its IBM mainframes. A key component of the risk management application is Oracle SQL software that permits users to transparently track commercial customers' financial activities throughout the day across multiple product databases, many of which are still housed on legacy mainframe systems, Camblin said.

"A risk management success would certainly argue for the Oracle/Sun partnership" supplying platforms for other re-engineering efforts now in the works, Holroyde said. "Highly likely" candidates include a business account customer service system, which is scheduled to begin rolling out early next year, and wire transfer and automated clearinghouse systems scheduled for completion in late 1993 and early 1994, Holroyde said.

A client/server success would help Camblin break down the last resistance of mainframe-minded IS managers, he said. "IS managers told me, 'If it ain't broke, don't fix it.' I said, 'As good as we are at what we're doing now, it won't get us to where we need to be three years from now.'"

Until recently, IS veterans who have logged an average of 16 years at Wholesale Services have fiercely resisted moving to a strange environment where their CICS and Cobol programming skills would be virtually useless, Camblin said.

IS managers learned the new system by implementing it, Camblin said. About half of the department has been fully trained on the risk management system, and the other half will come up to speed as the department implements other client/server applications now in the works. Even those maintaining legacy mainframe systems are learning by doing Cobol programming on a networked Sun workstation.

Still mainstream

Camblin has already given a series of client/server pep talks to TSO Cobol VSAM programmers. "They told me, 'This is a conservative bank; we don't want to be on the bleeding edge.' I said, 'We won't be bleeding edge, just early implementors.'"

Far from leading the pack on distributed computing, Wholesale Services will just be moving in step with competitors that are already implementing client/server applications, industry analysts said.

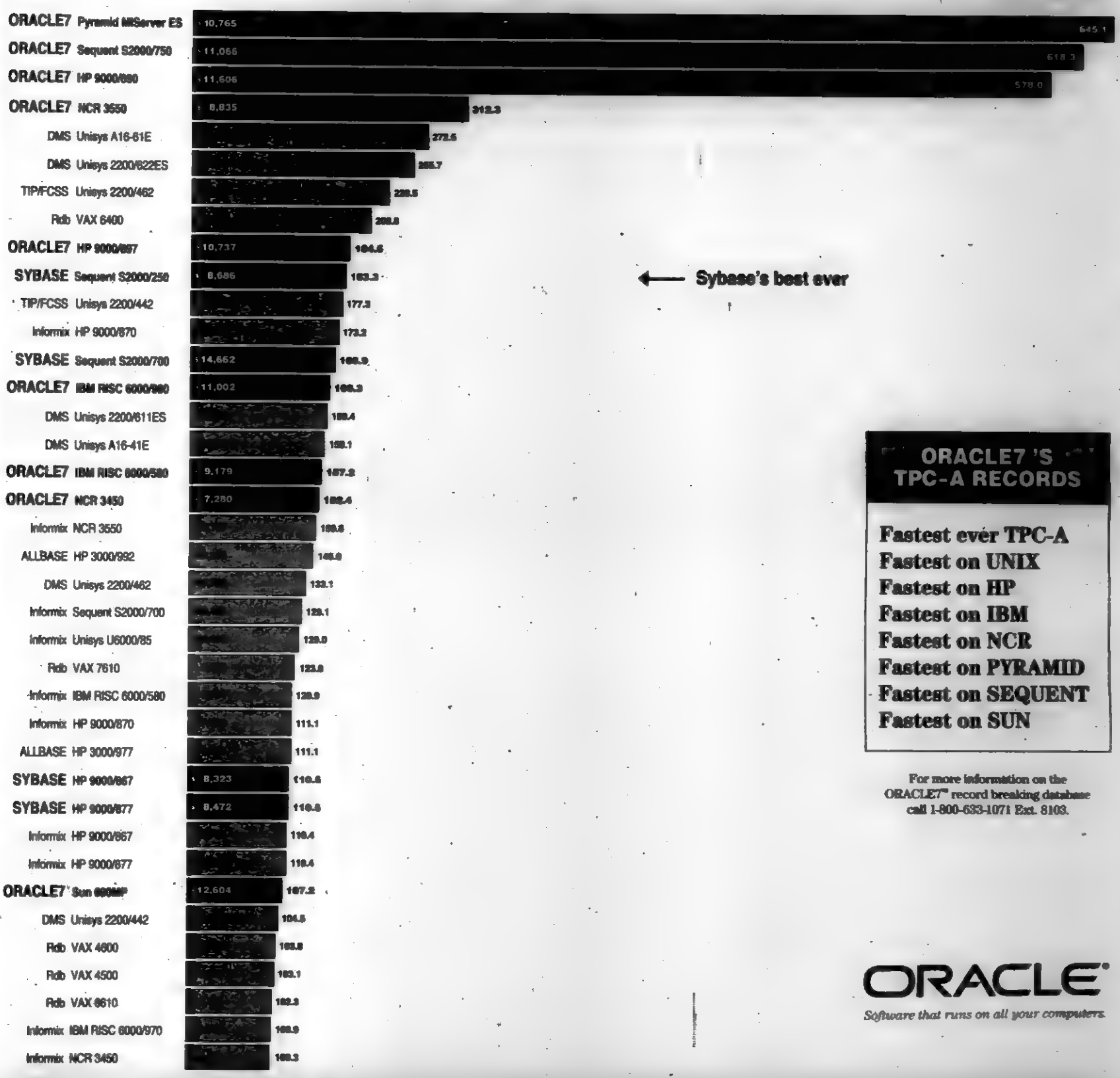
A recent report by Ernst & Young's Center for Information Technology and Strategy estimated that 45% of commercial banking companies currently have at least one major transaction processing application running in production mode on a distributed computing platform. That number will increase to 74% in 1995, the report projected.

Wholesale service applications make up the bulk of banks' client/server applications, according to Ladd Willis, an executive vice president at First Manhattan Consulting Group. Transaction-intensive core applications in the retail business, which handle individual customers, are still considered too bulky for client/server technology, Willis said.

> TRIED AND TRUE methods "won't get us to where we need to be three years from now."
>
> ROY CAMBLIN
> WELLS FARGO

SYBASE VS. ORACLE7

DATABASE PERFORMANCE



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486SL chip invades notebooks

Intel's chip to appear in systems from Compaq, AST, NEC and others

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Intel Corp.'s new 1486SL chip will soon appear in notebook computers from vendors such as Compaq Computer Corp., AST Research, Inc. and NEC Technologies, Inc., despite an industry that questions whether the chip will live to see another generation.

The new 25-MHz 486SL, expected today, gives users a 486DX-class processor that runs at 3.3V and uses System Management Mode, which combine to help generate a 25% longer battery life than the current 80386SL power management chip. Compaq and AST claim three and 6 ½ hours under normal use, respectively.

Compaq is now shipping the 4/25C, while AST expanded its PowerExec line with six new models. Both vendors offer active-matrix color screens and up to 200M bytes of storage. AST also has passive-matrix color and monochrome versions.

NEC will today announce its Ultralite Autograph pen-based system, which uses the 486SL and is slated to ship in January.

Users contacted generally gave an enthusiastic reception to new 486SL-based notebooks.

"We've been waiting for these products," said W. B. Soper, manager of information services at Chevron Canada Ltd. "Our new sales system is a client/server application, and we need quite a bit of processing power on the front end." Soper said Chevron has stopped buying 386-based systems. Because Compaq, Chevron's main PC supplier, has not had a 486-based notebook, Soper welcomed its product.

Compaq also introduced the LTE Lite/25E, a 386SL-based notebook with a twist: It has a high-resolution, active-matrix monochrome screen. This makes the display far brighter and easier to read than an ordinary monochrome screen. Apple Computer, Inc. is the only other company to use an active-matrix monochrome screen on a notebook.

Numerous other vendors announced support for the 486SL, although sources at some major OEMs said Intel has upset many vendors because it plans to make 3.3V, power management-capable versions of all of its 486 processors. Vendor sources said they see this giving an advantage to Toshiba America Information Systems, Inc. and Texas Instruments, Inc., which have invested heavily in power management software.

Still, the SL has integration features other Intel chips lack, and even the most disgruntled OEM source acknowledged that defections from Intel are unlikely, despite a new Cyrix Corp. CX486-SLC/E, a 16-bit chip with System Management Mode and 25% lower power consumption than existing Cyrix chips.

One analyst downplayed these squabbles. "The 486SL will have demand for quite a while," said Tim Bajarin, president of Santa Clara, Calif.-based Creative Strategies Research International, Inc.

Powerful savings

Intel's 486SL power saving chip will appear in the following vendor's systems:

	Compaq notebook	AST notebook	NEC pen-based
CPU	486SL (25MHz)	486SL (25MHz)	486SL (20MHz)
Display	Active-matrix color	Active-matrix color, passive-matrix color or monochrome	Monochrome
Storage	120M byte or 210M byte	80M byte to 200M byte	40M byte or 80M byte
PCMCIA	No	Yes, 2 slots	Yes, 2 slots
Weight	6.5 pounds	5.9 pounds (mono) 6.9 pounds (color)	3.9 pounds
Battery life	Up to 3 hours	Up to 6.5 hours	Up to 5 hours
Base price	$4,099	$2,795 (mono), $3,595 (passive), $4,495 (active)	$3,999 or $4,099
Available	Now	December	January

CW Chart: Michael Siggins

Lotus to Improv for Windows

BY ROSEMARY CAFASSO
CW STAFF

BOSTON — After months of sneak previews, Lotus Development Corp. is scheduled to officially unveil Improv for Windows, its advanced spreadsheet for modeling and analysis, at a meeting of the Boston Computer Society tonight.

"I've put it in the category of potentially valuable," said Joseph Caruso, director of corporate systems and technology at American Express Co. in New York. "It appears to be a leap in effectiveness in terms of modeling and analysis. It isn't restricted to the row and column format."

While Lotus is expected to use tonight's pre-Comdex/Fall '92 event to launch Improv, the software is not yet ready for volume shipment, sources said. However, Lotus had previously committed to ship Improv by year's end.

Must move cautiously

Improv for Windows is a redesign of the original version, which was built for Next, Inc.'s platform. Analysts said Lotus' positioning of the product is critical for it to avoid confusing potential buyers or detract from the still shaky 1-2-3 for Windows business.

"They have got to differentiate it from 1-2-3," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. "If it hits the market and users are left scratching their heads saying, 'Why do I need this, I have 1-2-3?', then the product is in trouble."

Lotus has said Improv is a step up from spreadsheets because it allows users to change and recreate data quickly.

As well, users can work with English words when creating models instead of letters and numbers.

"I think there's a group of spreadsheet users that would take this in a second: the power users and those doing modeling, analysis, strategic planning and forecasting," said John Donovan, a senior analyst at WorkGroup Technologies, Inc.

While Improv may be the focal point of the Boston Computer Society meeting, Lotus is also expected to demonstrate 1-2-3 for Windows Release 2.0, which was supposed to ship by year's end but was recently delayed until early next year.

Release 2.0 includes initial implementation of Chronicle, workgroup technology that would enable a group of users to work on a spreadsheet, make changes and see those adjustments reflected as they work.

Cyrix lures Intel 386 users to upgrade to its 486 chip

BY MICHAEL FITZGERALD
CW STAFF

RICHARDSON, Texas — Cyrix Corp. has confirmed plans to roll out at Comdex/Fall '92 a program designed to persuade corporate users to upgrade from Intel Corp. 80386DX-based systems to upgrade-ready 486DLC chips from Cyrix (CW, Sept. 7).

The Cyrix CXDRU and CXDRU2 chips will let users upgrade existing 386DX systems simply by popping out the Intel chip and popping in the Cyrix chip.

Cyrix has set pricing near $300 per chip, which has attracted the attention of corporate users, several of whom said they plan to install the chips in their Intel-based systems.

"I am absolutely going to recommend that we buy them," said Eric Lafortune, regional computer coordinator at Unocal Corp.'s oil and gas division in Bakersfield, Calif. Lafortune said his tests showed engineering applications ran 80% to 100% faster with the new Cyrix chips.

"As far as I'm concerned, before we buy 486 systems we ought to upgrade to these for a lot less money," he said.

While Lafortune's division is looking at perhaps upgrading only 150 PCs, he said he would recommend the Cyrix chip to the corporate information systems staff.

Another IS manager at a major West Coast financial institution, who asked not to be named, said his division would buy 200 of the Cyrix chips and will add them to the list of acceptable corporate standards. Landing on corporate buy lists will give Cyrix the potential to sell thousands of upgrades.

Not convinced

Still, some users who have tested the chips remain skeptical.

"It's a great idea, but we need to see the results," said Jon Davies, systems programmer at Alberta Wheat Pool, a grain cooperative based in Calgary.

Davies said his company has 300 AT&T 6386s running Unix, and the Cyrix chip could increase their life span, saving the cost of buying new systems.

He said OS/2-based machines showed a 25% speed increase, which was not enough to justify upgrading them, but a similar increase for the Unix boxes would be welcome.

Cyrix also acknowledged that it was working on an SX upgrade chip, but because SX chips tend to be soldered directly on the motherboard, replacing them presents some "mechanical difficulties."

CA teases OOPs workbench

CA-Visual Objects offers extensions to Clipper

BY GARRY RAY
CW STAFF

NEW YORK — Computer Associates International, Inc. last week previewed a version of its object-oriented application development technology, formerly code-named Aspen.

The technology, which Chairman Charles Wang said will eventually be used in CA's Cobol and fourth-generation language products, was shown working with the company's Clipper database development language here at CA Technicon '92, the company's conference for the Xbase developer. Price and shipping dates for CA-Visual Objects were not available at press time.

As for its usefulness to Xbase programmers, "the specific implementation, syntax and semantics will take time to learn," said Marc Schnapp, an El Sobrante, Calif.-based consultant and acting chairman of the ANSI Xbase language standard committee. However, "this is the first time an Xbase vendor has extensively demonstrated a fully object-oriented dialect of the language," he said.

Islandia, N.Y.-based CA acquired Nantucket Corp.'s Clipper development tools for Xbase programming last June.

CA-Visual Objects for Clipper, the first implementation of Aspen, comprises a database development workbench and a compiler for Xbase programming.

In prepared remarks, Wang said the workbench "protects investments by promoting the reusability of code and the ability to wrap legacy code in [to] the new object-oriented model."

Simple to port

CA-Visual Objects also includes a number of object class libraries that support graphical user interfaces and database functions. The libraries are derived from the Glockenspiel CommonView class libraries, which CA recently acquired.

With these libraries, Wang said, "Aspen applications will easily be ported to new environments, including OS/2 [Presentation Manager] and Motif under Unix."

According to company officials, CA-Visual Objects includes the following features:

- Extensions to the Clipper programming language.
- Four class libraries for standard functions, databases, user interfaces and applications.
- A program repository with application and class browsers.
- An incremental Xbase compiler.
- An integrated development environment with program editors, screen painters and other tools.

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Launch links ISDN 'islands'

CONTINUED FROM PAGE 1

and the ability to accommodate far-flung users in today's increasingly mobile, telecommuter-oriented society.

"Being able to access a variety of applications simultaneously over a single network architecture is probably our primary benefit," said Lari Sue Taylor, a telecommunications consultant at the Federal National Mortgage Association (Fannie Mae) in Washington, D.C.

"We can use an ISDN line from one desktop to access several hosts because of its switched nature," she explained.

The U.S. Environmental Protection Agency (EPA) is using ISDN to interconnect local-area networks and is also investigating the technology to save money, said David A. Bittenbender, telecommunications branch chief at the agency.

"We're upgrading to ISDN telephones for voice service, and we're considering dividing ISDN's two 64K bit/sec. channels between two phones," he said. This way, the EPA would accommodate every two phones for 1½ times the cost of basic phone service.

However, he is also looking at ISDN as a way to bring IBM 3270 traffic, which is currently flowing to cluster controllers in eight different D.C. branches, to controllers in a single site to centralize maintenance. His alternative, he said, would be to dedicate fractional T1 lines from each location. Dedicated lines traditionally cost much more than switched service.

Another Trip '92 participant, Canon U.S.A., Inc. in Lake Success, N.Y., is investigating ISDN for telecommuting applications, said Ben Oliva, manager of telecommunications.

"The 1990 Clean Air Act means companies of over 100 employees are going to have to reduce the vehicular traffic going in and out of their facilities," he noted. In addition, "ISDN will bring some human resources quality to the woman who starts a family or someone who is physically impaired."

"National ISDN will enable my company to look at itself on a national basis for deploying different applications," said Mike Brophy, manager of network office systems at Quantum Chemical Corp. in Cincinnati. "By 1994, ISDN service should cover a large portion of where we have concentrations of people."

Extending client/server

Aside from his goal of giving remote users the same access to corporate information via ISDN as those physically closer to the computing resources, Brophy said he envisions ISDN as a way to "extend client/server applications into a customer/vendor relationship" by allowing the various companies' networks to temporarily blend when they conduct business.

The University of West Virginia has similar ideas. One of its vendors in California was recently able to bridge into a university LAN via ISDN to perform some troubleshooting "without Federal Expressing a disk or faxing a printout," said Jeff Fritz, telecommunications engineer at the university.

ISDN's bandwidth limitations are often seen as roadblocks to ISDN's promise of a single network architecture for delivering dial-up voice, data and video as simply as users make a telephone call today. However, Brophy said that to his surprise, his Microsoft Corp. Windows applications have not missed a beat across the currently 144K bit/sec. network.

Trip '92 is the culmination of an effort kicked off by the Corporation of Open Systems (COS) in February 1991. Prior to COS' taking executive action in bringing together equipment makers, software developers and network service and switch providers on a common ISDN specification, the industry was at an ISDN interoperability stalemate because of internetwork compatibility problems.

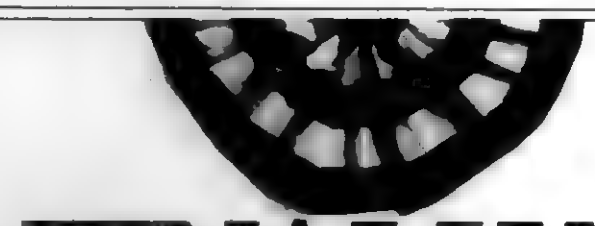
One service for all

National ISDN-1 means there are 22 standards-compliant central offices nationwide interconnected by a long-distance telephone company; 100 offices are planned by the end of the year. Other National ISDN characteristics include the following:

- Basic rate service only. Users get two 64K bit/sec. channels for voice, data or video and one 16K bit/sec. channel for transmitting management information or packet switching.
- Only AT&T and MCI Communications Corp. are up as long-distance ISDN interconnection carriers.
- Applications on display at nationwide open houses include image and file transfer, desktop- and video-conferencing, point-of-sale, LAN interconnection, telecommuting and Group 4 (fast, high-quality) fax.

When National ISDN-2 kicks in by late 1993, it will add the following:

- Primary rate (1.5M bit/sec.) service.
- Packet switching across the 64K bit/sec. channels.
- More than 56% of 115 million regional Bell operating companies network access lines with ISDN service by late 1994.



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Hertz talks with outsourcer

ISSC may selectively take on IS operations

BY MARK HALPER
CW STAFF

OKLAHOMA CITY — The Hertz Corp. last week began shedding light on its selective outsourcing plans, disclosing that it has entered negotiations to hand over some of its information systems operations to IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary.

In a sketchy statement, Hertz confirmed earlier reports that it plans to outsource some activities to ISSC while leaving others in-house [CW, Oct. 5].

"Affected areas include selected IBM-based application development and all IBM computer operations and technical support" in Oklahoma City, the company stated. The company did not return phone calls asking for elaboration. An ISSC spokeswoman also declined to comment.

The company said some operations will be "unaffected" by outsourcing. Those include reservation systems operations, technical support and development, rates development, yield management development, European development, telecommunications, research and development and "other selected areas of IBM-based application development."

Hertz also characterized certain systems and support providers as "unaffected." Those are Hewlett-Packard Co., Tandem Computers, Inc. and Digital Equipment Corp. It did not mention Unisys Corp. on the "unaffected" list. Hertz runs reservations — which it described as an "unaffected" operation — on Unisys mainframes.

A Unisys spokesman said, "Our information is that our status is unchanged," but he found it "curious" that Unisys was left off the list of unaffected systems.

Hertz did not consult Unisys on the announcement, and Unisys had not received a copy of it as of late last week, the Unisys spokesman said.

Premier executives

More than 50 IS executives from the *Computerworld Premier 100* companies gathered in New York last week for an awards dinner honoring America's most effective users of information technology. Executives from the companies who finished first in their categories include:
Front row (left to right): Burley Gayer, Helen Gipson and Liz Turner, Wal-Mart Stores, Inc. (retailing and wholesaling); William Delaney, The Boeing Co. (aerospace); Doyle Graham, Wal-Mart.
Back row (left to right): D. James Dull, Kimberly-Clark Corp. (manufacturing); Paul Gillin, *Computerworld*; Max Hopper, AMR Corp. (transportation); Gary Beach, *Computerworld*; Ken Nelson, Reader's Digest Association, Inc. (consumer products and services); Patrick McGovern, International Data Group; James Zucco Jr., MCI Telecommunications Corp. (utilities); Charles Bowerman, Phillips Petroleum Co. (petroleum and chemicals); Charles Popper, Merck & Co. (pharmaceuticals and food); and Bill Laberis, *Computerworld*.

IBM, ISSC probe widened

CONTINUED FROM PAGE 1

arate subsidiary.

The same ruling — an agreement between IBM and the Justice Department's antitrust division — barred IBM from providing equipment to the subsidiary at lower rates than those it offers to competing service bureau companies.

The agreement addressed the concern that IBM could turn its dominance as a product supplier into an unfair advantage in the processing business.

Some outsourcing vendors, led by Dallas-based Affiliated Computer Systems, Inc., maintained that the 36-year-old ruling pertains to today's outsourcing business, which is a form of service bureau work.

Affiliated first complained to the Justice Department almost two years ago and claimed that IBM's May 1991 formation of the Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary did little to alleviate IBM's breach of the decree.

The case had stagnated for almost two years, but it now appears to be moving forward: The Justice Department has kicked responsibilities up two levels, from staff attorney Richard Irvine to Gidley.

That development came in September. Since then, Gidley has met with Affiliated President Charles Young, has asked IBM for its response and has made plans to solicit industry association Information Technology Association of America (ITAA) for more information, Young said.

The Justice Department was scheduled to meet with IBM last week, Young said.

Calls to Gidley and Irvine were referred to a department spokeswoman, who characterized Gidley's actions as "an investigation of facts [into] whether or not there's been a violation of law." The spokeswoman declined to elaborate on the request the Justice Department has made of IBM or on how its request may differ from any earlier requests it has made of IBM.

An IBM spokeswoman said, "This is not a matter we discuss publicly. We believe we are in compliance with the Consent Decree. Anything beyond that is speculative."

Meanwhile, IBM chairman John Akers last August asked ISSC's general counsel Stephen Huhn to investigate the matter. That directive came in response to a letter that Young sent to Akers. In that letter, Young raised questions about the legality of ISSC and asked Akers to supply Affiliated and other outsourcers with a list of inventory and prices of products sold or leased by IBM to ISSC. IBM was bound by the Consent Decree to provide that and other information, Young said in his letter.

In his reply, dated Aug. 12, Huhn said: "We have begun an internal inquiry into your questions and will respond as soon as possible after its completion."

As of late last week, Young said he had not yet heard from Huhn or IBM. Huhn is also believed to be handling the Justice Department's request of IBM.

Affiliated alleged that IBM's formation of ISSC did not clear the computer giant of wrongdoing because ISSC continues to use IBM's sales force and name and to receive special discounts. Furthermore, ISSC continues to benefit from outsourcing jobs obtained by IBM prior to ISSC's formation, Affiliated claimed. Affiliated has urged that IBM be stripped of all pre-ISSC contracts.

"No matter how this turns out, IBM has had the effect of lowering prices to customers by bringing margins down to more of a manufacturing level than a service level," observed Warren Gallant, a principal at Technology Partners, Inc., a Houston consultancy that has helped negotiate IBM outsourcing deals for Riggs National Bank and Matson Navigation.

"I believe their prices are competitive but certainly not advantageous over the competitors," Gallant said. "If the decree came down and kept them from staying in the business, the margins could creep back up."

The Justice Department had asked ITAA to solicit members for input once before, but according to an ITAA spokesman, the "silence was deafening" when ITAA asked for comments. The ITAA spokesman noted that "there were some who did know about things but didn't want to say it." He further explained that for some members, "either there wasn't anything that bothered them, or if there was, they didn't want to talk about it."

Del Monte feeds EDS its IS operations

BY KIM S. NASH
CW STAFF

SAN FRANCISCO — Del Monte Foods canned its entire information systems operation last week, signing an estimated $150 million, 10-year outsourcing deal with Electronic Data Systems Corp. The contract, which Del Monte officials said will save the food processor an undisclosed "significant" sum, reverses a flat rejection of EDS outsourcing less than two years ago.

The agreement calls for EDS to purchase all Del Monte hardware and software, as well as offer positions to 100 of the food processor's 105 IS employees. EDS will provide all telecommunications, IS operations and applications enhancements and maintenance for Del Monte. The firm currently runs 85 financial, inventory and other applications on IBM 3090 mainframes as well as a recently completed distributed IBM Application System/400-based manufacturing system [CW, Oct. 19].

Del Monte contracted with EDS in March 1991 to help with a massive $12.4 million downsizing project that would move the food maker's manufacturing systems from IBM Series/1 machines to AS/400s. Del Monte declined an outsourcing offer from EDS at that time because it was completing a leveraged buy-out from Nabisco Brands, Inc., according to David MacPherson, chief information officer.

In addition to being unfamiliar with EDS back then, IS had to take a backseat to the business issues of seceding from Nabisco. "It was a matter of priorities," MacPherson said.

However, a poor U.S. economy forced the company to reconsider farming out IS. "If you can't grow the business the way you thought, you have to find a way to reduce expenses," MacPherson explained.

Officials declined to specify projected savings, but much of it is likely to stem from the elimination of IS salaries. All 100 Del Monte IS staff members are expected to transfer to EDS, officials said. The remaining five will stay at Del Monte to "represent our needs to EDS," MacPherson said.

Hardware upgrades will be handled as an incremental expense separate from the base fee Del Monte has paid EDS, MacPherson said.

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Sybase products challenge Oracle 7

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Sybase, Inc. is firing a round-the-world salvo at its largest competitor, Oracle Corp., this week, briefing users and analysts across the globe on its plans to distribute client/server computing across the enterprise.

The announcement of Sybase's System 10 product line is meant to assure users that Sybase will be delivering industrial-strength database tools for high-volume on-line transaction processing applications beginning next year.

However, Sybase does not intend to give specific delivery dates for the System 10 product line, longtime users said last week. "They've been burnt in the past by promising [products] and not delivering in certain time frames," said David Truch, former president of the Sybase International User Group and a senior technologist at BP Exploration Alaska, Inc. in Anchorage.

"We're going to be painting the big picture, but we will not be giving a whole lot of detail," agreed Perry Mizota, Sybase's director of strategic marketing. "We want to address some of the requirements of the next phase of client/server computing."

Flexibility key

That kind of long-range planning is fine with many users, who just want to be assured that the $160 million company will be able to respond to whatever products its relational database management systems competitors can dish out.

"They've been working on some of this stuff for two years or more," said Bill Soper, manager of information services at Chevron Canada Ltd. in Vancouver, B.C. "We saw some of this stuff at the design stage, but things were getting so complex out there in terms of what people are trying to do with these databases that [Sybase] decided to show [the products] now."

Industry analysts agreed that time is of the essence in unveiling System 10 products this month, as Oracle prepares to ship its new database in volume. "Sybase is feeling the heat of [Oracle's] Version 7," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass.

There are technical issues, too, including many related to the management of distributed DBMSs. Oracle claimed that Sybase's two-phase commit methods are awkward, requiring extra lines of programming for real-time transaction processing. That claim has been answered, in part, by System 10's Replication Server for updates of multiple, distributed servers.

Likewise, System 10's Navigation Server addresses Informix Software, Inc.'s parallel data query (PDQ) feature for its Informix 6.0 database, due in 1993. The PDQ feature speeds throughput by sending complex queries to multiple CPUs.

User patience wearing

However, some users noted that they could not wait much longer for forthcoming Sybase products, including the Replication Server. "It's not happening fast enough," said John Webb, manager of database administration at Moody's Investors Services, a securities rating firm in New York.

A year ago, Moody's started using a third-party product, the Multi Server Option from AFIC Computers, Inc. in Jerusalem, to update servers in real time across its local- and wide-area networks.

User enthusiasm runs highest for the Replication Server, which some said is expected to ship in the second half of 1993. "I think that anything that helps us manage a distributed database environment is a welcome addition," Soper said. "There will be automatic updates with less programmer intervention. It's a more intelligent way to handle operations."

The oil and energy firm is building a network of 30 Sybase SQL Servers in Western Canada that will update parent Chevron Corp.'s databases near San Francisco.

The value of the Replication Server lies in the ability of information systems managers to control network costs, said Dirk Epperson, vice president of research and development at Hill Arts & Entertainment, Inc. in Emeryville, Calif., which designs Sybase DBMSs for ticket vendors.

"We will be able to make the choice of what 'near real time' means to us and to make decisions based on how much it will cost to make each update," Epperson said.

Sybase 10 ingredients

Sybase 10, which is expected to begin shipping next year, will consist of the following components, according to comments made by Sybase executives in London and the U.S. last week:

- The Replication Server, a Sybase SQL Server system said to allow a master server to update multiple remote servers even if they are geographically dispersed. The updates are done in "near real time" so as not to choke networks with two-phase commit updates that lock servers.
- Sybase SQL Server 5.0, an enhanced database engine capable of storing very large databases comprising multiple gigabytes of data. Speed, performance, database security and data recovery have been enhanced in this upgrade.
- Navigation Server will support the division of complex database queries into small pieces for processing on parallel server systems. Sybase has been working with NCR Corp. for some time on this product, which reportedly can increase throughput tenfold or more when used on an NCR 3600 server.
- OmniSQL Gateway will allow users to write stored-procedure code in Sybase's proprietary Transact/SQL language, then use those applications to run against Sybase or Oracle databases.
- Performance monitors and network management software designed to support the use of Sybase database servers in high-volume on-line transaction processing environments. Additional IS controls are considered key to wider acceptance of large Sybase databases in IBM mainframe shops.

Compiled by IDG News Service correspondent Ron Condon and senior West Coast editor Jean S. Bozman.

Oracle Glue API debuts

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. last week announced software that it said will affix Windows applications directly to Oracle products through Microsoft's Dynamic Link Libraries (DLL).

Oracle Glue 1.0 is an application programming interface that allows Windows developers to tie programs written with Microsoft's Visual Basic and Excel to a variety of back-end database servers, including Oracle's SQL Net, IBM's DB2 and Borland International, Inc.'s Paradox and dBase.

Lotus Development Corp.'s 1-2-3 spreadsheet and AmiPro word processor applications are currently supported.

Oracle Glue is slated to be available in April 1993 for $2,995 through Oracle's direct sales force and via the firm's telephone sales. The product includes a license for unlimited runtime versions of Oracle Glue.

There is an additional $899 yearly maintenance fee for upgrades and support.

Downsizing pushes IBM DBMS revamp

CONTINUED FROM PAGE 1

(see story this page).

"I've heard [IBM] mention the AIX database at briefings, but I just tune it right out," said Bob Denison, open systems development unit manager at Wausau Insurance Cos. in Wausau, Wis., one of IBM's early commercial sites for the RS/6000.

"It makes sense for IBM to do this because not every customer is going to be as independent as one our size or willing to integrate their own stuff," said Mark Schmidt, vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark. The retailer uses Unix gear from NCR Corp., Hewlett-Packard Co. and IBM.

"We're a large Informix user now, but we would obviously want to take a look at an AIX [database], just as we look at all new technology," Schmidt added.

Analysts were similarly skeptical. Richard Finkelstein, president of Performance Computing, Inc., a Chicago-based consultancy, said, "There's no real vision here; IBM is just tossing things out like it's an inventory sale."

"Inevitably, DB2 sales will slow down as mainframe sales slow," said Colin White, president of Database Associates International, a consulting firm in Morgan Hill, Calif. "But IBM will find it very difficult going in Unix because they have never been able to add new functionality, test it and get it out the door as quickly as their competitors. It will require fundamental changes in IBM and its development organizations."

Nor is Version 3.1 of DB2 expected to help stem the downsizing tide. "I don't expect it to make a difference either way," White said. "It won't be any major reason for people to stop downsizing, although it will be good for existing DB2 users."

Mainframe distribution

The new DB2 will allow a mainframe to distribute portions of database processing to other computers, with the first machine coordinating the transfer. If a transaction is interrupted, the first machine decides whether to commit or abort the process. This feature is known as a distributed unit of work.

IBM officials disputed the negative view of its database moves. Al Zollar, DB2 product manager, said IBM expects to keep growing — albeit slowly — the number of DB2 licenses, which now stands at 6,000. About 40% of those are in the U.S.

"There's been shrinkage" in the number of U.S. DB2 licenses," Zollar acknowledged, "and growth outside. Overall, it's been a flat picture." Nonetheless, he said, IBM believes it can still increase DB2's market share on existing MVS platforms, particularly in the data query market. "I do see opportunity for DB2 growth," he said.

Extended relations

IBM's AIX relational database will have the following features:

- Built on the OS/2 Data Manager.
- Designed for a client/server local-area network architecture.
- SQL-based but not object-oriented.
- Equipped with an industry-standard interface to connect with IBM and non-IBM transaction monitors.
- Operating system-independent — such as Oracle Corp. or Sybase, Inc. — databases.
- Tightly integrated with DB2 on the mainframe and OS/2 Data Manager on the desktop.

Cincom soups up Supra DBMS

BY JOHANNA AMBROSIO
CW STAFF

CINCINNATI — Not content to let the distributed computing world pass it by, Cincom Systems, Inc. has revamped its mainframe Supra database manager to run on local-area networks and under Unix.

At the same time, Cincom managers said, the company has delayed the release of Supra Release 3.0 — its entry into the distributed database market — until March. It was originally due out on Oct. 15, but it turned out to be more challenging to get out the door than the company had originally thought.

The revamped database manager — called Supra Server, or Supra Version 2.4 — is receiving high marks from analysts for technical merit.

But some observers said Cincom's ability to market effectively against the major Unix contenders — including Oracle Corp., Ingres Corp. and Informix Software, Inc. — is anything but a done deal.

Nor are the other Unix database vendors sitting still. Sybase, Inc. is preparing a major announcement for next week, and IBM is slated to unveil its long-awaited AIX data manager next year (see stories pages 1 and 14).

Additional enhancements

Other features include forward and rollback recovery and hot backup, which allows administrators to back up the database without having to bring it down.

Supra Server runs under a variety of Unix-based operating systems, including those from Sun Microsystems, Inc.; Sequent Computer Systems, Inc.; the NCR division of AT&T; IBM; Hewlett-Packard Co.; and Digital Equipment Corp. It also supports LAN protocols including DECnet, LAN Manager, LAN Server, IBM's LU6.2, Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines.

Prices for Supra Server, available now, range from $2,000 to $150,000, depending on operating platform.

Consultant Shaku Atre, president of Atre, Inc. in Rye, N.Y., said, "It really looks very good. This could be a renaissance for Cincom."

Finding a new market

Still, technology may not be enough. Colin White, president of Database Associates International, a consultancy in Morgan Hill, Calif., said, "Cincom has good technology but like others has had difficulty selling it. It's a question of marketing. They have to appeal outside of their current customer base."

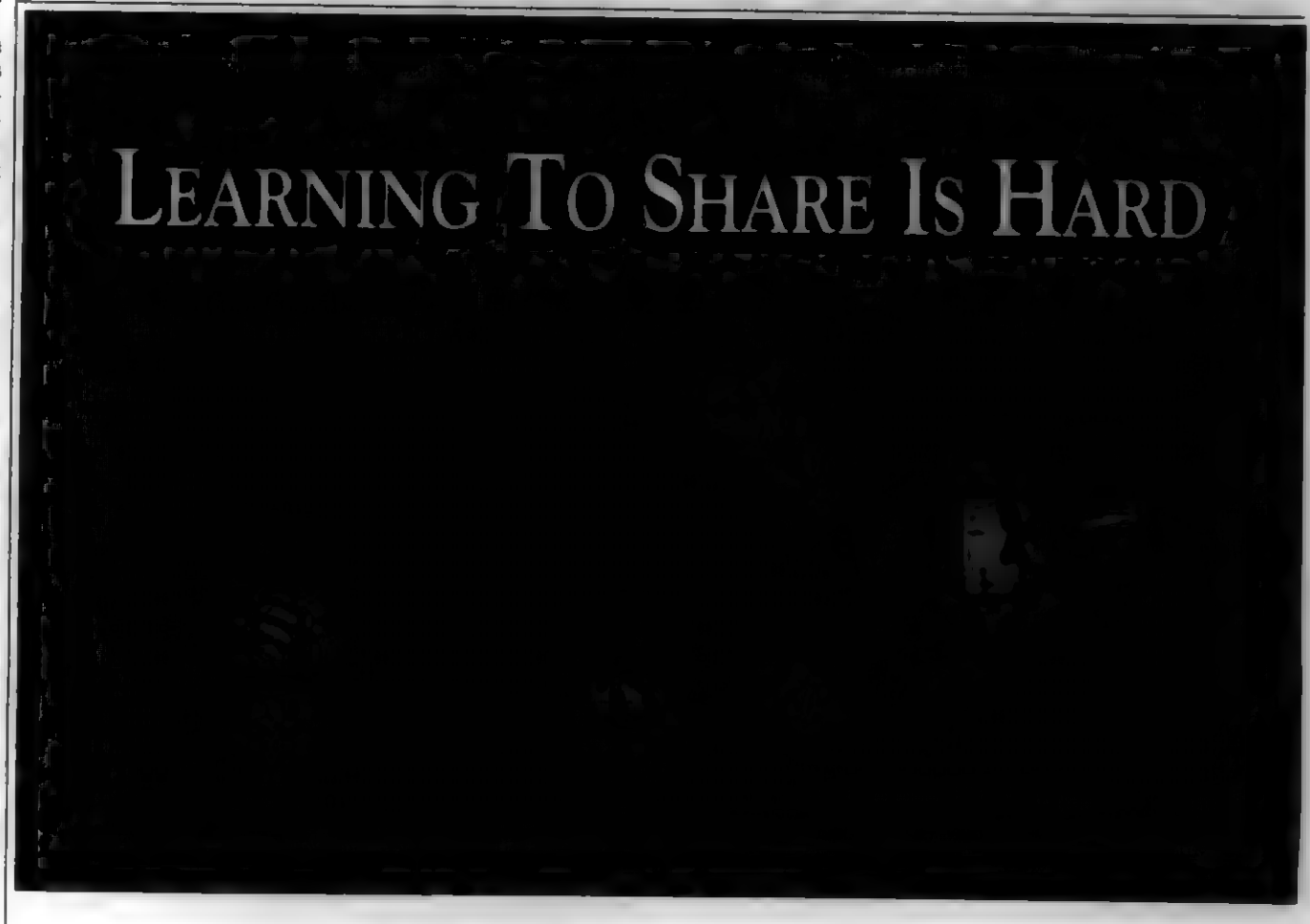
Dave Bunker, senior director of marketing and business planning at Cincom, said, "This is the most aggressive launch campaign in Cincom history." The launch budget of approximately $4 million will include advertising, trade show booths and seminars, among other things.

Craig Lincoln, manager of information services at Star Cutter Co., a manufacturer in Farmington Hills, Mich., said he is looking forward to implementing Version 3.0 at his VAX shop because "it makes sense to build independent databases to reside in the plants." But he said he is not disappointed with the six-month delay for the distributed Supra because "Version 2X is already doing a lot for us." Lincoln said he does not plan to install any Unix computers.

Cincom's basic strategy is to "bring the mainframe database, with all those reliability and security features, down into the client/server world," said Richard Finkelstein, president of Performance Computing, Inc., a Chicago-based consultancy.

Finkelstein said one important technical difference between Supra Server and other Unix database systems is a feature called updated views. It allows database administrators to change the structure of database tables without affecting the transaction.

"They're the only ones to do that," Finkelstein said.



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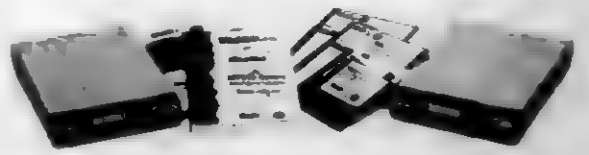

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NEWS SHORTS

High tech will not top Clinton agenda

President-elect Bill Clinton's proposed high-technology policy initiatives are not likely to make the new administration's agenda in its first 100 days, a Clinton spokesman said last week. Clinton's policy includes government investment in national communications networks, diversion of federal research and development funds from defense to civilian sectors, education and training programs and investments in private industry consortia. One immediate priority that may affect high technology is an emphasis on an incremental tax credit for investments in new plants and equipment, including computer systems.

CSC seeks giant outsourcing deal

Claims that the outsourcing megadeal is dead apparently have not made it to Australia. Computer Sciences Corp. (CSC) has started negotiating what it says will be a $1.5 billion, 10-year accord with Australian Mutual Provident Society, a Sydney-based insurance group. A tentative agreement calls for CSC to acquire Australian Mutual's data processing subsidiary, Computer Sciences Australia, which, ironically, CSC once jointly owned. CSC would pick up 1,000 employees from the subsidiary and roughly 600 from an information systems shop at the parent company. About $80 million in annual revenue would result from existing business with the parent company — which buys only some of its processing from the subsidiary and other clients — and $70 million would come from other business.

Solaris 2.1 debuts

With 1,300 bugs exterminated and a swarm of new features added for commercial account appeal, the Solaris 2.1 Unix operating system made its debut last week from SunSoft, Inc., a Sun Microsystems, Inc. software subsidiary. Sun officials said some 800 of the most popular Scalable Processor Architecture applications are now being ported to Solaris 2.1, which is slated to ship on Sun's new systems next month and on Intel Corp. platforms next year. Desktop pricing is $795.

AT&T plans to buy stake in McCaw

AT&T last week said it is negotiating a $3.8 billion investment in McCaw Cellular Communications, Inc., the nation's No. 1 cellular company and sixth-largest provider of paging services. The equity stake, which officials said they expect to complete in first- or second-quarter 1993, would speed the deployment of a "seamless, nationwide network for cellular and wireless services." AT&T would grant McCaw a long-term license to use the AT&T name and give it access to AT&T Bell Laboratories.

DEC eases Canadian licensing

Digital Equipment of Canada Ltd. is changing its marketing practices in response to concerns voiced by the Canadian Bureau of Competition. The bureau objected to an "integrated service policy" whereby DEC's hardware servicing was tied to software servicing and pricing, impeding third-party maintainers and increasing costs for certain end users. DEC said it will change its practices in 1993, allowing for separate price quotations and stand-alone purchases of products and maintenance services from the vendor.

Short takes

Ethernet switching start-up **Kalpana, Inc.** in Santa Clara, Calif., and **Sun Microsystems Computer Corp.** said last week they will jointly develop products to address network congestion problems in Ethernet networks that contain high-speed workstations. . . . **AT&T Microelectronics** said it will build the Mobitex two-way wireless data-transmission architecture into its V.32 bis and V.17 bis modem chip sets, allowing modem makers to support both terrestrial and wireless communications in one package. . . . **HP** announced its developer's environment for the **Open Software Foundation**'s Distributed Computing Environment last week and said the software will ship in early 1993, at prices ranging from $395 per network client to $2,000 for the application development tools. . . . **Toshiba America Information Systems, Inc.** is expected to sign a strategic agreement with **MediaShare Corp.** that will make it the exclusive distributor of MediaShare's Mambo Digital Video Interactive Board. The product, which is used in Toshiba's T6400DXC and T6400SXC portables, costs $1,699.

Exchange to implement ATM

Pacific Stock Exchange plans to replace physical trading floor next year

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — Although conservatives claim it will be years before users turn to Asynchronous Transfer Mode (ATM) networking in a big way, the Pacific Stock Exchange plans to embark whole-hog on an ATM network next year if the technology becomes widely available.

The exchange intends to leverage the technology to replace its physical trading floor with a virtual one so that traders can conduct financial transactions from "wherever they find it most efficient," said David Eisenlohr, vice president of telecommunications.

Rather than the exchange floor, "this is likely to be a brokerage or other member firm's regional office, where they can put a Pacific Stock Exchange trading desk next to others that contact other exchanges," he explained.

Eisenlohr's organization would like to run an initial virtual trading floor pilot next July, then move to a nationwide pilot in late 1993.

The project would entail delivering multiple, real-time news feeds and other forms of market information to far-flung traders.

Eisenlohr said there are three reasons the exchange is looking to ATM — the technology hopeful for one day blending local- and wide-area networks into one cohesive, high-bandwidth switched network — to build the virtual trading environment:

- The security afforded by ATM's virtual point-to-point connections is critical to a financial trading environment. Like a telephone call, ATM establishes a temporary end-to-end connection for each transmission.
- The speed of ATM connections — into the gigabit per second range — is necessary for the half-second response times required in the hurried buy-and-sell market, particularly as market data becomes more graphical and bandwidth-hungry.
- The purported long-term viability of the technology means the company could ease up on continually deploying new technologies as they are born.

"U.S. businesses cannot afford to follow the technology game and keep investing in the box of the month," Eisenlohr observed. He added that "the No. 1 problem facing businesses is how to answer phones better and deliver better service. If you're continually putting time, money and effort into technology, you're not doing that."

Eisenlohr said he plans to spend the next few months trying to blue-sky the problems he is likely to face. So far, the biggest hurdle is that "ATM isn't here yet, and there is no other [high-bandwidth] integrated voice and data solution today," he said.

The exchange is looking at Integrated Services Digital Network for "smaller trading functions that may only have one or two phone lines and a couple terminals," he said.

In ATM's absence, the Pacific Stock Exchange is also investigating Switched Multimegabit Data Service (SMDS) and frame relay, alternative high-speed networking technologies that are further along in development, though Eisenlohr questioned their migration path to ATM.

At a recent Interop '92 Fall session, however, the presidents of the ATM, SMDS and Frame Relay Forums said users investing in frame relay can use the technology to access ATM down the road (see story page 57).

In addition, 1993 should be a "big year for ATM," observed Steve Bell, director of product marketing at Hughes LAN Systems, Inc. in Mountain View, Calif., one of myriad LAN vendors that have announced plans for ATM deployment next year.

Some ATM services should also emerge from long-distance telephone carriers during the year, said Fred Sammartino, president of the ATM Forum, who said he sees ATM as being about a year away from being cost-competitive enough for mass deployment.

Start-up firm delivers 'fast Ethernet' connection

BY LYNDA RADOSEVICH
CW STAFF

SAN JOSE, Calif. — If network standards are not an issue, users whose interest was piqued by last month's announcements from Grand Junction Networks, Inc. and Hewlett-Packard Co. will not have to wait as long as anticipated for high-speed transmission over Ethernet. Start-up MicroAccess, Inc. last week revealed it is shipping a $699 network interface card for 100M bit/sec. over Ethernet.

The announcement fell one week before today's Institute of Electrical and Electronics Engineers, Inc. (IEEE) 802.3 committee meeting, at which 100M bit/sec. Ethernet standards will be addressed and where MicroAccess plans to present its "fast Ethernet" technology.

Industry giants HP, AT&T, 3Com Corp., Synoptics Communications, Inc., Sun Microsystems Computer Corp. and start-up Grand Junction Networks will present proposals at today's meeting as well.

However, pending standards approval, these vendors said they do not expect to announce products until the end of 1994 or later.

Analysts said the MicroAccess announcement is significant because it sets a low ceiling on the price of the technology. "There is no way for prices to go but down," said Mary Modahl, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

Despite the low costs, analysts agreed that the lack of standards would limit the growth of MicroAccess' fast Ethernet technology.

Some users — attracted by their availability and low price — are considering using MicroAccess cards to deploy small, departmental local-area networks.

For example, James Watson, manager of the advanced data processing laboratory at Sparta, Inc. tested MicroAccess's OptiLAN fast Ethernet Industry Standard Architecture (ISA) cards between four computers using six-pair unshielded twisted-pair wiring. The 25-minute installation process was easy, and the cards supported 30M bit/sec. transmissions, which were limited only by the ISA bus, Watson said. He plans to deploy a nine-node LAN in two weeks.

What price speed?

The costs of 100M bit/sec. Ethernet using MicroAccess' OptiLAN components are as follows:

16-bit XT/AT network interface card	$699
32-bit EISA network interface card	$1,595
400-ft unshielded twisted-pair wiring (6 pairs)	$28
400-ft shielded twisted-pair wiring	$72
Eight-channel star hub	$1,995*
Repeater	$995*

*Repeaters and hubs are optional components

CW Chart: Janell Genovese

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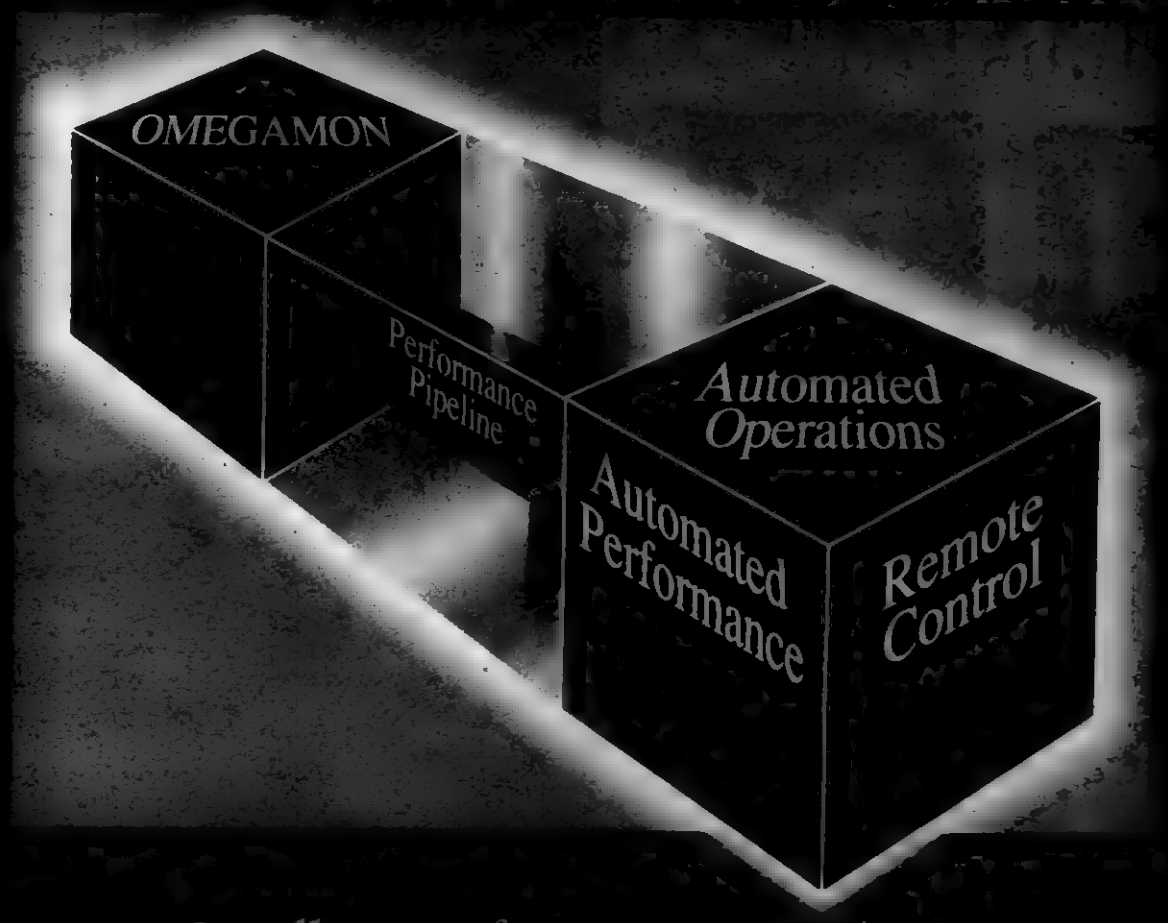

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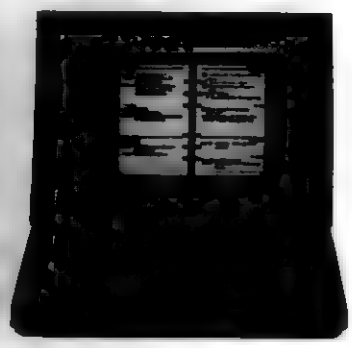

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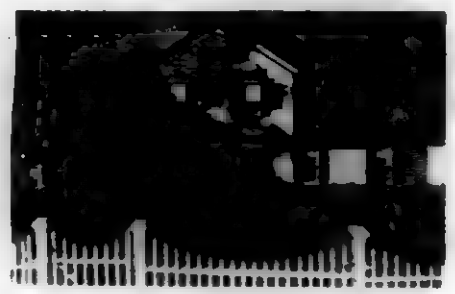

that money doesn't grow on one, the ThinkPad 300 series has the same slim design and an even slimmer price tag. And all ThinkPads are expandable, with a range of add-on products available.

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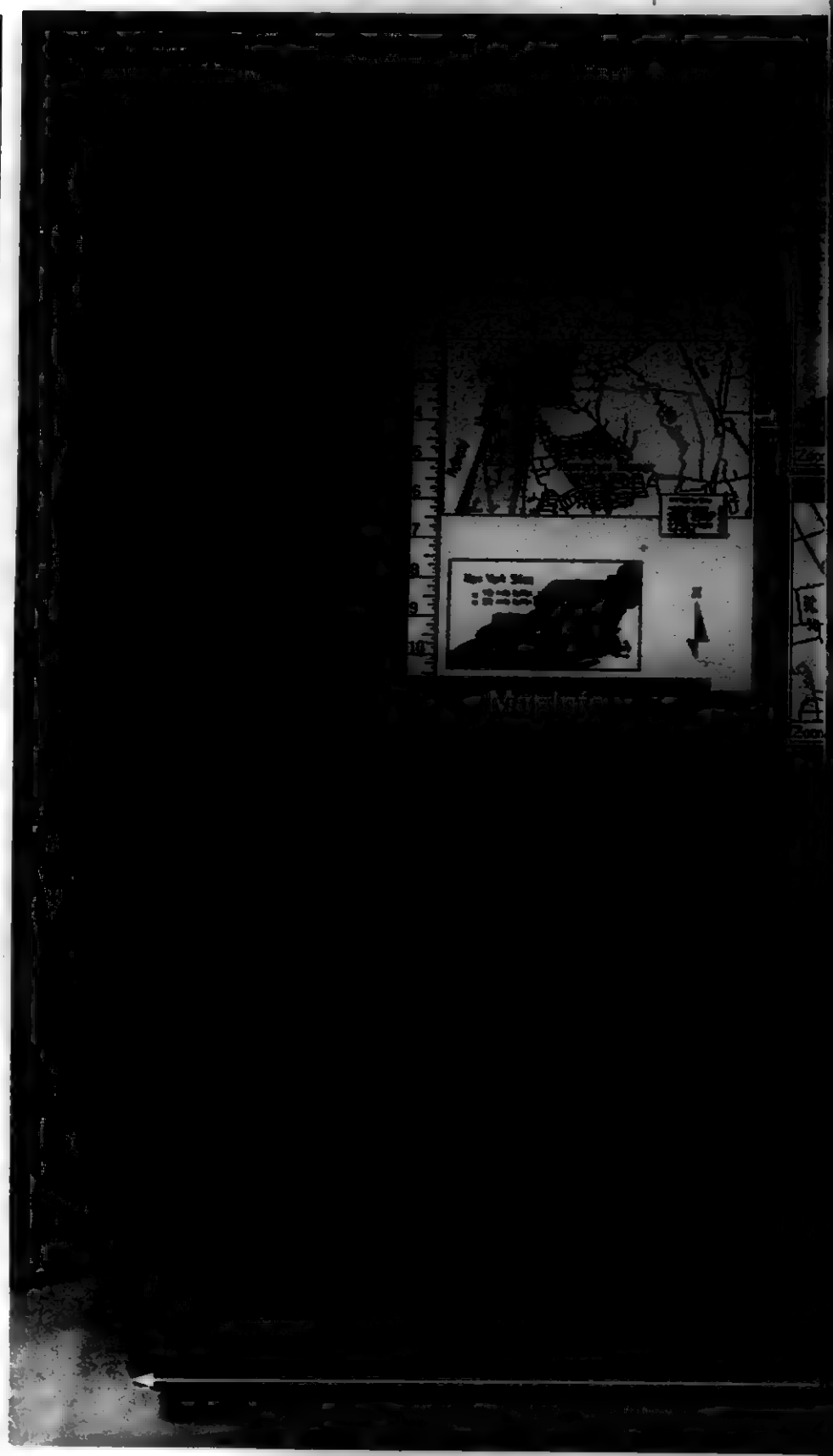

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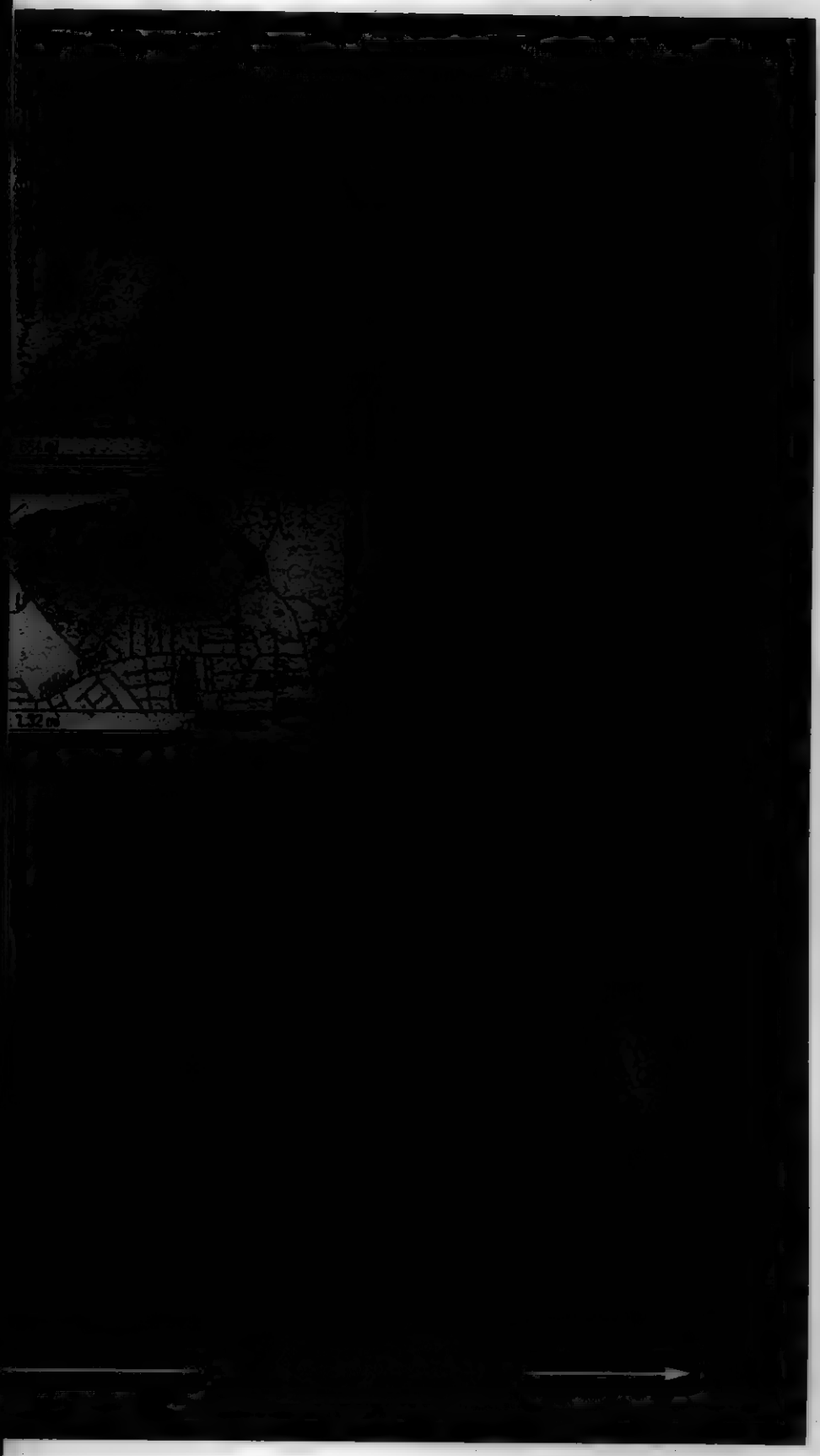

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ThinkPad	Model 700C	Model 700	Model 300
Processor	486 SLC/25 MHz	486 SLC/25 MHz	386 SL/25 MHz
Display	10.4" Active Matrix Display 256 Color Screen	9.5" Monochrome Display 64 Grayscale Screen	9.5" Monochrome Display 64 Grayscale Screen
Battery Life†	2–4 Hours	3.8–7.5 Hours	4–10 Hours
Weight	7.6 Lbs. with Battery	6.5 Lbs. with Battery	5.9 Lbs. with Battery
Warranty	3 Years (International)	3 Years (International)	1 Year (International)
Price††	$4,350	$2,750	$2,375

†Depending on usage and configuration. ††MSRP. Dealer prices may vary.

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CIM worries don't stall USAF overhaul

CONTINUED FROM PAGE 1

across all U.S. military branches.

Materiel's consolidations "are still meaningful" as an initial step to these broader plans, "provided we do it in lockstep with what the DOD is doing," said Paul Shahady, assistant deputy chief of staff for communications computer systems at Materiel. Otherwise, "we'll have to do the whole thing all over again" as part of the broader CIM effort, he added.

"It's a real trade-off," said Maj. Jack Stackhouse, chief of systems engineering and office automation programs at Materiel headquarters. "We have to look at what CIM will come down with and [yet] incorporate changes" that are necessary in the interim. For example, he said, "in some cases, such as database consolidation, it is advantageous to spend money [now]; in others, it is not a given that CIM will bring standardized systems across the DOD."

How much of Materiel's own IS facilities and projects it will retain during the next few years is another concern. A newly released CIM directive called Defense Management Review (DMR) 918 will give "overall responsibility" for data processing installations, central design and software activities to a central DOD agency, Shahady said. "At this point, we don't know how many computer assets will remain in Materiel."

The upcoming changing of the guard in the U.S. government will cloud not only the fate of Materiel IS projects, but also the fate of broader CIM efforts proposed by Director of Defense Paul Strassman, according to Jim Kerrigan, a private consultant based in Reston, Va.

A major upheaval in the executive branch, such as the one now in progress, tends to disarrange even seemingly solid projects such as CIM, said Kerrigan, who was the senior official of the Treasury Department at the time of the last party change in the administration, 12 years ago.

"So Materiel's modernization efforts may end up being more valuable than they expect. In this period of uncertainty, there are no guarantees that any major defense program will continue intact," Kerrigan said.

Indeed, Air Force logistics modernization projects have had a history of being shunted from one program to another, Kerrigan said. At one point, the Air Force Computer-aided Acquisition and Logistics Systems (CALS) project was canceled, and the Air Force was told to use the Army's CALS program, renamed Joint CALS. "That's been moving along, but it's not clear how much the Air Force has embraced it."

Materiel is the result of a merger, finalized in July, that combines Air Force Systems Command, which handles the design through acquisition phases of weapons systems, with Air Force Logistics Command, which handles maintenance, deployment and supply. Based at Wright Patterson Air Force Base in Dayton, Ohio, Air Force Materiels Command comprises some 126,000 civilian and military personnel, who are responsible for 52% of the budget and all weapons systems development within the Air Force.

Materiel expects a 10% to 30% reduction in overall personnel as a result of DMR directives during the next four years. In line with these reductions, the merger's central aim is to improve weapons' effectiveness and readiness within the Air Force by streamlining and consolidating the organization that handles weapons systems, all the way from research and development to the end of the system life cycle, Shahady said.

Prior to the merger, Systems Command would manage all Air Force requests for proposals through production stages of a new weapons system and then hand them over to Logistics Command, which would take care of deployment and maintenance.

Now, Air Force Materiels Command appoints a system program director to oversee the entire process and resolve any conflicts between Logistics, which wants the most "sustainable and maintainable" weapons possible, and Systems, which wants to "field the most capable weapon system possible," Shahady said.

Part and parcel with the merger are projects to consolidate and standardize IS and "make computer support a commodity across the whole command," Shahady said.

Materiel is far from such uniformity. Logistics follows a centralized systems philosophy based primarily on IBM mainframes. Systems, with its heavy emphasis on R&D of weapons systems, has supercomputer centers that house Cray Research, Inc. supercomputers and client/server systems combining Digital Equipment Corp. VAXclusters and a mix of local-area networks. The latter include Novell, Inc.'s NetWare, Tiara Computer Systems, Inc.'s 10Net, Transmission Control Protocol/Internet Protocol and the International Standards Organization's Open Systems Interconnect (OSI).

Ultimately, Materiel hopes to migrate to a client/server architecture based on standards such as Posix and OSI to ensure interoperability, if not uniformity, across the various systems. It is trying to keep to the Government OSI Program and other DOD directives.

The command also hopes to save between 13% and 30% in recurring operating costs from the move, based on the results of similar projects, Shahady said. Materiel's IS budget (hardware and software, not personnel salaries) is $425 million.

The Systems side of the house is three years into a project to migrate to a standards-based client/server environment by the late 1990s. However, the Logistics side is less eager to throw out the host systems that it has just spent millions of dollars modernizing and consolidating, Shahady indicated. Started in the mid-1980s and slated for completion within [redacted] months, that project is expected to realize a savings of between $70 million and $75 million from the consolidation of 44 IBM MVS hosts down to eight, housed in five data centers, he added.

The logistics modernization effort is one Materiel project that is in danger of being made obsolete by upcoming CIM initiatives, Shahady said. In particular, the DMR 918, still in the planning phase, "will call for another round of consolidation because Strassmann's vision is to create megacenters servicing large chunks of the customer base" across the Army, Navy and Air Force, he added.

Shahady expressed the hope, however, that Materiel's current consolidation efforts will become the initial steps to the full, DOD-wide consolidation under CIM, which is not expected to be completed for another seven to 10 years.

Some ongoing Materiel projects may be turned over to the Defense Information Systems Agency (DISA) when DMR 918 kicks in, Shahady said. Even so, the effort will not be wasted: "We can say, 'We tried this; it works. Here, DISA — we recommend you implement it,'" Shahady said.

Colossal consolidation

Another high-priority project now in the works at Air Force level involves consolidating "base-level" systems scattered across various Air Force bases into five regional processing centers running Unysis Corp. Model 622 hosts.

These systems will run applications such as personnel, finance and budgeting for the entire Air Force, said Paul Shahady, assistant deputy chief of staff for communications computer systems at Materiel.

The project, which was initiated by the DOD under Defense Management Review 924, involved moving from more than 300 mainframes, minicomputers and superminis to 21 large Unisys mainframes.

So far, two centers are up and running, with the rest slated to be on-line by May 1994.

Other Materiel projects also have the potential of feeding into the broader CIM effort. For example, the center is now combing Materiel command bases in search of "best-of-breed" office automation, network, electronic mail and business process support applications.

The aim is to ensure that each time a new weapons system is initiated, the task force team put in charge has a "set of packages that we've proofed and tested, so we don't have to reinvent the wheel," according to Shahady.

ELISABETH HORWITT

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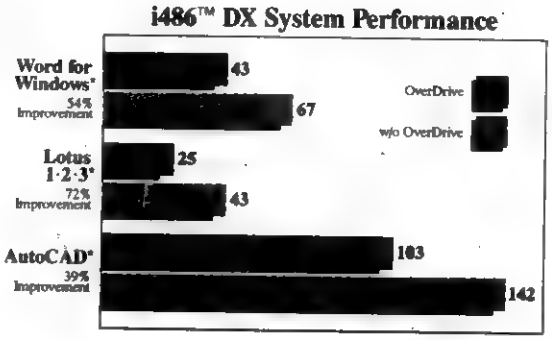

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SAS unveils initial packages for Windows

Spreadsheet, executive information systems, data analysis and natural languages tools bow

BY GARY H. ANTHES
CW STAFF

CARY, N.C. — SAS Institute, Inc. last week introduced its first set of products for Microsoft Corp.'s Windows. The products — six are new for the desktop and the others were released earlier for IBM's OS/2 — have been shipped to 680 beta-test users and will be generally available early next year.

SAS for Windows 3.1 is targeted at applications developers and end users. It includes a spreadsheet package, object-oriented tools for building executive information systems, a graphical data analysis tool and a natural language query tool (see story below).

The Federal Reserve Bank of Chicago uses SAS products in its research department for economic modeling and forecasting, and it recently added the Windows products to its stable of SAS products for MVS, DOS and OS/2 Release 1.3. Windows will provide a bridge solution for 100 users moving from DOS to OS/2, said Scott Johnson, a programmer at the bank.

Johnson said that at present, most user workstations — 80386-based, 20-MHz machines with 8M bytes of memory — are not hefty enough to run OS/2 well but are adequate for Windows. The bank will transition its applications from DOS to Windows to OS/2 as more powerful workstations are brought in, he said.

Johnson also said analysts would use the new SAS/Insight tool for data visualization, "to get an early feel for what the data looks like." He said it should be a big improvement over the text-based graphics from the DOS-based SAS products.

US West in Englewood, Colo., has the SAS Windows release and is planning to convert existing DOS licenses for 50 users to Windows when the production release is available.

Marvin Schwartz, systems programmer, said the company will probably move to Windows New Technology (NT) when it is available next year. "True 32-bit multitasking would be desirable because SAS is such a big product. [NT] would handle it better," he said.

No enhancement

Some users said they are unhappy with SAS' decision to support but not enhance the DOS version of SAS.

"There are researchers in our labs who are not interested in moving to either OS/2 or Windows," said Larry Bridges, corporate SAS coordinator at Eli Lilly & Co. in Indianapolis. "SAS has frozen [PC SAS 6.04], forcing the customer to go to either OS/2 or Windows."

An SAS spokeswoman said SAS will continue to support the existing release of SAS for DOS but cannot bring it forward because the operating system will not support the memory and graphical user interface needs of the newer SAS products.

SAS developed OS/2 versions of its desktop products first but found demand for Windows "overwhelming" and "surprising," according to Randy Betancourt, manager of workstation systems group sales and marketing. He said the clamor for Windows was spurring SAS to speed development of the Windows NT release.

SAS said it will release a beta-test version of the SAS System for OS/2 2.0 this week, a version for Unix in the second quarter next year and one for Windows NT in mid-1993.

Opening Windows

Desktop products introduced with the SAS System for Windows 3.1 include the following:

•**SAS/Calc:** Spreadsheet package that supports 120 functions, including three-dimensional views.

•**SAS/EIS:** Object-oriented development environment to build EISs.

•**SAS/Lab:** A sophisticated statistical tool for laymen.

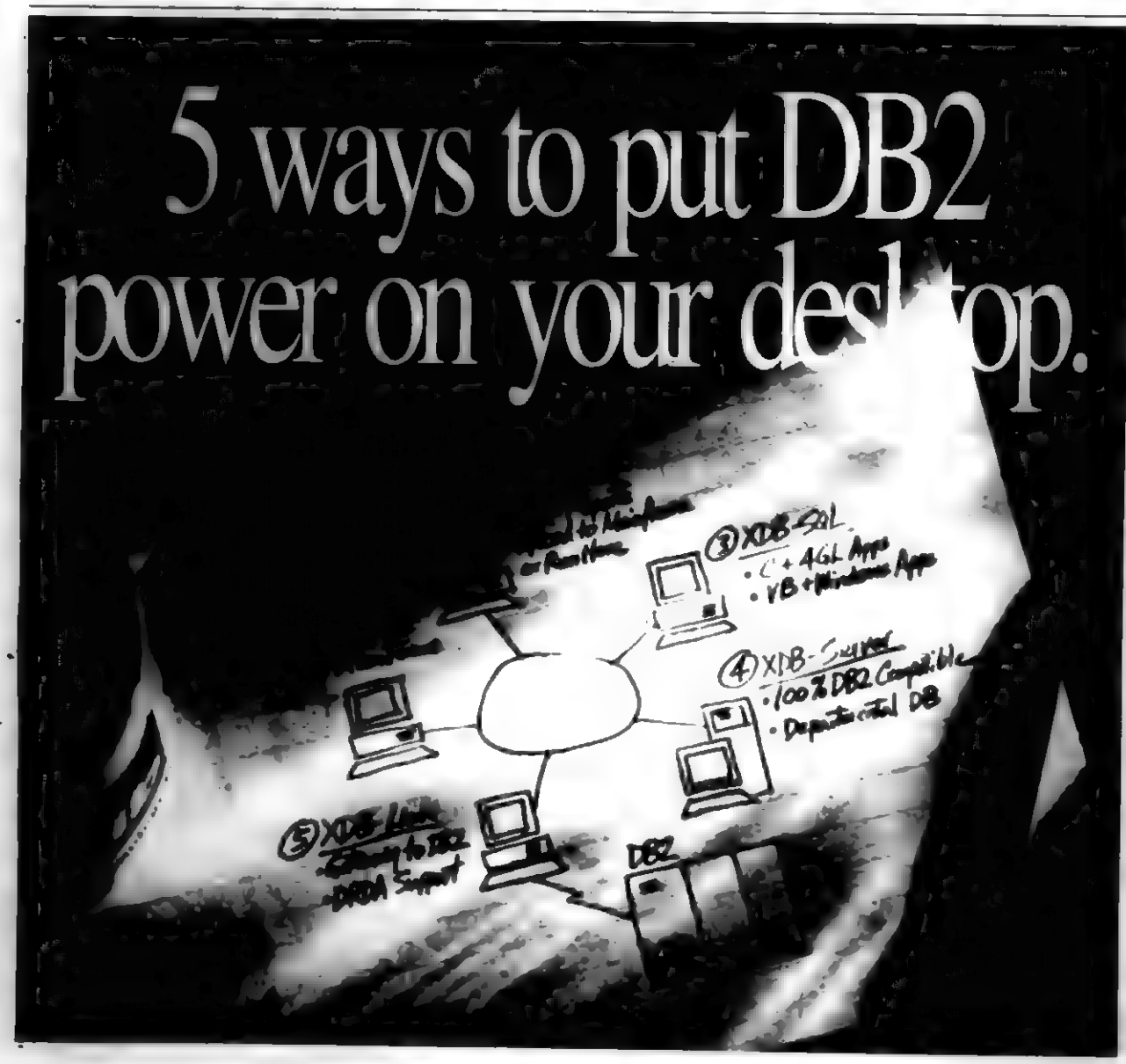
•**SAS/Insight:** An interactive graphical data analysis tool.

•**SAS/English:** A natural language interface for retrieving data from external sources and SAS data sets.

•**SAS/Access for PC File Formats:** Provides links to the major database management systems.

Price: First workstation, $695 for first year and $300 annual renewal; 10 workstations, $3,395 for first year and $1,650 renewal.

General availability: First-quarter 1993.



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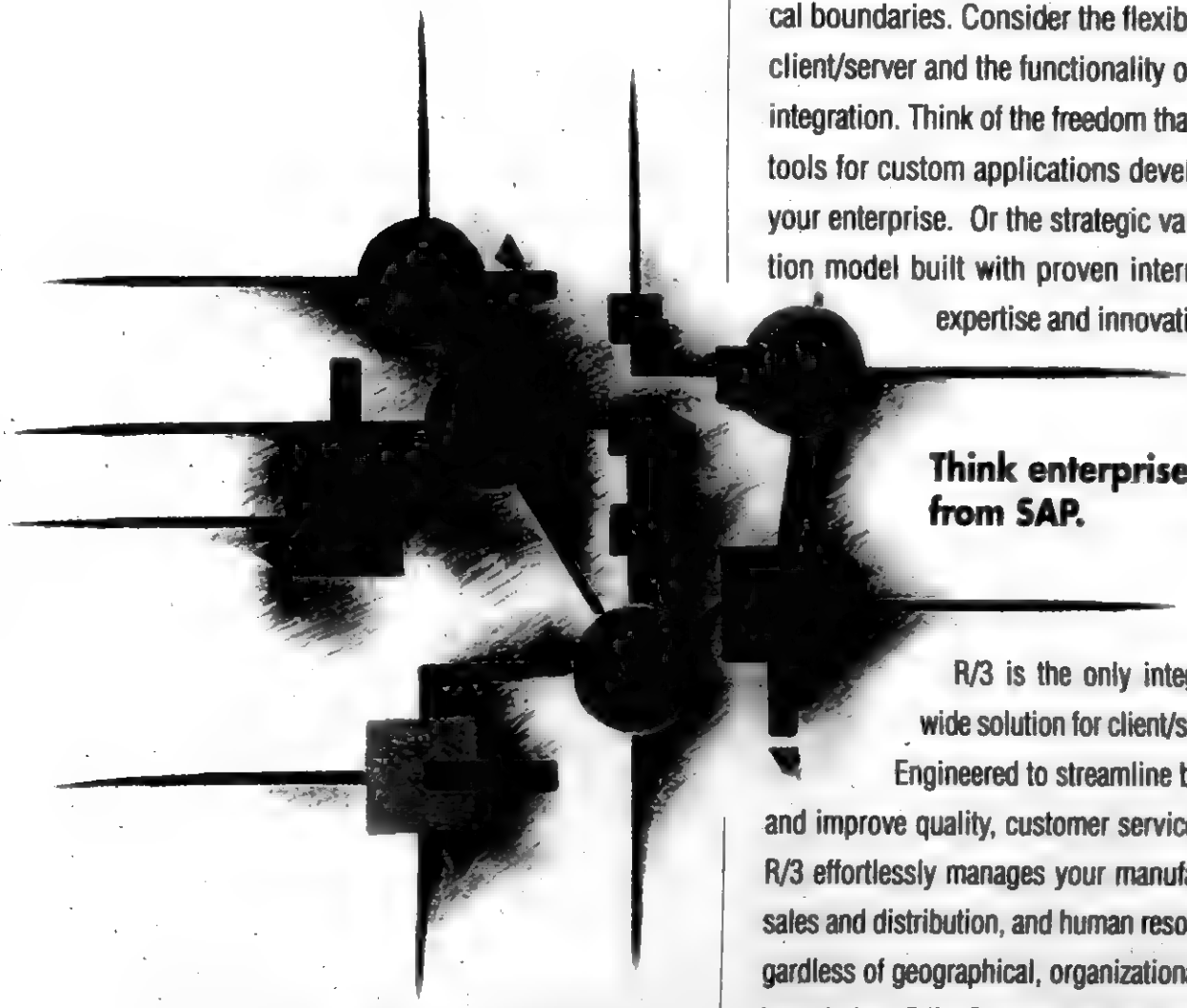

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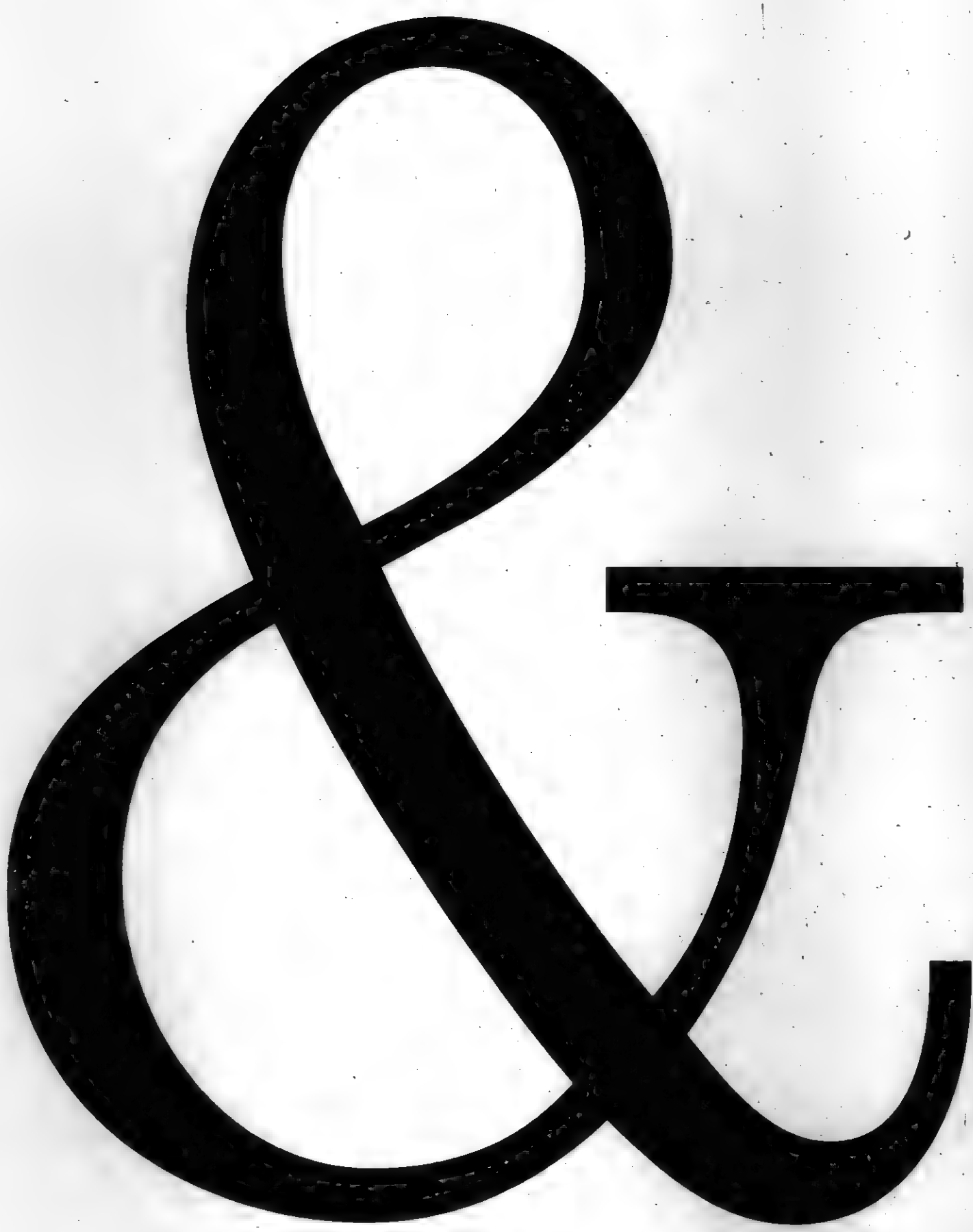

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ADVANCED TECHNOLOGY

Now playing: A medley of your favorite data

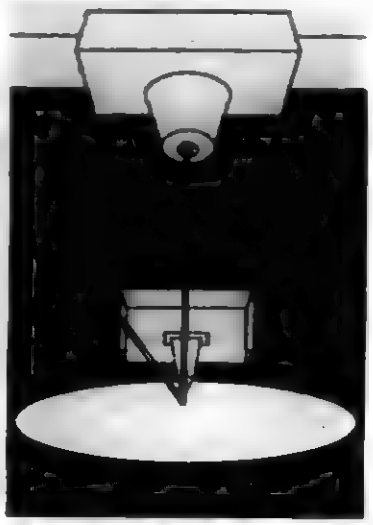
IBM would use phonograph-like setup to store up to 100 times more information than today's disks

BY KIM S. NASH
CW STAFF

Imagine a high-powered, supersensitive phonograph. A needle made of silicon nitride glides over a polycarbonate surface — the same material compact discs are made of. A small cantilever spring shifts when the tip meets a bump or dent, and these movements are measured with the laser beam down to the angstrom — about the size of a single atom.

Scientists at IBM's Almaden Research Laboratories in San Jose, Calif., are experimenting with such a system, and they are finding it yields impressively high storage capacities. Almaden's atomic force microscope (AFM) is at the center of the technique, which allows for about 100 times more capacity than a like-size optical disc.

Like a compact or optical disc, the AFM system records data in the form of tiny pits, but the pits are much smaller, each measuring one micron in diameter, or one-fiftieth the width of a human hair. The method can write 30 billion bits of data per square inch at a rate of about 100K bit/sec. That is about 10 times slower than a CD and among the more serious hang-ups to getting this technology to market.



Viable commercial products are not just around the corner, acknowledged IBM researcher Jonathan Mamin, who has studied so-called scanning probe techniques for five years. "We're making progress all the time," Mamin said, but the following technological hurdles remain:

•**Reading.** Speed — or a comparative lack of it — is the main problem with reading data this way. Reading takes a few seconds per individual pit. During the fastest demonstrations using the AFM, researchers have achieved speeds of 100 KHz, whereas CD technology operates 10 times faster at minimum.

•**Writing.** Speed is also an obstacle in writing data, but for a different reason. To record data using scanning probe methods, the tip of the stylus must be heated so it can soften and "burn" marks into the recording surface. The tip then has to cool down for a few seconds before it can be used to write again. Researchers are working on ways to release the heat faster.

•**Arithmetic.** There are other practical considerations besides speed — namely, economies of scale. For instance, manufacturing the tiny cantilever spring setups requires a huge effort right now in the field of micromechanics — the science of making nearly microscopic machines.

Some groups in the automotive industry are building mechanical contraptions, but no one is doing so currently in this field.

The cantilevers the Almaden lab uses in its demonstrations are commercial products but are not optimized for data storage purposes. Mamin said the lab hopes to start constructing its own springs. However, production requires machinery and clean-room precautions like those used in silicon processing, a large financial and technological hurdle.

Helical scanning

IBM and partner Ampex Systems Corp. in Redwood City, Calif., plan to develop high-speed, online archival storage systems capable of delivering trillions of bytes of data for scientific, engineering and commercial applications.

The project will be spearheaded by Adstar, IBM's San Jose, Calif.-based storage system unit, which will provide its data management, systems integration and subsystem control expertise. Ampex will contribute its experience in the use of helical scan recording.

Helical scan recorders are found in video gear; unlike linear tape systems, they use a spinning cylindrical read/write head around which the magnetic tape is wrapped.

A prototype of the storage system will be placed at the University of California Lawrence Livermore National Laboratory in Livermore, Calif.

ELLIS BOOKER

Bell Labs: Research first, commercialization later

The first in an occasional series of interviews with computer scientists conducted by Ellis Booker, Computerworld senior editor, advanced technology.

Ravi Sethi

Ravi Sethi is director of the Computing Science Research Center at AT&T Bell Laboratories. He joined Bell Labs in 1976 as a member of the technical staff and in 1987 was appointed head of the Computing Principles Research Department. Before joining AT&T, Sethi was on the faculty of the computer science department at Pennsylvania State University.

AT&T Bell Labs, located in Murray Hill, N.J., employs more than 1,000 scientists in four subject areas: physics, computing, communications and materials.

What's the mandate of AT&T Bell Laboratories?

We're a research center. [That means] we don't start out asking if something will be a commercial product. We don't want to be blindsided by changes. Rather, we want to look at technology trends independent of commercial possibilities. When it comes to commercialization, other units within AT&T, and now NCR Corp., handle it.

Given that, isn't it difficult to coordinate the lab's activities?

My other hat is more relevant [to that]. For all Bell Labs' research, I am a coordinator, or contact, for NCR. I facilitate contact between the research people and NCR.

Is there an overall direction to the research and development?

Some of the things we're working on are a natural outgrowth of things the company is interested in: distributed systems, for example.

Part of research's role is to be prepared for technology *before* the company needs it. When someone in the company comes along and says, "We need help with a particular technology," we don't have time, at that point, to look at the textbooks. When the need arises, we'll have experts or contacts or know where to look to find them.

[Also,] no matter how large an organization, it can't cover everything. So we make guesses. For instance, we might explore the limits of certain techniques and technologies.

How long does research take before it reaches fruition?

Some things that we do, the time horizon can be measured in five or 10 years. Not because we aim that far but because it may take that long to get something into commercial use.

For example?

We're exploring data communications at very high speeds. There's an experimental network connected at 45M bit/sec. to the University of California at Berkeley.

The questions we are exploring include: What happens when you have such speeds available? What applications will that [infrastructure] lead to? If we were to have high-speed communications, this might change where the computer, the compute engine and the display is [located].

Looking back to when you joined Bell Labs in 1976, what didn't you anticipate?

At the time, I personally could not have predicted the rise of PCs and PC software. Here at Bell Labs at the time, much of the emphasis was on Unix.

What technologies do you think are going to cause the biggest changes?

Personally, I'm looking at the way people use the PC on the desk. The fact is, 10 or 15 years ago, people were looking at the efficiency and performance of the processor and of disks. Those are not constraints today. [In the future], one's personal requirements will determine the interface.

How has the use of technology changed in your own office?

The use of E-mail. I've been using it since 1976, but only within the last three or four years have we been organizing the messages using Unix tools. I prefer getting E-mail, since I can manipulate it and still have access to it. I work three or four hours every day at home. It's very convenient to have access to everything [remotely]. I just came back from two weeks in Spain, and it was wonderful not to call in — but it's wonderful to have the option.

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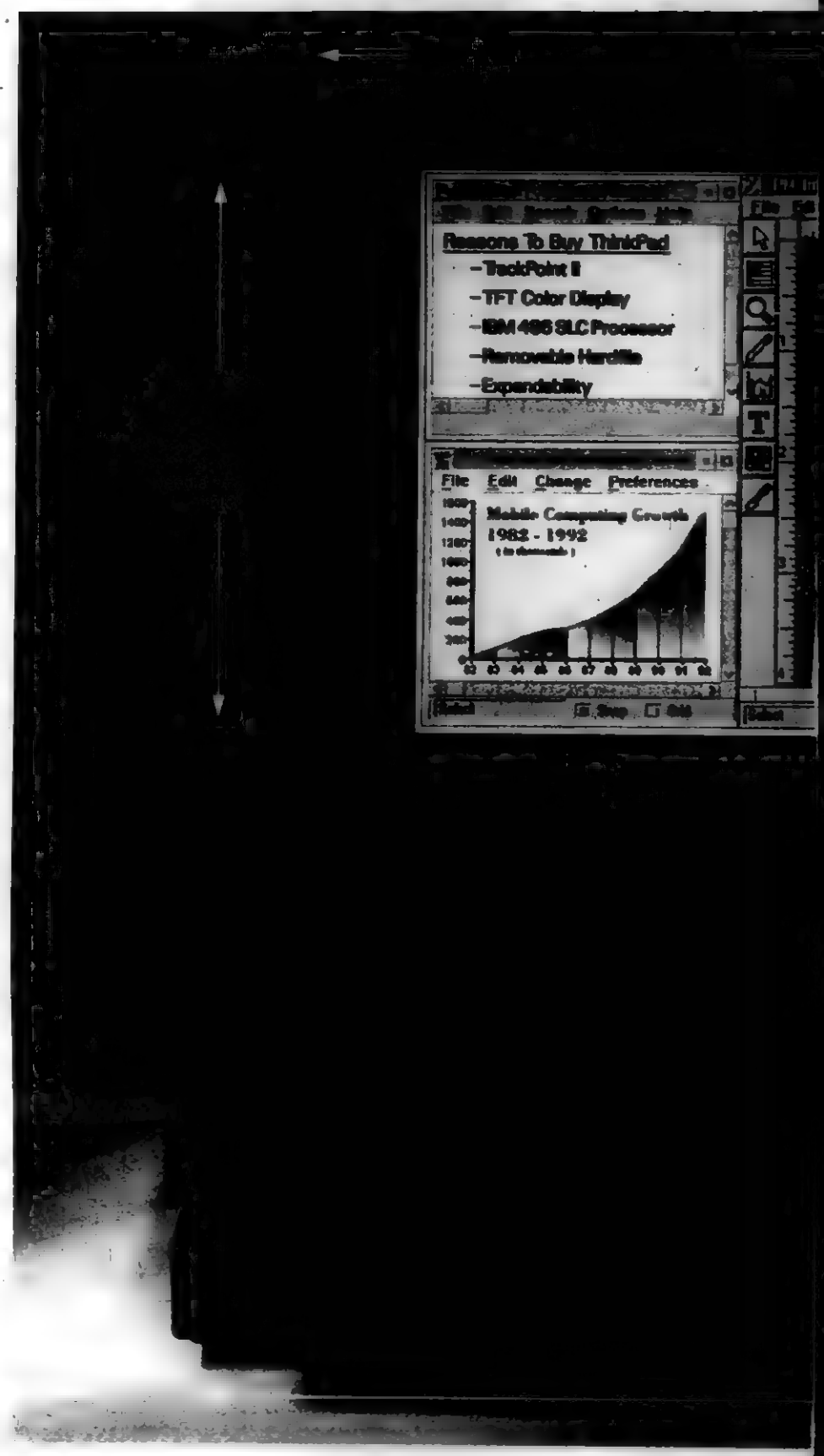

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EDITORIAL

Workgroup woes

Could it be, as Yogi Berra once said, deja vu all over again?

If you think back about a decade, the IS community was caught unawares when what started as a trickle rapidly built to a tidal volume of PCs entering the workplace. IS first rejected the machines as toys and erected barriers, but they did little to impede the flow.

Thus, a new paradigm in computing was launched. And while computing came to the professional masses, it came at the expense of many benefits that could have been derived had IS management jumped aboard the PC bandwagon and facilitated the move to end-user computing.

Thankfully, times have changed, and IS management today plays a pivotal role in the acquisition of PCs. In the 1990s, the emphasis is moving from personal productivity to the productivity of the so-called workgroup. A slew of new productivity tools, led by groupware products such as Lotus' Notes and Microsoft's Windows for Workgroups, are touted as the glue that will bind disparate PC applications and form integrated workgroup productivity environments.

Microsoft is planning to sell about $400 million worth of Windows for Workgroups in the next 12 months, and that might be a conservative figure. There is demand for the product, but IS is not registering much enthusiasm at this point. There should, and needs to be, more interest — if for no other reason than the product and others similar to it are coming, like it or not.

To be sure, IS has very valid concerns about these products. The Notes product, for example, has the unique capability of replicating databases throughout the network. Should the people who are responsible for data integrity and data security be concerned about this? Darned right they should.

IS, in general, is also being heavily scrutinized as it searches for metrics to prove the value of information technology expenditures. The attitude of many vendors, including Microsoft, is that the products they throw into the market will generate new and highly productive applications over time. There aren't many IS managers who would bank on that kind of payback.

So some healthy skepticism to this emerging class of products is understandable. But broad-based rejection, tacit or otherwise, would really be nuts. The users of products that target small groups of corporate users, like Windows for Workgroups, will soon seek ties to higher order networks and databases for more comprehensive, user-driven applications.

It will be vital for IS managers to play a key support and education role if user departments are to better understand what it is they are getting into, and what they can reasonably expect from their workgroup computing systems. Anything less would be abrogating a key responsibility, as well as ignoring some of the most difficult lessons of the past.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Good reason why Johnny can't get A's in programming

Regarding the Viewpoint article "Why Johnny can't get A's in C programming," by Edward Nilges [CW, Sept. 21]: I first became involved with PCs in 1982. After several days of studying C programming, the best I could say was that the syntax was extremely archaic, depending on 1s and 0s and special characters instead of real words.

When a co-worker was involved in a C coding project with three other programmers from Iran, India and Sweden, I realized that, for someone whose native language is not English, squiggles and wiggles are probably easier to comprehend than English words.

C is just plain weird, and therefore experienced people subconsciously criticize and reject it, whereas novices, with no basis for comparison, will accept it more easily.

As to whether the foreigners are "clearly" a "better buy" just because they work for a smaller salary, Nilges totally neglected the issue of verbal communication skills.

Communicating with someone who does not have English as a native language can be a significant problem when attempting to discuss system design and operation. It can also cause major misunderstandings and project delays, despite the technical capabilities of the person in question.

It is interesting that an article on the same page tells us that price is only one factor to consider — others being quality, support and vendor accessibility.

Nicholas J. Andrelli
Alexandria, Va.

Three out of five ain't bad

Your Oct. 12 issue had a product evaluation of Amdahl's 5995M on the front page with a comparison chart against IBM's ES/9000 Model 900.

Despite the fact that the ES/9000 scored better than Amdahl's 5995M on three of the five primary attributes you rated, including reliability and performance, your description over the chart only refers to the one area where the Amdahl had a higher rating.

I have for a long time been aware of your bias against what you appear to regard as the Big Blue monster, but so obvious a bias in the face of results from your own evaluators casts doubt on the impartiality of what should be straightforward reporting.

In the light of this and other such opinions very lightly masquerading as articles, I am canceling my subscription.

Thomas M. Cahn
Westbury, N.Y.

Missing CASE

In the recent package on the successes and failures of CASE, "All a state of mind" [CW, Oct. 12], it is remarkable that no mention is made of software engineering.

CASE stands for computer-aided software engineering, and if you're not practicing software engineering, CASE can't help you. Research indicates that few organizations have a software development process that is sufficiently mature to benefit from CASE.

Andrew Raybould
Jersey City, N.J.

Could Oracle be the culprit?

The article "Software makers fear downsizing toll" [CW, Oct. 26] quotes software manufacturers, particularly Oracle, as lamenting the shift of sales to client/server platforms at the expense of IBM mainframe and VAX minicomputer sales.

Could it be that companies such as Oracle, which charge up to 10 times more for a minicomputer license to support the same number of users as for a client/server platform license, are in fact a major cause for the shift?

Tom Quinn
St. Paul, Minn.

Dead and buried?

If the advent of client/server applications has killed and buried the mainframe, how come all three of the client/server success stories you wrote about in your Oct. 12 edition ["Distributed systems: Tough to take root"] rely on mainframes for their server component?

Howard Glassman
Seattle

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85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
69. Sys. Integrators/ VARs/Consulting Mgt.
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
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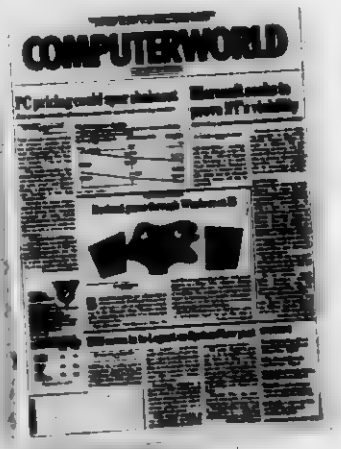

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Dismantle the pyramid and share power

HARVEY R. SHREDNICK

Information services at Corning, Inc. are now going through significant changes, and soon my role will change, too.

We realize that IS is no longer a corporate staff function but a services-for-sale business that must compete with outside providers on quality of service and cost-effectiveness.

Because of this, we have begun to seek total customer satisfaction by moving power and responsibility into the hands of those closest to the customers.

Roughly 40% to 50% of the IS staff is now involved in self-governing, high-performance teams that have the authority to make major decisions without being hamstrung by a chain of command.

It is easy to build a business case for empowering individuals in this way. Our customers' expectations are increasing. They are demanding world-class levels of performance and significant cycle time improvement.

IS is being measured on the effectiveness of its leadership in promoting an agreed-on technical strategy, the speed of its response to problems, the clarity of its communications and the value of its contributions. Meeting these kinds of expectations requires finding new ways of working that encourage openness and allow each employee to develop to full potential.

At Corning, this means IS teams make hiring and firing decisions, estimate budgets, suggest merit increases and tell us what training they need.

> I CAN'T ASK the managers, supervisors and directors in the organization to give up control unless I'm willing to do the same.

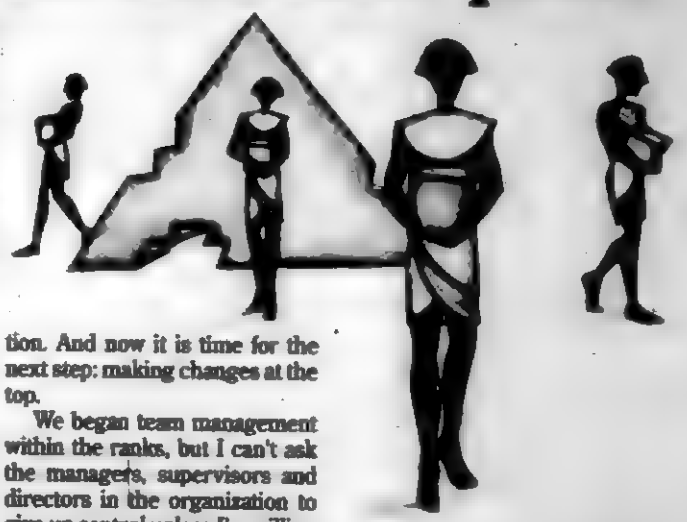
Acquired ability

This type of change does not come automatically or easily at first. It is a learning process, but one that is well worth the effort.

I remember one occasion when I brought in a new director in one area, and the people came to me and said, "Harvey, how dare you bring someone in without allowing us to interview him!"

The next time a position opened up, I made sure I didn't repeat that mistake. This time, the team went through an extensive interview process with the person proposed. In the end, this person became the team's candidate, someone they really wanted and pushed for.

This thing called empowerment is real dynamite. We have already seen measurable, continuous improvement in service quality, error reduction, operating costs and employee satisfaction. And now it is time for the next step: making changes at the top.



Betsy Lyon

We began team management within the ranks, but I can't ask the managers, supervisors and directors in the organization to give up control unless I'm willing to do the same. My role as chief information officer must also change.

Action words that have served me well over the years, such as "control," "manage" and "direct," must change to empowering verbs like "encourage," "coach" and "delegate."

If I am to achieve these goals, I must slowly but surely pull back from being a control figure and transform myself into a different kind of leader.

After the change

I see myself filling four key roles in the future:

•**MENTOR** to individuals within the IS organization, providing my perspective on career planning, relationship building and other important topics.

•**ADVISER** to other members of the IS leadership team, providing guidance on growing a service business, partnering with customers and developing high-potential IS staff.

•**CONSULTANT** to the Corning Executive Committee on the strategic and competitive use of information technology.

•**SPOKESMAN** to Corning's external customers on effective interenterprise deployment of information technology, strengthening relationships with our business partners.

This won't happen overnight. I expect it will probably take about three years. But I know I have to start because, if I am to persuade others to give up the power implicit in a hierarchical organization, I must lead by example. The entire organization will watch to see if I "walk the talk."

Shrednick is senior vice president of information services at Corning, Inc. in Corning, N.Y.

Confessions of an IS spouse

ALICE LESCH KELLY

I should have seen it coming before the wedding, when I asked my husband-to-be if he wanted to add anything to our gift registry list.

I read him my suggestions. "China, crystal, towels, sheets — anything else?"

"Yes!" Dave said, showing uncharacteristic zeal for our upcoming nuptials. "A Hewlett-Packard LaserJet printer. I think I have a picture of one on my desk."

Hmmmm.

Sure, it's great having access to a home office with as much computing power as the Pentagon and more software than can be found in all of Redmond, Wash. But sometimes, it can be trying being an IS spouse.

The first holiday after we tied the knot was one of those times. "See, I slip the Christmas cards right into the printer like this," my new husband explained proudly. "Then I do a merge with our address file. Voila! The cards are signed automatically in 14-point Old Gothic type. And the envelopes are printed in a nice 12-point Futura bold. See? We don't have to touch a pen. Now where did I put the red and green ink cartridges?"

Of course, all of our household bookkeeping is on-line. Writing a check used to be a simple matter of taking out the checkbook, grabbing a pen and writing. Now we boot up the PC, open up Quicken, load the checks into the printer, enter the name of the check recipient and the amount of the check....

The drive to build

I can see why Dave is so comfortable in the world of computers. It's all very workshop-oriented and certainly must bring out the home-improvement drive found in every Y chromosome. Without leaving his desk, my husband, who can be stumped by the prospect of hanging a picture on the wall, can immerse himself in a world of hardware, tool sets, workbenches and big iron. It's a world in which even the weak of muscle can be an empire builder.

That must be why computer people are so attracted to those railroad-building software packages. With little more than a nudge from the C prompt, the PC user can lay down miles of steel and create vast transportation networks that rival the history-making contributions of Andrew Carnegie.

My father worked for IBM for 32 years, so you can imagine how overjoyed he was when I brought home a boyfriend who worked with computers. And he was even happier when we got married. My father wasn't thinking son-in-law; he was thinking 24-hour on-call PC expert.

But their relationship has grown rocky lately. They aren't arguing Democrat vs. Republican or Toronto vs. Atlanta. To the dismay of my mother and anyone else who happens to be at the dinner table, they bicker over operating systems.

"OS/2!" cheers my father, whose blood runs royal Blue.

"Windows!" counters my husband, with Gatesian loyalty.

"OS/2!"

"Windows!"

It's like a Miller Lite commercial gone askew.

Left on the list

So, as it turns out, my husband and I did not receive a laser printer for our wedding.

"It's too bad we didn't get that printer," I said to my IS husband as we soaked up sun during our honeymoon.

"It's OK," he said. "I know how we can get the money for one."

"Oh?"

"We can return some of that china. Twelve of everything, can you imagine? Talk about unnecessary redundancy...."

Kelly, who keeps her china locked up, is a *Computerworld* copy editor.

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IBM to set identities for three PC lines

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

The IBM Personal Computer Co. has rolled out its PC strategy, and now the question becomes: They have announced it, but who will come?

IBM has chartered its three product lines for different purposes: Personal System/1s for home and small-office buyers, PS/ValuePoints for corporations for which cost is a major concern or that want to avoid the dealer channel, and the PS/2 line for people who want everything IBM has to offer in the way of technology and service.

The real difference among the systems is not so much the underlying technology but rather the channel they sell through and the way they will be serviced.

The PS/1, a product for the masses, has three distribution channels, one for each family in the PS/1 line: The Essential sells through office products stores, the Expert through superstores and the Consultant through retailers such as Sears, Roebuck and Co. The PS/1 comes with a one-year warranty.

The PS/ValuePoint sells through both traditional computer dealers and an IBM toll-free number. Dealers sell the products for a lower price, but purchases made through IBM's direct line guarantee four-hour

Continued on page 38

Comparison point

ValuePoint series gives IBM three key PC product lines with some potential for overlap

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CW Chart: Stephanie Faucher

Low price not the only factor attracting customers to suites

BY ROSEMARY CAFASSO
CW STAFF

The most well-known fact about desktop application suites may well be their low prices, but some users said there is actually more to these packages than their price tags.

Users of both Microsoft Corp.'s Office and Lotus Development Corp.'s SmartSuite said the packages streamline their support. They also offer consistency across applications, help to reduce training time and encourage users to work with more applications. Microsoft began shipping Office, which includes Excel, Word, PowerPoint and an electronic-mail license, in 1990.

Lotus in turn responded with SmartSuite, made up of Windows versions of 1-2-3, Ami Pro, Freelance and CC:Mail. More recently, it rolled in its personal information manager, The Organizer.

"The main reason [for licensing SmartSuite] was essentially the cost," said John Chamberlin, PC coordinator at the British Petroleum Ferndale Refinery in Ferndale, Wash. "It was pretty phenomenal — about $300 [per suite]," which translates to less than $100 an application.

However, "it wasn't until about four months later that people started blending the products and using the three packages together," Chamberlin added.

Chamberlin said he has not quantified training time saved as a result of the suite but said, "We are spending a lot less time supporting these people. Because of the commonality, the other packages come very quickly."

Finding their place

Microsoft's Office software suites established themselves in PC Research's Top 10 list of best-selling business software packages

Source: PC Research

CW Chart: Michael Siegel

He noted that users are also more willing to move beyond the spreadsheet and word processing packages they know well and try the graphics package. "There is a real increase in professionalism," Chamberlin said. "Maybe three or four people did memos that looked really spectacular. That has just snowballed."

Quality applications

Unum Insurance Co. in Portland, Maine, selected Office earlier this year. It said the key benefit has been its quality of applications. In fact, Unum did not care that it was packaged as a suite, according to Rachel Stamieszkin, manager of planning and development for distributed systems services.

"We didn't look for a suite," she said. "We picked [Office] because we thought it was the best of breed."

In fact, Stamieszkin said most of the 600 Unum users working with Office are not yet fully exploiting the application integration features. But they are working with what Unum considers the leading applications in each category. The insurance company has 5,800 users worldwide, and they will migrate to Office at their own pace, she added. Most will move from Lotus applications based on MS-DOS, so "they decide when and if they will get the value of changing their software."

Premark International, a holding company that owns companies such as Tupperware Worldwide, moved to SmartSuite this year when it switched from MS-DOS to Windows.

"Truthfully, it wasn't a cost issue at all," said Bonnie Becker, a systems analyst at Premark. "It was a service issue, and if Lotus products weren't good, we would have looked further."

Alpha database is music to composer's ears

BY CHRISTOPHER LINDQUIST
CW STAFF

Average viewers probably think little about the hundreds of pieces of music they hear while watching television shows. But it is Jonathan Wolff's job.

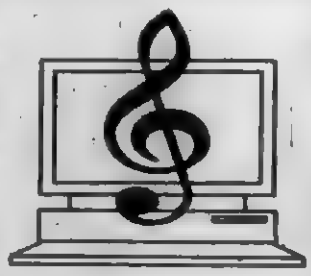
Wolff, owner of Burbank, Calif.-based Music Consultants Group, Inc., composes the music for several popular TV shows, including *Who's the Boss?* and *Seinfeld*.

For a long time, Wolff's music — snippets for between scenes and pieces to set a certain mood — were kept on tape and could be called up for use by the shows' producers. But finding them on a tape was not easy.

Wolff said he often found himself wanting to locate a piece of music, but he had no easy way to search through his lists. It was sometimes simpler to create new music than to search with his word processor and find the location of another piece. "It meant less time that I had to do music that absolutely had to be done," he said.

As a result, Wolff decided to have a database created where he could store and search through his music.

He asked staff member and system developer Steven Lack to meet his needs. Lack prescribed a relational database, and while he had worked with Borland International, Inc.'s dBase and Paradox products, he wanted something easier to develop with. To that end, he settled on Alpha Software Corp.'s Alpha Four.



"Everything is graphical," Lack said. "As we decide we have to modify the program, we do it."

Lack said Alpha Four also allowed him to create a completely menu-driven application that was easy for users to learn.

Lack stored the databases in five parts and created an interface that allows users to cross-reference the different databases quickly. The application lets users browse and select music cues and then create a "prelay" sheet, or list of cues for the show.

Wolff also found that by loading the database on a notebook computer he can bring it with him to dubbing sessions. If a producer decides that he does not like a particular piece of music, Wolff can look up a new piece quickly and pick another.

Lack said he hopes to create a link between the database application and a sound storage system on an Apple Computer, Inc. Macintosh. With such a link, Wolff could call up a piece on the database and immediately hear it on the Macintosh.

The current system still requires the user to load a tape and find the cue. But a totally automated system is still a ways off. For now, Wolff is happy to have just a little more time to make a little more music.

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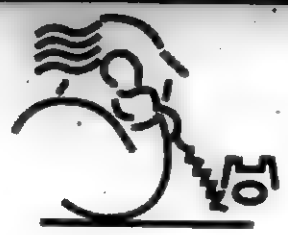
HELP LINE

Microsoft Word



Part of a continuing series of user tips drawing from questions commonly asked of PC software vendors' customer support lines. This week's focus is on Microsoft Corp.'s Word.

Q Why don't I see my graphics on the screen when I import them into my document?

A You may be using draft view, which represents a graphic with only an empty frame.

To see if your document is in draft view, select the View menu. If a check mark appears next to the Draft command, choose the Draft command to remove the check mark.

If you are not in draft view and your graphic still does not appear, do this:
1. From the Tools menu, choose Options.
2. In the Category box, select View.
3. Clear the Field Codes and Picture Placeholders check boxes.

Q How can I border the contents of a table cell without bordering the cell?

A To border the contents of a table cell:
1. Select a portion of the table cell text.
2. From the Format menu, choose Border.
3. Under Line, select the line style for the border you want.
4. Choose the OK button.

Note: Repeat the above steps for each cell you want to border.

Q I don't want Word to display the last four files I opened at the bottom of the File menu. How can I remove them?

A If you do not want the last four files you opened to appear at the bottom of the File menu, do the following:
1. From the Tools menu, choose Options.
2. In the Category box, choose WIN.INI.
3. In the Application box, select Microsoft Word 2.0.
4. In the Option box, type "NoFileCache."
5. In the Setting box, type "Yes."
6. Choose the Set button.
7. Choose the Close button.

Q How can I find more information about fields?

A To learn general information about fields, do the following:
1. From the Help menu, choose Help Index.
2. Under Reference Information, select Field Types and Instructions.

To find information on a specific field type, do the following:
1. From the Insert menu, choose Field.
2. In the Insert Field Type box, select the field type for which you want more information.
3. Press the F1 key.

Eaton keeps on truckin' with portables

BY MICHAEL FITZGERALD
CW STAFF

GALESBURG, MICH. — Heavy-duty parts maker Eaton Corp. may like to rely on "proven edge" technology to get the most bang for its buck, but it comes close to the cutting edge in its intensive use of workstation power for parts design and its use of portables.

Eaton, No. 5 in its category in this year's *Computerworld Premier 100*, has proved that notebook and palmtop technologies work by sticking them in the competitive fires at its Truck Components Operations — North America (TCONA), a $1 billion-plus business.

Use of portables starts at the top.

Fred M. Kovalik, the company's general manager, is so fond of his Hewlett-Packard Co. 95LX palmtop that he sounds like a walking testimonial. "I'm hooked on this; I mean, I'm dead meat without it," he said.

Kovalik takes the toylike 95LX seriously; he basically runs his business from it. Kovalik has had several specialised applications built into its Lotus Development Corp. 1-2-3 spreadsheet, and he keeps "a lot of confidential financial information" on the palmtop as well.

Kovalik's custom Lotus spreadsheets were built not by his information systems department but by Phil Claussen, a marketing and engineering coordinator who happens to be computer-literate. Kovalik said he likes the 95LX because it frees him from carrying a briefcase full of paper and helps him stay organized.

Kovalik has basically stopped using the notebook computer that sits in his office. Two other executives also have 95LXs, though neither is a power palmtop user like Kovalik.

Notebook upgrades

Bigger portables are in demand in other parts of TCONA. While both the transmission division and the axle/brake division's sales and marketing forces use portables, the transmission group is ahead of the game. The axle division uses Compaq Computer Corp.'s SLTs, but the transmission group dumped 1987-vintage NEC Corp. dual-disk drive portables a year ago in favor of Compaq LTE 386S/20 notebooks.

An application developed in-house drove the move to notebooks. Larry Cook, manager of microcomputer administration and support at TCONA, said Eaton built its product specifications into a program so that when Eaton's sales representatives meet with a customer such as Kenworth Truck Co. in Kirkland, Wash., they can choose the best transmission for a specific vehicle.

"You can literally go through this and pick a transmission, such as whether you want a four-speed or a nine-speed, geared to what the customer wants," Cook said. "There were a whole bunch of things the sales force wanted to do with notebooks, but this was the one thing that was strong enough to get them to dump what we had and go to entirely new systems."

The application happened to require a Video Graphics Array screen and at least 1M byte of random-access memory, which ruled out the older NEC machines.

Kevin Horan

Larry Cook *says Eaton's Truck Components Operations staffers use Toshiba T4400s while testing trucks' gears and antilock brake systems*

The reps helped choose the notebooks in a six-month process during which they re-evaluated the notebooks Cook had selected and eventually picked his same choice. Cook said that while this process saved money because Compaq cut prices in the interim, it also cost Eaton six months of increased productivity.

While the re-evaluation seemed redundant, Cook said he did not mind.

"They were the ones who had to be comfortable carrying this into customers' offices," Cook said.

The dozen members of the transmission sales force also opted for expansion stations, which keep them connected to TCONA's 320-node local-area network for electronic mail, printer access and centralised file storage and sharing.

TCONA has also created an on-line database that takes an 8-ft long shelf of three-ring binders filled with historical data, and the reps can access this information through the network.

TCONA makes its heaviest use of portables in its testing group. The division's research engineers have two dozen portables — 12 Intel Corp. 80286-based notebooks from Toshiba America Information Systems, Inc., 10 Compaq SLTs and two Toshiba T4400s — dedicated to data acquisition and analysis.

Eaton applies the notebooks to different purposes. "Processor speed means nothing to data analysis people," Cook said, so they use the 286- and 386SX-based notebooks for their tests, which largely study how a truck's gears react to changes in temperature and vibration.

The T4400s, based on the 486SX, are used during actual road tests to determine how trucks' transmissions, brakes and axles work while they are on the road.

"When they're actually doing on-the-road testing of shifting gears and antilock brake systems, that requires a higher level processor because the data has to come in that much faster," Cook said.

ON SITE

Eaton Corp.
Galesburg, Mich.

- **Goal:** Improve sales support and real-time testing.
- **Technology:** Notebooks, palmtop computers and specialized applications.
- **Results:** On-the-spot answers for customers; ability to analyze product lines on the road.

FINANCIAL OBJECTS WANTED

Swiss Bank Corporation — one of the world's leading banks — wishes to add to its library of financial objects written in CP++ or Objective C.

Please phone Dick Cassell in the Information Systems Division on 0 11 44 71 711 3064, or FAX brief details of your product to 0 11 44 71 329 8700.

SBC is an international bank which trades in a wide range of financial instruments and offers a comprehensive range of professional services to corporate, institutional and private clients.

IBM to set identities for PC lines

CONTINUED FROM PAGE 35

on-site service, while buying from the dealer nets service from the dealer. The products carry a one-year warranty from either source and a 30-day money-back guarantee.

The PS/2 line sells through dealers, value-added resellers and IBM's direct sales force. Distributors such as Merisel America, Inc. also push the PS/2. These premium PCs carry a three-year warranty and same-day, four-hour on-site service, as well as support from IBM's regional education centers.

Even IBM expects to see customers from one category buy PCs targeted at others, which should do particular damage to the flagship PS/2 line as corporate buyers shift to less expensive IBM alternatives. IBM officials act nonchalant toward the prospects of slumping PS/2 sales, saying they do not mind as long as a PS/2-type customer buys something from IBM. In fact, IBM officials have said they expect to see PS/2s make up no more than 30% of PC sales in the next year.

There are some substantive technological differences among the IBM lines.

The PS/1s come bundled with a variety of software, including Microsoft Corp.'s Windows on the low end and OS/2 on the high end, while the ValuePoint series includes OS/2 on its high-end models. PS/2s come with OS/2.

FOR THOSE SHOPS that have standardized on Micro Channel Architecture, the ValuePoint represents a dilemma.

On the hardware side, the PS/1 and ValuePoint are largely the same, but the PS/2 features Extended Graphics Array-2, a Small Computer Systems Interface controller for faster hard drive performance and a 2.88M-byte disk drive. It was designed to be International Standards Organization-compliant.

What may bring companies to IBM is its pricing, particularly on the ValuePoint line.

"We're looking at the ValuePoint for our agents. We want a competitive desktop machine with both the performance and the price, and those seem to qualify," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. Nelson said the PS/2s simply cost too much for his agents to seriously consider them.

Still, for those shops that have standardized on Micro Channel Architecture, the ValuePoint represents a dilemma. The ValuePoint appeals to those buyers because of its pricing, but it rankles the information systems schema because it uses the IBM PC AT bus.

"We've said we're going to be a Micro Channel company and an OS/2 shop, so this ValuePoint does pose us some different problems," said W. B. Lovan, assistant buyer of indirect materials at Caterpillar, Inc. in Peoria, Ill. Lovan said he expects Caterpillar to purchase ValuePoint systems, "probably in those areas ... where we do not need the high-powered functionality that you may have in a PS/2. If I can get the value of IBM behind a quality low-cost PC, I'll lean that way."

PC Expo product report

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — The recent PC Expo Chicago show attracted almost 30,000 attendees and spawned numerous introductions of portable computers, desktop machines and software with multimedia and OS/2 flavors.

New products that were on display at the show included the following:

•**Beaver Computer Corp.** (BCC)'s 6.6-pound Avanti Communications Corp. 486 notebooks. These continue BCC's elegant designs and feature a new sloped keyboard.

The 486 uses Cyrix Corp.'s 486SLC chip and offers a 200M-byte hard drive. A different version uses a built-in AT&T digital-signal processor and V.32 bis modem. BCC expects street prices to be less than $3,295.

•**SAS Institute, Inc.** showed five new pieces of its SAS System for Information Delivery, which will come out when SAS releases Windows and OS/2 versions of its SAS System in early 1993. These components include a spreadsheet, an executive information system, a natural language interface and two new data analysis modules.

•**SPSS, Inc.** announced SPSS/PC +5.0, a $295 upgrade package.

•**NEC Technologies, Inc.** announced a new laser printer, the 10-page/min. Silentwriter Model 97, which costs $2,149.

•**IBM** showed an OS/2 version of its Screen Reader, which vocalizes screen information. Previously, this product for the visually impaired had worked only under DOS.

•**Quill Corp.**, a large distributor based in Lincolnshire, Ill., came out with its second round of private-labeled PCs, the Q-Tech line. Starting price for a 486SX-based PC is $2,499. It includes an 80M-byte hard drive, a noninterlaced Super VGA monitor, and it is bundled with Windows 3.1 and Borland International, Inc.'s Quattro Pro for Windows.

•**Falcon Systems, Inc.**, based in Prospect Heights, Ill., released two new computers. One is a $2,295 Multimedia System, based on a 20-MHz 486SX, and the other is a 50-MHz 486DX-based server with 8M bytes of random-access memory and a 200M-byte hard drive for $2,895, the company said.

This is an honor.

CUSTOMER SATISFACTION
J.D. POWER AND ASSOCIATES
PC USERS • 1991

For the second consecutive year, J.D. Power and Associates has ranked Apple highest among Personal Computer Companies in Overall Customer Satisfaction. One more reason to choose Apple® Macintosh®. The easy way. Every Macintosh personal computer is designed to make it easy for you to do everything you have to do. Plug one in, and you're ready to work. It's easy to set up.

For an authorized Apple reseller near you, call 1-800-538-9696, ext. 255. In Canada, call 1-800-667-4777, ext. 255. J.D. Power and Associates' 1991 and 1992 Computer End User Satisfaction Studies. ©1992 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best."

NEW PRODUCTS

Software application packages

Approach Software Corp. has started shipping Approach 2.0 for Windows, an upgrade to the company's Microsoft Corp. Windows-based database.

More than 50 new features have been added to this release, including the capability for a seamless mail merge from within Approach and the ability to locate and eliminate duplicate entries, as well as automatically generate pull-down value lists from the same or other databases.

Version 2.0 also provides PowerKeys that deliver 100% compatibility to SQL Server, DB2 and FoxPro, the company reported. A new PicturePlus feature enables users to store graphics, charts, sounds and entire documents.

The product costs $399.

Approach Software
311 Penobscot Drive
Redwood City, Calif. 94063
(415) 306-7890

Optimum Electronics, Inc. has introduced PC PassKey, a PC security product.

According to the company, PC PassKey was designed to eliminate both accidental and deliberate security breaches. The product consists of security software that monitors all system activity and permits only authorized use of all PC resources.

PC PassKey offers a variety of optional features including hard disk encryption, the ability to encrypt floppy disks, password protection and system monitoring. A virus protection feature offers protection from viruses attacking the system and stops them from spreading.

PC PassKey costs $355.

Optimum Electronics
425 Washington Ave.
North Haven, Conn. 06473
(203) 239-6098

Peripherals

Sysgen, Inc. has started shipping the Sysgen Super21 floptical drive.

Capable of storing up to 21M bytes on a single 3½-in. disk, the Super21 drive is read/write compatible with existing 720K-byte and 1.44M-byte disk, the company reported. The drive is accessible to all DOS and Microsoft Corp. Windows programs and has the ability to archive, back up and distribute data with one DOS-compatible drive. Super21 floptical drive is a complete external subsystem that also includes an adapter and installation software.

A twin-pack of the disks costs $39.95; a five-pack costs $99.95.

Sysgen
556 Gibraltar Drive
Milpitas, Calif. 95035
(408) 263-4411

Systems

CompuAdd Express has introduced five new PCs.

According to the company, CompuAdd Express 425CX is configured with 2M bytes of random-access memory, a 40M-byte hard drive and one disk drive. Model 433DLC includes 4M bytes of RAM, a 200M-byte hard drive and a dual-disk drive. Model 450DX2 has the same configurations as 433DLC and is based on Intel Corp.'s speed-doubling technology.

Model 325SX has 2M bytes of RAM and a 40M-byte hard drive, and the Model 340DX includes 4M bytes of RAM and a 120M-byte hard drive.

Microsoft Corp.'s Windows 3.1, MS-DOS 5.0 and a mouse are included with each model.

Pricing begins at $995.

CompuAdd Express
12306 Technology Blvd.
Austin, Texas 78727
(512) 219-1800

Keydata International, Inc. has launched a line of notebook PCs.

Keynote 386SX-25 is an Intel Corp.-based computer that is configured with 2M bytes of expandable random-access memory. The product has a 640 by 480 high-resolution Video Graphics Array screen and includes ports for an external keyboard and monitor.

Another Intel-based product is the Color Keynote 386SL-25. The Color Keynote comes with 4M bytes of RAM and an 80M-byte drive, features a 64K cache and is capable of displaying up to 256 colors. The Keynote 486 has 4M bytes of RAM, an 80M-byte high-speed drive, a 10-in., supertwist backlit LCD display and a recessed trackball for fast cursor operation.

Prices start at $1,395.

Keydata International
111 Corporate Blvd.
S. Plainfield, N.J. 07080
(908) 755-0350

Franklin Electronic Publishers, Inc. has introduced the Digital Book System-1 (DBS-1), a handheld PC.

The DBS-1 has 16-bit architecture and is capable of storing up to 90M bytes of information in two removable interactive "Digital Books." The 4.6 oz. product uses Franklin's proprietary data compression system, where up to a 5-to-1 reduction ratio in physical memory requirements is allowed.

The DBS-1 has 32K random-access memory and is powered by four lithium button cells.

The product costs $199.

Franklin Electronic Publishers
122 Burrs Road
Mount Holly, N.J. 08060
(609) 261-4800

Operating systems

IGC has announced Version 2.2 of its VM/386 MultiUser PC-based operating system.

The product was designed for point-of-sale operations and database-intensive markets. It includes new features such as virtual COM ports, file-transfer capabilities, file system improvements and copy protection. According to the company, VM/386 MultiUser has architecture similar to a mainframe; its processing power is consolidated in one 386 or 486 host PC.

VM/386 MultiUser 2.2 costs $695 for the five-user version and $1,049 for the 32-user version.

IGC
Suite 108
1754 Technology Drive
San Jose, Calif. 95110
(408) 441-0366

This is a trend.

Easy to learn. Easy to expand. In fact, Macintosh is still the only computer engineered from the first chip to work that way. Which may also explain why Apple has sold more personal computers this year than any other company in the world. So if you're looking for a computer that's easy to use, there's really only one way to go. Macintosh. The power to be your best.

Apple

are registered trademarks of Apple Computer, Inc. This ad was created using Macintosh computers.

USL's Destiny: Unix for the masses

Evaluators say this version of Unix — which can be customized to run on everything from laptops to desktops to supercomputers — could make the operating system palatable to commercial users

NEW PRODUCT IN-SITE

Computerworld's New Product In-Site is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

UNIX SYSTEM LABORATORIES, INC.'S SYSTEM V RELEASE 4.2

- **Unix V 4.2, also called Destiny, won raves for its new graphical user interface. Evaluators found the interface to be a big time-saver in everything from installation to adding devices and users to a Unix system.**
- **The Unix V 4.2 graphics library, Motif OpenLook Intrinsics Toolkit, is a boon when running packaged applications or developing new programs. However, some OpenLook applications may require recoding.**
- **Evaluators were unanimous that Unix V 4.2 should be used on 486 rather than 386 platforms. They said the 386 does not provide even minimally adequate performance.**

For years, there have been rumors and hopes that Unix would make a once-and-for-all entrance into commercial computing. But detractors have bristled at the operating system's arcane commands and absence of standards. For example, *sed*, *awk* and *grep* have not been favorites in mainstream business computing.

The shipment of Unix System Laboratories, Inc.'s (USL) System V Release 4.2 — also known as Destiny — could bring an end to anti-Unix sentiment.

Unix V 4.2 is USL's catchall description for the latest version of the operating system. Unix V 4.2 can, theoretically, be customized to run on platforms as diverse as laptops and supercomputers.

USL does not sell its "generic" Unix V 4.2 to end users. Instead, it licenses the source code of the operating system to a variety of hardware manufacturers for implementation on their own computers. The exception — and the subject of this evaluation — is the version of Unix V 4.2 created to run on Intel Corp.'s 80386 and I486 PCs.

USL will not sell the Intel version of Unix V 4.2 but will license the product to vendors such as Univel, Inc., the joint partnership of USL and Novell, Inc., and Consensys Corp., which sells a version supporting Transmission Control Protocol/Internet Protocol networking for Microsoft Corp.'s Windows and Unix. However, USL put the generic Intel version through extensive preliminary testing, and that test version is the subject of this evaluation.

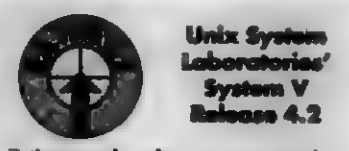
Unix V 4.2 is more than another Unix. It includes a graphical user interface (GUI) and a host of enhancements that insulate users and systems administrators from the internal workings of the operating system. Still, die-hard fans of VI and *grep* will still have access to the Unix command line.

For those needing to escape the frivolities of Unix commands, Unix V 4.2 could prove a blessing. The technical product evaluators participating in this survey were "shocked" at the changes wrought on the Unix interface by Unix V 4.2. Experienced Unix administrators and users, the evaluators found Unix V 4.2's graphical interface to be the first of many enhancements that will unleash them from tedious technical chores and free them to tackle business computing issues. Unix, they said, is no longer the intimidating and time-consuming "challenge" that it historically has been.

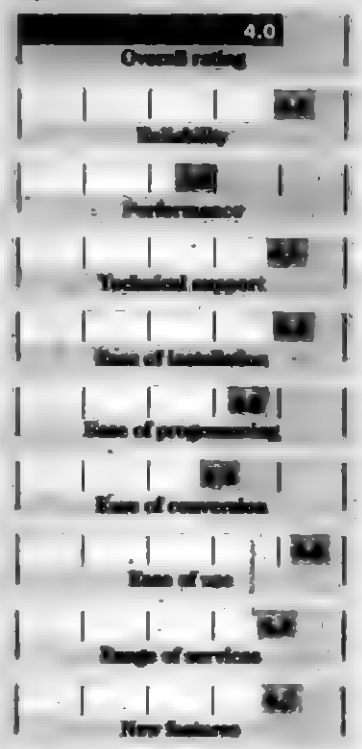
All of the evaluators participating in this survey were either conducting or finalizing evaluations of USL's Unix V 4.2. All had been beta-test sites for the operating system — two for more than six months. Final versions of Unix V 4.2 (Release P14) had been available to the evaluators since early September.

In a nutshell, the evaluators had few complaints with Unix V 4.2. One evaluator — the federal agency — had difficulty porting OpenLook applications originally written for a Sun Microsystems, Inc. SPARC machine to the Unix V 4.2 environment. The problem, apparently, was that low-level graphics functions used on the SPARC system were not available in the Unix V 4.2 Motif OpenLook Intrinsics Toolkit, which USL said will automatically support almost any OpenLook or Motif application. The federal agency evaluator uncovered the meaning of "almost any" application and was rewriting sections of the offending programs. "We like Motif better anyway," he said.

The research facility and the federal agency both had substantial installations of Unix workstations with a variety of Unix implementations already in in place. The total installed base exceeded 25,000 users at both sites. The insurance company had about 300 to 400 Unix users on a variety of mainframe and midrange systems. The systems integrator included a diverse mix of hardware — from Unisys, Inc. mainframes to clone PCs made in Taiwan — in its customer accounts.



Ratings are based on user expectations on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



Unix V 4.2 includes a "journaling" file system that is said to protect applications from sudden power failures and systems glitches. Users commented that in other versions of Unix, the same feature often caused system start-up times of more than 12 minutes. Under Unix V 4.2, according to the systems integrator, start-up times had generally been reduced to less than one minute.

Systems integrator: "No problems. The file system is a lot more robust in a power failure and recovers very well."

SITE PROFILES

Installation descriptions for users who evaluated Unix System Laboratories' Unix V 4.2

	Federal agency	Research facility	Insurance company	Systems integrator
Hardware platform	AT&T 6386 25 MHz	ALR 80386 50 MHz	IBM & Compaq 386, 25 MHz	Acer 486SX 33 MHz
Using previous version	No	Was beta-test site	Yes	Yes
Application types	Custom-built & OpenLook 4.0	Creating development tools	Interoperability testing	Tuxedo, Lotus, X Windows
Reason for using Unix V 4.2	Platform for cooperative network	Best Intel-based Unix	Reduce Unix learning curve	Cheap X-Station Standard hardware

Methodology: Product ratings are based on evaluations from four user sites (profiled above). These are early users of USL's Unix V 4.2. The users are members of Computerworld's Product Evaluation Council.

RELIABILITY

The evaluators found Unix V 4.2 to be remarkably reliable, with no significant downtime except in the earliest prerelease versions. They said Unix V 4.2 was, in fact, more reliable than IBM's OS/2 2.0.

COMPATIBILITY

Given that Unix V 4.2 is an industry-supported offshoot of AT&T's Unix Software Operation, the original creator of Unix, it would be difficult to imagine a USL Unix that is not compatible with industry standards. An "incompatible" USL Unix would, in essence, have to be incompatible with itself, since USL Unix is "the one and only Unix." However, it is conceivable that USL Unix could evolve in such a manner as to outmode existing applications. That was the thrust of the compatibility question. It becomes more important as graphical applications proliferate using a

variety of graphic protocols and standards.

In addition to its compatibility with previous versions of Unix (USL calls this "the Unix V 4 family," which includes Unix V 4 and Unix V 4.1), Unix V 4.2 includes a new graphical tool kit based on the X Window System standard.

The Motif/OpenLook Intrinsics Toolkit allows both OpenLook- and Motif-based applications to run, unaltered, in Unix V 4.2. However, some evaluators found that applications written for some versions of OpenLook required substantial revision in the graphics area.

In the experience of the evaluators, all character-mode applications, device drivers and packaged "off the shelf" applications ran unaltered on Unix V 4.2.

Federal agency: "Some higher level calls from OpenLook were grossly modified. Code still won't compile or run because they've changed the libraries."

Insurance company: "The interoperability tests that we run on all systems in the lab ran on Unix V 4.2 with no problems."

Research facility: "You're not going to take Unix V 3 application libraries, especially those that use memory management, and expect to compile something that's going to work."

Systems integrator: "It's good that you can change the configuration to go from OpenLook to Motif. We've tried packaged software and remote systems running X Windows. We haven't had any problems with the software we've tried."

PERFORMANCE

The evaluators said Unix V 4.2 ran precisely as expected on 486-based systems. They were generally not pleased with performance on 386 platforms of any kind.

Federal agency: "A 386, 25-MHz machine just doesn't cut it. I can fall asleep waiting for something to happen."

Systems integrator: "The X Windows environment requires heavy processing. You need a 486 machine."

TECHNICAL SUPPORT

Unix installations traditionally have relied on internal technical expertise to resolve difficult problems. Technical support generally has referred to the ability of Unix administrators, programmers and support staff to pore through and understand volumes of Unix technical manuals. And because USL sells Unix V 4.2 only to hardware manufacturers and other resellers, it does not provide technical support beyond that required to port the operating system to different hardware platforms.

As experienced Unix users and as preliminary test sites, the evaluators did not have tremendous need for technical support. However, the evaluators generally gave Unix V 4.2 high marks for documentation and on-line Help systems.

A new "drag and drop" icon system, for example, made printer configuration little more than a matter of moving the icon to the appropriate location on the desktop.

Federal agency: "On administrative functions like adding users, they've done a super job. Doing that in the past has been cryptic, but you don't have to know much at all to meet your goal now."

Insurance company: "It allows us to get back to answering business needs without having to play with operating systems."

Systems integrator: "The menu-driven installation guide is helpful. The event-driven hypertext help engine is excellent."

INSTALLATION

Unix installations usually require a complex mix of disk swapping, tape drive restorations, device configurations and a gamut of administrative programs. The difficulty of this process is multiplied by the requirement that system hardware be supported by custom device drivers; that storage devices be partitioned in a complex fashion supporting the Unix file system; and that users be added to a system profile to accommodate shared files and multitasking. Standard Unix utilities are not highly regarded for their assistance in such matters.

With its graphical approach, Unix V 4.2 eliminated many of these complexities, according to evaluators.

Federal agency: "You can get up and flying, and as you experience problems or learn more, you can tune parameters later. Before, you had to know at the front end or you couldn't get the system up."

Insurance company: "You don't have to be a Unix person, and you can install it in two hours."

Systems integrator: "All the graphical administration features are great. Absolutely amazing. People are in disbelief that this is a Unix system."

PROGRAMMING

Because Unix V 4.2 is in all respects "standard" Unix, writing applications for it is no different than for previous versions of the operating system. Evaluators said they anticipated no changes in programming practices or methods to work with Unix V 4.2. An enhanced, graphical debugger was noted by all the evaluators.

Research facility: "Their source code debugger seems to be more robust and easier to use."

Systems integrator: "You can wrap the debugger right around a process."

SOFTWARE CONVERSIONS

All evaluators reported that standard Unix programs written for the "generic" Unix V 4.2 recompiled and ran without any difficulty. The same was true for graphical applications written for X Windows and Motif. Some OpenLook applications, as noted above, required minor revision. Packaged application software ran without any difficulty, the systems integrator reported.

Federal agency: "Drivers which I first developed in 4.0 ported right over. We used a lot of OpenLook library calls [in older applications] that just aren't supported."

Systems integrator: "Porting is not an issue."

FACTS FACTS — Unix V Release 4.2

- Hardware platforms: Intel 386 and 486, SPARC and MIPS.
- Future platforms: RS/6000, DEC Alpha and HP.
- Support for common DOS and Windows emulation utilities.
- Graphical "point-and-click" environment.
- Multiple GUIs, including OSF's Motif and Sun's OpenLook.
- Adobe Type Manager embedded in the operating system.
- Optimized X Window System server.
- Smart interruptible installation routines.
- Graphical administration features.
- Dynamic kernel modules allowing on-line device installation.
- Meets Unix International desktop standards.

EASE OF USE

The best description for evaluators' reactions to Unix V 4.2 is "astonishment." All commented repeatedly on the improvements in ease of use made by the new graphical user interface.

Federal agency: "Unix has always been the way we wanted to go, but up until USL came out with Unix V 4.2, it was very alien for people to want to use and very obtuse."

Insurance company: "Anybody will be able to use it in a couple hours if they come from a graphical, windowing paradigm."

Research facility: "Users aren't going to be able to destroy any of the system files. For me, that's a blessing."

Systems integrator: "People who have used the Windows environment or OS/2 or a Macintosh soon pick up the [Unix V 4.2] file manager and [other utilities]. Compared to Unix 3.2, it's light years ahead."

RANGE OF SERVICES

Unix V 4.2 includes all standard Unix utilities. In that sense, it did not exceed the expectations of the evaluators. However, they considered easier access to these utilities to be the biggest improvement of all.

Insurance company: "There isn't enough time to test all of the utilities, at least in our world. But [of those tested] they've simplified them to such a degree as to make them trivial."

Research facility: "They haven't enhanced the services that much, but they've stunningly increased the ability of less experienced people to use them."

Systems integrator: "The only thing missing is an X.25 product. That's something we'd like to get ahold of."

Reported by Michael L. Sullivan-Trainor and Garry Ray, CW staff.

USL RESPONDS

This is USL's response to issues raised in this evaluation.

- **OpenLook portability:** OpenLook is completely upward-compatible with Unix V 4.2's Motif OpenLook Intrinsics Toolkit. Moving from OpenLook to Unix V 4.2 involves a simple recompile. Any difficulties might have stemmed from moving an application from a Sun SPARC platform to an Intel platform. It is possible that some subtle differences could occur in such a platform move. The difficulties could not have come from a move from OpenLook to the Motif OpenLook Intrinsics Toolkit.
- **Packaged software:** We are working directly with 50 top independent software vendors and their applications. We are also working together with top systems vendors and Univel [the joint partnership of USL and Novell, Inc.] to reach independent software vendors. This is already proving to be effective, as we are able to leverage the strengths and longstanding relationships of other companies.
- **Availability:** USL does not sell directly to end users. We sell to systems vendors and to Univel. We have been the source of Unix for over a decade. Our strategy is to provide the basis for open systems. Therefore, we make the operating system widely available to a myriad of vendors rather than trying to dominate distribution and capture the end user.
- **Unix in business:** Momentum is building for Unix in general-purpose office computing. The rightsizing movement naturally lends itself to Unix. People are moving away from proprietary environments.
- **Minimum configuration:** Our recommended minimum configuration is just that: a minimum for the foundation set.

PRODUCT EVALUATION FORUM

AT&T • American Pioneer Cos. • Bell Atlantic Corp. • Bell Canada • Bergen Brunswig Corp. • The Chase Manhattan Bank, NA • Commonwealth Edison Co. • Consolidated Freightways, Inc. • Corestates Financial Corp. • Dresser Industries, Inc. • EAA • Federal Express Corp. • First National Bank of Chicago • FMC Corp. • GCS Ltd. • Grumman Corp. • ITT Corp. • Kmart Corp. • Long Island Lighting Co. • Marshalls, Inc. • Massachusetts Mutual Life Insurance Co. • MCI Communications Corp. • Mellon Bank Corp. • Metropolitan Life Insurance Co. • NASA • Northeast Utilities • Preston Trucking Co. • Princeton Corp. • Public Service Electric & Gas Co. • Ryder System, Inc. • The Southern Co. • University of Michigan • University of Virginia

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If you've been hankering to move to open systems, there's good news. CICS,™ the world's most popular online transaction processing (OLTP) program, now runs on the RISC System/6000.® With CICS/6000™ for AIX,® IBM's enhanced version of UNIX,® you'll discover the flexibility of open distributed computing using the same investment you've already made in training and applications on your mainframe CICS.

Nobody knows OLTP or distributed processing like IBM, and with our support and service, you'll never feel lost in the wilderness. IBM also offers Encina,™ an exciting new OLTP product for multivendor distributed environments.

We're also introducing the new RISC System/6000 Models 580 and 980, the perfect partners for your open computing needs. Both provide leading price performance that's not a kick in the head.

Call your IBM marketing representative or Business Partner. For literature, call 1 800 IBM-6676, ext. 723.* We think you'll have only one thing to say.

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Introducing CICS/6000.

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IBM

COMMENTARY

David Coursey

Not really a Notes killer

Forget you heard the rumor that Microsoft's new Windows for Workgroups is Bill Gates' secret weapon for killing Lotus' Notes. That's not true. However, Lotus does need to stop positioning Notes as "all things groupware" and better communicate what Notes really does.

You can thank the PC trade press for latching onto the notion that Windows for Workgroups — which about half the time people manage to call Word for Windows by mistake — is a "Notes killer." Examining how this happened helps to address why Notes needs to be repositioned, even re-architected, if it's to remain a success.

Here's the story:

Since Notes' introduction, Lotus has gone to great pains to portray Notes as a great conferencing tool. If you're familiar with bulletin boards and CompuServe, the idea of leaving a message and having others leave responses, creating a message "thread," is nothing new to you. But because lots of supposedly savvy IS people — and especially their bosses — had never seen a CompuServe forum, people went gaga over Notes conferencing. So to many people, Notes and LAN-based conferencing are one

Continued on page 46

Lotus will not provide single mail engine

BY LYNDA RADOSEVICH
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. has pulled back from plans to integrate its electronic-mail and groupware software and no longer intends to provide a single mail engine.

The move is an apparent shift from a three-phase strategy Lotus outlined last spring for bringing together its CC:Mail E-mail software and Notes groupware. The plans included merging the products' back-end mail transport and message storage abilities and eventually offering a single mail product with elective Notes features.

CC:Mail, with 2 million users, is one of the leading E-mail packages; Notes has 200,000 users, according to Lotus.

"You can put the common back-end concept aside," said Justin Fielding, a Notes product manager. "We got strong feedback that users love both products, and they don't want us to hamper the strength of either architecture."

Instead, the company will take a modified approach.

"We are stressing that the two products work as synergistically as possible while preserving two separate products," Fielding said.

For example, a new Lotus Mail Exchange Facility is now shipping that preserves text formatting and graphics attachments in messages sent between the two products. The previous gateway seamlessly exchanges text but does not necessarily preserve fonts, colors and formatting.

The exchange facility also provides directory synchronization so that CC:Mail and Notes directories automatically update each other when users are added or deleted from one, for example.

More features

With Notes 3.0, which is expected early next year, there will be additional enhancements, including shared administration tools and an option to choose CC:Mail as the mail package within Notes, which comes with its own message system.

One reason for the change in strategy was that users were not clamoring for Notes/CC:Mail integration.

"I know there were small nuisances in transferring messages, such as inconsistencies in formatting, but nothing that was a major issue," said Alan Bidgoli, a Notes technical support person at the National Academy of Sciences in Washington, D.C. The academy runs both Notes and CC:Mail using a gateway to communicate between the two products. "It already seems seamless to the users," he said.

Another reason is that a merger did not make marketing sense for Lotus, said David Marshak, vice president and senior consultant at the Patricia Seybold Group in Boston. He pointed out that if CC:Mail, which sells for about $100, offered many of the same capabilities as Notes, which sells for about $500 per node, Lotus would have a hard time selling Notes.

Marketing did not enter the discussion to change plans, said Cynthia Lavoie, a Notes product marketing manager. "It was a technical decision," she said.

Lotus discovered that the technologies behind E-mail and workgroup applications are very different and did not want to compromise each product's architecture from doing what it does best, she said.

Even with tighter integration, the packaging of Notes and CC:Mail together may not be in the cards, according to Marshak. The introduction last month of BeyondMail for Notes from Beyond, Inc. — a Microsoft Corp. Windows-based messaging system that gives non-Notes users limited participation in Notes conversations — shows that other packages besides CC:Mail "can integrate with Notes as well or better than CC:Mail," Marshak said.

IS releases promoter from hardware shackles

BY MARYFRAN JOHNSON
CW STAFF

NORWALK, Conn. — The next time some nice lady hands you a coupon in the supermarket, think of Actmedia, Inc. Chances are, she works for the company.

As the industry leader of the in-store advertising and promotional business, Actmedia virtually invented the concept, 20 years ago, of providing marketing services on the premises of supermarkets, chain drugstores and mass merchandisers.

Today, the company is reinventing its information systems as it jettisons 6-year-old proprietary gear from Wang Laboratories, Inc. for a Unix-based client/server network based on Oracle Corp.'s relational database management system.

"One thing that really pleases me these days is I'm no longer a prisoner of my hardware vendor," said James Klump, senior vice president of information ser-

Continued on page 47

ON SITE

Actmedia
Norwalk, Conn.

- **Challenge:** To enable this in-store marketing business to respond more nimbly to market changes by replacing outdated Wang minicomputers and applications with a $4.5 million open client/server architecture.
- **Technology:** Oracle relational database management system and 4GL development tools and a Novell network of about 200 PCs anchored by a Unix-based server (choice still pending).
- **Timing:** Past year spent developing database model and design; installing first production server in January; final rollout expected by end of 1993.

$70 Billion

By the end of this week Computerworld readers will have spent over **$70 Billion** on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

DEC brings NAS to SunOS

BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp. recently announced a Network Application Support (NAS) package for Sun Microsystems, Inc. platforms that will allow Sun users to integrate applications across platforms.

One of the understated aspects of the introduction was that with this NAS 250 software, sites will be able to use the Sun workstations as servers to create an integrated environment without using DEC hardware.

The product's release exemplifies DEC's commitment to software and NAS, regardless of the hardware platform on which it is running, said Dennis Phelan, NAS marketing director at DEC.

"I've always liked the product, but my hang-up was that you had to have DEC equipment somewhere in order to run it, and now they've divorced themselves from that," said Rikki Kirzner, principal analyst at Dataquest, Inc., a market research firm based in San Jose, Calif. "If they can figure out how to get [NAS] to take off, it could solve the many interoperability headaches that vendors and users are facing."

Included in NAS 250 is the Open Software Foundation's Motif user interface and DEC's Application Control Architecture (ACA) Services and Compound Document Architecture (CDA) Services.

ACA Services is a set of object-oriented facilities for launching and linking applications across a networked, heterogeneous environment. Users could link a spreadsheet on a PC with a mathematics application running on a Sun machine.

Big player

ACA Services makes up a substantial portion of the dynamic application programming interface standard for the Object Management Group's Common Object Request Broker Architecture, facilitating the process for users building object-oriented applications.

CDA Services are a set of runtime services for creating, storing, transporting and interchanging compound documents in mixed environments.

DEC also announced Version 2.0 of the NAS 200 and NAS 300 for VMS and Ultrix servers and of NAS 250 and NAS 400 for Open VMS. New with Version 2.0 is support for ACA Services and expanded support for Microsoft Corp. Windows and Apple Computer, Inc. Macintosh systems, DEC officials said.

"If you look at NAS and what it tries to be — a solution for all the heterogeneous problems in the world — what this announcement does is position NAS as a foundation product for DEC," Kirzner said.

NAS 250 for the SunOS costs $265.

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Novell offers TCP/IP gear

BY MICHELE DOSTERT
CW STAFF

SAN FRANCISCO — Demonstrating the strength of its commitment to Unix, Novell, Inc. has announced new Transmission Control Protocol/Internet Protocol (TCP/IP) networking products to integrate PC local-area network users into the Unix networking world and manage them once they are there.

At Interop '92, Novell announced Version 4.1 of its LAN WorkPlace for DOS product, which allows DOS and Microsoft Corp. Windows users to connect to Unix or Novell NetWare servers via the TCP/IP suite. LAN WorkPlace for DOS is installed directly on the desktop and may be used with other LAN operating systems as well as NetWare.

Reflecting the growing strength of Unix-based Simple Network Management Protocol (SNMP) in the PC world, LAN WorkPlace 4.1 has added an SNMP agent loaded at the workstation. Any PC running LAN WorkPlace 4.1 can be managed by any SNMP-based network management system.

Remote possibilities

The new version also adds support for remote computing, using Unix standard protocols, and improved Windows and Unix File Transfer Protocol support. LAN WorkPlace 4.1 is slated to ship in December. The product is priced at $12,995 for 100 users.

For large NetWare installations where centralized administration is an issue, Novell also announced a new server-based connectivity product, LAN WorkGroup, that provides NetWare users with concurrent access to both Unix and NetWare file and print services.

LAN WorkGroup contains the same applications and utilities found in the client-based LAN WorkPlace. At a price of $12,995 for 150 users, LAN WorkGroup is also considerably cheaper on a per-user basis than LAN WorkPlace.

"LAN WorkGroup's centralized installation and administration allow us to set up networks much more quickly and efficiently," said beta-test site user David Willis, manager of network systems at the American Red Cross in Washington, D.C. "It lets us expand access to our remote networks without paying a heavy technical support penalty."

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Microsoft ships revised LAN Manager for Unix

Despite its long list of OEMs, industry observers do not predict success in LAN marketplace

BY MICHELE DOSTERT
CW STAFF

Microsoft Corp. recently began shipping Version 2.1A of its LAN Manager for Unix to OEMs, but users might not see much impact because OEMs may be too distracted by their Novell, Inc. NetWare sales to take much notice, analysts said.

Microsoft's OEM version includes all the functionality found in LAN Manager 2.1, plus many of the enhancements Microsoft will ship with LAN Manager 2.2, such as a new Windows Network Administration program, a terminate-and-stay-resident Print Station and support for Microsoft's Windows 3.1 and IBM's OS/2 2.0 clients.

Microsoft has a long list of OEMs currently licensing its LAN Manager for Unix product, but most industry watchers said they do not expect LAN Manager for Unix 2.1A to have great success in the local-area network marketplace.

Hard sell

"If you look at Microsoft's list of OEMs, you'll see that most are also selling and supporting Novell, Inc.'s NetWare or NetWare for Unix products," said Lee Doyle, an analyst at International Data Corp. in Framingham, Mass. "None of those OEMs are really pushing it as their strategic platform of choice. And while LAN Manager for Unix makes a nice integration tool for mixed LAN Manager/Unix environments, there just aren't that many of those environments out there."

"Our goal has been to eventually synchronize the Unix LAN Manager releases with the OS/2-based LAN Manager releases," said Robert Kruger, Microsoft's group manager for Corporate Network Systems. "We will shortly be releasing add-on products to LAN Manager for Unix, including Macintosh services and remote access services."

Meanwhile, NCR Corp., which co-developed the Unix product with Microsoft, is already shipping new versions of it's StarGroup LAN Manager for Unix 2.1A to customers.

NCR has enhanced the basic LAN Manager for Unix 2.1A with an Apple Computer, Inc. Macintosh server, multiprocessing support for the NCR System 3000 servers and a unique, server-based interoperability feature for NetWare, the market-leading operating system sold by Novell.

When NCR's StarGroup Server for NetWare clients is installed on a StarGroup server, NetWare clients will be able to access file and print services on StarGroup servers while remaining in their familiar NetWare environment.

Beta-test users of StarGroup LAN Manager for Unix 2.1A said they were pleased.

Marianne Levandoski, network architect at AT&T's tax department in Morristown, N.J., has a mix of Unix, DOS and Windows systems. NCR's take on Unix 2.1A gives her a simple translator that brings the two environments together, she said.

Kevin Wallace, a network analyst at Eastern Kentucky University in Richmond, Ky., said he is especially pleased with StarGroup's new Macintosh server, which lets Macintosh users access files and printers on LAN Manager for Unix networks.

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APPLIED BUSINESS TECHNOLOGY

Coursey

CONTINUED FROM PAGE 43

and the same.

Unfortunately, conferencing is not the best example of what Notes is about, although it is very easy to demonstrate and makes nice use of the replication engine, which copies the entire conference message base onto the hard drive of every user. So when Microsoft showed a conferencing application running atop Windows for Workgroups, some reporters latched onto it as a "Notes killer." To their credit, Microsoft executives didn't push the description, although they didn't argue much with it, either.

If all Notes was good for was conferencing, the "killer" designation might be true. Instead, Lotus has created a powerful object store (that means database in objectese) designed specifically for unstructured information. And this is why some very large companies are using Notes for maintaining client records, including every contact anyone at the company has ever had with the customer.

Notes is also a nice repository for multimedia and reference information, but its relational capabilities aren't really up to snuff.

Not alone

Those distinctions didn't really matter until Microsoft entered the fray. Until then, workgroup applications were essentially a one-horse town, and Notes was alone in the stable. Now, of course, Microsoft has announced plans to add workgroup underpinnings to its operating environments.

This is good for users but bad for Notes. That's because when Notes was built, designing workgroup software meant building your own messaging, user directories, development tools, security and other features right into the application. Lacking the necessary plumbing, Lotus had to build its own. That is just fine until the city inspector shows up on your doorstep and red-tags your house for nonstandard plumbing.

Red-tagging is exactly what Microsoft is doing to Lotus, and that explains why Windows for Workgroups will open the way for Microsoft and some opportunistic third parties to do some serious damage to Notes.

To avoid this, Lotus needs to position Notes as the tool of choice for specific types of workgroup applications and then admit to its limitations, especially as they relate to structured data.

More importantly, Lotus will be forced to break Notes into its component pieces, allowing the Notes database and replication engine to stand on their own. The free-form database and replication engine shouldn't require the existing Notes client software but should become fairly nondenominational server pieces available to everyone, even Microsoft applications.

Accepting this fate and learning to profit from it will pave the way for Lotus to build innovative workgroup applications instead of fighting the PC industry version of the Vietnam conflict.

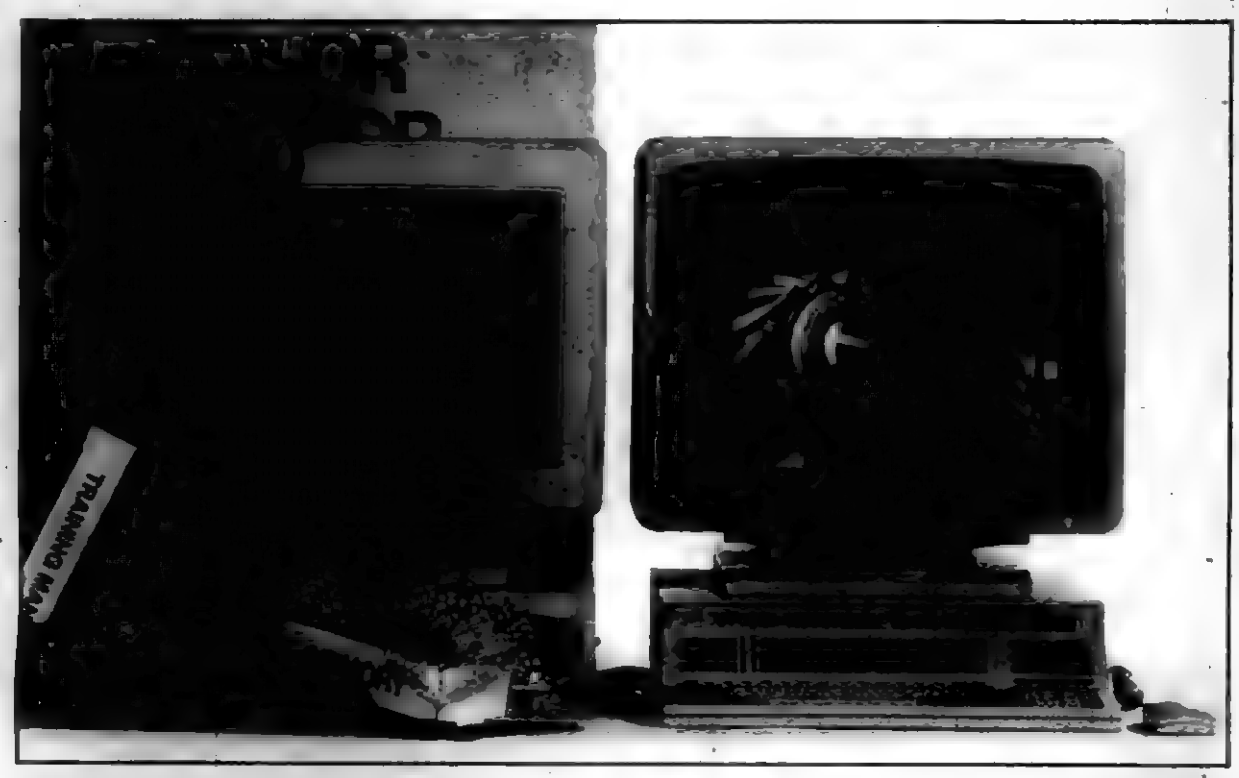
Just a start

The recent introduction of BeyondMail for Notes is just the beginning. BeyondMail offered its E-mail package as a replacement for the Notes/CC:Mail E-mail component with direct access to the Notes database. That is just the first company to try to use the Notes server without buying a truckload of Notes clients.

Lotus would be wise to embrace this trend, although it will force a new business model for making a profit from selling a stand-alone Notes server. This will be difficult, and the temptation will be to battle Microsoft head-to-head, perhaps in a higher stakes game of chicken than the VIM/MAPI war could provide.

It would be better for Lotus to adopt a cooperative attitude of adding value to Windows for Workgroups and concentrate on providing innovative applications rather than tying up resources defending a position that is being surrounded — even if it is a nice high spot today.

Coursey is editor of "P.C. Letter," a biweekly newsletter based in San Mateo, Calif.



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IN BRIEF

New RAID system debuts

■ **Micropolis Corp.** in Chatsworth, Calif., has introduced a redundant arrays of inexpensive disks (RAID) subsystem for PCs and servers that is said to provide the largest storage capacity available for machines running **Novell, Inc.**'s NetWare. Priced at $19,975 for a 4.2G-byte, three-module array, the Raidion Model 4200 line offers up to 65G bytes of RAID Level 5 fault-tolerant storage. Additional 2.1G-byte drives are priced at $6,658.

■ Fulfilling a promise to spread its ToolTalk software over multivendor platforms, **SunSoft, Inc.** said the interapplication communications software will be available shortly on platforms from **Hewlett-Packard Co., IBM, Digital Equipment Corp., Cray Research, Inc., Intergraph Corp.** and **Silicon Graphics, Inc.**

ToolTalk, which enables plug-and-play linking of applications, has been endorsed as an industry standard by more than 50 software vendors.

IS releases promoter

CONTINUED FROM PAGE 43

vices at Actmedia. "Of course, I suspect the transition I'm making is that now I'll be married to my software vendor."

Even so, the allure of open systems has been a powerful one for Actmedia, whose accelerated growth in the past five years has turned its $3 million customized Wang system into an albatross.

"I'll know we're all done with this conversion when I can push the Wang system out the fifth-story window," Klump said half jokingly. "Our applications systems are out of date, even though our code is only six years old."

Founded in 1971, Actmedia hit the $2 million revenue mark in 1982 and then blossomed to $200 million this year. It now employs more than 10,000 part-time coupon givers and product demonstrators in thousands of supermarkets.

> "IT'S NOT OFTEN you get funding and then give back $1 million. But when the technology is this new, you're learning as you go.... The most valuable lesson we've learned is to put your investment up front in the planning stages — the business model stage."
>
> JAMES KLUMP
> ACTMEDIA

The conversion project was launched one year ago with a "best guess" budget of $5.7 million. Six months later, Klump recalculated the cost and scaled it down to $4.5 million.

"It's not often you get funding and then give back $1 million of it," he said cheerfully. "But when the technology is this new, you're learning as you go. As we got smarter, we were able to reduce our costs."

His IS staff of 30 was also able to start with a "clean sheet of paper" in designing the new system. "We interviewed our users and developed a total model of the business," the IS executive said.

Actmedia found that at least 60% of the application functions on the old Wang system — many of them grafted onto the original database — were redundant and no longer necessary. Also, the nature of the business had dramatically changed in the past few years from mainly advertising to mostly promotional work.

Advertising has more to do with image in the consumer's mind (like connecting Bill Cosby with Jell-O Pudding) while promotional work has a more direct link between dollars spent and product sold. Coupons, for example, are promotions.

At this point, Actmedia's database modeling and detailed design are finished, and the first prototype application is ready to be installed on a still-to-be-chosen Unix server in January. After doing the Oracle development work on an IBM RISC System/6000, Klump said he is leaning toward an RS/6000 Model 970 as the database engine.

"The most valuable lesson we've learned is to put your investment up front in the planning stages — the business model stage," Klump said. "You can't just jump in and write code. You have to have a methodology."

Actmedia's methodology is based on consulting work done earlier this year with SQL Solutions, Inc., a subsidiary business of Sybase, Inc. The two parted amicably in August, however, when SQL Solutions decided to concentrate on Sybase clients rather than Oracle ones.

One major benefit Actmedia hopes to glean from the new client/server system is speedier, more accurate feedback for packaged-goods manufacturers about the promotions Actmedia manages for them.

"I think we're also going to see lower maintenance costs on our systems as we move down this road," he added.

The company's database is its lifeblood, brimming with information on the top 30,000 supermarkets in America. Of the roughly 140,000 grocery stores in the country, those 30,000 produce 75% of the dollar volume, according to industry sources.

Instant coupons

One of Actmedia's newest and most lucrative products this year was the "Instant Coupon" machine, a small device with a flashing red light that attaches to supermarket shelves and dispenses coupons on the spot. Installed in some 7,000 supermarkets nationwide, the coupon dispensers proved so popular that they generated $20 million for Actmedia this year.

"This turns out to be the most efficient way out there to deliver coupons," Klump said. Sunday newspaper inserts have a coupon redemption rate of only 2.3%, while the Instant Coupon machine rocketed that figure up to 20%. And the majority of that 20%, he added, came from people who had no intention of buying the product until they saw that red light twinkling away.

"We had to really hustle our IS function to build the systems we needed around this," Klump said. "On the new system, with a much more flexible platform, we would be able to deliver new applications for this significantly faster."

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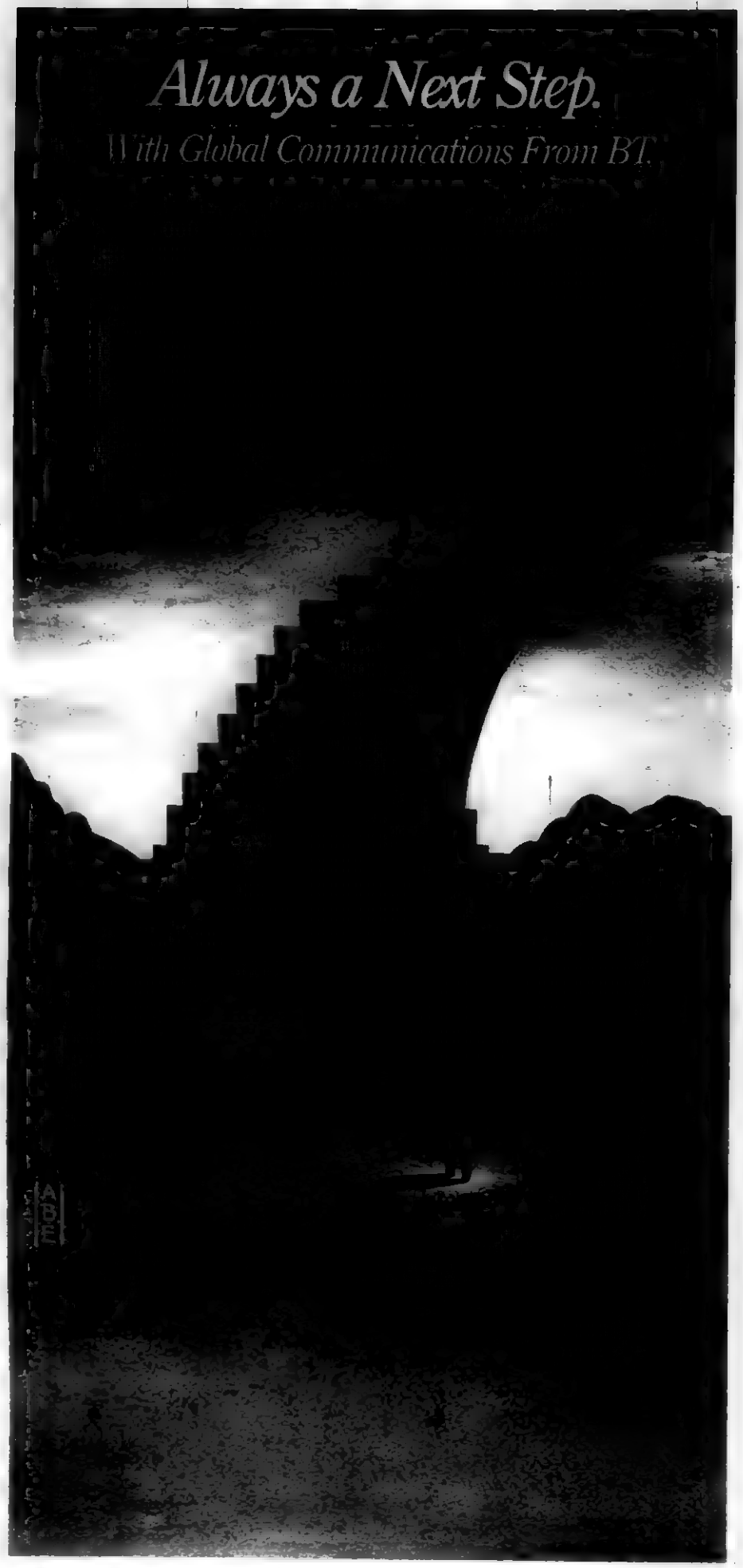

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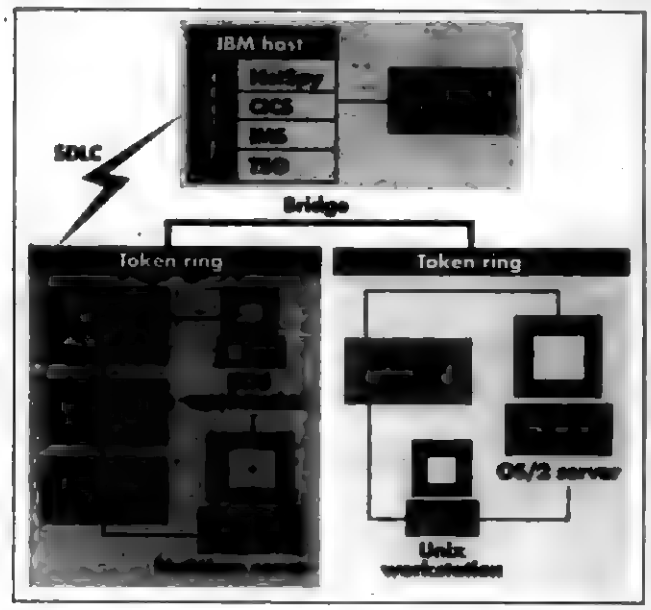
Legent's LANSpy at work



Source: Legent Corp. CW Chart: Stephanie Faucher

LANSpy gets the thumbs-up, but...

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Nearly a year after the introduction of LANSpy — Legent Corp.'s mainframe-based tool for monitoring and troubleshooting local-area networks — users said it offers advantages over products that are strictly LAN-based.

However, some users said Legent should also offer a client/server version of LANSpy that can operate independently of the older, host-based NetSpy performance monitor.

NetSpy, introduced in 1986, provides response-time and other performance data in IBM Systems Network Architecture (SNA) networks. LANSpy — a NetSpy component introduced last December and now installed at 29 U.S. sites — is a Token Ring LAN-resident software "probe" that scans all data packets and periodically sends performance statistics to NetSpy. LANSpy monitors LAN errors, LAN-to-host SNA response time and LAN file server and gateway volume statistics.

Columbia Gas System Service Corp. in Columbus, Ohio, has two IBM mainframes, one running MVS and one running VM, and a nationwide communications backbone tying together some 50 Token Ring LANs at 14 locations. NetSpy runs on the MVS machine, and LANSpy runs on the company's most critical LANs, said Gordon Kinney, manager of VM and data-network technical support.

Kinney said Columbia Gas purchased LANSpy to collect LAN use data for long-term capacity planning but now uses it extensively for troubleshooting. He said an analyst at a central site can watch the company's LANs and spot and fix problems, sometimes before users are aware of them.

Who's in charge?

Some users said bringing LAN information back to a central host raises thorny jurisdictional issues when central and departmental computing come under different groups or when computing and communications are separately administered. "Who gets the phone call when a LAN user is having a performance problem?" asked David Gruzeski, senior systems programmer at General American Life Insurance Co. in St. Louis, a beta-test site for LANSpy. "It really depends on how the company is organized."

Gruzeski said a separate telecommunications group at General American had originally looked for a "LAN solution" — IBM's LAN Network Manager — but agreed to Legent's LANSpy when the group found the IBM product did not provide the performance data required.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said the question of whether LAN

Continued on page 52

Consortia lend planning hand

ATM, frame relay, SMDS chiefs lay down telecom guidelines at Interop

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — Users trying to sort out the relative merits of today's emerging high-speed wide-area networking technologies gleaned a few pieces of planning advice from the presidents of the Frame Relay Forum, ATM Forum and SMDS Interest Group at the recent Interop '92 trade show.

A two-hour discussion with the heads of the consortia, which are charged with accelerating the development of telecommunications technologies that accommodate emerging high-speed applications, yielded at least some rules of thumb for users in transition who are worrying whether a certain technology will "win."

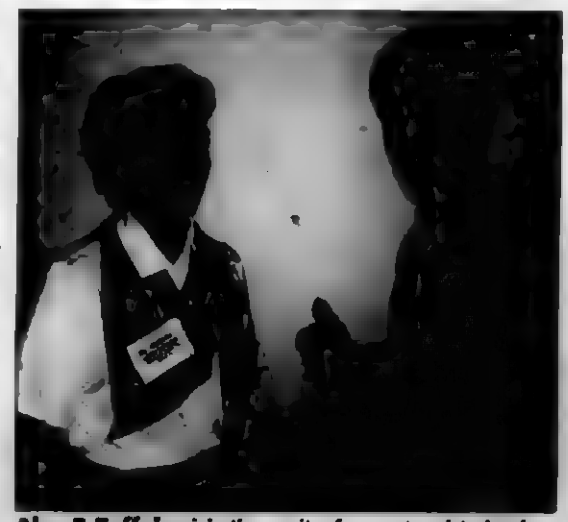
One user criterion is the time frame in which users intend to implement high-bandwidth applications, given that frame relay, Switched Multimegabit Data Service (SMDS) and Asynchronous Transfer Mode (ATM) are in different stages of availability.

One user, for example, said he was looking to link 15 nationwide sites with local-area networks — each with fewer than 20 sites — by the end of the year.

"Do I do point-to-point leased lines and wait to see how the technologies fall out?" he asked. "But then, what if there is no winner?"

The consortia acknowledged that given this user's time frame, he must choose frame relay or wait. However, they said there is no benefit in waiting because for multiple, small sites, leased lines are more expensive, and frame relay is widely available.

"You can still use frame-relay access to other technologies," said Alan B. Taffel, president of the Frame Relay Forum.



Alan B. Taffel *weighs the merits of new network technology with Northpoint Consulting principal Laura Capaldini*

"The biggest mistake you can make is to wait and keep paying leased line costs," added Fred Sammartino, president of the ATM Forum.

Another user questioned the reliability of frame relay for "life-line applications." The panel explained that virtually every public frame-relay service automatically routes around faults because of fairly redundant switching mechanisms. In a leased-line scenario, on the other hand, a circuit failure means two sites quit communicating unless the user has purchased two for redundancy.

The need for speed

If users can wait for more service ubiquity with SMDS and ATM, speed requirements become a consideration. With the current generation of hardware and software for each of the technologies, frame relay is specified to run from fractional T1 speeds to 45M bit/sec. (T3); SMDS from 1.5M bit/sec. (T1) to 2.5G bit/sec.; and ATM from T3 to 622M bit/sec., Taffel said.

Some users said they were concerned about what the network providers are doing to deliver network management information to customers.

Steve Starliper, president of the SMDS Interest Group, said a primary 1993 agenda item for his consortium is customized network management via the Simple Network Management Protocol.

SMDS service currently does not offer this because the Management Information Base extensions are still under construction, Starliper explained. He noted that the only management currently available is a $15-per-month Borland International, Inc. Paradox database that details lost data packets.

Conversely, "most frame-relay providers are giving customers a window into their virtual networks," Taffel said.

The capability is largely allowed by StrataCom, Inc.'s FastPacket multiplexer platform, which is the base for many public frame-relay services. Its Foresight management software allows users to see congestion, peak use and average use by hour or minute.

Management is being defined in the first release of ATM, Sammartino said. While there are no public ATM services available now, he expects them in 1993, he said, citing ATM as being about a year away from prices competitive enough to justify mass deployment.

Points to ponder

Users learned a few specifics at an Interop gathering about the relative merits of frame relay, ATM and SMDS:

- Public frame-relay services have been priced to compete with leased lines for transporting inter-LAN and SNA traffic among multiple sites.
- Users requiring nationwide LAN interconnection today can choose frame relay with an easy conscience: It is an inexpensive technology to upgrade to and can interface to cell-based transports such as ATM and SMDS in the future.
- ATM wide-area services will be available from some long-distance carriers in 1993.
- MCI Communications Corp.'s recent rollout of nationwide SMDS service should encourage local carriers to accelerate their SMDS efforts. SMDS may end up the least secure service because it is a public-switched service.
- All three technologies can carry multimedia applications, though frame relay and SMDS are not optimized for it. Frame relay and SMDS would use highly compressed video, which would slightly degrade quality.

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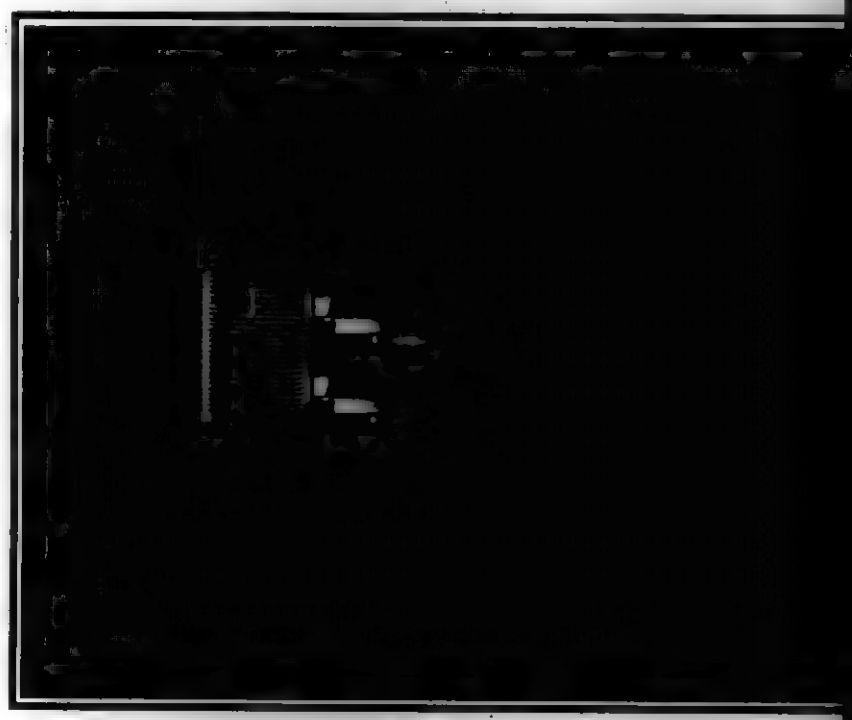

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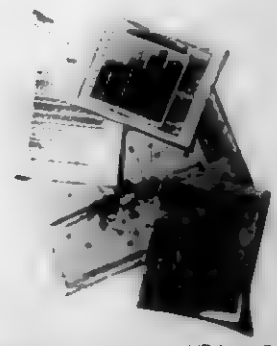

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COMPAQ

Graphical, LAN-based distribution system ships

BY LYNDA RADOSEVICH
CW STAFF

Start-up company Destiny Technology Corp. last week shipped DeliveryMan, a graphical, local-area network-based electronic software distribution system.

Aimed at users with 100-node or larger networks, DeliveryMan is a client/server application that allows network managers to install or update software on DOS, OS/2 or Microsoft Corp. Windows-based client stations from an OS/2-based dedicated server over NetBIOS and IPX/SPX LANs. Pricing ranges from $1,000 for 10 users to $4,500 for 100 users.

Citing reduced costs for disks, technicians' wages and end-user downtime, Stephen Bradley, program director at the Gartner Group, Inc. in Stamford, Conn., said, "Whatever the cost, the system pays for itself in less than a year."

Matthew Cain, program director at Meta Group, Inc. in Westport, Conn., estimated that businesses with 1,000 PCs spend an average of $50,000 annually just for software distribution. That includes one "bug fix," two application upgrades and one operating system change per year, assuming labor charges of $40 per hour and 20 minutes per upgrade.

"Today, an individual has to go from machine to machine doing the floppy disk shuffle," Cain said. "This method is labor-intensive and very costly." Electronic software distribution can help cut those costs, he said.

In addition to cost savings, electronic software distribution enables companies to simultaneously distribute client/server applications across geographically dispersed networks in a way that "wasn't physically possible before," Bradley said.

Using DeliveryMan, a network administrator can compress software program files, choose recipient clients, fill client information into graphical forms and simultaneously transmit the software from the DeliveryMan server.

A built-in scripting language allows the administrator to modify the necessary client files such as AUTOEXEC.BAT. Users at client stations can choose to accept the software update or wait until later. DeliveryMan stores transaction records in a database on the server and provides standard reports.

The updating process took "less than three minutes to deliver Windows 3.1 over Ethernet," said Scott H. Broder, president of Destiny Technology.

The software also addresses licensing — a sensitive issue with many network administrators — with a license tracking feature.

Distribution systems already exist in the mainframe environment, including IBM's Distribution Manager, AM:PM from Tangram Systems Corp. in Cary, N.C., and Synchrony from Farmington, Conn.-based Telepartner International.

DeliveryMan "is not as sophisticated or fully functional as mainframe-based solutions, but it is very simple and it seems to work," Bradley said. "The environment is LAN-based, so administrators can distribute applications without relying on the host data center."

In October, Novell, Inc. introduced Network Navigator DOS-LAN Distributor 2.0, an electronic software distribution system that runs on NetWare-based LANs. The product was developed by Annatek Systems, Inc., which Novell purchased last summer [CW, Oct. 5].

Analysts predicted that client/server-based electronic software distribution will become a function of operating systems such as Microsoft's Windows New Technology in a couple of years.

LANSpy gets thumbs-up

CONTINUED FROM PAGE 49

tools should be LAN- or host-based depends on how they are to be used. "You don't want to manage LANs from the glass house," he said. "But this isn't management; it's performance monitoring. You'll always have centralized monitoring."

Indeed, users said host-based LAN monitoring and capacity planning allow use of a rich set of mainframe analytical tools. For example, one LANSpy user said LANSpy data is processed and presented by Legent's mainframe-based set of integrated management tools for use analysis and work load and capacity forecasting.

Nevertheless, Dzubeck said, Legent will eventually have to deliver a mainframe-free version of its network products. "The equivalent of NetSpy must be produced for the LAN. Otherwise, this is just a master/slave relationship, and that is not the way the industry is going. It's going distributed."

Houston-based Texaco, Inc. has installed LANSpy at two of 19 major U.S. sites so far, and Sam Kapadia, telecommunications consultant, said he would like to use it for both centralized monitoring and localized troubleshooting. "At our [Houston] network control center we can look at LANs throughout the corporation, see end-to-end response time and do capacity planning. But at the same time, LAN administrators at local sites want to see the utilization of the LAN without having to log on to the mainframe."

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IN BRIEF

IBM to license Wollongong software

■ **IBM** will license networking software from the **Wollongong Group, Inc.** in Palo Alto, Calif., to use in future networking products that it expects to announce in the fourth quarter of this year. The products include IBM network/transport software and virtual terminal, terminal emulation, file transfer and high-level scripting language services for use on DOS, Microsoft Corp.'s Windows, the Apple Computer, Inc. Macintosh, OS/2 and Unix workstation platforms in an IBM/Digital Equipment Corp. host environment.

Separately, the Wollongong Group announced that **Harris Space Systems Corp.** has selected its new Management Station as the Simple Network Management Protocol manager for the **Kennedy Space Center's** Core Electronics Systems Project.

■ **Sun Data, Inc.** in Norcross, Ga., announced a new division to help customers integrate IBM Application System/400 minicomputers with local- and wide-area networks. The division will help customers install Novell, Inc. NetWare or IBM Token Ring LANs, integrate them with new, upgraded or existing AS/400s, load software and train systems managers.

■ **Syntrex Technologies, Inc.** in Eatontown, N.J., a wholly owned subsidiary of **Phoenix Technologies Ltd.**, launched a network management and support center that gives Syntrex engineers the capability to remotely manage customers' networks on a 24-hour-a-day basis.

■ **Frontier Technologies Corp.** in Mequon, Wis., will offer Super-NNTP for Windows in November, the company announced. The product will allow Internet users to access network news from a Microsoft Windows desktop.

■ Following its acquisition of Provo, Utah-based **ServicePoint Development Corp., Network Computing, Inc.** in San Jose, Calif., is offering the ServicePoint automated help desk as a component of its LANAlert system management suite. ServicePoint pricing starts at $995 for a single user and $12,995 for a site license.

■ **Northern Telecom, Inc.** and **Network Systems Corp.** in Minneapolis have agreed to work together to develop cell-switching technology and products for LANs and WANs.

Also, **Vitalink Communications Corp.**, a wholly owned subsidiary of Network Systems, reduced prices on its 6600 line of single-board Fiber Distributed Data Interface-to-Ethernet bridge routers. The 6612 and 6617 models were reduced from $24,000 to $19,500 and $28,000 to $22,000, respectively.

■ **Teleglobe Canada, Inc.** has formed a consortium with 20 European and U.S. telecommunications carriers to lay a $385 million high-capacity fiber-optic cable linking North America with Western and Eastern Europe. Teleglobe claims the cable, which is slated for service by December 1994, will have 300% more capacity than current fiber-optic technology.

■ **Fibermux Corp.** has rolled out Windows and Unix versions of LightWatch/Open, the Chatsworth Calif.-based company's network management system integrated with **Hewlett-Packard Co.'s** OpenView network management environment.

■ **Cisco Systems, Inc.** in Menlo Park, Calif., signed an agreement under which Italy's **Ing C. Olivetti & Co.** will resell Cisco's internetworking products — including multivendor routers and communications servers — as part of Olivetti's European-based network integration business.

■ **Chipcom Corp.** in Southboro, Mass., will port its ONdemand Network Control System software package to **DEC's** network management platforms in the first quarter of 1993.

■ **Tennessee Temple University** in Chattanooga, Tenn., has awarded **Memorex Telex Corp.** a contract worth approximately $500,000 to provide 145 1486SX PCs and Extended Industry Standard Architecture-based servers, as well as Novell and Synoptics Communications, Inc. products. The contract will include network design, installation, integration and training, the Irving, Texas, vendor said.

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SoftSwitch adds more enterprise mail gateways

BY JOANIE M. WEXLER
CW STAFF

SAN FRANCISCO — Electronic-mail connectivity vendor SoftSwitch, Inc. was a high-profile player at the recent Electronic Mail Association conference in moving users closer to their goal of building enterprise messaging networks from a patchwork of disparate systems.

The Wayne, Pa., company, which earlier this year rolled out a downsized version of its mainframe-based mail gateway system, made several announcements that address some of the concerns users expressed at the show about platform-to-platform connectivity [CW, Nov. 2]. These included the following:

- Gateways that allow Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Microsoft Mail users on local-area networks to communicate with X.400, IBM Systems Network Architecture Distributed Services and Transmission Control Protocol/Internet Protocol mail networks supported by SoftSwitch's mainframe-based translation software, SoftSwitch Central. The CC:Mail version quietly became available last month; the Microsoft Mail version began beta testing last month, and no ship date has been announced.
- Support of Apple Computer, Inc.'s Open Collaborative Environment (OCE), an extension of the Macintosh System 7.0 operating system that provides services such as messaging, directories and authentication. OCE support on SoftSwitch's distributed Enterprise Messaging Exchange (EMX) means the EMX can serve as a backbone for transport and directory services for OCE-compliant Macintosh applications.
- Implementation services, available immediately, to help customers simplify messaging system integration.
- A message switch, based on the EMX architecture, to allow public carriers to switch messages among different local area network-based systems.

Also at EMA, Apple announced three Open Systems Interconnect (OSI)-oriented products: MacX.400, which allows users to send mail from a Macintosh to other types of desktop computers and to recipients who use proprietary mail systems; MacODA, a software translator that allows the interchange of documents among different applications and platforms; and OSI Connection for Macintosh, which allows Mac applications to run across OSI networks.

Meanwhile, Verimation, Inc. in Rockleigh, N.J., released Version 4.0 of its Memo mail-oriented product, which adds PCs and other LAN-based desktop platforms to its mainframe-based office communications system. The Memo product blends mail, business applications, work-flow and document management functions into one package.

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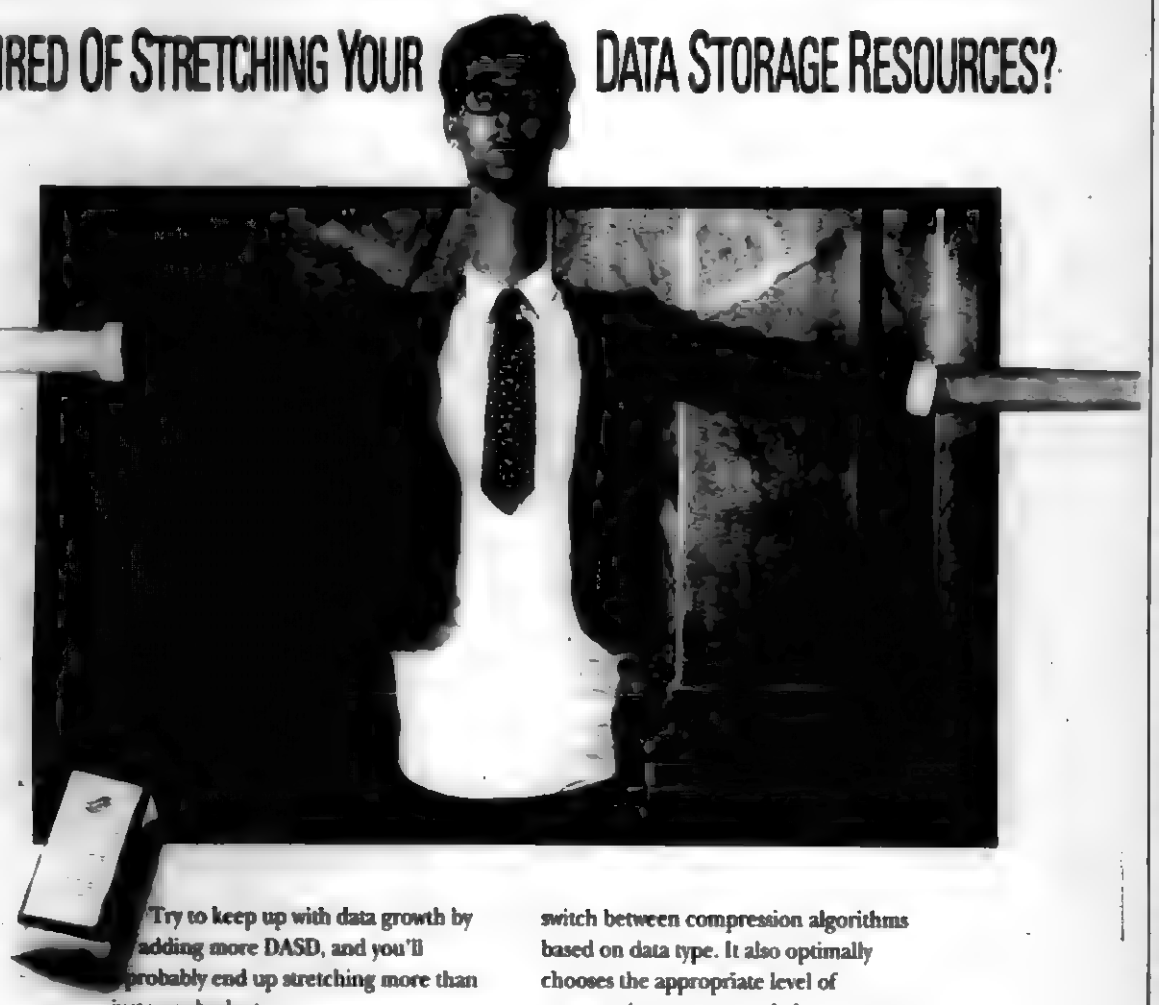

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Interop notebook

Announcements made at the recent Interop '92 conference included the following:

- **Bus-Tech, Inc.** in Burlington, Mass., will join with **Novell, Inc.** and **IBM** to market an implementation of NetWare for Systems Application Architecture (SAA) on the IBM 3172 communications controller. The built-in channel-based connection of the Bus-Tech 3172-BT1 eliminates the need to use an IBM 3174 cluster controller or equivalent as an extra piece of hardware between the NetWare for SAA server and the mainframe, the vendors said.

  In addition, the 3172 is five to seven times faster than the 3174, which was not designed to support local-area network-to-host connections, an IBM spokesman said.

  The product will also support direct mainframe access for other NetWare Loadable Modules, providing users with applications such as SQL database access. With pricing beginning at $21,950 for hardware and software, the 3172-BT1 is scheduled for December availability.

- **NetManage, Inc.** in Cupertino, Calif., announced what it claims is the first Transmission Control Protocol/Internet Protocol (TCP/IP) application for Microsoft Corp. Windows for Workgroups Version 3.1. The product extends NetManage's Chameleon product, which provides users with access to TCP/IP from Microsoft's Windows and Windows New Technology. Priced at $400, Workgroup Chameleon is shipping now.

- **NCR Corp.** announced support for the **Open Software Foundation**'s Distributed Computing Environment (DCE), which will be made available across the NCR System 3000 Unix V Release 4 family.

  The DCE implementation will include application support and DCE Core Services, including DCE Cell Directory and Security Services, NCR said. The DCE Global Directory Service will be integrated with NCR's Open Directory500 distributed X.500 directory service, the vendor said.

  NCR's Top End on-line transaction processing software will be able to make use of DCE remote procedure calls, and NCR's Star Sentry network and systems management software will support DCE as part of its evolution to OSF's Distributed Management Environment, NCR said.

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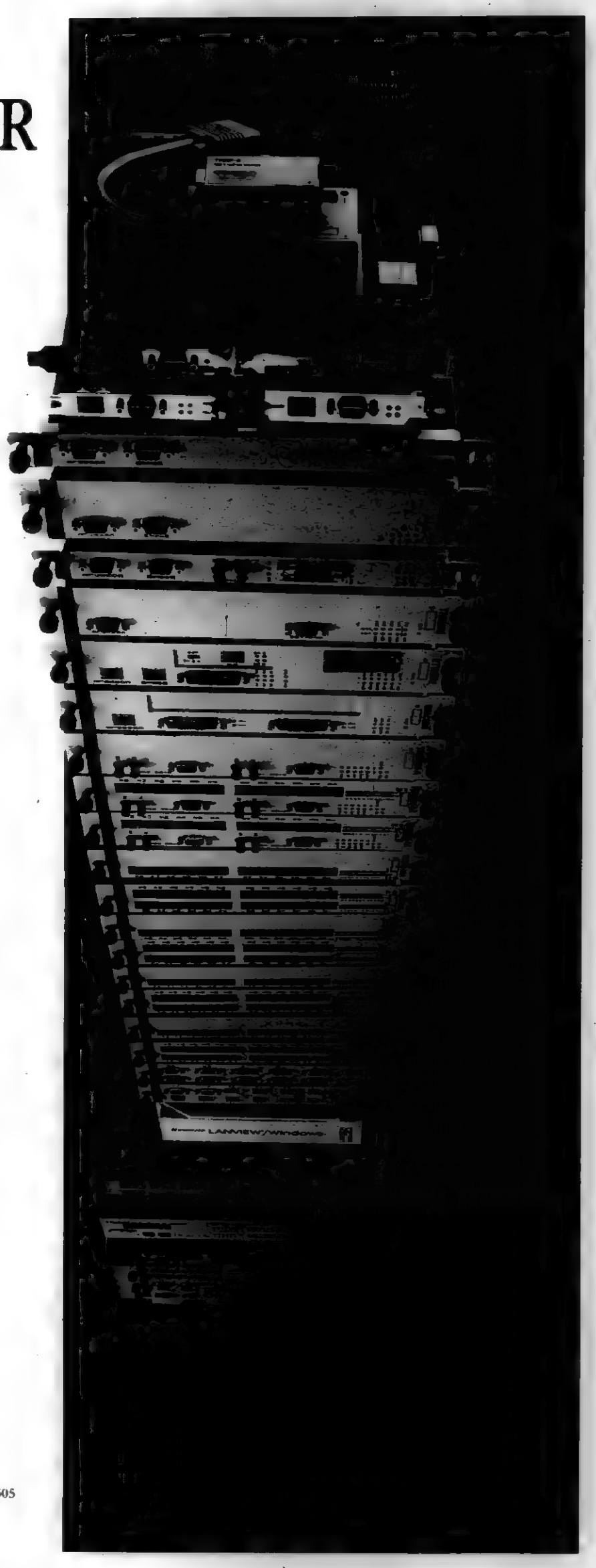

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NEW PRODUCTS

Network management

Tekelec has started shipping Version 1.0 of ChameLAN 100 Token Ring analyzer.

According to the company, the product can support simultaneous analysis of multiple Token Ring local-area networks and will include diagnostic functions similar to those of ChameLAN 100 Fiber Distributed Data Interface and Ethernet products.

New protocol decode support is provided for interfaces, including Novell, Inc.'s NetWare, Sun Microsystems, Inc.'s Sun NFS and Apple Computer, Inc.'s AppleTalk.

Through the system's DeskTop interface, users can choose multiple LAN segments to analyze. Data can be captured, viewed or filtered in real time on each indivdiual test interface.

The ChameLAN 100 costs $6,500.

Tekelec
26580 W. Agoura Road
Calabasas, Calif. 91302
(818) 880-5656

Network Security Systems, Inc. has introduced LanSafe II network power management software.

The product was designed to provide an integrated approach for centrally managing electrical power to all local and remote network components. Interactive management and control power management devices are provided for components such as data communications servers, critical workstations, bridges and file servers.

By using the software's management console screen, users can monitor real-time loads and troubleshoot power management problems and battery and voltage status.

LanSafe II software for Novell, Inc. networks costs $135.

Network Security Systems
9401 Waples St.
San Diego, Calif. 92121
(619) 587-7950

Frye Computer Systems, Inc. has introduced the NetWare Console Commander.

According to the company, the product allows users to automatically schedule any Novell, Inc. NetWare 3.1 console command to automatically take place at the time set.

NetWare Console Commander was designed to clear connections that interfere with backups, load and unload Netware Loadable Modules, send messages, set NetWare's setable parameters, run NetWare Command Files and run any server-based program. A screen-saver with password protection is also included.

The product costs $395.

Frye Computer Systems
19 Temple Place
Boston, Mass. 02111
(617) 451-5400

Metrix Network Systems has announced NetMetrix 3.0, an Internetwork Monitor designed for Ethernet, Token Ring and Fiber Distributed Data Interface networks.

It offers compatibility with RMON, the Simple Network Management Protocol standard for monitoring remote local-area networks. The product collects data from RMON agents running on each segment in the network and has software that runs on a standard Unix platform. The data is integrated and correlated for complete end-to-end visibility of a multisegment network, the company reported.

Version 3.0 works in conjunction with the NetMetrix Load Monitor, which offers analysis of the traffic on the LAN. Traffic can be measured and graphed by the Load Monitor by source, time interval, destination, packet size or protocol.

License prices start at $1,995 per tool.

Metrix Network Systems
1 Tara Blvd.
Nashua, N.H. 03062
(603) 888-7000

Gateways, bridges, routers

Hayes Microcomputer Products, Inc. has announced the Hayes Millennium 8000 Network System.

According to the company, the product provides a high-density communications platform that offers an upgradable solution for wide-area connectivity to both local-area network and host environments. Up to 16 Line Cards and two System Controller Cards are provided. Each Line Card has the capacity to provide between one and eight communications devices, including Integrated Services Digital Network terminal adapters and high-speed modems.

Support is provided for control management and access to a LAN by each controller card. An overall capacity of up to 128 communication devices per chassis is provided.

Prices range from $1,000 to $1,300 per port.

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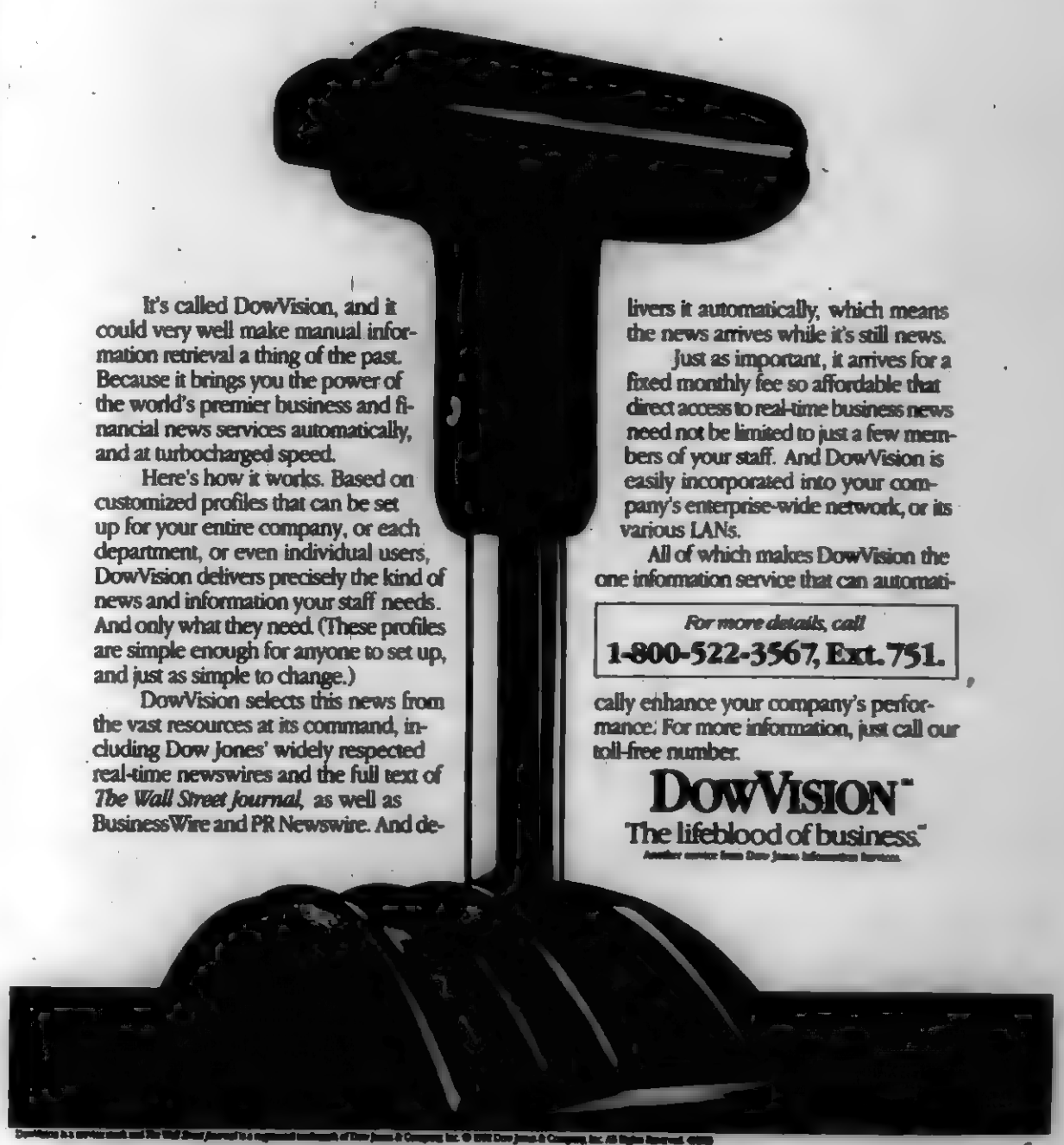

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IN BRIEF

User groups swap lists

■ The **IBM** user group **Guide International** and the open systems standards organization **X/Open Co.** have exchanged membership lists so members of one group are now automatically members of the other.

■ **Compuware Corp.** has filed a registration statement for an initial public offering. Additionally, the company has signed a letter of intent to acquire **Landmark Systems Corp.**'s Eyewitness CICS fault-diagnosis tool.

■ More vendors have jumped on **IBM**'s Distributed Relational Database Architecture (DRDA) bandwagon. **Object Technology International, Inc.** and **XDB Systems** have announced products that provide access to IBM's relational database managers. **The Ask Group's Ingres Products Division** and **Progress Software Corp.** said they will deliver DRDA gear.

■ **Intel Corp.** named Wendy Vittori general manager of the Intel Supercomputer Systems Division European Operation. Vittori, who has been director of marketing and strategic planning at the Supercomputer Systems Division in Beaverton, Ore., will also direct the operation of Intel's Supercomputer Development Centre in Munich, Germany.

CA/Citicorp deal spells change

Agreement may force big iron software vendors to abandon tiered pricing

BY THOMAS HOFFMAN
CW STAFF

Since Citicorp landed a five-year, flat-fee software licensing agreement with Computer Associates International, Inc. last month, users, analysts and software vendors have expressed mixed views on whether the agreement will force mainframe software vendors to abandon the standard tiered-pricing model in favor of alternate pricing options.

"Other mainframe software vendors will have to address this in their own way," noted Ed Acly, director of software research at Technology Investment Strategies Corp., a Framingham, Mass., market research firm.

Those vendors will have to adopt alternate pricing schemes, agreed Jerome Doniger, general manager of the technology support division at the U.S. Postal Service (USPS). He cited the changing technological needs of customers who are moving away from mainframe-centric computing to distributed computing environments.

The USPS became the first federal agency to agree to a flat-fee enterprise licensing agreement with CA — only a week after the Citicorp deal was announced [CW, Oct. 19].

Doniger said the USPS is working to restructure its licensing agreements with its nine primary software vendors. So far, it has inked new enterprise licensing agreements with CA and Legent Corp. in Vienna, Va. Doniger said the federal agency is still negotiating a deal with IBM.

A spokesman at IBM said the Armonk, N.Y., computer firm has no plans to shift away from tiered pricing for mainframe software. While the spokesman said the firm will continue to work with its customers on improving the price/value ratio, he said no major licensing changes are in store.

John Burton, president and chief executive officer at rival Legent, said his company has offered its customers flat-fee enterprise licensing for several months, though the firm did not announce it publicly.

"If you have outstanding problems with your pricing, you have to make a lot of noise. We don't have outstanding problems with our customers," Burton said.

Early clients of Legent's enterprise licensing program, Burton said, include Pacific Bell, Ameritech Corp. and The Boeing Co.

The enterprise licensing program Legent offers includes individual and multiple site licenses, with options for predetermined cost escalations for software, Burton said. Customers under this program are not forced to pay upgrade charges based on hardware changes, he said.

Pay per MIPS

Unlike CA's enterprise licensing program, which charges customers based on the number of millions of instructions per second (MIPS) of computing power required to run the software, Legent enterprise licensees pay a flat-fee based on the "value" of the software, Burton said.

Most users said they would have to evaluate the range of pricing options before deciding on the licensing agreement that best suits their company's needs. For example, Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla., said his company would not license software based on MIPS use because Alamo has been increasing its MIPS use 50% annually.

Dick Kane, department head of technical infrastructure and support at ITT Hartford, said his company would favor enterprise-wide licensing because it would allow the firm to run software across its multivendor environment without paying additional costs. But Kane said he would like to evaluate alternate pricing plans before deciding.

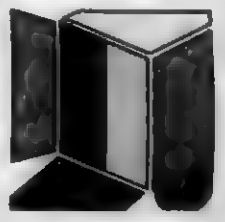
Manufacturers upgrade logistics applications

BY JOHANNA AMBROSIO
CW STAFF

Until this year, the Church of Jesus Christ of Latter-day Saints was using a warehouse-management system that was "older than dirt," said Ben Christiansen, warehouse operations manager. Now that a spanking new computer setup has been brought in, four positions have been eliminated and merchandise is easier to find.

The church is not alone. As small and medium-size manufacturers scramble to modernize their computers, they are finding a host of benefits to adopting a new approach to managing the warehouse and other aspects of the business.

"It used to be that manufacturers looked at each function — transportation, purchasing, manufacturing, logistics — and managed and optimized them separately," said Martin Piaszczalski, director of the manufacturing automation service at The Yankee Group in Ann Arbor, Mich. "Now they're looking at the whole picture to see how to improve customer service."



Warehouse management is one part of logistics, which is broadly defined as the movement of raw goods and merchandise from suppliers to the manufacturer and then to the manufacturer's customers.

"The old method and old software in place was based on guessing what was in there," said Curt Monash, a software analyst in New York. "And the old software was not tied to real business schedules. The new method is based on knowing exactly what is there and where it is." Another reason to modernize the software, Monash said, is the movement to distributed computing, which forces the issue of new hardware, software and database management systems.

Customer service was one driving motivation behind the modernization move at the church's 186,000-sq-ft warehouse in Salt Lake City. "We are like our civilian counterparts," Christiansen said. "My personal goal is to have flawless customer service."

The warehouse stores and ships 465,000 cases of merchandise per quarter, with an annual dollar volume of $30 million. Bibles and other printed material account for most of the goods shipped, but there is also the occasional refrigerator, cement mixer or forklift that comes through.

Continued on page 62

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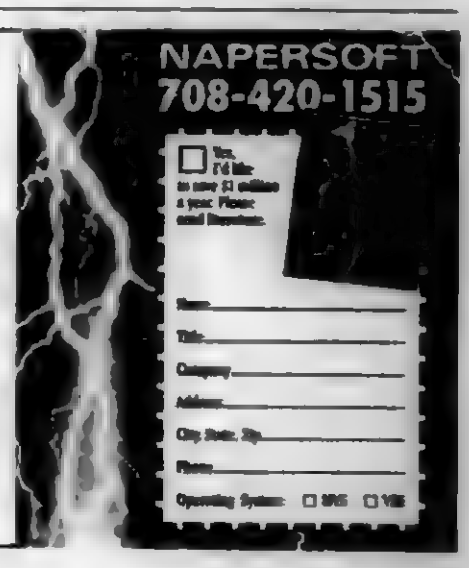


IBM accuses resellers of selling fake parts

BY LYNDA RADOSEVICH
CW STAFF

Seven third-party resellers distributed modified IBM code and circuit cards represented as genuine IBM parts, IBM charged in a recent lawsuit.

The suit, filed in U.S. District Court in Charlotte, N.C., last month, accuses the firms and five individuals of selling counterfeit circuit cards for IBM 3174 Establishment Controllers that connect workstations with mainframes. IBM is seeking temporary and permanent injunctive relief and undetermined monetary damages.

IBM recently mailed letters to the installed base of 3174 customers notifying them of the possibility of counterfeit parts and explaining that the cards do not comply with IBM standards and are not covered by IBM maintenance agreements. The company said it does not know how many counterfeit cards have been sold.

Named as defendants in the suit were American Data Company, Inc. in Charlotte, N.C.; Brookwood Computer Industries, Inc. in Alpharetta, Ga.; ClassicBlue Computer Services, Inc. in Randolph, N.J.; Com-Gear Unlimited, Inc. in Canton, Ga.; Computer System Services, Inc. in Canton, Ga.; Five Star Computer Services, Inc. in Carrollton, Texas; Savon Systems, Inc. in East Setauket, N.Y.; and five individuals.

The card in question — the 3270 Port Expansion Feature — allows the 3174 to connect to 64 ports rather than the standard 32. It sells for $4,865. The port expansion software code sells for $1,265. The company has shipped 200,000 3174s since the machine's introduction in 1986.

"We believe we are only seeing the tip of the iceberg," an IBM spokesman said.

No failed systems have been traced to the bogus IBM cards yet, but IBM claims the cards do not comply with IBM standards and can cause systems to fail.

Customer warranties from IBM would not cover the parts, even if users did not know the parts were counterfeit.

"That's just good business practice," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

IBM also said it would bill customers for maintenance it may have unknowingly provided on counterfeit parts. The company said it will continue to support customers and the genuine IBM parts of the system (see story below).

Surprise, surprise!

Several of the defendants seemed surprised by the charges.

John Lavin, president of ClassicBlue Computer, said, "There was no way for us to know" whether ClassicBlue was distributing modified IBM parts. "IBM never trained us to spot counterfeit software." According to IBM, the counterfeit parts come complete with fake IBM labels.

Others defendants in the suit who were contacted said they expect to reach an agreement with IBM.

The suit is the most recent in a string of actions that IBM has filed in the past 18 months. For example, in October 1991, IBM charged Comdisco, Inc., a computer leasing company in Rosemont, Ill., with passing off counterfeit IBM memory cards. The suit is ongoing.

IBM would not say how it is tracking the counterfeit parts, but it is being "much more aggressive" in managing its maintenance contracts and is increasing the number of physical, on-site inspections of its equipment, Dzubeck said.

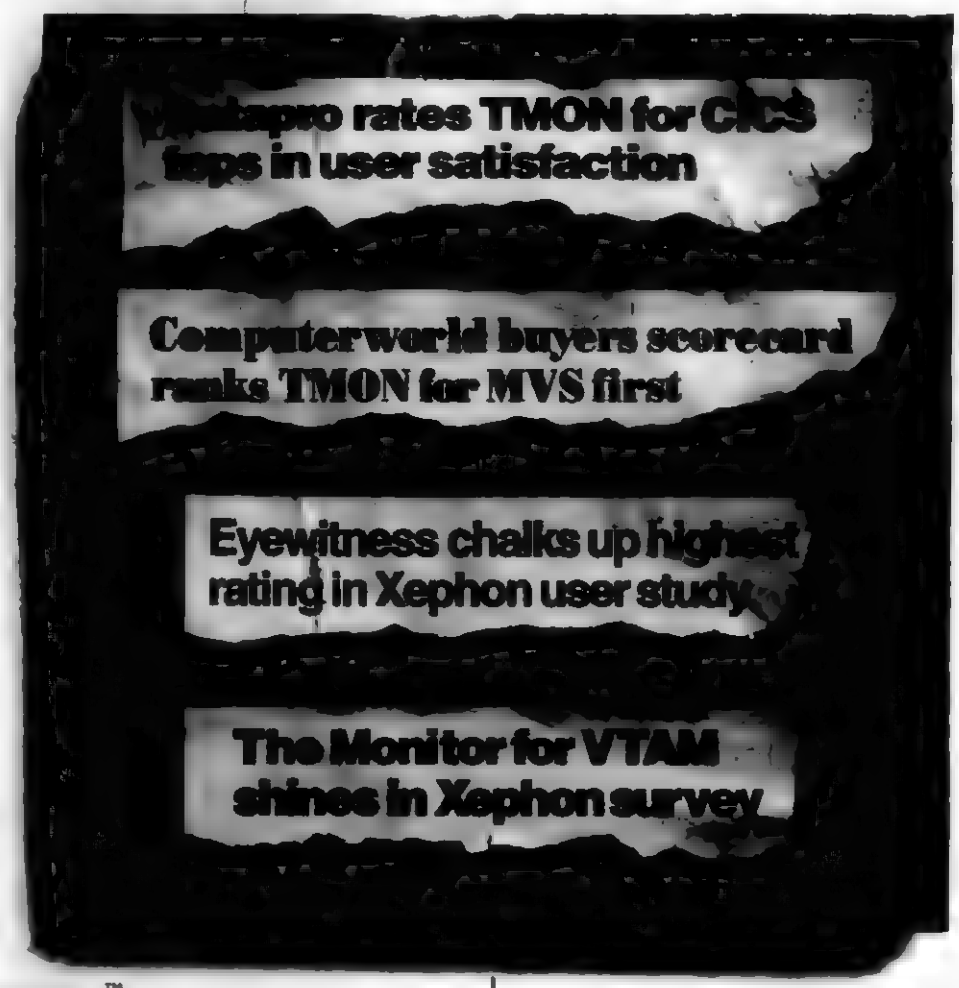
Duped?

Say you discover your IBM 3174 has parts you thought were genuine IBM but that were, in fact, modified. What do you do?

IBM said customers should contact suppliers and get a guarantee that only genuine IBM parts were used. If IBM finds a counterfeit part, it will not cover it under an IBM warranty. "If the customer chooses to maintain an IBM agreement, we recommend they buy a genuine IBM part," said George Mills, the establishment subsystems planning manager at IBM.

"I would go back to the person who sold it to me and ask for my money back," said Frank Dzubeck, president of Communications Network Architects in Washington, D.C.

IBM will check customers' systems for counterfeit parts for a fee. Users should contact an IBM marketing representative for pricing.



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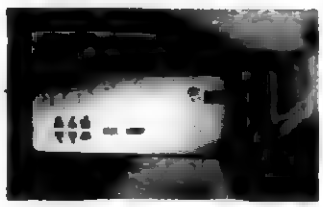

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'Software agents' make headway on office tasks

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Small firms may find themselves shorthanded when it comes to handling routine office tasks and processing purchase orders. A small Silicon Valley firm claims to have an answer to that quandary in the form of "software agents" that can answer the phone, retrieve vital information from the corporate database and send orders out the door.

Edify Corp. has been shipping its Information Agent software on a specially equipped IBM PC running OS/2 since February. Last month, as it was seeking another round of funding, the 50-person firm enhanced its bundled office system. Edify now has "express agents," or preprogrammed, object-oriented programs that know where to find data and how to pass it along to telephone callers or to customers with fax machines. They can also be interfaced with character-based electronic data interchange applications, the 2-year-old firm said.

The express agents are designed to speed development of Edify applications by business managers, often without the advice and counsel of information systems programmers. "We sell to the end users, not to IS," explained Charles Jolissaint, the firm's chief technical officer. "Our interface is set up so that a power PC user who can set up macros can set up the [Edify] application." Users manipulate icons written in the object-oriented C++ language, which can be reused in other applications.

Early users say the $70,000 system — complete with hardware and special fax and phone cards — can pay for itself in a few months; individual agents are priced at $7,500 each. "It's like you hired a person to manage your routine business tasks 24 hours a day," said Marty Martin, manager of customer service at Xilinx, Inc., a $135 million semiconductor maker in San Jose, Calif. Technical support personnel head home at 5 p.m., but European customers can check on their orders all night long, accessing an Ingres Corp. database on a Sun Microsystems, Inc. server.

Industry analysts said Edify works on a very high level of abstraction. It does not carry out SQL queries against relational databases, for example, but it can pass along query results for inclusion in user reports. "They rely on the fact that connectivity to all the relevant databases must already be in place," said Christina Filistowicz, a senior analyst at Dataquest, Inc. in San Jose, Calif. The underlying database and its applications then treat the actions of the Edify agents exactly as if they were human users logged on to the system.

The product's fax and telephone support allows Edify users to add Touch-Tone telephone queries to databases, using synthetic speech to read the data aloud to callers. So far, however, Edify is limited in that it works with character-based screens only; a Microsoft Corp. Windows version is about six months away from shipment, Jolissaint said.

Spending cutbacks hit home

BY JOHANNA AMBROSIO
CW STAFF

A study recently released by Nolan, Norton & Co. confirms what every data center manager must surely know by now: Data center staffing and spending levels are down across the board.

But other trends also emerge: Small data centers have been harder hit than their larger counterparts, the mix of data center employees has remained relatively stable during the last 12 months, and shops are using their disk storage resources more efficiently than ever.

The information for the study, based on surveys conducted at 200 Nolan, Norton client sites, includes data from 1990 and 1991. The information was compiled in April and was publicly released by the Boston-based consulting firm late last month.

For statistical purposes, a large data center is defined as having an active work load of at least 100 million instructions per second (MIPS); a small center has below 100 MIPS. All of the numbers that reflect a decrease or increase are compared with the respective numbers taken for the year-earlier period.

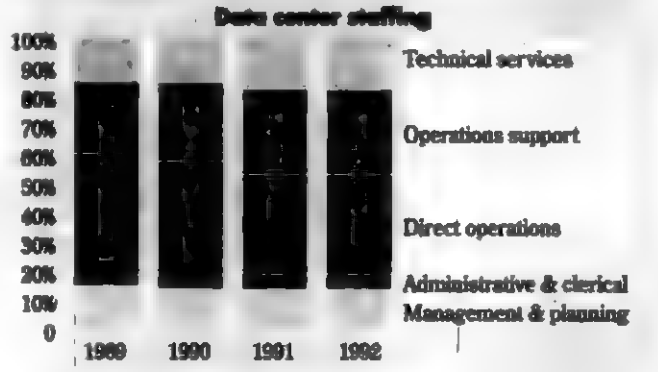
No spending spree

Spending on technology — which includes mainframes and minicomputers, tape and disk storage and systems software — dropped 7% at small data centers and 4% to 5% at large ones. "Spending on processors, disk and tape decreased, while spending on systems software increased," said Tom Hickey, senior manager at Nolan, Norton.

For example, he said, processor spending declined 12% at small data centers vs. 7% at larger ones, while systems software spending actually increased by 9% at small data centers and by 2% at larger shops. Systems software spending would be up even more, Hickey said, were it not held down by consolidation moves and programs in user shops to get rid of seldom-used packages to cut down on maintenance costs.

Support grows

Service and support roles are the ones showing even slight growth on data center staffs



Source: Nolan, Norton & Co. CW Chart: Michael Siegfried

On the personnel side, staff levels decreased by 10% in small data centers vs. 6% for their larger counterparts. One explanation, Hickey said, is that "where large shops automated early on, smaller data centers are kind of catching up." Likewise, personnel spending decreased by 10% at smaller data centers and by 1% to 5% at larger shops.

Other trends picked up include the following:

- Disk storage, which averaged 7.5G bytes for every MIPS of computer work load, has decreased to 7.1G bytes. "That says that people are running a lot tighter than in the past," Hickey said.
- Response times continue to improve. "Subsecond response times are no longer the exception," Hickey said.
- Levels of manually intensive activities, especially in tape mounting and printing outside of the data center, continue to decrease. Manual tape mounting dropped by 35%, Hickey said, mostly because of the use of automated tape loaders and tape silos. On the print side, the number of pages printed out of the data center decreased by 12%.

Factors here included use of print viewing software; two-up and four-up printing; downloading printing jobs to local-area networks and PCs; and redesigning some applications to use local print more efficiently.

The "general belt-tightening" will continue next year, Hickey predicted, as will more use of plug-compatible hardware because of better prices.

Sequent expands Symmetry line's clustering capability

BY MARK HALPER
CW STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc. last week added a host of hardware and software features to its Symmetry line of Unix multiuser systems in an effort to enhance the line as a database server in standalone client/server and mainframe coexistence schemes.

The highlight of the announcement was the expansion of the line's clustering capabilities so that systems in a cluster can share the same database. Previously, they could only share the same storage device.

The new clustering design supports up to four systems, compared with two under Sequent's existing scheme.

Sequent said the two-cluster systems, which will ship in the first quarter of 1993, and three- and four-cluster versions, which will ship in July or August of next year, will run Oracle Corp.'s forthcoming parallel relational database software, Oracle 7.0.

Two-system versions will be based on multiprocessing versions of Intel Corp.'s 50-MHz I486 chip, and the three- and four-box clusters will be based on Intel's forthcoming Pentium chip — the 586. All will run on Sequent's Open Software Foundation (OSF)-type Dynix/ptx Unix operating system, to which the company last week added security features and OSF application programming compliance.

In a key addition to Sequent's clustering capabilities, the company said it will provide its own, rather than Oracle's, manager, which includes fault tolerance.

The firm also added an integrity manager that will switch a user to a different system in the event of a system failure and return the user to an earlier data state.

The Sequent cluster schemes shuttle data between boxes over Ethernet or Fiber Distributed Data Interface media, according to product marketing manager Tejas Vakil.

One Sequent user said clustering should make Unix a more viable platform in commercial environments. Michael Higgins, technology support manager at San Francisco-based clothing manufacturer Byer California, said, "We've reached a fork in the road where you need either two-phase commmit or clusters." He said that clustering is less complicated and safer than using a two-phase commit process.

A two-system cluster consisting of a 6-processor Symmetry 2000/750 and a 4-processor model 250 costs $704,300.

Upgrading logistics apps

CONTINUED FROM PAGE 59

Until June, the warehouse had been managed with a Distribution Management system from GDS & Associates in Portage, Mich. The software, Christiansen said, "was good 20 years ago but was old 15 years ago." The church decided to replace it with a multimodule package from Daly & Wolcott in West Warwick, R.I., "to give us an integrated view of things," he added.

The new software, which runs on an IBM Application System/400, "shows us exactly where everything is and how much is there," Christiansen said.

At Harley-Davidson, Inc. in Milwaukee, "the goal is to be more efficient," said Richard Kolbe, director of MIS. To reach that goal, the firm is installing customer order processing software from American Software, Inc. in Atlanta. It should be in production by the beginning of next year, Kolbe said.

"Now we generate three different reports each day for the pick list, the packing list and address labels. The new system will save three to four hours a day," as well as cut down on errors, Kolbe said.

In contrast, cost-cutting was the basic reason behind the modernization effort at Fieldcrest Cannon's institutional towel division. In August, the company began installing warehouse-management software from Imrex Computer Systems in Great Neck, N.Y. "We're moving inventory from a larger warehouse down to a smaller one in Charlotte, N.C.," said Ken McHenry, manager of information systems at Fieldcrest Cannon in Kannapolis, N.C. "Once the technology has been proven there, we'll expand it to others."

NEW PRODUCTS

System software

Raxco, Inc. has released Version 2.2 of its Security Baseline System software.

The software was designed to locate and report the differences between current system characteristics and site-defined security standards on Digital Equipment Corp. VAX/VMS systems.

The product features the ability to collect baseline reports from remote nodes on a network and then use the reports to generate a consolidated summary report. This report determines which nodes comply with the security policy of an organization.

Prices range from $174 to $11,514.

Raxco
Suite 200
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Database management

IBM has introduced the IBM SQL Master/VM 1.1, an upgraded productivity tool.

According to the company, the product was designed to help users automate many routines and repetitive tasks. Working with the IBM SQL/Data Systems (SQL/DS) program, IBM SQL Master/VM 1.1 can automate a number of the manual functions needed to support SQL/DS databases within VM/XA, VM/ESA and VM/SP environments.

Improved support of VM and a variety of archiving methodologies are offered in addition to enhanced authorization structures.

Basic license charges range from $75 to $1,555 per month.

IBM
800 N. Frederick Ave.
Gaithersburg, Md. 20879
(301) 240-7277

BMC Software, Inc. has announced Data Migrator, a database management tool.

According to the company, Data Migrator was designed to move IMS data to DB2 tables quickly and easily while maintaining on-line data availability and maximum performance. The entire process of unloading data from IMS is automated by Data Migrator. The product maps the data into DB2, makes image copies and populates tables and indexes.

CPU-level prices start at $10,500.

BMC Software
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Software application packages

Generic Software, Inc. has announced Remdoc, a menu-driven software package designed for the IBM System/36 and Application System/400.

According to the company, users can create up-to-date documentation for RPG and Cobol-based libraries. Remdoc generates copy that can be printed or viewed on 80- to 132-column workstations. The product can simultaneously generate and analyze documentation for up to 30 different user libraries. Features include cross-references, library and member comparisons, screen and print charts and procedure flow charts. A data dictionary facility is also included.

Remdoc costs $1,250.

Generic Software
986 Madison Ave.
Madison, Miss. 39130
(601) 853-1189

SAS Institute, Inc. has started providing transparent access to data stored in IBM Application System/400 databases with the SAS System, the company's information delivery system.

Eliminating the need to create intermediate files, the interface is currently available to users of SAS System running OS/2. A full-screen, menu-driven interface is included for describing AS/400 tables and data to the SAS System. Users can insert, read and upgrade records into AS/400 tables or files, the company reported. Features include native data management capabilities and the ability to store private data libraries on the AS/400.

The first-year license fee for the SAS/Access software begins at $695.

SAS Institute
SAS Campus Drive
Cary, N.C. 27513
(919) 677-8000

Utilities

Megaware, Inc. has introduced MegaPrint, a VAX/VMS system utility.

According to the company, MegaPrint allows Digital Equipment Corp. VAX systems to communicate directly with Hewlett-Packard Co.'s PCL printer language. Users can directly tie HP or HP-compatible printers into their VAX engines with MegaPrint.

The utility is installed as a resident part of the VMS operating system, and it converts the VMS LNO3 format files into PCL commands and sends them to any queue within its command. Text formatting can be produced, and the utility seamlessly integrates with the VMS operating system, which eliminates the need for additional printing steps.

Individual printer licenses start at $349. Site and corporate licenses are also available.

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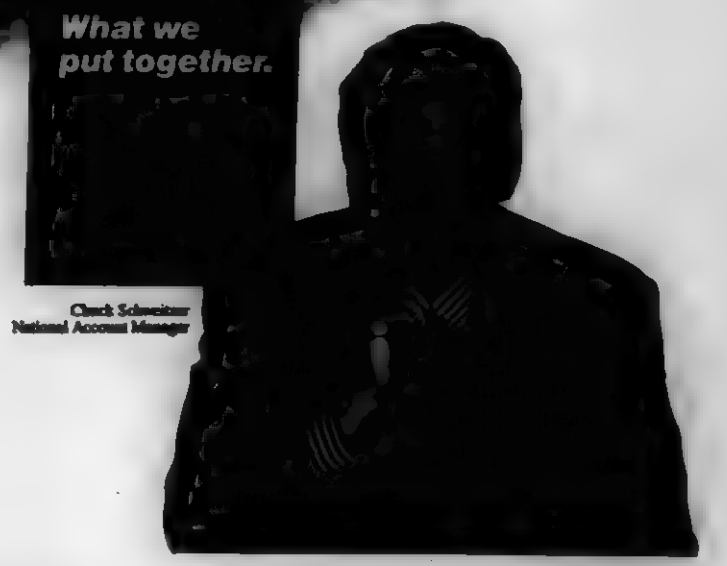

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More than a 'browse' at Phelps Dodge

Application development technology to boost productivity and prepare for client/server

BY GARY H. ANTHES
CW STAFF

PHOENIX — Whoever said mainframes are not user-friendly should take a look at the applications that Phelps Dodge Corp. is developing.

Armed with a mouse, a user can sit at his desk and browse through data in a metals inventory system running on an IBM Enterprise System 9000/440. The user can click on a column heading and sort the contents of that column; enter G* at the top of a list and retrieve all customers whose last names begin with G; select a figure showing inventory in pounds and convert it to metric tons; and drill down in seconds from a year-to-date tonnage figure to a single bill of lading.

"In our system, a browse is not just a browse," boasted Albert Barbieri, database administrator at Phelps Dodge headquarters.

Reusable templates

At the mining and industrial products company, a "browse" is one of 13 "application architecture models" developed to help automate the creation of new applications software. Written entirely in the Natural fourth-generation language (4GL) from Reston, Va.-based Software AG of North America, Inc., the models are predefined, reusable templates for the basic functions — such as browse, help, update, menu and user profile — that are found in most applications.

The models required 15 person-months to develop — a one-time effort that was done as part of the development of the metals inventory system. Using those models and Natural 2.2, Phelps Dodge was able to develop an insurance application with more than 1,000 programs in 90 days. That would have taken at least 15 months using conventional programming approaches, according to Dudley A. McRae, director of corporate information services.

In addition to speeding development, the models ensure that all applications have the same look and feel, McRae said.

ON SITE

Phelps Dodge Corp.
Phoenix

- **Challenge:** To leverage small IS staff to meet user demands for new systems while positioning the company for client/server computing.
- **Technology:** 4GL, application generator and database management software from Software AG.
- **Results:** In one major application, reduced development time from 15 months to three months; mainframe applications can be ported to client/server with minimal effort.

Now Phelps Dodge is poised to take another step forward. It is integrating the models into Software AG's Natural Construct code generator, which comes with some 65 software models of its own. Construct will speed the generation of the custom code that has to be added to the models for each application.

Small world

The company's quest to find faster ways of putting up new applications and overhauling old ones was mandated by a tiny information systems staff — fewer than two dozen application programmers at the corporate level in the $2.5 billion company — that is the legacy of severe cost-cutting in the face of depressed copper prices in the mid-1980s.

"It is self-preservation," said McRae. "Users aren't going to wait two years to do things."

Several acquisitions in Phelps Dodge's mining operations during the 1980s brought with them a number of incompatible computer systems, including, for example, three payroll systems written in four languages. "The company took a look at IS and wasn't too happy with what it saw," McRae said. "I saw that we had no long-term IS strategy. With the staffing we had, we were just keeping the wolves at bay, putting our fingers in holes in the dike because of all the dissimilar systems we had assumed."

With the purchase of the Chino Mines Co. in 1987 from Kennecott Corp., Phelps Dodge picked up Software AG's Natural and the Adabas database management software.

After considering other database alternatives, McRae decided to make those the foundation for the company's rapid application development as well as its approach to client/server computing.

The company cannot go very far toward client/server until next year, when Software AG is due to introduce Natural 2.2 for the major Unix environments.

In the meantime, mainframe applications now going up that use Natural, Construct and Adabas are being written to be fully compatible with a subsequent client/server implementation.

Pieces of the application can be moved to a Unix environment with only minimal effort, McRae said.

The key to making that work is the combination of Natural and Adabas, according to Phelps Dodge. In a distributed environment, additional software from Software AG will transparently intercept application program interface calls and send them to Adabas, regardless of where the program logic and the database are in the network.

"So many people are waiting to go client/server until they have all the pieces, because no [vendor] is really delivering a good client/server implementation environment yet," said Greg Hagen, program marketing manager at Software AG. "But Phelps Dodge is not waiting. When we deliver Natural 2.2 for Unix platforms, they'll be able to take pieces of the mainframe applications and just move them on down."

***Metals processor Phelps Dodge** is counting on recycling applications*

Update: NT development

Not a chore — if you already know Windows

BY CHRISTOPHER LINDQUIST
CW STAFF

If your company plans to develop products for Microsoft Corp.'s Windows New Techology (NT) after it ships in the spring, it may be wise to take some advice from some software vendors already caught in the throes of moving to the new operating system. From what several developers are saying, the shift may not be all that traumatic.

"If you know Windows, it's not so bad," said Marc Singer, owner of Straylight Software in Oakland, Calif. Singer ported his Windows-based Razor data analysis tool in about a week. "If you don't know Windows, you have to learn all the Windows stuff first."

"All the Windows stuff" may be a bit of an overstatement, however. According to David Lee, a senior computer scientist at Inference Corp., an object-oriented tools maker, developers no longer have to learn the "stupid programmer tricks" necessary to write Windows code. "Under NT, it's 32 bit, and you don't have to worry about a lot of stupid limitations," such as memory handling, he said.

There are other things to keep in mind, however. One is that corporations may want to run an application on something other than an Intel Corp. platform in the future. "Writing good solid code in a language you can port," such as C, is very important if you want to take advantage of the multiplatform capabilities of NT, Singer said.

That sentiment was shared by Douglas Hamilton, president of Hamilton Laboratories in Wayland, Mass. In fact, Hamilton noted that current versions of the

Continued on page 66

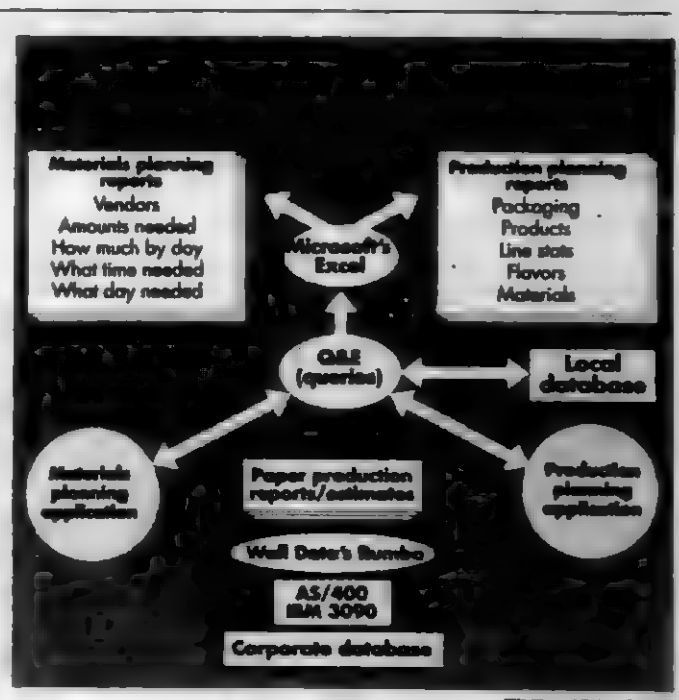
Client/server without the politics is it

BY GARRY RAY
CW STAFF

Talk of downsizing and client/server computing often brings to mind grand, strategic visions and a major rethinking of corporate computing systems. The hidden cost, as many companies have been discovering, is sometimes a significant disruption of existing lines of authority and communication.

In short, client/server sometimes forces a realignment of corporate policies and politics.

But Atlanta's Coca-Cola Enterprises, the administrative and manufacturing arm of Coca-Cola USA, has recently created a number of client/server applications that provide local manufacturing support without the political disruption that often accompanies new business systems.



CW Chart: Michael Siggins

Heading the effort has been Robert Gordon, an applications planning and development specialist who is just now completing

Continued on page 68

Slate ships PenApps tool

BY KIM S. NASH
CW STAFF

SCOTTSDALE, Ariz. — Slate Corp. began shipping PenApps Version 1.0 for Windows, an application-building tool for creating programs for pen-based systems.

Aimed at end users and third-party software makers, the product provides reusable objects for weaving pen computing features into new applications.

For example, PenApps lets developers create applications that recognize ink as a data type as well as cursorless operation without coding such options from scratch.

PenApps is available now for Microsoft Corp.'s Windows for Pen Computing operating system, with a version due out for The PenPoint system from Go Corp. in February 1993.

Applications created with PenApps will be portable across multiple pen systems, according to a Slate spokesman.

The product, priced at $995 for a standalone version, includes a screen designer, a database and PenBasic, Slate's programming language.

Single run-time licenses are $49, and unlimited run times are available for $2,995.

Update: NT development

CONTINUED FROM PAGE 65

tools available for writing Windows NT applications were more stable on Mips Computer Systems, Inc. platforms than on Intel platforms, simply because they adhered more stringently to ANSI C standards.

Hamilton ported some 90,000 lines of OS/2 code for his product, the Hamilton C Shell, which recreates a Unix environment, in about three months. For the most part, he said, the move was straightforward, requiring primarily some remapping of application programming interface calls with defined macros and writing some subroutine libraries. "The strategy that was important to us was to recognize that a lot of things are the same except that the names are changed," he said.

If something could not be fixed with either of those techniques, it was time to do some rewriting. However, even in those cases there were advantages when it came time to debug the code. After you recompile, "if the thing doesn't work, it's in the five lines of code you changed," he said. However, for early developers, using the supplied debuggers to find that error can be a harrowing experience.

While Windows NT is very stable, the tools, at least at this point in the beta testing, are not 100% reliable. The biggest weakness seems to be the debuggers. The NT Symbolic Debugger was described as "a throwback" while WINDEBUG, the Windows NT-hosted debugger, is reportedly called "Windbag" inside Microsoft.

"I'm hoping I'll be able to use Posix-type tools," Singer said, noting that the current crop of DOS-bred tools are not built to handle the stresses of developing for Windows NT. And even if the tools work with one version of the beta-test program, they may not with the next.

"The companies that come out with the compilers are not up to speed, so you end up getting a new release of Windows NT but you really can't do anything with it until the compiler companies get their software running on it," said Kathryn Gray, president of GrayTech Software, Inc. "That's something we weren't counting on."

Despite some of the problems, the developers were unanimous in their belief that the move should not be overly difficult.

Developer's checklist

The following are things to think about when you begin writing or porting applications to Windows NT:

- If you plan to port to non-Intel platforms, be sure to write solid, ANSI-compliant C code so recompiling will be easier.
- Porting OS/2 applications can be straightforward using macros and subroutines.
- If you are starting to develop before the final release, be prepared for less than stellar development tools and lags between beta-test shipments of Windows NT and the next release of the tools, particularly from third-party vendors.
- Knowing Windows first helps tremendously in working with NT, but it does not flatten the learning curve entirely. In fact, you may not need to be as skilled a Windows programmer for Windows NT as is necessary for Windows 3.1 because Windows NT removes many barriers with its 32-bit architecture.
- If you plan to port 16-bit Windows applications, the closer they are to being pure Windows 3.1 programs, the easier your port will be.
- It may be a faster process than you expect.

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Client/server without the politics is it

CONTINUED FROM PAGE 65

the second stage of a set of manufacturing planning applications that will be used in more than 40 Coca-Cola plants across the country. Intended to fit with the decentralized structure of Coca-Cola Enterprises, the applications were designed to provide better cost controls and more efficient manufacturing schedules as well as to support the notion of just-in-time delivery by the company's local vendors.

Prior to the applications, "planning was just a guesstimate. Now the production planners know the exact yield they need to produce," Gordon said.

Coca-Cola's decentralized structure provided both the impetus to develop the applications and a clear, guiding force for the implementation of the programs. A prior effort on minicomputer and mainframe systems "wasn't acceptable to users," Gordon said. "People would turn around with what they got from the mainframe, put it in a PC spreadsheet, shuffle it around and print and distribute the reports."

Coca-Cola Enterprises also recognized that local facilities had a better understanding of their own production requirements and what they wanted from the planning software, Gordon said. Thus, the company charged him to develop applications that fit the needs of local facilities.

Partially owned by Coca-Cola USA, Coca-Cola Enterprises provides administrative support for approximately 40 regional facilities. At each facility are a local production planner and a materials estimator, whose functions are to analyze corporate sales and quota projections for the coming week. "We normally plan a week in advance," Gordon said. Once done, the planner and estimator prepare production and materials plans for their local facilities.

Production plans include all of the local resources needed to meet corporate sales plans, including beverage ingredients, packaging and the manufacturing lines that will be run during the week. These plans are then turned over to local warehouse and manufacturing line foremen who prepare for the week's production.

A local materials planner analyzes the sales plans to determine all of the components needed to support the week's production run. Such materials include beverage containers, bottle caps, cartons and the amount of syrups and concentrates used to create a variety of beverages.

Rallying the troops

To create the applications, Gordon first rallied the participation of 12 production planners and business application specialists from six business groups.

The team first selected a set of application tools that included Wall Data's Rumba to download corporate planning reports from mainframe and minicomputer systems; ProtoView Development Corp.'s Protogen 3.0 to develop the query and reporting interface to the applications; Pioneer Software's Q+E to select data from local production databases; and Microsoft Corp.'s Excel for Windows to provide reports. The applications were sewn together to present a seamless interface to users.

The next step, Gordon said, was a four-month prototyping and development effort. "Five users from the College Park [Ga.] facility were involved in the development of the software. There was a lot of prototyping at the production center."

The production application has been delivered to all of the 40 regional facilities. The materials estimating program, which will be used to place local vendor orders on a daily and hourly basis, is being delivered this month.

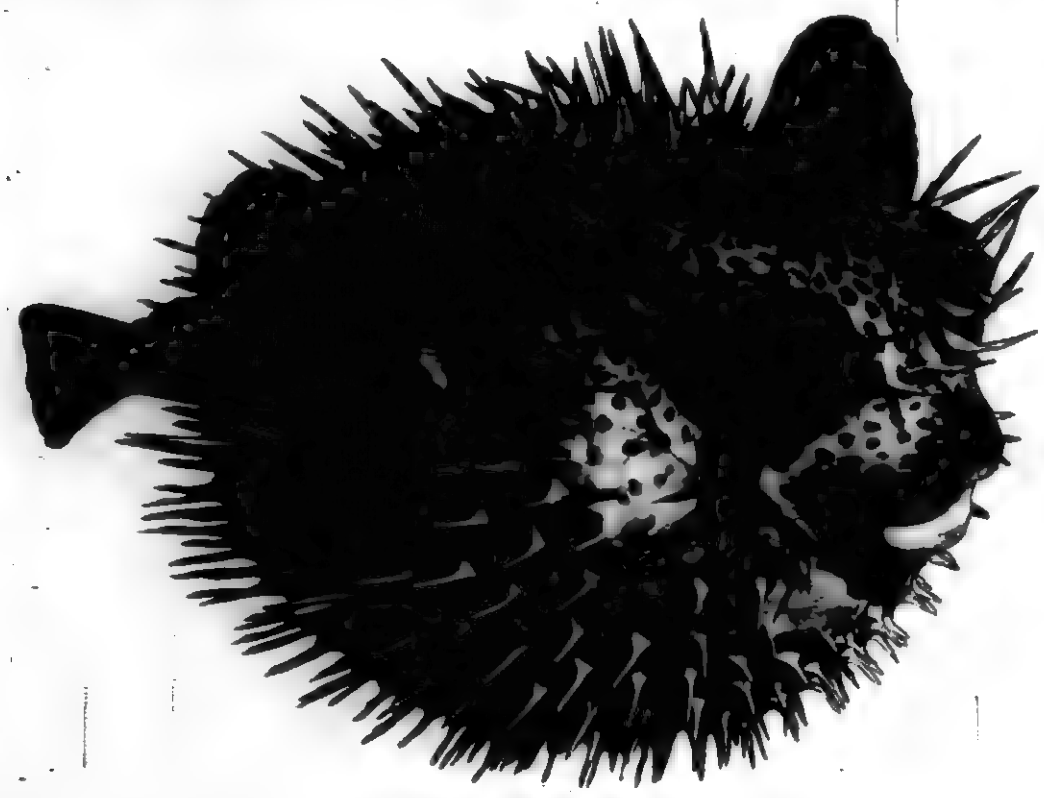
But from Gordon's perspective, the biggest success of the programs is that they maintain the decentralized focus of Coca-Cola Enterprises and its regional facilities. By localizing the software and stepping away from a mainframe orientation, the regional plants "can continue to manufacture their products, even if they never hear from us."

IN BRIEF

Easel tools now shipping

■ **Easel Corp.**, the Burlington, Mass.-based vendor of application development tools, is now shipping the Easel Transaction Server (ETS) tool kit and the $995 EDA/SQL Option for Easel workbench. The tools provide access to a number of industry-standard database products from within Easel applications. The ETS tool kit will be delivered at no charge to all Easel customers.

■ **Texas Instruments, Inc.** signed up Greenwich, Conn.-based **Ceridian Network Service** to help users learn and deploy TI's CASE workbench. Ceridian forms the base of TI's new Integrated CASE Environment Services (ICES) consulting group, which can also be contracted to handle operations and administrative services associated with software development while users focus on building applications with TI's tools. ICES will also be based in Greenwich.



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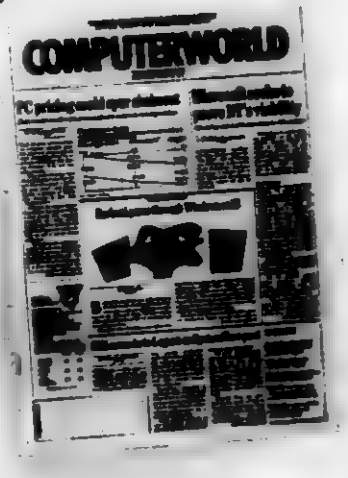

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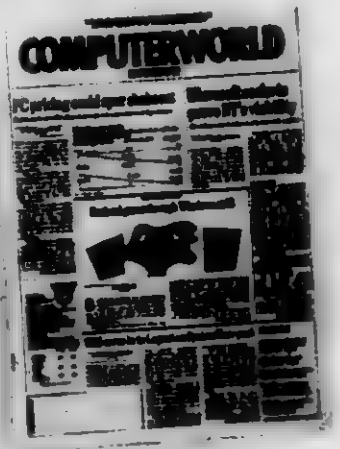

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NEW PRODUCTS

Application development tools

Treehouse Software, Inc. has released Profiler for Natural.

The product is a tool that monitors the execution of a set of Natural programs. It produces statistics that display how often each program is executed and how much CPU time each program consumes. The same information is provided from within a program. The tool can also record the time it takes to complete Adabas calls from within Natural programs.

Profiler offers a range of functions such as identifying problem programs and statements, inappropriate use of external subroutines, inefficient code, poor application structure and design and expensive Adabas access methods.

The introductory price is $12,000.

Treehouse Software
Suite 206
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Sewickley, Pa. 15143
(412) 741-1677

Set Laboratories, Inc. has announced PC-Metric for C Version 4.0, an upgrade to the company's software measurement and analysis package.

According to the company, the product can help locate especially complex parts of code that are more likely to contain programming errors. Features include IEEE-standard-size counting measures, additional new measures of control flow complexity and a revamped interactive query and analysis system that enables users to track metrics across releases.

A single-user license for Version 4.0 costs $399.

Set Laboratories
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Franz, Inc. has introduced Allegro CL/PC, a full-featured object-oriented programming solution.

The product is an interactive development environment for PCs that was designed for Microsoft Corp.'s Windows and based on the Common Lisp Object System. Users can build and maintain applications such as knowledge-based systems, scheduling and process control, computer-aided design, simulation and modeling or any graphical user interface-based system.

The Allegro CL/PC features tools such as a programmable integrated editor, inspector, debugger, tracer and structure editor. Common Graphics, an object-oriented layer on top of the Windows application programming interface, is also featured.

Allegro CL/PC costs $595.

Franz
1995 University Ave.
Berkeley, Calif. 94704
(510) 548-3600

Code libraries

EMS Professional Software has started shipping an expanded version of the dBUtility Library.

The library is a collection of 2,422 public domain and shareware products designed for Xbase languages such as dBase, FoxPro and Clipper.

According to the company, a database index and search program is included for these and 1,000 additional commercial Xbase-related utility programs. Users can search by name, vendor and type.

The dBUtility Library provides more than 70 types of products, including benchmarking, computer-aided software engineering, data compression, desktop publishing and printer control.

The library costs $179 on disk and $99.50 on CD-ROM.

EMS Professional Software
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

TechWorks International has introduced Volume 1 of the TechWorks CDF Library.

The library is a set of 36 ready-to-use Custom Defined Functions (CDF) offering DOS and OS/2 DataEase users the ability to enhance applications.

The SQL Server-access functions enable SQL CDF to retrieve one or multiple values from Microsoft Corp.'s SQL function. This can be done without employing DataEase International, Inc.'s SQL Connect Engine Driver.

From within DataEase, the Array CDF can use the CDF to initialize, load, search and access text and numeric arrays.

Users can open, close and write to multiple DOS and OS/2 files while staying within a DataEase application with the File Access CDF group.

The product costs $179.95

TechWorks International
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Westport, Conn. 06880
(203) 221-1500

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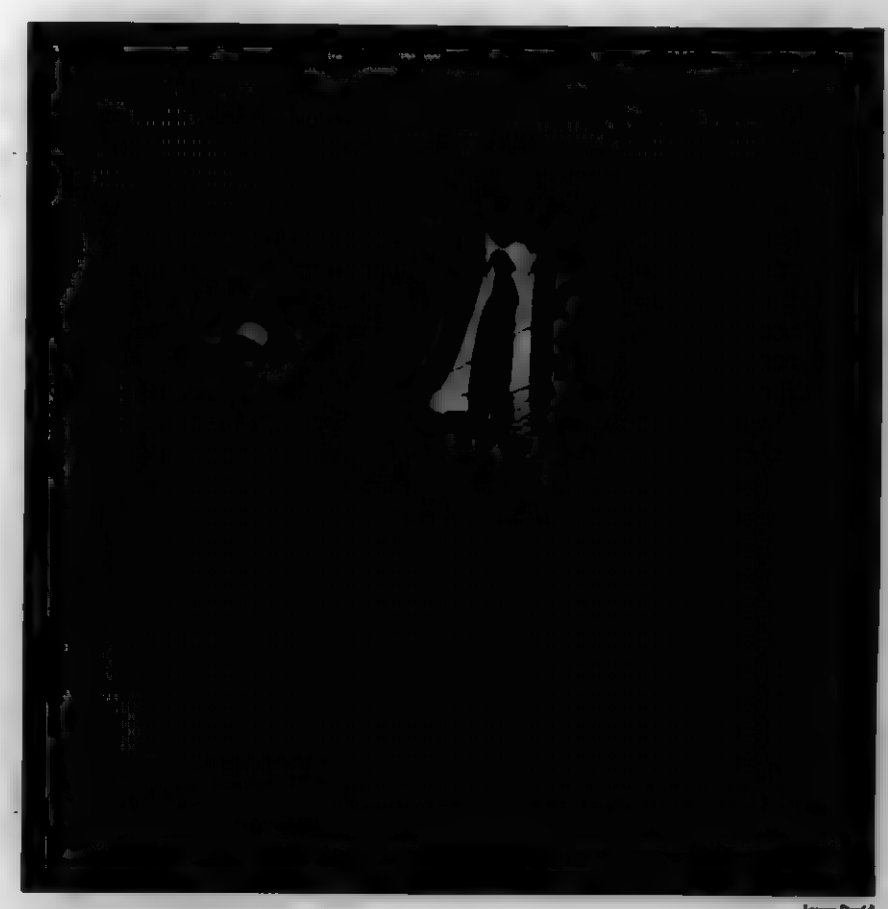
Assignment: RE-ENGINEERING

It's not academic:

Columbia University is linking up and scaling down in a five-year project that can teach corporations a few things about involving users



Joyce Rudd

Mike Marinaccio: *'We're not here to run a bureaucracy'*

BY MELINDA-CAROL BALLOU

Like many others, Mark Olson wanted distributed computing to help improve the efficiency of services at Columbia University. Instead, Olson, the school's vice president of student financial and information services, faced what he describes as *disintegrated* computing.

"Local PCs were tied in through creative ways to the mainframe," Olson explains. "But it was all undocumented and very fragmented." The result was a patchwork system that relied too heavily on an overworked, batch-oriented IBM mainframe running CICS and Systems Network Architecture, he says.

So two years ago, Columbia, a 238-year-old private institution located in New York, decided that it was time to graduate from a tangle of poorly connected systems, including many that were off-line altogether, to a downsized, client/server environment that includes an IBM Enterprise System/9000 mainframe, RISC System/9000 Unix technology and Transmission Control Protocol/Internet Protocol.

Today, Columbia is halfway through a five-year re-engineering plan that officials say will fundamentally change how business is done at the school's 15 colleges.

The information systems department is made up of 180 members, many of whom are now working to bring several key functions on-line, including accounting, alumni resources, facilities management, human resources and a student information system to handle billing and registration, financial aid, admissions and housing (see chart page 73).

Ballou is a *Computerworld* senior writer.

New technology curriculum

To bring its computing into the next century, Columbia is employing several new tactics and technologies, including short-term outsourcing, a software partnership with American Management Systems, Inc. — the Arlington, Va.-based consultancy working on the project — and a state-of-the-art imaging system that will be rolled out in the financial aid department on Dec. 7. It is also bringing together IS applications directors and end users.

"The system is not viewed as being run by those people over there in the central computing office," says Mike Marinaccio, Columbia's deputy vice president for administrative IS. "They take responsibility for the system, with us supporting them. We're not here to run a bureaucracy."

While higher education is usually not thought of as a hot-bed for re-engineering, Columbia's case points out that colleges and universities need to radically rethink processes and technology as much as anyone — and in some cases more. And their freedom from typical corporate constraints can even add a new twist to business process redesign.

At Columbia, day-to-day business depended on an older mainframe that officials say was heavily modified and very unstable. Marinaccio says a centralized processing structure meant that information was not always accessible from the mainframe, forcing the growth of redundant "shadow" systems.

The result? IS had to maintain both the small-scale redundant systems and the large central organizations, a situation no one liked.

"When I looked at what was going on with those shadow systems," Olson adds, "it wasn't distributed or decentralized computing. It was disintegrated computing."

So IS began to review the human resources available to set up a new organizational structure. American Management was hired to assist and provide software for the student information system via a temporary, six-month outsourcing arrangement. (Columbia and American Management will jointly develop software for the accounting system.)

Olson was hired away from the University of Southern California (USC), where he headed a sim-

Continued on page 73

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IBM

Re-engineering: Not an academic assignment

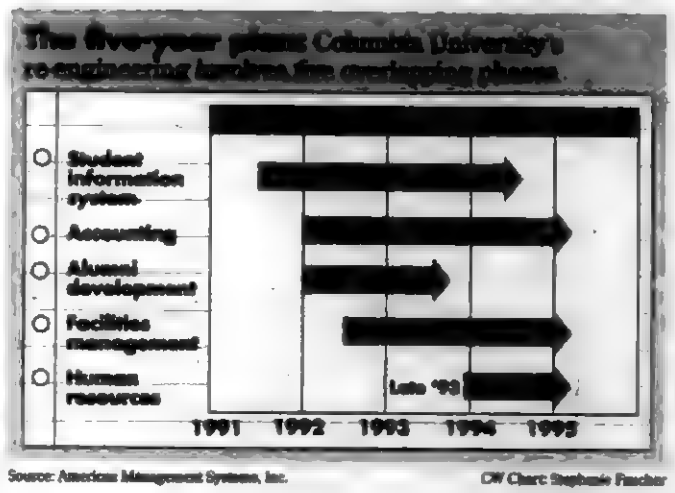
CONTINUED FROM PAGE 71

ilar project to create a new student financial and information system.

Meanwhile, Marinaccio was hired to focus on technology infrastructure — networking and the configuration of platforms and applications for business operations.

"We think that it is critical to organize for distributed computing in a distributed fashion," Olson says. "I have responsibility for end-user computing with bursars and others located in my office, for instance."

The five-year plans: Columbia University's re-engineering handbook has overlapping phases.



Source: American Management Systems, Inc. CW Chart: Stephanie Faucher

User ownership

Those in charge of the project realized that users, despite possible benefits, were likely to resist sweeping changes in process or technology. So to foster a sense of ownership, they made it a priority to heavily involve users right from the start — an IS basic that becomes crucial in a re-engineering project.

To that end, Olson worked directly with the student and financial offices to incorporate their requirements. "The users as well as the systems people responsible for this application area report to me — the bursar, the registrar, the financial services director and the systems director for this project are all on the same staff," Olson says. "As organizations implement open systems and client/server, there has to be a concomitant organizational change. Our model offers application support in the end user's office."

The homework: A number of systems must be created

- **Facilities management system**
  Comprehensive support for facilities functions including operations and maintenance; design and construction; and space and equipment.
- **Image-based financial aid system**
  Folder management and work-flow processing for paper-intensive process.
- **Research system**
  Unix-based; designed to streamline all facets of sponsored research acquisition and administration.
- **Decision support system**
  Designed to provide access to information that crosses old and new administrative systems.

Source: AMS, Inc. CW Chart: Stephanie Faucher

Together, they reviewed billing procedures and financial systems, as well as how to set up the imaging program and how financial aid is delivered.

Industry analysts and experienced hands affirm that perhaps more than any other factor, closely involving users can make or break their satisfaction — and the entire project.

"Users are telling MIS that the empowerment they want goes beyond having a PC running shrink-wrapped applications," says John Logan, executive vice president at the Aberdeen Group, a market research firm based in Boston. "They want the ability to dictate [not merely influence] how they do their jobs in the best way."

Olson acknowledges that this requires that both IS and users be willing to accept a major cultural shift and let go of worrying about boundaries. "With distributed computing, you need to do it," he declares.

Fernin Vigil, a controller who worked closely with the IS department at USC, which had tackled a similar initiative, agrees that there are few better ways to boost user satisfaction than to involve end users in an "iterative" dialogue.

"You can't be rigid and you have to understand what your objective and goal is," he says. "The people who operate the systems have to be happy with them."

Of course, adds Joe Mullinix, senior vice president at Columbia, old-fashioned persuasion plays a big role too. "We avoided telling anyone that they had to unplug anything," he says. "But we eventually convinced [users] that they wanted to."

Starting small

When the requirements analysis was completed, the Columbia teams developed a five-year plan, including smaller segments that could be successfully done to gain further project funding.

"We painted a pretty comprehensive picture," Marinaccio says, "making sure that we can create a good business case for each of the pieces."

The student information systems project went into full-swing in March 1991. By last December, all 15 colleges at Columbia began billing nearly 20,000 students on the new system.

The job required the conversion of about 130,000 student records, 6,000 course records and 400 detailed billing records from the old system.

"We still have a long way to go," Mullinix says. "But up front we decided to dramatically improve our billing system as a top priority."

Payoffs soon

Although the project is only about half completed, Columbia officials say there have already been several benefits.

Now, for example, students no longer have to wait in long lines at a central gymnasium to register. Instead, they can simply go to one of four sites and register online; dial-up registration is planned for the future.

Financial aid has also improved, Olson says. "In the past, the financial aid forms from families would go to the financial aid office. Now the forms will go to central processing, which reports to me. We will make images of the forms."

The new arrangment, Olson says, will give financial aid advisers more time to counsel students rather than chasing paper.

The imaging program goes live early next month for the financial aid office. Electronic file folders will be created for applicants and will become accessible by next February — a relatively fast turnaround that Mullinix says is necessary to keep user interest and trust high.

"You have to move very quickly to get the product out into the community," he says. "The overall plan may take years, but they need to see some sort of results within 12 to 18 months."

Other portions of the plan will be implemented from now through 1995 (see chart at left). For now, technological work continues. Workers are now considering distributed data manage-

The syllabus: Mutinecest goals underly work with consultant AMS

- **Strategic systems planning**
  Build framework for five-year replacement of administrative systems and evolution to open systems.
- **Implement AMS Legend applications**
  Financial package is cornerstone of five-year plan; implemented in 1991.
- **Develop administrative information architecture**
  AMS and Columbia jointly develop enterprisewide information architecture.
- **Create systems strategy**
  Jointly build and migrate applications to open environment.
- **Develop new applications**
  Jointly build new products and extensions to existing projects.
- **Implement imaging technologies to improve business processes**
  Co-develop financial aid imaging applications. Goal is to establish single center to serve 15 financial aid offices.

Source: AMS, Inc. CW Chart: Stephanie Faucher

ment using Sybase, Inc. equipment together with DB2 across multiple enviroments.

Besides keeping up a tight partnership with user departments, Mullinix says, the teams will make sure they don't lose sight of the forest just to please.

"You don't have to have all the pieces precisely defined," he concludes, "but you need to have a conceptual vision that you can keep your eye on, or you tend to lose your way along the route and end up with a product that doesn't meet your objectives." •

Canion warns re-engineers: Beware of outsourcing dangers

BY MARK HALPER

HOUSTON — While outsourcing vendors may provide the right solution for some information systems challenges, they should not be entrusted with ultimate IS responsibility, according to former Compaq Computer Corp. Chief Executive Officer Rod Canion.

Canion, who is chairman of Insource Management Group, Inc., an IS consultancy that he co-founded in June with former Electronic Data Systems Corp. and Perot Systems Corp. executives, says he views outsourcing as just one possible element in a re-engineering scheme.

"We are not against the component of outsourcing," Canion said in a recent interview with *Computerworld*. "What we are against is for the outsourcer to be in charge of information systems. There is a fundamental conflict in that the outsourcer runs the system and is paid by transactions that flow through it," Canion observed.

Rod Canion *cites outsourcing pitfalls*

Good bets for outsourcing

Canion said it makes more sense to outsource some functions than others.

For instance, banks could outsource "commodity functions" such as check clearing while keeping IS support of their differentiated services in house, he said.

Meanwhile, Insource Management has added another former outsourcing executive to its ranks.

Charles Biebighauser, who was vice president of operations for the Intrico travel industry consortium, which oversaw the now-defunct Confirm reservation system project, has signed on as a principal. He started Nov. 2.

Biebighauser, also an EDS veteran, will be responsible for business development and "helping to define our strategy," acording to Canion. He reports to CEO Ron Fischer, a former EDS and Perot executive, and joins a staff that includes Perot co-founder Gary Wright.

Biebighauser characterized the re-engineering business as "a less greedy approach" than outsourcing and one that "in three to five years will be as big a business as outsourcing."

Ergonomics: Early fixes

BY MITCH BETTS
CW STAFF

MELVILLE, N.Y. — Even enlightened managers who want to relieve the aches and pains of intensive keyboard work may balk at spending $10,000 for ergonomics consultants. But a new service from Biomechanics Corp. of America makes getting an ergonomics report card much more affordable.

Biomechanics recently introduced a service dubbed Early, for Ergonomic Assessment of Risk and Liability, that helps employers of all sizes to identify repetitive stress problems and solutions. In essence, the service allows company employees or local contractors to collect the relevant data and send it to the company's ergonomists for expert laboratory analysis.

An Early report costs about $300 for a job category, such as data entry clerk.

"To have a team of ergonomists fly out and conduct ergonomic assessments would be cost-prohibitive — over $10,000 when you include travel expenses, time and everything," said Andrew Ellis, senior loss-control consultant at Tokio Marine Management, Inc., a Pasadena, Calif.-based insurance firm.

Biomechanics is recruiting a network of occupational health professionals across the country who are trained to do the data-collection work.

The relevant data includes company statistics on health problems, a videotape of typical work activities, an employee survey on physical stress and, most importantly, actual measurements of muscle tension registered by an ergometer supplied by Biomechanics.

Other benefits

Besides low cost, the other advantage of the Early system is that it produces some hard data, Ellis said. "Traditionally, workstation assessments have been rather subjective. The Early system is a much more standardized and formal approach that leads to a quantitative assessment," he added.

About seven days after getting the data-collection forms and other information, the Biomechanics laboratory produces a detailed report that identifies problems and offers solutions.

For example, at one company, there was not enough room above a computer monitor for proper height adjustment because of the office's overhead flipper door cabinets. In addition, the worker's chair did not provide arm support for keyboard work.

These observations coincided with high measured levels of muscle stress on the left hand and wrist, as well as the back. The report, citing specific manufacturers' products, recommended an adjustable monitor arm and an adjustable task chair with armrests.

The emergence of Biomechanics' Early service comes at a time when the U.S. has experienced a tenfold increase in repetitive stress injuries in white-collar jobs during the past five years [CW, Sept. 21].

Ideally, the Early reports will help companies identify problems and solve them before they result in injury claims, according to Chris Maynard, director of ergonomic programs at Biomechanics.

The Early reports draw from a database full of scientific literature and thousands of ergonomic studies, Maynard said.

EXECUTIVE TRACK

James L. Bradley has been named vice president at New York-based information management consulting firm **Howard Systems International, Inc.** Bradley comes to Howard Systems following 25 years at Aetna Life & Casualty Co., where he most recently served as vice president of telecommunications.

In his new post, he will head up and expand the firm's "in-sourcing" program, under which Howard information systems professionals are placed in client organizations to lead internal IS initiatives.

. . . . . .

At the **Indian Health Service** in Rockville, Md., **Richard M. Church** was recently named to the post of associate director of the office of information resources management.

Church, a 20-year veteran of the **United States Public Health Service** (PHS), recently completed a four-year term as the PHS' chief professional officer for pharmacy, a job he held in addition to that of chief pharmacist at the Indian Health Service.

He is a winner of the Surgeon General's Medallion, the highest honor given by the U.S. Surgeon General.

. . . . . .

There's extra spice in **C. Robert Miller**'s life these days: The former IS director of Sparks, Md.-based **McCormick & Co.**'s flavor division has been named vice president of IS at the company he has served since 1967.

Miller will have worldwide responsibility for the integration of information technology into the seasonings company's business plans.

. . . . . .

The Rockefeller University has announced the appointment of **Francis (Frank) Lees** as its new director of information and computing services — the New York-based university's highest IS position, equated to that of a chief information officer.

Lees comes to Rockefeller from the **State University of New York** at Albany, where he was an associate professor of bioanthropology as well as associate vice president of IS and technology.

In his new post, he will spearhead Rockefeller's effort to streamline and consolidate four current IS-related departments into a single information center.

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Items of interest from publications, speeches, surveys and research projects

To pilot or not

The conventional wisdom is that companies interested in imaging systems should begin with a small pilot demonstration.

But Ron Landers, director of expenditure accounting at Pizza Hut, Inc., argues that pilots are too expensive and disruptive for their meager benefits. Instead, he says companies should do considerable up-front analysis and then take the imaging plunge.

"In the world of image processing, we are far beyond the tire-kicking stage. It's time to buy the car," he says.

In a counterpoint article, consultant Len Yencharis argues that imaging pilots in departmental applications can provide the evidence needed to cost-justify enterprisewide applications in the future.

Source: *"Are pilot installations necessary for successful imaging systems?" by Ron Landers and Len Yencharis,* Imaging World, *September 1992.*

To the back office

Traditionally, companies have focused on the quality of their products and have tried to improve customer service by beefing up the sales force. Today, progressive companies are learning that investing in "administrative quality" in the back office is equally important.

Back-office problems that generate invoices with the incorrect price or deliver the wrong goods can ruin customer relations and cause considerable internal disruption.

Where to concentrate remedial effort? Lines of communications between sales, inventory and accounting departments.

Source: *"Cleaning Up The Back Office," by Christopher A. Bielenberg, Directors & Boards, Summer 1992.*

Tips for targeted marketing

If you've built a customer database for targeted marketing, how can you use it to market smarter? Here are three ideas:

- Assign customers a unique identification number, or use Caller ID, so customer service representatives can quickly retrieve the customer's computer file and provide customized service on the phone.
- Ask every 10th caller a few questions about the current product line and future products or incentives. Enter this polling data into the customer database and analyze the trends.
- Use the database to generate repeat orders. For example, mail reminders to your customers that they may want to reorder or upgrade the holiday gifts they ordered last year.

Source: *"Three Ideas for Smarter Marketing," by David Shepard and George Orme,* DM News, *Sept. 21, 1992.*

Rock 'n roll server

"Implementing client/server is like guitar-playing," says Fred Wingograd, vice president of distributed applications planning at Merrill Lynch & Co. and former rock band member. "You learn a few chords, you get something done, and you evolve from there."

Source: *Remarks made at the annual "CIO Perspectives" conference Oct. 11 to 14 in Boca Raton, Fla.*

Compiled by national correspondent Mitch Betts, with contributions from Joanne Kelleher, features editor, and James Daly, senior correspondent.

CALENDAR

NOV. 22-28

Openforum '92. Utrecht, The Netherlands, Nov. 23-27 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

NOV. 29-DEC. 5

Technical Marketing 2000: Opportunities and Strategies for a Changing World. Washington, D.C., Nov. 30-Dec. 1 — Contact: Technical Marketing Society of America, Torrance, Calif. (310) 534-3822.

European Conference on Hypertext '92. Milan, Italy, Nov. 30-Dec. 4 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Cause '92. Dallas, Dec. 1-4 — Contact: Cause, Boulder, Colo. (303) 449-4430.

The Open O/S Conference. San Francisco, Dec. 2-3 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

EO/IR Sensors Seminar. Orlando, Fla., Dec. 2-4 — Contact: Advanced Technology International, Dept. EO/IR, Washington, D.C. (202) 223-8840.

Improving Employee Performance Using Technology. New York, Dec. 2-4 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Corporate Information Management Conference (CIM). San Diego, Dec. 3 — Contact: Susan Miguel, IMS, Tiverton, R.I. (401) 683-5760.

Environmental Marketing and Contracting Conference. Washington, D.C., Dec. 3-4 — Contact: Technical Marketing Society of America, Torrance, Calif. (310) 534-3822.

14th ACM Symposium on Operating Systems Principles. Asheville, N.C., Dec. 5-8 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

The Migration to Client/Server Computing. Dallas, Dec. 3 — Contact: Informart, Dallas, Texas (214) 746-3500.

DEC. 6-DEC. 12

Software Support '92. Monterey, Calif., Dec. 6-9 — Contact: United Publications, Inc., Yarmouth, Maine (207) 846-9600.

Supporting and Troubleshooting Windows 3.1 Seminar. Seattle, Dec. 7-8 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Wireless Between '92 Exposition and Conference. Boston, Dec. 7-9 — Contact: Communication Events, Norwalk, Conn. (203) 847-5131.

Computer Measurement Group (CMG) '92. Reno, Nev., Dec. 7-11 — Contact: CMG '92, Department 77-5185, Chicago, Ill. (312) 527-6652.

Image World Atlanta. Atlanta, Dec. 7-11 — Contact: Benin Rountree, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

The 1992 Federal Computer Conference. Washington, D.C., Dec. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

May we introduce ourselves?

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We are the only UNIX-based computer company that can offer compatible, scalable chip technology for notebook computers to supercomputers, with SPARC® and Solaris® operating enviornment.

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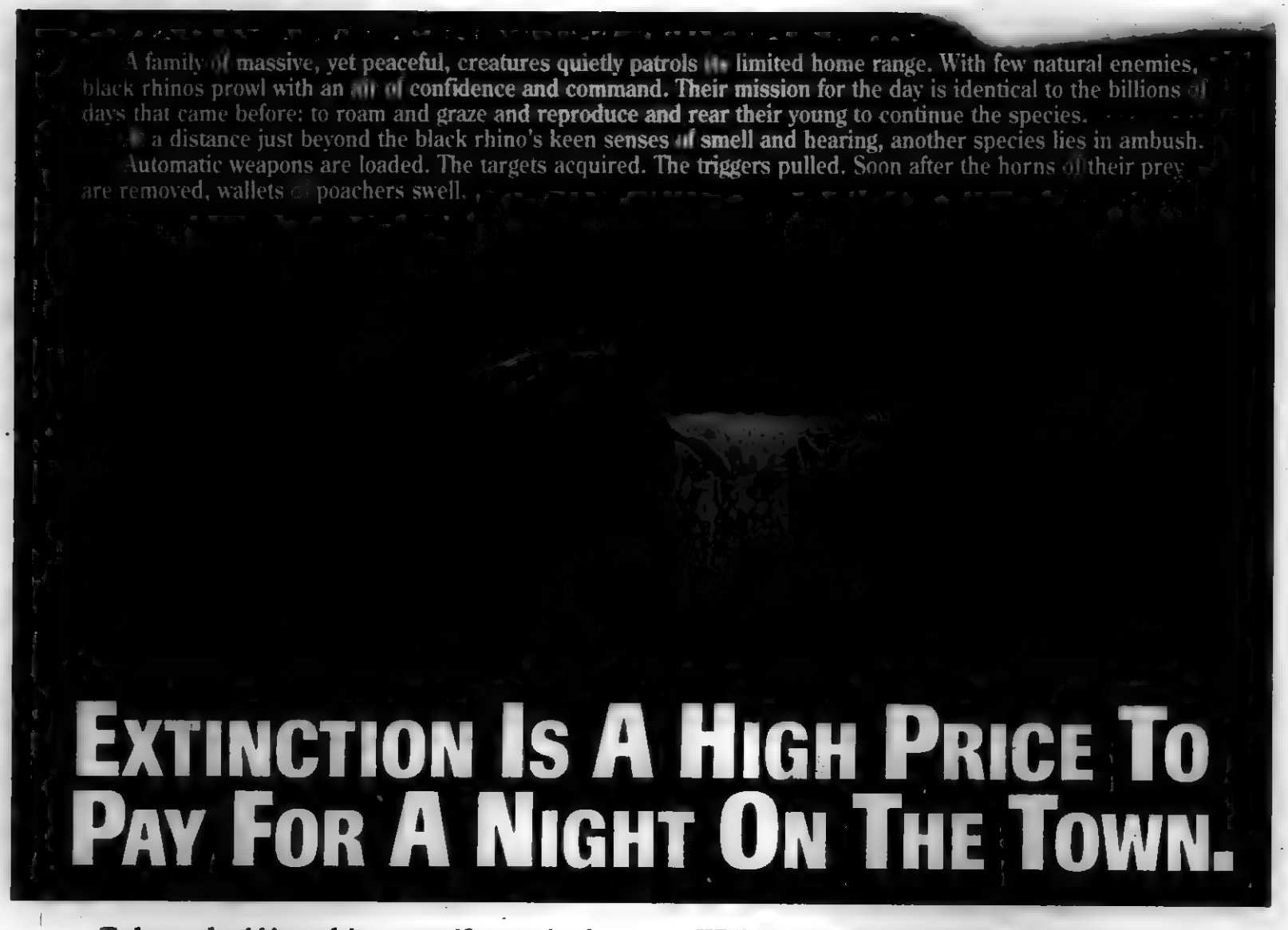


A family of massive, yet peaceful, creatures quietly patrols its limited home range. With few natural enemies, black rhinos prowl with an air of confidence and command. Their mission for the day is identical to the billions of days that came before: to roam and graze and reproduce and rear their young to continue the species.

At a distance just beyond the black rhino's keen senses of smell and hearing, another species lies in ambush.

Automatic weapons are loaded. The targets acquired. The triggers pulled. Soon after the horns of their prey are removed, wallets of poachers swell.

EXTINCTION IS A HIGH PRICE TO PAY FOR A NIGHT ON THE TOWN.

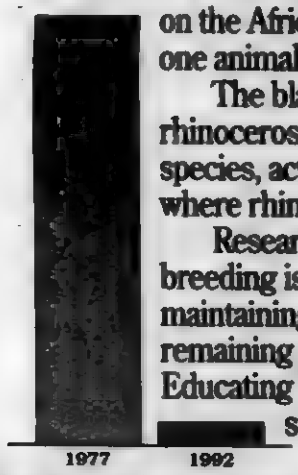
Today on the African plain, a magnificent animal will be slaughtered in order to provide a psychological lift for someone living thousands of miles away.

When ground, the horns of the black rhinoceros are reputed to be a strong aphrodisiac. Powdered, the horns are alleged to be potent medicine. Carved, black rhino horns make handsome handles for daggers.

As poachers supply the demand for horns, the black rhino is vanishing. Every dehorned carcass left on the African landscape brings the species one animal closer to extinction.

The black market for horns of the black rhinoceros is flourishing. To save the dying species, action is now required in the fields where rhinos dwell.

Research into black rhino behavior and breeding is very important. Establishing and maintaining areas of safe refuge for the few remaining members of the species is critical. Educating individuals and seeking their support has never been more vital.



Since 1977, more than 95% of the black rhino population has been lost, along with the lives of scores of human defenders.

The bottom line, however, is that unless the poachers are stopped there will soon be no living black rhinos left in the wild to study, support, or safeguard.

While our mission includes support for research, education, and habitats, our focus is to stop the tragedy of killing black rhinos for their horns.

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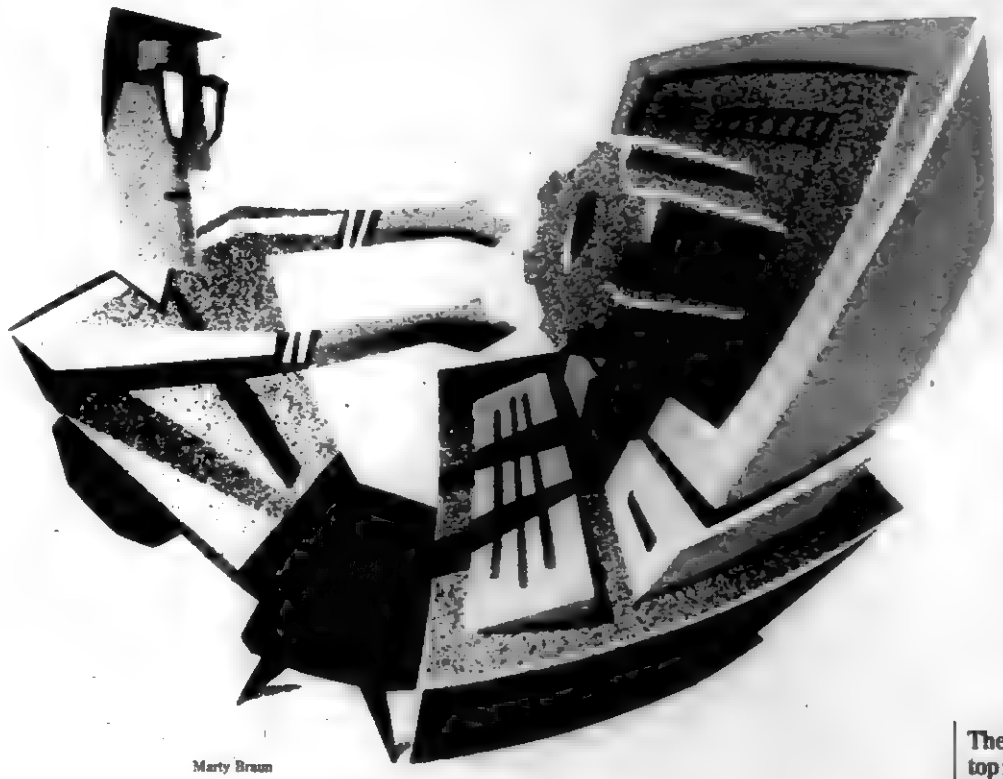
From art to part



Marty Braun

Desktop manufacturing lets companies transform CAD data directly into parts and models without ever going to a machine shop. The benefit? Up to a 95% reduction in costs and time to market.

By Anil (Neil) Chaudhry

Day 1
noon
A product idea gels. An engineer at a large automotive company and a customer support manager are in the last of a string of lunch meetings to discuss the engineer's new idea for a distributor cap design. His co-worker confirms that the part has been giving customers trouble and needs improving.

The engineer gathers his paperwork, including customer input, and takes the idea to his boss, who approves it.

Day 1
1:30 p.m.
Collaboration. The product engineer takes his scribbled drawing to the computer-aided design (CAD) expert in the design department. They roll up their sleeves and begin to hack out the design for a three-dimensional solid CAD model.

Day 2
5 p.m.
A journey. The CAD model is finished. The product engineer sends the computer image to a desktop manufacturing machine with the click of a mouse.

Day 2
5 p.m.— 8 a.m.
Machines take over. The desktop manufacturing equipment translates the detailed design information into a series of precise 2-D cross-sections of the part.

The machine feeds the cross-section data into a computer-controlled ultraviolet laser beam, which scans the surface of a vat of liquid photopolymer.

The photopolymer hardens into a solid layer of plastic when light hits it. A computer-controlled elevator system lowers the hardened layer. The surface is recoated and leveled.

The laser scans and solidifies the next layer. Layers are built on top of one another until the part is complete.

Day 3
8 a.m.
The real thing. A technician lifts the object from the liquid, cleans the excess polymer, cures it in minutes and hands it to the product engineer and designer to analyze.

Day 3
9 a.m.
Making the rounds. The design engineer presents the new design to managers in marketing, customer support and production.

They suggest minor modifications to improve the design and minimize costs. Engineers rework the CAD drawings and resend the design through the desktop manufacturing process.

Day 4
9 a.m.
Success. The new product is approved. The company orders molds so it can manufacture several dozen prototype production parts for qualification testing.

The company has successfully launched a new product.

The process just described, known as desktop manufacturing or rapid prototyping, is being repeated in manufacturing companies worldwide. With an average investment of $300,000 to $500,000, companies can quickly transform CAD drawings into parts and models as big as 20 in. by 20 in. by 30 in. without ever going to a machine shop or machining a tool. The benefit is a 30% to 95% reduction in development cycle time and cost.

Designing a new product has always been a creative but slow process, requiring several iterations to fine-tune a part. Designers need to check with peers, technicians and shop-floor engineers to approve a design. If a change is needed, the process starts all over again; blueprints need redrawing and shop-floor machines resetting.

Each iteration increases the developmental cost of the product and increases the time required to bring a new product to market. That's why catching problems and making adjustments early in the cycle — things desktop manufacturing lets you do — can save hundreds of thousands of dollars.

Whether the computer-controlled process involves a laser that hardens photosensitive liquid into a part or heat that fuses fine powders into shapes, desktop manufacturing techniques are improving the economics of getting products to market faster.

A select group

The list of desktop manufacturing users isn't long, but it is illustrious. Nearly all the major automakers — General Motors Corp.,

Continued on page 78

INSIDE

Descriptions of various desktop manufacturing techniques, including their advantages and disadvantages. Page 81.

Computer systems and cost specifics. Page 78.

Continued from page 77

Ford Motor Co., Toyota Motor Corp., BMW of North America, Inc. — have signed on, as have aerospace giants The Boeing Co., General Electric Co. and Pratt & Whitney. The technology, commercialized in 1987, is also making its mark in tooling companies — those organizations that create molds, dies, punches and other items used to make production parts.

Organizations are using desktop manufacturing to make prototype parts as well as to create models for testing and for in-house or client critiques.

For Aluminum Company of America (Alcoa), Chrysler Corp. and Ford, desktop manufacturing techniques are key to quickly producing prototypes for review. They can check the models for fit, form and function, making changes to the design as needed — before any huge manufacturing effort gets under way.

Alcoa has trimmed its manufacturing review process from two to three weeks down to two to three days and has also minimized mistakes caused by misinterpretations of manual drawings and prints and miscommunication of design details, says Paul Fussell, who is responsible for Alcoa's rapid prototyping program.

Ford's goal is "to do the up-front work to get better quality in the part," according to Tony Anderson, the senior research and development engineer who oversees the technology at Ford. "We do analysis on the model to verify part properties and optimize properties before a single prototype is built." Only when the CAD model is satisfactory does Ford use it to make tools.

Proving that a design is manufacturing-worthy is one of the ways Chrysler makes use of its $500,000 desktop manufacturing system. By turning its CAD models into prototype parts, the company checks ideas for diesel starter motors, automotive transmission shifter handles, seat belt turn loops and distributor caps.

The company also tests its prototypes under simulated operating conditions. Chrysler part designers and product development engineers tested the Viper's equipment in this way. The automaker has also tested desktop-manufactured parts alongside and sometimes in place of production components. Chrysler says its investment has had a payback of less than one year in cost and time savings.

Fashioning models

Perhaps one of the greatest beneficiaries of desktop manufacturing is the tooling industry, which creates molds and other items used to make production parts.

For most companies, machining a rough bar stock (chunks of solid metal) to make molds, dies or other tools is costly and requires long lead times (several weeks to months). The process is hard to justify, especially in the case of intricate geometric parts and for relatively small lot production runs. Desktop manufacturing systems, on the other hand, enable users to generate prototype tooling rapidly.

Tooling is generated primarily in two ways: one, by using a prototype part as a pattern to make "soft-tooling" (i.e., rubber, epoxy, polymer-based molds); and two, by generating a prototype as a pattern to make "hard-tooling" (i.e., investment cast metal molds).

Another option is emerging from the laboratories at MIT, which are developing a rapid prototyping system called Three Dimensional Printing, which can make ceramic molds directly from the prototyping machine. The ceramic molds can then be used for casting metal parts.

Product development engineers use these desktop manufactured tools to produce actual parts made not of rapid prototype materials (such as photopolymers, wax, paper, etc.) but of real materials (such as polyethylene, aluminum, copper, etc).

Mack Industries, Inc. in Troy, Mich., which specializes in molding parts, building patterns and producing prototype castings, is using a desktop manufacturing method to make models quickly. These models are in turn used for building molds to cast actual parts. According to the company, the time it takes to build a woodlike model using desktop manufacturing vs. conventional techniques has been reduced by days or weeks.

For example, Mack had to supply a front-end accessory drive bracket for a major automotive company and used a desktop manufacturing system to create a 3-D solid model from CAD data. The system in this case reduced the total project time by 34% compared with conventional pattern-making methods. Futhermore, the system can run unattended, except for setup.

Breaking the mold

Other tooling companies are aggressively using rapid prototyping systems not just to provide prototype parts but also to produce a variety of tools for casting, forming and injection-molding applications.

Alpha Mold, Inc. in Dayton, Ohio, for instance, is integrating desktop manufacturing technology with computer-aided design and manufacturing and metal machining equipment to build molds. "A stereolithography model allows the customer to see the part and determine if any changes are required before expensive tooling is started," says Bob Burgess, sales/marketing engineer. (Stereolithography is the process of creating a part layer by layer in a vat of photocurable liquid. See story page 81.)

According to Burgess, Alpha Mold recently completed a project for The Regina Co., the manufacturer of the Electrik-Broom line of vacuum cleaners. Alpha built a part from CAD data to check form and fit before making a final product design decision. Once the design was approved, Alpha was able to use the part as a pattern to create urethane duplicates.

Regina "improved product quality, reduced lead times, as well as lowered overall costs," Burgess says. The company cut the time it takes to make the machine prototype mold by six weeks, he adds. •

Chaudhry is technical transfer manager at the Edison Materials Technology Center in Dayton, Ohio.

Technically speaking

The Edison Materials Technology Center, a materials and processing consortium based in Dayton, Ohio, has joined with key manufacturing companies, the University of Dayton's Rapid Prototyping Development Laboratory and Carnegie Mellon University in Pittsburgh to study the technical side of desktop manufacturing.

Their work concentrates on the development and improvement of desktop manufacturing software, the property and behavior of materials exposed to ultraviolet lasers and laser scanner control using desktop manufacturing techniques to make prototype tooling quickly.

Computer technology developments include the following:

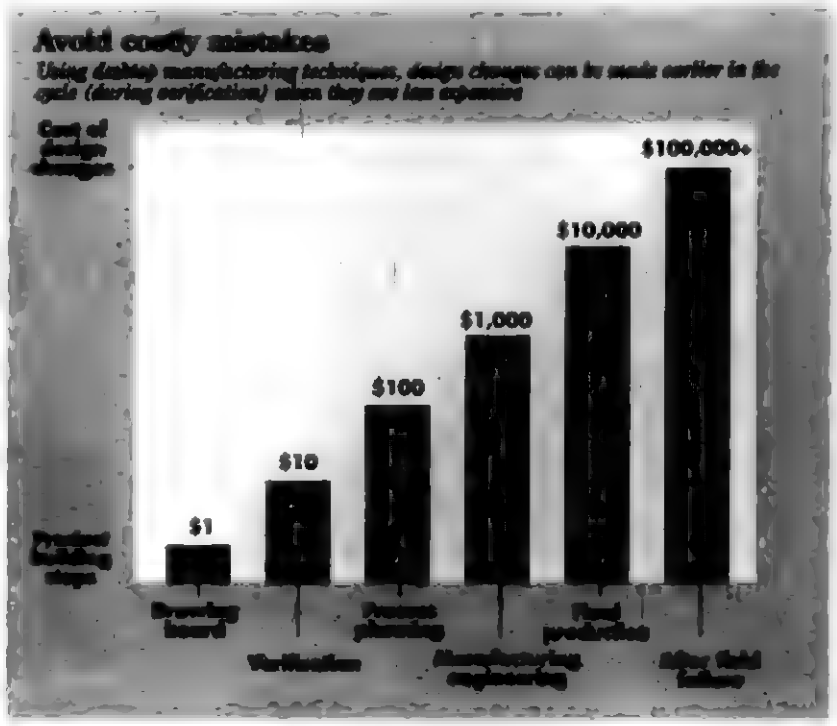
•**The Rapid Prototyping Tool Language (RPTL).** One of the major challenges facing software developers working to improve rapid prototyping systems is in simplifying and streamlining the steps involved in converting CAD data into a 3-D part.

In current systems, the 3-D CAD model must be faceted, sliced and then merged to create a control data file used to fabricate a solid object. In an RPTL-based system, the control unit compiles/interprets the input programs (which carry the layer boundary and laser movement information generated either by a human programmer or a CAD/CAM system) to build the solid part layer by layer.

Thus, RPTL replaces the existing data conversion process with a single program control step. Eliminating intermediate steps reduces the potential for errors.

•**Stereolithographic Apparatus (SLA) Previewer/Editor software package.** Users of SLA technology (which creates parts layer by layer when photocurable liquid gets hit by a laser beam) can view and edit input files before CAD data is merged and the part built.

Because this enables CAD engineers to catch software errors, such as stray vectors or incorrect lines, companies can reduce time-consuming, costly and repetitive part-building steps.



Source: Edison Materials Technology Center

Vital stats

What's needed and what it costs to make desktop manufacturing fly

Desktop manufacturing system	Computer system	Approximate equipment cost
Stereolithography (SLA-500) by 3D Systems, Inc.	386-based controller; Silicon Graphics Unix-based slicing software; STL input format (a de facto standard)	$385,000
Solid base curing (Solider 5600) by Cubital America, Inc.	Vaxstation 3100; input from solid models; surface models, wire-frame models; 2-D drawing (semi-automatic); computer-aided tomography and magnetic resonance imaging scanners; stereochemical models; digital terrain models	$490,000
Laminated object manufacturing (LOM 2030) by Helisys, Inc.	386-based IBM-compatible; MS-DOS 3.3 and Microsoft Windows 3.0; STL input format	$140,000
Selective laser sintering (Sinterstation 2000) by DTM Corp.	386 microcomputer running Unix; STL input format (486 with GUI used in latest models)	$397,000 - $427,000
Fused deposition modeling by Stratasys, Inc.	Initial Graphics Exchange Specification format; numerical control program code; STL format; Unix-based slicing software; 3-D wire-frame CAD model; (Silicon Graphics Iris workstation optional)	$130,000 - $183,000

Source: Edison Materials Technology Center

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3Com	10%	Brightwork	8%	Cisco	7%	Timeplex	9%	Proteon	8%
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Advanced Computer	2%	David	3%	Network	2%	Cisco	2%	Network	3%
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								Bridge	2%

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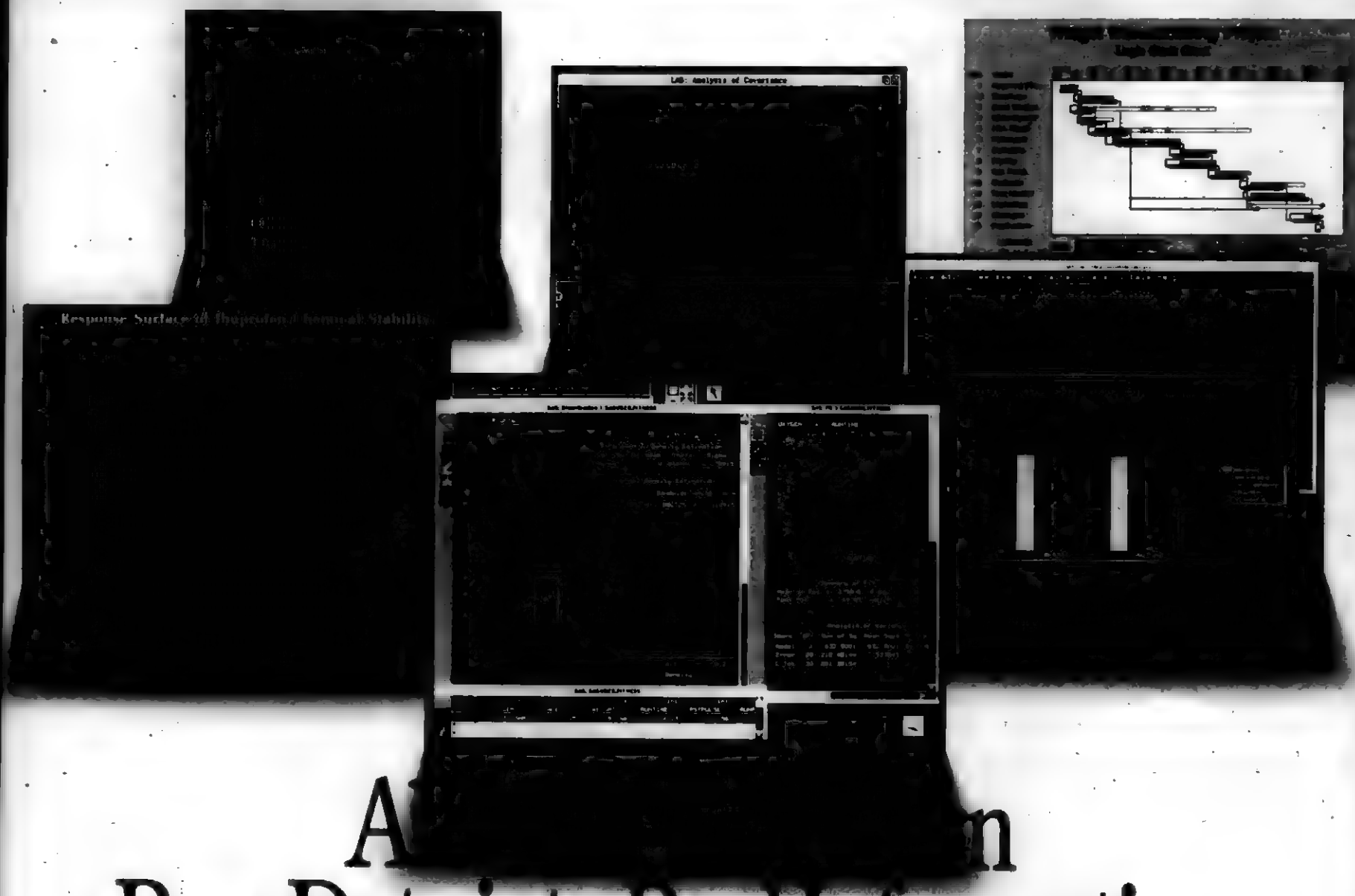

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Desktop manufacturing flavors

Finding the right method is not always easy. Here are six techniques, including pros and cons of each.

BY ANIL (NEIL) CHAUDHRY

The list of vendors in the desktop manufacturing world stands at about a dozen. Following is a description of certain leading techniques, including pros and cons:

Stereolithography apparatus
3D Systems, Inc., Valencia, Calif.
Creates a part layer by layer in a vat of photocurable liquid that hardens when hit by an ultraviolet laser.
Advantages:
- Many resins available with varying properties.
- New, patented laser scanning and part-building techniques minimize part shrinkage and distortion.
- Parts can have both internal and external contours and shapes.

Disadvantages:
- Need to build artificial structures to support certain overhanging shapes.
- Part warpage and curl possible.
- Postcuring required.

• • • • • • • •

Solid base curing
Cubital America, Inc., Warren, Mich.
Works like a three-dimensional copying machine. It uses layer-by-layer photomasks in conjunction with a supporting wax encasement and a high-power ultraviolet lamp to expose an entire layer at a time, as opposed to tracing the profile of a layer with a laser beam as done in 3D's systems.
Advantages:
- Virtually no limits on part shape, including intricate part-within-part shapes (i.e., ball-bearings rotating inside a ball-bearing housing).
- Parts can be fabricated with no additional support structures.
- Liquid is cured; no postcuring needed.
- No curling, warping or swelling during fabrication.
- Entire layer-at-a-time cure process enables parts with wide cross-sections to be produced fairly quickly.

Disadvantages:
- High equipment cost: $490,000.
- Equipment is large (25 ft by 25 ft) and may require its own room. (Other equipment average: under 10 sq ft.)

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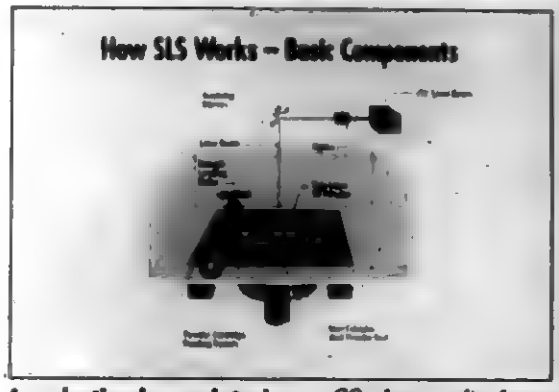
Resources

The Edison Materials Technology Center (Emtec) has sponsored three international conferences on desktop manufacturing (rapid prototyping) in Dayton, Ohio. Its next conference is scheduled for June 15-17, 1993, in Dayton.

Emtec recently published a special report on the "Commercialization Opportunities for Selected Rapid Prototyping Techniques." The report is a summary of Emtec's nine-month study to review and summarize the latest developments in the desktop manufacturing industry.

You can obtain more information by calling Emtec at (513) 259-1393.



In selective laser sintering, *a CO_2 laser melts, fuses and solidifies one layer of fine powder at a time until a part emerges. These systems range in price from $397,000 to $427,000.*

Laminated object manufacturing
Helisys, Inc., Torrance, Calif.
A laser cuts an adhesive-coated sheet of paper that is laminated layer by layer to make a 3-D part. Future systems may be able to use high-strength metals, composites and plastics to make rapid prototype parts.
Advantages:
- Can use a variety of thin sheet materials.
- Equipment costs are low: $85,000 to $140,000.
- Part size possibly larger than the current limit (30 in. by 20 in. by 20 in.).
- Possible to make composite parts by alternating layers of any number of materials (i.e., fibers, ceramics, metals, etc.).
- Possible to make tooling on the machine.

Disadvantages:
- Part removal is manual and delicate, as is part cleanup.
- Closed surfaces cannot be fabricated as a single piece.
- Part strength is limited — the paper can absorb moisture and cause distortion and delamination.
- Moisture absorption affects stability, part accuracy and shelf life.

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Selective laser sintering
DTM Corp., Austin, Texas
A carbon dioxide laser scans a layer of fine powder. Because the powder is kept close to its melting point, it melts, fuses and solidifies wherever the laser scans. In building successive layers, the laser must penetrate to the appropriate depth to fuse the top layer and the one below.
Advantages:
- Builds wax models in a few hours from a CAD file. Wax models are used to make investment-casting ceramic shells, which in turn can be used to cast metal parts.
- Possible to make ceramic shells or even ceramic parts directly by having the incoming ceramic powders precoated with heat-fusible plastic. Metal powders, such as brass, copper and bronze, may also be sintered.
- No artificial support structures required.

Disadvantage:
- High equipment cost: roughly $400,000.

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Photosolidification system
Light Sculpting, Inc., Milwaukee
A 140-watt ultraviolet lamp is used to irradiate an entire layer of liquid photopolymer through a photo mask.
Advantages:
- Low equipment cost: $99,600 to 159,500.
- Excellent for high-precision parts with small repetitive features.
- Small minimum slice thickness (.0005 in.) allows for great accuracy and surface smoothness.
- Rigid glass plate minimizes warping during the imaging process.

Disadvantages:
- Manual placement of the photomasks can be very time-consuming.
- Only one photopolymer resin is available with a limited range of properties.

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Fused deposition modeling
Stratasys, Inc., Minneapolis
A filament 1.25 mm (0.050 in.) in diameter feeds into a heated extrusion head and is deposited by a precision pump.
Advantages:
- High-speed process (head goes up to 900 in./min.).
- No wasted material; parts don't require support materials or cleaning.
- Excellent for making investment-casting patterns using wax.
- Uses variety of heat-fusible thermoplastic filament materials and wax filaments.

Disadvantage:
- Part strength limited to adhesion/fusion between filaments.

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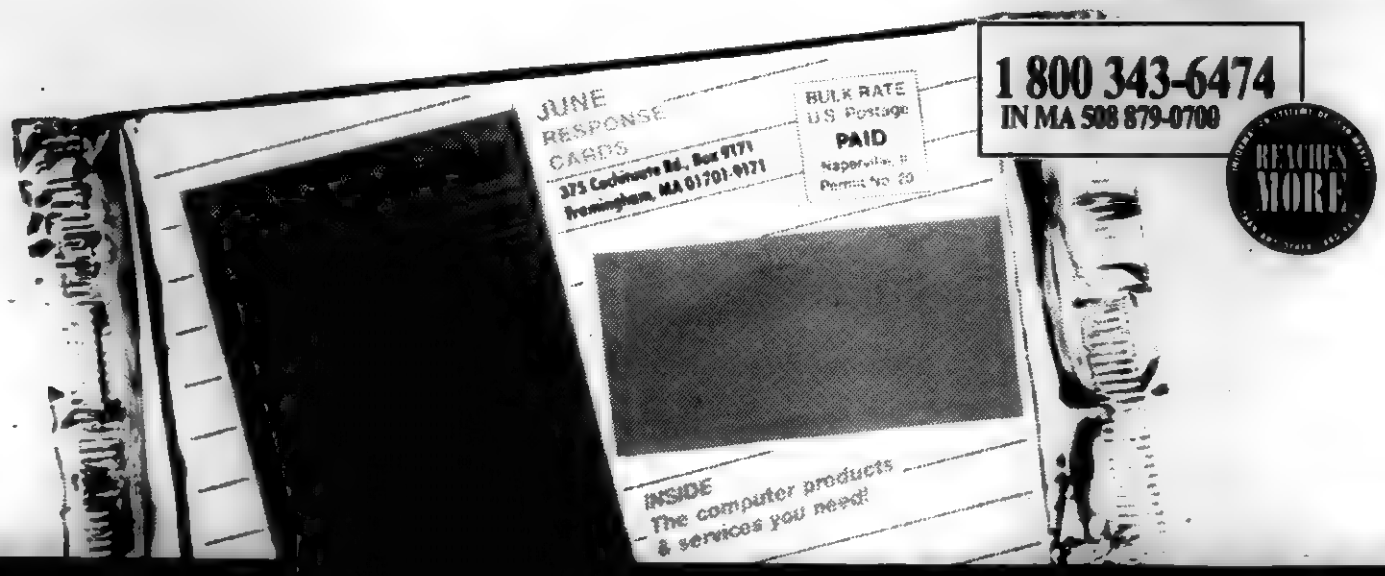

Off-the-job training: Compete in a triathlon, race a yacht

BY SALLY CUSACK
SPECIAL TO CW

What do skydiving, sailing, rock climbing and triathloning have to do with building a career in information systems? Perhaps more than you think. According to some weekend warriors, what you do with your free time can have a real impact on your success on the job.

Peter LoConto, a systems engineer at Dun & Bradstreet Software, says skydiving has improved his self-confidence and taught him to take responsibility for his actions. His concentration is also better, he says, explaining that skydiving "improves your listening skills" by teaching you to stay completely focused on the task at hand.

LoConto, who is responsible for internal IBM MVS operating systems support at D&B Software, first tried skydiving two years ago. Since then, he says, he has been "bitten by the bug" and is working to upgrade his current student status to one of a fully certified sky diver.

For Carol J. Anderson, vice president of information technology at TTX Co. in Chicago, sailing is both a diversion and an ongoing lesson in teamwork.

An avid sailor, Anderson currently races out of the Chicago Yacht Club on Lake Michigan and maneuvers a 52-ft yacht with 14 other crew members. She likens the team sailing and racing concepts to the total quality management programs in place in many large corporations today.

"You can see the same principles applied: Every team member is vital, and ultimately, you are only as strong as your weakest link.

"In an IS department, as in sailing, everyone must be cognizant of the whole picture and be able to step into any vacated situation," she says.

One vital management lesson Anderson says she's learned from her time hauling sail is that good ideas don't always come from the top. "Many people have ideas, and in IS, as in team sailing, everyone has a stake in making decisions," she says.

Carol Anderson *likens team sailing and racing concepts to total quality management programs*

According to Harry S. Keck, there may be no better way to learn teamwork and trust than rock climbing. Keck, project coordinator at Keck & Wood, an Atlanta-based manufacturer of software applications for municipal governments, started scaling cliffs several years ago while working as a software engineer in North Carolina. He was lured into the sport by his former project leader.

Over time, the rock climbing outings improved their relationship because they were able to trust each other's judgment more and had a deepened trust in one another's capabilities.

In the same way that Keck needs to trust the team leader and depend on other members of the group when rock climbing, he says he's learned to place more faith in the members of the software development team he leads.

"Rock climbing, where you are literally linked to one another on the edge of a mountain, really helps you learn to trust and depend on others," Keck says.

One sport may not be enough for everyone. In fact, two sports may not even be enough. Mike Llerande, who is local-area network manager at Union Ink Co. in Ridgefield, N.J., pursues three sports simultaneously: swimming, biking and running. Llerande began training as a triathlete 10 years ago. He says once when he was out of work for an eight-month period, heavy training was a terrific way to relieve stress.

However, triathlon competition isn't just a release for Llerande. It also helps his career. When he worked as a programmer/analyst at a Fortune 500 company on the West Coast, for example, a lot of problems were solved after work in this totally unrelated environment.

"The results were better for both my job and my training. It gave me a better balance — a better synergy," he says.

While Llerande doesn't compete professionally anymore, he still trains and coaches other triathletes. The coaching allows him to take a cerebral approach to what he has been doing physically for so long, Llerande says. As a LAN manager, it's helped him explain things that have always been second nature to him to others.

IS professionals who engage in both competitive and noncompetitive activities in their private lives agree that these extracurricular pursuits enhance their working lives. Take a hike or jump in a lake, they say. It will do your career in information systems a world of good.

Cusack is a free-lance writer based in Marstons Mills, Mass.

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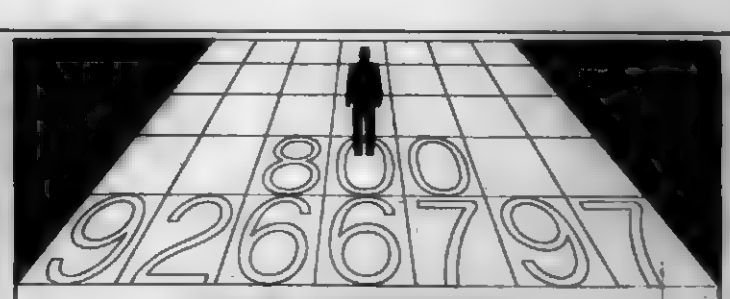

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Testing pros: Stay sharp technically

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles-based executive search firm specializing in the placement of computer professionals.

Q I have 16 years of information systems experience, and my specialty is testing. I'd like to update my skills with current technology, but I don't know how much I should absorb because I'll only be using these technologies in an ancillary way. What do you suggest?

A Staying sharp technically is a must for testing professionals. Ignoring emerging trends and technologies will significantly diminish your market value.

Progressive companies treat the testing staff as integral members of the development process and involve them in initial project planning. Insert yourself early in this development process, where most technology evaluations are made. Maintain close working relationships with the developers to enhance your knowledge of their tools.

Q I'm a senior programmer analyst at a large manufacturing company. While I still have my job, the company is laying people off. How can I make sure my luck doesn't run out?

A If you have managed your career by gaining skills that are in demand, and if you are flexible, there will always be a job available for you. The time to plan for your next job is while you're still in your current position.

Keep your contacts open both within and outside your company. If you think a layoff is approaching, let your network know that you are looking for another position. The rules have definitely changed. Job security no longer comes from your company; rather, it comes from having the right skill set at the right time.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q I've been a systems analyst at a financial institution for four years. When my manager accepted early retirement two years ago, I assumed responsibility for the system he supported. But my company recruited from outside to fill his position.

His replacement has been promoted twice since then, while I've been ignored. How can I get my employer to notice my accomplishments and promote me, too?

A Your situation needs immediate attention. Filling management positions from outside the company without reason can be demoralizing to staff members, who perceive a limited career path. Does management view you as unqualified? Are your accomplishments truly outstanding and critical?

Approach your manager with your concerns to determine exactly why you weren't promoted. Work with him to develop a plan for correcting any deficiencies. Then, meet regularly with your manager to review your progress. And when the next position becomes available, tell him directly and early that you want to be considered.

Q I am a computer support trainer and specialist at a large law firm, but I'm interested in going into programming. With all the various languages, I'm not sure what is the best approach to take. What language do you recommend I learn to get started?

A Professional programming is far more than just learning a language. You should take an introductory course in data processing. Along with programming, you will learn analysis, design, structured techniques and computing fundamentals. Equipped with this knowledge, you will be well prepared to learn languages.

While taking the class, network with staff programmers. Find out how your training compares with their on-the-job experiences. Then, let your manager know you're interested in an entry-level programming position.

☞ Burned out? Grappling with work/family issues? Worried about skills stagnation? We want to hear from you about these and other issues that affect your career. Call your questions in using the Fast Track line at (508) 820-8522 or send them by fax to Kelly E. Sewell at (508) 875-8931. If we use your question, we'll send you a gift.

How to cope with endless change requests from users

➤ We don't accept change requests from users. Instead, we ask for a description of the problem. Many times users give us their idea of a request for a change. But, not being analysts, the solution doesn't really meet their needs. We turn that around by asking them to explain the problem. Then we work with the user to resolve it.

Dale Woodland, manager of advanced planning
Loral Data Systems, Sarasota, Fla.

.....

➤ We have developed a steering committee comprised of people from the user community. Each user group has a representative on the committee. The committee is responsible for prioritizing requests, and we act according to their priorities.

Julie Denison, project leader, applications programming
Anitec Image Corp., Binghamton, N.Y.

.....

➤ User requests can usually be dealt with by using a report writer or utility program. Often the user wants a different format, criteria or data for a report. Our staff works with report writers and utilities to handle these requests.

Bill Walton, director of IS
Habitat for Humanity International
Americus, Ga.

.....

➤ It is a matter of trying to coordinate, prioritize and schedule the work. To do this we try to look at the cost benefit of each request — how it adds value to each system compared to other requests. The value measurement can be either a cost benefit or improved service to our user.

Randy Winkelman,
systems development manager
Black Hills Power & Light Co., Rapid City, S.D.

.....

➤ I meet with the user to try to figure out what business function he is addressing. Then I look at other departments to see if they have similar needs and if we could coordinate activity.

Greg Braginsky,
Systems and application programming supervisor
Augsburg Fortress Publishers Co., Minneapolis

Compiled by Emily Leinfuss, a free-lance writer in Sarasota, Fla.

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for personal computers	66,366
for technical workstations	26,022
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VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	52,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	36,940
Communications Systems	30,264
Public Utilities	43,687
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Wholesale/Retail Trade	82,674
Education	91,073

SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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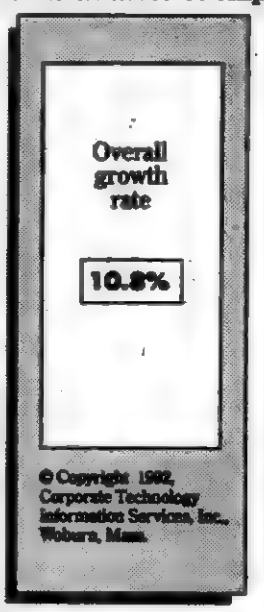

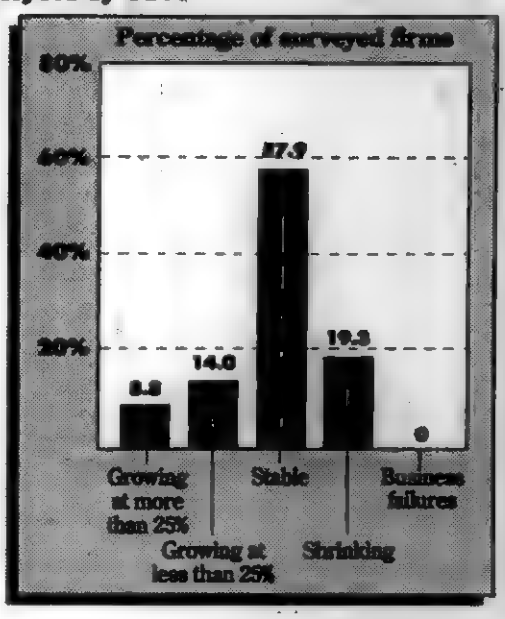

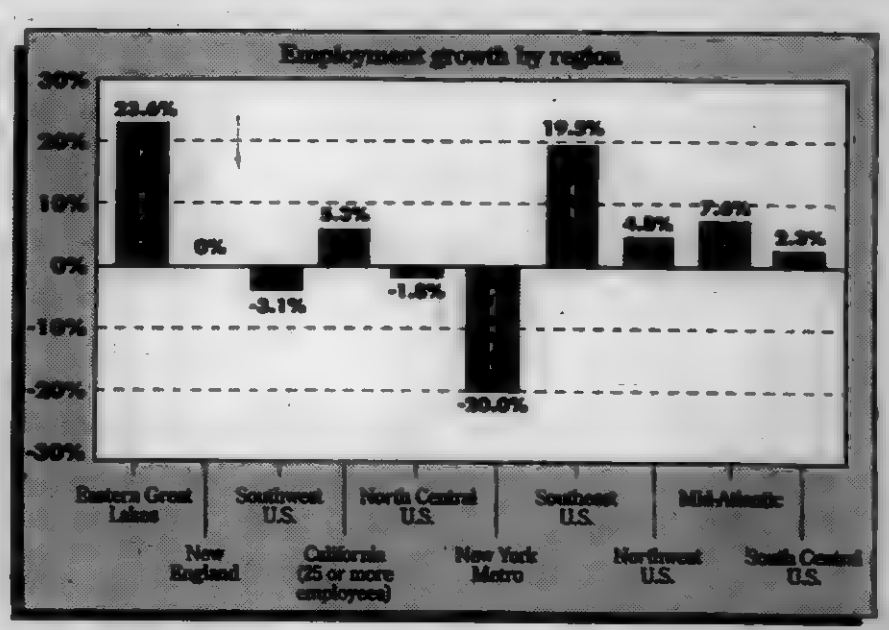

Don't take 'no' for an answer

BY ALICE BREDIN
SPECIAL TO CW

There you are, closing in on a deal. But when the subject of maintenance comes up, the vendor insists on charging you during the warranty period. You refuse to pay and ask for a break. The vendor says, "We can't."

You may think your back is against the wall, but veteran negotiators say there are ways to get around a "no." In fact, good negotiators are used to dealing with these situations.

"If you are doing a good job of pursuing your goals in negotiations, there will be some 'no's,'" says Joe Auer, president of International Computer Negotiations, Inc. in Winter Park, Fla., a consultancy that helps companies negotiate better deals with high-tech vendors. "If you haven't heard a 'no,' you've left something on the table."

One way to turn a "no" into a "yes" is to investigate the refusal. Is the "no" in response to the request or the concept? For example, if a vendor wants to charge maintenance during the warranty period, you should ask what the problem is.

"The vendor might say, 'Field engineering has to get its money one way or another, so we cannot give away service fees,'" Auer says. "In that situation, you can arrange to pay for the first year [of maintenance] and get credit on software."

Some buyers research what other vendors offer. Carl Schwimmer, director of administration at the College of Business Administration at Northern Arizona University in Flagstaff, tries to have an ace in the hole — the name of another vendor that will do what he wants.

A twist on Schwimmer's approach: Find out how flexible the vendor has been in previous deals by calling some of its customers. It would be difficult for the vendor to turn you down if you can cite a precedent that the vendor representative may not know about if it is outside his region.

The most likely way to do this is by attending conferences and seminars and asking attendees about their negotiating strategies. For serious bargain hunters, on-line negotiating networks are available for buyers to trade tips and techniques electronically.

A formal part of some buyers' negotiating strategy is calling the deal off if they hear "We can't."

"If a vendor is going to be hard and fast, you have to play hard ball," says Edward Barrow, director of the corporate data center at Occidental Petroleum Corp. in Tulsa, Okla. "Tell them you are going to walk. Say, 'I guess that means we cannot do business.'"

Barrow adopted this approach because, he says, compromising usually means you don't meet your objectives. He notes, however, that in 80% to 90% of the deals, the vendor calls back and says "We can."

"It's surprising how fast the phone rings back, especially if they've been at it for a while," Barrow says.

This hard-nosed approach only works if the technical people testing the product don't give the vendor an advantage by letting on how interested their firm is in the item. "We value their technical opinion, but we don't want them telling the vendor that we have to have it or that it's the best thing they've ever seen," Barrow says.

Good negotiating strategies and dealing with a tough bargainer start a long time before all parties sit down at the negotiating table. The best negotiators have done their homework, which puts them at the same level as the vendor.

For instance, be sure you've got plenty of options. "If you feel backed into the corner with one technology, I suggest thinking about changing technologies. It's not that hard to do in most cases," says Ned Livornese, an attorney with a high-tech private practice in Colorado Springs. Livornese also teaches courses in high-tech software negotiating strategies.

Research is especially important for smaller firms, which have less leverage than large companies. Small firms can make up for what they lack in buying power by planning a technology strategy that leaves them with many buying options. Planning is everything," Livornese says.

Bredin is a free-lance writer based in New York.

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• That's not the way we figured the deal.	
• We have to get any changes approved by headquarters.	

Source: International Computer Negotiations, Inc. "High Tech Procurement" newsletter, Winter Park, Fla.

When 'no' is OK

Part of negotiating is knowing when not to argue with a vendor's "no." These instances include the following:

➤ **Proprietary rights in software negotiating.** Software vendors see a world of limited sale opportunities for their products, so when it comes to proprietary rights, you may not have success negotiating.

➤ **Contract elements.** A vendor will not take out certain elements such as a disclaimer of warranty, an entirety clause and a clause that holds it to assuming consequential damages.

➤ **Lease negotiations.** A vendor will not remove a clause that ensures the buyer will make payments even if the equipment doesn't work.

➤ **Financial stipulations.** Vendors will sometimes refuse to bend on financial arrangements. One user negotiated with a vendor that demanded 50% payment up-front. He checked with the vendor's other customers and discovered that the firm always does business that way.

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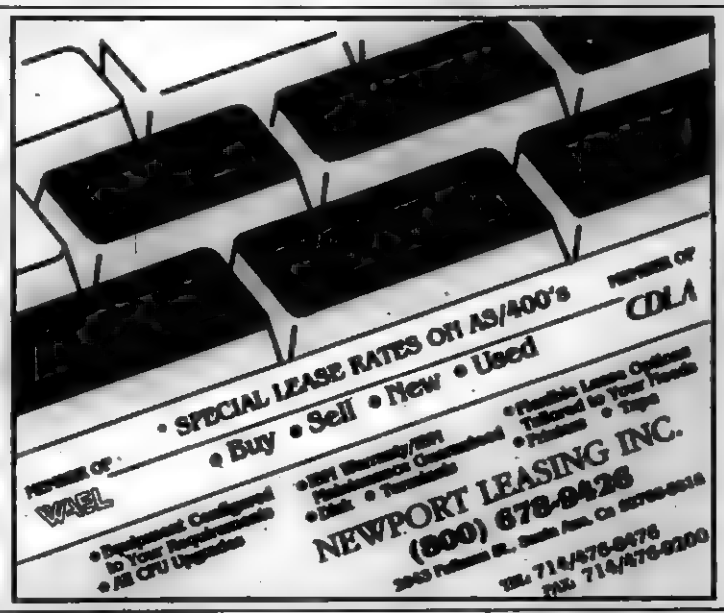

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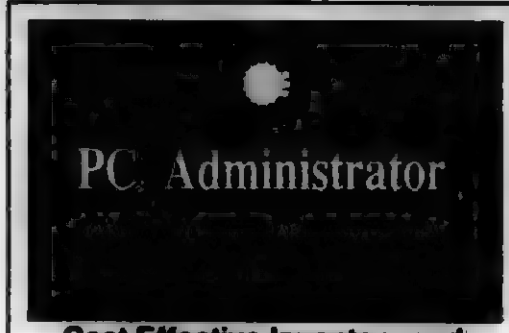

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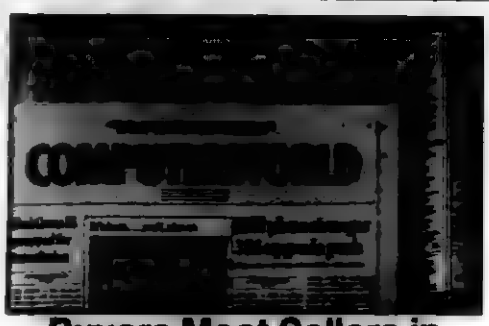

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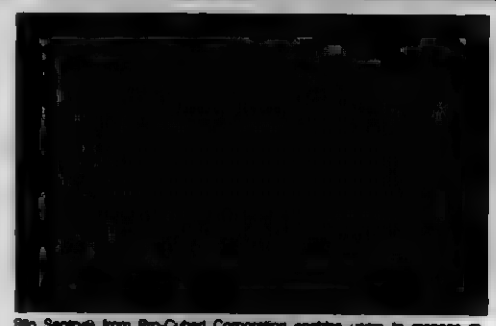

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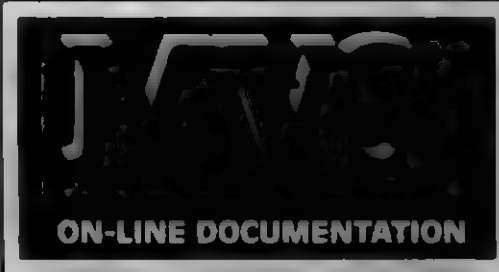

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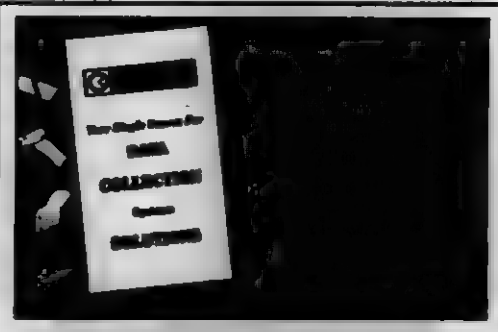

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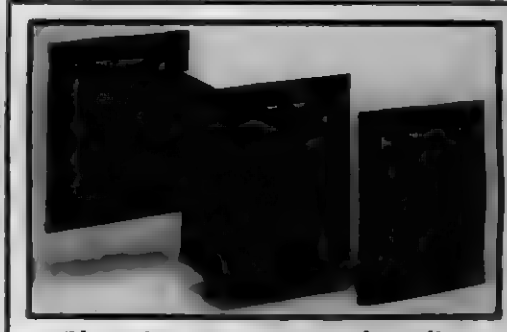

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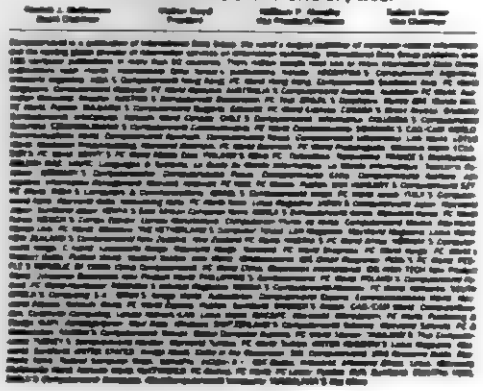

ADVERTISERS INDEX

Acer America	34
Apple Computer	38-39
Applied Business Technology	45
AT&T	81
British Telecom North America	48
Cabletron Systems	56
Candle Corp.	21
Comm Net	68
Compaq Computer Corp	36,50-51
Computer Associates	5
CW Circulation	67
CW Classified	45,53,57,60,69,
CW Marketing	43
CW White Paper	69
Digital Equipment Corporation	79
Dow Jones Services	57
Eastman Kodak	66
EMC Corp	99
Encore Computer Corp.	70
IBM	18-19,30-31,42,55,72
Information Builders	64,76
Informix	100
Intel	22-23
Intergraph	46
JWP Information Systems	29
Landmark Systems	60
Micro Focus	11
Motorola Codex	61
Multi-Tech Systems	15
Napersoft	59
Oracle	7
Platinum Technology	58
Ram Mobile Data	52-53
SAP America	25
SAS Institute	9,80
Software 2000	10
Sterling Software	54
Sun Microsystems	74-75
Swiss Bank Corp.	37
Sybase	13
Synscort	3
Unisys	26-27
XDB Systems	24
Xerox Corp.	63
Xircom	44
X/Open	47

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Companies in this issue

▶ *Page numbers refer to the page on which the story begins.*

3Com Corp. 16
3D Systems, Inc. 81

A

Actmedia, Inc. 43
Adobe Systems, Inc. 6
Adstar 28
Advantis 12
Aetna Life & Casualty Co. 74
Affiliated Computer Systems, Inc. 1
AFIC Computers, Inc. 14
Alamo Rent-A-Car, Inc. 59
Alberta Wheat Pool 8
Alex. Brown & Sons, Inc. 97
Alpha Software Corp. 35
Aluminum Company of America 77
American Data Co. 60
American Express Co. 8
American Management Systems, Inc. 71
American Red Cross 44
American Software, Inc. 59
Ameritech Corp. 59
Ampex Systems Corp. 28
Andersen Consulting 97
Annatek Systems, Inc. 52
Apple Computer, Inc. 6,8,38,53,54,57,98
Approach Software Corp. 39
AST Research, Inc. 98
ATM Forum 49
Atre, Inc. 15
AT&T 8,15,16

B

Bank South Corp. 97
Bankers Trust Co. 4
Banyan Systems, Inc. 15,52,
Beaver Computer Corp. 38
Bell-Northern Research 68
Beyond, Inc. 43
Biomechanics Corp. 73
BMC Software, Inc. 63
BMW of North America, Inc. 77
Borland International, Inc. 14,35,38,49
Boston Computer Society 8
Boston Notes Users Group 4
BP Exploration Alaska, Inc. 14
Brookwood Computer Industries, Inc. 60
Bus-Tech, Inc. 54

C

Canadian Bureau of Competition 16
Canon U.S.A., Inc. 1
Carnegie Mellon University 78
Caterpillar, Inc. 35
Ceridian Network Services 68
Chevron Canada Ltd. 8,14
Chevron Corp. 14
Chipcom Corp. 53
Chrysler Corp. 77
Cincom Systems, Inc. 15
Cisco Systems, Inc. 53
Citicorp 59
Claris Corp. 6
ClassicBlue Computer Services, Inc. 60
Coca-Cola USA 65
Columbia Gas Systems Service Corp. 49
Columbia University 71
Com-Gear Unlimited, Inc. 60
Communications Network Architects, Inc. 49,60
Compaq Computer Corp. 8,37,73,97,98
CompuAdd Express 39
Computer Associates International, Inc. ..8,59
Computer Sciences Corp. 16
Computer System Services, Inc. 60
Compuware Corp. 59
Concurrent Controls, Inc. 6
Corporation of Open Systems 1
Cray Research, Inc. 1
Creative Strategies
Research International, Inc. 8
Cyrix Corp. 6,8

D

Database Associates International 1,15
Dataquest, Inc. 4
Del Monte Foods 12
Destiny Technology Corp. 52
Digital Equipment Corp. ..1,4,12,15,44,53,98
Digital Equipment of Canada Ltd. 16
Digitalk 98
DTM Corp. 81
Dun & Bradstreet Software 63
Dyncorp 8

E

Eastern Kentucky University 45
Eaton Corp. 37
Edify Corp. 62
Edison Materials Technology Center 78,81
Electronic Data Systems Corp. 12,97
Eli Lilly & Co. 20
EMS Professional Software 69
Eo, Inc. 6

F

Falcon Systems, Inc. 38
Fannie Mae 1
Federal Reserve Bank of Chicago 20
FiberMux Corp. 53
Fieldcrest Cannon 59
First City Bancorp of Texas 97
First Manhattan Consulting Group 6
Five Star Computer Services, Inc. 60
Ford Motor Co. 77
Forrester Research, Inc. 8,16
Frame Relay Forum 49
Franklin Electronic Publishers, Inc. 39
Freeport McMoRan, Inc. 97
Frontier Technologies Corp. 53
Frye Computer Systems, Inc. 57

G

Gartner Group, Inc. 52,59
Gateway 2000, Inc. 97
GDS & Associates 59
General American Life Insurance Co. 49
General Electric Co. 77
General Motors Corp. 77,97
Generic Software, Inc. 63
Go Corp. 6,66
Grand Junction, Inc. 18
Grand Junction Networks, Inc. 16
GrayTech Software, Inc. 65
Grid Systems Corp. 98
Guide International 59

H

Harley-Davidson, Inc. 59
Harris Corp. 6
Harris Space Systems Corp. 53
Hayes Microcomputer Products, Inc. 57
Hekisys, Inc. 81
Hewlett-Packard Co. 1,4,12,15,
Howard Systems International, Inc. 74
Hughes LAN Systems 16
Hurwitz Consulting Group 14

I

IBM Personal Computer Co. 35
IBM 1,3,6,12,14,15,28,35,38,39,43,
....59,60,62,63,97,98
Imrex Computer Systems 59
Inference Corp. 65
Informix Corp. 96
Informix Software, Inc. 14,15
Ing. C. Olivetti & Co. 53
Ingres Products Division 15
Insource Management Group, Inc. 73
In-Stat, Inc. 97
Institute of Electrical and Electronics Engineers, Inc. 16
Integrated Systems Solutions Corp. 1,12
Intel Corp. 6,8,9,39,59,62,96
International Data Corp. 45
International Computer Negotiations, Inc. ..90
International Trade Commission 97
ITT Hartford 59

K

Kalpana, Inc. 16
Keck & Wood 83
Kennecott Corp. 65
Kennedy Space Center 53
Keydata International, Inc. 39
Kidder Peabody & Co. 97
Kingston Technology Corp. 97

L

Labatt Breweries of Canada Ltd. 4
Laird Plastics 59
Landmark Systems Corp. 59
Legent Corp. 49,59
Light Sculpting, Inc. 81
Lotus Development Corp. 4,6,8,14,32,
....35,43,54

M

Mack Industries, Inc. 77
Matson Navigation 12
McCaw Cellular Communications, Inc. 16
McCormick & Co. 74
MediaShare Corp. 16
Megaware, Inc. 63
Memorex Telex Corp. 46,53
Merisel America, Inc. 35
Meta Group, Inc. 52
Metrix Network Systems 57
Micro Access, Inc. 16
Micropolis Corp. 46
Microsoft Corp. 1,4,6,14,20,32,35,38,39,
....43,45,53,54,62,65,66,69,96
Mitem 98
Montgomery Securities 96
Moody's Investors Services 14
Music Consultants Group, Inc. 35

N

Nabisco Brands, Inc. 12
Nantucket Corp. 8
NCR Corp. 1,15,14,54
NEC Corp. 37
NEC Technologies, Inc. 8,38
NetManage, Inc. 54
Network Computing, Inc. 53
Network Security Systems, Inc. 57
Network Systems Corp. 53
New York Life Insurance Co. 35
Next, Inc. 8
Nolan, Norton & Co. 62
Northern Arizona University 96
Northern Telecom, Inc. 53,68
Novell, Inc. 1,6,15,44,45,52,54,57,96

O

Object Management Group 44
Object Technology International, Inc. 59
ObjecTime Ltd. 68
Occidental Petroleum Corp. 90
Open Software Foundation 16,54
Optimum Electronics, Inc. 30
Oracle Corp 1,6,14,15,43,62,96

P

Pacific Bell 59
Pacific Stock Exchange 16
PC Expo 38
Performance Computing, Inc. 1,15
Perot Systems Corp. 73
Phoenix Systems 4
Phoenix Technologies 53
Pioneer Software 65
Pizza Hut, Inc. 75
Powercore, Inc. 38
Powersoft Corp. 98
Pratt & Whitney 77
Prezark International 35
Procter & Gamble Co. 97
Progress Software Corp. 59,96
PrintoView 65

Q

Quantum Chemical Corp. 1
Quill Corp. 38

R

Ranco, Inc. 63
Reference Software International 6
Riggs National Bank 12

S

Samsung 97
SAS Institute, Inc. 20,38,63
Savon Systems, Inc. 60
Sears, Roebuck and Co 35
Sears Technology Services, Inc. 12
Sequent Computer Systems, Inc. 15,62
ServicePoint Development Corp. 53
Set Laboratories, Inc. 69
Shaw Pittman Potts & Trowbridge 1
Slate Corp. 66
SMDS Interest Group 49
SoftSwitch, Inc. 54
Software AG of North America, Inc. 65
Soundview Financial Corp. 97
Sparta, Inc. 16
SQL Solutions, Inc. 43
Star Cutter Co. 15
State University of New York 74
StrataCom, Inc. 49
Stratus Computer, Inc. 98
Straylight Software 65
Sun Data, Inc. 53
Sun Microsystems, Inc. 4,6,15,16,57,62
Sun Microsystems Computer Corp. 16
Sunsoft, Inc. 16
Sybase, Inc. 1,14,15,39,43,96
Sybase International User Group 14
SynOptics Communications, Inc. 16
Syntrex Technologies, Inc. 53

T

Tandem Computers, Inc. 12
Tangram Systems Corp. 52
Technology Investment Strategies Corp. 59
Technology Partners, Inc. 12
TechWorks International 69
Tekelec Corp. 57
Teleglobe Canada, Inc. 53
Telepartner 52
Tennessee Temple University 46,53
Tezaco, Inc. 49
Texas Instruments, Inc. 68
The ASK Group, Inc. 59,96
The Boeing Co. 59,77
The Chase Manhattan Bank NA 4
The Hertz Corp. 12
The Ringina Co. 77
The Rockefeller University 74
Tiara Computer Systems, Inc. ....
Tokio Marine Management, Inc. 74
Toshiba America Information Systems, Inc. ..16
Toyota Motor Corp. 77
Treasury Department 1
Treehouse Software, Inc. 69
TTX Co. 83

U

Union Ink Co. 83
Unisys Corp. 12
United States Public Health Service 74
University of Dayton 78
University of Southern California 71
University of California at Berkeley 28
University of West Virginia 1
Unocal Corp. 8
Unum Insurance Co. 35
U.S. Air Force Materiel Command 1
U.S. Department of Defense 1
U.S. Department of Commerce 97
U.S. Environmental Protection Agency 1
U.S. Postal Service 59
US West 20

V

Verimation, Inc. 54
Vitalink Communications Corp. 53

W

Wall Data, Inc. 65
Wal-Mart Stores, Inc. 1
Wang Laboratories, Inc. 43
Wausau Insurance Co. 1
Wells Fargo Wholesale Services 6
Western Digital Corp. 6
Wollongong Group, Inc. 53
WordPerfect Corp. 6
WorkGroup Technologies, Inc. 8

X

XDB Systems 59
X/Open Co. 59

Sun Microsystems, Inc.	Hold	Smith Barney, Harris Upham & Co.
	Buy	S.G. Warburg & Co.
Silicon Graphics, Inc.	Hold	Smith Barney
	Strong buy	Alex. Brown & Sons, Inc.
Intergraph Corp.	Source of funds/ Underperform	Alex. Brown & Sons

Industry Almanac

SECTOR FOCUS: DATABASE SOFTWARE FOR UNIX

The stocks of midrange and Unix database purveyors such as **Informix Corp.** (INFX) have been strong performers lately. In an Oct. 21 report, Montgomery Securities said it sees room for continued growth despite the high values these issues currently carry.

Montgomery Securities categorized these companies under "Network Computing Software," reflecting the distributed nature of their database management products.

The ongoing transition of the user population to client/server and other networked computing architectures will provide a prolonged window of opportunity for these vendors.

Montgomery Securities analysts Bill Shattuck and Doug Crook projected collective compound annual growth of more than 50% through 1996 for software vendors whose applications work across enterprise networks.

Other factors contributing to this healthy expansion include the move toward a cease-fire in the Unix wars and the growth of the database applications tools market.

The rapidly increasing ability of Unix hardware to handle industrial-strength on-line transaction processing will also open new opportunities for Unix database and tools vendors.

In addition to Informix, Montgomery Securities recommends the purchase of several stocks in this sector:

•**Oracle Corp.** (ORCL). Oracle is strongly positioned, with support for Novell, Inc.'s NetWare and IBM's OS/2 as well as Unix servers. Version 7.0 of the company's flagship relational database management system features greatly improved client/server capabilities.

•**Sybase, Inc.** (SYBS). The forthcoming Version 5.0 of the Sybase RDBMS is expected to automatically manage data that is duplicated on multiple servers for fast access (see story page 14).

•**Progress Software Corp.** (PRGS). Progress Software is approaching a new Unix product cycle. Progress applications are easily ported to new platforms, providing an advantage for users linking heterogeneous systems.

•**The ASK Group, Inc.** (ASKI). Product transitions resulted in an earnings shortfall for the company's most recent quarter.

However, Montgomery Securities said it believes the long-term outlook is bright and that the current value of the stock provides a good buying opportunity.

DEREK SLATER

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, NOVEMBER 6, 1992

TOP PERCENT GAINERS

Microcom Inc.	48.18
Esseil Corp.	44.44
Kendall Square Research	28.03
CE Software	26.67
Exabyte	26.45
Bolt, Beranek & Newman	21.88
State of the Art	21.74
Cypress Semiconductor Corp	21.33

TOP PERCENT LOSERS

Sequoia Systems Inc.	-30.00
Intelligent Electronics	-16.80
Everex Systems Inc.	-14.32
CompUSA Inc.	-12.42
Cray Computer	-9.52
Meca Software	-9.09
Wellfleet	-7.69
Banyan Systems Inc.	-6.83

TOP DOLLAR GAINERS

Cisco Systems Inc. (H)	5.75
Newbridge Networks Corp.	4.38
Cabletron Systems (H)	4.25
System Software Assoc.	4.00
Microsoft Corp.	4.00
Exabyte	4.00
Wellfleet Communications (H)	3.88
BMC Software Inc.	3.50

TOP DOLLAR LOSERS

CompUSA Inc.	-4.88
Nynex Corp.	-4.50
Bellsouth Corp.	-2.88
American Info Techs Corp.	-2.50
Southwestern Bell Corp.	-2.38
Bell Atlantic Corp.	-2.25
Intelligent Electronics	-2.00
Sungard Data Systems	-1.75

Exch	52-Week High	52-Week Low		Nov. 6 Close	Wk Net Change	Wk Pct Change
Communications and Network Services					**Up 4.95%**	
OTC	23.13	9.63	3COM Corp. (H)	23.13	2.13	10.12
NYS	70.63	56.25	American Info Techs Corp.	64.25	-2.50	-3.75
NYS	45.38	32.88	AT&T	44.88	1.25	2.87
OTC	4.25	0.75	Ariel Communication Corp.	1.44	0.13	9.52
OTC	22.00	10.25	Banyan Systems Inc.	18.75	-1.38	-6.83
NYS	48.75	40.25	Bell Atlantic Corp.	45.38	-2.25	-4.72
NYS	55.50	43.38	Bellsouth Corp.	48.88	-2.88	-5.56
NYS	8.75	3.63	Bolt, Beranek & Newman	4.88	0.88	21.88
NYS	72.25	36.63	Cabletron Systems (H)	72.25	4.25	6.25
OTC	31.00	17.50	Chipcom Corp.	24.00	-0.25	-1.03
OTC	65.75	24.00	Cisco Systems Inc. (H)	65.75	5.75	9.59
OTC	35.25	5.50	Compression Labs Inc.	11.63	1.38	13.41
OTC	3.38	0.88	Data Switch Corp.	2.06	0.06	3.15
NYS	23.63	13.75	Digital Comm. Assoc.	16.38	-0.38	-2.24
OTC	15.25	7.75	Digital Systems Int'l Inc.	7.88	-0.25	-3.08
OTC	19.50	3.63	DSC Communications (H)	18.50	1.25	7.25
OTC	10.88	4.75	Fibronics Int'l Inc.	6.25	-0.25	-3.85
OTC	37.50	10.50	Fibronics Int'l Inc.	17.00	1.00	6.25
OTC	3.38	1.13	Gandalf Technologies Inc.	1.75	0.25	16.67
OTC	2.25	0.69	Gateway Communications	1.31	-0.06	-4.51
NYS	5.50	2.38	General Datacomm Inds.	4.63	0.63	15.63
ASE	5.88	0.94	Go Video	2.50	0.13	5.26
NYS	35.75	28.88	GTE Corp.	33.50	-0.63	-1.83
NYS	70.63	56.00	ITT Corp.	66.25	1.13	1.73
OTC	37.63	25.25	MCI Communications Corp. (H)	35.00	-1.38	-3.78
OTC	14.50	2.25	Microcom Inc.	5.00	1.88	48.15
NYS	18.25	9.50	Network Equipment Tech.	10.63	-0.75	-6.59
OTC	25.50	8.88	Network General	15.88	1.50	10.43
OTC	30.00	8.50	Network Systems Corp.	14.75	1.13	8.28
OTC	27.50	5.63	Newbridge Networks Corp.	27.50	4.38	18.92
NYS	49.25	30.50	Northern Telecom Ltd.	38.75	0.00	0.00
OTC	32.50	22.19	Novell Inc.	31.88	1.38	4.51
NYS	86.38	69.13	Nynex Corp.	79.38	-4.50	-5.37
OTC	37.50	14.50	Octel Communications Corp.	20.50	0.50	2.50
OTC	9.88	3.38	Penril Data Comm. Netwks.	4.63	0.38	8.82
OTC	53.00	10.25	Picturetel Corp.	22.13	1.50	7.27
OTC	16.75	7.00	Proteon Inc.	9.88	1.63	19.70
NYS	30.63	13.88	Scientific Atlanta Inc. (H)	30.63	0.75	2.51
NYS	70.50	56.25	Southwestern Bell Corp.	64.38	-2.38	-3.58
NYS	28.38	20.75	Sprint Corp.	25.63	0.00	0.00
OTC	21.13	4.88	Standard Microsystems Corp.	20.63	1.25	6.45
OTC	63.00	15.25	Synoptics Communications (H)	63.00	2.00	3.28
NYS	40.00	32.88	US West Inc.	36.13	-1.13	-3.02
OTC	58.50	24.00	Wellfleet Communications (H)	58.50	3.88	7.36
PC and Workstations					**Up 1.30%**	
OTC	13.50	3.50	Advanced Logic Research	4.50	0.50	12.50
OTC	70.00	41.50	Apple Computer Inc.	66.75	3.25	5.10
OTC	24.50	11.25	AST Research Inc.	17.88	-0.38	-2.05
NYS	19.25	6.75	Commodore Int'l	7.25	0.00	0.00
NYS	42.38	22.13	Compaq Computer Corp.	42.00	1.50	3.70
OTC	37.38	13.91	Dell Computer Corp. (H)	37.38	3.25	9.52
OTC	7.75	0.88	Everex Systems Inc.	1.13	-0.19	-14.32
NYS	34.63	21.25	Harris Corp. (H)	32.88	-1.00	-2.95
NYS	86.00	44.63	Hewlett-Packard Co.	58.63	1.75	3.08
NYS	29.75	14.13	Silicon Graphics	26.63	1.88	7.59
OTC	36.13	20.75	Sun Microsystems Inc. (H)	34.88	-0.38	-1.06
NYS	31.25	22.25	Tandy Corp.	26.25	-0.25	-0.94
NYS	11.13	5.50	Zenith Electronics	5.75	0.00	0.00
OTC	25.50	2.75	Zeos International Ltd.	4.00	-0.13	-3.03
Large Systems					**Up 3.36%**	
ASE	20.63	7.75	Amdahl Corp.	8.75	0.63	7.69
NYS	16.38	4.75	Convex Computer	7.75	0.00	0.00
OTC	16.88	1.88	Cray Computer	4.75	-0.50	-9.52
NYS	52.25	19.00	Cray Research Inc.	21.75	0.50	2.36
NYS	18.13	7.13	Data General Corp.	10.13	-0.63	-5.81
NYS	65.50	32.88	Digital Equipment Corp.	36.75	3.00	8.89
NYS	100.75	65.00	IBM	66.25	-0.63	-0.93
OTC	13.25	5.50	Kendall Square Research	10.88	2.25	28.03
NYS	119.25	86.25	Matsushita Electronics	90.25	-0.75	-0.82
OTC	17.50	6.00	Pyramid Technology	10.00	1.25	14.29
OTC	17.88	9.88	Sequent Computer Sys.	15.50	0.88	5.98
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	-1.50	-30.00
NYS	54.25	29.50	Stratus Computer Inc.	34.25	1.63	4.98
NYS	15.13	9.50	Tandem Computers Inc.	14.50	1.38	10.48
NYS	11.75	3.63	Unisys Corp.	8.63	0.25	2.99
ASE	7.50	0.25	Wang Labs Inc. (B)	0.50	0.06	14.16
Software					**Up 4.69%**	
OTC	68.50	25.25	Adobe Systems Inc.	37.50	1.88	5.28
OTC	44.25	10.25	Aldus Corp.	15.25	-0.75	-4.69
OTC	19.75	7.00	American Software Inc.	9.00	0.75	9.09
OTC	20.00	9.75	Ask Computer Systems	17.13	1.00	6.20
OTC	53.50	23.25	Autodesk Inc.	53.50	2.75	5.42
OTC	37.75	3.75	Bachman Info. Systems	6.00	0.50	9.09
OTC	42.50	32.00	BGS Systems Inc.	37.00	-1.50	-3.90
OTC	79.00	37.25	BMC Software Inc.	63.50	3.50	5.83
OTC	25.50	12.25	Boole & Babbage (H)	24.00	-1.50	-5.88
OTC	86.75	25.25	Borland Int'l Inc.	33.50	-0.75	-2.19
OTC	10.50	3.63	CE Software	4.75	1.00	26.67
ASE	28.88	8.75	Cheyenne Software Inc. (H)	28.88	1.63	5.98
OTC	13.13	5.63	Cognos Inc.	5.88	0.00	0.00
NYS	18.88	8.63	Computer Associates (H)	18.88	1.38	7.88
NYS	12.38	4.75	Computervision Corp.	8.63	0.63	10.42
OTC	20.00	6.75	Consilium Inc.	18.50	0.25	2.44
OTC	47.88	6.00	Esseil Corp.	9.75	3.00	44.44
OTC	25.00	11.50	Group I Software	15.00	2.50	19.23
OTC	6.88	3.50	Hogan Systems Inc.	6.00	0.13	2.13
OTC	36.25	18.50	Information Resources	27.38	-0.38	-1.36
OTC	31.00	8.88	Informix Corp.	29.75	1.00	3.48
OTC	22.38	11.50	Intergraph Corp.	13.25	0.25	1.92
OTC	15.00	7.00	Interleaf Inc.	11.13	-0.50	-4.30
OTC	20.25	10.25	Interlink Inc.	14.00	-0.88	-5.88
OTC	21.38	9.50	Knowledgeware Inc.	13.75	0.50	3.77
OTC	48.25	28.75	Legent Corp.	48.25	1.75	3.82
OTC	36.75	14.75	Lotus Development	22.25	2.13	10.56
OTC	7.38	1.88	Meca Software	2.50	-0.25	-9.09
OTC	22.25	5.25	Mentor Graphics	7.25	0.00	0.00
OTC	37.38	27.38	Micro Focus	26.13	-0.50	-1.87
OTC	20.50	9.50	Micrografx Inc.	9.75	0.00	0.00
OTC	92.75	61.84	Microsoft Corp.	92.75	4.00	4.51
OTC	24.13	12.00	Oracle Corp.	24.13	1.88	8.45
OTC	53.25	19.63	Parametric Technology	50.63	-0.38	-0.74
OTC	11.00	3.50	Phoenix Technologies	4.13	0.13	3.13
OTC	25.25	11.25	Platinum Technology	16.38	-0.88	-4.55
OTC	56.50	28.00	Progress Software Corp.	53.50	0.00	0.00
OTC	26.63	4.00	Quarterdeck Office Sys.	6.13	0.25	4.26
OTC	32.75	11.75	Rainbow Technologies Inc.	23.75	0.50	2.15
OTC	22.75	4.00	Reuters plc	6.25	0.00	0.00
OTC	17.25	3.63	Ross Systems	5.50	0.38	7.32
OTC	16.63	8.50	Sapiens USA Inc. (H)	16.63	0.88	5.56
OTC	26.25	6.75	Software Publishing Corp.	8.75	-0.38	-4.11
OTC	8.50	2.00	Software Toolworks Inc.	4.44	0.44	10.86
OTC	7.25	0.75	Spinnaker Software	1.75	0.25	16.67
OTC	16.50	3.25	State of the Art	7.00	1.25	21.74
NYS	25.25	13.75	Sterling Software Inc.	20.00	0.50	2.56
OTC	30.00	8.00	Struct. Dynamics Research	12.25	1.25	11.36
OTC	42.25	16.25	Sybase Inc. (H)	42.25	0.50	1.20
OTC	51.00	8.88	Symantec Corp.	12.75	0.13	0.99
NYS	19.50	5.25	Systems Center Inc.	6.63	-0.25	-3.64
OTC	34.25	15.16	System Software Assoc.	25.75	4.00	18.39
OTC	13.25	2.50	Triusic Corp.	3.63	-0.25	-6.45
OTC	23.75	14.50	Walker Interactive Systems	18.25	-0.38	-2.01
OTC	5.50	1.50	Wordstar	1.88	0.25	15.38
Semiconductors					**Up 3.59%**	
NYS	21.50	7.38	Advanced Micro Devices	10.25	-0.25	-1.92
NYS	12.38	7.13	Analog Devices Inc. (H)	12.00	0.00	0.00
OTC	14.25	6.75	Atmel Corp.	14.25	0.75	5.56
OTC	14.13	3.25	Chips and Technologies	4.75	0.75	18.75
NYS	18.63	7.38	Cypress Semiconductor Corp	11.38	2.00	21.33
NYS	12.88	6.75	Dallas Semiconductor	12.25	0.25	2.08
OTC	99.13	39.75	Intel Corp.	89.00	1.50	2.22
NYS	9.88	4.88	LSI Logic Corp.	8.75	0.75	9.38
NYS	22.38	12.13	Micron Technology	19.63	0.25	1.29
NYS	97.75	57.50	Motorola Inc.	66.38	0.38	0.39
NYS	14.13	4.88	National Semiconductor (H)	12.13	-0.13	-1.02
OTC	27.00	8.25	Sierra Semiconductor	13.00	0.88	7.22
NYS	51.25	26.00	Texas Instruments (H)	50.75	1.63	3.31
OTC	10.50	6.00	VLSI Technology	7.88	0.13	1.67
OTC	7.00	2.13	Weitek	4.50	-0.38	-7.69
ASE	7.25	2.00	Western Digital Corp.	7.00	0.13	1.82
OTC	31.00	14.50	Xilinx	19.50	0.75	4.00
OTC	33.50	15.00	Zilog Inc.	29.25	-1.25	-4.10
Peripherals and Subsystems					**Up 4.95%**	
OTC	11.13	3.63	Archive Corp.	10.75	0.13	1.18
OTC	28.75	13.75	Banctec Inc.	23.88	-0.88	-3.54
OTC	23.50	9.25	Cambex Corp.	14.25	-0.50	-3.39
ASE	14.50	5.88	Cognitronics Corp.	12.63	0.38	3.06
NYS	23.88	12.50	Conner Peripherals	19.88	0.13	0.63
OTC	20.50	14.25	Data Race Inc. (H)	20.50	1.63	8.61
ASE	19.88	4.75	Dataram Corp.	8.13	0.13	1.56
NYS	24.75	8.38	EMC Corp (H)	24.75	1.38	5.88
OTC	8.38	4.75	Emulex Corp.	7.25	1.00	16.00
OTC	22.00	13.25	Evans & Sutherland	19.00	1.75	10.14
OTC	40.63	12.00	Exabyte	19.13	4.00	26.45
OTC	35.63	15.75	Intelligent Info. Systems (H)	33.13	-0.50	-1.49
OTC	11.25	4.75	Iomega Corp.	7.88	0.38	5.00
OTC	34.75	10.25	IPL Systems Inc.	12.00	-0.50	-4.00
OTC	21.25	10.75	Komag Inc.	19.25	0.25	1.32
OTC	15.63	4.38	Maxtor Corp.	14.63	0.25	1.74
OTC	12.63	6.38	Micropolis Corp.	8.00	0.75	10.34
NYS	105.13	85.38	3M Co.	104.88	2.00	1.94
OTC	6.75	3.50	Printronix Inc.	5.25	0.50	10.53
NYS	24.00	6.88	QMS Inc.	8.00	0.25	3.23
OTC	18.00	8.88	Quantum Corp.	13.25	0.25	1.92
OTC	12.75	3.75	Radius Inc.	5.63	-0.38	-6.25
NYS	13.38	6.50	Recognition Equipment (H)	13.38	0.75	5.94
OTC	13.13	5.63	Rexon Inc.	12.50	1.63	14.84
OTC	17.63	7.75	Seagate Technology	17.00	2.13	14.29
NYS	78.00	21.00	Storage Technology	31.75	2.13	7.17
NYS	22.88	16.00	Tektronix Inc.	22.00	0.88	4.14
NYS	82.25	60.25	Xerox Corp.	75.25	1.00	1.35
Services					**Up 0.05%**	
OTC	22.00	11.84	American Mgmt. Systems (H)	20.38	-1.38	-6.32
NYS	5.38	2.88	Analytics Int'l (H)	3.75	0.00	0.00
OTC	21.25	12.50	Analysts Int'l (H)	20.50	-0.75	-3.53
NYS	60.75	36.13	Auto Data Processing (H)	59.75	2.38	4.91
NYS	16.63	7.06	Candela Corp. (H)	16.50	0.13	0.76
NYS	23.44	12.50	Comdisco Inc.	15.00	-0.13	-0.83
OTC	13.50	6.75	Computer Horizons (L)	8.50	1.00	13.33
NYS	84.88	57.00	Computer Sciences	70.75	1.00	1.43
NYS	10.13	7.00	Computer Task Group	8.00	0.25	3.23
OTC	40.50	15.00	CompUSA Inc.	34.38	-4.88	-12.42
OTC	19.25	6.00	Corporate Software	11.75	0.88	8.05
OTC	30.75	7.75	Egghead Discount Software	10.00	0.00	0.00
NYS	33.00	25.25	General Motors E (EDS)	26.25	-0.75	-2.58
OTC	30.38	6.25	Intelligent Electronics	8.75	-2.00	-18.60
OTC	14.88	6.63	Mentel	10.25	0.13	1.23
OTC	15.75	6.75	Microage Inc. (L)	7.75	0.75	10.71
OTC	36.25	17.88	Paychex	36.25	2.25	6.62
NYS	77.50	55.00	Policy Management Sys. (H)	73.25	-1.75	-2.33
NYS	48.75	27.88	Reynolds and Reynolds (H)	48.75	3.38	7.44
OTC	32.00	22.00	SEI Corp.	27.75	0.50	1.83
OTC	24.38	16.88	Shared Medical Systems	20.38	-1.25	-5.78
OTC	30.00	16.00	Sungard Data Systems	27.25	-1.75	-6.03
NYS	3.63	1.13	Ultimate Corp.	1.25	0.00	0.00

KEY: (H) = New annual high (L) = New annual low

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IN BRIEF

Unisys cuts health care

■ **Unisys Corp.** last week said it is phasing out full cost coverage of health care for retired employees. The Blue Bell, Pa., firm said escalating national health costs and a change in accounting has made it too expensive to continue coverage.

Under the new accounting method, Financial Accounting Standards Board Statement 109, Unisys must reserve funds on its balance sheet to cover projected health care costs of both current and future retirees.

Unisys estimated that it will take a charge of no more than $260 million in the first fiscal quarter of 1993 to cover its projected medical costs. The cumulative effect of this charge will increase net income in the quarter by $325 million to $425 million.

■ **CompUSA, Inc.**, a Dallas computer superstore retailer, reported first-quarter net profits of $1.3 million, up 48% from the same period last year. Sales increased 56% to $263.4 million in the quarter. The company's 11 new stores contributed almost half of the sales increase in the period.

■ **Wordstar International, Inc.** said it is cutting worldwide staff by 26%, to 130 employees, as part of an ongoing expense reduction plan. Wordstar, which began life as MicroPro International Corp. in 1978 and has 5 million users, has struggled during the last few years to keep pace with market leader **WordPerfect Corp.**

■ **IPL Systems, Inc.**, a Waltham, Mass.-based storage firm, said healthy demand for disk array subsystems helped boost fiscal third-quarter sales 24%, to $15.7 million. However, profits dropped 44%, to $1 million from $1.8 million, partly because of cost associated with switching from third-party to direct sales channels.

EDS still unscathed by GM cuts

Faced with heavy losses, automaker relies on subsidiary for financial help

BY MARK HALPER
CW STAFF

DETROIT — While General Motors Corp. may be looking for price or contractual concessions from subsidiary Electronic Data Systems Corp., analysts said they believe the auto giant will spare its data processing subsidiary the cuts it is inflicting on other suppliers.

That is because the faltering automaker is counting more than ever on a solid EDS and EDS stock — GM Class E — as a source of financial backing at a time when its coffers have been depleted by losses costing billions of dollars.

That outlook holds true, analysts said, through last week's management changes in which the automotive giant named a new chairman, former Procter & Gamble Co. chief John Smale; promoted GM President John Smith to the additional post of chief executive officer; and replaced EDS overseer Robert Schultz — who retired — with GM general counsel Harry Pearce. Those actions followed the resignation a week earlier of Robert Stempel, former chairman and CEO.

As Soundview Financial Corp. Vice President Chuck Phillips noted, the changes "inject an element of uncertainty — EDS knows the new guy a lot less."

But most analysts said they expect EDS' GM contracts will remain relatively unscathed under the new leadership.

Some analysts, such as Terry Quinn at Kidder Peabody & Co., suggested that GM's interest in a healthy EDS could be motivated by a desire to sell the subsidiary for a much-needed capital infusion. "GM would likely spin off the company rather than take action that would hurt EDS," Quinn said.

That scenario comes in a modified version, in which GM could have an interest in selling EDS shares down the road as a way to raise cash, observed Cato Carpenter, an analyst at Alex. Brown & Sons, Inc.

And short of any sale plans, GM — which wholly owns EDS but sells Class E stock that is based on the integrator's performance — simply needs a strong EDS stock price, analysts noted.

Less GM business

EDS, however, continues to lower the GM mix of its business. GM, which in the mid-1980s accounted for two-thirds of EDS' revenue, represented about half of its $7.1 billion in business — $3.3 billion — in the year ended Dec. 31, 1991. It is imperative that these deals remain profitable for the outsourcer, analysts said.

"GM has a lot riding on the performance of GM E stock, so EDS may continue to be a sacred cow," Carpenter said.

That observation may rub a legion of GM suppliers the wrong way. That is because new GM purchasing chief J. Ignacio Lopez de Arriortua has implemented tough cost reviews and in some cases replaced suppliers.

GM's EDS posture is a sticky wicket of business politics, analysts noted. Factors keeping GM's EDS knife in its sheath include the following:

- A 1984 master agreement that guaranteed EDS a certain profit margin on all GM business. EDS typically receives between 10% and 12% margins on its GM contracts, compared with 13% and 14% for non-GM contracts, analysts said.
- A GM stock offering early this year that gave buyers an option to convert 15 million shares of the new GM stock into GM Class E stock.

Because GM pays Class E dividends out of EDS income, the automaker is not about to make any contractual cuts that would undermine GM's EDS revenue and dampen the public's interest in buying this new EDS-linked stock, analysts said.

"They have much more riding on it now because they have a specific issue based on GM stock converting into EDS stock," Carpenter observed.

Analysts said EDS will make small price concessions on some projects if, as Anderson noted, Arriortua is to bring data processing costs down from 2½% of sales to less than 2% of sales.

GM said that while it implemented new cost review measures for EDS during the last several months, those reviews lack one element to which GM has subjected other suppliers — the prospect of replacement.

"EDS and GM are conducting benchmarks to make sure EDS is competitive," a GM spokeswoman said. While cost reviews with other suppliers have entailed inviting bidders in as possible replacements, the spokeswoman said EDS and GM are conducting their benchmark studies "without going out and quoting the business."

If EDS and GM were not linked by ownership, the shrinking auto behemoth would probably be more solicitous of EDS' competitors, noted Howard Anderson, chairman of The Yankee Group in Boston.

Safe and secure?

EDS' GM contracts may be safe, the company continues to rack up outsourcing wins and in the third quarter ending Sept. 30, it reported an impressive 15% income gain to $167.3 million.

But as with other outsourcers, the recessionary economy has strained some existing deals. Last week, a 4-year-old commercial megadeal grew questionable when the client, First City Bancorp. of Texas, filed for Chapter 11 bankruptcy protection a few days after Federal Deposit Insurance Corp. took charge of the bank.

Chuck Phillips, vice president of Soundview Financial in Stamford, Conn., noted that if the takeover and bankruptcy lead to a loss of business, EDS may actually receive a blessing in disguise. "At best, the account is break-even, and it's probably unprofitable," said Phillips, who notes that the value of the contract was adjusted downward "a couple of times" during the course of the contract.

The 10-year deal, once worth about $50 million a year, has decreased by about 20%, Phillips estimated. Such adjustments are growing more common. IBM, for instance, recently restructured its outsourcing deal with Bank South Corp. [CW, Nov. 2].

EDS earlier this year fell victim to the world of change when client Freeport-McMoRan, Inc. dropped EDS in favor of IBM and Andersen Consulting.

MARK HALPER

PC prices OK despite levies

BY MICHAEL FITZGERALD
CW STAFF

WASHINGTON, D.C. — While fears of higher systems prices have sprouted in the wake of recent antidumping tariffs imposed on Korean chip makers, price tags should remain stable, analysts and vendors said last week.

The U.S. Department of Commerce recently hit several Korean manufacturers of dynamic random-access memory (DRAM), including heavyweight Samsung Electronics Co., with a preliminary decision recommending tariffs as high as 88% on their products, because of predatory pricing practices. The decision means the Koreans must contribute the difference between their pricing and fair market value to an escrow fund that could total $450 million.

The Korean manufacturers lose the bond only if the Commerce Department and the International Trade Commission both rule that manufacturers were selling DRAMs below market value into the U.S. The Commerce Department will not rule until March 1993.

Korean companies hold some 20% of the U.S. DRAM market, according to Phoenix-based researcher In-Stat, Inc. Despite worldwide overcapacity for DRAM makers, In-Stat said some U.S. chip brokers raised prices as much as 66% in the last week.

No conscience

"There's some major profiteering going on here, where DRAM brokers with no conscience are profiting from perceived bad news," said Dean McCarron, an analyst at In-Stat. McCarron said DRAM supplies continue to be stable, and prices on DRAMs have not increased.

Small PC makers and end users should shop around because some chip brokers continue to charge market rate, McCarron said. Big companies will likely not see prices rise. IBM makes its own DRAMs and is completely unaffected by the tariffs. A spokesman at Compaq Computer Corp. said the company would simply redirect any Korean DRAMs it might purchase to its overseas facilities.

Spokesmen at Gateway 2000, Inc. in North Sioux City, S.D., and at Fountain Valley, Calif.-based Kingston Technology Corp., the biggest board maker in the country, also said their component prices should not be affected for at least the next two quarters.

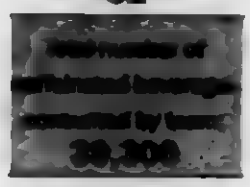
Wysiwyg

FACTS 'N' FIGURES

Quattro Pro for Windows

Total lines of code:
572,316

Total months in development:
31



Total vacation time taken by team during two years of development:
10 weeks

GREAT NAMES

Andrew M. Prophat
President
AP Research, Cupertino, Calif.

WINNER

Best technical paper, Society for Computer Simulation:

Simulation Analysis of a Collisionless Multiple Access Protocol for a Wavelength Division Multiplexed Star-Coupled Configuration

- We'll wait for the movie

BDUs*

"One of our remote users had inadvertently turned on the key click on the keyboard, although the user didn't know what it was. Every time a key was pressed, it made a squeek noise. The user called me up to ask if we had any computer oil in stock, or if it would be OK to order some to oil her keyboard and get rid of the noise."

Bert Bondo
DP manager
Merkel Donohue

*Brain Dead Users

THE KISS OF DEATH

"I'm probably the greatest computer genocide guy going. That's kind of a paradox. It's one of the most brutal things you can do to an engineer: kill his project. But the worst thing for an engineer is to face the market and have a product fail in the marketplace."

Gordon Bell
Former Digital Equipment Corp. engineering manager who guided the creation of the PDP-11 and VAX series

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

CW Chart: Stephanie Faucher

The 5th Wave

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INSIDE LINES

Multimedia-mania

Tomorrow, Apple will try to upstage today's joint Microsoft/Intel multimedia announcement by announcing QuickTime for Windows. Apple hopes its product's ability to run the growing installed base of Macintosh QuickTime applications on DOS-based PCs will keep Microsoft in catch-up mode. Microsoft's upcoming Windows for Video Computing (WFV) is a layered extension of the Windows environment that will let users run animation and full-motion video as QuickTime does. Microsoft will sell WFV in a separate shrink-wrapped package through retailers. More interesting is Intel's role in the announcement: The chip maker has reportedly built video capture and playback software that will be on display.

Cajun cravings

Apple is slated to announce a new suite of development tools at the MacIS user group conference in New Orleans this week. The tools were designed to enable IS professionals to easily build client/server applications that operate on a variety of platforms. At least nine independent software vendors — including Brio, Powersoft, Digitalk and Mitem — will stand shoulder-to-shoulder with Apple execs to announce support for the new tools.

Worse than in-laws

Intel sits atop the heap in processors right now, but its biggest customer, IBM, is ready to roll with a 100-MHz, 32-bit version of its homegrown Intel derivative chip, the SLC. The chip, which sources say has been shown to potential OEMs such as AST Research, uses clock-tripling to run at 33 MHz externally and 100 MHz internally. IBM can't sell the chip by itself, but it has been showing a chip surface-mounted on a daughterboard that basically matches the chip size.

Customer dissatisfaction

While DEC focuses on customer satisfaction, a minor uproar has been occurring on DECUServe, the network for DECUS, the DEC user society, about changes taking place in DEC's Documentation Support Service. It appears that DEC is removing volumes of documentation that had been previously available, repackaging it and then charging users for information they had been receiving as part of the service, according to Bill Mayhew, a DECUS chairman. "On the one hand, DEC is improving business practices, but on the other, there are things like this happening, and a product manager says it's a 'corporate edict.' I said, 'Where is the customer-driven company?' " Mayhew said.

Not fault tolerant

Indications are that DEC may soon shut down its fault-tolerant development unit in Marlboro, Mass., after unveiling the high-end VAX FT 810 model this month. The machine, which tops off DEC's fault-tolerant line, was due in August but was delayed when turmoil over founder Ken Olsen's resignation hit full boil. Several of the unit's 150 employees have sent resumes to rival and neighbor Stratus Computer, one analyst said.

Plans a changin'

Grid has changed its mind on its convertible pen-and-keyboard notebook computer. Instead of showing it at its shareholder meeting on Tuesday, sources near the company said, Grid will wait to release the product at Comdex/Fall '92. AST, meanwhile, is delaying its Renegade low-end product line, sources say, to work on making the systems smaller and lighter.

Computers definitely improve over time: Compaq shipped its first portable 10 years ago last Tuesday. The 20- by 8½- by 16-in. Compaq Portable PC used an Intel 16-bit 8088 processor; had 256K bytes of RAM, expandable to 640K; and had two double-sided, 5¼-in. disk drives, no hard drive and a 9-in. monochrome display. It weighed 28 pounds. Today, Compaq will ship a battery-powered notebook with a 32-bit 486SL, an active-matrix color screen, up to 200M bytes of storage and 20M bytes of RAM in a 6.4-pound package. The original portable was so successful that when Compaq finally retired the product line in 1986, the company founders formally buried the last model at Compaq headquarters. The 4/25C, by contrast, will probably be retired unceremoniously in 18 months or so. Don't bury your news, though. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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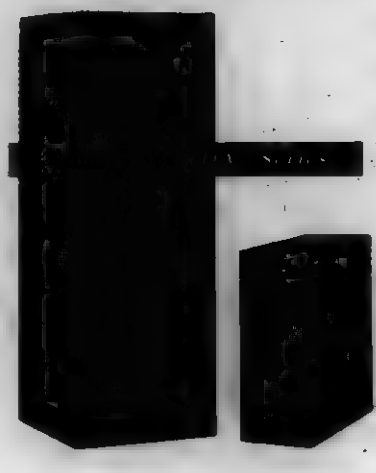

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November 16, 1992, Vol. 26, No. 46, 202 Pages, $2/Copy, $48/Year

COMPUTERWORLD

COMPUTER BUYERS' SCORECARD WORLD

Speedy delivery

MAIL-ORDER 486 PC BRANDS FARE WELL AGAINST OTHER NAME BRANDS IN USER SATISFACTION WITH OVERALL SYSTEM PERFORMANCE.

SEE BUYERS' SCORECARD, PAGE 160

Vendor	Performance satisfaction score
Gateway 2000	8.8
Dell	8.5
Compaq	8.5
AST Research	8.1
IBM	8.1

MAXIMUM POSSIBLE SCORE: 10

IBM gives OS/2 unit more freedom

By Rosemary Cafasso and Christopher Lindquist
WHITE PLAINS, N.Y.

IBM confirmed last week that it is shaping its desktop operating system business into a more independent unit as part of an ongoing plan to make its PC businesses more competitive.

The company could also eventually spin off the business as a separate company, much as it did with its desktop hardware business two months ago, although no specific plan is now in place, a company spokesman said.

Information systems executives said they would welcome a more focused effort from IBM's desktop business and believe it could bring about better service and quicker

IBM, *page 12*

PCs in short supply

By Michael Fitzgerald

■ The IBM PC Co. and Compaq Computer Corp. have been asking users to hop on a low-price bandwagon, but as the crucial fall buying season heats up, the two giants of corporate PC sales have quickly discovered that a high demand for seats is far exceeding supply.

"This is a disaster for us — customers want to manage their MIS installations and roll out networks, sales force automation projects, etc., and they're furious over this," said William Tauscher, chairman and chief executive officer of ComputerLand Corp. in Pleasanton, Calif.

Success, it seems, can be hard to handle. The shortages result from a combination of record demand and an inability to get extra parts.

IBM acknowledged that demand exceeds supply for much of its Personal System/2 line from the Server 295 on down, and there is probably a two-month backlog for its ThinkPad portable line. It also appears to be on the brink of breaking its promise to meet demand for its low-cost PS/ValuePoint line, according to numerous industry observers.

IBM has said it initially delayed ValuePoint's launch to make sure it would not repeat Compaq's continuing supply problems, delivering 14,000 low-end ValuePoints to dealers the week before it announced the product.

Yet while IBM officials said it is on schedule so far, several well-placed reseller executives said it is a few days behind promised deliveries of 486SX-based ValuePoints. IBM said it can fill orders for the 486DX models, though that will not be clear until later this month when the machines are scheduled to ship.

And callers to IBM's 800 line for ValuePoint systems are experiencing a near-two-month wait for new systems, while some major customers contacted said they were being told by IBM reps to expect similar delays. "We've been told that [ValuePoint] will probably not be available in quantity for six weeks," said Richard E. Nelson Jr., vice president of agency systems at New York

Supply, *page 12*

COMDEX

Microsoft to unveil client/server database. Page 12
Technology promises near reality. Page 14
CC:Mail for OS/2 to get a new face. Page 14

Aiming high

Microsoft pursues IS

By Christopher Lindquist

Abetted by an industry shift to client/server computing, Microsoft Corp. has spent the past two years attempting to shed its skin as a shrinkwrapped vendor. Since it released Windows 3.0, the company has been striving to position itself as a software supplier capable of establishing strategic, long-term relationships on multiple levels with large, corporate information systems departments.

What does Microsoft need to do to convince IS it can be a dependable, strategic ally? See page 20.

Microsoft has rolled out a number of changes designed to bolster that effort, including vastly improved service and support, more flexible licensing policies, a separate consulting arm and an entire division devoted to corporate customers.

And last week, the company confirmed that it will expose yet another stratum this January in its bid to capture IS fealty, including simplified purchasing and licensing options and more robust support (see story page 20).

Despite these efforts, interviews with 12 IS managers and a separate poll taken by the CW Database Division last week indicated the microcomputer software giant may face more than a few obstacles in its bid to achieve first-class citizen status in large corporations. Not the least among these hurdles will be the issue of trust. Microsoft has a reputation among users and developers for constantly tweaking delivery dates and product plans.

Microsoft, *page 20*

SDLC routing snags users

Glitches cause some to find networking workarounds

By Elisabeth Horwitt

Bad user karma is overwhelming Cisco Systems, Inc.'s current dogma that a router can handle Systems Network Architecture with the same ease with which it directs local-area network traffic.

Painful experiences with bugs, poor performance and lost IBM SNA sessions are causing early implementors of Cisco and other router vendors' Synchronous Data Link Control products to rethink their internetworking strategies.

They are also causing users to question whether Cisco has the expertise to develop its own SDLC products rather than farming them out to an SDLC expert, as Wellfleet Communications, Inc. and Proteon, Inc. are doing.

SDLC specialists such as Sync Research and Netlink Corp. have consistently provided more options and better throughput than the router vendors, user sources said.

Questions on its SDLC credibility come at a bad time, given that Cisco has just launched an all-out effort to get its Advanced Peer-to-Peer Internetworking protocol accepted as an industry standard for routing SNA traffic.

Indeed, more than one user company is rethinking its strategy of using a router, which was originally designed to handle LAN-to-LAN traffic,

SDLC, *page 7*

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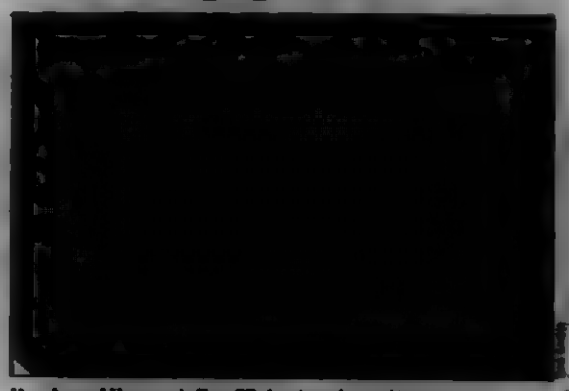
There's no generation gap here

Reports of an IS generation gap are greatly overrated.

An exclusive *Computerworld* attitude survey of more than 1,400 information systems professionals found that young and old agree on the importance of PCs, local-area networks and client/server technologies to success in the field, though they say mainframes are far from dead. However, the generations don't always concur about broader business and societal issues. See page 148 for complete survey results.



Handy and Hanson's Ron Flink: *Age doesn't count*

Executive Briefing

A comprehensive guide to the week's news

INDUSTRY

Microsoft aims to cozy up to large customers by putting a new face on revamped strategies. *Pages 1, 20*

IBM cuts the cord on its desktop operating system business. *Page 1*

MANAGEMENT

Surprisingly few major differences in attitudes exist between the old guard and young turks in IS. An exclusive *Computerworld* survey shows broad agreement on a variety of issues. *Page 148*

EXCLUSIVE CW SURVEY

OUTSOURCING

McCaw Cellular Communications will let expire an outsourcing deal with Cincinnati Bell Information Systems in favor of a real-time, in-house Unix system aimed at improving customer support and billing. *Page 10*

Outsourcing at HUD surpasses expectations, but efforts to shore up financial applications in the wake of the 1989 scandals are moving slowly. *Page 16*

COMDEX

It would be possible to run Comdex by computer, according to industry observer Esther Dyson. But that would remove most of the attraction. Besides, the possibility of a big payoff is what keeps people coming. *Page 33*

Comdex kicks off the quest for productivity with multimedia, next-generation portables and workgroup computing. Also on tap are a host of products in the sectors of PCMCIA, wireless technology, multiprocessing, high-end servers and portable computing. *Page 14*

Microsoft will unveil the first pieces of its database strategy, including the Access database, a GUI-based development environment and a means to connect with third-party PC databases, rolled into one. *Page 12*

Lotus will unveil a 32-bit version of CC:Mail for OS/2 2.0. *Page 14.* The company will also show Improv for Windows and announce plans to ship it early next year. *Page 14*

An old-fashioned shootout at high noon is expected as IBM, Borland, Novell and WordPerfect announce a client/server application interface for databases to counter Microsoft's widely accepted Open Database Connectivity API. *Page 12*

ENTERPRISE NETWORKS

Early implementations of IBM SDLC traffic on routers has run into glitches, causing users to rethink that strategy. *Page 1*

IBM plans to deliver frame-relay technology by mid-1993 and ATM products within a few years, but it won't offer SMDS. *Page 99*

Meanwhile, ATM plans are coming together for router vendors Wellfleet and Cisco. *Page 99*

MCI proposes the FCC license spectrum for building wireless personal communications networks to teams of companies, which can quickly construct more far-reaching networks than individual licensees. *Page 10*

PC hardware

■ Too many customers have hopped on the sweet seats set out by IBM, Apple and Compaq, who find they can't get their product bus rolling because demand is too heavy. *Page 1*

■ When it comes to PCs, productivity is beside the point, says science fiction author Bruce Sterling. What PCs are really all about are glamour and personal power. They can make you seem more impressive than you are, and they give you access to just about anyone or anything. *Page 33*

■ Modifications to PC power supplies could eliminate some of the need for UPSs. *Page 44*

■ Conversions to IBM's newest DB2 release go well, provided maintenance is current. *Page 113*

Technology surveys

■ Price wars may promise that you can get cheap 486 PCs, but getting a true Best Buy entails carefully examining your applications load to determine what system you really need. It also means writing detailed bid specifications, inspecting each candidate system to check quality and leveraging volume purchases for even better prices. Product Spotlight on 486 PCs provides the practical tips you need. *Page 153*

■ Gateway 2000 486 PC users give their systems the highest satisfaction ratings, besting Dell, AST, Compaq and IBM. *Page 160*

Client/server

■ It's true that moving to client/server can save you as much as 50% on hardware. But it is also true that labor, training, telecommunications and other costs can eat away at those savings. *Page 149*

■ Client/server IS staffs at United Airlines, GTE, Texaco, ITT Hartford Insurance and Harvard Community Health Plan are forging ahead with downsizing plans, but they admit that it hasn't been an easy passage. Two key hang-ups: training and the lack of tools for capacity planning, network management and predicting performance. *Page 149*

■ *Computerworld* nears its goal of converting to a client/server, Unix-based production system in time to implement a redesign of the paper. *Page 92*

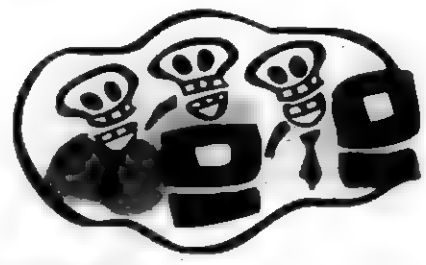
■ Levi Strauss took client/server systems for a test drive and liked what it learned. *Page 127*

■ Apple users are eating up an Apple document about client/server. *Page 1*

Downsizing

■ A planned 5,000-person work-force reduction at The Travelers could cut sharply into the firm's professional IS ranks — but the importance of IS in the firm's business mix is going nowhere but up. *Page 10*

■ With Wang, its minicomputer supplier, suffering financial problems, a Cleveland law firm is looking for ways to make use of its 40 minis while planning for a future based on PC LANs. *Page 53*



Does your job give you nightmares? See page 177

Software pricing

■ Computer Associates continues to move away from tiered pricing, introducing simpler, more flexible enterprise pricing models for users of its mainframe, Unix and PC software. *Page 8*

Large systems

■ Hitachi Data Systems CEO John Staedke plans to maintain HDS' steady course in the choppy waters of IBM-compatible mainframe marketing. Staedke says HDS will stick to its plan of growing at about 15% a year. *Page 197*

■ EMC is ready to ship a mainframe storage system that observers say outperforms IBM's comparable offerings and beats Storage Tek to market. *Page 8*

Midrange systems

■ DEC finally unwraps a range of Alpha platforms with a staggered shipment schedule. The company also introduces some homegrown software, promising third-party packages to follow shortly. And for those still waiting, the firm confirms that the final pieces of DECnet/OSI are slated to roll out by mid-1993. *Page 24*

■ Chicago's city library runs its on-line terminals as if they were ATMs in a bank and has a fault-tolerant host in its data center. *Page 110*

■ Dallas/Fort Worth Airport has a Pyramid-based technology plan to help it expand into what may be the world's largest airport by the year 2000, but a number of integration challenges lie in the way. *Page 120*

Databases

■ Sybase shows its 1993 product lineup but declines to give pricing or shipment dates. Users eagerly await the products. *Page 15*

■ Oracle's Glue API for client/server applications is intended to spur the development of more Windows programs that access Oracle database servers. *Page 37*

PC software

■ Corporate software evaluators rarely encounter truly awful programs, but they still put software — especially Windows-based programs — through the wringer. Three tough testers give practical tips. **189**

■ Microsoft's TrueType was one of the key benefits of the Windows 3.1 update. **38**

■ Apple's software subsidiary, Claris, rolls out its second Windows product, a version of ClarisWorks. **46**

■ SAS Institute pushes the theme that its software is more than just a statistics package. **113**

LANs

■ Watch for a major impact on peer-to-peer LAN vendors from Windows for Workgroups. **49**

■ The DECAdvantage program, featuring integration of servers with NetWare, is one step in DEC's plan to offer more solutions packages. **89**

■ LAN vendors partner with IBM-savvy shops to merge SNA and Token Rings into a multiprotocol backbone. **103**

■ EO, Inc.'s new communications devices present IS with a challenge — and an opportunity. **105**

Support issues

■ Technical editor Charles Babcock examines the real cost of peer-to-peer technical support, citing his own experiences and a recent study from Nolan, Norton maintaining that this approach to support costs more than the tangible expenses for hardware, software and IS technical support. **24**

Unix

■ Sun pitches Solaris 2.1 at the commercial desktop market by improving security and adding ease-of-use features for installation and administration. **49**

■ Sun goes after the data center and the desktop markets, while HP keeps its leading edge in high-performance workstations for the technical and scientific worlds. **4**

Computer careers

■ If work-related worries are keeping you up at night and affecting your job performance during the day, you're not alone. This week, we identify some of the symptoms and offer some suggestions for easing work pressures. **177**

Applications development

■ Data modeling catches on in some large companies as a way to clean up conflicting data types, although the effort is largely start and stop. **127**

■ Visual Basic from Microsoft may help Basic gain acceptance among professional programmers. **128**

Portable computers

■ Color becomes routine for notebook vendors as Compaq and AST lead a pack of announcers bringing color to their screens. **37**

Departments

Advanced Technology 28
Application Development .. 127
Buyers' Scorecard 160
Company Index 195
Computer Careers 177
Computer Industry 197
Desktop Computing 37
Editorial/Viewpoint 32, 33
Enterprise Networking 99
Friday Stock Ticker 196
In Depth 169
Inside Lines 198
Large Systems 113
Management 148
Marketplace 189
News Shorts 4, 16
Product Spotlight 153
Regional Scope 180
Trends 198
Workgroup Computing 49

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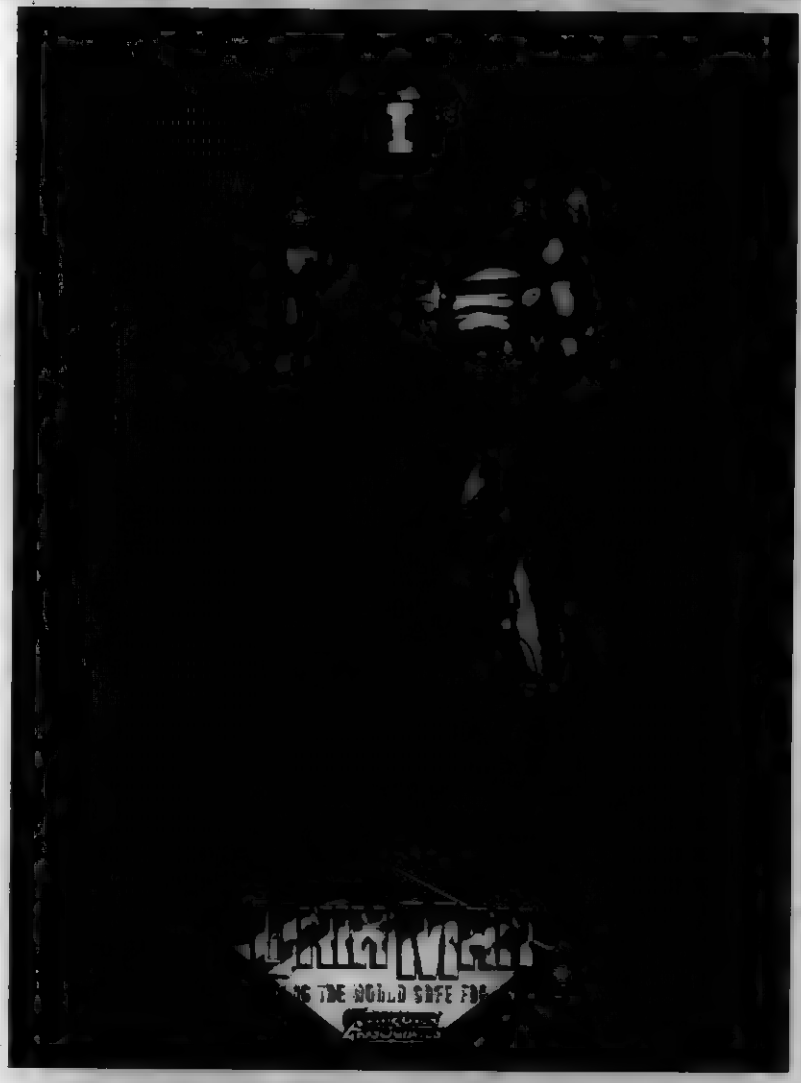

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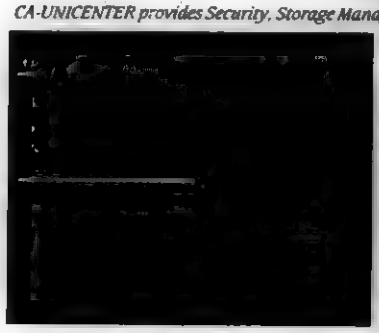

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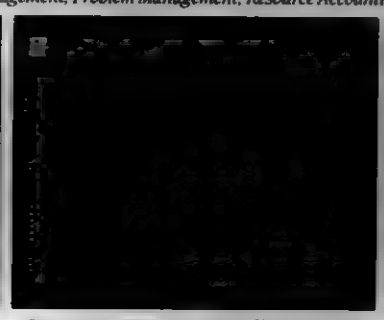
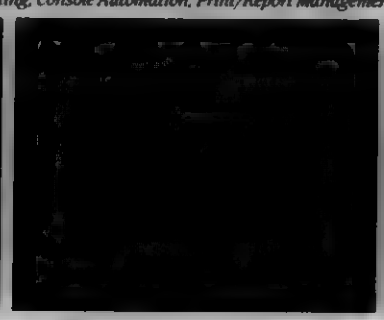


Storage Management ensures files are backed up and archived. Frees space when file systems become full and keeps backup and archived files safe from accidental or intentional destruction.



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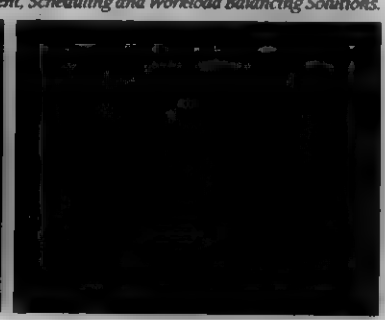

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Sun, HP rev workstation engines

Sun takes on enterprise computing for commercial sites, while HP secures technical markets

By Maryfran Johnson

Pitching their workstation wares to markedly different customers, Sun Microsystems, Inc. and Hewlett-Packard Co. last week unveiled a lineup of systems, software and services designed to appeal to both commercial and technical users.

Sun made a beeline for commercial sites with its mainframe-class SPARCcenter 2000 multiprocessors and SPARCclassic color workstations, while HP held firmly to its leading position in raw CPU and graphics performance with five new models of the HP 9000 Series 700 line.

"Sun is positioning itself as an enterprise computing vendor, and there is a shift of engineering and technical markets toward HP," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Sun said it hopes to displace PCs from commercial desktops, and HP is concentrating on the midrange and high-end workstation user.

Mix and match

Citibank NA's treasury risk management division is expanding use of both vendors' workstation lines, according to John Martino, vice president of software development.

"We bought HP machines for our division because it satisfied a need for performance," Martino said. "Sun has satisfied other needs in other parts of the corporation."

From the vantage point of one of Sun's premier commercial customers — Wells Fargo Bank in San Francisco — the announcement last week "reflects the kind of things we've been asking for," said Roy Camblin, senior vice president of Wholesale Services at the bank.

Along with the low-end color SPARCclassic and the data center system, Sun introduced the SPARCstation LX, an accelerated graphics workstation priced at $7,995 that is slated to be available next month.

The vendor also set up SunIntegration Services to assist customers in planning technology migrations, and it will offer its "SunService 2000" support package for SPARCcenter 2000 customers.

Yet Sun's strategy of pushing the SPARCclassic as a replacement for high-end PCs may be anchored more in wishful thinking than reality, some users and analysts suggested. They noted how market research shows no signs of high-end PC users migrating to Unix.

Coattail effect

On the HP side, the sheer technical appeal of the new Series 700 models is likely to solidify its reputation in commercial markets as well.

"HP's technical improvements seem to coincide with a number of our requirements," said Ed Reedy, manager of information management technologies at GTE Telephone Operations, Inc. in Tampa, Fla.

With its new Precision Architecture-RISC 7100 chip, HP cranked up the clock rate of the new systems by 50% and dropped the price of its entry-level color workstation by 26%.

HP improved its three-dimensional graphics performance and is offering 3D solids workstations priced from $7,795.

Also new is the HP MPower software, a single product that integrates multimedia capabilities into the HP Visual User Environment. Available in February 1993, it is priced at $495 per client and $1,495 for server software.

At a glance

Five new workstations in the HP/Apollo 9000 Series 700 are based on the PA-RISC 7100 chip. Systems are scheduled to ship in February and are priced from $4,995 (gray-scale, diskless) to $72,995 for a color system.

Sun SPARCcenter 2000: an expandable, high-end Unix server. Pricing begins at $95,000, with two- to eight-way processor systems available in mid-1993.

SPARCclassic, the least-expensive color workstation on the market today, is priced at $3,995 when purchased in quantities of 12.

CW revamps design, production system

This week's issue of *Computerworld* features a number of changes that have been several months in the making. The most obvious of these is our new look — the result of a complete overhaul of our publication design and one that is intended to make the information in our stories more accessible and quicker to read and digest.

The redesign process began a year ago when, using focus groups, surveys and informal interviews, we collected data from our readers. This data revealed a great deal about changing habits and helped us lay the foundation for a redesign.

We selected award-winning Boston designer Roger Campisi as our design consultant.

Paralleling this redesign effort has been an overhaul of our computer systems. We have moved from a proprietary, minicomputer-based editing system to the world of client/server computing, with all editing and page makeup functions driven by workstations and high-performance PCs.

The system was installed by Atex, Inc. in Billerica, Mass. Our information systems director, Linda Nelson, and her team oversaw the installation (see story page 92) while the redesign and systems coordination was marshaled by Catherine Gagnon, chief copy editor, and the entire *Computerworld* copy desk.

"These people quite literally sacrificed their personal lives for the last several months," said Bill Laberis, editor in chief.

Additionally, *Computerworld* has reduced its trim size to fit better in a briefcase. And we have upgraded our paper stock significantly.

Vital satisfies Mac users

By James Daly
NEW ORLEANS

Apple Computer, Inc. customers starved for information about how to handle the wrenching job of moving to a client/server environment are eating up Apple's Vital document, an internally developed design for integrating the Macintosh into mixed hardware and software configurations.

Eight months after its release, Virtually Integrated Technical Architecture Lifecycle (Vital) was on the minds and lips of many of the several hundred attendees at last week's MacIS user meeting.

Much to consider

Macintosh users said they are digesting the 1,000-page document in two ways: in nibbles and in gulps.

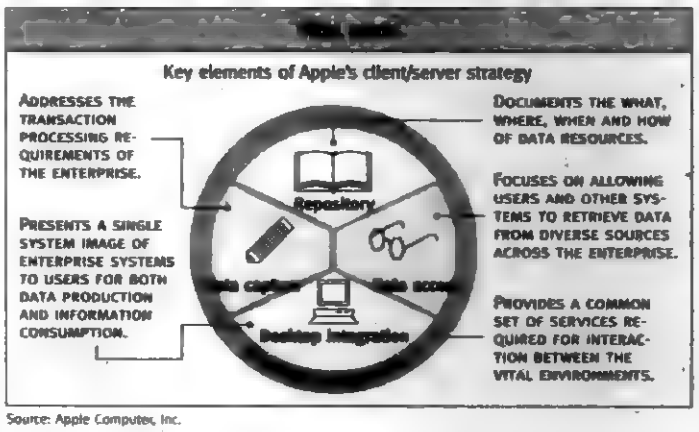
"We're using the smorgasbord approach, taking a little bit here and a little bit there, to help us get through the tough spots," said Craig Elerbroek, director of research and technology planning at Martin Marietta Corp.'s information services division in Orlando, Fla.

Others see Vital as welcome ammunition for confronting an issue they long have avoided — integrating desktop computers into an enterprisewide client/server design.

"A lot of folks have been scared off about going to a client/server setup because there was no one there to show them how," said David Lustig, manager of technical services at Bose Corp. in Framingham, Mass. "Apple is forcing many people to think about something they'd rather not."

Experts say such a plan is critical. "Infrastructure is the name of the game," said John Zachman, president of Zachman International, Inc., a consulting firm in La Canada, Calif. "A solid, well-designed infrastructure is the only way management has to change their entire environment."

Vital suggests replacing traditional host-down methods of integrating disparate architectures with one that begins at the desktop. It also does not require users to entirely redevelop systems already in place. Rather, it says that dissimilar systems can be bridged at the desktop using application programming interfaces available in Apple's Data Access Language and Data Access Manager.



Source: Apple Computer, Inc.

Apple hopes Vital will grease Apple's drive to place the Macintosh into corporations. Rather than having to buy and build new systems, an organization can make existing systems work harder.

Meanwhile, a key ingredient in Apple's client/server plan, the firm's first dedicated Macintosh server, is expected to ship during the first half of 1993.

Position decision

Although Apple's high-end Quadra Macintosh certainly had the power to work as a server, Apple never positioned it as such and added the functionality expected in a general-purpose machine.

As a result, users rarely considered the Quadra as a server. "The Quadra is nice, but what they need to do is get rid of some of the frills and give us a multiprocessing device with high I/O that we can dedicate to just communications or database functions," said Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif.

Analysts said the absence of a dedicated server has hurt Apple's corporate sales, adding that until Apple gets a product out, it risks falling further behind companies such as IBM, Digital Equipment Corp. and Compaq Computer Corp.

DISTRIBUTED QUERIES

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
se
wh
be
    CREATE PROCEDURE la_qty
    /* for use on WESTCOAST server */

    /* returns count for one part only */
    @partno char(6),
    @la_count int output
    AS
/*  SELECT @la_count =
    (SELECT qty FROM la_parts
/*  WHERE partno = @partno)

    DECLARE @cnt int
    DECLARE @counter int
/*  DECLARE @la_count int
    DECLARE @partno char(6)
    SELECT @cnt = COUNT(partno) FROM ny_parts

en  /* ny_parts is the parts master; need count
/*  for sequential comparison with la_parts
*/  to simulate a distributed join */
DE  SELECT @counter = 0
DE
pr  /* create temporary table for part numbers
se  and quantities from ny_parts */
wh  CREATE TABLE #allparts1
      (partno char(6) NULL,
se    ny_qty int null)
se
EX  /* create temporary table for row numbers
@c  for sequential call of la stored procedure */
@l  CREATE TABLE #allparts2
up    (seq int)

en  /* create temporary table for
    sequential build from first two temp tables */
/*  CREATE TABLE #allparts3
SE    (partno char(6) NULL,
      ny_qty int null,
      la_qty int null,
      seq int)

    /* build sequence numbers for each ny row */
    while @counter 1> @cnt
    begin
      select @counter = @counter + 1
       insert into # all parts 2 (seq) values ( @ counter )
    end

    /* populate temp table with ny parts and quantities */
    insert into #allparts1 (partno, ny_qty)
    select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

These two programs do exactly the same thing: retrieve data from multiple servers. Oracle does it with a single 3 line industry standard SQL query. Sybase requires 90 lines of complex code. If productivity is important to you, call 1-800-633-1071 Ext. 8185 for a free copy of "Client/Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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News Shorts

Runtagh is new GE CIO

Hellene Runtagh, president of Rockville, Md.-based General Electric Information Services (GEIS), has replaced General Electric Corp. Chief Information Officer Edward Sikko. Runtagh will continue to manage GEIS as well as head GE's worldwide information systems operations. Sikko took the helm of GE's real estate, construction, distribution and corporate facilities divisions; he will also continue to head up the firm's data centers. Meanwhile, GE agreed to sell off its consulting and contract programming group, GE Consulting Services, to Keane, Inc.

Microsoft, Intel go video

Microsoft Corp. and Intel Corp. are making movies together. Microsoft last week unveiled Video for Windows, a software system for creating, editing and playing back digital video. The $199 product will include software for editing and creating videos as well as a CD-ROM of video clips for incorporation into presentations. Intel announced its Indeo video technology, which it said permits "scalable performance" of digital video by allowing video quality to improve as the speed of hardware improves. Meanwhile, Apple Computer, Inc. continued its move to compete in the Windows marketplace with a version of its QuickTime multimedia technology for Windows-based PCs.

Job cuts at BellSouth

BellSouth Corp. announced that it will slash 8,000 jobs by 1996 because the network service industry "has become a competitive free-for-all," forcing the regulated phone company to streamline operations. A spokesman insisted the staff reductions "will not affect the pace of innovation or service rollout."

New life for Ethernet?

More than 200 participants — 10 times the normal attendance — showed up for last week's Institute of Electrical and Electronics Engineers, Inc. 802.3 meeting on standardizing 100M bit/sec. Ethernet. The committee is examining proposals by several vendors that hope to stave off competitive threats by non-Ethernet technologies. A follow-up meeting is planned for January.

Informix pulls trigger

Informix Software, Inc. last week announced availability of Version 5.01, a maintenance version of its Informix Online relational database that supports database triggers. The triggers, previously expected sometime in 1993, are fired off by client/server applications during inserts, deletes or updates to the server database.

Candle Corp. boosts database tools

Candle Corp. enhanced its software tools designed to optimize performance of IBM's DB2 database management system. It enhanced its DB/Explain tool for correcting the syntax of programmers' SQL queries and Omegamon II for DB2, which provides DB2 performance statistics.

SHORT TAKES **NCR Corp.** cut prices on its PCs and workstations, including a 15.5% price reduction on the NCR 3170 notebook computer and a 39% cut in the price of the Intel 1486-based 3321 PC.... **Epoch Systems, Inc.** signed an agreement with **Sun Microsystems Computer Corp.** (SMCC) and **Storage Technology Corp.** to market Epoch's network data management software for SMCC's SPARCcenter 2000 server.... *Nikkei Computer Magazine* in Japan ranked **Nihon Unisys Ltd.** first in 16 of 17 categories of a mainframe customer satisfaction survey.

News shorts, *page 16*

CA sheds tiered pricing

Vendor's flat-fee approach based on MIPS, total number of sites

By Thomas Hoffman
NEW YORK

Computer Associates International, Inc. last week introduced new enterprisewide pricing models that do away with the unpopular mainframe tiered-pricing approach and greatly loosen site restrictions. Analysts said the enterprise licensing schemes will be particularly attractive to large information systems shops with multiple sites.

The new scheme uses a formula that combines mainframe millions of instructions per second (MIPS) with the total number of customer sites that might use the software to come up with a single enterprisewide price (see chart below).

The new policies are an extension of an enterprise pricing program CA introduced last April that charges fees based on the total capacity of the hardware on which the software runs, instead of on the size or numbers of CPUs [CW, April 20].

CA Chairman Charles Wang said the new format removes geographical restrictions on the use of software throughout the user's enterprise. "Sites and CPUs are replaced by aggregate MIPS," he said.

Users and analysts had mixed reactions to the initiatives. M. Lewis Temares, chief information officer at the University of Miami, said the new licensing scheme should enable the university to add new software products to its cache, including CA's TopSecret security software, which Temares said the school was unable to afford previously.

Multiple benefits

Mike Egan, an analyst at The Meta Group in Morgan Hill, Calif., agreed that some user shops will benefit from the expanded enterprise licensing structure, especially those that run the same software packages across multiple sites.

However, Egan said, many IS shops will shy away from the program because it requires them to adapt CA's Total Client Care program, an on-line support program. He said Total Client Care allows CA to "disable" a customer's software code if the vendor believes the software is being used improperly on unlicensed CPUs.

However, CA Senior Vice President Mark Combs said CA cannot disable software from headquarters, and customers under the new plan should not have to worry about licensing violations because software can be freely used across the enterprise.

MIPS requirements

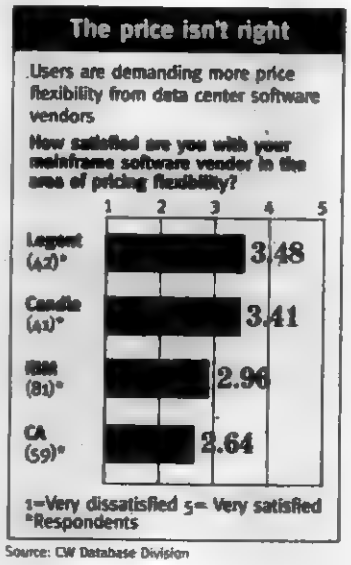
Under enterprise pricing, users will be able to pay a flat annual fee to run software throughout the enterprise depending on a predetermined number of MIPS with a mimimum of 120 MIPS for IBM MVS-based products and 60 MIPS for VSE and VM software.

CA will continue to offer its current tiered licenses and provide room for growth for users who want to migrate to the enterprise plan, said Sanjay Kumar, CA's senior vice president of planning.

CA also revised its Unix and PC product licenses and maintenance policies. Under enterprise licensing for desktop products, CA customers can license desktop software based on the total number of PCs in the enterprise.

For example, Kumar said, a company with 250 PCs running CA-SuperProject would pay an annual fee of $11,700 — or $46.80 per PC — compared with a list price of $885 per package. CA also gave its CA-Unicenter for Unix customers a pricing option based on a Transaction Processing Performance Council benchmark.

CA officials said they hoped the pricing structure would be widely adopted.



Source: CW Database Division

How it works

CA's Enterprise Pricing charges on the basis of aggregate MIPS across multiple sites rather than by sites and tiers

Example: Two MVS sites running CA-ACF2

	CPU	Tier group	MIPS
Site 1	IBM 3090-600J	FF	114
Site 2	IBM 3090-200E	DD	32
Tiered pricing fee			**$134,424**
Enterprise license fee (based on 150 MIPS maximum)			**$129,927**

CW Chart: Stephanie Faucher

Room to grow

Under CA's enterprise licensing program for desktop products, customers are allowed to expand the number of PCs throughout their enterprise by 10% to 15% per year without having to pay additional software licensing charges.

However, officials from IBM and Legent Corp., which are CA's most direct competitors in data center software, said they have no plans to change their existing licensing policies.

Under its new maintenance agreements, CA is allowing its customers to pay a fixed cost for maintenance under one-, three- and five-year options.

The University of Miami expects to save $43,000 over five years under the fixed-cost agreement it designed with CA two months ago, according to Temares.

Paying attention

Some users said the pricing initiatives reflect CA's increasing responsiveness to its installed base. The announcement "shows me that they are listening to the needs of their customer base in terms of flexibility and practicability, given the severe economic times we're in," said Ron Landau, vice president of MIS at CHF Industries, Inc., a Charlotte, N.C., home furnishings manufacturer.

The pricing alternatives appear to have arrived too late for one customer.

Glen Stout, systems programming manager at Becton Dickinson Vascular Access in Sandy, Utah, said his company abandoned the use of its CA-Datacom/DB and UCC/1 products when the firm downsized from an IBM MVS mainframe environment to an Application System/400 platform.

"We were not thrilled with their pricing policies on the MVS-based applications so we didn't even consider their products on the AS/400 side," said Stout, whose company eventually purchased AS/400-based applications from Data 3 Systems, Inc. in Santa Rosa, Calif.

SDLC routing snags users

CONTINUED FROM PAGE 1

as a gateway that converts the SDLC output of IBM devices into Logical Link Control — a type of packet that was designed to travel over LANs. The following are a few cases in point:

- After finding some serious bugs in a beta-test version of Cisco's SDLC-to-LLC conversion product, Pfizer, Inc. turned to SNA vendor Sync Research Corp. Pfizer also could not justify the cost of routers, so it implemented source-router bridges from Andrew Corp. to handle the LAN-to-LAN connections.
- The Travelers Corp. has backed off from initial plans to use Cisco boxes, primarily because they lacked a way to address NetBIOS devices so as to stop the broadcast storms that were eating up bandwidth. Travelers is now testing IBM and CrossComm Corp. routers.
- Holiday Inn Worldwide found that SNA sessions going over its Proteon routers tended to disappear when a line outage occurred or when other types of LAN traffic crowded out the SNA, said George Morales, a network analyst. The hotel chain is in the process of migrating "an extensive SDLC" network to Transmission Control Protocol/Internet Protocol (TCP/IP), which provides dynamic transparent rerouting of sessions.

Bancomer is one firm that is entrusting its SDLC to Cisco. The Mexican financial services company last week announced a huge contract under which Cisco routers will link some 10,000 nodes. However, the bank said it will have to use Sync Research boxes in combination with Cisco routers until Cisco delivers promised support of older SDLC protocols, such as half duplex, a spokesman said.

Cisco will deliver that support, along with other enhancements, within the next six to eight months, a company spokesman said. Cisco just started shipping a prioritization feature that is said to prevent other LAN traffic from bumping off SNA sessions, the spokesman added. Proteon will be introducing a similar product next month, the company said.

Users await SDLC fix

Several users said that they expect Cisco to remedy many of its SDLC glitches, but they still question the vendor's strategy of rolling its own SNA software and putting both SNA and LAN traffic in the same box.

"I'm confident that Cisco will get its act together, but it is putting it all in one basket," said Vinnie Costa, a data communications manager at Pfizer. "We feel comfortable putting SNA-to-LLC conversion in one box, and [LAN protocols such as] TCP/IP in another, for economic, performance and network management reasons."

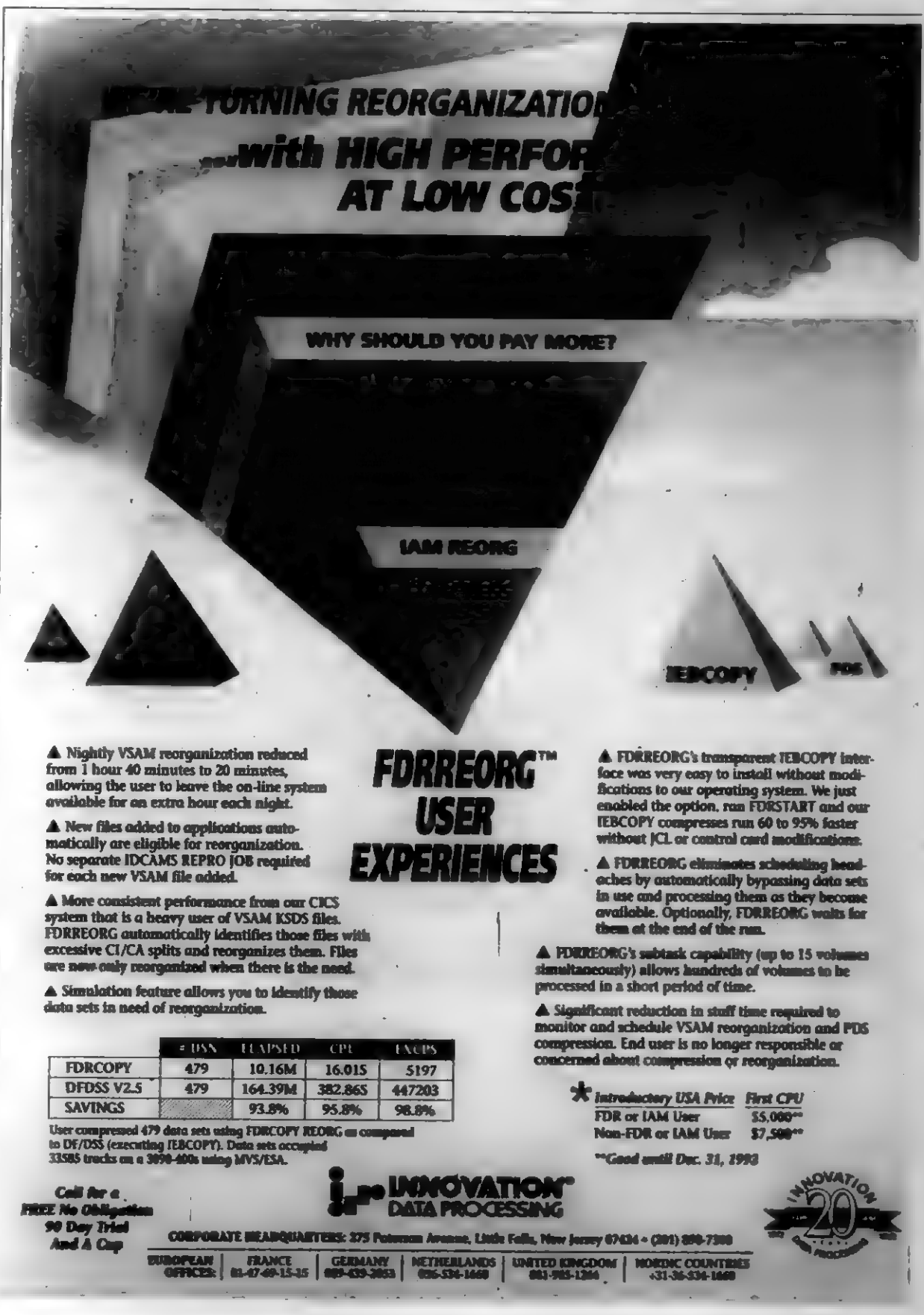
Recent tests by InterLab back up these concerns. An independent testing and consulting company in Seagirt, N.J., InterLab tested SDLC-to-LLC conversion software running on Cisco's M68040-based MGS router, as well as products from three SNA vendors: Sync Research, Netlink and Ring Access, Inc.

Throughput on the Cisco box was approximately 5.5K bit/sec., while the SNA vendors' products had a throughput of about 8.2K bit/sec., according to InterLab President Kevin Tolly. "Given that the test was not enough to overload anyone's box, [Cisco's performance shortcomings] must be attributable to immature code," he said.

"We're continuously improving the code; we're not suggesting the first out is the best," the Cisco spokesman said.

Several users also questioned Cisco's decision to support IBM's NetView in only a limited fashion through a Simple Network Management Protocol intermediary. They pointed out that information systems managers can go on managing SNA traffic on Sync Research and Netlink boxes, just as they always managed IBM cluster controllers, via NetView.

Robin Layland, manager of SNA software engineering at Travelers, spoke for many when he suggested that routers have not been around long enough to achieve the high level of reliability that SNA users take for granted.



EMC ups mainframe storage ante

By Kim S. Nash
HOPKINTON, MASS.

EMC Corp. unveiled a new mainframe storage system last week, just one day after Storage Technology Corp. was forced to announce that shipment of its rival Iceberg has been delayed for the fourth time.

EMC's Symmetrix 5500, which is currently in beta testing at five sites, contains several key features touted in Iceberg, a redundant arrays of inexpensive disks (RAID) subsystem. Plus, the EMC product is said to outperform IBM's latest high-end offerings. That is turning users' heads.

Symmetrix 5500 — due out first-quarter 1993 — faces a receptive user audience. General Accident Insurance Company of America in Philadelphia, plans to replace 180G bytes of IBM storage systems with a Symmetrix 5500 it has beta-tested for several weeks. The EMC system is smaller than the comparable IBM offering, requires less cooling and manages data better, according to Alan Pomerantz, vice president of technical services.

"I got nothing from IBM that I couldn't have from EMC for less [money]," Pomerantz said. The insurer figures it will save $2.50 per megabyte of storage space, plus the cost of adding air conditioning and other data center accommodations required by IBM's comparable product, the 3990/3390.

"EMC is now able to compete seriously in the very high-end market," said David Vellante, an analyst at International Data Corp. in Framingham, Mass. The product can perform several RAID-style functions, such as disk mirroring and dynamic sparing, which automatically reallocates data to a spare disk should a predefined level of disk errors be reached. These features give EMC increased leverage in large accounts such as brokerage firms and hotels, which require continuous data availability.

Pershing, Inc., a brokerage firm in Jersey City, N.J., is a pure IBM shop, running an IBM Enterprise System/9000 Model 700 mainframe and an all-IBM storage setup. Symmetrix 5500's functionality and price are interesting, said Bruce Bordonaro, systems software manager.

Bordonaro said he wanted to price-shop storage systems to "at least keep IBM on their toes." He acknowledged, though, that Pershing likes to stick with the tried and true and may not want to take a chance on EMC, which is just building a reputation in the glass house.

Storage Tek attributed snags in delivering its RAID offering to continuing software integration problems (see chart). Iceberg, first announced in January, will not be out until late 1993. As a result, the company's stock took a pasting, tumbling $8.13 last Tuesday to $23.63. It later recovered 5⅞ points to close late last week at $29.50.

Dense disk

The Symmetrix 5500 tops out EMC's subsystem line.

Storage: 60G to 240G bytes.

Channels: 16 parallel channels, up to 32 native Escon channels.

Emulation: IBM 3990/3390 or 3880/3380.

Size: 17 sq ft

Warranty: Two years.

Price: $865,000 to $2.8 million.

Availability: First-quarter 1993.

Melting Iceberg

Though Storage Tek was the first to announce a mainframe RAID, its lead has evaporated as the product's delivery schedule has slipped.

January: Iceberg announced, beta testing to begin by second quarter, production to follow late this year.

April: External beta testing pushed back to third-quarter 1992. Storage Tek maintains it will sell $50 million worth of Iceberg by year's end.

May: Production shipments rescheduled for fourth-quarter 1992.

August: Beta testing rescheduled for late 1992.

November: Continuing software integration problems forces yet another delay.

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Layoffs may impact Travelers IS

Continuing cutbacks won't affect projects that have immediate payback

By Nell Margolis
HARTFORD, CONN.

Plans to slash 5,000 jobs at The Travelers Corp. during the next two years could take a large chunk out of the insurance giant's 3,213-member information systems ranks, according to two sources highly placed in the company.

But Travelers executives and industry observers said the firm is even more committed to boosting IS' role in its business mix.

Earlier this fall, the quest for efficiencies and economies in the face of industrywide competition and nationwide recession led $11.4 million Travelers to put 3,500 jobs on the chopping block. Two weeks ago, it upped that number by 1,500.

Travelers, which has been battling effects of the lingering nationwide recession and a stressed insurance market for months, announced the new round of cuts as it posted its second-ever quarterly loss. However, Chairman Edward Budd assured employees that neither the loss nor an impending equity alliance with New York-based conglomerate Primerica, Inc. spurred the reductions.

Tight times
Between year-end 1989 and year-end 1991, Travelers saw an approximate 9.6% work-force reduction, from an estimated 37,200 employees to 33,600.
Two rounds of layoff announcements in the past several months promise to chop an additional 5,000 staffers from the rolls.
Widely regarded as a company in the IS vanguard, Travelers runs on $127 million worth of computers, not including an estimated 42,800 PCs.

According to one IS employee who requested anonymity, the 1,500-employee reduction is largely aimed at the corporate staff, which includes the lion's share of the firm's 3,213 IS professionals.

A Travelers IS executive who also asked not to be identified speculated that "data center, telecommunications and workgroup support people are going to be highly affected."

Reiterating Travelers' policy of refusing to comment on rumor and speculation, a company spokesman said that it is "way, way too early to tell" what toll the cuts will take on any specific group within the firm.

But wherever the ax falls, "IS initiatives with real payback to the company won't be altered," Chief Information Officer Lawrence Bacon said. That could include most IS projects currently afoot at Travelers, he added, because "we've made sure over the past couple of years that everything we're doing is specifically aligned to a business goal."

Theoretically, attractive technologies without immediate business payback have been quietly shelved, Bacon said. They include the following:

•Pilot imaging projects in the managed-care arena and pensions. "There are a great number of things we need to do before we can get the most out of imaging," Bacon said. High on the list for further exploration are advances in electronic data interchange and increased reliance on rapid application development methodology.

•Expert-systems technology. "It's interesting," Bacon said, "but we ended up saying, 'Hey, wait a second — who's using this stuff?' "

Larry Bacon: *Travelers' IS has made sure to align its projects to a business goal*

Ann Purr, manager of information management resources at Atlanta-based insurance industry association Loma, noted that Travelers has long been hailed as a firm in the IS vanguard. Wherever the coming layoffs occur, she said, "I'd be surprised if the company's emphasis on IT diminished."

McCaw to replace outsourced hosts with Next-supplied servers, software

By Mark Halper
KIRKLAND, WASH.

Just one week after receiving a promise of a $3.8 billion equity infusion from AT&T, McCaw Cellular Communications disclosed last week that it will replace its outsourced mainframes with in-house Unix servers tied to some 3,000 desktops running Next, Inc.'s operating system.

The move marks an effort by the nation's largest cellular carrier to improve customer support, billing and other operations, in part by moving from a slow batch process.

Ingvar Petursson: *McCaw is satisfied with CBIS*

Nonetheless, McCaw last month renewed its Cincinnati Bell Information Systems, Inc. (CBIS) mainframe outsourcing contract in a retroactive three-year pact that extends through 1994, giving the company time to bring the in-house system on-line.

McCaw Chief Information Officer Ingvar Petursson said he may retain CBIS for software development and invoice processing but will put raw processing on the Unix system.

McCaw has enlisted object-oriented development help from Andersen Consulting as it readies a real-time scheme of Unix servers and databases at some 60 McCaw sites. McCaw's sales and customer service representatives will tie into the system through Next's NextStep operating system running on 486 PCs or Next workstations, according to Petursson.

Petursson said McCaw has been satisfied with the CBIS relationship, and CBIS may participate in developing billing software for the forthcoming McCaw system, called Axys.

McCaw may also tap CBIS for selective outsourcing tasks, such as printing customer bills.

McCaw's design calls for installing Unix servers loaded with rates and billing data at its 40 call-switching sites. The servers would tie directly to the switches and keep up-to-the-minute accounts of customer activity. These servers would also tie into another 20 Unix servers housing customer databases installed at McCaw business offices to provide instant updates of customer records and immediate response to customer requests.

McCaw plans to implement Axys in two stages. The customer databases will begin to come on-line in January, and the rates and billing systems will go live in 1994, Petursson said.

He declined to estimate capital expenditures for the Axys system.

MCI makes wireless pitch

By Joanie M. Wexler
WASHINGTON, D.C.

MCI Communications Corp. last week proposed that the Federal Communications Commission (FCC) allocate radio spectrum for building nationwide, wireless personal communications networks (PCN) to consortia rather than to individual firms.

MCI's filing, with an eye toward wireless PCN service by early 1994, rounded out moves by roughly 150 companies that have responded to the FCC with advice on how the industry should build next-generation, wireless voice/data networks supporting nomadic users. MCI's proposal includes allocating a spectrum license in the 2-GHz frequency range to each of three carrier teams.

What a deal
The portable voice/data devices that roaming users will carry to hook into an MCI-managed PCN will cost about $70, according to MCI. Users said the price is "extremely reasonable."

PCNs will eventually allow users with specially designed voice/data devices to roam the globe with one personal "phone number." This should allow firms to better leverage far-flung expertise and to minimize phone service costs by eliminating the installation of multiple lines for traveling employees, users said.

However, they said, the service's appeal hinges on the dynamics of how issues such as tariff costs and the breadth of network reach play out.

"The key is how these networks will be regulated, what kind of tariffs we're looking at and whether they will really be nationwide, rather than focused on major metropolitan areas," said Robert H. Hamilton, president of the Tele-Communications Association (TCA) user group.

"Many members of TCA are not necessarily headquartered in or have facilities in metropolitan areas," Hamilton explained.

Wireless packet data networks from RAM Mobile Data and Ardis, a joint venture between IBM and Motorola, Inc., "are limited in scope as to where subscribers can receive signals," agreed Phillip Evans, director of telecommunications at Perot Systems Corp. in Dallas.

"But this is partly a resource problem that could be addressed by spreading capital investments" across several consortia, he said.

Jane Videtich, president of user group International Communications Association, said, "I don't think one company should have a lock on the available spectrum. This works against competition."

MCI competitors Sprint Corp. and AT&T do not support the consortia approach. AT&T suggested the FCC allocate 20 MHz of spectrum to five competitors in each nationwide market rather than to the three licensees it is considering. Sprint has recommended the FCC allocate at least 30 MHz per license to three licensees and allow noncontrolling minority interests of up to 30%.

Such issues must be resolved before users can think ahead to the potential benefits: A PCN should allow, for example, "a company to tap into talent throughout in its personnel base. It gives you that freedom of movement and accessibility to the people who have the knowledge necessary to make quick, informed decisions," Evans said.

Steve Zecola, vice president of personal communications services at MCI, said it will take $5 billion to $10 billion to build the technology nationwide, and by the year 2000, "there will be 70 million users generating $40 billion in revenue. In listening to president-elect Bill Clinton that capital formulation and job creation are the highest priority, we can't think of anything that would do that more quickly than PCN."

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Standards challenge

Microsoft's connectivity API no longer only one on block

By Jean S. Bozman
LAS VEGAS

This week's Comdex/Fall '92 attendees will witness the latest schism in the client/server market: A consortium of vendors, including IBM, Borland International, Inc., Novell, Inc. and WordPerfect Corp., will begin challenging Microsoft Corp.'s emerging standard for database connectivity.

The new kid on the database block — Integrated Database Application Programming Interface (IDAPI) — is a variation of Borland's ODAPI interface for its own databases: Paradox, dBase and Interbase. Now Borland's creation is being offered as an alternative to Microsoft's Open Database Connectivity (ODBC) Windows interface.

At a glance

Major vendors lined up behind IDAPI are IBM, Borland, Novell and WordPerfect.

Microsoft lists 30 vendors as supporting its ODBC interface for Windows.

With IDAPI, programmers can write to a single interface, which in turn can address both SQL relational databases and flat-file databases such as Borland's dBase and Novell's Btrieve, said Rob Dickerson, vice president of Borland's Paradox business unit. "I think we figured if we didn't support the industry standards bodies, we'd get kicked."

The first wave of IDAPI environments are DOS, Windows, OS/2 and NetWare.

Industry analysts said the IDAPI backers are pushing their standard because they were wary of Microsoft's domination of an API standard.

"With Microsoft's Access database coming out, people are afraid that Microsoft will control the database access standards," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

Microsoft was brought up short by the IDAPI move. "Our view of IDAPI is we'd like to see it," said Mary Engstrom, group manager of Microsoft's Database Products Group, which is shipping Access this week.

She also said ODBC could support both SQL databases such as the Microsoft/Sybase, Inc. SQL Server or flat-file databases.

However, Borland said IDAPI would soon be available to software vendors and that ODBC applications would work with it.

"Drivers that support ODBC will be able to take advantage of IDAPI without modification," said Mid Walsh, director of strategic partnerships at Novell. "It simplifies the task of writing and maintaining multiplatform applications for developers and allows users to access many data sources across their enterprise."

First fruits of Microsoft database strategy ready

By Jean S. Bozman
LAS VEGAS

Microsoft Corp. is slated to announce this week a development framework for desktop database applications in the form of its Access database and a companion graphical user interface-based Windows tool kit.

Both products, which grew out of Microsoft's Cirrus project, will be unveiled here this week at Comdex/Fall '92, the company said.

Comdex attendees will also view FoxPro 2.5, an enhanced version of the fast Xbase database Microsoft gained through the June acquisition of Fox Software, Inc.

Microsoft, which tested Access for nearly a year at more than 4,000 beta-test sites, said Access can be used by business managers and Windows users to craft the sort of database applications heretofore available only from information systems programmers.

For example, guided by prompts, on-screen Help and preprogrammed "macros," end users can set up database tables and create database reports.

Access is capable of creating relational database management system tables and making SQL queries to other DBMSs, said Mary Engstrom, manager of Microsoft's Database Products group.

Among the outside DBMSs supported in the first release are Borland International, Inc.'s Paradox and dBase and Novell, Inc.'s Btrieve.

Access is priced at $99 until January, when the price will be $700.

One beta-test user said he has already created several Access applications. "I'm the kind of developer who uses abstract, high-end tools," said Bill Serrahn, president of WorkGroup Solutions in Seattle.

With little Windows programming experience, he said, he began using Access 11 months ago. "It has the capability to do very complex things," he said.

PCs in short supply

CONTINUED FROM PAGE 1

Life Insurance Co.

Compaq, meanwhile, has caught up with current demand for its Prolinea and DeskPro/I low-priced lines but has made little headway into what reseller executives said was a 200,000-unit backlog.

Meanwhile, the third member of the Big Three — Apple Computer, Inc. — is backlogged through the first quarter of 1993 with its hugely successful PowerBook and PowerBook Duo notebook lines, and it has spot shortages of up to two weeks on its high-end Quadra 950 line, an Apple spokeswoman confirmed.

"Our backlogs [with the Big Three] are worse than they've ever been in the history of our business," Tauscher said.

Other dealers agreed, expressing concern about their ability to keep customers happy if they cannot deliver product.

The problem, said Seymour Merrin, publisher of "The Channel-marker," a Palo Alto, Calif., newsletter, is that the Big Three "were all too conservative to figure out that demand was going to be so high, and they kind of 'stuffed' themselves."

The Big Three cannot in some cases provide simple components such as hard drives and monitors in the quantities they need to meet massive demand driven by lower priced machines and innovative products.

On its own

IBM has the most potential to escape this problem because it can make most of its own components, including processors. But it also has the most to lose if it fails. Most analysts said they feel that Compaq's three-month jump into the low end of the market gives it a solid footing, and that Apple's problems involve unique products, making it unlikely that customers will shift vendors.

IBM, meanwhile, is struggling to prove that it can compete profitably in the PC market and needs a successful low-end product to remain a broad supplier.

"One thing that will determine how well IBM does [as a company] is whether they can get into supply before Compaq does," Tauscher said. "Compaq should have been back in supply by now, and they're not."

Tauscher thinks IBM can stem the flow of customers looking at Compaq and claim substantial portions of Compaq's order backlog if it can deliver its ValuePoint line.

It will be an uphill battle, however. Computer Intelligence's user surveys show that Compaq actually caught up to IBM in terms of planned PC purchases in the months after the Houston-based PC maker introduced the Prolinea, DeskPro/I and Contura product lines.

"The battle is going to be won on availability, and I'm beginning to see that IBM cannot ship [ValuePoint 486s] in quantity this quarter," said Matt Fitzsimmons, who runs a Computerland dealership in White Plains, N.Y.

IBM gives unit freedom

CONTINUED FROM PAGE 1

product delivery.

"If this is getting them more focused to better understand and provide what the customers really need, then that will be beneficial to everybody," said Robert Hecht, vice president of investment systems at Prudential Investment Corp.

IBM's first public display of this intent comes this week at Comdex/Fall '92 in Las Vegas, where the vendor will showcase the business under its new name, the Personal Software Products group, which replaces the former label, the Personal Systems Programming group. The Personal Software Products group is responsible for OS/2, DOS and associated operating system products such as multimedia development.

In an interview last week, John Patrick, vice president of sales and marketing for the Personal Software Products group, described the unit as an "independent stand-alone business that's totally focused on the operating systems software business." A spokesman said Patrick did not mean to imply a spin-off plan is on the table, adding, "The plan is to move toward the PC company as a model. If it makes sense and the time is right, we will do the same thing on the software side."

At a glance

December 1991: Personal Systems line of business receives go-ahead to reorganize. It includes the Entry Systems Division and Programming Systems Division.

September 1992: IBM Personal Computer Co. is formed from Entry Systems Division. Marketing and distribution from National Distribution Division are rolled in. Programming Systems Division also receives some NDD responsibilities.

November 1992: Programming Systems is renamed Personal Software Products group.

James Cannavino, an IBM vice president and general manager of the Personal Systems line of business, has been directing a reorganization since early this year to give each of the Personal Systems units more independence. Meanwhile, the operating system software unit was granted more responsibility in September. It received worldwide marketing strategy responsibility and owns all U.S. marketing execution and distribution. Unlike its hardware counterpart, it shares profit-and-loss responsibility with the holding company.

Industry analysts said they suspect IBM will want to watch how the IBM Personal Computer Co. fares before letting go of the desktop software business. It is more likely eyeing OS/2's progress and would spin off the software group once it believes the operating system can sustain 1992 shipment levels.

OS/2 is not yet a profitable piece of business for IBM, according to a statement made last month by John Soyring, Personal Systems director of software development programs.

The Editors were unbiased, objective, impartial, and impressed.

PC MAGAZINE ▶ EDITORS' CHOICE

• Sybase SQL Server for NetWare

For its state-of-the-art feature set and blinding speed, Sybase SQL Server for NetWare wins our Editors' Choice. The product supports on-line back-up, stored procedures with control logic, server-based referential integrity through triggers, and more.

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Server NLM earns an honorable mention. Though it lacks some of SQL

support is relatively light, SQLBase is a good choice for companies without an existing database.

platforms, and Novell's NetWare SQL is especially well suited for companies

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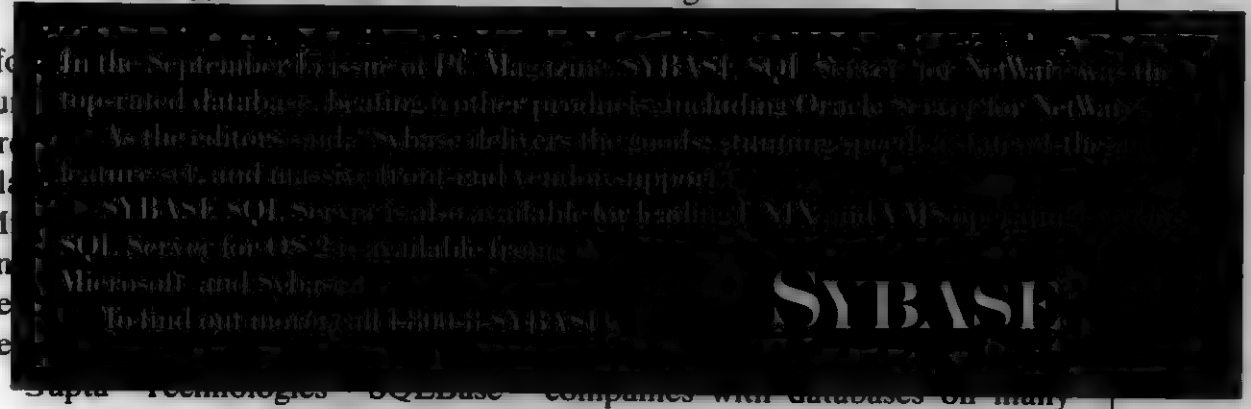


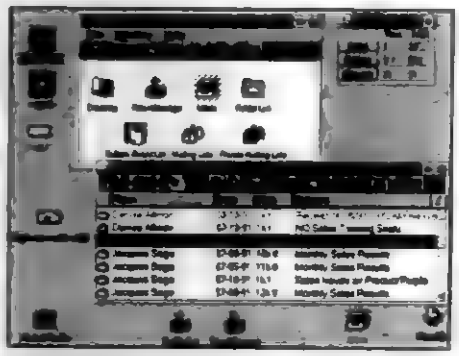
Revised CC:Mail debuts

By Lynda Radosevich
CAMBRIDGE, MASS.

Lotus Development Corp. will introduce today at Comdex/Fall '92 an overhauled version of CC:Mail for IBM's OS/2 2.0 that can be used as an integrated component of the Workplace Shell, the company said.

Lotus said pricing would be available when the software ships in early 1993. It is evaluating offering a free upgrade to CC:Mail for OS/2 1.3 users.

IBM will resell the product, and while it said the move is not a direct response to Microsoft Corp.'s Windows for Workgroups, CC:Mail will boost its workgroup product line.



CC:Mail for OS/2 *can now be used as an integrated component of the Workplace Shell*

Most relevant

"It is probably more relevant to the hardcore MIS operations than Windows for Workgroups. There is no question that OS/2's real strength is in communications-intensive applications," said Jeffrey Tarter, editor and publisher of "Softletter," an industry newsletter.

CC:Mail for OS/2 Workplace Shell has been redesigned to be an integrated part of the Workplace Shell and to function like another icon on the desktop. According to IBM, it is the first 32-bit electronic-mail package for OS/2. Unlike the previous 16-bit version of CC:Mail for OS/2, the program uses OS/2 2.0's object-oriented file management, drag-and-drop and multitasking features.

The program lets users automatically attach files to CC:Mail messages by dragging and dropping the file's icon into the message.

Other features include Boolean searching, mail enabling of any OS/2 file and quick addressing that calls up a complete address when a user types the first letters of a recipient's name. An undocumented feature will allow programmers to use OS/2's programming language to write rules-based processing programs for automatic mail routing, according to Lotus. The interface includes Lotus' SmartIcons and a Windows-like menu bar.

CC:Mail for OS/2 Workplace Shell does not support fonts, bolding, underlining or other forms of rich text, but Lotus said it plans to introduce support for rich text across the CC:Mail product line in 1993.

IBM said it is evaluating whether to package CC:Mail or Lotus' Notes with OS/2. IBM currently resells the 16-bit version of CC:Mail for OS/2.

Lotus to show Improv

By Rosemary Cafasso
LAS VEGAS

■ Lotus Development Corp. will show off Improv for Windows, its next-generation spreadsheet, this week at Comdex/Fall '92 but do not expect to take a copy home with you.

Lotus had promised to ship the software, which early users said greatly improves the management of complex financial models, by the end of 1992. It now plans to ship it in the first quarter of 1993.

Improv for Windows will be positioned as a companion to 1-2-3

This is the second minor delay in Lotus' spreadsheet business in recent months. The company had also targeted a year-end shipment for 1-2-3 for Windows Release 2.0, but it too is now scheduled for early 1993.

Better late than never

"They are a little bit later than we'd like, but we want to take the time to ship the right product," said Jeffrey Beir, vice president of the spreadsheet division.

Improv for Windows will be positioned as a companion product to 1-2-3 and in some cases will be pitched as a 1-2-3 replacement, Beir said.

Improv delivers ease-of-use features by allowing users to input data in English. At the same time, it should appeal to power users who have hit the wall with their current spreadsheets because it removes the restrictions of conventional spreadsheets and allows multiple, different scenarios to be built from a single model.

It also allows users to make changes to a model by simply adding new data or dragging and dropping variables to a different location on the model. Either change is automatically calculated and reflected throughout the model.

And despite Improv's delay, it is scoring big with some early users. Tor-Einar Olsen, a planning coordinator at Conoco, Inc. in Houston, is using Improv after swearing off spreadsheets years ago.

"Spreadsheets are basically too hard to use and too hard to maintain because of all the cell formulas," Olsen said.

Nonetheless, Olsen had been in search of a software tool that would help him with cash-flow modeling — a big chunk of his work. Improv, he said, allows him to change things quickly.

Hot technologies center stage at Comdex

By Michael Fitzgerald
LAS VEGAS

Users said they want Comdex/Fall '92 to show them effective ways to turn computing's hot technologies — multimedia, mobile computing and groupware — into real-world applications. While their goal will not be in sight, they will find a well-marked path toward increased productivity.

"I hope to come back from Comdex with the ability to make some plans," said Bob Holmes, computer technology research analyst at Southern California Gas Co.

Another PC manager, who oversees 3,000 mostly IBM PCs and servers at a major New York bank, expressed interest in getting production applications on multiprocessing servers and local-area networks.

The bank, which already runs **Lotus Development Corp.**'s Notes, is also scouting for groupware systems that can be integrated with efforts to equip bank officers with PCs.

By showcasing real implementations of these technologies, Comdex this year will fulfill some of the promise of Comdexes past. Take last year, when **IBM** broke its pledge to ship OS/2 2.0, and **Microsoft Corp.** failed to deliver Windows 3.1. Both products had been promised by Comdex and shipped in January and late April, respectively. This year's show promises plenty of applications for both environments.

Among the eagerly awaited products that will see the light of neon at Comdex are Access, Microsoft's Windows-based relational database, and development tools for Windows NT and OS/2 (see story page 12). **Borland International, Inc.** plans to show C++ for OS/2 behind the scenes, as well.

Of course, those offerings are just a drop in the Comdex bucket of products. What follows is a brief tour, segmented by technology sectors, of some of what users can expect to find on display:

A slew of next-generation portables will be on display, many of them smaller than today's typical notebook. These will make use of Personal Computer Memory Card International Association (PCMCIA) cards, which will make their first major splash here this week, with up to 40 vendors showing a variety of cards.

Besides PCMCIA, the big mobile computing themes will be wireless technology, display and color screens. Color screens will be a staple offering, even from smaller players such as **Northgate Computer Systems, Inc.** and **Dauphin Technology, Inc.** Northgate's active-matrix ZXPortable will use a 25-MHz 1486SX and a 120M-byte hard drive for $3,799, while Dauphin will show the GT-500C, a 386SL-based passive-matrix notebook for an impressively low $2,395.

Pumping up

Hardware vendors will put on some speed to boost graphics performance of the system-stopping graphical interfaces. Numerous vendors will display systems that use the Video Electronics Standards Association VL local-bus design, and while it won't be at the show, Epson America, Inc. will officially begin shipping its Progression line of PCs with the Chips and Technologies Wingine graphics accelerator inside. IBM and Reply Corp. will offer a performance-boosting upgrade board that will allow the installed base of Personal System/2 Models 50 through 80 to move to the 386SLC and 486SLC2 chip.

Pocket-size portables will proliferate, too, as will numerous smaller-than-notebooks. For instance, **Zenith Data Systems** will release the Z-Lite 320L, a 3.9-pound near-notebook-size PC, based on Intel Corp.'s 3.3V 80386SL.

Sharp Corp. will begin shipping a new pen-capable version of its Wizard pocket organizer. **Chips and Technologies, Inc.** will officially get into the OEM hardware business, displaying prototypes of its 2.3-pound MiniBook, a 10- by 6-in. product based on its PC/Chip. The San Jose, Calif.-based chip set maker has also joined with **Logitech, Inc.** to create a reference design for a 4- by 6-in. pen computer.

PCMCIA cards will come into their own at Comdex, thanks to a recent software standard the group set. PCMCIA cards have fallen far short of being as system-independent as floppy disks, but the new standards are "the first major step for true [PCMCIA] interoperability," said Brendan McGwire, executive director of the PCMCIA.

The current driving force behind PCMCIA is the add-in card market, fax/modems, network adapter cards and the like, for notebook and smaller computers.

Wireless communications demos will take many forms. **NCR Corp., Toshiba America Information Systems, Inc.** and **Zenith Data** will be among the vendors showcasing portables working in a wireless environment.

Motorola, Inc.'s Robert Growney, executive vice president and general manager of the paging and wireless data group, cautioned that while plenty of products will be released during 1993, standards are two to three years away.

"Wireless is off the paper napkins and onto bond paper, with some hard products out there, but it takes some time to acquire substance," he said.

Thirty-two bit applications are vaporware no more. Look for more third-party demonstrations of real applications running on the 32-bit platforms, including mainstream

Sybase unveils System 10

By Jean S. Bozman
SAN FRANCISCO

As expected, Sybase, Inc. last week laid out Sybase System 10, its sweeping vision of client/server computing, but stopped short of giving shipment dates for specific components such as its enhanced relational SQL Server 10 database server and new distributed-processing options.

System 10 is a series of new products designed to attack many problems associated with real-time distributed database computing.

The products include the SQL Server 10, Replication Server software for distributing updates to multiple sites, Navigation Server software for parallel data query and massively parallel systems, the OmniSQL Gateway for reaching relational databases made by other vendors and Control Server software for better performance monitoring, backup and recovery of on-line database systems. Prices were not disclosed.

Sybase marketing Vice President Stewart Schuster said all System 10 products would be beta-tested in the first half of 1993 and shipped sometime during the year. That coincides with the first volume shipments of rival Oracle Corp.'s Oracle 7 relational database system, which has many distributed database features.

Industry analysts said Sybase's vision was sweeping but may have missed a few spots, including computer-aided software engineering and migration tools. "They've provided a road map, all right, but there are many places where the bridges are out and the road doesn't exist," asserted Brian Boyle, director of research at Novon Research Group.

"I think what they missed is providing power tools to help people get from central mainframe operations to decentralized servers," he added.

However, many Sybase sites are eager to get the Replication Server because distributing updates has been a problem for sites with multiple Sybase servers. The OmniSQL Gateway, built on top of older Sybase gateway technology, will address operational concerns in multivendor database sites.

One early OmniSQL user, the United Leeds Teaching Hospital in Leeds, England, tried OmniSQL with both Sybase and Oracle servers in September.

"We've been able to build, within the Gateway, views of both the Oracle and Sybase tables, and we're now beginning to see the OmniSQL Gateway as being the database," Ian Frost, assistant director of information services, told a London Sybase briefing recently.

IDG News Service correspondent Ron Condon contributed to this report.

suppliers such as Lotus and **Computer Associates International, Inc.** Lotus is also revamping the OS/2 version of its CC:Mail electronic-mail software (see story page 14).

The multimedia pavilion will feature big splashes, with **Microsoft's** recently announced Video for Windows and **Apple Computer, Inc.**'s new Windows version of Quicktime likely proving a big draw.

IBM will display motion video software support for OS/2 called Ultimotion and a beta-test version of Multimedia Presentation Manager/2.

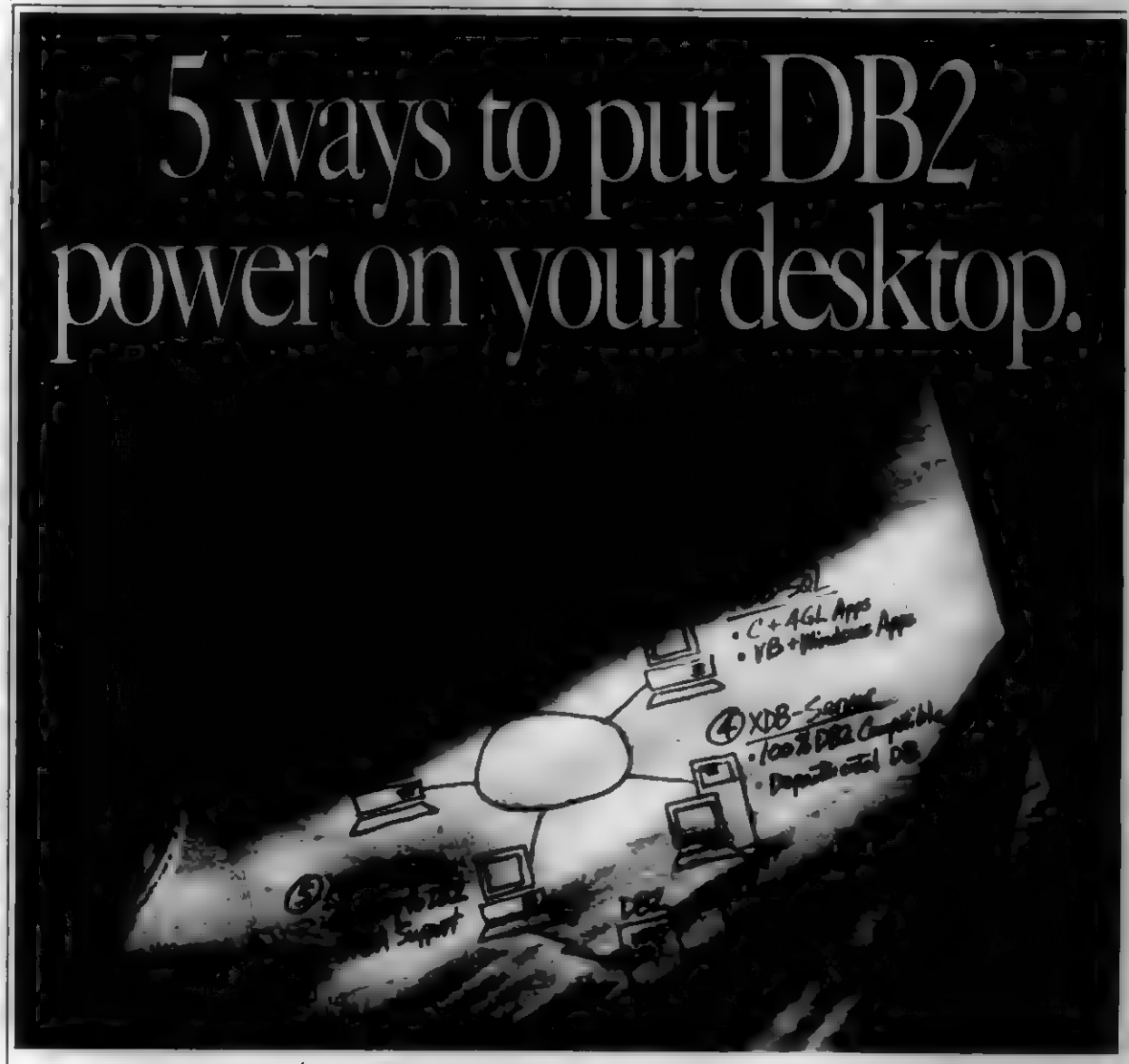
Intel Corp. will showcase Indeo, a video compression algorithm that offers scalable software motion video performance. Indeo is already lining up industry support.

Number crunching applications might not be there yet, but hardware makers plan to serve up a buffet of conventional and multiprocessing servers this week. Intel's next-generation Pentium chip will be shown running inside boxes positioned as next year's high-end servers from a numbers of suppliers, including **NCR Corp., Dell Computer Corp.** and **AST Research, Inc.** Others demonstrating Pentium-based systems look to include **IBM** and **Digital Equipment Corp.**

Citrix Systems, Inc. in Coral Springs, Fla., will demonstrate its new Windows-based dial-in remote access product.

Computerworld staff members contributed to this report.

5 ways to put DB2 power on your desktop.



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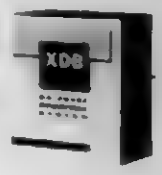

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News Shorts

DEC software exec resigns

David Stone, vice president of Digital Equipment Corp.'s Software Group, is starting a new job today as president of the operations systems business unit within AT&T's network systems, partly in response to restructuring at DEC, internal DEC sources said. Dennis Roberson, vice president of corporate software, will take over some of Stone's duties. What the consequences will be on DEC's software strategy are unclear.

Parallel RS/6000 expected

IBM is slated to unveil its first parallel processing RISC System/6000 this week at the Supercomputing '92 Conference in Minneapolis, sources close to the company said last week. The four-processor Shared Memory Powerparallel System is intended for scientific and technical markets only. The new system is not part of IBM's work with Bull HN Information Systems, Inc., however. IBM and Bull are developing multiprocessor RS/6000s for commercial transaction processing.

College exec nabs Cause, AMS awards

Boston College's executive director of information technology, Bernard Gleason, last week became a two-time winner. He won both the 1992 Cause Elite award for exemplary information systems leadership — given by the higher education IS community's professional association — and one of the annual awards for achievement in IS given jointly by American Management Systems and Carnegie-Mellon Graduate School of Industrial Administration. The other 1992 winners were Salomon Brothers, Inc.'s Peter Bloom, The Chase Manhattan Bank NA's Craig Goldman, McGraw-Hill, Inc.'s Robert Lynch and Wal-Mart Stores, Inc.'s Bobby L. Martin.

That's Dr. Robot to you

A 64-year-old man received a new hip last week with the help of a robot, which was used for the first time to prepare a hip socket for a prosthetic implant more precisely than traditional surgery could, according to doctors at Sutter General Hospital in Sacramento, Calif. The robot and preoperative planning software were provided by Integrated Surgical Systems, Inc. in Sacramento.

Surprises from Wang

Wang Laboratories, Inc. previewed several products last week — some expected, others not. Unanticipated products included three new minicomputers, due to be formally announced early next year, to expand the middle and high end of the VS line. Wang also demonstrated Open/Office 3.0, a Unix version of its office automation and electronic-mail system to run on IBM's RISC System/6000. The Chapter 11-protected company finally rolled out Open/Pace, an RS/6000 edition of its database/application development environment. Wang originally showed the product a year ago running on SCO Unix but shelved that version after signing a contract to support IBM's Unix line.

SHORT TAKES Mainframes at Comdex/Fall '92? Yes, **IBM** will make the PC-oriented show, with its big iron running multimedia software for the first time. . . . IBM also introduced a new version of its Workstation LAN File Services software, which runs under VM and turns the mainframe into a superserver for PCs connected to local-area networks. It also announced shipment of its 9337 storage subsystem, based on redundant arrays of inexpensive disks (RAID), making it the first vendor to deliver RAID for the IBM Application System/400. . . . **Comshare, Inc.** in Ann Arbor, Mich., announced a Microsoft Corp. Windows version of its Commander decision-support software. . . . **BMC Software, Inc.** this month will unveil a network-tuning package that runs on IBM's 37XX family of front-end processors.

HUD, Martin Marietta celebrate outsourcing contract success

Pact is expected to save taxpayers roughly $100 million over 10 years

By Gary H. Anthes
WASHINGTON, D.C.

Two years after signing one of the largest outsourcing contracts ever, the U.S. Department of Housing and Urban Development (HUD) and Martin Marietta Corp. contend they are months ahead of schedule and millions of dollars below budget — characteristics not seen in many government systems projects.

But inside HUD, applications development and maintenance — the only data processing functions not outsourced — are not faring so well, charged critics, who pointed to a choppy sea of poorly integrated, conflicting and unreliable financial management systems.

The outsourcing project, called HUD Integrated Information Processing Service (HIIPS), consists of a 30-month effort to transfer all computer processing and data communications to Martin Marietta, followed by 10 years of running the new data center and network.

Below budget

The project is now 20%, or $18 million, below budgeted cost. Transition to a new data center was accomplished eight months early, and the nationwide data network went up three months early, according to Donald C. Demitros, director of HUD's Office of Information Policies and Systems. He said HUD expects the outsourcing deal to save taxpayers $100 million over 10 years.

And that is not all.

"It's one of the largest IS contracts in years, and it's had no negative press, no congressional investigations — and there have been no protests," said Ned Cooper, vice president and head of the $526 million project at the Martin Marietta Information Systems Group.

There is no magic or silver bullet at work here, according to the agency and its contractor. The project's success hinges on a harmonious relationship between the parties, which stems from extraordinarily careful preparation and execution of the bid solicitation, Demitros said.

HUD began planning for the outsourcing in 1983 and made an award in 1990, after making more than 100 revisions to the solicitation based on industry feedback. Martin Marietta, which battled Boeing Computer Services Co. and Electronic Data Systems Corp. for the job, had as many as 50 people working on the bid at one time. The companies may have spent as much as $10 million each on their proposals, observers said.

Demitros said another reason for success is that HUD did not follow the more common government practice of sitting on its hands while waiting for a systems integrator to deliver the goods. On any one day, HUD has 25 to 75 people supervising project activities.

Organization is key, Demitros added. "Martin Marietta set up a team, and we established a mirror image. We have peer-to-peer talking. I can always find two people — a government person and a vendor person — to hold accountable."

Other innovations have been more technology-driven. HUD's plan had been to set up a new data center and replace two aging networks with a new network, then bring up the whole thing all at once in one "big-bang" finale. But Martin Marietta found a way to make the transition faster and more gracefully.

"We were able to do more any-to-any connectivity so we could connect new terminals to old mainframes and new mainframes to old terminals and have all three networks interoperate," Cooper said.

That allowed HUD to move applications to the new data center early and realize cost savings by terminating a time-sharing agreement and closing a data center early.

Although they are not part of the outsourcing project, HUD has worked hard to put together applications with two objectives: to give employees a common set of tools agencywide and to give them access to all computer environments.

"We have one E-mail package, one word processing package, everyone uses the same menus, the same log-ons and so forth," Demitros said. "No other cabinet-level agency and very few large commercial enterprises can say that every employee uses the same things."

Out with the old. . .

Primary data center: Unisys Corp. 1192, 1194, 2200/622 mainframes.

Time-sharing system: Hitachi Data Systems Corp. EX 60 mainframe from Martin Marietta.

Backup data center: Unisys 1192.

In with the new. . .

Primary data center: Hitachi EX 60 running MVS and DB2; two Unisys 2200/644s running OS 1100 and DMS 1100.

HUD Integrated Network: X.25 data network using FTS 2000 T1 backbone from Sprint Corp. Connects 150 Novell, Inc. NetWare LANs.

Closing the gate after "Robin HUD"

In 1989 a HUD employee, known later as "Robin HUD," exploited flaws in the agency's financial systems in order to make off with $6 million. A subsequent report by HUD's inspector general revealed that HUD had more than 70 poorly integrated, sometimes conflicting and often unreliable financial management systems.

In January, the U.S. General Accounting Office (GAO) announced that HUD's problems remain largely unresolved. Poor systems "leave the department open to fraud, waste, abuse and mismanagement," the GAO charged.

HUD IS chief Donald C. Demitros did not dispute that bleak assessment: "HUD has been criticized, [and] rightly so, for having poor financial systems."

Demitros said HUD is spending $40 million annually on application development — much of that for seven new financial systems to replace the 70-odd existing systems. He said HUD is 18 months into a five- to seven-year financial systems reform project.

The system exploited by Robin HUD, which failed to properly match the sale of houses with cash received for them, has been rewritten, Demitros said, adding that "we have a long way to go. There are still a lot of fixes to be made to systems."

His efforts may be slowed by budget cuts that hit HUD hard this year; Demitros said he got 20% less than he had requested for the financial systems reform effort.

— Gary H. Anthes

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An independent study proves it

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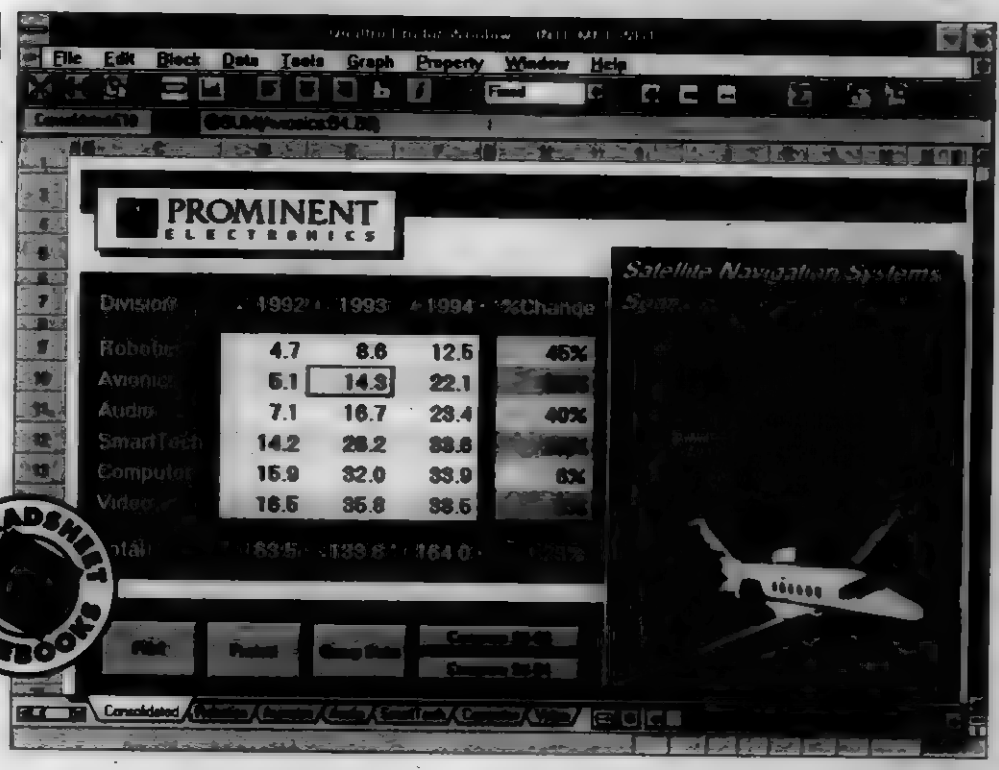

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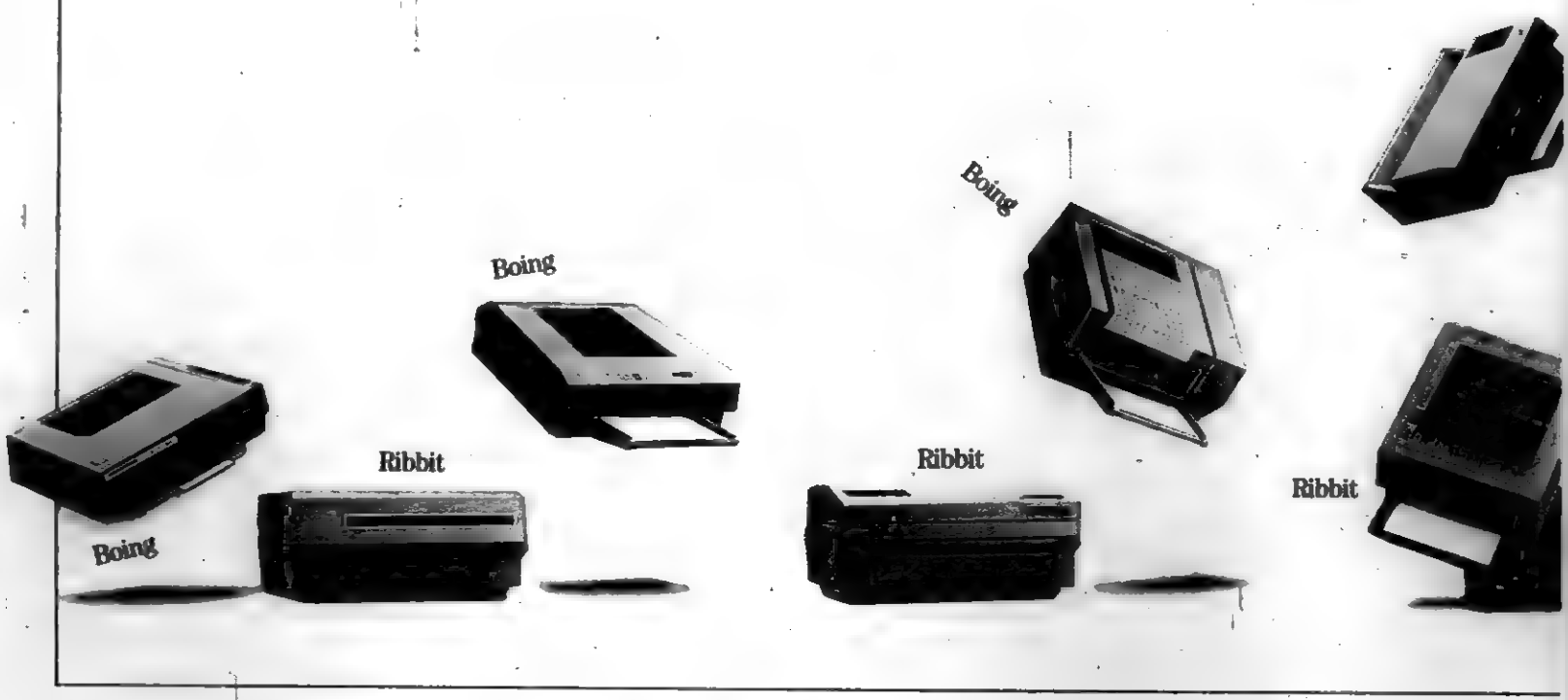
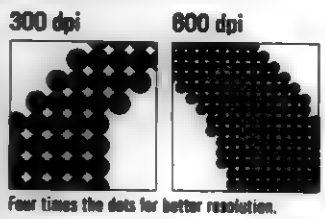
Other laser printers play leapfrog trying to catch up with the HP LaserJet.



The new HP LaserJet 4 printer isn't a hopped-up version of the past generation. Its new, advanced design sets much higher standards for print quality, speed, built-in features and value than ever before.

Higher resolution. More typefaces.

Unlike other 600 dpi laser printers, the HP LaserJet 4 was designed for 600 dpi printing from the ground up.



Four times the dots for better resolution.

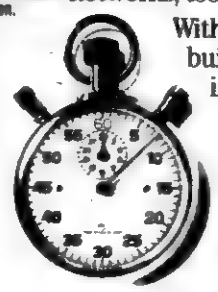
As a result, it produces the best 600 x 600 dpi resolution ever for noticeably crisper, clearer text and graphics. At less than a 300 dpi price.

Microfine toner and HP's exclusive Resolution Enhancement technology give you razor-sharp edges and much smoother curves.

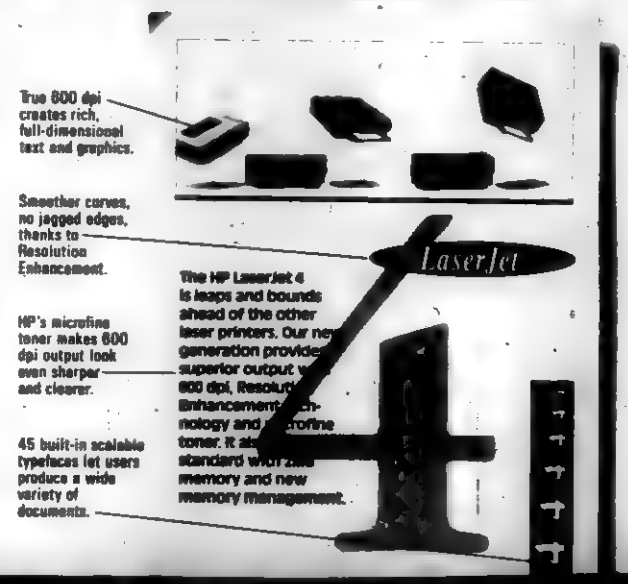
With 45 scalable typefaces built into the printer, users can produce a wide variety of documents. Without hassling with downloading or accessory cartridges. Or buying additional typefaces.

More speed, more trays, more flexibility.

Thanks to a new RISC processor, tuned vector graphics and faster I/Os, the HP LaserJet 4 also sets new standards for speed. It even prints many 600 dpi graphics at a true 8 pages per minute. It's faster on networks, too.



With 2 MB of memory built in and new internal memory compression algorithms, virtually all 300 dpi and many 600 dpi documents print from standard memory. Two standard paper trays, with a total capacity of 350 sheets, and an optional 500-sheet tray let users keep printing without constantly reloading different sizes and types of paper. And the optional 75-capacity power envelope feeder saves them from manual feeding. Or dealing with jams.



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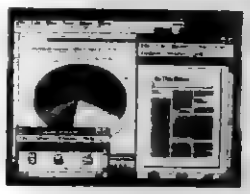
Introducing the new HP LaserJet 4 printer. So advanced, there's no catching it.

Mixed environment compatibility. Faster Windows.
The LaserJet 4 is very much at ease with most languages and personal computing platforms. Automatic switching lets it switch between HP's PCL 5 printer language and optional PostScript Level 2 software from Adobe. Hot I/Os allow different hosts to be connected simultaneously.

Optional JetDirect cards provide LAN connections to Ethernet, TokenRing, TCP/IP and LocalTalk/EtherTalk. This makes it easy to plug into just about any network, including PC and Mac LANs. And to get really fast network performance.

To optimize the LaserJet 4 for Windows printing, we codeveloped some breakthroughs with Microsoft.* Including Windows 3.1 TrueType fonts and rasterizer built in to make sure your users get fast, WYSIWYG printing. The fast Windows driver with HP-GL/2 vector graphics also enhances printing speed.



Several popular software drivers are included: Windows, WordPerfect and Lotus. As well as the new HP Explorer PC utility software, which provides a printing tutorial to guide your users through set-up and operation of the printer's new features.

All this makes the HP LaserJet 4 printer supremely simple to plug-and-play. As you'd expect, it also offers complete document and software compatibility with the HP LaserJet III printer.

Setting the standard in price, too.
With all these advances and more, you'd expect a big jump in price.

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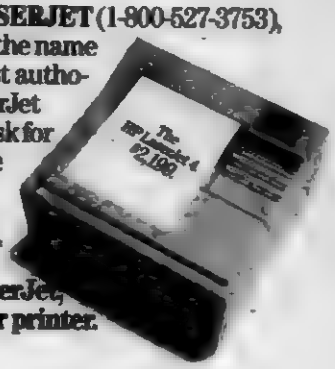

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*Suggested U.S. list price. †In Canada call 1-800-387-3867, Ext. 7133. **To have a LaserJet 4 printer data sheet sent immediately to you via fax machine, call 1-800-864-1492 from your touch-tone phone. Microsoft is a U.S. registered trademark of Microsoft Corp. Windows 3.1 is a product of Microsoft Corp. Adobe and PostScript are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. Lotus is a U.S. registered trademark of Lotus Development Corporation.

Aiming high: Microsoft woos IS

CONTINUED FROM PAGE 1

"You just can't have faith in Microsoft that they know where they're going, they're going to support you, and they're going to be there," said a director at a California firm who wished to remain anonymous. He said he has worked unsuccessfully with Microsoft.

Microsoft's general manager of business strategy, John Neilson, conceded that Microsoft must address that lack of trust if it is to succeed in working with large corporations.

"If we start making recommendations that put IS jobs at risk, they won't trust us," Neilson said. He indicated that Microsoft has several plans in the works that the company hopes will address the trust issue.

Those plans are aimed at addressing the needs of today's environment, where IS personnel must not only be technically fluent but must understand the business as well.

To that end, most IS managers said what they are looking for from Microsoft is "everything and more." Specifically, the company needs to move beyond marketing and support changes to gain a real understanding of what is involved in managing thousands of pieces of software that are vital to keeping customers' companies running. So far, that understanding seems superficial at best, users complained.

All the big firms do it

Microsoft "is probably going to have to do what IBM does, which is overkill," said Roger Jamboor, vice president at Dun & Bradstreet Corp. IBM representatives on site "basically live here" supporting policies that cover all the bases from debugging to upgrading to locating consulting services. "All the [big system] software companies do it," he said.

Jamboor's point is key. If Microsoft wants to be considered a strategic partner on a par with traditional IS partners — IBM, Digital Equipment Corp. and Hewlett-Packard Co. — it will have to play by the same rules.

"They're going to have to concentrate on business needs," said a director at a large California firm who wished to remain anonymous. Microsoft does not "have the business processes [in place] to support the customer yet." He went on to say that Microsoft needs to understand that support for a large business encompasses far more than what a single PC user needs.

It has to include not just the software, but the business that runs on that software. Microsoft has "bright technical folks but not good business folks," he concluded.

Microsoft is responding to that criticism. The company is reported to be actively recruiting experts in fields in which it has little experience, particularly in dealing with systems outside the PC realm, such as DEC, HP and IBM machines. "It's been an incredibly concerted effort," said Krystyna Filistowicz, an analyst at Dataquest, Inc. in San Jose, Calif.

Neilson did not confirm the recruitment effort but said Microsoft needs to do a better job addressing customers' multiplying multivendor computing needs. Customers "want us to develop a lot of skills" to help provide mission-critical applications and access heterogeneous data, he said. "Customers don't want us to say, 'We'll do a great job on the desktop, but sorry, you've got to get DEC for networking.'"

Giving the customer a voice in product direction is also key, said a technology director at a large New York bank. "In the past, it was 'send me your order and I'll send you an invoice.'" These days, he said he sends a team to Redmond, Wash., to discuss products and directions.

In addition, Microsoft is making allowances for multinational companies and the difficulties of supporting licensing agreements overseas and multiple-language copies of products. By streamlining licensing programs, Microsoft has reduced large customers' legal concerns.

Customers also expect help with internal distribution issues. "It's one thing to give a customer a master disk and manual and say 'have a good time,'" said Jo M. Haraf, director of office technology at Booz, Allen & Hamilton, Inc. "It's another thing to have a distribution plan."

Changes in the works

Seismic activity surrounding the required changes is there:

- Microsoft has begun implementing its Channel Partners programs to provide extra support for integrators and value-added resellers in vertical markets.
- The role and size of Microsoft Consulting Services is being expanded.
- Support services now include seven-day, 24-hour technical support as well as "hot site" on-site service.

Microsoft also recently had a meeting with several Microcomputer Managers Association members to discuss the vendor's plans for working with large customers and to solicit advice on what kinds of programs need to be implemented if Microsoft is to be taken seriously.

Another issue being addressed is the need to put a more consistent "user interface" on the company so customers will no longer find themselves dealing with several autonomous regions when trying to work with the company. Microsoft is said to be implementing changes in that area.

All of these measures are oriented at satisfying large customers who demand that their vendors understand the overall computing realm and not just the box their software runs on.

"Microsoft needs to make inroads into MIS, where they speak a number of different languages," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. "What Microsoft can offer is integrating the desktop to those upper end systems."

However, despite all this talk — and indeed, some concrete evidence of change — it may still be several months before the real impact of all these changes is felt by any but a few customers.

Microsoft has "assigned people to our company, and they relate to us from a technology standpoint, but that's about all I see," said Joe Hunter, MIS manager at Baltimore Gas and Electric Co. "Maybe it's out there, but they haven't gotten the message through to me that there's a significant change in how they do business."

Still, other IS directors are hopeful that the improvements they are hearing about will translate into tangible offerings soon.

"We're building stronger relationships with [Microsoft]," said a technical director at a large bank in New York. "Is it going as fast as we want? Of course not; it never does."

But users seemed confident that Microsoft can, and will, take firm steps to meet their needs, even though patience may be required. "Microsoft is definitely listening," Haraf said. "I've got great hopes for them."

Microsoft's track record of making things work, even if it takes more than one try, is impressive, some observers said.

"There are very few areas where Microsoft has articulated a strategy where they are not successful," Filistowicz said. "And make no mistake, they want to own it all. They just don't have all the pieces yet."

93 mid- to top-level IS professionals with 50 or more PCs installed relate what Microsoft needs to do to become their strategic partner

	Number of responses (multiple allowed)
Bolster customer support	6
Pay more attention to integrating with high-end systems	8
Improve customization services	5
Offer better solutions to enterprise computing	4
Provide better coordination between direct sales and resellers	4
We are not interested in Microsoft's becoming our strategic business partner	14
Other	54

Other suggestions include:

- Address business needs better
- Drop concern with being No. 1
- Better open network standards
- Offer better site licensing
- Offer discounts to developers

Source: CW Database Division

At a glance

Microsoft claims to receive more than 19,000 support calls per day, with more than 80% of them being responded to within 60 seconds.

One in five Microsoft employees is in product support services, according to the firm.

Microsoft's conversations with IS have turned up four key requests: more line of business applications, rapid development and deployment of applications, design review services for downsizing and the ability to customize.

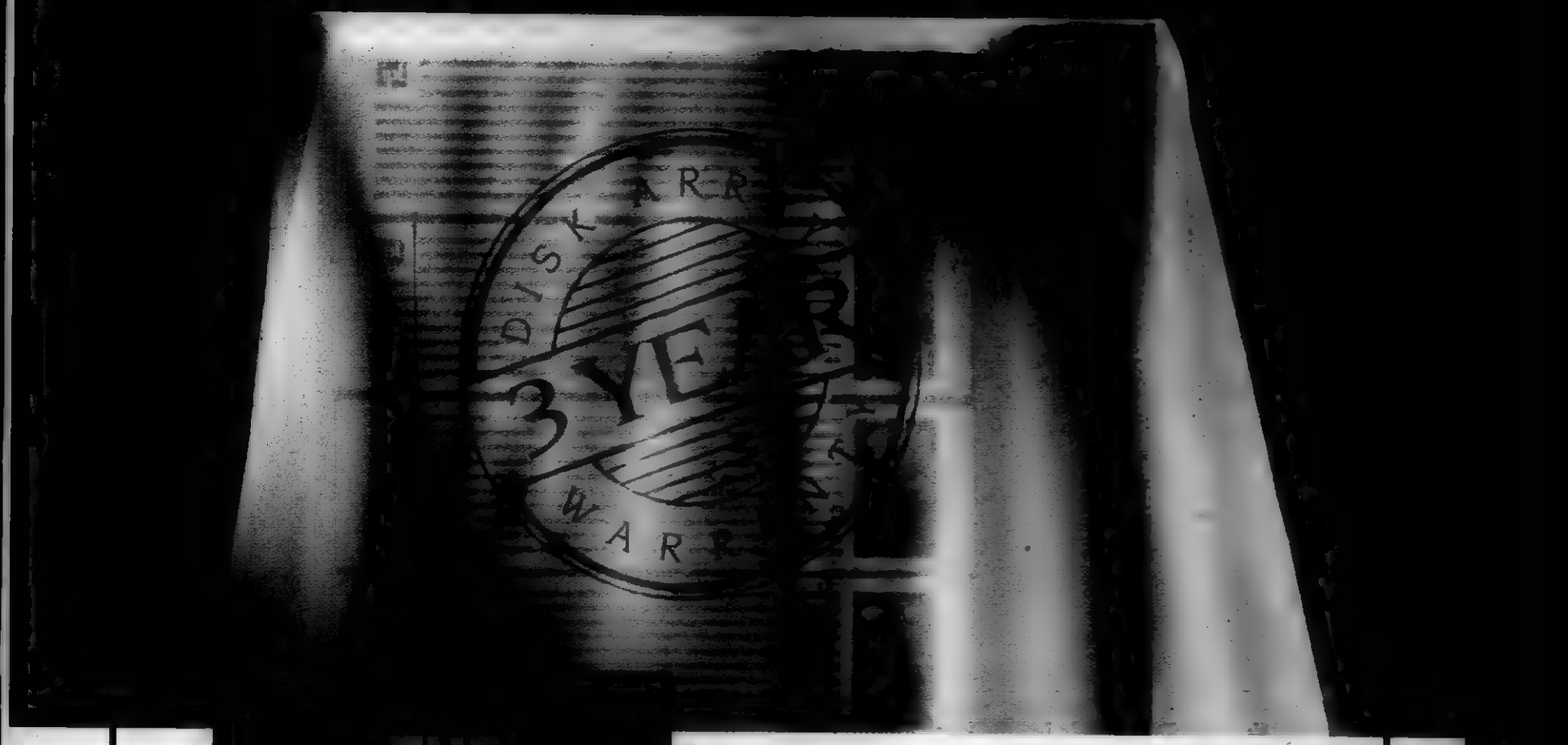
Coming soon

Although he could not yet provide full details, John Neilson, Microsoft's general manager of business strategy, last week ticked off the following indications of what policy changes large customers can expect to see as early as January:

- **A much-simplified licensing program that takes into account the needs of multinationals that want multiple language versions of software on several platforms in many countries and still want to write one check for everything. The company also said it will implement ways to dramatically decrease turnaround time on purchases.**
- **A "menu" of support options for users, including the ability to bring "on-demand" Microsoft experts on site to assist with specific projects.**
- **An increase in Microsoft expertise in areas besides PCs, including mainframes and networking, through closer relationships with vertical market suppliers and hardware vendors and by bringing outside experts into Microsoft.**
- **The ability to provide consistent support policies throughout the world, including support for software asset management and upgrading through service providers.**
- **Improved dissemination of technical and strategic information to customers through programs such as executive symposia for chief information officers. The company has even offered to keep an account on corporate electronic-mail systems through which it could distribute information directly to interested parties. Formalized means of collecting information from customers will also replace the current "ad hoc" system.**

John Neilson: *changes are en route*

— Christopher Lindquist



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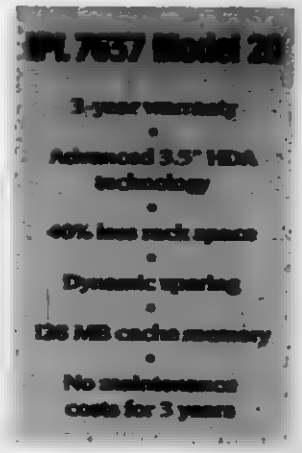

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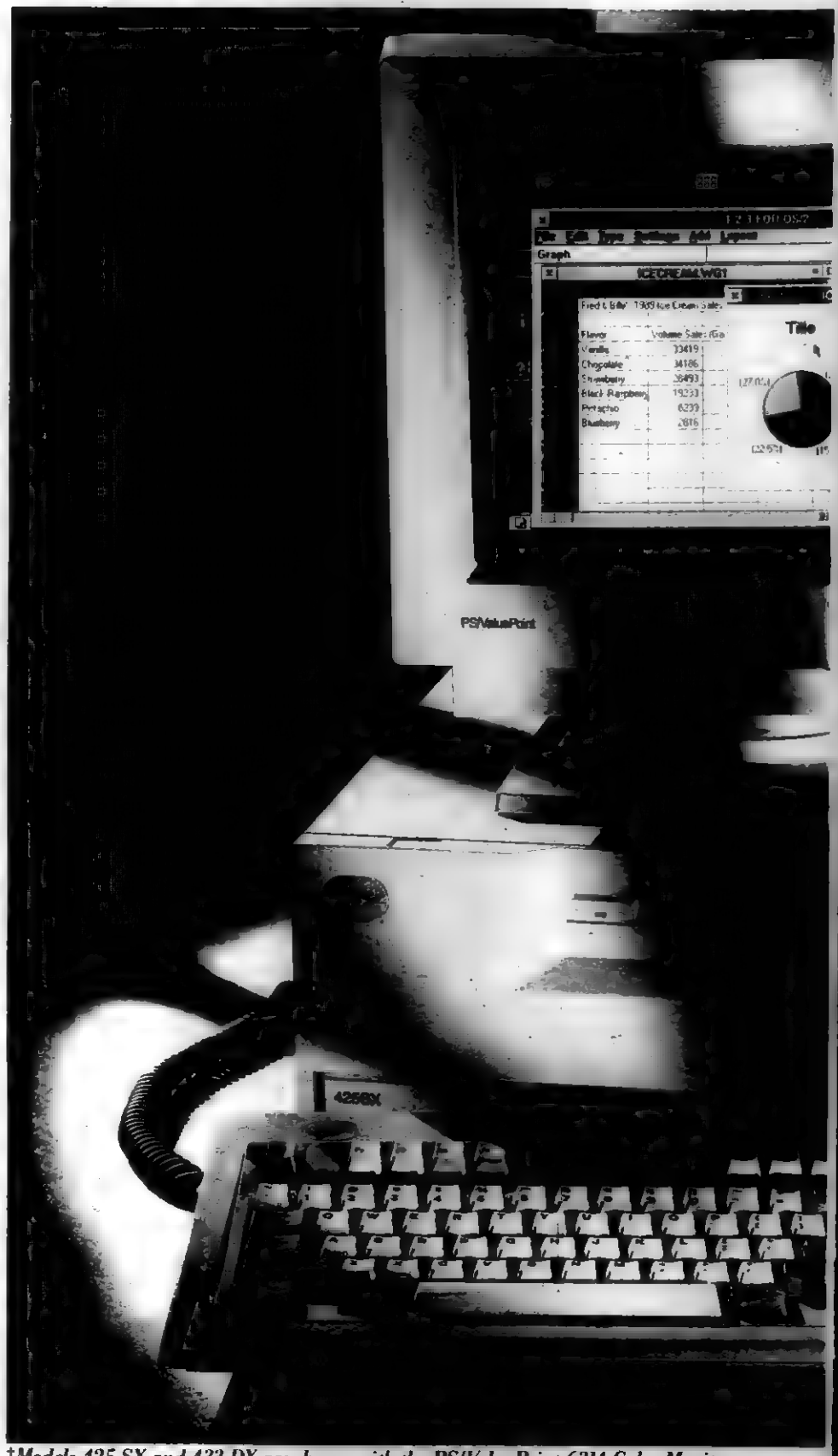
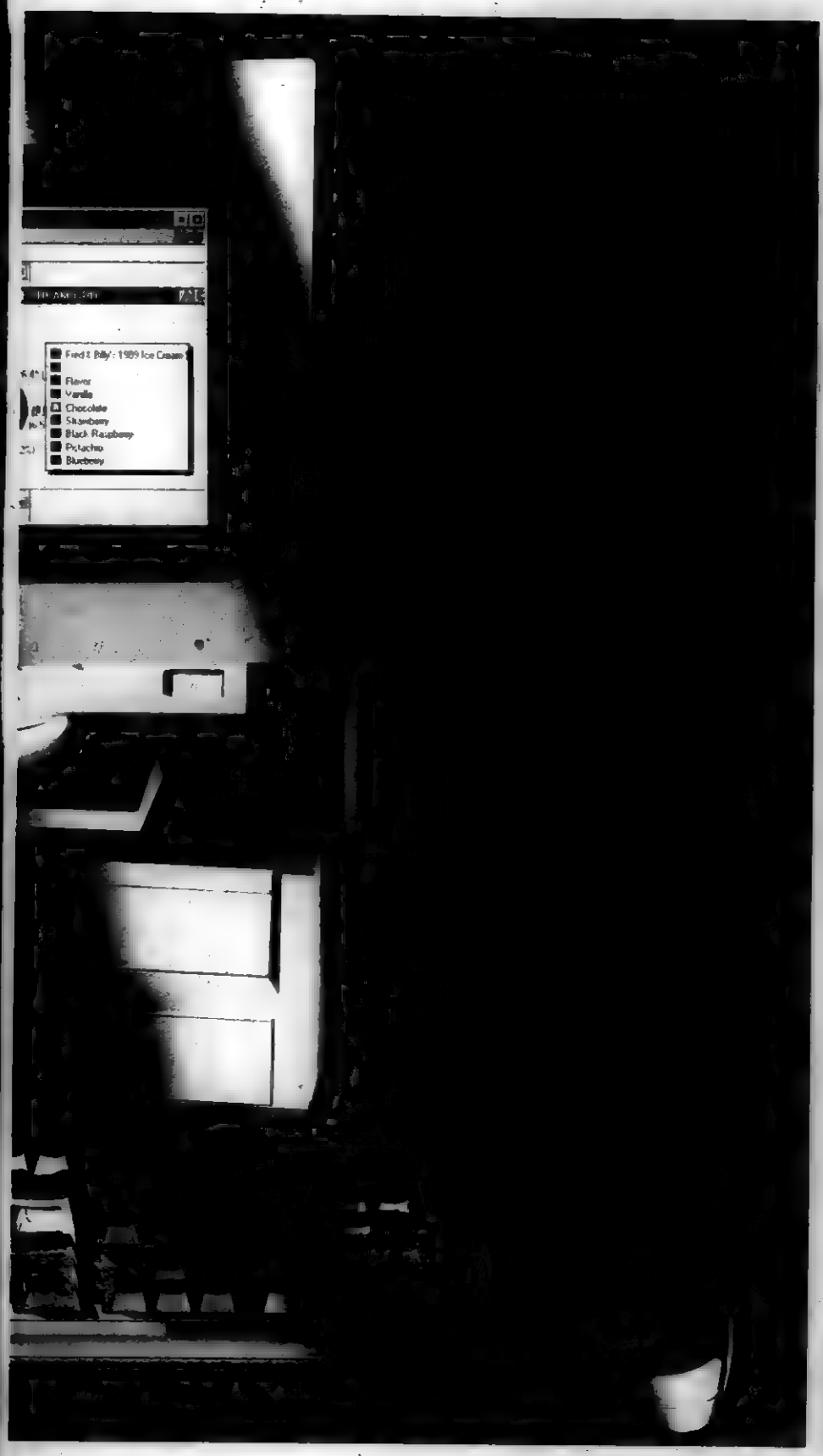


†*Models 425 SX and 433 DX are shown with the PS/ValuePoint 6314 Color Monitor.*

Computers that do pr for practic



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Charles Babcock

Peer support

I was working with a friend on a project for International Data Group recently with a full panoply of computing equipment: two VAXs and a dozen Macintoshes — including three Quadra 700s, QuarkXPress and three laser printers — all of which were connected via Ethernet and AppleTalk. It was a good assortment for two people, but unfortunately, an envious IS group spotted our abundance and relieved us of two-thirds of it.

Neither one of us realized it, but a VAX — now removed — had been the server for our QuickMail E-mail system. We had been doing everything over QuickMail, moving stories over modem lines and exchanging edited versions. Some of these stories had suddenly disappeared with the VAX. Others were on my Macintosh and needed to be somewhere else. "David," I said to my acquaintance, now drafted as PC support technician, "let's move this file from here to there."

And he did. Many times. At a great expense of time.

When something goes wrong on your desktop, who you gonna call? Most likely it is not IS. More likely it is going to be David, under whatever name and title he happens to be disguised as he sits somewhere near you. It was not David's responsibility to support PC users. His job was managing copy flow, writing headlines and producing attractive pages. In the process of doing those things, he had learned more about our computing environment than anybody else except the IS director.

When the IS director left before the end of the project, David became the de facto technical support person, and it added hours to his job and hundreds of dollars of expenses that were hidden in his salary.

IS directors have long suspected that end-user technical support was costing more than their organizations realized. With their budgets constrained, IS has had little choice but to force end users to rely on the expertise in their own ranks rather than run to the professional staff with every glitch.

Just how much this entrenched, peer-to-peer technical support costs is the subject of a study by Nolan, Norton & Co. It concludes that it is much higher than imagined and much greater than the tangible expenses for hardware, software and IS technical support.

Nolan, Norton concluded that the known or budgeted spending per PC or workstation was $2,000 to $6,500. The unbudgeted or invisible PC/workstation spending came to another $6,000 to $15,000 per end user. The hidden costs are "peer support, people who are not counted in the IS head count but who provide peers with guidance and support in the use of end-user computing."

By closely accounting for this expense, companies are likely to find that it is equal to or several times greater than the accounted-for costs. In the end, this hidden expense will come back to haunt IS departments, with budget officers demanding to know why the company should pay for technical support in so many forms when it is funding a central department.

Because IS budgets are not keeping up with the pace of PC installations, technical support clearly must be selective. But the challenge is for IS to provide infrastructure and leadership in this evolving end-user picture.

IS must get the resources to provide a solid infrastructure and supply training and guidance. It then has little choice but to leave the rest to those talented end users co-workers rely on for help.

Babcock is *Computerworld*'s technology editor.

Alpha hits the streets

DEC line gets good reviews despite a lack of available software

By Melinda-Carol Ballou
BOSTON

The long-expected debut of Digital Equipment Corp.'s Alpha AXP systems last week was hailed by analysts and users despite the lack of a range of immediately available software.

DEC initially plans to ship around 10 applications, with between 50 and 100 additional third-party applications slated to ship by the end of December and at least 700 more to follow by summer 1993, said Steve Howard, marketing manager for Alpha applications at DEC.

"We're planning to provide a list of the ongoing status of application availability," Howard said. The company is also making a toll-free telephone number available for users seeking access to that information.

As expected, DEC also announced two low-end workstations with corresponding servers and three other servers for use with systems ranging from the desktop to the mainframe [CW, Nov. 9].

Company officials also demonstrated but did not officially release three products: an Alpha AXP PC running Microsoft Corp.'s Windows NT; a low-end version of the DEC 3000 Model 400 AXP desktop workstation, which is slated to be priced at less than $10,000 when it ships in the spring; and a high-end workstation based on the design of the DEC 3000 Model 500 AXP deskside graphics workstation, slated to run at 160 SPECmarks and ship in the spring.

Also announced were Advantage Server turnkey systems that include CPU, memory, disk, tape, CD-ROM, services, choice of Open VMS or OSF/1 and Network Application Support (NAS) 300 applications at a discount. Pricing for the Advantage Server starts at $20,720.

Users who had been waiting for Alpha details can now begin to make decisions. "The announcement makes it a lot more real and easier to plan things like getting the systems into our mix of hardware," said Joel Richon, a computer scientist at the Space Telescope Science Institute in Baltimore, which operates the Hubble telescope.

"The third-party software will be rolling out [over time], and the ultimate support for DEC software with clusters will be nice, but as long as we can get our data to Alpha and back, we can do our job," Richon said. His group has already ported some in-house applications to Open VMS on Alpha AXP.

DEC has been more forthcoming than in the past about its rollout plans for software and about the Alpha technology, according to Marge Knox, president of the U.S. chapter of the Digital Equipment Computer Users Society. In response to user input, for example, DEC moved up the timing for the release of VAXcluster support, she said.

"DEC took a drubbing in the press" for preannouncing Alpha, Knox said, "but the feeling that we were informed and able to help guide the process is important."

Analysts attempted to differentiate DEC's announcement from those of competing vendors Sun Microsystems, Inc. and Hewlett-Packard Co., which were made the same day (see stories page 4).

"It's like comparing apples and oranges," said Chuck Casale, an analyst at Aberdeen Group in Boston. "Sun is the undisputed leader of the low-cost, blue-collar workstation; HP is arriving at the high end."

DEC is not announcing one more in a series of products but an entire 64-bit architecture that spans the high and low end as well as a range of operating systems, he said.

A sample of DEC software products
Immediately available on Alpha AXP platforms:

- DEC FORTRAN AND DEC C COMPILERS: ALLOW FOR MIGRATION OF C- AND FORTRAN-BASED APPLICATIONS TO ALPHA; $650 EACH.
- DECNET FOR OPENVMS AXP VERSION 1.0: OFFERS DECNET NETWORKING SUPPORT; $1,200.
- DECSET: PROVIDES CASE TOOLS FOR VMS; $2,250.
- DECMIGRATE: A GROUP OF TRANSLATION TOOLS THAT TAKE EXECUTABLE VAX CODE AND GENERATE ALPHA CODE; $589.
- NAS 250 AND 300 ADVANCED KIT: SOFTWARE AND SERVERS TO MORE EASILY INTEGRATE ALPHA WORKSTATIONS INTO A CLIENT/SERVER ENVIRONMENT; SHIPS WITH WORKSTATIONS OR SERVERS.

DEC to deliver last part of DECnet/OSI strategy

By Elisabeth Horwitt
MAYNARD, MASS

The final pieces of Digital Equipment Corp.'s DECnet/OSI product are slated to roll out by mid-1993 — approximately six years after the company first announced that Open Systems Interconnect (OSI) would form the basis for its next-generation network architecture.

DEC chose to delay the product in order to incorporate features demanded by customers, such as the ability to perform file transfer, terminal emulation and other services across OSI, Transmission Control Protocol/Internet Protocol and DECnet Phase IV networks, a DEC spokeswoman said. Of prime interest to OSI-oriented DEC users was the delivery of DECnet/OSI for OpenVMS this month — about two years late.

Lawrence Livermore National Laboratory has been waiting to put OSI on its VMS systems — primarily because the international Energy Science Network, in which it participates, is running out of DECnet Phase IV address spaces, according to Kevin Osterman, a network manager at the laboratory. While DECnet IV has an upward address limit of 64,000 nodes, OSI has virtually unlimited address spaces, Osterman said.

Having tested DECnet/OSI on Ultrix systems, Lawrence Livermore found that it "works pretty well," but it requires more effort to manage than DECnet Phase IV, Osterman said. "OSI is full of functions," such as the ability to administer files remotely. "However, even if you don't need them all, you still have to configure them," he added.

DEC has addressed that problem by providing automated configuration of key DECnet/OSI elements such as the name server and Packetnet System Interface, the DEC spokeswoman said.

The new DEC OpenVMS AXP platform will initially communicate via DEC's proprietary DECnet IV software, which is priced from $1,200 to $11,667, depending on the configuration, DEC said. The system will communicate over Ethernet or Fiber Distributed Data Interface.

OpenVMS AXP support for DECnet/OSI is scheduled to be available by mid-1993, DEC said.

DECnet/OSI network software for the OSF/1 version of AXP is slated for March shipment, priced the same as the DECnet IV software.

OSI

In a Business Research Group summer 1992 survey of 400 Fortune 1,000 sites, 13% said they were using some aspect of OSI; of those, OSI comprised 2% of their traffic.

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Advanced Technology

Tech Talk

Encyclopedia uses fractals

Microsoft Corp. will stuff a record amount of data into its Encarta CD-ROM encyclopedia. Expected to be released in February, the $395 reference guide will contain 21,000 articles in 94 categories, 6,500 audio clips for seven hours of digital sound, 100 animations, 800 color maps and 7,000 photos, illustrations and graphs. Microsoft achieved this feat, in part, by using fractal compression technology from Iterated Systems, Inc. for storing color images.

Four-in-one

A team of researchers at the University of California at Irvine has put the power of four reduced instruction set computers into a single chip. The new microprocessor, dubbed Viper, is only 10 by 12mm in size but can perform 100 million instructions per second. The chip design could be used in high-definition television, medical imaging, video phones, computers, advanced fax machines and in-vehicle navigation systems.

Compression innovation

IBM late last month demonstrated a multimedia computer teleconferencing system that cuts the computational overhead associated with processing real-time video images by two orders of magnitude. The IBM prototype "composes" tens of frames into moving pictures while the data is still compressed. Other systems compose frames after the images are decompressed. IBM's system, called Multimedia Multiparty Teleconferencing, reduces the computational requirement for decompressing analog video signals and transmitting them across a local-area network from 100 million operations a second to about 1 million operations a second, or within the range of current PC chips. The prototype system involved IBM Personal System/2 Model 95s running IBM's AIX Unix implementation and linked over a high-speed LAN.

Enabling multimedia

As prices of digital signal processors fall, applications emerge

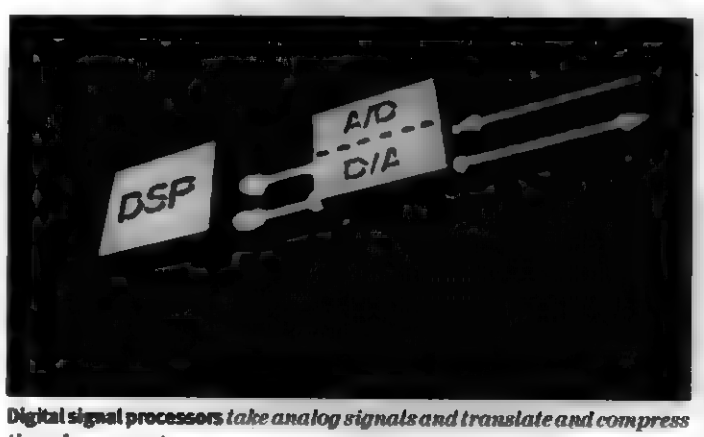
By Ellis Booker

MULTIMEDIA COMPUTING — the integration of sound, image and video on the desktop — would not be possible without them, yet few users know what they are.

They are digital signal processors (DSP), the bridge between the "real world" of sounds and sights and the digital realm of bits and bytes. And they are becoming cheaper and more common.

DSPs can be understood, simply, as very fast translators that take analog signals from the outside and convert them into bit streams that a computer can understand. In addition, DSPs compress the arriving signals — in the case of video, for instance, crunching the incoming pictures at ratios of 100 to 1.

"DSP technology is the enabling technology for all multimedia," said Will Strauss, president of Forward Concepts Co., a market research company in Tempe, Ariz.



Digital signal processors *take analog signals and translate and compress them for computers*

Lucky 13

But if multimedia is new, DSP technology is not. The world's first single-chip, programmable DSP was introduced by Intel Corp. in 1979. The 2920, as it was called, could filter, convolve and analyze audio signal waveforms. But sales did not meet expectations, and Intel abandoned the DSP market to the likes of Texas Instruments, Inc., which retains a market leadership role in this part of the semiconductor business.

But the most significant change has been falling prices for these specialized chips, which has brought them out of high-priced military and networking products. For instance, one class of TI chips dropped from $300 apiece a decade ago to $15 today, while it increased in horsepower from 5 million instructions per second (MIPS) to 40 MIPS.

A watershed event came when Rockwell International Corp. introduced a DSP chip set for 1,200 bit/sec. modems.

"The greatest quantity, both in units and dollars, is still in modem chips," Strauss said. But he said he expects DSP-based hard disk controllers — used to optimize the spacing of bits on the disk as well as adaptively correct for damaged disk sectors — will pass modem DSP sales in 1993. The reason for this is the shrinking size and increasing storage capacity of hard disks.

"We'd like to think the watershed was 2½ years ago, when we introduced a $9.90 DSP," said Bill Schweber, marketing engineer at Analog Devices, Inc. in Norwood, Mass.

Along with falling unit prices, Schweber said, applications have evolved to take advantage of sound and video. He pointed out that Microsoft Corp.'s Windows 3.1, for example, comes with icons for audio record and playback to support voice annotation to a text document.

Many observers said 1993 will be the year that audio begins to be seriously integrated into general-purpose computer applications.

Meanwhile, DSPs to support full-motion, full-screen video (defined as full frames at 30 frame/sec.) are being announced left and right.

As general-purpose chips get faster and faster, will there continue to be a need for DSP?

Analysts said they think so, noting that general-purpose chips are not optimized for signal conversion/compression and decompression. Rather than putting these tasks into general-purpose chips, DSPs will, they predict, get faster (i.e., able to handle multiple *billions* of calculations per second) and perform even more impressive, real-time compression. Compression is key, many observers said, because networks are the chief bottleneck in multimedia computing.

DSP products

At Comdex/Fall '92 this month, IBM and TI will show MWave, a jointly developed DSP able to handle audio (record and playback), modem and fax and still-video compression using the JPEG specification.

IBM has said this chip will be standard in all its Personal System/2 Ultimedia branded products next year.

AT&T Microelectronics, meanwhile, is reportedly sampling a full video codec on a chip that is aimed at desktop-to-desktop video teleconferencing. AT&T already has a base multimedia chip, the DSP3210, that provides low-level voice, modem and fax functions. Several vendors — including Apple Computer, Inc. and Commodore business Machines, Inc. — will announce support for the AT&T chip at Comdex.

Common multimedia terms

Digital Video Interactive (DVI), Intel's proprietary image compression and expansion scheme. In 1993, the industry is expected to move to the MPEG-1 standard for real-time video.

Motion Picture Experts Group (MPEG or MPEG-1): A standard for 100-to-1 video compression from a U.S. standards group.

Joint Photographic Experts Group (JPEG): A standard for 15-to-1 still-image compression.

Function and Algorithm Specific IC (FASIC): Nonprogrammable DSPs used in video coder/decoders (codec) and modems.

In the beginning, only hackers cared about UNIX.
Now it's ironic to see gaggles of suits
trekking down to IS asking the gurus about UNIX.
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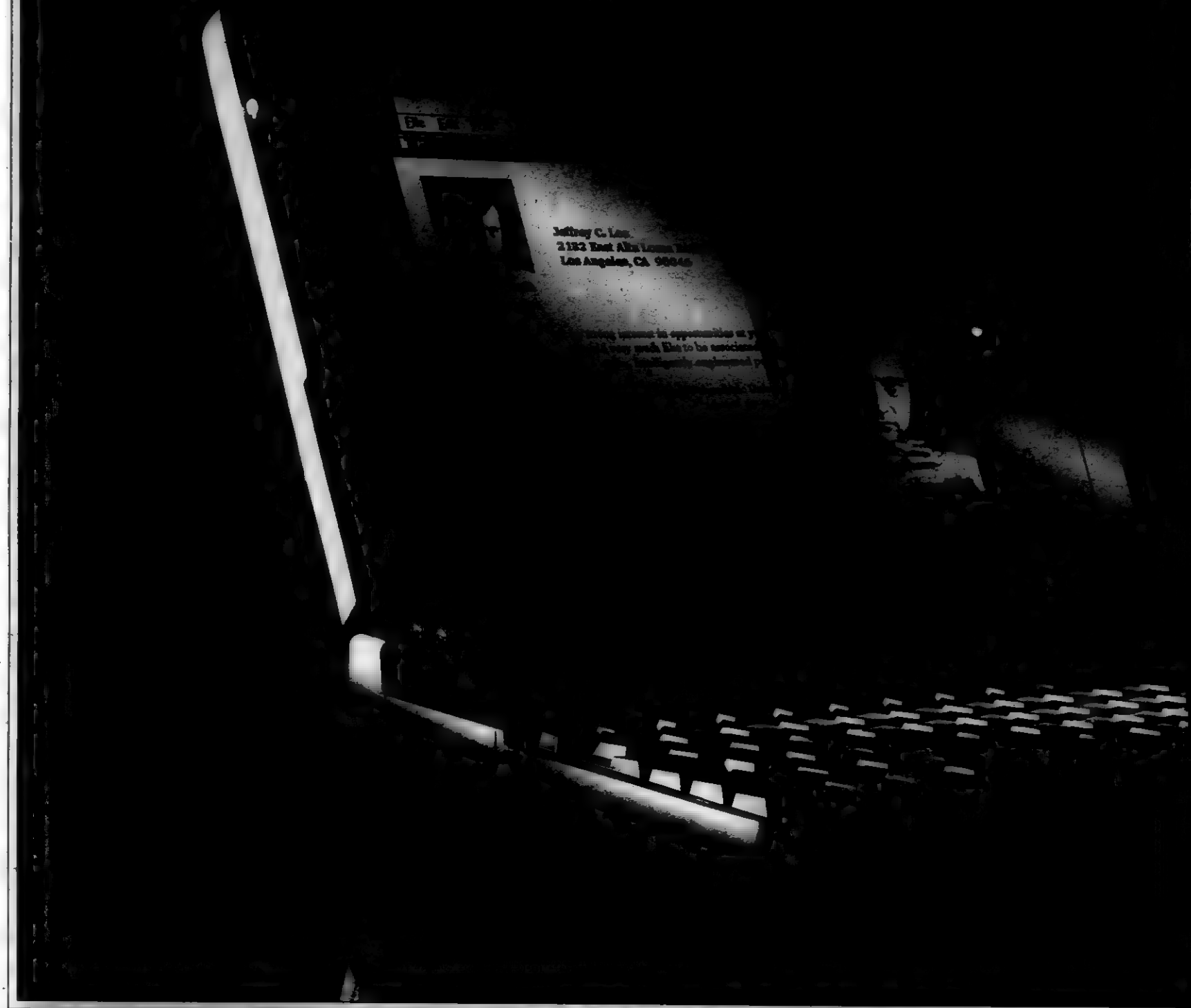

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August 1992
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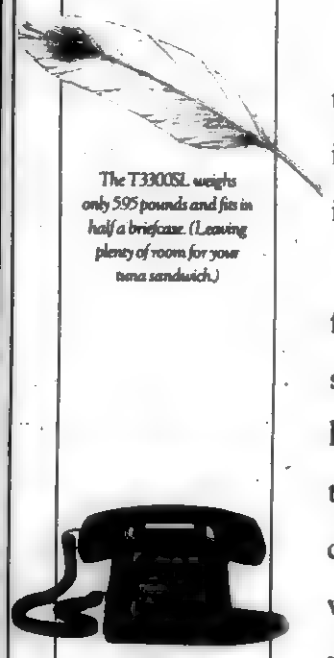

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intel inside

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In with the new

For the past 10 months, we've affixed a "New in '92" label to various revisions and additions appearing in *Computerworld*. Change is a fixture in our world and the one we write about. And we've been meeting the changes in the paper bit by bit during the year.

Today's issue by contrast is the greatest manifestation of change at this newspaper. But before I run down the specifics, let me first tell you why we've revised our design, and why change is the only constant here.

First and foremost, the needs of our readership are fast-evolving. In a nutshell, your information needs are greater than ever while the time you can devote to professional reading remains the same — at best. You, the reader, need more information but cannot allocate any more time to absorb it.

Change in the information technology environment is also utterly breakneck. Intel's next-generation microprocessor will pack almost 100 MIPS on a single chip. That's 10 times the raw power found in the mainframes of less than a decade ago. Keeping up with such change is a job in itself.

So we've changed. For one thing, we look much different. Our new design speeds you through more of the paper in less reading time, and we're now using a higher quality paper stock. For a full explanation of this most apparent difference, see page 4.

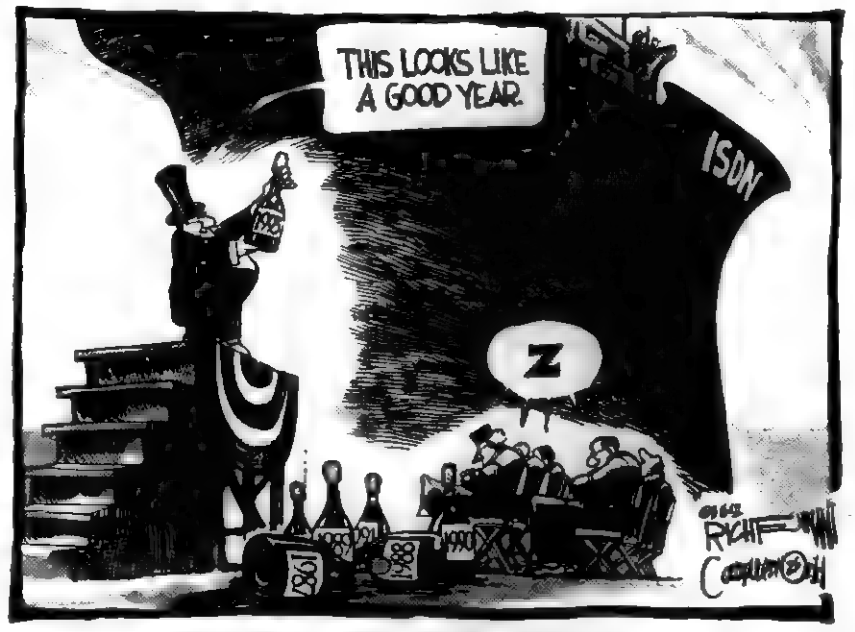
We're also featuring a company index, an expanded executive briefing page and a newly fashioned management section targeting senior IS managers. And we are adding a group of "marquee columnists," who include the following:

- **Esther Dyson**, without question among the most highly regarded industry observers in the world and editor of the "Release 1.0" newsletter.
- **John Gantz**, head of desktop and workgroup computing research at International Data Corp., former chief analyst at Dataquest and oft-quoted industry commentator.
- **Michael Schrage**, a foremost authority on the interplay of technology and human behavior, as well as a noted author and research associate at MIT's Sloan School of Management.
- **Elaine Bond**, longtime CIO at The Chase Manhattan Bank and senior technology consultant and founder of Open Users Recommended Solutions, a user advocacy group.
- **Charles Babcock**, our new technical editor and former editor in chief at *Digital News*, who will write a weekly technology column.

These and other revisions have a singular goal in mind: to provide you, the reader, with more value for your money and reading time. I'd love to know if we are on the mark, in your esteemed opinion. I'm reachable through various means, as listed on this page.

Bill Laberis

Bill Laberis, *Editor in chief*



Thief wanted car, not laptop

Your Page One story "Laptop thefts spur security efforts" [CW, Oct. 12] asserts that thieves made off with Gen. Norman Schwarzkopf's laptop containing battle plans for the invasion of Iraq. It did not happen.

What did happen is that on Dec. 17, 1990, a Royal Air Force wing commander, David Farquhar, stopped by a downtown London auto showroom to look around. While in the showroom, someone stole Farquhar's car along with the laptop he left in the trunk. The laptop's hard disk contained details of the Iraq invasion.

The computer was returned a week later, with information intact, after the theft was widely reported in English newspapers. Farquhar subsequently was court-martialed, demoted and fined.

Michael Alexander
Framingham, Mass.

Managers must respect workers

Joshua Hammond's informative viewpoint article, "Hard and fast truths about quality" [CW, Oct. 26], hits the nail on the head. He states, "Our greatest untapped potential for improvement ... lies in the underutilized energy and resourcefulness of the American people."

American managers must look in a mirror and ask ourselves if we are providing the leadership necessary for all employees to grow and reach their fullest potential. If the answer is no, then we're looking at the answer.

Once all employees experience the satisfaction of success and the praise and recognition that they earn, total quality management will become an irreversible way of life.

Roger Duryer
Winthrop, Maine

Joshua Hammond writes in his article [CW, Oct. 26]:

- "Quality puts people before technology.
- "The "greatest untapped potential for improvement lies not in technology or better processes but in the underutilized energy and resourcefulness of the American people."

Thank you, thank you, thank you! If just one manager now understands this, you've sure earned your keep!

Karl M. Waldman
BBN Systems and Technologies

All hands are needed on DEC

Your editorial "DEC, take 2" [CW, Oct. 19] was very good and well received, I'm sure.

It is evident that DEC has taken some wrong turns in downsizing itself. At my company, RJR Tobacco in Winston-Salem, N.C., we have felt the impact of DEC's effort to cut costs in its field service division.

The turnaround time on service calls has increased, causing us to look at taking over some of the maintenance ourselves.

DEC must take a hard look at its downsizing effort. You are right: "Without question, DEC is at the most critical juncture in its 35-year history."

Thomas Renn
Systems technical specialist
Winston-Salem, N.C.

Help wanted?

I read in disbelief about the support that Gov. Clinton received from the executives of the high-tech companies ["High-tech backing," CW, Oct. 26].

I know President Bush is not a capitalist (i.e., he is not a defender of individual rights), but he does not have an explicit policy that seeks to control the high-tech industries; Clinton does.

It looks as if the high-tech leaders are looking for "help," and the only "help" the government can give is protectionism and subsidies.

I don't think they realize that this is the same "help" given to the many industries wracked by government intervention, including the automobile, steel, banking and savings and loan industries.

Many firms in those industries were once world-class, and American firms dominated the world's Top 10 lists. Today, they frequently cannot compete in the markets they created. If this kind of "help" is sought by the high-tech industry, it can expect similar results.

Thomas Palmer
San Jose, Calif.

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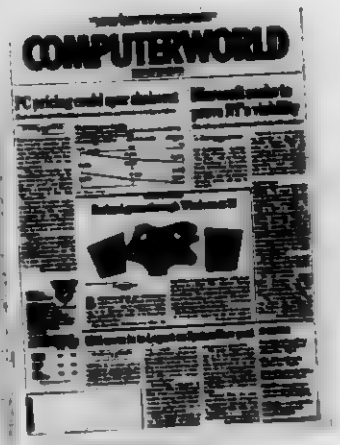

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The great glamour accessory

Bruce Sterling

I'm a science fiction writer by trade. I live by speculation and vaporware. Naturally, I dote on the computer industry.

I'm especially fond of the PC industry. No other industry in the world indulges in such head-spinning flights of fancy. There's no end to its forecasts and fond hopes for what computers will do for you, to you and through you. I find this vastly entertaining.

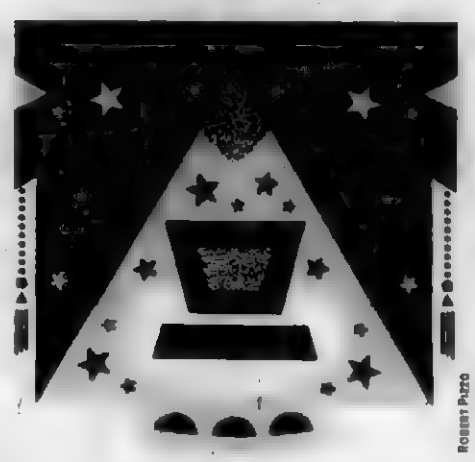
But what are PCs really about? As far as I can figure, PCs aren't really about "productivity" or even "information." PCs are machines whose main purpose is to make people pay attention to other people. That's why people want them.

Modern computing is basically a glamour industry.

This may seem an odd perspective to a serious-minded information technologist, but glamour shouldn't be despised. There's a lot of money and power and influence in glamour. Politics (including office politics) is mostly glamour — catching people's eye, making people talk about you, cutting a swath on the public stage, cutting yourself out of the crowd.

The PC is a desktop glamour accessory. You can produce documents that look really impressive and authentic. Twenty years ago, the U.S. secretary of state didn't have documents that looked this good. And you would never guess from looking at its beautiful business form letter that Krypto-Process Advocates, Inc. is some unshaven dude in a bathrobe at his kitchen table.

Do I write better novels because I use a computer? Nope. So why do I use one? Because it helps me get people's attention, that's why.



ROBERT PUZO

Thanks to computer networking and the global phone system, I can now, with very little effort or expense, thrust myself into the lives of hundreds, maybe thousands, of people just by posting a comment, uploading a file or sending a fax.

The downside of this swell situation is that almost anyone, in return, can reach out and touch me. I already get 90 pieces of E-mail a week. The fax hums regularly, too. And I can tell that the computer network scene is getting smarter, faster and more thoroughly electric.

If you think it's hell handling the fierce demands of human beings for attention, wait till the computers are tirelessly hanging on your phone, sending autonomous mail, collecting debts, narrow-casting junk faxes and gladhanding you.

Computers are eating up our time and attention — not just in our business lives but in every aspect of our lives, including, by design, our most personal ones.

Consider this strange phenomenon: There are guys burning megabuck access time right now, downloading racy GIF files from X-rated bulletin-board systems. Many, maybe most, of these graphic images are scanned and stolen from traditional print skin magazines.

It doesn't matter that the magazine images are better in every way; computer people pay huge sums to get these images in their computers. Why? They want these tacky glamour shots inside their computers right now, that's why! It's as simple, and as utterly compulsive, as that.

Computers are no longer "logical" or "rational." They're too close to us now; there's too much of us inside them. They're full of juice and blood and law and art and politics and paradox and deep, profound, nonlinear treachery.

For some people — the smart, the ambitious, sometimes the strange and the dangerous — they're becoming the place you can stick a crowbar and move the world.

Sterling is a best-selling science fiction author. His latest book, *The Hacker Crackdown*, is a nonfiction description of "law and disorder on the Electronic Frontier."

Comdex: Why efficiency is beside the point

OPEN MIND *by* Esther Dyson

Comdex is like the real world, but more so: It's large and inefficient, and there's lots of stuff there — if you could only find it. Most things are either free (bite-size quiches and product literature), overpriced (limos and decent food) or unavailable (rooms at the Hilton). Particular people are impossible to reach, yet you run into long-lost friends in every waiting line.

Any software vendor worth its salt could figure out how to make Comdex more efficient. Create an on-line catalog of firms, products and attendees, add a scheduling program and use a linear optimization program (and perhaps a Cray supercomputer). Everyone would be on-line, with beepers and E-mail, and would be able to reach anyone.

This raises interesting questions: What would the trade-offs be? How do you value Bill Gates' time, as opposed to Fred Bloggs'? Maybe you could design an algorithm that would equalize things by having thousands of people listen to Bill at the same time.... Of course, that's precisely what happens during the keynote speeches — all without benefit of software.

But Bill Gates isn't the only one. Many people's time is too valuable (to them, at least) to allocate fairly. Vendors want to see buyers and reporters more than the buyers and reporters want to see the vendors. Thus, because this is a market (of sorts), the sellers offer bribes — bite-size quiches, rock concerts or the company of the buyers' peers at some Las Vegas-ritzy location.

In fact, Comdex is a lot more efficient than it looks. There's no central computer, but a lot of local units make calculations and trade-offs, balancing expenses against expected returns. Still, if you factor in the enormous extra costs — time spent waiting in line, travel expenses, fruitless conversations — the whole experience may cost a lot more than it returns to many players.

In the end, the best way to explain Comdex is — appropriately — the lottery. Comdex is ultimately a gamble.

At Comdex and in the real world, people don't really want an efficient slot machine or a market; they want one that lets them win from time to time. The real lure of Comdex is the possibility of a special discovery — the product no one else has noticed, the chance visit from the head of MIS at Chase or Boeing or DHL, the reporter's seat on the bus next to a garrulous insider after his fifth drink or the vendor's seat next to the credulous reporter who'll help spread misinformation about a competitor.

People remember their wins, not their losses. For me, one win came when I was standing alone outside the Sands, waiting for a taxi that wasn't coming. A man joined me. I offered to share my taxi if it ever came. As it happened, the man was John Kelley, who runs the Congressional Research Service effort to provide computers and know-how to East European parliaments. It was through him that I met Mirek Priban and Zdenek Malina of the Czechoslovakian Parliament (hi, guys!) who are attending Comdex this year in hopes of . . . who knows?

Which reminds me of my all-time favorite Comdex story — guaranteed true.

It happened last year when Mitch Kapor took a taxi in from the airport. "You here for this Comdex show?" the driver asked.

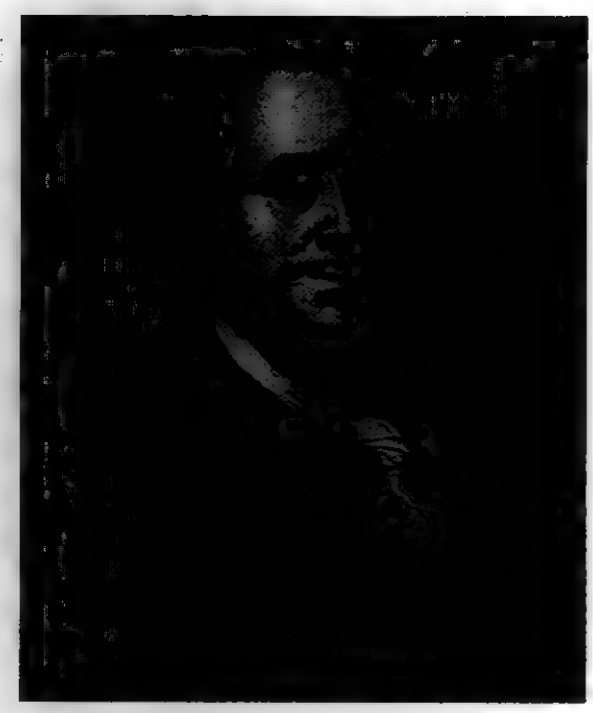
"Yup," Kapor replied.

"So whaddaya do?" the driver asked.

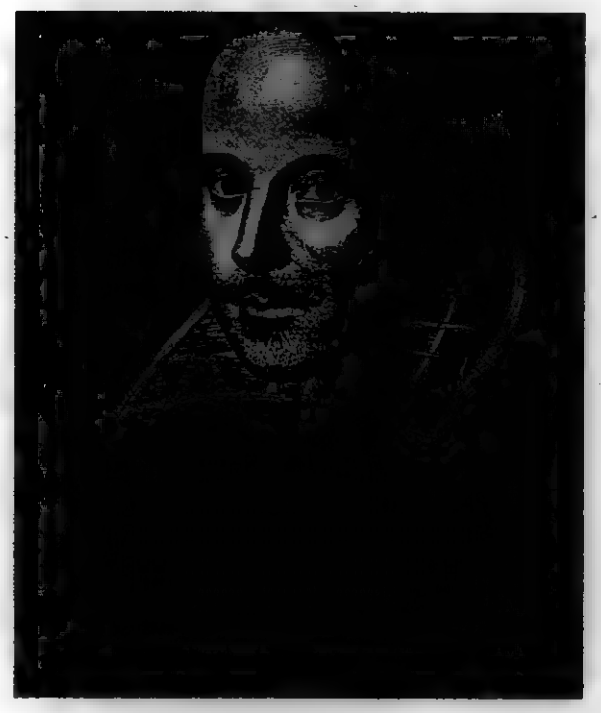
"I'm in software," Kapor said.

"Oh," said the driver, peering around to look. "Are you Bill Gates?"

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe, respectively.



"Electrifying idea, my boy."
Benjamin Franklin



"Thou art a superb writer."
Shakespeare

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"Music to my ears."
Wolfgang Amadeus Mozart

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"Best Frame Relay"
"Best ISDN Services"
"Best Switched Digital Services"
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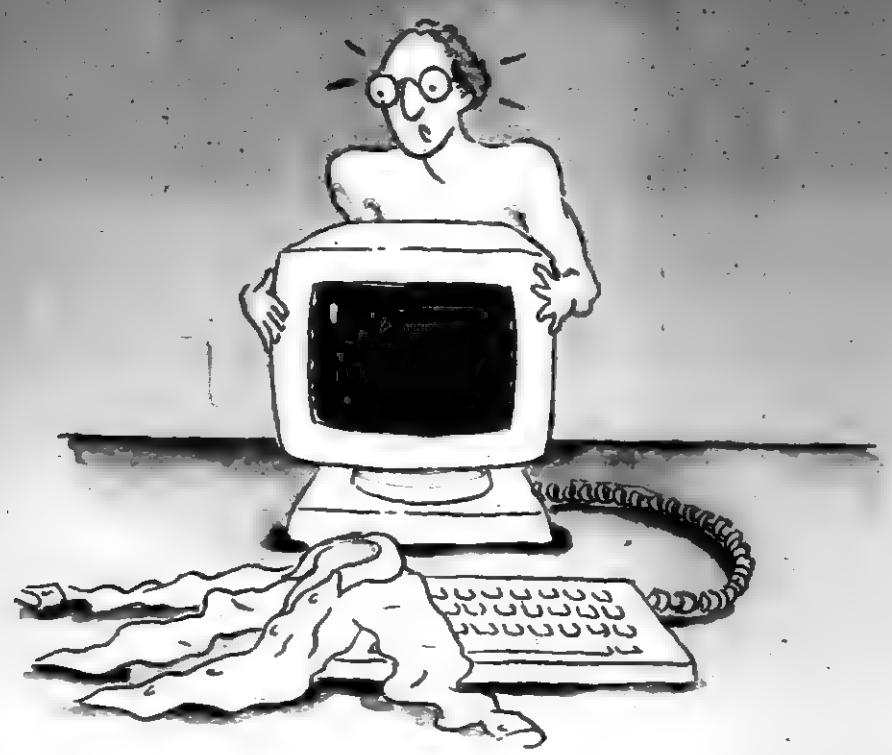

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Wireless notebooks next in line

By Michael Fitzgerald

As notebook computer vendors begin to make color an everyday option, wireless communications becomes the next technology frontier.

A series of recent color notebook introductions has set the stage for the next round of features — new communications capabilities.

Compaq Computer Corp., for instance, now offers a 14.4 bit/sec. SpeedPaq 144 Modem, which is the first data/fax modem to connect directly to cellular phones. Users of Motorola, Inc.'s MicroTac and MicroTac Lite families and Nokia Mobile Phones, Inc.'s 121 can use their phones with the SpeedPaq, which costs $649.

AST Research, Inc. has chosen to support cellular communications by installing Personal Computer Memory Card Interface Association (PCMCIA) slots in its PowerExec family of notebooks [CW, Sept. 21].

"It's a blemish not to have PCMCIA at this point — there's an explosion of PCMCIA cards coming," said Leslie Fiering, analyst at the Gartner Group, Inc. in Stamford, Conn.

Not convinced

Notebook vendors say problems with cellular data transmission methods will be greatly reduced through use of the MNP10 error-correcting protocol, but analysts doubt the protocol will be a panacea. "The general public is going to find out that connecting over cellular is harder than connecting over regular phone lines," said Andrew Seybold.

At the same time, Fiering said notebook vendors could get away without offering PCMCIA cards, which will really not become widely available until next year. Andrew Watson, director of portables marketing at Compaq North America, said that was the major factor in his company's not introducing PCMCIA in its machines yet.

"We have the luxury of waiting until PCMCIA is widespread because we've published the spec on our option slot, and vendors have built cards for it," Watson said. However, he acknowledged that Compaq will "have to make a clean break" to PCMCIA in the future.

Daniel D. Sheppard, director of product marketing at AST, acknowledged that "Q1 next year is when the PCMCIA issue ends." But he said the open standard it establishes will drive far more options for notebooks than exist today.

In the lead

AST's six new notebooks greatly expand the company's PowerExec family, and analysts praised the vendor for refreshing its hot-selling Premium Exec notebook family as the market shifted. They added that the breadth of the announcement at least temporarily put AST ahead of Compaq and probably Toshiba America Information Systems, Inc. as well.

"They've taken a winner of a de-

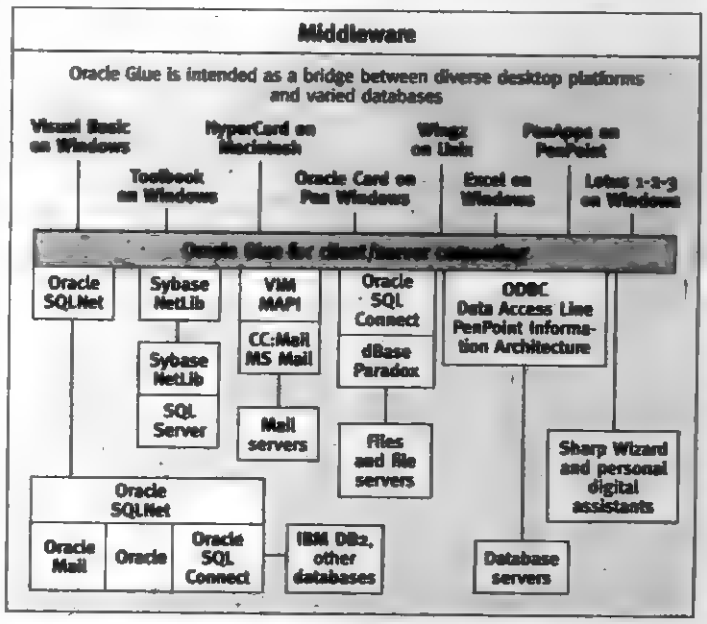
Notebooks, *page 39*

Oracle charts own course with Glue

By Jean S. Bozman
REDWOOD CITY, CALIF.

Oracle Corp.'s recent launch of its Oracle Glue application programming interface (API) neatly sidesteps a potential conflict with software rival Microsoft Corp., industry analysts said. Glue is intended to spur development of Microsoft Windows programs that tap into Oracle database servers; it works without relying on Microsoft's Open Database Connectivity (ODBC) API.

Oracle Glue 1.0's architecture (see chart) provides an alternative to Microsoft's ODBC client/server interface. Oracle has promised to support ODBC but said Glue will not support ODBC until the third quarter of 1993. Meanwhile, Oracle is reportedly working with Microsoft on a separate product, a low-level driver for ODBC.



"It's a sign that open systems are coming to the database world," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass., a market research firm that tracks software tools. "Oracle is realizing that the client market can help them sell a lot of database engines. But a company like Oracle has nothing to gain by being closer to Microsoft than to Novell. They could be buddies with everybody."

Glue approaches connectivity at a high level of abstraction, analysts said. It uses another Microsoft product, Dynamic Linked Library (DLL), to translate commands into server calls. "This means you don't need to buy a gateway to get to a database," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif. "Oracle had to do some serious design work to create a general-purpose API." DLLs are widely supported by PC application vendors, he said.

Developers can use Glue with Microsoft's Visual Basic and Excel programming environments, pasting in Glue commands such as ExecSQL, for example, to reach target databases. Supported servers will be connected to clients via Oracle's SQL Net communications software and SQL Connect gateways. Glue Version 1.0 also supports any Microsoft Dynamic Data Exchange application, such as Lotus Development Corp.'s 1-2-3. Future Glue versions will add support for several electronic-mail file servers and personal digital assistants such as Apple Computer, Inc.'s Newton.

Oracle Glue was developed by Oracle's New Technology Division, which also developed the Oracle Card application builder for Windows and Apple Macintoshes and the older Oracle Access method for client/server applications. "Glue is an adaptable, portable, integrated API that works with many tools and many platforms," said Marc Benioff, vice president of Microsoft's NT unit. "It's an API to the APIs."

Among databases supported by Glue Version 1.0 are those from Oracle, IBM's DB2, Tandem Computers, Inc.'s NonStop SQL and Borland International, Inc.'s Paradox and dBase. Future versions will support Oracle competitor Sybase, Inc.'s SQL Server database and Microsoft's SQL Server for OS/2. The basic Glue tool kit is priced at $2,995 and is slated to be available from Oracle's direct-sales force in April of next year. The tool kit price includes a license for unlimited runtime versions of Oracle Glue. However, there is an additional $899 yearly maintenance fee for upgrades and support.

James Daly

Virus paranoia

When paranoia reigns, gullibility follows. . . . It looks like a Philadelphia TV station got hornswoggled pretty well last month. The station began reporting on a mysterious virus named "Oliver," set to hit Oct. 13, when it would wipe out hard disks and display politically incorrect messages. The station quoted a representative from a suburban computer consultancy and ran several segments about Oliver on the morning news. Oct. 13 came and went, and there were no reports of the enigmatic virus.

Computer-literate viewers were befuddled: Although there is one obscure virus named Oliver, it has no known activation date. Then the lights began to dawn. Seems that the TV station's limited description of Oliver bears more than a passing resemblance to a fictional virus written by superhacker Oliver Wendell Jones on a Banana computer in the "Outland" comic strip. "Outland" is produced by Berkeley Breathed, the same sarcastic wit who drew "Bloom County." Last we heard, the TV station was considering legal action against the consultant.

Whatever you do, don't use the name of your poodle. . . . What's the most prevalent method of system entry by determined data snoops? Late-night break-ins? Putting a gun to your head? Wrong. Most IS security people report that it's the relatively simple procedure of cracking passwords.

Now there's Password Coach, a software pack-

Daly, *page 40*

Jesse Berst

TrueType tributes

First of a two-part series on TrueType.

At first glance, font technology might not seem central to the concerns of IS managers. However, Microsoft's TrueType was one of the most important benefits of last spring's Windows 3.1 update. TrueType helps with three common problems:
1) Overcoming printer differences and limitations.
2) Enforcing corporate standards and consistency.
3) Enabling document exchange across networks.

In this first of two installments, I'd like to spell out why TrueType is important and fill you in on two developments that will make it even more valuable. In the second installment, I'll cover "embedded fonts," a little-known TrueType feature that has great potential.

The TrueType "engine" is built right into Windows. Users don't have to buy anything extra to use it with any Windows application. TrueType not only delivers high-quality type to the printer, but it also creates a matching screen display. What you see on the screen is as close as possible to what you get from the printer.

And when I say "from the printer," I mean any printer, whether it's a Hewlett-Packard LaserJet, a PostScript printer or even a dot-matrix model. As long as it works with Windows, it can reproduce TrueType fonts.

As you probably know, TrueType is a "scalable" technology. Once you have a font outline on your computer, you can scale it up or down to any size. You are not limited to particular point sizes.

TrueType disguises the differences among printers. For instance, a company's Dallas branch can use the same fonts on its HP LaserJet as the Cleveland home office does with its Apple LaserWriter.

Two new products make TrueType even more valuable for corporate users. The original Microsoft Font Pack has become the best-selling type offering in history. Now Microsoft is out with a second Font Pack and a special Microsoft/Hewlett-Packard Font Set.

The $69.95 Font Pack 2 adds new typefaces, including decorative and headline faces. The $69.95 Microsoft/Hewlett-Packard Font Set lets owners of Series II and Series III LaserJets have the same fonts that are built into the new HP Series IV.

Although these products are collections of fonts, the real story is not the type. The real value comes from two new technologies bundled along with Font Pack 2.

One is Font Assistant, which is a way to manage fonts. As users get more and more TrueType fonts on their systems, the situation soon gets out of hand. For instance, applications such as CorelDraw ship with hundreds of free TrueType fonts.

But having that many fonts creates problems. For instance, users may find they can't properly use the font dialog box in some applications. There isn't enough room on screen to display all the names.

Font Assistant lets users organize fonts into smaller, more manageable collections. For instance, a user might have one group for business documents and another for newsletters. Font Assistant lets you see all your fonts at any time, print a font catalog and print type specimen pages at the click of a button.

Graphic artists and type specialists will be interested to know that Font Assistant also includes the Panose font identification technology, which classifies type numerically according to a dozen or so key characteristics. The resulting number can be "attached" to TrueType fonts.

Microsoft has classified all its fonts, so you can use Font Assistant to select a similar font if the original is not available. The system is able to rank fonts by their degree of similarity, giving you a simple way to select the best available match.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

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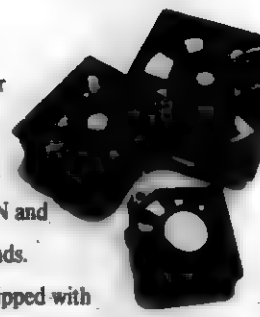

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Wireless notebooks next in line

CONTINUED FROM PAGE 37

sign and put it across their whole product line, which they needed to do," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing" in Brookdale, Calif.

Meanwhile, users appear to be considering color more seriously now, as shown by how demand has outstripped supply for active-matrix color products such as IBM's ThinkPad 700C.

"We would like to use color now, particularly for people who have to make presentations and work with [Microsoft Corp.'s] PowerPoint," said William Lodge, a project leader at The Turner Corp. in New York.

W. B. Soper, manager of information systems at Chevron Canada Ltd., said 486-based notebooks should last at least three years, which lets his company cost-justify color. Active-matrix color notebooks in particular remain expensive, although street prices are dropping significantly on these, falling from more than $5,000 to $3,500.

Several color notebooks appeared with Intel Corp.'s new 486SL chip inside them.

Visible option

Users appear to be considering color more seriously now, as shown by how demand has outstripped supply for active-matrix color products such as IBM's ThinkPad 700C.

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The 486SL essentially takes the integrated logic components in the 386SL and sticks them around a 486DX core. This will help create more power-efficient notebook designs, but users who buy from vendors that have heavy investments in software-based power management features, such as Toshiba, will see little boost in battery life from the SL.

The initial versions of this 3.3V low-power chip run at 20 MHz and 25 MHz, and a 33-MHz version is slated to appear in the first quarter of 1993.

While Compaq and AST both released color screens on their new 486SL-based notebooks [CW, Nov. 9], both look ahead to a more communications-intensive environment.

Compaq, meanwhile, cut prices on a number of its LTE Lite/25 models to make room for a new model with an active-matrix color screen. Analysts and users said the screen could make this 386SL-based model a hot seller.

"That's a dynamite addition to Compaq's line," commented William F. Ablondi Jr., an analyst at BIS Strategic Decisions in Norwell, Mass.

"I was extremely impressed by this screen," said Edward Fernstrom, MIS director at DynCorp., a near-billion-dollar technical services firm in Reston, Va. Fernstrom cited the improved brightness of the screen over ordinary passive-matrix monochrome screens.

Other vendors announcing color notebooks included Ergo Computing, Inc. and Keydata International, Inc.

Peabody, Mass.-based Ergo released the Nifty Fifty 486 Notebrick, a 6.7-pound color notebook based on a 25/50-MHz Intel I486DX2. One of the most powerful notebooks on the market, it has an 8½-in. passive-matrix color screen and a battery life of two hours. Ergo also released a monochrome version of the product and a monochrome 486SX-based notebook.

Keydata, in South Plainfield, N.J., announced Keynote, a $2,795 notebook featuring a 10-in. passive-matrix screen. It is based on Cyrix Corp.'s 33-MHz 486SLC.

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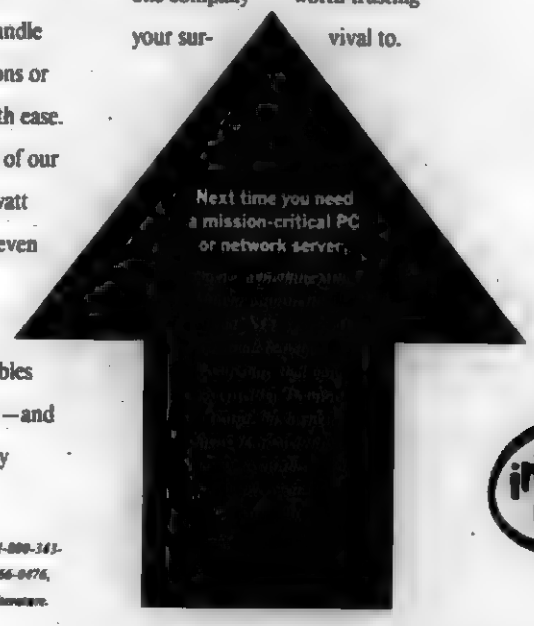

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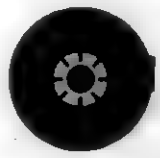
age that puts your password choice through 45 strength tests before giving it a stamp of approval.

Password Coach starts at $395 per Novell NetWare server (for an unlimited number of users) and is available from Baseline Software in Sausalito, Calif.

And counting. . . . According to the Defense Advanced Research Projects Agency's Computer Emergency Response Team, the number of security incidents on the Internet have increased from one per day in 1991 to three a day this year.

Pretty as a picture. . . . Woodside Technologies in Sunnyvale, Calif., has announced what it claims is the first GUI-based security program with antivirus protection for Unix. The $495 Fortress includes a Trojan Horse detector, a password strength test, a file virus inoculator and a feature that looks for weak points in your system. Fortress is now available on Sun hardware sporting the OpenLook interface and will be available in the Motif GUI for IBM and HP workstations next year.



System meltdown countdown. . . . Users of distributed systems may want to get their hands on a new book called *Distributed Systems Security Perspectives* from Demax Software in San Mateo, Calif. The $29.95 book is a collection of interviews with prominent members of the IS security community. Among the conclusions: A security breakdown far greater than the Internet worm could not only happen but is likely to happen.

Peter Neumann, principal scientist at SRI International, says: "We haven't yet had the colossal break-in where somebody gets into a life-critical system and kills people, or billions of dollars disappear as a result of fraud. You will see the Bhopals and Chernobyls of computer security." Call 1 (800) 283-3629 for a copy.

Bring your own lampshade. . . . For the past few years, the computer underground has sponsored a late-year conference called HoHoCon. This year, it will be open to all interested parties including "federal agents, lawyers and authors." If you'd like to check in for three days of meetings, speeches and good times, the meeting is scheduled for Dec. 18 to 20 at Houston's Allen Park Inn. For conference details, the "Security Insider Report" suggests you contact your friendly neighborhood hacker or dial into the Demon Roach Underground at (806)794-4362. Login: THRASH NUP: Jihad.

Speaking of cyberpunks. . . . On Nov. 24, Tucson, Ariz.-based security consultant Ray Kaplan will host an interactive 90-minute telephone conference with some of the most legendary names in the computer underground, including Kevin Mitnick, Lenny DiCicco and Roscoe, all of whom were featured in the 1991 book *Cyberpunk*. Here's your chance to squeeze these fellas about the technical details of their attacks and what can be done to prevent similar assaults. Call Kaplan at (602) 323-4606 for more details.

Daly is a *Computerworld* West Coast senior correspondent.

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In Brief

NetWare-ready PC pact

CompuAdd Corp. signed a reseller agreement with Novell, Inc., paving the way for all desktop and floor-standing PCs from CompuAdd — including a six-model line of PCs and servers announced last week — to be shipped NetWare-ready.

Disk drive from Adstar

IBM's Adstar unit released several new disk drives, including a 4G-byte 5¼-in. drive, a 2G-byte 3½-in. drive and the first 3½-in. drive to use Enhanced Intelligent Peripheral interface, a disk control device, the company said.

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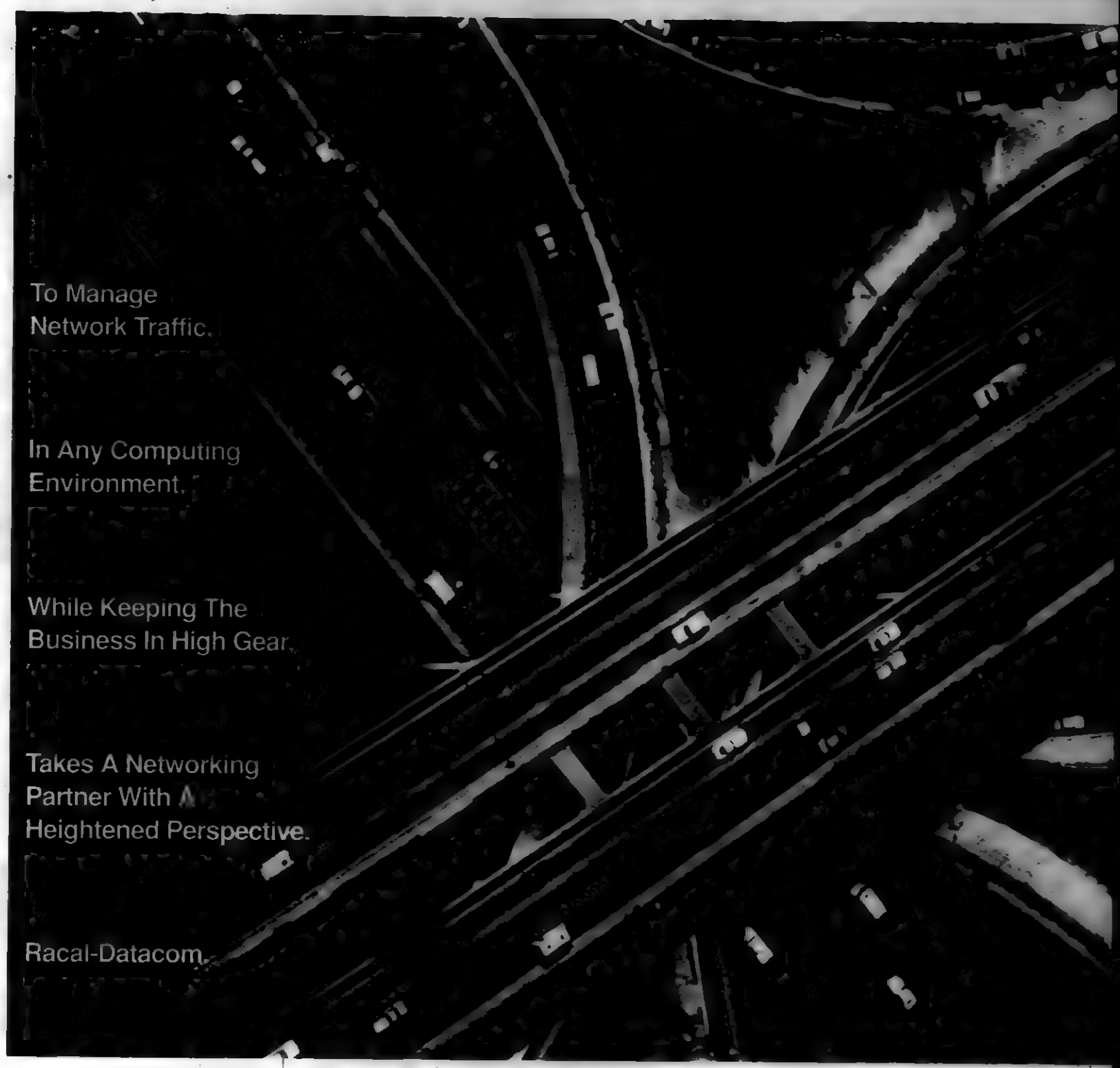

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IBM

Cheap cure for power problems posed

By Mel Mandell

The addition of a few dollars worth of capacitors to the power supplies of PCs may prevent many crashes, according to recent research by an engineer at New England Power Service.

Edward M. Gulachenski, manager of relay and control engineering at the Westboro, Mass., subsidiary of New England Electric Company (NEEC), based his recommendation on a study of power delivered to 50,000 NEEC customers.

What he found was that most of the power disturbances lasted less than a second, and adding the extra capacitors to PC power supplies would help override those momentary interruptions. The added capacitance would eliminate the need for many, although not all, users to buy uninterruptible power supplies (UPS).

Now, Gulachenski is lobbying computer makers and the companies that make their power supplies to add the capacitors, and he has received interest from at least one vendor, Digital Equipment Corp. A DEC engineer was one of thousands of New England Power customers to whom Gulachenski sent a report of his findings.

Gulachenski had Model 626 Universal Disturbance Analyzers from Dranetz Technologies, Inc. in Edison, N.J., attached to the feeders fanning out from six NEEC substations spread from the border of New Hampshire down into Rhode Island. He then did a PC-based analysis of the disturbance data before drawing his conclusions.

Each monitor was equipped with a Hayes Microsystems, Inc. modem connected to a Compaq Computer Corp. 386 PC in Gulachenski's office. The data, collected automatically, is maintained on a Borland International, Inc. Paradox database.

Problem monitor

Once a month, Gulachenski prints a report on a Hewlett-Packard Co. LaserJet III that details all disturbances detected during the prior month. During the study period, customers whose power was monitored were queried as to the impact and extent of problems.

John Elsbree, engineering manager at DEC's PC group in Acton, Mass., has met with Gulachenski and circulated the recommendation to his staff for comment and is planning to test it.

But even if a test finds a cost-effective gain in overriding common short interruptions, the best way for it to be implemented is for the vendors of PC power supplies to add the extra capacitance "... so that all PC makers benefit from economies of scale," Elsbree said.

Gulachenski's recommendation to add energy-storing capacitance to the power supplies of PCs has met with skepticism from the manufacturers of UPS.

Douglas S. Dorr, an evaluation engineer at National Power Laboratories, a division of Best Power Technology, Inc. in Necedah, Wis., noted that the added capacitance protects only against the minority of interruptions that last one second or less.

In addition, there are other kinds of power-line disturbances, such as surges, that cannot be countered by adding capacitance, Dorr said. He also claimed that the added capacitance increases distortion on the power line.

In rebuttal, Gulachenski cited research showing that even adding twice the capacitance that he suggests would bring little distortion.

Conceding that his recommendation only counters momentary interruptions, Gulachenski rated it a highly cost-effective measure compared with spending $150 to $600 for an UPS for each PC. Even in Gulachenski's office some PCs are protected by UPSs.

Gulachenski said the substation study was the first ever undertaken by a power company. However, he expects others to follow based on his presentations of results at two recent conferences on power quality.

Mandell is a technical writer based in New York.

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ClarisWorks now available for the Windows platform

By James Daly

SANTA CLARA, CALIF.

Apple Computer, Inc. software subsidiary Claris Corp. continued its "if you can't beat 'em, join 'em" strategy last week when it announced its second internally developed product for Microsoft Corp.'s Windows platform.

The rollout of the ClarisWorks for Windows integrated application comes several months after the introduction of Claris' FileMaker Pro for Windows 2.0 database management system.

The about-face by the perennially Macintosh-centric Claris stems from heavy market demand for the Windows 3.0 and 3.1 graphical user interface. Microsoft claims to have shipped a total of more than 12 million copies of both versions.

ClarisWorks has proved to be a huge success on the Macintosh platform since it was introduced last year, stealing the top position in the integrated packages category from archrival Works from Microsoft.

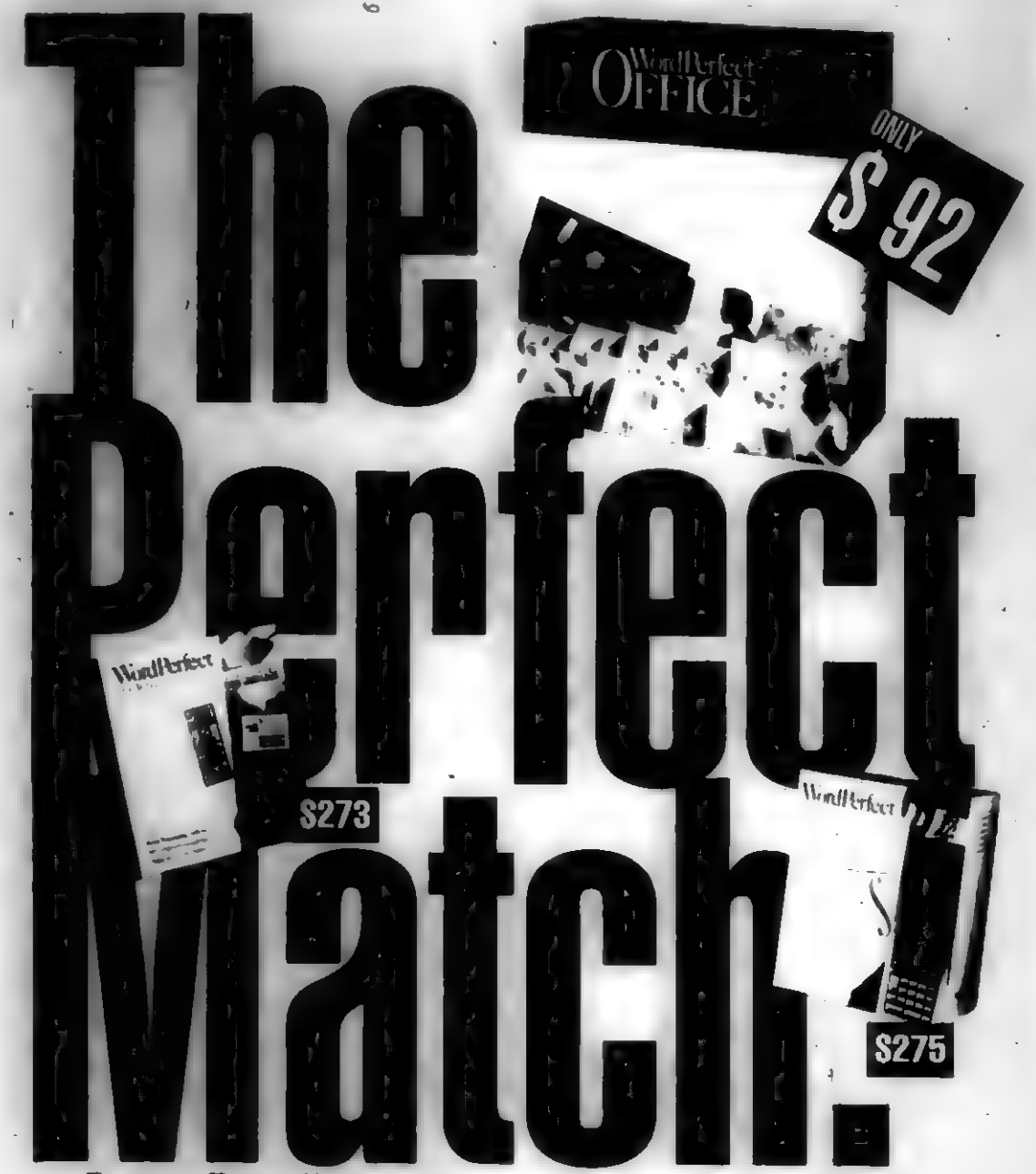
ClarisWorks accounted for a 77% share of that market during the second quarter, according to the Software Publishers Association (SPA). The market for limited function, integrated Windows applications is also growing at the astounding rate of 100% a year, according to the SPA.

Integrated applications have become popular in recent years as a result of the massive increase in the number of portable computers. Integrated packages are typically geared toward mobile users looking for a fundamental set of standard business tools in an inexpensive package.

They are often considered a good option for users who are repelled by the high cost of full-featured software overloaded with esoteric features that they will probably never touch. Such applications also do not require the vast amount of memory or storage of their full-featured cousins.

ClarisWorks for Windows will include word processing, graphics, spreadsheet, charting and database features. Both the Macintosh and Windows versions of ClarisWorks share the same file format so work created on a PC or Macintosh can run on either platform without modification or translation, Claris officials said.

The new application is slated to ship during the first half of next year. A suggested retail price will be announced at a later date, Claris officials said.



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Systems

BlackCurrant Technology has introduced BlackMirror, an automatic, continuous hard disk drive data backup system.

Users install BlackMirror by plugging it into the parallel port of an IBM PC or compatible and uploading the software. Files are copied automatically. Because the backup process is continuous, files are always up to date, the company reported.

Stored data can typically be accessed at the same speed as data on the PC's internal hard disk drive, according to the firm.

BlackMirror is available in 80M-, 120M-, 160M- and 240M-byte capacity units. Prices start at $799.

➤*BlackCurrant Technology*
Suite 300
575 Anton Blvd.
Costa Mesa, Calif. 92626
(714) 432-6514

Fax

Future Soft Engineering, Inc. has announced Terminal Plus with FAXit, a communications and fax software solution for Microsoft Corp. Windows.

According to the firm, the software allows users to send and read faxes from any Windows application. The package offers preconfigured settings for more than 80 modems, plus a range of terminal emulations and file transfer protocols. Other functions include automatic notification of incoming faxes and on-screen revision of outgoing faxes.

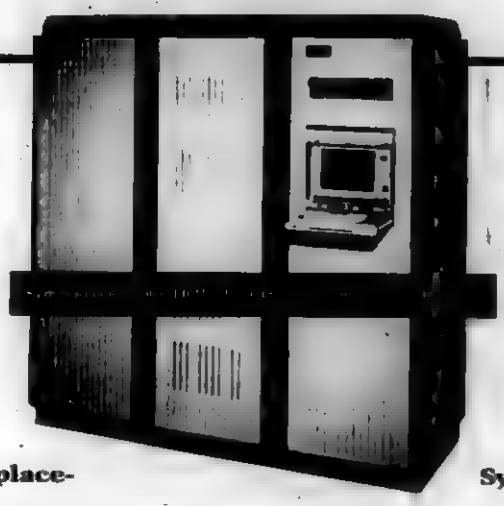
Terminal Plus with FAXit costs $195.

➤*Future Soft Engineering*
Suite 101
1001 South Dairy Ashford
Houston, Texas 77077
(713) 496-9400

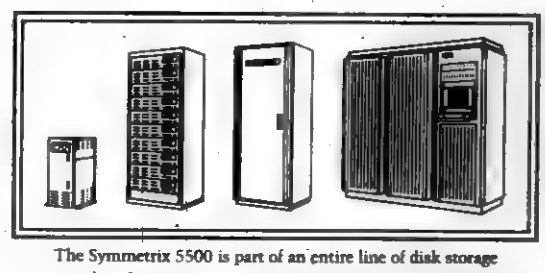
Whoever said time is money must have been thinking of disk storage on a mainframe computer, where downtime can cost upwards of $100,000 a day. But now that's a thing of the past, thanks to the Symmetrix 5500 from EMC.

As the latest product in the Symmetrix Series, the 5500 also offers true continuous operation, which provides access to your data when you need it – 24 hours a day, seven days a week. It also offers proactive maintenance features, a full mirroring option, hardware redundancy and hot replacement and upgrade of all critical components.

Introducing Symmetrix 5500 from EMC.



The Symmetrix 5500 is a further evolution of EMC's Symmetrix Series of Integrated Cached Disk Arrays (ICDA™), which leads the industry in virtually every significant disk category: performance, capacity per square foot, environmentals, cost of ownership and data availability.



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

Simply put, Symmetrix is a significant technological advancement over conventional DASD and cached storage. Which helps to explain why it already enjoys widespread acceptance across all IBM and compatible platforms.

The Symmetrix 5500 is a product of EMC's MOSAIC:2000™ architecture for storage development, which allows us to bring the best of today's technology to market quicker. This allows our customers to take advantage of the strategic benefits of technology leadership with the Symmetrix Series.

In today's competitive business environment, it is vital to have access to critical data when you need it. Now Symmetrix 5500 brings around the clock availability and fast access to data that is mandatory for times like these.

For further information on the Symmetrix Series, please call 1-800-424-EMC2, extension LM63C.

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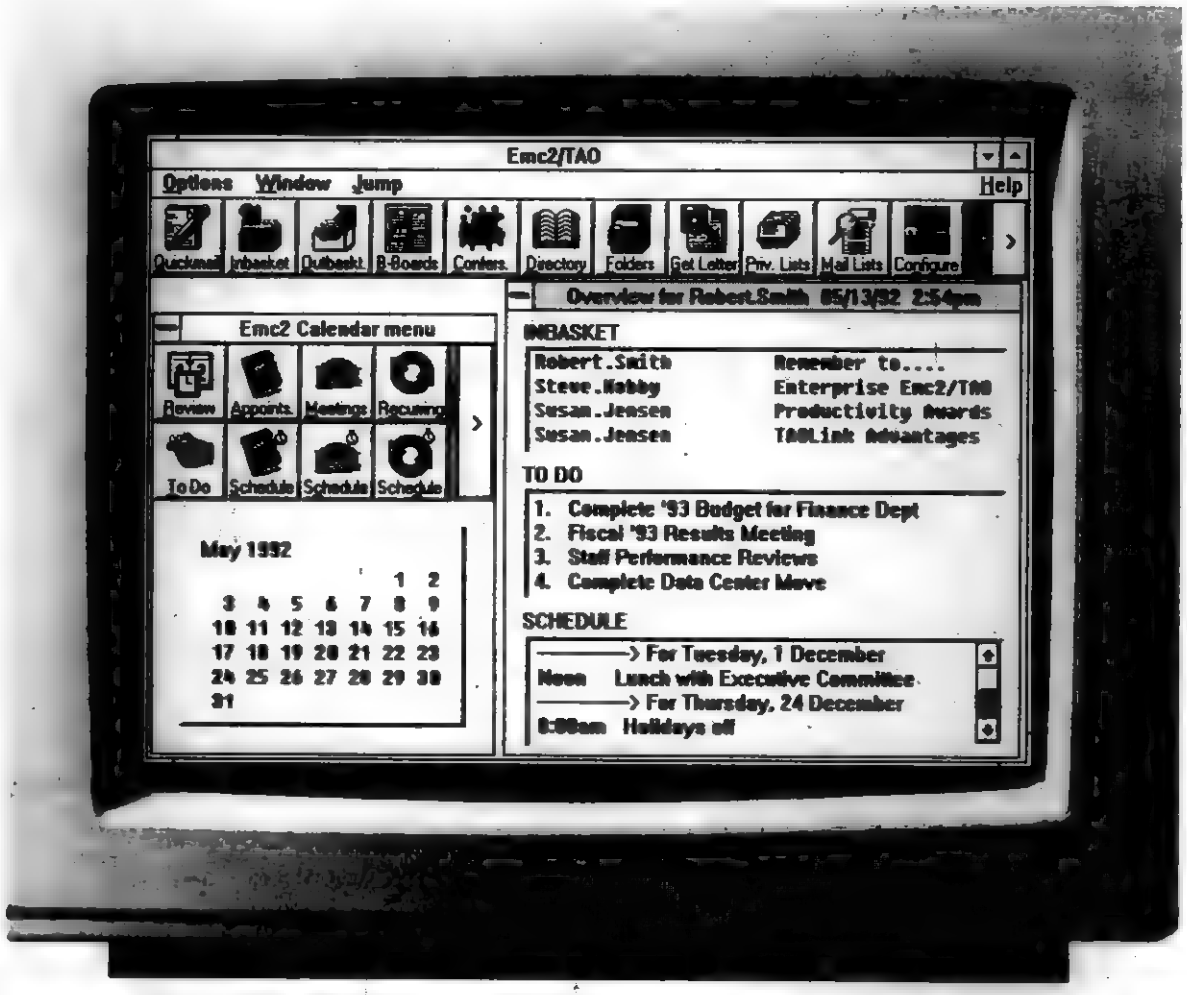
E-Mail For Both Mainframe And LAN Is A Huge Headache...



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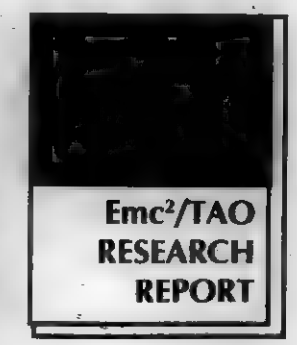


Sun clears up Solaris act

By Maryfran Johnson

With its gaze fixed on the commercial market and the "rightsizing" phenomenon, SunSoft, Inc. recently launched an updated, bug-bombed version of the Solaris operating system.

"Quality improvement" was the rallying cry for Solaris 2.1, which SunSoft cleansed of some 1,300 bugs from 4 million lines of code. The 32-bit software environment, scheduled to ship next month on all new systems, offers a 40% increase in network performance and a slew of installation, administration and security improvements.

SunSoft cleansed Solaris 2.1 of some 1,300 bugs from 4 million lines of code

"The two biggest problems in downsizing are security and system management," said Tom Wood, a senior industry analyst at Business Research Group, Inc. in Newton, Mass. "It appears quite clearly that Sun has addressed those problems strongly with this new release of Solaris."

Critical components

This version, priced at $795 for single desktops, also provides fully symmetric multiprocessing and multithreading capabilities — critical components for SunSoft's multiprocessor servers. Major enhancements for users with two- and three-dimensional graphics needs were also added.

"It's probably a pretty decent operating system, but Sun isn't capturing a lot of mind share yet," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. "One thing they have done is make Solaris more modular, and that's important to users."

Another important aspect for users is the ability to run their current applications under Solaris 2.0 and 2.1. Yet, of the 5,000 Scalable Processor Architecture (SPARC) applications available today, only 800 of them so far have third-party vendors committed to native ports for Solaris 2.0 and beyond.

One way SunSoft said it hopes to avoid this problem is by enabling users to run SPARC applications under 2.0 through the Binary Compatibility Mode feature, a kind of emulator that includes the Solaris 1.1 libraries.

The catch is that applications have to be dynamically linked to use the compatibility mode. SunSoft officials said about 40% of currently available applications were built with dynamic linking capabilities.

Important features

Among the key features of Solaris 2.1 are the following:

- JumpStart: A feature that automatically installs and configures hundreds of SunSoft systems across a network, simultaneously and with no user interaction.
- Online Backup: A product for restoring and backing up Solaris 2.0 data across the network.
- User Manager: A graphical tool enabling users on worldwide networks to add new accounts and build user directories on remote servers.
- Solaris Shield: A product providing C2-level security, which is a critical requirement in some government contracts.
- XGL Graphics Library: A software programming interface, hardware device driver interface and runtime environment for developing 2-D and 3-D geometry-based graphics applications in the technical market.
- Information On-Line: A bundled version of the AnswerBook hypertext-based on-line documentation facility with information from user manuals.
- Software Manager: An icon-based feature for installing and manipulating third-party applications, whether they are on CD-ROM or hard disk.

Windows for Workgroups tough LAN competitor

By Michele Dostert

Windows for Workgroups, the combined desktop/networking product from Microsoft Corp., is expected to have a major impact on the peer-to-peer local-area network operating system market.

Because Windows for Workgroups includes, at no extra charge, the same type of networking services sold by companies such as Artisoft, Inc., based in Tucson, Ariz., Sitka, Inc., based in Alameda, Calif., and Tiara Computer Systems, Inc., based in Mountain View, Calif., these companies may have suddenly become superfluous in the networking world.

"Windows for Workgroups eliminates the need for customers to buy additional networking software to connect their PCs," said Russell Siegelman, product manager for Windows for Workgroups. "We have built the peer-to-peer networking, which people used to buy from companies like Artisoft, directly into Windows for Workgroups as a set of services."

What's missing?

In its first release, Windows for Workgroups does not have many of the features found in other peer-to-peer LAN operating systems. For example, Artisoft's LANtastic operating system supports DOS servers, 12 levels of security control, immediate print spooling, network troubleshooting and remote processing on servers as well as the ability to copy user accounts to a server, log users out of a server and disable server log-ins and diskless workstations. None of these features are in

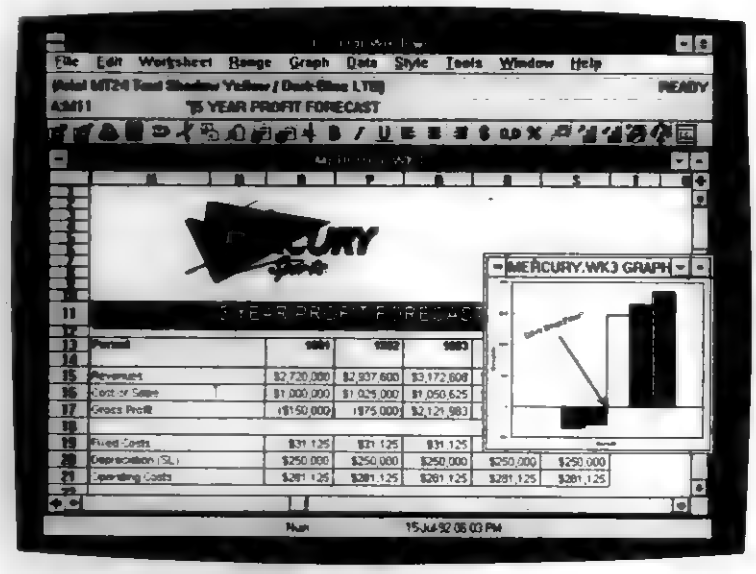
Windows, *Page 52*

Networking with Windows for Workgroups

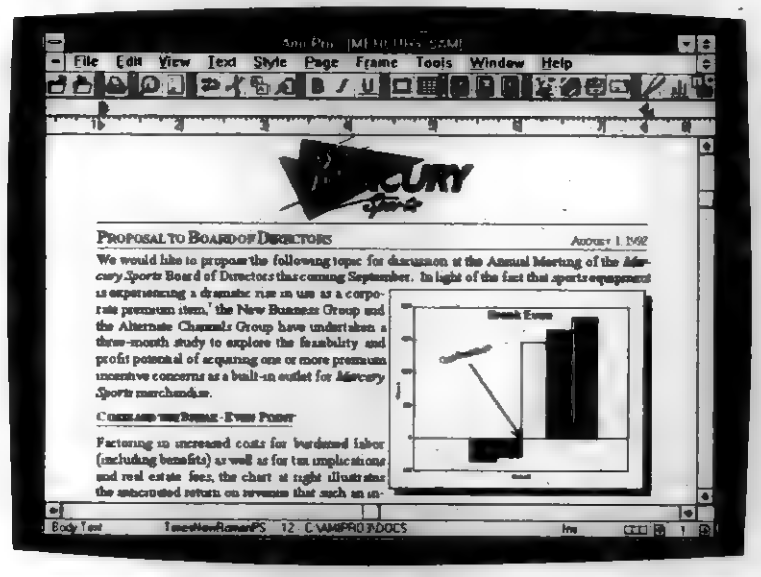
STRENGTHS:
- FREE WHEN YOU BUY THE DESKTOP OPERATING SYSTEM.
- SIMPLE, EASY TO USE AND MAINTAIN.
- TIGHTLY INTEGRATED WITH MICROSOFT'S MAIL-ENABLED APPLICATIONS, MESSAGING AND SCHEDULING.

WEAKNESSES:
- WON'T WORK WITH MACINTOSH OR OS/2 CLIENTS.
- WON'T SUPPORT OTHER PEER-TO-PEER LAN CLIENTS.
- LACKS SERVER-BASED SECURITY AND ADMINISTRATION.
- REQUIRES 386-BASED PC; 4M BYTES OF RAM RECOMMENDED.

Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.

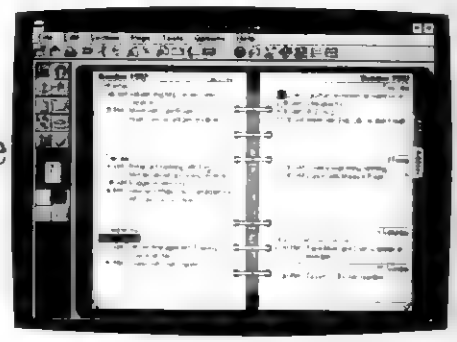


Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite and Microsoft Office include full-featured products. But SmartSuite has been recently updated to include 1-2-3 for Windows Release 1.1 with SmartPak and the newly released Ami Pro 3.0, as well as Freelance Graphics and cc:Mail.

All four of these award-winning products share a common interface as well as our innovative SmartIcons. So when you've learned one, you've learned them all.



For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products, for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint. You can even move

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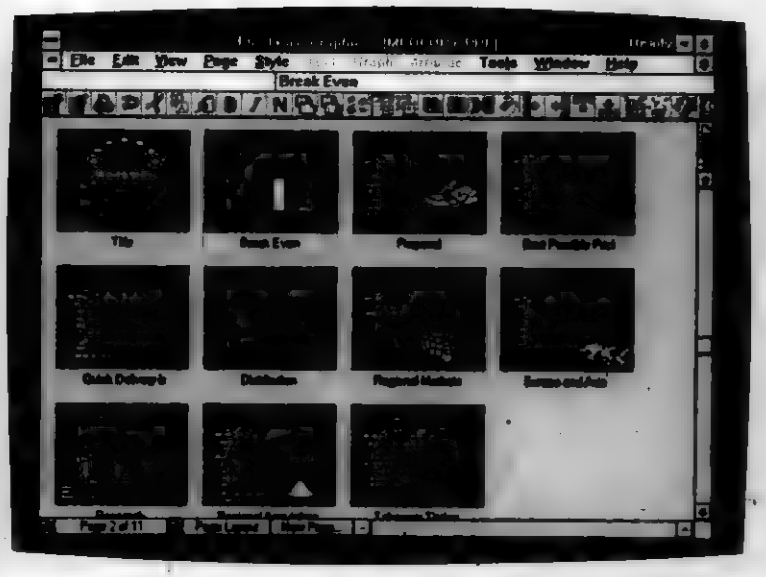

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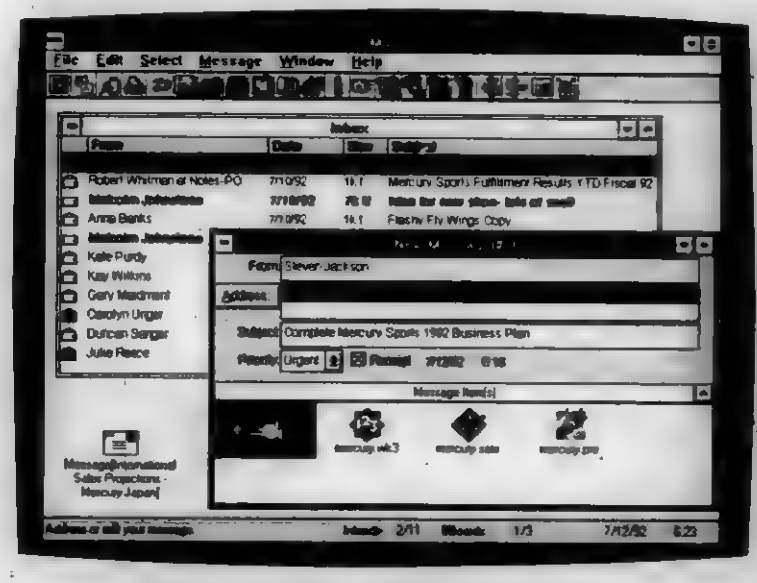

cc:Mail, the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

quickly between SmartSuite applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

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Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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Windows for Workgroups tough LAN competitor

CONTINUED FROM PAGE 49

Windows for Workgroups.

"Our primary goal in Windows for Workgroups was to make networking easy, which is why it's user-based, rather than supervisor-based, and lacks some of these administration capabilities," Siegelman said. "We made a conscious choice for simplicity and left the high-end LAN administration and management functions to the client/server LAN operating systems."

Peer-to-peer LAN operating systems also support more client types than Windows for Workgroups, which can only support DOS and Windows clients. Artisoft supports DOS, Windows, Apple Computer, Inc. Macintosh and Transmission Control Protocol/Internet Protocol clients, with OS/2 support scheduled for the spring. Sitka's 10Net LAN operating system supports DOS, Windows and Macintosh clients.

Windows for Workgroups contains client software for powerful client/server LAN operating systems, such as Novell, Inc.'s NetWare, Microsoft's LAN Manager and Banyan Systems, Inc.'s Vines. However, Windows for Workgroups will not work with peer-to peer LAN operating systems such as NetWare Lite or LANtastic.

Willing to sacrifice?

This means customers who want to upgrade to Windows for Workgroups may have to discard their simple, fairly robust peer-to-peer LAN operating systems and replace them with the more limited connectivity found in Windows for Workgroups. Also, in order to network Windows for Workgroups, it must be running on a 386-based PC, with a recommended 4M bytes of random-access memory — a hardware investment that many peer-to-peer customers may be unwilling to make.

"A lot of our customers are really attached to their current LAN operating system and are in no hurry to discard it," said Al Conway, president of ACG, Inc., a Dayton, Ohio, reseller of PC-based business systems. "Also, there are a lot of people out there who don't want to throw out their hardware and buy 386-based PCs to run Windows, when most of their applications are still DOS-based."

At first glance, Windows for Workgroups, at $249 per PC, appears more expensive than LANtastic, which costs $99 per network if purchased with Artisoft Network Interface Cards, or NetWare Lite, at $1,995 per 10-node network. However, because Windows for Workgroups includes both network and desktop operating systems, it will actually be cheaper for first-time network installations.

Since Windows for Workgroups' debut, peer-to-peer vendors have been poohpoohing Microsoft's impact on their sales.

"When Novell jumped into the peer-to-peer market, our sales went up because that helped legitimize the peer-to-peer LAN operating system. We think the same thing could happen with Windows for Workgroups," said Jack Schouf, president and chief executive officer of Artisoft.

Industry watchers, however, are not so sanguine about the future of the peer-to-peer marketplace.

Jodi Mardesich, a LAN analyst at The Burton Group, a Salt Lake City-based LAN market research firm, said, "Windows for Workgroups has got to be frightening the peer-to-peer vendors because it's going to affect their sales. How much it affects them depends on how good Windows for Workgroups is. The major peer-to-peer players, like Artisoft, Sitka and Tiara will survive; I think the smaller peer-to-peer companies may be in for rough sledding."

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21 MEGABYTE*

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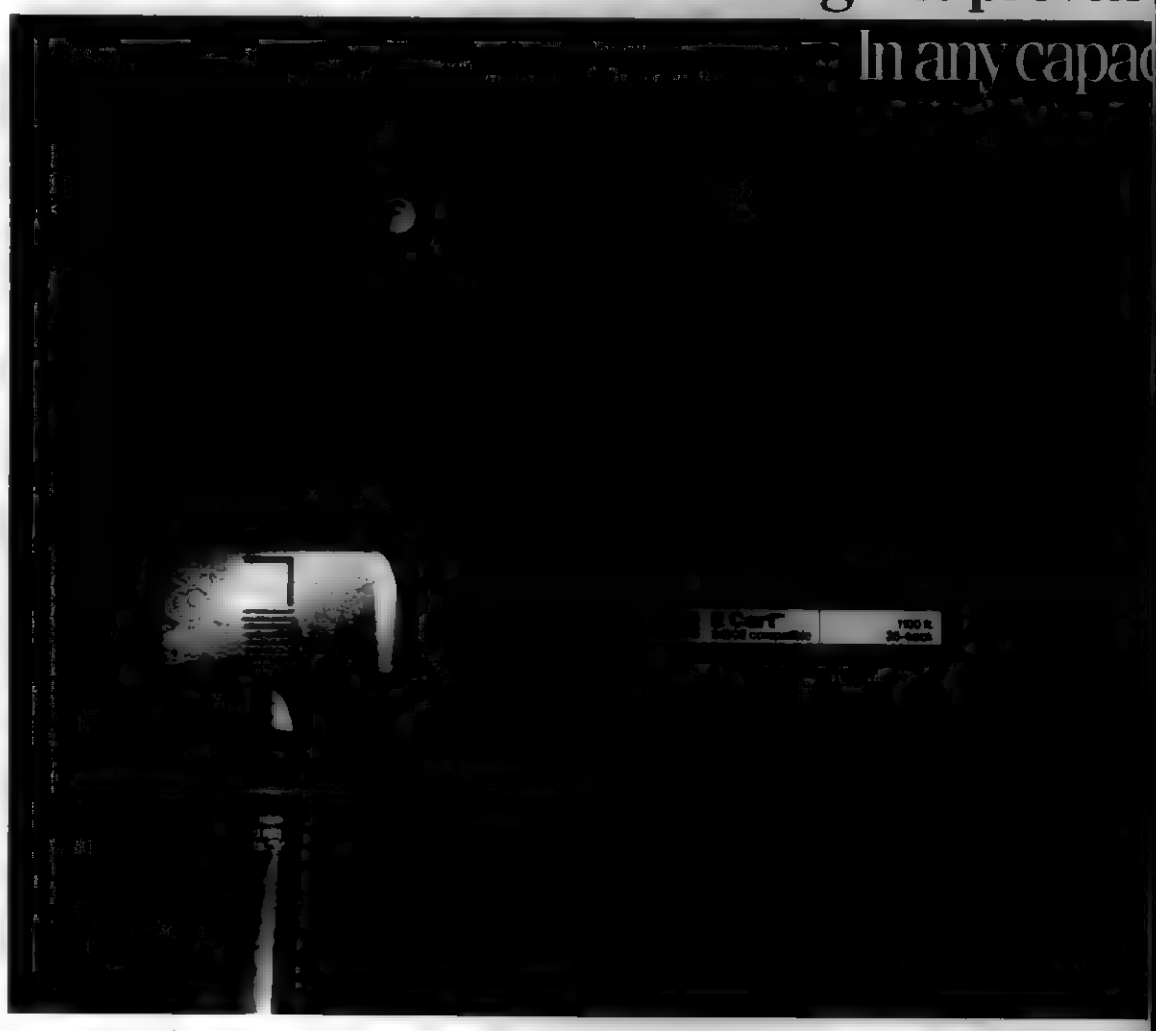

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Law firm migrates from Wang

By Kim S. Nash
CLEVELAND

The folks at *L.A. Law*'s MacKenzie, Brackman have nothing on Jones, Day, Reavis & Pogue, one of the largest law firms in the world with 1,200 attorneys and 22 major offices throughout the world.

However, with size come sizable problems, and Jones, Day has one. Forty VS minicomputers from Wang Laboratories, Inc. have become a source of concern with Wang floundering in Chapter 11 bankruptcy protection.

"We know there is stuff we'll want to do down the road, such as imaging, that the VS doesn't have the . . . power to handle now. And the future's not looking so good," said Bryan Burgin, systems analyst and software architect at Jones, Day.

But with an estimated $50 million worth of hardware, it is tough to turn on a dime. So the law firm has mapped out a two-year interim plan to transform VS processors into file servers for PC local-area networks, on the way to probably dumping Wang altogether.

Instead of tying itself further to Wang, the firm is replacing Wang electronic-mail, document management and word processing software with popular PC systems, such as WordPerfect Corp.'s flagship word processing package.

Approximately 3,000 PCs from various clone makers will run these packages but continue to access data on the VS boxes. That translation is made possible via Lightspeed NVS, a utility from third-party Wang supplier MacSoft, Inc. in Bakersfield, Calif.

Lightspeed, priced according to the number of VS processors to be accessed, acts as a go-between to help VS minicomputers talk to PCs. The product lets up to 32 PCs, Apple Computer, Inc. Macintoshes or Unix workstations share one Wang Local Office Connection board across a LAN to get at VS data.

"The VSs still work well, so why ditch them now?" Burgin observed.

However, the firm is committed to PC LANs, where availability of components "is more stable."

Because of the volumes of paper they generate, legal firms and departments are a major target for Office 2000, Wang's plan to sell imaging software and services. That a giant law firm such as Jones, Day is not interested does not bode well for the stay-alive scheme.

Jones, Day's server transformation project, dubbed VS LAN, has a budget of $7 million. VS LAN was tested in two offices for about six months before formal rollout began early this month with shipment of installation kits to all major locations.

The law firm developed menus similar to those that end users currently see to make the change as invisible as possible, Burgin added.

Implementing VS LAN lets Jones, Day rapidly install PC products without changing business operations. The benefits are twofold. Users do not have to learn new procedures while they are being trained to use PCs. Plus, VS LAN lets the IS department migrate at a "sane" pace, Burgin said.

The Austin, Texas, office, where VS LAN has been in place since May, has reported quicker processing under the distributed architecture.

ON SITE

Jones, Day, Reavis & Pogue
Cleveland

Challenge: To preserve investment in Wang minis while downsizing.

Technology: PC LANs and MacSoft's Lightspeed, a PC/Wang VS interpreter.

Results: Two years of breathing room to retrain users and implement new technology.

128 MEGABYTE

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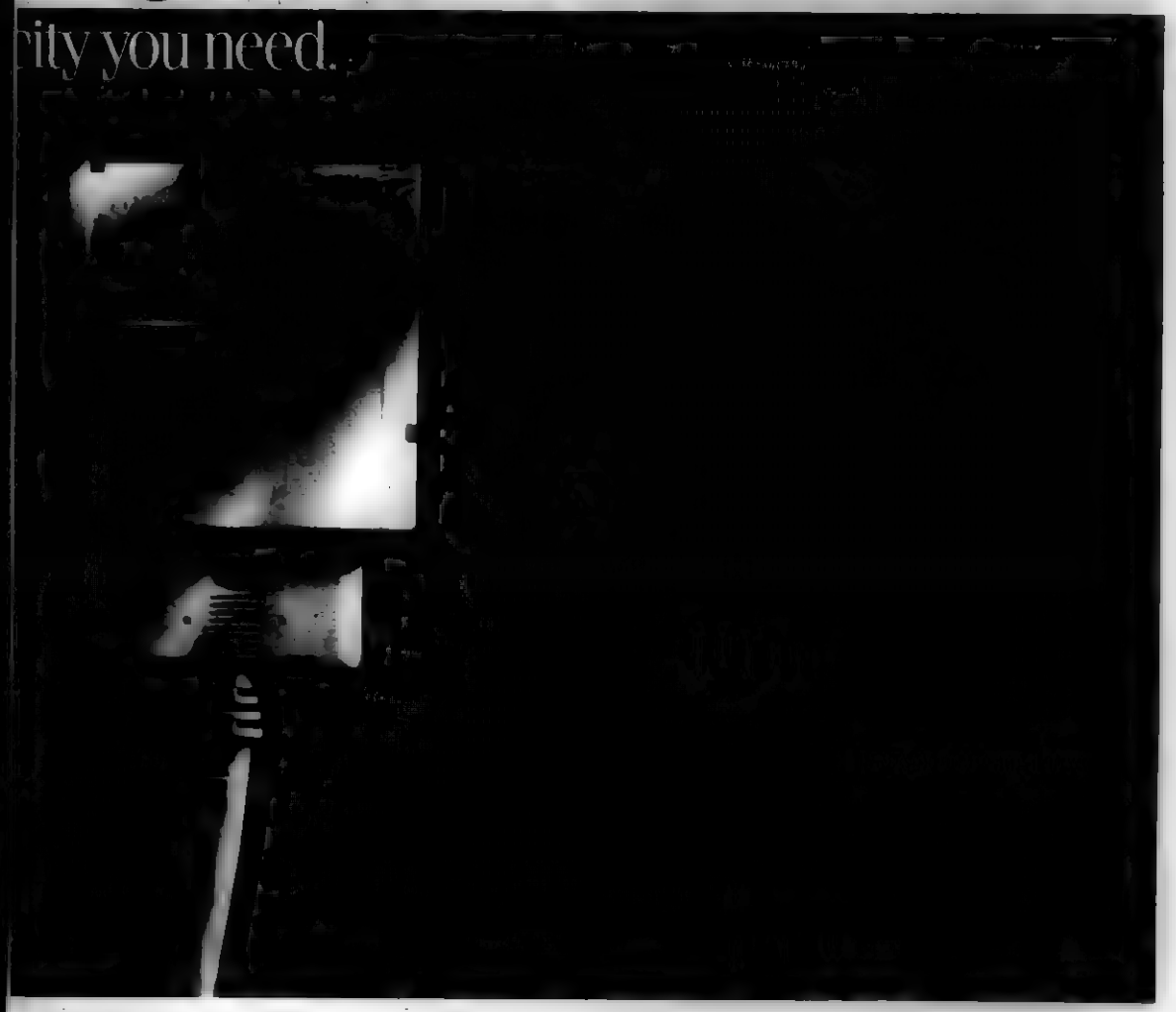

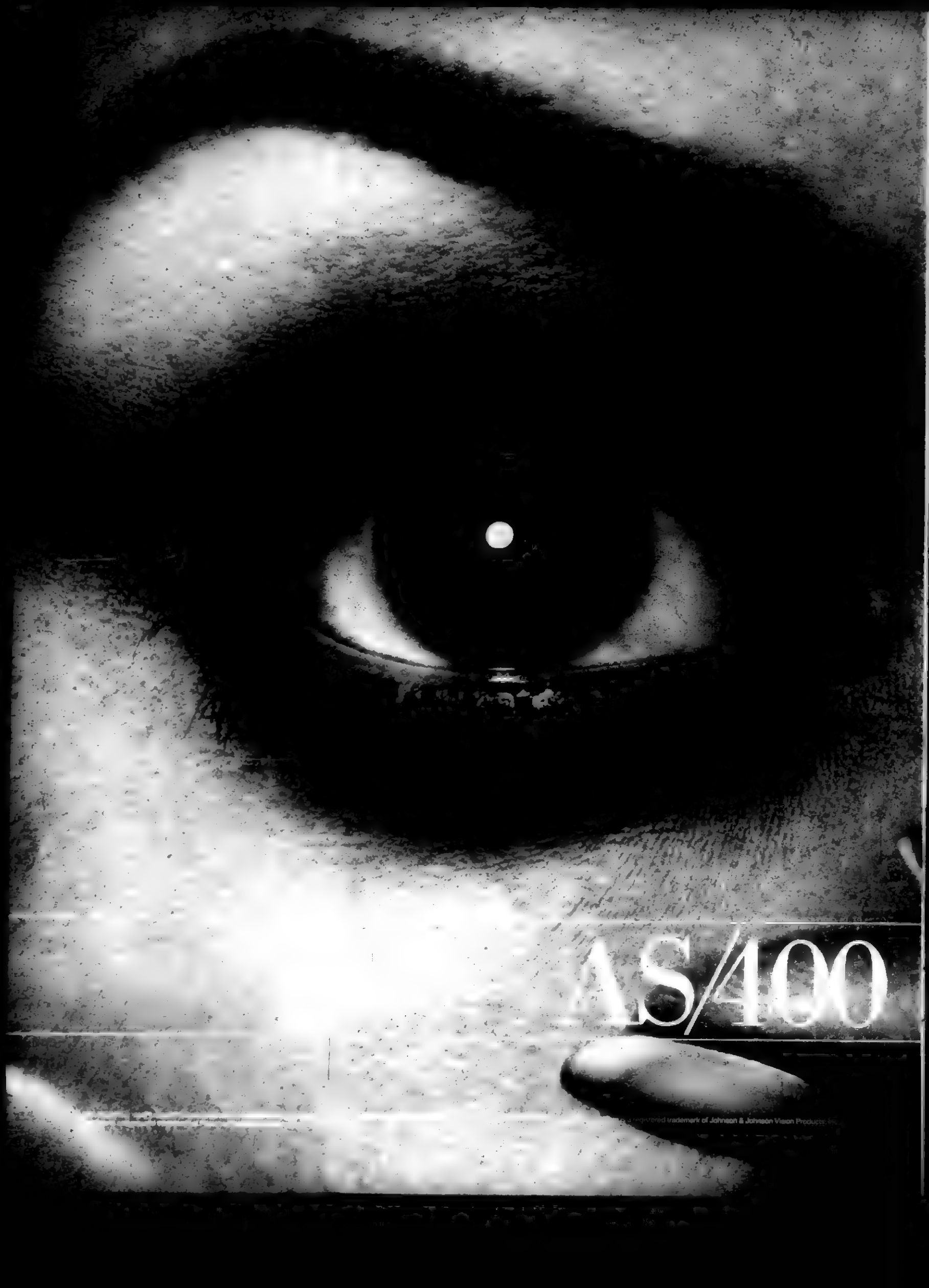
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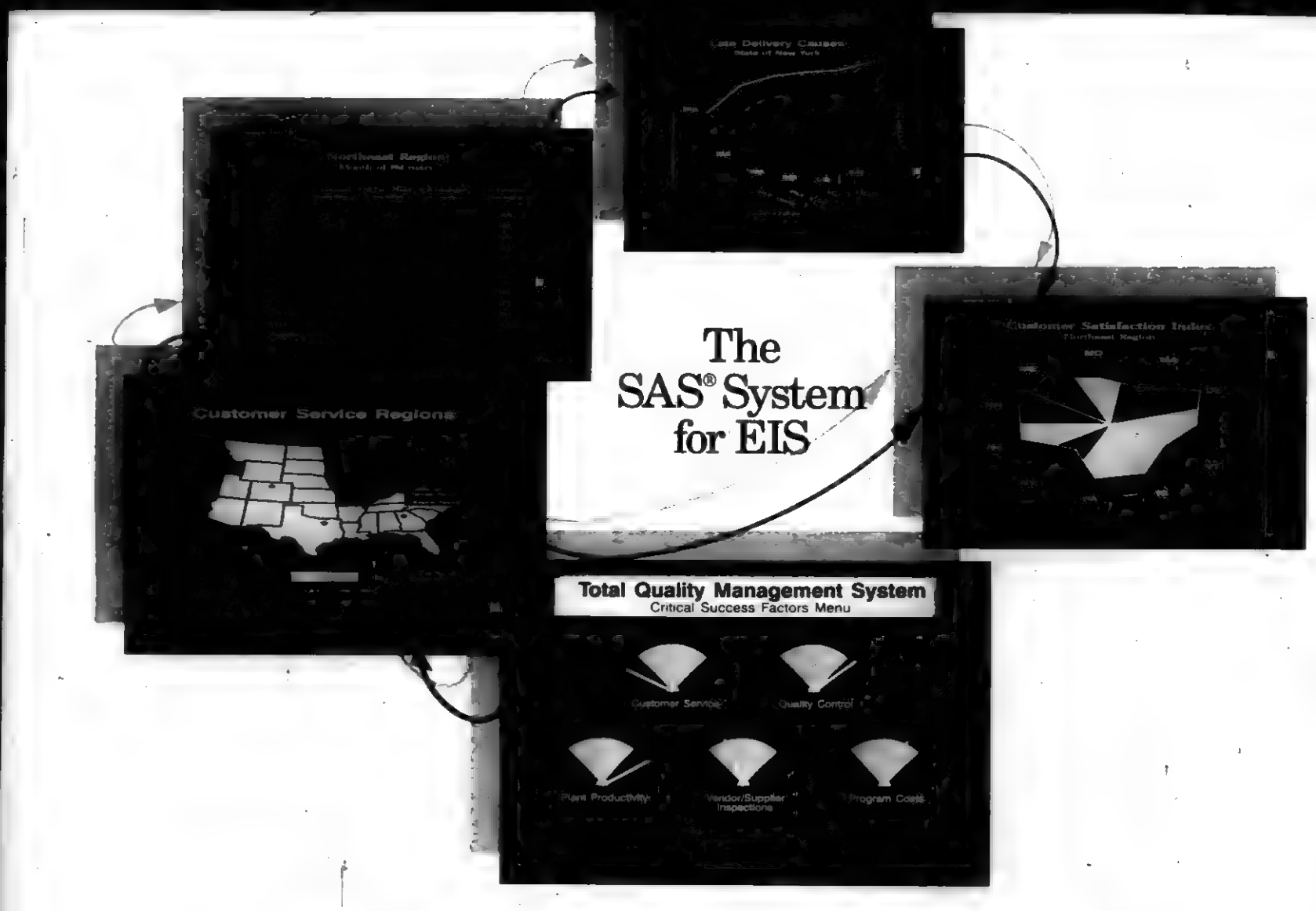

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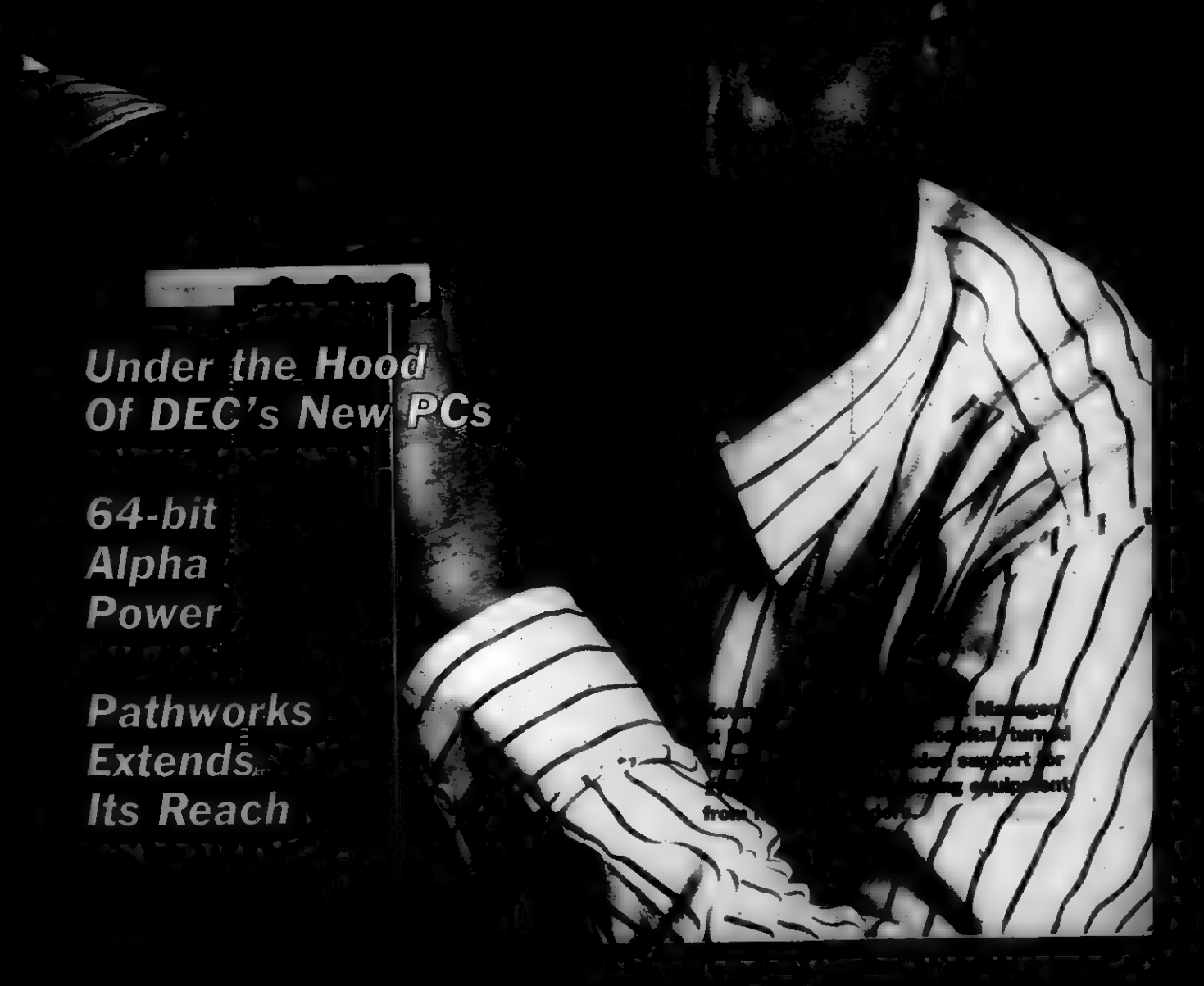
Digital
ON THE DESKTOP



Under the Hood Of DEC's New PCs

64-bit Alpha Power

Pathworks Extends Its Reach

JULY 1992, PC MAGAZINE DESCRIBES THE PERFECT PC.

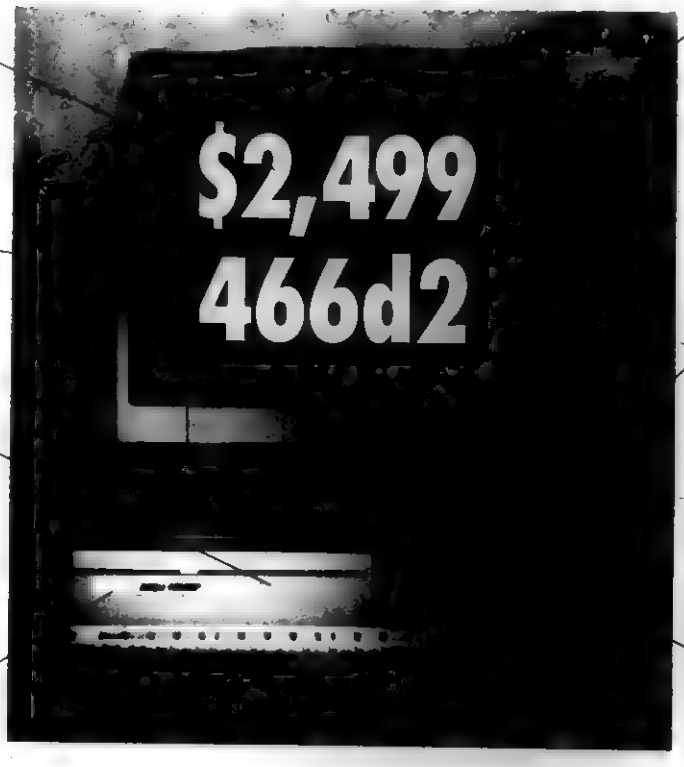
SEPTEMBER 1992, DIGITAL MANUFACTURES IT.

"...if your ultimate PC system runs Windows, an accelerated VGA card can boost performance to 3 to 20 times that of a dumb frame buffer."

"For the utmost in display speed, look at local bus designs..."

"A high scale of chip set integration lowers cost and improves system reliability..."

"To save space, look for built-in parallel and serial ports, and IDE and video circuitry."



"Display adapters using VRAM...are often twice as fast as DRAM-based boards."

"To take advantage of a 32-bit operating system such as OS/2 2.0 or Windows NT (when it ships), you will want at least 8 MB of RAM, so a 16 MB motherboard may prove limiting in the next couple of years."

"Note that metal SIMM sockets are preferable to plastic ones."

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• 4 MB RAM • 122 MB hard drive • 14" low-radiation Super VGA non-interlaced color monitor
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Digital Sizes Up the Desktop

This special supplement, prepared for Digital Equipment Corp. by editors and writers of the International Data Group, is meant to focus attention on the technologies and services Digital offers on the desktop.

While starting from a relatively small base, Digital has become one of the fastest growing vendors of PC hardware this year. In addition, Digital officials say revenues from its PC networking product, Pathworks, will soon overtake revenues from DEC's mainline VMS operating system.

Desktop mainframe? Digital's 64-bit Alpha workstation.

DEC approaches desktop connectivity from the server down rather than from the desktop up – given its experience with wide area networking – and is seeking through Pathworks to provide a layer of integration services above the stand-alone PC.

To examine these technologies, we have organized this supplement into four sections: PC hardware, PC integration services, workstations, and X terminals/dumb terminals/other desktop services.

In the first section we try to explain how Digital can claim to speed up Microsoft Windows and ask both inside and outside sources how Digital is doing as a PC vendor.

In the second, Kevin Hourican of Boston's Children's Hospital and Nina Lytton of the Open Systems Advisor newsletter, explain how they use DEC's integration services.

In the third, workstation guru Don Gaubatz talks about the future of Digital workstations, then illustrates it by teleconferencing via his desktop machine.

The fourth section touches upon how dumb-terminals aren't so dumb anymore and how a software architecture called DECprint can allow you to initiate a two-way conversation with a remote printer. ■

Service and Low Prices Fuel DEC's PC Sales Growth

In January, Digital Equipment Corp. launched a massive direct marketing and mail-order PC sales program, slashing prices 50 percent. In its determination to compete, Digital cut prices an additional 30 percent in February and again in July.

The aggressive marketing and pricing appear to be paying off. Digital was the fastest growing PC vendor in the country in May and June and five times this year has appeared among the top 10, according to Computer Intelligence, a La Jolla, Calif., market research firm.

"Digital has stayed on the Up-and-Coming PC Vendors list longer than anyone in recent history," noted Dan Ness, senior industry analyst at Computer Intelligence, of Digital's five-month appearance there. In July it dropped out of the number one slot to number five, being replaced by Cumulus Computer.

In fact, Digital's overall PC sales for the fiscal year ending June 30 were 275-percent greater than its PC sales during the previous year, sources at the company claimed. InfoCorp of Santa Clara, Calif., tracks PC sales and says Digital sold 134,700 worldwide in the first six months of calendar 1992, compared to 69,660 for all of 1991. In the U.S. alone, the figures were 59,767 for the first half of 92 compared to 31,105 for 1992, according to analyst David Carnevale.

However, reports of rapid growth of PC hardware sales are based on increases in a relatively small installed base. Digital barely cracked the top 20 in overall sales and it accounts for slightly more than 1 percent of the domestic PC market, according to Ness.

On the other hand, Digital's revenues from PC-related sales of software and networking like Pathworks, its PC-to-host and LAN-to-WAN package, boost its total revenue take. InfoCorp estimates DEC PC revenues, including software and peripherals as well as hardware, at $423 million in the first half of 1992, compared to $261 million in 1991. PC-related sales are one of Digital's fastest growing areas of revenue, analysts said.

PC market share
In percentage as of July 1992

IBM	17
Apple	12
Compaq	8
Dell Computer	5
Gateway 2000	5
DEC	1
Other	54

Source: Computer Intelligence

Digital's effort through the first half combined the competitive pricing strategy of fast-growing PC makers such as Dell Computer Corp. with free, onsite service for a year and the Desktop Direct, 1-800-PC-BY-DEC, quick delivery number. Since Aug. 25, it has been offering its Low Profile line of PCs that it manufactures itself with a modular, snap-in-CPU upgrade capability.

"The sales reps know the products and can explain them in a way that makes sense," said Mike Luckenbach, an MIS manager at Asea-Brown-Boveri, a Windsor, Conn., electrical power systems and nuclear fuel manufacturer.

Through Desktop Direct, Digital has increased the company's customer base by more than a third, said John MacGilvary, Digital's U.S. PC sales and marketing director.

On June 26 Dell reduced prices on a line of PCs, prompting other clone makers, including Advanced Logic Research Inc. and Hyundai Electronics, to follow suit. Digital's latest cuts came soon after. It likewise priced its LP line of PCs aggressively.

Both MacGilvary and Computer Intelligence's Ness believe Digital's reputation as a service provider rather than low prices has fueled the accelerated growth in PC sales. "Right now we're the only manufacturer delivering our own onsite support services," he said. Clone makers supply a similar service through third parties like TRW. Ness added, "It's hard for a smaller company to offer that kind of service." ■

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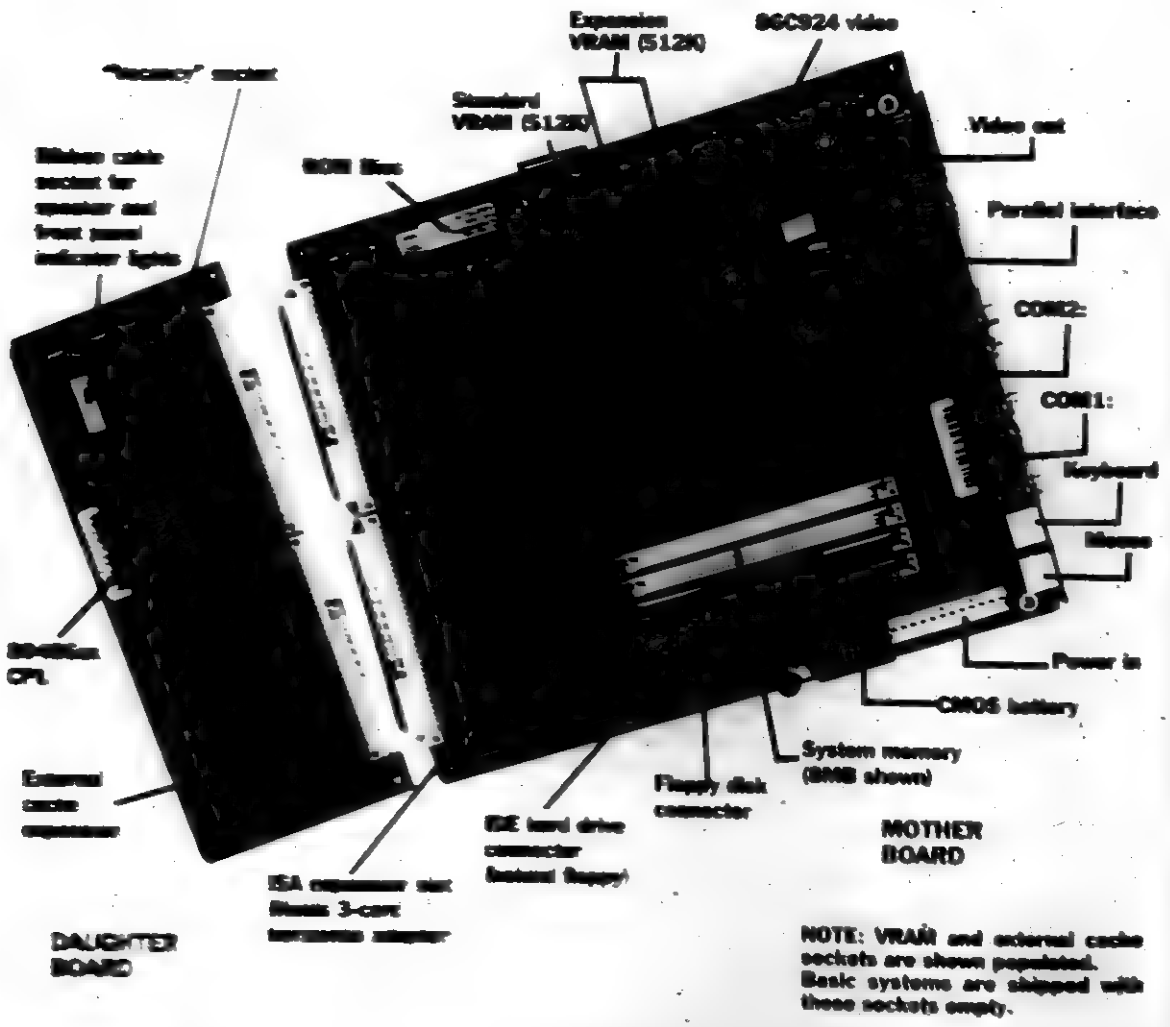
Design: David Grober and Thea Shapiro

Inside the 425sx LP



NOTE: VRAM and external cache sockets are shown populated. Basic systems are shipped with these sockets empty.

DECpc 425sx LP technical reference

Note: Many of these features are common to the other units in the ___ line.

CPU: 80486SX at 25 MHz

Standard Memory: 4-MByte system memory; 512-KByte video RAM (VRAM) video memory

Maximum Memory: 64-MByte system memory; 8 MBytes as evaluated; 1 MByte VRAM video memory

External Cache: 128-KByte; expandable to 256 KBytes

Jumper System Clock: 25, 33, 40, 50 MHz

Storage: 122-MByte IDE hard disk; 1.4-MByte 3.5-inch floppy disk

Video: SVGA-compatible adapter with graphics accelerator on mother board

I/O: AT I/O on mother board: IDE and floppy controllers, two serial ports, one parallel port, and one mouse port

Expansion: 3- x 16-bit, full-length ISA slots

Internal Drive Bays: Two (one free in basic configuration)

External Drive Bays: Two (one free in basic configuration)

Case: 3.5 x 16.1 x 15.6 inches (90mm x 410mm x 396mm)

Standard Software: MS-DOS 5.0, Microsoft Windows 3.1, DiagSoft QAPlus diagnostics, drivers and system utilities

System BIOS: Phoenix

Video BIOS: AMI

Power: 145 Watt, auto-sensing supply with 100-240VAC input

Warranty: One year, money-back guarantee

Maintenance: 1 year on-site maintenance

Configuration as evaluated

DEC's New PCs

Low Profile line speeds up Windows and offers modular upgrade capability

By TOM BADGETT

Digital Equipment Corp.'s 425sx LP is among the front runners in the company's new line of high-performance, low-cost, upgradeable PCs.

Notice the individual components of that description. The LP in the product name stands for low profile, a reference to the narrow case that makes this line of PCs look more like terminals than PCs.

The high-performance part refers not only to the 25-Mhz 80486sx CPU that drives this machine, but also to an internal design that runs some programs especially applications for Microsoft Windows – faster than competitive hardware. Screen updates for the typical Windows application running on an LP PC will be four times faster, and WordPerfect will be up to 10 times faster.

This speed is achieved by using a graphics accelerator and local bus video to connect the video processor directly to the CPU. That means the video-to-CPU communications are conducted at the CPU speed – 25 Mhz in the case of the 425sx LP – rather than at the much slower 8 Mhz of the conventional PC I/O bus. (*See accompanying story on video technology, page* 7.)

And, low cost means what it says. Although the Digital of yesterday was not known for competitive prices, this new line of PC offerings is competitive in features and price. The 486sx LP package, for example, includes 4 MBytes of memory, an SVGA (Super Video Graphic Array)-compatible display adapter, a 3.5 inch floppy drive, 122-MByte hard drive, keyboard, mouse, DOS 5.0 and Windows 3.1 for $1,649. Similar LP packages range from $899 for an 80386-based system to $2,199 for a 66-Mhz, 80486-based system.

All one needs to get these systems up and running is a video display, also offered by Digital and available from a number of third-party suppliers as well.

The LP line includes a range of processor options, from the low-end 80386sx to the high-end 66-Mhz 486. The machine we evaluated used a 25-Mhz 80486sx. The 486sx is a replacement for the 386DX microprocessor, the high-end chip in the previous processor line. The 486sx chip is a scaled-down 486DX. The DX model includes internal math co processor circuitry; the sx doesn't. The original concept of this design was to provide users who do not need high-speed math operations with a lower-cost alternative to the DX chip. An obvious application for this type of chip would be in a network server, for example, where resource and application sharing are more important than number crunching.

The marketplace has chosen broader applications for the lower-cost 486 chip, however. The 486sx certainly is not relegated to just server applications. And the reduced complexity of the sx-series chip lowers system cost enough to make it an especially attractive choice for applications that require reasonable speed, technology compatibility and the lowest possible cost.

Digital's new line of PCs competes on features and price. The reviewed model – the 486sx LP seen here – includes 4MB of memory, an SVGA-compatible display adapter, a 3.5-inch floppy drive, 122MB hard drive, keyboard, mouse, DOS 5.0 and Windows 3.1 for $1,649.

Photos by Rhea Rippey

The 486sx series uses some of the same clock speeds as the 80386DX line and is priced competitively with it. However, a 486sx running at the same speed as a 386DX is faster because its internal design is more efficient. In fact, Intel Corp. tests show that a 486sx can work twice as fast on some tasks as a 386DX running at the same clock speed. And, whereas an 80386DX running at a faster clock speed could approach the performance of a 486sx at a lower cost, some tests have shown that a 25-Mhz 486sx can be up to 40-percent faster than a 33-Mhz 386DX.

Couple the speed issue with the fact that the 486 line is a newer technology and may offer easier and better upgrade potential, and Digital's 486sx-based PC is an excellent CPU choice for performance and price.

The Digital 425sx LP is a compact, low-profile computer with a lot of logic packed onto the mother board. You won't need an additional display adapter, for example, and the controllers and ports are all on the mother board. Consequently, there are only three available slots, which are turned sideways to keep the case slim.

The configuration of this machine is attractive. The low-profile box fits easily under the monitor on a desktop. Its rounded corners and uncluttered appearance make it look less like a high-tech PC and more like a terminal. The integral power supply fan is extremely quiet, thus the system easily fits into a crowded office environment.

CPU on daughter board

The machine's mother board is small (roughly 8.5 x 14 inches) and positioned in the left side of the case. The internal hard drive and floppy disks partially cover the right side of the mother board, which means one has to remove installed drives to upgrade system cache.

Similar to other members of the LP family (except the entry-level 386sx model), this machine uses a daughter-board arrangement to hold the CPU. The board attaches to the front of the mother board via a set of pin connectors and lies parallel to it. This flexible design lets Digital use a common mother board and other building blocks for the whole line, changing only the daughter board to build models.

The daughter board in the LP line includes a separate 169-pin upgrade socket. You can use this socket for a math coprocessor on the 486sx model or to install a faster 80486DX chip or a clock doubler chip in any of the upgradeable machines. (*See story below.*)

Interestingly, the LP series does not include a SCSI or network interface. Rather, you have to plug in a separate SCSI adapter or a network interface into one of the available expansion slots. This keeps the initial cost of the machine low and makes it so that only those users who really need SCSI pay for it.

However, you would normally expect to find at least a network interface and perhaps a SCSI port on a Digital machine.

System software is pre-installed; therefore, you can plug in power, attach a

Need To Upgrade? It's a Snap

All members of the LP family except the low-end 80386sx model, can be pumped up to faster, higher-performance machines. The 40-Mhz 80386DX unit, for example, can be moved to any of the 486 models simply by replacing the daughter card. Any of the 486 models can be upgraded easily by plugging a faster CPU in the vacancy socket. The speed of the 486 processors can be doubled using Intel's clock-doubling chip.

The DX2 chip doubles the internal processing speed of the onboard processor. A 16- or 20-Mhz system operates at 50 Mhz; a 33-Mhz system operates at 66 Mhz. The speed doubling takes place on internal calculations. Data is moved from the CPU to the rest of the system at the existing system speed.

The so-called "upgrade" socket is becoming a common feature with new PCs, and Digital's LP line is no exception. This 169-pin "overdrive" or "performance enhancement" socket (Digital calls it a "vacancy" socket) enables users to plug in an overdrive chip, which is essentially an enhanced 80486 microprocessor with DX2 clock-doubling circuitry.

The overdrive chip disables the existing CPU and takes over at a higher speed. The overdrive chip includes a math coprocessor as well as Intel's DX2 speed-doubling technology. This means it operates at twice the system clock speed internally, but still communicates with the rest of the system at the existing system speed.

Two overdrive chips are available, one to upgrade 16- or 20-Mhz systems and another to spark up 25-Mhz systems. The 25-Mhz version includes a heat sink to help dissipate the additional heat generated by high-speed CPU operation. The overdrive concept helps users upgrade their own systems. Since the existing CPU does not have to be removed, you can upgrade to a faster CPU by plugging a chip into the extra socket.

Adding a coprocessor

You can use the vacancy socket on Digital's LP machines in two other ways as well. If all you need is enhanced math performance, you can also plug in a math coprocessor in sx systems. (Remember, the sx chip's internal math coprocessor is disabled). And, you can plug in a higher-speed 80486DX CPU. In this case, the onboard CPU is disabled and the new upgrade processor takes over.

Remember that while the upgrade process lets you speed processing on your existing system, such an upgraded system will not run as fast as one designed from the ground up for 50- or 66-Mhz operation. The reason is obvious. When you plug a 50-Mhz chip into a 25-Mhz system, the computer's memory, BIOS and controllers still operate at the original system speed.

A full-blown 50- or 66-Mhz system, on the other hand, includes memory and other components rated at the speed of the processor. How much these considerations affect actual throughput depends on your applications, primarily, but you should be aware that there will be differences. At the same time, however, a 50-Mhz chip in a 25-Mhz system should provide noticeable performance improvements, especially when your applications are compute-intensive as opposed to I/O-intensive.

The CPU daughter board on the LP machines includes additional sockets for expansion. The base unit comes with 128 KBytes of external, adaptive write-back secondary cache. You can plug in an additional 128 KBytes of cache for even more speed. – *T.B.*

monitor, keyboard and mouse, and be up and running in a few minutes. Licensed copies of MS-DOS 5.0, Microsoft Windows 3.1 and other utilities are included with the package, but you don't have to install them unless your change drives or crash some software.

In keeping with Digital's ongoing push for broader markets, the LP series will be offered through some conventional PC outlets, including national distributors and perhaps even mail order. Digital's Desktop Direct sales organization will market the machines (1-800-PC-BY-DEC), and they can be ordered through other Digital sources. But look for the DEC name to appear in places it hasn't before, too. As this was written, no one at Digital would say which sales organizations may carry the machines.

Digital designed the LP series for easy upgrades to higher performance. You can plug in a faster CPU daughter card or double the clock speed with one of Intel Corp.'s clock doubler chips. An interesting aspect of the Digital design is onboard clock-speed jumpers. All of the normal clocks are built into the mother board, so, for example, to upgrade a 25-Mhz system to a 33-Mhz system, you can change the jumper, plug in a new CPU, upgrade memory (if necessary), and you're up and running with a faster machine.

The machine is supplied with a quick-start guide, a fairly detailed user manual, separate instructions on upgrading the CPU and memory, as well as software documentation. Overall, the DEC documentation is better than many competitive products we've seen. Detailed drawings and charts help you locate jumpers, sockets and switches. You'll have to get support telephone numbers when you buy the machine, however, because no information on this is included with the package we evaluated. And, there is no technical reference manual with the system, nor is one available from Digital.

In summary

The overall impression this newest Digital PC makes is good. The package is attractive and performance is excellent. And, Digital's worldwide sales, shipping and maintenance organization makes these PCs attractive to multinational corporations that want system compatibility and single-source supply. The DECpc 486sx LP we evaluated is a good performer, appears to have quality construction and is competitively priced. ■

Tom Badgett is a principal of Word Association Inc. and the author of several books on PC computing.

Chip Design Speeds Microsoft Windows

Among the features Digital Equipment Corp. is pushing for the LP line is improved performance with Microsoft Windows – at least four times faster, according to the company. Actually, your own experience with Windows could be even better, depending on the applications you run.

How do they do it? It's all in the chips. The LP mother board includes VGA (Video Graphic Array)-compatible video circuitry based on the S3 Inc. 86C924 graphics accelerator. This chip was designed from the ground up to improve the performance of Microsoft Windows. This is done in two ways.

First, the chip includes eight of the most common Windows commands and procedures – such as moving boxes and redrawing the screen. A separate software driver captures these commands when they are issued and, instead of sending the commands to system memory for processing by the main CPU, they are sent to the accelerator chip. There, the procedures are processed directly in hardware and the results sent to the screen without passing through conventional system RAM and without the main CPU stopping what it was doing to process these video messages.

Systems without the accelerator have to pass video data back and forth across the 8-Mhz I/O bus, in and out of memory. With the 86C924, that step is skipped for most operations, speeding Windows considerably. And, although Digital suggests an improvement of four times, experts at S3, which built the chip, say you can expect eight-times-or better performance with some software. WordPerfect for Windows, for example, is notoriously slow in screen scrolling. S3 said to expect 10 to 20 times better scrolling in WordPerfect with the Digital LP video technology.

Our tests confirmed this claim. Large documents with WordPerfect for Windows are all but unmanageable with the standard system we used, a 33-Mhz 80386DX machine with 8 MBytes of system RAM and a 1-MByte SVGA board running at 1,024- x 768-pixel resolution. WordPerfect on the DECpc 425sx LP, on the other hand, scrolls rapidly, even updating text boxes and image files integrated within a document in real time without the familiar (and frustrating) wait for screen updates.

One design feature improves performance in the Digital machines over conventional competitive models: the use of VRAM in the video circuitry. VRAM is dual-ported memory that lets the system update the screen and pull in new video data at the same time. Conventional dynamic RAM-based systems handle only one operation at a time: write the screen or gather new data for display.

Cost is negligible

And, while it is true that the graphics accelerator and VRAM technologies cost more than conventional SVGA adapters, the actual retail cost differential is less than $200 for add-on options. When incorporated with Digital's machines, the additional cost is probably negligible.

When the most common Windows functions are executed, the I/O bus is bypassed and performance is improved. What about the other calls, and what about when you load an image from disk, which requires CPU and main memory interaction? The Digital technology speeds these operations by using the local bus instead of the I/O bus. The local bus is a direct connection between the CPU and the video card that transfers data at system speed rather than the lower, 8-Mhz I/O bus speed. On a 33-Mhz system, this communication takes place at 33 Mhz, for example.

This is a feature you cannot easily add to existing systems, but when incorporated into a new mother board, it is a sensible and cost-effective addition. – *T.B.*

Speaking with James Liu

James J. Liu, vice president of Digital Equipment Corp.'s Personal Computer Business Unit in Acton, Mass., was named to succeed John Rose as head of the Personal Computer Business Unit in July.

Digital is coming into a crowded market saying it can compete by producing its own PCs. What makes you think you can pull it off?

"We started out looking not only at quality but also at reducing the cost throughout the whole operation. We broke the cost structure down into a manifest – design/engineering through manufacturing, warehousing, distribution, promotion.

"The PC business is a high-volume business. It is very important that you look at inventory, pipeline and obsolescence of technology costs. These are three very important areas of expenses. What we did in design/engineering was [to turn] the design into a modular approach so that you can turn the design into a new product by replacing only a tiny portion of the CPU daughter card. You do not have to redesign the whole thing. You do not have to scrap the whole thing.

"We have the same boxes for the whole product line. The power supplies are the same. The floppies and hard disks are all the same. So upgradeability from the current model requires a minor change of the daughter card.

"We also have a vacancy socket into which you can plug in an [Intel Corp.] clock doubler chip to double the frequency from 33 Mhz to 66 Mhz. The daughter card and vacancy socket are double protection for our customers, which is unique in the industry.

"We also use advanced S3 video chips [S3 Inc. 86C924 microprocessors], which give you the best video performance, because now the chips interface directly from the CPU to the local bus – at a bandwidth three or four times that of the EISA [Extended Industry Standard Architecture] bus. You take advantage of very fast CPU performance in terms of the video display. We bring the power of the CPU to the customer – that's our added value. If you go through the EISA bus, you have a limitation on how much you can do. Even if you have a fast CPU, it doesn't help you much if your video is slow.

"The other thing we do is use a quiet fan, with variable speed. It makes the office a much quieter place to work."

If your PCs have these differentiators; how are you going to produce them at competitive prices?

"We did everything we could to reduce the costs of producing these PCs.

"We call it the franchise model. We ship all the components – the CPU, the mother board, the disk, the floppies – to the market for final assembly. We bring them from whatever geography makes sense to supply a particular component.

"It's very much like a McDonald's restaurant. You buy the beef, the napkins, the tablecloth and ship them to the restaurant, where they control the quality. You bring the final assembly point closer to the customer and that will guarantee the quality when you deliver the product. It's very much the same as delivering a hamburger or cheeseburger.

We did everything we could to reduce the costs of producing these PCs. We ship all the components to the market for final assembly.

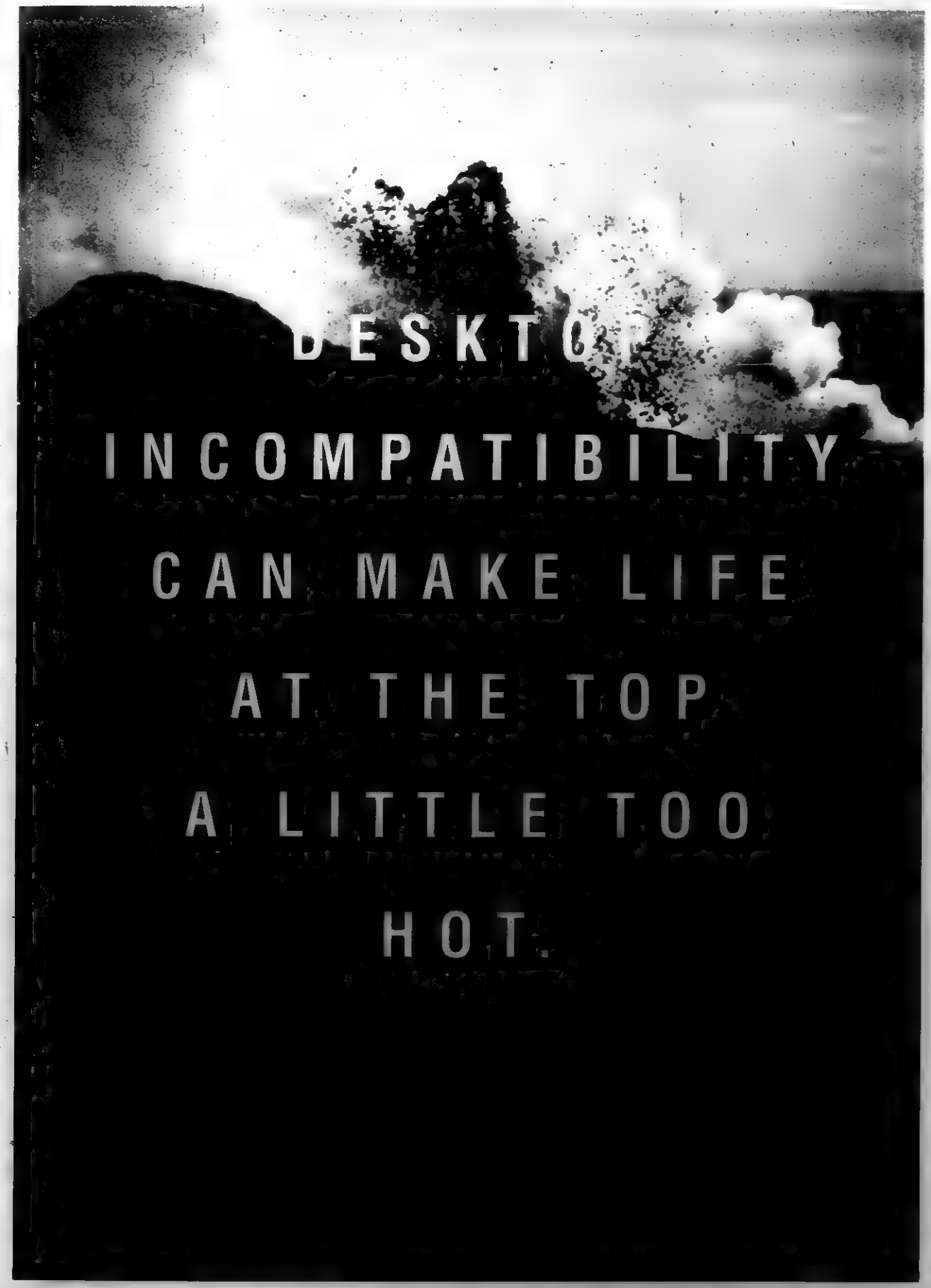
"My inventory can be minimal. I can stock all common components. The only thing that is different is the daughter card. We also reduce the cost of freight and duty because now you ship them by subassembly. [*Lower duties are paid on imported parts than on fully assembled products. – Ed.*]

"The CPU daughter card is an expensive, small item that I can ship them by air and reduce the pipeline time from 21 days to only five days. My inventory cost will be less. Bulky components, the monitor, the box, etc., can be shipped by sea. Those components change more slowly, so that fits my model very well. In the PC business, inventory is a very important part of your business. A PC can become obsolete very quickly. When the technology changes, we can change very fast.

"We've tried to learn from what McDonald's did in the restaurant business. It's very similar. We developed a cookbook for each country for final assembly, so the product will be consistent. We're the only company that can do that."

Don't you still have a cost conflict between low-priced PCs and doing all the things that Digital wants to do in producing computers?

"Quality doesn't mean higher costs. Quality means more knowledge and skills. For example, when you pass a mother board through the soldering process, the control of the temperature determines the quality of the soldering. A young company does not have 35 years of manufacturing experience to control the temperature flow. That doesn't cost you money. It costs you knowledge and skills, and that's how we can build a quality product without incurring more costs." ■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CAN MAKE LIFE
AT THE TOP
A LITTLE TOO
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"Digital Equipment Corporation racked up $1 billion in catalog revenue last year, toppling Dell Computer as the computer industry's top mail-order seller."

USA Today, August 2, 1992

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—Richard Hechinger, Hong Kong Stock Exchange

In these headline making days of PC company cost-cutting maneuvers and substandard components, only Digital continues to have the technology, alliances and commitment to guarantee integration in today's complex multi-vendor environments — and tomorrow's.

Some people tell us we're too obsessed with integration. Too much the engineers. So be it. At Digital we still believe in taking the heat — so you'll never have to.

DECpc 333sx LP
i386SX 33MHz System
• 64KB Cache • 4MB RAM
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• 3.5" 1.44MB Floppy Drive
• Keyboard and Mouse
• MS-DOS 5.0 & Windows 3.1
$1,549

We take the heat. So you'll never have to.

In the real world not everyone calls Digital for *all* their desktop product needs (yet). We recognize you buy servers from here, math coprocessors from there and entirely somebody else's PCs—somewhere else.

Which is why we built our own labs to test interconnectivity back in 1985. Since then, every Digital desktop product is network tested with every other industry standard machine available, from IBM® PS/2® and OS/2® to COMPAQ®, Sun Workstations® and Macintosh®. We operate a 70,000+ node network that runs our company—and tests our PCs. We even test applications between different networking configurations.

In fact, Digital's networking lab is so highly regarded in the industry that other manufacturers now hire us to network test *their* PCs and printers.

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"DECPC BESTS LOW-COST 486DX FIELD. PERFORMANCE, EXPANDABILITY AND DESIGN STAND OUT...Digital Equipment Corp.'s system was the overall winner in PC Week Labs tests..." — *PC Week*, October 5, 1992

PC WEEK LABS

Scoreboard

Based on a scale of 1-5 (5=excellent).		Advanced Logic Research Inc. *Flyer 32DT 4DX/33*	AST Research Inc. *Bravo 4/33 Model 1238*	Dell Computer Corp. *Dimension 486DX/33*	Digital Equipment Corp. *DECpc 433dx LP*	IBM PC Co. *PS/1 Model 2155-S76*	Zenith Data Systems *Z-433DX Model 200*
Overall weighted score		**3.6**	**3.5**	**2.4**	**4.0**	**2.8**	**3.4**
1. Price vs. performance	(30%)	4	4	2	4	3	4
2. Performance	(25%)	3	4	2	4	3	3
3. Expandability	(25%)	4	3	3	4	2	3
4. Serviceability	(10%)	3	3	2	4	3	4
5. Quality of construction	(10%)	3	2	3	4	3	3

1. Overall performance relative to cost (comparative among these six machines). 2. Overall comparative system performance in all tests. 3. Support for processor, memory, storage and expansion board upgrades. 4. Ease of processor, memory, storage and expansion board upgrades. 5. How well the system is assembled (including case design, power supply and tools required for assembly).

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Monitor may differ from that shown

"I think they're a winner."

— Andrew Seybold, Editor-in-Chief
The Outlook on Professional Computing
August 24, 1992

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Our Hardware Service Plan puts the expertise of more than 40,000 technical experts worldwide at your fingertips — whether you're using Apple®, IBM, COMPAQ, (or Digital), to name a very few of the vendors it covers.

Our Software Support for more than 100 popular applications from Microsoft®, Banyan™, Ashton-Tate™, Novell® and many others — thanks to our alliances.

An integration strategy only Digital can deliver.

"Experience in networking" are three words most commonly associated with Digital. That's because our passion for integration never allowed us to to settle for mere compatibility.

Which is why when it comes to developing solutions for making the right information available to the right people at the right time in the most useful form — regardless of geography, hardware or software — Digital should be your first choice.

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— LAN Magazine, March 1992

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DECdirect

Supporting It All

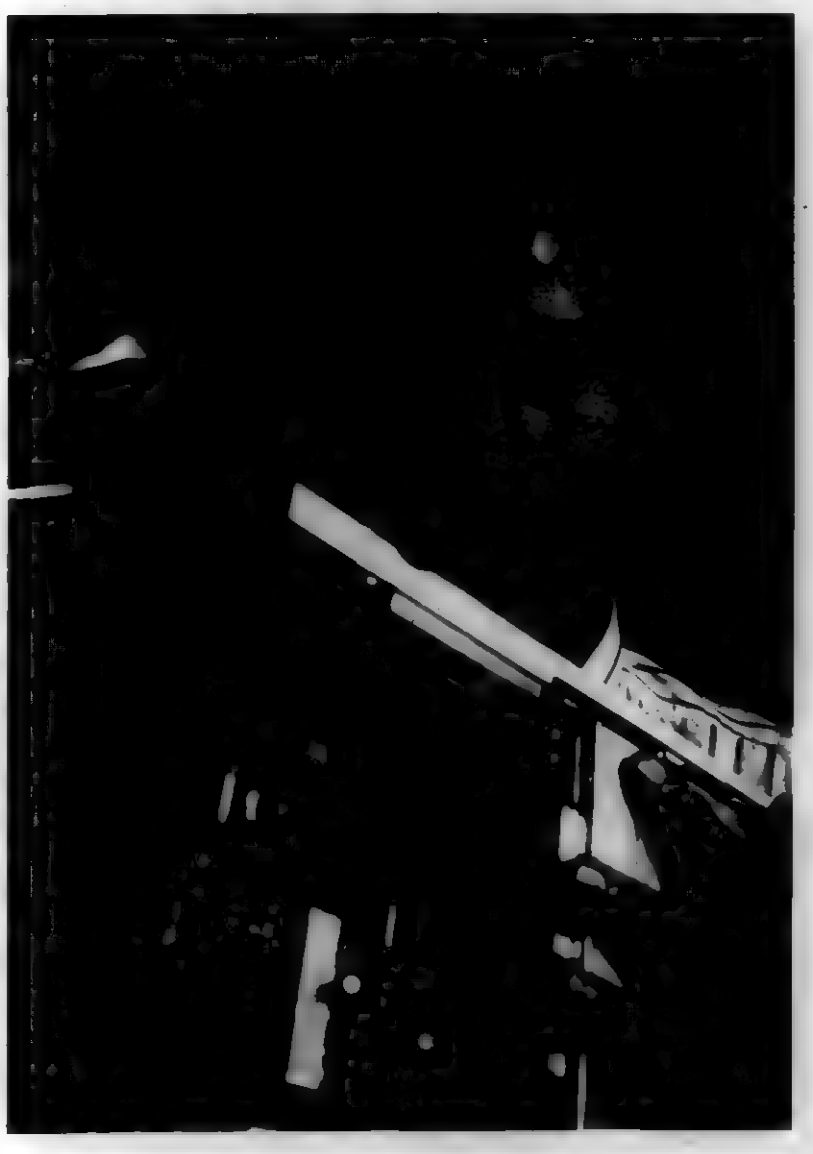
Digital offers one-stop service to deal with complexities of multivendor PC sites

A recent full-page cartoon in a national magazine showed two lab-coated MIS professionals scratching their heads, struggling to figure out what went wrong with their network of multivendor PCs. Two computer screens in the foreground are filled with arrows, each pointing at the other as if to say, "He did it!"

Finding the source of a problem across a multivendor PC installation often creates a problem as large as the one the network manager was hoping to solve. The complex mix of hardware, software and networking technologies, as well as of vendors, OEMs and service providers, can prolong downtime and leave a network manager confused. In situations like this, customers want a wide range of services and a single point of contact for problems that cut across platforms, vendors and technologies.

Paul Kelly, corporate business manager for desktop services at Digital Equipment Corp. in Stow, Mass., believes Digital can provide the one-stop-shopping service.

"What clients really want from a service provider is a company that has good technical skills in its own right, as well as contractual relationships with other



As PC support manager at Boston's Children's Hospital, Kevin Hourican has his hands full. The hospital has more than 1,500 pieces of computing equipment under contract with Digital. "I really like Digital's ability to support everything," says Hourican.

Copyright 1992 by Seth Resnick

major vendors through which it can track down and solve multivendor problems," Kelly said.

Digital is no stranger to the PC market, having provided PC integration services for more than 10 years. It is currently one of the fastest growing PC vendors in the industry, according to Computer Intelligence, a La Jolla, Calif.-based market research firm, and its PC Integration Services business has been growing at double-digit rates over the last two fiscal years.

At the same time, Digital has contractual relationships with many of the industry's largest PC software vendors, including Microsoft Corp., Banyan Systems Inc. and Novell Inc.

"If we look at the contract mix at most end-user sites, in terms of multivendor support, it becomes obvious that we have moved out of being a per-box supporter," Kelly said. "Any fault within the system is really a fault with the entire system and not an isolated problem."

Kelly said Digital has invested nearly $30 million in multivendor testing and certification through its Customer Support Centers. For example, many of the centers maintain a wide mix of PC hardware, software and networking equipment so that when a user calls with a problem, Digital technicians certified for each of the different packages can simulate the user's network environment onsite in order to better diagnose the problem.

Nina Lytton, president of Open Systems Advisors Inc. in Boston, Mass., said she was essentially "pre-sold" on Digital's phone support for multivendor PC environments based in part on its ability to simulate her 10-node LAN environment at its Customer Support Centers.

Digital has its own experts who brainstorm among themselves and figure out the problems that are too complex for a small business like us to handle.

Nina Lytton
OPEN SYSTEMS ADVISORS

LAN Manager network

Open Systems Advisors has a mixed LAN Manager network of IBM-compatible PCs, including those from Dell Computer Corp., Compaq Computer Corp., Hewlett-Packard Co. and IBM. (Open Systems Advisers has no Digital PCs.) The server on the network is a System Pro running OS/2, while the clients are IBM-compatible PCs running Microsoft Windows 3.1. The primary application on the network is an R-Base database with more than 15,000 names that serves as a single source for the entire company. The database is a mission-critical application for Open Systems Advisors – no database means no business.

"What we were really looking for was a single number we could call if we had any problems," Lytton said. "Digital has lots of its own experts who brainstorm among themselves and figure out the problems that are too complex for a small business like us to handle."

For example, the employees at Open Systems Advisors recently went into work only to find they had lost access to R-Base as a result of some unknown problem. The only thing the network manager knew was that the cover was off the server and a cleaning person had been in the office the night before. Open Systems Advisors called Digital's phone support and soon had a conference call involving three experts – one specializing in R-Base, one in OS/2 and one in LAN Manager.

By the end of the day, the team of experts determined that Open Systems Advisors would be best served by having the database restored from tape and had the company up and running by the next morning. In this case, the Digital experts saved the client from chasing leads that would prove unfruitful and held network downtime to a minimum.

"We used to get our support from different dealers, but we ran into knowledge and timeliness problems," Lytton said. "The database support people would say it was the network [vendor], which would blame it on the hardware, etc. Digital gives us a single point of contact."

Much larger installations also find Digital's offer enticing. Boston's Children's Hospital has more than 1,500 pieces of computing equipment (PCs, printers and peripherals) under contract with Digital, including 700 IBM PCs, 100 clones and more than 200 Apple Computer Inc. Macintoshes. Most of the PCs are used as stand-alone boxes, while 120 are networked using Digital's Pathworks. Another 15 reside on a Novell NetWare network.

"The largest part of our service contract with Digital is for hardware support on our PCs, printers and peripherals," said Kevin Hourican, PC support manager at Children's Hospital. In addition, the hospital purchased applications and network support from Digital.

Prior to choosing Digital for its support needs, Children's Hospital contracted with IBM to cover its hardware, while Sears maintained the mix of Hewlett-Packard and Epson printers, and the hospital did its own application support. As the number of users grew, Children's Hospital found it could not keep up with the application support without outside help. At the same time, it found that there were limits to the support being provided by IBM and Sears – IBM would not support the clone PCs, and Sears could not deal with the complex interaction of printers, networks and PCs.

"The best thing we found about Digital, besides being a single point of contact, was that they were very, very flexible and willing to customize their service," Hourican said. For example, Digital was willing to come to the site and install applications for end users and even helped to physically move equipment. At one point, an end user had a severe hard disk crash and Digital personnel went to the site, removed the hard disk, sent it to the manufacturer and reinstalled it.

"I really like Digital's ability to support everything," Hourican said. "That way we could give our end users a single phone number and leave it up to Digital to triage and fix the problems." ■

Manufactured by DEC

Digital Equipment Corp. is capitalizing on its strengths as a worldwide manufacturing company in an attempt to become a leader in industry-standard, modular PCs that can be upgraded to a new CPU with a snap-in card.

In order to compete with smaller, fleet-footed companies, Digital has adopted a "franchise" manufacturing and distribution model that will allow PCs to be assembled and shipped from seven integration centers, while ensuring that the output of each center matches the quality of any other assembly point.

"When buying a PC, customers ask themselves, will this company be here to support me? Will it support me in multiple countries? Is the support and service consistent? Our business architecture and strategies address these concerns," said James Liu, Digital's new vice president of its Personal Computer Business Unit.

Under Liu's aegis, Digital recently set about manufacturing its own DECpc LP (Low Profile) line, which consists of six models. The systems, priced from $899 to $2,199, range from a 33-Mhz, 386-based system to a high-end 66-Mhz, 486dx2-based system.

The new PCs are based on a modular design with components manufactured at the company's facility in Taiwan for assembly at seven centers around the world – Springfield, Mass.; Kanata, Ontario; Tokyo, Japan; Taoyuan, Taiwan; Sydney, Australia; Sao Paulo, Brazil; and Ayr, Scotland. Previously, Digital had subcontracted PC manufacturing to Tandy Corp., Intel Corp. and Ing. C . Olivetti & Co.

"A lot of DEC customers were jumping ship. DEC will be able to pull those customers back into the fold because of the LP machines' specs and pricing. If DEC is able to get existing customers excited about this line, we think they'll do $200 million in sales in 1992 and 1993," said Randal Guisto, senior analyst at Workgroup Technologies, a market research firm in Hampton, N.H. Digital officials estimate 1992 to 1993 PC revenues in the $250 million range.

InfoCorp., a market research firm in Santa Clara, Calif., reports that DEC sold 134,700 PCs through the first half of 1992, compared to 69,660 in all of 1991.

The new PCs, including the high-end 66-Mhz 486dx2, are based on a modular design with components manufactured at the firm's Taiwan facility for assembly at seven centers worldwide.

The new PC's modular design allows it to be customized by snapping in different components, 80 percent of which are common to all models. "This cuts down on inventory and price. We also cut costs by shipping the heavy components by ship and the lighter, high-value components such as mother boards and daughter boards by air," said Liu.

Digital is aiming to shave a few hundred dollars off the cost of making each PC it sells, he explained.

The franchise model

Digital unveiled its franchise model with each manufacturing center following the same rules as it launched the LP line of PCs at the end of August.

"Large customers get the same models everywhere. These customers save on testing and training because application software works everywhere, network compatibility applies everywhere and upgrades are available everywhere," said Liu. Digital is one of the few companies large enough to build and sell PCs on an international franchise model, he claimed. The franchise model allows faster sales, service and support by providing centers closer to customers. The approach offers the strengths of both large and small vendors, Liu added.

"This strategy looks more sustainable than the OEMing strategy they pursued earlier. Bob Palmer [Digital's new president] had said, to make money in PCs, you have to build them yourself," said Eric Clow, senior analyst at InfoCorp.

When Intel, Olivetti and Tandy were producing its PCs, Digital's marketing had been the strongest part of its PC strategy. "Now it is adding design and manufacturing. The missing manufacturing piece was a weakness," Clow noted.

"Overall, DEC will have to make up in volume for the lower prices it is offering," said Workgroup Technologies' Guisto. "DEC squeezes $100 to $200 out of each LP box and is hoping that will offset some of the volume they need. I don't think it will as much as they expect because DEC's new strategy will energize the competition."

The new LPs will be sold through Digital's Desktop Direct for PCs program. Launched last January, Desktop Direct allowed the company to tap into the $27 billion PC market by establishing a direct channel for customers that combines 50 percent off Digital list prices, fast response, and full-line service and support. It has its own toll-free number (1-800-PC-BY-DEC), sales and marketing force, and catalog. Customers are promised 48-hour turnaround, optional next-day delivery, 100-percent qualified parts, a 30-day money-back guarantee and one year of free onsite service.

"DEC's PC business is growing fast, but they started at a real low base – so it doesn't take much to pump those numbers up. DEC's trying to attract the corporate user with the combination of reliability, service and support, which are positives for this sort of a buyer," said Steve Widen, senior analyst at Workgroup Technologies.

"But," he asked, "are they a little too late in the PC market to be able to garner a significant amount of market share?"

"DEC has a bigger presence in Fortune 100 accounts than the other PC vendors and everyone at these accounts knows DEC's reputation for service and support. DEC is in a good position to differentiate itself," said Guisto. ■

Speaking with Vijay Thakur

Vijay Thakur, director of the PC Integration Business Unit of Digital Equipment Corp. in Littleton, Mass., is the head of the Pathworks product line.

What is the future direction of your PC connectivity software?

"We want to do three things with Pathworks. We clearly want to use the Windows paradigm and make the entire installation management, configuration and operation intuitive. Installing something like this under VMS today requires you to have VMS knowledge and PC knowledge. That combination is scarce in the market and it's not going to get any better. So what we have to do is create a Windows-driven environment with a graphical, mouse-driven interface so you can pick-and-choose, click, and drag and draw, rather than know the VMS syntax. That's a priority. We want to drive to the point where the management environment is very intuitive and Windows-driven. The first phase will happen in early 1993.

"The second thing we want to do is create a single, integrated server environment for the three popular technologies, NetWare, LAN Manager and Macintosh. Right now you have three separate server environments. You can run them all on the same server at the same time, but they look like three different server environments. The Macintosh looks like a Macintosh because our original goal was to make the server environment look native to the client. That satisfies today's market. But tomorrow's market ... wants some consistent environment from which to manage that heterogeneous environment.

"At the same time they want NetWare clients, LAN Manager clients and Mac clients to access the same information simultaneously in a shared, record-lock manner. So our second objective with the next version of Pathworks would be to create a single, integrated server environment. You can buy any Pathworks client of your choice, but you need only one set of bits on the server. Depending on the client that you have chosen, the appropriate server would be installed and the management environment would be a consistent, Windows-driven, one."

Webb Chappell

We're building an integration environment on top of LAN Manager, NetWare and AppleShare for Macintosh. We're not tied to any one specific technology any more.

You frequently mention "information integration." How are you moving toward that?

"It is necessary for us to create that robust underlying environment to allow the layered application services to be available for people transparently. We intend to add more value into Pathworks, which we believe will be a necessary prerequisite for all future information integration services.

"For example, system management of heterogeneous clients and servers. Or back-up services from any client to any server. Or basic database access engine API [application programming interface]. Virtually every application from now on is going to require a database. Even a system management application requires a database — you're going to track all these things and keep the information in a database. So you're going to have one common database engine and then that engine allows you to access any of the back-end databases — whether it is Informix or Sybase or Ingres or Oracle or Rdb from Digital or DB2 from IBM, or whatever — Pathworks will provide you with a path to any of them. We believe the next generation of Pathworks should have a database bundled into it. If you want access to any one of these databases, you would have it."

Doesn't that start to change the role that Pathworks plays? Instead of connecting PC users to the net and leaving them there, you're attempting to bring the desktop user much closer to the data?

"That's right. Pathworks is taking on the role of accommodating these popular technologies that become standard in the industry. We're actually building an integration environment on top of LAN Manager, NetWare and AppleShare for Macintosh. That's an advantage that we have because we're not tied to any one specific technology any more. We're trying to build an integration environment around the heterogeneity of technology that people are going to have." ■

Pathworks Extends Its Reach

In its five years of existence, Digital Equipment Corp.'s Pathworks has grown from a link between the humble PC and the host VAX into a client-server infrastructure, supporting a variety of key platforms, GUIs (graphical user interfaces) and network protocols.

Today Pathworks supports OS/2, Windows, the Apple Computer Inc. Macintosh and Unix along with the standard MS-DOS PC. Microsoft Corp.'s LAN Manager is part of Pathworks, which in turn interoperates with Apple's AppleShare and offers partial integration with the reigning local area network operating system, Novell Inc.'s NetWare. Pathworks supports Ethernet and DECnet, as might be expected of a Digital product, as well as TCP/IP, the X Window System and X.400 messaging. With support provided by Proteon Inc., Pathworks also works with token ring.

These capabilities are proving attractive to a growing number of managers who need a client-server architecture to link disparate platforms and environments that now characterize many computing environments. In the slow-to-grow minicomputer industry, Pathworks has become a star. With 1.5 million installed clients and a growth rate of 30 percent last year, Pathworks revenues are second only to the VMS operating system itself in DEC's software business. Within the foreseeable future, Pathworks revenues will overtake VMS, said Vijay Thakur, group manager of Digital's PC Integration Business Unit in Littleton, Mass.

Digital officials have plans for Pathworks that they believe will continue to enhance its appeal. Thakur sees the evolution of Pathworks as going through three stages. The first stage consisted of the use of LAN Manager to link MS-DOS and Windows PCs to the VAX. The second stage had Pathworks reaching out to a broader array of platforms, environments and protocols.

Thakur conceives of the third stage as "information integration." Pathworks is now moving beyond the limited capacity to supply connectivity and file and print services to a variety of desktop devices into a more fully functional, heterogeneous environment.

Such an environment would offer the ability to access a document throughout the network, regardless of platform, environment or protocol. It could share voice, image and other multimedia services across desktop devices, offer enterprise-wide messaging and transaction processing and a host of other features.

These functions – or some of them – indicate the future direction of Pathworks. In the short term, over the next six months, users can expect a series of announcements that extend Pathworks to new platforms while increasing the range of features and ease of managing the PC integration suite, Thakur said.

When Microsoft's Windows NT ships, DEC will support it within Pathworks on both the client and the server side. Thakur said such support could be expected within the next six months. The Santa Cruz Organization Inc.'s SCO Unix may be supported in the same time frame if users request it, said Katrina Hollman, marketing manager for the PC integration group.

Pathworks developers are working on a new management application that will enable a user of a Windows or Windows NT Pathworks client to manage the entire Pathworks network. Today Pathworks can only be managed from the server and the task requires a high degree of skill. Hollman said Digital plans to regularize management of all the environments so that a standard GUI becomes the interface to all current and future Pathworks-supported platforms and protocols.

"You will see Novell doing a great job managing NetWare and Microsoft doing a great job managing NT," Thakur said. "But Pathworks is going to be perhaps the only technology out there doing an equally good job producing a GUI-driven management environment across all these technologies and platforms."

By late spring Digital intends to offer NetWare file and print services from either VMS or Ultrix Pathworks servers. Today Pathworks clients running the NetWare Coexistence option can select either a Pathworks or NetWare server. But they cannot obtain NetWare services from the Pathworks server.

Thakur said this move would be one step toward the goal of providing "a single integrated server environment." Today Pathworks servers are separate. Pathworks for Macintosh, for example, provides file service to Macs, and Pathworks for DOS provides file services for DOS or Windows systems. Both server applications can run on the same VMS system. And while both save files in a VMS format, both provide interfaces to the client user that make it appear as if files are in their native formats.

"But if a Mac client using AppleShare and a DOS client using LAN Manager in a Pathworks environment want to access the same file today, they can only do it as a sequential access. They could not do a simultaneous read-write because we lack the necessary record locking and management," Thakur said. "In the longer term, our vision is to combine the ways of accessing the server into an integrated server environment."

For users turning to an open systems philosophy to avoid dependence on single vendors, Pathworks supports an array of standards and de facto standards. But there are still holes. Digital says, for

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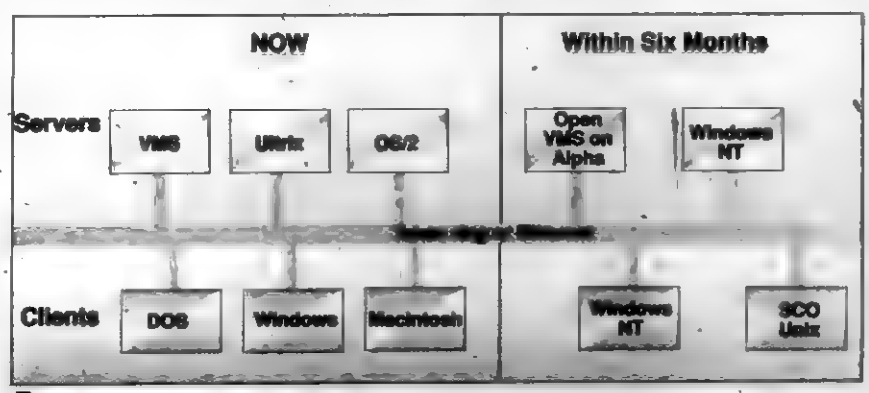
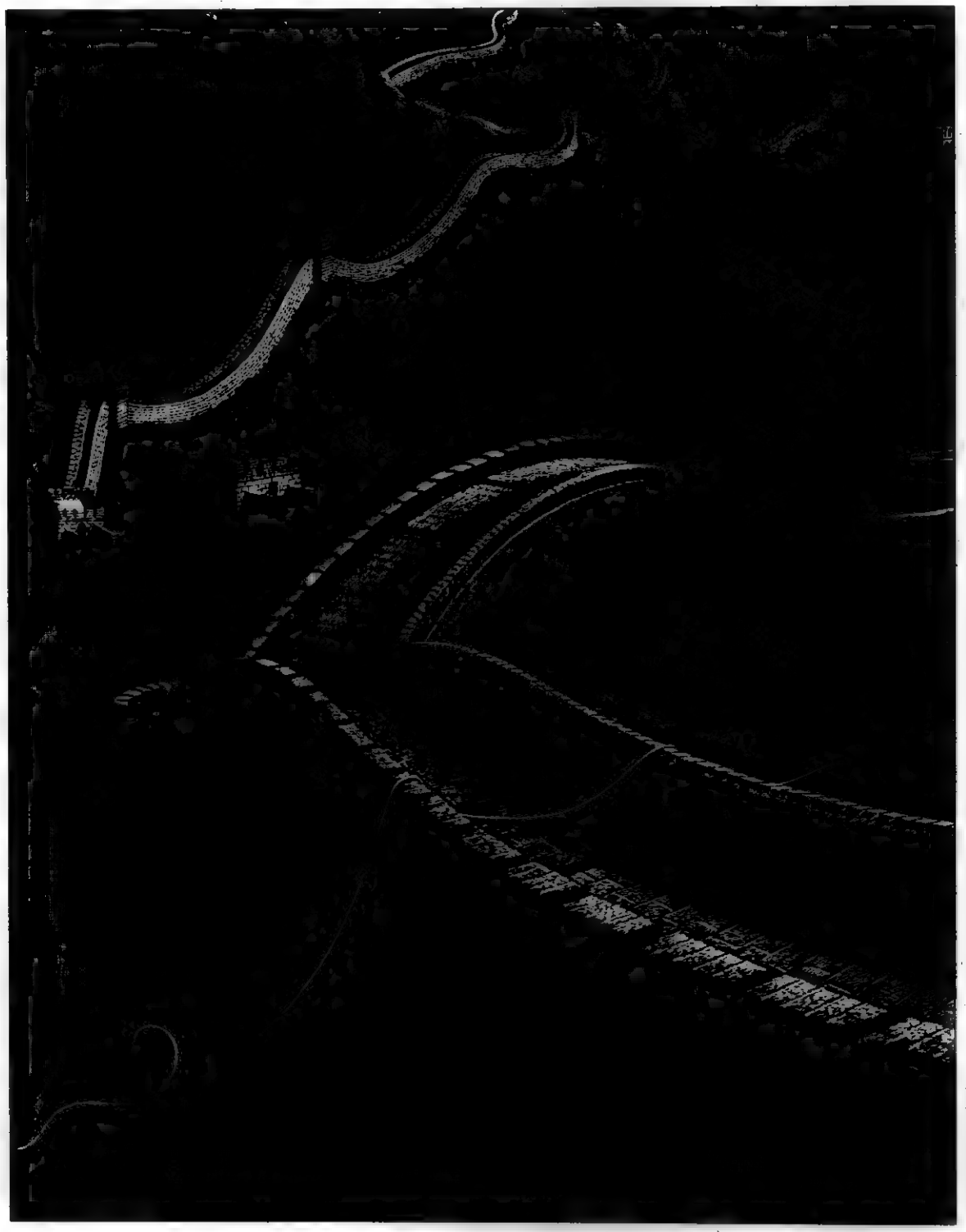


Digital views PathWorks' next major phase as moving beyond integrating platforms, environments and protocols to "information integration."



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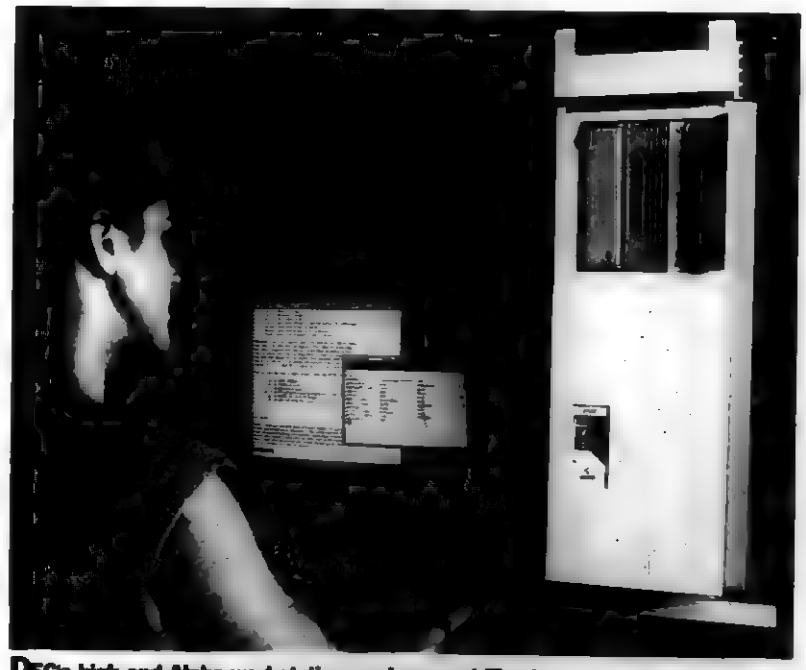
Mainframe on The Desktop

"You can run a whole company from one of these machines," says DEC's Gaubatz. The 64-bit Alpha workstations are due by year's end.



DEC's high-end Alpha workstation, code-named Flamingo, is a single-processor machine that features six 100-Mbit/sec. TurboChannel slots.

Digital Equipment Corp. recently offered a sneak preview of its upcoming Alpha workstations, code-named Sandpiper and Flamingo, featuring three and six 100-Mbit/sec. TurboChannel slots, respectively. Digital touts the high-end Flamingo as a "desktop mainframe."

Flamingo will likely be priced at less than $50,000, and Sandpiper, the midrange model, will likely be less than $20,000. Both are single-processor machines and will be part of a complete line of Alpha workstations to be announced by the end of the year.

"Flamingo is the highest end traditional workstation we're addressing right now. I would position the Sandpiper in the midrange. That leaves room for other things to happen at the low end," said Don Gaubatz, vice president of Digital's Workstations and Servers Group in Maynard, Mass.

"We do have low-end machines actually running at this time on at least two operating systems. You're looking at what I call a full product line very early in the launch of the Alpha workstation family," said Gaubatz.

The Alpha workstations are a continuation of the existing DECstation line, according to Gaubatz. Common to both lines is the TurboChannel system bus. The machines also have the same two-dimensional and three-dimensional graphics, multimedia, communications, storage, and VME and real-time interfaces. The primary difference between the DECstations and the Alpha workstations is the 64-bit CPU.

"People tend to overlook the fact that going from a 32-bit machine to a 64-bit machine is a major accomplishment. You can run a machine at 32 bits and achieve reasonable SPECmarks," said Gaubatz. "To get the same SPECmarks while you're actually running a machine twice as big [64 bits] says you have an unprecedented amount of 'headroom.' These platforms will have the headroom to be able to evolve large applications through the 1990s."

An example of a large application is ECAD (electrical computer-aided design) used in microprocessor engineering. Chip design can be done on a 32-bit system, but it becomes increasingly more difficult because you run out of headroom and start bumping your elbows against the sides of the box, said Gaubatz. From the chip designer's perspective, the actual microprocessor is, in some cases, as much a reflection of the design environment as of the physical entity, he said.

Other "large" applications include MCAD (mechanical computer-aided design). For example, the Flamingo could produce an image of an engine block and a piston and enable users to fit the piston into the cylinder block, checking clearances. The approach allows the designer to model how the pieces will work together and adjust the clearances during the design stage, rather than in early manufacturing.

The systems promise a much higher level of simulation using more complex data sets and more data, Gaubatz added.

Applications are in demand

In architectural applications, the machines provide the capability to show a prospective buyer of a 90-story building how it will look inside and out, exactly as it would be when occupied. "This is one of those situations where the least sophisticated customer or user will place the largest demands on the system. Such applications are in demand as soon as they are implementable," Gaubatz said.

Applications such as these put existing computer systems at their limits. "When we say to the industry we're going to 64 bits and some people say we don't need it – that's not true. These systems not only have the power to do these kinds of applications, but also the room to grow beyond them," said Gaubatz.

Currently, Digital is working on running benchmarks for the Flamingo and Sandpiper, which the company says are so powerful that they have the ability to contribute as database servers and application servers. "We've doubled the word size and the capacity. For those applications in which the data spills over and becomes twice as big, the systems are not going to slow down. That's what we mean by headroom. The Flamingo is literally a desktop mainframe. This machine is more computing than most companies have in their whole place. You can run a whole company from one of these machines," said Gaubatz.

The Alpha CPU itself features 8 KBytes of internal cache for data and 8 KBytes for instructions. Secondary cache consists of 512 KBytes with a high-speed, 256-KByte data bus tying the secondary cache to main memory. "We have doubled the [word] width for the fetch. We can fetch 32 bytes in one cycle, so 256 bits comes flying into cache in about 200 nanoseconds. The memory and cache have been optimized for the Alpha chip," said Bill Jackson, marketing manager for Alpha workstations in Maynard, Mass.

The 100-Mbit/sec. TurboChannel slots

Snap-in CPU Upgrades Keep DECstation Family Current

Although Alpha chips are at the heart of still-to-be-announced DEC workstations, the company has not forgotten the microprocessor architecture that powered its earlier entrants into the RISC market.

Customers who invested in Ultrix-based DECstations that use the MIPS R3000 family of chips will soon be able to move to the next generation of MIPS processors by simply snapping new "daughter cards" onto the mother boards of their workstations.

DECstation Product Manager Tracy Richardson emphasized the ease of these customer-installable upgrades to the R4000 chip, which he said will deliver a performance increase doubling or tripling the power of Digital's current R3000A-based workstations.

In addition to installing the new daughter card, users will also have to install a revision of Ultrix that supports the R4000 chip, said Richardson.

The R4000 is a 64-bit chip, but the Digital implementation will be 32 bits. Digital plans to use the fastest chips available in volume on the daughter cards, according to Richardson. The first available upgrades will use an R4000 running at 50 Mhz.

Even in a 32-bit implementation, the R4000 contains design features that take it beyond the R3000 in performance. Industry chip guru Michael Slater wrote in his October 1991 "Microprocessor Report Newsletter" that the superpipelined R4000 is "the first of a new generation of microprocessors that will reshape computer systems over the next few years."

Slater said that although the R4000's average of 2 to 2.5 clocks/instruction is roughly twice that of the R3000's 1.25 clocks/instruction, the performance gain comes from the fact that the deeper pipeline makes a higher clock rate possible. According to Slater, the R4000 appears from an external view to fetch, decode, dispatch and execute two instructions per cycle at 50 Mhz, but when viewed internally, it is apparent that the processor runs at 100 Mhz with a pipeline executing one instruction per cycle.

Slater added that although the R3000 peaked at 40 Mhz, the R4000 is starting out with a pipeline clock of 100 Mhz.

The MIPS R4000 64-bit chip is designed to serve as the basis for two and possibly three generations of processors.

He said the R4000 is designed to serve as the basis for two and possibly three generations of processors: One next-generation version will feature a smaller die size and lower power dissipation, and another will have twice as much cache, 32 KBytes, and will be designed to operate at 150 Mhz internally. Another version in 1993 will have a 64-KByte cache using 0.5-micron and denser processes, and operate at a 200-Mhz internal clock rate.

DEC's Richardson said the upgrades will be offered for all current DECstations: the Personal DECstation 5000 Models 20, 25, and 33 and the DECstation 5000 Models 133 and 240. Two form factors for the daughter cards exist. One measuring 3 x 5 inches will be used in all of the models except the 240, which will require a 5- x 8-inch daughter card. (The older DECstation 5000 Model 200 can also be upgraded to the R4000, but will require a new mother board that is not customer-installable.) The list price for the upgrades will be $3,000 for Personal

Continued on page 26

on Sandpiper and Flamingo are compatible with existing two- and three-dimensional graphics boards, communications options such as FDDI (Fiber Distributed Data Interface), and storage options from DEC and third-party vendors. Sandpiper offers three Turbochannel slots, the same as the existing top-of-the line DECstation 5000 Model 240. Flamingo ups the ante to six Turbochannel slots.

The systems will feature standard Ethernet and physical interconnects, including ThinWire and10Base-T. Users will be able to network the systems immediately.

The systems also feature embedded I/O, including one internal and one external SCSI interface that work concurrently. Also featured will be built-in audio and two-dimensional graphics.

"I see these systems becoming the multimedia development platforms of choice. For example, you can put DECspin [Digital's video teleconferencing product] in one slot, FDDI in the second slot and another SCSI controller for even more disk in the third slot," said Gaubatz.

"You could have very much greater than 120 GBytes of data. so you could have huge databases. You could put ATM [asynchronous transfer mode] in a slot, you could put a token ring and you could put in a TurboChannel-to-VME interface," he added.

Analysts expect the Alpha workstations to deliver 100 SPECmarks (more than double the performance of a VAX 9000 Model 210).

Some analysts say Flamingo will operate at 80 to 120 SPECmarks with 512 MBytes of memory. In comparison, The DECstation 5000 Model 240 rates 32.4 SPECmarks and has a maximum memory of 480 MBytes.

Flamingo will offer graphics capability of 1.2 million three-dimensional vectors/sec. and 270,000 Z-buffered triangles/sec., according to company docu-

Continued on page 26

Opening PC Windows in a Workstation World

Even though workstations have been made easier to use with graphical interfaces such as DECwindows, for some users there's just nothing like comfortable MS-DOS and their favorite PC applications.

DOS aficionados who have Digital Equipment Corp. workstations can get the best of both worlds without squeezing a second machine onto their desktops. Rather, a software product called DEC SoftPC provides a complete DOS environment, including access to users' existing DOS files and applications.

DEC SoftPC is available in a $595-pre-user version for both VMS VAXstations and a $725 version for RISC/Ultrix DECstations. It enables users to retrieve and share data among the different operating system environments. Users of VT220 terminals or X terminals connected to workstations that run SoftPC can also use the DOS emulation environment.

Although the software provides emulation of a PC AT-class machine (based on Intel Corp.'s 80286 plus a 80287 numeric coprocessor), performance is actually better because the application is running on a more powerful workstation. According to Digital's testing, DOS applications can run anywhere from one-and-a-half times as fast as a PC AT on the VAXstation 4000 VLC to more than three times as fast on a VAXstation 4000 Model 60 or a DECstation 5000 Model 200. At the top is the VAXstation 4000 Model 90, seven times as fast as a PC AT.

The latest release of DEC SoftPC, version 3.0, adds several features to the basic package that runs MS-DOS 3.0. Resizable windows are now available. Video emulation includes VGA (Video Graphic Array), EGA, CGA and Hercules, as well as MDA on the VT220. In addition, a native MS-Windows driver provides higher performance with Windows-based applications. As before, multiple DEC SoftPC windows can be opened simultaneously.

DEC SoftPC provides a complete DOS environment for users of Digital workstations.

Users can set up two hard disks of up to 32 MBytes each, designated C and D. LIM 4.0 expanded memory, up to 32 MBytes, is supported.

DOS files and applications on 3.5-inch or 5.25-inch diskettes can be accessed at the workstation if it has a local floppy drive. If there is no local floppy disk, SoftPC can attach to a PC and use its floppy drive in a feature called SlavePC.

If the workstation or X terminal running DEC SoftPC has a mouse attached, it can emulate a Microsoft bus mouse in the DOS environment.

Communications ports, COM1 and COM2, map to the serial ports of the system running DEC SoftPC. Printer connections, LPT1 and LPT2, map to the serial ports or to a spooled device. Digital support literature warns that communications software should be tested before purchasing because of the differences in signaling on the PC and the VAX or RISC processors and differences in the way those processors handle interrupts compared with a PC chip. However, according to the company, many communications programs do work correctly.

By the same token, Digital has tested hundreds of PC applications but does not guarantee that all of the tens of thousands of available DOS applications will run.

DEC SoftPC for Ultrix requires 8 MBytes of main memory to operate in conjunction with Ultrix Worksystem software. Running in a VMS environment, DEC SoftPC alone requires 2 MBytes of main memory; when running in conjunction with DECwindows it needs 6 MBytes. Digital recommends, however, using it with more memory to improve performance. Disk space requirements are 7.5 MBytes in Ultrix and 15.2 MBytes in VMS. ■

DEC's Spin on Multimedia

Even though they are working in different locations and in some cases, different states, a group of Digital Equipment Corp. software engineers see each other every day – without ever leaving their offices.

Networking engineers in Littleton, Mass., software developers in Nashua, N.H., and their boss, Don Gaubatz, vice president of workstations in Maynard, Mass., consult by talking to video cameras while sharing screens of text and diagram specifications. The interactive, live consultations are made possible by a little-known application, DECspin teleconferencing software.

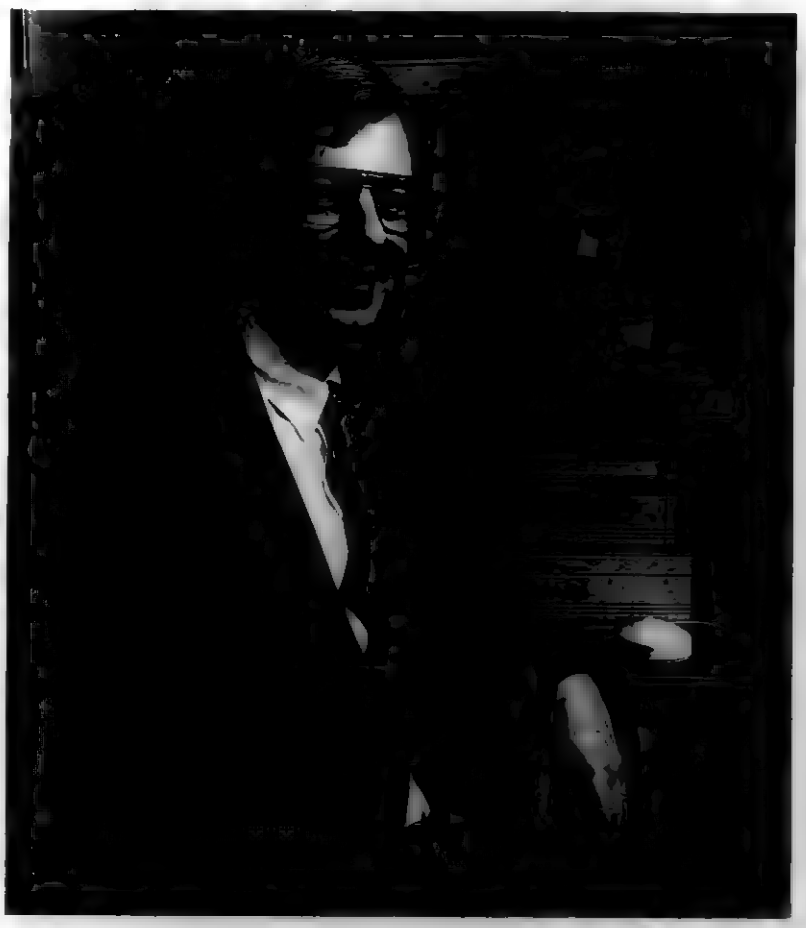
Two FDDI (Fiber Distributed Data Interface) networks loop 54 miles between the Nashua and Littleton plants and between the Littleton and Maynard facilities, with 10 DECstation 5000s providing the data transmission power, explained Jack Toto, multimedia marketing manager at Digital.

"The primary benefit I get from having DECspin on my desk is I can use it without thinking about it," said Gaubatz, who is used to talking to a TV camera mounted on his workstation. "I can play with DECspin in a very user-oriented way and then feed my reaction to the developers through the DECspin user interface."

Previously, Gaubatz communicated with his project workers by telephone. "When we communicate over DECspin, our conversations are usually shorter. I think that's because when we talk face to face, the human communication bandwidth is much higher," he said. "I get the advantage of seeing the functionality of DECspin right on my desk and the advantage of talking to the other sites without spending the time traveling to them."

DECspin, a multimedia application created by Digital to speed software development, is being used in the development of DEC multimedia software. "We use it in-house as an engineering tool as well as to facilitate meetings," said Toto.

Gaubatz can dial up engineers, ask questions and share and modify engineering drawings if necessary without having to drive 45 minutes each way between facilities. "In this economic climate, you can't have key personnel wasting that kind of time away from the development process," he said.



Walt Chappell

Sitting at a DECstation 5000, Digital's Don Gaubatz uses DECspin teleconferencing software to consult with engineers and developers at distant DEC offices.

DECspin is currently available only for DECstation 5000s. Toto said that Digital is looking toward providing future versions for other platforms, including Sun Microsystems Inc. and Hewlett-Packard Co.

DECspin is designed to work with several pieces of multimedia hardware, which are included in the price of the run-time license. The hardware consists of a DEC video card, a frame buffer card, an audio card and a distribution box. The audio card is built into the Personal DECstation 5000 Models 20 and 25. DECspin loads on each machine participating in the teleconference, transmitting live video and audio among them. The video originates from cameras mounted on the workstations. The telephone handset or headset plugs into the distribution box, which plugs into the workstation.

Digital is developing a compression board based on industry standard JPEG (Joint Photographics Experts Group). The compressor will enable images to be captured, compressed, sent over the network and decompressed at their destinations. In tests, the JPEG board used with the DEC NS 600 hardware router over T1 lines from Chicago to Boston transmitted 11 to 15 frames per second as opposed to about two frames per second without compression, Toto said. The frame buffer card and the video card will be included in the JPEG board. ■

WORKSTATIONS *from page 24*

ments. In comparison, the DECstation 5000/240 offers 445,000 2D vectors/sec. and 436,000 3D vectors/sec.

Sandpiper is suited for two-dimensional simulation and mapping, CASE and logic simulation, the documents indicated.

Gaubatz said the SPECmark ratings for Sandpiper and Flamingo have not been finalized. "We have our compilers maturing on a very frequent basis. Once you get the hardware in place, once you figure out the feeds and speeds – then you continually evolve the compilers.

"The compilers right now are in a very fast state of evolution and they literally improve the preliminary SPECmarks of these things every week. So we can't say what the SPECmarks will be by the time the machines come out," he said. ■

It's All in the Chip

The 64-bit Alpha CPU rates 150 SPECmarks. Known as the 21064, the chip's maximum clock rate is 150 Mhz and its peak MIPS rating is 300. Currently, the R4000 chip from MIPS Technologies Inc. is the only 64-bit chip on the market. It has a maximum clock rate of 50 Mhz, a peak 100 MIPS and 70 SPECmarks.

At 100 Mhz, a peak 200 MIPS and 120 SPECmarks, Hewlett-Packard Co.'s Precision Architecture RISC 7100 comes closest to Alpha performance – but is a 32-bit chip.

The former MIPS Computer Systems Inc., which recently merged with Silicon Graphics Inc. and is now known as MIPS Technologies Inc., said it will take the R4000 to 150 Mhz by the end of 1992 and has targeted 200 Mhz for the second half of 1993. The Alpha chip differs from the R4000 because it incorporates 15 VUP (VAX units of performance) instructions, including VAX floating point.

Pathworks

Continued from page 19

example, that its support for the Banyan Vines network operating system is "coexistence only" right now. And it has still to make a firm commitment to SCO Unix support.

Digital claims to have a unique breadth of support planned for Pathworks' future. But even product managers within Digital concede that users will continue to be the judge of whether existing support or future support in Pathworks meets their needs for PC integration. ■

R4000 Snap-in Upgrades

Continued from page 23

DECstations and DECstation 5000 Model 133; the upgrade for the Model 240 will cost $4,000.

The Personal DECstation family, which currently ranges from $3,995 to $6,995 in entry-level, diskless configurations, features a main memory capacity of 40 MBytes. Onboard audio and the availability of live video input options make these systems capable of running multimedia applications. The systems have two TurboChannel bus slots, integral SCSI one RS-232 synchronous/asynchronous port, and, like the rest of the current DECstation models, onboard 802.3 Ethernet as well as optional multiple FDDI and multiple 802.3 Ethernet.

The DECstation 5000 Models 133 and 240 have main memory capacities of 128 MBytes and 480 MBytes, respectively. They feature three TurboChannel slots, integral SCSI and two RS-232 synchronous/asynchronous ports. In entry-level, monochrome diskless configurations, the Model 133 is priced from $8,495, and the Model 240 is priced from $11,995.

According to Richardson, key to the upgrade strategy is the fact that virtually all current DECstation hardware, such as graphics options and storage peripherals, will work seamlessly with the new architecture.

The RISC workstation family was the first set of Digital systems to use the 100-Mbit/sec. TurboChannel bus interface, which is also the peripheral interface for future Alpha systems. DEC has promoted TurboChannel as an open interface and encouraged the development of third-party peripherals through its Tri/Add program.

Among third-party Turbochannel options listed in a recent Tri/Add catalog are network adapter cards, data-acquisition interfaces, serial and parallel line interfaces, IPI (Intelligent Peripheral Interface) disk drive controllers and real-time video interfaces.

Turbochannel-to-VME bus interfaces enable customers to use industry-standard VME peripherals with their DECstations as well.

Also, DECstation support for standard SCSI peripherals ensures that a wide variety of inexpensive storage devices can be used with the workstations.

The entire line of Digital's TurboChannel-based graphics options will go forward with R4000-based systems. At the low end of the graphics line are the MX options, a single-plane, high-resolution (1,280 x 1,024 pixels) monochrome frame buffer that takes up one TurboChannel slot. The TX graphics option was designed for use in conjunction with the DECvideo multimedia options and provides a socket for the live-video daughter card. This high-resolution option contains a 24-bit true color frame buffer and an independent 8-bit color-mapped frame buffer; it takes up one TurboChannel slot.

Another one-slot graphics option is the HX, which has 8-bit planes with 1,280- x 1,024-pixel resolution. Unique to the HX is a Smart Frame Buffer custom chip that provides acceleration for two-dimensional line drawing, stippled polygon filling, pixel copy and Boolean operations.

A key to the upgrade strategy is the fact that virtually all current DECstation hardware will work seamlessly with the new architecture.

Offering a higher level of graphics performance are the PXG, PXG+ and PXG Turbo+. All implement an advanced graphics acceleration architecture, but with differences in form factor and performance. The PXG and PXG+ occupy two TurboChannel slots, while the Turbo+ is a triple-width card. At the top of the line, the Turbo+ has 24 image planes, a 24-plane double buffer, 24-plane Z-buffer and 24-plane buffer for offscreen storage of pixmaps.

One uncertainty that remains in the DECstation upgrade strategy is whether future hardware options will be compatible with the R4000-based workstations. A Digital spokesman said that although all TurboChannel options will physically fit into the older systems, it will be up to the options designers to write the appropriate drivers for the DECstations. ■

It's Not a File Server

DEC's Infoserver offers virtual disk and tape services to clients in multiple environments.

One way to begin a description of Digital Equipment Corp.'s InfoServer network storage device is to say what it is not – it is not a file server.

"The InfoServer is a unique device that offers the opportunity for LAN users to share SCSI devices," said Mike Lynch, InfoServer marketing manager at Digital. "The benefit to Macintosh, PC, VMS and Ultrix clients across a LAN is that now they have at their disposal up to 14 SCSI devices they did not have to go out and buy."

According to Lynch, the differences between InfoServer and generic file servers are basic. The InfoServer, which is based on the MicroVAX 3100 processor, offers virtual disk and tape services to clients in multiple environments and is optimized for handling multiple reads and seldom writes. In contrast, file servers offer clients a variety of file-based services, including the opportunity to share files transparently but only across a bounded LAN environment. In their favor, file servers deal equally well with multiple writes and multiple reads.

Underlying the services provided by InfoServer is Digital's LASTport (Local Area Storage Transport) protocol. LASTport is a protocol developed by Digital that optimizes the efficiency of read functions and ensures the heterogeneity of the InfoServer by transferring data at the block level.

LASTport was built using an asymmetrical client-server model that contrasts sharply with DECnet's peer-to-peer model. The asymmetrical client-server model allows LASTport to speed interactions between clients and the server across a LAN by handling up to 255 simultaneous transactions and eliminating the need for clients to send acknowledge messages back to the server.

System managers can hang up to 14 different SCSI devices off the InfoServer, including CD-ROM drives, hard drives and tape drives. The InfoServer 150 ships with an internal 120-MByte RZ23L hard disk and an RRD-42 CD-ROM drive already installed on one of its two 7-port SCSI buses, leaving a total of 12 SCSI ports open.

To users, the InfoServer simply looks like another SCSI device, another area

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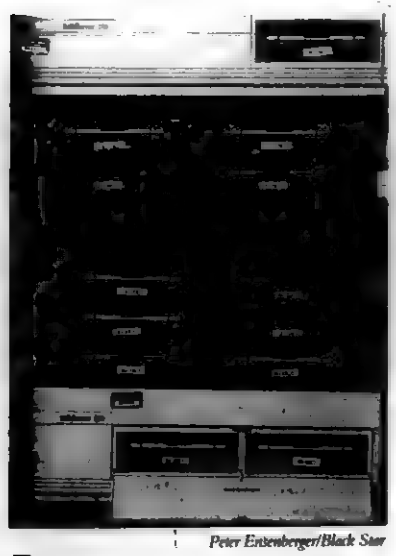


Peter Entenberger/Black Star

Bill Dellan, coordinator of computer services at Mesa Community College in Arizona, uses two InfoServers (above) to provide virtual disk services to 12 diskless, 386-based DOS workstations scattered around the college's library. Behind Dellan is systems technician Carl Nelson.

Speaking with Larry Cabrinety

Larry Cabrinety is vice president of the Video, Image and Print Systems Group for Digital Equipment Corp. in Westford, Mass. The group is responsible for producing Digital's printers, DECprint Architecture, imaging systems, and X Window and other terminals.

How do you characterize the change in your unit as you observed the movement toward end user computing?

"We decided three years ago to stop just addressing the Digital base of customers. We decided that we had to start offering the customer the lowest-cost solution that gets the job done. There was to be no more of this, because we're a workstation vendor, we want to sell you a workstation. We want to supply text terminals that can put up PC Windows when hooked to a 386 or 486 machine. That's a $500 seat. Most companies have not done that.

"The desktop was the fastest-growing area of computing, and we said to each other, 'Hey, guys, let's try to do it right.' It was part of the restructuring here."

What's an example of your investing in this approach?

"Every network needs a good shared printer. Nobody can print on a network the way we can. We have invested $15 million in software for our DECprint Architecture to print anywhere on the network. We have the ability to queue up jobs (with non-sequential priority). We can reroute the job to another printer. We have patented the ability to do end-up image, or printing multiple images on one piece of paper. If you received 10 memos during the day, you can order them printed out on one sheet to take home and read. We can reroute the job to another printer. We can deliver bar codes anywhere on the network and print them out.

"DECprint provides a two-way communication capability. We printed out a technical manual in Cannes, France, from Westford, Mass., and we knew when the printer in Cannes was out of paper or jammed up. We have the power on the network to do these things.

"The DECimage part of the architecture allows you to print scanner-style images at printer speed. We can produce resolutions of 1,000 by 1,000 dots per inch off an image produced from a 300- by 300-dot-per-inch engine. It makes the lines much crisper. We call it image enhancement.

"And the MIS manager has full systems control of that printer. He knows when it's out of toner or paper. He can take full control of that printer and get the job done."

Webb Chappell

We decided three years ago to stop just addressing the Digital base of customers. We had to start offering the customer the lowest-cost solution that gets the job done.

But is this in the Digital environment only?

"DECprint can drive about half of the PostScript laser-printers out there. It takes some fine tuning to get it to run on third-party printers — not a lot. But we can't support all printers, just the big runners [established, high-volume printers]. By the first quarter of 1993, we will have DECprint playing on Hewlett-Packard printers. (But Digital has not set pricing.) IBM's RS6000 and System V machines will be able to run printers using DECprint by first quarter 1993.

"We are also aiming to have PCs on Novell NetWare able to make use of DECprint printer services.

"SunQuest Information Systems of Tucson, Ariz., resells our DECprint software on Sun machines."

Digital used to sell a half-million dumb terminals a year. Isn't that business declining and what do you see coming onto the desktop in its place?

"There are six million dumb terminals sold worldwide [per] year now, and Digital sells 600,000 of them. We're expanding into the private label, OEM market. Three years ago we decided to go after the worldwide base of computing.

"Digital used to produce ANSI character-cell and graphics terminals. That was it. Now we will do [IBM] 3270, Tektronix 4270 or whatever you want. We have VT420 PCTerm that can be run off a multiuser Intel PC for MS-DOS or SCO Unix applications. We'll make a terminal do whatever you want it to do.

"The terminal market is still evolving. The world of the X Window System will take it to a new dimension. X will make the terminal market start to grow again. We plan to run X Window terminals on token ring next spring. We'll have an InfoServer on token ring feeding X Window terminals. Not everybody wants to buy a PC for every worker.

"The world is changing rapidly. Some workstation vendors disavow that an X terminal can be tied to a workstation but it's going to happen. It lowers the cost per seat." ■

DEC Printers Talk Back

A Digital Equipment Corp. engineer in Westford, Mass., delivered a technical document to a colleague the next day in Cannes, France. Instead of trying to catch the Federal Express pickup, she sent an electronic file of the document over DEC's internal network to France, ordering a printer there to output it.

When the printer ran out of paper, she was informed of the interruption by sensors on the machine and she was able to leave an E-mail message for her French counterpart to reload the paper tray in the morning. Once the reload occurred, the printer continued to give priority to the technical document and picked up printing it from the point where the paper had run out. Before his co-workers had shown up for work, the French employee had his document in time for the day's demonstrations.

Examples like this are the result of DEC's $15-million effort to develop DECprint Architecture, a set of networked software products to maximize printer services, according to Larry Cabrinety, vice president of the Video, Image and Print Systems Group in Westford, Mass.

"Printers had to learn to talk back. They had to tell the user about their status, whether they were low on paper or other consumables, whether they received a job, when they finished a job and other things that allow remote printing to be as efficient as local printing," said Allan McDonald, DECprint marketing manager.

Most printer usage on a network is marked by one-way communication, agreed Angele Boyd, director of print research at the International Data Corp., a market research firm based in Framingham, Mass. "DEC offers more two-way communication than is typical in other environments. DEC will give the user little cheat sheets – codes that can be used to order two-up printing [multiple pages or images on one sheet]" and other special processes, she said. If the printer to which a task is sent is not available, DECprint functions will reroute it to another printer on the network and let the user know, Boyd said.

DEC relies on standard PostScript language within DECprint and is designed to work with Digital-produced printers, and some third-party products that support PostScript. Many PostScript printers are not equipped with the sensors and communication facilities needed to supply DECprint services, noted Boyd.

Under the DECprint Architecture, Digital has released a number of products that allow users on DECnet, TCP/IP or Pathworks (Digital's PC and LAN connectivity package) to maintain two-way interaction with a networked PostScript printer. DECprint Printing Services, for example, provides network services and printer feedback to users in DEC's VMS environment.

"Talking back was always part of VMS systems services," noted Mike Maynard, president of Integrated Management Resources Inc. (IMR), a market research and consulting firm in Stow, Mass. "Now it is more standard and more graphical in nature. Also, under DECprint, the printer talks back to you at a finer level of granularity."

Part of the architecture outlines standards for applications that create documents, clients that accept print requests from applications, and the printers and services that execute a print request.

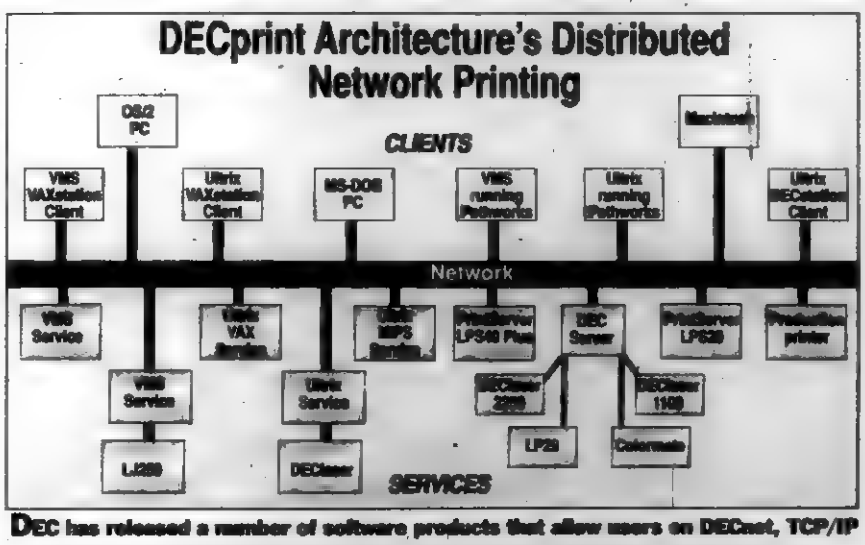
These standard functions are generally implemented in DECprint Client or DECprint Service software. DECprint Clients offer a standard user interface, job assembly functions and a job manager. DECprint Service packages offer job scheduler and print supervisor functions.

DECprint Service software is currently available only for VMS hosts. Digital plans to migrate the services to Ultrix and other Unix platforms, McDonald said. The current batch of DECprint software ships with all Digital PostScript printers (such as the PrintServer family of network laser printers) and is available for use with PostScript printers from other vendors. DECprint software packages for third-party PostScript printers are loaded directly onto the printers and are licensed separately.

An example of the extended flexibility of the DECprint Architecture is its handling of DECfonts, a separately licenseable part of DECprint. Users who have DECfonts do not need to have all fonts resident on all printers. With DECfonts, the fonts are distributed with the document so that any PostScript printer can print any DECfonts document.

"DECprint products take advantage of the richness of the PostScript language to increase the efficient use of the shared printing resource," McDonald said. Nevertheless, selling DECprint requires convincing a customer that printers are a

Continued on page 32



DEC has released a number of software products that allow users on DECnet, TCP/IP or Pathworks to maintain two-way interaction with networked PostScript printers.

Dumb Terminals Remain Preferred Device of Many

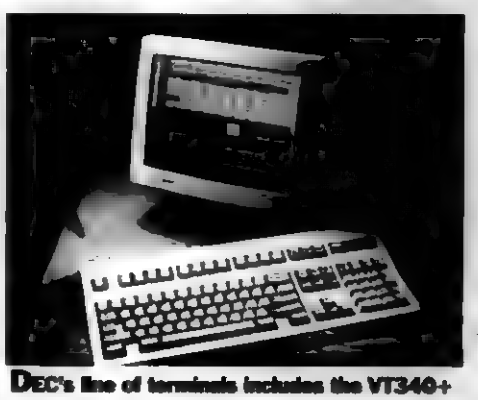
As Digital's VT dumb terminals move into the future, they are taking on a more intelligent look, offering split-screen capability and looking towards windows functionality, while maintaining the rock-bottom prices customers have come to expect.

"Eighty-five percent of people use computers for word processing and mail only, so these terminals are not going to go away," said Larry Cabrinety, vice president of Digital Equipment Corp.'s Video, Image and Print Systems Group in Westford, Mass. "Now we are getting to the point where it's easier to put more into the terminals than to lower the price of the terminals as they are now."

Besides windowing capability, future terminals are likely to add such features as clocks, calculators and mice. Many are moving from a character base to a simple dot-matrix base, which would facilitate bit-mapped graphics and possibly color. Digital currently is watching to see if a market will develop for these features and functions, said David Cotton, text terminal business manager. "Color tubes cost more and we need to maintain a two-to-one price advantage over PCs with color. We do get requests for color on these terminals, but at this point it is a niche market," he added.

Currently DEC's line of traditional terminals includes the VT420 (which replaces all earlier models), the VT420 PCTerm, the VT330+ and the VT340+. The VT340+ is Digital's only color terminal. All models will run the thousands of available ASCII and ANSI application packages and do simple line drawings, graphics and spreadsheets. The PCTerm models can run monochrome PC applications as well. Digital is working with the MDOS (Multiuser DOS) Federation to establish a standard for PC terminals.

The VT420 PCTerm is a text terminal adapted for SCO (Santa Cruz Operation) Unix and MDOS PCs, as well as a desktop system for accessing PC applications running on multiuser Intel Corp.-based PCs and Unix systems. It uses a PC keyboard to access applications running on SCO Unix and SCO Xenix operating systems and MDOS systems. It provides the functionality of Digital's standard VT420 terminal, including single- or dual-session operation with full- or split-screen viewing and text windowing. Both the VT420 and the VT420 PCTerm are priced at about $629. The VT330+ and VT340+ offer dual sessions, graphics and split-screen capability. The VT340+ offers a 16-inch color monitor. The terminals are priced at about $1,885 and $2,725 respectively.



DEC's line of terminals includes the VT340+ with a 16-inch color monitor.

DEC's terminals are now becoming international in scope with support for a number of foreign languages. They support ISO (International Standards Organization) Latin 1 standard for Western Europe and ISO Latin 2 standard for Eastern Europe. "Digital is establishing a market presence for these terminals in the former Soviet bloc countries," according to Cotton. Some Asian languages are available but are not yet in the mainstream and so are not cost-effective, he added.

"We have run 10 different languages

Continued on page 32

X Terminal:

A telemarketing representative at a financial services company works from a Digital Equipment Corp. VXT 2000 X terminal that runs off your department's RISC DECstation 5000. Similar systems are dedicated to customer support, accounting, order inventory and purchasing, all running off Ultrix, Unix or MS-DOS hosts.

In the past, the representative would have had to log in and out of four or five databases to get information, a process riddled with opportunities for keystroke errors. With Digital's VXT 2000 terminals, however, users can have database applications from different departments and heterogeneous hosts displayed as they run simultaneously in windows on their screens.

According to Digital representatives, this scenario is accomplished every day by the 20,000-installed base of VXT 2000 terminals currently in use. To function across heterogeneous hosts, a second Digital product is needed, the InfoServer 150 network terminal server, according to Larry Cabrinety, Digital's vice president of the Video, Image and Print Systems Group in Westford, Mass.

This VXT 2000 terminal family is a line of nine X-windowing terminals introduced last December, ranging from monochrome, gray-scale or color versions in 15-, 17- or 19-inch monitors. At the low end is the monochrome 15-inch, single-box VXT, complete with 4 MBytes of main memory. At the high end is the 19-inch, color VXT 219A terminal with main memory expandable to 16 MBytes. All VXT systems are expandable to 16 MBytes.

The monitors' resolution is 100 dots/inch, with a flicker-free refresh rate of 72 hz. A choice of thick-wire, Thin-Wire or twisted-pair Ethernet connections is available. All VXT terminals use the Motif window manager as their local window manager.

The CPU for these systems is the SOC (System on a Chip) – the 10e microprocessor – the standard for the DEC MicroVAX 3000 and DECstation 3000 families, with a 60-nanosecond clock speed. The SOC is compatible with all available software used on VAX and DECstation systems.

The InfoServer150, also introduced last December, is a specialized terminal

Digital's 'Universal Desktop Device'

server that acts as a companion product to the VXT 2000 family of terminals. Via a derivative of Digital's standard LAT (Local-Area Transport), the InfoServer150 uses the LASTport (Local-Area Storage Transport) protocol.

Via LASTport, the InfoServer 150 offers high network performance by offloading host functions onto the server to provide automatic load balancing across the network, automatic downline loading of fonts from the host and unlimited virtual memory for the terminals via demand paging. Additional options are available, such as the Bookreader service, which is the ability to store large amounts of information on a CD-ROM that can later be accessed and displayed on an X terminal, according to Cabrinety.

"The InfoServer allows the network manager to segment the network traffic to particular portions of Ethernet by individual work group," said Vic Bellemare, Digital's program manager for the VXT 2000 line in Westford, Mass. Terminals will boot from the InfoServer; they will get their virtual memory, window manager, fonts and DECterm from the InfoServer so that the only thing the user needs from the host via TCP/IP or LAT is the application itself.

The VXT terminals, unlike traditional text terminals, which functioned neatly in host-based configurations, are specifically targeted for distributed, client-server computing in multivendor networks, according to Bellemare.

"We offer total automatic load balancing aeross the network, via LASTport, which automatically moves the resource load from the host so that it does not bring down the system when resources are heavily used," Cabrinety added.

An open system?

"Digital's competitors will throw stones at the InfoServer, saying that it is a nice concept and that it improves efficiency, but they will say it is not a true open system," said Jack Roberts, principal analyst for Graphics and Displays at Dataquest, a market research firm in San Jose, Calif.

But, according to Digital, VMS or other network systems managers who must manage multivendor networks and the Hewlett-Packard, Sun, VMS, Ultrix and MS-DOS users on them, can custom-configure groups of users.

The VXT 2000 terminal family includes monochrome, gray-scale or color versions in 15-, 17- or 19-inch monitors. All VXT systems are expandable to 16 MBytes. The monitors' resolution is 100 dots/inch, with a flicker-free refresh rate of 72 hz.

"The VMS systems manager also has complete systems management configuration control at his fingertips with our new VXT terminals and InfoServer," Cabrinety added, claiming that competitive systems do not offer that facility.

"You can't do that just by putting X on a system and expecting it to be easily configured. With our system, we have virtual unlimited memory," he added.

As an example of dedicated configuration capability, Cabrinety said the VMS network manager can configure 20 VXT terminals to be used by technical support users, 20 for telemarketing, 20 for online transaction processing and 20 for customer support, all running windows from multiple hosts simultaneously.

Market analysts cited another advantage of Digital's VXT/InfoServer solution: It saves systems management expenses by having one network manager at a central location for X terminals on desktops across a multivendor network. The network manager can handle X terminals in a multivendor network of MS-DOS, Unix, Ultrix and VMS systems from one location.

"If you want to see where X is going, look at someone who is managing 200 to 300 VAXs from a technical support site," said Wes Melling, program director for Midrange Computing Strategies for the Gartner Group in Stamford, Conn. "That gives you a model of the relative ease with which distributed computing, intelligent workstations and X terminals will be managed by the middle of the decade."

Workstations are approximately 50 percent higher in annualized systems management costs than X terminals. PCs cost approximately 30 percent more in annualized systems management costs than X terminals, according to Cabrinety.

Ultimately, Digital wants its VXT 2000 family to become the "universal desktop device," Cabrinety said. It expects to sell 25,000 by the end of 1992, 40,000 in 1993 and 80,000 in 1994.

A 15-inch VXT monochrome terminal with 4 MBytes of main memory is priced at $1,595. A high-end, 19-inch, color VXT terminal with 4 MBytes of main memory is $5,395. An InfoServer costs $6,300, with up to 20 seats per server. ■

InfoServer

Continued from page 27

where the InfoServer contrasts with file servers. The InfoServer does not impose a file system on its virtual devices. For DOS clients accessing one of the InfoServer's CD-ROM drives, that drive will simply look like any other drive (generally, G: or higher). For Apple Computer Inc. Macintosh clients, there is a separate InfoServer icon provided in the InfoServer client software. Any client can mount a volume stored on the InfoServer and it would appear the same as any other locally stored volume.

Reaping the benefits

One system manager who understands the difference between an InfoServer and a file server and has been reaping the benefits is Bill Delhan, coordinator of computer services at Mesa Community College outside of Tempe, Ariz. Delhan is using two InfoServers (an InfoServer 100 and an InfoServer 150) to provide virtual disk services to 12 diskless, 386-based DOS workstations scattered around the college's library. All network services to the PCs are provided by Digital's Pathworks.

The InfoServers are connected to each other and to a VAX 6430 in the college's administration building via thick-wire Ethernet. Delhan emphasized that the InfoServers do not count on the VAX for any file services. They provide any needed temporary disk services from their own internal hard drives to the clients over ThinWire Ethernet.

At the 21,000-student college, the 12 CD-ROM drives in the InfoServers are primarily being used to provide read services to the client terminals for such things as reference materials, periodical abstracts, textual information and maps. In order to take greater advantage of the speed of the InfoServer, computer service technicians at the college removed many of the search engines from the different CD-ROM disks and loaded them directly into InfoServer memory.

"By taking the search engines on the different CDs off the disks and [putting them] onto the InfoServer, we've found that searches go a lot faster," Delhan said. ■

DEC printers

Continued from page 29

shared resource and that a print strategy can increase efficiency and save money, he noted.

With low-end laser printers dropping below $1,000, few companies have seen the need to implement extensive print strategies. Instead of having a strategy, company MIS directors respond to user demand by buying an additional printer. The result is a majority of a company's printers standing idle most of the time, while the cost of maintenance goes up, McDonald said.

Printing with a high-capacity printer, such as Digital's PrintServer 32 (at 32 pages per minute), can cut a company's cost per page. When used with a judicious mix of personal printers, the networked PrintServer's ability to churn out 150,000 pages per month makes for a cost-effective print strategy, he said.

"Printing is not really looked at in most companies as a strategic issue. It's a tactical issue," said IMR's Maynard. "Until they can't get out a report, people don't recognize the printers." ■

Dumb Terminals Remain Preferred Device for Many

Continued from page 30

simultaneously off one host. This means you could have 10 employees working in 10 different languages on terminals all hung off the same host," said Cabrinety. These terminals are the lowest-cost display device you can use to communicate in different languages, he added.

Another factor affecting the terminal market is the recently established AlphaWindow standard, which enables windowing capability on text terminals. The standard was established through the Palo Alto, Calif.-based DIA (Display Industry Association), which creates hardware and software standards for display terminals. Digital is a member of the association.

AlphaWindow terminals achieve windowing through a display server in firmware on the terminal itself working with a window manager software package that loads on the host computer. The window manager drives the terminals and the terminals run the windows. The AlphaWindow standard defines the interface between the window manager and the terminal in a series of escape sequences that define the windows and identify the sessions running in them. The standard is expected to expand to define a standard for graphics-capable terminals.

Priced in the $600 range, the AlphaWindow terminals will run all existing character-mode applications – roughly 80 percent of all existing applications without any modifications and use RS-232 serial communication lines. The windowing functions include running multiple applications, transferring information between applications and resizing. Other features are scroll bars, icons and buttons. AlphaWindow terminals can attach directly to a multiuser system such as a DOS PC or a Unix system.

While a number of vendors have brought out AlphaWindow products, Digital is taking a wait-and-see approach.

While a number of vendors including Cumulus Technology Corp. and Applied Digital Data Systems Inc., have brought out AlphaWindow products, Digital is taking a wait-and-see approach. The company declined to discuss its specific plans, if any, to develop such machines.

"AlphaWindow terminals are in our plans because windowing is the way of the world. It's just a question of timing," said Cabinety. "People have a lot to learn with regard to making AlphaWindow terminals and it might not pay to be among the first out with such machines," Cotton added.

With 5.5 million terminal devices sold last year (according to International Data Corp., a market research firm based in Framingham, Mass.), dumb terminals appear to remain the smart choice for a multitude of customers. "These machines fit in nicely," said Cabrinety. "They give users all the basic applications, are simple to operate, inexpensive, and work with any kind of a host on any kind of a network. Realistically, traditional terminals will be around the rest of this decade." ■

DEC rolls out services

Woos users with DECAdvantage integrated platform

By Melinda-Carol Ballou

Digital Equipment Corp. is already taking up the "Solutions Provider" banner from Chief Executive Officer and President Robert Palmer by announcing new services.

Earlier this month, the firm released DECAdvantage integrated hardware/software platforms for Intel Corp.-based servers and revealed that preinstallation of NetWare v3.11 is an option for the Application DEC 400xP server. DEC also began shipping Pathworks for The Santa Cruz Operation's SCO Unix V1.0.

"The most interesting thing to me is the packaging and factory installation of NetWare and other applications because those are the kind of services which are in wide demand from customers, regardless of whether they are small or large," said Bill Bluestein, an analyst at Forrester Research, Inc., a market research firm based in Cambridge, Mass.

DECAdvantage platforms are certified to run on DEC's Application DEC 400xP, Application DEC 433MP and DECpc 400ST Intel-based servers. They include pretested hardware — application packages, utilities, tools and networking software — to make the servers easier to install, integrate and operate, DEC officials said.

"DEC is trying to leverage its service capabilities ... by bringing servers into big PC networks and offering good support," said Lou Brentano, an analyst at Computer Intelligence/Infocorp in Acton, Mass. "There's a hole right now in the PC arena — there are products to integrate [disparate PCs] and networks, but users need someone to service it all."

Brentano described a situation at his company — an eight-node site — where two out of four printers ceased functioning when a new printer was brought in.

"What if our site had been an entire company and all the printers went out? You need someone you can call," he said.

Purchasing the preinstalled NetWare option will save one or two days for those configuring the system, depending on the complexity of the network, Brentano said. The preconfigured DECAdvantage servers can be a real time and headache saver, though he offered one caveat in his assessment: "What I don't know and the market will have to judge is how flexible the preconfiguration menus are going to be and whether they will be flexible enough to meet the needs of a bunch of users."

Some analysts questioned DEC's move to support Pathworks running on SCO Unix. "DEC has as much said that they will jump on the NT bandwagon with Pathworks. And then what will happen to the SCO business other than to go away quietly into the sunset?" asked Peter Kastner, vice president at the Aberdeen Group, a market research firm based in Boston.

But the Microsoft Windows NT-based servers are not available yet, and the SCO platforms have an installed base of more than 300,000 users, making this current focus on SCO Unix an intelligent move for DEC, according to Brentano. "The NT servers are a ways off, and it makes sense to make use of the good Intel server, which they now have available," he said.

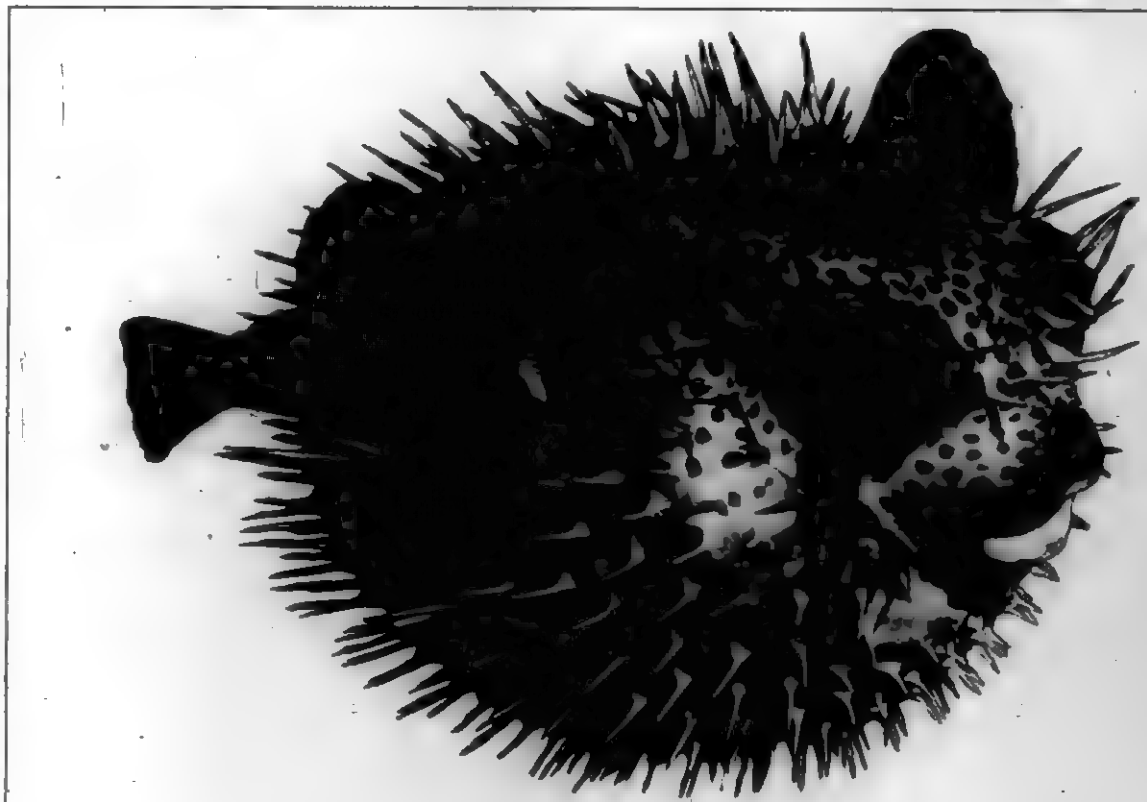
The DECAdvantage products are shipping now. A sample entry-level configuration of a system management products license costs $1,300.

Accelerator boosts IBM workstations

Legato Systems, Inc. in Palo Alto, Calif., recently agreed with IBM to develop and market a version of Legato's Prestoserve accelerator card and software for IBM workstations.

Prestoserve's main advantage, said product manager Ranga Rangachari, is that it allows users to support more clients per server.

Prestoserve accelerates Network File System (NFS) servers. Versions for Sun Microsystems, Inc. and Digital Equipment Corp. NFS servers were introduced in 1989 and 1990, respectively. The product can double server NFS operation throughput or reduce operation average response time by 50% by overcoming write bottlenecks, according to Rangachari.



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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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CW nears migration goal

Part of a series of reports on Computerworld*'s migration to a Unix-based client/server system.*

By Maryfran Johnson

The worst is over now — or so we hope.

And one result of *Computerworld*'s merry march from outdated, proprietary systems to client/server computing is in your hands. Literally.

This week's issue showcases our redesigned newspaper and the $850,000 of new technology behind it. The entire publication is now produced under Atex, Inc.'s new Unix version of its Workgroup Publishing Software, which runs on a pair of IBM RISC System/6000 Model 530 servers.

While a more sane group of people might have set aside 18 months to accomplish a mission-critical conversion project and a complete redesign, *Computerworld*'s management chose Comdex/Fall '92 as the do-or-die deadline for both. That meant accomplishing everything in one frantically stressed-out year.

"My staff is completely stretched, but we're down to the wire and we will be done," said Linda Nelson, *Computerworld*'s information systems director. "Any problems that turn up now will be minor and fixable."

A recent trial run of our new design with a select group of subscribers yielded generally positive feedback.

Built-in flexibility

The basic format of *Computerworld*'s pages has been altered so our layouts can be more easily varied, which opens up design possibilities that have our art department positively giddy.

Even the colorful little icons, which jazz up the look of the pages, are crafted for quicker deciphering. Also, the new system will allow us to save a day or more of paperwork shuffling by allowing copy editors to produce text boxes on their workstations rather than sending that work to artists.

The client end of *Computerworld*'s new setup includes 50 IBM Personal System/2s and IBM clones from DTK Computer, which on the reporters' desktops will run Microsoft Corp.'s Windows 3.1 and Atex Writer software, based on Xyquest, Inc.'s Xywrite package. Although most of the machines are installed, staff training for the reporters will not be completed until mid-December.

In the meantime, our Digital Equipment Corp. PDP-J11 minicomputers are linked to the RS/6000s over a common Ethernet backbone.

Atex provided a specially written Unix daemon for the AIX Unix-based operating system, which monitors the old system and automatically transfers stories to the RS/6000 servers for retrieval by the copy desk. That was one transition tool that made the mid-November conversion deadline workable, Nelson explained.

CW chief copy editor *Catherine Gagnon (left) and IS director Linda Nelson coordinated systems, design and copy flow under tight editorial deadlines*

The copy editors are 100% up and running on the new system — a critical milestone for producing the redesigned pages.

"Our major goal for the next few weeks is to get through this and keep our sanity," said Executive Editor Paul Gillin, who recently gave the copy editors sweatshirts labeled "Hurricane Atex '92: The Survivors."

Managers said they appreciated the straight talk they got from IS. "Linda always presented this to us as a difficult, painful process, and she always kept us informed," Gillin said.

"One of the hardest things to avoid is too much optimism," he added.

"The demos that vendors show you look really spiffy, but they're usually an order of magnitude better than what you can actually do," Gillin said.

While the road to client/server systems has been rockier than the managers expected, there were never any catastrophic data losses, Nelson pointed out. "We've wiped out the data on the backup server a couple of times, but we were always able to recover — from either the primary server or from the last backup tape — without impacting the users," Nelson explained.

One remaining software gap involves the Writer software, which works under DOS 5.0 but not Windows. Atex and Xywrite are working to resolve that now. "One of the problems of working on standard platforms is that often the vendors have to rely on other vendors to supply some portion of their application," Nelson said. In this case, Xywrite needs to make a few adjustments to its software to enable it to run under Windows.

"Overall, Atex has really come though for us in a big way," Nelson said. Atex supplied its most knowledgeable technical expert, Dora Jeffers, who practically lived at *Computerworld* during the conversion and was on hand as system bugs were found and eliminated.

One nerve-racking prospect still on the horizon, however, is the possibility that Atex's parent company, Eastman Kodak Co., will sell Atex. "I'm not feeling comfortable about that, but Kodak has said they won't sell Atex to a competitor who then shelves the software," Nelson said.

Even if that happened, however, there are contractual provisions in place to assure *Computerworld*'s access to the Atex source code and continuing support, she added.

At a glance

For the past 10 years, *Computerworld* has used an Atex publishing system running on a DEC PDP-J11-based hardware platform with dumb terminals and character-based writer and production software.

Today, we have a client/server system that uses dual IBM RS/6000 servers and Intel Corp. 486-based PCs as clients. WYSIWYG production software is in place, and Windows-oriented word processing is being developed. Page production is now done totally on the new system, with writer workstations being phased in during the coming weeks.

Cost of the project: $850,000.

Benefits: Faster turnaround, a more flexible design, complete text/graphics integration.

Microsoft picks copper

CDDI gives the speed of FDDI without the cost of fiber

Ethernet galore

Microsoft has a worldwide network of 24,000 nodes, 99.8% of which are running Ethernet. About 15,000 of the computers are located at the company's Redmond, Wash., campus. Planning for growing bandwidth is an ongoing process for the company.

By Lynda Radosevich

■ "It was an easy decision," Dave Leinweber, senior manager of corporate networks at Microsoft Corp., said about choosing Fiber Distributed Data Interface (FDDI) over copper to enable 100M bit/sec. speeds from servers and desktop machines.

Leinweber estimated that he would save between $2,000 and $2,500 per station using FDDI over copper rather than fiber. The savings included the price of adapter cards, concentrators and cabling.

Copper Distributed Data Interface (CDDI) "gave me the speed of FDDI without the cost and support of running fiber to desktop," he said. "And the CDDI adapter card wound up being one of the fastest we tested."

Since 1989, when Leinweber installed an FDDI backbone made by Ungermann-Bass, Inc., he had planned to install FDDI Extended Industry Standard Architecture adapters in file servers and high-level workstations someday, namely for Microsoft's software engineers whose development work was sure to tax available bandwidth.

This fall, while Leinweber was evaluating desktop FDDI technology from "all the major vendors," Crescendo Communications, Inc. in Sunnyvale, Calif., came out with adapters that use FDDI transmission protocols over copper wiring. Leinweber tested the Crescendo cards on three workstations and found a 300% boost in throughput.

"That's at the low end," he said. "I'm hoping to get higher throughput as we install servers that support symmetrical multiprocessing."

Over the next eight months, Leinweber said, he plans to install some 200 copper FDDI stations using high-quality Category 5 data-grade unshielded twisted-pair wiring that was preinstalled in Microsoft's main engineering building. The first stations will be operational in about three weeks, he predicted.

Installing FDDI over copper before standards are published does not worry Leinweber because, he said, he attended standards meetings and thinks standards will be completed next year. Once standards are established, he will move more than half of the company's roughly 5,000 development engineers to FDDI over copper.

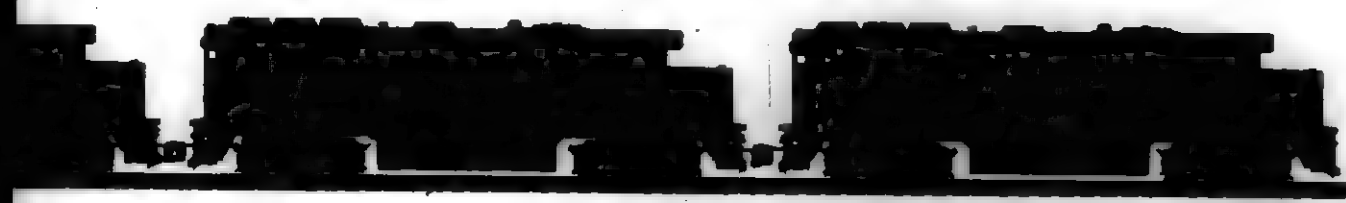
Gigaswitch on its way

Planning for growing bandwidth needs is an ongoing process for Leinweber. He said that adding 100M bit/sec. servers and stations on the fiber backbone will test its limits. Rather than breaking networks into smaller subnetworks, he said he plans to deploy a DEC FDDI Gigaswitch by next summer.

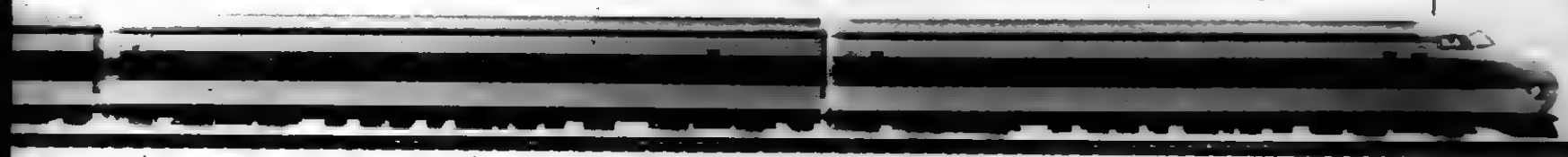
The Gigaswitch — a 3.6G bit/sec. switch that DEC said it expected to ship in the first half of 1993 — includes FDDI ports. Using switching technology similar to Asynchronous Transfer Mode (ATM), the Gigaswitch will interconnect FDDI networks, switching from one FDDI port to another port. Because it is a true matrix switch, the actual bandwidth is the sum of all the connected ports, he said.

Leinweber's plans include using ATM for metropolitan or wide-area network connectivity. He said he does not expect to move ATM to the desktop in the next five years because he does not see the technology taking off. He is also watching 100M bit/sec. Ethernet developments. "The important thing is that CDDI solves our problems today. I can't base our overall strategy on promises," he said.

Why combine a number of SPARCstations,



when a network of HP workstations and X stations operates for less?



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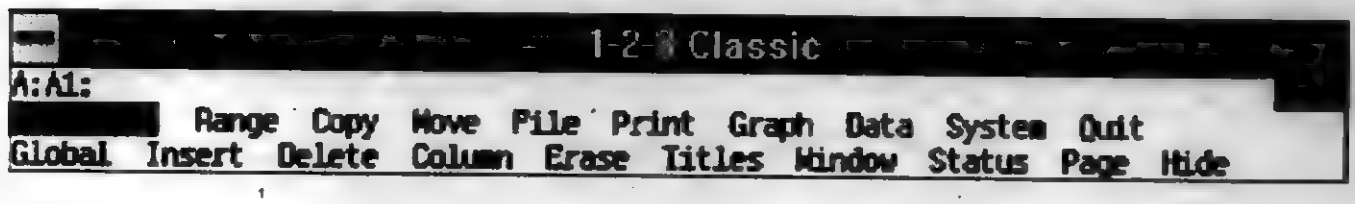
commands whenever you choose. Excel, on the other hand, only supports 80% of 1-2-3 Release 2.01 commands. And has no support for releases beyond.



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Corporate Computing (8/92) wrote that *"for the experienced 1-2-3 database user, 1-2-3 for Windows with DataLens is the front-end tool of choice."* Excel's data access capabilities rely on a third-party product with limited relational capabilities.

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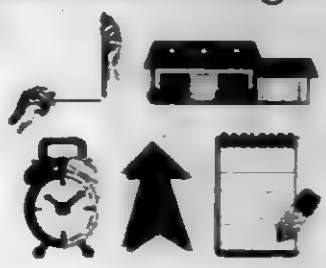

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[redacted]

LAN hardware

Racore Computer Products, Inc. has introduced the M8110, M8111 and M8112, 4M-byte 802.5 Token Ring adapters.

According to the company, the M8110 is a 16-bit XT/AT bus interface that is compatible with IBM AT or compatibles; the M8111 is Micro Channel interface is compatible with the IBM Personal System/2 or compatibles; and the M8112 is an 8-bit XT/AT bus interface that is compatible with IBM PC/XT, AT and compatibles. Each of the adapters operates with Type 1 shielded cable and Type 3 unshielded cable with an optional media filter and conforms to IEEE 802.5 and 802.2 Token Ring standards.

The adapters support network environments including Novell, Inc. NetWare 286, 386, IBM PC Network and Microsoft Corp.'s LAN Manager, among others.

The adapters start at $195.

➤*Racore Computer Products*
170 Knowles Drive
Los Gatos, Calif. 95030
(408) 374-8290

Workgroup software applications

Telephoto Communications, Inc. has introduced Alice-SPC JPEG Image Compression and File Conversion software.

The software was designed for Sun Microsystems, Inc. SPARCstations and compatibles. The Alice-SPC software can be used for archiving, retrieving and displaying full-color and gray-scale continuous tone images.

It supports all of the popular pixel formats and image file types, the company reported.

Cross-platform connectivity is offered, and Alice-SPC operates in SunOS, Solaris and Open Windows environments. Support is provided for eight- and 24-bit color and gray-scale adapters as well as the Sun-Raster and Tag Image File Format formats.

Alice-SPC costs $495.

➤*Telephoto Communications*
Suite D
11722 Sorrento Valley Road
San Diego, Calif. 92121
(619) 452-0903

Systems Union, Inc. has introduced Version 4.0 of its SunSystems accounting and financial management software.

The software includes a new graphical user interface that runs in Microsoft Corp.'s Windows 3.1 and IBM's OS/2 2.0 environments. According to the company, Windows and OS/2 users operating Version 4.0 accounting modules can run multiple screens and perform multitasking with drop-down menus.

Interoperability is provided across platforms including Novell, Inc. and other leading local-area networks, all PC operating systems, Unix and a number of reduced instruction set computing systems such as Hewlett-Packard Co.'s HP9000 and IBM's RISC System/6000.

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Modems

Shiva Corp. has introduced NetModem/E for Windows for Workgroups.

The product is a remote networking server for Microsoft Corp.'s Windows for Workgroups operating system Version 3.1. It was designed to enable users to more easily access their workgroup resources from any standard telephone line.

NetModem/E is a dedicated hardware device that plugs into the workgroup's Ethernet cable and a telephone line. It does not require a PC, keyboard or display screen. Connection is available for remote users by using a standard modem.

Remote users receive all of the same capabilities offered by the Windows for Workgroups operating system, including Microsoft Mail, Microsoft Schedule + and file sharing.

The product has security features that include passwords, dial-back phone numbers and individual user names, according to the company.

NetModem/E for Windows for Workgroups costs $1,699.

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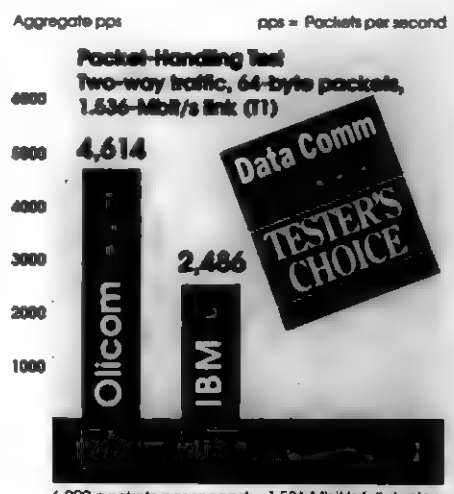

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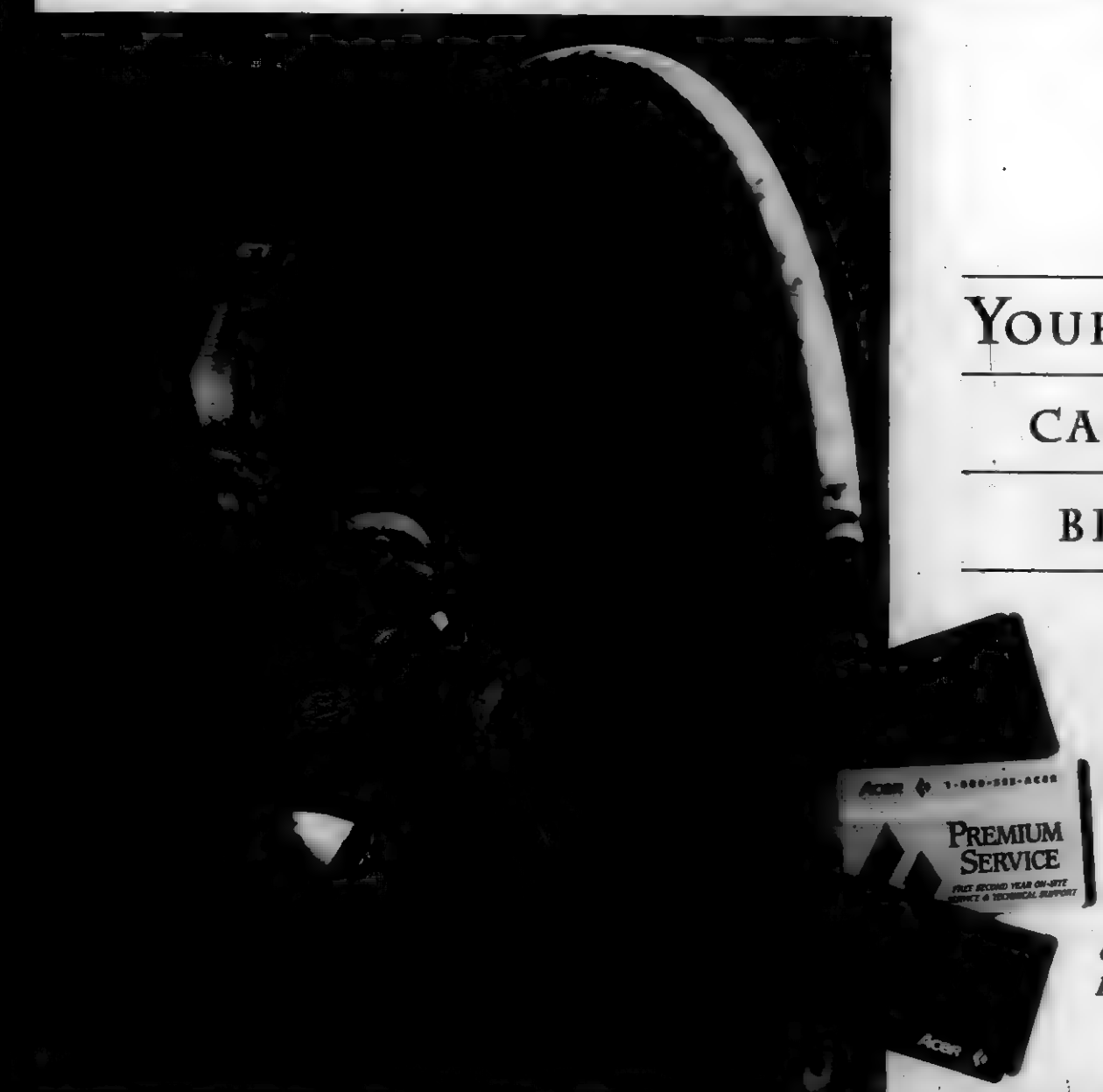

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It's an SNA gateway. (That's nothing new.) **It's also a local router.** (Excuse me?) **It's an SNA gateway *and* a local router** (You mean in one product?) **in one product. So it provides you with two solutions in one:** (Let me guess; the functionality of a gateway along with the performance of a router.) **the functionality of a gateway combined with the high-performance of our router's SPARC processor.** (I was close.) **Since this new product** (I think it should be called a gateway-router.) **performs two functions at once, it offers unprecedented levels of administrative convenience and manageability.** (But does it access multiple LANs?) **It also accesses multiple LANs, including Token-Ring, Ethernet, and LocalTalk,** (Ask a stupid question...) **and supports mixed PC environments such as Windows, Mac, and DOS.** (Holy Toledo.) **Naturally, our Netway gateway-router** (Hey, that's *my* name for it.) **can route Novell IPX and AppleTalk protocols,** (And?) **and comes complete with powerful 3270 services like terminal and printer emulation.** (I wonder who came up with this thing.) **As you might have guessed by now, the company behind this revolutionary product is Avatar,** (I should have known.) **leaders in SNA connectivity for over a decade.** (Must be about time for the obligatory 800 number.) **For more information, and our free "Gateway-Router Guide to Network Manageability," send in the coupon or call 1-800-AVA-3270.**
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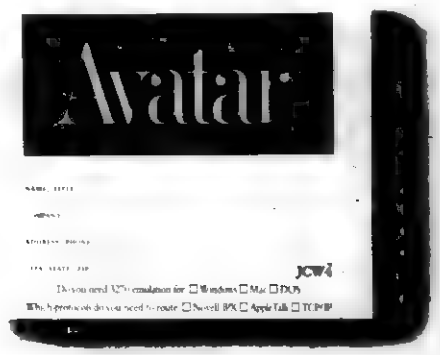

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Router rivals unveil 3-phase ATM plans

By Joanie M. Wexler

Amid the Asynchronous Transfer Mode (ATM) statement-of-direction blitz, the two leading router vendors last month sketched out plans for evolving their customers to high-speed switched networks based on the multimedia-oriented technology.

Cisco Systems, Inc. and Wellfleet Communications, Inc. both issued three-phase ATM strategies, with Cisco's culminating in an ATM network interface card for its router in early 1994. Wellfleet went a step further by committing to integrating an ATM switch into its high-end Backbone Node router "over the next few years."

ATM strategy

Key points of Cisco Systems, Inc.'s and Wellfleet Communications, Inc.'s ATM plans.

Cisco expects to provide an ATM network interface card for its router in early 1994.

Wellfleet says it will go a step beyond rival Cisco by integrating an ATM switch into its high-end router.

Wellfleet's articulated plans to leverage its gigabit-backplane Backbone Node for ATM switching are more in sync with statements made to *Computerworld* by the presidents of both Wellfleet and Cisco in June that the companies were considering getting into the ATM switch business [CW, June 29].

Cisco, however, said recently that the plans it revealed — which include evolving its Switched Multimegabit Data Service network access device to an ATM version in early 1993 — do not necessarily represent its complete ATM strategy.

"As new switches and interfaces become popular, they will become part of Cisco's strategy," a company spokesman said.

Cisco's intentions with ATM are important to customer Lehman Brothers in New York "because we expect in the next couple of years there will be workstations that require ATM bandwidth in hubs and routers," said Victor Duchovni, senior systems analyst. He said that while "we don't need all the Cisco specifics yet," he would eventually like to see ATM switching within his Cisco routers or Cabletron Systems, Inc. wiring hubs.

"What kind of performance will come out of the router if it does not incorporate ATM switching at some point?" he wondered.

Wellfleet's stated ATM intentions are a step ahead of Cisco's, with its Phase 1 for an external ATM access device corresponding to Cisco's Phase 2. Wellfleet's Phase 2 plan for an ATM interface maps to Cisco's Phase 3.

Wellfleet's third-phase commitment to an internal switching architecture "helps us plan for the Wellfleet router to continue to play a part in our network infrastructure," said Ameet Patel, emerging technologies analyst at BASF Corp. in Parsippany, N.J., and president of the 80-company Wellfleet User Group.

With its ATM switching capabilities, Wellfleet will likely compete directly against the ATM switch vendors such as Adaptive Corp. and Fore Systems, Inc., noted Fred McClimans, program director at Gartner Group, Inc., a consultancy

Router rivals, *page 103*

IBM to support frame relay, ATM technology

By Elisabeth Horwitt
SAN FRANCISCO

■ IBM's plans for broadband networking call for the company to have frame-relay offerings in place by mid-1993 and Asynchronous Transfer Mode (ATM) products within the next few years. However, executives made it clear that IBM has no plans to support the Switched Multimegabit Data Services (SMDS) standard that is considered a rival standard to frame relay.

Speaking at a meeting of the Frame Relay Forum during the Interop '92 show, Ellen Hancock, general manager of IBM's Networking Systems Division, said "a full complement of frame-relay products" will be available from IBM by the middle of next year. This fall, IBM announced frame-relay switching capabilities for its 3745 front-end processor, as well as the RouteXpander 2 card, which is said to convert an OS/2-based Personal System/2 workstation into a frame-relay gateway for Token Ring local-area network clients.

Frame relay is specified to run from fractional T1 speeds to 45M bit/sec. (T3); SMDS from 1.5M bit/sec. (T1) to 2.5G bit/sec.; ATM from T3 to 622M bit/sec., and it is said to be more suitable than frame relay for supporting voice and video transmissions.

Around the bend

Coming in the next 18 months, Hancock said, are frame-relay products for IBM Application System/400 and RISC System/6000 platforms. IBM has announced plans to put frame relay on the 6611 router but has no plans to do the same with its traditional Systems Network Architecture (SNA) controller, the 3174, Hancock said.

In the shorter term, IBM said it intends this month to announce products that deliver multimedia over Integrated Services Digital Network (ISDN) links, to Token Ring LANs, Hancock said.

"IBM has talked with customers, and it is clear that frame relay is easier than SMDS, causes less disruptions on the network and does not require [them to install] new hardware and software," Hancock told her Frame Relay Forum audience. "We are spreading frame relay across our product set," in preparation for the higher speed ATM products, she added.

Holding back

Hancock was less specific about IBM's ATM plans. The vendor is "waiting to see carriers' deployment" before deciding whether just to roll out a campus ATM switch initially or a wide-area network switch as well, she said. IBM will not necessarily put ATM on the 3745 front end, Hancock said. Also undecided is whether the vendor will build its own ATM switch or source it out to a third party, she added.

IBM is also working on Advanced Peer-to-Peer Network Plus (APPN+), an updated version of its peer-to-peer SNA protocol that will be optimized for broadband network protocols such as frame relay, according to Rick McGee, manager of communication systems architecture and development at IBM. APPN+ will be a leading member of "the next generation of routing protocols" that will provide high-speed, intelligent routing of network transmissions, McGee said. APPN+ will preserve customers' investments by routing transmissions from devices that still use older network protocols such as Transmission Control Protocol/Internet Protocol and SNA, he added.

The next step after APPN+ will be a gigabit/sec. APPN, which will support ATM, McGee said. IBM is a member of the ATM Forum and is working with standards bodies to develop a silicon implementation of the protocol, IBM spokespeople said. In keeping with its promises to make its network protocols open and standardized, "IBM intends for APPN+ to converge with the ATM Forum's work on a routing protocol," McGee said.

NY agency to add LAN connectivity

ON SITE

CityNet
New York

CityNet statistics:
- Implemented 1989.
- Approximately 1,800 SNA lines.
- More than 160 AS/400s using IBM Low-Entry Networking, 2,000 terminals, printers and PCs.
- Novell, Banyan LANs.
- Approximately 400 non-SNA sites, expected to grow to 600.
- 11 LAN protocols supported.

CityNet annual operating budget: $14.5 million.

By Elisabeth Horwitt
NEW YORK

CityNet, a 4-year-old, leased line, IBM Systems Network Architecture (SNA) network that services 85 New York City agencies and area data centers, is moving on to the next stage of its development: a hub-router configuration that will enable a burgeoning population of local-area network users to access computing resources anywhere in the greater New York area.

"About two years ago, we decided there was a LAN explosion in agencies and areas," said Pat Carragee, assistant commissioner of network systems at the City of New York's Computer and Data Communications Services Agency.

The current CityNet encompasses some 50 to 60 wiring centers made up of IBM 3745 and 3720 front-end processors connected over T1 leased lines. The network has saved the city more than $26 million by consolidating a hodgepodge of dial-up and leased-line links used by the agencies into a high-speed backbone that provides users with access to 25 IBM and IBM-compatible host data centers.

Going for integration

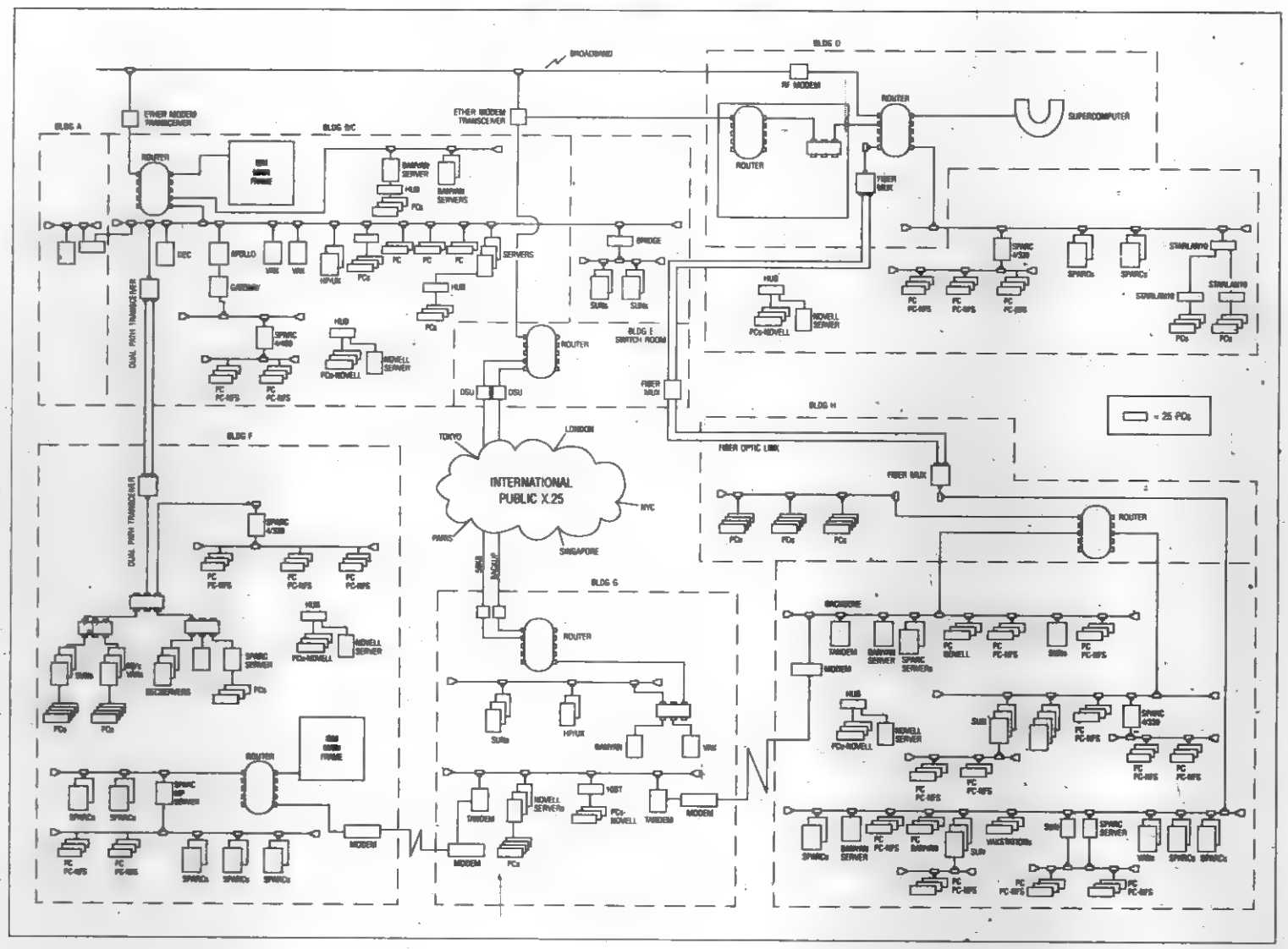
However, the current configuration does not provide a way to interconnect LAN users or to support the growing need for distributed applications and electronic-mail exchanges in all five boroughs, Carragee said. Right now, all LANs installed in the boroughs are stand-alone, he added.

A request for proposals, formulated over 18 months, went out last spring. Needed is a way to interconnect approximately 400 non-SNA sites, expected to grow to 600 sites by the time the project is finished. Responses are still being evaluated.

The design the city has chosen is a combination hub and

Connectivity, *page 107*

Perception.



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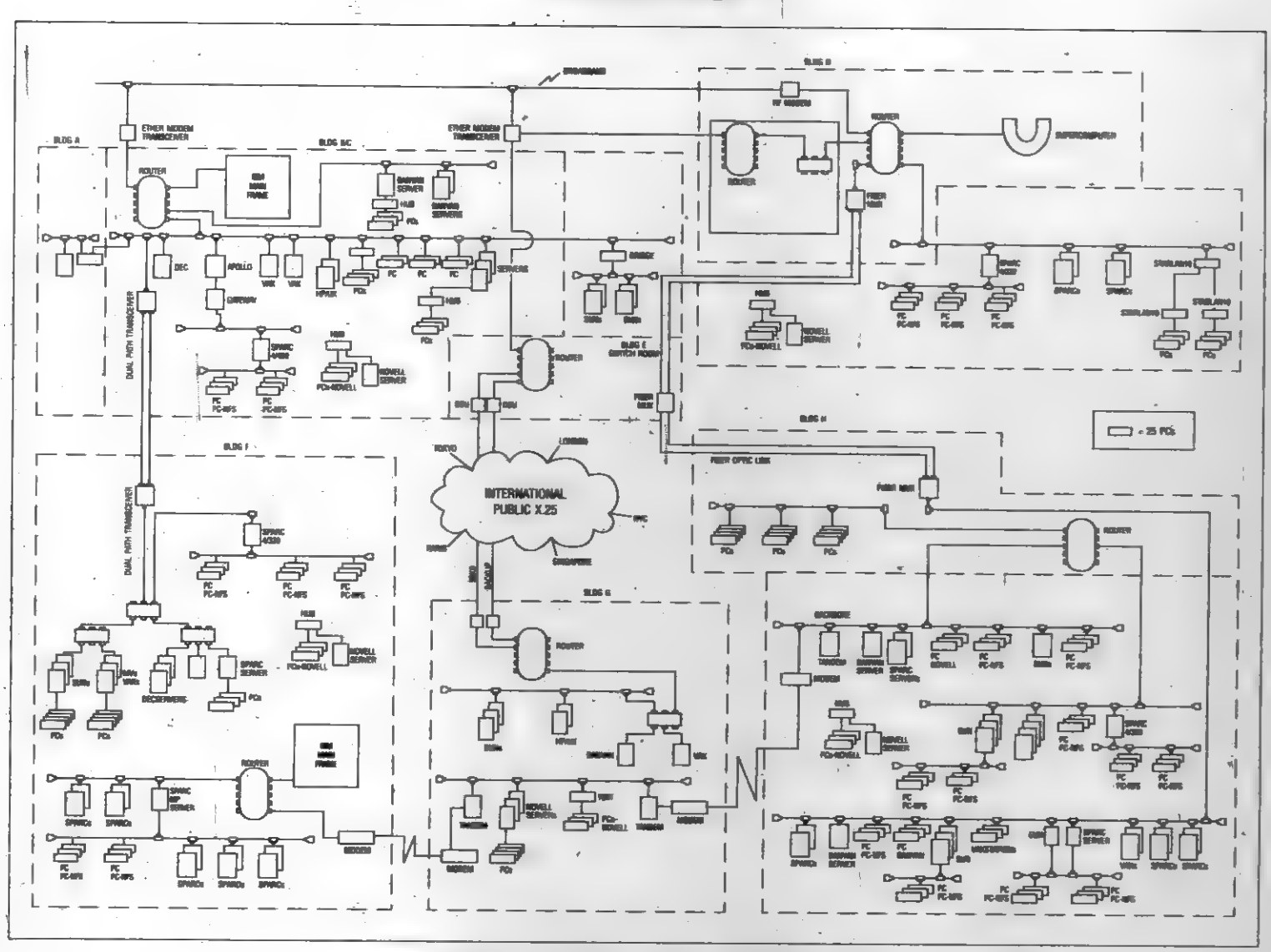
Reality.



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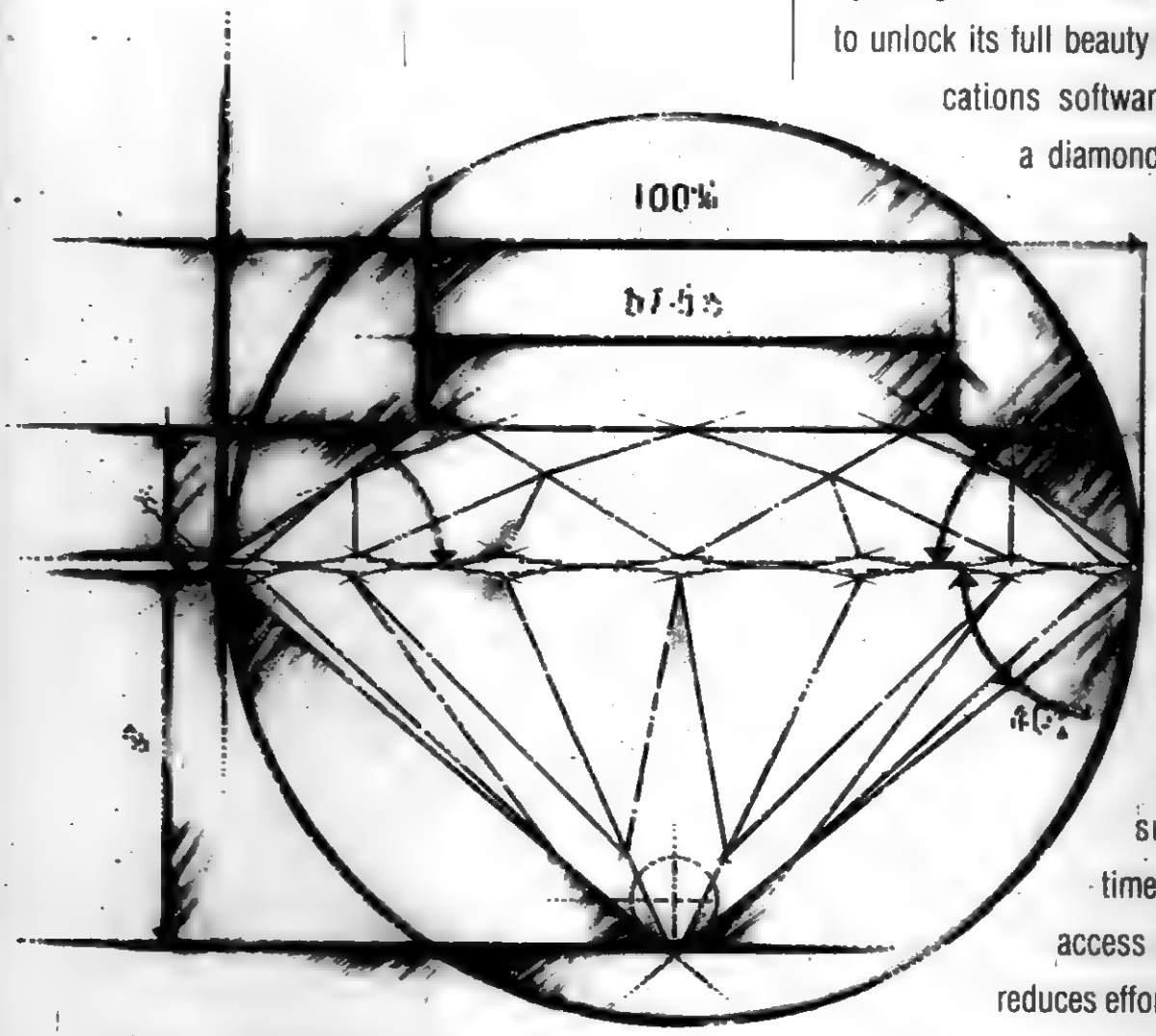

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LAN, IBM shops team up to link SNA, Token Ring

By Joanie M. Wexler

If there is a trend in local-area networking companies today to rival Asynchronous Transfer Mode (ATM) rollout plans, it would be efforts to allow users to merge IBM host-oriented Synchronous Data Link Control (SDLC) devices onto Token Ring LANs, which are likely to be components of a multiprotocol backbone.

Last month, for example, router vendors Wellfleet Communications, Inc. and Proteon, Inc. both announced that they will resell SDLC-to-Token Ring protocol conversion devices from NetLink, Inc. in Raleigh, N.C. The conversion process allows SDLC devices to appear to both the network and the host as if they were natively LAN-attached.

Router vendor Advanced Computer Communications, Inc. is expected soon to announce that it will acquire NetLink competitor Ring Access, Inc. in Cupertino, Calif., to gain the conversion technology. Meanwhile, Cabletron Systems, Inc. announced at Networld Dallas '92 last month the conversion capability in the form of a module for its smart wiring hubs.

Last March, 3Com Corp. said it would be providing a stand-alone SDLC-to-Token Ring converter via a similar partnership, though at press time no specific information or delivery dates were available.

However, Edgar Masri, 3Com's director of business development, said the firm believes the conversion reaps "higher performance and better IBM NetView management" when performed in a stand-alone device tied into a router, rather than via an integrated module in a hub or router.

> Efforts to merge IBM host-oriented SDLC devices onto Token Ring LANs rival ATM rollout plans

Router leader Cisco Systems, Inc. has integrated its own SDLC-to-Token Ring technology into its internetworking devices, though some analysts said they believe LAN vendor partnerships with IBM Systems Network Architecture-focused vendors might deliver better products because of the niche companies' expertise with IBM technology.

Router rivals unveil 3-phase ATM strategies

CONTINUED FROM PAGE 99

in Stamford, Conn. He added that if Cisco ends ATM development after the interface stage, its routers could eventually become feeder nodes into Wellfleet ATM backbones.

Switch partnership

The Cisco/Wellfleet announcements came on the heels of a strategy outline by Proteon, Inc., which said the vendor would team up with business partners — whom analysts peg as likely to include Motorola/Codex — to develop a high-performance ATM switch that spans the local and wide areas in 1995.

Meanwhile, Proteon will add an ATM interface to its high-end router in late 1993 and in 1994 plans to deliver an ATM-compatible integrated hub-based router.

A hub-based ATM switching module is desirable to the user community, which is creating hub-centric networks, Patel acknowledged. However, he said, an outstanding question is whether to route within the hub. If not, and "you have 20 hubs feeding into a router, the router must handle higher speeds," as afforded by ATM.

McClimans said he anticipates a "big push during the next 12 to 18 months for ATM in campus networks."

Beyond that, he said he sees wide-area ATM services unfolding during the next two years, and "in five years, ATM will truly give Ethernet, Token Ring and FDDI a run for their money."

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EO communicators herald new way of computing

By Michael Fitzgerald
MOUNTAIN VIEW, CALIF.

The name EO, Inc. sounds like it could be the chant from a signature song for some Los Angeles band. But the company means all business, and it believes its new class of communication devices will begin to create what some call a new paradigm of computing.

"It's a whole new ballgame, similar to what happened when we shifted from the minicomputer to the desktop micro," Mark Cummings, analyst at SRI International, Inc. in Menlo Park, Calif., said of the 440 and 880 model personal communicators EO introduced recently.

The game shift comes from the communications-intensive nature of EO's products. This could lead to users' carrying them around and maintaining contact with their home office systems at all times, as well as being able to move data in true real-time fashion.

But EO's two personal communicators — the 2.2-pound 440 and the 4-pound, notebook-size 880 — represent a break from the desktop environment, which will likely slow their adoption.

The new products break with desktop computing in several ways: They are based on a version of Go Corp.'s PenPoint operating system enhanced for better communications, they use AT&T's new Hobbit reduced instruction set computing (RISC) processor, and their emphasis is on communicating.

"EO, I think, is interesting because it's the first of a different species of systems," said William F. Ablondi Jr., an analyst at BIS Strategic Decisions in Norwell, Mass. At the same time, he said, his interest lies more in EO's potential than its present, in part because its communications efforts are currently outstripped by more conventional products, such as Compaq Computer Corp.'s new implementation of a cellular modem in a notebook.

Analysts also said EO, Apple Computer, Inc.'s RISC-based Newton and other products-to-be in this class give no clear indication of how they will really be used.

"We don't know yet what the new paradigm is," Cummings conceded. "We have a three-step process to go through — denial, then a phase where we implement the old paradigm with new computers, and then finally explosive growth, which is discovery of new paradigm."

Cummings said user companies are just now beginning to step into Phase 2.

In Brief

ServicePoint bought out

Network Computing, Inc. in San Jose, Calif., has acquired **ServicePoint Development Corp.** and integrated the ServicePoint automated help desk product into its LANAlert system management product suite. All employees at ServicePoint will be retained in their current positions, Network Computing said.

BT to expand dial services

BT North America, Inc. has announced a multimillion-dollar plan to expand domestic and international dial services, supporting speeds of 9.6K bit/sec., to 329 additional U.S. sites during the next two years — up from 72 locations today. This will enable users to realize throughput increases of up to four times when compared with 2,400 bit/sec. dial-up, BT said.

Novell tool for Ethernet

Novell, Inc. has announced a Microsoft Corp. Windows-based application for its NetWare Management System platform for centrally managing Ethernet wiring hubs that conform to the Hub Management Interface standard. The application is priced at $995.

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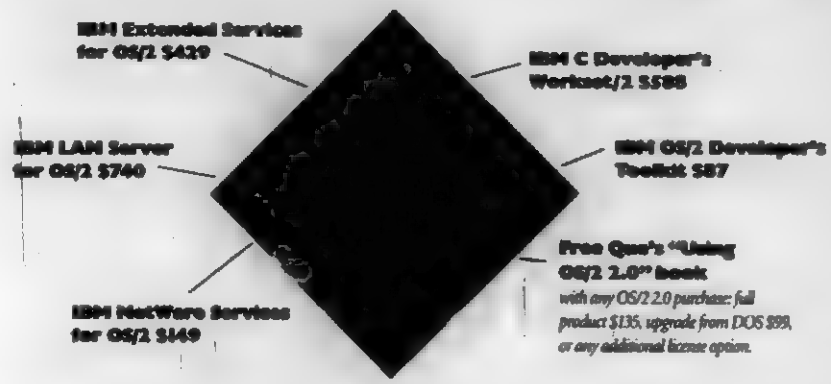

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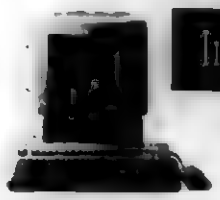

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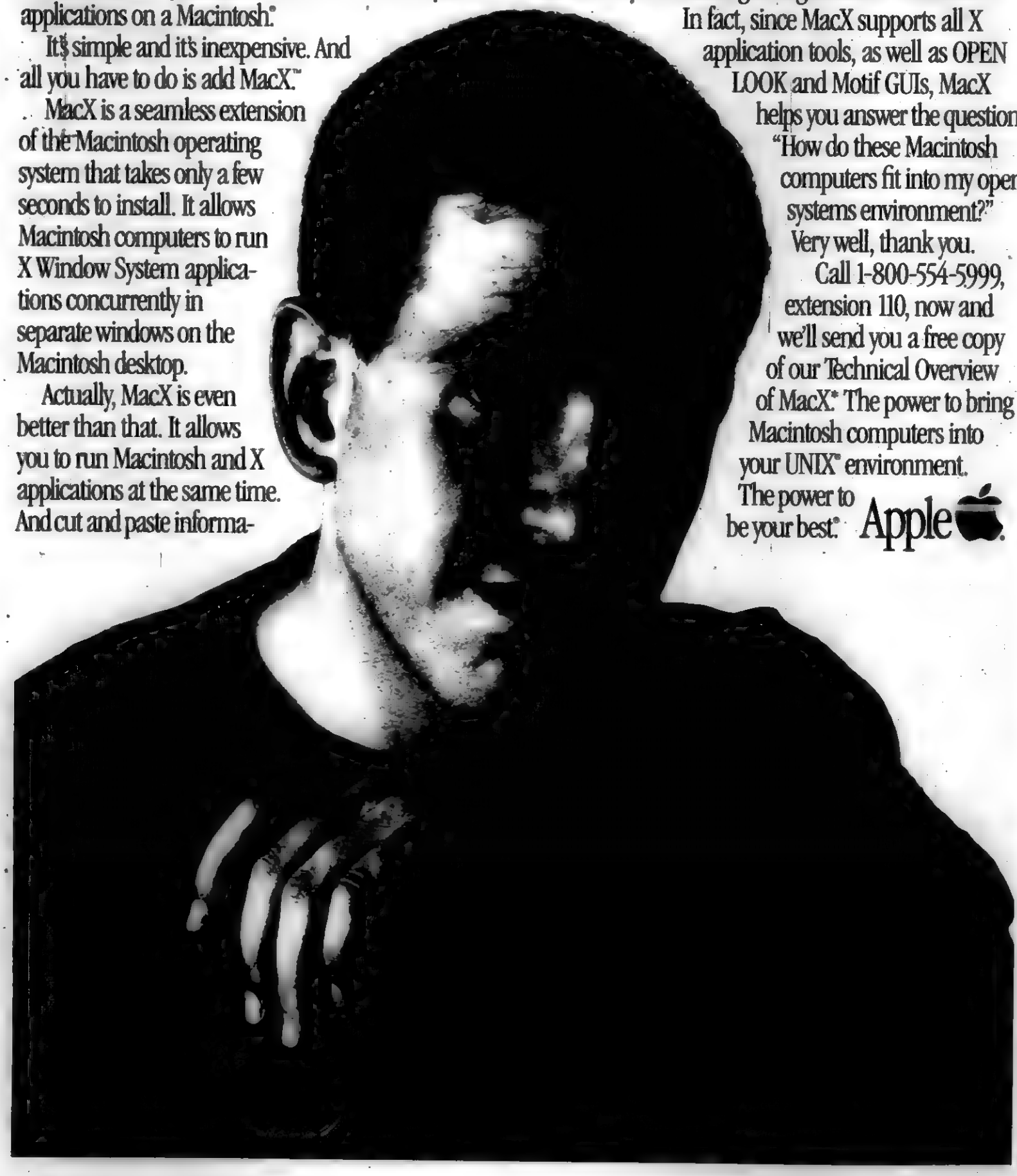

Crosstalk for Windows 2.0 debuts

By Lynda Radosevich
ALPHARETTA, GA.

Digital Communications Associates, Inc. (DCA) will roll out an updated version of Crosstalk for Windows asynchronous communications software later this month.

Crosstalk for Windows 2.0 adds new terminal emulation and file-transfer protocols, DCA's scripting language and support for Microsoft Corp. Windows 3.1's Multiple Document Interface. Pricing is set at $195; $49 for users of previous versions of Crosstalk for Windows.

Release 2.0's support for Multiple Document Interface lets users open and run multiple communications sessions at the same time, a Windows feature not supported in earlier versions of Crosstalk for Windows. Users can hide, resize and reduce the session windows to icons. A bar at the top of the screen provides icons that let users perform frequently used functions — such as sending and receiving files — with a mouse click.

A new "quick pad" utility lets users place scripts, macros and frequently used keys on an on-screen pad that can be accessed using a mouse.

New file-transfer protocols give users access to IBM mainframes (FTTERM and IND$FILE), bulletin boards (ANSI and ZMODEM) and VAX minicomputers (Digital Equipment Corp. VT emulation and Kermit). Terminal emulation support includes DEC VT52, VT100, VT220, VT320, IBM 3101, FTTERM, HP-700, Wyse and others.

LAN connectivity

CONTINUED FROM PAGE 99

router that will be installed at 12 geographic areas that have the highest concentration of non-SNA traffic, Carragee said. Those areas would include a geographic area, such as Forest Hills, and actual agencies, such as the New York Housing Authority.

The hub will combine a bandwidth manager, which will allocate channels on a T1 link among LAN, SNA and asynchronous devices, as well as fax and imaging devices, Carragee said. The router will provide interconnections for various agencies' LANs, while the X.3/X.25 packet assembler/disassembler will support asynchronous systems such as Digital Equipment Corp. minicomputers. A 3745 front end attached to an IBM host will coordinate the SNA traffic as a Communications Management Processor.

Carragee's group evaluated the idea of using SNA front ends to support LAN traffic but concluded that this design worked best in terms of guaranteeing service for existing SNA users, he said.

New York City plans to migrate its network to IBM's Advanced Peer-to-Peer Network (APPN) sometime after IBM VTAM 4.2, NCP 6.2 software becomes available next year, Carragee said. All front-end processors will eventually be APPN nodes, but "we expect it to be a long, complicated migration," he added.

Moving to peer-to-peer SNA will be less of a leap for the city given that it is already doing extensive low-entry networking over SNA backbones that link more than 160 IBM Application System/400s. The city began using IBM's low-entry networking Type 2.1 as soon as it became available, Carragee said.

New York City is currently committed to supporting 11 protocols, including IPX, Transmission Control Protocol/Internet Protocol, Banyan Systems, Inc.'s Vines, frame relay, X.25, Open Systems Interconnect and Digital Equipment Corp.'s DECnet.

The contract has yet to be awarded, Carragee said. The award is scheduled to be made at a public hearing next month.

The city uses IBM's Officevision but only as an E-mail platform for IBM VM systems, Carragee said. E-mail products from Banyan and Novell, Inc. are also used, as are CC:Mail and other E-mail products, which speak to each other over the SNA backbone using LU6.2 with SoftSwitch, Inc.'s Gateway performing connections and translation.

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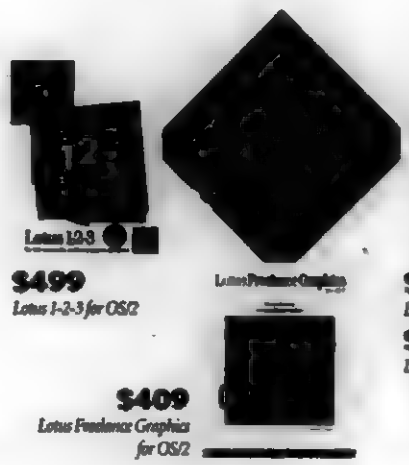

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WAN software

Frontier Technologies Corp. has introduced Super-NNTP for Windows.

The product was designed to enable users to access network news from a Microsoft Corp. Windows desktop.

Based on the Network News Transport Protocol (NNTP), Super-NNTP provides client access to NNTP Servers that are located at most computer centers.

The product is used in conjunction with the company's Super-TCP for Windows 100% Dynamic Link Library Transmission Control Protocol/Internet Protocol connectivity software and offers a Local NNTP Server feature designed for custom filtering of incoming information, according to the company.

Super-NNTP for Windows costs $95.

➤*Frontier Technologies*
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(414) 241-4555

Electronic data interchange

System Software Associates, Inc. has introduced EDI-SET, an electronic data interchange (EDI) product.

According to the company, EDI-SET was designed for developing trading partner-specific interfaces between an application database and EDI messages. With EDI-SET, users can develop inbound and outbound message interfaces via "intelligent" file and field mapping to any IBM Application System/400 application database, the company reported.

The applications processing logic is coupled to the interface program with an intelligent-copy feature, and EDI-SET automatically posts EDI messages to the application database.

Prices range from $4,900 to $50,000.

➤*System Software Associates*
500 W. Madison
Chicago, Ill. 60661
(312) 641-2900

Gateways, routers, bridges

Cascade Communications Corp. has introduced Version 2.0 of STDX frame-relay switches.

New features include the RFC 1294 Gateway, a software-based function that permits multivendor routers that are incapable of supporting frame relay to connect to a frame-relay network, according to the company. A 30 Bundle E1 I/O module provides up to 30 High-Level Data Link Control data links on a single E1 line and supports E1 or fractional E1 interfaces, the company said.

A six-port Universal module is also offered that supports connections to a variety of popular synchronous interface connections.

Prices start at $2,000.

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Computer Mail Services, Inc. has introduced the M-Bridge gateway for Unix-to-MCI Mail.

According to the company, the product resides on a dedicated Microsoft Corp. Windows-based PC gateway. Support is provided for both message attachments and return receipts.

The product includes an M-Bridge nickname facility that offers Unix users more access to the more advanced capabilities of MCI Mail, including sending messages to nonelectronic recipients through fax and telex and the capability to access preregistered graphics such as signatures and letterheads.

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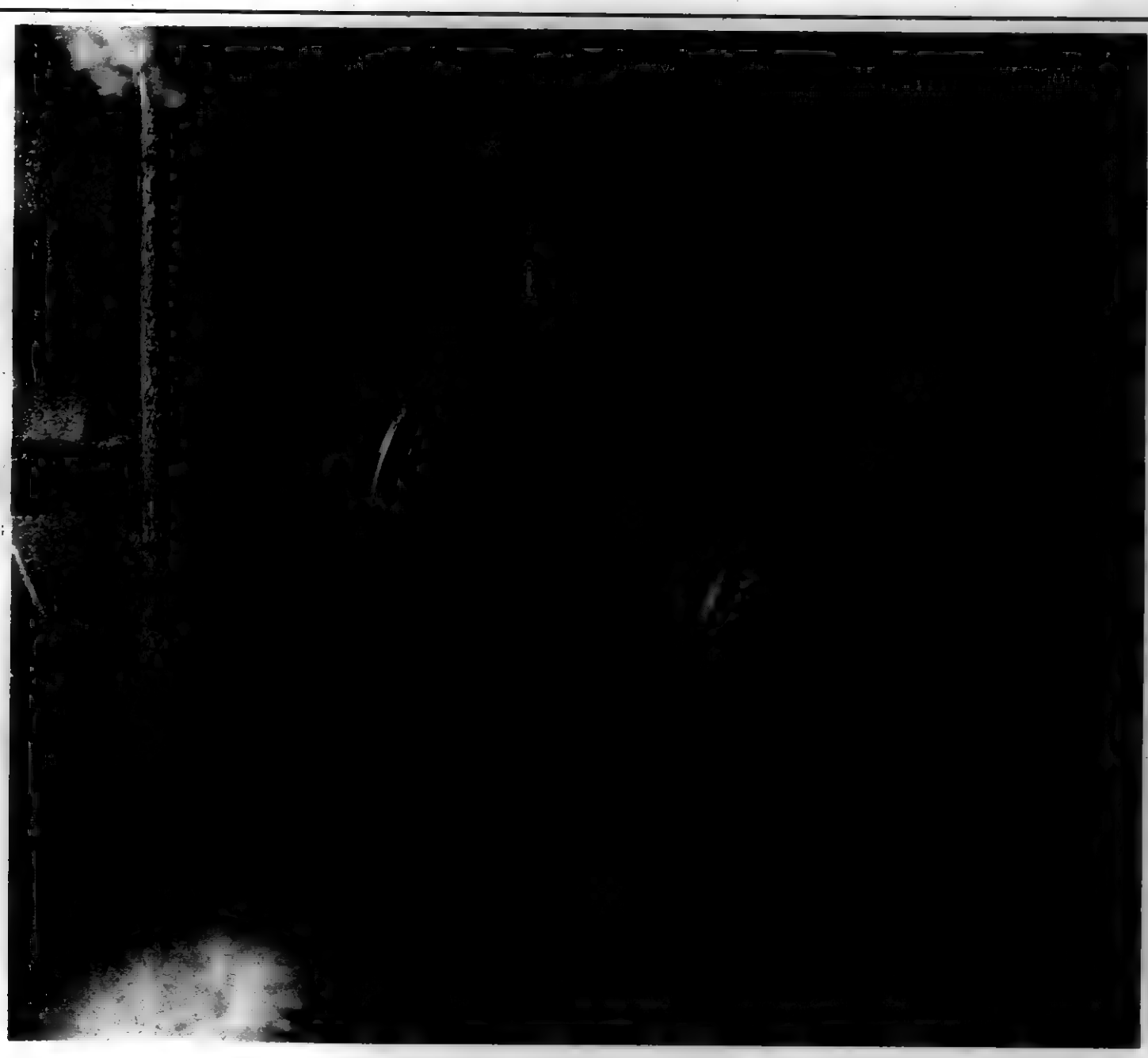

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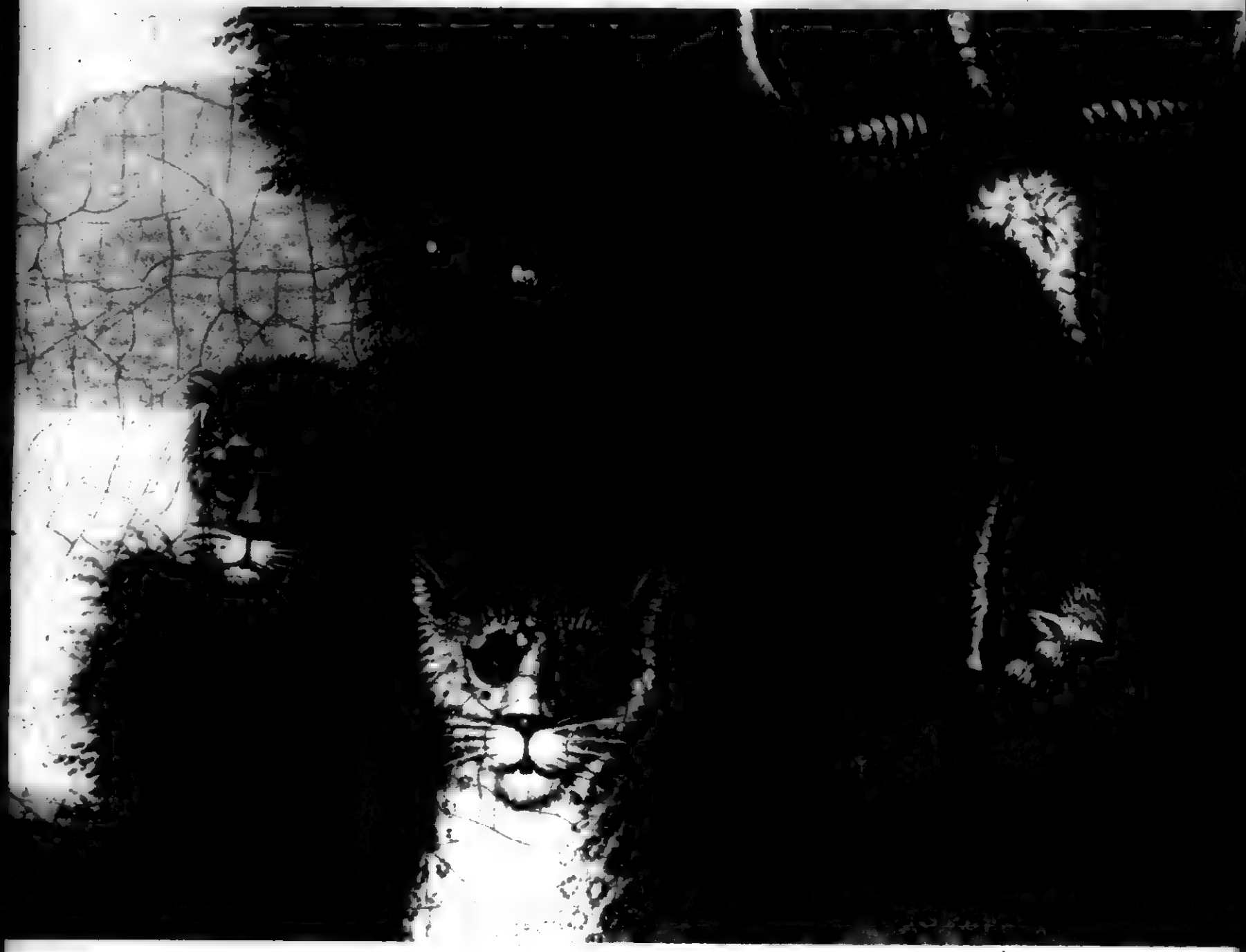
Multivendor networks.



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DB2 conversion simple if you're prepared for it

By Johanna Ambrosio

■ Converting to the most recent release of DB2 is pretty much a simple matter, according to some users who have done it. But that is assuming the shop is up to date on its maintenance releases and is using the catalog correctly. Otherwise, the job can be much more painful.

IBM announced the most recent DB2 release, 2.3, in September 1990 and delivered it in December 1991.

About half of the 6,000 or so DB2 customers are using the current release, analysts said.

Spiegel, Inc. finished converting its major production applications last March, according to David Beulke, senior software specialist. After some initial bugs in the beta-test version that were fixed in the general release, "everything went smoothly," he said.

The company has some 80G bytes of data on Release 2.3, Beulke said, and has noticed a performance improvement of about 5% to 10% with the new release.

Although Spiegel hit no major snags once the general release was available, other shops have not been so lucky. The problems have not been because of the software but because users in some cases have not implemented all of the maintenance tapes associated with Release 2.2.

Another issue is how people have implemented the DB2 catalog in Release 2.2.

"If people have not paid attention to what they were doing in 2.2, then 2.3 can be difficult because errors will come up," said Shaku Atre, president of consulting firm Atre, Inc. in Rye, N.Y. "You have had to enter things into the catalog properly in 2.2, with business rules and referential integrity."

Assuming all that has been done correctly, "2.3 is not a major problem," Atre said.

Bi-Lor, Inc., a retail grocer in Mauldin, S.C., is going through the conversion now to try to tap into some of the performance gains from Release 2.3, according to Don Parrott, software systems specialist.

They are finding it "a pretty substantial effort," he said, "because we weren't up to the current maintenance level. We have had to bite the bullet and put two years of maintenance in."

Generally, Parrott said, "we like to keep more current, but we're running lean and mean on staff, and some things just got put off."

Other than that, he said, judging from the other users he has talked to, "it's pretty cut-and-dry."

Life after statistics

SAS Institute goes beyond original offerings, challenges Cobol

By Gary H. Anthes

SAS: It's not just for statistics anymore.

In fact, it has been quite some time since products from SAS Institute, Inc. were solely for statistical applications, but some people just don't get it, the company complained.

Founded by statistics professor James Goodnight and three others, the company had just one product in 1976 — the Statistical Analysis System for IBM MVS mainframes. That product survives today in the form of a SAS/Stat, one of 28 SAS products in 5.5 million lines of source code for 20 operating systems.

SAS now says it is in the business of "information delivery" and offers software for application development, executive information systems (EIS), spreadsheets, data entry, project management, computer capacity planning, host-to-host data transfer and dozens of other functions.

"As the number of customers grew, they began asking for a lot more capabilities — reporting, graphics and general-purpose data processing capabilities," Goodnight said. Now, he said, SAS can do almost anything, and at the SAS Institute in Cary, N.C., it does (see story page 117).

While SAS has deployed its own products wider and deeper than most of its 3 million customers, some users have found that the SAS System for Information Delivery can replace much of what has traditionally been done in Cobol, with a big boost in programmer productivity and a modest — if any — penalty in processing efficiency.

Associated Insurance Cos. in Indianapolis has an array of SAS products installed on IBM mainframes and DOS-based PCs. Actuaries at the company began using SAS 13 years ago for statistics. Now, in one key application, it summarizes huge databases of health claims; it extracts, manipulates and analyzes data and then generates reports highlighting things such as questionable claims or excessive charges.

"We were a Cobol shop, but I started doing things in SAS," said Diane Brown, a former actuary and now data systems manager in the AdminiStar unit of the insurance company. "I was getting real productive and people were looking at me and wondering."

According to Brown, the attitude used to be, "real programmers don't use SAS," but that has changed. "Today there is no prejudice against SAS by our systems people. In fact, we use it more than the end users."

A staff of five SAS programmers has put into production some 500 programs that process 100 million claims records a year, Brown said. Advantages of SAS include gains in application development productivity and its great power to ma-

SAS, *page 117*

Across the spectrum

Most of SAS Institute's customers are on large systems, although PC platforms are showing gains

SAS products available as of 6/91/92

	Installations	Total product licenses
MVS	5,937 MACHINES	25,992
CMS	1,521 MACHINES	7,601
VAX	3,196 MACHINES	15,374
MS-DOS	9,000 SITES	33,756
OS/2	1,428 SITES	7,383
Unix	2,896 SITES	15,109

Source: SAS Institute, Inc.

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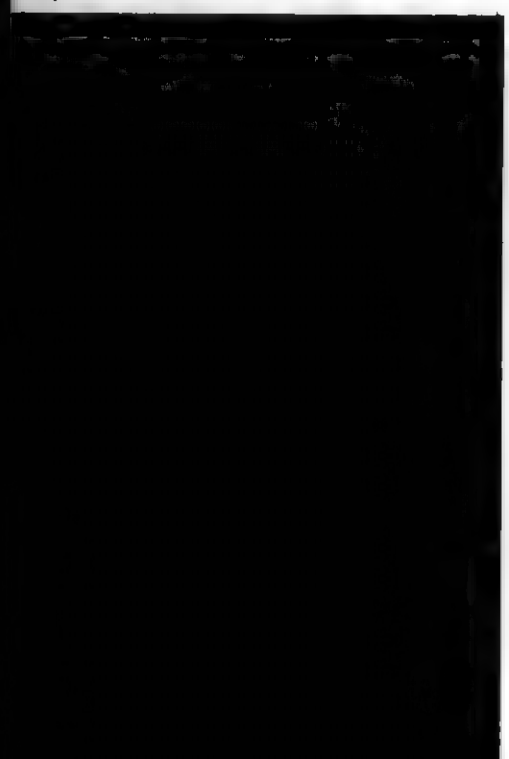

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Chicago library stays on-line

By Ellis Booker
CHICAGO

Visitors entering Chicago's year-old Harold Washington Library Center are sure to be impressed by the splendid architecture of the 10-story building, with its terrazzo and marble floors and its plaster, marble and maple walls.

But when Ulo Ormiste, director of computer services at the City of Chicago Public Library, looks at the building, he is more likely to see an institution that handles thousands of on-line transactions.

From Ormiste's perspective, this library looks like a bank, and like a bank it needs a fault-tolerant host in its data center.

For this reason, two of the library center's most mission-critical applications — the on-line card catalog and the book check-in/checkout system — run on a Tandem Computers, Inc. Cyclone processor. The Tandem sits a couple of miles away at the library's data center and is connected via two T1 lines.

"The check-in/checkout is almost an automated teller machine [ATM] transaction, but the delivery of information is a bulk file transfer. That's a problem for integrated library systems," Ormiste said. These functions are segregated on the Tandem system, which handled about 40 million transactions the first year, he said.

Another key aspect of the Tandem, according to Ormiste, is its fault-tolerant, nonstop features. Using the bank ATM analogy again, Ormiste said he wants his card catalog terminals to be available to library visitors full time.

In addition to the Tandem, the library uses a Wang Laboratories, Inc. VS 5000 as a front end to an IBM mainframe for its personnel, financial and book-ordering systems. The IBM host, run by the city, resides in Daly Center, across from city hall.

The library, which began using Tandem machines in the early 1980s, plans to move its book acquisition module onto the Tandem. Unlike some other users, however, Chicago's library system is not exploring a client/server migration for its critical applications.

"The problem is, we have 82 physical locations around the city, and you can return a book or pay a fine at any one of them," Ormiste said. "Inventory and customer records have to be available to every location."

The library is using high-speed networking solutions to address the needs of its main and remote locations. About 200 on-line card catalog terminals are connected over a 9.6K bit/sec. twisted-pair network to a StarMaster data switch from Gandalf Systems, Inc.

From there, this traffic is carried on one of two T1 lines to another Gandalf switch at the library data center, where it is sent into one of 20 X.25 packet assembler/disassemblers (PAD) attached to the Tandem. Each PAD supports 48 terminals.

Library users can also dial into the catalog remotely through an Illinois Bell node, which hops the call onto an Integrated Services Digital Network B channel running at 2.5K bit/sec. Like the library terminals, up to 48 of these calls can feed into a single X.25 PAD on the Tandem.

ON SITE

Chicago Public Library

Challenge: To keep two of Chicago Public Library's most important and public on-line applications available on a full-time basis.

Technology: A fault-tolerant computer from Tandem Computers, Inc. installed in a data center a few blocks away.

Result: Now in its third generation of Tandems, the library is moving administrative applications, currently running on the city-owned IBM mainframe, to the Tandem system.

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SAS: Life after statistics

CONTINUED FROM PAGE 113

nipulate files, Brown said.

At CitiBank Telemarketing Services in Baltimore, SAS/Stat has been used for years for forecasting, market analysis and credit analysis. Now the company — which sells credit cards and financial services for parent CitiBank NA — is using SAS products to develop an EIS to measure the effectiveness of the bank's marketing programs and telemarketing staff.

Kevin Kramer, director of information services, said the EIS, which he prefers to call "Everybody's Information System," summarizes the results of 1 million monthly telephone calls and produces reports and on-line files for graphical display. It replaces a process in which data printed out from the minicomputer-based telemarketing software was keyed back into PC-based spreadsheets.

"We had a potpourri of ad hoc solutions," Kramer said. "We saw we needed to get our act together and come up with an integrated, holistic approach."

Kramer agreed that SAS has a bit of an image problem. "It's the name — Statistical Analysis System," he said. "But when you begin to explain to people all the other modules that exist and all the things it can do — access data, report it and manage it — it opens people's eyes."

Xerox Corp.'s Occupational Health Information System is written in SAS from stem to stern. SAS handles the data entry and validation, database management, analysis and reporting. The system measures and analyzes employee health and workplace conditions.

Anne Slocum, a systems analyst in Xerox's Corporate Strategic Services Division, said the company considered putting the application up with Cobol and DB2. But she said Xerox was committed to using SAS for the statistical chores in the application, and the company found SAS could handle the data entry and database functions as well.

Proof that SAS software works

Software firms sometimes liken themselves to the cobbler's barefoot children, sheepishly acknowledging that their own internal systems are not quite state of the art.

Jim Goodnight: Cobol not needed at SAS

But SAS Institute has made its systems a showcase for its products. Cobol programmers need not apply at SAS.

"We are estimating revenues this year of $350 million, and we run the entire company with SAS — payroll, accounts payable, accounts receivable, the human resources database and sales support systems," said SAS President James Goodnight. "We do a lot of reporting in SAS, and my EIS is done entirely in SAS."

Goodnight said SAS provides a good database environment for holding data for analysis but may not be ideal for high-volume transaction processing applications. However, he said, many people buy expensive database management systems for chores that could be handled quite nicely with far less expensive SAS solutions.

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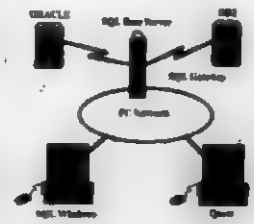

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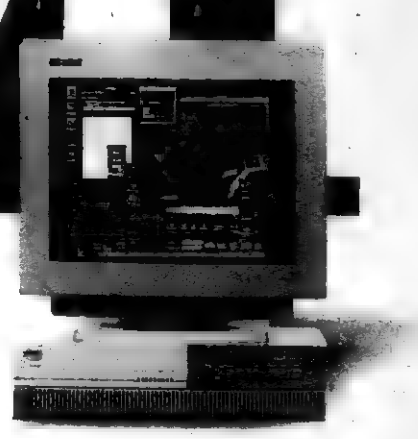

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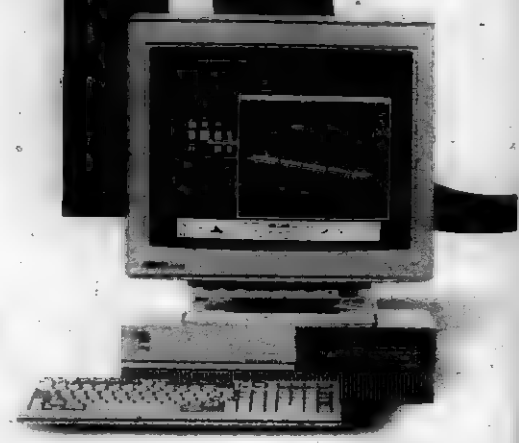

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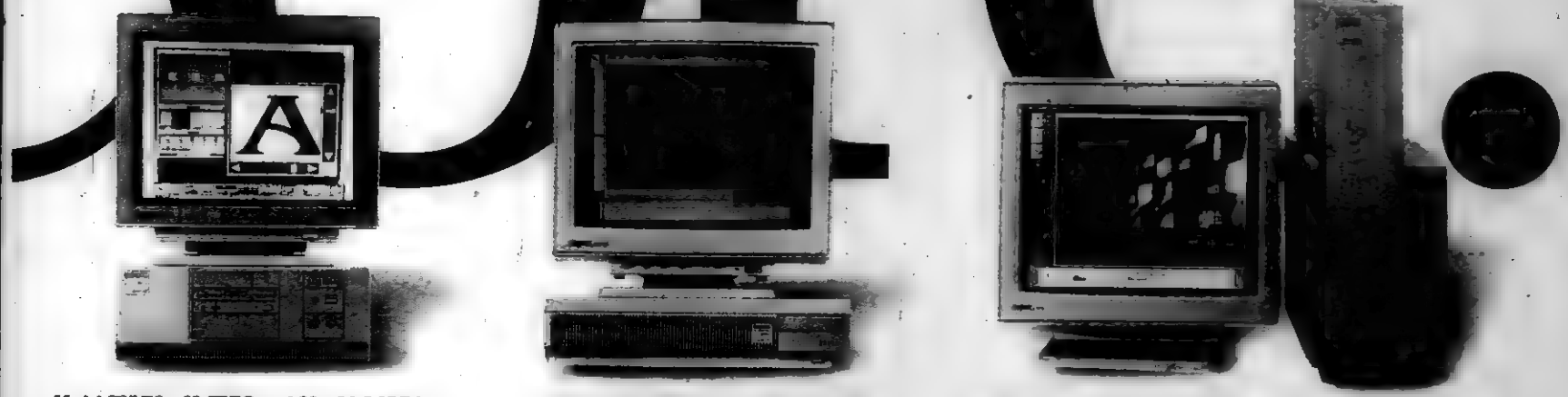

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Unix drives airport transition

By Mark Halper
DALLAS/FORT WORTH, TEXAS

At the Dallas/Fort Worth International Airport, a forthcoming cutover from an aging IBM System/38 to a Pyramid Technology Corp. multiuser system running Unix is revolving heavily around integration issues.

It was an integration problem in the first place that caused the airport to start looking for an alternative to the System/38 in the spring of 1991. The airport had, since it opened in 1974, added a host of applications to the system, few of which communicated easily with others such as the core financial programs for which the system was originally purchased.

"The staff was spending 75% of its time just maintaining the interface of software packages and only 25% of its time developing," recalled David Dearth, director of systems and technology management. He joined the airport a year before it issued its first of two requests for proposals (RFP) regarding the overhaul.

Expanded core

Software, including work order processing, payroll, purchasing and inventory, had all been added to the core financial systems, which included general ledger, accounts payroll and accounts receivable.

"Those needed a great deal of customization. We were pretty much in a maintain situation," Dearth said.

In issuing its first RFP, the airport was looking not so much for savings as for a technology that would help the airport — which claims to be the world's second-busiest airport based on total passengers — to continue to expand, Dearth said.

The first RFP contained about 2,000 specifications, including databases and tools. It narrowed finalists down to a mainframe system proposed by American Management Systems and an Oracle Corp. system pitched on a Digital Equipment Corp. VMS or Unix platform.

The airport chose the Oracle system — the platform decision was to come later. An Oracle solution would be built around the Oracle database, tools and applications, whereas a mainframe approach would have been more hardware-driven.

"Oracle had a better fit in terms of actually meeting our requirements without modifying their package," Dearth said, noting that some of the Oracle applications required little or no tweaking.

Pricing was not the principal criterion, but lower costs vs. a mainframe approach weighed in Oracle's favor, Dearth noted.

A second RFP, in August 1991, involved choosing the hardware platform. It was during this process that the airport had to decide if it wanted Unix or VMS to drive its business.

"We struggled over the issue of how open we really wanted it to be," Dearth said, recalling that the airport had some of the usual concerns of commercial users about Unix. "We wondered about its security, its reliability and its crypticness."

David Dearth: *Oracle had a better fit*

ON SITE

Dallas/ Fort Worth International Airport
Texas

Challenge: To plan a system to carry management of the airport into the next century.

Technology: Pyramid Technology Unix systems running Oracle DBMS, tools and applications replace IBM System/38.

Benefit: Integration of applications should be easier than under the System/38 environment.

An industry movement toward Unix standardization raised the airport's comfort level, Dearth said, noting, "We think that Unix is going to mature, going to get better."

Unix, Dearth claimed, allows a user to pull out the hardware if a machine does not work out and is better suited to provide "the horsepower you need for relational performance."

Close competition

Four bidders in addition to Pyramid responded: Sequent Computer Systems, Inc., AT&T, Data General Corp. and Hewlett-Packard Co. Dearth said pricing was "extremely competitive," and all the bids came in at close to the same level.

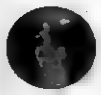
"A lot of them thought DFW was a site they could use to market to other municipal clients," he observed.

When it came down to choosing a finalist, "one of the things that was most important was the relationship with Oracle — where they sat in the porting schedule with Oracle," Dearth said. Pyramid and Sequent outperformed the others on that count. Pyramid held the final advantage of being Oracle's development platform for government Unix financial software.

The airport has two Pyramid machines in-house: One will be the production system and the other a development system. The Pyramid production system is a four-processor Model MIS 12; the development system is a two-processor Model MIS 12.

Relief organization adopts database tool

By Mitch Betts
MISSISSAUGA, ONT.



World Vision Canada refuses to sell its database of donors to the direct marketing industry out of respect for donor privacy.

For World Vision Canada, the economic recession has meant a dramatic drop-off in charitable donations to the international relief organization. So the last thing it needs to do is annoy donors with too many mailings and impersonal pitches.

As a key part of its move toward more selective and personalized mailings, World Vision Canada has acquired a software package, called MarketPulse, that was designed especially for database-driven marketing campaigns. The vendor is MarketPulse, a Cambridge, Mass.-based subsidiary of Praxis International, Inc.

With the software, which runs on an IBM 4381 mainframe, World Vision Canada will be able to identify, for example, donors who prefer to give to relief efforts in Ethiopia and those who never respond to follow-up mailings, according to Peter Ward, director of donor research.

About 85% of the charity's income comes from people who "sponsor" a starving child they have seen on World Vision's television specials. But the list of donors has a high attrition rate, Ward said, because the donors either lose interest or become annoyed by repeated fund-raising appeals.

World Vision Canada *needs to raise more money for its relief efforts*

The goal of the targeted marketing campaign is to retain those sponsors longer by sending personalized mailings that focus on the giver's motivations and by reducing unwanted mailings.

"Not all sponsors are the same," Ward explained. "Some are child-focused, perhaps because they are empty-nesters who have a vacuum to fill. Some are social activists in the war on poverty."

The database has about 750,000 names, 400,000 of which are considered active donors.

Ward said the decision to use MarketPulse was clinched when he saw a demonstration of the software's segmentation power using tapes of World Vision's own database. "We were overwhelmed by how easy it was to select categories of donors and how easy it was to use. We didn't want something that would be intimidating," he said.

World Vision Canada is in the process of moving its database from the mainframe to an IBM Application System/400, but MarketPulse will continue to reside on the spare mainframe and will extract data from the AS/400.

In Brief

System/88 deal lives

IBM and Stratus Computer, Inc. recently announced that they will extend their OEM arrangement for IBM to distribute the IBM System/88 platforms, which are based on Stratus fault-tolerant computers.

Outsourcing for Prime users

Denver-based Gemisys has jumped into what it sees as a void left by the troubles of Prime Computer, Inc. Gemisys plans to provide outsourcing services to users of Prime minicomputers by offering access to Prime platforms at Gemisys' data center. Gemisys claims its service will allow Prime users to retain applications based on Prime's proprietary architecture without new hardware.

NY Life buys into vendor

A subsidiary of New York Life Insurance Co. has picked up a cooperative processing-based securities management software package by buying an 83% stake in software supplier Magnus Software Corp. in Marietta, Ga. The subsidiary, NY Life, Inc., had previously used the Magnus securities management software. NY Life officials said they hope to make Magnus software a standard in the insurance field.

Michigan to use Unisys gear

The state of Michigan recently signed Unisys Corp. as its supplier for a $60 million client/server-based system to automate management of a welfare program. The networked system will use two Unisys 2200/644 mainframes, 144 Unisys U6000 Unix servers and 6,200 PCs.

Siemens picks Veritas system

Systems maker Siemens/Nixdorf Informationssysteme AG recently signed an agreement to use Veritas Software Corp.'s Veritas File System as a storage management product within the Siemens/Nixdorf Sinix operating system.

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screaming 486 SLC™ 25 MHz upgradable processor. But it's built for comfort too. There's a surprisingly roomy interior, with a full-size, ergonomically designed keyboard. And a screen that literally bends over backwards (180 degrees, to be precise).

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The ThinkPad's screen is a thing of almost aching beauty. Its 640 x 480 VGA resolution is sharper than that of many desktop computers. It displays 256 colors. And it's the biggest screen on any notebook. All of which makes ThinkPad very easy on the eyes.

The ThinkPad comes standard with things some other notebooks don't even offer as options. Like 4MB of memory you can upgrade to 16MB. 120MB of hard disk space. Pre-installed DOS 5.0 and

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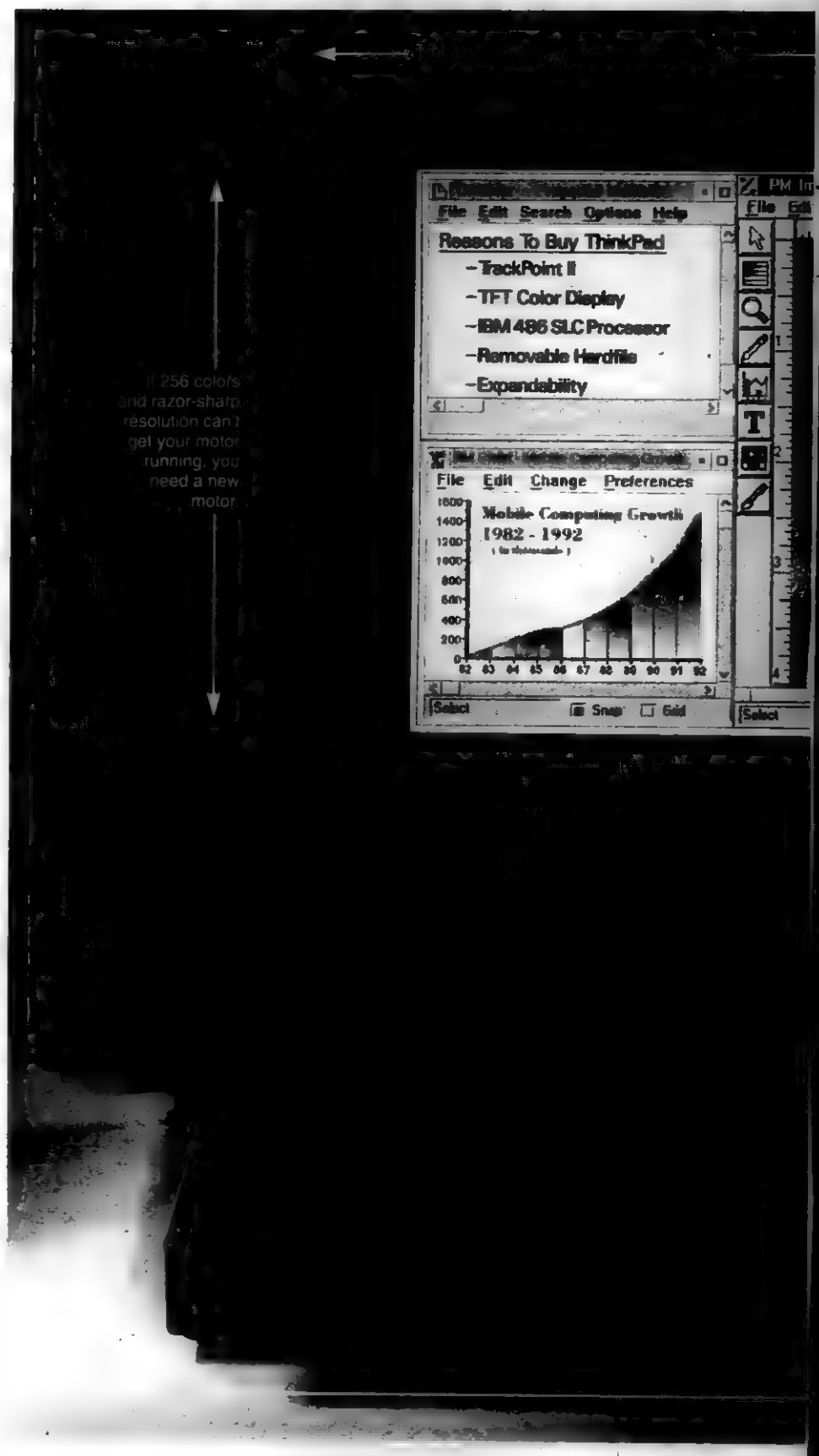

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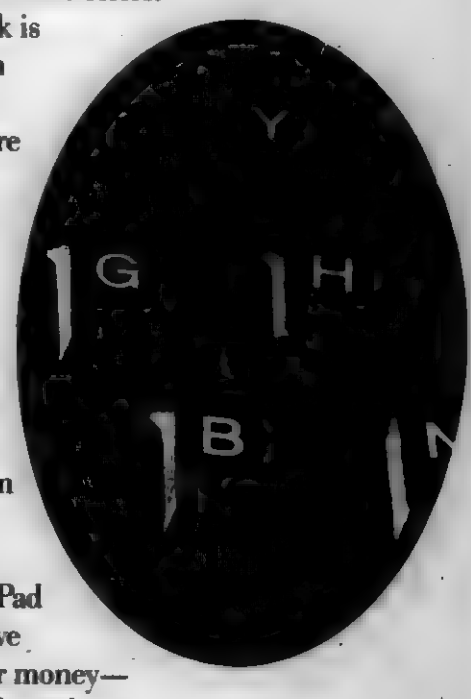

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System software

KineticSystems Corp. has introduced the H TMS 6000, a VME-based, fully integrated High Performance Test Management System.

The software provides separate windows for text and graphics and can now run under X Window System. Data collection and conversion, signal conditioning, analysis software, test control, graphical displays and report outputs are offered in an integrated package, according to the company.

Standard features include anti-aliasing filters, programmable gain, auto-calibration and the ability to expand to 1,568 channels.

Time is saved in test setup, report generation and data analysis with menu-driven software, the company said.

Tests plans can automatically be generated, modified, stored and executed. On-board dynamic random-access memory, floating point co-processor and memory management are included.

Pricing for the TMS 6000 system starts at $33,000.

➤*KineticSystems*
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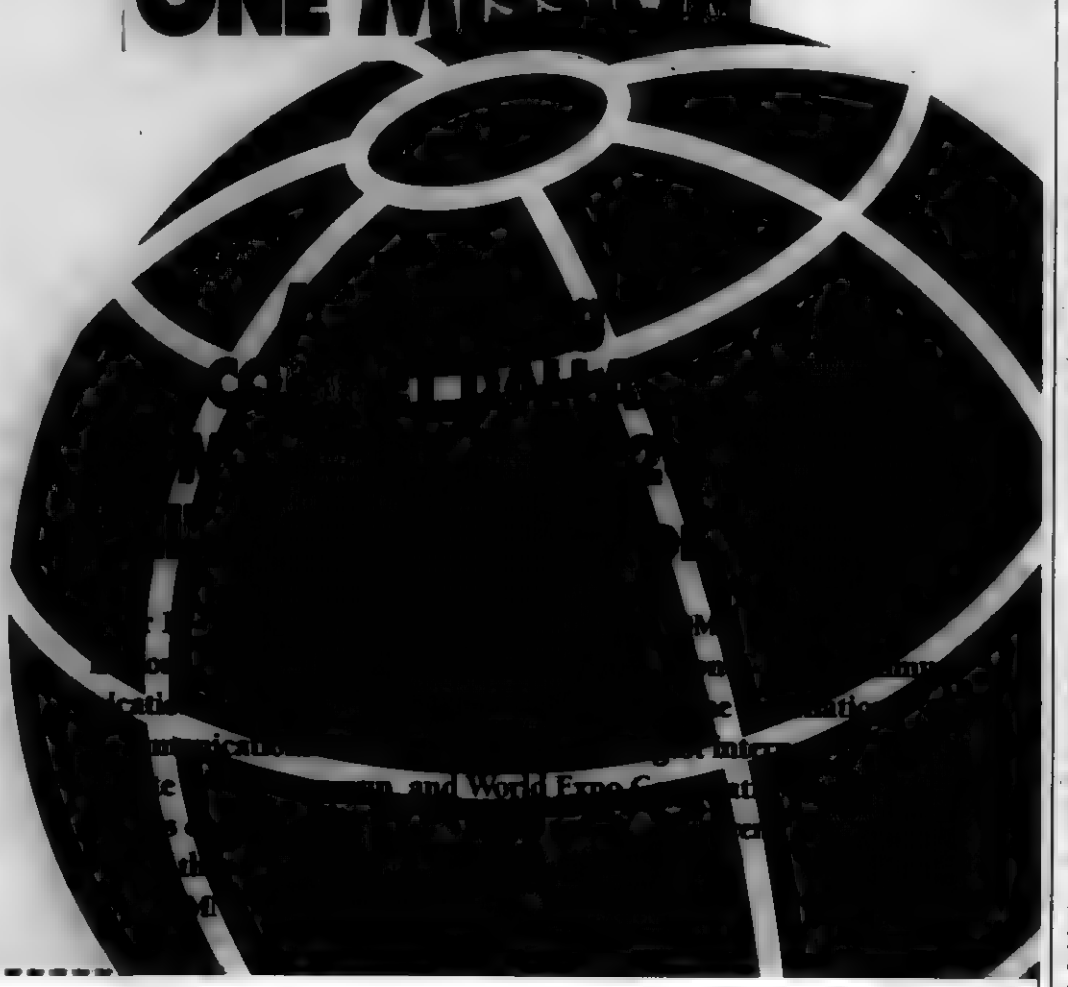

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Database management

Integral has annouced a new combined materials management/accounts payable product.

According to Integral, the product is a fully integrated inventory control system that combines the functionality of the company's materials management application and accounts payable software.

Through a common set of data files shared between the systems, users can receive and review vendor information, purchase orders and receipts.

Separate batch processing procedures are not needed because the application's real-time processing automatically updates records at the same time with data entry, the company reported. The product runs in the CICS environment.

Pricing begins at $278,000.

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Utilities

Reltech Products, Inc. has announced the availability of a Microsoft Corp. Windows-based utility for DB Excel.

DB Excel is a DB2 Systems Application Architecture repository-based data dictionary for IBM mainframes. Organizations receive complete control over their "meta data" such as the field names and other attributes that define their information systems with DB Excel.

According to the company, the Windows utility enables users to browse through the same important data that conventionally was accessible only to data processing and information systems personnel, assisting users in a variety of departments to make more informed business decisions.

The utility costs $10,000.

➤*Reltech Products*
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Fairfax, Va. 22030
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Services

Data 21 has announced Version 4.4 of CICS Help, a software package that facilitates IBM Common User Interface Contextual Help for CICS applications and Hypertext On-line Documentation.

New enhancements and options include improved Hypertext support such as Hypertext jumps and pop-up definitions enabling users to create PC-style Hypertext documents in CICS.

Dynamic Database Access allows files to be defined to CICS Help, which presents fields in the Help and Field prompts displayed in CICS Help. PC "authoring" support is available for options designed for WordPerfect Corp.'s WordPerfect 5.1 and Word for Windows 2.0.

CICS Help pricing starts at $6,005 for DOS and $14,995 for MVS.

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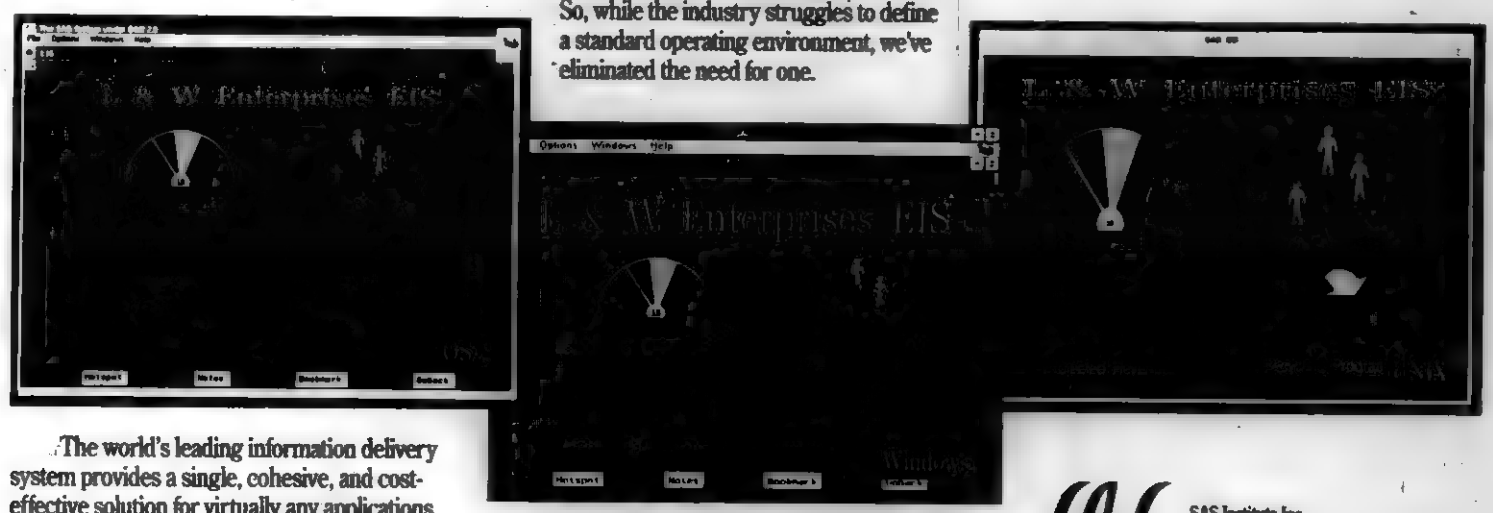

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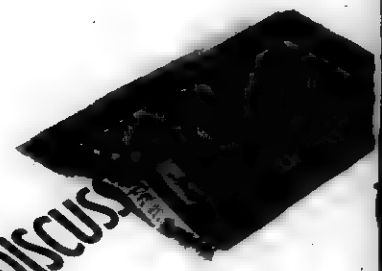

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Data modeling: Tough but rewarding

By Johanna Ambrosio

Data modeling is rather like going to the doctor for wellness checkups: You know it is good for you, but you cannot necessarily quantify the benefits.

Although hard numbers are tough to come by, those who have done data modeling say it offers many advantages. Among them are getting data to users in a format that supports their business requirements and cleaning up conflicting and redundant data formats that are part of most large companies' information systems repertoires.

> It is often difficult to convince management that a data modeling effort is needed.

But data modeling is not easy or cheap. It can be a five- to 10-year effort fraught with political battles and difficulties justifying it to top management.

Data modeling, in its essence, is defining what the business does and how, and then figuring out what data is required to support those requirements. This information is then modeled and drives all application development efforts.

Donnette Bruno, a data administrator at Barnett Technologies, Inc. in Jacksonville, Fla., likened data modeling to "cleaning MIS' house." In her last job, at an insurance company, "We found 87 different varieties of region code. Why? Because programmers were doing what they were trained to do: being creative. And they were very good at it," she said.

Alan Kortesoja, a partner at Ernst & Young in Ann Arbor, Mich., said changing business requirements have forced insurance companies into the vanguard of data modeling. "Insurance companies are thinking now in terms of providing services, not in terms of individual policies. But the old batch systems just weren't set up that way."

Most companies, he added, are doing data modeling in fits and starts. That has been the case at Blue Cross/Blue Shield of Minnesota, which began data modeling about 2 ½ years ago but has been doing it "intensely" for the past year, said Steve Hiller, manager of data resource management. "The primary benefit has been clarifying terminology to the business people, so we all have one way of communicating with each other."

Mellon Bank Corp. has been involved with data modeling for about three years, according to Jim Stuber, first vice president. "It's been very successful. The quality of applications has improved," he said. The bank measures that quality by how stable applications are once they are in production.

"If you're building relational applications," Stuber said, "you need to be doing data modeling. If you don't, you'll build relational systems the same way you built the old ones."

Bruno said she has heard of returns on investment ranging from 20% to 80% from data modeling. Those numbers are difficult to substantiate, however, in part because of the challenges to data modeling. These include justification and political battles.

Kortesoja said, "The general problem with an architectural group is that it's hard to relate to cost reduction or revenue enhancement," the two primary motivators for any business decision. As a result, it is often difficult to convince management that a data modeling effort is needed.

Still, he said, some firms justify it "on the basis that they are going to lose revenue or miss opportunities" if they do not get their data act together.

Another problem is the political situation. "Systems people are our worst enemies," Bruno said. "They think we're taking their jobs away."

Kortesoja noted that part of the problem is that some data modelers become almost religious in their zeal for perfect data. "Other people look at them as a strange cult that is hooked on data. There can be a certain righteousness about people who are 'into' data," he added.

One way to avoid that, Kortesoja said, is to "help the developers understand that you're doing something for them, too — providing a better understanding of how their application works." For that reason, he said, some companies assign a data modeler to every applications development team.

Start where?

A big question at many companies is how to get started. It can be a catch-22 of modeling data for existing applications, which are presumably working and would be a hard sell, vs. a top-down effort that starts with the business needs.

Del Monte Foods in San Francisco struck an approach that may not sit well with data modeling purists. The company is implementing a corporate repository for decision-support applications.

"I've already warned the users that they will have conflicting data formats," said Les Bain, manager of data resources. "When they start screaming, I'll begin data modeling to clean everything up."

Still, it can be worth the time and effort. "We started in 1985," said John Chatfield, senior principal analyst at Salt River Project in Phoenix. "It's led to rapid systems development and data standardization that has paid big benefits, and now it's pretty much routine."

What is data modeling?
The process of matching business requirements to the data needed to support them. The resulting models are used to drive future applications development.

Status
Insurance firms, banks and telecommunications concerns are the primary users of data modeling techniques. In most other companies, the effort is fraught with political and justification battles.

Benefits
Faster systems development and standardization of data for use by varied applications.

One user's comment
"If you're building relational applications, you need to be doing data modeling. If you don't, you'll build relational systems the same way you built the old ones."

ON SITE

Levi Strauss & Co.
San Francisco

Challenge: Discover alternatives to the traditional mainframe development platform and identify the best method for each application.

Technology: Sun servers, Sybase database management system and ParcPlace Systems Objectworks/SmallTalk language.

Levi Strauss cuts client/server pattern

By Jean S. Bozman
SAN FRANCISCO

After years of running its business on IBM mainframes and Hewlett-Packard Co. computers, Levi Strauss & Co. is taking client/server systems for a test drive. The $5.4 billion company is in the final stages of completing a pilot project to prove that object-oriented programming, workstations and Unix servers can be used in production systems.

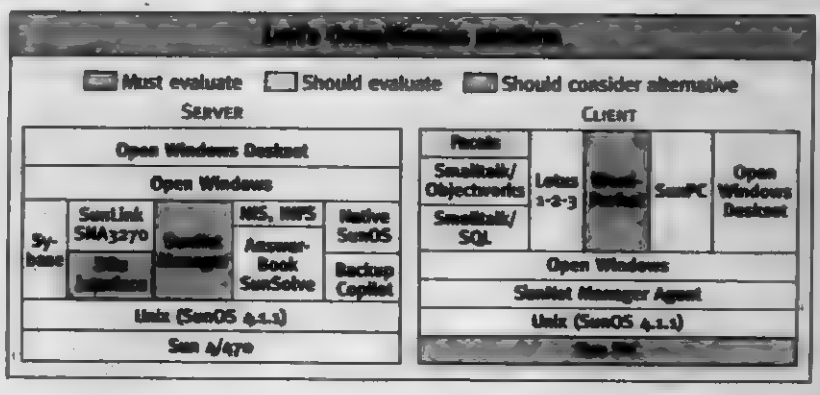
The pilot project, named Orion, began in June 1991 with a few basic building blocks: Unix, Sun Microsystems, Inc. servers and the Sybase, Inc. relational database. Those basic elements were selected beforehand by a special task force within Levi Strauss called Information Technology Action Group.

During the Orion project, a team of eight programmers and analysts learned new ways to create applications and had to master object-oriented programming techniques. The clothing firm now plans to test a pilot Unix application in several business units before approving the rollout of production client/server systems.

"We see the effort as providing an alternate platform to our mainframe development environment," said project leader Craig Lee, who is manager of Levi Strauss' Advanced Technologies Group. "We will develop the criteria to choose which development method is appropriate for each application. The long-term goal is to use our mainframes as database servers."

Doing that would allow user PCs and workstations to access data on either the IBM mainframe systems or their HP counterparts in Levi Strauss' international organization. Mainframes will serve as data repositories under Levi Strauss' reengineering program, known as the Customer Service Supply Chain.

Levi Strauss, *page 145*



Basic gains commercial respect

By Garry Ray

Basic, the 1960s brainchild of two college professors, is making headway as a "serious" programming language in corporations. But developers faced resistance as they began suggesting use of the language.

Though Basic was once considered inadequate for corporate needs such as structured programming, database access and maintainability, the turn toward the language is being fueled by Microsoft Corp.'s Visual Basic for Windows, which was recently upgraded. With more than 113,000 Visual Basic applications now in business use, according to Microsoft, the language is clearly taking hold. "The source of Basic's [tawdry] reputation is on decades of old interpreted technology, not on compiled, event-driven Basic," said Tom Button, a group product manager at the Redmond, Wash., software company.

While that may be the case, converts to Visual Basic said there was initial resistance to using it as a prototyping and development language.

"I cringed when I first heard about Visual Basic," said Heng Tan, a manager of application development at The Prudential, an insurance firm located in Newark, N.J. Tan, an experienced C and Cobol programmer, had been looking for alternatives to C and Microsoft's Windows Software Development Toolkit, which he thought were not appropriate for his team of five former Cobol programmers. After looking at "other development tools, all of them," Tan said Microsoft's Basic seemed to satisfy a number of development concerns.

Among those were that the language could be used to prototype applications quickly; that code could be reused in multiple projects; and that no runtime license fees were required for finished applications. "There's no runtime to distribute, so from a corporate point of view it's a no-brainer," he said.

Other managers stressed the importance of maintenance and an ample supply of Basic programmers. "Management doesn't have concerns about what happens if I get hit by a truck. It's easy to find people who can program in Basic," said Tim Landgrave, an MIS manager at a Midwestern oil company and owner of consulting firm Kizan Technologies, Inc. in Louisville, Ky.

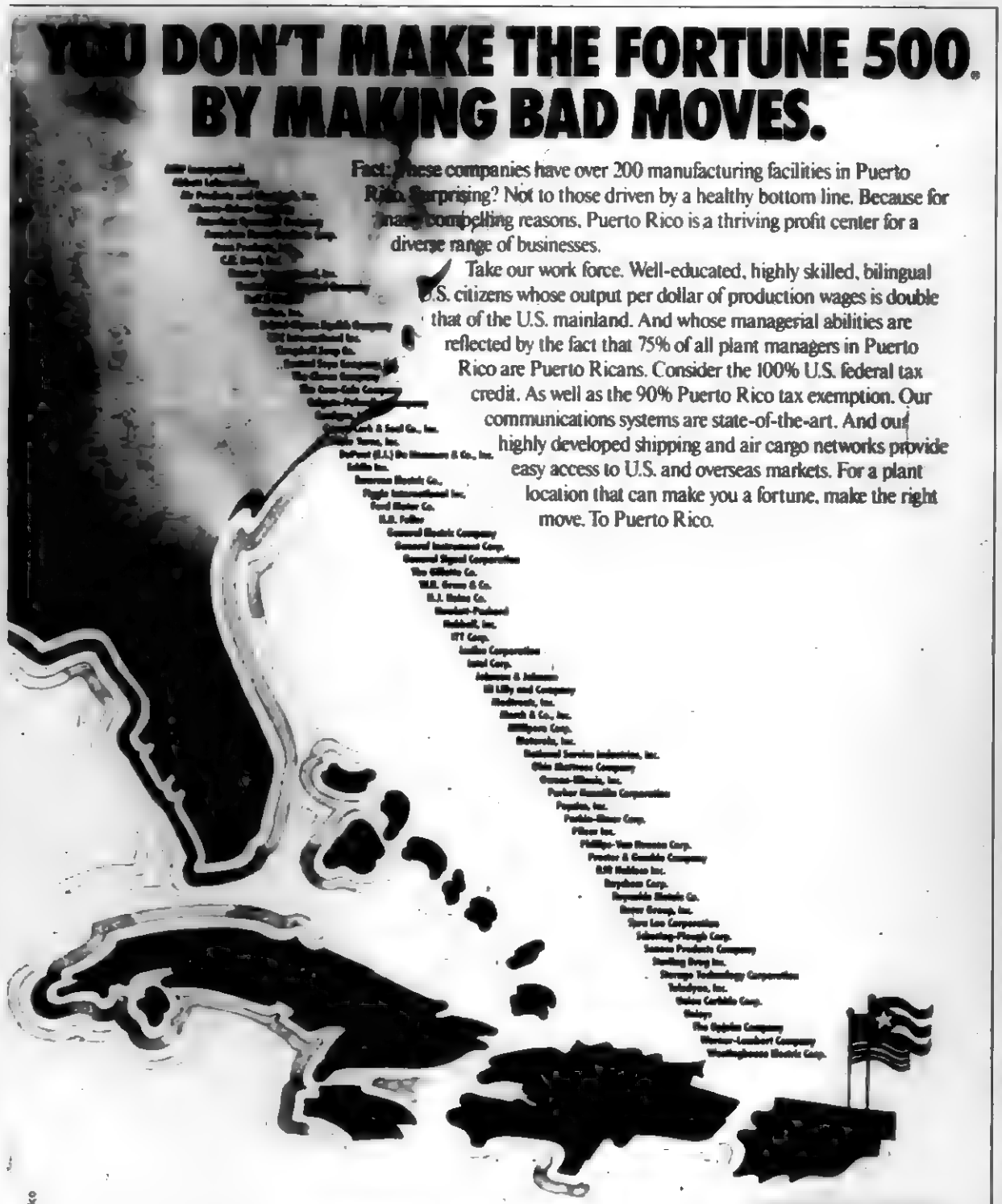
C advocates

Despite its benefits, advocates of Basic development still encounter what Frank Peters called "C snobbery." Peters, president of Plaid Brothers Software, an Irvine, Calif., development house, described one development contract where "we asked if we could go from C to Visual Basic, and in five minutes we were fired." He maintained that Basic is a more suitable vehicle for rapid application turnaround because "you can't keep your head above water with C and C++ no matter how many programmers you have."

The ubiquitous nature of the Basic language also made it easy for Nielsen Marketing Research, the Northbrook, Ill., division of A. C. Nielsen, to deliver front-end technology for its Nielsen Infact Workstation. The workstation includes market research databases of up to 1.5G bytes and a range of front-end database access tools that are delivered to customers as Visual Basic VBX controls. VBX programs and controls are customized additions to the Visual Basic tool set.

"We buried some VBX controls in the front end so that if someone wanted a button that would give database access, all they have to do is add it to the application," said Walt Wickman, director of global delivery technology at the firm.

Even a few C programmers, noted for their aversion to other languages, are beginning to consider the benefits of Basic programming. Sunil H. Shah, a Farmington Hills, Mich., software consultant specializing in process control and data acquisition, said, "I've shown [Visual Basic] to some C programmers, and they are very surprised. Some are now using it instead of C or C++." As for the unconverted who "think Basic is a toy," Shah said, "They don't know there isn't much of a difference in languages."



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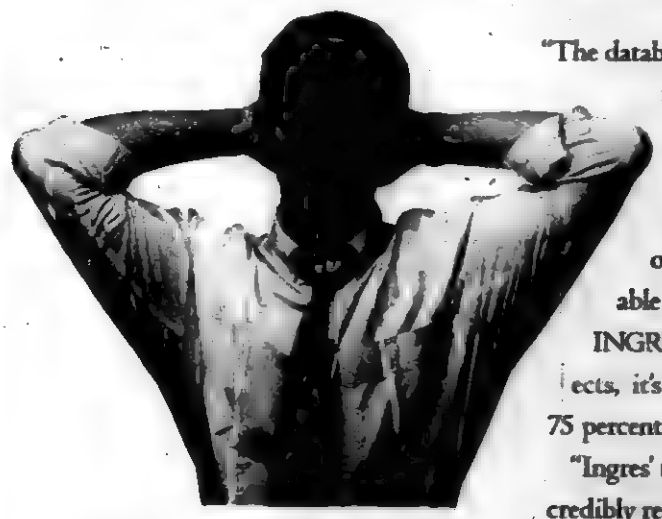

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At Candle, we're as committed to IS people as we are to IS technology.

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Dear IS Professional,

When an IS organization succeeds in meeting the needs of the enterprise, technology often gets the credit.

While carefully applied technology can help companies succeed in the marketplace, at Candle we believe that the people who make that technology work are just as important.

It's the people in IS organizations who work to see the needs of the future, define the strategies necessary to meet those needs, evaluate available and emerging technologies, cut through the confusing clutter of competing claims, and build and implement the solutions that help the enterprise move forward.

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Sincerely,

Bill Pike

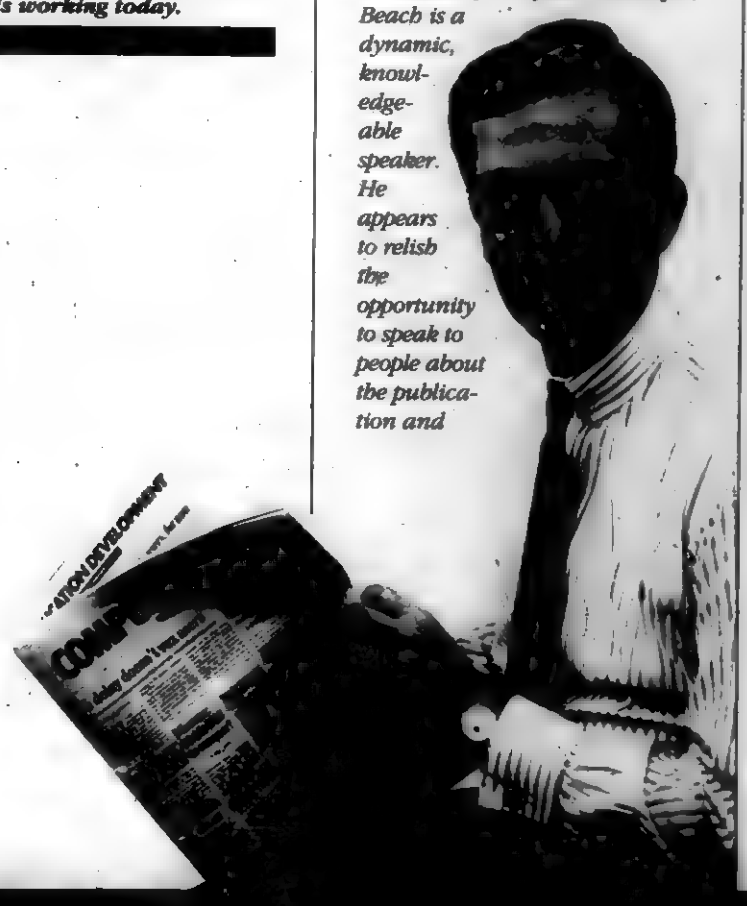
Bill Pike
Senior Editor, Candle Publications

Meet Computerworld's Gary Beach

Eighteen months ago, Davis Tharayil was confronted with a very difficult IS mission; that of developing and implementing an information technology framework which was flexible and yet true to the overall culture of Aetna Insurance. We recently spoke to Tharayil about the challenges he initially faced and how well the framework is working today.

Gary Beach, the publisher of Computerworld, has the uncanny ability to memorize people's names as he is casually being introduced to them just before he is about to speak. During his presentation, he makes direct eye contact with an individual and deftly weaves each person's name into his presentation. "We feel that people, such as you, Jim Smith, have a role to play in helping to change the direction of our industry." Beyond technique, Beach is a dynamic, knowledgeable speaker. He appears to relish the opportunity to speak to people about the publication and information technology. He easily gains and holds the attention of his audience. It is, of course, his business to know a great deal about the current state of the IS industry as well as new computing trends.

Beach's fast-path career has seen him rise rapidly, having been in the data processing and publishing industry only little over 12 years. For eight of those years he was with Data Communications magazine at McGraw-Hill. In 1987 he went from being the sales manager of Data Communications to managing a new weekly they started called Networkworld. Four years later, in the Spring of 1991, he moved over to Computerworld and for the last 10 months he has held the position of publisher. The following interview offers insight into the mindset of this dynamic, and outspoken IS manager.



Q: Do you enjoy meeting and talking with your readers?

A: Yes I do. We conduct eight surveys, two a quarter. We also run focus groups around the country. We never miss an opportunity at a trade show to sit down with our readers and find out what's on their minds. They are the ultimate judges of how well we're doing. And if they're saying we're doing a good job, they're going to vote with their pocketbooks and renew their Computerworld subscriptions.

Q: It seems that very few computer industry publications last long before merging or going out of business. Computerworld is one of those rare exceptions. Why is that?

A: It's very simple. We're driven by a rudimentary vision; staying close to our readers' needs. We ask them how we are doing and what do they like to see? We also ask them to tell us what they see that they don't like. What are the burning issues that keep them up at night? How can we address those needs and concerns better? By meeting their needs, we have been successful over the last 25 years.

Q: Do you need to be aggressive to stay on top?

A: Oh yes. Climbing a mountain is fun but staying on top of it can be very challenging.

Q: Why is that?

A: Because we're always in the sights of our competitors. We have to work very hard and be externally focused. We have to get out there on the road and talk to our readers, to find out what their needs and concerns are.

We need to manage Computerworld like a new, "start-up" enterprise. That is the message I've been communicating to my management team over the last ten months. When you work for a start-up company, it's exciting. During those first critical years, everyone has energy, enthusiasm, and a shared vision. The enterprise has, as a result, a sense of vitality. If we blend the passion new companies enjoy with a well-established product, we have a winning combination.

Q: You recently presented a series of seminars across the country in which you identified several distinct management cultures that currently exist within the IS environment. Would you define them again, please?

A: Yes, but let me first tell you why we were interested in knowing more about our cultural management style. I believe we've all heard a number of industry gurus describe what they think IS and data processing managers are like.

The untested, but widely accepted, image has been that of a group of nervous, worried people working in the glass house watching their power base steadily erode. These people are often described as being defensive and powerless. We are told that they have passively resisted change as new IT opportunities came onto the scene, such as open systems, the PC explosion, LAN innovations, etc.

We began to question the image we were being given because it didn't fit our frequent, first-person interactions with our readers, many of whom are IS managers. So we commissioned a psychographic cluster study to better understand who IS managers really are. As a result of the study, we found five distinctive IS management styles (see Figure 1). Let me briefly describe each type:

- *IS Warrior (Operating Style – Entrepreneurial).* The study shows that what we call the IS Warrior represents the largest segment of our subscribers. These people are leading the charge of computing down the platforms, from the mainframes to the midranges, the workstations, and the PC. The issue that keeps them up at night is, "How do I stay ahead of my end-users' computing needs?" And, "How can I leverage new or existing technology here at XYZ Company do a better job in supporting my end-user departments?"
- *Visionary (Operating Style – IS Champion).* Visionaries are more like corporate CIO types. They're looking at technology,

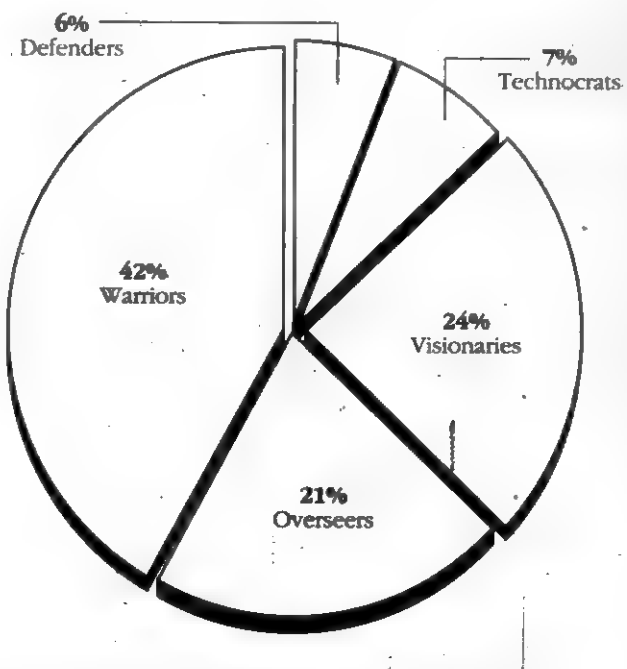


Figure 1 - Computerworld Subscribers in the Five IS Cultures

but rather than from the end-user basis that the warrior uses, visionaries are asking "How can I use this technology to help my corporation be more competitive in the marketplace?" Visionaries take a more macro view of new technology.

- *Overseer (Operating Style – Maintenance Mode).* Overseers are very loyal IS managers, but tend to come in at nine and leave promptly at five. When they are on-the-job, they do a very good job. There's a significant shift in this style from the visionaries and the warriors, who are externally focused, in terms of helping the corporation or end users. Overseers look at technology and IT purchases and ask, "How will this make my life easier?" They have more of an introspective approach when it comes to purchasing new technology.
- *Technocrats (Operating Style – The Old Guard).* The study found these people to comprise a small segment of today's IS management. Technocrats tend to look at technology for technology's sake. They get excited by the fastest chip from Intel, or the biggest IBM mainframe; but they're also the most cost-conscious. They enjoy getting involved in and understanding complexity. Technocrats are highly knowledgeable and will shop for price much more so than the other four groups. They do a lot of comparison shopping and tire kicking.
- *Defenders (Operating Style – Survival Mode).* The last group are the segment of IS management who truly see their power-base eroding and don't know what to do about it. When they purchase products, their driving motivation is "How is this information technology product going to help me maintain control over what I have left?" Ironically, it is this segment that many industry analysts characterize as the entire IS management community. We found the image couldn't be more inaccurate.

We identified five solid IS management styles in the U.S. in 1992. Of course, each corporate culture is unique and depends on the type of business, age, and management structure of the company. Some organizations tend to encourage a more conservative style of IS management, while others foster more aggressive style. We also believe that there are worldwide counterparts to our U.S. management model.

Q: Were you personally surprised by the results of your study?

A: No I wasn't. It confirmed what we saw in the people we met and know. We also conducted a sample across the IDC database, that confirmed our belief that all IS managers (including those who aren't Computerworld subscribers) can be fit into one of the five cultural definitions.

Q: What happens when the "defender," for example, makes purchasing decisions? Don't his or her decisions influence industry direction?

A: Not really, because the defenders in IS are a very small management segment. Only six out of every 100 IS managers are defenders. We also believe the number of defenders is decreasing.

Q: What were the root causes for the emergence of the new, more self-actualized IS management styles?

A: To answer that question, we have to look back in time. In the 1980s, IS management learned a very important, telling lesson. Prior to 1980, data processing managers "owned" the corporate data by default. It resided on a mainframe within the glass house. The decade of the 1980s marked a time when a new debate began in companies regarding who truly had ownership over corporate information. Underlying the debate was a transition in philosophy. Computers were changing in image from being a "tool" to becoming a "strategic resource."

A less service-oriented management style in many data centers made it difficult to access data and began to trouble the community of end users. Users were growing increasingly frustrated by a poor MIS response to their increasingly sophisticated needs. IS managers were also frustrated by the inability of their staffs to quickly migrate to newer, more reliable systems. The typical MIS project list in the early 1980s was five or six pages or longer. The inside joke was, "You want it when?" with a cartoon character doubled up in laughter.

The advent of the PC quietly signaled the end of centralized data ownership and the productivity logjam of the 1960s-style data center. For the first time, the individual began to own the data. Applications such as PC Spreadsheets, databases, and word processing applications quickly met and exceeded the far less personalized, accessible, user-friendly mainframe solutions.

The increased popularity of the local area network, toward the end of the decade, also marked an important shift in the issue of ownership. Departments in the company, with LANs, began to claim ownership of their local information. IS and data center management of the 1980s initially viewed the exodus of

their most troublesome users and departments with a profound sense of relief. But they soon realized that they were losing an important constituency of their internal user base. They began to see that delivery of information to internal end users is best viewed as a *service-based* relationship and that end users are very much like a business customer. As such, providing information needs to be prompt, reliable, and responsive to the needs of the enterprise.

Q: Where are we today?

A: In the 1990s, we see slight back swing of the pendulum. Departments and IS are beginning to share ownership of the data. Technology in the 90s is being applied to help corporations and empower greater productivity.

The computing power that formerly resided only in the glass house is being pushed out into the organization to the midrange and workstation where it is of most value. IS is actively managing the move. We see the 1990s as the "golden era" of corporate computing, and it's only going to get better.

Q: What about the bad news you print in Computerworld of large reorganizations, layoffs, and downsizing activity in company IS organizations?

A: Of the sad stories we print, part has to do with a weak national and world economy. Large and small companies are facing difficult, challenging times. The other part has to do with rapid, large scale changes in the IS industry. In any given discipline there are people who cannot adjust to rapid job changes, and they will see their jobs forever altered or go away. It is worth emphasizing that some of the people who have lost their jobs are out of work because they were unable to adapt to the demand for a more responsive IS management style.

Q: What does the newer IS style require of a manager?

A: The directive to IS managers is; to do your job properly, you have a mission to assist your "customers" out in the field as well as administering the work within the confines of the data center.

Q: Do you think the people at the lower end of your management style spectrum can change their behavior and become more visionary or warrior-like?

A: They have no choice. We're in a very competitive economy, not only nationally but globally, and information is the heart of most organizations. Users, managers, and executives will not stand for an IS organization that behaves like a defender.

Q: Based on your frequent interaction with your readers, is there a common concern emerging that you hear expressed more often these days?

A: The major problem, or challenge, facing IS management today, is how do we maintain security as more and more people, new users, come online. It wasn't a particularly difficult issue in the past when data and data management were centralized and the environment was controlled. Today it is a significant problem IS leaders must face as information becomes decentralized and more widely disseminated. Who gains access to critical information and who is denied becomes a non-trivial issue.

Q: Are there ever times when you wonder about the wisdom and direction of new technology?

A: I ponder on two issues. One question that I keep asking anyone who will listen is, why does everybody need all those MIPS on their desktops? There are so many MIPS these days, we're getting over-MIPed. I believe that applications are going to start driving computer purchases and software purchases, much more so than how many MIPS we can cram into a box.

The second issue that I wonder about is that the rate of change and often-misleading claims of new technology can be very confusing to users. IS managers are often very confused by technology claims, as well. Even your most sophisticated CIO is struggling to get a handle on a direction that is in the best interest of a company, for the long-term. The confusion is exacerbated by all the information that reaches the IS manager's desk.

I frequently use a quote from Bill Gates in my presentations, that is very telling. One of the biggest jobs Gates has, is reading all the printed material so he can stay current and can set corporate direction.

Q: But doesn't Computerworld also contribute to that mind-boggling load of new technical information?

A: Without a doubt, we do. Particularly as a weekly newspaper. It's one of the issues that motivated us to redesign our publication. A frequent concern that we hear from our readers is, "I receive my copy of Computerworld on Monday or Tuesday and I can't always get my reading done by the following Monday. I know there's a lot of important information in there. Please help me get to what I need to know, faster."

Q: Have your readers' expectations of the publication changed since Computerworld first started?

A: We find that readers aren't as interested in scoops any more. They prefer more in-depth analysis of the information. For example, if Candle was coming

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out with a brand new product next month, it doesn't do our readers much good to see a front-page story in Computerworld unless they understand how the news is of particular value to them. They're asking, why do I need to know about a new product, what is its specific value to me, and are there any problems in the product that I should know about?

Q: Few computer vendors wish to see the downside of their new offerings in print, yet readers want the most accurate picture they can get, warts and all. Isn't that a challenge for you?

A: Not really. Our charter is to print accurate, timely information. We are a user advocacy publication. When a vendor markets its answer to every computing problem known to mankind, some of the less invasive publications pick up the language of the press release verbatim. Their stories say, "We too believe this is the greatest product on the market and it looks like the vendor has, once again, saved the industry."

I happen to believe that the IS community is not that naive. So, we run the story, based on what customers, who have actually used the product, are saying. We try to give the stories we run a slant from the user's perspective.

Q: Can you give another example of writing to the customer's perspective?

A: We saw on MCI mail that Microsoft bought Fox Software for $165 million. Our stories the following week were asking what this change means to a Fox Software user. In our stories, there were definite pros and cons.

Q: How do you respond to the vendor who is embarrassed or angry by an unflattering story?

A: There are stories that have to be told that are difficult, but we tell them. If the vendor gets annoyed, we try to convey to that vendor, we're only doing our job. We try to run a balanced story. Consistent with our mission, we're sharing feedback from their constituency base, users, and customers. Our quotes represent how they feel. We print what they told us.

I will sometimes suggest to an upset vendor, contact the quoted customer yourself and if you are told something totally different, come back and let us know. If we misrepresented the information, we'll run a retraction.

Q: On the subject of marketing/sales claims, how important will the message of *technical complexity* be to customers in the future?

A: Let me respond by relating what a very technically bright IS manager with Aetna Insurance Company did recently. He attended our sister publication's (Networkworld) annual conference and brought with him to the conference, the marketing director for the property and casualty division.

They were there looking for a local area network software product to support the specific needs of the property and casualty division. As they passed by companies with potentially suitable products in the vendor area, and were greeted by sales staff, they would insist that, since the director had absolutely no technical background, the salesperson had to present the merits of the product offering in plain English. The IS manager's objective was to ensure that his user could make an informed decision and not be baffled by technical jargon. It must have challenged a few sales people that day!

I think most of us have found ourselves tuning out a technical sales presentation that is trying to impress us with product complexity and only succeeding in making us feel inept and confused. After all, there are only a few Technocrats.

Q: A final question. What do you see as the major issues beyond the 1990s? What should IS managers and CIOs be thinking about in preparing for the next 15 years?

A: Most important, in my opinion, is staying close to your customers. Customers will tell you what to do over the next 10-15 years. While that sounds like an overly simplistic and cliche response, I have found that it holds very true. The most successful IS managers will be those who ask their company's important customers, what are the information issues that really concern you? Over the last ten years, IS management has realized that they have to do that, and from our psychographic cluster study, a majority of them are already doing it today. ■

Aetna's Information Technology Framework

Like most large-scale enterprises, the core of Aetna's business is using information. The firm recently adopted a company-wide architecture that provides a means to use information by shaping an information technology environment which is flexible enough to meet business needs and respond to business and technology changes at whatever rate they occur.

The challenge of gathering all company opinions, biases, and independent mindsets in order to blend them into a workable consensus would seem to represent an impossible assignment. But then, we spoke to Davis Tharayil, associate vice president responsible over the last 18 months for developing the single-mindset to manage Aetna's complex and diverse IS functions.

Q: Davis, would you define for our readers what your management responsibilities are at Aetna.

A: My responsibility is to define and implement a framework to make consistent decisions related to technologies and information management so as to simplify and leverage our information technology environment.

Q: That sounds like a difficult assignment. What does the word "framework" mean within Aetna's IS culture?

A: It has been challenging. The framework is a plan or architecture for the deployment and use of information and information technology resources to support the business.

The idea behind Aetna's architecture definition is that a traditional definition of IT architecture is inappropriate in a dynamic and unpredictable environment. To most people in IT, architecture is often thought of as a diagram or set of products or lists of approved vendors. The fallacy in this approach is that we are dealing in an ever-changing business and technology environment. A static diagram cannot anticipate nor solve all our new problems. By the time a diagram is approved and published, it is already obsolete. What we needed was a framework that transcended outdated lists which permitted us to make consistent decisions throughout the organization regarding information and information technology resources.

Q: How did you apply the architecture throughout your organization?

A: The first thing we did was to understand Aetna's business context and to capture the values with which the senior managers make decisions. We call these values principles. Throughout Aetna, those principles were debated and agreed upon by the business heads as well as the senior managers including our president, Ron Compton.

Q: Can you give us an example of one of those principles?

A: Yes, but first let me explain the scope the principles cover. The principles can apply to one or more of four different IS areas: The *information* area, the *infrastructure* area (the term "infrastructure" includes computing, telecommunications, electronic printing and publishing), the *applications* area, and the fourth area, *organization and people.*

Now, to answer your question and give you an example of a principle, "Reuse before you buy and buy before you build."

Q: That sounds pretty good, but what does it mean?

A: The principle is saying, if there's a possible solution within Aetna, let's reuse it before we buy it, and if we can buy a solution, let's buy it rather than building it from scratch. We have 13 principles that can apply to one or more of the four major areas. The 'reuse' principle is applicable to most of the areas. It is especially applicable to the information, the infrastructure components, and the applications.

I believe that Aetna is one of the few companies, in the United States, which has created a set of high-level principles, gained senior business and IS managers' acceptance, and actively practices them today.

Q: Were these principles hard to get focused and finalized?

A: Yes they were! The principles represent an applied value system company-wide affecting 45,000 employees. Employees needed to understand the rationale for a given principle, why it is a principle, and the implications of the principle. Agreeing on the implications of a principle was the difficult part.

Q: Somewhat related to the issue of architecture, what has Aetna done to manage its IS costs?

A: Until recently, Aetna was highly decentralized. IS functions ran in each of the different divisions with some redundancy. One of our first priorities was to consolidate the IS efforts. That was the challenge Aetna was facing when I came on board.

Q: It seems you faced two challenges; making sure that costs were managed and ensuring that your costs gave

corporate IS the highest return on investment.

A: Yes, both are true. In addition, we wanted to provide greater, more responsive service. We wanted to differentiate in the market through our superior service.

Q: Let's compare Aetna to another business, commercial banking. In the competitive banking marketplace, needs for IS solutions come up very fast when business opportunities come along. The technical people have to scramble to fit the business needs. How do you compare or contrast that with the industry you're in?

A: I think that banking is a little bit ahead of the insurance industry in some ways. However, many of the issues that apply to the banking industry are also becoming true in the insurance industry. This is due in part because the insurance industry is also a financial services organization. Both insurance and banking have a number of similar business goals. Both want to manage risks effectively so that they can make money. The raw material both industries are dealing with is information. The challenge to IS organizations in either industry is ensuring that there is an organizational understanding of the importance of information and how it is managed.

In other ways, the insurance industry is more mature than banks. For example if one examines the procedural aspects and management aspects, one finds the insurance industry to be more advanced than banks.

Q: Insurance companies are often depicted, in advertising, the media, movies, and so forth, as being very slow-moving, predictable, stable organizations. Is that an accurate image?

A: That image is changing. Most of the money made by insurance companies these days is not from the premiums they charge their customers but from the investments they make on the money from the premiums. Insurance companies are in a competitive time and must make prudent decisions in short time frames.

Q: Who measures compliance with the principles and who is responsible for carrying them out?

A: Let me walk you through the process, so that it becomes more clear. The biblical Ten Commandments were a set of architectural principles for a society. They dictated, "If you follow these rules, you'll have a thriving culture." They were a high-level value system. At a high level, ideas can be abstract and it is often difficult to comply with them.

What we have done is translated our high level values into an *architectural vision*. Once one has read the principles and understands all their implications, then what emerges is a glimpse of our future technology environment.

The process consists of four key steps:

- Understanding the business context
- Building the principles
- Drawing the blueprints
- Establishing the standards

Constructing an architecture requires cycling through each of these steps for every component of the IT environment. The business context is important, as it ensures that all of the work is grounded in the business by expressing the themes that will drive Aetna in the coming years.

The IT architecture principles state Aetna's approach to managing information and information technology. They are closely linked to the business context to ensure that technology decisions closely support business strategies and priorities. We now make our decisions in accordance with the single set of principles to realize a logical, consistent computing environment.

Blueprints are pictures of the desired technology and how it is all interconnected. Standards, the last step, are the specific rules and guidelines for implementing the pictures or models. They permit the physical implementation.

Q: But technology doesn't stay the same very long in IS.

A: We recognize that technology is changing, but as long as we know our architectural standard, which is basically specifying the interface and functionalities that we're expecting to make, these different pieces of the architecture to work, then we've separated the technology and product complexities out. If we want to choose a specific product, we simply have to ask, does product X support all our architectural standards related to the different

components? It either fits or it doesn't. Making product decisions using a set of standards becomes easy.

Q: How is it working?

A: It's working extremely well, so far. As you know, it takes time for people to start seeing and appreciating the method we are employing to create consistency in our overall plan.

Q: Is there a downside to it? Do you find detractors within the company who say they're missing out on the latest technology because you have them locked into a plan?

A: No, I don't think so. In fact, I am actually opening up the possibilities more, rather than restricting them.

Q: How is that?

A: Because once we understand the functionalities and interfaces that are needed, we're not locked into a particular product or technology. If a given technology can support me at the interface and functional level, I don't care what technology is underlying it. So that, in fact, I am opening up possibilities to absorb technology.

Most companies that talk about an architecture are really only listing a set of products they will be using. The problem is that each product has its own assumed internal architectures. The company, in most cases, has no idea what the underlying internal architecture is.

We deal with over 600 technology vendors. When we discover that a product doesn't fit together with other products or systems, we are faced with a very large problem.

Q: What do you do about non-compatibility?

A: In the past we built bridges to accommodate the non-connections. We've built bridges over bridges, and the unplanned structures are almost like a house of cards. It doesn't take much of a problem to bring the whole thing down.

Q: It sounds as if you have changed the way in which Aetna looks at its technology vendors.

A: Absolutely. We consider our vendors to be strategic partners. A close vendor relationship, built on trust, is one key way in which we will realize cost-efficiency.

Having an architecture and a structure in place has improved our vendor relations with our key vendors that we depend on to do business.

Q: Do end user departments see the results of your planned approach?

A: For the first time, our own business users are starting to see the value of this type of a framework, of architecture, and I think our business community is catching on more to the value of being in the driver's seat with technology rather than playing the game of "victim."

Q: One last question, when you first came to Aetna and got into the job of defining an architecture, did you have a clear vision, or was it a slow discovery process?

A: Ron Compton, our president, asked, after we presented the approach to him, "How is it possible for you, a 'new guy' coming from the outside into our industry, to gain the consensus from all the autonomous unit heads within nine short months?"

I answered him with an old saying, "When the mind is ready, a teacher appears." But in reality, Aetna Corporation was more than ready to gain control over its IS destiny. An innate organizational readiness needs to be there, otherwise no plan will work.

Based on assets of $92 billion, Aetna is the largest stockholder-owned insurance and financial services organization and is the 15th largest U.S. corporation. The firm is involved in healthcare, retirement programs, as well as property and casualty divisions. Aetna's business is world-wide.

The information technology area of Aetna employs close to 5,000 technical professionals. The company invests $.5 billion in technology-related expenses every year. The computing environment consists of 15 mainframes delivering over 1700 mainframe MIPS. The company's population uses over 250 midrange computers and 23,000 personal computers. Close to 3 terabytes of data are managed in DASD. And close to 1.6 billion pages are printed a year. ■

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OMEGAMON II for IMS – Analyzes region occupancy, IMS shutdown in progress, stopped OLDS, online change in progress, connections, and resources. DBCTL support.

Performance Management (continued)

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Levi Strauss cuts client/server pattern

CONTINUED FROM PAGE 127

Orion's pilot Shipment Information System application, which tracks clothing materials as they are trucked from denim suppliers to factories to warehouses, will be completed in December. Plans call for the distribution application to be reviewed by four sites, including a transportation center in North Little Rock, Ark., and three business units at the firm's headquarters in San Francisco.

Retrieving data

Working with Sun IPC workstations, users will be able to retrieve from suppliers electronic data interchange data that has been relayed from an IBM mainframe to a Sun SPARC II server in their business unit.

The system does not use data from IBM's DB2 relational database, which is heavily used at Levi Strauss, in part because the client/server system has no DB2 gateway.

The Shipment Information System application was developed in ParcPlace Systems, Inc.'s Objectworks/SmallTalk object-oriented language, using somewhat of a new type of design and analysis method.

Systems designers categorized object "classes" by using index cards and talking through the object-modeling process with colleagues. The Class Responsibility Collaborators method, which has been described in technical journals and is a ParcPlace developer's technique, fits with Levi Strauss' management policies, which encourage group decision-making.

"In the object world you start by defining classes," explained Lanny Lampl, a technical consultant in Levi Strauss' Information Resources Group. "You have to parcel out the responsibilities of each object and decide how classes will interact with each other."

Carrying out an object-oriented analysis turned out to be harder than switching to SmallTalk. "The syntax of the language is not the big thing," Lampl said. "The important thing is learning how to think about objects."

The advantage of building with objects is that they can be used again in future applications. In November 1991, the Orion group decided to use object-oriented programming instead of Sybase's APT tool kit, which then supported only character-based screen interfaces.

To jump-start the Shipment Information System application, Levi Strauss used an object-oriented framework called Facets from Reusable Solutions, Inc. in Portland, Ore. That framework came with a collection of graphical user interface objects.

Outside consultants assisted in the client/server evaluation process, including a Sybase specialist and a SmallTalk consultant. They helped the Orion team make the transition from Cobol development to object-oriented programming and move from mainframe-based DB2 to Sybase database servers on Unix machines.

There was an initial learning curve to climb with object-oriented programming, Lampl said, but the DB2 programmers were already familiar with the relational tables used in Sybase.

In the works

Now that the first test run of client/server technology is nearly done, Levi Strauss plans to build up the Orion team as new applications are identified for development. The trials of the initial learning experience will be documented to ease future development.

"We have developed guidelines for all the future pilots to follow," Lee said. "We will definitely retrain in-house staffers to do this, but I see this group as being consultants and trainers at the same time. They will help the developers of the next project, and so on, as the client/server technology fans out [through the company]."

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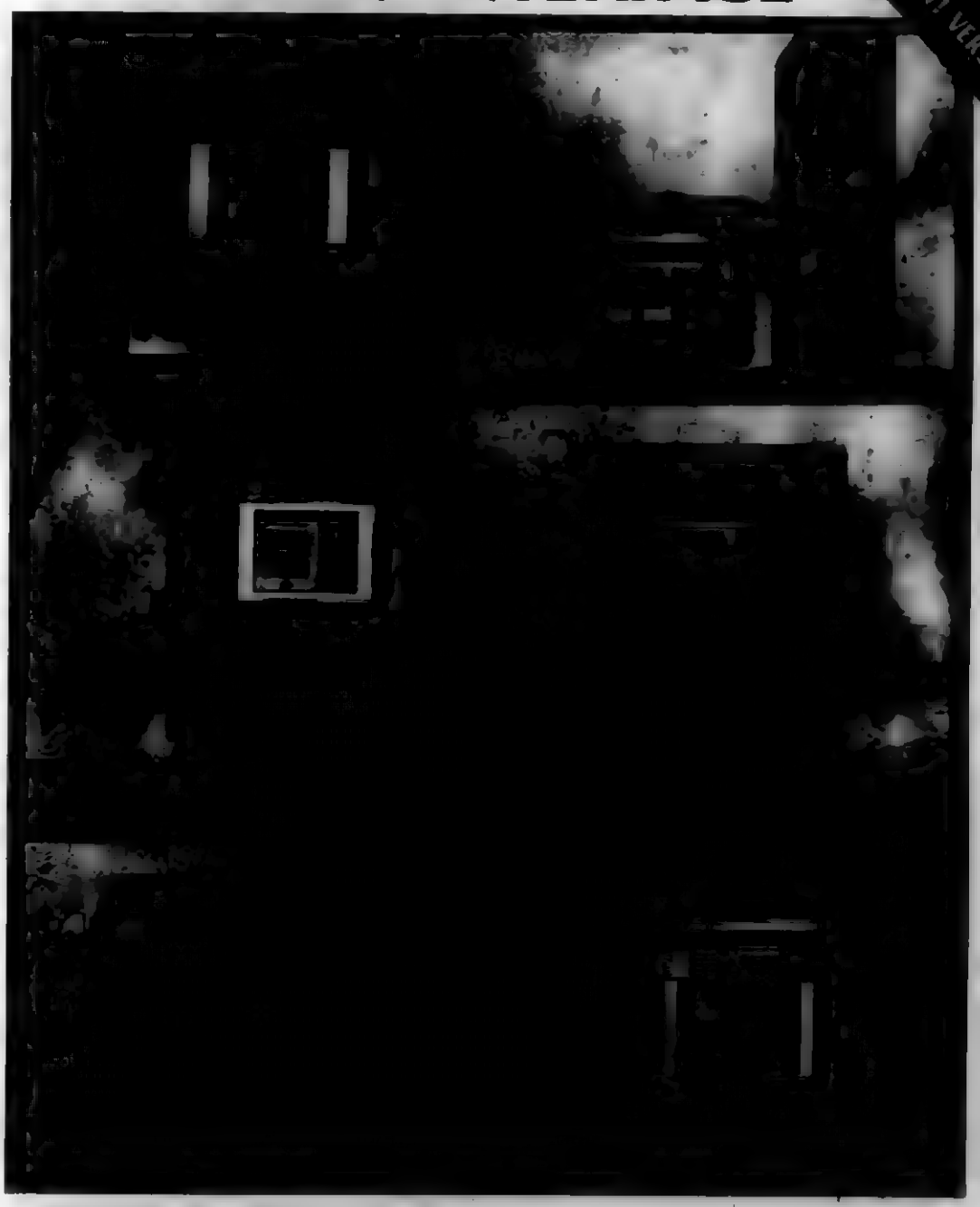

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Application development tools

Apex Software Corp. has announced Agility/VB, a database manager designed for Microsoft Corp.'s Visual Basic.

Without writing a line of code, users can create database applications by using custom controls. Grid, button, text and picture controls are included along with a full-featured set of commands. Agility/VB offers a feature called View Editor, a graphical tool that specifies relationships among multiple databases in view. View Editor has the ability to distinguish databases of different formats. The product provides its own native database for variable-structure and variable-length data storage and supports dBase and text file formats.

Agility/VB costs $189.

➤*Apex Software*
Suite 401
4516 Henry St.
Pittsburgh, Pa. 15213
(412) 681-4343

Donnay Software Designs has introduced dClip 3.0, which the firm said is a true engine for Clipper, designed for compatibility for the user and offering unsurpassed speed. New support is provided for all third-party replaceable database drivers, giving users a range of file formats to use in their applications. Other features include built-in command and menu support, a database editor, enhanced browse functions and a "work" system that can save an entire working environment, quit the application and restore everything with a DOT-prompt command. The Clipper 5.01-Compatible Preprocessor is a test preprocessor that commands without having to compile first.

dClip 3.0 costs $399.

➤*Donnay Software Designs*
Suite 200
20251 Acacia St.
Santa Ana, Calif. 92707
(714) 263-1011

Electronic Imagery, Inc. has announced the ImageScale Plus Developer's Toolkit for DOS and Unix applications.

The tool kit now includes the JPEG compression/decompression algorithm. Users can create a fully functional imaging system with items such as enhancement analysis and compression and file management routines. For ease of use and adaptability, the tool kit provides a layered architecture and the company's image processing library. The tool kit's graphics, text and cursor routines in the image processing library, as well as the command line executable programs, are written in C.

ImageScale Plus for DOS costs $1,995, and Plus for Unix costs $3,995.

➤*Electronic Imagery*
Suite 3400
1100 Park Central Blvd. South
Pompano Beach, Fla. 33064
(305) 968-7100

Lexcel, a Micro Technology, Inc. company, has introduced Lance+ Version 3.2, a Simple Network Management Protocol (SNMP)-based management system that offers several enhancements such as the Chassis Administrator, a Lance+ tool that allows users to build customized interfaces. The firm said this provides a consistent "look and feel" for any standard SNMP device contained within a chassis on a network. Lance+ runs on Sun Microsystems, Inc.'s SunOS and VMS platforms.

The product costs $20,950.

➤*Lexcel*
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 680-0100

Languages

ExperTelligence, Inc. has announced Action 3.0 for the Apple Computer, Inc. Common Lisp (MCL) 2.0. Action 3.0 has 32 bit-clean virtual memory and total control over colors, and it includes all the features of MCL 2.0, all System 7 events and access to MCL 3.2 traps. Improvements include the "connect to" mechanism that allows objects to exchange their values and a "run" option that permits users to automatically execute the application in run mode, assuring them that initialization methods will be correctly executed at runtime, the company reported.

Action 3.0 costs $595.

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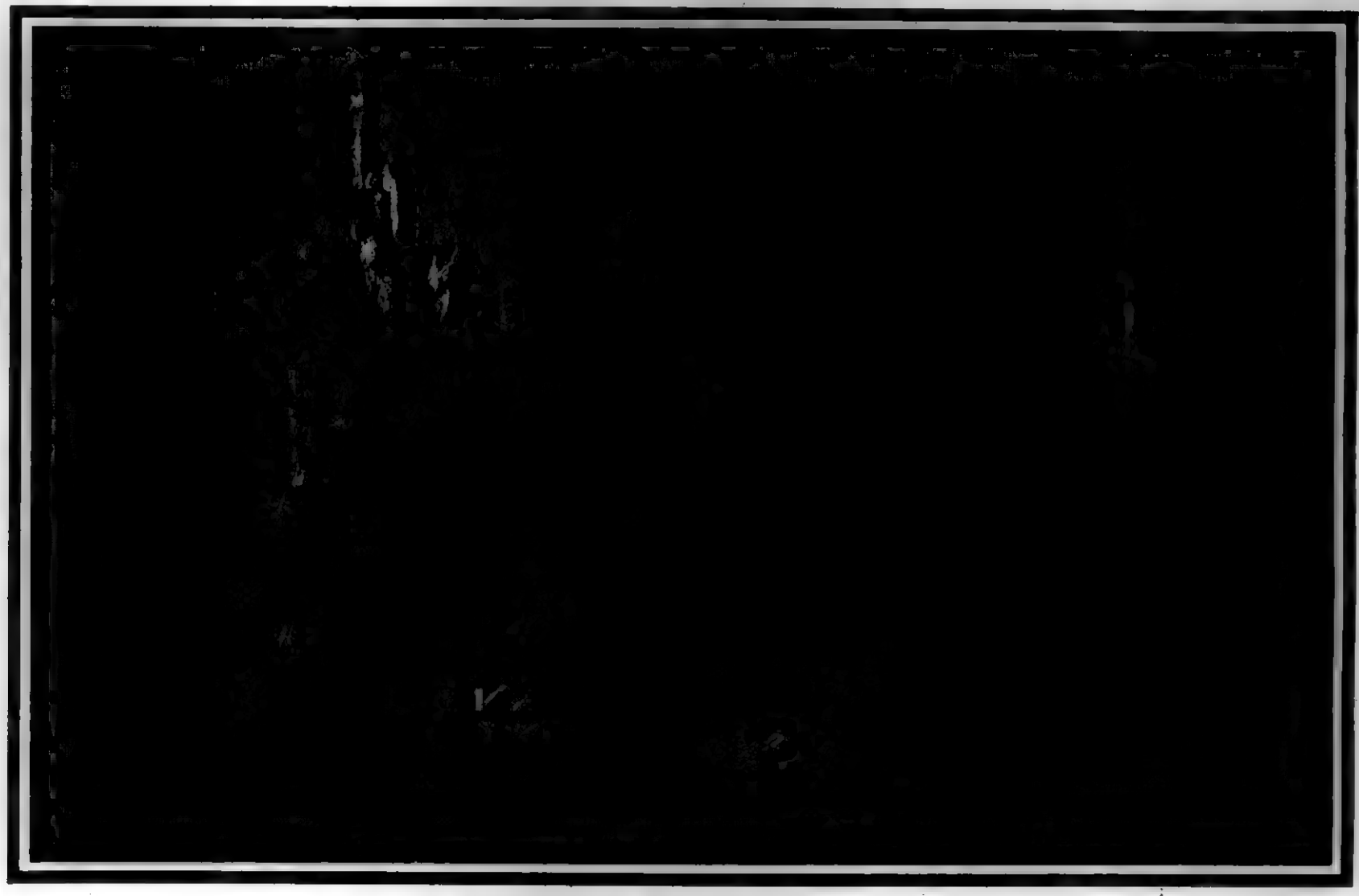

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Tough times create one tribe.
The industry's first major survey of IS attitudes reveals a surprising agreement on big issues — from the benefits of PCs to family values.

EXCLUSIVE CW SURVEY

All TOGETHER now

By Nell Margolis

BRUTAL business conditions and rapid business change have forged a strong bond between the young turks and old guard of corporate information systems.

In fact, a *Computerworld* survey has found that there is little evidence of any major generation gap in IS.

"It's sort of like the arguing about the sexes," says Jack Bush, director of information services at Apopka, Fla.-based Southern States Utilities Services. "There are differences, sure — but for most purposes, they aren't meaningful."

In the first major survey of its kind, *Computerworld* polled approximately 1,400 IS leaders and staffers at U.S.-based companies on a broad range of technological, managerial, sociological and political attitudes.

METHODOLOGY

Survey questionnaires were mailed to *Computerworld* subscribers between Sept. 1 and Sept. 29, 1992 and tabulated by IDG Research Services. A total of 1,383 responses were received from IS managers (78.5%) and professionals (21.5%) age 21 to 74 in 20 industries.

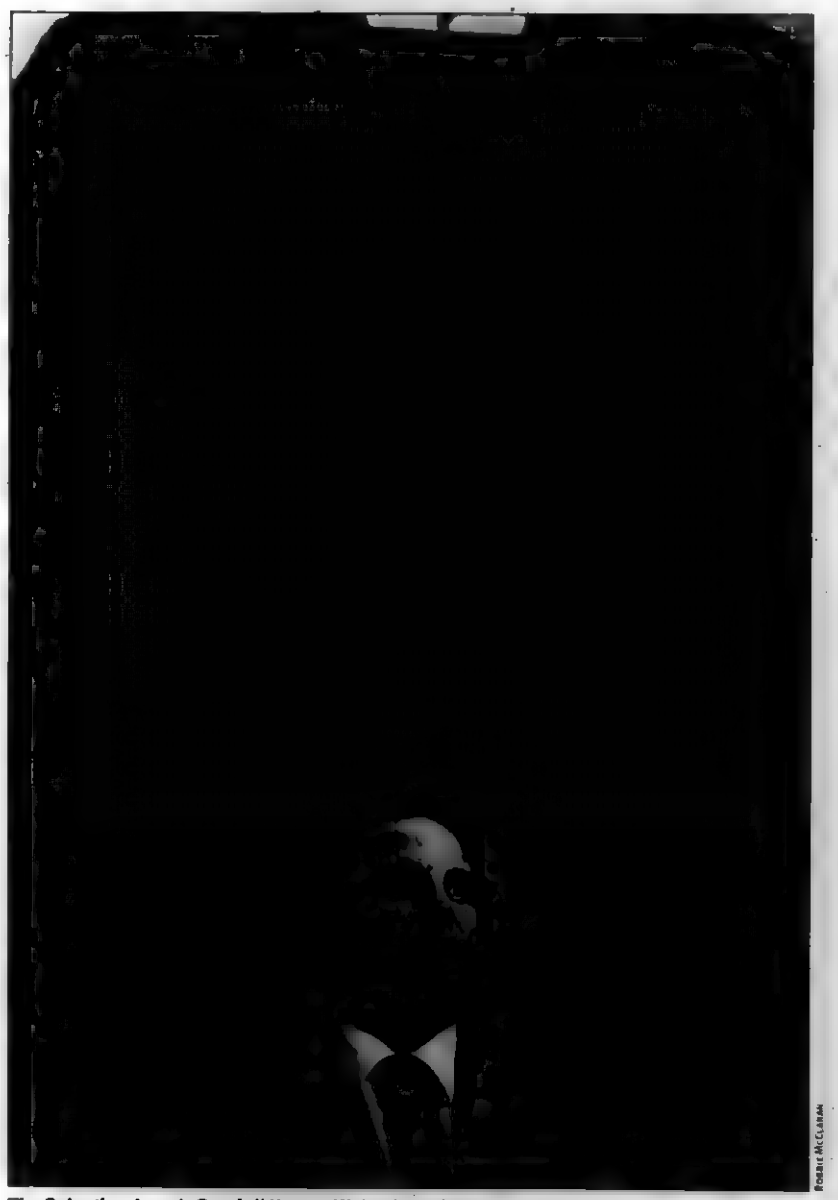
A predictable split emerged along age lines where opinions were more likely to be shaped by work and life experience. IS folks under 30, for example, showed more optimism about their career paths than did the 40-plus crew. But overwhelmingly, the IS community chimed in together on the key issues affecting their profession:

- The mainframe is fast becoming history; the desktop rules.
- Nobody has enough time, especially people in their 30s.
- IS must weave itself into the businesses it serves. For its part, business must serve its community as well as its customers.
- Outsourcing could be big trouble.
- IS professionals who don't change today won't see tomorrow.

Why the harmonious convergence? Rick McDaniel, IS director at the Oklahoma City-based law firm of Crowe & Dunlevy, P.C., suggests "foxhole psychology" as one key explanation. "Anytime you have a common foe, old differences begin to pale and bonding begins," he says.

And IS personnel are currently confronted on several scores. "For instance, the recession is a great leveler," McDaniel notes. "We're all fighting on that front. Virtually overnight globalization and the lightning pace at which technology changes also come to mind."

So do current trends aimed at recasting how U.S. companies do business, which are forcing IS to rethink and reshape its own role.



Robbie McClaran

The Salvation Army's Randall Haan: *'We've been bitten too many times'*

> *"I hate these slick consultants who write that if you're over 50, you're dead."*
>
> Ron Flink • Handy and Harman, Inc.

Bob Sacha

AGE AND TALENT

Significant differences exist in the skill set of older and younger IS professionals

Yes: 80.5%
No: 19.5%

FRESH BLOOD HELPS

Younger IS professionals bring innovative ideas to IS strategy

Yes: 76.4%
No: 23.6%

Take outsourcing: Randall Haan, IS director at The Salvation Army's Cascade Division in Portland, Ore., says he's cautious.

"We've been bitten too many times," he says.

Mistrust of outsourcing

Several years ago, Haan explains, his organization tried to save money and time by outsourcing a critical business application development project. Unfortunately, he reports, the "company made lots of promises and then changed direction in midstream."

Months of stagnation, one lawsuit and "well over $1 million" later, the project moved back in-house. "It was devastating," Haan says.

Several years into the outsourcing boom, many IS leaders have either lived or heard such stories, or they have heard the siren song of vendors promising to make technology problems vanish overnight. That could explain why respondents of all ages fell almost smack in the middle of the outsourcing road.

Because *Computerworld* recently polled IS professionals on another hot industry issue — re-engineering [CW, Oct. 19] — the current survey did not address that topic. However, that research and new interviews with IS leaders show that opinions here also cluster rather than clash.

"Re-engineering ... isn't just important; it's critical," says Roy Camblin, senior vice president of Wells Fargo Wholesale Services in San Francisco. "It's a challenge that's facing most organizations in this country. And the biggest challenges are the cultural, not the technological."

One of the strongest bonds welding IS professionals regardless of age, notes New York-based industrial psychologist Laurence Lipsett, is appreciation for technology — an observation borne out in the *Computerworld* survey results. Respondents agree that Cobol is history, mainframes are fading fast, and client/server, local-area networks and desktop applications rule.

Another reason for the widespread sense that "we're all in this together," Lipsett says, is that the age range in IS is narrower than in other professions. Thus, he says, there is likely to be less of a generation gap.

"Computer technology itself is still relatively new," Lipsett notes. "Generally speaking, no one has had a chance to grow old in IS yet."

Moreover, several experts noted that those who believe age stereotypes — of arrogant young whippersnappers and recalcitrant old codgers, for instance — may turn up less frequently these days among the ranks of the employed.

"I certainly don't see an IS 'old guard' mired in old ways and averse to change," said 29-year-old Mark Bowers, software developer at Tucson, Ariz.-based Tucson Federal Credit Union. "If there were such a group, they wouldn't still be here."

Culture, not birth date, counts

Anecdotal experience and formal studies also support our survey findings. For example, DuWayne J. Peterson, former chief information officer at Merrill Lynch & Co. and now a private consultant, says he recently saw firsthand how few differences exist between older and

YOU AGREE . . .

SMALL IS GOOD

The PC and network boom has been good for the IS profession

Yes 87.1%
No 12.9%

IS EQUALS BUCKS

Information technology is key to a competitive advantage in my organization's field of business

Yes 91.4%
No 8.6%

BIZ WIZ WANTED

IS needs to be more business-oriented

Yes 91.8%
No 8.2%

GOVERNMENT AND BUSINESS HAVE WORK TO DO

Business needs to be more responsive to the community and environment	94.5% AGREE
The U.S. government needs a more proactive technology policy	91.2% AGREE
Corporations need to be more responsive to family needs	89.7% AGREE
Information technology is making information workers more productive	83.1% AGREE
The U.S. has lost its competitive edge	78% AGREE

Hearts and minds

Several years ago, Guy Ministeri found himself grappling with a gut-wrenching decision an increasing number of Americans face each day: His mother, aging and ill, needed more care than his full-time working hours allowed him to give her. "On the other hand," he says, "I didn't want to put her in a nursing home.

"The best idea," concludes Ministeri — who is director of operations at Stride-Rite Corp. — "was to bring her to work with me." Thanks to Stride-Rite's "Intergenerational Center," he could.

The center, an on-site day care and elder care combination, provides employee relatives at both ends of the age spectrum with professional care and the pleasure of each other's company. It's only one of a broad range of Stride-Rite programs — wellness, fitness, employee assistance, community outreach and a panoply of personal-improvement seminars brought in on an outside contract basis — aimed at accommodating employees who rank family concerns as top priority.

The overall initiative, spearheaded in the early 1970s by then-Chairman Arnold Hyatt, is now headed up by family programs director Karen Liebold. Her very position is a declaration of the Cambridge, Mass.-based footwear manufacturer's recognition that the lines between family and work are fading fast.

Computerworld's first-ever IS attitudes survey is proof: Asked what motivates them most in life, a whopping 53.8% of respondents said "family." That's more than twice the 14.8% who made "personal satisfaction" the runner-up.

And IS folks are typical of the general work force population, according to a study compiled last February by The Conference Board. Perception that work/family concerns are compelling and consistent across the board, the report said, is encouraging firms to establish positions like Liebold's. Several hundred U.S. companies reportedly have created work/family management slots during the past two years.

According to Arlene Johnson, Conference Board work force research director, the numbers are expected to keep growing, as are the number of related jobs. "More effort will go toward managing change, dispersing work/family responsibilities throughout the organization and creating synergy with other business functions," Johnson says.

Report co-author Karol Rose adds: "Management wants to make sure that work/family initiatives are linked to the bottom line. —*Neil Margolis*

DREAM JOB

What one company or organization would you most like to work for?
(In order of preference)

1. My own company
2. IBM
3. My current employer
4. Microsoft
5. U.S. government

FAVORITE VENDOR

What one computer company do you most admire?
(In order of preference)

1. IBM
2. Microsoft
3. HP
4. Apple
5. Other

younger IS hands.

As head of a blue-ribbon task force researching ways to mainstream IS into business, Peterson asked older team members to select younger representatives from their companies to add a fresh perspective.

As work progressed, Peterson says, project leaders made a surprising — and initially disconcerting — discovery: "Age didn't figure."

"We were struck with how solid the so-called 'young turks' were," Peterson recalls. "They weren't wild-eyed hotheads; they were very confident."

On technological matters, some had expected disagreements between younger desktoppers and older mainframers. But again, according to Peterson, the younger group showed surprising agreement with the old guard.

Instead of resistance to traditional beliefs, he says, younger team members exhibited diverse views.

"Some felt that older IS models could be worked with; others said, 'No, we've got to throw them out and start over.'"

No surprise

That experience squares with recent research by STAT Resources, a Brookline, Mass.-based market research firm, which discovered that corporate cultural styles, not age, were a key factor in how IS people think and behave.

In a recent study of reading and buying trends of 400 IS professionals, STAT isolated five main segments: "Warriors" (42%), desktop champions who think strategically and act as business enablers; "Visionaries" (24%), who share Warriors' strategic goals but are skeptical of desktop computing; "Overseers" (21%), underambitious, passionate protectors of the status quo; "Technocrats" (7%) — zealous, aging devotees of cost savings and technology for its own sake; and "Defenders" (6%), ineffective, defensive IS protectionists.

In all groups, age, while a factor, was not a meaningful one, says Susan Ellerin, an industrial psychologist and STAT president.

"Don't get me wrong, differences between older and younger IS people do exist," McDaniel says. His peers agree: Asked if they see major differences between older and younger IS folk, 81.6% said yes but were not able to describe the differences clearly.

Are we not PC worthy?

Consider, for example, the mixed responses on the following topics:

- **Personal computing.** Is a PC-savvy younger generation crowding out an older, mainframe-oriented group? Not if you judge by Jim George, IS director at Pittsburgh-based Ohio Valley General Hospital. George would like to inoculate the hospital against what he calls "Biggest Calculator Syndrome."

"The PCs themselves can do just about anything these days, but the users aren't taking advantage of that. They use them for word processing, for spreadsheets," he says. "I see a lot of PCs out there getting used about an hour a day; that doesn't make a whole lot of sense."

In fact, George says he suspects that the desktop revolution exists largely in the mouths and minds of "a lot of people who are trying to fool themselves to justify all the money they've put into PCs" from which they are realizing scant payback.

Typical old-fogey talk? Maybe — but, George is 34 years old.

- **Professional skills.** While 80.5% of survey respondents said they see big differ-

"It's absolutely imperative for IS to be increasingly embedded in the business units it serves."

Thomas Charbonneau • Bose Corp.

John Nicholson

FACE TIME	FARMING OUT	CLOUT
It is important for IS to spend some time working with end users	Information systems outsourcing is a dangerous trend for IS professionals	The influence of IS is growing at my organization
Yes 99.1%	Yes 60.5%	Yes 76.2%
No .9%	No 39.5%	No 23.8%

GENERATION MAP

Although over-40 and under-40 IS professionals agree on many issues, respondents noted several differences, notably in financial and career hopes

Under 40

- More open to change, adaptive
- Better trained and up-to-date
- PC-oriented and experienced
- More loyal to their companies
- Optimistic about their financial prospects for the next decade
- More confident that young people can be IS innovators

Over 40

- Slower to accept change, less flexible
- Well-rounded and experienced
- Mainframe-oriented and experienced
- Less convinced that IS offers "an excellent career track"
- Less convinced that today's children will have a better quality of life than their parents

ences in the skill set of younger and older IS pros, it was less clear which group's skills were seen as superior.

"Younger developers tend to lack discipline," George says. A third-generation developer who looks back on his training on an old Univac as rigorous and beneficial, George wonders whether the generation that grew up with PCs and user-friendly interfaces has traded depth for "cleverness — which doesn't really cut it in IS."

But Ron Flink, director of IS at Rye, N.Y.-based specialty metal products manufacturer Handy and Harman, Inc., concedes that newer technologies are passing some old guard members by. "I hate these slick consultants who write that if you're over 50, you're dead," says Flink, 59. "You're not. But there are some people who can't bridge the gap."

EXCLUSIVE CW SURVEY

He continues, "Some of the old IS professionals try to equate mainframe technology with all that's being done with, say, client/server. They think it's all the same, but they're wrong. You don't just take out a template and write pages and pages of Cobol code."

•Company loyalty. While most respondents under 30 agreed that staying loyal to one company is key to advancing an IS career, 59.8% of their colleagues in the 30-39 age bracket, and an equal percentage in the 40-plus group, disagreed. The gap, at last? Not necessarily.

One's stand on company loyalty, notes 30-year-old Susan Alexander, probably has more to do with your berth than your birthday.

"If you find yourself in an organization where IS is undervalued — and that unfortunately accounts for the majority of them — you've got to move on," says Alexander, director of IS at The William and Flora Hewlett Foundation, a nonprofit organization located in Menlo Park, Calif. Sticking with such an employer, she adds, "isn't loyalty; it's martyrdom."

If IS professionals of all ages generally agree on the state of their profession, they are even more solidly united on where it should be headed.

Of 40 questions asked by *Computerworld* ranging across categories from quality of life to technology, business, life in IS and professional goals, two topics drew much stronger agreement than any others: the importance of spending time working directly with end users and business' need to be more responsive to the community and the environment.

"It's absolutely imperative for IS to be increasingly embedded in the business units it serves," says Thomas Charbonneau, manager of corporate information services/business administration at Framingham, Mass.-based audio equipment manufacturer Bose Corp. "And I think this is universally noted."

And the urgency of working directly with end users, he adds, goes well beyond the realm of being politically correct. While preaching about melding with user departments still outstrips practice, Charbonneau says, the talk/action gap is closing quickly.

"To really do our job, we have to know and serve the business users' latent needs," he says. "That's not something you can get from the outside looking in."

Relying on users

Charbonneau says Bose got user religion about five years ago, when the demands of a mammoth new manufacturing resource planning system implementation forced an IS team to work constantly with — and take direction from — the manufacturing group in charge of the project.

Today the team, now ensconced in the manufacturing unit, has grown from its original complement of seven IS professionals to approximately 20, complete with its own team leader.

And it's not alone. The team's success has spawned three more mixed IS/business teams, resident in the engineering systems, direct marketing and sales and marketing business units.

"I see a lot of PCs out there getting used about an hour a day."

Jim George • Ohio Valley General Hospital

Mainframe computers are dinosaurs

Yes 43.7%

No 56.3%

HOT TECHNOLOGIES THAT AFFECT YOUR CAREER	Rated on a scale of 1 to 4, where 1 is not important and 4 is very important
PC application software	3.92
LANs	3.90
Client/server computing	3.76
GUIs	3.52
Portable and remote computing	3.50
Object-oriented technology	3.21
Multimedia	3.04
CASE	3.02
Cobol programming	2.37

The lesson is clear: Success at interweaving business goals and technology will be met more easily when IS professionals are seen as valued insiders.

Sadly, even in Silicon Valley, many respondents noted, this acceptance is still rare. In fact, many said that if a stubborn attitude gap exists, it's between IS and the rest of the business, not between older and younger computing professionals.

But there's good news: 76% of those polled say the chasm appears to be narrowing. Craig Muranaka, chief information officer at Culver City, Calif.-based E. V. Roberts & Associates, Inc., an adhesives manufacturer, says he thinks the answer to closing it completely lies in popular culture.

"All it would take would be a new Tom Peters to write a book about the critical relationship between IS and business, hit the talk show circuit and become a media darling," says Muranaka, referring to the management consultant whose blockbuster *In Search of Excellence* fueled the mid-1980s entrepreneurial boom.

Beyond that, Muranaka adds, one more thing is crucial for bringing both camps together: "Guts — on both sides of the IS/business equation.

"There are blue sky opportunities out there, if we only take them," he says, citing the near-legendary IS-fueled success of Federal Express Corp. "There was somebody out there who was acutely aware of the use of technology — and somebody who didn't flinch when it came to signing checks."

Our Computerworld IDC White Paper was innovative and effective in delivering our message to readers that make a difference.

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Christopher Stone
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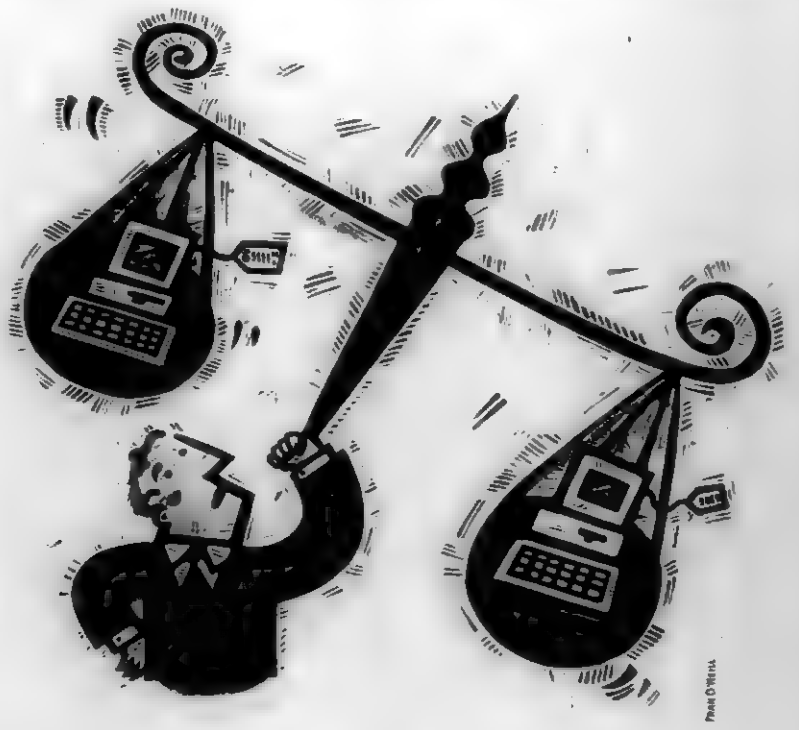
BEST BUYS

Deals abound, but beware of pitches that provide more problems than value



Prices on 486-based PCs are falling so fast that buyers are having trouble keeping track of this week's low-cost vendor. It should be simple to cut an incredible deal on a PC. Right?

Well, maybe.

No doubt about it, you can pick up a 486 for cheap. But combine the volatile pricing with the abundance of processors, vendors and channels, and many buyers are left scratching their heads. Name brand or third-tier clone? 486DX2 or 486SX? Mail order or retail?

The bottom line is, it takes more than price to make an incredible deal on 486s.

Users have to strike a careful balance between price and the need for a quality system that does exactly what their applications require. What constitutes a "Best Buy" depends on what your needs are and how you plan to use your PCs.

Are your stand-alone end users clamoring for a box that will let their graphical user interface fly? Will your 486s serve as the engines for a companywide, mission-critical database application? Or do your bean counters need a coprocessor to crunch their spreadsheets?

How well a given system will meet each of these needs depends on the type and speed of the processor as well as the quality and compatibility of the components.

Knowing *what* to buy is only half the battle; you must also know *where* to buy. Can you count on the goods from a storefront operation, and will service be sufficient from a mail-order vendor? Where (and how) can you leverage the volume of your purchase for the best discount?

In the following pages, you'll find practical advice — quality checklists, caveats, consultants' choices — for purchasing the 486 that matches your power and reliability requirements without exceeding your spending limits. Users who've taken the plunge also share their experiences. A leading consultant even cautions users to look twice before buying a 486 at all.

In short, we've rounded up the practical information you'll need to make an informed decision when buying a 486 PC.

And still save a bundle.

What counts most

150 USERS, WHO RATED THE TOP 486 PCs IN BUYERS' SCORECARD, RANKED THE FOLLOWING CRITERIA AS MOST IMPORTANT IN MAKING PURCHASING DECISIONS

1. Software compatibility
2. Reliability
3. Hardware compatibility
4. Value for the dollar
5. Performance
6. Vendor responsiveness
7. Technical support
8. Ease of maintenance
9. Configurability
10. Ease of setup

Shifting values

PCs users are shifting their buying priorities.

In Buyers' Scorecard a year ago, they rated reliability as the most important requirement and placed vendor service and support near the bottom of their lists.

Performance was fourth last year, followed by value for the dollar, ease of use and availability of upgrade options.

CONTENTS

- How vendors can cut corners on 486 bargain brands. Pg. 156
- Gateway 2000's 486 PCs wow users in Buyers' Scorecard survey. Pg. 160
- Why you shouldn't skimp when buying a server. Pg. 161
- Lab Report: The fastest 486s measured by the Khomerstone. Pg. 162
- Special considerations for volume 486 PC buyers. Pg. 162
- The best prices you can get on the street. Pg. 163
- Column: Stephen Rood says you might not need a 486. Pg. 164
- Users talk buying strategies and priorities. Pg. 166

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486 PCs

Beware the bargain PC

By Andrew M. Seybold

Though this may be the best time to find a bargain 486 PC, it's also the best time to end up with a system with lower quality components than you need if you aren't careful.

In addition to the "name" brand PCs, there are literally hundreds of vendors assembling systems and selling them through every type of computer outlet. Companies with sufficient PC support capabilities and resources can certainly find good deals.

Many storefronts offer quality products at very attractive prices, and some even offer the "build to order" type of sale where you discuss your requirements and they assemble the various bits and pieces into a system.

Some of these systems might be considered wise purchases for the savvy PC buyer. But this channel is not for every company, and caution is needed when dealing with vendors and suppliers.

Only those who feel comfortable working under the hood of the system (or who have a technical support staff with enough expertise and manpower) should venture into this tier of vendors. The "garage door opener test" is an informal way to determine whether you can safely purchase a system through these channels:

- If, when your electric garage door opener quits working, you pick up the phone and call a repair person, you should avoid the bargain, no-name sellers and deal with established or name-brand systems that include extended warranties.
- If you experiment with the garage door opener — changing the battery in the remote control, looking for obvious obstructions — then you are a prime candidate for not only the "full service" vendor but also the vendor/retailer that offers systems with less recognizable names, which you might want to purchase and configure to your own needs.
- If you do not stop working on your garage door opener until you have dismantled it and fixed it; then you can walk into any store and purchase pieces and parts and "roll your own" systems, oftentimes at considerable savings.

Bang the keyboard

It may seem like a small point, but don't forget to try the keyboard for feel. Many of these low-end systems include a "throwaway" keyboard. After the first week of operation, you will be back at the store upgrading it to one that feels right.

Quality control

When purchasing a computer that has been assembled in front of your eyes or that has been preconfigured but does not include a familiar brand name or warranty beyond the sellers' own, you should check and verify the following items:

- **Power supply.** What is the capacity of the power supply? Many low-end products cut corners and provide supplies that will not support more than the basic system. Add-on cards or drives will fry the system.
- **Case construction.** Is the metal case rigid enough to support a monitor? Does the computer chassis slide in and out easily, seating properly? When the system is assembled, are add-in cards installable without being either forced into the connector and the board and/or bent to line up with the slots at the back of the case?

Many buyers do not try to insert an add-in card until they buy the machine. Then they find out that the generic metal case and the motherboard do not align properly, making it difficult, if not impossible, to add cards into vacant slots.

- **Keyboard.** Try the keyboard for feel. Many of these low-end systems include a "throwaway" keyboard. After the first week of operation, you will be back at the store upgrading it to one that feels right.
- **Monitor.** Look at the monitor specifications closely. If the specifications for a Video Graphics Array (VGA) or Super VGA monitor do not include dot pitch specs, or if the specs state that the dot pitch is higher than .28, do not buy the monitor. Typical cheap monitors usually have a dot pitch spec of .31 or even .33.

Also, make sure that the video adapter card and the monitor are compatible. Many times a video card will be included that does not properly support the monitor. If the monitor is capable of Super VGA or Extended Graphics Array resolutions, make sure the video card either comes with 1M byte of random-access memory or that it can be upgraded with plug-in memory.

- **Documentation.** Is there any? Is it just a series of small pamphlets on each individual component, or is it "systems-oriented," helping you understand how the pieces work together?
- **BIOS.** Finally, check the BIOS. If it is from one of the major vendors — Phoenix Technologies Ltd., American Megatrends, Inc., Quadtel or Award — chances are you will not encounter any surprises as far as systems integration is concerned. If there is no name or an unfamiliar name on the BIOS, the safest bet is to pass on the system.

The quality of the system is not the only important issue. The longevity of the company is also worth consideration. If the systems you purchase are from a small retailer or single-location dealer and the only warranty being offered is directly from that dealer, you should ask the dealer how long it has been in business under the same name and in the same location.

It is better to spend a few extra dollars than to return a "bargain" system to the store — only to find out it is now in the pizza business.

Seybold is editor-in-chief of industry newsletters "The Outlook on Professional Computing" and "The Outlook on Mobile Computing."

Brands to consider

TOP 486-BASED PC BRANDS SELECTED BY CONSULTANTS AND VARS INTERVIEWED BY *COMPUTERWORLD*

"Expensive but worth it" servers and stand-alone systems

Acer America Corp.
AST Research, Inc.
Compaq Computer Corp.
Digital Equipment Corp.
Dell Computer Corp.
Hewlett-Packard Co.
IBM
NCR Corp.
Netframe Systems, Inc.
Tricord Systems, Inc.

"Cheap but good" servers and stand-alone systems

Acer America
AST Research
Compaq
CompuAdd Corp.
Everex Systems, Inc.
Galaxy Corp.
Gateway 2000, Inc.
Leading Edge
NCR
Northgate Computer Systems, Inc.
Tandy Corp.
Wyse Technology, Inc.
Zeos International Ltd.

Lowdown on 486 chips

Are you confused by the alphabet soup of 486 chips that are on the market? Here's a quick primer to help keep them all straight and prevent you from buying a DX2 when you want an SX or an SLC.

➤Speed is the chief concern.
From the user's perspective, speed is the primary difference among these various offerings: DX2 systems are faster than DXs, followed by SXs and then SLCs. (Cache size and other variables can affect this hierarchy.)

Within each chip type, a higher clock speed obviously yields faster processing.

➤Coprocessors count.
Some software, most notably Autodesk's, Inc.'s AutoCAD, requires a coprocessor; users need to double-check whether their applications can run on the Intel Corp. I486SX, which has no built-in coprocessor.

➤Why the DX2?
The DX2 works twice as fast inside as it does outside. For example, the 33/66-MHz DX2 "thinks" at 66 MHz but communicates with the rest of the PC as if it were a regular 33-MHz chip.

The advantage of such a chip is that it can work in a system designed for a 33-MHz processor. Users can upgrade a 33-MHz DX processor without modifying the other system components, and vendors can put out a DX2 system without having to design it from the ground up — theoretically passing on some research and development savings to the user.

➤The Cyrix conundrum.
The Cyrix Corp. 486SLC has the same pin configuration as a 386 chip, but it handles software in the same manner as a 486. Competitors say the Cyrix chip is not a true 486 and is mislabeled.

The bottom line for users is this: All other things being equal, a 486SLC system will be faster than any 386-based PC and slower than an Intel 486-based system, according to Michael Slater, editor of the "Microprocessor Report."

As to whether it's "really" a 486, Slater says, "It's certainly different from an Intel 486, but it's a gray area. If I have a very fast two-door sedan, can I call it a sports car?"

➤The "crippled DX" controversy.
Detractors initially protested that the I486SX chips were full-fledged I486DX processors with the internal math coprocessor simply disabled. That tactic allegedly gave Intel an opportunity to bilk users by later selling them an additional external coprocessor for a higher total cost.

The original 486SX chips were in fact altered DX chips, "but that was just a time-to-market issue," according to Slater.

The SX processors currently shipping from Intel are redesigned, with the internal math coprocessor completely eliminated from the die.

"I can't work my VCR
and they're expecting
me to understand this?"

–Richard Link, Administrative Assistant

"This was a big investment.
I'm still waiting
for the big return."

–Peggy Turner, CFO

"I thought you said
these were going
to increase productivity."

–Greg Collins, Office Manager

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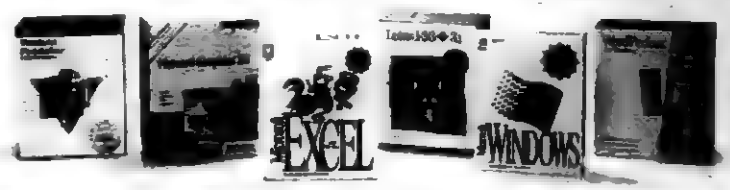

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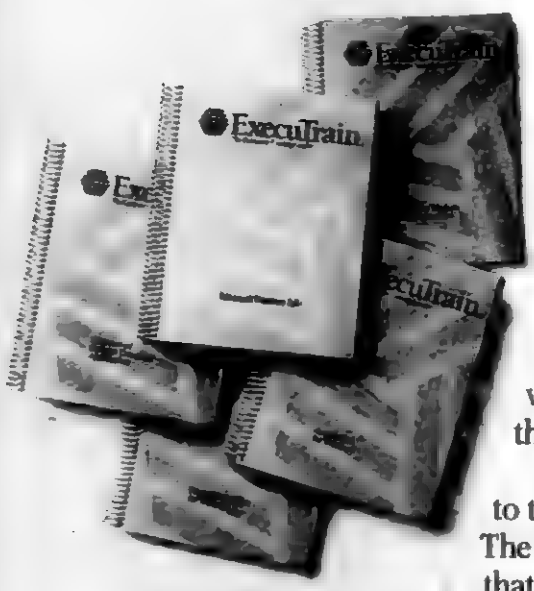

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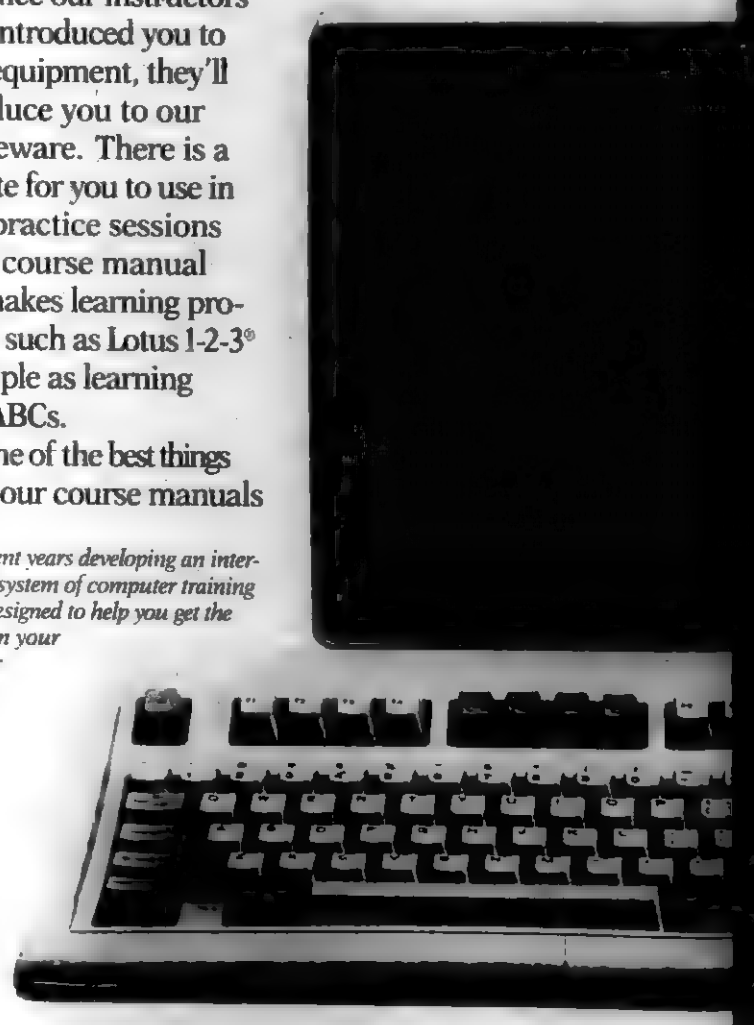

nputer training popular complaint.

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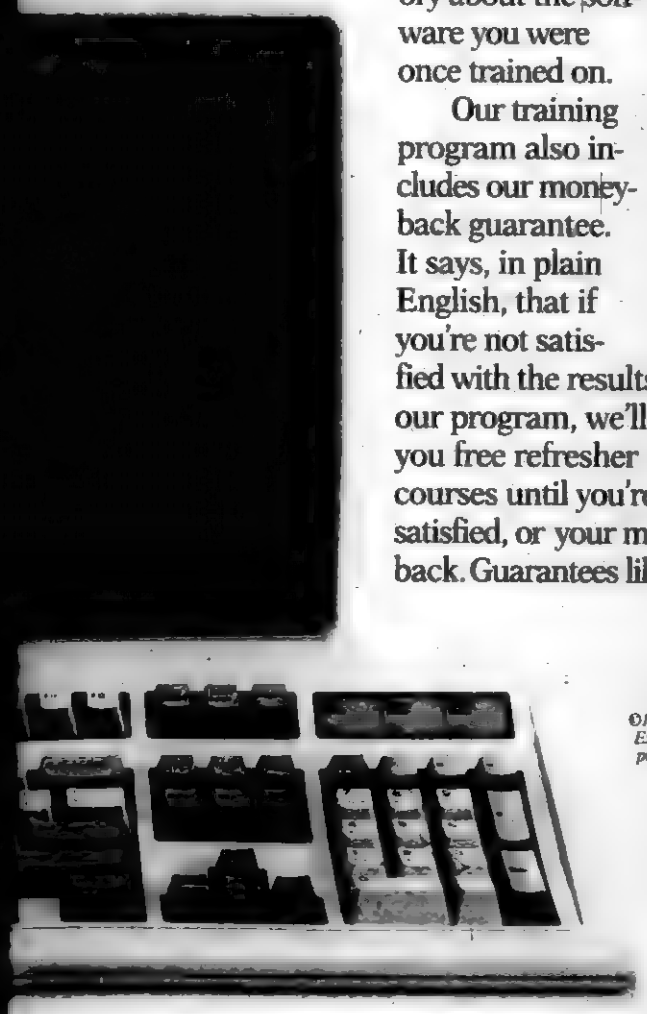

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Buyers' Scorecard

Mail-order vendors prove their point

By Derek Slater

DIRECT-SALES PC vendors showed how far they have come since the days when the mail-order channel was considered a risky way to buy. In the Buyers' Scorecard poll on 486-based PCs, corporate users gave the highest satisfaction scores to Gateway 2000, Inc. Overall, mail-order vendors took the Top 2 places ahead of AST Research, Inc., Compaq Computer Corp. and IBM, which have traditionally worked through reseller channels.

In particular, the direct sellers earned significantly higher scores in the area of value for the dollar. However, IBM's new ValuePoint line and Compaq's hot-selling ProLinea systems, which are too recent to have had an impact on this survey of currently installed systems, indicate an increasing willingness on these vendors' part to compete on pricing.

Gateway 2000's 486-based systems topped the ratings with an overall score of 85, two points ahead of Dell Computer Corp. and followed by AST Research (82), Compaq (80) and IBM (78).

Some of the vendors produce several different lines of PCs with 486-based models. For example, Compaq 486 systems include various DeskPro desktop models, SystemPro servers and others. The response base for each vendor included users of any 486-based system which that vendor produces.

Most of the respondents (68%) said they are using stand-alone models rather than servers, however.

Gateway 2000, which is based in North Sioux City, S.D., was the No. 2 vendor in terms of 486 units shipped in 1991, with strong results also expected for 1992, according to Bruce Stephen, an analyst at International Data Corp. The company rose to prominence in the past few years based partly on its low-cost producer status.

Gateway 2000's systems earned the highest score in value for the dollar but also posted good marks in reliability, compatibility and performance. In verbatim responses, a number of users mentioned service as a relative weakness.

Dell users gave their systems high marks in software and hardware compatibility and reliability. Surprisingly, Dell earned lower scores in responsiveness of vendor service — an area the company prides itself on.

AST Research users cited their systems' ease of setup and variety of upgrade options as particular strengths.

Compaq respondents — most of them DeskPro users — said they liked the systems' reliability but indicated relative dissatisfaction with the company's service and support. They also criticized Compaq's use of proprietary parts, which they said make the systems difficult and expensive to maintain.

Similarly, users said IBM's Personal System/2 PCs tended to be reliable performers. The primary complaints stemmed from pricing issues; IBM's lowest rating was in value for the dollar.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their 486-based PCs in 13 specific categories. Users also rated the importance of each category.

All 13 categories were factored into the final scores. The scores for each product in the six most important categories are listed in the tables below. (See the methodology on the following page for a complete description of the scoring process.) •

486-based PCs

Total scores reflect user ratings for 13 measured areas, weighted by user-assigned importance. Response base: 150 total respondents (30 per product).

TOTAL POSSIBLE SCORE 100 MEAN SCORE 82

PRODUCT	HIGHEST RATINGS	LOWEST RATINGS
Gateway 2000 SCORE 85	• Software compatibility • Hardware compatibility • Value for the dollar	• Vendor responsiveness • Upgrade options • Technical support
Dell SCORE 83	• Software compatibility • Hardware compatibility • Reliability	• Upgrade options • Vendor responsiveness • Technical support
AST Research SCORE 82	• Software compatibility • Upgrade options • Ease of setup	• Value for the dollar • Documentation • Configurability
Compaq SCORE 80	• Software compatibility • Hardware compatibility • Memory capacity	• Value for the dollar • Technical support • Vendor responsiveness
IBM SCORE 78	• Software compatibility • Hardware compatibility • Performance	• Value for the dollar • Upgrade options • Documentation

Ratings are based on a 1-to-10 scale, where 10 is best.

Responses are based on the most frequently stated answers. Quotes are selected from users' responses.

Reasons are based on the most frequently stated answers.

Gateway 2000

RESPONSE BASE: 30 USERS

LIKES: "The price."

DISLIKES: "The customer service is unsatisfactory."

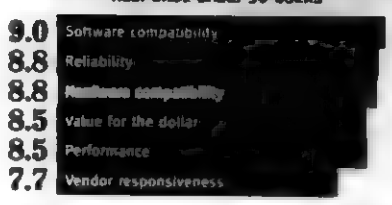
Would you buy the product again?

LIKELY REASON: Reasonable price, good value

UNLIKELY REASON: Better products available

Dell

RESPONSE BASE: 30 USERS



LIKES: "Quality of machine and quality of service."

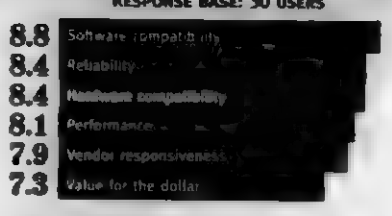
DISLIKES: "Needs more power for a low price."

Would you buy the product again?

LIKELY REASON: Reasonable price, good value

AST Research

RESPONSE BASE: 30 USERS



LIKES: "Well-designed and quality-fabricated product."

DISLIKES: "High price—product not on cutting edge."

Would you buy the product again?

LIKELY REASON: Compatibility, reliability

UNLIKELY REASON: Better products available

486 PCs

Servers: Not the thing to skimp on

By Andrew M. Seybold

THERE IS one place in your enterprise where it makes little sense to take any risk on a "bargain" 486: the network server. While a high-priced, high-quality server will not guarantee you a trouble-free network, it will certainly go a long way toward providing you with more uptime — the most important commodity in the network.

Don't cut corners, and don't purchase a system that uses oddball disk drives or other components that cannot easily be replaced. Other items to check include the rating of the power supply, the total memory capacity of the main board, the number of slots for add-in cards and the number of bays for add-in storage and backup devices. This truism applies more for servers than for most other PCs: You cannot have too much speed, too much storage or too much memory. If there is going to be a bottleneck anywhere, it will be in the server.

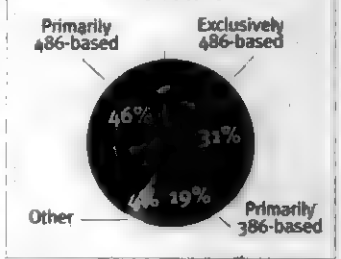
You can employ a desktop PC as a server; however, the high-end products designed for server use permit a wider range of expansion options, more memory and more hard disk space.

You will pay more for a high-end server, though. Compared to today's low-end desktop price wars, these systems have dropped in price very little during the past year. In fact, just before IBM announced its new Personal System/Valuepoint desktop systems, it raised its prices on high-end PCs and servers.

The new corporate standard

Which type of PC is your company primarily purchasing?

RESPONSE BASE: 150 USERS FROM BUYERS' SCORECARD SURVEY



With the higher prices, however, come a number of other advantages to purchasing a PC that has been "hardened" for server duty.

Typically, these systems have larger power supplies (250 watts or more) and more hard disk bays, CD-ROM, tape backup systems and expansion slots than a typical desktop system.

Many of these systems can be equipped with a pair of same-size disk drives so that they can perform mirroring. That is when both drives run at the same time and record the same data. If there is a failure on one, the data is still intact on the other. Tape backup or mirroring is critical for a server. In some companies, when a network server goes down, the employees go home, as they literally cannot perform their work activities.

As networks grow in size and complexity, many companies are using multiple servers. The first split is usually necessitated by the number of users on a system. If one department has a need for heavy, server-based use, this can slow down the network for other users.

In this case, the options include splitting the network into sections and adding other servers with gateways between them or splitting the server functions. Some users configure one server for printing only, one for communications and one for programs and data.

Many of the systems designed for the low-end market can be used for servers, but again, the buyer has to make sure that the systems can handle the requirements of a server and can withstand the continuous duty cycles necessitated for them.

Multiprocessor servers

Several firms are touting the use of multiprocessor-based servers for networks. At this point, the leading operating systems do not support the management of multiple processors within the same machine.

As is the case with all generalizations, there are times when a multiprocessor-based server makes sense. However, at present, these units require lots of individual configuration and attention to detail to function properly. For now, two separate single-processor servers, tied together via a gateway, makes sense in most cases. •

Mind over server

Can you get by with a desktop PC as a server? The answer is yes, especially if yours is a small network (10 to 25 users). In truth, any desktop PC can be configured as a server for network applications. However, most vendors offer products that, according to them, are better suited for servers than their standard desktop offerings. Overall, though, remember that the server is the heart of the network and will usually be required to provide uninterrupted service — in most cases, 24 hours a day, seven days a week.

Vital statistics

Profile of users who rated these products
RESPONSE BASE: 150

Primary operating system	
DOS only	54%
Windows	27%
OS/2	13%
Other	5%
Unix	1%

Clock speed of processor	
33 MHz	65%
25 MHz	15%
50 MHz	11%
Other	6%
20 MHz	2%
66 MHz	1%

How long have you used this product?	
More than 24 months	17%
19-24 months	11%
12-18 months	34%
7-11 months	13%
4-6 months	14%
0-3 months	11%

BUYERS' SCORECARD METHODOLOGY

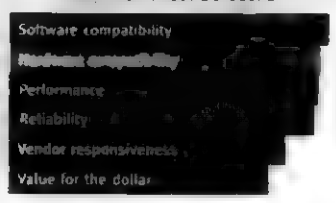
User names were obtained from nonvendor sources. First Market Research Corp. in Austin, Texas, conducted the survey and tabulated the results.

To compute each overall score, perform the following: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded offwhere necessary.

Computerworld thanks the following for their assistance: CW Database Division; Bruce Stephen, International Data Corp.; Computer Intelligence/Infocorp.

Compaq

RESPONSE BASE: 30 USERS



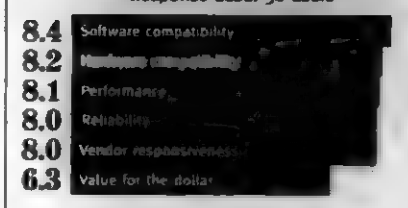
LIKES: "Upgradability, overall reliability and performance."

DISLIKES: "Slow technical support."

Would you buy the product again?

IBM

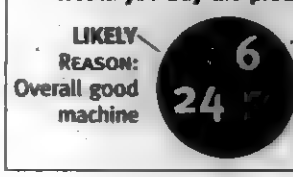
Response base: 30 users



LIKES: "Reliability and IBM service."

DISLIKES: "Poor price/performance ratio."

Would you buy the product again?



Ratings in order of importance

Users rated the following categories on a scale of 1 to 10, where 1 is least important and 10 is most important

RESPONSE BASE: 150 USERS

Where are they?

More than a third of the Scorecard respondents say they are using their 486 PCs in manufacturing settings. Another 8% are in financial services groups, 4% are in education and 3% each are in retail, health care and government. The remainder are in consumer products or transportation companies. All respondents have direct control of, or influence over, PC purchasing at their companies.

LAB REPORT

486 PCs

Lab report: Anatomy of the Khornerstone benchmark

Time

(Weight: 30%)

- Total time to run script that runs 21 benchmarks included in Khornerstone

LEADERS

1. NCR 3445	11,157
2. Wyse 900CI	8,682
3. Mobius P450ICX	6,232
4. AT&T StarServer S	5,937
5. Compaq DeskPro L	5,657

Khornerstone Top Scorers

SYSTEM*	SCORE**
1. NCR 3445	53,926
2. Wyse 900CI	34,339
3. Microway B3	29,542
4. AT&T StarServer S	24,091
5. Mobius P450ICX	22,968
6. Altos 4500	22,849
7. Compaq DeskPro L	18,722
8. ALR p'icache 3314	18,644
9. Compaq SystemPro	17,108
10. Northgate 433E	16,469

Test Configurations

	MHz	RAM (M bytes)	OPERATING SYSTEM
ALR	33	8	SCO Unix 3.2
Altos	33	32	Unix 2.1
AST	33	4	ISC 2.02
AT&T	33	8	V/3864.2.1
Compaq DeskPro	33	12	ISC 2.2
Compaq SystemPro	33	10	SCO/MPX
Microway	50	8	ISC V2.2
Mobius	50	16	ISC V3.2
NCR	33	48	Unix V.4
Northgate	33	4	ISC V2.2
Wyse	25	64	V1386 3.21

Floating point test

(Weight: 23%)

- Sequential sort 5,000 floating-point numbers
- Fortran Whetstone double precision test; various Whetstone tests
- Trigonometric function test in C

LEADERS

1. Microway B3	15,734
2. Mobius P450ICX	7,897
3. AST Premium 486/33	7,894
4. Northgate 433E	6,739
5. AT&T StarServer S	6,129

CPU Test

(Weight: 27%)

- Sequential sort 5,000 integers
- Fortran sieve tests
- Various tests in C (Ackerman, Dhrystone, Fibonacci)

LEADERS

1. AT&T StarServer	8,901
2. Microway B3	8,854
3. Mobius P450ICX	8,845
4. Altos 4500	8,641
5. Wyse 900CI	7,738

Disk I/O Test

(Weight: 20%)

- Build 8M-byte file
- Random read 8M bytes of data
- Sequential reads 1M to 8M bytes of data

LEADERS

1. NCR 3445	27,903
2. Wyse 900CI	13,271
3. Altos 4500	3,186
4. AT&T StarServer	3,124
5. Mobius P450ICX	2,154

Source: ARS/Workstation Labs

Full speed ahead

NCR Corp.'s 3445 system is the fastest 486 machine, according to the Khornerstone, a widely used benchmark that is made up of 21 separate tests consisting of the components at left.

Both NCR and AT&T do well in the benchmark testing because their products were designed as multiuser network servers. If the tests were run in DOS, the results would be half as strong.

The results include only those systems tested by ARS/Workstation Labs.

The Khornerstone benchmark was designed to provide a realistic measurement of comparative performance for both PCs and workstations.

Cheaper by the zillion

By Andrew M. Seybold

BUYING a high volume of 486 PCs presents its own set of challenges.

Although the customer is king at the moment — even more so when he is purchasing lots and lots of 486s — it is especially crucial in volume agreements to be very clear on exactly what the systems requirements are and what the follow-on service and support services need to be.

Even then, some vendors may try to meet the letter of the law without actually matching all of the buyer's expectations.

Horror stories

Several companies that have just completed the purchase of a large quantity of machines did not get exactly what they wanted.

In one instance, a company sent out bids for several hundred 486-based systems with Video Graphics Array monitors, DOS 5.0 and Microsoft Corp.'s Windows 3.1 loaded, a large hard disk and 4M bytes of random-access memory in each machine.

The low bidder, anxious for the volume business, provided machines that met the specifications. However, while the vendor supplied the proper monitor (the specifications called for a dot pitch of .28) and the basic system, it cut corners on the keyboards.

Once the PCs were installed, the end users complained bitterly about the feel of the keyboards. In the end, the company had to throw away and replace several hundred inferior keyboards.

In another case, a company purchased several hundred PCs for use on a network running Novell, Inc.'s NetWare. It took delivery of the systems — all from the same vendor and all the identical model number — during a six- to eight-week period.

After installing the first group in the network, the company found that many of the systems received in later shipments were different from ones in the first group. After some investigation, the PC vendor admitted changing BIOS vendors, integrated drive electronics controller vendors and even hard disk vendors on the same model to save a few dollars in the manufacturing process.

One of the systems I tested came loaded with DOS 5.0 and Windows 3.1 but did not include a mouse or even a mouse port. I had to supply my own mouse and attach it to one of the serial ports (thus losing the use of one port).

Another troublesome practice that even major vendors are starting to follow is that of providing all of the software on the hard disk but not shipping any floppy disks. This can be a dangerous situation.

In testing various PCs, I found one system that froze when I installed a 10Base-T network card. Because this was one that

No longer a sideshow

Results based on 150 respondents who were asked whether they use 486 PCs for mission-critical applications

Yes	62%
No	37%
Other	1%

Application type (multiple responses allowed)

Spreadsheet	71%
Word processing	71%
Database	51%
Graphics	29%
Engineering	14%
Network management	15%
Project management	13%
Desktop publishing	13%
Financial	12%
E-mail	11%
Manufacturing	5%
Logistics	5%
Scientific	5%
Image processing	3%

Source: Buyers' Scorecard

486 PCs

Power hitters

Some applications demand all the power a PC can bring to bear. Most of these are graphics-intensive applications, and all of them operate better when the processor has some help from a coprocessor.

These high-performance applications include the following:

- Computer-aided design.
- Heavy-duty accounting or numeric modeling software.
- Desktop publishing.
- Graphics imaging packages.
- Industrial-strength drawing and drafting packages.

If high-end applications are in your future, then look for not only a 486DX-based system but also a system that has been optimized specifically for high-performance operation.

The low-end (386-based) systems offered by most of the name-brand vendors are, for the most part, optimized for the processor installed in them. However, this is not always the case with 486-based systems, some of which have not been optimized for the highest possible performance.

This includes cache, buffered disk controllers and even video boards that sport their own video coprocessors or at least accelerators.

Beware: Matching video boards to monitors is not easy. If you purchase a complete system, make sure these two components are matched to each other. Also, if you use Microsoft Corp.'s Windows, be sure the proper video drivers are included and loaded on the system.

Performance tests offer some means of comparing various systems. It is ideal to take the time to install your own suite of applications and run your own performance tests.

Failing the ability to do this, you should run the tests supplied by utilities vendors such as Symantec Corp., or run Intel Corp.'s newly released IComp performance tests.

486 PC street prices

THE FOLLOWING ARE SELECTED STREET PRICES FOR SYSTEMS THAT CAN SERVE AS A GUIDELINE FOR GETTING THE BEST DEAL ON YOUR PC

Top 3 overall (by price)

Vendor	Model	Chip/ Speed (MHz)	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
Occidental	25-MHz 486SX	I486SX/25	4	170	–	$1,595	$1,346
ALR	Flyer 32DT 4SX/25	I486SX/25	4	170	–	$1,749	$1,500
Gateway 2000	25-MHz 486SX	I486SX/25	4	250	–	$1,575	$1,570
Compaq	SystemPro 486/33	I486DX/33	8	420	512	$14,999	$12,658
Zenith Data	Z-Server 450DE	I486DX/50	8	500	256	$7,499	$7,734
AST	Premium SE 4/50	I486DX/50	8	500	256	$8,695	$7,438

Top systems by class (by price)

486SX/25	Model	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
Occidental	25-MHz 486SX	4	170	–	$1,595	$1,346
IBM	PS/2 95XP OH9	8	160	–	$7,475	$5,962
Average					$3,208	$2,134

486DX/33	Model	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
Compudyne	486DX/33	4	211	128	$2,000	$1,650
Compaq	SystemPro 486/33	8	420	512	$14,999	$12,658
Average					$6,046	$3,405

486DX/50	Model	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
Compudyne	486DX/50	8	210	128	$2,200	$2,160
Zenith Data	Z-Server 450DE	8	500	256	$7,499	$7,734
Average					$4,664	$4,717

486DX2/50	Model	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
Compudyne	486DX2/50	4	211	128	NA	$1,850
IBM	PS/2 90XP-OLF	8	400	–	$7,415	$5,887
Average					$4,215	$2,897

486DX2/66	Model	RAM (K bytes)	Hard disk (M bytes)	Extended cache (K bytes)	List price	Street price
DEC	DECpc 466D2LP	4	120	128	$2,199	$2,199
Dell	486SE	8	230	128	$4,999	$4,900
Average					NA	$3,237

KEY: Least expensive | Most expensive | Average

Source: International Data Corp. PC Pricing Report (September 1992)

had not been shipped with a floppy disk copy of the operating system, I would not have been able to get into the system to make the necessary file changes if I had not had a set of my own bootable disks.

In another vendor's system, installation of an internal fax/modem card crashed the system and destroyed the COMMAND.COM file on the hard disk. It was necessary to reload DOS and start over again. If we had not had a copy of DOS on a floppy, we would have been out of luck; no disks came with the machine.

The lesson you should learn from all of this is to be very careful in planning your purchase and choosing your vendors, particularly when you are looking at a volume discount. 486 prices have fallen to the point where you can truly score a bargain and still receive equipment that is high-quality and reliable.

The following steps will help keep you out of trouble when you make volume purchases.

1) Details, details.
Write a detailed set of specifications. Require that all systems come configured exactly as you need them, and make sure the specifications prohibit a vendor from making any changes to critical components such as the BIOS, floppy and hard drive controllers and serial and parallel ports.

2) Casting for extras.
If possible, purchase some "spare" systems. With 486 prices as low as they are (and falling), it is easy to tack a few more systems onto your order. Spare computers provide instant replacements for systems that are down, as well as spare parts.

It is also much easier to troubleshoot problems if you have another computer on which you can try to duplicate the failure.

3) Get disks.
Insist that you get at least one set of master disks for each operating system and/or program that comes loaded on the system. If possible, make sure you get a complete set of installation and support manuals.

4) Try, try again.
Don't just settle for one round of bidding. Oftentimes you can better the first price you receive by going around a second time. If you have a favored vendor, it is possible to "push" that vendor somewhat by letting it know that it has some competition.

> Ask for a bid sample system to configure and test your way.

5) Remember service specs.
Determine ahead of the bid award exactly what service and support is included. Add a stipulation to the bid requiring the vendor to change out a system that is "dead on arrival" or that fails during the first few weeks of operation.

6) Matching samples.
Ask for a bid sample system, test it out, configure it exactly as it will be in your system and then insist that each and every machine delivered is *exactly* like the bid sample.

7) Price protection.
If you are purchasing a large number of systems for delivery over a long period of time (six months to a year), insist on price protection. In other words, if the company reduces the list price by 5% during the delivery cycle, make sure you will get a price adjustment, at least on the systems you have not yet received. If you are a really good negotiator and if the order is large enough, you may even be able to obtain a rebate on the systems already in place.

8) Money talks.
Offer payment terms that will motivate the vendor. Even the largest vendors are concerned about cash flow. Suggest payment terms that provide a portion of the payment very shortly after delivery but hold back a final portion of the invoice until acceptance of all of the units and verification that all of the specs have been met.

Ask for a discount for net 10 days if your company can turn an invoice around. You may find that you will get an additional 1% to 2% discount by paying for the systems quickly.•

Bring your own
One troublesome practice many 486 vendors are following is providing all the software on the hard disk but not shipping floppies. This can be a problem if you have to reboot the system. In an extreme case, incompatibilities can crash the system and destroy key files, or the system may become frozen during operation. If the user doesn't have the system floppy disks handy to start from scratch, he might be out of luck.

486 PCs

Counterpoint

Who needs a 486 PC anyway?

By Stephen Rood

Today's 486 PC story is as follows: Prices are low, the marketing hype is high and there are countless choices.

But do you and your users really need a 486 PC?

Well, it depends on many factors, but more times than not, the answer is no.

The question to ask here is not "What is today's lowest price on a 486 PC?" but "Are we really in need of such technology in all cases, regardless of how attractive prices may be?"

Before I become a target of much wrath, let me profess my total support for the 486 platform. It is a great processor, and there are very good PCs built around this chip. However, this technology is overkill for the great majority of end users.

We are led to want these newer machines through a very effective marketing program organized by firms such as Intel Corp., the PC manufacturers and the retail channel trade.

With a growing competitive base, Intel must keep innovating in chip design and marketing to maintain its market share and stock price.

It seems like only yesterday that Intel ads featured a spray-painted, crossed-out 286 logo. They made us want to forget the 286. Now Intel would like us to forget the 386 for the 486.

Productivity unproven

Faster 486 machines don't necessarily translate into greater end-user productivity, and I have yet to see studies that go beyond laboratory benchmarks. If users need to boost hardware performance, maybe a simple memory upgrade, coprocessor addition, new hard disk or graphics card replacement is more appropriate.

Before you succumb to the sales pitches, take stock of which applications your users are really running on their PCs.

If they're dedicated Microsoft Corp. Windows users, yes, performance on a 486 will be more dramatic. If your users plan to run Microsoft Corp.'s 32-bit Windows NT, OS/2 2.0 or Unix, performance requirements suggest a 486 machine. Users of computer-aided design packages need the power of a 486 for its improved instructional set and processor caching. The same holds true for users of high-end graphics packages and statistical forecasting and modeling packages.

Finally, if you're designing a PC network comprising 10 or more workstation nodes, a 486 will perform more efficiently than a 386 machine as the server.

The point here is that users need to resist the temptation to purchase the latest in 486 technology just because "prices have never been lower."

The bottom line is that the 486 technology is a great investment and cost-justifiable when selected to address particular application needs. But Windows NT hasn't even been released yet. How soon will we see a lot of 32-bit applications software?

The new technology is great. Track it, and keep up with its developments. Just don't fall victim to the marketing programs.

Rood is president of Ossining, N.Y.-based Rood & Associates, Inc., an IS consulting firm. Previously, he was manager of information technology at Coopers & Lybrand.

Hackers? Viruses? Toll Thieves? LAN/WAN Crash?

Is your unit really prepared enough for 1993?

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3/10 Wednesday [$40 courses are each free to first 10 registrants]:
9:00 Schiffman,Skulason: Intro to Computer Sec & Viruses | Banyan: Virus Security
1:00 Staff: Telecom Mgmt | Skulason: Virus Tech Course | Novell: NetWare Security
Dinner: "Why Don't They Nail/Jail 'Em All?" vs "Virus Factories & Free Speech"

3/11 Thursday:
9:00 Keynote Address: Seamless Security
10:15 Telecom I: Toll Fraud (Richard Lefkon, NYU) | IBM's Approach (William Vanos, IBM) | LAN HW/SW Defense (Padgett Peterson, MartinMarietta)
12:00 [Buffet and restaurant Luncheon Provided]
1:00 Risk Assessment Panel (Stuart Katzke & Irene Gilbert, NIST; Jane Paradise, Apple) | MAC Attacks I | Disinfecting LAN Server (Harold Highland, Comput)
2:30 Encryption, RSA, OSI (William Murray, Deloitte) | UNIX Security I (Tom Duff, Bell Labs) | LAN Policy and Disaster (Kenneth van Wyk, CERT/CMU)
4:00 Transborders: EC, Law (Eli Obaroski, JAIST) | What's Wrong With AntiVirus Products and Testing? (Greg Onstine, Fridrik Skulason, Alan Solomon, Peter Tippett)
6:00 Empire State Building Observatory "MEET THE EXPERTS" Sit-Down Reception

T.Duff, AT&T, UNIX | L.Gilbert, NCSC, NIST | W.Murray, Deloitte Touche | J.Paradise, Apple Security | D.Parker, SRI | R.Riordan, The Man Behind Michelangelo | R.Schiffman, Royal Cracker | F.Skulason, F-PROT, Bulletin | W.Vanos, IBM Security

3/12 Friday:
9:00 Publicly Available Help (Klaus Brunnstein, U. Hamburg) | Tekkies' In-Depth Session Intrusion Detect/Prevent (Fred Cohen, ASP; Dorn Parker, SRI)
11:00 MAC II & DEC Attacks (Eugene Spafford (s) Purdue) | UNIX Security II (Karl Levitt, U.C. Davis) | Computer Crime Law, FBI (J.J. Bloombecker, (s))
1:30 "ET TU, HACKER?" THE GREAT DEBATE: 9 experts, sometimes heated views including Robert Schiffman, who cracked U.K. Queen's Husband's E-Mailbox & tells how to stop him
3:15 WAN/Warfare/Telecom II | New Research and Ideas | Recent CompCrime Cases (Guillermo Mallen-Fullerton, Mex.; Fridrik Skulason, F-PROT; Gail Thackeray, Maricopa)
4:45 Continuation of Security Product "Shoot-Outs"

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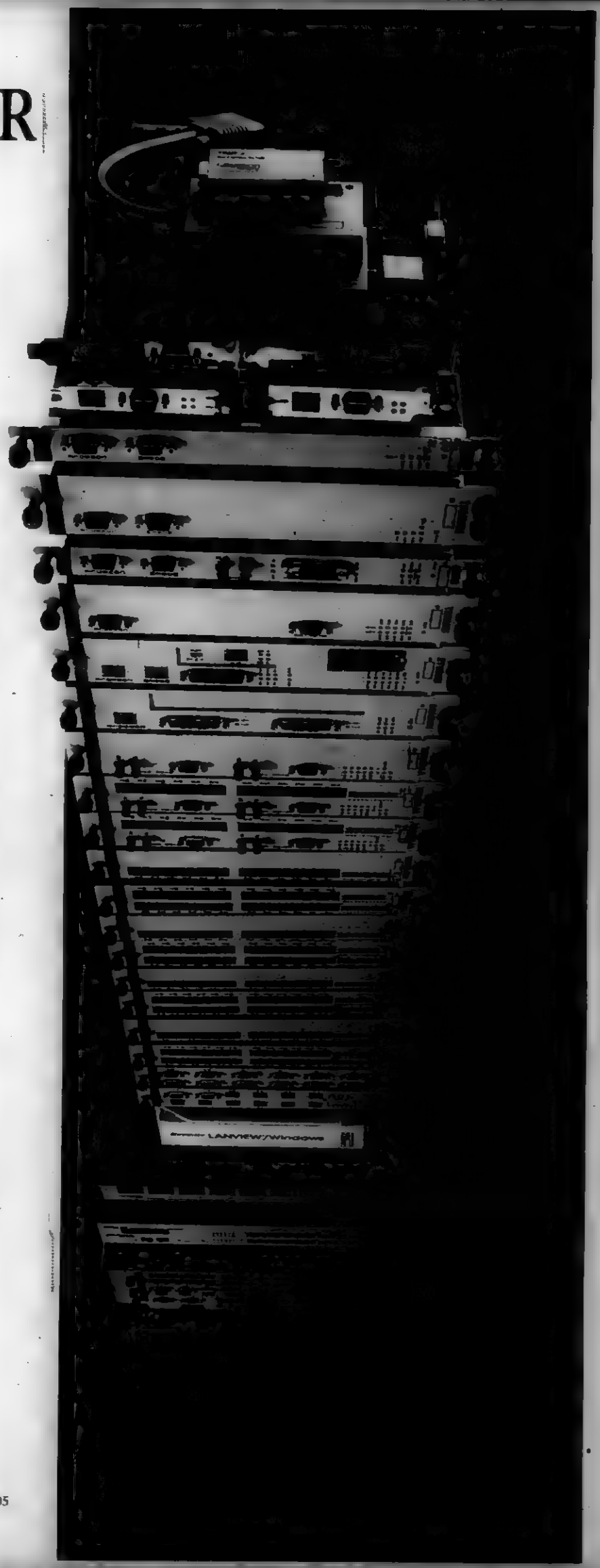

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486 PCs

Voices of experience

By Robert M. Knight

■ Decisions about where and how to obtain the best buy in 486 PCs are based on the individual priorities and experiences of the purchaser. Here are a few examples of what's important to information systems buyers:

When Robert Selff decided it was time to replace his Intel Corp. 80386-based PCs a year ago, he knew exactly what he wanted in an 1486 machine, and he knew exactly where to go to get it.

"I just said to the local reseller, 'This is the case I want, this is the system board, this is the power supply, the hard drive and the amount of memory I want.'" says Selff, an electronic data processing technical support specialist at the Cherry Textron subsidiary of Textron Corp. in Santa Ana, Calif.

"The system board is the major component of any PC," he says. "If you buy cheap, you have problems."

At Santa Ana reseller Micro City, Selff says, "they assemble it all for nothing, since there's nothing off the shelf like [his particular list of components]. Our 486 is half the cost of one from Compaq Computer Corp. or IBM — about the same as a clone, but I know what's in this one."

One reason why Selff is so picky, he explains, is because 486 PCs are fast becoming the company standard at Cherry Textron. They are key to a local-area network that provides computer-aided design (CAD) software from Autodesk, Inc. in Sausalito, Calif., as well as an in-house tooling management package for cost accounting.

The company is also attempting to gradually move payroll software off its IBM 4381 mainframe onto the network, according to Selff.

Needs speed

For Bob Gallaway, the purchase decision comes more from a long process of "kicking tires and wheels."

According to Gallaway, manager of data processing at A&S Building Systems, Inc. in Caryville, Tenn., fast response time has made the 486 the standard for his company.

A&S designs and engineers modular metal structures such as storage buildings, aircraft hangars, car dealerships and professional buildings.

The only exception, Gallaway says, is when someone needs a "stand-alone desktop operation where we can pick up a real cheap 386."

Even at that, Gallaway hasn't had to pay too much more for a 486. "I paid $2,000 for a 33-MHz 386 about a year ago. Now I've got a 33-MHz 486 for about $100 more. And I have clock-doubling capability that gives us 66 MHz," he says.

The 486 is at the heart of Black & Decker Corp.'s power tools and home products group in Towson, Md., as it attempts to bring about 30 sites across North America into a single network, according to Don Lee, vice president of information systems technologies for the group.

> Although for some customers, price is a big factor, it seems to mean nothing to a surprising number of them.

"Next, we want to network worldwide," Lee says.

Such a network brings with it several functions that he considers mission-critical, especially electronic mail, which supplies the operating numbers that are rolled into revenue and expense statistics used to measure monthly company performance.

"Because we have facilities worldwide, the fax capability of a 486 is important," Lee says.

In Towson, the Black & Decker group works with about 50 computers attached to a LAN housed in a three-building campus. But as the company expands the range of its networks, Lee says, he expects to negotiate agreements with its reseller, System Source in nearby Baltimore, which will include leasing as well as purchasing new 486 machines.

Making a deal

Purchasing the best 486 computer does not always encompass just price/performance, hardware, software and price/performance, according to Lee.

"You don't need to commit out front to large-volume purchases, but you do need to share your plans and intentions to set up a vendor relationship that allows for significant discounts," Lee says. "It's a very competitive environment, and you really should compare several vendors and make sure that you've considered service, too."

Other users say they see relatively little difference in quality among the many systems competing for users' dollars. As a result, there are more viable channels to search for a good deal.

"We went through a reseller [Compass Computer Service in Falls Church, Va.,] and got a markdown, but resellers aren't really necessary for us right now," reports Jeff Saper, network manager at Cadwalader Wickersham & Taft, a 300-lawyer New York firm that employs a total staff of about 700. "PCs are a commodity at this point, and you're just as well off going to Computerland or Gateway."

Wants Windows

The memory and processing power required by Microsoft Corp.'s Windows graphical user interface has become a major reason to buy 486s in corporations and enterprises as diverse as Cobb-Vantress, Inc., a poultry breeder in Siloam Springs, Ark.; Bendix Oceanics, a subsidiary of Allied Signal Aerospace in Arlington, Va.; and the Business Network Sales Division of AT&T's central region in Chicago.

"We're moving aggressively toward Windows," Lee says. "We also feel the need for expanding our processing power for graphics and client/server systems," he adds.

"The 486 machines have more RAM, a bigger hard drive, a video card and they come with better screens," says Jim Lewandowski, a strategic revenue analyst and staff manager at AT&T Chicago. "With Windows, you're always in the graphics mode, so you need better resolution that won't cause eye strain."

It was the prospect of using Windows' graphics that convinced Philip Normand, IS manager at Cobb-Vantress, to purchase a couple of 486s from a catalog from Gateway 2000, Inc. located in North Sioux City, S.D.

"Gateway was a little cheaper, and it included a 15-in. monitor on a 33-MHz 486DX with a local bus architecture, as well as Excel, DOS, a mouse and Windows," Normand says. "But mainly, we needed the video speed for Windows."

Price not critical

Although for some 486 customers, price is a factor in determining which PC or clone they will buy, it seems to be no factor at all for a surprising number of them.

At Cadwalader, 486 machines come together on a link from Network Connections in Alpharetta, Ga. The 486 machines handle word processing, database applications, file sharing, E-mail, graphics, spreadsheets and some accounting and payroll, according to Saper.

"In a law firm environment, all applications integrate into one common product: money," Saper says.

Thomas Holdbrooks, computer service engineer at ABB Environment Systems, Inc. in Birmingham, Ala., says, "Price is not a factor. The major thing, because I come out of the user community, is speed, especially in CAD work because it's so computing-intensive. Granted, I'm not going to pay twice what it's worth, but. . . ."

A critical factor for Holdbrooks, whose company supports a mixture of clones, is expansion space.

"We make sure we have enough card room to plug in accessories like a graphics cards, accelerator boards or a LAN board," he says.

Lewandowski agrees that PCs, even 486s, have become a commodity. He says it isn't unusual to find a 486SX in the $1,000 price range.

Don't want

For most 486 users, the features they get are the features they want. Some know what they don't want.

"I can do without the slimline case, and I don't care about having everything built into the motherboard," Normand says.

"Initially, we will not exploit the channel architecture part of the 486," Lee says. "We don't feel we need some of the software that will run on a 486, such as the sophisticated scheduling that is part of the operating system."

Users of 486s seem divided on whether they would be willing to purchase the next-generation Pentium chip just introduced by Intel.

"I would go with the P5 because it will have more capabilities and horsepower that LANs are going to take," Saper reports. "It means that the 486 is going to become what the 286 was when the 486 was introduced."

Some agreed with Holdbrooks, who says, "I don't think we're ever satisfied, but the 486s we have right now are serving our purposes, and we're looking into a five-year life span for them."

Lee says he sees the life span of 486 PCs at Black & Decker being "18 months to two years."

At Cherry Textron, "we're not going to consider the P5 very soon," Selff says. "I like everything to be stable with a new technology first."

Alex Koludrovic, senior engineer at Bendix Oceanics, says, "I don't want to fall behind because the revolution is happening so fast. But I think the 486 is going to last longer than other platforms."

Knight is a free-lance writer based in Chicago. He teaches part-time at Northwestern University.

Labels count

Response base: 150 users of 486-based PCs

Types of PCs purchased (multiple responses allowed)	
Name brand	62%
Mail order	42%
Other	9%

Why do you purchase the brand you do? (multiple responses allowed)	
Price	52%
Reliability	46%
Service	27%
Performance	27%
Other	21%

Source: Buyers' Scorecard

Old reliable

With reliability one of the Top 2 most important criteria for selecting 486 PCs, users set the following minimum standards for the PCs they use:

(Response base: 150 users surveyed in Buyers' Scorecard)

No. of crashes or failures per year	Percentage of respondents
0	44%
1-2	46%
3-5	7%
6-10	1%
Other	2%

Percentage of respondents who say the PCs they purchase meet their expectations for reliability

Always	32%
Most of the time	66%
Never	1%
Other	1%

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1 percent. That's the total increase in corporate productivity since 1980. By contrast, investment in information technology over the same period billowed to almost 50 percent of capital spending.

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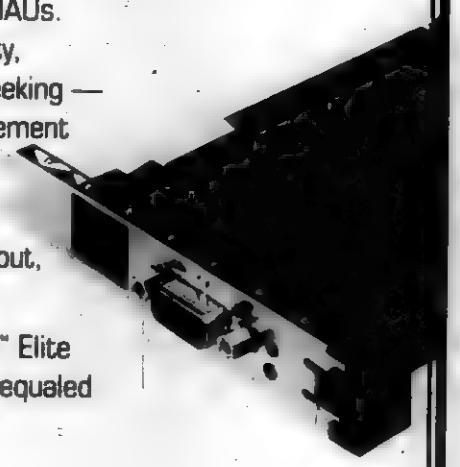

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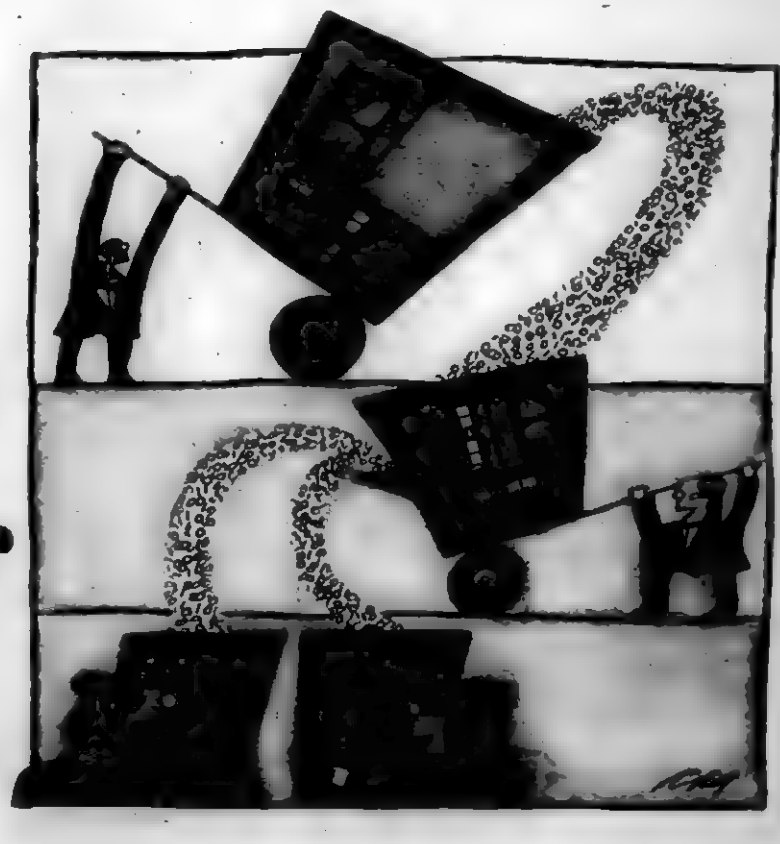
The SCOOP on client/server costs



Richard Goldberg

***Yes**, you'll save, but only if you know what costs to expect*

By Lynn Berg

When most people think about client/server cost savings, they envision the extreme dramatic stories about companies tossing out their mainframes, replacing them with local-area networks and saving millions.

True, moving applications off mainframes and onto smaller systems could save you as much as 50% in hardware costs. What is also true is that hardware savings are sometimes offset by certain overlooked costs — mainly those associated with setting up and then running a client/server environment.

Smart information systems chiefs plan for those costs, take advantage of simple cost-cutting measures and implement client/server technology in areas that will provide the highest return on investment. In this way, they're sure to take advantage of realistic cost savings.

Unexpected costs

The list of companies moving to client/server is growing (see story below). However, while many organizations are proponents of the technology, they acknowledge that the savings they expected haven't materialized. That's because unexpected costs tend to eat away at savings. Watch out for the followihg savings busters:

•**Training costs.** When client/server computing is fully implemented, the mix of skills required in the average IS department will change. Existing staff will have to be retrained or replaced.

IS staff in the past were responsible only for a central system —its applications, file backup, performance problems and systems tuning. Staff in a client/server environment must also take care of those tasks but on dispersed systems. Depending on where a bottleneck occurs, for instance, they'll need to deal with the system, the network or some strange, far-flung hub.

Whether training occurs on the job or in the classroom, plan on spending some bucks to bring staff up to speed on PCs, LANs, PC applications, network and systems management, application development, prototyping and support for end-user applications.

Former big-system staffers will need to learn how to handle software asset management, configuration management, performance analysis, archiving, backup and other management activities in network-based configurations. Mainte-

Costs, *page 172*

Client/server is worth it, but . . .

Product selection can be a hang-up
Case: United Airlines

Reduced costs, improved computing efficiency and better employee scheduling were United Airlines' goals in shifting the company's CPU-intensive crew scheduling application from an IBM 3090/600 mainframe to a client/server environment in early 1990. Eighteen months later — six months later than projected — the company reached its goals.

The project came in later than planned because the Chicago-based airline hadn't counted on the amount of time it would take to investigate the plethora of available client/server offerings and train mainframe programmers in the new Unix-based system.

According to systems analyst Steve Greenfield, United's information systems team spent months talking with dozens of vendors, weeding out pure "sellers of hardware and software" from those willing to act as consultants and answer the company's questions about distributed architectures.

"Our decision was sometimes not made around the best hardware or its cost but whether a vendor could answer our questions. We wanted expertise because from a technical standpoint, we were breaking new ground," Greenfield says.

Ultimately, United purchased processors from Silicon Graphics, Inc. and Unix-based IBM RISC System/6000 workstations running SAS Institute, Inc. software for data entry, editing and file management.

Client/server, *page 172*

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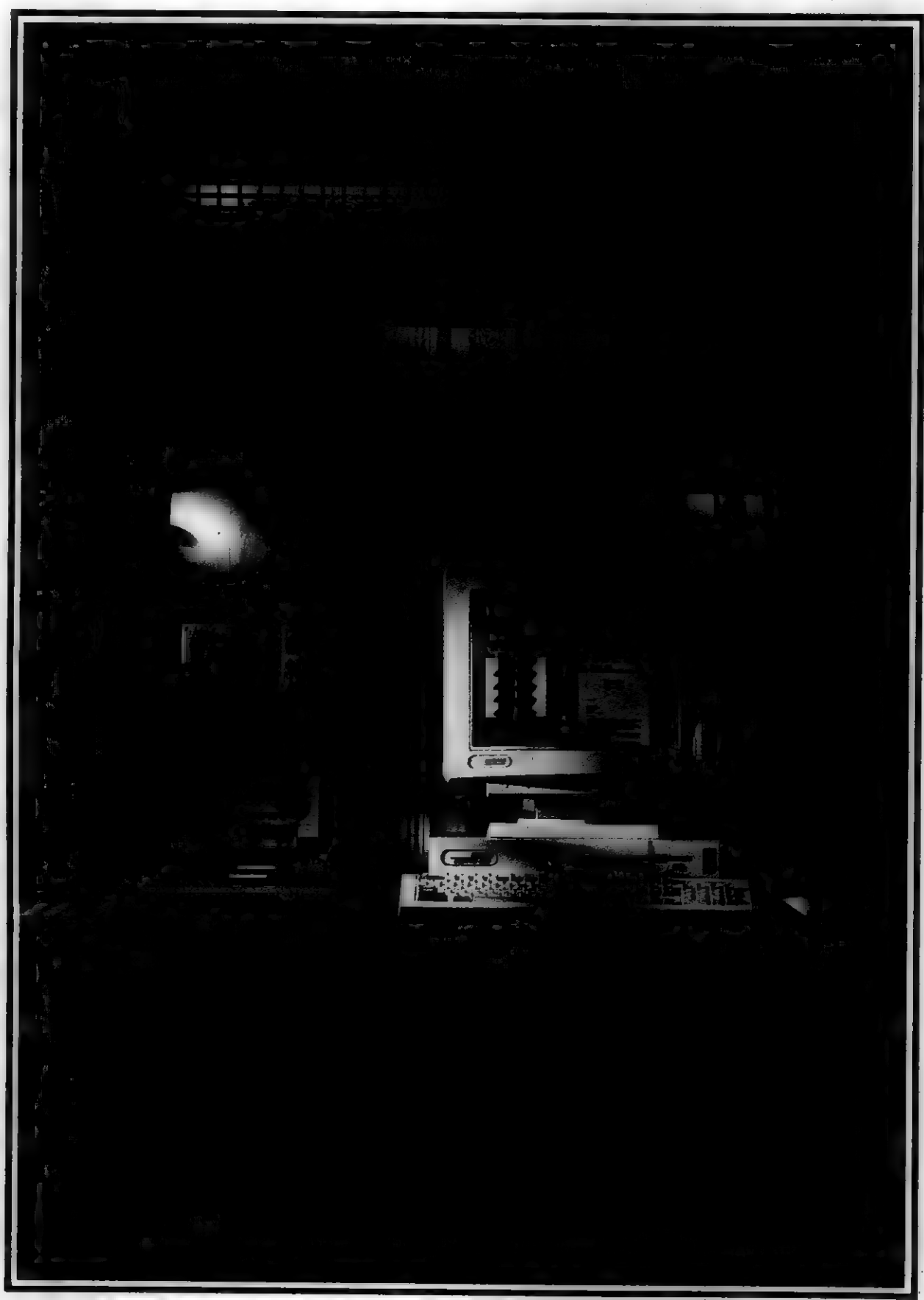

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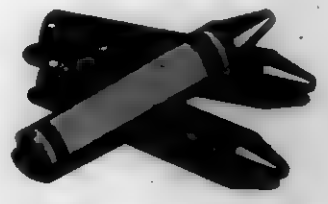

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COMPAQ

Continued from page 169

nance programming staff will need to shift gears because end users will be modifying their own programs and generating their own reports, databases and even applications.

Off balance

AS HARDWARE GETS SMALLER AND MORE CONNECTED, IS LABOR COSTS INCREASE

Percent of IS budget

	LABOR	EQUIPMENT
Mainframe	55%	45%
Minicomputer	60%	40%
PC (stand-alone)	83%	17%
PC (terminal)	72%	28%
PC (LAN workgroup)	69%	31%
PC (enterprise network)	61%	39%

Source: Gartner Group, Inc.

The 75% to 90% of programmers' time spent on maintenance will decrease, freeing them up for new client/server development, including setting up interim files for end users. They may also work at staging views of databases to help users do their own maintenance.

It is not enough, however, to hand programmers new PC-based development tools. What's needed is a change of development philosophy at the highest levels in the IS organization. The application development life cycle model, in which the design is planned to handle every possible eventuality, must give way to a systems design that is flexible and reusable. Systems can debut in months.

Everyone in IS must buy into this new thinking. Only then does it make sense for staffers to learn and apply skills in C++, fourth-generation languages and relational database access methods.

•Labor costs associated with system and network management. While technology costs might decrease in client/server environments (PC millions of instructions per second are less expensive, and hardware can be written off over time), these savings tend to be offset by the high cost of additional labor (see chart at left).

One area in which this is particularly apparent is in system and network management. Vendors haven't yet provided tools for comprehensive, centralized management of distributed, heterogeneous systems. Until this becomes available (time frame: three to five years), you'll need people to deal with software coordination, troubleshooting, help desk calls and configuration management at every remote installation.

Some IS departments think a way to curb labor costs is to manage the backbone while abdicating remote LAN and system management responsibility to end users. This may not be a good strategy in the long run. When centralized management finally becomes possible, it may be difficult to regain control and consolidate sites. Labor costs may rise as IS tries to bring management under its domain.

•Telecommunications costs. Enabling users to get at information anywhere on the network, no matter where the user is, is the powerful appeal of client/server computing.

However, as network access to systems becomes more common and access methods become more portable, network use costs become more difficult to predict. Users will be peers on the network, no matter where they are.

I recently spoke to a telecom manager at a large company who discovered that an application involving laptops in the service department could increase the cost of public network use by a factor of four.

•Capacity planning costs. Most mainframe or minicomputer systems today have tools and guidelines to help figure out the initial

Tell it like it is

Here's a definition of client/server, courtesy of the IS folks at Levi Strauss & Co.:

The client/server model divides applications into functions and data that need to be shared by many users – the "server" part – and those that are particular to each user – the "client" part. Clients perform front-end functions (managing the user interface, collecting input data, formatting database query and report requests). Servers perform back-end functions (managing shared peripherals, controlling access to shared databases).

Continued from page 169

Moving the scheduling system to a distributed architecture enabled United to avoid a mainframe upgrade that, computer systems engineer Jim Schneider says, would have cost between $3.5 million and $4.5 million. The new architecture has also more than doubled the CPU time available to schedule analysts for testing and to set up monthly schedules for the carrier's 8,000 pilots and 17,000 flight attendants.

"The more CPU time the scheduling application gets, the better the results," Greenfield explains, "and the better the results, the less scheduling costs." Overall, Schneider says, United expects to save about $1.5 million annually as a result of the improved scheduling.

While client/server is hitting its stride at United, Greenfield cautions other managers against underestimating the amount of retraining a move to client/server computing involves. Inadequate training materials is one of the culprits. "There's no manual that says, 'If this is how you did something in the mainframe world, this is how to do it in a client/server environment,'" he says.

Mainframe programmers must learn and become proficient in capacity planning management and security techniques. They must also learn to work in a networked environment.

"What a commitment to client/server means is a commitment to training," Greenfield says. "The typical scenario of coding and then releasing a demo doesn't work in this environment. People need the opportunity to learn and to play with all of this."

Despite the challenges involved with client/server, Greenfield says he wouldn't turn back. "You take risks in exchange for the enormous potential for reduced costs and improved processing," he says.

Expect to labor over integration

Case: GTE Corp.

As recently as last year, customers who called GTE Corp. to place an order or request repairs had only a slim chance of receiving assistance without being transferred one or more times to a different department or service representative.

That was not a good record for a company that wanted to increase sales. To improve service, GTE felt it had to create a single point of customer contact.

To that end, GTE decided to rip out its 20-year-old "user-ugly" mainframe-based order entry system and move to a client/server computing architecture, says Carl Schulz, vice president of Unix distributed computing at GTE Data Services, the company's IS subsidiary in Tampa, Fla.

The project, which is in progress, will ultimately give service representatives universal access to ordering, service and repair data. In this way, customers can call a single number for assistance.

The first and most critical step in the $15 million migration, which began in April 1991, has been building an infrastructure capable of supporting Unix-based client/server applications, Schulz says. This has involved, among other things, building a separate Transmission Control Protocol/Internet Protocol (TCP/IP) network and implementing network control and management structures; establishing overall client/server standards; developing experience in the Unix operating system; and training developers in the C and C++ programming languages.

"From the beginning, our emphasis has been on putting our time and energy into the infrastructure rather than into applications, which, by comparison, are easy," Schulz says.

In June 1992, 14 months after the project was launched, GTE completed infrastructure testing and began replacing the desktop equipment of its 3,000 service representatives, swapping out 3270 terminals for X Window System-equipped workstations from Hewlett-Packard Co. Clients are linked over the TCP/IP network to HP servers, which house all application code and logic, and the mainframe, which acts as both database and data manipulator.

By the middle of this month, Schulz says, the new client/server system will be fully operational. That date is two months later than the projected 21-month schedule. "I did not include enough time for modifying the mainframe system, which was a larger effort than anticipated," Schulz explains.

Another pitfall was underestimating the time and effort involved in integrating various client/server system components, including multiple databases and applications and a graphical user interface system, Schulz says.

"In the old days, IBM did it all for you, but now we're buying packages from various vendors with products developed to run on multiple hardware platforms. Many times it is up to us to find the incompatibilities," Schulz says.

Integrating packages in-house also requires additional memory and throughput capacity.

Training can slow you down

Case: Texaco, Inc.

Eighteen months ago, the challenge facing Texaco, Inc.'s Scientific Systems Management (SSM) Group was providing users with seamless access to multiple VAX and mainframe-based databases containing oil exploration and production data. Additionally, the company wanted to create a plug-and-play computing environment that allowed both new and existing applications to access data companywide.

Texaco solved part of its problem by building what Tom Peters, manager of SSM's data group in Houston, describes as a "virtual data server" that combines a Sybase, Inc. relational database running on a Unix-based Sun Microsystems, Inc. server with a series of gateways. These gateways were either developed in-house by SSM's 10-person development team or purchased.

The system replaces a proprietary database

What to expect

Here are the problems five companies encountered implementing client/server:

United Airlines' system was off schedule by six months because it took longer than expected to investigate products and train mainframe programmers in Unix.
Quotable: "People need the opportunity to learn and to play with all of this." – Jim Schneider, computer systems engineer.

Harvard Community Health Plan underestimated the magnitude of security issues. Workers' day-to-day tasks changed.
Quotable: "Client/server means a huge cultural commitment." – Donna DeAngelis, implementation director.

GTE Corp.'s effort to modify its mainframe system was greater than anticipated. Integrating client/server components, including databases, applications and GUIs, required much time and effort.
Quotable: "In the old days, IBM did it all for you, but now we're

systems purchase, monitor system use, partition work loads and help plan future purchases.

Unfortunately, these tools and capabilities don't exist in the client/server world. For instance, IS cannot perform systems monitoring effectively across networks of PCs. Work loads are typically set up for transaction throughput, not interactive file sharing or ad-hoc inquiry.

As a result, capacity planning is vague: You're never quite sure if you've bought too much or too little. Buying too much capacity is an expensive proposition, made more so because it may keep you from moving to the next wave of technology. It's tough to justify moving to something new when you've got more than enough system on hand.

Too little capacity hits the budget hard because in the long run you'll need a costly overhaul.

My advice is this: When considering a purchase, make your vendor run your applications to see if the system can handle what you've got.

Making a move

Notable firms moving to client/server:

Charles Schwab & Co. Moving to distributed client/server architecture based on Open Software Foundation protocols. Personnel costs reportedly may hit $25 million.

Simon & Schuster, Inc. Replacing isolated finance, production, manufacturing systems with server-based systems supporting workstations.

Mead Data Central, Inc. Moving core applications (inventory, invoicing, order management) to a client/server platform.

- **Scalability costs.** Vendors are developing many client/server applications and tools for the PC and PC LAN environment.

However, because these applications and networks were designed to handle the communications needs of small workgroups, they aren't always scalable to a larger and more demanding environment. The option, in many cases, is a costly change — either adding multiple servers or starting again with a minicomputer.

Starting with a robust server can minimize scalability costs and problems. While such a server can save you from conversion later on, be advised that you may sacrifice file-sharing performance.

Cost-cutting measures

Just as companies may forget to factor costs such as training into the hardware, software and maintenance equation, they may also overlook these cost-cutting measures:

- **Maximizing end-user resources.** In most corporations today, users work with personal productivity tools such as spreadsheet and word processing software. Take advantage of users' familiarity with their environments and their ability to access new applications directly from their existing systems and applications. It'll save you money in the long run.

There are tools available that use a spreadsheet model to enable users to, say, generate a report or do a query. Staff won't need to write turnkey applications (think of what you'll save there), plus it will reduce training and equipment costs and give users a sense of ownership and accomplishment.

Studies have shown that users who control and format their own information and determine their own access requirements are at least 50% more productive and about 70% more satisfied with their systems.

- **Taking advantage of flexible, reusable software development.** The move to client/server computing is an opportunity to rethink the approach to developing new systems. In the past, companies had to use a comprehensive information flow and systems design to ensure that all elements of a major system were integrated. Coding these projects would take years, and maintenance would go on forever.

IS organizations today need to think of client/server system design in terms of flexibility, not detailed planning of every inch of the system. Such flexibility is enabled by standards (such as standard programing interfaces) and tools (such as emerging object-oriented tools) that let IS staffs integrate and change system elements easily. When all these elements come together, programmers will be able to generate code that is recognizable and reusable by every other programmer. Maintenance becomes easier.

Companies save because they

Cost-cutting, *page 176*

buying packages from various vendors. Many times it is up to us to find the incompatibilities." – Carl Schutz, vice president, Unix distributed computing.

Texaco, Inc.'s training took 50% longer and cost 300% more than anticipated. Hardware and software vendors were inexperienced in end-user client/server setting. IS had to write database gateways and routines.
Quotable: "A commitment to client/server computing probably means a lot more than most people first think." – Tom Peters, data group manager, Scientific Systems Management Group.

ITT Hartford Insurance Group found no tools to predict performance and configuration capacity, nor any support tools for network management, security and version control.
Quotable: "It is not the safest of courses, and you must be willing to pay for the experience, but the rewards are there." – Raymond L. Howell, assistant vice president of information management, commercial markets segments.

system linked to a Digital Equipment Corp. VAX, which will be phased out during the course of the next year or so.

The project took 18 months to build and cost about $1.5 million ($1 million for labor and the rest for hardware and software).

Under the new client/server system, users access exploration and oil production data from Intel Corp. 80386-based PCs and Unix workstations using Sybase DBLib client software.

Initial applications, which took twice as long as initially projected to convert, were brought up in April and target geophysical tasks such as map generation and oil well analysis.

While using off-the-shelf database software eased the overall development and implementation process, SSM's migration to a client/server system wasn't entirely problem-free, Peters says. Like others before it, Texaco underestimated the time and cost involved in training both system programmers and end users. Training took 50% longer than expected and cost 300% more.

"Part of the problem is [Fortran] programmers' lack of expertise in the C programming language. Separating data from applications took time — about nine months —and programming in a Windows environment was difficult and required a lot of training," Peters says. "Also, using networks takes more expertise than the average user has. This necessitates making them seamless."

Another warning Peters offers is that neither hardware nor software providers can furnish all of the answers.

"We found that software vendors had a hard time visualizing a client/server environment in an end-user setting because they hadn't had the experience," Peters says. "We also had hoped that the software had come further than it has. Some things just aren't available in the Unix world," he adds.

Peters and his group ended up writing many of their own database gateways and routines.

"A commitment to client/server computing probably means a lot more than most people first think," Peters concludes. "The hardware is relatively inexpensive. But it is very easy to underestimate training and implementation costs in both time and dollars."

Network performance management tools are missing

Case: ITT Hartford Insurance Group

"Client/server computing is not the safest of courses, and you must be willing to pay for the experience, but the rewards are there," says Raymond L. Howell, assistant vice president of information management at ITT Hartford Insurance Group's commercial markets segment.

Tell me what's important

TOP IS CHIEFS PEGGED CLIENT/SERVER SYSTEMS AS THEIR TOP PRIORITY FOR THE NEXT FIVE YEARS

	% OF RESPONDENTS
1. Client/server systems	27%
2. Open systems	18%
3. Computer-integrated manufacturing	10%
4. Notebook PCs	6%
Pen-based systems	6% (tie)
5. Wireless networks	4%

Base: 100 IS directors

Source: *Computerworld Premier 100*

While a true believer, Howell acknowledges the client/server puzzle is still missing a few pieces. "First, we haven't found anything really useful to predict performance or configuration capacity needs," he says. "Also missing are support tools for everything from network management and control to security and version control. All of these are in their early phases."

As for training and retraining requirements, "these are bigger issues than I'd like," Howell says.

Given these constraints, ITT Hartford has a multiyear phase-in of distributed computing at its 40 offices. The goal, Howell says, is to move computing power as close to the end user as possible via portable, open systems.

For now, only its Minneapolis office has been cut over to a new client/server system, which delivers office applications such as electronic mail and group scheduling via NCR Corp.'s Cooperation software running on NCR 3600 servers and Intel-based PCs.

Insurance applications, migrated from a mainframe to SQL Corp. and Oracle Corp. relational databases, run on server platforms from both DEC and Sequent Computer Systems, Inc. Currently, the system is OS/2-based, with plans to move to Unix eventually, perhaps as early as the end of 1993. By that time, the company says, it expects to have rolled out the system to a dozen more offices.

The project has been in the works since November 1989. The longest leg thus far has been defining the business requirements the new architecture would meet, Howell says.

"For the most part, our offices are equipped with 3270 terminals connected to a humongous mainframe system," he explains.

"It took a long time to establish where we wanted to go, and it is only now that we are rewriting mainframe-based legacy systems function by function. Our strategy was to start with office automation products to get users comfortable with the new system," Howell adds.

Previously, office functions were delivered via what Howell describes as the proverbial "islands of technology," primarily local-area network-based and stand-alone PC office products. Now, users have access to word processing, spreadsheet and other office applications via the Cooperation-based system.

Between equipment purchases and software development, Howell estimates the overall cost of the migration will be in excess of $100 million when it is completed in four to five years.

Cultural changes will occur

Case: Harvard Community Health Plan

January 1991 marked a new year and a new system for Harvard Community Health Plan, one of the nation's largest health maintenance organizations (HMO), with 500,000 members. It cut over its Burling, Mass., health center from an aging batch-oriented automated medical records system running on a DEC PDP platform client/server

Harvard, *page 176*

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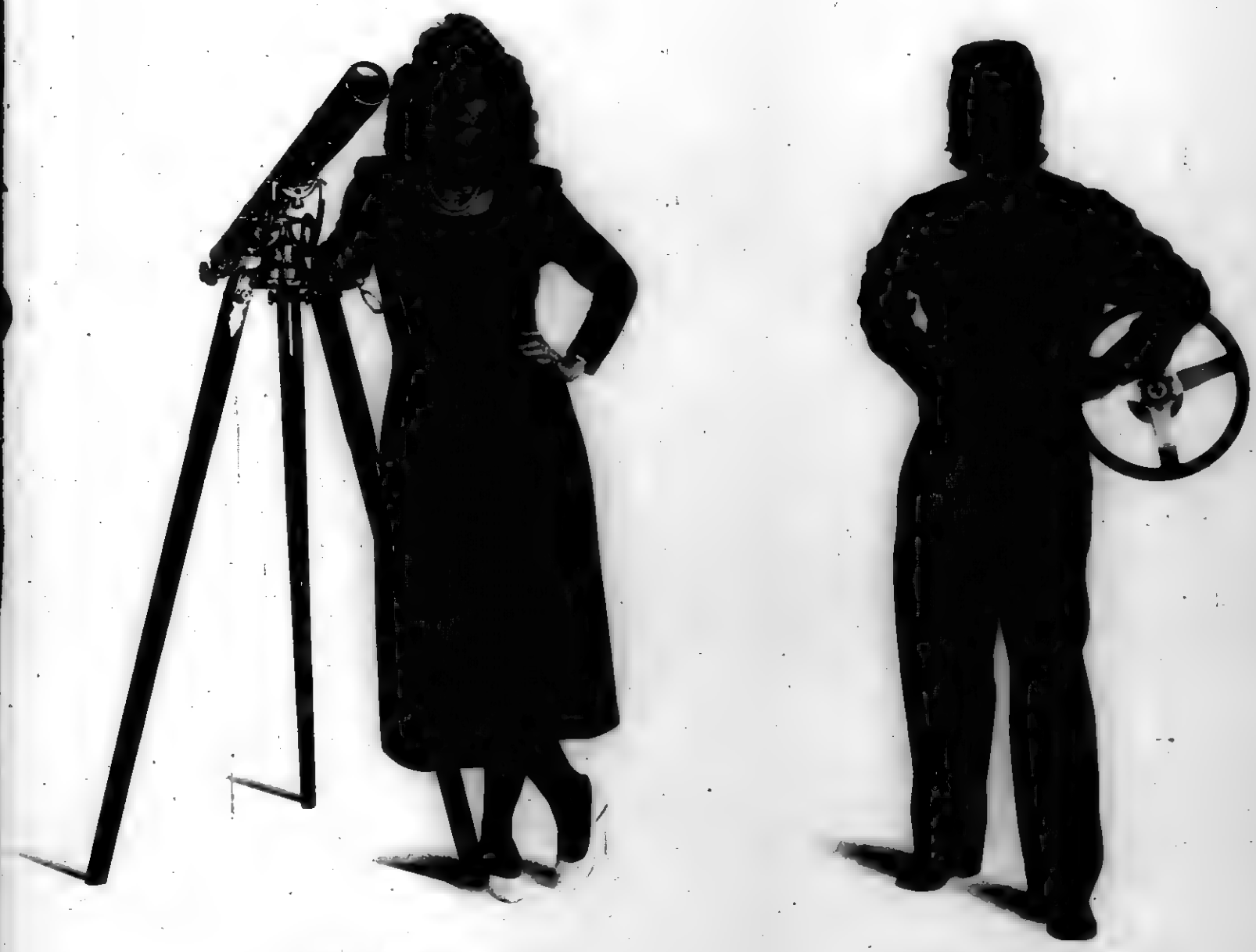

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The Newspaper of IS

Continued from page 173

don't have to reinvent the wheel with every system.

High return-on-investment areas

When considering where to launch a client/server effort, keep in mind the following target applications. They have the advantage of increasing end-user satisfaction, providing a good training ground for new end-user and IS computing skills and starting the move toward a more integrated environment:

•Decision support and information access. I have often run across situations in which end users are rekeying data from reports into spreadsheets or local applications. This approach is slow, error-prone and wasteful. There are client/server products on the market that provide end users with access to one or more remote databases. These products not only let you cut out time-consuming steps but also give you a good start at building a data network and helping you make better use of your existing investment in personal productivity tools and databases.

•Interdepartmental document management. Many companies have the need to reduce the paper shuffle. Creating, editing and routing documents is easy to automate, but it may be complicated when working across groups that have standardized on different editors and word processors, different systems, different mail routing and filing routines and different data types.

Check out products that let you convert formats, build compound documents and rationalize mail routing and filing.

These types of projects not only reduce wasteful overhead activity but also put you on the road to an integrated communications capability.

•Interfaces. Too often I see IS departments rewriting existing applications for the sole purpose of moving them to lower cost platforms.

Wholesale changes to applications may not be right in all cases. For applications that are working pretty well and have no urgent business reason to be rewritten or for applications that are just going through a simple platform conversion, consider merely putting a fresh face on them. You can develop easy-to-use front ends for those applications.

> As network access becomes more common, use costs are harder to predict.

Front-ending existing systems with a jazzy screen will hone both developer and user skills in building and using graphical user interfaces and improve overall end-user satisfaction.

. . . . . .

Deterred by immature technologies, blinding backlogs and the costs mentioned, some IS departments are reticent about the move to client/server. The danger here is that things are not standing still.

Users are installing local computing solutions every day, often without regard to corporate standards or the need for integration. Without a corporate infrastructure actively in place, there is the potential for this ad-hoc approach to impede growth and competitiveness.

I'd recommend picking projects now that will keep everyone together. You want to focus on projects that are visible enough to get participation but not so critical that you can't handle mistakes. Properly implemented, these projects can be used to establish corporate standards, train staff, build partnerships with end users and evolve corporate guidelines for information access and use.•

Berg is a program director in midrange computing strategies at Gartner Group, Inc. in Stamford, Conn. She is the former group manager of the client/server program at Digital Equipment Corp. in Maynard, Mass.

Continued from page 173

system. That system is made up of Apple Computer, Inc. Macintosh desktops linked via an Ethernet LAN to a relational database from The ASK Group, Inc. running on a VAX server.

Harvard's clinical applications, including automated appointment scheduling, medical records and systems supporting the center's laboratory and pharmacy were the first to be migrated to the new system. Eventually, these will interface with a separate administrative system for membership and claims processing.

During the next three to four years, Harvard will also migrate its 20 other health centers to the client/server architecture, a move driven by a need to more efficiently provide clinicians and others with current and accurate patient data and to cut costs.

Developed by San Francisco-based InterPractice Systems, a joint venture between Harvard and Electronic Data Systems Corp., the system took three years, or about 300 man-hours, to build, according to Scott Belmont, EDS' general manager at InterPractice.

Had InterPractice not underestimated the magnitude of security issues surrounding patient records as well as certain architectural design trade-offs, the process might have been somewhat shorter, Belmont adds.

"In designing the architecture, we focused on portability so that software could be migrated to other platforms and clients could be changed out without impacting the database or back-end business code," Belmont says. "But in doing so, we added [processing] overhead to the system, which affected performance. This is something we're now working on improving."

Training also turned out to be a sticky wicket for InterPractice's 100-person team. "There were pockets of expertise in advanced architectures and user interface design at EDS, and we were able to tap those resources, but the learning curve was still more than we anticipated," Belmont says.

At Harvard's Burlington center, where the system has now been in operation for more than a year and a half, implementation director Donna DeAngelis declined to comment on system costs, saying only that the system represents "a huge financial commitment."

It has also meant a huge "cultural commitment," DeAngelis says, noting that the system has changed the day-to-day tasks of many Harvard workers.

For example, there is no longer a need for data entry clerks to enter patient information, DeAngelis says. "The cultural change comes in moving operators to different jobs," she says.

Cases written by Julia King, a freelance writer based in Ridley Park, Pa.

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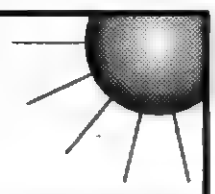

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Trying times indeed for IS staffs

Part I of a two-part series. This week, IS professionals talk about their work-related worries. Next week's article will provide insight into what is worrying managers.

You know you're stressed when...

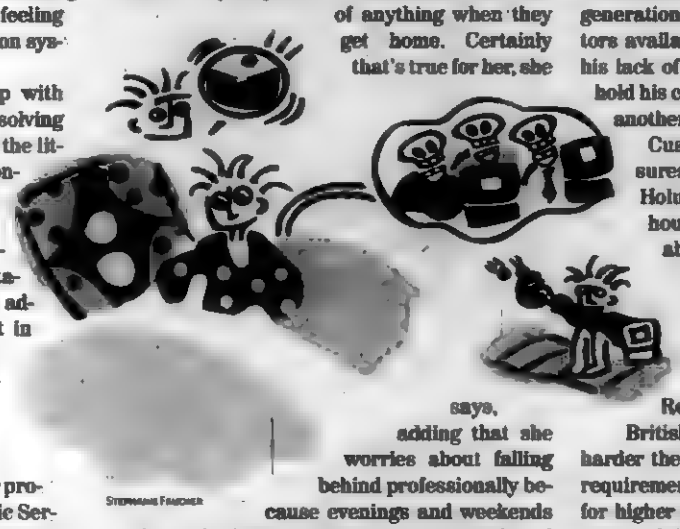
✔ You're having trouble solving problems.
✔ You're snapping at co-workers.
✔ You have no energy left for your personal life.

By Alice Bredin

You've just watched the display on your digital clock turn over another hour. You've been tossing and turning for hours now, and you just can't fall asleep no matter how many sheep you count. What's the problem here? It could be something you ate, but it's more likely you're just feeling the effects of today's stressful information systems environment.

Meeting tight deadlines, keeping up with technology, juggling varied tasks and solving complex technical problems are among the litany of responsibilities that IS professionals say have them gnawing at their cuticles and losing sleep.

"A project that used to have four people suddenly has three," says Stanley Stables, computer systems analyst at the administrative office of the Illinois Court in Springfield, Ill. "Suddenly, you've got 33% more work to do in the same time period."



Stephanie Faucher

No place like home

Debbie Bolk knows that feeling. A senior programmer analyst at Southwestern Public Service Co. in Amarillo, Texas, Bolk is starting to forget what home looks like. Cutbacks have almost halved Southwestern's IS staff during the past two years, she says, and when 16 people try to do the work of 30, days get very long.

Overtime is a given — on occasion, Bolk has had to put in a 24-hour stint. Overall, morale is OK, she says, but when staff members work several long days in a row, they begin to get testy.

The company has tried to help by forcing all employees to take a lunch break and two 15-minute breaks every day. But the work environment is so intense that, according to Bolk, most staff members say they are too exhausted to do much of anything when they get home. Certainly that's true for her, she says, adding that she worries about falling behind professionally because evenings and weekends are her only chance to catch up on research and reading. "It's hard to find time to read all of the magazines and newspapers that come across my desk, not to mention learning new software and platforms," she says.

Keeping up with technology is also a concern for IS professionals whose companies can't afford to be on the cutting edge right now.

"I worry about the tools I have to work with," says Richard Holub, systems administrator at Burch, Inc., a commercial printer fulfillment and telemarketer in Benton Harbor, Mich. Holub says he could do a better job expediting projects and services for users if only he had SQL tools, fourth-generation languages and application generators available to him. He's also concerned that his lack of experience with these products will hold his career back if he decides to move on to another post.

Customers are also adding to the pressures on IS by demanding faster service. Holub says this pressure "bleeds into off-hours," when he finds himself worrying about whether or not he'll be able to meet deadlines.

Even routine technical duties can turn stressful in the current pressurized climate.

Greg Atwood, a systems analyst at Red Lion Inns and Hotels in Vancouver, British Columbia, says he's noticed that it is harder these days to sort through development requirements. Things are just a little too hectic for higher logic to function properly. "At work, you are doing so many things at once, it's difficult to solve some problems," Atwood says.

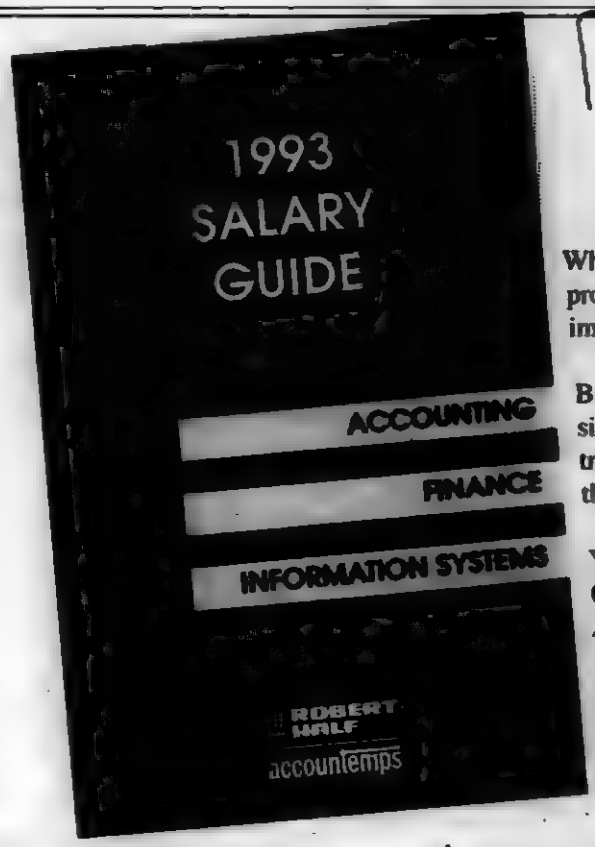
His solution: Take the problems with him. "The best time for me to solve these problems is when I get home and unwind."

Bredin is a free-lance writer based in New York.

You can ease this stress if you...

✔ Put your concerns into words to determine the source of your worry.
✔ Remind yourself that you've handled difficult problems and situations before.
✔ Look around and realize that you're not the only one feeling this way.

Source: Linda Barbanel, a New York psychotherapist who helps professionals deal with work stress.



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Job Close-up

Database administrators: Super stress handlers

By Leslie Goff

If you're a glutton for work with a high tolerance for stress and an interest in avoiding the limelight, perhaps database administration is a career you should consider.

Database administrators are the unsung heroes of information systems, says Marilyn Cumberland, manager of the data administration/computer center at COMSAT Corp. in Washington, D.C. "We're sort of the engine that runs everything," she says. However, like most engines, they seldom get much attention until things go wrong.

What database administrators do is critical for the smooth operation of an enterprise. They manage the physical and logical aspects of the database and work with systems analysts to create tables and indexes that let users access data. They also maintain the tables, back up and recover the data, monitor direct-access storage device use, troubleshoot and help the systems staff fine-tune the operating system. They are the keepers of the data, says Dean Flannigan, database administrator at Quality Stores, Inc. in North Muskegon, Mich.

The demand for database administrators is good, as are job security and growth potential. Database technology will likely continue to be an IS centerpiece, so those who can keep up with technology changes will always be able to find a job. Salaries are a plus as well, ranging from $35,000 to $65,000, depending on your location and experience.

"It could be a springboard into upper management because you tend to see the big picture and deal with so many other users," says Mike Ewanowski, database administrator at the Data Resource Management Group, Technical Services, at Emory University in Atlanta.

Management potential

In a small shop, database administrators can become prime candidates for upper IS management. For instance, at the Pacific Maritime Association, an arm of the International Longshoreman's and Warehouseman's Union based in San Francisco, Jose Martinez leveraged his database experience to become assistant director of IS, with overall responsibility for applications development, systems software and the database.

"In a small organization, you tend to have people who are knowledgeable in a variety of areas," Martinez says. "You have to wear different hats, do different functions, as well as deal with end-user problems. The path from applications programmer to database administration to getting into the operating systems was a natural opportunity."

Database Administrators

SALARY: $35,000 to $65,000.

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EDUCATION: Bachelor's degree in computer science or IS. Business background a plus.

SKILLS: Knowledge of system software needed. Relational database experience on a mainframe or a PC is required. Problem-solving ability is also a plus.

Unfortunately, many of these activities are transparent to business users and managers. They see the applications but don't spend much time thinking about what will keep the database that feeds them in good repair.

But that could be changing, as DB2 shops implement joint application development techniques that bring database administrators directly into the applications development loop, along with systems analysts and end users.

> Job provides technical challenge and a bird's-eye view into an organization.

Pressure is high

Intense pressure on the job is the most common complaint among database administrators: keeping up with new technologies, solving problems as soon as they occur, serving as a jack-of-all-trades and being constantly on call.

Therein lies the job's appeal: It offers constant technical challenges as well as a bird's-eye view into the organization.

"You're always in on the big picture," Cumberland says. "There's always something new and always a different challenge. You have a new set of problems with every system you design, and you have to be able to anticipate them."

Most database administration managers say they are looking for a candidate with three to five years of experience in programming and systems analysis. A stint as a database analyst, a more task-oriented position, is usually a prerequisite for administration.

Knowledge of systems software is a plus, as is experience with a relational database on the mainframe or the PC.

David Wollenberg, technical support manager at Bloomington, Ill.-based Eureka Co., a vacuum cleaner maker, says learning PC-based relational databases "could add a lot of years to your career."

Even though Eureka is a Unisys Corp. shop running a hierarchical database, Wollenberg looks for relational experience when hiring.

A bachelor's degree in computer science or IS is usually required, although Wollenberg says he doesn't believe one is necessary. "I'm looking for a tech-head," he says. "I'll ask a lot of technical questions."

Ewanowski says a business degree is also a good start because it provides background into business functions and how an organization is run, and Flannigan recommends "any kind of course or curriculum that focuses on problem-solving ability, from math to philosophy."

Goff is a free-lance writer in New York.

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In industry, this university position is more commonly known as Database Analyst. We are seeking a full time individual with strong design and programming experience in IBM PC and LAN based DBMSs. Experience with relational databases preferred. The analyst will provide programming, training, and documentation services for the Foundation's database applications and on-line information resources. The Foundation's applications are in R:BASE, DBASE, and CLIPPER. The analyst will install upgrades and maintain system software for CD-ROM database services. Other duties include assisting in periodic administration of accounting and related application software. The Foundation's LAN currently consists of 60 nodes and 5 servers.

Bachelor's degree is required with preference for computer science, MIS or business majors. Relevant work experience in the area can be substituted for the academic major.

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We are seeking a full time network administrator with strong UNIX and DOS skills, and experience in a (heterogeneous computing environment. Our current hardware set-up includes AT&T UNIX Servers, MACs, 382 minicomputer, AS/400 and IBM PCs. Experience with 10-Base-T, LocalTalk, MS Lan Manager and TCP/IP preferred. This individual will implement and maintain existing connectivity with Wide Area Networks and mainframes using gateways, bridges, modems and high speed communication devices. You will be required to diagnose and repair minor problems with servers, NICs, Ethernet HUBs, 5394 controllers, IBM PCs, and other hardware on the LAN. The LAN currently consists of 60 nodes and 5 servers. You will assist with System Administration tasks for an AT&T 382 minicomputer. Maintain existing documentation and develop system and network documentation as required. There will be occasional weekend and night work.

Bachelor's degree is required with preference for computer science or MIS majors. Relevant work experience in the systems area can be substituted for a CS or MIS major.

Positions offer salary commensurate with experience. Competitive benefit package.

For full consideration, send cover letter and resume in confidence by December 11, 1992. Please address with Position Title to:

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- Joe Allegra
President
Princeton SOFTECH, Inc.

At Princeton SOFTECH, revenues have more than doubled in the past year and business is booming. In addition to its headquarters in Princeton, New Jersey, the company boasts a network of nine international distributors and just recently opened a European office in Amsterdam. With its salesforce firmly in place, President Joe Allegra faces the challenge of finding the best prospects for a unique mainframe software product, Version Merger.

"In a nutshell, Version Merger accelerates the reconciliation of multiple versions of application systems. Since companies typically purchase off-the-shelf software and then make modifications to fit their own internal requirements, they must also make the necessary upgrades every time a new version is released. With Version Merger, much of that task is accomplished automatically. By identifying and reconciling conflicts between internal customized software and vendor changes in new releases, Version Merger automates all aspects of the upgrading process.

"For users of IBM's MVS operating system, this means reduced programming time, quicker introduction of the new functionality, and increased application quality. By simply implementing Version Merger, our clients tell us that they experience a 50% reduction in the time required to introduce an upgrade. At Princeton SOFTECH, then, our goal is to get this message out to large mainframe-using organizations in the financial, insurance, pharmaceutical, and manufacturing sectors, as well as to application software companies.

"To reach project managers within sites responsible for maintaining and upgrading application systems, card deck advertising has really paid off. *Computerworld's Direct Response Cards*, in particular, have helped us achieve widespread success in finding individuals actually plagued by upgrade problems. With its longstanding reputation as the industry's news leader, *Computerworld* delivers a large paid circulation that definitely works to our benefit.

"And the proof is in the pudding, so to speak. With each *Computerworld Direct Response Card* we run, we receive lots of responses. At least 40 of these responses were very solid leads. More importantly, with our revenue tracking system, we can trace substantial dollars in product sales right back to these leads. The numbers are conclusive: *Computerworld Direct Response Cards* deliver results directly to our bottom line.

"Deck after deck, *Computerworld Direct Response Card* advertising has been effective in helping us target our best prospects for Version Merger and in increasing market awareness for Princeton SOFTECH. Not only do we plan to increase our 1992 frequency schedule, but we also are looking to advertise two new products in *Computerworld Direct Response Cards* upon their release mid-year."

Every month, *Computerworld Direct Response Cards* give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 136,000 computer professionals. They're delivering bottom-line results for Princeton SOFTECH - and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at 201/587-0090 to reserve your space today.

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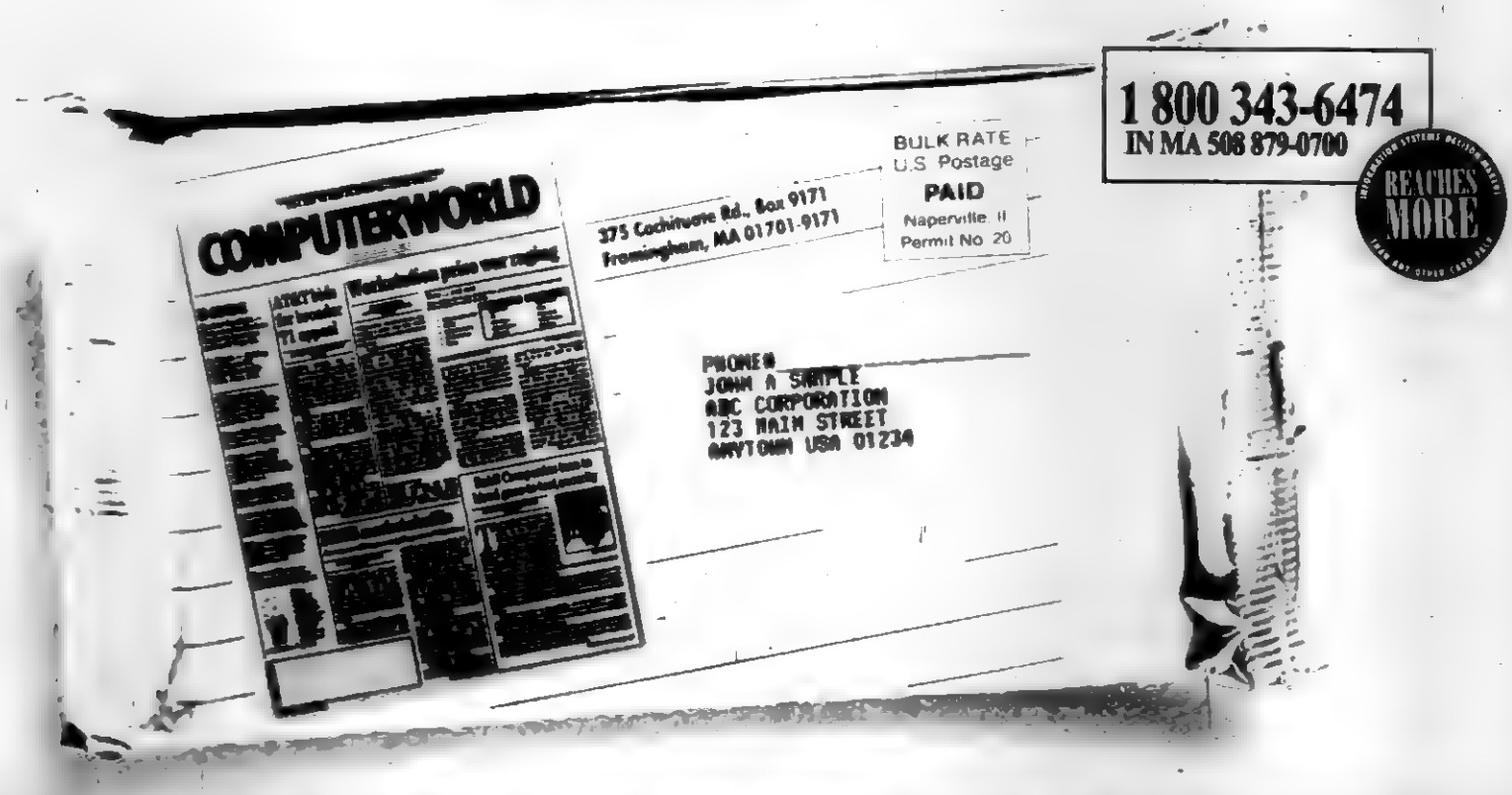

"In computer trade press advertising, Computerworld Direct Response Cards are first in quantity and quality - and lowest in cost per qualified lead."

- Charles A. Mills
President
Firesign Computer Company

Firesign Computer Company is a data communications software developer with 17 years in the business. Having tripled in size during the past two years, this San Francisco-based company retains rep firms on the East Coast and in Europe to service a worldwide customer base that extends as far as Australia and New Zealand. For President Chuck Mills, finding new sales prospects for the company's flagship product Outbound means advertising in *Computerworld Direct Response Cards* every month.

"Outbound's claim to fame is unattended file transfer. Supporting MVS and VM mainframes and OS/2, DOS, and Windows PC networks, it is the only product whose main thrust is unattended mainframe-to-PC file transfer. Virtually invisible to the PC user, Outbound saves time, provides flexibility, and eliminates training - all while automatically ensuring consistent reliability.

"By its very nature, Outbound has a cross-industry and cross-functional appeal, with potential users ranging from mainframe network software managers to information center professionals to project analysts. So when it comes to targeting our audience, we need a broad-spectrum advertising vehicle with a broad reader base. It's no surprise, then, that *Computerworld Direct Response Cards* have proven to be our best choice.

"In computer trade press advertising, *Computerworld Direct Response Cards* are first in quantity and quality - and lowest in cost per qualified lead. They consistently generate over 70 responses every month - and a full two-thirds are very qualified leads. Some months, we've even received as many as 120 responses. On a cost-per-lead basis, *Computerworld Direct Response Cards* are also our best value dollarwise.

"As an added benefit, I see *Computerworld Direct Response Cards* having an equalizer effect. Here, unlike other advertising vehicles, companies with smaller advertising budgets like ours stand out and make just as big an impact as much larger companies. *Computerworld's* large circulation also gives us reach to the right cross-section of potential buyers. And, since we continue to receive responses for many weeks after each deck hits, we obviously benefit from both a long shelf life and an active pass-along readership.

"As long as *Computerworld Direct Response Cards* remain our top lead generator, we'll definitely maintain our advertising presence in every deck. Looking ahead, I also foresee expanding our *Computerworld Direct Response Card* advertising should we develop a new data communication software product requiring similar exposure."

Computerworld Direct Response Cards give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 135,000 computer professionals. Every month. They're working for Firesign Computer Company - and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at (201)587-0090 to reserve your space today.

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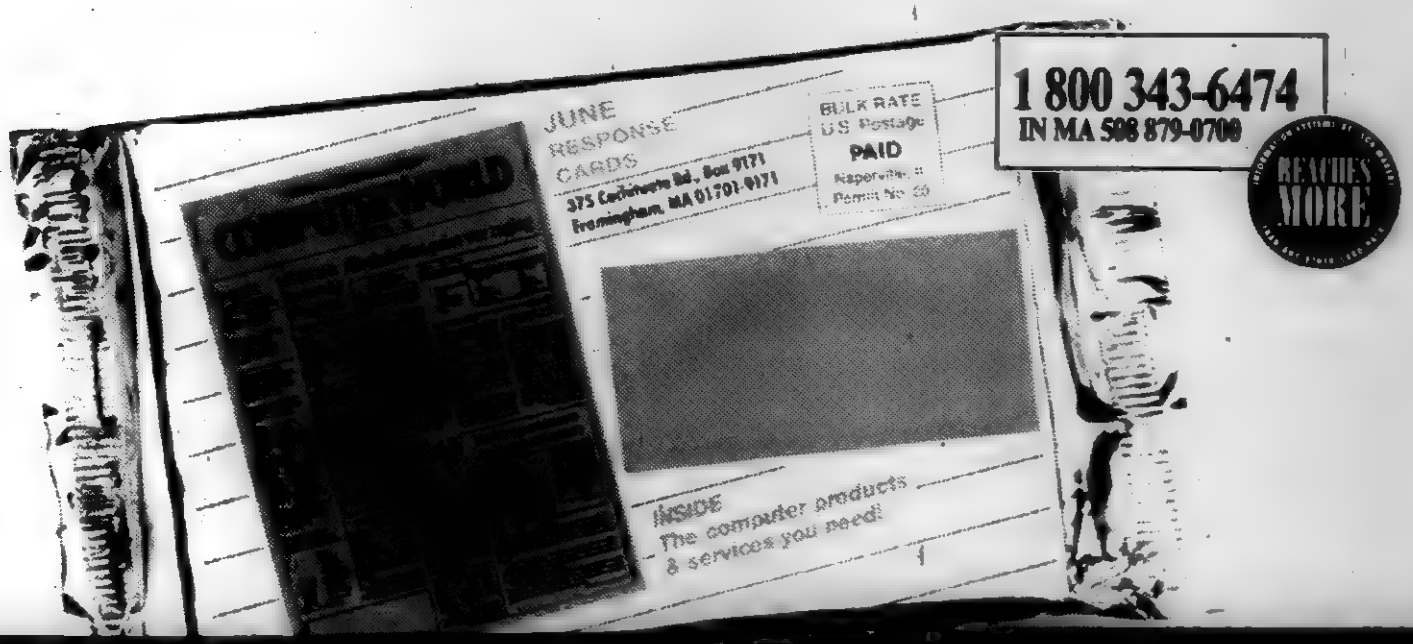

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- Kurt Wilkinson
Vice President,
Advanced Technology Practice
Halbrecht & Company, Inc.

True to its motto, "Your Competitive Edge...Is People," Halbrecht & Company is well on its way to claiming top spot as America's leading CASE recruitment firm. With almost 20 years in the business and offices in Fairfax, VA, Old Greenwich, CT, and New York, NY, the firm provides national search and recruiting services on a contingency, and executive search basis. For Kurt "CASE" Wilkinson, Vice President, Advanced Technology Practice, recruitment advertising in *Computerworld* fulfills a two-fold purpose: generating quality resumes and maintaining its premier image among clients.

"Because of our expertise in leading-edge technologies, our clients look to us as management consultants rather than simply recruiters. So it's crucial that we focus on senior-level CASE tool and methodology professionals with strong I/S backgrounds. Our clients, including Fortune 500 companies, CASE tool vendors, and large consulting firms, typically have requirements for information engineers, senior consultants, data modelers, and I/S planners. Our *recruitment advertising in Computerworld* has positioned us as America's leading CASE recruiting firm.

"We consistently get up to 40 responses for every *Computerworld* recruitment advertisement we run. Since June 1988 we've placed over 70 I/S professionals in CASE positions, and a significant percentage have been direct placements from our *Computerworld* advertising. In fact, our statistics indicate that recruitment advertising in *Computerworld* attracts more qualified and placeable CASE candidates than any other source.

"In addition to generating resumes that closely match job specifications, we also get other valuable benefits from our *Computerworld* recruitment advertising. For example, the advertisement we ran prior to attending CASE WORLD in Chicago opened new doors with contacts that I otherwise would not have made at the show. Also, ongoing contacts we establish at companies, as well as referrals from vendors who recognize our name, help us secure future placements and even acquire new clients. Dollar for dollar, our national recruitment advertising in *Computerworld* is significantly more effective than classified advertising in local newspapers.

"Right now I believe we are strategically positioned to facilitate the hiring cycle for candidates and clients, whether they are vendors, consulting types or end-users. This market is still in its infancy, with the major growth period still ahead in the 90's. Our greatest challenge is maintaining a competitive edge. As we continue marketing long-term, Halbrecht & Company is dedicated to strengthening its market focus and positioning through its highly successful recruitment advertising program in *Computerworld*."

Computerworld. It's where serious employers - like Kurt Wilkinson - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell products and services for computers, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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ENGINEERING OPPORTUNITIES

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BSEE or Masters Degree in Electrical or Computer Engineering or BS in Systems Engineering Technology or Electronic Engineering Technology required. 1-3 years experience in 8032/8051/80960 firmware development in C and Assembly language required. Video graphics, real-time control, communications, in-circuit emulators, DOS and VAX/VMS experience desired.

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IGT

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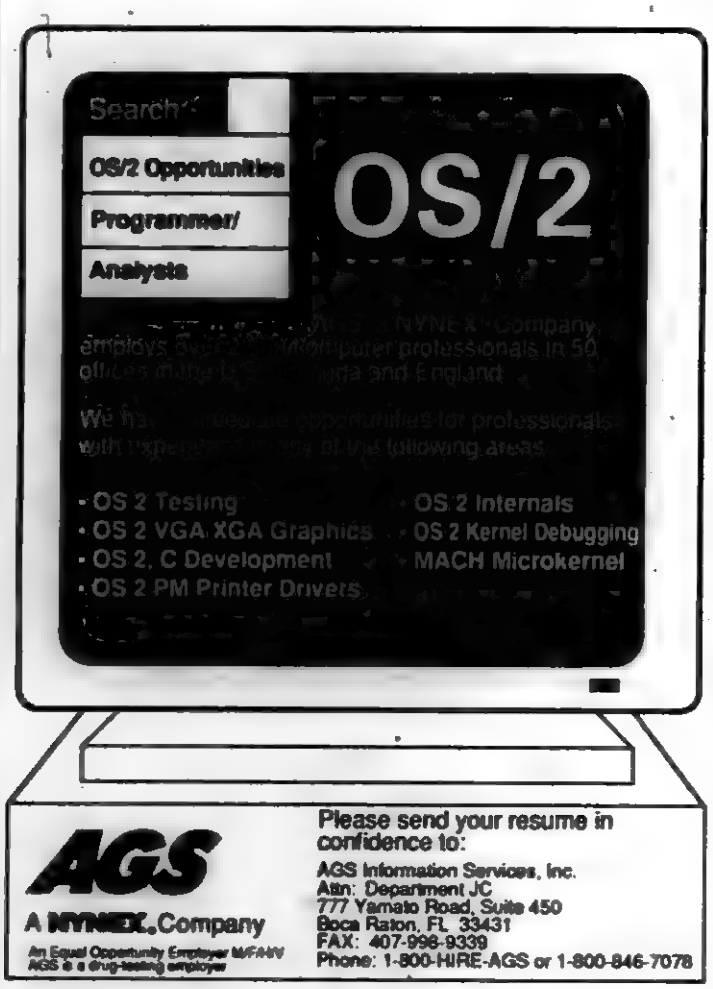

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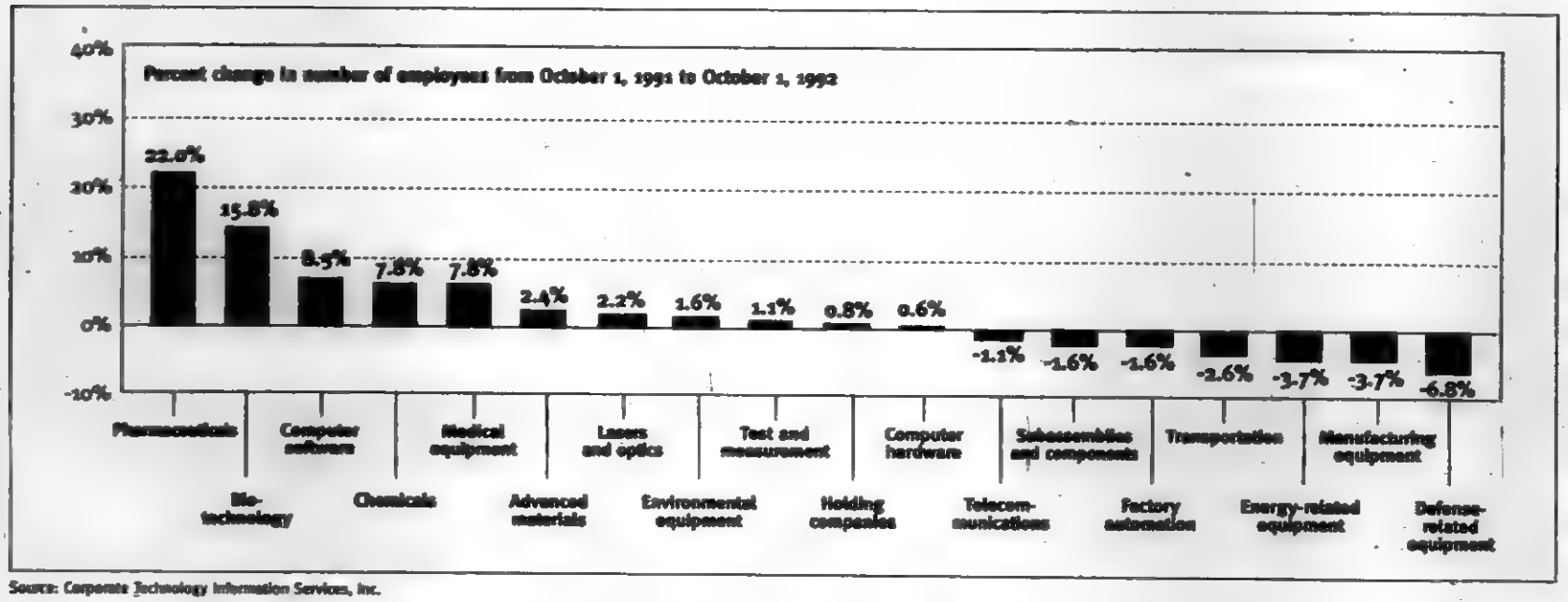

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BEST READ

Tips from three tough software testers

By Alan Radding

No one can afford to install a software package that contains even one time bomb or booby trap. Yet the chances of doing so are higher as the market is deluged with untried Microsoft Corp. Windows programs.

While your software evaluators may have testing methods that work, it can't hurt for them to take stock of other procedures as PC-based systems take on more responsibility.

Read on to find out how three tough testers approach software evaluation.

Getting started

Dave Grana, a planning assistant and a power user at Chevron USA Products Co. in Houston, begins with the documentation if it is a brand-new product. "It's not as bad as the early days of Windows, but you have to be careful if it's the vendor's first Windows program," he says. (For updates to proven products, he just loads the new version and lets it run.) Early Windows applications sometimes didn't boot up at all, locked up the mouse or crashed the entire system.

Just to be on the safe side, however, Grana makes an incremental backup of his system before installing the new software. He also checks to see if the application creates its own WIN.INI files, as opposed to appending existing files, making it easier to troubleshoot and deinstall the software.

Steven Birgfeld, manager of computing standards and support at Booz Allen & Hamilton, Inc. in McLean, Va., also begins by looking at the documentation. With programs he considers volatile, he creates a special directory and does a system backup.

On the opposite end, Joel Diamond, technical director of the Windows Users Group Network in Media, Pa., skips the documentation and goes right to the install procedures. He looks at embedded help files, tutorials and, especially, any README files. The reason: Some developers put more information than just how-to explanations in the Help files, he says.

To make it easy to extricate his system from any problem, Diamond uses tools developed by the Windows Users Group Network that save existing configuration files to an archive.

Evaluation

Once assured that the software can be installed and deinstalled without a major crisis, the evaluators start looking at the software itself.

Diamond is very concerned with how well the developer implemented the Windows interface. He reviews the screens, menus and messages to identify the features and customization options. He also examines the program's consumption of resources, particularly disk and memory use, and he times the minimum install procedure.

"I want to know how much disk space the program requires. That is not something the vendor reveals on the box," Diamond says. The vendor states a minumum configuration for running the program, which may not allow for adequate performance.

Birgfeld tests the application's features against a list of requirements drawn up by the end users. He scores the application for its must-have and would-be-nice features. He also exercises the data import/export capabilities.

When problems arise, Grana turns to utilities such as Windows' Dr. Watson and Norton Utilities (a set of PC management tools) to identify the problem and make corrections. "Say the program suddenly locks up. If I'm lucky, I can stay in Windows 3.1 and get over to Watson." Dr. Watson files record everything that happens to the system and are used in determining what has gone wrong.

In addition, he will try to save and close whatever open files he can. He uses Norton Utilities to try to reconstruct damaged files.

When they can't solve a problem, the evaluators don't hesitate to call the vendor's technical support line.

Compatibility testing

Compatibility testing is the final step in the evaluation process. The goal is to determine how the software works with the users' likely hardware and software combinations. Fortunately, most software now is network-friendly. "There is no way to test every compatibility concern," Birgfeld warns, but "make sure you are testing the right version level." Vendors may release unannounced or unnumbered releases of software containing a minor fix that changes the compatibility picture. The only way to determine in advance if a package contains the latest fix is to check for a date on the box or disks.

Evaluators rarely encounter a truly awful program anymore. "The worst thing is a program that just isn't easy to use," Birgfeld says.

Still, there is always the possibility of an unpleasant surprise in the next box that arrives on the software evaluator's desk. "In a market that moves as fast as the Windows market," Diamond says, "you're sure to find some lead balloons."

Radding is a free-lance writer based in Newton, Mass.

At a glance

Read through documentation. If you skip to install procedures, check out README files, which may contain more than how-to information. Also, back up your system before installing new software.

Benchmark the application in terms of hardware performance. You may also consider not doing a full install. Sample files, for example, can be easily skipped.

When doing compatibility testing, be sure to test the right version level. The only way to determine if a package contains the latest fix is to check for a date on the box or disks.

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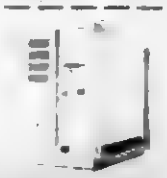

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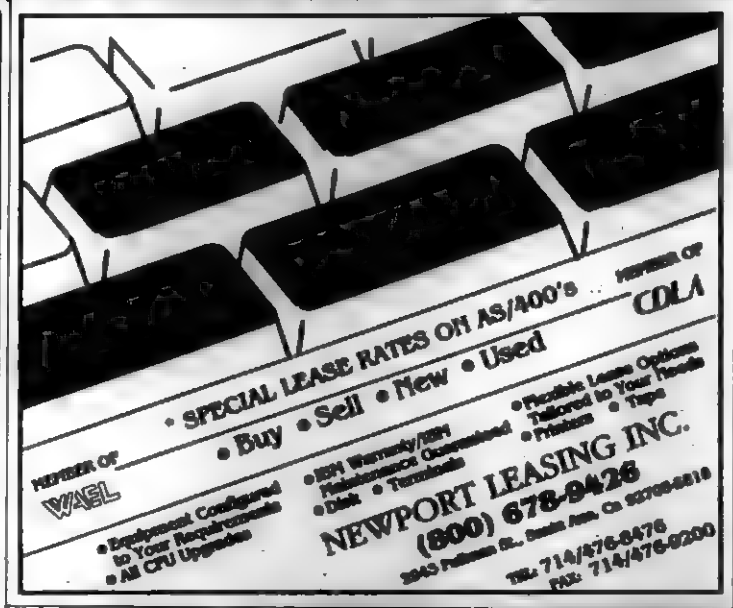

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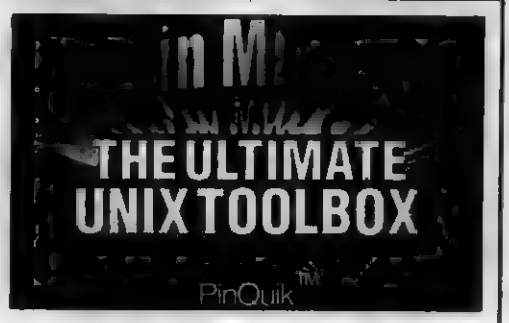

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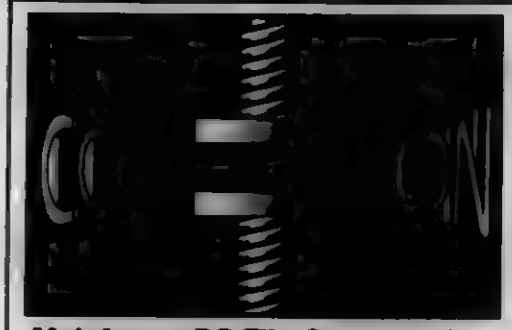

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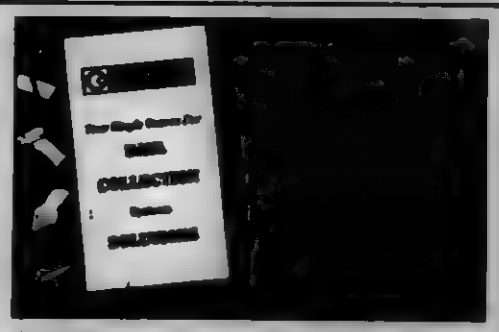

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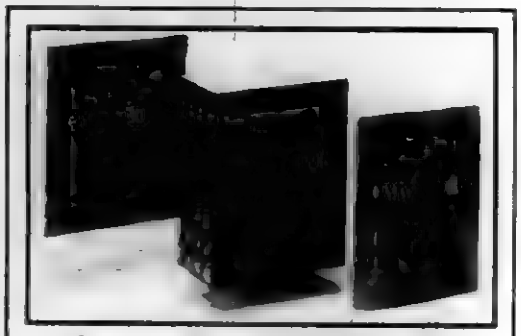

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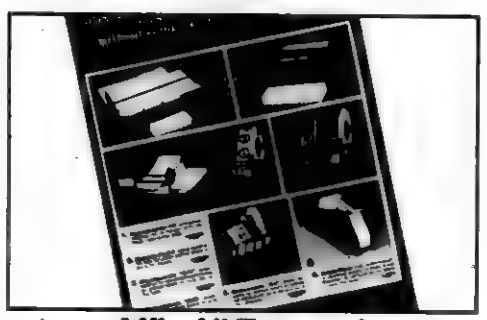

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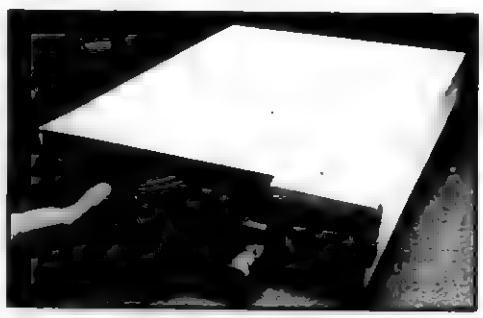

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Acer America **97**
Anderson Consulting **187**
Apple **106**
AT&T Business Communications Services **34-35**
Avatar **98**
Borland **17**
Bull Worldwide Information Systems **200**
Cabletron Systems **165**
Candle Concepts **133-144**
Cincom Systems **121**
Cisco Systems **9**
Cognos **126**
ComNet **89**
Commonwealth of Puerto Rico **128**
Compaq Computer Corp. **170-171**
Computer Associates **3, 8**
ComTek Expo **44**
Corporate Software **103, 105, 107**
CW Classified **29, 52, 108, 117, 148**
CW Circulation **174-175**
CW Marketing **49, 122**
Digital Equipment Corporation **57/60**
Dunn & Bradstreet Software **29**
E-Mass Group **112**
EMC Corp. **45, 47**
Executrain Corp. **157-158**
Fisher International **48,113**
Gupta Technologies **117**
Hewlett Packard **18-19, 93, 118-119**
IBM **22-23, 54-55, 42-43, 110-111, 122-123, 146**
ICA ComNet **124**
Information Builders **147**
Informix **109**
Ingres **129**
Innovation Data Processing **7**
Intergraph **40**
IPL Systems **21**
Knowledgeware **25**
Laser Data **100**
Lotus Development Corp. **58-61, 94-95**
Micro Focus **11**
NCR **114-115**
NEC **38-39**
Netec **176**
Neuron Data Systems **145**
Novell **26-27**
Olicom **96**
Oracle Corporation **5**
Programart **109**
Pyramid Development Corp. **36**
Racal Datacom **41**
SAP America **102**
SAS Institute **56, 125**
Security & Virus Com. **104**
Software Spectrum **46**
Standard Microsystems **188**
Sun Microsystems **104**
SunSelect **100-101**
Sybase **13**
3M Corp. **52-53**
Texas Instruments **130-131**
Toshiba **30-31**
Ungermann-Bass **98-99**
Universal Data Systems **116**
Workstation Group **176**
Wyse Technology **154-155**
XDB Systems **15**

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Companies in this issue

Page number refers to the page on which the story begins.

3Com Corp. 103

A

ABB Environment Systems, Inc. 166
ABB Systems Control Corp. 107
Aberdeen Group 24
ACG, Inc. 49
Adaptive Corp. 99
Computer Communications, Inc. 103
Advanced Logic Research, Inc. 14
Advanced Technologies Group 127
Allied Signal Aerospace 166
Amdahl Corp. 197
American Management Systems 16
AMI 156
Analog Devices, Inc. 28
Andersen Consulting 10
Andrew Corp. 1
Apple Computer, Inc. 1,4,6,14,35,46,169
Ardis 10
Artisoft, Inc. 49
A&S Building Systems, Inc. 166
Associated Insurance Cos. 113
AST Research, Inc. 14,35,160
Atex, Inc. 92,113
AT&T 10,166
Autodesk, Inc. 156,166

B

Baltimore Gas and Electric 1
Bancomer 1
Bank of New York 197
Banyan Systems, Inc. 49,99
Barnett Technologies, Inc. 127
Baseline Software 35
BASF Corp. 99
Bay Partners 197
Becton Dickinson Corp. 6
Bi-Lor, Inc. 113
BIS Strategic Decisions 35, 105
BitWise Designs, Inc. 196
Black & Decker Corp. 166
BlackCurrant Technology 46
Blue Cross/Blue Shield 127
BMC Software 16
Boeing Computer Services Co. 16
Booz, Allen & Hamilton, Inc. 1
Borland International, Inc. 12,14,35
Bose Corp. 4,148
Boston College 16
Brooktrout Technology, Inc. 196
BT North America, Inc. 105
Bull HN Information Systems, Inc. 16
Business Research Group, Inc. 49

C

Cabletron Systems, Inc. 99,103
Cadwalader Wickersham & Taft 166
Candle Corp. 6
Carnegie Mellon Graduate School of Industrial Administration 16
Cascade Communications Corp. 108
Chase Manhattan Bank 16
Chevron Canada Ltd. 35
CHF Industries, Inc. 6
Chips and Technologies, Inc. 14
Cincinnati Bell Information Systems, Inc. 10
Cisco Systems, Inc. 1,99,103,197
Citibank 4
CitiBank Telemarketing Services 113
City of New York 99
Claris Corp. 46
Cobb-Vantress, Inc. 166
Compaq Computer Corp. 1,4,35,105,160,166
Compass Computer Service 166
Computer Associates International, Inc. 6,14
Computer Mall Services, Inc. 108
ComputerLand Corp. 1,166
Comshare, Inc. 16
Connecting Point 1
Conoco, Inc. 14
Control Data Systems, Inc. 197
Corollary Systems, Inc. 14
Crescendo Communications, Inc. 92
CrossComm Corp. 1
Cyrix 156

D

Dallas/Fort Worth International Airport 120
Data 3 Systems, Inc. 6
Dauphin Technology, Inc. 14
Defense Advanced Research Projects Agency 35
Dell Computer Corp. 14,160
DelMonte Foods 127
Demax Software 35
DHL Airways, Inc. 4
Digital Communications Associates, Inc. 107
Digital Equipment Corp. 4,14,16,24,89,92,99,169,198
Digital Equipment Corp. Users Society 24
Dun & Bradstreet Corp. 1
DynCorp. 35

E

Electronic Data Systems Corp. 16,169,197
EMC Corp. 8
EO, Inc. 105
Epoch Systems, Inc. 6
Epson America, Inc. 14
Ergo Computing, Inc. 35,46
Ernst & Young 127
Export-Import Bank of the U.S. 197

F

Federal Aviation Administration 107
Federal Communications Commission 10
Federal Express Corp. 148
Fore Systems, Inc. 99
Forward Concepts Co. 28
Fox Software, Inc. 12
Frontier Technologies Corp. 106

G

Gandalf Systems, Inc. 116
Gateway 2000, Inc. 160,166
GE Aircraft Engines, Inc. 4
Gemisys 120
General Accident Insurance Company of America 8
General Electric Corp. 6
GTE Corp. 160
GTE Telephone Operations, Inc. 4

H

Hambrecht & Quist, Inc. 4
Handy and Harman, Inc. 148
Hewlett-Packard Co. 4,24,35,127,169
Hitachi Data Systems Corp. 16,197
Holiday Inn Worldwide 1

I

IBM 1,4,6,8,10,12,14,16,35,89,92,99,120,124,127,160,161,166,197,198
Information Systems, Inc. 14
Informix Software, Inc. 6
Integrated Surgical Systems, Inc. 16
Intel Corp. 28,35,46,163,164,169
Interal 124
InterLab 1
International Communications Association 10
Interpractice Systems 169
InterWest Partners 197

J

J. F. Shea & Co. 197
Jones, Day, Reavis & Pogue 53

K

Keydata International, Inc. 35
KineticSystems Corp. 124
Kizan Technologies, Inc. 128

L

Legato Systems, Inc. 89
Lehman Brothers 99
Levi Strauss & Co. 127,172
Logitech, Inc. 14
Lotus Development Corp. 14,15,35

M

MacSoft, Inc. 53
Magnus Software Corp. 120
MarketPulse 120
Martin Marietta Corp. 4,16
Macy's 198
McGraw-Hill, Inc. 16
MCI Communications Corp. 10
Mellon Bank 127
Micro City 166
Microsoft Corp. 1,6,12,14,20,24,28,35,38,46,49,92,105,124,128,164,166,198
Motorola, Inc. 10,35,99

N

NCR Corp. 6,14,169
NetLink, Inc. 103
Network Computing, Inc. 105
Network Connections 166
New England Electric Co. 44
New York Life Insurance Co. 1,120
Next, Inc. 10
Nielsen Marketing Research 128
Nihon Unisys Ltd. 6
Nikkei Computer Magazine 6
Nokia Mobile Phones, Inc. 35
Nolan, Norton & Co. 24
Northern Telecom, Inc. 105,116
Northgate Computer Systems, Inc. 14,198
Novell, Inc. 12,16,35,49,105,162,197
Novon Research Group 15

O

Ohio Valley General Hospital 148
Oracle Corp. 15,35,169

P

Parc Place Systems, Inc. 127
Performance Computing, Inc. 12
Perot Systems Corp. 10
Pershing, Inc. 8
Personal Computer Memory Card Interface Association 14,35
Pfizer, Inc. 1
Phoenix Technologies Ltd. 156
Plaid Brothers Software 128
Prime Computer, Inc. 120
Primerica, Inc. 10
Proteon, Inc. 1,99,103
Prudential Investment Corp. 1

Q

Quadtel 156

R

Racore Computer Products, Inc. 96
RAM Mobile Data 10
Reach Software 197
Reltech Products, Inc. 124
Reply Corp. 14
Reusable Solutions Inc. 127
Ring Access, Inc. 1
Rockwell International Corp. 28

S

Salomon Brothers, Inc. 16
Salt River Project 127
SAS Institute, Inc. 113,169
Sequent Computer Systems, Inc. 169
ServicePoint Development Corp. 105
Sharp Corp. 14
Shiva Corp. 96
Siemens/Nixdorf 120
Silicon Graphics, Inc. 169
Sitka, Inc. 49
Software Publishers Association 46
Sommers & Associates 196
Space Telescope Science Institute 24
Spiegel, Inc. 113
Sprint Corp. 10,16,197
SQL Corp. 169
SRI International 105,135
SSU Services 148
STAT Resources 148
Storage Technology Corp. 6,8
Stratus Computer, Inc. 120
Stride-Rite Corp. 150
Sun Microsystems, Inc. 4,6,24,35,89,127,169
Sunsoft, Inc. 49
Supercomputing '92 Conference 16
Sutter General Hospital 16
Sybase, Inc. 12,15,35,127,169
Symantec Corp. 163
Sync Research 1
System Software Associates, Inc. 108
System Source 166
Systems Union, Inc. 96

T

Tandem Computers, Inc. 35,116
Tele-Communications Association 10
Telematics International, Inc. 105
Telephoto Communications, Inc. 96
Texaco, Inc. 169
Texas Instruments, Inc. 28
Textron Corp. 166
The ASK Group, Inc. 169
The Burton Group 49
The Channelmarker 1
The Conference Board 150
The Prudential 128
The Salvation Army's Cascade Division 148
The Society for World InterBank Financial Telecommunication 105
Tiara Computer Systems 49
Toshiba America Information Systems, Inc. 14
Travelers Corp. 1,10
Triumph 166
Turner Corp. 28

U

UDS Motorola 197
Ungermann-Bass, Inc. 92
Unisys Corp. 16,120
United Airlines 169
United Leeds Teaching Hospital 15
Univac 148
University of Miami 6
U.S. Department of Housing and Urban Development 16

V

Veritas Software Corp. 120
Video Electronics Standards Association 14
VTech Computers Inc. 197

W

Wal-Mart Stores, Inc. 16
Wang Laboratories, Inc. 16,53,116,197,198
Wellfleet Communications, Inc. 1,99,103
Wells Fargo Wholesale Services 4,148
Woodside Technologies 35
WordPerfect Corp. 12,53,124
WorkGroup Solutions 12
World Vision Canada 120

X

XcelleNet, Inc. 197
Xerox Corp. 113

Z

Zachman International, Inc. 4
Zenith Data Systems 14
Zeos International Ltd. 197

Gainers

Percent

Digital Systems Int'l Inc.	55.56	Storage Technology	-27.56
Mecca Software	55.00	Artel Communication Corp.	-13.07
Ultimate Corp.	50.00	Microcom Inc.	-12.50
Datapath Corp.	44.62	Systems Center Inc.	-11.32
Ross Systems	36.36	CE Software	-10.53
Rastergops	24.00	Borland Int'l Inc.	-10.07
EMC Corp. (H)	22.73	Gateway Communications	-9.52
Frelnet Corp.	22.06	Adobe Systems Inc.	-9.33

Dollar

EMC Corp. (H)	5.63	Storage Technology	-8.75
Cisco Systems Inc. (H)	4.50	Adobe Systems Inc.	-3.50
Policy Management Sys.	4.50	Borland Int'l Inc.	-3.38
Digital Systems Int'l Inc.	4.38	Matsushita Electronics (L)	-3.25
Computer Sciences	4.00	Digital Equipment Corp.	-2.63
Progress Software Corp. (H)	3.88	Cabletron Systems (H)	-2.25
Frelnet Corp.	3.75	3M Corp (H)	-1.88
Datapath Corp.	3.63	Boole & Babbage	-1.75

IPOs roll on

Unaffected by a marketwide summer slump in initial public offerings (IPO), computer-related stock offerings continued unabated through the third quarter.

The dollar volume of IPOs in all industries declined by 58% in the third quarter, according to market analysis firm Sommers & Associates. The computer industry generated 12 first offerings. That number is down from 18 IPOs in the second quarter, but the total dollar amount raised was comparable.

"Within the computer industry, there has been pretty consistent performance over the past three quarters," said Tom Sommers, president of the Houston-based company. Sommers noted that the overall market trends in IPOs have been driven mostly by demand for biotech and health care industry issues.

Companies pursue public stock offerings for a number of reasons. The IPO often provides a payback for venture capitalists who have funded the company's startup. According to Steve Ide, vice president of sales and marketing at newly public Brooktrout Technology, Inc. (BRKT), "Our investors wanted to have some liquidity. More importantly, though, we needed additional cash to fund the next level of future growth."

BitWise Designs, Inc. (BTWS)'s IPO in May raised capital for production and marketing purposes. According to Chief Executive Officer John Botti, the company had fully developed a new portable workstation product, but the additional funds were used to bring the product to market. "The IPO wasn't done to raise a research budget, and I think investors liked that," Botti said.

—Derek Slater

Grand openings

Many of the high-tech companies that have gone public in 1992 have seen an increase in their stock price. Selected issues with their initial and current share values:

Company (products)	IPO	Initial price	Current price (11/10 close)
Stac Electronics (data compression)	May	12	41/2
Network Systems, Inc. (network servers)	June	9	15
Creative Technologies Ltd. (multimedia products)	Aug.	12	191/2
Banyan Systems, Inc. (networking software)	Aug.	101/2	201/2
Computervision Corp. (CAD software)	Aug.	12	63/4
Netrix Corp. (telecommunications products)	Sept.	12	171/4

[redacted]

Each	52 Week	Range		Nov 13 3PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up 3.34%
OTC	23.50	9.63	3 COM Corp. (H)	21.50	-1.63	-7.03
NYS	70.63	56.25	American Info Techs Corp.	63.38	-0.88	-1.36
NYS	45.50	32.88	AT&T	45.50	0.63	1.39
OTC	4.25	0.75	Artel Communication Corp	1.25	-0.19	-13.07
OTC	22.00	10.25	Banyan Systems Inc.	20.50	1.75	9.33
NYS	49.75	40.25	Bell Atlantic Corp.	44.88	-0.50	-1.10
NYS	55.50	43.38	Bellsouth Corp	47.50	-1.38	-2.81
NYS	6.75	3.63	Bolt, Beranek & Newman	5.00	0.13	2.56
NYS	73.25	36.63	Cabletron Systems (H)	70.00	-2.25	-3.11
OTC	31.00	17.50	Chipcom Corp.	26.00	2.00	8.33
OTC	70.25	24.00	Cisco Systems Inc. (H)	70.25	4.50	6.84
OTC	35.25	5.50	Compression Labs Inc.	13.75	2.13	18.28
OTC	3.38	0.88	Data Switch Corp.	2.25	0.19	9.06
NYS	23.63	13.75	Digital Comm. Assoc.	16.50	0.13	0.76
OTC	15.25	7.50	Digital Systems Int'l Inc.	12.25	4.38	55.56
OTC	19.25	3.63	DSC Communications (H)	18.00	-0.50	-2.70
OTC	10.88	4.75	Fibronix Int'l Inc.	5.75	-0.50	-8.00
OTC	37.50	10.50	Frelnet Corp	20.75	3.75	22.06
OTC	3.38	1.13	Gandalf Technologies Inc.	2.00	0.25	14.29
OTC	2.25	0.69	Gateway Communications	1.19	-0.13	-9.52
NYS	5.50	2.38	General Datacomm Inds.	4.75	0.13	2.70
ASE	1.88	0.94	Go Video	2.94	0.44	17.52
NYS	35.75	28.88	GTE Corp.	33.63	0.13	0.37
NYS	70.63	50.00	ITT Corp	68.00	1.75	2.64
OTC	37.63	25.25	MCI Communications Corp.	36.00	1.00	2.86
OTC	14.25	2.25	Microcom Inc.	4.38	-0.63	-12.50
NYS	18.25	9.50	Network Equipment Tech.	10.75	-0.38	-3.53
OTC	25.50	8.00	Network General	16.63	0.75	4.72
OTC	20.00	8.50	Network Systems Corp.	15.25	0.50	3.39
OTC	28.75	5.63	Newbridge Networks Corp. (H)	28.00	0.50	1.82
NYS	49.25	30.50	Northern Telecom Ltd.	39.13	0.38	0.97
OTC	33.25	22.19	Novell Inc. (H)	32.38	0.50	1.57
NYS	88.38	69.13	Nynex Corp.	79.88	0.50	0.63
OTC	37.50	16.50	Octel Communications Corp.	20.50	0.00	0.00
OTC	9.88	3.38	Penril Data Comm. Ntwks.	4.38	-0.25	-5.41
OTC	53.00	10.25	Picturetel Corp.	24.25	2.13	9.60
OTC	18.75	7.00	Proteon Inc.	10.13	0.25	2.53
NYS	33.75	13.88	Scientific Atlanta Inc. (H)	33.75	3.13	10.20
NYS	70.50	56.25	Southwestern Bell Corp.	64.38	0.00	0.00
NYS	26.38	20.75	Sprint Corp.	25.75	0.13	0.49
OTC	21.13	4.88	Standard Microsystems Corp	21.00	0.38	1.82
OTC	67.25	15.25	Synoptics Communications (H)	64.50	1.50	2.38
NYS	40.00	32.88	US West Inc.	35.50	-0.63	-1.73
OTC	58.75	24.00	Wellfleet Communications (H)	58.75	2.25	3.98
PC'S AND WORKSTATIONS						Up 0.45%
OTC	10.50	3.50	Advanced Logic Research	4.25	-0.25	-5.56
OTC	70.00	41.50	Apple Computer Inc.	56.00	0.25	0.45
OTC	24.50	11.25	AST Research Inc.	17.50	-0.38	-2.10
NYS	19.25	6.75	Commodore Int'l	7.63	0.38	5.17
NYS	42.50	22.13	Compaq Computer Corp.	42.50	0.50	1.19
OTC	37.88	13.91	Dell Computer Corp. (H)	35.75	-1.63	-4.36
OTC	7.75	0.88	Everex Systems Inc.	1.31	0.19	16.71
NYS	34.63	21.25	Harris Corp.	33.75	0.88	2.66
NYS	85.00	44.63	Hewlett Packard Co.	56.88	-1.75	-2.99
NYS	29.75	14.13	Silicon Graphics	27.13	0.50	1.88
OTC	36.13	20.75	Sun Microsystems Inc.	p 34.00	-0.88	-2.51
NYS	31.25	22.25	Tandy Corp.	p 26.88	0.63	2.38
NYS	11.13	5.00	Zenith Electronics (L)	5.38	-0.38	-6.52
OTC	25.50	2.25	Zeos International Ltd.	4.00	0.00	0.00
LARGE SYSTEMS						Up 1.36%
ASE	20.63	7.75	Amdahl Corp	8.00	0.75	8.57
NYS	16.38	4.75	Convex Computer	7.75	0.00	0.00
OTC	15.88	1.88	Cray Computer	4.50	-0.25	-5.26
NYS	49.50	19.00	Cray Research Inc.	21.38	-0.38	-1.72
NYS	18.13	7.13	Data General Corp.	10.00	-0.13	-1.23
NYS	65.50	32.88	Digital Equipment Corp.	34.13	-2.63	-7.14
NYS	100.38	64.63	IBM	64.63	-1.63	-2.46
OTC	13.25	5.50	Kendall Square Research	11.50	1.50	15.00
NYS	119.25	87.00	Matsushita Electronics (L)	87.00	-3.25	-3.60
OTC	17.50	6.00	Pyramid Technology	10.50	0.50	5.00
OTC	17.88	9.88	Sequent Computer Sys.	15.13	-0.38	-2.42
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.00
NYS	54.25	29.50	Stratus Computer Inc.	35.25	1.00	2.92
NYS	15.13	9.50	Tandem Computers Inc.	14.63	0.13	0.86
NYS	11.75	3.63	Unisys Corp.	8.88	0.25	2.90
ASE	7.50	0.25	Wang Labs Inc. (a)	0.50	0.00	0.00
SOFTWARE						Up 4.51%
OTC	68.50	25.25	Adobe Systems Inc	34.00	-3.50	-9.33
OTC	44.25	10.25	Aldus Corp.	15.75	0.50	3.28
OTC	19.75	7.00	American Software Inc.	10.25	1.25	13.89
OTC	20.00	9.75	Ask Computer Systems	17.25	0.13	0.73
OTC	55.25	23.25	Autodesk Inc. (H)	54.00	0.50	0.93
OTC	37.75	3.75	Bachman Info. Systems	6.00	0.00	0.00
OTC	42.50	37.00	BGS Systems Inc.	38.25	1.25	3.38
OTC	79.00	37.25	BMC Software Inc.	67.00	3.50	5.51
OTC	25.50	13.00	Boole & Babbage	22.25	-1.75	-7.29
OTC	86.75	25.25	Borland Int'l Inc.	30.13	-3.38	-10.07
OTC	10.50	3.63	CE Software	4.25	-0.50	-10.53
ASE	29.75	8.75	Cheyenne Software Inc. (H)	29.00	9.13	0.43
OTC	13.13	5.63	Cognos Inc.	7.13	1.25	21.28
NYS	19.50	8.63	Computer Associates (H)	19.13	0.25	1.32
NYS	12.38	4.75	Computervision Corp.	6.50	-0.13	-1.89
OTC	20.00	6.75	Comshare Inc.	11.50	1.00	9.52
OTC	47.88	6.00	Easel Corp	9.13	-0.63	-6.41
OTC	25.00	11.50	Group I Software	14.75	-0.75	-4.84
OTC	6.63	3.50	Hogan Systems Inc.	5.25	-0.25	-4.17
OTC	36.25	18.50	Information Resources	27.00	-0.38	-1.37
OTC	31.00	5.88	Informix Corp.	30.50	0.75	2.52
OTC	22.38	11.50	Intergraph Corp.	13.38	0.13	0.94
OTC	15.00	7.00	Interleaf Inc.	12.63	1.50	13.48
OTC	20.25	10.25	Intersolv Inc.	13.38	-0.63	-4.46
OTC	21.38	9.50	Knowledgeware Inc.	15.38	1.63	11.87
OTC	49.00	28.75	Legent Corp. (H)	49.00	2.75	5.95
OTC	38.75	14.75	Lotus Development	21.00	-1.25	-5.62
OTC	7.38	1.88	Mecca Software	3.88	1.38	55.00
OTC	22.25	5.25	Mentor Graphics	8.25	1.00	13.79
OTC	38.00	27.25	Micro Focus	38.00	1.88	5.19
OTC	20.50	6.50	Microgram Inc.	10.00	0.25	2.56
OTC	93.25	61.84	Microsoft Corp. (H)	92.88	0.13	0.13
OTC	24.38	12.00	Oracle Corp. (H)	22.63	-1.50	-6.22
OTC	55.25	19.63	Parametric Technology (H)	53.38	2.75	5.43
OTC	11.00	3.50	Phoenix Technologies	5.00	0.88	21.21
OTC	25.25	11.25	Platinum Technology	19.75	1.38	7.48
OTC	57.38	29.00	Progress Software Corp. (H)	57.38	3.88	7.24
OTC	26.63	4.00	Quarterdeck Office Sys.	5.88	-0.25	-4.08
OTC	32.75	11.75	Rainbow Technologies Inc.	23.00	-0.75	-3.16
OTC	22.75	4.00	Rasterops	7.75	1.50	24.00
OTC	17.25	3.63	Ross Systems	7.50	2.00	36.36
OTC	18.25	8.50	Sapiens USA Inc. (H)	17.25	0.63	3.76
OTC	26.25	6.75	Software Publishing Corp.	18.00	1.25	34.29
OTC	8.00	2.00	Software Toolworks Inc.	5.00	0.56	12.66
OTC	7.25	0.75	Shiva Nrep Software	1.88	0.13	7.14
OTC	16.50	3.25	State of the Art	7.00	0.00	0.00
NYS	25.25	13.75	Sterling Software Inc.	19.88	-0.13	-0.63
OTC	30.00	8.00	Struct. Dynamics Research	12.88	0.63	5.10
OTC	45.25	16.25	Sybase Inc. (H)	43.75	1.50	3.55
OTC	51.00	5.88	Symantec Corp.	12.63	-0.13	-0.98
NYS	15.50	5.25	Systems Center Inc.	5.88	-0.75	-11.32
OTC	34.25	15.16	System Software Assoc.	28.75	3.00	11.65
OTC	13.25	2.50	Trinzic Corp.	3.63	0.00	0.00
OTC	23.75	14.50	Wallace Interactive Systems	21.50	3.25	17.81
OTC	5.38	1.38	Wordstar (L)	1.81	-0.06	-3.31
SEMICONDUCTORS						Up 1.24%
NYS	21.50	7.38	Advanced Micro Devices	16.25	0.00	0.00
NYS	12.38	7.13	Analog Devices Inc.	12.13	0.13	1.04
OTC	14.75	6.75	Atmel Corp. (H)	14.25	0.00	0.00
OTC	14.13	3.25	Chips and Technologies	4.88	0.13	2.63
NYS	18.38	7.38	Cypress Semiconductor Corp	11.75	0.38	3.30
NYS	13.13	6.75	Dallas Semiconductor (H)	13.00	0.75	6.12
OTC	70.25	39.75	Intel Corp. (H)	68.75	-0.25	-0.36
NYS	9.88	4.88	LSI Logic Corp.	9.13	0.38	4.29
NYS	22.38	12.13	Micron Technology	20.75	1.13	5.73
NYS	101.38	57.50	Motorola Inc. (H)	98.50	2.13	2.20
NYS	14.13	4.88	National Semiconductor	12.50	0.38	3.09
OTC	27.00	8.25	Sierra Semiconductor	14.00	1.00	7.69
NYS	52.13	26.00	Texas Instruments (H)	50.63	-0.13	-0.25
OTC	10.50	6.00	VLSI Technology	7.25	-0.38	-4.92
OTC	7.00	2.13	Weitek	4.50	0.00	0.00
ASE	7.63	2.00	Western Digital Corp. (H)	7.63	0.63	8.93
OTC	31.00	14.50	Xilinx	20.00	0.50	2.56
OTC	33.50	15.00	Zilog Inc.	28.75	-0.50	-1.71
PERIPHERALS AND SUBSYSTEMS						Up 4.48%
OTC	11.13	3.63	Adaptive Corp.	10.25	-0.50	-4.65
OTC	26.75	13.75	Banctec Inc.	24.75	0.88	3.66
OTC	23.50	9.25	Cambex Corp.	13.50	-0.75	-5.26
ASE	14.50	5.66	Cognitronics Corp.	14.00	1.38	10.89
NYS	22.88	12.50	Conner Peripherals	20.25	0.38	1.89
OTC	24.88	14.35	Data Race Inc (H)	21.25	0.75	3.66
ASE	19.66	4.75	Datapath Corp.	11.75	3.63	44.62
NYS	30.38	8.38	EMC Corp. (H)	30.38	5.63	22.73
OTC	8.38	4.75	Emulex Corp.	7.38	0.13	1.72
OTC	23.00	13.25	Evans & Sutherland	18.50	-0.50	-2.63
OTC	40.63	12.00	Exabyte	20.13	1.00	5.23
OTC	36.88	15.75	Intelligent Info. Systems (H)	32.88	-0.25	-0.75
OTC	11.25	4.75	Iomega Corp.	8.13	0.25	3.17
OTC	34.75	10.25	IPL Systems Inc.	11.75	-0.25	-2.08
OTC	21.25	10.75	Komag Inc.	20.25	1.00	5.19
OTC	15.88	4.38	Maxton Corp.	15.88	1.25	8.55
OTC	12.63	7.13	Micropolis Corp.	9.25	1.25	15.63
NYS	107.00	85.38	3M Corp (H)	103.00	-1.88	-1.79
OTC	6.75	3.50	Printronix Inc.	5.25	0.00	0.00
NYS	22.63	6.88	QMS Inc.	8.88	0.88	10.94
OTC	18.00	8.88	Quantum Corp.	14.63	1.38	10.38
OTC	12.75	3.75	Radius Inc.	6.50	0.88	15.56
NYS	14.13	6.50	Recognition Equipment (H)	13.75	0.38	2.80
OTC	13.25	5.63	Rexon Inc.	13.25	0.75	6.00
OTC	17.63	7.75	Seagate Technology	17.38	0.38	2.21
NYS	78.00	21.00	Storage Technology	23.00	-8.75	-27.56
NYS	22.88	16.50	Tektronix Inc.	20.63	-1.38	-6.25
NYS	82.25	60.25	Xerox Corp.	76.38	1.13	1.50
SERVICES						Up 5.22%
OTC	22.00	11.84	American Mgmt. Systems	20.50	0.13	0.61
NYS	5.88	2.88	Arbacomp Inc.	4.13	0.38	10.00
OTC	21.75	12.50	Analysts Int'l	21.75	1.25	6.10
NYS	51.25	36.13	Auto Data Processing (H)	50.13	-0.63	-1.23
NYS	17.25	7.06	Ceridian Corp. (H)	16.50	0.00	0.00
NYS	23.22	12.50	Comdisco Inc.	15.50	0.50	3.33
OTC	13.50	6.75	Computer Horizons	8.00	-0.50	-5.88
NYS	84.88	57.00	Computer Sciences	74.75	4.00	5.65
NYS	10.13	7.00	Computer Task Group	8.25	0.25	3.13
OTC	40.50	15.00	CompUSA Inc.	33.38	-1.00	-2.91
OTC	19.25	8.00	Corporate Software	12.00	0.25	2.13
OTC	30.75	7.75	Egghead Discount Software	12.00	2.00	20.00
NYS	33.06	25.25	General Motors E (EDS)	29.00	0.75	2.65
OTC	30.38	6.25	Intelligent Electronics	8.88	0.13	1.43
OTC	14.88	6.63	Merisel	10.50	0.75	2.44
OTC	15.75	5.75	Microage Inc.	8.00	0.25	3.23
OTC	40.00	17.66	Parcher (H)	39.00	2.75	7.59
NYS	77.75	55.00	Policy Management Sys.	77.75	4.50	6.14
NYS	49.25	27.88	Reynolds and Reynolds (H)	49.00	0.25	0.51
OTC	32.00	22.00	SEI Corp.	27.75	0.00	0.00
OTC	24.38	16.88	Shared Medical Systems	20.88	0.50	2.45
OTC	30.00	16.00	Sungard Data Systems	28.00	0.75	2.75
NYS	3.63	1.13	Ultimate Corp.	1.88	0.63	50.00

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Cisco rolls

Continuing its strong showing, Cisco Systems, Inc. last week posted first-quarter earnings of $33.2 million, an increase of 115% from the year-earlier period. Revenue in the quarter grew 99% to $126.3 million, the Menlo Park, Calif., internetworking vendor said.

Wang's woes

Wang Laboratories, Inc. said revenue for the first quarter of fiscal 1993, which ended Sept. 30, was roughly $360 million, a decrease of 22% from the comparable period last year. The Chapter 11-bound Lowell, Mass., company did not estimate its expected operations loss.

Zeos names COO

Zeos International Ltd., coming off a string of financial reversals, has named Martyn Ratcliffe as president and chief operating officer. He succeeds founder Gregory E. Herrick, who remains as chairman and chief executive officer. Ratcliffe joins the St. Paul, Minn., PC maker after holding similar positions at VTech Computers, Inc. in Beaverton, Ore.

Control Data's dough

Control Data Systems, Inc. has finally received a $20.4 million payment from Russia's Research and Development Institute of Power Engineering for six computers sold in 1990. Control Data received an initial payment for the systems, but subsequent payments were delayed.

UDS reinvests

UDS Motorola has acquired an additional 8% of XcelleNet, Inc., bringing its total ownership in the Atlanta networking company to 20%.

IBM VP to retire

Terry Lautenbach, IBM senior vice president in charge of worldwide manufacturing and development, will retire Nov. 30 after 33 years.

HDS eyes change

New CEO re-evaluates product mix, strategy in competitive PCM market

By Jean S. Bozman
SANTA CLARA, CALIF.

Hitachi Data Systems Corp.'s (HDS) management style and focus may not change appreciably under new Chief Executive Officer John D. Staedke, but the company's product strategy probably will.

HDS' John Staedke *plans to stick it out in the PCM business*

Staedke is not ruling out new product opportunities, although he said he intends to stick it out in the highly competitive IBM plug-compatible mainframe (PCM) business. His plans include diagnostic software and support for Unix systems software, which is proliferating as users turn to client/server systems.

"It's clear to us that there will be a significantly more rapid growth curve in the open systems area than in the industry-standard area," Staedke said, referring to IBM-compatible systems.

But HDS' project to put the Open Software Foundation's OSF/1 onto mainframes has not gone as quickly as predicted, he said. HDS has not chosen to support it or IBM's AIX — yet. "We have never provided any operating system software before," Staedke noted. "It's an option, but we have made no announcement."

Product shift?

Staedke, who recently succeeded Gary B. Moore — HDS' CEO since the firm's inception as a joint venture between Hitachi Ltd. in Japan and Electronic Data Systems Corp. in 1969 — is also looking at shifting the company's product mix. Until recently, HDS got 60% of its revenue from sales of its disk drives and peripherals and 40% from processor sales. Now that ratio is 55% peripherals and 45% processors. Staedke told *Computerworld* the goal is a 50/50 mix.

Abetting this plan, Staedke said, is the projected increase in high-end mainframe sales, which is tied largely to big corporations' continuing data center consolidation moves.

Staedke does have one luxury: HDS can afford to stick to its long-term plans without pressure from Wall Street's quarter-to-quarter expectations. Because it is privately owned, HDS does not have to report its financial results every 90 days and can harbor resources for future projects.

In addition, corporate parent Hitachi Ltd., which owns 80% of HDS, has the deep pockets and forward-thinking corporate culture needed to support extensive product development and fine-tuning.

Staedke, who joined HDS a year ago as executive vice president of marketing from EDS where he led strategic planning, is a battle-tested manager, analysts said. He played a role in HDS' roughly 15% annual growth, even as competitors Amdahl Corp. and IBM stem erosion of their customer base with heavy discounts.

"HDS stayed focused on servicing the needs of large customers," said Peter Burris, director of commercial systems research at International Data Corp. in Framingham, Mass. "They've gotten pretty good at ensuring that their products behave and perform as advertised. And, they're not doing a lot of ancillary projects."

HDS' calling card is reliability and paying attention to maintenance issues, Staedke said. The firm's customers often agree.

"What we've seen over the years is that their disk drive reliability beats their competitors, and that lines up with the reliability surveys we get," said Curt Bray, an information systems technical specialist at Sprint Corp. in Westwood, Kan., whose organization bought 2.2T bytes of HDS peripherals during a recent data center consolidation. Sprint also owns several HDS mainframes.

Staedke said he does not expect his tenure as HDS CEO to be remarkably different from Moore's. Moore returned to EDS last month as chairman and group executive of EDS Japan.

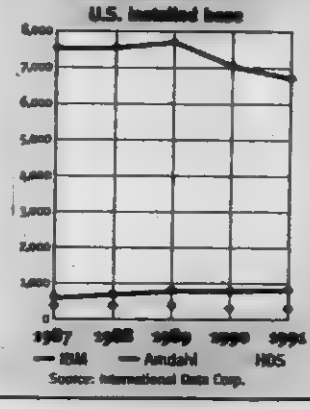
"We are going to continue to dance with the ones that brought us here," he said, referring to Hitachi and EDS. "We're in the PCM business, and we're going to stay [there]."

He did not deny the value of having EDS as a backer. "Yes, they are a good customer," Staedke said. "But because of the size of their appetite [for equipment], all three primary providers [of IBM-compatible systems] believe EDS is a very good customer."

Worldwide shipments of mainframes are expected to increase 3% this year to 3,369, according to International Data Corp. That's a temporary gain, the research firm projects, as shipments are expected to increase only .9% in 1993 before declining 1.3% in 1994.

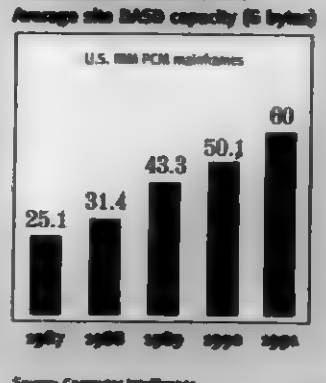
Yin & Yang

As the number of mainframes installed begins to slip . . .

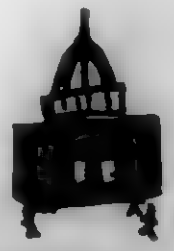


Source: International Data Corp.

. . . mainframe sites continue to increase their DASD capacity



Source: Computer Intelligence



Winners and losers

The American Electronics Association found good news and bad news in the recent elections, as some industry supporters on Capitol Hill were sent packing while others were re-elected. Some examples in the science and technology field:

Defeated:
Rep. Don Ritter (R-Pa.), a senior member of the Science, Space and Technology Committee.
Rep. Les AuCoin (D-Ore.) in a bid for the Senate. A member of the House Appropriations Committee, AuCoin played a key role in supporting dual-use critical technology programs.

Victorious:
Rep. George Brown (D-Calif.), chairman of the Science, Space and Technology Committee and co-author of the American Technology Preeminence Act. He co-authored the High Performance Computing Act.
Sen. Ernest Hollings (D-S.C.), who is considered the "father" of the National Institute of Standards and Technology and co-author of the American Technology Preeminence Act.

Resigned:
Sen. Al Gore (D-Tenn.), chairman of the Commerce Committee's Science, Technology and Space Subcommittee, to become vice president. Gore co-wrote the High Performance Computing Act.

Trends Network management update

Staffing the network management effort

"Network nodes and traffic is outgrowing the ability for staff to adequately manage and maintain system"

- **33%** Strongly agree
- **27%** Somewhat agree
- **27%** Somewhat disagree
- **13%** Strongly disagree

Personnel costs

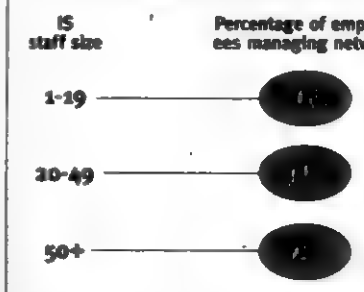
47% of IS managers feel personnel costs for network management are a major concern. **42%** say they are a minor concern. **11%** are not concerned at all.

Network downtime

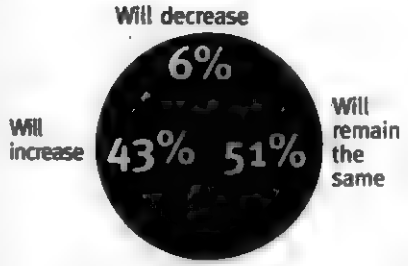
Has your company estimated the cost of network downtime?

74% have not, **14%** have and **12%** do not know.

How many employees does it take to manage your network?



How will this change in two years?



Base: 400 enterprise and systems managers from large and midsize U.S. companies
Source: Business Research Group, Newton, Mass.

"I'M SEEING JOHN SCULLEY AND TONY BENNETT AT 10:00, AND AMY WOHL WITH WAYNE NEWTON AT 2:00. BUT I'M SKIPPING THE WORKSTATION SEMINAR AT 4:00 SO I CAN CATCH THE ELVIS IMPERSONATORS AT 5:00."

Inside Lines

Merry Christmas

DEC's layoffs quietly continue, according to internal sources. At least several thousand employees will have received pink slips by the second week in December. Total head-count reduction could amount to more than 10,000 during the second fiscal quarter, one source estimated. During the first fiscal quarter, which ended Oct. 1, 5,300 employees left the company. Disclosure of the cutbacks could coincide with the announcement of DEC's rebuilt business structure and additional management changes. Meanwhile, negotiations aimed at landing a U.S. sales vice president from outside the company — one with actual sales experience — may be made public this month.

My enemy, my vendor

Dealers are upset with IBM for its ValuePoint pricing. "ValuePoint came without a suggested retail price, and then IBM quoted prices through the direct number, which de facto became the MSRP. Those prices they quoted were significantly lower margin than anything we've ever got from IBM in the past, and to make matters worse, [IBM] stated that dealers would sell probably 5% to 10% less than that — that's unconscionable," fumed Matt Fitzsimmons, a ComputerLand dealer in White Plains, N.Y. "At 10% better than what they're doing, I lose money after I pay royalties. If this is the new IBM, they better get themselves under control." An Inacom spokesman concurred: "IBM set their direct pricing in such a way that dealers have to set a pretty aggressive price just to match that price." Still, dealers want ValuePoint because they can talk to customers who left them years ago because of IBM's high pricing.

Can we talk?

Users aren't the only ones frustrated by the inability of the major players to agree on common formats. Last week, Microsoft Senior Vice President Pete Higgins lamented on the same day that his company and Apple unveiled competing methodologies allowing Apple's QuickTime multimedia technology to run on Windows machines. "There are a lot of needless differences between the two file formats," Higgins said at the MacIS user group meeting in New Orleans. "We could and should work together to make it easier for the users."

Singing from the same score

Microsoft, meanwhile, should release core code versions of its FoxPro, Word and Mail applications in 1993. Core code versions allow the near simultaneous release of Macintosh and Windows variants of the same application. Microsoft already has core code overlap on its Excel, Project and PowerPoint packages.

Go East, woman!

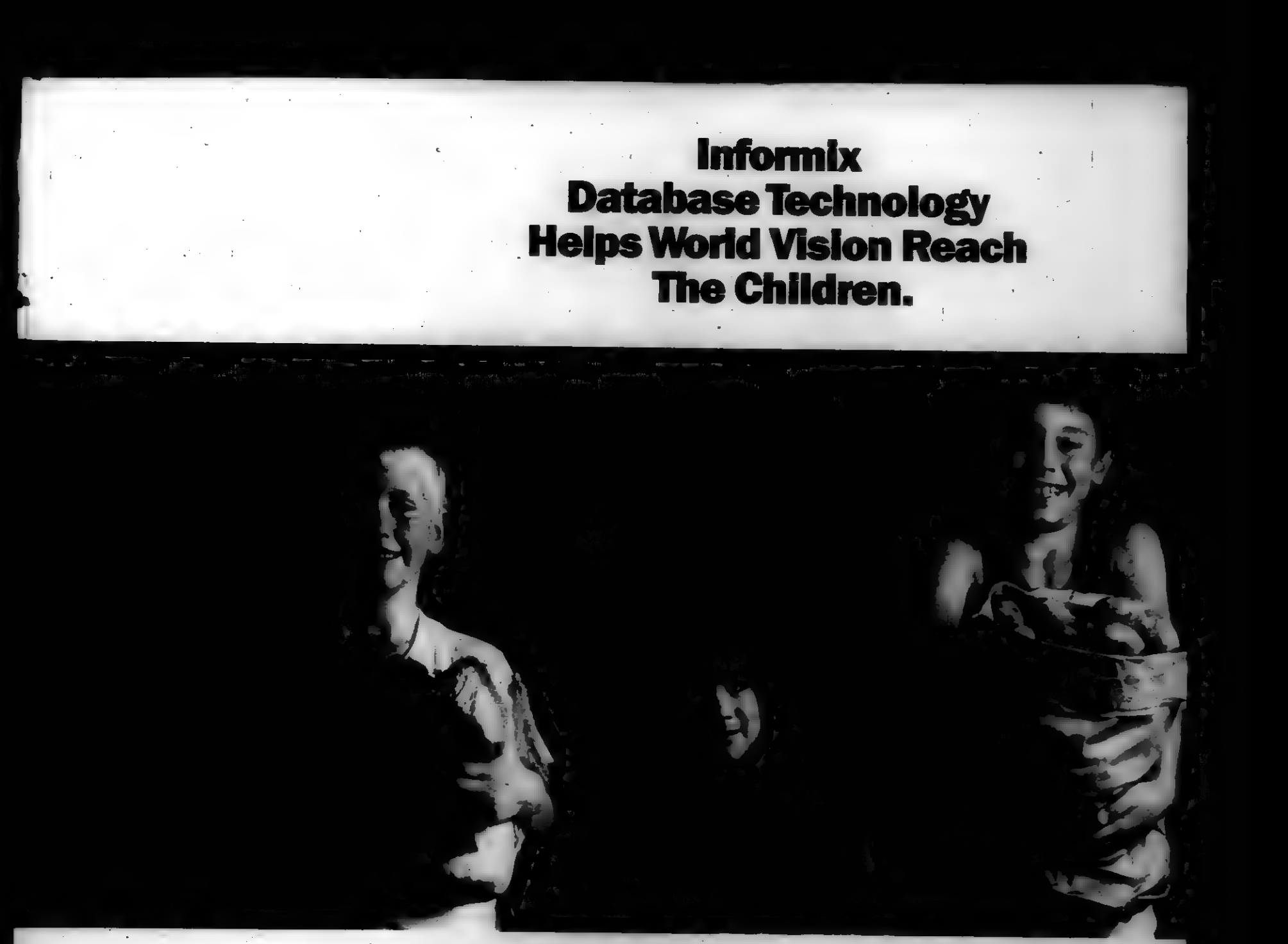
She probably won't be marching in next week's famed Thanksgiving Day parade, but Macy's new CIO plans to relocate from San Francisco to New York soon. Rachel Graham recently took over top technology duties, replacing Leonard Bellezza, who left the company in mid-October. Officials declined to comment on the shuffle, which comes just as the bankrupt retailer finished a super-automated inventory control system designed to give Macy's buyers a better handle on what sells, what doesn't and what, if anything, can pull the world's largest department store out of Chapter 11.

From Apple to cherry trees

John Sculley's name has been rumored for a position in the Clinton administration since the Apple exec headlined a group of pro-Clinton Silicon Valley executives. Now, sources say, Sculley has sold his house in California and purchased a retreat in Milford, Conn., for weekends off from the rigors of being Secretary of Commerce.

You would think a PC maker would be immune from this somehow: A Northgate rep, coming around to show off the company's new notebooks to members of the press, left them under his dashboard in the front seat of the car when he made a quick stop at a Boston-area mall. A thief broke into the car, stole the notebooks and also made off with the rep's briefcase, which had all his press kits. The thief did not take the expansion station, which was out of sight in the trunk. Phone, fax or CompuServe News Editor Alan Alper with news tips (or notebook bandits) at (800) 343-6474, (508) 875-8931 or 76537, 2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

Informix Database Technology Helps World Vision Reach The Children.



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COMPUTERWORLD

Unix net helps Fedex say 'no problem'

By Kim S. Nash
MEMPHIS

■ An extra-inning meeting makes you miss the regular pickup from Federal Express Corp. No matter. You call customer service, which reroutes a plane coming up from Memphis to make an unscheduled stop at your local airport. Your package will arrive on time after all.

That is one of the "no problem" scenarios Fedex hopes to create with a several-year client/server project said to be the largest Unix initiative in the world.

With the first of three phases kicking off now, the 19-year-old company showcased the multimillion-dollar project at Comdex/Fall '92 last week. Fedex's ultimate goal is to lash together disparate customer service systems and overhaul package-tracking technologies.

The market-leading delivery company is working with Sun Microsystems, Inc., Hewlett-Packard Co. and 10 other hardware, software and consulting firms.

Fedex has "reached a self-imposed budgetary and personnel limit. Now we want to grow without adding more costs or people," said Dennis Jones, Fedex's chief information officer. Daily package volume has ballooned 16% to 20% an-

Fedex, *page 14*

Data center consolidation

Bank touts revamp as customer draw

By Maryfran Johnson
HARBORSIDE, N.J.

The moment a corporate customer steps off the elevator on the seventh floor at Bankers Trust Co.'s technology services center, the high-tech showmanship begins.

A curved section of wall slides open into a sleek customer briefing room, where gray walls disappear at the touch of a button. Suddenly, the customer is peering through floor-to-ceiling glass into the command center of the bank's new, fully automated IBM data center.

"This room shows our commit-

Bank, *page 8*

Banking on IS

Bankers Trust's re-engineering goals include the following:
- Eliminating inefficient operator procedures.
- Suppressing unnecessary console messages.
- Enhancing system monitoring facilities.
- Automating recovery of critical applications and program loading.

Warren Ousley *led the technology project at Bankers Trust*

Microsoft lays out tiered DBMS plan

Access gives end users programming tools

By Jean S. Bozman
LAS VEGAS

■ The Comdex/Fall '92 introduction of Access, Microsoft Corp.'s first homegrown database, marks the kickoff of a very broad client/server database strategy for the $2.8 billion software giant.

But the emphasis for the near term is on several client application development environments, or "frameworks," as Microsoft database designers continue to work on a new generation of database servers.

> Microsoft admitted last week to spending $20 million and three years on Omega, its first unsuccessful attempt to develop a database.

The company plans to complete its database blueprint during the next two years by introducing several back-end servers. These include a 32-bit version of the Microsoft/Sybase, Inc. SQL Server for Microsoft's Windows NT operating system and a high-performance Indexed Sequential Access Method database engine based on technology gained from its Fox Software, Inc. acquisition.

Last week, Microsoft announced the first fruit of the June Fox merger, FoxPro 2.5, an enhanced Xbase database and query builder (see story page 14).

Microsoft must move quickly to make a dent in Borland International, Inc.'s dominance of the PC database market, estimated at 70% to 80%. Industry analysts said it could prove to be a tough fight, particularly because $480 million Borland has several databases and a high-end server in its Interbase relational database.

But Borland is somewhat vulnerable as it tries to ship Paradox for Windows and dBase for Windows in the coming weeks.

Microsoft may be six times larger than Borland, but it will still have to define itself in the PC database market to make headway against Borland, said Tony Picardi, director of software research at International Data Corp. in Framingham, Mass.

"First they have to decide what game they want to play," he said. "They could focus on database or middleware or on data-access lan-

Access, *page 14*

IBM mulls groupware strategy

By Rosemary Cafasso
LAS VEGAS

IBM said last week it is pulling together the pieces of a more cohesive OS/2-based workgroup strategy that will address issues ranging from very basic communications needs to more sophisticated collaborative computing requirements.

Currently, IBM offers some workgroup tools, from its LAN Server software to Notes and CC:Mail, two Lotus Development Corp. packages it began reselling last year. However, it has trailed behind the likes of Lotus, Microsoft Corp. and Borland International, Inc. in charting a specific, unified strategy for the workgroup market.

IBM is now evaluating a plan that would better position its current product lineup in the workgroup market as well as add workgroup products to it. Company officials insisted they have not made any final decisions nor set any delivery dates, but if the current options turn into product, they will include the following:

- The starting point would be a new version of OS/2 with basic peer-to-peer communications that would

IBM, page 24

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Comdex highlights

Photographer Chip Simons did Salvador Dali proud by capturing the surrealistic side of Comdex (see montage page 28). For a more conventional view, see pages 20, 24 and 29 covering pen-based computing, wireless networking, OS/2's future and the lighter side of Comdex.

Executive Briefing

A comprehensive guide to the week's news

RE-ENGINEERING

Federal Express and 12 computer vendors are implementing a real-time transportation-tracking and customer service system, which they claim is the largest Unix project in the world. *Page 1*

Users who are re-engineering networks alongside business processes cite management as their key hurdle. *Page 49*

CAREERS

Asked where they would most like to work, some 1,400 IS professionals surveyed by *Computerworld* went to extremes: Entrepreneurialism and IBM got the biggest votes of confidence. *Page 76*

OUTSOURCING

Will 1993 be the year outsourcing catches up with the major insurance firms? While vendors and industry observers say yes, insurance firms are keeping mum. *Page 6*

LEGAL ISSUES

Novell and Microsoft appear to be escalating the battle over NetWare connectivity in Windows for Workgroups and NT. *Page 6*

ENTERPRISE NETWORKS

DEC's OSI-based network architecture runs up against customer inertia, TCP/IP partisanship. *Page 8*

Cabletron's upcoming hub generation will serve both traditional LAN users and early ATM implementors. *Page 10*

COMDEX HIGHLIGHTS

Microsoft is positioning its overall database strategy to focus on front-end framework environments for application development. *Page 1*

IBM said it is evaluating a plan that would offer multiple OS/2 workgroup options. *Page 1*

IBM PC Co. displays "PS/3" and other coming technologies. *Page 29*

IBM begins to lay down its desktop operating system strategies. *Page 24*

Wireless has a debutante party at Comdex, but don't expect to see it married into everyday use soon. *Page 29*

Grid and AT&T unveilings boost pen market. *Page 20*

MANAGEMENT

If your manager has been jumping down your throat and placing unreasonable demands on you, don't take it personally. Managers are constantly grappling with pressures and worries that affect how they run their departments. *Page 89*

IS managers say small, specialized systems integrators can be just the ticket for small, specialized projects. *Page 77*

The latest Harris poll finds Americans are so worried about privacy that they believe the use of computers will need to be sharply restricted. Experts say the privacy issue should be the CIO's domain. *Page 12*

E-mail

Users can link E-mail systems without laying out big money for gateways using a new E-mail linking service from Pacific Bell. *Page 49*

Putting together an E-mail privacy policy will go a long way toward ensuring acceptable E-mail practices and will likely keep your company out of court. *Page 85*

Interex (the HP user group) and the Aerospace Industry Association have crafted E-mail privacy guidelines that frown on monitoring mail for the purpose of discovering misconduct. *Page 87*

Expert systems

Fed up with swallowing $1.5 million in unbillable calls, the country's largest local phone company — Pacific Bell — is putting in an $800,000 on-line expert billing system to pursue freeloading callers and round up lost revenue. Meanwhile, IS head Eric Firdman is building and tending a bridge between the systems integrators and end users. *Page 69*

Experts and expert systems are not always a quick or easy match: At one credit information organization, it took six months for the analysts to trust a new credit-reporting expert system — and another six months to like it. *Page 73*

Large systems

A large systems software salesman tells all. His advice to buyers is to negotiate the payment schedule, not just the payment; ask for service-level agreements; and always haggle for free training up front. *Page 97*

Viruses and security

Novell issues a security fix to plug holes in NetWare v3.11. *Page 4*

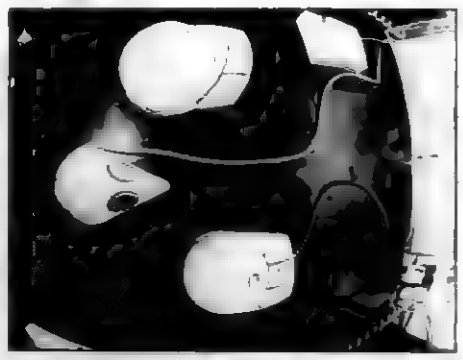
An antivirus utility for NetWare file servers is on the way from Fifth Generation. *Page 4*

The head of the U.S. Department of Justice's computer crime investigation unit has called for a strengthening of federal laws to fight new threats from computer viruses. *Page 15*

Network management

A consortium will work toward SNMP-based management of SNA devices. *Page 49*

Intel has started beta-testing its new LANDesk product, a comprehensive management tool for Novell NetWare networks. *Page 46*



Hickory dickory dock — *While the cat was away, photographer Chip Simons captured some of the Comdex wildlife on film. See page 28.*

PCs

Macintosh users give Apple middling grades on a report card. *Page 39*

Logitech expands beyond the touchy-feely world of mice and scanners and goes for the sound experience with Audioman. *Page 39*

Lotus plans to ship Freelance Graphics for Windows next month. *Page 40*

Memory chip prices and installation challenges for OS/2 and Windows users are hot topics on the bulletin boards. *Page 41*

New hardware from NEC may help spark the pen-based computer market. *Page 41*

Microsoft's Windows NT, Windows for Workgroups and Borland's Interbase were on the minds of three of the PC industry's top players at a recent meeting. *Page 41*

Groupware

Xerox hopes to carve its slice of the groupware pie with its Unix-based office productivity applications. *Page 45*

Imaging

A small New York law firm is benefiting from a network integrated imaging system designed to provide staff members with instant access to optically stored case files. *Page 45*

DBMS

Sybase's new System 10 product line was intended to address user concerns about nuts-and-bolts IS issues such as performance, backup and recovery and duplication of critical data. Users said they had voiced these concerns to Sybase designers earlier this year. **57**

Software AG tool allows automatic propagation of Adabas transactions to target databases across a network. **4**

To stir sales of its object-oriented database, HP is repackaging the software so that users can buy less-expensive evaluation kits before committing to a whole developer's package. It has also loosened its licensing policy. **62**

Midrange

Wang Labs, fighting to reorganize under Chapter 11 bankruptcy protection, previews unannounced VS machines and unveils some long-awaited Unix software. **57**

While DEC sets a good tone with its Alpha release, recharged business practices and clear migration path, it is unclear whether the company will be able to press beyond its current user base. **61**

Supercomputers

Cray Research joined the roster of companies with massively parallel processing (MPP) supercomputers last week, announcing its first MPP system, which is due in 1993. **16**

Industry

Early-stage failures of technology start-ups are easily avoidable, according to Arlen Lessin, an adviser to high-tech entrepreneurs. What is needed, Lessin writes in an open letter to President-elect Bill Clinton, is a Head Start for fledgling enterprises. **35**

After Unisys posted its fourth consecutive profitable quarter, Reto Braun, the company's president and chief operating officer, said Unisys is "reinventing" itself as a services provider. **105**

IBM as an OEM? That is the likely outcome of a long-standing deal between IBM and Intel, according to IDC's John Gantz. And when IBM becomes a purveyor of chips, customers had better be ready for other big changes. **35**

Most observers say the U.S. computer industry spends enough on research and development, but some say the money could be spent in better ways. Meanwhile, R&D partnerships are increasing. **33**

DEC loses a software VP, and its software strategy may suffer as a result. **8**

Application development

A pilot application redevelopment project has given Arizona State University room to breathe and has also cut its energy wasted on maintaining its old programs. **63**

Commitment to software productivity tools helps an oil distributor run a $3 billion business with an IS staff of four. **63**

The downward push toward PCs is in the forefront at development tools vendor company Intersolv. **63**

Departments

Advanced Technology 33
Application Development ... 63
Calendar 76
Company Index 103
Computer Careers 89
Computer Industry 105
Desktop Computing 39
Editorial/Viewpoint 34, 35
Enterprise Networking 49
Friday Stock Ticker 104
In Depth 85
Inside Lines 106
Integration Strategies 77
Large Systems 57
Management 69
Marketplace 97
News Shorts 6, 16
Workgroup Computing 45
WYSIWYG 106

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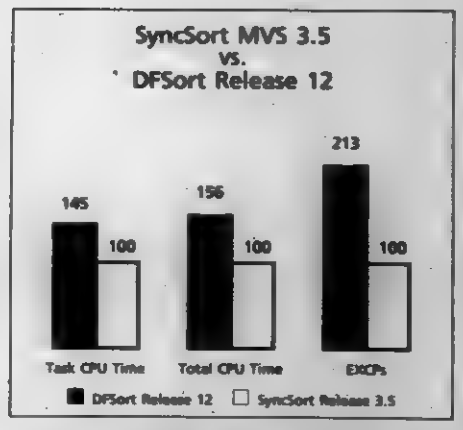

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Software AG tool mirrors Adabas across networks

By Gary H. Anthes
RESTON, VA.

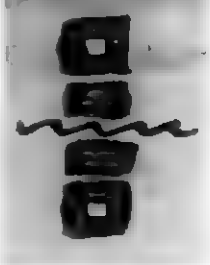
Software AG of North America, Inc. last week unveiled software that will automatically replicate Adabas transactions across networks of heterogeneous computers.

It was designed for distributed applications in which all or portions of a mainframe database must be mirrored at other sites or in other processing environments but where absolute synchronization of databases is not required.

Called the Entire Transaction Propagator, the software tool will send updates from Software AG's Adabas database management system, at user-specified intervals, from mainframes to remote databases running on other mainframes or to Unix, OS/2 or VAX/VMS platforms. The user can specify which updates are sent to which locations, and if a target node is unable to accept the transaction, the transaction is logged and sent again later.

Mike Schiff, director of the data management program at Software AG, said the new product exacts much less of a performance penalty than does the "two-phase commit" technology often used in real-time distributed applications such as funds transfer. He said 80% of distributed applications do not need to ensure that source and target databases are updated simultaneously, a requirement that adds much processing complexity.

Doubling up
The database server segment of the superserver market is expected to grow at a compound annual rate of 51% through 1996, fueled primarily by the emergence of distributed database requirements, according to Brad Day, principal analyst at Dataquest, Inc.



"Users are insisting on this," said Richard Finkelstein, president of Chicago-based Performance Computing, Inc. He agreed that most users do not need the absolute synchronization offered by other database vendors such as Oracle Corp. and Sybase, Inc. He said a large Oracle user told him recently that his company could not afford to stop processing everything whenever a node went down.

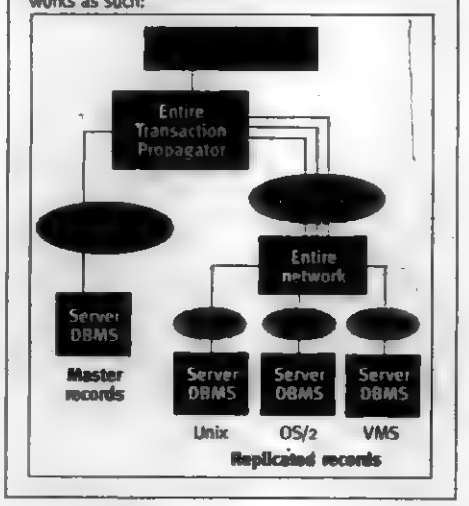
"For them, it is more important to keep processing and less important to have everything synchronized," Finkelstein noted.

Beta-test user Frank Stromboe, director of information services for the city of San Antonio, said the city will use the product in its 911 emergency dispatching system. The application maintains a master database of names, addresses and related information on an Amdahl Corp. mainframe. Periodically — roughly every 10 minutes — a CICS program running in the background will take new updates and send them to a pair of NCR Corp. 3450 minicomputers, which are used by emergency dispatchers.

Stromboe said the alternative to using the Transaction Propagator would have been to put together a manually invoked batch process. "It might work 99% of the time, but there's that 1% chance that they would look at an address and it would be wrong," Stromboe said. "It might be a life-and-death situation."

The product will ship by year's end and will be priced between $7,600 and $113,500.

Software AG's Entire Transaction Propagator works as such:



Antivirus utility for NetWare servers due

By James Daly
BATON ROUGE, LA.

Users of Novell, Inc.'s NetWare will gain an added layer of network security armor today when Fifth Generation Systems, Inc. unveils a NetWare Loadable Module (NLM) designed to protect Intel Corp. 80386-based file servers running NetWare from both known and unknown viruses.

The Untouchable Network NLM will use a multipronged security approach to detect and eradicate viruses, Fifth Generation officials said.

During the initial program installation, Untouchable Network NLM scans and flushes out more than 1,500 known viruses, including self-mutating viruses and viruses located on compressed and archived files.

Another equally important facet of protection occurs during this phase: Untouchable Network NLM fingerprints and registers all executable files on the server, then stores this information in the protected DOS partition area.

If a virus is later detected, the product uses this database of file signature information as a reference to reconstruct infected files to their former healthy state.

Unlike other NLM antivirus methodologies, Untouchable Network NLM will not need to know a new virus' signature before it can protect users from the malicious code. Instead, the utility employs a method called integrity checking, which looks for the changes in executable code in application files that betray all viruses.

Thus, network administrators can avoid the headache of frequent virus signature updates.

Untouchable Network NLM is slated to be available by the end of next month at a suggested retail price of $995 per server. A bundled package of Untouchable Network NLM for file server protection with a 10-node starter kit for workstation security can be had for $1,295.

Novell issues network security patch

Device will guard against LAN break-ins but not careless users

By Michele Dostert
PROVO, UTAH

Novell, Inc. has issued the first part of a two-phase,patch to its NetWare v3.11 network operating system designed to plug up the security holes discovered last month in a Dutch laboratory.

Workers in that laboratory discovered that if a user could log on to a NetWare local-area network in any capacity, even the "guest" account commonly established on LAN servers, the user could then forge supervisory privileges on the LAN. This would then allow the trespasser to roam the LAN at will, deleting, copying or altering any data he chose.

By popular demand
A Datapro Information Services Group survey of 1,102 security professionals found that the most popular network security mechanisms currently implemented in the U.S are commercial and in-house access control software and dial-up port protection.

In response, the first phase of the patch, which is now available, consists of a NetWare Loadable Module (NLM), a new user shell and several new utilities.

The user shell generates 16 bytes of information that are appended by the NLM to the packets as an 8-byte NetWare core protocol signature. The NLM uses a security algorithm, licensed from RSA Associates in Sunnyvale, Calif., to add that "signature" to each packet.

Each packet's signature depends on the previous packet, so an intruder could not simply capture a single supervisor's packet and then forge the signature.

Good practice
"The Netherlands break-in was actually good for us: It showed us the holes in a laboratory setting, and we used the information to design the current patch," said Jan Newman, Novell's vice president of systems. He claimed that "none of our users had problems because of it."

Although the problem was first discovered on a NetWare LAN, industry experts said all LAN operating systems are vulnerable to the same kind of forgery.

Novell said it will share its research and information with other LAN vendors so that LANs as a whole will not be vulnerable to attack.

According to Newman, the second phase of the security patch, which will be available sometime in 1993, will be a packet encryption solution that will encrypt the data traveling across LAN cable.

This will guard against intruders who physically tap into LAN cables or intercept wireless transmissions, collect packets and then decode them.

Novell said it will share its research and information with other LAN vendors.

"Intruders will be able to decode the protocol types but not the data in the packets themselves," Newman said.

While users welcomed Novell's security patch, most said their biggest security breaches come from their own users.

"I'm not worried about the determined hacker or someone tapping into my cable; I worry about the user who gives someone else his password," said Gregg Scott, network manager at Oregon State University in Corvallis, Ore.

James Shipp, an MIS engineer at WordPerfect Corp. in Orem, Utah, agreed. "It's people walking away from their desks without logging out, people who don't change their passwords — those are the most common security threat."

REFERENTIAL INTEGRITY

SYBASE

200 LINES OF PROPRIETARY CODE

```
/*    Make sure deletes manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*    Make sure deptno column of inserted emp rows is either null
      or specifies an existing department. Also make sure that
      mgr column of inserted emp rows is either null or specifies
      an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*    check "emp.deptno <--> dept.deptno" foreign/primary
            key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*    check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

These two programs do exactly the same thing: direct the server to enforce business rules to ensure data integrity. Oracle does it in 12 lines of industry standard SQL. Sybase requires 200 lines of their vendor proprietary language, Transact-SQL™. If productivity is important to you call 1-800-633-1071 Ext. 8186 for a free copy of "Client/Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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News Shorts

Oracle 7 for VAX due in December

Oracle Corp. managers told an East Coast Oracle user group last week that production versions of Oracle 7 will arrive next month for Digital Equipment Corp. VAX/VMS machines and in February for Unix machines. Oracle said last month that it had shipped its Oracle 7 to a small number of selected user sites. But most Oracle 7 code in user hands was shipped with the developer's copy released this fall.

Reeling Sequoia posts loss

Beleaguered fault-tolerant vendor Sequoia Systems, Inc. last week announced a net loss of roughly $9.19 million for the first fiscal 1993 quarter on revenue of only $9.9 million. About $3 million of that was restructuring fees to cover staff cuts of around 25%. Sources said that Hewlett-Packard Co. may acquire more Sequoia stock — it currently holds 6% — to infuse cash into its strategic partner. But Sequoia officials would only say that they are talking with their partners in an effort to bring in badly needed capital. A rumored sale of the entire company to HP is unlikely because of potential liabilities as a result of a class action suit filed by Sequoia's shareholders. The shareholders are suing for damages as a result of Sequoia's restatement of financial results for 1992. A third and final restatement of those 1992 figures will be released within a few weeks, Sequoia officials said.

Nynex drives ISDN golden spike

Nynex Corp. has gained Federal Communications Commission approval to deliver the first regional Integrated Services Digital Network (ISDN) service to hook up to long-distance carriers' ISDN connections. The service will be the first to make use of National ISDN-1 standards that enable local and long-distance carriers' ISDN switches to communicate. When all carriers implement the standard, users will be able to set up switched voice, data and video ISDN links from one end of the country to the other. Formerly, regional operating companies' ISDN services were restricted to a given local access and transport area, and long-distance ISDN services did not extend over the local loop, forcing customers to use dedicated lines for that segment of the link.

SHORT TAKES **Dun & Bradstreet Software** began shipping host-based financial applications for Unix systems from **Data General Corp.**, **Hewlett-Packard Co.** and **ICL**.... Fast food giants **Taco Bell Corp.** and **KFC Corp.** last week announced an agreement to develop a point-of-sale computer automation system with **SHL Systemhouse, Inc.**.... **DEC** was selected by **Chevron Corp.** for a two-year, $5.8 million project to automate business and accounting practices at 675 of Chevron's Food Mart convenience stores and gas stations in the U.S.... **NCR Corp.** has kicked off a program to provide its resellers with financial and other incentives to migrate **AT&T** 3B2 and NCR Tower systems users to NCR System 3400 servers.... **Sybase, Inc.** has agreed to make the Sybase SQL Server relational database management system and related software available on **Unisys'** U6000 Unix servers beginning in the first half of 1993.... **The ASK Group, Inc.** announced Release 9.0 of its 18-year-old MANMAN manufacturing application software. The VAX version has a new quality-measurement software module that stores data in DEC's Rdb relational database.... **Sybase** announced Ada Workbench, a graphical user interface framework that lets users code Sybase database applications in the Ada language.

News shorts, *page 16*

Microsoft, Novell square off

By Michele Dostert

■ Novell, Inc. and Microsoft Corp. are both downplaying their current squabble over the insertion of NetWare client code into Windows for Workgroups, but behind the scenes, the two are reportedly considering their legal options, according to a source close to both firms.

Novell last week confirmed that it sent a letter to Microsoft officially canceling an agreement to let Microsoft use Novell's NetWare client code.

Microsoft Chairman Bill Gates, meanwhile, when questioned at Comdex/Fall '92 regarding the dispute, appeared unruffled by the legal maneuvering. "Microsoft is committed to offering easy NetWare connectivity in both Windows for Workgroups and Windows NT. We would like to work it out with Novell, using their code and joint support, but we will do the NetWare client ourselves or license from third parties if we have to," he said.

The NetWare client code currently shipping in both Windows and Windows for Workgroups consists of Novell's IPX networking protocol and parts of the NetWare core protocol that allow the client to be recognized by and communicate with NetWare servers. While Microsoft could easily emulate or license an IPX stack, the rights to the NetWare core protocols are tightly held by Novell. It would be difficult for Microsoft to duplicate them without risking patent infringement.

The dispute surfaced early last month, the week before Windows for Workgroups was scheduled to begin shipping. Novell's position is that while it has supplied the NetWare client code to Microsoft free of charge for inclusion in Windows 3.1, the company claimed it never agreed to its insertion into Windows for Workgroups. Novell maintains that both Windows for Workgroups and the forthcoming Windows NT product, because of their built-in networking capabilities, are not the same products as Windows.

"I see why Novell thinks WFW and Windows NT, with their networking capabilities, are threats to NetWare, but I think they're wrong," said Craig Burton, president of the Salt Lake City-based local-area network industry analyst firm The Burton Group and a former Novell executive.

"Nobody's going to pull out their familiar, powerful NetWare just because they now have WFW or Windows NT as their desktop environment. Novell should stick to their plan of supporting all the clients that its customers use and resolve this thing quickly," Burton said.

Dwayne Walker, director of Windows NT and networking products at Microsoft, said the two firms were continuing discussions. "Neither one of us would move down any kind of path that would jeopardize our technologies working together," he said.

However the dispute is resolved, there is the question of what to do about the copies of Windows for Workgroups that have already shipped with Novell code. Neither Novell nor Microsoft, both of which are trying to keep the dispute under wraps, would address this issue.

Insurance eyes outsourcing

By Nell Margolis

Are the nation's insurance giants about to break their unspoken taboo against information systems outsourcing?

Outsourcing vendors say yes, and industry observers increasingly agree, but to date, no major life insurance player has given up a piece of its IS rock to an outsourcer.

"Sure, we look at outsourcing IS," said Lawrence Bacon, chief information officer at Hartford, Conn.-based The Travelers Corp., which is planning to cut up to 25% of its IS staff as part of a corporatewide downsizing effort.

Other insurance firm IS executives — for instance, New York Life Insurance Co.'s John Foy — echoed Bacon's words.

Loss of control feared

But while interest is high, noted Suzanne Lattimore, executive director of the Data Processing Management Association, "There's still a lot of concern that outsourcing means loss of control over big, complex systems that are the life blood of policy processing." Lattimore is a former director of information support services at Nashville-based American General Life & Accident.

"All the symptoms of an industry niche about to outsource are there," said J. P. Richard, outsourcing analyst at Vienna, Va.-based market research firm Input. These include profits under extra pressure from the prolonged recession and brutal competition as firms scramble to top one another's service levels in a market where product differentiation is hard to come by.

Similar factors have turned large banks into a gold mine for outsourcing vendors during the past several years.

There is evidence aplenty that vendors and analysts believe insurance outsourcing is about to take off:

- IBM outsourcing subsidiary Integrated Systems Solutions Corp. (ISSC) has teamed with Columbia, S.C.-based insurance software vendor Policy Management Systems Corp. (PMSC) to launch an outsourcing joint venture targeted at large insurance firms.
- Electronic Data Systems Corp. has an approximately 1,000-person special business unit aimed at life, property and casualty insurance firms and a unit twice that size to serve the health insurance market.

> Insurance firms spent $693 million on outsourcing over the last two years, compared with $1.06 billion spent by financial services firms.

Firms will eventually fall into these and other waiting arms, said Mark Hodges, a principal at Mountain View, Calif.-based G2 Research, Inc. "But not necessarily as quickly as some think," he said. Early adapters of information technology and widely seen as still in the vanguard, huge insurance firms are more apt to view their IS operations as a route to increased efficiency than as a roadblock, he noted.

The first flurry of demand is likely to come from the health insurance community, particularly as the coming Clinton administration begins to act on its mandate to address the nation's health care crisis, Hodges said.

ISSC Marketing Vice President Ed Archer agreed. The ISSC/PMSC joint venture has already made one big health insurance score: a $52 million outsourcing and co-development deal with Blue Cross/Blue Shield of New Jersey, signed in August. What's more, "not a day goes by that I don't get a call from a health insurance provider inquiring about managed care opportunities," Archer said.

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DECnet for OSI runs into TCP/IP roadblock

By Elisabeth Horwitt
MAYNARD, MASS.

Digital Equipment Corp.'s decision some years back to embrace openness through the Open Systems Interconnect (OSI) standard has resulted, after many years of labor, in a network architecture that essentially is almost as closed as its predecessor. The reason: The industry seems to be moving en masse toward Transmission Control Protocol/Internet Protocol (TCP/IP).

DEC is in the process of making functions friendlier for beginners.

"If you're a DEC customer attracted to DECnet Phase V features such as distributed naming [of network nodes], your problem is that Phase V does not connect your DEC systems to Unix or local-area network environments," said Rick Villars, a director at International Data Corp. in Framingham, Mass. "TCP/IP does."

Several DEC customers said that while they like several of DECnet Phase V's sophisticated features, they have neither the time nor any immediate pressing need to implement a new, complex network architecture.

"It's sitting under my desk in a box with the shrinkwrap on it so the dust won't get in it," said Jim Hendricks, senior telecommunications analyst at Tyson Foods, Inc. in Springdale, Ark. He said he expects to install Phase V "within the next year or two, or as soon as a major application comes along that needs Phase V capabilities."

"DECnet Phase V has nothing that will force us into it today," said Leslie Multz, director of computing and communications resources at Stevens Institute of Technology. "DECnet IV is working, and the first round of anything is suspect; we'll let someone else be first on the block."

Several network managers complained that Phase V's greater sophistication means an unwelcome increase in administrative overhead. "Phase V has a lot of great new functions, all of which you have to administer even when you don't need them," said David Osterman, chairman of the University of California Lawrence Livermore National Laboratory's network advisory group.

"For us, [DECnet Phase V] is a way to get our feet wet with OSI" while continuing to migrate the majority of systems to TCP/IP, said Sholom Bryski, managing director of distributed systems and networks at Bankers Trust Co. Bryski was one of several users to praise DEC for providing application interoperability and portability across DECnet IV, OSI and TCP/IP under the DECnet V umbrella. "Then, if the world ever goes from IP to OSI, as DEC originally intended, we're ready."

According to Henk Hazelhoff, associate consultant of corporate information systems at Dow Chemical Co., Dow "believes that OSI, in the longer term, will turn out to be the better choice" as a standard. "IP is there and easy to implement, but it's less sophisticated."

The need to support Government Open Systems Interconnect Profile coupled with insufficient Phase IV address space is driving Lawrence Livermore toward DECnet Phase V, Osterman said.

However, even government users are finding ways to support TCP/IP rather than pure OSI, Osterman said. "I think DEC now regrets its decision to go with an OSI-based open network architecture," he added. "Now they're the only vendor keeping OSI alive."

DEC exec's exit spurs software concerns

By Melinda-Carol Ballou
MAYNARD, MASS.

■The departure earlier this month of David Stone, Digital Equipment Corp.'s vice president of software, for a position at AT&T has some people both outside of and within DEC wondering how its software group will fare during the company's ongoing reorganization.

Sources close to the company said a number of office automation packages will be among the first to be cut back. Moreover, up to 1,000 employees in software could lose their jobs next month amid continuing personnel reductions.

While DEC's vision on the software side has often been unclear, it was galvanized by Stone.

Many DEC software employees are "stressed and nervous" now, following Stone's departure, according to one internal source.

Mr. Nice Guy

Stone's replacement, Dennis Roberson, is well-respected in the software group and has committed to follow through on Stone's plans to run software across platforms and push forward on Network Application Support (NAS), groupware and commercial applications, sources said.

But some observers said they feel that he is "too nice" to be able to address political conflicts as the company is restructured.

Roberson has his work cut out because budgets have already been finalized. The approximately 1,000 employees expected to be laid off on the software side alone by the middle of December will primarily come from research and development, sources said.

Also in the works are plans to cut future development on a number of packages, including DECwrite and DECpresent office automation.

VAXset and DEC Rally development tools are expected to fall under restricted development budgets, sources said. A DEC spokesman denied that such plans have been made at this point.

Rdb plans vague

Plans for a commercial database strategy for DEC's Rdb remain foggy. Although DEC emphasized its commitment to Rdb by announcing a decision to port it to Microsoft Corp.'s Windows NT last week and by hiring more Rdb engineers, DEC decimated its marketing group several months ago, and replacements have yet to be assigned.

This is an "unsupportable" situation if DEC is to compete with the well-oiled marketing machines elsewhere in the relational database management system market, said Lynn Berg, a director at Gartner Group, Inc., a market research firm in Stamford, Conn.

Bank touts revamp as customer draw

CONTINUED FROM PAGE 1

Quick benefits
Substantial time savings and enhanced system monitoring were two immediate benefits from Bankers Trust's use of Candle's AF/Operator, Omegamon for CICS and OmegaView. Messages from IBM's CICS are captured with AF/Operator, while Omegamon for CICS picks up other system alerts. The two are combined and displayed by OmegaView as a graphic showing the "health" of the CICS region.

ment to technology," said Warren Ousley, managing director of the technology center. "We're trying to demonstrate to customers how our technology works on their products. We're putting our money where our mouth is."

Banking executives and consultants agree that corporate financial customers today — especially in trust or cash management services — have to ensure that an operation "is a world-class user of technology," said George DiNardo, a partner at Coopers & Lybrand's financial services consulting group.

In the next four to six months, Bankers Trust will complete a merger of its IBM facility with its Digital Equipment Corp. data center, which is located across the Hudson River in New York. The merger will be more virtual than physical, with more than 50 VAXs remaining in their current home.

Data center resources will be transparently accessible to users over a Fiber Distributed Data Interface (FDDI) network, and protection against data loss will be insured by Micro Technology, Inc.'s FailSafe RAID-5 disk array.

By automating and merging the data centers, the bank will save money and be able to service its customers more quickly, Ousley said. "Bankers Trust has automated just about every possible function in the data center, ranging from system management to tape management of silos," he said. "It's the whole gamut — from soup to nuts."

Ousley would not discuss any financial aspects of the automation and merger project, but he did say that the year-long data center automation was "cost-justified." System reliability and availability have improved sharply, while a 20% to 30% staff reduction trimmed data center operations costs.

Another driver behind the automation project was "cost avoidance," as the increasingly complex environment was bound to require a larger data center staff down the road. "We wanted to grow MIPS, not people," Ousley said.

Now managing a trio of IBM Enterprise System/9000 systems are four IBM Personal System/2s running system operations software, automation applications and utilities supplied predominantly by IBM and Candle Corp.

The re-engineering work got under way in October 1991, with the bank's team of technical managers working closely with the two vendors in the complex ordeal of automating a diverse collection of system software onto the common platform of IBM's NetView.

By the end of next month, the combined data centers will share a collection of nine Storage Technology Corp. automated tape libraries or silos, using software and hardware supplied by DEC and Storage Tek.

"To the best of our knowledge, this level of complexity in sharing everything between DEC and IBM has not been done before," said Peter Coriasco, a vice president from the DEC side of the technology center.

Consultants who follow the financial services industry said Bankers Trust's creation of a technology "war room" for customer briefings is a practice still rare in banking. The concept has long been popular, however, with the major system vendors and outsourcing firms.

"Banks haven't really considered themselves to be selling technology as much as financial products dependent on technology," said Ladd Willis, executive vice president of First Manhattan Consulting Group in New York.

Yet Bankers Trust and competitors such as Chemical Banking Corp. are clearly changing that scenario, Willis added, as the task of marketing specialized services such as funds transfers, securities processing and cash management requires a tighter alliance between business and technical units.

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Cabletron offers ATM migration

By Elisabeth Horwitt
ROCHESTER, N.H.

Cabletron Systems, Inc. last week disclosed a migration strategy that includes some shrewd bet-hedging in terms of how quickly users will decide to turn in their trusty old local-area network cards for exciting but expensive new technologies such as Asynchronous Transfer Mode (ATM).

A product rollout slated to start in April will provide Cabletron hubs with ATM support and the ability to offer a major throughput boost to users' existing LAN cards, according to company spokesmen.

The hub vendor announced its entry into the ATM market through an agreement to remarket Fore Systems, Inc.'s ATM switches, which are said to support 2G bit/sec. throughput. In addition, an ATM card slated for April 1993 shipment will enable Cabletron Multi Media Access Center (MMAC) hubs to send ATM packets to a Fore Systems switch at speeds of 100M bit/sec. or 140M bit/sec., a Cabletron spokesman said.

Cabletron user Blue Cross/Blue Shield of Connecticut likes the idea of the vendor's providing both integration and — through its Spectrum platform — network management of "a bunch of plug-in components that we'll need [to meet users' future networking requirements] in intelligent progression," said Graham Morrison, project leader for network design and engineering at the health insurer. Blue Cross/Blue Shield plans to start looking seriously at ATM next year, he added.

Networking

Cabletron will not be Blue Cross/Blue Shield's only option. Synoptics Communications, Inc., Cabletron's chief rival, spent $10 million during a three-year period developing its own ATM technology, which will come to market sometime next year, said Paul Callahan, a senior analyst at Forrester Research, Inc., a Cambridge, Mass., research firm. Ungermann-Bass, Inc. is working with BBN Communications on ATM technology spanning the local- and wide-area networks.

For those users who are not ready to throw out their old LAN boards, Cabletron announced that its next generation of hubs, due out next spring, will provide each Ethernet user with a dedicated 10M bit/sec. connection. The hubs will use ATM technology to handle the multiple 10M bit/sec. links without degradation; however, users will be able to employ their existing Ethernet cards, the spokesman said.

Duplex Ethernet

Cabletron's new hubs will also allow Ethernet LAN devices to support full-duplex Ethernet — 10M bit/sec. sending and receiving simultaneously — by eliminating the need for LAN devices to keep watching for collisions, the spokesman said.

However, users will have to trade their old LAN cards for new, Cabletron-supplied cards to gain this feature, he added.

A third key feature of Cabletron's upcoming hub generation will be Secure Fast Packet Switching, which is said to incorporate a variety of filters to ensure that users access only those networks and networked resources to which they are entitled.

Blue Cross/Blue Shield is interested in Secure Fast Packet Switching as a way to allow customers to access their own medical histories and insurance data on the network and still assure them that "your data is safe with us," Morrison said.

Cabletron will also provide "feeder node routing," in which MMAC hubs will be able to feed data to multivendor routers via industry standards such as Point-to-Point Protocol, the vendor said.

The routing feature will enable the hub to intelligently handle protocols such as Transmission Control Protocol/Internet Protocol, which minimizes broadcast storms and other problems that beset bridges.

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Public: 'Computers invade privacy'

By Mitch Betts
WASHINGTON, D.C.

The vast majority of Americans believe computers have improved the quality of life and customer service, but they are also extremely worried about the lack of privacy in the computer age, according to a nationwide poll slated for release this week.

In fact, more than two-thirds (67%) of the public agreed with the statement, "If privacy is to be preserved, the use of computers must be sharply restricted in the future." The poll was conducted by Louis Harris and Associates, Inc. in New York.

For professionals who build computer applications, the overriding message from the poll results is that unless privacy safeguards are built into systems, a severe public backlash against computerization is possible, experts warned.

The poll comes at a time when the American public has been deluged with reports of easy access to credit reports, computer hackers, proliferating consumer databases for targeted marketing and "information brokers" who buy and sell personal data.

Computer professionals need to have the same strong conviction about information privacy as the medical profession has about medical confidentiality, said Gwen Bell, president of New York-based Association for Computing Machinery, Inc.

She added that curtailing the use of computers is not the answer to the privacy problem. "We didn't stop the automobile because there were car accidents. It has taken us a while to get air bags and other safeguards," Bell said.

Losing control

The answer is for businesses to give consumers more control over how information about them is used and circulated, said Mary J. Culnan, associate professor of business administration at Georgetown University. The Harris poll found that 76% of Americans believe they have lost all control over personal information.

Giving consumers more control means giving them easy ways to "opt out" of direct marketing campaigns and correct errors in credit databases, as well as other "fair information practices," Culnan said.

In some cases, the only thing companies have to do is provide a check-off box on order forms so that consumers can elect not to have their names and data sold to third parties. But it may require passage of federal legislation that codifies those fair information practices before consumers have real privacy rights that can be enforced, Culnan said.

Most information systems professionals duck the privacy issue, Culnan said [CW, June 3, 1991]. She maintained that information privacy is a business issue that should be part of the chief information officer's domain "if CIOs really want to be serious players in the executive suite."

Companies that roll out products or services that fail to respect privacy sometimes find that consumer protests force them to retreat at a financial loss. Lotus Development Corp. withdrew its Marketplace CD-ROM of consumer data after widespread protests, and Citicorp is terminating its frequent-shopper database because of privacy and business problems, Culnan said.

"The companies who design their systems and practices to maximize privacy for consumers" and quality service will have an advantage in the marketplace, said C. B. Rogers Jr., chairman and chief executive officer of Equifax, Inc., a credit and demographics information service. Equifax, based in Atlanta, sponsored the Harris poll.

Alan F. Westin, a professor at New York's Columbia University who developed and analyzed the survey, said Americans' ambivalence about computers is quite rational.

"The public can perceive both positive benefits in their daily lives from the swift and customized consumer services they now enjoy," Westin said, "but also worry about the accumulation of too much information, erosion of confidentiality and threats to information security that they see taking place in the mid-1990s."

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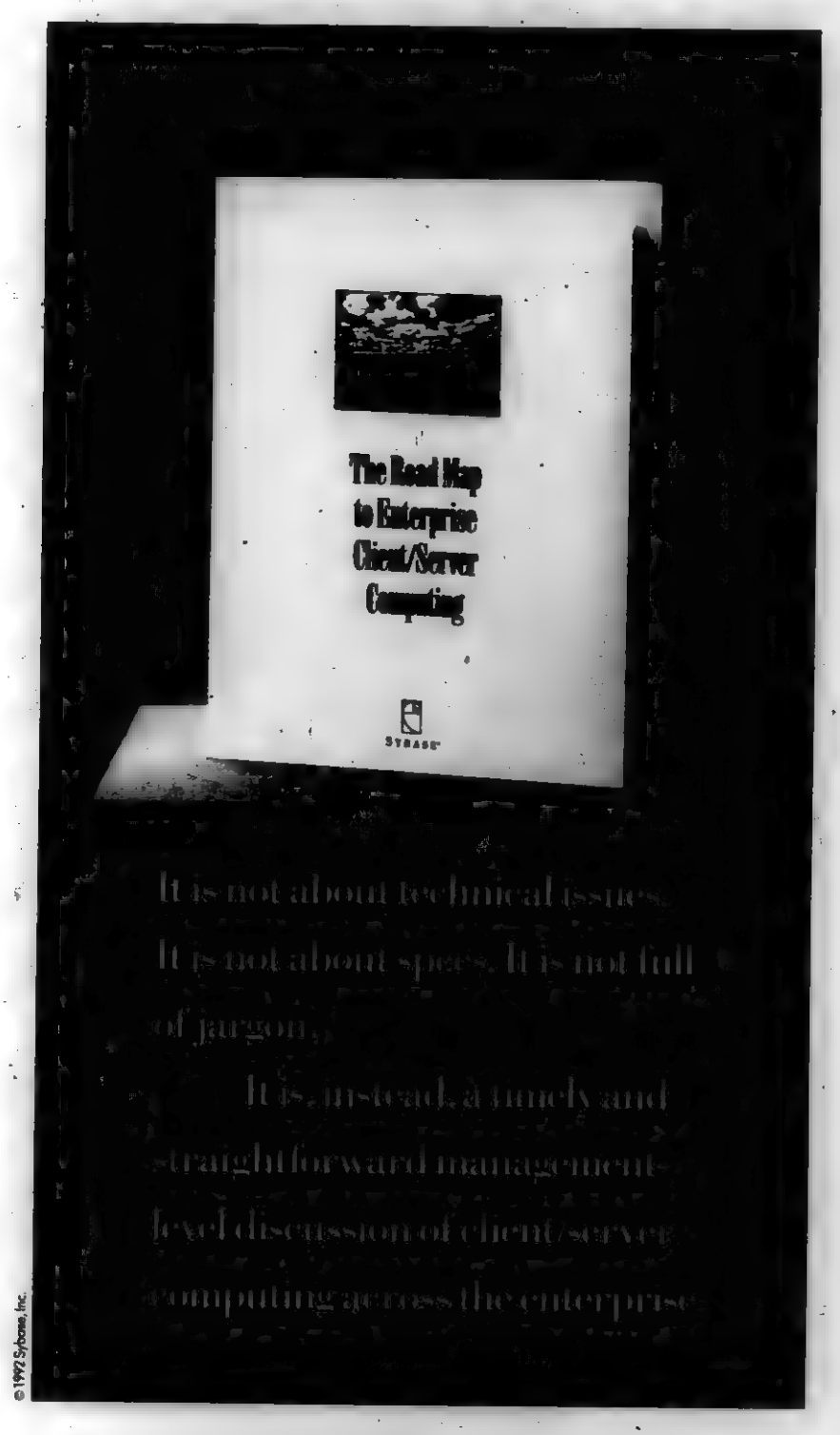

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Microsoft lays out tiered DBMS plan

CONTINUED FROM PAGE 1

At a glance

Access involves users in the IS programming process.

It gives users a building-block approach to writing database queries and reports and gives programmers a language similar to Microsoft's Visual Basic, called Access Basic.

Access has special modules called "wizards" to help users create and modify database forms and reports. There are "cue cards" for on-line Help, as well as macros for routine database query routines and support for a version of Visual Basic.

Access Basic also contains its own relational database engine.

guages."

"I don't expect [Microsoft] to be the dominant player in database, but I do expect them to be a thorn in Borland's side," said Tim McCollum, a research vice president at Dean Witter Reynolds in New York.

So far, Microsoft has delivered three of four targeted application development frameworks for different types of programmers: Access for end users; Visual Basic for programmers, which will be blended with the Access database query language; and FoxPro 2.5 for Xbase developers.

A fourth environment for C programmers will appear in late 1994, said Charles Stevens, business unit manager for Microsoft's Database Products Division.

Other options

Even without a broad range of homegrown database servers, Microsoft applications can address other vendors' databases through Microsoft's Open Database Connectivity (ODBC) programming interface. Already, more than 40 vendors have signed up for ODBC, including database makers Oracle Corp., The ASK Group, Inc.'s Ingres Products Division, Informix Software, Inc. and Sybase.

Access can link directly to several databases: Microsoft's SQL Server for OS/2, Borland's dBase and Paradox, and Novell, Inc.'s Btrieve. Microsoft said it plans to support Oracle 7 sometime in early 1993.

A more important issue for Microsoft is that back-end database servers have already proved a formidable challenge. Microsoft admitted last week to spending $20 million and three years on Omega, its first, unsuccessful attempt to develop a database. Next came the Cirrus project, which produced Access. Microsoft Chairman Bill Gates reportedly did not think Omega had enough unique features to be a commercial success.

Database development woes also appear to have stalked the Access project. Originally scheduled for June, Access' formal release was delayed until Comdex last week for technical reasons.

"The good news is that it will empower users who are demanding access to corporate data," said Peter Kastner, a vice president at the Aberdeen Group in Boston. "The bad news is that Access alone should not be viewed as a tool that can craft all the applications in an enterprise."

Programmers may need to write C programs or use database-specific tool kits to take advantage of database-specific features such as stored procedures and triggers in relational databases, analysts said.

Ready to experiment

Some Microsoft users said they are eager to try out Access' modules, which are aimed at various levels of programmer skills.

"I'm going to buy a couple of copies to see if everything in the specs holds true," said Michael Fitzmaurice, MIS director at the National Association of Broadcasters in Washington, D.C., which has a Microsoft SQL Server for OS/2 and a Sybase database on its Novell local-area networks.

"An end user could design the forms and reports by himself, then ask us to wrap some more code around that," he said.

Bankers Trust Co. is likely to team Access end users with business unit developers, said Jon Lonoff, assistant vice president at the New York bank's Technology Strategic Planning Group.

"End users aren't going to go off and buy this on their own," Lonoff said. "Eventually, they'll talk to the developers because they're going to need IDs to reach the target databases."

FoxPro 2.5 gets thumbs-up

Microsoft's demonstration of the soon-to-be released Version 2.5 of its FoxPro database drew applause from the Comdex audience.

Dave Fulton, founder of Fox Software, Inc. and now database architect at Microsoft, showed off new FoxPro features to the appreciative crowd. Among the additions were the following:

- A completely Windows-hosted environment.
- Support for running dBase III and FoxPro applications unmodified.
- The ability to "Windowize" DOS-based FoxPro applications, making them more graphical without the user's having to change any code.
- Speed improvements on the order of three to eight times.
- Dynamic Data Exchange and Object Linking and Embedding support.

"If I was still at Fox, I'd ship it in the next two weeks," Fulton said. The product is scheduled to ship sometime in the first quarter of 1993.

Unix net helps Fedex say 'no problem'

CONTINUED FROM PAGE 1

nually for the past four years and currently tops 2 million packages per day.

Jones, who took over former CIO Ron Ponder's slot a year ago, said he views the project as a short-term expense with long-term gains. So while costs to implement the project may be high, they are a known quantity, unlike other investments.

For example, Fedex lost "several million dollars" in the early 1980s by getting into fax mail services before the market was ready, according to Otto Grote, an analyst at Derby Securities in New York.

To grow volume in the business it knows best while avoiding additional infrastructure, Fedex is rebuilding an IBM mainframe-based customer service and package-monitoring system to run over networks of mostly Sun SPARCstations being rolled out now. The new configuration is intended to give Fedex views of the business down to the individual customer level. Once those details are evident, the company can schedule vehicles and crews more efficiently, Jones said.

Dennis Jones: *Fedex wants to grow without adding costs*

Systems on tap

Key new systems include the following:

- **Command and Control** is a Unix client/server-based transportation system to monitor — in real time — Fedex's 400 planes and thousands of ground vehicles on delivery routes. The system also tracks weather conditions and Federal Aviation Administration bulletins.

Seventy-five Unix workstations from Sun, HP and National Computer Division are to be installed in the U.S. within 18 months. The boxes will run on an Ethernet wide-area network, which replaces an IBM mainframe-based Systems Network Architecture configuration.

- **Cosmos**, a 10-year-old, mainframe-based package tracking system, is in for a face-lift. In-house-developed graphical user interfaces have, in beta tests, cut user training time in half, from six weeks to three, according to Laurie Tucker, vice president of customer automation systems. Cosmos data, such as bar-code scans from Fedex envelopes, will be available to Command and Control users.
- **Powership** is also being overhauled. Unveiled four years ago, the free customer self-maintenance program puts a terminal at customer sites that ship more than six packages daily. The sender fills out air bills electronically and can tap into Cosmos for tracking data. The revamped version will include completely electronic self-invoicing and remittance, Tucker said.

Fedex facts

Four hundred of Fedex's 22,000 customers do their own package tracking and billing estimates electronically via dedicated terminals that Fedex provides free. The setup has cut paperwork 45%, to about one million documents processed per day.

Fedex moves 2 million packages per day.

While package volume has grown in the 20% range annually for the past few years, revenue growth has not been as noteworthy. Sales for 1992 topped $7.6 billion, up about 10% over 1990's $7 billion.

Fedex has run into rough riding against rivals such as United Parcel Service, Inc. and Roadway Express, Grote said, adding that fax technology has also cut into courier business. Fedex "is a fabulous company, but they're getting zapped," he said. "Their technology has been a differentiator, though."

Initial design on Command and Control began 18 months ago. Fedex's 3,000 programmers worked closely with developers from Sun and HP to model business processes using object-oriented tools including C++ from Borland International, Inc.

However, Borland is not one of the dozen partners. Sybase, Inc. and Oracle Corp., among others, have supplied relational database management systems.

"We don't like to strap ourselves to one vendor," Jones explained.

Convenient access

Eventually, each of the company's 40 departments will have access to the same information from a single Unix workstation. The old system was composed of 38 major mainframe applications available through dumb terminals.

Complete rollout of the entire Unix system will take another two years and may be revised. Imaging, for example, may play a larger role. Overseas imaging pilots have "gone well," Tucker said, paving the way for testing to begin here next year.

Although Jones said he has no immediate plans to sell the new system to rivals, going commercial is by no means unthinkable. "If marketable products fall out of this, fine," he said.

Update fraud law, G-man says

By James Daly
CHICAGO

The head of the U.S. Department of Justice's computer crime investigation unit is calling on Congress to add teeth to the Computer Fraud and Abuse Act to fight the growing threat of computer viruses.

"Criminal laws need to reflect technological advances," said Scott Charney, speaking at the Computer Security Institute's annual security conference last week. "Unfortunately, technologies advance faster than the law, and some of the statutes are out of date."

The Computer Fraud and Abuse Act of 1986 made it a violation for anyone to knowingly access, without authorization, a computer that is used substantially for government and/or financial purposes. While still probably the most significant law of its ilk on the books, Charney said it is burdened with loopholes and has simply been outrun by today's electronic bandits.

"Should a disgruntled employee at a hospital be immune from prosecution because he had the 'authority' to access the computer in which he inserted a virus and destroyed thousands of patient records?" Charney asked.

Charney had harsh words for the Federal Wiretap Statute. He called portions of the law that make it difficult for users to monitor their own systems "the too-stupid-to-be-true" rule. Such prohibitions should be loosened to reflect the swiftness at which computer crime can occur, he added.

Charney said he is helping to draft a legislative proposal that would criminalize the introduction of malicious programming code into computers. The act does not criminalize the increasingly common practice of planting viruses in apparently legitimate programs and then mailing them to companies that insert them into their machines.

"In such cases, the only 'access' to the computer is one that is authorized — that is, an employee accessing their own machine," Charney said.

As such, the statute needs to be amended to criminalize conduct where an individual intentionally dupes an innocent party into inserting malicious code into a machine.

Charney said the better view is to move away from the concept of access and focus on whether the particular use of the computer is authorized.

"It is important that the statute require a suitable intent requirement," Charney said. The prosecution must prove the individual knew his conduct was unauthorized.

Another key component of Charney's get-tough stance on computer crime is a proposed forfeiture provision that would allow the government to confiscate the defendant's computer and other property used in the commission of the offense.

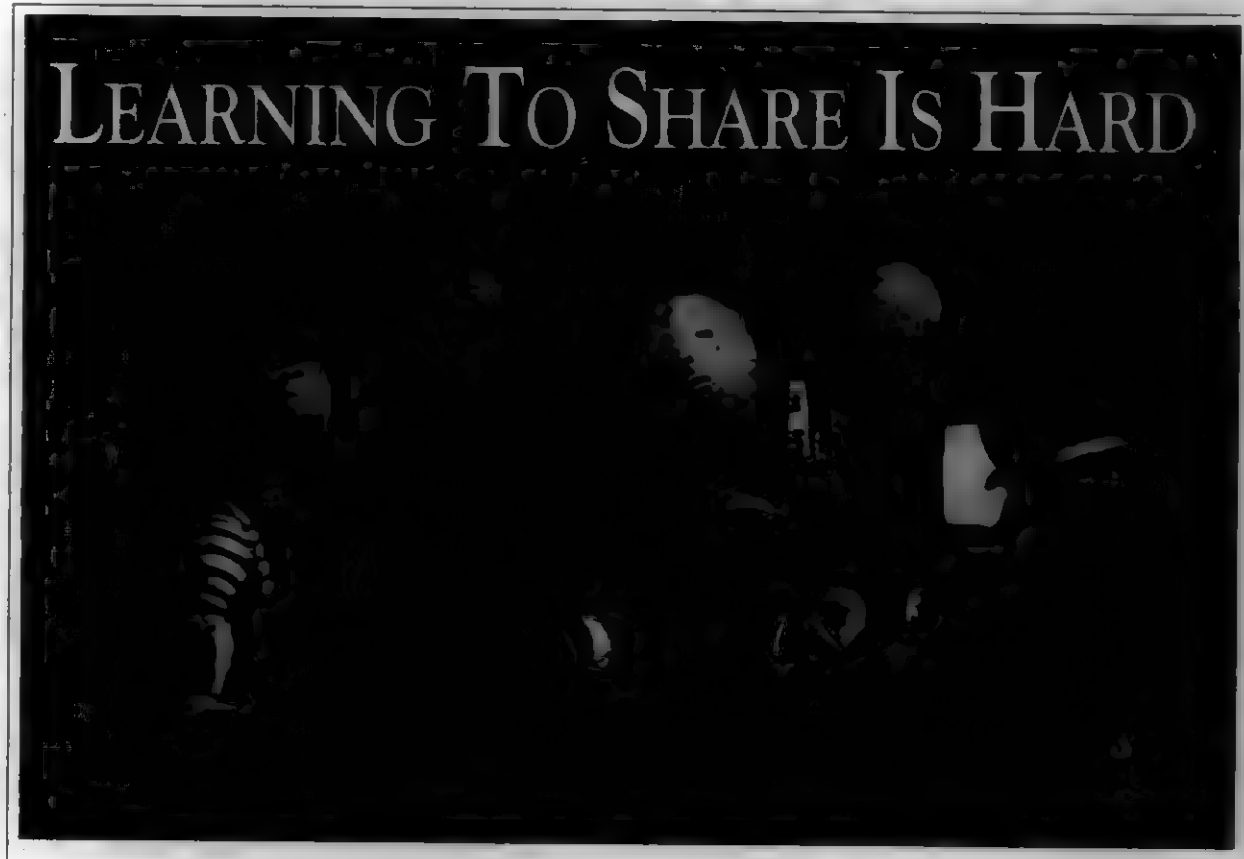
Other lawmen are also grappling with the problem of hitching older laws to new technologies in which information flits unseen across wires, beams of light and radio waves. "A whole lot of jurisdictional law is based on borders, but borders don't matter anymore," said Don Ingraham, who handles high-tech crime investigations at the Alameda County District Attorney's Office in Oakland, Calif. "It's no longer adequate to say, 'Thou shalt not steal.' Now we've got to spell out exactly what constitutes stealing."

SECURITY

Telecommunications fraud, for instance, transcends state lines and federal and state jurisdiction.

Charney said he will pursue other measures as well, including centralizing reporting of computer crime and more international cooperation.

LEARNING TO SHARE IS HARD



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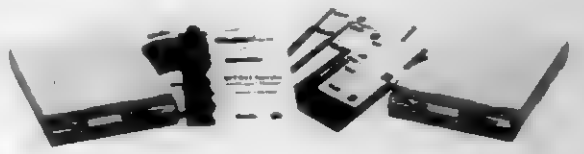

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News Shorts

Dell rides profit rocket

Dell Computer Corp.'s fiscal third-quarter profits more than doubled compared with the same period last year, topping $28.6 million compared with $13 million a year ago. The Austin, Texas-based PC maker credited rich service offerings for spurring sales in a highly competitive market. Also, sales of 486-based systems surged to make up 70% of total revenue, up from 19% in the same quarter a year ago. Total sales reached $570 million from $229.3 million last year.

IBM to license BIOS to Phoenix

IBM said it would license its basic I/O system (BIOS) for AT-bus and Micro Channel Architecture computers to Phoenix Technologies Ltd. in Norwood, Mass. An IBM spokesman called the move a sign of how aggressive the company will be as an OEM of technologies it develops. Phoenix said it will reduce to four months the time it takes to get a new IBM system, video, keyboard and Small Computer Systems Interface BIOS technology to manufacturers that are starting with current IBM technology. The vendors said they would work together on future BIOS versions to develop broader and faster acceptance of technology advances.

Rival database API gains support

To gain momentum against Microsoft Corp.'s Open Database Connectivity (ODBC) standard, Borland International, Inc. proposed its Integrated Database Application Programming Interface (IDAPI) standard at last week's Comdex/Fall '92 show, joined by IDAPI partners IBM, Novell, Inc. and WordPerfect Corp. Other firms announcing IDAPI support at Comdex included Computer Associates International, Inc., Oracle Corp., Gupta Corp., Micro Decisionware, Inc., Cognos, Inc., Microrim, Inc. and XDB Systems, Inc. Some vendors, including Oracle and Gupta, said they would support both ODBC and IDAPI.

Map software aided Clinton campaign

Basking in the glow of Gov. Bill Clinton's presidential election victory, Strategic Mapping, Inc. in Santa Clara, Calif., last week pointed out that the Clinton campaign used the firm's desktop mapping software for high-level strategic planning. The color-coded Atlas Pro maps — with overlays of political data — were used to chart trends, recruit volunteers, decide where to send the candidates and determine the number of television ads to buy in specific markets, recalled Janet Handal, a technology strategist at Clinton headquarters.

Chip maker's problems deepen

Citing intense price competition and weaker-than-expected sales, Chips and Technologies, Inc. said it has laid off 20% of its work force, cutting ranks to between 340 and 350 employees. The company also plans to restructure operations to focus on two revenue-generating product lines: graphic controllers and PC/Chip, a processor for handheld computers.

SHORT TAKES **Apple Computer, Inc.** named human-focused design expert Donald Norman as an Apple Fellow. He will advise product developers on how to make offerings "even simpler and easier to use."... **National Semiconductor Corp.** demonstrated live videoconferencing to Ethernet-equipped desktops at Comdex/Fall '92 last week. The firm predicted the technology will be used in affordable, real-time desktop video applications in "a few years."... Walnut Creek, Calif.-based **PeopleSoft, Inc.** completed an initial public offering last week of 3 million shares at $17 each.... **Motorola, Inc.** introduced software last week that will let Apple PowerBook users receive wireless electronic mail through its Embare wireless E-mail service in 200 cities nationwide.

Cray, IBM add support to multiprocessing push

By Ellis Booker
MINNEAPOLIS

Cray Research, Inc., the world's largest supercomputer vendor, jumped on the massively parallel processing (MPP) bandwagon last week when it announced at Supercomputing '92 that its first MPP product, code-named T3D, will ship in 1993.

The supercomputer giant was joined by IBM, which announced December delivery of the IBM Shared Memory System Power/4, an MPP system that integrates four RISC System/6000s.

For the sophisticated end users of supercomputer technology, however, the proof of MPP will be in the pudding. "We'd like a parallel processing system to do what it's advertised to do," said a Texas petroleum company official at the show, alluding to more cost-effective processing. "We've scaled back the number of processors we ordered," said the official, who asked not to be identified.

Taken together, the IBM and Cray announcements mean "the big guys are in this game," said George E. Lindamood, vice president and director of high-performance computing at Gartner Group, Inc. in Stamford, Conn. MPP players, among them NCube Corp. in Foster City, Calif., and MasPar Computer Corp. in Sunnyvale, Calif., had better find a niche or strong distribution channel, he added.

Donald M. Young, a senior vice president at Lehman Brothers in New York, said he thinks MPP technology has a better chance than vector supercomputers of making it out of what some have called the research/scientific "ghetto" and into mass commercial settings.

Target applications include decision support and what has come to be known as "data mining," which uses the raw horsepower of an MPP system to look at huge, unstructured data sets as part of market research — for example, looking at the where and when of every bottle of shampoo sold by a particular retailer during a two-week period.

"But the key is going to be applications," Young added, echoing the belief of many MPP proponents.

How will these users build MPP applications? Toward that end, several attendees at Supercomputing '92 said they were encouraged by the nearly codified High Performance Fortran (HPF) standard. Derived from Fortran 90, HPF will be portable among different MPP systems. "My sense is [HPF] compilers will appear early next year, meaning [independent software vendors] will start writing code, which means applications will show up at the end of '93 or early '94," Lindamood said.

Cray's announcement, which had been expected, underscored the widely held belief among observers of high-performance computing that MPP is the next step in supercomputing. This is because the architecture has better price/performance characteristics, and many believe only MPP systems will be able to reach the level of 1 trillion floating-point operations per second (FLOPS) and attack such phenomenally complex "grand challenge" tasks as atmospheric modeling.

Traditional supercomputers — using a technique pioneered by Eagan, Minn.-based Cray — are vector processors, which line up calculations in a row (a vector) that is then calculated sequentially. By contrast, MPP systems use a higher number of less powerful processors, which work on the calculations simultaneously, or "in parallel."

At the heart of Cray's MPP will be tens, hundreds or thousands of Digital Equipment Corp. 64-bit, 150 MFLOPS Alpha microprocessors. Cray said its first configuration will have 1,024 processors and will be scalable to 300 peak GFLOPS in a 2,048-processor version. Cray said it expects to achieve peak TFLOPS performance on the system by mid-decade.

But Cray by no means rejected its current vector-based solutions last week. Citing what they called the "deficiencies" of current MPP products, Cray officials said they envisioned the T3D not as a stand-alone product but as a tightly coupled part of its current Y-MP supercomputer line, which uses a parallel-vector-scalar architecture.

IBM executives, meanwhile, said the Shared Memory System Power/4 may eventually have 64 reduced instruction set computing processors in it.

In September, IBM showed a four-processor configuration running Oracle Corp.'s Oracle 7, which contains extensions to support parallel databases and parallel queries. The Power/4, which IBM plans to soon evaluate at customer sites, sits between two other high-performance computing approaches IBM is exploring.

At the high end are massively parallel systems such as those in development at IBM's Highly Parallel Supercomputing Systems Laboratory in Kingston, N.Y. Those systems will have eight to 64 RS/6000 processors. Another approach features a supercomputer soon expected from affiliate Supercomputer Systems, Inc. (see story above).

At the low end, IBM is forging ahead on cluster computing technology, which distributes computational tasks to workstations over gigabit-speed networks. IBM installed this kind of network, composed of 33 RS/6000s, at the NASA Lewis Research Center this month.

Super anticipation

A standing-room-only crowd attended an 8:30 a.m. presentation at last week's Supercomputer '92 conference to hear renowned supercomputer designer Steve Chen talk about the future of parallel processing technology.

Many in the audience also wanted to hear Chen, president and chief executive officer of Supercomputer Systems, tell when his long-awaited, next-generation supercomputer would arrive.

"Soon, very soon," Chen said in response to the first audience question following his talk.

But knowledgeable sources said the system may come even sooner. At least one source suggested that Chen's reluctance to speak last week had more to do with an imminent initial public offering with the Securities and Exchange Commission.

In his talk, Chen strongly endorsed the concept of parallelism, advocating this design not only for hardware components such as processors, memory and I/O but also for compiler, system and application software.

Such "parallel by design" systems will be better able to respond to grand scientific challenges and the tasks of interest to business, said Chen, the architect of the first parallel supercomputer, the Cray X-MP.

— Ellis Booker

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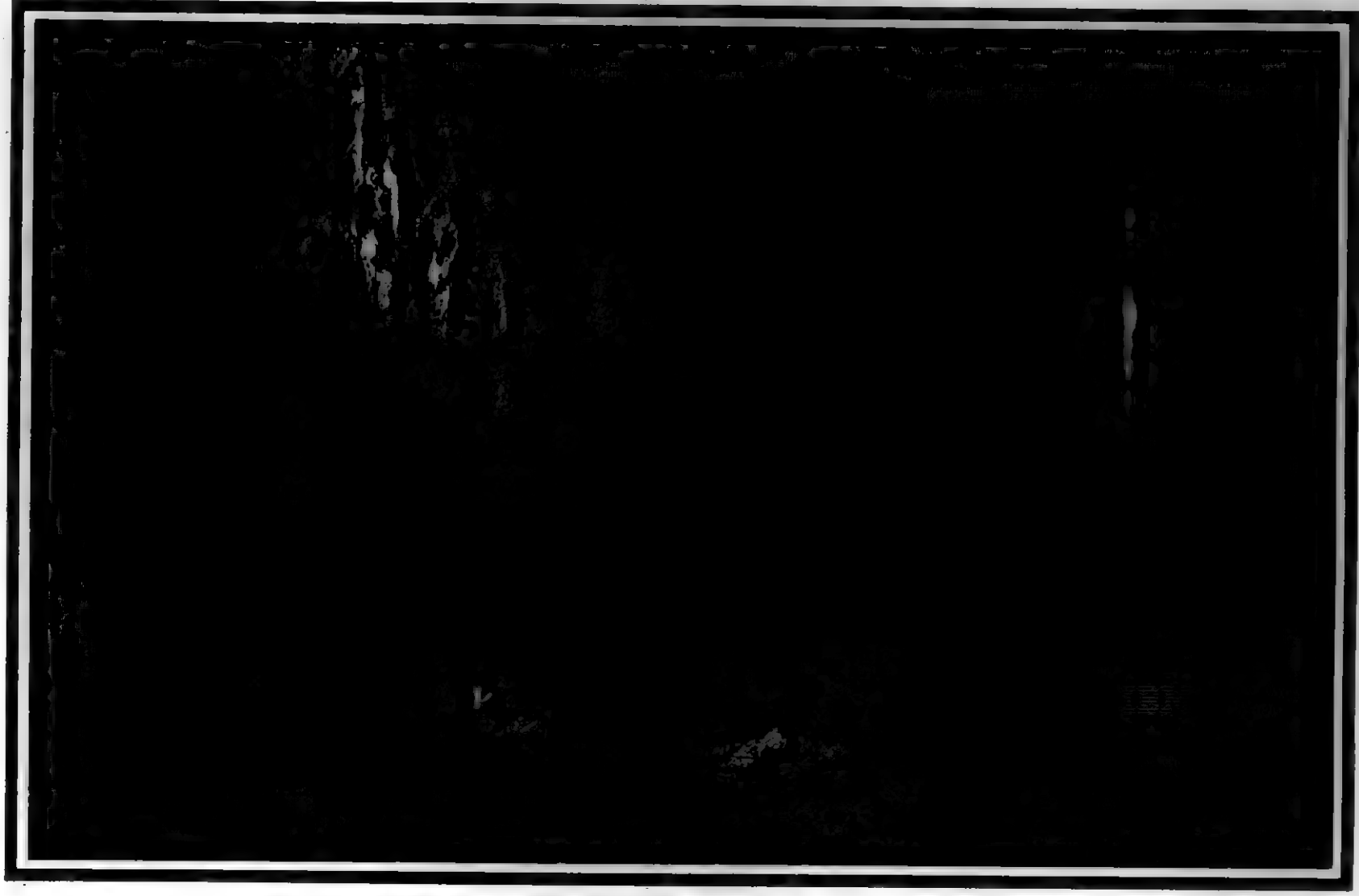

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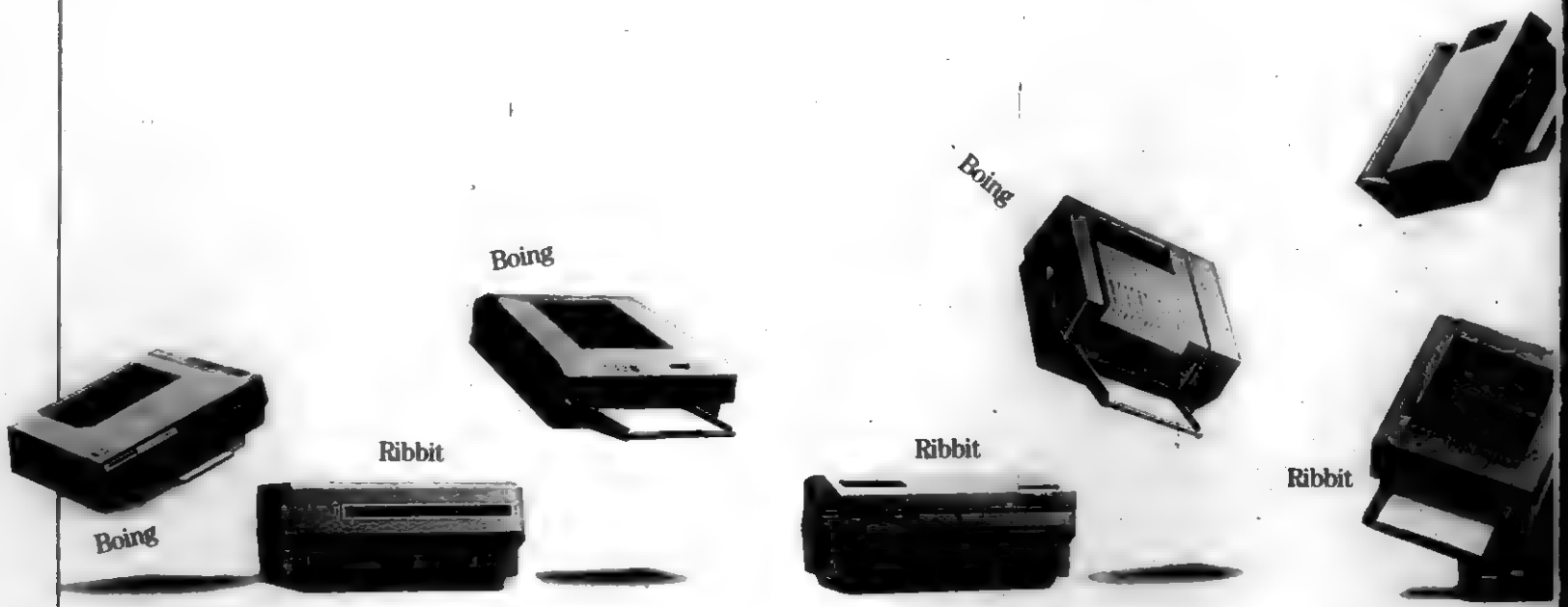
Other laser printers play leapfrog trying to catch up with the HP LaserJet.



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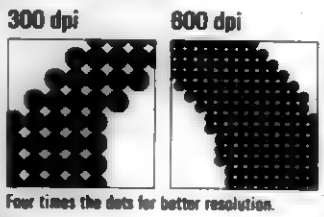

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As a result, it produces the best 600 x 600 dpi resolution ever for noticeably crisper, clearer text and graphics. At less than a 300 dpi price.

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More speed, more trays, more flexibility.

Thanks to a new RISC processor, tuned vector graphics and faster I/Os, the HP LaserJet 4 also sets new standards for speed. It even prints many 600 dpi graphics at a true 8 pages per minute. It's faster on networks, too.

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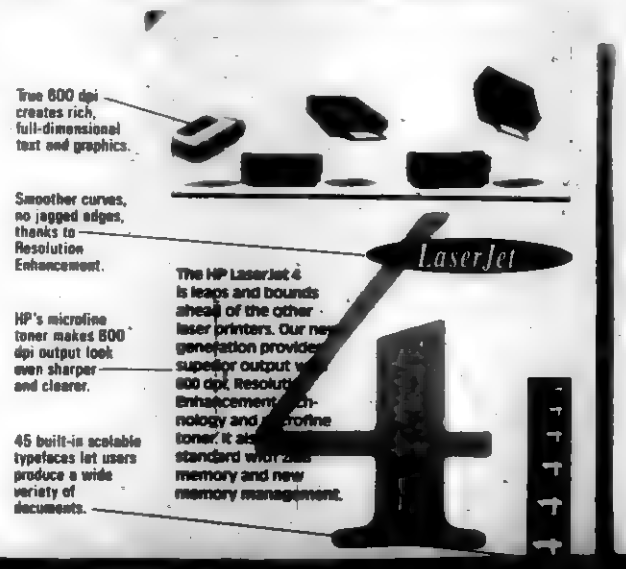

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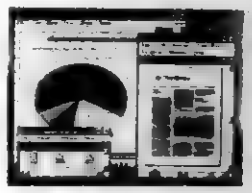

Several popular software drivers are included: Windows, WordPerfect and Lotus. As well as the new HP Explorer PC utility software, which provides a printing tutorial to guide your users through set-up and operation of the printer's new features.

All this makes the HP LaserJet 4 printer supremely simple to plug-and-play. As you'd expect, it also offers complete document and software compatibility with the HP LaserJet III printer.

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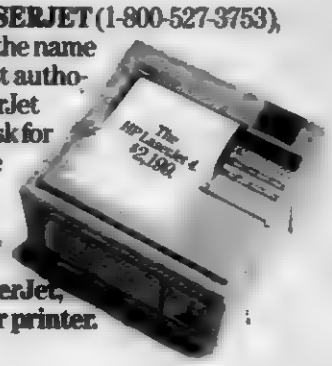

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Grid, AT&T jolt pen market

By Michael Fitzgerald
LAS VEGAS

The shaky pen market got what looks to be a solid shot in the arm last week from several major announcements and some real live customers.

Grid Systems Corp. unveiled the Grid Convertible, a combination pen and keyboard notebook featuring Intel Corp.'s 25-MHz 80386SL. Priced at $3,495, it runs Microsoft Corp.'s Windows for Pen Computing and is bundled with Penware, Inc.'s PenCell spreadsheet.

D. Bruce Walter, Grid's president, said he is looking forward to healthy Convertible sales, in part because of input from beta-test users such as Brent Rogers, manager of information systems at Columbia, S.C.-based Colonial Life & Accident Insurance Co. Rogers has five units right now, with 45 more on order. He said if the product works out, Colonial will outfit all 1,500 of its agents with a Convertible.

"Most of our agents are computer illiterate to the point where it takes them a lot of time to even use the mouse. They're more comfortable with a pen," Rogers said. "But the big value to us is the ability to do electronic signature capture — this means we have the ability to sign deals when we make the initial call."

Analysts said they liked the product and noted that Grid's pricing and design would help it avoid the sales woes that sank Momenta International, Inc. Some said they expect the unit will sell for less than $3,000 on the street.

"If I had to choose a notebook, it'd be this one," said Andrew M. Seybold, editor in chief of the "Outlook on Professional Computing" in Brookdale, Calif. "It's a good notebook, plus it has the Pen for Windows software, so it gives you capabilities beyond the mouse."

Grid's system also "throws down a gauntlet to traditional notebook vendors because it makes the pen important enough to pay attention to," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. Bajarin predicted that more products like the Convertible will debut.

Corporate support

Pen-only computers are by no means dead and received a strong vote of confidence from AT&T, NEC Corp., Matsushita Electric Industrial Co. and Toshiba Corp. These companies all announced last week that they would build products around AT&T's Hobbit microprocessor and Go Corp.'s PenPoint operating environment. Previously, only AT&T's Microelectronics division supported Hobbit.

AT&T also said it will resell the EO, Inc. Personal Communicators — which are Hobbit- and PenPoint-based — through its Phone Center stores.

"The pen-based market has bifurcated into a notebook and pen business and a personal communicator business, and we think the EO machine is the most exciting thing in the pen market," noted Go Chairman S. Jerrold Kaplan.

Go announced PenPoint Version 2.0, an international version that runs in different languages. It was built using Universal Code, which is a 16-bit code, rather than the 8-bit (or 1-byte) model used in the U.S. This could make it easy for U.S. and Japanese software vendors to convert their programs to each other's markets. Go is now developing PenPoint Version 3.0, with much-enhanced communications abilities, for release next year.

Several companies said they were seriously investigating the Go environment for their businesses. "We think it could let us do things we can't do today," said Richard A. Groff, business area consultant at Central and South West Services, Inc. in Dallas. Groff said his company was in a proof-of-concept stage right now, testing the various hardware devices on the market on the way to a June 1993 pilot.

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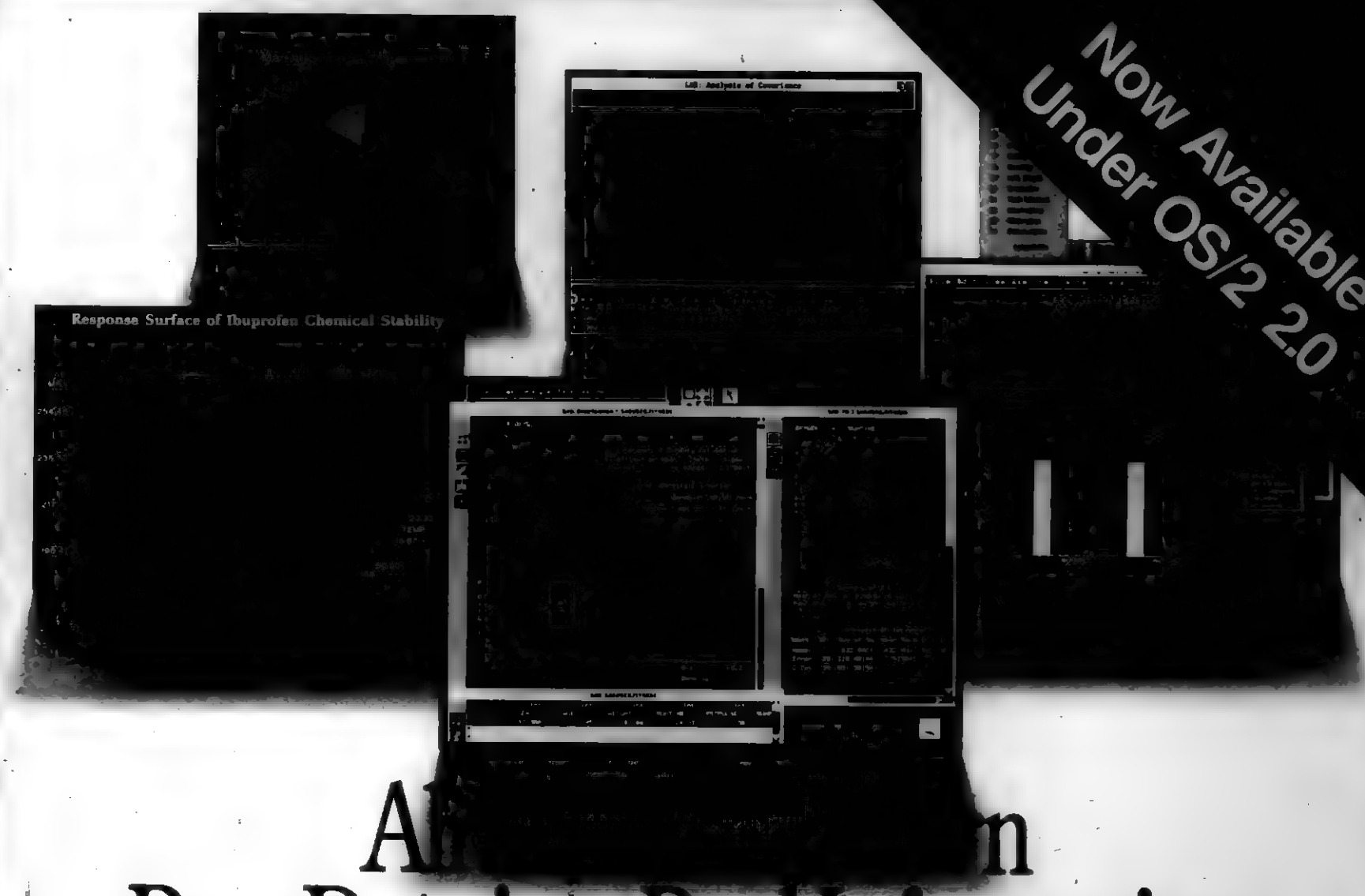
(Without taking a political stand - users *still* change a system they perceive as failing to deliver sufficient value.)



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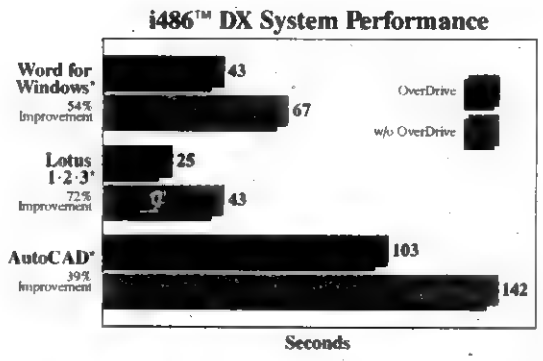

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IBM maps out OS/2's path

Object technologists will link existing apps to Pink operating system

By Christopher Lindquist
LAS VEGAS

Where is OS/2 headed? That was the question answered partially by Lee Reiswig, who heads IBM's Personal Software Products group, as the group made its public debut at Comdex last week. The road is still a bit unclear, but at least there is a road.

The company's current operating system lineup includes OS/2, DOS, AIX and the future fruits of Taligent, a joint venture with Apple Computer, Inc. that is developing an object-oriented operating system.

Additionally, Taligent's foundation, the Mach kernel, offers portability across platforms for OS/2 and AIX.

To which should users or independent software vendors turn? They can look for guidance from a rough road map sketched out by IBM officials last week:

•Starting next year, OS/2 will offer object technologies that will allow developers to write applications that will later be able to run on Taligent's Pink operating system.

•In addition, these OS/2 developers will be able to run their applications on a micro kernel-based version of OS/2.

•Meanwhile, Unix developers can stay on Unix and write applications to a version of AIX also based on the micro kernel.

Is interest in OS/2 rising? According to a Forrester Research survey of 500 Fortune 1,000 sites, the answer is yes. OS/2's networking features, multitasking capabilities, DOS and Windows integration and the ability to downsize key business applications were the reasons cited for using the operating system.

Exactly how they are going to get to Taligent is a key question.

The micro kernel is intended to enable portability and multiprocessor support for OS/2 and AIX. Reiswig acknowledged that IBM has just begun to speak to users and developers individually on the latest operating system strategy but said there will be a concerted effort to get the information out.

IBM will not only be giving information but will request it. "It's not what we've done in the past," Reiswig said: "Blast the things out and hope everyone likes it."

Analysts said the strategy will work but added that it is neither a great solution nor one that is very well spelled out.

"It's the 'Anything but NT' strategy," said John McCarthy, director of computing strategy research at Forrester Research, Inc. in Cambridge, Mass. "They're scrambling."

Where they are scrambling to, of course, is Taligent. Exactly how they are going to get there and how long that will take are the key questions, which no one at IBM or Taligent seems ready to answer.

"I don't know how they're going to do it, and they're not telling anyone how to do it," said Andy Mahon, director of advanced software development at New Science Associates, Inc. in Boston. Developers "have to take it on faith."

This raises yet another question: After years of hanging tough with IBM on the many reincarnations and repositionings of OS/2, will developers stay the course or transfer all allegiance to competing systems such as NT? It is too early to know for sure.

IBM mulls groupware alternatives

CONTINUED FROM PAGE 1

serve as the entry-level workgroup product. An alpha version of this software was demonstrated at Comdex/Fall '92 and included capabilities to remotely share the OS/2 Clipboard as well as a feature called OS/2 Chat that would allow a real-time, two-way conversation.

•A second level would be another OS/2 with built-in integrated workgroup applications, such as electronic mail. Also targeted at small groups, it would be designed for users who do not need a full-blown workgroup platform but want some workgroup functions. It would likely be the most direct Microsoft Windows for Workgroups competitor. Art Olbert, IBM Personal Systems director of LAN systems, would not say which applications would be bundled in it but said, "It isn't going to be all IBM stuff."

•A third level would be OS/2 and LAN Server, to which separate components could be added, such as CC:Mail. This would be aimed at users who need higher level networking functions and who may wish to add workgroup elements on a component basis.

•A fourth level would be Notes, which IBM currently resells and considers its premier workgroup offering for local-area networks. It is offered to users requiring a more sophisticated workgroup platform.

•An optional fifth level would be Notes technology bundled into the OS/2 operating system. Work has been under way on this project since last year. "We are still working on this," Olbert said. "We are working to make it so their security, directories and log-ons can be replaced by what you get with the OS/2 system. But you would still get the Notes function."

> **"Windows for Workgroups is receiving a questionable response."**
> *—Art Olbert, IBM*

Information systems managers said this strategy appeared to be a cover-all-the-bases approach, which could appeal to a variety of users. But one executive said it still would not change his mind on OS/2's role.

"I'm not sure it would make a fundamental difference," said Ronan McGrath, vice president of IS and accounting at Canadian National Railways in Montreal. "There is nothing out there that would change our view of OS/2 as a server operating system only."

While IBM evaluates workgroup plans, Microsoft is planning to ship at least 1 million copies of Windows for Workgroups within 12 months.

Paul Zagaeski, a senior analyst at The Yankee Group in Boston, said the plan suggests IBM is rethinking the way it traditionally approaches a new market.

"In the past, IBM's preferred customer profile would have excluded the kind of customer that would want this really low-end function," Zagaeski said.

While Olbert would not say if or when any of these efforts would become real products, he nonetheless asserted that IBM's plan will one-up Microsoft because it fills in gaps left by Windows for Workgroups.

"Windows for Workgroups is receiving a questionable response because people are saying, 'I'm not sure how to use this,'" Olbert said.

Not surprisingly, Microsoft challenged IBM's claim and said the Windows for Workgroups offering can be tailored to fit different user requirements.

Rogers Weed, a Windows for Workgroups product manager, said that users can choose to install any or none of the workgroup applications bundled with the operating system.

Reporter's Notebook

The folks who put on Comdex/Fall '92, the Interface Group, were kind enough to supply a show guide on floppy disk for people who didn't want to cart around the fat 723-page book. Unfortunately for the thousands of laptop users who attended, however, it was only on 5¼-inch disks.

One of the hottest — or at least most noticeable — freebie pins at the show came from Stargate Technologies, a networking hardware manufacturer. It wasn't just the look of the battery-operated, flashing accessory that got people to wear them, though: Stargate spotters handed out cash to people seen wearing the pins on the show floor or at local casinos. Rumor had it the Mirage and Caesar's offered the best odds for pin wearers.

While Microsoft's Foxpro 2.5 database performed flawlessly in demos, sister product Access wasn't so lucky. Access twice failed to import a graph properly. To top things off, when the room went dark for the final video, nothing happened for an embarrassingly long moment. "Maybe someone tripped over the power cord," one attendee was overheard saying.

The annual sexist booth award goes again to Computer Associates, which got some bad press at the spring Comdex event for featuring a fashion show with scantily clad women at its booth. At Comdex/Fall, the company stuck with the fashion show theme but this time trotted out beefcake along with the cheesecake.

IBM showed its micro kernel technology in action at its software booth, demonstrating the Carnegie Mellon Mach 3.0 kernel running a few AIX "personalities" along with a DOS personality. The one missing? OS/2 2.0, which was not quite ready to demo in public.

T. S. Microtech pressed people's hot buttons with a $40 prize for attendees who could stand the transistors' heat and hold a finger on the company's 486-based microprocessor for 40 seconds.

Rumors around the show floor held that Apple is talking to IBM about developing a Newton operating system that runs on Intel processors — another step in Apple's transmogrification to a software vendor.

IBM's OEM booth had OS/2-ready versions of PCs from Compaq, AST, Zenith Data and Gateway 2000. An IBM marketing rep said negotiations for these vendors to bundle OS/2 were under way. Don't hold your breath, though. A well-placed Dell source said that after Dell's Glenn Henry and IBM's Lee Reiswig shook hands on a deal for Dell to bundle OS/2, six months passed before IBM's lawyers signed off on the deal.

— Compiled by CW staff members

In the beginning, only hackers cared about UNIX.
Now it's ironic to see gaggles of suits
trekking down to IS asking the gurus about UNIX.
"Will it save our company?" they plead.
And hackers (we mean IS professionals),
weary of flaming the clueless *veeblefesters*,
shouldn't be faulted for wondering what took so long.
(All at once now: "What took management so long to *get* UNIX?")
Anyone with an IQ above room temperature knows that the hostile
takeovers, LBOs, and "consolidations" of 1980's-style
attack capitalism finally caught up with everyone.
Efficiency is now in fashion.
Right-sizing is in vogue.
Now people *need* UNIX because it makes applications and data
portable to platforms of vastly different scale.
So companies can rebuild while vastly reducing costs.
Those who have tried it are very happy with UNIX.
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screaming 486 SLC™ 25 MHz upgradable processor. But it's built for comfort too. There's a surprisingly roomy interior, with a full-size, ergonomically designed keyboard. And a screen that literally bends over backwards (180 degrees, to be precise).

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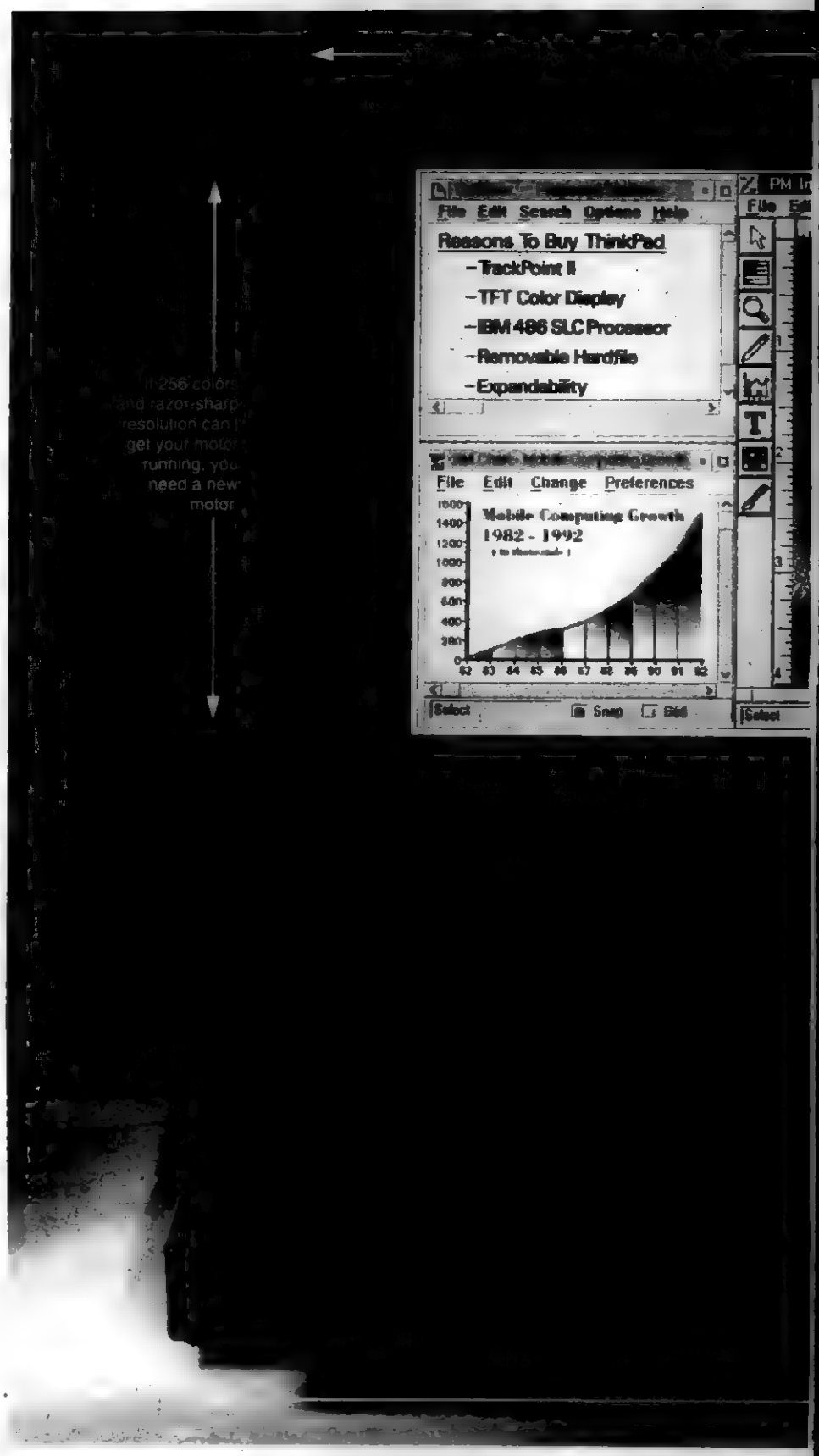
The ThinkPad's screen is a thing of almost aching beauty. Its 640 × 480 VGA resolution is sharper than that of many desktop computers. It displays 256 colors. And it's the biggest screen on any notebook. All of which makes ThinkPad very easy on the eyes.

The ThinkPad comes standard with things some other notebooks don't even offer as options. Like 4MB of memory you can upgrade to 16MB. 120MB of hard disk space. Pre-installed DOS 5.0 and



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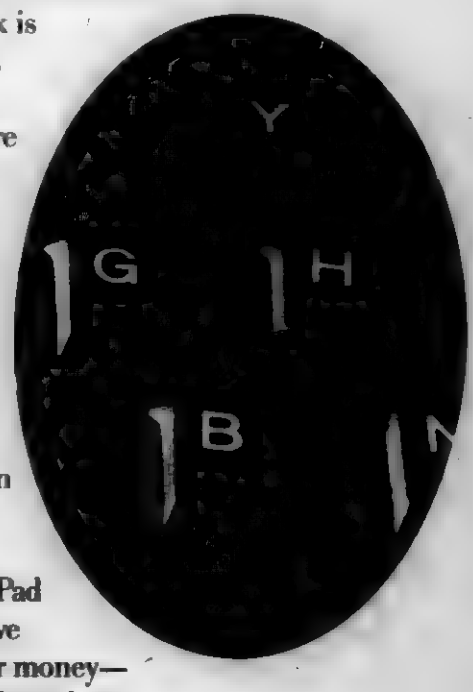

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Processor	486 SLC/25 MHz	486 SLC/25 MHz
Display	10.4" Active Matrix 256-Color Screen	9.5" Monochrome Display 64 Grayscale Screen
Battery Life*	2–4 Hours	3.8–7.5 Hours
Weight	7.6 Lbs. with Battery	6.5 Lbs. with Battery
Warranty	3 Years (International)	3 Years (International)
Price**	$4,350	$2,750

If you have questions along the way, your ThinkPad Models 700C and 700 are supported by HelpWare,™ an invaluable service package that includes a three-year international warranty.†

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UNConventional View

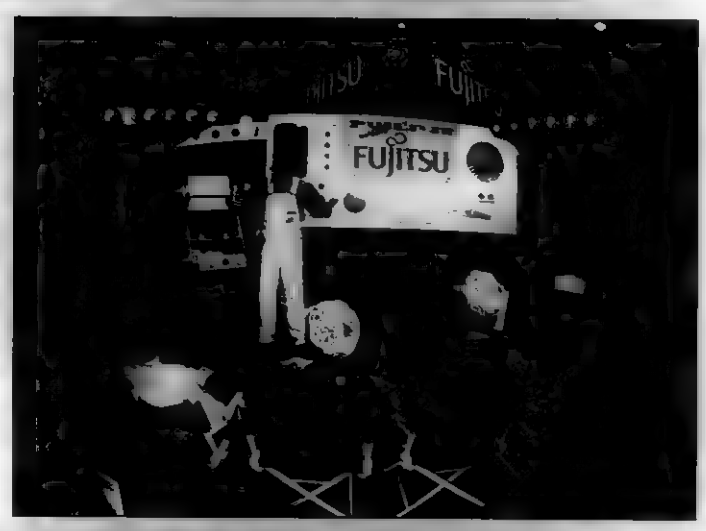
Photographer Chip Simons took an unorthodox view of the Comdex show. After five days of cruising the six convention sites, show goers may well identify with these surrealistic images.

Comdex visitors flock to the Las Vegas convention center, one of six show sites.

A visitor to Microsoft's Windows display is apparently overcome by the sheer volume of applications on display.

Virtual reality? No, a multimedia display for a vendor of local-bus equipment.

Off the show floor, a mobile computing showcase highlights how small computers have become.



Everyone's got a gimmick. For Fujitsu, it's construction garb.

A couple of employees on booth duty liven it up with Lotus-colored glasses.

Toshiba relies on a giant message to draw attention to its tiny computers.

IBM PCs to take 'Green' slant

Environmentally sound, or "green," PCs are being driven by emerging European standards. A European Community directive, scheduled to take effect next month, states that radiation from PCs should be reduced to negligible levels. Commodore's German unit has gone one step further: It will recycle any old PC.

By Michael Fitzgerald
LAS VEGAS

The IBM PC Co. unveiled a next-generation PC last week that weighs 4.4 pounds, measures 12 by 12 in., uses neither the AT nor the Micro Channel Architecture bus and has a flat-panel monitor in place of a CRT.

Compliant with Environmental Protection Agency regulations that go into effect in 1993, a family of products similar to the IBM Energy Prototype PCs will appear before the middle of next year, according to James G. Turner, director of premium systems at IBM.

"I guess you could call it the PS/3, though I don't know that that's what we'll call it," Turner said. One source said the new machine may be called the Personal System/2 Executive model.

IBM's prototype, which Turner said is very close to what IBM intends to introduce next year, has several other unusual features, including the following:

•The bus interface has four Personal Computer Memory Card International Association (PCMCIA) Type 2 slots, two on the front and two on the back.

•The casing has room for a 3½-in. disk and a 2½-in. hard drive.

•Advanced power savings are built-in. With the flat-panel display, the system will draw 51W of electricity, compared with the 250W today's PCs use.

IBM estimated a PS/3 will cost $15 a year in power, as opposed to $150 to $200 a year today. Turner said he did not expect the new PCs to cost customers a premium.

The display machine used IBM's clock-doubling 25/50-MHz, 3.3V 486SLC2. Intel Corp., Cyrix Corp. and Advanced Micro Devices, Inc. also make 3.3V processors, which they plan to include in their product lines.

Turner said IBM was moving its product line in an energy-conserving direction because of the high cost of energy here and in Europe and the small footprint needed for the rapidly growing Japanese market.

"You could put this inside your desk drawer," he said, because the PS/3 uses so little power it does not need a fan.

Customers will also be able to purchase a new keyboard — with the numeric keypad split off from it — and the TrackPoint pointing device recently introduced in the ThinkPad notebook line.

While the PS/3 was shown with an active-matrix, thin-film transistor, flat-screen color display, which is pricier than a monitor, Turner said IBM will also offer a regular CRT with built-in power management.

The new machine was also designed with snap-in components to make it easy to upgrade — and recycle when it is no longer useful.

Turner said the systems will use MWave, a multimedia chip developed by IBM and Texas Instruments, Inc., on the planar board and may use a new version of Extended Graphics Array to greatly enhance multimedia graphics. For security, Turner said, IBM will build a utility into the system software that will force users to type in a password to swap PCMCIA cards.

Wireless not ready to take off

Security, connectivity, standards issues still need to be addressed

By Michael Fitzgerald
LAS VEGAS

Cutting cables

The present wireless market primarily consists of LAN and PBX technology, but wireless integrated systems will be the market's real push in the future

Total U.S. wireless office market
(Rounded figures)

	Unit shipments (thousands)	Revenue (millions)
1989	0.8	$1.2
1990	4.2	$3.6
1991	28.4	$24.8
1992	113.8	$96.6
1993	520.8	$456.9
1994	1,127.0	$951.8
1995	1,958.5	$1,556.9

Source: Market Intelligence Research Corp.

Wireless communications was on parade at Comdex/Fall '92, but the industry agrees it will be a while before the sweet music of easy connectivity and reduced costs becomes generally available.

"Wireless is in that magic egg-hatching period right now, and this was its coming-out party, but there are a lot of issues to be resolved around the cost and the networking infrastructure," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

"With the cellular and packet networks, you have 90% population coverage and only 30% geographic coverage, and you have issues with power consumption, cost, security and transaction efficiency," said Vern Raburn, chairman of Slate Corp.

The search for standards will not stop early implementors from making effective use of wireless technology, analysts said.

"For transaction-oriented enivronments like banking or sales, where real-time data exchange is valuable, or for fast-moving industries like trucking companies, this technology represents an immediate gain that will make it attractive," Stephen said.

Analysts and vendors said several issues remain to be resolved before wireless communications takes off:

•**Security** — Right now, people can tap into cellular lines and read files as they are transferred. Encryption software and hardware are being developed but are not ready to ship yet.

•**Connectivity** — Cellular networks suffer from staying connected and interference. While Microcom Networking Protocol-10 (MNP-10) helps, it only works if it is installed in both the sending and receiving ends or is built into the cellular network.

•**Standards** — Nothing is standard, and no one knows for sure whether cellular will win in the market, or if packet-switching approaches such as Ardis will win. Infrared communications and radio frequency efforts will also compete for attention during the next year.

•**Better compression algorithms** — These are needed to compress data for faster transmission, an important cost-cutter.

"We're talking to RAM Mobile, but their packet-switching price is on the high side. But we have a mobile sales force, and this would fit into what we're doing," said James Wallace, information services manager at TruTest Manufacturing Co. in Cary, Ill.

Next year there will be a frenzy of standards efforts spearheaded by groups such as the Portable Computer Communications Association. For instance, IBM's Robert L. Carberry, assistant general manager of the Entry Systems Division, said IBM and a number of the regional Bell operating companies are pushing Cellular Pocket Data Protocol, a standard that will allow digital packet-switching over standard analog cellular lines.

Reporter's Notebook

Lexicus, a Palo Alto, Calif.-based start-up, introduced what it called the first pen computing software to recognize cursive handwriting. However, Lexicus met its match with our reporter, whose careful rendition of "The quick brown fox jumped over the lazy dog" was interpreted as "The quick boom fox leaped ourr the iegy dog."

While **Motorola** touted its 68000 and 88000 series chips on the show floor, other industry figures pegged the processors for ultimate demise. Chip survivors of the '90s, according to John Gage, director of the science office at Sun Microsystems, will be the following: Intel because it is so well-entrenched; Sun's 64-bit SPARC, again because of proliferation; and the IBM/Apple PowerPC, simply because of the big bucks behind it.

Proving that there is life beyond computers, **Microsoft** scion Bill Gates fielded questions on the human genome project, the declining quality of American education and bringing art to the masses — all during a PC user group reception.

IBM had the right idea for attracting foot-weary attendees to its OS/2 independent software vendor display. Demo machines were set up on ergonomic desks from Brossard, Quebec-based Flexiforce. Not only did the desk have very comfortable chairs, but the footrests also included massagers.

In the hype, kitsch and sound bite category, Bob Corrigan, chief of IBM PC Co., likened the independent unit's now-found financial and decision-making freedom to "rediscovering our inner child" during a well-attended speech. He also said, "This is not your father's IBM" and donned Mickey Mouse ears after talking about a giant PC deal with Disneyworld France.

If Windows for Workgroups "is a virus, we're the antivirus," quipped IBM's Bob Carberry after consultant Roger McNamee predicted that Microsoft's new workgroup application will be wildly popular — "spreading like a virus." Carberry alluded to IBM's own basic workgroup features reportedly in the cards for OS/2 (see story page 1).

Kaleida, Apple's multimedia venture with IBM, has a new kind of CD in "early alpha testing" with selected developers, according to Nat Goldhaber, president and chief executive officer of Kaleida. The goal is to build a disk that can be played on any multimedia machine adhering to Apple's ScriptX standard.

Some Comdex attendees — after being turned away from hotels where they had prepaid reservations, waiting two hours in taxi lines and traipsing miles between Vegas hotels and the convention center — were heard muttering, "Never again. They don't pay me enough for this kind of abuse."

(WHEW!)

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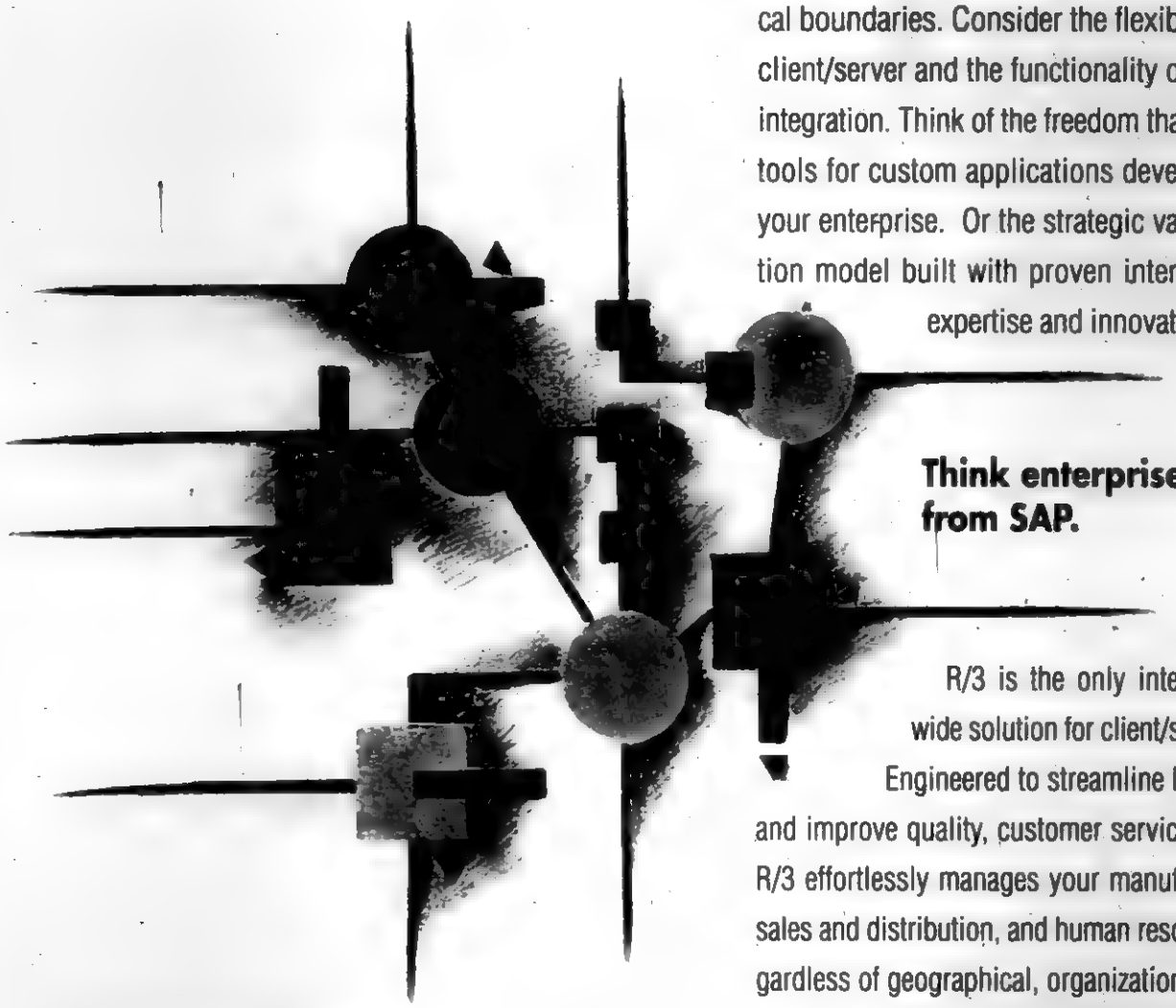

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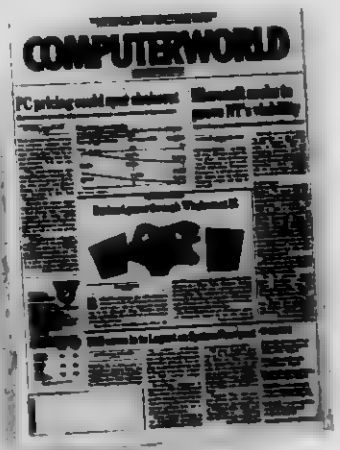

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Advanced Technology

More than a matter of money

U.S. companies must work on their methods if their R&D is to be effective

By Gary H. Anthes

NO ONE NEEDS TO TELL APPLE Computer, Inc. about the importance of research and development: Last year, Apple derived an astonishing 85% of its revenue from products introduced during the year.

The company spends nearly $2 million a day on R&D, about average for a computer company with $7 billion in annual sales. Computer hardware, software, services and semiconductor companies last year invested $18.6 billion in R&D, more than any other industrial sector.

Computer companies are spending more on R&D as technology change accelerates. They are also seeking R&D partners, a practice that leverages R&D budgets, provides access to scarce skills and brings users new products faster.

On average, computer and semiconductor firms invested 8.7% of their sales in R&D, more than double the average for all U.S. industry, according to *Business Week*. A few companies went much higher; Intel Corp. spent 17% of its $4.8 billion in sales on R&D, and SAS Institute, Inc. in Cary, N.C., plowed a whopping 35% of its $295 million in revenue back into its software products.

But despite these huge sums — and despite the obvious success of companies such as Apple, Intel and SAS — critics say U.S. R&D funds could be better spent. "We are underinvesting in long-term research," said Erich Bloch, distinguished fellow at the private Council on Competitiveness in Washington, D.C., and former director of the National Science Foundation (NSF). "You look at IBM or GE or RCA or Bell Labs; they have large labs that did a lot of basic research, and they have cut it back."

Continual improvements

At the same time, Bloch said, U.S. firms do not make enough small, incremental improvements to existing products. "IBM's problem with the PC was that they sat on it too long instead of constantly improving it." Others say too much federally funded university research remains locked in the ivory tower, with little trickling down to the products taxpayers buy.

"There is some validity to the view that we have become detached from the application of technology," said William Wulf, AT&T professor of engineering and applied science at the University of Virginia.

Wulf is a founder of software vendor Tartan Laboratories, Inc. and former head of computer science programs at the NSF, which Congress is now pressing to focus more on applied research. Wulf said the NSF should devote more attention to technology transfer as long as that does not jeopardize long-term basic research.

Some observers fault industry for not more effectively tapping into the technology available through government programs and industry partnerships, but a trend to do just that is emerging.

"Company after company — AT&T, IBM, Motorola — is reaching out to other companies [for] research work," said J. Richard Iverson, president of the American Electronics Association (AEA).

Iverson said an AEA member, which he would not name, may be on a course that heralds a new paradigm for obtaining technology. The company has sought funding from the Defense Advanced Research Projects Agency for one phase of R&D, from the U.S. Department of Commerce for another phase, from a joint venture with a large company for another and has entered into technology-sharing agreements with two federal laboratories.

"It's pretty exciting, a very bold venture," Iverson said. "They have taken a look at how they can move their business forward, and it takes all these elements to do it. It's a fairly small company and they'd never have enough money or expertise to do it themselves."

R&D partners

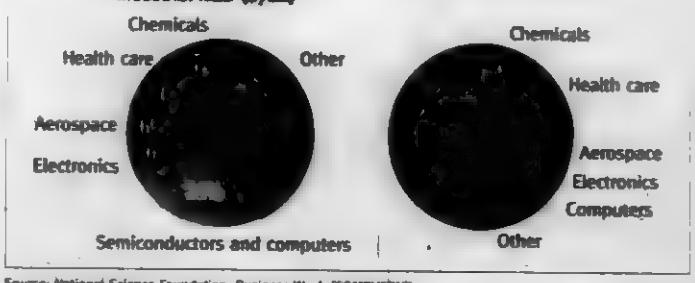
He said another company, a large one, has gone the same route but has taken it even further by including customers in the research alliance, not as so-called "beta" testers of new products but as R&D partners. That ensures users will get what they need, and it gives key customers the advantage of having new technology before their competitors, he said.

Iverson said it is too soon to say whether these omnibus partnerships will become common, but he called the idea "a good model."

The government now spends some $70 billion on R&D, about 60% of it for defense, a percentage President-elect Bill Clinton has said is too high. He said he would shift $7 billion over three years from defense R&D to civilian R&D, double the budget of the National Institute of Standards and Technology, earmark 10% to 20% of the budgets of the national laboratories to joint ventures with industry, establish a civilian technology agency to foster development of high-risk, high-payoff technologies in the private sector, encourage the establishment of consortia such as Sematech and make the R&D tax credit permanent.

Share of R&D spending by U.S. industry sector

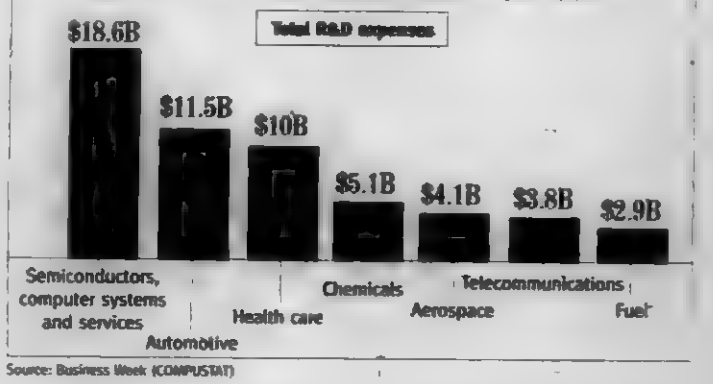
THOUGH THE U.S. SEMICONDUCTOR AND COMPUTER INDUSTRY PERFORMED 24% OF ALL PRIVATE SECTOR R&D IN 1991, THE U.S. GOVERNMENT ALLOCATED ONLY 2% OF ITS R&D BUDGET TO COMPUTER-RELATED R&D



Source: National Science Foundation, Business Week (COMPUSTAT) American Association for the Advancement of Science

U.S. corporate R&D by industry (1991)

IN 1991, THE U.S. SEMICONDUCTOR AND COMPUTER INDUSTRY INVESTED MORE IN R&D THAN ANY OTHER SINGLE INDUSTRY SECTOR — $18.6 BILLION



Source: Business Week (COMPUSTAT)

The R&D payoff

"U.S. chip makers surging to front," trumpeted a Page 1 article two weeks ago [Nov. 8] in the *San Jose Mercury News*. The industry has turned back six years of global dominance by Japanese rivals, the newspaper reported, through "dogged pursuit of self-interest and its ability to summon government help."

That may be a prescription for success for high-technology firms in the 1990s, said Andrew Procassini, president of the Semiconductor Industry Association in San Jose, Calif. In addition to helping the industry overcome unfair Japanese trade practices, Uncle Sam matches the industry's $100 million annual contribution to Sematech, the Austin, Texas-based consortium developing improved chip-making techniques, and adds millions more to semiconductor R&D, he said.

The companies have done their part as well. Between 1978 and 1991, semiconductor firms increased spending on R&D from 8% of sales to 13.3%, Procassini said. And U.S. companies developed high-margin microprocessors, application-specific integrated circuits and the like.

Reality check

Someone recently asked me if I agreed with analysts' consensus that Comdex would be a drag because 1992 had been so uneventful.

The question amazed me. How could anyone say this year was uneventful? True, there haven't been any big bangs along the lines of a Windows 3.0 or an AT&T breakup. But there have been enough controlled explosions to make this Comdex one of the most fascinating in years. Since the last Comdex, the following has happened:

•**Hardware price wars made 386/486 PC purchases a no-brainer**, even for home buyers. The sudden demise of the 286 and other old-generation technology is a major step toward laying the foundation for the crop of 32-bit software that's coming down the pike.

•**Windows cornered the mass market** and achieved the critical mass necessary to get all the critical applications on the Windows platform. Its slam-dunk success on the low-end desktop has sent DOS development falling off the table faster than a bowling ball. Good thing, too, because innovation in the DOS market had become so painful that some vendors had even taken to writing their own graphical interfaces as an alternative to doing something interesting.

•**The Unix wars ended** as the Open Software Foundation and Unix International put to rest one of the silliest standards battles in memory. And Unix will need all the help it can get as the desktop operating system battle shifts to the high end.

•**Client/server took off like a rocket**, to the extent that virtually every large company is now actively developing or seriously considering client/server applications. In 10 years in the industry, I've never seen a concept catch on in corporate IS as fast as this one.

•**Object-oriented programming came of age** and brought with it real opportunities for major advances in programming productivity. IS people should be on this stuff like a pack of wolves.

•**Advances in portability** have brought computers within the reach of 25 million mobile professionals. The combination of high-capacity notebook devices — like the one I'm writing on, a Dell 386, 80M-byte machine that weighs about 3 pounds — and wireless networking will allow organizations to make a dent in the tremendous amount of downtime that's now wasted when people are on the road.

•**Voters elected a high-tech administration** with a president who doesn't think high-tech policy is a dirty word and a vice president who's been a vocal advocate of building high-speed information superhighways. There's a superb opportunity here for the country to reestablish its technology supremacy and build the kind of infrastructure needed to bring the benefits of information technology to consumers.

Yes, the economy's been a dead fish this year and maybe some of the vendors are suffering. But 1992 uneventful? Get real. I wish every year could be like this.

Paul Gillin, *Executive editor*

HP sets the record straight

Regarding "HP forms client/server division" [CW, Oct. 26]: Two quotes were taken out of context. Following a reference to Electronic Data Systems Corp., the quote "typically, they have not mapped well with our client/server solutions bundle" was misleading.

EDS has played a very significant role in helping customers move to client/server computing, as evidenced by a recent $10 million fingerprinting EDS/Hewlett-Packard contract.

The article also noted that the HP program includes products from 50 vendors. In fact, HP's integrated client/server solutions consist of 50 components, five of which come from alliances with key third-party software vendors.

Sridhar Ramanathan
Cupertino, Calif.

Only kidding

I am writing in response to Alex Kelso's letter to the editor [CW, Oct. 26]: His assertions are completely unfounded.

To set the record straight, my article, "Technical dysfunction in systems professionals," is absolutely a humor-type article. The Data Processing Management Association (DPMA) was not used as an "example" of anything as Mr. Kelso stated but was included for two reasons.

First, I wanted to indicate where I had met my acquaintance. Second, over the years, I have belonged to several professional organizations because of my high regard for their membership. In fact, I especially noted DPMA in my article to establish part of my acquaintance's superior technical credentials.

I reiterate my strong support for all professional organizations of quality.

Sheryl Kay
Tampa, Fla.

Missing the Macintosh

I am truly stunned that your Buyers' Scorecard on graphical user interfaces (GUI) [CW, Nov. 2] omitted the Apple Macintosh, which pioneered the market! I can understand omitting Desqview/X (which you explained) and NextStep (which you do not even mention).

But Apple desktops number close to 10 million. Moreover, the Macintosh GUI remains the standard against which others must be measured. I have more than a year's hands-on experience with Motif, OpenLook and DECwindows; I have also used NextStep, Desqview/X and Windows. I have written extensively on several of these products.

Your respondents agree with my own preference in the reviewed products — I would much rather use OpenLook than Windows or Motif. But I run my consulting firm using a Macintosh network, and it must be 10 times a day I say to myself, "Thank God I'm using a Mac rather than MS-Windows or X Windows!"

Andrew D. Wolfe Jr.
President
LIPA Strategic Technologies
Salem, Mass.

CASE Communique corrections

Regarding your coverage of the CASE World '92 exhibition, "CASE show goes beyond technology" [CW, Oct. 5], and CASE Communique: CASE Communique, not Hewlett-Packard, hosted the CASE World '92 CASE Communique panel discussion.

CASE Communique was formed in October 1991 as an industrywide, open forum for creating standard specifications to enable CASE tools to work together more effectively in multivendor development environments, independent of the underlying framework technology.

Also, it was incorrectly stated in the article that our group "promotes SoftBench as a Unix CASE framework over ToolTalk from Sun Microsystems, Inc."

In fact, the rules and regulations agreed to by every participant in CASE Communique specifically state that membership in CASE Communique in no way constitutes an endorsement of any commercial product or a service produced or distributed by CASE Communique members.

Edie Bailey
Fort Collins, Colo.

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An open letter to Bill Clinton

Arlen R. Lessin

First of all, President-elect Bill Clinton, congratulations on your election victory. And now I want to suggest a vital preinaugural good deed you can perform to activate root-level change and help rebuild the national industrial infrastructure.

What I have in mind is a program for technology entrepreneurs similar to the Head Start program, which allows U.S. children to benefit from early childhood education. Such an early-stage investment program has been proposed and sidetracked, yet it urgently deserves support. I appeal to you to endorse this critical and underaddressed issue before your inauguration.

Earlier this year, a nonpartisan National Science Foundation panel, chaired by former Secretary of Defense Harold Brown, proposed a privately administered, federally seeded Civilian Technology Corp. (CTC), which would have the job of actively promoting the success of high-tech innovators at the idea/concept stage.

The government investment required would be modest; what has been proposed is a $5 billion firing-up appropriation. After that, private sector operations would take command, and the enterprise would be self-funded from patent licensing fees, stock holdings and loan interest payments. As a self-supporting, nongovernment program, CTC would not be prey to the traditional critics of government funding.

CTC would operate outside government interference and could not be eliminated by Congress for at least 10 years. This would permit objective

support and promotion of technologies based solely on merit and commercial potential. Investments would be made at the very early, critical stage when the majority of enterprising innovators meet financial defeat and must give up.

Earlier this year, I discussed the CTC proposal with Vice President-elect Albert Gore as well as Sen. George Mitchell (D-Maine) and Sen. Ernest Hollings (D-S.C.). Hollings heads the Senate Commerce Committee, which would recommend CTC as legislation. At the time, he said that although he favored CTC, he did not feel he could get the bill passed in the last session because President George Bush would have vetoed it.

Gore and Mitchell told me this situation prompted them to propose an alternative $60 million bill. I believe that this bill, as yet unenacted, is inadequate.

I have not discussed CTC with Sen. Robert Dole (R-Kan.), although I know from previous contacts that he supports technology initiatives. Some fine-tuning will be necessary, but I would hope to see nonpartisan congressional agreement with the CTC concept based on its apolitical nature and its clear-cut potential to aid the U.S.

The CTC Head Start program for U.S. innovators would encourage a critically required reseeding of U.S. technology at the grass-roots level. There are tens of thousands of Americans with potentially valuable ideas and inventions fruitlessly seeking start-up assistance. These people could be the basis for a bumper crop of new enterprises, products and jobs.

Mr. Clinton, in your election night address, you reiterated key words from the 1992 Democratic platform: "Economic growth will not come without a national economic strategy to invest in people." Your committed support and active endorsement of CTC could powerfully and concretely show your resolve to a waiting electorate.

Lessin is chairman of the Association for Information Management and New York-based Lessin Technology Group.

Clone maker IBM may kill monolith IBM

FIRE WATCH *by* John Gantz

It is a sign of the times and a warning of scary passages to come: IBM wants to be a clone vendor. If it succeeds, as it likely will, users will have to make some adjustments because such a change will rip the fabric of the systems business and probably signal the end of IBM as we know it.

The story begins with an agreement between IBM and Intel that allows IBM to co-design variations of the X86 architecture. While the agreement has been long-standing, the first fruit from IBM under the pact was the 386SLC chip, introduced in Models 56 and 57 of the Personal System/2 line earlier this year.

The 386SLC is similar to the Intel 80386SX (32-bit core, 16-bit bus), but it has an 8K-byte internal cache similar to the 1486. As a result, it's quite a bit faster than the 386SX at the same clock speed.

This fall, Big Blue introduced more IBM-designed Intel chips, namely the 486SLC2 chip, as a second generation for the PS/2 Models 56 and 57, and the 486SLC — the former chip without clock-doubler circuitry — in the ThinkPad 700C notebook computer. The 486SLC2 is a 3.3-V chip with 16K bytes of internal cache — larger than Intel's. It's a screamer.

This means that come spring, when volumes are up on the IBM 486SLC2, IBM will have an excellent chip to pop into next-release ThinkPads and may then have the best 486 notebook computer with an active-matrix display in the market.

Now for the clone part. By the nature of its agreement, IBM is not allowed to sell chips in competition with Intel, but it can sell boards. The word on the street is that IBM is actively looking to sign up OEM customers who would be interested in buying chips premounted in motherboards of either IBM's or their own design — putting IBM in direct competition with Intel.

Such a chip would be of interest to Far East notebook vendors that are not expecting to see even samples of the rival Intel chip, the 486SL, until spring and volume supplies until summer. By that time, first-tier players such as Compaq and Toshiba will already be in the market.

If IBM can bring an Intel chip to market sooner than Intel, it will find customers — particularly OEMs that want to have favored customer status when 50- and 100-MHz chips come out. Intel's premier customer is suddenly a competitor.

For users, the immediate prospects are good: better notebook computers cheaper and sooner — unless, of course, they have just committed to a large purchase from one of the vendors IBM shoulders aside with its leading-edge products.

The long-term prospects are scarier. Not only is there the increased overhead of doing business in a world so complex that it has IBM selling motherboards to manufacturers, but there is also the specter of the disintegration of IBM.

As the various IBM "companies" search for strongholds in the market by selling to OEMs, they'll begin competing with one another without the adjudicating influence of a single IBM sales force. They can't help but become very separate companies, not the ersatz separate companies they are now. Then that comforting blanket of one-stop shopping with an IBM tuned to the needs of the corporate customer and the IS shop is shredded to pieces.

It is one thing for IBM to want to make Intel chips to secure the best designs for itself, but it is quite another to sell them to others. Believe me, the IBM SLC2 is a bellwether chip. IBM the monolith is disappearing.

Gantz is senior vice president at International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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Charles Babcock

OSF to fill software gap

I was talking with Carl Zeigler, the iconoclastic Unix guru at the SAS Institute in Cary, N.C., and true to form, he was pushing the envelope of public discourse: "I keep urging the Open Software Foundation to drop work on the OSF/1 kernel. It's only a way of getting DEC and IBM to fund the technology that goes into HP's HP/UX."

Carl, who works for a company that is not a member of the OSF, was cheerfully warming to the task: "OSF has a credibility problem. I want the things that OSF provides, but I don't know that I need OSF to provide them."

These are unrewarding times for the OSF, my candidate for forsaken stepchild of the year. In fact, the role of the OSF is so poorly understood that its future may be challenged even as its contributions begin to make themselves felt.

The OSF was not set up as a software institute to produce a set of discrete products. Rather, it is an industry collaboration for defining a set of specifications and adapting a set of technologies that implement them. If assembled rigorously enough, these specifications and technologies will be built into many vendors' products and will allow their customers to develop applications that can run across multivendor environments.

This means the OSF is creating, for want of a better term, "middleware" — the Distributed Computing Environment (DCE) and the Distributed Management Environment (DME).

DCE provides security, threads, a distributed naming service, file sharing and remote procedure calls for applications to operate across dissimilar systems.

DME uses an object request brokering system to achieve a logical view of a network that supersedes single-vendor and single-platform views. A systems manager can then manage the network through one consistent interface, OSF/Motif.

Because of plug-in points provided by DEC, you will have the option of getting your application to share data and work with other applications across the network.

So why isn't the OSF a huge success selling middleware? That's not its job. It only produces the specifications and source code to accomplish these things, then turns them over to its members.

It is the member companies that must build DCE and DME into their products. With the third release of DCE due in the first quarter of 1993, this process is well under way at DEC, IBM and HP. (The first release of DME is slated for September 1993.)

So the OSF is doing something quite different from standards formulation. Instead of assembling widely used and politically acceptable technology under an umbrella, such as Posix or OSI, the OSF is bringing new technology to bear on difficult issues of distributed computing. DCE and DME may one day be accepted as standards, but first they must prove their technical wherewithal.

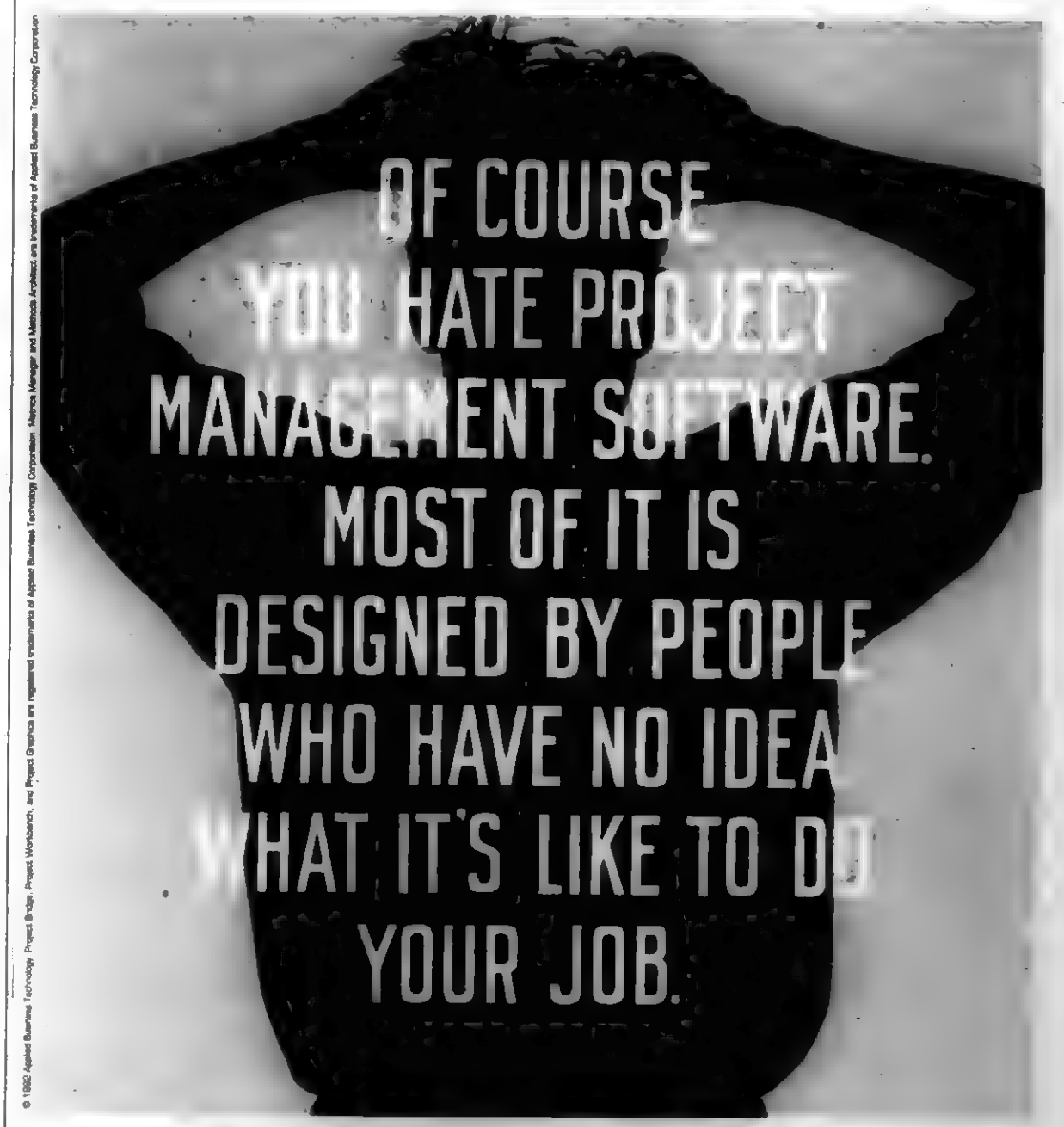
"We have been watching OSF with acute interest. It may show us how to avoid developing something three times," says John Burton, president of Legent Corp., the Vienna, Va., systems software house.

To return to Carl Zeigler and the SAS institute, I had to agree that the OSF has an imperfect technology selection process. But how, I asked, are we going to fund the development of middleware if we don't do it through a quasi-government agency like the OSF?

"You got me there," he conceded.

In fact, development houses with the resources — Oracle, Computer Associates, Lotus and Microsoft — have been developing their own middleware for some time. The rub here is that their middleware is designed to extend their products first and the independence of the customer second. Until somebody comes up with a better idea, the OSF or some agent like it will be a fixture of the software industry.

Babcock is *Computerworld*'s technology editor.



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IBM®

New sounds

Noisy debut for Audioman

By Christopher Lindquist

If you are sensible about the future of PCs, you are probably sensitive to the fact that people are coming to their senses about the sensational potential of giving computers sensory perceptions. Nonsense, you say? Logitech, Inc. is betting you will change your mind.

Logitech has spent years giving computers a sense of touch, through mice and trackballs, and sight, with scanners and digital cameras. Now it wants to add to its "Senseware" line by giving computers a means to hear via Audioman, its entry into the burgeoning "business audio" peripherals market.

> Audioman is easy to set up and use, requiring no screwdrivers or complex installation software, according to one user.

Audioman is a portable, self-contained unit that includes a speaker and microphone as well as audio input and output jacks. The unit plugs into the parallel port on any PC and runs on either battery or AC adapter power. A pass-through allows a printer to be attached to the port simultaneously with Audioman.

Business audio in this case means just that. Audioman is not meant for games, nor does it support MIDI files or compatibility with other sound cards. It plays .WAV files and comes with software that allows users to annotate sound, such as voice, into applications that support Object Linking and Embedding. And according to users, it does it well.

Comes in handy

"I think it's a great little product," said Randy Dugger, manager of the workstation/LAN support group at Tandem Computers, Inc. in Cupertino, Calif. "It fills a need that hasn't been ad-

Audioman, *page 41*

A solid report card

Hardware: B+
The best grade of the four categories, it pulled up the overall score. However, users found CD-ROM and high-volume printing capabilities unimpressive.

Software: B-
Users downgraded software because of weak development tools, particularly the lack of CASE options.

Networking: B-
Many of the respondents' negative comments centered on AppleTalk, but performance, network management and security also need work.

Support: C+
The worst of the four grade categories. Buyers were unhappy with post-sales support, citing dealers as inadequate sources for solving large-enterprise and multinational problems.

Overall: B-
Buyers said Apple can and must do better.

Source: Aberdeen Group

Users prove tough graders with Apple

By James Daly

Apple Computer, Inc. has received a report card from its corporate customers that leaves it shy of making the honor roll.

The report, the result of a survey of hundreds of Macintosh devotees by the Boston-based research firm Aberdeen Group, noted that while corporate users still have a high regard for Apple's hardware, they have quibbles with the available software and find networking with the Macintosh less than spectacular. Their harshest criticism was reserved for Apple's support — or lack thereof. Apple's overall grade: a B-.

"Buyers believe Apple can and must do better," the report read. "Clearly the company has work to do if it wants to be a major presence in large enterprise markets."

Not all the news, however, was glum. The very nature of the sampling, ranging from customers in small firms to large companies, suggested that Apple has already penetrated the dense and difficult wall of general corporate acceptance.

The report described the typical Macintosh corporate user as one networked to one mainframe, two midrange machines (predominantly Digital Equipment Corp. VAX machines), a handful of peers and a database.

The surveyed sites had an average of 2,600 desktop machines, split evenly among Macintoshes, PCs and other desktop devices such as workstations and terminals. Overall, 125,000 desktops were represented in the survey.

Apple took it on the chin most severely in the area of support. It was the only area in which Apple did not receive a single positive comment. "Post-sales support is nonexistent," one respondent grumbled. "Dealers can't cope with the complex questions large accounts need answers for." Another said: "Apple still doesn't get it."

The assessment should come as no surprise to Apple, which for years has heard complaints about its poor support from user groups such as Management Apple Computers in Information Systems. Apple is structured much like an automobile manufacturer, relying heavily on third-party distributors.

Users praised Apple's traditional ease-of-use stronghold but warned that it can no longer rest on its decade-old laurels. "Ease of use, Apple's hallmark trait of the 1980s, is just not competitive enough to win over large numbers of today's savvy — and often IBM PC-committed — corporate buyers. Apple's efforts to market to the large enterprise are particularly critical now because buyers are locking in desktop-architecture decisions that will dictate buying patterns for the next several years," the report said.

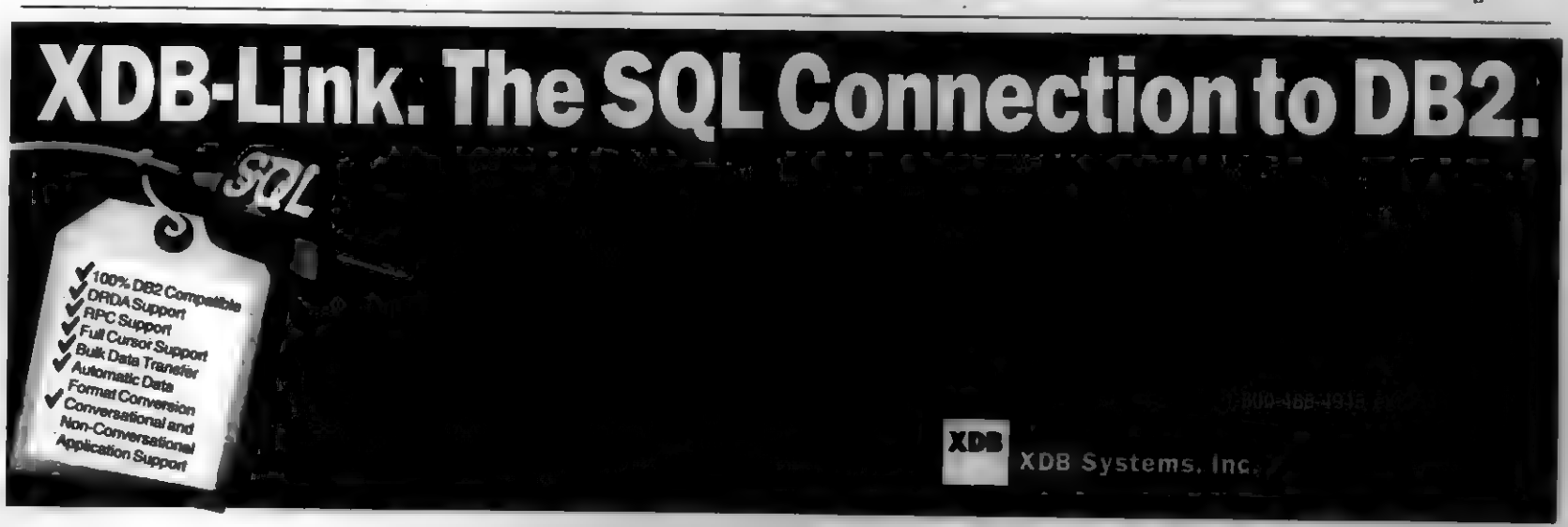
While Microsoft Corp.'s Windows 3.0 and 3.1 have certainly narrowed the usability gap in this area, they are still not enough to woo longtime Macintosh fans. The report said few of Apple's corporate customers are enthusiastic about Windows and that most show little sign of abandoning Apple.

Still, there is no getting around the fact that work needs to be done if Apple is to continue to exploit its inroads in the corporate marketplace. The Macintosh has expanded beyond its toehold in the art department, but it is still far from being No. 1. Aberdeen Group estimated the overall corporate ratio is one Macintosh for every 12 PCs.

Networking was another area targeted for complaints. Users groused that Apple's built-in networking scheme, AppleTalk, was slow, proprietary and nonscalable.

The implications for Apple are not good, particularly in light of the survey's projection that corporate information systems budgets for next year will be flat or down.

Apple declined comment on the findings.



Users welcome Freelance Release 2.0

By Rosemary Cafasso

When Frank Arduini, a consulting manager at Baxter Healthcare Corp., was putting together a presentation last year with Lotus Development Corp.'s Freelance Graphics for Windows, he discovered that it had no template for organizational charts. Then he realized that he was limited by the types of lines he could draw.

While these were not big problems, they nonetheless really bugged him. But Arduini said these annoyances are fixed with Release 2.0, which he beta-tested and Lotus plans to begin shipping next month.

He said Release 2.0 is "evolutionary, not revolutionary," but the company did a good job in making it a better graphics package than the previous release.

"We had a whole list of things like that, and they were all taken care of," Arduini said.

Freelance Graphics for Windows Release 2.0 is Lotus' second major effort in the Windows-based graphics market. It competes with Software Publishing Corp.'s Harvard Graphics and Microsoft Corp.'s Powerpoint.

Release 2.0 attempts to create an intuitive design environment so that professionals without graphics experience can quickly create presentations. For example, the software includes ready-made presentation page layouts that a user can simply fill in with data. Layouts can also be customized.

The software provides users with the option of using an outline facility, which appears on-screen as a page of a notebook, to create a presentation. Once completed, the outline is then translated into a chart. Or a user can create the presentation in the chart pages themselves.

Tony Gleicher, a marketing research manager at Pepsi Cola Co., said the software goes a long way toward helping make presentation preparation easier. He said the use of context-sensitive menus can be a big time saver because "you don't have to go searching the menu bar." Context-sensitive menus can be called with a mouse click and will reflect options based on the work in progress.

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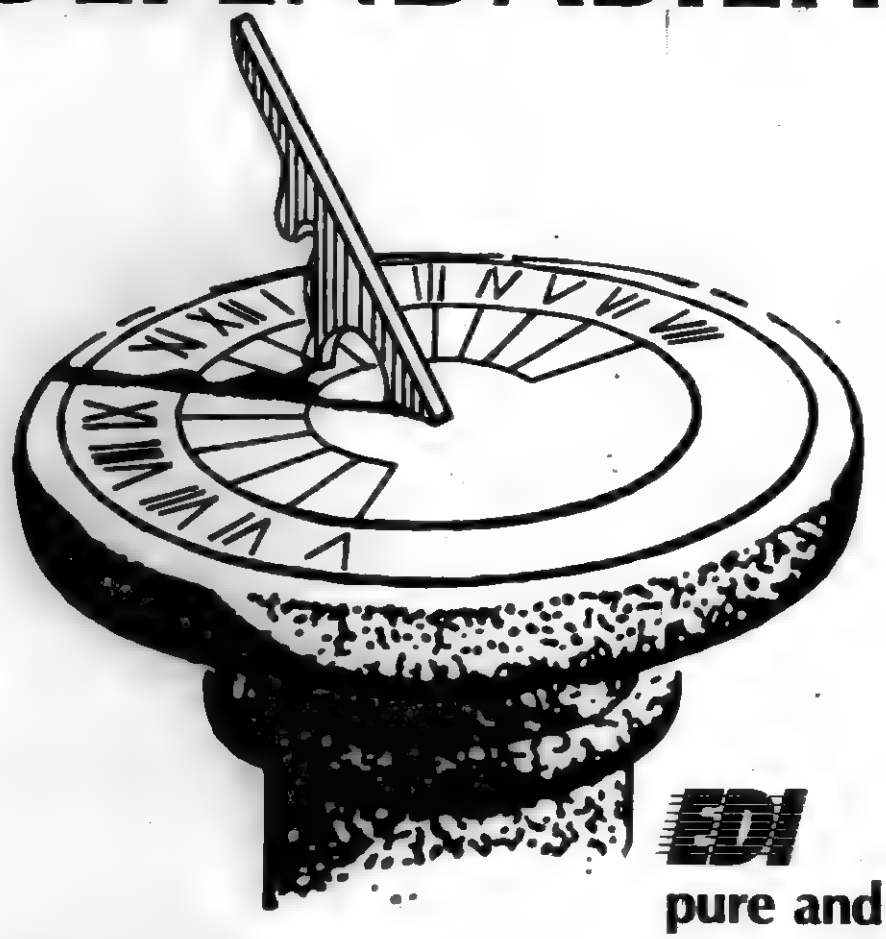

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Responding Globally

In Brief

Software sting

Federal marshals in Baltimore recently raided an electronic bulletin board that offered its subscribers the ability to illegally copy nearly 500 software programs. The raid came in the wake of a sting-type investigation. The operators could face stiff new penalties under recent legislation that provides up to five years' imprisonment and a $250,000 fine for copyright infringement.

SPA raids Vicon

The Software Publishers Association has announced the completion of a court-ordered raid on Vicon Industries, a maker of closed-circuit television components in Melville, N.Y. The firm had been accused of illegally pirating software. Vicon allegedly made unauthorized copies of several computer-aided design packages, reportedly employing a product specifically designed to break the copy protection devices on the software.

Sharp organizer debuts

Sharp Corp. has announced its latest palmtop organizer for the U.S. market, according to Tadao Kitada, products planning department manager at Sharp's Personal Systems Division. The organizer — dubbed the [illegible] — is small enough to fit in a shirt pocket and [illegible] touch screen [illegible] built-in applications such as a telephone directory, a scheduler, a to-do list, a scrapbook and a [illegible] program.

Christopher Lindquist

Biting the bullet

The price of the 1M-byte SIMMs I need for my PC went up nearly 40% last week. Seems the government wants to protect the U.S. chip market by preventing Korea from dumping memory chips on our market.

The tariff isn't in effect yet, but the government has announced an intent to investigate and has imposed a bond on all chips imported from Korea. The result has been a drop in Korean memory imports and, therefore, higher prices — $15 per megabyte for me. The goal is to protect U.S. jobs, though the memory I was going to buy is Japanese. All it did was protect my bank account — I'll wait for the prices to drop again.

I certainly wasn't the only one who noticed the price increase. What may end up a trade battle between the U.S. and Korea is already a war of words on some bulletin boards.

Help or hindrance?

Part of the reason I want to get more memory is that I'm ready to load the OS/2 2.0 Service Pack on my home system and give it a try. The verdict still seems to be out on whether IBM's bug fix/upgrade package is a blessing or a bane. Some users love it. Others say they still can't install it and have all sorts of nasty words for IBM.

Of course, any of those disgruntled OS/2 2.0 users who want to give Windows NT a try still have a while to wait, unless they want to jump on the beta-test bandwagon. And if you want to do that, you'll want quite a machine. While Microsoft is stating that Windows NT will eventually run in 8M bytes of memory, the current beta test suggests 12, plus about 50M bytes of your disk space in program and swap files. Of course, you also need at least a 386.

Those of you with 286s can still run Windows 3.1 if you're not in a hurry. The requirement once again? Get more of that memory.

A lot of Windows users are running on 486 machines. And the issue of heat sinks and extra cooling fans to keep the faster chips running safely seems to be coming up quite a bit. The consensus? Using a sink may not help, but it can't hurt.

One Symantec Norton Backup user was a bit surprised by the response he received from Symantec technical support when he requested info on support for a SCSI tape drive. They reportedly told him that the software supports only SCSI hard disks, not tape drives.

"When I asked them what use a backup program was that supports the disks but not the tapes, they merely repeated themselves," he said. To which a sympathetic respondent replied, "I'm surprised they didn't ask why you'd want to back up a tape drive."

Got any Comdex tales of dread? Send a message via MCI Mail at 549-8464, CompuServe with 72360,2005 or Internet under christ@unifirland.natick.ma.us.

Lindquist is a *Computerworld* West Coast correspondent.

NEC presents first pen computer with true PCMCIA compatibility

By Michael Fitzgerald
BOXBORO, MASS.

NEC Technologies, Inc. recently cast its hat in the pen computing hardware ring with its Ultralite Autograph, based on Intel Corp.'s 20-MHz I486SL.

"The problem has been lack of hardware, so any announcement like this helps," said William Lempesis, editor of the newsletter "Pen Vision News" in Pleasanton, Calif.

According to industry experts, Ultralite Autograph could help jump-start the nascent pen-computing market.

The Autograph features a 1.8-in., 40M- or 80M-byte hard drive, two Personal Computer Memory Card International Association (PCMCIA) cards and a local-bus video architecture. It uses Intel's new 20-MHz 486SL.

NEC claimed the Autograph was the first system to have true PCMCIA compatibility. The standard has been plagued by spotty software support and only recently developed a solid standard.

With this standard, "PCMCIA makes it as easy to install peripherals as it is to insert a floppy," said Renee Bader, NEC's director of strategic marketing.

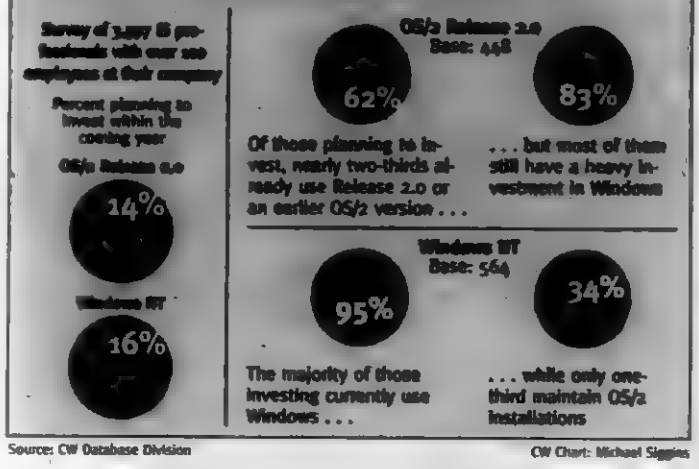
While NEC already has a digitizer interface and pen attachment for one of its Ultralite notebooks, the Autograph is its first pen-only interface system.

Bader said NEC is "committed" to pen technology and plans more systems that use the pen interface.

The Autograph is slated to ship in January. Retail prices are $3,999 with Microsoft Corp.'s Windows for Pen Computing operating environment and $4,099 with Go Corp.'s PenPoint operating system.

Where is the loyalty?

Respondents planning to further invest in Windows NT appear to be closer to a standardization decision than those investing in OS/2 Release 2.0



Source: CW Database Division — CW Chart: Michael Siggins

Noisy debut for Audioman

CONTINUED FROM PAGE 39

dressed [by sound cards]."

Dugger said Audioman is easy to set up and use, requiring no screwdrivers or complex installation software.

That ease of use, combined with its portability — it can be quickly attached to a laptop computer — make it ideal for people who have wanted to give sound annotation capabilities to users but have not yet found a low-cost, nonintrusive means of doing so.

With easy-to-use tools and the advent of built-in audio capabilities from such system vendors as Compaq Computer Corp., sound annotation may move quickly from the realm of "gimmick" and into mainstream business, the users said.

"Sound does add the missing element that people sometimes need to express urgency in a message," said Sal Merchant, a PC specialist at Conner Peripherals, Inc. in San Jose, Calif. "I would say that it is something to look at seriously."

Merchant said he uses Audioman to voice-annotate Excel files that are then sent via electronic mail to other users. The annotation allows truly "human" stresses to be placed on instructions and helps eliminate misunderstandings.

Audioman is scheduled to be available next month for a list price of $179.

Reporter's Notebook

Top guns from the Big Three mainframe-computer software companies were in Boston recently for the Forrester Research, Inc. 1992 Technology Management Forum. While the conference's agenda was client/server computing, executives from Microsoft Corp., Lotus Development Corp. and Borland International, Inc. spoke more about desktop platforms. Here are some of their views:

Jim Manzi, chief executive officer of Lotus, reiterated the company's commitment to Microsoft's Windows NT. "We expect to have one of the first NT products out," Manzi said. First out of the Lotus box for this Microsoft platform: Notes, its workgroup computing software.

Manzi was not so kind when it came to Windows for Workgroups, which may or may not be a "Notes killer," depending on which industry viewpoint you hear. But Manzi made himself very clear: "It is not a full workgroup product. It's designed for dental offices that don't want to expand."

Curiously, then, Manzi added: "We will have apps to ship on it."

Asked by the Forrester audience if he believed Microsoft could trip as it delivers Windows for Workgroups or NT, Manzi said, "I light candles for that. I was never a religious guy until a year ago."

Philippe Kahn, Borland CEO, never strayed far from the subject of objects. But he did stress his company's commitment to OS/2, noting that ObjectVision is now shipping and a "final beta for C++ is out."

He also said Borland is "looking at" making interbase for OS/2 2.0 available in 1993.

Theo Kahn tossed IBM a backhanded compliment: "I believe OS/2 2.0 will be a successful server operating system." IBM has long been insisting that OS/2 will do well as both an end-user and a server operating system and claims a large chunk of the software sales so far have been to customers.

Mike Maples, executive vice president at Microsoft, had little to say about OS/2. He was asked to explain and help differentiate the many flavors of Windows, including Windows 3.1, Windows for Workgroups and the yet-to-be-delivered Windows NT.

"If you have one PC, use Windows. More than one, use Windows for Workgroups. More powerful requirements, use NT," Maples said.

When asked which server operating system will be key next year, Maples didn't surprise anyone with his claims for NT.

"On Intel-based servers, two-thirds will be running NT by year-end 1993.

"If you go out to 1993, every desk will be NT," Maples added. "Windows will have gone out to the consumers."

Computerworld staffers were contributing editors to this report.

[redacted]

Systems

Diamond Flower Electric Co. has introduced the 486-66DX2 Diamond Series Computer.

Both MS-DOS and Microsoft Corp.'s Windows 3.1 operating system are included with the desktop model.

Other features accompanying the product are 4M bytes of random-access memory, a 1.2M- and a 1.44M-byte floppy disk drive, a 200M-byte hard disk drive, two serial ports, one parallel port, 1M-byte video RAM, a 1,024 by 768 noninterlaced color monitor, a 101-key board and a Diamond Flower Electric mouse, the company reported.

The 486-66DX2 costs $4,539.

➤*Diamond Flower Electric*
135 Main Ave.
Sacramento, Calif. 95838
(916) 568-1234

Application packages

Contact Software International, Inc. has announced 1stACT for Windows, a contact management software product.

A contact database, activity manager, report generator and auto-dialer are integrated within the product. A full-featured word processor with spell-checker and mail-merge capability are also included. Industry-standard dBase-compatible file structures are incorporated for activity, contact and history data, and 1stACT has built-in import capabilities to automate the process of exchanging data with other ACT products.

Microsoft Corp.'s Windows 3.0 or 3.1 or DOS Version 3.1 or higher are required as well as 2M bytes of system memory and hard disk space and one high-density 5¼-in. or any 3½-in. disk drive.

1stACT for Windows costs $149.

➤*Contact Software International*
Suite 200
1840 Hutton Drive
Carrollton, Texas 75006
(214) 919-9500

Peripherals

Procom Technology, Inc. has announced the Procom ISA SCSI Xelerator, a Small Computer Systems Interface (SCSI) host adapter for PC compatibles.

The Xelerator offers a Fast SCSI XT/AT bus-mastering interface that is capable of user selectable transfer rates of up to 10M bytes per second, according to the company.

Other features include disk spanning and striping, transparent disk mirroring, multiple formatting, password protection, virus protection and selectable boot drive.

A configurable virtual drive engine is provided that is capable of dispersing multiple I/Os to a number of independent disk drives.

The product can also automatically detect and reassign bad block-on-the-fly as well as automatically restore the mirror state in case a system power failure occurs.

The Xelerator costs $359.

➤*Procom Technology*
2181 Dupont Drive
Irvine, Calif. 92715
(714) 852-1000

Data I/O Corp. has introduced the CardPro Universal PC Card Drive.

Through memory cards, the product permits the transfer of data from mobile computing systems to desktop PCs.

The drive supports all mobile computing systems and every memory and I/O card conforming to Personal Computer Memory Card International Association standard 2.0, the company reported.

CardPro costs $450.

➤*Data I/O*
10525 Willows Road N.E.
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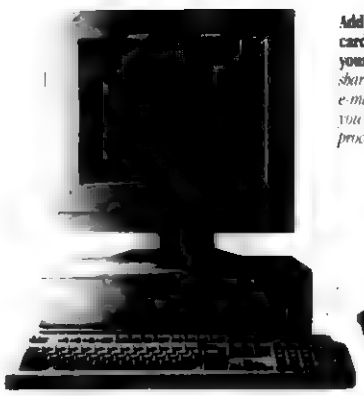
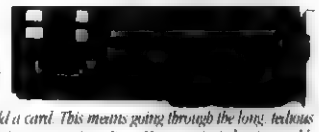
If you're looking for a computer that will grow with your needs, there are basically only two ways you can go.

The hard way.



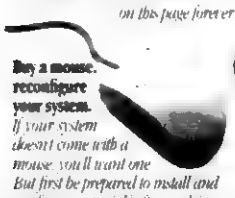
Add networking card, reconfigure your system. *To share files and send e-mail to other PCs, you may have to add a card. This means going through the long, tedious process of reconfiguring your system. On a Mac, you just plug in a cable.*



Upgrade your memory, reconfigure your system. *Add memory to a Mac, and it reconfigures itself accordingly. But add memory to a PC, and you'll almost always have to run a setup program to configure the new memory – or the computer won't know what to do with it.*

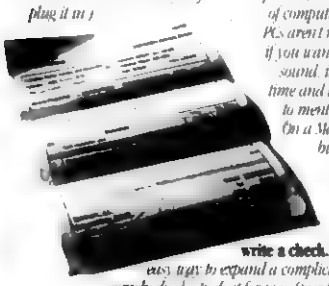
Add Windows, buy a new PC. *Most PCs in use today weren't designed for graphical computing. So if you want to run Windows, you may have to buy a new computer. Why not consider a Macintosh and avoid all the problems on this page forever?*

Add almost anything, reconfigure your system. *Expanding your PC's capabilities can be amazingly frustrating. But a Macintosh easily adjusts to whatever extra device you add to it.*

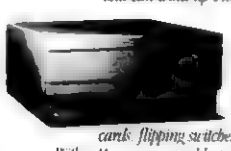


Buy a mouse, reconfigure your system. *If your system doesn't come with a mouse, you'll want one. But first be prepared to install and configure a special software driver. (No need with a Mac – you just plug it in.)*

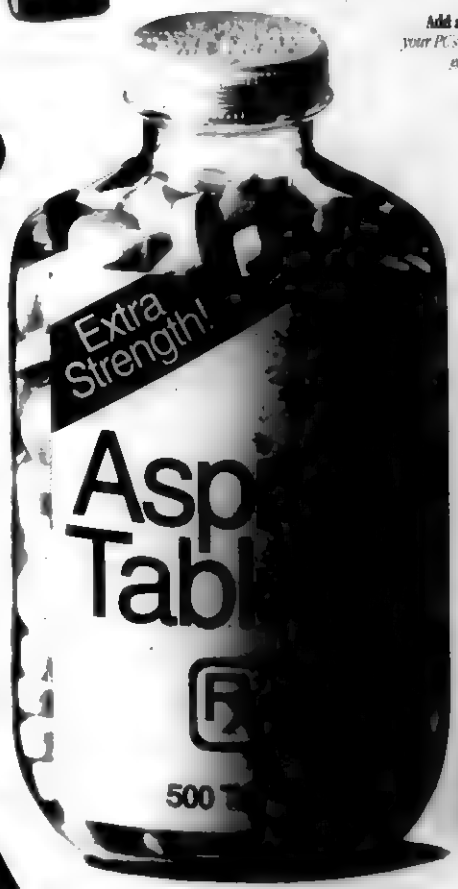
Play and record sounds, reconfigure your system. *Multimedia promises to be the future of computing. But most PCs aren't ready for it. So if you want to work with sound, it'll cost you time and trouble – not to mention money. On a Mac, sound is built in.*

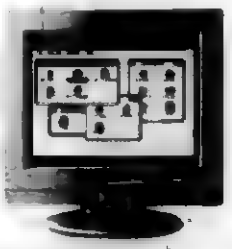


Call for help, write a check. *There is one easy way to expand a complicated PC – hire somebody else to do it for you. Over time, of course, that can wind up costing you more than the PC.*



Add peripherals, reconfigure your system for each one. *Want to add a CD-ROM or hard disk drive? Then prepare to spend hours installing cards, flipping switches and editing files – for each one. With a Mac, you can add up to seven peripherals by simply plugging them in and clicking a button or two.*





Change monitors, reconfigure your system. *Add a new monitor, and you'll have to reconfigure your entire system or your monitor could look like this one. A Mac recognizes a new monitor and adjusts to it automatically.*

Whoops! *When you add something to an ordinary PC, you may have to "reconfigure" your system – a process of hardware and software adjustments, which can be complex, tedious, and take up hours of your time.*

Add printer, adjust DIP switches. *Hooking up a printer seems easy. Until you set your DIP switches, install your driver, locate your Windows diskettes, make an error and start all over again.*

Expand your PC, take two aspirin. *Inevitably, you'll want to expand your computer's capabilities by adding extra devices. The more instructions you slog through and switches you fiddle with, the more time it will take. And the more pain reliever you'll need.*

Manual labor. *Software like Windows purports to make things easier. But the reality is, you'll still spend hours reading manuals just to make it all work – time you could spend doing more useful things with your computer.*

On a typical PC, even adding a simple hard disk can be extraordinarily complicated. You'll probably have to "reconfigure" your system – the time-consuming process of telling your computer what pieces you've added. You may have to edit complex CONFIG.SYS and SYSTEM.INI files, install special device drivers and fiddle with DIP switches. And, of course, building even a basic network is extremely difficult – what with installing

The easy way.

Macintosh *is designed to make it easy to grow. Networking and sound support are already built in. File-sharing and multimedia capabilities are standard. So is support for up to seven peripherals. Which means you can add everything you see on the other page to this Macintosh IIfx without using up a single expansion slot. Leaving room for things like an accelerator card, an Ethernet or Token Ring card or other cards that allow you to customize a Mac for high-performance or specialized tasks.*

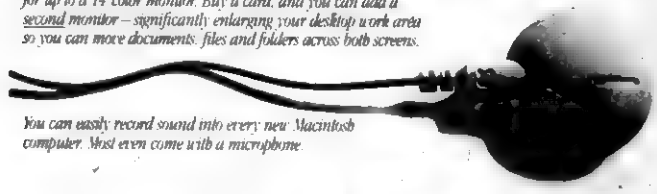
cards and networking software. An Apple® Macintosh, on the other hand, knows when you've added a hard drive. Installing a CD-ROM drive or scanner is a matter of plugging in a cable and clicking a couple of buttons. Even installing a network requires nothing more than plugging one Mac® into another. It's just one more example of how a Macintosh works in a simple, logical way. So you can, too.

If you know how to use a plug, you know how to expand a Macintosh.

This Macintosh IIvx has built-in monitor support for up to a 14" color monitor. Buy a card, and you can add a second monitor – significantly enlarging your desktop work area so you can move documents, files and folders across both screens.

Plug in an AppleCD™ 300 CD-ROM drive, and you'll have access to huge libraries of reference sources, fonts, clip art and video images on CD. (It even supports Kodak's exciting new Photo CD technology.)

A Mac gives you professional-quality documents even if you're on a student budget. Just plug in an Apple StyleWriter™ printer.



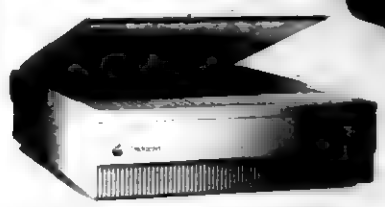
You can easily record sound into every new Macintosh computer. Most even come with a microphone.

Plug in an Apple Personal LaserWriter™ NTR, and everyone in your workgroup will have access to the fastest printer in its class. (It works with PCs, too.)

Plug in a SyQuest drive, and you'll have virtually unlimited hard drive storage via removable 44MB or 88MB cartridges.

Plug in an Apple LaserWriter IIg, and everyone on your network will instantly be able to take advantage of the Apple PhotoGrade™ technology that rivals 800 dpi printers costing thousands more – for spectacular-looking documents.

Plug in an external hard drive or other storage device, and you increase your storage capacity in seconds.



Plug in an Apple OneScanner™, and you can add beautiful black-and-white photographs to your documents with one touch of a button. No fussing or fiddling required.

Adding a peripheral to a Mac is as easy as using one. Plug it in, click a couple of buttons and get back to work.

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For the name of your nearest authorized Apple reseller, call 1-800-538-9696, ext. 230. In Canada, call 1-800-668-2132, ext. 230. *Increase power are based on industry averages. **J.D. Power and Associates 1994 and 1993 Computer End User Satisfaction Studies. 1994 study conducted among 2,253 business end users at 1,145 business sites. ©1994 Apple Computer Inc. All rights reserved. Apple, the Apple logo, LaserWriter, Mac, Macintosh, StyleWriter and The power to be your best are registered trademarks of Apple Computer Inc. AppleCD, OneScanner and PhotoGrade are trademarks of Apple Computer Inc. Kodak and Photo CD are trademarks of Eastman Kodak Company. Windows is a trademark of Microsoft Corporation. SyQuest is a registered trademark of SyQuest Technology. This ad was created using Macintosh personal computers. 10986LL/A

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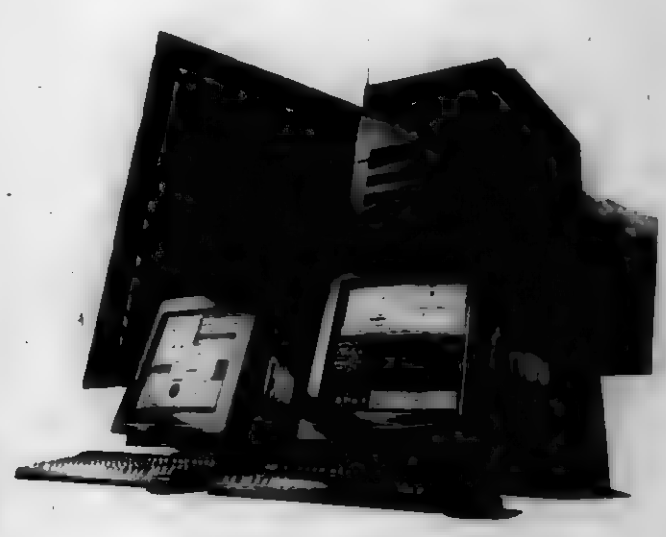

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IBM®

New workgroup player

By Maryfran Johnson
PALO ALTO, CALIF.

Unix and office productivity applications are still an odd couple in the world of workgroup computing, but this burgeoning $3 billion market is attracting a crowd of would-be matchmakers these days.

While PC software goliaths Microsoft Corp. and Lotus Development Corp. seek to inherit this market with products such as Windows for Workgroups and Lotus' Notes, some comparatively small Unix vendors are also getting in line.

One high-hopes contender is XSoft, a software division of Xerox Corp.

Earlier this fall, XSoft unveiled a number of office productivity applications for the X Window System environment, plus document search and retrieval products, publishing software and a utility that allows Windows users to connect to XSoft's document services. Its flagship product is the $1,495 GlobalView for X suite of document management products for Unix, now installed in beta-test sites and slated for shipment in early 1993.

GlobalView's personal productivity tools help users create documents quickly, present information, automate forms in routine tasks and interoperate with third-party applications such as Lotus' 1-2-3.

In other words, they do the sort of things Unix users often turn to PCs and Apple Computer, Inc. Macintoshes to accomplish.

The XSoft document software currently runs on Xerox 6085 and 6500 workstations, Sun Microsystems, Inc. SPARCstations and PCs running OS/2 and The Santa Cruz Operation's SCO Unix.

Market make-over

The market XSoft addresses is undergoing a significant transition now, said Krystyna Filistowicz, director of business applications at Dataquest, Inc. in San Jose, Calif. "It's moving from the old office software market to the new definitions of workgroup computing or groupware," she said.

Now pegged at $3 billion in size, the workgroup software market could treble to $10 billion by 1996, Filistowicz said.

"XSoft is a very tiny player right now, initially focused only on Unix but now extending to encompass Windows users. That's a wise move," she added. "But they're on a tightrope of sorts. They want to shed the legacy Xerox reputation, which is mostly negative on the desktop, yet still leverage the work coming out of Xerox PARC."

XSoft has managed to do some technology transfer already, said Steve Unger, manager of office applications marketing at XSoft. For example, an offshoot of some Xerox Palo Alto Research Center (PARC) research became the "Rooms" desktop manager utility that is built into GlobalView for X.

One beta-test user of GlobalView is ITT Federal Services, which handles all engineering work for the missile and aircraft test range at California's Vandenberg Air Force Base.

"We're now able to do document review on-line and then electronically transfer the data between us and the government and the engineers developing the documents," said Bill Smith, deputy director of engineering at ITT, which has GlobalView for X running on a network of 10 Xerox workstations.

The software also helps ITT comply with the requirements of the government's Computer-Aided Logistics Support standard for electronic document interchange, Smith said.

Another benefit is the flexibility of being able to transfer data more easily to other platforms, such as Digital Equipment Corp. VAXs and other Unix-based workstations, he said. "Over the long run, we think this will save us and the government time — which is money," Smith explained. "We won't have to produce nearly as many documents in hard copy as we do today."

XSoft
A division of Xerox

Lines of business: Document software, including office applications, publishing, document services, search and retrieval tools and personal productivity tools.

Competitors: Applix, Inc., Clarity Software, Inc., Island Graphics Corp., Uniplex Ltd. and Frame Technology Corp.

ON SITE

Anderson & Co.
New York

Business challenge: To develop a network-based integrated imaging application.

Technology: Executech's IMAXS and LaserData's LaserView imaging software, Gupta's NLM SQL database engine, Microsoft's Windows 3.1 and Novell's NetWare v3.11.

Law firm makes strong imaging case

By Thomas Hoffman
NEW YORK

Anderson & Co. might be one of the smaller law firms in the Wall Street district, but the company's savvy use of image technology is helping it stand tall among lower Manhattan's legal giants.

The 36-person firm focuses primarily on insurance and reinsurance litigation cases. Founded in 1984 by A. Broadus Anderson III and a handful of partners, the firm prides itself as being one of the least expensive law firms around Wall Street, according to Anderson.

Earlier this year, Anderson and his staff began to study the merits of adding a network integrated image processing application designed to provide the legal staff with instantaneous access to case documents. Such a system, Anderson said, would enable the legal staff to locate case information in a fraction of the time it took to scour case documents manually.

Cost justification

"We realized that we could be much more efficient as litigators and bring our clients' costs down," Anderson said.

Anderson added

Anderson, *page 47*

$73 211 538 664

By the end of this week Computerworld readers will have spent over **$73.2 Billion** on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Intel eases LAN control

LANDesk applications enable LAN management from a single console

By Michele Dostert

LAN managers who currently use several consoles to manage their Novell, Inc. local-area networks will soon be able to centralize their management on one PC.

Intel Corp. has begun beta-testing its new LANDesk family of LAN management software products, which provide a single point of control for a variety of node management tools for Novell NetWare 3.X networks.

Early beta testers of the product were enthusiastic. "What I like about LANDesk is the single point of control for a number of solutions," said Glen Farrell, a programmer/analyst at Firestone Textiles in Ontario. "I can tell everything I need to know about the network instantaneously, without leaving my desk."

The LANDesk family includes the LANDesk Manager, a local environment that provides core network management software under a single Microsoft Corp. Windows-based interface, and a line of companion software to expand the LANDesk Manager's capabilities. These will include the LANDesk Inventory Manager software for hardware/software inventory and an application for continuous virus protection.

Single-agent design

The LANDesk Manager software employs a single agent running on LAN nodes to provide remote control and access, application monitoring, packet monitoring, virus protection and Windows-based access to standard NetWare administration utilities. The single-agent design provides simplified installation and low-memory overhead — less than 6K bytes — at user workstations.

According to Intel, the LANDesk family will include a Simple Network Management Protocol (SNMP) gateway that will enable LANDesk to report to SNMP-based management environments, such as those from Sun Microsystems, Inc. and Hewlett-Packard Co. Future versions of the LANDesk software will also support the Desktop Management Task Force application programming interface when a reference implementation becomes available.

"I was really impressed by LANDesk's ability to track network performance by application. That's an incredibly valuable tool for network managers," said Diane Danielle, an independent network consultant in Berkeley, Calif.

"It tells [the network manager] that either there's something wrong with how the application is installed or maybe he needs an application server or whatever. It shows that Intel is thinking of network management from the systems management perspective, which has been sadly lacking in LANs up to now," Danielle added.

Intel's LANDesk family of products is scheduled to be available in early 1993 through Intel's network of distributors and value-added resellers.

In Brief

Product automates E-mail delivery

Employees at Sun Microsystems Computer Corp. in Mountain View, Calif., have their electronic mail automatically sorted, prioritized and forwarded with the help of Personal Postmaster, a software product for Sun workstations from Qualix Group, Inc. in San Mateo, Calif. Sun signed a worldwide site license agreement with Qualix Group in August. Personal Postmaster was designed for the Solaris operating environment and standard Unix E-mail.

LAN prices drop

The cost of bridging Ethernet and Fiber Distributed Data Interface (FDDI) local-area networks dropped last week when Synernetics, Inc. in North Billerica, Mass., lowered prices on several workgroup models of LANplex 5000 Ethernet switching hubs. The LANplex 5004, which includes eight switched Ethernet networks plus an FDDI network interface, is now priced at $25,800, including software. Without FDDI it costs $16,800, an 18% price decrease.

Company profits from the weather

Concurrent Computer Corp. recently announced a contract with a potential value of more than $80 million for its role in Nexrad, a weather radar, storm tracking system sponsored by the U.S. departments of Commerce, Transportation and Defense. Under the contract from Paramax Systems Corp., Concurrent will install its real-time minicomputer systems at up to 175 sites.

As your business maintain the agility to

With the help of EDS, Riser Foods answered yes.

Supermarket chain Riser Foods has become a regional powerhouse thanks, in part, to a new information technology system integrated by EDS.

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The EDS system also cuts the time it takes for stores to order and receive merchandise. Orders entered directly into

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Law firm makes strong case for integrated imaging

CONTINUED FROM PAGE 45

that he was dismayed to find few, if any, off-the-shelf, image-based legal applications that suited the firm's needs. "We looked at all the legal imaging applications out there, but what we were discovering were applications written the way computer programmers think legal professionals do work, and not how lawyers and paralegals actually do work," Anderson said.

Anderson and Sheldon B. Pressman, a partner in the firm, decided to develop the system specifications themselves and work with a third-party consultant who would write the application. The firm contracted Executech, Inc., a New York-based imaging systems integrator, to develop a Microsoft Corp. Windows-based image application.

Anderson plans to have 1 million documents stored by the end of 1993.

Software framework

The Windows-based imaging application, called IMAXS, is front-ended by LaserData, Inc.'s LaserView imaging software. Topic, a full-text search software engine developed by Verity, Inc., searches for information housed in a Gupta Corp. Network Loadable Module (NLM) SQL database.

Documents are scanned into the system using a LaserData scanner, compressed with a LaserData decompression/compression board and stored on 5¼-in. optical discs housed in a Panasonic Co. jukebox. Information is routed through the network using a variety of six Intel Corp. 1486-based PC servers, including PCs from Dell Computer Corp. and Northgate Computer Systems.

The imaging application went into production when it was added to the 3-year-old network in May. So far, the firm has stored 400,000 case documents on optical disc, with plans to have 1 million documents stored on the system by the end of 1993.

Time is money

According to Pressman, the imaging system has already helped the law firm work faster. In the past, it took a month for the firm to have several paralegals manually put case documents into chronological order at a cost of $25 per hour per paralegal, Pressman said. Using the imaging system, the process is completed in less than a minute.

"Paralegal and reproduction copying costs represent a large percentage of costs for legal clients. The imaging system has helped us to reduce these costs significantly," Pressman said.

Anderson said the firm is considering marketing the imaging application to other law firms through third-party channels. Anderson runs its operations in a Windows 3.1 environment over a Novell, Inc. NetWare v3.11 network operating system. The Novell-based local-area network also runs WordPerfect Corp.'s Office word processing software as the network operating system shell.

Anderson said the Windows environment is particularly useful for lawyers. "Windows is more intuitive than Nexus or Westlaw, which is good for computer-phobes because it's simple," Anderson said.

Market misread

Anderson & Co. discovered how vendors may misunderstand how users work when the law firm found a lack of Windows-based image applications that provided annotation capabilities. Of the programs that did include annotation, none allowed users to search through annotations in case revisions or updates were required, which is a feature that is important to attorneys.

Network expedience

The networked environment, Anderson added, has enabled the firm to work more efficiently. In 1989, the firm dismissed its seven secretaries who were employed mainly to conduct word processing tasks. Once the legal staff was fully trained under the Novell/WordPerfect environment, the secretaries became expendable.

"We found that it was faster to do our own work on networked PCs than it was to delegate responsibility," Anderson said. "We're much more efficient without [secretaries]." The law firm continues to employ a file clerk, a receptionist and a LAN administrator.

Anderson and Pressman said they hope to see major technological advancements from Microsoft's upcoming NT operating system. Anderson said he hopes Windows NT will provide the multitasking capabilities Windows lacks.

"Right now, we can't toggle back and forth between the imaging system and the word processing system while the imaging system is conducting a search," Anderson said. "Hopefully, NT will provide us the flexibility to do that."

grows, can you outmaneuver competitors?

hand-held computers are transmitted to the Riser warehouse. As soon as the warehouse receives the order, it can be processed and shipped in a few **hours instead of days**.

This ensures that each store provides its customers with the right merchandise at the right price, when they want it. "Streamlined technology has helped us increase profits by 14% and margins by 33%," says Anthony Rego, Chairman and CEO of Riser Foods. "EDS helped us gain a big edge over our competition and continues to **help us increase our lead**."

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HELP LINE

Lotus' Notes

Part of a series of user tips provided by vendors and drawn from their customer support lines. This week's topic is Lotus Development Corp.'s Notes.

Q: What happens when one Notes document is edited by two users simultaneously on the same Notes server?

A: There is no document lock feature in Notes. When one person opens a document and makes a change, and another person opens the same document (before the first user has saved and exited it) and makes some change, the following will happen: The first person to save the document will have his changes written. When the second person attempts to save, Notes will warn, "Another copy of this document was saved while you were editing it," and ask the user whether to overwrite the first person's changes. If you are faced with this situation, you can opt not to overwrite the previously saved document (i.e., select "No" when asked "Overwrite it?"). Then select and copy your edits to the clipboard. Exit the document without saving your changes. Reopen the document and check the previous editor's changes and, if necessary, paste your changes to this copy of the document.

Q: What does "Error SYS:0252" mean when I'm loading Notes Server?

A: This message usually occurs on a machine that has installed both IBM's OS/2 Extended Edition and Novell, Inc.'s Requester, which is loading Novell's NetBIOS. It is caused by a conflict between a Novell Requester file called NETAPI.DLL and an IBM Communication Manager file with the same name.

To resolve the conflict, you must remove the directory C:MUGLIBDLL from the LIBPATH statement in the CONFIG.SYS file and make sure that the directory where the Novell NETAPI.DLL file is located is listed in the LIBPATH statement. You must reboot the machine after making the changes to the CONFIG.SYS file, and then you can start the Notes Server. To find out if you have installed the Extended Edition of OS/2, go to a full screen OS/2 prompt and type in SYSLEVEL.

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HP DAT triples its data transfer rate

By Mark Halper
LAS VEGAS

Hewlett-Packard Co. last week introduced a digital audio tape backup system that it said will provide close to three times the data transfer rate of the firm's current offering and will quadruple its longevity.

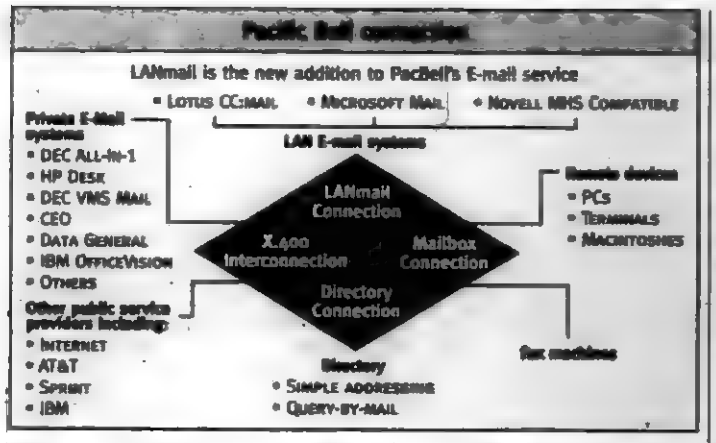
Robert Hill, marketing manager at HP's computer peripherals division in Bristol, England, said the 4mm HP C1532A will record at 510K byte/sec., compared with the 183K byte/sec. speed of the firm's current offering, HP35470A. The new unit, which will be commercially available in April or May, is rated at 200,000 hours mean time between failures vs. 50,000 hours for HP's existing model, Hill said.

The HP C1532A, which uses a Small Computer Systems Interface-II connection, is positioned for use with network servers, workstations and minicomputers. It will be made available to beta-test sites in January.

The existing model, packaged with tape backup software, is priced at $2,100. Initially, HP will not bundle the faster model with software because early users will be large operations that will want to integrate that function themselves, Hill said. HP will add a bundled option when it offers the tape drive through-reseller channels.

At 510K byte/sec., the 4mm HP tape drive operates as fast as the fastest 8mm drives and faster than other 4mm drives, Hill claimed. Industry analysts speculated vendors may match HP's speed by the time the new drive ships six months from now.

Hill said the new drive provides 2G bytes of storage in noncompressed mode. It will compress some data — typically applications — at a 2-to-1 ratio and other data — that is in databases — at a 4-to-1 ratio. Storage capacity could reach 8G bytes.



Pac Bell offers E-mail service for LANs

By Lynda Radosevich

Users who are trying to glue together disparate electronic-mail systems have a new option open to them: Rather than investing in gateways, software and staff expertise, they can outsource their connectivity headaches to Pacific Bell.

Pacific Bell, a subsidiary of Pacific Telesis Group in San Francisco, introduced LANmail Connection last month for national and international users. The service provides directory synchronization and gateways for Lotus Development Corp.'s CC:Mail, Microsoft Corp.'s Mail and Novell, Inc.'s NetWare Message Handling System-compatible systems. All that is required to use it is a mail server equipped with a modem and a phone line.

The service "removes the overhead from the user side," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif. "It means users have a lower barrier of entry into electronic-mail integration."

Because of regulatory issues, Pacific Bell cannot provide long-distance services, and users must select a long-distance carrier separately. Analysts point out that these long-distance charges could significantly add to the cost of the service, depending on the amount of traffic. Pacific Bell said it reduced message costs to account for this.

Compared with the roughly $15,000 it would cost to install a dedicated X.400 gateway between agencies, the Pacific Bell solution was cheap, said Tom Laffey, E-mail administrator at the California Department of Forestry in Sacramento, Calif. Laffey estimated that the department is spending between $200 and $250 a month, including phone charges, for 80 users to send mail to other agencies in California

Pac Bell, *page 53*

Seeking a MIB for SNA nets

IBM, DEC, others look to manage SNA devices via SNMP

By Elisabeth Horwitt

■ Vendors of IBM Systems Network Architecture (SNA) networks – including, most recently, IBM itself – are banding together to come up with a standard for managing SNA devices via Simple Network Management Protocol (SNMP).

A consortium of about 17 vendors, formed last month, includes SNA gateway vendors such as Attachmate Corp., Digital Communications Associates, Inc., Digital Equipment Corp., Eicon Technology Corp., Novell, Inc., Adacom Corp., Apple Computer, Inc. subsidiary Orion Network Systems, Inc., Sun Microsystems, Inc. subsidiary SunConnect and Systems Strategies, Inc.

"It has been apparent to us that there is no standardized way to manage SNA gateways — i.e., to configure them or query them to see how many users are on them or what traffic or error levels are like," said Kevin Tolly, president of independent consulting and testing firm InterLab in Seagirt, N.J., and coordinator for the group. Users generally had to find out what was wrong with a gateway by going there in person, which is "not an ideal solution when [gateways] are sprinkled all over the enterprise," according to Tolly.

The group plans to become a working group of the Internet Engineering Task Force.

IBM announced recently that it would publish a management information base (MIB) for managing networks running its Advanced Peer-to-Peer Networking (APPN) protocol; however, the MIB does not include variables for managing more traditional, 3270-based SNA networks.

While it will definitely join, IBM is still evaluating whether the consortium is the right vehicle to open up its APPN MIB to the vendor community, an IBM spokeswoman said. IBM's proposed MIB would enable SNMP systems to manage nodes on an APPN-based multivendor internetwork. However, the consortium might provide an important missing piece: management of LAN devices that are attached to APPN nodes but do not directly use APPN protocols, Tolly indicated.

The consortium plans shortly to go through the process of becoming an Internet Engineering Task Force working group so it can make a formal MIB proposal to the SNMP standards body. The group should have a working document soon, given that members such as Eicon have draft documents in progress, Tolly said.

Another promising development is that Sync Research, Ring Access, Inc. and Netlink, Inc. have all expressed interest in joining the consortium, Tolly said. The vendors sell products that convert IBM Synchronous Data Link Control (SDLC) packets into a format that can travel over a local-area network.

These efforts should give users more choices for managing such products; however, some information systems managers said their companies will continue to use IBM's NetView to manage their SNA devices and SNMP to manage their LAN devices.

One such company is The Travelers Corp. Network control center technicians can manage Sync Research and Netlink devices using the same familiar NetView commands they use to manage IBM 3174 cluster controllers, said Robin Layland, manager of SNA software engineering at the insurance firm. Travelers is looking at IBM's SNMP-based NetView/6000 system to manage its LANs and routers, he added.

Similarly, mainframe IS managers at Pfizer, Inc. use NetView to manage Sync Research boxes and other SNA devices, while the LAN group uses SNMP for bridges and routers, according to Vinie Costa, a data communications manager at the New York drug company. "It allows each group the best tools for its area," he said.

There is a good chance that the SDLC conversion vendors will develop a separate MIB rather than try to enhance the SNA gateway MIB to manage their products, Tolly said.

Management key re-engineering hurdle

By Joanie M. Wexler

When it comes to re-engineering networks to support distributed computing, managing the new infrastructure poses a bigger user challenge than constructing it, according to several companies that have embarked on network revamp projects.

"I think the industry has gotten over the connectivity issues and is worrying about management," said Don Rife, director of computer services at the Medical Center of Delaware, based in Wilmington. "And the state of integrated network management is greatly exaggerated."

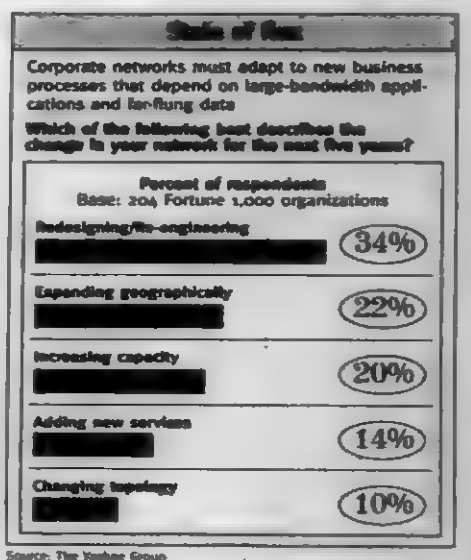
For example, Charles Stunson, chief information manager at U.S. Army Acquisition, a government agency that builds the army's research and development budget, said there is one thing missing in the client/server infrastructure his agency built: integrated management of hardware and applications.

He said he considers most management systems to be strongly oriented toward the vendor's equipment, so "the only way for complete management is for an independent vendor with the right alliances" to offer a solution.

Stunson told this to *Computerworld* at a recent seminar in Washington, D.C., conducted by Boston-based research firm The Yankee Group, on the ins and outs of the network metamorphoses accompanying business process revamps sweeping corporate America. At the event, Yankee's managing director, Howard Anderson, asserted that the "role of the new IS is to manage highly complex networks."

A hurdle facing information systems departments in this task, said Todd Dagres, vice president of data communications at Yankee, is that users bypassed IS for much of today's distributed, local-area network infrastructure. "Now the departments want to hand back to central IS the management of a function it never created," he said.

Re-engineering, *page 52*



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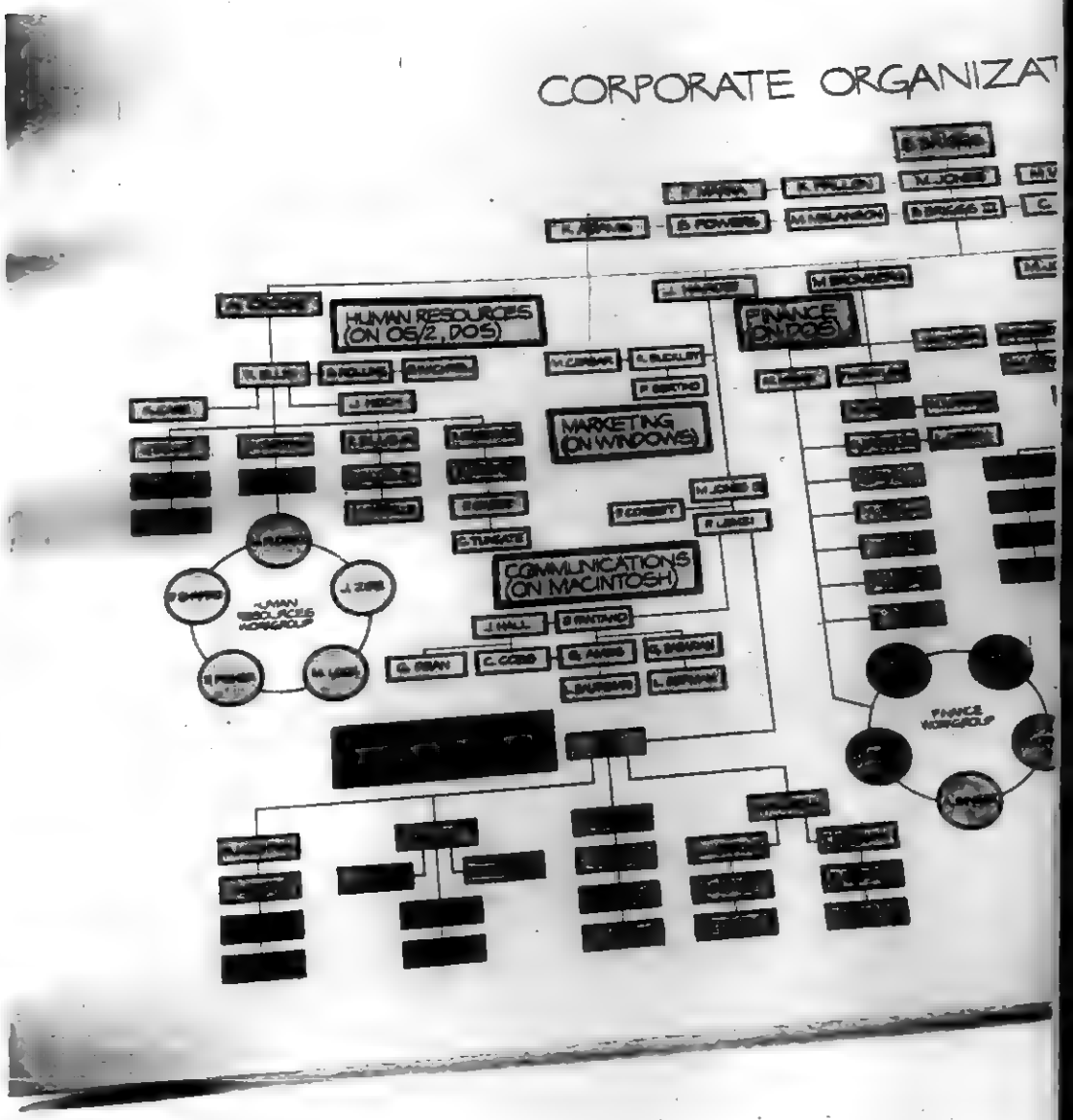

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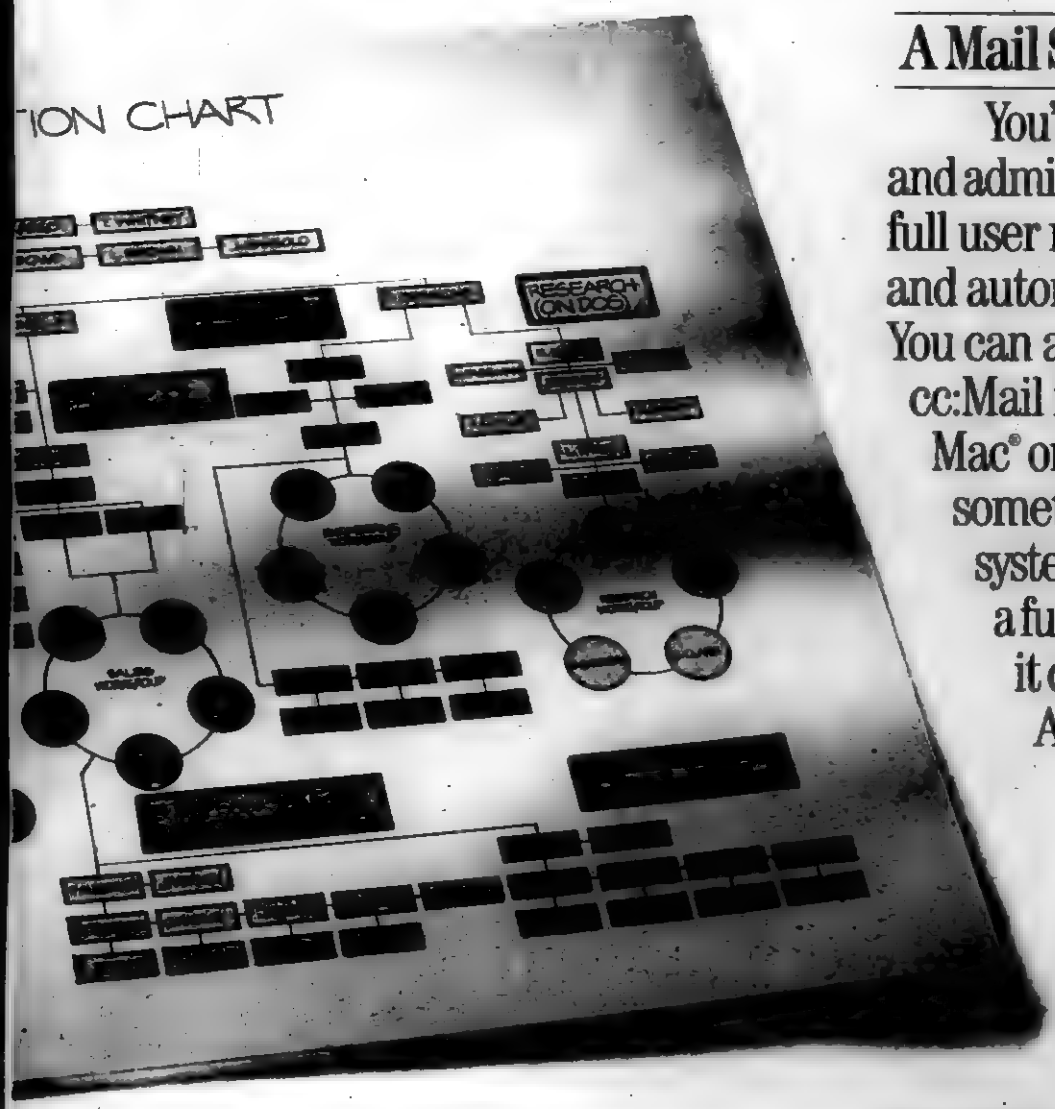

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Key re-engineering hurdle

CONTINUED FROM PAGE 49

This situation raises the question of who actually owns and manages the corporate network. "Where do I find management tools similar to those available in the mainframe environment for managing distributed data?" asked one IS manager at the conference.

Dagres replied that "nobody has rolled out a system that can plug in and manage the whole thing. Today, it is not possible to go out and buy an integrated network management system without doing a lot of customization."

Rife said his challenges are more managerial than technical. "If a carpenter arrives at my house, I don't expect him to have one tool for the whole job," he said. "I expect him to have a truckload of tools and the expertise to use all of them."

He added, "In the giant scheme of things, I couldn't care less about alerts [from a network management system]. I have 3,000 users who will alert me if something goes wrong. It's managing change that's the biggest challenge."

However, other users with more broad-reaching networks are concerned with tools. For example, "the wide-area equipment vendors need to support SNMP," the limited-function management capability widespread in today's LAN equipment, said Ed Ward, communications services manager at American Management Systems, a management consulting firm and software company in Arlington, Va.

Ward said two factors are driving his quest for getting a firmer grip on network management: Networked corporate applications have become mission-critical, and the business has become more geographically dispersed.

American Management network management today is basically "Novell-oriented and home-written," Ward said, adding that he is seeking a management system "more open" than Novell's NetWare Management System (NMS).

But NMS "is not approaching the maturity of others" such as Unix-based internetwork managers from Hewlett-Packard Co. and Sun Microsystems, Inc., he said.

Funny money

For some users, it can be difficult to gain funding for network management software, given that the paybacks are somewhat intangible.

However, the Medical Center of Delaware has an innovative approach: Its IS department collects onetime "network connection" fees from new users whose departments have fronted the costs as determined from an IS price list. The procedure removes the IS department from "the cost-justification business," explained Don Rife, director of computer services at the Wilmington, Del.-based facility.

For example, at the beginning of each fiscal year, departments pay $3,700 for any new users who require a medical center-standard workstation, word processing site license, LAN connection and mainframe access, he said.

Aside from eliminating network management cost-justification headaches, "I know what my demand will be for the next year. I know quantities, so I can negotiate discounts" with suppliers, he said.

Using this system, the medical center has deployed a $3 million network with "almost no IS funding."

—Joanie M. Wexler

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Pac Bell offers LAN E-mail service

CONTINUED FROM PAGE 49

and around the country. The department has been using the service since August and has not had a chance to measure messaging traffic or cost savings exactly, according to Laffey.

Users can send a message to users inside or outside the company.

"It is more expensive than nothing," which is what the agency spent to connect its E-mail systems before August, he said, "but it is definitely less expensive than buying our own gateway."

The main difference between this and other value-added E-mail services such as those provided by Sprint Corp. and MCI Communications Corp. is that LANmail supports more E-mail protocols and does not require additional software, said Randall Edminston, electronic messaging marketing manager at Pacific Bell.

Industry analysts agreed that the service may appeal to small companies and corporations with many satellite offices. But some said large, centralized companies will want the control of managing their own messaging backbone.

"E-mail public services are nice to reach beyond the corporations," said Mark Leary, director of communications research at International Data Corp.-Technology Investment Strategies Corp. "But anyone who thinks they will get better service for internal communications is probably misguided."

To use the LANmail service, a user on a CC:Mail system, for example, can send a message to a co-worker using Microsoft Mail. The message travels from the sender to the CC:Mail server, which then dials up LANmail Connection and transmits its messages. (The frequency of mail server/LANmail connections is programmed by the customer's mail administrator.)

Pacific Bell sends the message through X.400 gateways and stores it in the company's Microsoft Mail mailbox at Pacific Bell. The translation typically takes 10 minutes, according to Pacific Bell. The message is stored in the mailbox until the Microsoft Mail server makes a connection with Pacific Bell and picks up its messages. Pacific Bell takes care of synchronizing the mail directories.

Pacific Bell charges a onetime $25-per-LAN fee for LANmail setup and $10-per-LAN monthly services charges. Domestic use charges are 15 cents for typical messages of 1,000 characters or less. International use is 30 cents per 1,000 characters.

In Brief

EPA grants MCI contract

The U.S. Environmental Protection Agency (EPA) has awarded **MCI Communications Corp.** a five-year, $7 million contract for telecommunications services among domestic and international EPA locations. Voice and data services to be provided by MCI include the carrier's virtual private network service, local-area networking and MCI Mail.

Novell to finance Reach

Electronic-mail and work-flow developer **Reach Software Corp.** recently closed $4 million in a second round of financing, a deal that included **Novell, Inc.** as an investor.

Bell markets ISDN apps

Bell Atlantic Network Services and **DigiBoard** in Minneapolis said they have allied to jointly market the telephone company's Integrated Services Digital Network applications and DigiBoard's internetworking and telecommuting products.

DEC, Vitalink standardize

Router vendor **Vitalink Communications Corp.** recently said it has entered into an agreement with **Digital Equipment Corp.** to implement interoperability standards between the two companies' internetworking products and to cross-license their products.

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Sybase System 10 answers user pleas

By Jean S. Bozman

Sybase, Inc. apparently took to heart information systems managers' concerns about day-to-day operations of on-line distributed database systems. Longtime Sybase users last week said their concerns about backup and recovery, database copies and performance were addressed by Sybase's recent announcement of its System 10 product lineup for 1993 [CW, Nov. 16].

System 10 addresses distributed database updates with its Replication Server and IS operational control with its Control Servers for backup, recovery and database tuning. Its SQL Server 10 database engine (formerly known as SQL Server 5.0) supports multigigabyte databases and faster processing.

But users will have to wait for System 10 features, some of which have been in development for two years.

The products have not yet passed beta tests and will be phased in during 1993, said Stewart Schuster, Sybase's vice president of marketing. He gave no pricing or shipment dates.

The System 10 test schedule means that most users will face some operational difficulties for several months. The Norton Co. in Worcester, Mass., a maker of abrasive wheel and grinding equipment, uses four Sybase SQL Server databases to run its manufacturing systems. But, under heavy work loads, the systems sometimes slow down, said Ron Beroll, a database project leader.

"If SQL Server were to speed up, it would help since the schedule program is taking longer to run when data volumes are high," Beroll said.

Backup and recovery is also a primary concern for production data on Sybase servers.

Takes time

"Loading and dumping of data takes a disproportionately large amount of system resources and time," said Roland Klinger, database systems manager at Tri Valley Growers, Inc., a San Francisco food processing cooperative.

Klinger said he wants a separate application programming interface that would handle data dumps without affecting other database engine resources, which he believes is included in the System 10 Control Server feature.

Customer technology institutes, including one held by Sybase in February, gathered user concerns about IS operational issues, according to Paul Hamel, vice president of systems and planning at Textron Financial Corp., a Providence, R.I., division of Textron Corp.

"We're happy with the product direction, which

Sybase, *page 60*

Database derby

Two approaches to distributed databases

Methods:	Two-phase commit	Replication
Characteristics:	PEER-TO-PEER SERVERS	MASTER/SLAVE SERVERS
	REAL-TIME UPDATES	NEAR-REAL-TIME UPDATES
	SYNCHRONOUS UPDATES	ASYNCHRONOUS UPDATES
	NEW TRANSACTIONS BLOCKED DURING UPDATE	CONTINUOUS SERVER OPERATION
Bottom line:	IS HAS LIMITED CONTROL OVER UPDATES	LETS IS CONTROL TIMING AND NETWORK TRAFFIC

Source: International Data Corp. CW Chart: Michael Siggins

Wang previews VS machines; unveils Unix software — finally

By Kim S. Nash
BOSTON

Wang Laboratories, Inc. surprised attendees at its recent user group conference with previews of three new VS minicomputers and Unix versions of key proprietary software products. The company also unveiled — finally — Open/Pace, a database/application development environment that runs on IBM's RISC System/6000 line.

The loudest and most oft-repeated message from Wang officials at the show was that the VS is not dead.

Despite laying off more than 2,000 workers since filing for Chapter 11 bankruptcy protection in August — with at least that many more employees still scheduled to be cut — Wang "still has significant resources behind the VS," said Peter Crenier, manager of VS systems marketing.

However, neither he nor other Wang officials would comment on the size of the VS' research and development staff or budget, and some users expressed doubt that the VS is long for this world.

One information systems manager who oversees some 200 VS machines said he attended the show to "get a sense of how [Wang] management is relating to [its] customers and to figure out for myself where the VS is headed."

He did not want to be identified, but he explained that he faces a crossroads: The 200 VS systems need upgrading, and he wants to know if he should invest further in Wang technology or turn to another vendor for Unix platforms. "A lot of people are like me — confused," he said.

The Lowell, Mass.-based company tried to allay such fears by previewing VS processors that are scheduled to be announced next month and early next year.

Wang plans to extend the high end with two VS 12000 systems that bracket the performance of today's VS 12000 Model 550. The midrange is due for a kicker in a few forms: a new processor in the VS 6000/Server, new pricing and op-

Wang, *page 60*

Highlights of Wang's new processors

VS 12000 Models 450 and 650 minicomputers.

Look for a March 1993 unveiling of the **VS 9000**, which combines VS 12000 memory capabilities and cabinet with the CPU of a VS 8000.

VS 8000 includes two series: the 8400 with up to 64M bytes of capacity, and the 8200 aimed at smaller shops.

VS 6000/Server designed to do duty as a minicomputer and an application server.

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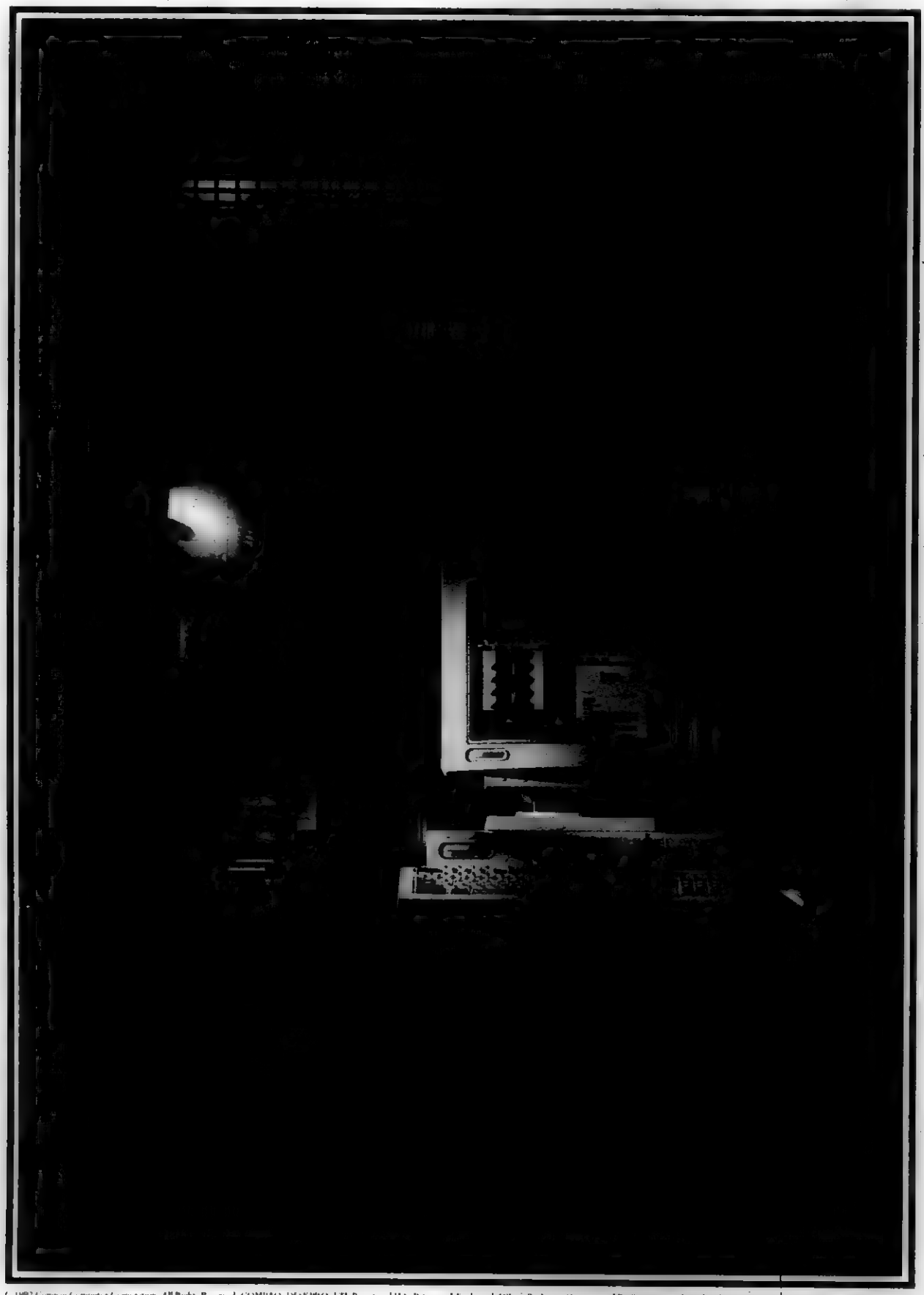

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–PC Week, June 22, 1992

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–PC Week, October 5, 1992

"Despite its low price, the ProSignia packs a variety of features."
–PC Week, October 5, 1992

"...For running Windows on the road, the Compaq LTE Lite/25c is clearly the best notebook yet."
–PC Laptop, October 1992

"It is the best-looking color screen on any notebook, plain and simple."
–PC Computing, August 1992

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–PC Week, June 22, 1992

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–PC Week, June 22, 1992

"You'd expect technical leadership from Compaq, but the Lite/25c's aggressive price took us completely by surprise."
–PC Computing, August 1992

"Low-cost ProLinea offers solid quality."
InfoWorld, October 5, 1992

"...Compaq Contura 3/25 notebook is part of Compaq's clone-beater strategy and packs an aggressive price/performance punch..."
PC Magazine, August 1992

"That's leadership."
PC Week, June 22, 1992

intel inside

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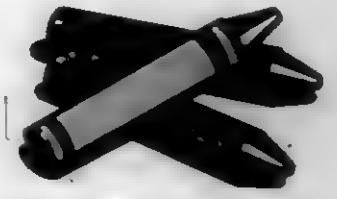

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COMPAQ

Sybase System 10 answers user pleas

CONTINUED FROM PAGE 57

will support enterprise client/server applications as well as departmental solutions," said Hamel, who installed Sybase databases on Sun Microsystems, Inc. servers several years ago. High on Hamel's wish list is the System 10 Replication Server that can keep multiple Sybase database servers in sync.

Industry analysts said they believe Sybase's attention to IS concerns should help stem customer concerns about large-scale Sybase production systems.

"People want to be able to do production applications the way they have done them in the glasshouse for years," said Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Stamford, Conn. "The piece that has been missing is systems management software for backup and recovery."

Many users cited the System 10 Replication Server as the single feature they most wanted to install when it becomes available.

The Replication Server is Sybase's answer to Oracle Corp.'s automatic two-phase commit scheme (see chart page 57).

Wang previews VS; unveils Unix

CONTINUED FROM PAGE 57

tions on the VS 8000 and a smaller cabinet for the VS 9000 to which users can field-upgrade from the VS 7000 or VS 8000 (see box page 57).

On the corporate side, reorganization plans at Chapter 11-protected Wang are taking shape, and it looks like the company wants to be a network integrator. LAN Management Services is a newly formed group that harnesses various local-area network support efforts under one roof.

The 30-worker unit, based in Atlanta, will not enjoy a stature in the company equal to Wang's imaging group, "but it'll be up there, just below imaging," said Dan Brown, a marketing representative.

The Technetron '92 conference was sponsored this year by both Wang and non-Wang groups, such as the Boston Computer Society and a local Banyan Systems, Inc. group.

Wang is one of the largest Banyan Vines resellers in the U.S., generating approximately $15 million worth of network operating system revenue for Banyan last year, according to Brown.

Plenty of pitches

VS users also heard migration pitches from Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc., which outlined conversion and VS hardware trade-in programs to interested VS users.

Wang itself touted RS/6000 versions of the following key software products:

- **Open/Pace.** Wang originally showed the database/development tool more than a year ago running on SCO Unix from The Santa Cruz Operation but shelved that version after signing a contract to support IBM's Unix line in June 1991. Wang then declared that an IBM AIX edition was on the way, finally making good on that promise earlier this month.
- **Open/Office 1.0.** Office is Wang's VS-based electronic-mail package. It was built to run in client/server mode, with an RS/6000 as a server and PCs using Microsoft Corp.'s Windows as clients. The product adheres to the X.400 and X.500 standards of the Consultative Committee for International Telegraphy and Telephony, according to Wang.

Also unveiled was Cobol Resource, a tool kit for downsizing Cobol applications, such as software written in the VS' ANSI Cobol 85, to run on AIX-based platforms.

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"The Computerworld White Paper Program helped us accomplish our objectives by educating information systems management, the most important buying influence in the market today, on how to make open systems a reality."

Ann Dalrymple
Manager of Publications
The Open Software Foundation

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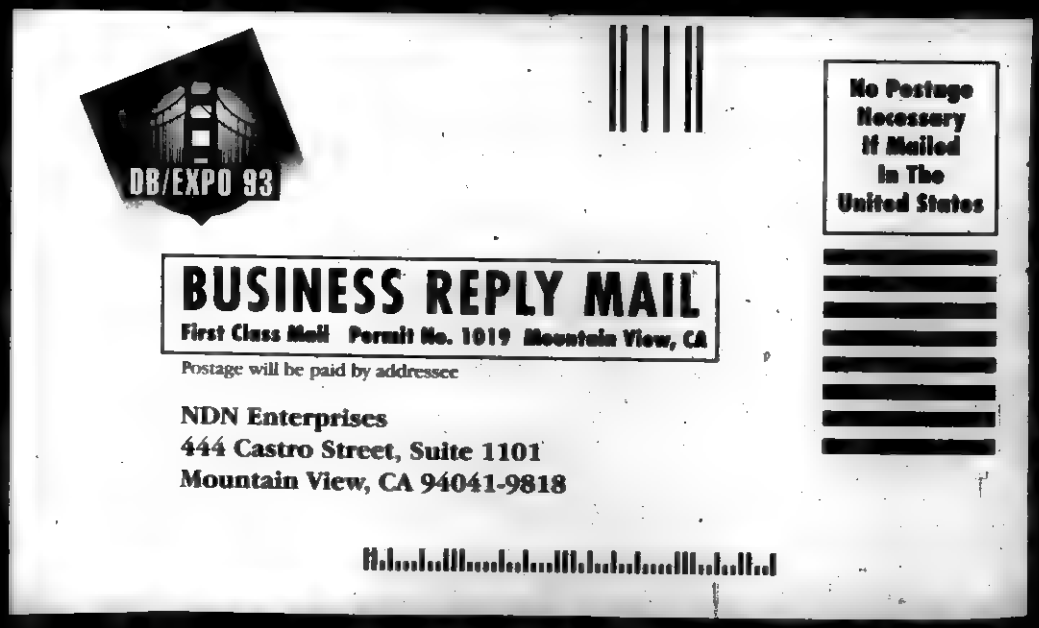
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DEC fortune needs Alpha and more

By Melinda-Carol Ballou

Digital Equipment Corp.'s long-awaited release of Alpha AXP platforms earlier this month was welcomed by analysts and users, setting what some described as a "new tone" for the company.

The products are an important step, but Chief Executive Officer Robert Palmer and analysts agreed that Alpha alone will not move DEC out of its financial slump; the company's survival strategy must also focus on a more efficient organization and on new markets, such as systems integration and services.

As an indication of its focus on services, DEC supplemented the unveiling of Alpha AXP platforms with announcements on migration and services for Alpha and business practices geared toward easing the move to the new platforms [CW, Nov. 9].

The new Alpha AXP Services include Application Re-engineering and Migration Services; Learning Services for doing design work for Alpha AXP; Vendor/Developer Support Services; Consulting Services with DECstart packages for Open VMS and DEC OSF/1 with system installation, training and technical consulting; DECathena for DEC OSF/1 Version 1.2; and Hardware/Software System Services or traditional DEC support services for Alpha.

DEC also clarified upgrade paths and pricing for making the migration from specific VAX models to Alpha AXP. New upgrade pricing of $99 per SPECmark is in line with Alpha-ready pricing made available earlier this year.

Analyst reaction

Analysts spoke approvingly of the new systems and service — for the most part.

"The pricing on a performance basis for the new systems is extremely low, but there are a lot of missing pieces right now," said Ted Krum, research analyst at D. H. Brown & Associates, a market research firm based in Port Chester, N.Y. He added that critical software and applications will not be ready for another year or 18 months, especially for commercial customers with clustering volumes.

"Without the actual applications, they are going to be in a tough situation; for existing customers, they can push the Alpha-ready solutions and say that they will migrate them over later," said Steve Widen, senior analyst at WorkGroup Technologies, Inc., a market research firm based in Hampton, N.H. "But new customers aren't going to opt for one architecture today and move in the future. The window of opportunity is closing for DEC."

HP sweetens object licensing

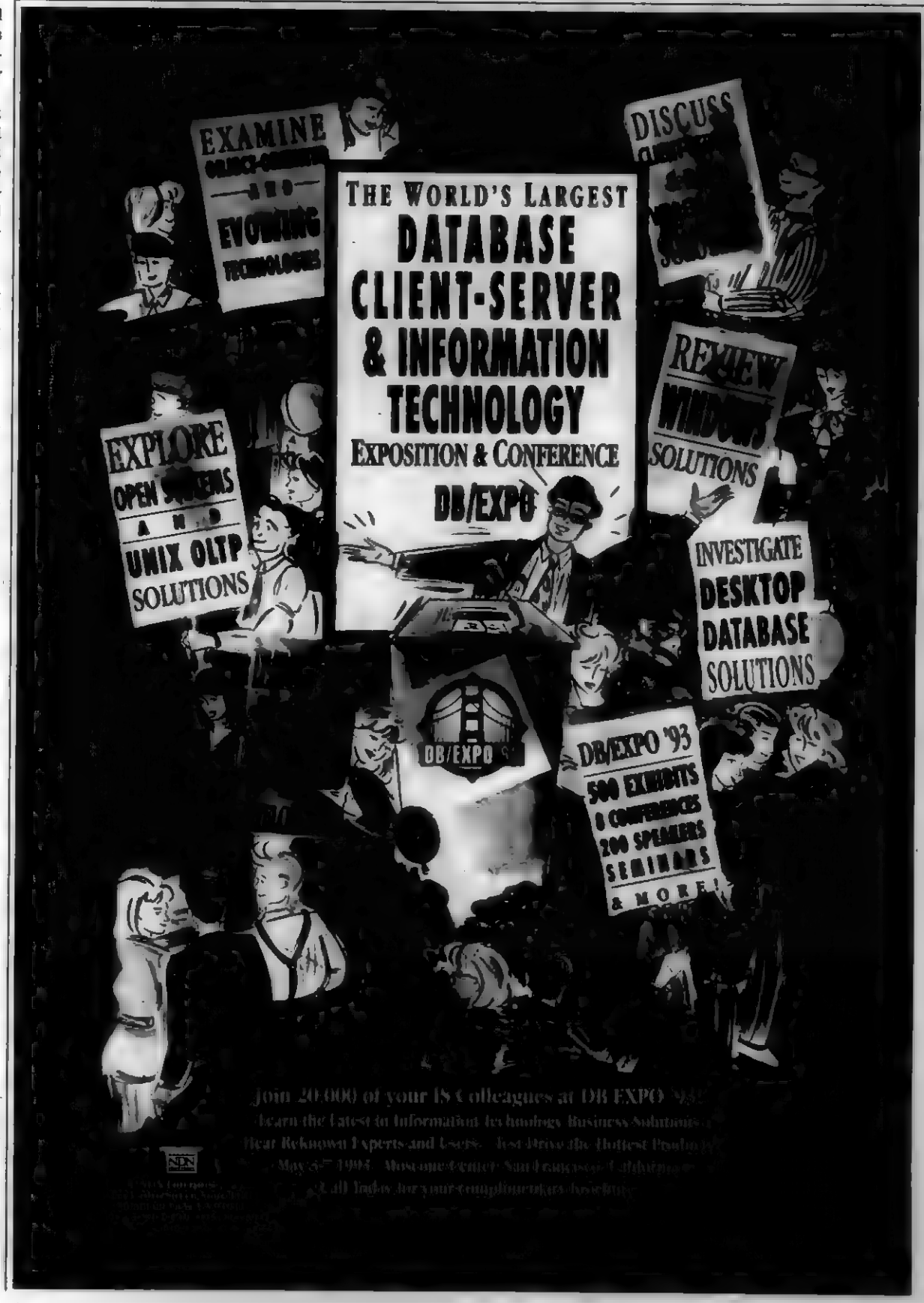
By Mark Halper
PALO ALTO, CALIF.

Hewlett-Packard Co. this week plans to give a little lift to its object-oriented database marketing program, adding inducements primarily for its Unix machines.

The company will disclose new packaging that enables users to evaluate OpenODB before committing to a full purchase and increases the number of users supported by a license from eight to 64. The user expansion applies to HP's Unix servers and workstations and its MPE line of multiuser systems; the other purchasing incentives apply only to the Unix line.

An HP spokesman said HP emphasized Unix platforms because they are typically used for development of both MPE and Unix applications and because an MPE user can get evaluation benefits from examining OpenODB on a Unix machine. The user expansion applies to deployment and development, which is why HP is easing licensing policies for MPE and Unix.

An evaluator's bundle of OpenODB costs $5,000 and includes a three-month license for up to 64 users. A learning version costs $10,000 and includes a one-user license for an unlimited time period.



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Redevelopment takes root

Pilot effort frees up Arizona State University programmers

By Garry Ray
TEMPE, ARIZ.

About a year ago, Arizona State University (ASU) was in the same position as many of its 43,000 students. The university's 55 application programmers spent much of their time poring through tomes of dusty Cobol code to learn how the school's systems functioned. There was little time to add new features or to satisfy maintenance requests.

The problems did not end there. With a thin budget for 1992, the programming staff could not be expanded, although it was stretched to the limit maintaining 35 applications serving more than one quarter of the university's 5,000 employees. Locked away with reams of Cobol code, the data processing department had to shunt to the back burner most new maintenance requests.

The situation was becoming desperate. "We knew that if the trend in maintenance demands continued, and if resources stayed flat, there would be no resources to add new functionality to the applications," said Darrel Huish, assistant director of computer information systems at the university. "We'd be doing nothing more than keeping existing systems alive, and maybe not too adequately."

But a pilot re-development effort started last spring has given the university its second wind. Employing tools from Viasoft, Inc., a Phoenix software re-development firm, and from IBM, ASU has launched a new maintenance methodology that Huish said it expects to have fully in place "within four or five months."

Somewhat different than re-engineering, re-development is intended to make maintenance easier. "Re-development modularizes existing code to make it more efficient without changing functions. Re-engineering is actually changing the functions," said Doug Griffin, manager of IBM's application development consulting practice in Phoenix. During the ASU effort, Griffin's consulting group took the role of "project management, including coordination of tools and trying to make sure we met the objectives [ASU] outlined," he said.

Surprisingly, ASU's initial objectives were turned to longer term goals as the project took shape. With its pressing maintenance problems, the university initially wanted to examine and re-develop its largest and most important applications from the outset. "They wanted to re-engineer live programs that they could put right into production," said Steve Tesinsky, manager of consulting practices at Viasoft. However, it quickly became apparent that smaller pilot projects, along with staffwide training, would better fit the university's long-term objectives.

"They said the emphasis should be on learning how to do [re-development], not to cut corners," Huish reflected. "They were right."

Still, the pilot project provided immediate proof that there would be a significant payback from re-development. One of the two pilot projects involved a campuswide directory of student information, Huish said. Over the years, security rights and access codes had become embedded in various parts of the application. "It was really a tangled mess," Huish said. "When we got [maintenance] requests, we would say, 'It's more trouble than it's worth.'"

During the pilot, users requested a change to the system. Working with the code from the pilot program, "making a change went from 40 hours of work down to six hours," Huish said.

With the pilot phase now complete, Huish said he plans to have 10 programmers use Viasoft's Renaissance, which decomposes Cobol programs into functional components. The rest of the staff has been trained in the new re-development and maintenance methodology.

Although the project has spanned more than six months and has required training and software acquisitions, Huish said it has been an eminent success. "We feel we've gotten about a 20% productivity gain. It's like getting six new programmers."

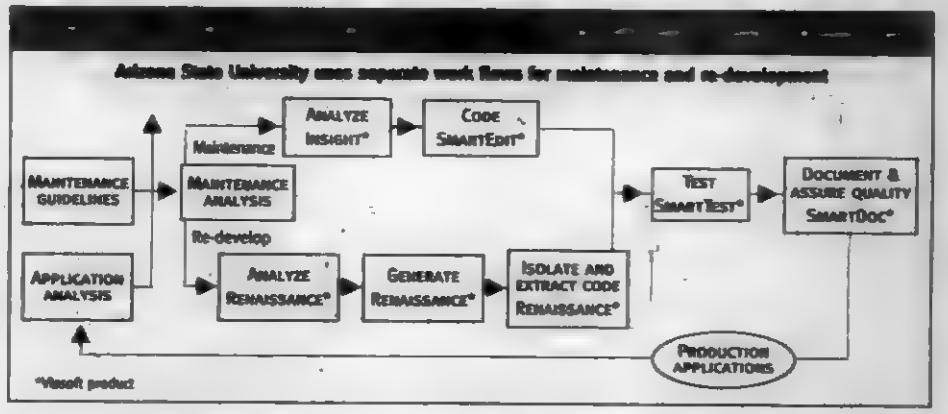
ON SITE

Arizona State University
Tempe, Ariz.

Challenge: To reduce the maintenance load burdening 55 programmers supporting 35 administrative applications.

Technology: Cobol redevelopment methodologies and tools from Viasoft and IBM.

Result: An estimated 20% gain in productivity.



On Site

Petroleum firm relies on CASE

By Paul Gillin
WALTHAM, MASS.

When your business grows a thousandfold in 20 years, you do not have much time to mess around with Cobol.

That is why Global Petroleum Corp. has made a major commitment to computer-aided software engineering (CASE) tools and high-level languages. Global, a closely held energy distributor, has grown from a $3 million regional company in 1973 to a $3 billion giant today. Yet Global has an information systems staff of only four people.

The secret? Use productivity tools, contract out for expertise and do not reinvent the wheel. "We automate the stuff that ought to be automated," said data processing director Jim Shelton, who noted that Global went to a virtual lights-out data center 10 years ago. "And," he said, "we're good."

Global Petroleum's *Jim Shelton and Martha Thayer*

Global employs its staff sparingly. The data center manager who supports a Unisys Corp. A6 mainframe and Micro A workstation also supports the 80 local-area network users at headquarters. There are just two programmers, and Shelton doubles as database administrator and occasional programmer.

Key to Global's productivity is a commitment to buying what it can and developing new systems entirely in high-level languages. One of its bread-and-butter applications — an inventory system that gets the bulk of new development work — was built in Unisys' Linc fourth-generation language (4GL). The system runs more than 150 reports and 100 screens and accesses two external databases for real-time reporting.

Accounts payable and general ledger packages

Petroleum, *page 64*

Intersolv unveils upgrades

By Garry Ray

The downward push to PC-based development platforms was in evidence at a recent user conference held by Intersolv, Inc.

The Rockville, Md., company, which sells development, re-engineering and version-control products, continued its emphasis on PC-based platforms with the unveiling of the following products:

- **PVCS Reporter 1.0**, a report writer that extracts and presents information stored in the PVCS version-control repository. The program, which is now available for Microsoft Corp.'s Windows and OS/2, is priced at $200.
- **Excelerator II 1.1 for OS/2**, an analysis and design tool that company officials said will now support client/server application development. New features include event-driven application modeling and an integrated graphical user interface design tool. The new version of Excelerator is planned for release this month.
- **Design Recovery for Windows 1.0** is a redevelopment tool for use with Cobol applications. First released as an MS-DOS product this year, the upgraded tool captures and stores design specifications from Cobol code. Specifications can be transferred to the company's Excelerator for subsequent analysis and design. Design Recovery 1.0 is available now for $6,500.

On the business front, Intersolv announced that PVCS will be delivered for Microsoft's Windows NT simultaneously with the release of the operating system next year. Intersolv officials said other development tools will be ported to Windows NT.

Petroleum firm relies on CASE

CONTINUED FROM PAGE 63

were purchased from Lawson Associates. Global's only major homegrown Cobol application is a 20-year-old accounts receivable system that is maintained using an ad-hoc report writer called EZSpec from Software Clearing House, Inc. in Cincinnati. The product provides a checkoff approach for specifying data fields, criteria and sort orders. "I can probably do in five minutes using EZSpec what used to take two to three hours in Cobol," said Martha Thayer, Global's manager of technical support. "If it's not what I want, I can easily change it and generate the report again."

Under its best-of-breed philosophy, the IS department also chose Progress Software Corp.'s Progress 4GL in 1990 to build a Unisys CTOS application for its traders. As the size of the application grew, Global migrated it to Unix, a conversion made easier by Progress' portability.

For most of Global's projects, the tools of choice are Linc and the Linc Systems Approach, a methodology designed around the Linc tool set. "We looked at several alternatives to Unisys but found that the other CASE tools aren't as well integrated," Shelton said.

Global's processing load is not very transaction-oriented, but it involves a steady stream of report requests from users. Using a joint application development approach and the Linc tool set, the department's two programmers can turn around most reports in a day or two, Shelton said. IS staff members can produce mock-up reports using Linc screen painters to give users a quick preview of the applications they request.

The Unisys environment is particularly well-adapted to quick change artistry, Shelton explained. "Except for the largest shops, I don't know any Unisys users who have database administrators," he said.

For example, Shelton handled a recent change request that required adding several database fields and application screens by dialing in from home and making the change over the weekend. When the company expanded a product code from three to four digits last year, the staff first ran an impact report to identify the more than 80 reports and 50 screens that would have to change and then made all the changes in 10 days.

Shelton estimated that the process would have taken six weeks or more using conventional programming.

Brushing aside concerns about 4GL performance ("A fast solution that's late doesn't buy you anything"), Shelton said the real benefit of software productivity tools is in their impact on the business.

"Our primary focus is to make the application do what it's supposed to do," he said. "The Linc system generates code as efficiently as an average programmer. Maybe I could write code more efficiently, but I couldn't do it anywhere as quickly."

ON SITE

Global Petroleum
Waltham, Mass.

Challenge: To keep pace with information demands of a $3 billion company while maintaining an IS staff of only four people.

Technology: Unisys and Progress Software 4GL products generate new applications. Core financial packages purchased from Lawson Associates. Only in-house-developed Cobol package maintained with ad-hoc report writer EZSpec.

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According to the company, the product quickly generates DB2 SQL data objects, data object programs and IBM Presentation Manager window definitions. Benefits include less DB2 programming, easier DB2 maintenance and an easier DB2 application design that permits users to alternate design applications without having to manually modify completed DB2 application programs.

Application programming task features include static or dynamic SQL execution and business logic exit, among others.

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➤*Shared Financial Systems*
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Dallas, Texas 75248
(214) 233-8356

Softool Corp. has introduced a new version of CCC/Manager for the IBM RISC System/6000.

According to the company, the tracking version of any type of component such as object, source, computer-aided software engineering, graphics or executable is automated and designed to give faster access to applications through a graphical user interface or a Unix command line.

For complete reporting, the product merges concurrent versions of applications and components. For application management, CCC/Manager enables users to optimize productivity by comparing, isolating and securing multiple versions of an application system.

CCC/Manager costs $3,200 per user.

➤*Softool*
340 S. Kellogg Ave.
Goleta, Calif. 93117
(805) 683-5777

Advanced Software Automation, Inc. has released Hindsight-Fortran.

According to the company, Hindsight-Fortran is a fully integrated software maintenance, testing and reengineering environment. The product parses Fortran source code and has the capability to decompose system structure. Hindsight-Fortran produces a detailed look at a representation of the common and local data, a static structure of the software system and connections to the dynamically collected runtime data. Currently, Hindsight-Fortran is available for Sun Microsystems, inc. Unix workstations running the Open Software Foundation's Motif.

A single floating license costs $8,450.

➤*Advanced Software Automation*
3130A Coronado Drive
Santa Clara, Calif. 95054
(408) 492-1668

GE Advanced Concepts Center has announced the OMTool, an interactive data modeling tool.

Users working within a PC environment can develop a graphical model of an application that can be easily edited, allowing the user to focus more on analysis and design, the company reported. For object-oriented languages, the product automates the process of preparing an application model, adding implementation details, updating it and producing program skeletons and data structures.

OMTool will cost $695 throughout 1992. The price in 1993 will be $995.

➤*GE Advanced Concepts Center*
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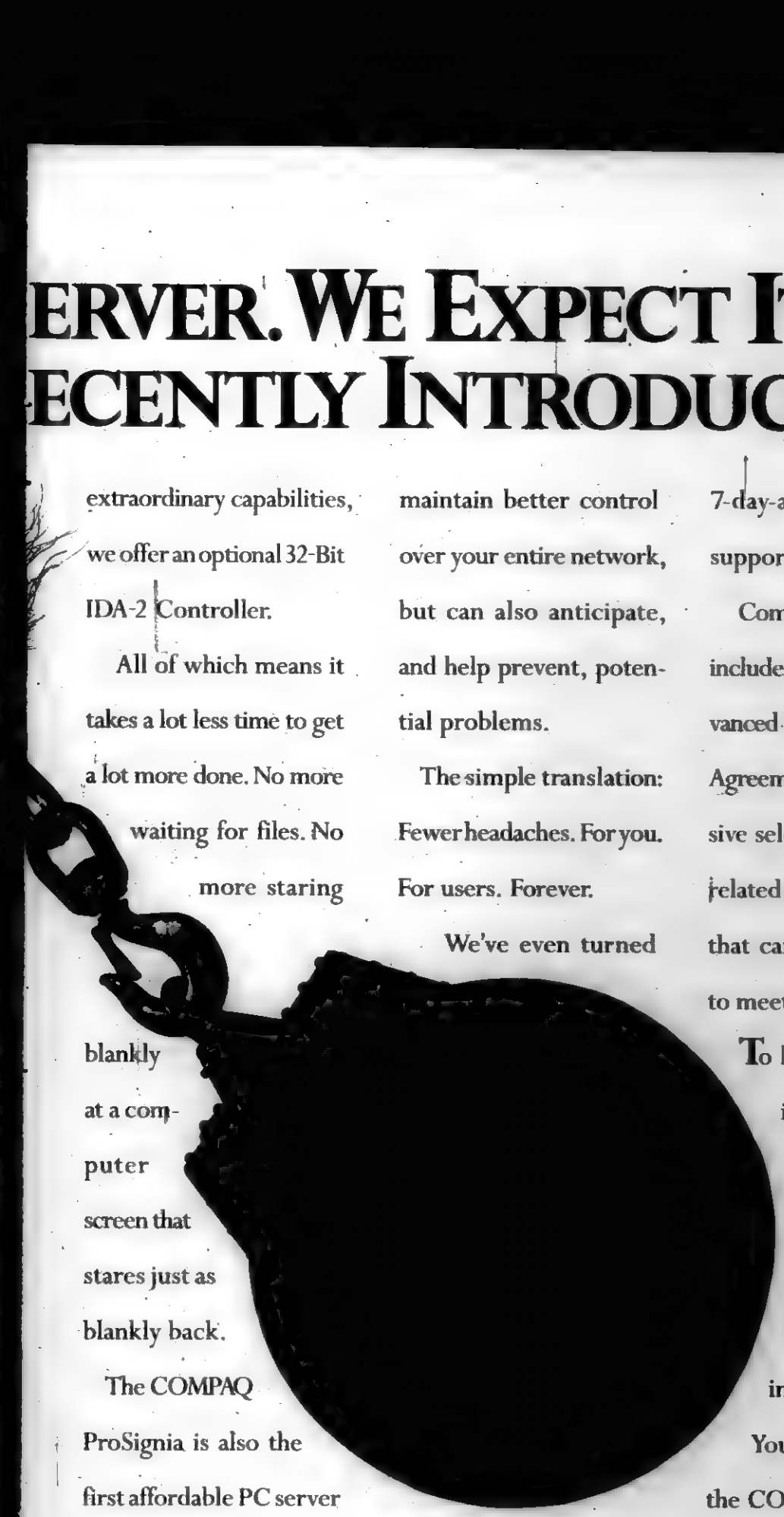

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Pacific Bell wants to know . . .

"WHO'S CALLING, PLEASE?"

No longer able to say what the hell' to more than 1.5 million unbillable calls a month, the nation s largest local phone company is calling on a new expert system to recoup lost cash.

Pacific Bell's Eric Firdman *says bringing in an outside vendor as an integrator helped foster cooperation with user departments*

By Willie Schatz

Contrary to popular Orwellian belief, the telephone company doesn't know everything about who calls whom. In California, the country's largest local system, Pacific Bell, processes 1.88 billion calls — yes, you read it right — per month.

Yet even though the San Francisco-based utility uses the most advanced technologies available to stuff every possible penny into Pacific Bell coffers, some 3.9 million calls cannot be routinely charged each month. Chief among the two dozen or so reasons? Many callers — from teenage phone hackers to drug dealers and organized crime figures — simply cannot be located or identified.

Not that Pacific Bell, a division of Pacific Telesis Group, doesn't try: Labor-intensive manual searching by 120 company investigators identifies roughly 2.4 million calls per month. But that still leaves 1.5 million calls unbilled. At this point, Pacific Bell simply writes off the calls and swallows losses, totaling more than $4 million a year.

"In the previous monopoly environment, we could have continued to write off the calls and said, 'What the hell, we'll just increase rates,'" explains Eric Firdman, Pacific Bell's executive director of strategic information systems. "But we can't do that now."

There's another motive, notes Tom Nolle, president of CIMI Corp., a telecommunications consultancy in Voorhees, N.J.

> The old manual system certainly had room to improve.

"One-and-a-half million unbilled calls are not necessarily going to hurt them," Nolle says. "But, if you have a hole big enough to stuff that many calls through, you run the risk of being known as a patsy. It's more of a proactive stance."

With big monthly losses ringing in their ears, Firdman and other Pacific Bell executives set about creating a re-engineering plan to capture some of the lost revenue. By next April, when a new knowledge-based billing system is slated to go on-line, they're hoping to hear the clink of lost coins in corporate cash registers once again.

The new $800,000 on-line system will pursue freeloading callers with two Hewlett-Packard Co. 9000 servers running ART-IM, an Automated Reasoning Tool from Inference Corp., over Unix workstations. Collectors will use the system to access billing data now residing on three mainframe legacy systems.

When fully operational, the "Expert Message Correction System" is expected to resolve 328,000 (about 22%) of the monthly write-offs. While Firdman concedes the system won't solve the problem entirely, he says it will help Pacific Bell's bottom line and improve worker efficiency and morale.

"The phone business, especially in the regional Bell operating companies, is becoming more market-oriented and more competitive," Firdman explains. "We've got to look at all possible sources of saving money and generating revenue. This isn't funny money. It's just waiting around to be collected."

Economy forced the issue

Pacific Bell's effort is a good example of how tougher economic conditions have forced a once-complacent firm to leap into process automation and re-engineering.

Over the past year, Pacific Bell has cut 4,300 jobs, part of an effort to trim 11,000 positions by 1994. Last month, plans were announced to cut 600 man-

Pacific Bell, *page 73*

Never be

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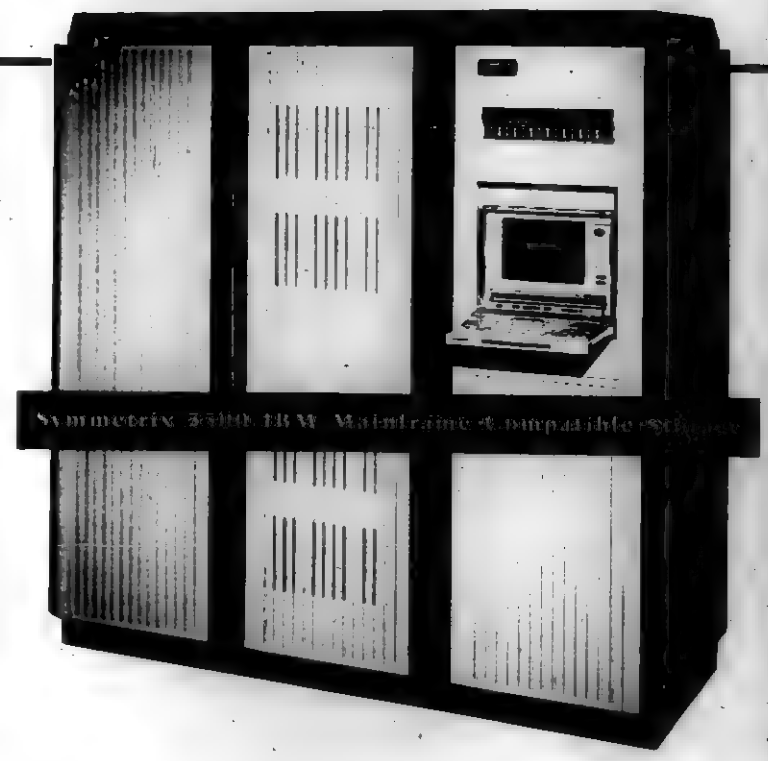
While other mainframe disk companies have been slow to deliver high data availability, the new Symmetrix 5500 ICDA™ from EMC was designed for IBM and compatible mainframe sites that need continuous operation – 24 hours a day, seven days a week. With redundant hardware



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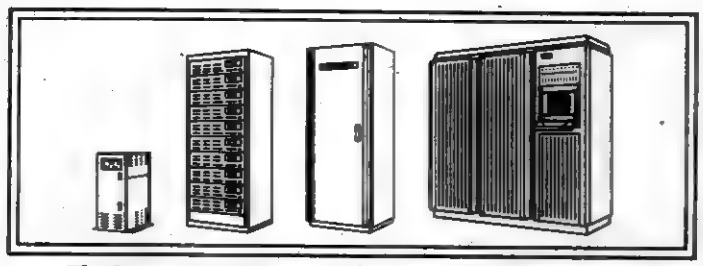

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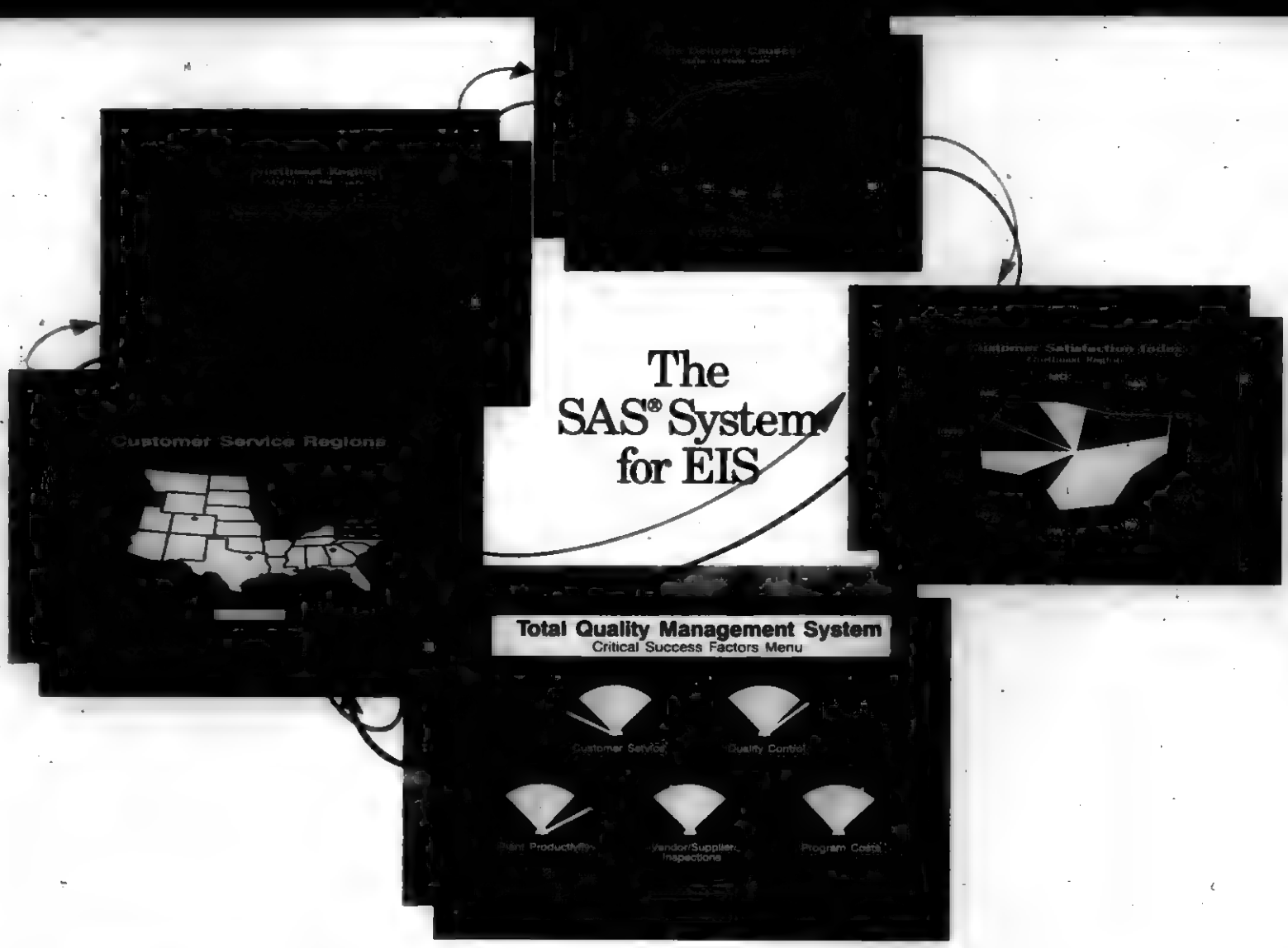

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"Who's calling, please?"

CONTINUED FROM PAGE 69

agement jobs by year's end.

The company is also starting to pay $56 million in refunds to customers as ordered by the California Public Utilities Commission, which charged that Pacific Bell improperly made customers pay for research into new technology, such as electronic messaging and voice mail.

And two months ago, Pacific Telesis announced that it is exploring spinning off its three telephone companies, including Pacific Bell, to focus on more profitable ventures, including cellular, cable television, paging and overseas systems. Pacific Bell's third-quarter revenue rose slightly to $2.51 billion. So at this stage, every penny clearly counts.

The old manual "unbillables" system certainly had room for improvement. When management asked Firdman to examine the process, a "quick and dirty" study process revealed investigators were maximizing their time by chasing big-bill rogues, leaving smaller calls untouched. But, as Firdman notes, small calls can nickel-and-dime a company to distraction. "They may be small peanuts individually, but they represent a lot of money."

Initially, Firdman had to make the tough choice of whether to use an outside expert system vendor or give the work to the internal IS staff. Given the scope of Pacific Bell's problem, it soon became clear that outside expertise and manpower were required, Firdman says.

One result of using an outside integrator and subcontractor, Firdman says, was the low level of disagreement between IS and business. "We became the intermediary and the technical liaison between the business side and the end users," Firdman says.

Another small company was hired to provide an interface be-

Eric Firdman *set up the bridge between business and end users*

tween Pacific Bell's legacy systems and any new knowledge-based ones.

Let go of the past

While the system is fairly straightforward to install, Firdman initially was concerned about resistance to the new methods by front-line staff or business units.

He says cooperation has been surprisingly good, however. "I'm amazed that there's been absolutely no conflict between IS and business. There are other projects going on in Pacific Bell that I can't say that about. We've been on the same wavelength since the beginning."

Firdman attributes this unusual cooperation to a widespread understanding that the expert system will reduce paperwork, boost collections and generally make everyone look and perform better.

"There's been a strong psychological boost," he says, "because everyone knows that the faster we implement it, the more money we save."

To make sure the system would be accepted, Firdman decided to position the IS department as a liaison between the end users and the integrators from Inference.

His reasoning: "When a systems integrator comes in and tries to work with the end users and with the business people, it never works. The systems integrators don't speak the same language, and there's no communication between the two sides. But as the managers, we can speak both languages."

Although a good six months of work remains before the project is completed, Firdman predicts things will continue to go smoothly because the most potentially rocky political parts of the project are now behind.

"Employees are really convinced the system's going to help them," he says. "And we don't anticipate any layoffs. That's why I'm convinced this project is going to work."

Schatz is president of the Schatz Group in Washington, D.C.

Update: Intelligent systems

During the past decade, artificial intelligence has been born, slain and resurrected almost as many times as Dracula.

Little wonder the average IS manager can still barely supress a yawn or skeptical wink ("Right. . . .") when the topic of AI comes up.

"The whole idea of expert in a box has not been popular, even though it has saved millions and millions," observes Neena Buck, a vice president at New Science Associates, Inc., a Westport, Conn., consultancy.

A poor economy, programmer resistance, weak internal marketing and elitist and unproductive AI groups haven't helped matters, either, she adds. But AI use appears to be changing.

Re-engineering and business process automation has rekindled interest in knowledge-based systems as smart pieces of larger systems. Whirlpool Corp., American Express Co., General Motors Corp., American Airlines and others showed off money-saving applications at this summer's American Association for Artifical Intelligence conference in San Jose, Calif.

At some companies, AI groups are teaming up with development teams using object-oriented technologies. This mirrors an industry trend in which big AI vendors such as Neuron Data, Inference and IBM are recasting themselves as general-purpose development software vendors.

Two AI pioneers, AI Corp. and Aion Corp., for example, recently merged under the new name Trinzic and industry observers say a new partnership between computer-aided software engineering guru James Martin and AI vendor Intellicorp represents the wave of the future.

Such ventures are expected to begin producing libraries that will let end users develop applications atop object-oriented programming systems.

Still, big obstacles remain, including political battles with user groups (which now buy many AI packages), battles between AI and computer-aided software engineering groups and plain old management apathy.

Buck concludes: "The biggest problem with AI remains not the tools but the systematic transfer of technology into the organization." — *Joseph Maglitta*

Dun & Bradstreet pushes the positive

Not every rollout of a knowledge-based system — darned few in fact — go as smoothly and seemingly without political problems as Pacific Bell's.

Seasoned companies honest enough to share their hair-pulling experiences implementing knowledge-based systems will attest to that. Consider the experience of the Credit Clearing House of Dun & Bradstreet Corp.'s Business Information Group in Morristown, N.J.

Like Pacific Bell, Credit Clearing House used Inference Corp.'s ART-IM tool to tackle what Roger Jambor, an assistant vice president at D&B, terms "a number of significant business problems."

Credit Clearing House assigned credit ratings and dollar-specific recommendations to the apparel industry's retail customers. Demand for credit information swelled to more than 125,000 businesses, and the suppliers of answers were overwhelmed.

"If a customer called in and his case needed updating, that could take as long as three weeks," Jambor explains. "If a customer requested information on a particular prospect and we couldn't find it or we couldn't retrieve it fast enough, that meant a lost sale."

Little wonder that in such conditions the average analyst burned out in about 18 months. Pressure also grew because the retail companies were developing their own information, which posed a growing source of competition.

Smart sources

American Association for Artificial Intelligence
Menlo Park, Calif.
(415) 328-3123

Association for Computing Machinery
Special interest group on AI
New York, N.Y.
(212) 869-7440

Ablex Publishing Corp.
Catalog of titles and serials on AI
Norwood, N.J.
(201) 767-6717

Turning to outsourcers

Unable to cope with the situation internally, Jambor, whose job includes identifying, evaluating and introducing new technology to the business information group, went outside.

Credit Clearing House's predicament seemed ideally suited for an expert system: a well-bounded problem that, if the new technology failed, would not negatively affect the business.

In January 1988, Credit Clearing House began building a prototype of a credit reporting system; a production version was installed 18 months later. The system was developed on a PC using ART-IM/MS-DOS and ported to two MicroVAX 3100s. These act as coprocessors to an IBM 3090 mainframe running under CICS with database access through CA-IDMS. That was the easy part, Jambor says.

How could anyone argue with a reporting system that cut information search times from three weeks to five seconds and paid for itself in less than a year instead of the 30 months predicted? Easy, Jambor says.

> "It's a natural human tendency to be concerned," Jambor says.

From the start, analyst users disliked the idea of a computer's invading even a small piece of their territory, Jambor recalls. "You could tell they were concerned because they'd say so in the meetings we had to discuss the new system," he says. "It's a natural human tendency to be concerned."

Convincing skeptics was hardly easy, but Jambor emphasized several key points: The system would help staff focus on more complex cases, work more efficiently and reduce paperwork. "Management assured them it wasn't going to throw people out the window. We stressed the positive from the beginning." The approach worked.

"It took six months before the analysts really believed the system was working and another six months before they reached the enthusiastic level," Jambor says. "But now it's clear that the business side and the technical side have gotten more from the system than each expected."

—*Willie Schatz*

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The idea of open systems—that computers should easily share things and basically behave like friends—is what everybody is aiming for.

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good, but not always from the same point of view.

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It's Big Blue or you

Entrepreneurship and IBM top IS work favorites

By Nell Margolis

Which organization would you most like to work for? Young and old, male and female, staff and line agree: My own company or Thomas Watson's.

A recent *Computerworld* survey asked some 1,400 information systems professionals what topped their workplace wish lists. Surprisingly, respondents whizzed past such highly acclaimed corporations as Ben & Jerry's Homeade, Inc., Levi Strauss & Co., Federal Express Corp. and General Electric Co.

Some paused at the likes of 3M Corp., AT&T, Novell, Inc., Apple Computer, Inc. and Electronic Data Systems Corp. and gave a more striking salute to the U.S. government, NASA and Microsoft Corp. But the clear winners were "my own company" and IBM — with 34% of the vote.

That's how the grass looks from across the fence. But how do the entrepreneurial alternative and IBM stack up as viewed from *inside*?

John Kohler: *Entrepreneurship 'not fun'*

Sweet and sour

"I wouldn't do it again for anything in the world," John Kohler said of his stint as an entrepreneur. Between a partnership at Chicago-based systems integration player Andersen Consulting and six years heading up IS operations at Dallas-based paper products giant Kimberly-Clark Corp., Kohler founded and headed his own IS management consulting firm. Being the chief executive officer was great, he says, but being the chief financial officer was something else. "What made an old man out of me — and quickly — was trying to balance the checkbook and meet the payroll," he says.

Even when the details of running the business left him time for the customer-oriented activities he craved, "I was constantly torn between selling the work and doing the work," says Kohler, who left Kimberly-Clark to become a partner at Chicago-based systems integration firm Technology Solutions Corp. "Entrepreneurship looks good from the outside, but it's just not *fun*; you don't get to do the things you went into it for."

That is news to Larry Phipps, now head of his own IS marketing and consulting firm after a 25-year career in media relations at the survey respondents' other top choice, IBM.

"I'm very tired, I'm very stressed, but I've never enjoyed anything so much in my life," said Phipps, a second-generation entrepreneur who acknowledges that following in his dad's footsteps gives his current career an extra layer of satisfaction.

But learning to be a part-time CFO — or earning enough to hire one — is a worthwhile trade-off for having your hand on the reins when it comes to business strategy and customer relations, he said.

Among Phipps' new clients is his old employer, a firm that Phipps said was a good place to work. "It still is, from everything I hear," said Phipps, who is in close touch with a raft of former colleagues throughout IBM, including those in IS.

Ironically, he said, these days life at IBM — whose reputation for corporate security and solidity zoomed straight past legend and into cliche during the past several decades — is sometimes hard to distinguish from life at a start-up.

"You'll hear different answers from different people if you ask them what it's like to work at IBM right now, but you'll find general agreement that, 'Boy, has it changed! This ain't the company I signed on with,' " he noted. "And that's not totally a negative. . . . A lot of people are excited by the change."

True Blue

Meanwhile, many on the outside look beyond the Big Blue/New Blue distinction. What they see is True Blue, said Jacqueline Bynsdorp, PC coordinator at Jockey International, Inc.

"IBM is a corporate standard," said Bynsdorp — and that goes for the company as well as its products.

"Why would I want to work there? Because they're stable," Bynsdorp said, noting that her own Kenosha, Wis.-based firm is happily bypassing the headaches of heterogeneous computing by standardizing on the IBM Application System/400.

"Through all their alliances, [IBM] is constantly in touch with the latest technological advancements, whether they're acting on them at any given moment or not."

Calendar

DEC. 6 - DEC. 12

Supporting and Troubleshooting Windows 3.1 Seminar. Seattle, Dec. 7-8 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Wireless Datacom '92 Exposition and Conference. Boston, Dec. 7-9 — Contact: Communication Events, Norwalk, Conn. (203) 847-5131.

Computer Measurement Group (CMG) '92. Reno, Nev., Dec. 7-11 — Contact: CMG '92, Department 77-5105, Chicago, Ill. (312) 527-6652.

Image World Atlanta. Atlanta, Dec. 7-11 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

The 1992 Federal Computer Conference. Washington, D.C., Dec. 8-10 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

The Auditing LANs Symposium. Chicago, Dec. 8-10 — Contact: Pam Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

Database World Conference and Exposition. Chicago, Dec. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

The New York Technology Summit Conference and Exhibition. Jacob Javits Center, New York, Dec. 8-11 — Contact: American Exposition, Inc., New York, N.Y. (212) 226-4141.

Process for Using Quantitative Data to Manage Information Technology Projects and Activities. Orlando, Fla., Dec. 10-11 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

DEC. 13 - DEC. 19

The Fourth Annual Baltimore Computer Conference and Exposition. Baltimore, Dec. 15-17 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

JAN. 3 - JAN. 9

ShowBiz Expo East. New York, Jan. 7-9 — Contact: Live Time, Inc., Los Angeles, Calif. (213) 668-1811.

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

JAN. 17 - JAN. 23

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London. 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700

FEB. 7 - FEB. 13

1993 UDMS User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Denver, Colo. (303) 987-1001.

Executive Track

Mark Wiesenberg is the new head of the Computing and Communications division of **Brookhaven National Laboratory**. Wiesenberg comes to the Upton, N.Y.-based telecommunications research organization from two decades of data processing and management at Long Island, N.Y.-based AIL Systems, Inc. He will head an 86-person staff that provides technological support to the lab's scientific researchers.

Palatine, Ill.-based **William Rainey Harper College** has a newly created position — vice president of information systems — and a new executive to fill it: **David J. McShane**. Formerly the dean of IS at Livonia, Mich.-based **Schoolcraft College**, he will head up a technology acquisition initiative at Harper as well as a drive to incorporate the acquired technology into the college's academic and administrative endeavors.

David Altman has been promoted to senior programmer analyst for corporate MIS at spice and specialty foods giant **McCormick & Co.**, based in Sparks, Md. Altman came to McCormick and to the U.S. in 1991 from Moldava, USSR, where he served as a programmer/analyst at the Computer Center for the Ministry of Health. In his new post, he will head the design and programming of a contract management system for McCormick as well as system development and support functions for the firm's sales and marketing applications.

John G. Foy Jr., former vice president and director of a management consulting organization at Cincinnati Bell Information Systems, is the new vice president in charge of the management consulting practice at **Consulting Research Associates (CRA)**. In addition to offering consulting in a range of management areas, Bloomfield Hills, Mich.-based CRA represents outsourcing vendor The Genix Group.

Moving on up

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to tell the rest of the IS community. Contact Associate Editor Carol Hildebrand at (800) 343-6474 to pass the news.

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Integration Strategies: Specialists

Little firms, big benefits

By Alan Radding

■ Hiring a small systems integrator can be like seeing a small-town doctor: It's probably better at patching up small cuts and bruises than attempting major surgery.

But that's also a big attraction, according to information systems managers who have opted to work with smaller integrators. Plus, they add, smaller companies appear more eager to please — and less likely to present a hefty bill at the end of a project.

"If you need a Band-Aid, don't set yourself up for major surgery," says Karen Phillips, a network engineer and project manager at a major federal agency based in Washington, D.C.

Phillips says that smaller players work well for less comprehensive jobs, enabling her to save her resources for the big projects that require an integration heavyweight.

That's why she turned to ISYX LAN Systems, Inc., in Rockville, Md., to install and tie together about half a dozen departmental local-area networks in the Washington, D.C., metropolitan area. With experience in Novell, Inc., Tricord Systems, Inc.'s superservers and X.400 electronic-mail systems, ISYX was qualified to handle the specialized network integration job, she says.

For others, the wallet plays a big part in the decision. Curtis Meltzer, director of information services at Chadbourne & Parke, a New York law firm, says specialized firms usually cost less and respond faster — and are more appreciative of smaller projects.

Richard McGuire

Meltzer recently hired New York-based LAN Systems, Inc., a small integrator specializing in networking, to handle the installation and integration of a 600-node LAN, tying together the law firm's Microsoft Corp. Windows-based PCs and Apple Computer, Inc. Macintoshes.

"Our project probably equals 10% of their annual income," he says. "If I went to EDS with a project this size, they'd tell me to get in line."

Hal Neumann, senior process control engineer at SMS Concast, Inc. in Montvale, N.J., also likes being the big fish in a smaller pond.

The company turned to a small group of integrators, particularly the Computer Task Group (CTG) in Buffalo, N.Y., to provide the software development and integration of custom control equipment for the steel industry. "One reason we like CTG is they bend over backward to give us what we ask for. The big guys are more likely to tell us to take a hike," Neumann says.

Specialized knowledge and familiarity with the particular project is what attracted Boston-based John Hancock Mutual Life Insurance Co. to Fusion Systems Group, an integrator located in Boston specializing in expert systems. John Hancock was using an expert system with a shell from a vendor that went out of business. Last year, it decided to convert to a new shell.

Little firms, *page 78*

Vendors that wear two hats

Giants such as IBM, DEC and Oracle are getting serious about the integration business

By Mark Mehler

Candy mint. Breath mint. Tastes great. Less filling. Computer vendor. Systems integrator.

Thanks to re-engineering, shrinking software profit margins, the spread of low-cost PCs and complex enterprise integration projects, a high-tech entry has been added to these "two-in-one" pairs.

During the past couple of years, IBM, Digital Equipment Corp., Unisys Corp., Microsoft Corp., Lotus Development Corp., Oracle Corp. and a host of other hardware and software companies have spun out large consulting and integration organizations, both to support their core businesses and to create new revenue streams.

While these vendors have different strengths and missions, all are serious about succeeding in the crowded, $15 million marketplace. Industry insiders say survival demands it. "Today, customers don't care what technology you use," says Mark Tebbe, president of Chicago-based client/server integration specialist Lante Corp. "The focus has clearly shifted to a business consulting role. No company can afford not to be in that business."

INSIDE

Big or small?
Page 80

Oliver Pflug, a consultant at G2 Research, Inc. in Mountain View, Calif., adds that technology has made it difficult to separate systems from business re-engineering.

Talent raids

The most ambitious vendors are aggressively recruiting top consultants. Oracle, for example, recently hired Booz, Allen & Hamilton, Inc. heavyweights Ray Lane and Robert Shaw as president of Oracle USA and head of the 700-person Oracle Consulting Division, respectively.

Other product vendors are greedily eyeing the limited pool of consulting expertise.

Bonnie Digrius, project manager at Gartner Group, Inc., says this commitment to talent will separate the future standouts from the also-rans. "Bringing in a Ray Lane gives Oracle enormous credibility," she says.

IBM	$1.96 billion
Andersen Consulting	$1.58 billion
Digital Equipment Corp.	$1.26 billion
Electronic Data Systems Corp.	$1.02 billion
Computer Sciences Corp.	$700 million
Unisys Corp.	$667 million
SHL Systemhouse, Inc.	$650 million
Control Data Corp.	$591 million
Boeing Computer Services	$370 million
TRW, Inc.	$350 million

Source: International Data Corp.

Several big obstacles face every product vendor with designs on professional services. These include resource allocation, lack of track records on major projects and an inherent issue of neutrality that targets IBM and DEC.

Then there's the harsh fact that operating a service business is very different from running a hardware or software business, both from an organizational and a financial view.

"This is a relationship business," says Don Monaco, managing partner for integration services and technology at Andersen Consulting's Americas practice. Monaco, who predictably is skeptical about product vendors succeeding as full-blown consultancies, says most hardware and software firms have a lot to learn. "Managing a large portfolio of jobs, maintaining billables, is a very different thing than managing people who are out selling product," he says.

Vendors, *page 78*

At a glance

A quick glance at three vendors who recently took the integration plunge:

Oracle Consulting, in a bid for recognition, has raided Booz, Allen & Hamilton for its top boss, Robert Shaw. The consulting arm is growing at an annual rate of 25%. Look for it to eventually outstrip the company's product income by four times. Oracle Consulting has made a serious investment in personnel: The company employs approximately 700 people.

Microsoft tried the same trick as Oracle, tapping Ernst & Young partner Bob McDowell as its consultancy chief. With the Consulting Services unit numbering 220 staffers already, the company is figuring to add more than 100 more employees during the next eight months. Some Microsoft Consulting clients who have already signed on: Pacific Gas & Electric Co., Mirage Resorts, Inc. and Baxter Healthcare Corp.

Lotus Consulting Services is concentrating on a global strategy: Former Deloitte & Touche staff member David Connor heads up the group and is determined to move beyond Lotus' touchstone Notes and spreadsheets. The company has acquired consultancies in Canada, Germany and Dallas and is opening offices in Australia to strengthen its global punch. The division, which numbers about 160 employees, is raking in about twice its revenue forecast for fiscal 1992.

Little firms

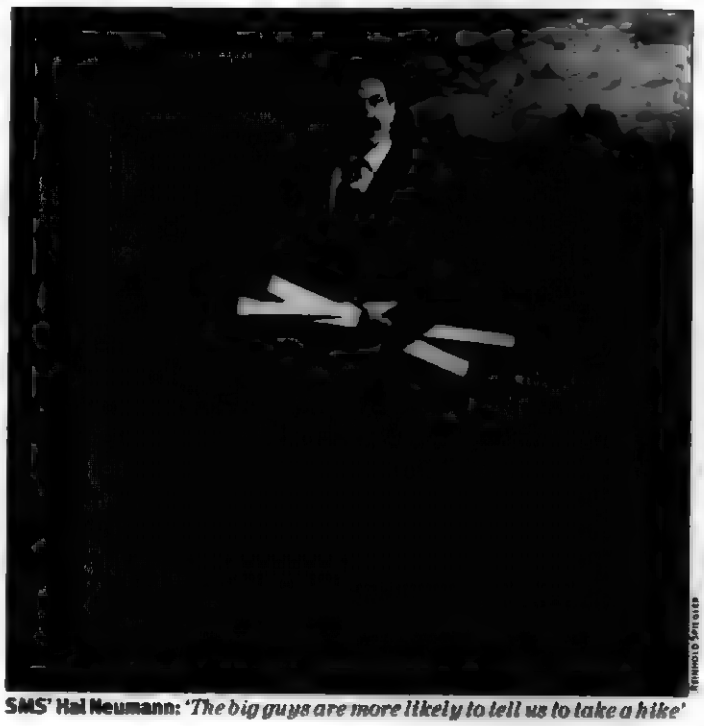
CONTINUED FROM PAGE 77

After reviewing a variety of systems integrators in the expert area, it settled on Fusion, where several people from the original vendor had ended up. John Hancock found other advantages besides technical familiarity with the small integrator.

In terms of cost, "Fusion was a bargain," says Raymond Barr, a senior consultant at the firm.

Small firms, he notes, are hungrier for assignments and more willing to go the extra mile. Even when their hourly rates are the same as a large firm, they deliver more production per hour than the large firms, which may load more people than necessary on a project and tie them up in more meetings.

Barr also says he finds it easier to work with a small company. "You deal with the top people, and they know they have to do a good job." With large systems integrators, on the other hand, the top people are brought in for the sales presentation but disappear when it is time to do the actual project work, he says.



SMS' Hal Neumann: *'The big guys are more likely to tell us to take a hike'*

Small size can hurt

On the other side of that coin, dealing with the top people all the time can be a drawback: Smaller integrators typically lack the depth of talent found at the large firms. "They may revolve around one or two key people. If those people leave, you're out of luck," Meltzer says.

Specialized firms may also lack the financial wherewithal to survive, leaving the customer to scramble for support in the future. "We evaluated 11 systems integrators, and one went bankrupt during the selection process," he recalls.

Specialized systems integrators work best, customers report, with projects that have a clear start and finish. The assignment of three to four people for a project lasting between six and nine months is a comfortable size and duration for a specialist.

When the specialist seems to take up permanent residence in the company, it may be masking some underlying problem.

Such was the case at a major West Coast transportation company, reports Dick Tonnemacher, its former information resources director who is now a management consultant based in Novato, Calif.

In the late 1980s, the company launched a new business unit that was an immediate success, outstripping the ability of the company's central IS department to support it with systems.

"The IS people couldn't build systems fast enough, so the business people were trying to manage this unit with spreadsheets and PCs," Tonnemacher recalls.

He recommended the business unit call Marathon Systems, Inc., a San Francisco-based system integrator specializing in PC-based projects.

Marathon's assignment was to piece together some small systems with the PCs and spreadsheets already in place until the company's IS department could crank up a permanent solution.

"They showed up three days later and delivered something that worked in two weeks," Tonnemacher recalls.

With the heat off, the IS staff put the major project of integrating the business unit on the shelf. The result? The Marathon relationship continued for two years, encompassing file servers, databases and LAN technology.

Although the unit loved the service it received, the IS department paid dearly in the end. Management pressured the business unit to cut costs by turning over all its systems to the IS department, which was totally unprepared to support the PC-based systems.

The lesson, Tonnemacher says, is to bring IS into the systems integration effort early, even if it has to be dragged, and make sure it's prepared to carry on. •

Radding is a free-lance writer based in Newton, Mass.

Vendors that wear two hats

CONTINUED FROM PAGE 77

This challenge is reflected on the bottom line. "Consulting is a very expensive business over the long term," Digrius notes.

Product vendors also bring some big advantages to the consulting market. At the high end, IBM and DEC can try to link new re-engineering capabilities with strong systems design, implementation and outsourcing operations to create a total services offering.

Consulting divisions of product firms bring a deeper understanding of the guts of their systems — a big edge when the technology is as ubiquitous as Microsoft's on the desktop or as ground-breaking as Lotus' Notes in the workgroup arena.

Moreover, some customers may want long-term consulting relationships with their product vendors, simply to keep them on the hook indefinitely. Oracle Consulting's Shaw argues that the "traditional need for independent consultants to come in and study 35 solutions and do a bake-off" is dwindling.

"Companies, once they've made their backbone decision, want expert advice on how to leverage their investment to achieve the maximum business benefit," Shaw says. "We don't have to become masters of many different technologies to compete against Andersen and Price Waterhouse."

Shaw says Oracle Consulting is currently growing at a minimum of 25% annually. He envisions the possibility of increasing consulting/integration revenue to four times that of Oracle's product business. "This is no hobby for us," he says.

Bob McDowell, vice president of education and consulting services at Microsoft, likewise eyes rapid growth for the software giant's 220-member consulting services unit, hoping to add more than 100 people by June.

In Microsoft's case, the technology backbone is Windows, and the driver is client/server. Consulting focuses on designing and architecting custom applications for users requiring full-time, on-site assistance; building Windows front ends to existing client/server or legacy systems; and developing client/server systems from scratch for customers willing to take a higher risk. McDowell says Microsoft Consulting also eschews "the soup-to-nuts, all-things-to-all-people" consulting mentality. The firm, he says, is content to subcontract to Andersen Consulting and DEC on large client/server engagements.

> IBM, DEC, Unisys, Microsoft, Lotus, Oracle and Borland have all opened consulting arms within the last two to three years.

Lotus professes to harbor some lofty intentions for its services. Carla Marcinowski, director of business development at 2-year-old Lotus Consulting Services, says the operation has made a sharp departure from its modest initial goal of supporting existing customers.

Under new chief David Connor, formerly of Deloitte & Touche, Lotus Consulting is looking to expand beyond Notes and spreadsheet applications into "classical" consulting in multiplatform environments.

Marcinowski says Lotus Consulting aims to assist customers in the global deployment of network and workgroup computing. With the acquisition in September of three independent consultancies and the opening of new offices in Australia, the global strategy is beginning to come together, she says.

Lotus Consulting employs 160 workers and is running at twice its revenue forecast for 1992, Marcinowski says.

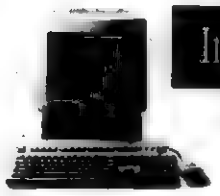
In terms of revenue and market share, all these newcomers have had a relatively small impact on the consulting sector, observers agree. There remains more than enough business and systems re-engineering work for even this crowded field to handle.

However, Lante's Tebbe says, some product vendors are making their presence felt in the constant scramble for good consulting help.

"I've had five people hired away by Microsoft. They've got the glamour appeal, and that's very scary when you consider the amount of investment a small integrator has to make in people." •

Mehler is a free-lance writer based in Jackson Heights, N.Y.

"Why's Apple talking to me about UNIX?"



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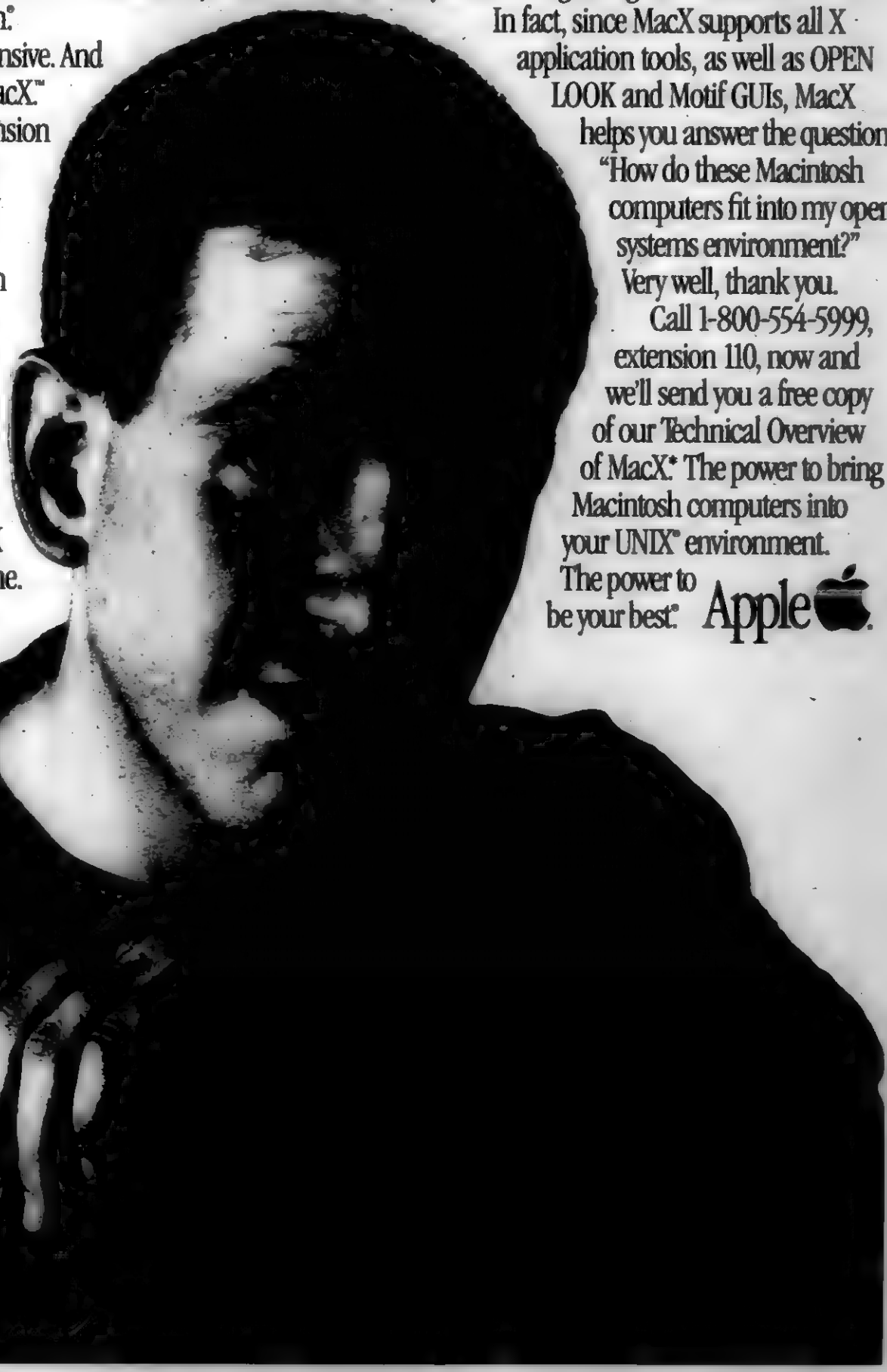


Big or small?

Is it better to do business with a giant systems integrator or a nimble specialist?

Pick a world-class decathlete

By Rudy Puryear

Puryear is a Chicago-based managing partner of Andersen Consulting's Information & Technology Strategy Practice for the Americas. Andersen Consulting is an international management and technology consulting organization that helps clients integrate strategy, people, processes and technology. The firm has more than 21,000 consultants in 151 offices and 46 countries.

The niche consultant is like an outstanding discus thrower who cannot pole vault or run the 100-meter hurdles. The full-service provider is like a decathlete. With a variety of strong skills, this player need not specialize in one event to be a world-class athlete.

I don't think the issue, however, is strictly "niche" vs. "large."

After all, some consultancies generate billion-dollar revenues and employ thousands of people. But they are still "niche" because they focus on one industry, one part of your business, one technology platform, one geographic region or one part of the solution — such as strategy or implementation.

Strengths: Technical depth, global reach

The *real* issue is knowing when to select a niche firm vs. a global, full-service provider. The latter offers industries around the world a complete spectrum of services, from strategy to implementation to change management to ongoing business process management. The former focuses on what it does best or where.

Based on 10 years of experience at a niche technology strategy firm, and now several years at Andersen Consulting, a global, full-service firm, I'd like to offer some guidelines about choosing which route is right for you.

Here are three characteristics common to clients of global, full-service providers:

■ **Complex business problems.** Do you simply need to tune a DB2 database? Or do you have a complex need, such as re-engineering part or all of your business?

The clients of global, full-service providers tend to have complex problems that affect all components of a business: people, business processes, information technology and strategy.

■ **Need complex solutions.** Many organizations today need innovative strategies tightly coupled with re-engineered business processes, which is a complex task. Many companies find a large consultancy can leverage skills that span the entire project cycle — from developing the plan to implementing the solution to helping smooth the path for re-engineering.

Moreover, such ways of doing things often call for new technologies from multiple vendors. Global, full-service providers can assemble the many pieces of such complex solutions in an unbiased way.

Rather than choosing a solution to match their capabilities, full-service providers can opt for the one that is best for the client. If an appropriate solution does not exist, the integrator can use its industry knowledge and technical skills to modify an existing solution or build a new one.

Plus, with extensive capital resources, big global firms can develop the skills to implement anything.

Finally, full-service firms can help manage change — a key part of any business process redesign.

■ **Global market and/or competition.** Often companies that are expanding internationally or facing tough off-shore competition need a partner that understands the global marketplace. Obviously, they'll want a company that does business in more than one nation itself.

It's also a good idea to partner with a global provider when you're targeting international customers or dealing with international suppliers. These consultancies deal with the same competitive challenges as their globally oriented clients, so they are well-equipped to handle these business issues.

Bottom line: There will always be narrowly defined problems that require niche solutions.

But if your international-minded organization struggles with complex business problems, a global, full-service provider may be your only choice.•

Watch out, Goliath!

By Barton Goldenberg

Goldenberg is chairman of Information Systems Experts, a Washington, D.C.-based systems integrator firm specializing in sales, customer service and marketing information systems.

The times, they're changing. Just as many companies are replacing mainframes with networked PCs, an important parallel trend is emerging: the rise of small, "lean and mean" systems integrators.

Driving the rise of the specialists is a widespread need to build simple, useful and growable systems for less time and money.

These small, new firms are not tied to old, stale ways of development but use new and proven approaches that can speed up work by 40% to 50%. Because we are not looking to sell canned products or for projects to keep hundreds of employees busy, we can look for simple solutions.

Often, this may be as simple as doing "iterative" development and testing that is quick, thanks to new object-oriented tools, along with proven methods.

Strengths: Flexibility, less costly, simpler approach

Because the project is done quickly with little labor, overall implementation cost is kept low. And because these systems are based on discrete functional modules — like "Lego" building blocks — customers select only those tailored modules that match their unique needs.

Perhaps most importantly, small integrators often use international software standards, such as the Open Software Foundation's OSF, graphical user interface (GUI) standards such as X Window System, database standards such as SQL, multitasking operating systems standards such as Unix and de facto network standards from firms such as Novell, Inc.

The result is compatible applications that let customers continually grow their system using new technology.

Let's see how the "lean and mean" approach works in real life.

■ **Group Hospitalization and Medical Services, Inc.**, a large, Washington, D.C.-based health insurance firm, wanted to automate 24-hour health insurance eligibility questions for several hundred thousand customers traveling abroad.

Options included cross-Atlantic fiber-optic circuit, satellite transmissions and several communications networks. Development time for the project was estimated at six months to nine months at a cost of $250,000 to $500,000.

One quick look revealed that 24-hour access for an application that involves infrequent bursts of traffic amounted to overkill. So we developed an easy-to-use, graphical-based application running on a multitasking system connected to a public-switched X.25 data communications network.

The job cost less than $100,000 and was implemented in only 90 days.

■ **Development Alternative, Inc.**, an international consulting firm based in Bethesda, Md., was trying to develop a marketing information system last year to handle 50 currencies, 200 products and 100 units of measure.

The system had to be simple enough for use by clients of varying computer skills in locations with little or no technical back-up. Larger integrators either said, "It can't be done" or "We have a nice package that we could build on."

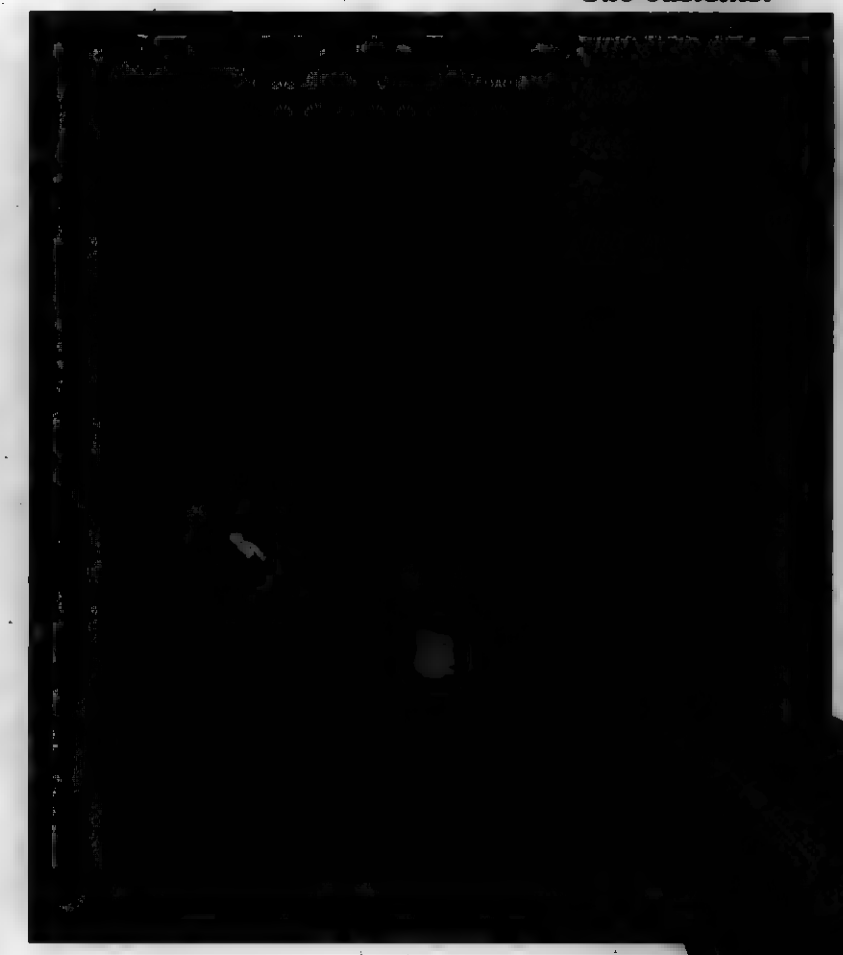
It was clear that the firm needed a presentation package and a project implementation tool. Using GUI and database management system tools, we built a powerful system that also looked good. The company president loved it.

These kind of big benefits are helping lean integrators gain respect. And small firms have begun to address the two key issues that will determine future growth: staffing and support.

A growing number of partnerships with large hardware, software and communications firms are helping to ensure needed client support services.

This creates a win-win scenario whereby big partners provide personnel and support, while small integrators become a new distribution channel.

Watch out Goliath — David has a pocket full of stones.•



"The customer

CHANGE, CHALLENGE, *and a* NEW DIRECTION

"There's nothing permanent except change" — an adage that could well describe the state of today's computer industry. Reduced margins, lower profitability, and slower growth are the result of rapid technological change. The investments required to maintain product leadership are enormous — more than some companies will be able to afford. A few are merging or forming new alliances. Others are leaving the industry altogether. The question remains: ***Who can you count on for the long term?*** Let's face it. What hasn't changed is your need to succeed and remain competitive. These needs have helped guide the development and delivery of ***Digital's Alpha AXP Program*** — a program committed to helping sustain your competitive advantage well into the 21st century.

By Ed Pinter
Market Development Manager
Alpha AXP Program

With its Alpha AXP Program, Digital is putting you and your success first. You've told us that you need an information technology supplier who can deliver value over the long term — a vendor who will:

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On Getting the Best Information Technology Money Can Buy

When your competitive advantage depends on information technology, you want access to the best. Your definition of "the best" encompasses many dimensions. One aspect is balanced systems that can be upgraded over time — with memory, I/O capacity, high-speed mass storage, and communication capability to match their very high speed microprocessors.

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On the Ease of Doing Business

Perhaps the technology you need is available. But the purchase process is not easy, and the price tag is out of reach. You're looking for a vendor with whom you can easily do business and who can offer you:

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- Simple software licensing terms across hardware platforms.

You need a vendor who utilizes a flexible approach in providing you with successful business solutions.

Is there any vendor who can do it all? Yes — Digital.

continued ▶

continued ▼

We Offer You Four Commitments
Our Alpha AXP Program is designed to help you succeed today, tomorrow, and in the future. That means you can expect us to make good on four key commitments.

Delivery of 21st Century Computing
First, Alpha AXP is the only architecture that delivers the features that are required for 21st century computing — features that include scalable CPU performance and full 64-bit addressing. These will enable you to run today's applications faster at reduced costs, and will allow you to efficiently access very large databases.

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Second, Alpha AXP is the universal platform for software development and deployment.

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Delivery of Worldwide Services
Third, Alpha AXP offers a complete portfolio of services worldwide to help you succeed.

At over 30 Alpha AXP resource centers around the globe, Digital provides you with a seamless transition to Alpha AXP technology and products — helping you to maximize the investments you've already made in systems, software, data, and development of your staff. Plus, Digital's worldwide consulting capabilities help you capitalize on new business opportunities.

Our ultimate goal is to provide the multivendor support and systems integration services you require anywhere you need them.

Delivery of Cost-effective Solutions
Lastly, Digital offers you the easiest, most cost-effective way to build solutions today and tomorrow.

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Meeting Your Needs
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THE Alpha AXP ANGLE

VAX Systems: Even More Valuable with Alpha AXP Systems

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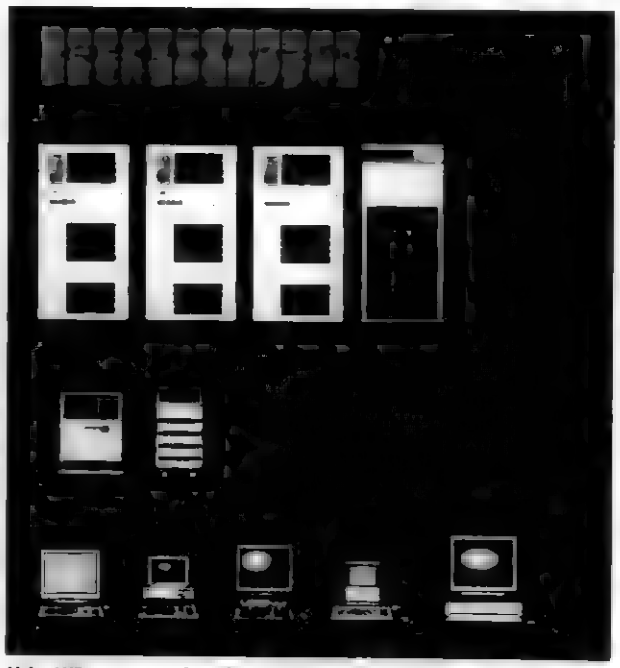

Alpha AXP systems, such as the DEC 7000 AXP, the DEC 4000 AXP, and the DEC 3000 AXP, will work together with VAX systems because they run the same OpenVMS software. They'll connect to the same networks and clusters, run the same applications, have the same user interface, and use the same data.

Once connected to the same networks and clusters, Alpha AXP and VAX will run the same applications, have the same user interface, and use the same data. In addition, you can use a VAX system to develop software for Alpha AXP, or use an Alpha AXP system to develop software for VAX.

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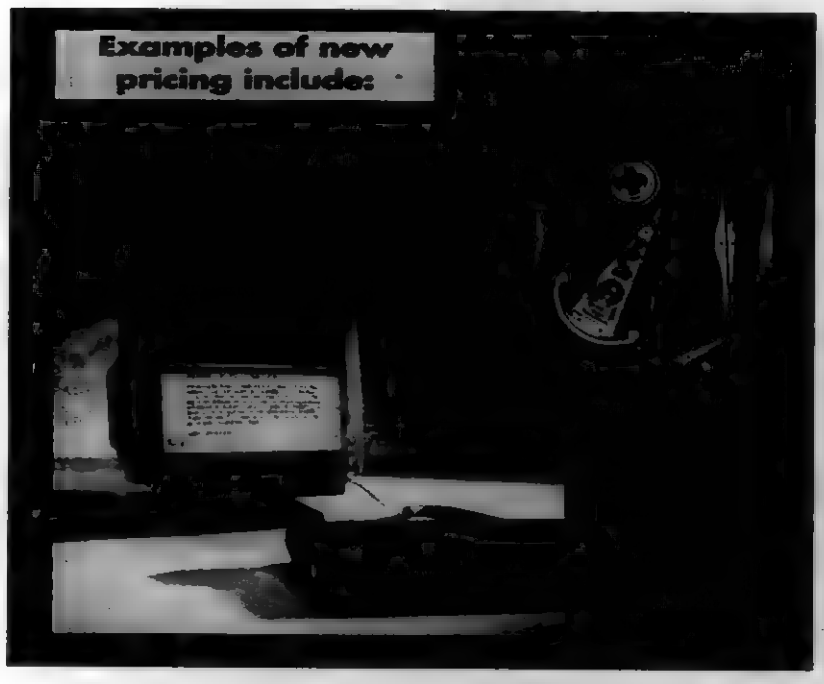

Digital understands that the way you buy computer products has changed. Years ago, you had to purchase practically a whole team of support personnel to get you "up and running" and to make sure your new products "fit in." But, that was then.

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- SDI disks, tapes, and arrays
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Video, Image, and Printers
- Desktop printers
- PrintServer networked printers
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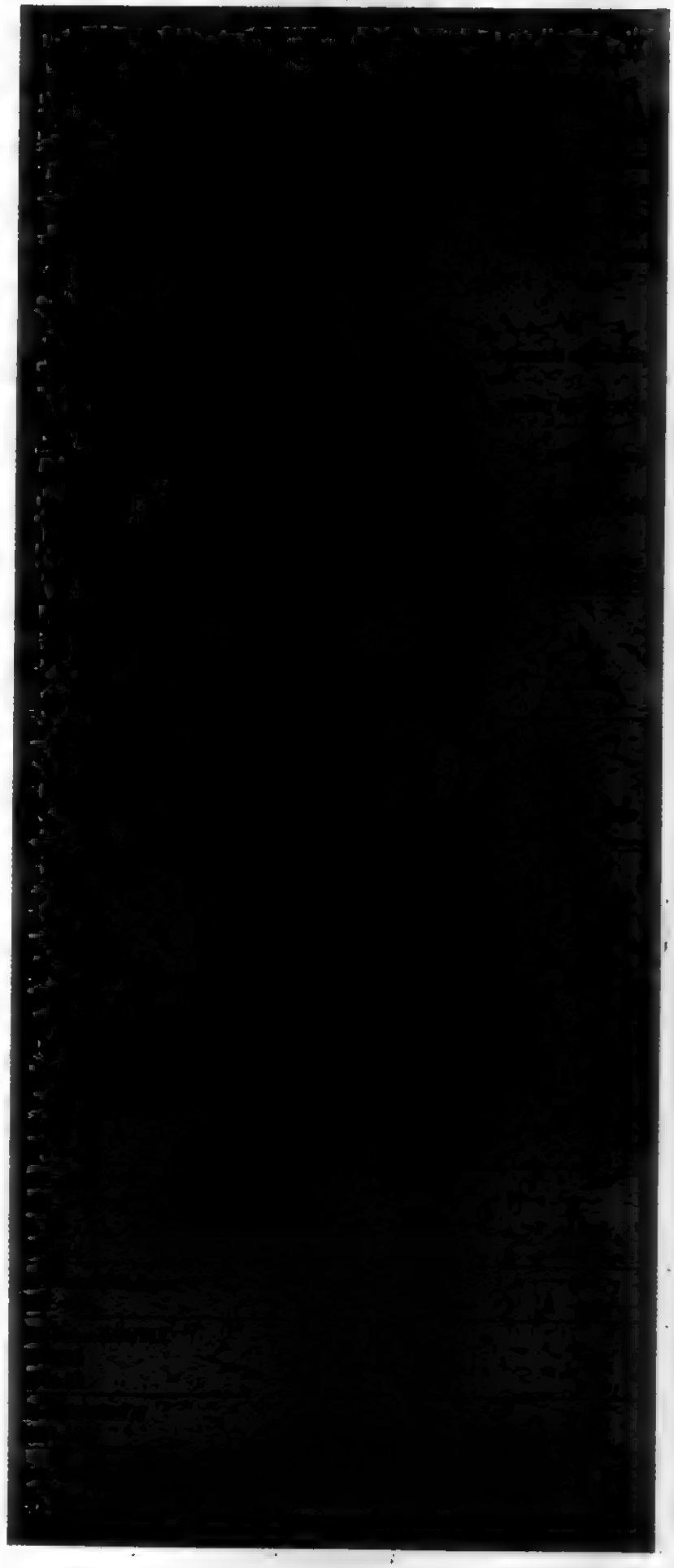

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PRIVATE matters

E-mail privacy is a contentious issue. Here are some ideas for putting together a privacy policy that works.

By Ernest A. Kallman and Sanford Sherizen

It's not enough to say you're for protecting the privacy rights of your users. You've got to act.

As information systems professionals, you are deeply involved in creating systems that have a direct impact on privacy. These systems exchange messages, text, data, images and digitized voice among computers. Every time users send an electronic-mail message, perform electronic data interchange (EDI), transfer funds, exchange voice mail, use videotext services or transmit a fax, they are leaving a trail of messages that may come back later to haunt them, their managers or the company.

Privacy issues pose problems for business executives and users. Executives, for instance, may face the prospect of a lawsuit. Right now, there are about half a dozen privacy lawsuits pending whose charges include invasion of privacy, wrongful termination, breach of contract and slander. For their part, users must deal with having their privacy challenged or limited.

Don't wait for the lawyers to etch your organization's privacy policies in stone. You have to get involved in helping your company understand privacy issues and develop appropriate policies, not only because privacy is becoming a major technical/social/legal issue but also because you may have something personal at stake: If a situation gets litigious enough, you may find yourself in court.

A good place to start is with policies associated with internal and public E-mail, which has in recent years become an area of privacy contention. And as one of the fastest growing forms of computer use — the number of electronic mailboxes has grown from 430,000 in 1980 to about 19 million today — E-mail isn't about to step out of the privacy limelight.

We'd like to help by providing some insight into what users should be told about E-mail privacy and suggesting some items that privacy policies should include. Putting together the right privacy policy will go a long way toward ensuring acceptable E-mail practices and will likely keep everyone out of court.

Educate users

One of the reasons privacy problems may crop up is a lack of understanding about E-mail on the part of users. Because they don't comprehend how E-mail works, users assume their messages are private.

Unfortunately, that's not the case. It's up to IS managers to ensure that users know what they are dealing with when it comes to E-mail so that they can use it appropriately. There's more at stake here than

Private matters, *page 86*

Hitting the books

Want more information about E-mail privacy? Try this recommended reading:

Privacy for Sale by Jeffrey Rothfeder (Simon & Schuster, 1992).

The Law of Electronic Commerce: EDI, Fax and E-mail by attorney Benjamin Wright (Little, Brown, 1991).

Continued from page 85

users' private information; the more users know about the E-mail system, the more they will guard correspondence containing company information (trade secrets, customer data, salary records, etc.).

Here is what IS should make sure users understand:

■ **A message does not disappear when it is received.** Most users think of E-mail as keyboard-to-keyboard or screen-to-screen transmission. Once it is received, the message is deleted or destroyed. However, they don't take into account the fact that the receiver often prints out the E-mail message.

Printing an E-mail message came into play during the Iran Contra investigations, in which a court ruled that a printed copy of an E-mail message between National Security Adviser John Poindexter and Oliver North could be used as evidence.

A rule of thumb might be this: If you would not send the information on a postcard through the postal service, you should hesitate to send it by E-mail.

In terms of public E-mail systems, most of these services keep records of messages for backup and administrative purposes. As long as these messages exist, people can get at them.

■ **The addressee may not be the only person reading the mail.** Even if a message is not printed but only appears on the screen, someone can read it if the terminal is left unattended. Perhaps more disturbing is that the sender has no control over what happens at the receiving end.

■ **Copies of messages aren't necessarily duplicates of the original.** When an E-mail message is received and that recipient forwards the message to another party, the last recipient has no way of knowing whether the original message was altered before it was forwarded.

■ **The E-mail process isn't innately private.** Lots of people can get into E-mail for legitimate reasons. For example, internal or external staffers can audit the communications facility to ensure its proper operations and security; law enforcement officers can investigate misconduct; supervisors can monitor employee activity; and IS staffers can perform operation control functions such as creating backup files, rerouting misaddressed messages

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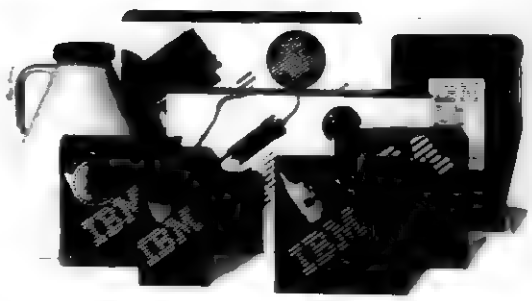

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A tangled web

When Eugene Wang, former vice president of the Computer Languages Division at Borland International, Inc., left the company to join rival Symantec Corp., what happened next was a situation that may have ramifications for E-mail privacy policy.

Borland alleges that Wang may have traded Borland secrets to Symantec before leaving his job. To find evidence of this, Borland opened Wang's MCI Mail account, where it claims to have found messages that the company believes back up its suspicions. What followed were police searches of the homes of Wang and Symantec Chief Executive Officer Gordon Eubanks and Symantec offices, a pending criminal investigation of Wang and Eubanks and a civil suit by Borland against Symantec.

Wang, on advice of company attorneys, has separated himself for the time being from any work in Symantec's language area.

How were Borland and its attorneys able to get into Wang's mailbox, even though the federal Electronic Communications Privacy Act of 1986 protects messages in transmission on a public mail service such as MCI as well as after transmission and storage of said messages? According to Mitchell Kapor, head of the Electronic Frontier Foundation, a group interested in individual computer users' rights, the intrusions were explained as a property right: Borland was paying the bills for Wang's MCI account. When Wang left, his E-mail reverted back to the corporation.

In an article in *Forbes* magazine, Kapor says Borland could have strengthened its case against Wang if it had announced its policies on E-mail. The company, however, reportedly continues without a formal E-mail privacy policy to explain when messages sent from company equipment are company property.

and reissuing lost passwords.

■ **People can break into an E-mail system.** Hackers, disgruntled employees and even corporate or government spies and saboteurs have attempted to gain (and in some cases succeeded in gaining) unauthorized access to users' messages.

■ **The technology can work against privacy.** Sometimes, not understanding the software that supports the messaging operation causes problems. For example, using the REPLY command in some software to automatically send a reply to a message can be problematic. If they're not careful, users can mistakenly send the message not only to the original addressee but also to all those copied in the original message.

This often happens when a user responds to a message posted on an electronic bulletin board or forum. Rather than the reply going only to the message originator, all subscribers to that discussion receive it.

In one actual case, a vice president at a computer vendor company responded nastily to a message and inadvertently broadcast it to a group of people rather than to one person, as he had intended.

Time to talk

Once you've got the message out about E-mail — how it works and why it's not so private — you've got the basis for a dialogue among IS, management and users from which a privacy policy can emerge. Human resources and the legal department should also eventually be part of this team.

Ideally, privacy should be viewed as a functional activity that the entire organization can support. For some organizations, this will mean a change from asking "What can we legally do with information about our employees?" to "What is an appropriate way to collect, use, distribute and store employee information?"

Foreign affairs

As of Jan. 1, 1993, the European Community (EC) is enacting laws and regulations regarding privacy and information protection. In essence, private information cannot be moved out of one EC country into another unless the target country has adequate privacy protection. In one case, information could not be sent from France to automaker Fiat in Italy because Italy doesn't have adequate protection. In the end, U.S. companies doing business in Europe may very well spur the move to define a national privacy policy in the U.S. Without such a policy, it is conceivable that U.S. companies in Europe may not be able to send E-mail and other messages to the U.S.

The former question results only in a narrow, legal definition of privacy. It's old-time management thinking: We own everything, and the employee owns nothing. The latter question is broad in scope and keys in on appropriateness — what's right for the organizations *and* its employees, so no one gets wronged.

Before putting together a policy, you may want to undertake a privacy audit to review the adequacy of privacy protection in the collection, use, distribution and storage of information throughout the organization. When you're ready to formulate your policy, use the following items as your guide:

- E-mail policies should take into consideration the law, public opinion, technology, existing employer/employee agreements and other relevant factors.
- The policy should cover all E-mail, whether internal or external (exchanged over public carriers).
- The policy should contain statements about what is considered private E-mail and under what conditions an E-mail message can be read (such as when an employee is absent or ill for an extended period of time, what the legal grounds are for reading it and who will read it).
- A senior executive should act as the organizational privacy officer to ensure that policies are written, promulgated and implemented.
- The policy must have immediacy. Establish and implement an E-mail privacy policy as soon as possible. Employees presume privacy unless informed otherwise.
- Make sure employees know what is expected of them. This may include having them sign off on the policy.
- A good privacy policy is best supported by appropriate security practices and an environment that fosters ethical computer use.
- Keep the policy relevant, changing it as technology changes.

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Privacy is not a liberal plot. It is of great concern to many people and is receiving legislative attention. Privacy laws are appearing every day. Court cases are in the news (see story page 86).

For its part, E-mail privacy is just the tip of the iceberg. Privacy practices not only need to eventually encompass EDI, voice mail, videotext and so on but must also go even broader to cover privacy in the corporation in general. For instance, do employers have the right to look in your desk drawer?

The best advice is start right now on a policy for your company. •

Kallman is a professor of computer information systems at Bentley College in Waltham, Mass., where he teaches about privacy and ethics. Sherizen is an information security consultant and president of Data Security Systems, Inc. in Natick, Mass.

Unsavory choices

You don't want to take the easy way out when it comes to an E-mail privacy policy. Avoid the following two "easy" choices:

Choice 1. E-mail messages are open to the organization regardless of content. Everything on the system and network belongs to the organization. No privacy rights for employees are appropriate.

This choice starts management/employee wars. Any employee privacy rights will have to be won, traded or negotiated. Employees will be angry and may even sue. Do you want to be known as the company that "invades worker privacy" or "violates the public trust"?

Choice 2. Conditional privacy. The company tells employees that their privacy will be protected only if certain management-defined criteria are met. For example, a message must be deemed appropriate, have a certain format, appear only in certain forums and bulletin boards and so on.

In this case, the company has announced employee privacy rights but with so many restrictions that workers view the policies as a legal trick to protect the organization from lawsuits. The main message employees walk away with is, "Be careful, we're watching you." There's no faster way to demoralize employees and devalue E-mail.

Furthermore, such a stringent policy might cause employees, worrying about being trapped or tapped, to use E-mail too carefully. In the end, they will likely be less productive.

For example, Hewlett-Packard Co. experienced a two-thirds reduction in E-mail use after it let users know supervisors might monitor the system, according to Jeffrey Rothfeder, author of *Privacy for Sale*. While some of that message exchange may have been "social," some of it was probably work-related.

Some organizations are defining E-mail privacy

Interex, Aerospace Industry Association take a stand: 'It is just common sense'

■ Some organizations are doing more than just talking about E-mail privacy guidelines — they're crafting some of their own.

Interex, the $8 million nonprofit Hewlett-Packard Co. user group, established a formal E-mail privacy policy as the direct result of publicity surrounding a 1990 incident in which Epson America, Inc. fired its E-mail administrator, Alana Shoars, after she questioned the company's alleged monitoring of employee messages.

"To me, the fact that anybody would even think of doing what happened in that case was appalling," says Steve Souza, technical systems specialist at the Sunnyvale, Calif., organization.

After contacting Shoars and finding out what happened, Souza wrote an E-mail privacy policy that Interex's IS department and board of directors approved in late 1991.

The policy governs any interaction among Interex's 42 staff members, volunteers, committee members, board of directors and its 10,000 members. Some of its specific tenets are as follows:

- E-mail is considered private, direct communication between sender and recipient(s).
- E-mail will not be monitored, observed, viewed, displayed or reproduced in any form by anyone other than the sender or intended recipient(s).
- In the case of employment termination or when an employee is absent for an extended period of time, work-related mail is forwarded to the most appropriate employee. Personal messages are forwarded to the intended recipient. If that's not possible, they're destroyed. Messages aren't examined further than is necessary to determine in which category they fall.

. . . . . .

The impetus for creating guidelines for E-mail privacy for the 54 members of the Aerospace Industry Association of America, Inc. came from the members themselves, says Joseph Dauksys, director of information technology and quality assurance at the Washington, D.C.-based group. "A lot of it is just common sense for people working with E-mail," Dauksys says.

Recommendations in the four-page document, which a committee pulled together during six months in 1991, include the following:

- Employees should be advised of their company's E-mail privacy policies.
- Companies shall treat E-mail transmission and files as private information.
- Company E-mail is for the primary purpose of correspondence relating to business.
- The company will not routinely monitor E-mail for the purpose of discovering misconduct.

— *Lory Zoltola Dix, senior editor, in depth.*

Do it yourself

While no numbers exist on how many companies in the U.S. have E-mail privacy policies, the Electronic Mail Association in Arlington, Va., says it receives about two requests a week for its corporate E-mail privacy policy kit. The association has sent out approximately 200 kits since 1991. For more information, call (703) 875-8620.

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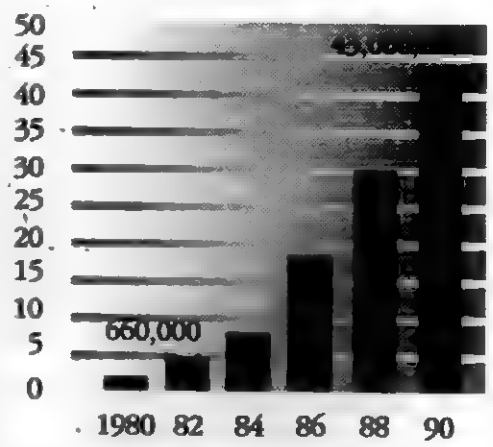

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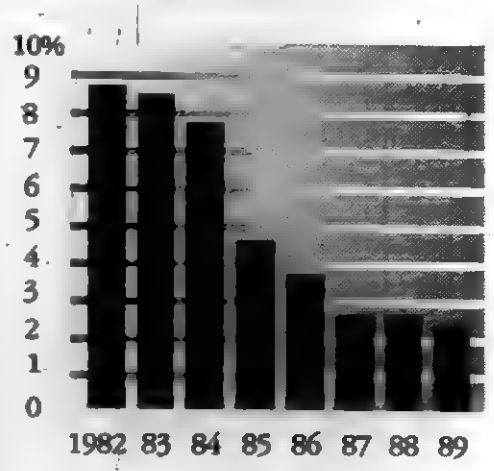

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Pity your overworked manager

This article, the second in a two-part series, looks at the pressures and worries IS managers grapple with on a day-to-day basis and how these factors can affect their departments.

By Alice Bredin

Has your manager been acting like he's had one cup of coffee too many? Has he been jumping down your throat and placing unreasonable demands on you? Don't take it personally. Chances are, he's experiencing the same thing from his own boss.

Chris Boisaubin, director of information systems at Van Ru Credit Corp., a collection agency in Skokie, Ill., says when he's feeling the heat from a higher-up, he tends to be less forgiving of his staff and not as willing to consider excuses or mitigating factors.

A few of the issues that could be stretching your manager's patience are budget constraints, personnel shortages, increased support demands from users and growing demand for key systems in all business areas.

Or it could be something else. Mel Culp, MIS director at Siemens Power Corp.'s Fossil Power Division in Milwaukee, says the declining quality of packaged software gives him the most stress. He says off-the-shelf software often has bugs and problems that prevent the department from getting the product out to users. It's taking more time for his people to fix the bugs, which takes them away from other jobs.

What's toughest, Culp says, is keeping multiple balls in the air as a working manager. "There are more decisions than ever before and more interruptions in my day," says Culp, who must also do technical jobs when no one else is available. "I have to turn on my voice mail and hide behind it until I have a break to go through all my calls and decide who I have time to call back."

Service levels and response time have become more critical than ever, as computer systems have grown more interconnected and more critical to business operations. Many managers say the pressure of ensuring that critical systems are always functioning properly is taking its toll.

David Jacobsen, the manager of IS at Georgia Pacific Corp. in Palatka, Fla., says he lies awake at night when he is close to a solution but doesn't have it yet.

"Today, with the extent of integration, if it doesn't work just right, we are holding up the business, we are influencing profits and customer satisfaction and we are influencing the achievement of production," Jacobsen explains.

Michael McFarlin, director of IS at Mary Meyer Corp., a maker of stuffed toys in Townsend, Md., acknowledges all of these stresses but says it's personality-related issues that affect him the most. "If I'm going to take stress home, it's usually a run-in with someone at work," he says.

McFarlin added that such conflicts usually occur with peers or higher level managers, not with his staff, and most often concern policy disagreements. He says taking his work home with him, literally or figuratively, takes his energies away from his family. "It's stressful for my family because I'm there, but I'm not there," he says.

Roy Mayberry has been a manager of IS at Mason Shoe in Chippewa Falls, Wis., for 27 years. Because he works at a small company with only one expert in each application, he frets when someone goes on vacation or is out sick. He has to pinch-hit, sometimes at 4 a.m.

When hours are long, families pay a price. "Before I got this job, I was living in St. Louis working 9 to 5," Boisaubin says. "When I started here, I was working about 18 hours a day, and my not being around put strain on my wife and kids."

Boisaubin says his family has remained intact despite the long hours and after-hours stress, but for a long time he didn't have too much time to spare for them. "Even now that the hours are better, I just don't have the energy I used to before I was a manager," he explains. "I wish I could make the money I make now and have the pressures and hours I had when I was a programmer."

Bredin is a free-lance writer based in New York.

Stressed out?

What can you do when your manager takes his stress out on the staff?

- ✓ Don't take it personally; try not to internalize it.
- ✓ Focus on the task; not the person; focus on getting the job done.
- ✓ Let your manager know you know he's having a hard time.
- ✓ Try to see things through his eyes.
- ✓ Talk to him directly or, if the situation warrants, to his manager.
- ✓ Wait it out. Sometimes that's the best you can do.

Source: Naomi Karten, president of Karten Associates, Randolph, Mass.

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Career advice for the '90s

Skipping basics will hurt later

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Jeff Jones, a principal at Andersen, Jones & Muller Associates, a recruiting firm in Southfield, Mich., specializing in the placement of IS professionals.

Q: I was hired into a commercial programmer training program at a major computer services firm. Prior to entering the technical training phase of this program, I was working at a customer site as a coordinator.

Recently, my manager offered me a position as a business analyst. What would be best for my career?

A: Your ability to grow into more responsible positions and transfer to other jobs or companies depends on the skills base you have acquired early in your career, and programming is still the foundation of most career paths in the IS arena. Analytical skills are less transferable to other jobs and industries.

Spending two or three years coding and learning the development process gives you a stronger career path. It will also make you a better analyst when you move in that direction.

Q: I am the only person in my IS department who knows our payroll system. I am tired of payroll work, but no one else wants to do it. My boss walks away whenever I complain. What can I do to get a different assignment?

A: Take initiative to learn other meaningful application systems by filling in during absences or vacations. Second, look for chances to initiate new hires or trainees in your applications.

If all else fails, look for an opportunity outside your company that leverages your payroll skills but offers additional diverse assignments.

Q: I am a senior programmer analyst with experience in CICS, VSAM, DB2, Cobol, MS-DOS and FoxPro. I'm considering learning new technologies — possibly database administration — to continue to be marketable. What do you suggest?

A: Try to get training in database internals and physical design. You might also use your mainframe and PC skills augmented with training in LANs and SQL to move toward client/server applications development.

Both of those areas are marketable, but you must apply skills in the work environment for them to be recognized.

Q: I have been a programmer in the insurance industry for five years. I recently had a baby and would like to be at home more. What is the best way to find a part-time position?

A: Start by looking in your own company — your experience is most valuable there. While the IS industry has not generally accepted the concept of part-time workers, you may be successful by taking the following steps:

Put together a written proposal to your manager outlining your desired schedule; point out the pros and cons of off-site (home) work activities, as well as the benefits of retaining your expertise and the costs associated with hiring and training a replacement.

Indicate a target time period when you could move back to full-time status.

Outside your firm, concentrate your search on organizations that use your exact skills — in this case, insurance companies.

Save that you're being undervalued? Stressed out? Feeling discriminated against? We want to hear about these and other issues that affect your career. Call your questions into the Fast Track line at (508) 820-8522 or fax them to Kelly E. Sewell at (508) 875-8931. If we use your question, we'll send you a gift.

How to handle Project Politics

■ You have to know your team well and what their goals and objectives are, and you try to incorporate those into your own and reach a balance. There has to be a collaboration, and building the right team is the start.

Lee Keene, assistant administrator, special projects
City of Columbus, Columbus, Ohio

TIPS for the TIMES

■ There's no such thing as a project without politics. Making sure that the program we're creating will be useful to the people using it is what we call politics. Conflict occurs when the product designers and the various user groups differ on what is useful. So, you regularly get everyone together until they agree.

Henry Rabinowitz, technical director, expert systems lab
Nynex Science and Technology, White Plains, N.Y.

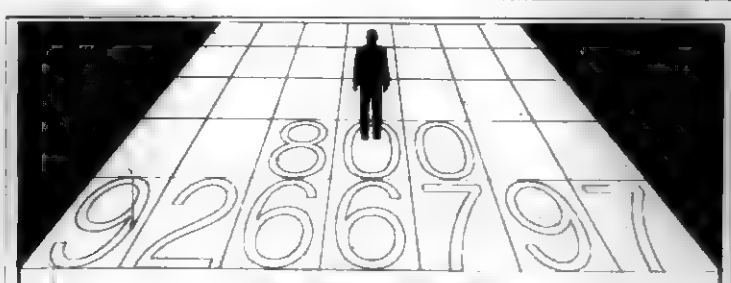
■ There are at least two aspects to project politics. You have systems analysts and programmers in one group and application users in the other. You have some control over the programmers and analysts, but with users, there are so many different groups that it's difficult. You have to use finesse and diplomacy.

John Murphy, security management, data processing
Mecklenburg County, Charlotte, N.C.

■ We include as many users and management people as possible in the requirements definition phase, and then we do a lot of follow-up. That keeps politics to a minimum, and we haven't experienced many problems.

Brian Hawthorne, manager of systems development
Providence Gas Co., Providence, R.I.

Compiled by Leslie Goff, a free-lance writer in New York.



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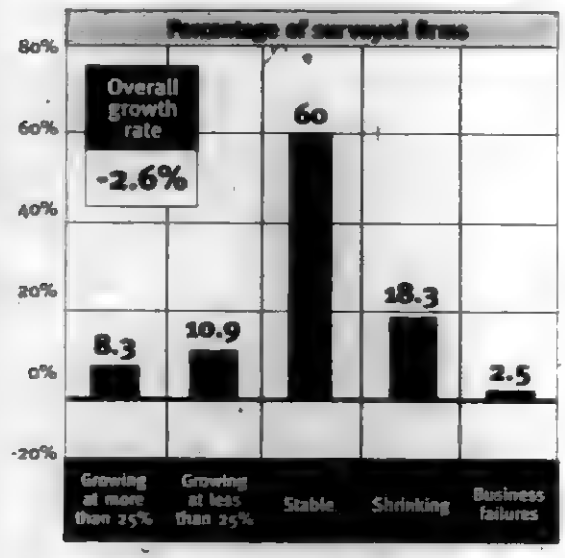

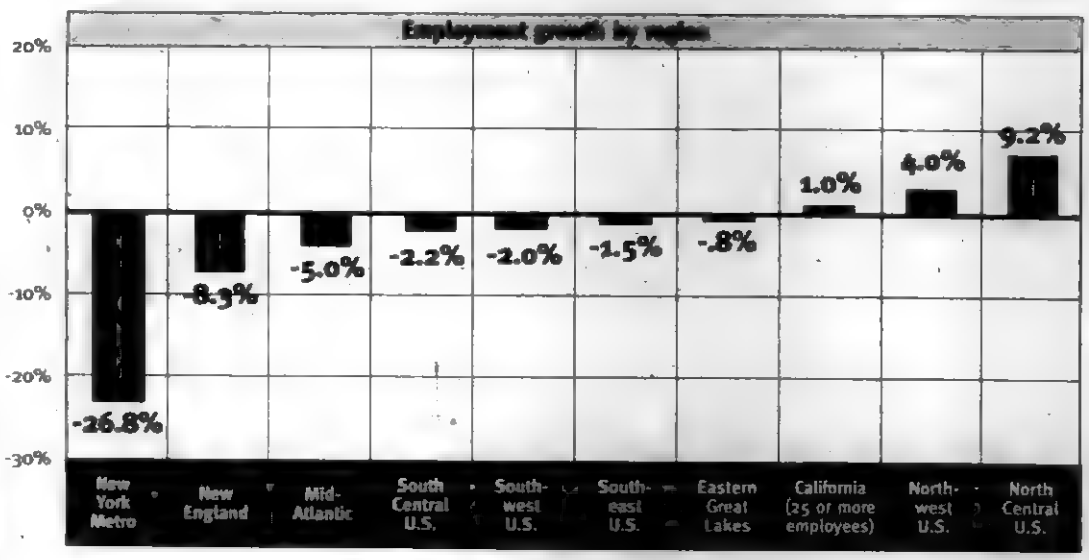

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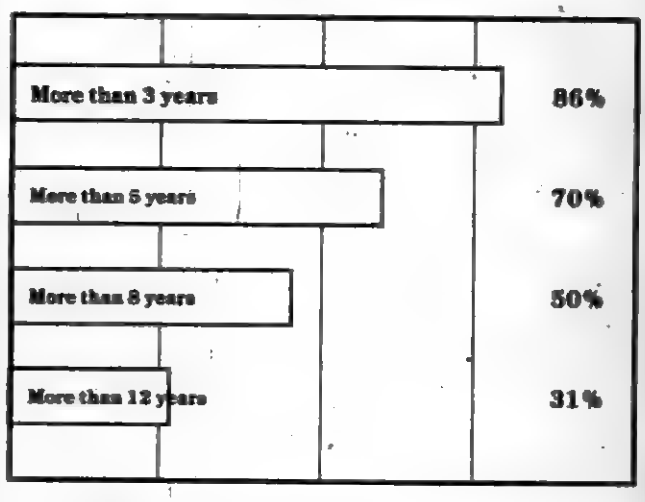

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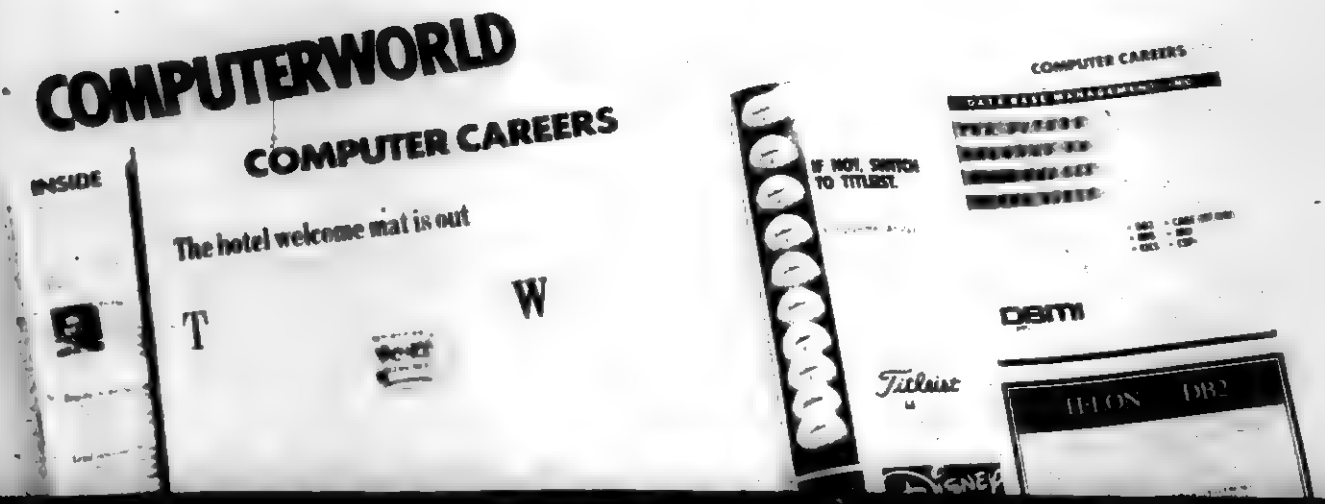

Oh, the pain of purchasing software!

By Anonymous

Occasionally, people have to do some rather unpleasant things, such as painting the house or going to the dentist — or just being a dentist. But none of these compare with the stress of buying software. People truly suffer when buying software, especially expensive large systems software.

When buying software, there's a lot of information you need to know. Stuff salesmen hope you'll never know and questions they hope you'll never ask. But ask before you sign on the dotted line. You could be betting your company on this decision.

The first thing you have to know is that users talk to other users. That's why vendors provide dozens of great user references who'll talk all day about graphical user interfaces, features, ease of use or anything else that users love to stick in their requests for proposals.

But while users check user references, information systems managers must also check IS references. Was the software easy to install? Did the code compile the first time? While you're on the phone, you may also want to ask about...

■ Processor requirements. Sometimes software looks great — until users start measuring response time with a calendar. Find out about performance! Just because the system screams during a demo does not mean it will scream on your CPU.

Also find out about CPU pricing. Does a bigger CPU mean a bigger software license? What if you run it in a smaller partition? Or multiple copies in multiple partitions? Will you be charged extra? Know the answers before you buy. Only then, after you've gone beyond the technical issues, can you satisfy your chief financial officer by...

■ Deciding how to pay. Everyone worries about haggling over how much to pay. But when to pay is another story. Never, never, never buy the software, mount the tapes and write a check for the whole thing.

If the stuff doesn't work, or even if it does work, you'll still need support and fixes. And if the vendor already has your money, he may suddenly forget to return your calls.

Some firms offer monthly licenses. Others let you pay a portion when you sign the contract, a portion when you get the tapes and a portion when you "go live." Another good idea is to ask to hold a portion back until one year after you're live, ensuring you get timely support and fixes. But once that's done, you've got an even bigger problem: wading through which software charges are standard and which are...

■ Extra charges. Nothing is free anymore. I had a coupon for a free salad, and they charged me for the dressing. I bought a $100 suit and got hit for $80 in alterations. Ask about every possible charge. Get them waived — in writing. It may seem ludicrous to argue about $9 in overnight mail when you're buying a $900,000 system, but you'll get stuck with a shipping invoice every other month. You'll have to hassle with purchase orders or petty cash. So don't pay for this or any other stuff your salesman refers to as...

■ Other services. Vendors don't make enough on software anymore. So they try to hit you up for a lot of other services. They'll offer installation, training, custom interfaces, maintenance, modification retrofitting and Ginsu knives.

Salesmen get fat commissions for selling software. But they get fatter commissions for selling services. Not that services are bad. You might even need them, especially if every time you've tried to do your own installation, the tapes show up inside-out or written in Hebrew or erased by an airport X-ray machine. But be smart. Ask for these services, and ask for them for free. Make the salesman use them to close the sale. If you don't, you might be sorry, especially if the vendor is notoriously bad regarding...

■ Fixes, support and new releases. Now let's be fair, this is software. New versions are always late. There are always bugs.

So ask a lot of questions. Of course, you'll get lots of flowery answers, so push the vendor as far as you can go. Bring up the three words that strike fear in the heart of the high-tech industry: service-level agreements.

Vendors will waffle on service-level agreements faster than Aunt Jemima. You'll get plenty of "But we'll have to raise our price," or "I'll have to ask my boss," or "Gosh, I think we have a bad connection." But be firm. Get something in writing.

And finally, ask a vendor if he has a toll-free support hot line. I've seen vendors with hot lines in Nebraska, Guam and Taiwan. I've got nothing against these places, but if you're in Baltimore and sitting on that Guam hot line, it might be cheaper just to hire another systems programmer.

The writer is a software salesman in a major Midwestern city.

At a glance

DO

- ✓ Negotiate the payment schedule, not just the payment.
- ✓ Ask for service level agreements.
- ✓ Make sure there is toll-free phone support and test it.
- ✓ Get commitments about performance and response time.
- ✓ Get IS references, not just end-user references.
- ✓ Find out how the CPU is priced.

DON'T

- ✓ Pay for training and services – negotiate them up front.
- ✓ Believe "the tape's in the mail" – and even if it is, don't assume you can read it.
- ✓ Stop asking questions about service and support.
- ✓ Pay for everything at once.
- ✓ Let the vendor stick you with extra charges.

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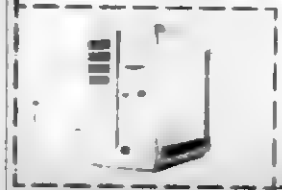

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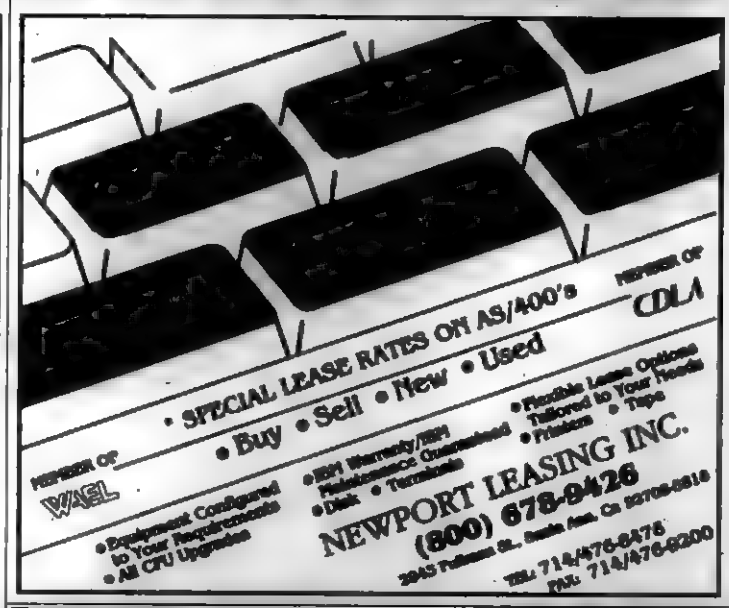

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PS/2 Model L40SX	$800	$1,000
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PS/2 Model 60	$600	$500
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PS/2 Model 80	$1,200	$1,150
PS/2 Model 90	$3,100	$2,850
Compaq Portable II	$425	$325
Portable III	$500	$450
Portable 386	$950	$850
SLT-286	$800	$675
LTE-286	$800	$750
DeskPro 386s	$900	$825
DeskPro 386/33	$1,600	$1,600
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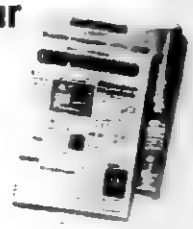

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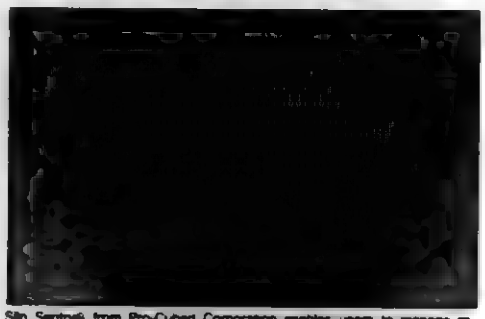

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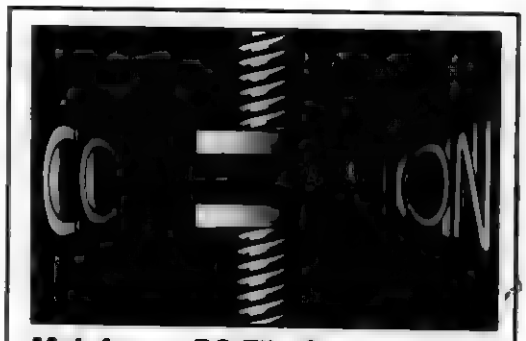

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Apple **40/41, 79**
Applied Business Technology **37**
AT&T Tridom **53**
AT&T Business Communications Services **30-31**
Bachman **107**
B.I. Moyle **57**
CANAC Telecom **40**
Compaq Computer Corp. **28-29, 48-47**
CW Classified **42, 52, 60, 64**
CW House **60**
CW Marketing **45**
DB Expo **61**
Digital Equipment Corp. **81-84**
Dun & Bradstreet Software **25**
Eastman Kodak **52**
EDS **46-47**
E-Mass Group **9**
EMC Corp. **70-71**
Hewlett Packard **18-19**
IBM **25-27, 38, 44, 54-55, 65, 74-75**
Information Builders **17**
Information Resources **28**
Intel **22-23**
Intergraph **48**
Landmark Systems **94**
Lexmark **85**
Lotus Development Corp. **80-81**
Micro Focus **11**
Multi-tech Systems **15**
National Education Foundation **12**
Northern Telecom **36**
Object Management Group **65**
Oracle **5**
Ross Systems **58**
SAP America **32**
SAS Institute **21, 72**
Software Engineering of America **100**
Sybase **13**
Syncsort **3**
Systems Center **7**
Unisys **82**
Windows World **86**
XDB Systems **20**
Xircom **42**

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Companies in this issue

Page number refers to page on which story begins.

3M Co. ... 76

A

Aberdeen Group ... 1,14,39
Adacom Corp. ... 49
Advanced Micro Devices, Inc. ... 29
Advanced Software Automation, Inc. ... 65
Aerospace Industry Association of America, Inc. ... 87
AJCorp. ... 73
Aion Corp. ... 73
Alex. Brown & Sons, Inc. ... 104
Amdahl Corp. ... 4
America West Airlines ... 105
American Academy of Arts and Sciences . 16
American Airlines ... 73
American Association for the Advancement of Science ... 16
American Electronics Association ... 33
American Express Co. ... 73
American General Life and Accident ... 6
American Management Systems ... 49
American Psychological Society ... 16
Andersen Consulting ... 76,77,105
Anderson & Co. ... 45
Apertus ... 69
Apple Computer, Inc. ... 16,24,29,33,39,49,76
Ardis ... 29
Arizona State University ... 63
Association for Computing Machinery, Inc. ... 12
AST Research, Inc. ... 24,106
AT&T ... 6,20,76
Attachmate Corp. ... 49

B

Bachman Information Systems, Inc. ... 105
Bankers Trust Co. ... 1,8,14
Banyan Systems, Inc. ... 57
Baxter Healthcare Corp. ... 40
BBN Communications ... 10
Bell Atlantic Network Services ... 53
Ben & Jerry's Homemade, Inc. ... 76
Blue Cross/Blue Shield of New Jersey ... 6
Blue Cross/Blue Shield of Connecticut ... 10
Booz, Allen & Hamilton, Inc. ... 77
Borland International, Inc. ... 1,14,16,41
Boston Computer Society ... 57
Brown Brothers Harriman & Co. ... 105
Bull HN Information Systems, Inc. ... 105

C

Cabletron Systems, Inc. ... 10
California Department of Forestry ... 49
Candle Corp. ... 1
Carnegie Mellon University ... 24
Central and South West Services, Inc. ... 20
Chadbourne & Parke ... 77
Chemical Banking Corp. ... 1
Chevron Corp. ... 6
Chips and Technologies, Inc. ... 111
Cisco Systems, Inc. ... 49
Citicorp ... 12
City of San Antonio ... 4
Cognos, Inc. ... 16
Colonial Life & Accident Insurance Co. ... 20
Columbia University ... 12
Compaq Computer Corp. ... 24,39,104
Computer Associates International, Inc. ... 16,37,106
Computer Corporation of America ... 105
Computer Security Institute ... 15
Computer Task Group ... 77
Concurrent Computer Corp. ... 46
Conner Peripherals, Inc. ... 39
Consulting Research Associates ... 76
Contact Software International, Inc. ... 96
Council on Competitiveness ... 33
Cray Research, Inc. ... 16
Creative Networks, Inc. ... 49
Creative Strategies Research International, Inc. ... 20
Crownx, Inc. ... 105
Cyrix Corp. ... 29

D

Data House Information Systems ... 49
Data I/O Corp. ... 66
Data Processing Management Association 6
Dataquest/Ledgeway Group ... 45,61,105
Dean Witter Reynolds ... 1,14
Dell Computer Corp. ... 16,45
Deloitte & Touche ... 77
Derby Securities ... 1
Development Alternative, Inc. ... 80
D. H. Brown & Associates ... 61
Diamond Flower Electric Co. ... 86
Digital Communications Associates, Inc. .. 49
Digital Dealers Association ... 6
Digital Equipment Corp. ... 8,6,16,37,39, ... 45,49,53,57,61,77,105,108
Disneyworld France ... 29
Dow Chemical Co. ... 8
Duff & Phelps ... 105
Dun & Bradstreet Corp. ... 73
Dunes Hotel ... 106

E

Eicon Technology Corp. ... 49
Electronic Data Systems Corp. ... 6,76,105
Electronic Mail Association ... 87
Environmental Protection Agency ... 29
EO, Inc. ... 20
Epson America, Inc. ... 87
Equifax, Inc. ... 12
Everex Systems, Inc. ... 106
Executech, Inc. ... 45

F

Federal Aviation Administration ... 1
Federal Communications ... 6
Federal Express Corp. ... 1,76
Fifth Generation Systems, Inc. ... 4
Firestone Textiles ... 46
First Boston Corp. ... 105
Fore Systems, Inc. ... 10
Formtnco ... 28
Forrester Research, Inc. ... 10,24,41
Fox Software, Inc. ... 1,14
Fusion Systems Group ... 77

G

G2 Research, Inc. ... 6,77
Gartner Group, Inc. ... 8,16,77,106
GE Advanced Concepts Center ... 65
General Electric Co. ... 76
General Motors Corp. ... 73
Georgetown University ... 12
Global Petroleum Corp. ... 63
Go Corp. ... 20
Grid Systems Corp. ... 20
Group Hospitalization and Medical Services, Inc. ... 80
Gupta Corp. ... 16,45

H

Hewlett-Packard Co. ... 1,6,39,48,49, ... 57,61,69,87,105

I

IBM ... 1,16,24,29,37,39,49,57, ... 63,65,76,77,96,105
IBM PC Co. ... 29
IDC Technology Investment Strategies ... 49
Inference Corp. ... 69,73
Information Systems Experts ... 80
Informix Software, Inc. ... 1
Integrated Systems Solutions Corp. ... 6
Intel Corp. ... 4,29,33,45,46
Intellicorp ... 73
Interex ... 87
Interface Corp. ... 28
Interface Group ... 24
InterLab ... 49
International Data Corp. ... 1,8,14,29
ISYX Lan Systems, Inc. ... 77
ITT Federal Services ... 45

J

Jockey International, Inc. ... 76
John Hancock Mutual Life Insurance Co. .. 77

K

Kaleida ... 29
KFC Corp. ... 6
Kimberly-Clark Corp. ... 76

L

LAN Systems, Inc. ... 77
Lante Corp. ... 77
LaserData, Inc. ... 45
Lawrence Livermore National Laboratory 8
Lawson Associates ... 63
Legent Corp. ... 37,104
Lehman Brothers ... 16
Levi Strauss, Inc. ... 76
Logitech, Inc. ... 39
Lotus Development Corp. 1,12,37,40,41,45,77
Louis Harris and Associates, Inc. ... 12

M

Marathon Systems ... 77
Maspar Computer Corp. ... 16
Matsushita Electric Industrial Co. ... 20
McCormick & Co. ... 76
MCI Communications Corp. ... 53
Medical Center of Delaware ... 49
Mellon Bank Corp. ... 1
Michigan Department of Social Services 105
Micro Decisionware, Inc. ... 16
Microrim, Inc. ... 16
Microsoft Corp. ... 1,6,8,14,16,20,29, ... 37,40,45,76,77,87,106
Mirage Hotel ... 106
Momenta International, Inc. ... 20
Motorola, Inc. ... 16,29

N

NASA ... 76
National Science Foundation ... 33
National Semiconductor Corp. ... 16
NCR Corp. ... 4,6,106
NCube Corp. ... 16
NEC Corp. ... 20
NEC Technologies, Inc. ... 41
NetLink, Inc. ... 49
Network Systems Corp. ... 105
Neuron Data ... 73
New Science Associates, Inc. ... 24
New York Life Insurance Co. ... 6
Nexus ... 45
Nolan Norton & Co. ... 1
Northgate Computer Systems ... 45
Novell, Inc. ... 1,4,6,14,16,45,46, ... 49,53,76,77
Nynex Corp. ... 6

O

Oracle Corp. ... 1,4,6,14,16,37,77
Oregon State University ... 4
Orion Network Systems, Inc. ... 49

P

Pacific Bell ... 49,69
Pacific Telesis Group ... 49,69
Panasonic ... 45
Paramax Systems Corp. ... 46
Pavosoft ... 77
Paychex, Inc. ... 104
Pen Vision News ... 41
Penware, Inc. ... 20
PeopleSoft, Inc. ... 16
Pepsi Cola Co. ... 40
Performance Computing, Inc. ... 4
Personal Computer Memory Card International Association ... 29,41,86
Pfizer, Inc. ... 49
Phoenix Technologies Ltd. ... 16
Policy Management Systems Corp. ... 6
Portable Computer Communications Association ... 29
Praxis International, Inc. ... 105
Procom Technology, Inc. ... 86
Progress Software Corp. ... 63
Prudential Securities, Inc. ... 104

Q

Qualix Group, Inc. ... 46

R

RAM Mobile Data ... 29
Reach Software Corp. ... 53
Ring Access, Inc. ... 49
Roadway Express ... 1
RSA Associates ... 4

S

SAS Institute, Inc. ... 33,37
Semiconductor Industry Association ... 33
Sequent Computer Systems ... 104
Sequoia Systems, Inc. ... 6
Shared Financial Systems ... 65
Sharp Corp. ... 40
SHL Systemhouse, Inc. ... 6
Smith Barney, Harris Upham & Co. ... 104
SMS Comcast, Inc. ... 77
Softool Corp. ... 65,86
Software AG of North America, Inc. ... 4
Software Clearing House, Inc. ... 63
Software Publishing Corp. ... 40
Software Publishers Association ... 40
Soma, Inc. ... 77
Stargate Technologies, Inc. ... 24
Stevens Institute of Technology ... 8
Storage Technology Corp. ... 1
Strategic Mapping, Inc. ... 16
Sun Microsystems, Inc. ... 1,29,49,57,65,106
Sun Microsystems Computer Corp. ... 46
SunConnect ... 49
Supercomputer Systems, Inc. ... 16
Sybase, Inc. ... 1,4,6,14,
Sync Research ... 49
Synercetics, Inc. ... 46
Synoptics Communications, Inc. ... 10
Systems Strategies, Inc. ... 49

T

T. S. Microtech, Inc. ... 24
Taco Bell Corp. ... 6
Tandem Computers, Inc. ... 39
Tartan Laboratories, Inc. ... 33
Technology Solutions Corp. ... 76
Texas Instruments, Inc. ... 29
The ASK Group, Inc. ... 1,6,14
The Burton Group ... 6
The Genix Group ... 76
The Object Group, Inc. ... 65
The Santa Cruz Operation ... 57
The Travelers Corp. ... 6,49
The Yankee Group ... 1,49
Toshiba Corp. ... 20
Tru-Test Manufacturing Co. ... 29
Tyson Foods, Inc. ... 8

U

Ungermann-Bass, Inc. ... 10
Unisys Corp. ... 6,63,77,105
United Parcel Service, Inc. ... 1
University of Virginia ... 33
U.S. Army ... 6,49
U.S. Department of Justice ... 15
U.S. Environmental Protection Agency ... 53

V

Viasoft, Inc. ... 63
Vicon Industries ... 40
Vitalink Communications Corp. ... 53

W

Wang Laboratories, Inc. ... 57
Westlaw ... 45
Whirlpool ... 73
William Rainey Harper College ... 76
WordPerfect Corp. ... 4,16,45
WorkGroup Technologies, Inc. ... 61

X

XDB Systems, Inc. ... 16
Xerox Corp. ... 45

Z

Zenith Data Systems ... 24

Gainers Losers

Percent

Phoenix Technologies	30.00	Borland Int'l Inc. (L)	-20.33
Babel Corp.	26.00	Egghead Discount Software	-19.79
Cambex Corp.	25.93	Data Switch Corp.	-16.67
System Software Assoc.	17.83	Artel Communication Corp.	-14.96
Software Toolworks Inc.	17.50	Gandalf Technologies Inc.	-12.50
Cray Computer	16.67	Wang Labs Inc. (N)	-12.40
Gateway Communications	15.74	Intergraph Corp.	-12.15
Emulex Corp.	15.25	Group I Software	-11.86

Dollar

Wellfleet Communications (H)	6.50	Borland Int'l Inc. (L)	-6.13
System Software Assoc.	5.13	Autodesk Inc. (H)	-4.25
Cabletron Systems	5.00	3M Corp	-3.00
Southwestern Bell Corp.	4.75	IBM (L)	-2.63
Cisco Systems Inc. (H)	4.25	Egghead Discount Software	-2.38
American Info Techs Corp.	3.88	Adobe Systems Inc.	-2.25
Hewlett Packard Co.	3.88	BMC Software Inc.	-2.13
BGS Systems Inc.	3.75	Matsushita Electronics (L)	-2.00

Supply shortages cut rating

Compaq Computer Corp. (CPQ)
Downgraded from Buy to Neutral
Alex. Brown & Sons, Inc.

Citing Compaq's ongoing difficulties in meeting market demand, analysts Steven Eskenazi and Janet Regulia lowered the PC maker's rating to Neutral in a Nov. 4 report. Component shortages have kept Compaq from shipping enough of its low-cost ProLinea PCs, Alex. Brown also lowered its expectations for Compaq's fourth-quarter profit margins to about 26%. However, Alex. Brown said Compaq will continue to grow its market share and profitability in the near term.

Compaq's stock closed Thursday at 42, close to its 52-week high of 43.

Smooth transition

Legent Corp. (LGNT)
Upgraded from Neutral to Buy
Alex. Brown & Sons

Legent surprised Wall Street with strong fiscal fourth-quarter results, indicating a smooth acquisition of Goal Systems International, Inc. Alex. Brown also said Legent is benefiting from the current trends toward data center consolidations and buying large systems software from a single vendor. Analysts Chris Morjenson and Laurence Fong raised Legent to Buy status Oct. 29 and expressed confidence that the company will continue to grow at a healthy rate during the next fiscal year.

At Thursday's close, Legent's stock stood at 50¼.

Cloudy forecast

Sequent Computer Systems (SQNT)
Downgraded from Buy to Hold
Prudential Securities, Inc.

A Nov. 5 report lowered Prudential Securities' rating for Sequent, based on uncertainties about the European market — Sequent's traditional stronghold. Prudential Securities analysts also said the weakness of the dollar contributed to Sequent's strong third-quarter results.

Sequent closed at 14¼ on Thursday.

— Derek Slater

[redacted]

Each 52 Week	Range		Nov 20 3PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES					Up 1.65%
OTC 24.00	9.63	3COM Corp. (H)	23.13	1.63	7.56
NYS 70.63	56.25	American Info Techs Corp.	67.25	3.88	6.11
NYS 47.63	32.88	AT&T (H)	47.63	2.13	4.67
OTC 4.25	0.75	Artel Communication Corp.	1.06	-0.19	-14.96
OTC 22.00	10.25	Banyan Systems Inc.	20.50	0.00	0.00
NYS 49.75	40.25	Bell Atlantic Corp.	47.75	2.88	6.41
NYS 55.50	43.38	BellSouth Corp.	49.75	2.25	4.74
NYS 6.75	3.63	Bolt, Beranek & Newman	5.00	0.00	0.00
NYS 75.00	40.88	Cabletron Systems	75.00	5.00	7.14
OTC 31.00	17.75	Chipcom Corp.	27.25	1.25	4.81
OTC 74.50	24.13	Cisco Systems Inc. (H)	74.50	4.25	6.05
OTC 35.25	5.50	Compression Labs Inc.	14.00	0.25	1.82
OTC 3.38	0.88	DataSwitch Corp.	1.88	-0.38	-16.67
NYS 23.63	13.75	Digital Comm. Assoc.	17.13	0.63	3.79
OTC 15.25	7.50	Digital Systems Int'l Inc.	11.75	-0.50	-4.08
OTC 19.25	3.63	DSC Communications	18.50	0.50	2.78
OTC 10.88	4.75	Fibronics Int'l Inc	6.13	0.38	6.52
OTC 37.50	10.50	Filenet Corp.	21.00	0.25	1.20
OTC 3.38	1.13	Gandalf Technologies Inc.	1.75	-0.25	-12.50
OTC 2.25	0.69	Gateway Communications	1.38	0.19	15.74
NYS 5.50	2.38	General Datacomm Inds.	4.63	-0.13	-2.63
ASE 5.88	0.94	Go Video	2.88	-0.06	-2.14
NYS 35.75	28.88	GTE Corp.	34.25	0.63	1.86
NYS 70.63	50.00	ITT Corp.	70.63	2.63	3.86
OTC 38.25	26.50	MCI Communications Corp.	38.25	2.25	6.25
OTC 14.25	2.25	Microcom Inc	4.38	0.00	0.00
NYS 18.25	9.50	Network Equipment Tech.	10.00	-0.25	-2.44
OTC 25.50	8.00	Network General	16.63	0.00	0.00
OTC 20.00	8.50	Network Systems Corp.	14.88	-0.38	-2.46
OTC 30.63	5.63	Newbridge Networks Corp.	30.63	2.63	9.38
NYS 49.25	30.50	Northern Telecom Ltd.	42.00	2.88	7.35
OTC 33.50	22.50	Novell Inc. (H)	31.75	-1.13	-1.67
NYS 88.38	69.13	Nynex Corp.	82.00	2.13	2.66
OTC 37.50	14.50	Octel Communications Corp.	21.88	1.38	6.71
OTC 9.88	3.38	Penril Data Comm. Ntwks.	4.13	-0.25	-5.71
OTC 53.00	10.25	Picturetel Corp.	25.50	1.25	5.15
OTC 18.75	7.00	Proteon Inc.	9.25	-0.88	-8.64
NYS 36.38	13.88	Scientific Atlanta Inc. (H)	36.38	2.63	7.78
NYS 70.50	56.25	Southwestern Bell Corp.	69.13	4.75	7.38
NYS 26.38	20.75	Sprint Corp.	25.50	-0.25	-0.97
OTC 22.13	4.88	Standard Microsystems Corp (H)	19.88	-1.13	-5.36
OTC 67.50	15.25	Synoptics Communications (H)	65.00	0.50	0.78
NYS 40.00	32.88	US West Inc.	37.25	1.75	4.93
OTC 65.25	24.00	Wellfleet Communications (H)	65.75	6.50	11.06
PCS AND WORKSTATIONS					Up 2.24%
OTC 10.50	3.50	Advanced Logic Research	4.75	0.50	11.76
OTC 70.00	41.50	Apple Computer Inc.	57.75	1.75	3.13
OTC 24.50	11.25	AST Research Inc.	18.25	0.75	4.29
NYS 19.25	6.75	Commodore Int'l	7.50	-0.13	-1.64
NYS 43.13	22.13	Compaq Computer Corp. (H)	41.88	-0.63	-1.47
OTC 37.88	15.00	Dell Computer Corp.	35.25	-0.50	-1.40
OTC 7.75	0.88	Everex Systems Inc	1.38	0.06	4.72
NYS 34.63	21.25	Harris Corp	34.38	0.63	1.85
NYS 85.00	47.25	Hewlett Packard Co.	60.75	3.88	6.81
NYS 29.75	14.13	Silicon Graphics	27.13	0.00	0.00
OTC 36.13	20.75	Sun Microsystems Inc.	32.25	-1.75	-5.15
NYS 31.25	22.25	Tandy Corp.	27.50	0.63	2.33
NYS 11.13	5.00	Zenith Electronics	5.88	0.50	9.30
OTC 25.50	2.75	Zeos International Ltd.	3.88	-0.13	-3.13
LARGE SYSTEMS					Off 1.34%
ASE 20.63	7.75	Amdahl Corp.	8.00	0.00	0.00
NYS 16.38	6.75	Convex Computer	7.50	-0.25	-3.23
OTC 15.25	1.88	Cray Computer	5.25	0.75	16.67
NYS 69.50	19.00	Cray Research Inc.	21.50	0.13	0.58
NYS 18.13	7.13	Data General Corp	11.50	1.50	15.00
NYS 65.50	32.13	Digital Equipment Corp. (L)	32.13	-2.00	-5.86
NYS 100.38	62.00	IBM (L)	67.00	-2.63	-4.06
OTC 13.25	5.50	Kendall Square Research	10.25	-1.25	-10.87
NYS 119.25	83.00	Matsushita Electronics (L)	85.00	-2.00	-2.30
OTC 17.50	6.00	Pyramid Technology	10.75	0.75	2.38
OTC 17.88	9.88	Sequent Computer Sys.	14.25	-0.88	-5.79
OTC 18.38	2.75	Sequoia Systems Inc	3.50	0.00	0.00
NYS 54.25	29.50	Stratus Computer Inc.	34.00	-1.25	-3.55
NYS 15.13	9.50	Tandem Computers Inc.	13.88	-0.75	-5.13
NYS 11.75	3.63	Unisys Corp.	8.63	-0.25	-2.82
ASE 7.50	0.25	Wang Labs Inc. (B)	0.44	-0.06	-12.40
SOFTWARE					Up 1.08%
OTC 68.50	25.25	Adobe Systems Inc.	31.75	-2.25	-6.62
OTC 44.25	10.25	Aldus Corp.	16.25	0.50	3.17
OTC 19.75	7.00	American Software Inc.	10.25	0.00	0.00
OTC 20.00	9.75	ASK Computer Systems	16.75	-0.50	-2.90
OTC 56.50	23.25	Autodesk Inc. (H)	49.75	-4.25	-7.87
OTC 37.75	3.75	Bachman Info. Systems	5.63	-0.38	-6.25
OTC 42.50	32.00	BGS Systems Inc.	42.00	3.75	9.80
OTC 79.00	37.25	BMC Software Inc	64.88	-2.13	-3.17
OTC 25.50	13.00	Boole & Babbage	22.50	0.25	1.12
OTC 86.75	24.00	Borland Int'l Inc. (L)	24.00	-6.13	-20.33
OTC 10.50	3.63	CE Software	4.25	0.00	0.00
ASE 29.75	9.16	Cheyenne Software Inc.	27.50	-1.50	-5.17
OTC 13.13	5.63	Cognos Inc	7.13	0.00	0.00
NYS 19.50	8.63	Computer Associates	17.75	-1.38	-7.19
NYS 12.38	4.75	Computervision Corp	5.88	-0.63	-9.62
OTC 20.00	6.75	Conshare Inc	11.50	0.00	0.00
OTC 47.88	6.00	Easel Corp	11.50	2.38	26.03
OTC 25.00	11.50	Group I Software	13.00	-1.75	-11.86
OTC 6.63	3.50	Hogan Systems Inc.	5.63	-0.13	-2.17
OTC 36.25	18.50	Information Resources	30.25	3.25	12.04
OTC 32.75	5.88	Informix Corp. (H)	32.50	2.00	6.56
OTC 22.38	11.50	Intergraph Corp.	11.75	-1.63	-12.15
OTC 15.00	7.00	Interleaf Inc.	13.25	0.63	4.95
OTC 20.25	10.25	Intersolv Inc.	13.75	0.38	2.80
OTC 21.38	9.50	Knowledgeware Inc.	14.88	-0.50	-3.25
OTC 50.50	28.75	Legent Corp. (H)	49.75	0.75	1.53
OTC 38.75	14.75	Lotus Development	20.75	-0.25	-1.19
OTC 7.38	1.88	Meca Software	4.00	0.13	3.23
OTC 22.25	5.25	Mentor Graphics	8.25	0.00	0.00
OTC 38.25	27.25	Micro Focus (H)	37.50	-0.50	-1.32
OTC 20.50	6.50	Micrografx Inc.	10.25	0.25	2.50
OTC 95.00	61.84	Microsoft Corp. (H)	95.00	2.13	2.29
OTC 24.75	12.00	Oracle Corp. (H)	22.25	-0.38	-1.66
OTC 55.25	20.13	Parametric Technology	58.25	0.88	1.64
OTC 11.00	3.50	Phoenix Technologies	6.50	1.50	30.00
OTC 25.25	11.25	Platinum Technology	20.50	0.75	3.80
OTC 58.50	29.00	Progress Software Corp. (H)	58.50	1.13	1.96
OTC 26.63	4.00	Quarterdeck Office Sys.	5.75	-0.13	-2.13
OTC 32.75	11.75	Rainbow Technologies Inc	22.00	-1.00	-4.35
OTC 22.75	4.00	Rasterops	7.50	-0.25	-3.23
OTC 17.25	3.63	Ross Systems	7.63	0.13	1.67
OTC 18.25	8.50	Sapiens USA Inc.	17.63	0.38	2.17
OTC 26.25	6.75	Software Publishing Corp.	9.75	-0.25	-2.50
OTC 8.00	2.00	Software Toolworks Inc.	5.88	0.88	17.50
OTC 7.25	0.75	Spinnaker Software	2.13	0.25	13.33
OTC 16.50	3.25	State of the Art	7.00	0.00	0.00
NYS 25.25	13.75	Sterling Software Inc.	20.00	0.13	0.63
OTC 30.00	8.00	Struct. Dynamics Research	12.25	-0.63	-4.85
OTC 45.25	26.25	Sybase Inc.	42.25	-1.50	-3.43
OTC 51.00	5.88	Symantec Corp.	12.50	-0.13	-0.99
NYS 15.50	5.25	Systems Center Inc.	6.00	0.13	2.13
OTC 34.25	16.66	System Software Assoc.	33.88	5.13	17.83
OTC 13.25	2.50	Trinzic Corp.	3.50	-0.13	-3.45
OTC 23.75	14.50	Walker Interactive Systems	22.50	1.00	4.65
OTC 5.38	1.38	Wordstar	2.06	0.25	13.79
SEMICONDUCTORS					Up 2.90%
NYS 21.50	7.38	Advanced Micro Devices	18.13	1.88	11.54
NYS 12.88	7.13	Analog Devices Inc. (H)	12.50	0.38	3.09
OTC 15.13	6.75	Atmel Corp	15.13	0.88	6.14
OTC 14.13	3.25	Chips and Technologies	5.00	0.13	2.56
NYS 18.38	7.38	Cypress Semiconductor Corp	11.63	-0.13	-1.06
NYS 14.25	6.75	Dallas Semiconductor (H)	14.25	1.25	9.62
OTC 70.75	39.75	Intel Corp (H)	70.25	1.50	2.18
NYS 9.88	6.88	LSI Logic Corp.	8.88	-0.25	-2.74
NYS 22.38	12.13	Micron Technology	19.88	-0.88	-4.22
NYS 101.38	57.50	Motorola Inc.	99.88	1.38	1.40
NYS 14.13	5.25	National Semiconductor	13.13	0.63	5.00
OTC 27.00	8.25	Sierra Semiconductor	14.00	0.00	0.00
NYS 52.25	26.88	Texas Instruments (H)	49.50	-1.13	-2.22
OTC 10.50	6.00	VLSI Technology	7.38	0.13	1.72
OTC 7.00	2.13	Wyse	5.00	0.50	11.11
ASE 8.00	2.00	Western Digital Corp. (H)	7.38	-0.25	-3.28
OTC 31.00	14.50	Xilinx	20.38	0.38	1.88
OTC 33.50	15.25	Zilog Inc.	31.50	2.75	9.57
PERIPHERALS AND SUBSYSTEMS					Up 3.90%
OTC 11.13	3.63	Adaptive Corp.	11.13	0.88	8.54
OTC 26.75	13.75	Bantec Inc.	26.00	1.25	5.05
OTC 23.50	9.25	Cambex Corp.	17.00	3.50	25.93
ASE 15.13	5.66	Cognitronics Corp.	15.13	1.13	8.04
NYS 23.88	12.50	Conner Peripherals	19.88	-0.38	-1.85
OTC 24.88	14.25	Data Race Inc.	21.75	0.50	2.35
ASE 19.66	4.75	Databram Corp.	11.13	-0.63	-5.32
NYS 31.00	8.63	EMC Corp. (H)	29.50	-0.88	-2.88
OTC 8.50	4.75	Emulex Corp.	8.50	1.13	15.25
OTC 23.00	13.25	Evans & Sutherland	17.50	-1.00	-5.41
OTC 40.63	12.00	Exabyte	18.38	-1.75	-8.70
OTC 36.88	15.75	Intelligent Info. Systems	34.00	1.13	3.42
OTC 11.75	4.75	Iomega Corp.	8.50	0.38	4.62
OTC 34.75	10.25	IPL Systems Inc.	11.75	0.00	0.00
OTC 22.00	10.75	Komag Inc. (H)	22.00	1.75	8.64
OTC 17.38	4.38	Maxtor Corp. (H)	17.38	1.50	9.45
OTC 12.63	7.13	Micropolis Corp.	9.00	-0.25	-2.70
NYS 107.00	85.38	3M Corp	100.00	-3.00	-2.91
OTC 6.75	3.50	Printronix Inc.	5.75	0.50	9.52
NYS 18.00	6.88	QMS Inc	8.88	0.00	0.00
OTC 18.00	8.88	Quantum Corp.	14.50	-0.13	-0.85
OTC 12.75	3.75	Radius Inc.	6.75	0.25	3.85
NYS 14.25	6.50	Recognition Equipment (H)	12.63	-1.13	-8.18
OTC 13.88	5.63	Rexon Inc. (H)	12.75	-0.50	-3.77
OTC 19.00	7.75	Seagate Technology (H)	19.00	1.63	9.35
NYS 78.00	21.00	Storage Technology	21.00	-2.00	-8.70
NYS 22.88	16.50	Tektronix Inc.	20.75	0.13	0.61
NYS 82.25	60.75	Xerox Corp.	77.13	0.75	0.98
SERVICES					Up 0.79%
OTC 22.00	11.84	American Mgmt. Systems	21.75	1.25	6.10
NYS 5.38	3.00	Amacomp Inc.	4.13	0.00	0.00
OTC 22.00	12.50	Analysts Int'l (H)	22.00	0.25	1.15
NYS 51.25	36.50	Auto Data Processing	50.50	0.38	0.75
NYS 17.25	7.00	Ceridian Corp.	15.38	-1.13	-6.82
NYS 23.22	12.50	Comdisco Inc.	15.63	0.13	0.81
OTC 13.50	6.75	Computed Horizons	8.75	0.75	9.38
NYS 84.88	57.00	Computer Sciences	74.88	0.13	0.17
NYS 10.13	7.00	Computer Task Group	8.13	-0.13	-1.52
OTC 40.50	15.00	Compusa Inc	36.00	2.63	7.87
OTC 19.25	6.00	Corporate Software	12.00	0.00	0.00
OTC 30.75	7.75	Egghead Discount Software	9.63	-2.38	-19.79
NYS 33.06	25.25	General Motors E (EDS)	30.50	1.50	5.17
OTC 30.38	6.25	Intelligent Electronics	9.13	0.25	2.82
OTC 14.88	6.63	Merisel	10.25	-0.25	-2.38
OTC 15.75	5.75	Microage Inc.	7.88	-0.13	-1.56
OTC 40.00	18.16	Patchen	38.25	-0.25	-1.92
NYS 78.50	55.00	Policy Management Sys. (H)	76.13	-1.63	-2.09
NYS 49.50	29.75	Reynolds and Reynolds	49.50	0.50	1.02
OTC 32.00	22.00	SEI Corp	28.00	0.25	0.90
OTC 24.38	16.88	Shared Medical Systems	21.50	0.63	2.99
OTC 30.00	16.00	Sungard Data Systems	27.75	-0.25	-0.89
NYS 3.63	1.13	Ultimate Corp.	1.88	0.00	0.00

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

HP profits drop

Weighed down by a $37 million restructuring charge, Hewlett-Packard Co. last week reported that fourth-quarter net profits declined 46%, to $68 million. The firm also blamed continuing pricing pressure, increased expenses and a shift to lower margin products for the profit plunge. Revenue for the period increased 13%, to $4.3 billion. For the year, HP earned $549 million on sales of $16.4 billion, compared with profits of $755 million and revenue of $14.5 billion in the year-earlier period.

Bachman revamps

Bachman Information Systems, Inc. is cutting 15% of its 340-member work force as it reorganizes product development into two business units: Application Development and Data Management. Both units will support international and North American operations. In the first quarter ended Sept. 30, the Burlington, Mass., applications tool vendor posted a $3.6 million loss on revenue of $8.1 million.

Net consolidation

Seeking to consolidate duplicate production facilities for its internetworking products, Network Systems Corp. in Minneapolis is laying off 65 employees, or 4.5% of its work force. The company intends to take a special fourth-quarter charge of $40 million to cover its restructuring costs.

Wang to sell plant

Wang Laboratories, Inc. plans to sell its PC manufacturing unit in Taiwan to a group of investors there in exchange for grace on a $150 million debt tied to the plant. The investors plan to form a company, which will operate under an as-yet undetermined name, that could manufacture Wang-labeled PCs, according to a spokesman at the Chapter 11-constrained company.

Unisys back on road to black

By Thomas Hoffman
BLUE BELL, PA.

■ After posting its fourth consecutive profitable quarter, Unisys Corp. appears to be making a bona fide financial comeback.

The company's return to profitability, however, came at the expense of revenue growth and was preceded by major bloodletting. Unisys reduced its head count by 37,000, closed 17 of its 26 commercial computer manufacturing plants and dramatically scaled back its product line.

Now the company is counting on a more focused business plan to help it start growing again. The once-mighty mainframe monolith is targeting the government, airlines, telecommunications and banking markets as it moves from a hardware orientation to one driven by software and services.

Success in this high-risk gambit is far from guaranteed, however. The company's services business is lagging far behind those of other hardware vendors such as IBM and Digital Equipment Corp., which have already repositioned themselves as software and services providers.

Rough road ahead

Moreover, Unisys faces tough competition from entrenched competitors Electronic Data Systems Corp. and Andersen Consulting, according to analysts.

"It's a tough area for Unisys. I don't know how they're going to get the business," said William J. Milton Jr., a financial analyst at Brown Brothers Harriman & Co. in New York.

Unisys remains undaunted. Adding to its traditional systems integration and management services, the company last month unveiled a program that combines professional services with maintenance services for multivendor environments.

Julie Schwartz, associate director of professional services at Dataquest/Ledgeway Group, a Framingham, Mass., services research firm, said the inclusion of a monthly billing system makes the program even more desirable to customers. "It has taken away a barrier many customers have had in buying professional services," Schwartz said.

Unisys is also bolstering its services ranks with experienced managers. The company recently recruited Victor E. Millar, a longtime executive at Andersen Consulting, as senior vice president of Unisys' worldwide Professional Services group. Millar's charter is to expand the company's systems integration and outsourcing business.

If anything, the company's return to profitability has bought it time — and investor confidence — which it needs to expand its software and service portfolio. Two weeks ago, Duff & Phelps upgraded its credit rating for Unisys Senior Notes from B-minus to B-plus, reflecting Wall Street's growing trust in the company's financial stability. And last week, the company announced that its Unisys Finance Corp., a wholly owned equipment financing subsidiary, had paid off the balance of a $300 million credit facility.

Reto Braun, Unisys president and chief operating officer, said the company's cost-reduction program is ahead of schedule. Last year, the company embarked on an ambitious cost-cutting program that Unisys Chairman and Chief Executive Officer James A. Unruh projected would save the once-troubled firm $800 million per year. Braun said the company achieved those savings in the first nine months of this year, or three months ahead of schedule.

Braun said the staff reductions adversely impacted customer support for a brief period, but he said the firm has since added customer support representatives.

However, customer support problems appear to have cost Unisys at least one valued client. Two years ago, America West Airlines in Phoenix decided to migrate from a Unisys 1100/94 mainframe platform to an IBM Enterprise System/9021-500 environment because of Unisys' unsettled financial status and a perceptible degradation in systems software development and support, according to Mike Shanks, America West's former systems manager. Shanks now oversees telecommunications at the airline.

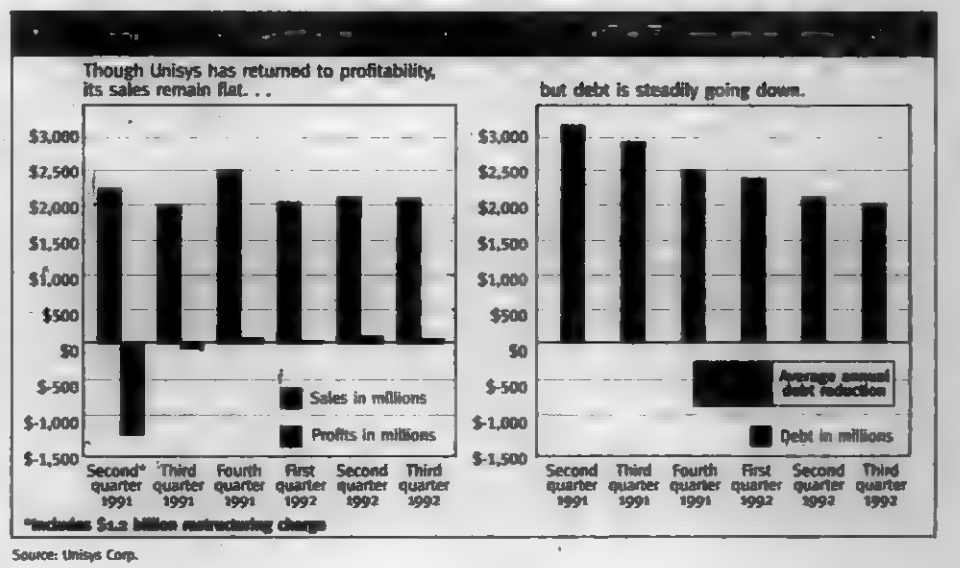
Long-term viability

"Our major concern was their ability to survive and continue enhancing their mainframe hardware and software products with proper support," Shanks said. He added that America West has not had a Unisys account representative in Phoenix for the past year.

But the vendor's financial turnaround has helped it retain and even expand some of its customer relationships. Last month, the Michigan Department of Social Services (DSS) awarded Unisys a $60 million contract to revamp its statewide networking platform. Norm Charles, the department's chief information officer, said DSS had been concerned about Unisys' financial condition for the past three years, when DSS was evaluating vendor proposals for the contract.

"During that period, Unisys had been in pretty dire straights. But our financial people and attorneys have been evaluating its financial position, and we're a lot more comfortable with their financial performance," Charles said.

DSS is comfortable enough, Charles added, to choose Unisys over IBM and Bull HN Information Systems, Inc.



Source: Unisys Corp.

In a nutshell

Unisys' commercial services revenue for the past year was $600 million, or one-tenth of DEC's revenue in that business.

Software and services currently make up 40% of overall revenue for Unisys, said Reto Braun, Unisys' president and COO. That figure includes workstation and server revenue.

Services revenue is growing at an 8% annual clip — below the industry average of 12% — but Braun said the firm is targeting 20% growth in this area.

The company reduced its debt by nearly $275 million during the third quarter. During the past 2½ years, Unisys has cut its debt by $1.8 billion, Braun said.

As part of its cost-cutting initiatives, Unisys has reduced its staff from 93,000 employees in 1988 to approximately 56,000 as of Sept. 30.

Wysiwyg

HACKER JARGON: CARGO CULT PROGRAMMING n. A STYLE OF (INCOMPETENT) PROGRAMMING DOMINATED BY RITUAL INCLUSION OF CODE OR PROGRAM STRUCTURES THAT SERVE NO REAL PURPOSE. FEATURECTOMY n. THE ACT OF REMOVING FEATURES FROM A PROGRAM. NASTYGRAM n. A PROTOCOL PACKET OR ITEM OF E-MAIL THAT TAKES ADVANTAGE OF MISFEATURES OR SECURITY HOLES ON THE TARGET SYSTEM TO DO UNTOWARD THINGS. WEENIX n. A DEROGATORY TERM FOR UNIX, DERIVED FROM UNIX WEENIES.

STUPID RESUME TRICKS

"On the back of one person's resume, there was a section for recommendations. In that space, the guy had a recommendation from his computer. It read: 'This man is a whiz at what he does and really knows my language.' I guess he thought it was cute. We tossed it."

Al Kahl
Senior programmer/analyst
Blue Cross/Blue Shield
Columbus, Ga.

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IT HAD TO HAPPEN

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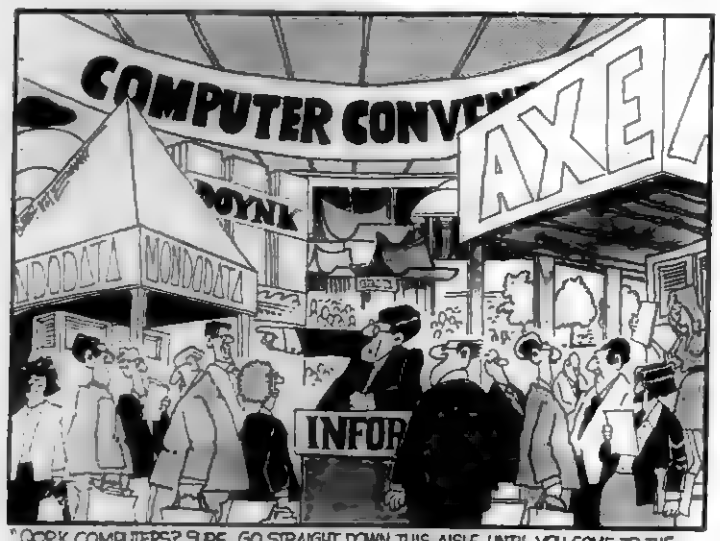
GREAT NAMES

Larry Cable
Data communications analyst
Fannie Mae
Washington, D.C.

Sources: *Hundreds of Fascinating & Unique Ways to Use Your Computer* by Tina Rathbone (Computer Publishing Enterprises, San Diego); *The New Hacker's Dictionary*, edited by Eric Raymond (MIT Press).

The Fifth Wave



"GORK COMPUTERS? SURE. GO STRAIGHT DOWN THIS AISLE UNTIL YOU COME TO THE ARROW SYSTEMS DUDE RANCH BOOTH. THEN TURN RIGHT AND GO TO THE GIANT BUDDHA WITH A GUY BREAKING BRICKS WITH HIS FEET—THAT'S YAMAGAZI COMPILERS. GORK COMPUTERS IS THE SOUTH PACIFIC ISLAND EXHIBIT ON THE LEFT, BUT WATCH OUT FOR THEIR VOLCANO—IT'S DRIBBLING GOOP ALL OVER THEIR BROCHURES."

Inside Lines

Hold that eraser

A federal judge issued a temporary restraining order Friday that prohibits the outgoing Bush administration from erasing thousands of White House computer backup tapes when it leaves office. The order was sought by a research institute called the National Security Archive. The White House has argued that the tapes are not federal records and that erasing them is normal procedure. An identical dispute over the Reagan administration's backup tapes continues to drag on in the same Washington, D.C., court.

All ears

Computer Associates continues to make a concerted effort to heed the demands of its installed base. CA Chairman and Chief Executive Officer Charles B. Wang recently disclosed that the company has established a CIO council that will meet regularly with CA executives. During the past two years, CA has sponsored several two- to three-day seminars with 50 to 100 CIOs to gather customer input on issues ranging from pricing to administrative queries. Wang said he was not prepared to announce who will be on the 12- to 13-member CIO council, but he said the group plans to hold its first meeting in early February.

Say what?

Korean press representatives temporarily stunned Intel's Andy Grove at last week's Comdex/Fall '92 by telling him that the government of South Korea has decided to standardize on Pentium processors for its future minicomputer systems. "How on earth will you do that?" Grove asked. The reply was that the government intends this as a strategic plan. He then recovered and told a reporter, "Notice they said a Pentium-based minicomputer."

Document disabler

Early versions of Microsoft's Word for Apple's Macintosh Version 5.1 are experiencing some problems saving documents with headers and footers. When used after a "full save," the "fast save" option does not save headers and footers, company officials said. It does not affect any other data, however. Users may avoid the problem by disabling the "Allow Fast Saves" option under the "Tools/Preferences/Open and Save" menu item. Only copies of Word dated Oct. 10, 1992, are affected. Call Microsoft's customer service at (800) 426-9400 for a patch and more details.

Dual identity

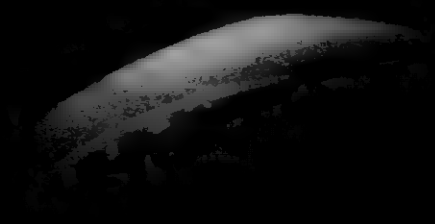
While the PCMCIA card gets a lot of attention for use in portables, analysts such as Leslie Fiering at Gartner Group in Stamford, Conn., add, "You're going to see it on the desktop, too. It's the perfect solution to the two-standard problem in networking." That is because one PCMCIA Type 2 slot can simultaneously hold both an Ethernet and a Token Ring adapter card. Another intriguing possibility for PCMCIA is combined software and hardware on a single card. German vendor Dr. Neuhaus is rumored to be working on a combo fax/modem card with both the fax/modem hardware and the communications software on it. A Dr. Neuhaus spokesman refused to comment.

A tad insecure?

All of the major systems vendors were doing it at Comdex. Windows NT ran virtually nonstop last week on machines from AST, Everex, DEC, NCR, ad infinitum. But at a seminar upstairs, John Gage, director of Sun's science office, named NT one of the "embarrassments of the '90s.... The thing has 3.5 million lines of C++, but it's not secure," he claimed.

The bankrupt Dunes Hotel in Las Vegas, which hosted many a PC watcher during Comdex, is gambling that dumb terminals connected to IBM AS/400 minicomputer hosts are the way to go. When asked whether he had any interest in connecting PCs to minis or in PCs in general, the Dunes' IS director responded sharply, "Why should we go to PCs when terminals are fine?" The Dunes was recently bought by the owner of a rival hotel, The Mirage. Rumor has it The Mirage plans to level the Dunes, save an 18-hole golf course. Phone, fax or CompuServe News Editor Alan Alper with news (or golf) tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

Where are you headed with your applications development?



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COMPUTERWORLD

Some users are wary of encrypted software keys

By Thomas Hoffman and Johanna Ambrosio
NEW YORK

■ While many users like flexible enterprise systems licensing options, some are uneasy that they must also adopt specially encrypted keys to prevent them from using unlicensed software.

Vendors contend the keys are a competitive necessity to ensure they get the license revenues that are coming to them. Among the vendors that use encrypted keys are Computer Associates International, Inc., SAS Institute, Inc., Boole & Babbage, Inc. and Legent Corp.

Under CA's Enterprise Licensing program, users are required to adopt Total Client Care, an on-line support program [CW, Nov. 16]. One provision of Total Client Care requires users to run licensed software using encrypted keys for each CPU and license under the attached License Management Program.

The keys have several lines of code that contain the expiration date of the software license. Thirty days before a license expires, the keys begin issuing daily messages warning the user of the impending expiration. Users have a 30-day grace period after expiration to renew the license. If the license is not renewed, the coded keys instruct the CPU to stop running the software.

"We have not accepted any software with encrypted keys," said Val Morgan, a database administrator at a large Pacific Northwest aerospace firm. Morgan, whose company runs four CA-IDMS 10.2 database

Encryption, *page 12*

Measuring up

Benchmarking helps IS improve competitiveness

By Mitch Betts

After studying how other information systems departments measure user satisfaction, the IS department at Texas Instruments, Inc. in Dallas developed what it believes is the best user survey in the nation, according to its IS quality director, Gary Pollard.

Having said that, Pollard will soon be inundated with calls from other IS managers wanting to copy that success — and he will let them, as long as they agree to share some of their top-notch practices in return.

Welcome to the world of quality benchmarking, in which stealing great ideas is an honorable profession. This sort of benchmarking, not to be confused with hardware performance testing, involves comparing a department's activities with the best practices of other companies.

Benchmarking, *page 20*

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IBM moves to boost client/server unit

Company will establish custom software demo centers

By Johanna Ambrosio
ARMONK, N.Y.

■ IBM last week formally disclosed a beefed-up organization spearheading its efforts in the client/server arena. Nevertheless, some customers said IBM has at best an even shot in this emerging market and that they will continue to consider other vendors' wares.

A programming group at IBM's Endicott, N.Y., laboratory, which has been in place for about three years, has been tapped to lead IBM's renewed charge into the client/server wars.

At your service

- IBM established its Client/Server Computing Group in 1989.
- Initial products released in September 1990 allow workstation users on networks to share resources, including backup and restore and software distribution.
- Last week approximately 500 coders from IBM's Programming Systems line of business were assigned to the client/server unit.

CW Chart: Janet Genovese

The Client/Server Computing Group now reports directly to IBM President Jack Kuehler and has some 800 programmers on whom it can draw for custom projects — more than three times the number of technicians who were attached to the original group.

In addition, IBM said it will form several client/server customer centers around the world to demonstrate client/server systems and help customers test software.

The initial focus of the client/server unit will be to work behind the scenes with IBM's sales force to do custom programming work in the client/server arena, primarily in the systems integration area. As projects are developed, IBM might release the work as formal products, depending on customers' needs, said Marty Clague, general manager of consulting, software and services.

Still, the group is primarily a marketing support organization rather than a full-fledged line of business measured by the usual profit-and-loss parameters, he added.

Observers said successfully tapping the client/server market is critical for IBM as the traditional mainframe continues its gradual decline. However, they added that the road ahead will be tough for the company.

"I'm not sure they know where their customers are or exactly how to put their stake in the

IBM, *page 8*

DHL revamps with Big Blue

Unix rightsizing targets package tracking, service

By Elisabeth Horwitt
REDWOOD CITY, CALIF.

There is no use rightsizing if you do it wrong. Ask DHL Airways, Inc., which is one year into its third major rightsizing project in two decades.

Having migrated from IBM mainframes to System/36s in 1975 and having moved to Unix in 1986, DHL is now re-engineering around a Unix client/server system based on IBM RISC System/6000s.

Furthermore, not only is DHL bringing back an IBM mainframe to serve as a database repository, but IBM has come on board as combined systems integrator, co-developer and support provider.

The main reason behind this latest re-engineering effort is that

DHL, *page 14*

Michael Lanier *crafted DHL's distributed network strategy*

Executive Briefing

A comprehensive guide to the week's news

RE-ENGINEERING

After getting along without mainframes for 17 years, DHL Airways has put IBM back on its IS team to help lead an effort to re-engineer its Unix-based corporate computing platform. With IBM's help, DHL aims to give Fedex and UPS a run for their money in the U.S. *Pages 1, 14*

Some pioneering IS departments are involved in quality 'benchmarking,' in which stealing great ideas from other companies is an honorable profession. *Pages 1, 20*

DOWNSIZING

Fully 80% of major corporations are interested in downsizing, according to recent studies. But one size doesn't fit all. While some companies will go to highly distributed LANs, others are taking a more low-risk approach and 'rehosting' applications on minicomputers. *Computerworld*'s Buyers' Scorecard and Lab Report rate the leading minis based on user satisfaction and benchmark performance. *Pages 82, 84*

Despite IBM's redoubling of its client/server technical expertise, customers say it still stands at best an even shot when they evaluate suppliers. *Page 1*

INDUSTRY

Kodak unloads its Atex publishing subsidiary to a British investment group. *Page 16*

The top executive at Software AG resigns, but the company promises business as usual. *Page 4*

With its acquisition of Gerber Alley last week, First Data Corp.'s Health Systems Group obtains an international presence and becomes one of the largest providers of health care information systems. *Page 8*

Sequoia users sit tight and wait to see whether the company will right itself. *Page 15*

Dell stock slides after a Wall Street analyst questions whether the PC maker artificially boosted quarterly financial reports. *Page 6*

LICENSING ISSUES

Users express mixed emotions on the issue of requiring encryption keys as part of user software licensing agreements. *Page 1*

MANAGEMENT

A recent study concludes that companies completing successful IS projects followed similar patterns of behavior. Particularly key was CEO support. *Page 8*

Long-term planning is for the birds, says Ken Harris, vice president of worldwide IS at KFC Corp. Grand plans consume time, limit flexibility and often get in the way of what customers really want, he says. *Page 33*

We've put together a case study that reveals the turmoil a CIO goes through when his budget is cut. While the case is fictitious, the issue it raises — having to do more with less — is very real. *Page 87*

The information revolution is over and we lost, says author Michael Schrage. We bet on the power of technology to boost productivity, but we forgot that it's really people — and how they interact — that makes the difference in running a business. *Page 33*

Outsourcing

Outsourcing vendors are eagerly watching the Justice Department's probe of charges that IBM's outsourcing business violates antitrust regulations. IBM's rivals continue a strong interest in the issue while relying on IBM for products. *Page 109*

An IBM outsourcing executive addresses charges that IBM is violating the 1956 Consent Decree. *Page 109*

Databases

Users of Microsoft's Access database should be wary when working with LAN Manager networks. *Page 4*

Informix Software plans to ship a multithreaded release of its OnLine relational database system, Informix 6.0, in the summer of 1993. Early beta-test sites said last week that Informix 6.0 runs much faster than earlier versions because it spreads the work load evenly in a multiprocessor system. *Page 4*

As Borland promoted its Integrated Database Application Programming Interface standard for desktop access to many database servers, it shipped a new version of InterBase with special links to Paradox desktop clients. *Page 4*

Marketplace

Negotiating tactics used by dirty dealers are exposed for what they really are — attempts to confuse and stall the buyer. *Page 100*

Document transfer

Adobe's Acrobat technology holds the promise of a greener world through a paperless office. *Page 41*

Groupware

Computer Associates plans a workgroup computing strategy without a 'workgroup' product. *Page 47*

Application development

Wrapping object-oriented code around aging procedural code may be a quick transition to client/server systems. Some users have used this technique to let a new generation of Unix workstations and PC applications browse data sources scattered throughout a corporate network. *Page 73*

A CASE integration standards effort is raising hackles among many U.S. participants. At stake, they say, is the future of the American CASE industry. *Page 73*

Software testing programs are the best way to cope with growing concerns about software quality in the United States. *Page 73*

Nip and tuck

HP AND IBM MINICOMPUTER USERS GIVE THE TWO VENDORS CLOSE SATISFACTION RATINGS IN THE KEY AREA OF OVERALL PERFORMANCE

SEE BUYERS' SCORECARD, PAGE 84

Product	Performance score
HP's 3000	8.8
IBM's AS/400	8.6
DG's MV Eclipse	7.7
DEC's VAX	7.7

MAXIMUM POSSIBLE SCORE: 10 RESPONSE BASE: 119 USERS

Security

Commercial users of the Internet, wary of security risks, block access to some capabilities and turn to encryption. *Page 55*

Enterprise networks

Routing SNA over LAN internetworks may become less problematic with recent introductions from leading router companies. *Page 7*

Sprint reveals a packet-based ISDN service. *Page 58*

Manufacturing

At Autofact earlier this month in Detroit, Microsoft's presentation of grand plans for Windows NT on the shop floor indicated how far manufacturers have come in embracing desktop platforms. *Page 49*

Careers

When we asked IS professionals what IS position they would like to try if given the chance to trade jobs for a day, the answers were split: a third said they wouldn't change at all; a third wanted to give upper management a try. The remainder wanted to swap spots for a day with a powerful industry leader such as Bill Gates. *Page 95*

If you entered the computer field because of a keen interest in technology but you aren't particularly interested in all of the administrative tasks required of a manager, there is a career path for you as a technical contributor. *Page 94*

PC hardware
Dell plans to introduce lower priced, redesigned PCs and notebooks and cut prices on its Dimension line. 6

Apple moves to ensure data exchange capability between Newton and Hobbit PDAs. 44

American Airlines boosts load-planning productivity with a smarter application. 39

Just because ValuePoint has not stormed the world the way Prolinea did doesn't mean the new IBM is a dud. 39

Midrange systems
DEC's ability to run multiple operating systems across Alpha gives it flexibility to target a range of markets. 67

A basic upgrade to its IBM AS/400 and the addition of T1 lines are the cost-effective alternatives to a new platform for a Boston health group. 68

PC software
Early adopters of graphical user interfaces found hidden costs run up the tab, but they said a move to a GUI was strategic. 32

Embedded fonts in Microsoft's TrueType may help solve enterprisewide problems. 44

Comdex wrap-up
The things you love to hate about Comdex. 41

Several storage vendors touted RAID subsystems at Comdex/Fall '92. 24

Unix
A reservation system running on an IBM RS/6000 cured the headache of scheduling many of the 2.7 million rounds of golf played in the Myrtle Beach, S.C., area each year. 47

Although Unix is its declared new emphasis, Cognos is poised to feed the AS/400 development market with upgraded and new software-building tools. 16

Syntax, Inc. is offering open systems networking software to link DOS, Unix, OS/2 and Macintosh-based workstations to Unix servers. 49

Large system software
Carnegie Group improves its TestBench program, which lets field service workers better diagnose customer problems. 70

Verity offers APIs for topic document retrieval. 67

Metaphor, Inc. is branching out to support more industry-standard software with its decision-support system. 67

Advanced technology
Once seen as the operating system of the future, Japan's TRON has found few homes in business. 38

Departments
Advanced Technology 38
Application Development ... 73
Buyers' Scorecard 84
Calendar 79
Company Index 106
Computer Careers 94
Computer Industry 109
Desktop Computing 39
Editorial/Viewpoint 32, 33
Enterprise Networking 55
In Depth 87
Intelligence Files 79
Large Systems 67
Management 77
Marketplace 100
News Shorts 6, 16
Product Spotlight 81
Workgroup Computing 47

TWO-PHASE COMMIT

SYBASE

50 LINES OF COMPLEX CODE

```
dbsqlexec ( dbproc_ server 2 );
/*
    two-phase()
    {

    /* open up two servers and a commit service */

       dbproc_server1 = dbopen(login, databasename1);
       dbproc_server2 = dbopen(login, databasename2);
       dbproc_commit = open_commit(login, NULL);

    /*
    ** prepare data for each command buffer and select a database to
    ** use, then start distributed transaction on commit service
    */

       commid = start_xact(dbproc_commit, application, "my_xact", 2);

    /*
    ** build transaction name and begin transactions on different
    ** servers
    */

       build_xact_string("","" commid, xact_string);
       dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s",
       xact_string);
       dbsqlexec(dbproc_server1);
       dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s",
       xact_string);
       dbsqlexec(dbproc_server2);

    /* perform various updates and then.... */

    /* if there is a failure on one abort all of them */

       if (return_code == FAIL)
       {
          abort_xact(dbproc_commit, commid);
          dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
          return_code = dbsqlexec(dbproc_server1);
          dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
          return_code = dbsqlexec(dbproc_server2);
          if (return_code != FAIL)
          {
             remove_xact(dbproc_commit, commid, 1);
          }

       dbexit();
       exit(ERREXIT);
       }

    /* otherwise prepare to commit */
    dbcmd ( dbproc_server 1, "PREPARE TRANSACTION");
    dbsqlexec (dbproc_ server 1);
    dbcmd (dbproc_ server 1);
    dbcmd ( dbproc_server 2, "PREPARE TRANSACTION");
}
/*
m
D
D
co
{
```

SYBASE code example from A Guide To SYBASE and SQL Server by D. McGoveran with C.J. Date.

ORACLE7

7 LINES OF INDUSTRY STANDARD SQL

```
UPDATE SAVINGS
SET S_BALANCE = S_BALANCE - 250.00
WHERE S_DEPOSITOR = 'JONES';

UPDATE CHECKING
SET C_BALANCE = C_BALANCE + 250.00
WHERE C_DEPOSITOR = 'JONES';

COMMIT WORK
```

These two programs do exactly the same thing: update related data on multiple servers. Oracle does it in 7 lines of Industry Standard SQL. Sybase requires 50 lines of complex C code. If productivity is important to you call 1-800-633-1073 Ext. 8187 for a free copy of "Client/ Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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In Ontario or Quebec call 1-800-263-8073, elsewhere in Canada call 1-800-263-8080

Informix chases DBMS rivals

Touts forthcoming multithreaded database with greater performance

By Jean S. Bozman
MENLO PARK, CALIF.

Informix Software, Inc. plans to counter the new databases from rivals Oracle Corp. and Sybase, Inc. next year with a multithreaded database targeted at high-end information systems shops. Early beta-test sites said last week that existing applications run much faster than they did under single-threaded Informix OnLine 5.0.

The new multithreaded database allows tasks such as user log-ons and complex queries to be evenly spread among multiple CPUs, making better use of resources.

Originally scheduled for shipment in early 1993, Informix OnLine 6.0 is now set to ship in about six months, Informix executives said last week. No reason was given for the delay of the rearchitected database.

However, Informix acknowledged that it added more features, some of which match features of Oracle 7, announced in June, and Sybase System 10, announced earlier this month.

Beta testers said Informix added several extra features, such as backup and recovery for mainframe-class processing and large database support.

Testing scheduled

Informix 6.0 will be shipped on four Unix platforms sometime during the summer of 1993, said Tim Shetler, vice president of product marketing, who manages Informix's database server and connectivity software. The first platforms will be Sequent Computer Systems, Inc., Sun Microsystems, Inc., Hewlett-Packard Co. and IBM RISC System/6000 machines, he said. The database will enter a formal beta test in February 1993, he added.

No price ranges were given for Informix 6.0, a rearchitected version of Informix OnLine. Future Informix OnLine releases — Informix 6.1 with a parallel data query (PDQ) option and Informix 7.0 with PDQ and support for loosely coupled multiprocessor systems — are due in the spring of 1994 and early 1995, respectively, Shetler said.

Attention grabber

For now, beta-test users are most interested in Informix 6.0's reportedly higher performance for Informix applications.

"We were really impressed by the performance," said Jon Vemo, database administrator at Electronic Transaction Corp., a Bothell, Wash.-based check-authorization service for retail merchants. "Parts of it were up to 10 times faster, and overall, it was 30% faster than Informix 4.1."

Vemo tested Informix 6.0 on a four-processor Sequent system with a 3G-byte database. His firm has a 20G-byte master database based on Informix 4.1 that allows retail merchants such as grocery stores to compare personal checks presented by their customers against a bad check list.

Another early site, AT&T Network Systems in Lisle, Ill., tested Informix 6.0 with a 20-million-row database table that supports a new 911 emergency telephone system. Building an index for the 4G-byte database, which runs on an eight-processor Sequent system, took a fraction of the planned time, said Mark Nelson, a member of AT&T's technical staff.

From days to minutes

"With Informix 4.1, it took days and days to build an index that large," Nelson said. "With Informix 5.0 it took hours, and now we're talking about minutes."

He attributed the speedup to the multithreading feature, which spreads the index work over eight Intel Corp. CPUs in the Sequent machine.

Industry analysts said Informix has to prove it can compete head-on with Oracle and Sybase for high-end IS applications.

Informix already had such key distributed relational database management system features as declarative referential integrity, stored procedures and two-phase commit, industry analysts said. With Informix 6.0's multithreaded architecture, it can match its rivals feature for feature.

Informix facts

Though Informix is the fourth-largest provider of RDBMSs in terms of license revenue, it is the second-largest player in the Unix segment, according to market researcher Dataquest, Inc.

The company posted Unix RDBMS revenue of $80.7 million last year, which accounted for 18% of that market segment.

The company's Unix RDBMS business is growing at a compound annual rate of 40%.

In comparison, market leader Oracle recorded $343.2 million in Unix RDBMS revenue last year, which accounted for 44.2% of the segment.

The open RDBMS market is firmly in the hands of the top four vendors

Open RDBMS companies
(Percent of license revenue)

Oracle	56%	54%	47%
Ingres	15%	15%	17%
Sybase	9%	11%	13%
Informix	10%	10%	12%
Interbase	4%	5%	5%
Unify	4%	4%	4%
Other	2%	1%	2%
Total revenue	1.004B	1.235B	1.547B

Source: Dataquest, Inc.

Borland ships non-IDAPI database link

By Jean S. Bozman
SCOTTS VALLEY, CALIF.

Even as Borland International, Inc. extolls the virtues of its Integrated Database Application Programming Interface (IDAPI) standard for client access to many database servers, it plans to ship a non-IDAPI link between its own Paradox desktop database and its InterBase relational database server by tomorrow.

The new Paradox SQL Link client/server software connects with InterBase 3.3, an enhanced release that supports Paradox DOS and Windows "requestors" that recently shipped. InterBase is generally used with Unix and Digital Equipment Corp. VAX computers, the firm said.

Bridging the PC and Unix worlds is a challenge for Borland as it moves to support open systems, analysts said.

"Borland wants to be sure there is a good client/server relationship between its clients, Paradox and dBase for Windows and its server," said Bill Higgs, vice president of software research at Computer Intelligence/Infocorp in Santa Clara, Calif.

Borland executives said they saw no marketing conflict in their shipment of the Paradox API and the all-purpose IDAPI.

"If you're going after a single database source, like InterBase, it can be an advantage to use the native API," acknowledged Bruce Linn, director of product management at Borland's InterBase business unit. "It's a tighter link."

That sort of connection, he said, can tap database-specific features such as InterBase's support for array data type or event-alerters.

Better for browsing

IDAPI, by contrast, is a better solution for enterprisewide data browsing or for ad hoc data queries, Linn said.

"If a given client wants to get at more than one database, InterBase and [Oracle Corp.'s] Oracle, for example, then the generic higher level IDAPI is ideal because it is designed to connect to different database sources with a single API," he explained. Paradox clients would use IDAPI to reach non-Borland databases, he added.

Paradox's SQL Link software module will "provide secure, transparent access from Paradox 4.0 to data on the InterBase server," according to Borland. Paradox SQL Link, a $395 module, requires the use of $795 Paradox 4.0.

The enhanced InterBase engine is available as a free upgrade for InterBase users who pay maintenance fees.

Interbase info

Interbase came from nowhere in 1988 to become the fifth-largest relational database system in terms of licensing revenue, according to Dataquest, Inc.

License revenue totaled $55.7 million last year, up 16% from the year-earlier period.

That equaled to 4.6% of the overall relational database market on a license revenue basis. All revenue is derived from Unix systems.

Access and LAN Manager: a corrupting combination

By Christopher Lindquist
BELLEVUE, WASH.

Read those README files — that is the advice of Microsoft Corp. Access users who discovered that the additional on-line documentation for the new database contains a rather disturbing warning: Using Access with LAN Manager can lead to corrupted database files.

Both an independent consulting firm and Microsoft technical support confirmed that the problem exists but added that a patch, which is on the Open Database Connectivity disk supplied with Access, should take care of any problems. Reportedly, the patch can also be downloaded from CompuServe.

The bug in LAN Manager was discovered late in the testing process for Access, a Microsoft spokeswoman said. It affects all versions of LAN Manager after Version 1.0 and before Version 2.1a and could affect other networks that use an unchanged version of the LAN Manager redirector, such as Digital Equipment Corp.'s Pathworks. It will not affect Version 2.2 of LAN Manager, due to ship shortly, Microsoft said.

The patch that Microsoft ships for LAN Manager with Access reportedly will prevent any problems, but at least one user said he was extremely concerned that such a new product should have such a potentially dangerous problem. "Why am I applying a hot fix to a brand new product?" asked the user, who wished to remain anonymous.

He added that while he has a programmer working with Access as a safety precaution, the Access workstation is not connected to his network. "It means that I definitely am not going to be connecting it to my production database," the user said.

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KEYS - Automated Help Desk Management.

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News Shorts

HP scores wins over IBM

Last week was a good one for Hewlett-Packard Co.'s ongoing rivalry with IBM in the multiuser computer business. First, Los Angeles-based Universal Software, Inc., which makes software for converting IBM System/36 machines to RISC System/6000 Unix platforms, said it will offer software for converting System/36 software to the HP 9000 Unix box. Then, the Transaction Processing Performance Council (TPC) said the HP 3000, which runs the MPE operating system, outperformed the Application System/400 in an on-line transaction processing test running the new TPC-C benchmark.

EDS buys outsourcing client

Electronic Data Systems Corp., long known for its equity-for-business strategy in outsourcing circles, last week took that approach to the limit when it acquired one of its outsourcing clients, Cummins Cash and Information Services. Neither company disclosed the acquisition price. Cummins, which provides card-based payment systems for truckers to purchase fuel and other goods and services, has been an EDS client since 1990. The acquisition brings some 1,900 trucking customers and 15,000 truck stops, banks and retail locations into the EDS fold.

Wang posts Q4, year-end losses

Wang Laboratories, Inc. posted an operating loss of $34 million for its fiscal fourth quarter, about 50% better than the $70 million reported for the same period last year. Sales slipped nearly 4%, from $492 million to $474 million, for the period. However, Wang's fourth-quarter net loss approached $334 million after restructuring charges and other unusual items associated with the company's Chapter 11 filing, such as selling off its PC unit and other overseas groups. For the year, Wang reported a net loss of $357 million on sales of $1.9 billion.

DEC management shakeup continues

Digital Equipment Corp. Chief Executive Officer Robert Palmer named Russell Gullotti vice president of the U.S. area last week. Gullotti replaces Don Zereski, who is now working in a different capacity at DEC under Vice President of Operations Jack Smith. One of Gullotti's first responsibilities will be to appoint a new senior U.S. sales/channels manager, who sources said is likely to come from outside DEC. Restructuring efforts elsewhere in the company are taking shape: Palmer is expected to announce managers for eight business units by the middle of next month.

SHORT TAKES **Micrografx, Inc.** President George Grayson has resigned. A company spokeswoman said Grayson has not announced future plans, nor has he indicated a reason for leaving. Grayson's brother, Chief Executive Officer J. Paul Grayson, will take over day-to-day operations of the company until a full-time president is hired.... The cellular phone industry announced its 10 millionth customer last week, reaching that landmark faster than any communications industry segment, according to the **Cellular Telephone Industry Association**.... **Micom Communications Corp.**'s Marathon 1K and 5K multiplexers will provide the cost benefits of data compression for IBM AS/400 hosts communicating via IBM's Advanced Program-to-Program Communications. The multiplexers support a combination of compressed voice, data, fax and fast-packet communications, the vendor said.... **Proteon, Inc.** has announced a driver that enables SCO Unix systems to make use of its ProNet-4/16 Token Ring local-area network family of adapters. Proteon also announced an adapter for the low-end XT/AT bus PC market that is priced at $495.

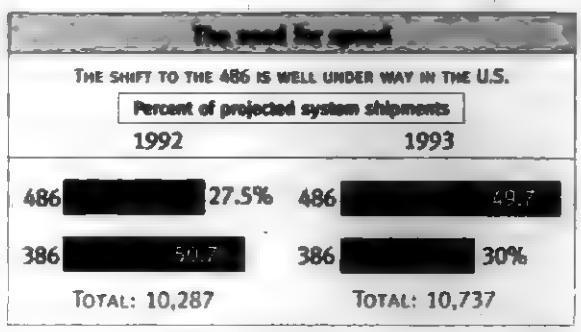
News shorts, *page 16*

Dell to revamp entire product line

By Michael Fitzgerald
AUSTIN, TEXAS

Dell Computer Corp. will begin a complete overhaul of its product lines tomorrow, when it replaces its entire desktop and server lines, according to sources close to the firm.

The all-486-based product lines are expected to reinforce an industrywide trend away from the 386. Other major vendors, such as IBM, Compaq Computer Corp. and AST Research, Inc., have also shifted emphasis away from the 386. Systems vendors cite Intel Corp.'s aggressive pricing on the 486SX and 486DX and the need to run Microsoft Corp.'s Windows applications as reasons for the move.



Source: International Data Corp.

The shift to the 486, while driven by Intel, could cause supply problems for some vendors. Many vendors contacted said second-tier makers and those that have forecast poorly for 486 demand will have trouble getting extra midrange 486DX chips from Intel, in part because Intel's Albuquerque, N.M., fabrication plant is switching to new production lines.

While Andrew S. Grove, Intel's president and chief executive officer, said at Comdex/Fall '92 that "we are not limiting anybody's ability to ship [right now]," many sources said Intel is essentially on allocation for at least some 486 models.

Dell, Compaq and AST do not appear to be affected by this, but IBM's ValuePoint line will be, sources close to that company said. IBM officially denied this, but IBM PC Co. President Robert Corrigan said at a Comdex press briefing that IBM has been "notoriously bad about forecasting demand," suggesting that if demand outstrips IBM's expectations, customers could have to wait for high-end ValuePoints.

Dell's announcement, meanwhile, will help the firm stay competitive with IBM and Compaq, both of which refreshed their product lines more recently than Dell, users said.

"We're evaluating what we want to do with our systems and looking at several different vendors, and this will help Dell stay in the running," said a micro manager at a major Dell shop, who asked not to be identified.

Leonard Steinbach, assistant director of computing services at the SUNY Health Science Center in Brooklyn, N.Y., added, "I'm glad to see external cache availability, and I'm glad to see it's Pentium-upgradable. We don't know how fast or high the hardware/software spiral will spin, and I want to put the days of every-couple-of-years hardware upgrades behind us."

The first of the new lines has actually already hit the market — the recently announced Dell 333S/L, based on Intel's 33-MHz 80386SX (and Dell's last 386-based desktop). The 333S/L marks the first of the new L line, which will replace Dell's P series. Dell will also replace its D and DE lines with the M and ME product lines, sources said.

These products will feature local-bus graphics driven by a graphics accelerator from S3, Inc.; external cache for the processor; Pentium upgradability; and an easy-off, one-screw case design, used on the 333S/L. The sources said Dell will also ship its first non-Dimension tower built around the AT bus.

Dell is also expected to eliminate the Smartview LED it has used on its towers and servers and will use a low-insertion-force socket for upgrading, rather than the zero-insertion-force socket many vendors have adopted.

Dell refused to comment on any new products.

Analysts said the product refresh was welcome. Dell has "had phenomenal performance with an old, tired product line," said Kimball Brown, vice president at Computer Intelligence/Infocorp in Santa Clara, Calif.

Pricing for the new lines is expected to be $100 to $200 lower on average than current models, the sources said. Dell is also expected to cut prices on its low-end Dimension line this week.

Dell will revamp its notebook product line in the first quarter of 1993, the sources said. Details were sketchy, but Dell is expected to offer its first active-matrix color screen and update its design to incorporate more modularity.

Separately, sources said Dell will begin shipping a version of its 3½-pound 320SLi with a backlit screen before the end of the year.

Trading queries?

Dell invited a Securities and Exchange Commission (SEC) probe after Wall Street raised questions about the PC maker's accounting practices last week.

David Korus, a Kidder, Peabody & Co. analyst, said a two-month study of Dell's financial doings showed "unusual" ways of accounting for losses on foreign currency exchange rates.

Korus speculated in an investment briefing that Dell's record profits and sales for its fiscal third quarter may be the result, in part, of those methods and not Dell's products.

"False," Dell countered, asking the SEC to investigate its books.

The SEC also made an informal request, according to Dell, to see documents on last week's stock trades. Korus made the statements the day after Dell posted $39.6 million in profits for the quarter, compared with $13 million a year ago. Sales topped $570 million from $229 million [CW, Nov. 23].

After climbing $2 on that happy news, Dell stock dropped $3.75, to $34.63, in response to Korus' remarks, as 10 million shares changed hands. The stock was trading midweek at $35.50 a share.

Dell said there is no chance it will have to restate historical earnings and that future results will not shrink because of as-yet unrecognized foreign exchange losses.

The Austin, Texas-based company admitted to trading currency to generate a current-quarter profit but said it stopped the practice in July, restricting activity to hedging on overseas currency only. Most companies that do a lot of international business use currency trading as a hedge.

—Kim S. Nash

SNA over TCP/IP

Routers address lost SNA sessions

By Elisabeth Horwitt
BEDFORD, MASS.

Leading router vendors are starting to address a major downside to linking Systems Network Architecture (SNA) and local-area networks over the same router backbone: the tendency of IBM SNA sessions to get lost during traffic jams or glitches on the internetwork.

The vendors' basic approach to solving the problem is the same: Invest SNA traffic with the dynamic routability of Transmission Control Protocol/Internet Protocol (TCP/IP).

"These features are very critical" to companies that want to direct their SNA traffic over routing backbones but are not ready to make the big transition from traditional SNA to peer-to-peer protocols such as LU6.2 and IBM's Advanced Peer-to-Peer Networking, said Rick Villars, a director at International Data Corp. in Framingham, Mass. However, "the whole approach [of routing SNA over TCP/IP] can only go so far; you can only do so much [with a protocol such as traditional SNA], which was designed to be nonroutable," he added.

Strategies detailed

Last week, several vendors detailed to *Computerworld* their strategies for addressing SNA routing issues:

•Wellfleet Communications, Inc. announced that its routers will support a traffic prioritization feature through which users can ensure that their SNA sessions are not lost because of insufficient bandwidth, the vendor said.

Users can set prioritizing filters according to a variety of criteria, including node address, protocol and application name, a Wellfleet spokeswoman said. The feature is available free of charge with Wellfleet software within 30 days, she added.

•Proteon, Inc. indicated that it will announce a similar capability — although not necessarily through prioritization — in the next couple of months.

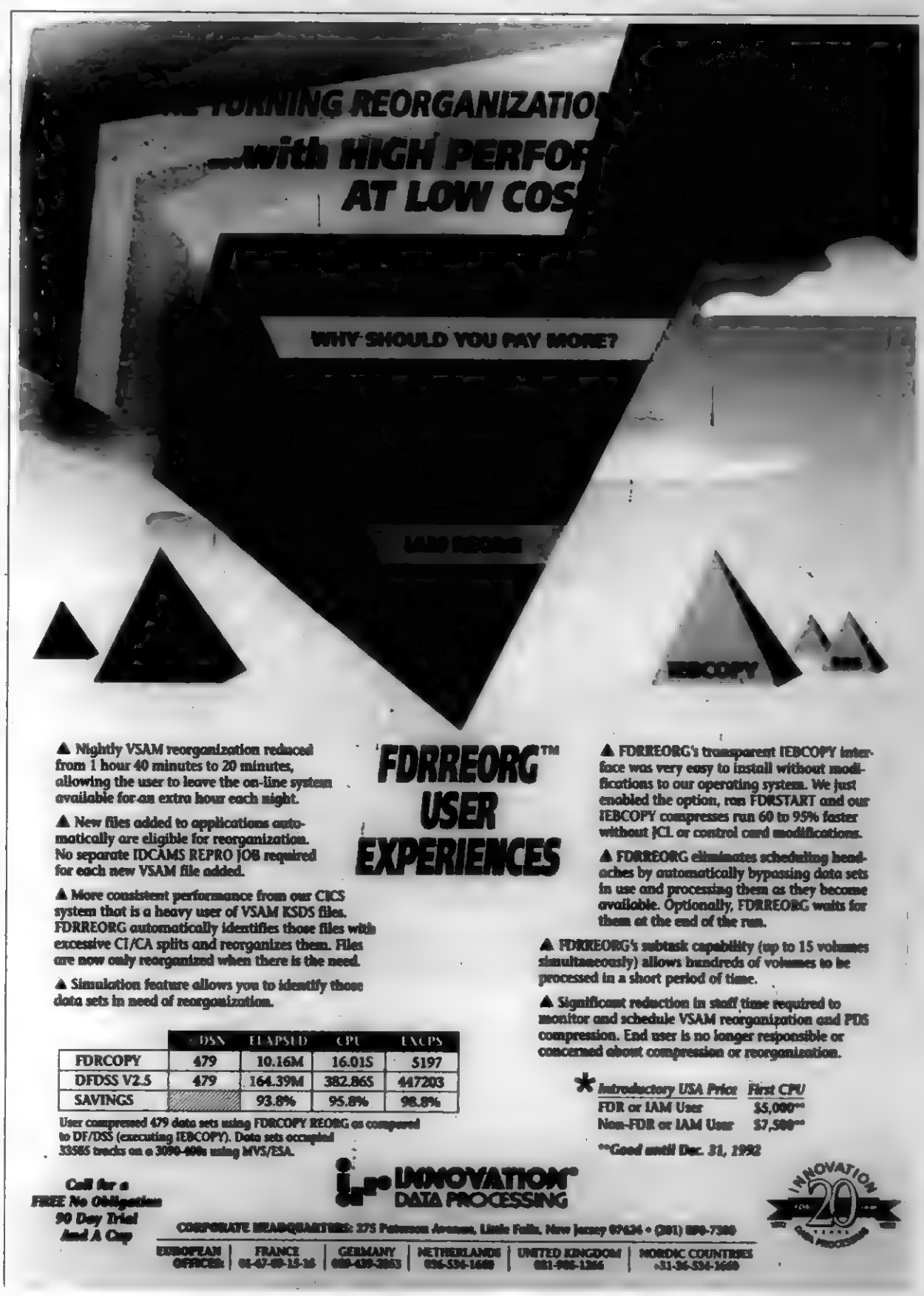
•Cisco Systems, Inc. has been offering SNA prioritization for about a year now, a spokesman said. Cisco recently began shipping a feature that enables users to prioritize a particular type of SNA traffic, such as 3270 terminal or batch file transfer, the spokesman added.

Holiday Inn Worldwide has experienced SNA session loss on its Proteon internetworks during peak traffic times, when various applications were competing for bandwidth, said George Morales, network analyst at the Alpharetta, Ga., firm.

While devices using LAN protocols such as TCP/IP merely experienced delays at these times, SNA devices communicating via the IBM Synchronous Data Link Control protocol automatically terminated a session when they received no acknowledgment within a set period of time, he added.

Wellfleet also announced SNA/IP, which routes SNA over TCP/IP, coupled with a Directed Explorers feature that is said to minimize "broadcast storms" by directing SNA devices to the router nearest the host they want to access.

In a broadcast storm, the internetwork is congested by multiple SNA devices in search of a host.



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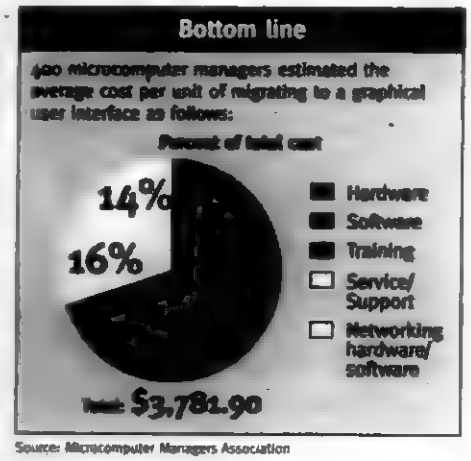
INNOVATION 20 YEARS

Survey uncovers hidden GUI costs

By Lynda Radosevich
NEW YORK

PC managers are discovering not only that the costs of upgrading users to a graphical user interface (GUI) are high but that the benefits are difficult to measure. Still, most say that moving to a graphical platform is a strategic move, according to a recent survey conducted by *Computerworld* for the Microcomputer Managers Association (MMA).

The majority of the 400 managers surveyed found the average cost per PC of upgrading to a GUI is about $3,800. The most obvious costs are hardware and software upgrades, which averaged $1,200 and $800, respectively (see chart). However, it is the less obvious costs — training and extra support staff — that jack up the price.



Source: Microcomputer Managers Association

For example, Theresa Doyle, vice president of computer and information services in the equity research department at Dean Witter Reynolds, Inc. in New York, found that training was the most expensive part of upgrading her department to Microsoft Corp.'s Windows 3.1 from DOS. Because she leases the department's 120 Intel Corp. 80386- and 1486-based PCs, she has no hardware upgrade costs.

To bring users up to speed quickly, Doyle devised a five-day, 2½ hours per day course to teach 120 employees how to use Windows, Word and Excel. The course cost the firm $25,000.

"GUI is supposed to be easy, but it is different than what people used before," Doyle said. "If you don't train people, I believe you are wasting the investment in GUI." Vendors such as Microsoft commonly tout GUI as making computing intuitive and easy to learn.

Tom Howker, a systems team leader at the Maine Bureau of Taxation in Augusta, has spent the past six months upgrading 310 employees from dumb terminals to IBM's OS/2 2.0-based PCs. Training was a bigger cost than hardware, he said, because on top of learning a GUI, users had to learn how to use PCs. "They had keyboard fright, disk drive fright. People wanted to know, 'How do I turn this thing on or off?' " he said. "When you add in the individuals' nonproductive time spent learning the new systems at their desktop, it is a very big expense."

Although managers cite benefits from moving to a GUI, which range from ease-of-use to multitasking capabilities, most said they were moving to a GUI because they see it as a strategic platform, not because they can quantify cost/benefits.

"In general, people feel the handwriting is on the wall, and they must do it to remain competitive," said Priscilla Tate, executive director of the MMA in New York. She said one reason companies see GUIs as strategic is because software vendors are focusing their development efforts for new strategic applications on GUI platforms.

Jeff Szabla, a network administrator at Liberty Diversified Industries in Minneapolis, is migrating users to 486-based PCs running Windows 3.1 as part of a broader company plan to downsize from an IBM 4381 mainframe. "I can't justify the costs [of upgrading users' PCs] to the head accountant," he said. "I have to find people with needs that can be met by graphical applications and get them to use the applications. Then when they complain that their computers run too slowly, I can justify upgrading their computers."

Of the 400 survey respondents, more than 15% run a GUI as the predominant platform and 40% plan to within 12 months. Windows owned the lion's share of the GUI interest, trailed by Apple Computer, Inc.'s Macintosh, OS/2 and Unix.

IBM bolsters client/server

CONTINUED FROM PAGE 1

ground," said John Stevenson, vice president of MIS at Dr. Pepper Co./Seven-Up Cos. in Dallas. "This is very, very new to them."

"We will look at IBM and other suppliers as we continue to put more applications onto PC local-area networks," added Marvin Ehlers, vice president of MIS at Natural Gas Pipeline Co. in Lombard, Ill. "We look for cost, reliability and performance."

For example, although some 75% of the company's 1,300 PCs are from IBM, the energy concern is also using Novell, Inc. networking products and a database management system from Sybase, Inc.

Heading up the client/server group is Thomas E. Furey Jr., former assistant general manager in the Programming Systems line of business and manager of IBM's Santa Teresa, Calif., laboratory. Approximately 500 of the programmers assigned to the client/server unit will continue to work on the VM operating system — historically Endicott's main development effort — and will be tapped to do client/server projects as necessary.

Programmers from other IBM lines of business, including Personal Systems and Networking Systems, will be added over time as customer demands warrant, Clague said.

Forcing the issue

At issue is just how much the entrenched IBM sales organization will actually use the new client/server group instead of continuing to sell big iron.

"Furey will need to be a good politician," said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C. "Some trading areas [IBM sales organizations] with large installed bases of mainframes will have to be made to do it. My concern is whether they will follow through. We'll see over the next couple of months."

Dzubeck added that the client/server group also fills the role of "repositioning" the Endicott laboratory. "One eases people into something else instead of having to obsolete them," he said.

"Can they do it? Sure. Will they successfully do it? They need to, or else they'll be in deep trouble," added Amy Wohl, president of Bala Cynwyd, Pa.-based consultancy Wohl Associates. "That's a powerful incentive to succeed. But it's one thing to wave the magic wand around and say, 'Pay attention to what we're doing in the client/server field'; it's another to actually be a successful client/server vendor," she said. "IBM isn't what most customers have in mind when they talk client/server."

In fact, some customers actively ignore IBM as a purveyor of client/server goods.

"We hadn't thought of IBM in this context," said Doug Underhill, vice president at CSX Technologies in Jacksonville, Fla. "Client/server should be simpler and not require as much vendor involvement as the traditional mainframe. We're trying to avoid transferring the IBM bureaucracy into a smaller platform," he added.

Ehlers added, "The client/server group may help IBM, but it will be incremental help. It's not really a deciding factor."

If you're waiting for client/server technology to progress before investing, Forrester Research, Inc.'s John McCarthy said companies should start addressing the training, organizational and budgeting issues now. Early implementers have found that those issues can be more of a problem than the technology itself.

Page exits Software AG

By Gary H. Anthes
RESTON, VA.

Peter Page, a top executive and product visionary at Software AG of Germany, parent of the U.S. subsidiary, resigned unexpectedly last week.

Michael J. King, president and chief executive officer of the North American operation, would not comment on reports that Page resigned over differences with company founder and co-leader Peter Schnell. "Peter [Page] concluded it was time for him to resign and move on to other things," King said.

King said Software AG of North America, Inc. works independently of its German parent except in developing product strategy, where headquarters in Darmstadt takes its cues from the all-important U.S. market. "We lead in that we set the broad direction for products," he said.

"There will be no change at all in our strategy and direction as a result of Peter leaving," he added.

Other observers were not so sure. "It's never transparent or insignificant when the founder of a long-term and successful company leaves," said Peter Kastner, vice president at Boston-based Aberdeen Group. "To say there will be no ripple in the water is specious."

Software AG's *Peter Page decided it was time to move on*

Page was the original developer of Natural, a fourth-generation language and one of the company's two flagship products. The other cornerstone of the company's line of 100-plus products is the Adabas database management system, which Schnell developed.

"For a long time, there has been a Peter Schnell camp and a Peter Page camp," a source close to the company said. "You either joined one or the other, but you didn't join both."

Robert Tasker, a vice president at International Data Corp. in Framingham, Mass., said both Schnell and Page were "extremely good technically" but that Page had a better sense of where the market was going. He gave Page most of the credit for starting the old-line mainframe company on the road to open systems and client/server.

"I think what happened was a differing as to where to apply the company's resources," said Tasker, who consulted with Software AG management in the U.S. and Germany earlier this year.

But he said Page's departure will not cause Software AG to retreat to the glasshouse. "Page was able to bring in a second tier of extremely good managers and sound technologists, so I think you'll not see much change. There is now less reliance on what either of the two Peters do."

At present, King said, there is no plan to replace Page.

Software AG has been profitable every year since its founding in 1969. Last year, the company earned $27 million on sales of $475 million, with $112 million flowing through its North American subsidiary.

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AT&T sells bandwidth choice

By Lynda Radosevich
BASKING RIDGE, N.J.

AT&T last week unveiled dedicated digital services that will give users private-line bandwidth options between the 1.5M bit/sec. and 45M bit/sec. speeds currently available with T1 and T3 services.

The services were designed for emerging bandwidth-hungry applications such as interconnections between local-area networks, imaging and multimedia, AT&T said.

Called Accunet Fractional T45, the services will offer data transmission speeds of 4.6M, 6.2M, 7.7M and 10.8M bit/sec. and will provide an alternative to high-speed switched services such as Switched Multimegabit Data Service (SMDS), fast-packet technology such as Asynchronous Transfer Mode and frame relay.

"This shows that AT&T is trying to maintain growth in the private-line service in light of advanced switched services such as SMDS and even frame relay," said Caroline Michel, a senior analyst for the carrier service program at International Data Corp. in Framingham, Mass. "While we're seeing migration to switched services, some users still like private-line services, which offer them better control over their data transmissions."

David Yedwab, vice president at Eastern Management Group, telecommunications consultants in Parsippany, N.J., said the private-line solution is better for point-to-point or one-to-many applications — such as sending long database files. High-speed switched services are more suited for many-to-many applications connectivity transmission with infrequent needs for connectivity.

"Having something in between [T1 and T3] does meet a number of requirements, such as LAN connectivity, where 1.5M bit/sec. doesn't provide enough speed, but there is no need yet for full-time 45M bit/sec. capability," he said. However, users will have to weigh the benefits of always having a line available against the costs, which can be higher than switched services if users have low or inconsistent volumes of traffic, Yedwab said.

Currently, users who require more than 1.5M bit/sec. can purchase multiple T1 circuits that are maintained separately. With Fractional T45, the service is managed as one unit, providing faster restoration in the event of errors and eliminating transmission delays, AT&T said.

AT&T rival Sprint Corp. plans to provide a fractional T3 service but does not see a demand for it yet, according to Mark Kaish, director of data marketing. He said Sprint will likely offer the service in late 1993 or early 1994. The other main long-distance carrier, MCI Communications Corp., said it does not offer a fractional T3 service.

AT&T said it plans to begin beta testing next month and will introduce Fractional T45 services in early 1993.

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Corrections

- An item in the Nov. 9 issue incorrectly said Texas Instruments, Inc. set up Integrated CASE Environment Services, a consulting unit to help users deploy TI's application development tools. In fact, the unit is part of Ceridian Corp. in Greenwich, Conn.
- A product brief in the Nov. 9 issue on Megaware, Inc.'s VAX/VMS utility omitted the company's phone number. That number is (800) 538-6342.
- McData Corp.'s LinkMaster 6200 Network Gateway does not off-load 100% of Transmission Control Protocol/Internet Protocol applications and protocols, as stated in the Nov. 2 issue; the Linkmaster 6100 Network Server does.
- Technocron Software Systems is in Palo Alto, Calif. Its location was incorrectly stated in the Nov. 2 issue.

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Study cites successful IS project patterns

By Thomas Hoffman
NEW YORK

■ Companies successfully completing information systems projects that help transform their industries tend to follow similar patterns of behavior during their project's life cycle.

That is the finding of a recently completed Harvard Business School study. Consultants involved with the study said they believe that by modeling these patterns, other user companies may be able to successfully follow suit.

The results of the study, which were introduced last week at New York University's Stern School of Management, were based on five case studies conducted during the past four years, according to Frederic G. Withington, a member of the Harvard Business School advisory board and a 35-year IS veteran who worked on the report.

The study examined five leading-edge applications that were developed during the past 40 years by BankAmerica Corp., American Airlines, Frito-Lay, Inc., American Hospital Supply and the United Services Automobile Association (USAA).

In each case, a similar cascade of events took place, along with similar patterns of professional behavior, according to Withington.

For example, when BankAmerica began developing the first electronic check-processing systems in the early 1950s, it was reacting to soaring manual check-processing requirements facing the banking industry.

Thirty years later, Frito-Lay attacked an industrywide problem of controlling escalating distribution costs when it began developing a quantitative database. In both cases, the companies overcame their problems using similar IS development techniques.

Visionary and bean counter

According to Withington, the chief executive officers involved orchestrated control over the research and development of the projects and recruited the IS executives who would direct it. In each case, Withington said, the CEO adapted his company's organization to the potential of information technology.

"You need a CEO who is both a visionary and a bean counter," Withington said.

Each IS executive, the study revealed, was a "technology entrepreneur" who adapted to change during the course of the projects. The IS chiefs all met their targeted deadlines and were able to produce early, profitable results, Withington said.

Each IS chief was a "facilitator of organizational change, a leader of technologists and a creator of the planning process," Withington said.

Industry pundits added their own revelations. Howard Anderson, president of The Yankee Group, a Boston-based consultancy, noted how American Airlines (which developed the Sabre electronic airline reservation system) and USAA (which developed one of the first integrated image processing systems) were able to divide their respective projects into small, manageable parts. Anderson said these examples echo the importance of a solid organizational structure.

"Successful companies have an internal discipline that makes projects successful and identifies runaway projects early," Anderson said.

However, not all of the projects resulted in a competitive advantage for the companies involved, Withington noted.

For example, he said American Hospital Supply did not gain a competitive advantage from the Burroughs Corp. mainframe-based inventory management system it developed in the late 1960s because the company was later acquired by Baxter Healthcare Corp. and migrated to an IBM mainframe environment.

Evolution of a dominant design

Dominant systems are usually the result of responses to a business crisis, according to a recent Harvard Business School study. A state-of-the-art design typically exhibits the following qualities: provides significant cost reduction, offers superior service, supports new business functions and delivers better data both within the company and to suppliers and customers.

Users wary of encrypted software keys

CONTINUED FROM PAGE 1

programs, said CA is requiring users to adopt encrypted keys to run IDMS upgrades currently slated for April 1993 delivery.

"From our perspective, there's no business requirement for these keys," Morgan said.

Mark A. Combs, senior vice president of research and development at CA, said he was unfamiliar with the example Morgan noted but said the encrypted keys help CA track how its software is being used on CPUs for billing purposes.

Combs said the keys also enable CA to better support and maintain its software by tracking the physical location of the code. And, he said, the keys should help CA cut down on fraudulent use of its software. CA's senior vice president of planning, Sanjay Kumar, has estimated that 15% of all CA products on the market are used illegally.

Keeping law and order

SAS began providing the keys with its software in 1978 to harness those users who were unlawfully switching SAS software to unlicensed CPUs, according to James Goodnight, SAS president. The first year after their implementation, Goodnight said, the keys helped bring in an additional $500,000 in revenue. "If it's done properly, it's very useful," he said.

"We administer [the keys] very kindly and gently. We don't use it as a weapon," he added.

While some users said they fear the keys could be used to shut down their software, vendors said that is impossible. However, other users were concerned their vendors might withhold upgraded keys during contract renewals for licenses.

Occidental Petroleum Corp. in Tulsa, Okla., is in a contract dispute with CA over its recent consolidation of three data centers into one. Edward Barrows, director of the corporate data center, accused CA of poor record-keeping and said, "Until we know for sure that their records are correct, I'm not installing any of the CA products with locks in them."

Combs said CA is trying to smooth out past administrative bungles. "We have had record-keeping problems in the past, there's no doubt about that," he said. CA invested in new administrative systems two years ago, which have improved its record-keeping, he added.

"We don't use it as a way of twisting customers' arms. If they don't pay, they don't get the new release," said Paul E. Newton, president and chief executive officer at Boole & Babbage in Sunnyvale, Calif.

Several users who have used encrypted keys in their software said they have had no problems. Darrell Richardson, an administrator in the data services division of the state of Oklahoma's Department of Transportation, said the department has been using encrypted keys for 10 SAS products for the past few years with no disruptions.

Bob Wint, a technical support manager at Kelly Services, Inc. in Troy, Mich., also said he has had no problems with encrypted keys his company has used to run software from Goal Systems International, Inc. (now part of Legent Corp.) and Comshare, Inc.

One large systems user said vendors' deployment of encrypted keys makes sense to him. "If someone were to tell me they were uncomfortable having encrypted keys in their software, I'd have to wonder if they were using their software legally," noted Stanley Zemka, database administrator at Equitable Resources, Inc., a gas transportation and services firm in Pittsburgh.

Rob Schafer, program director at Meta Group, Inc., a Westport, Conn., market research firm, said encryption keys offer users certain benefits, such as improved service and more accurate license administration. But, Schafer said the inclusion of encrypted code is so disconcerting to some users that the potential for software shutdown often outweighs the benefits.

Senior correspondent Gary H. Anthes contributed to this report.

Mega health care merger

FDC to acquire Gerber Alley

By Ellis Booker
CHARLOTTE, N.C.

In the year's largest merger in the health care information systems business, First Data Corp.'s (FDC) Health Systems Group last week said it was acquiring privately held Gerber Alley, providing a ready-made entry into the European market.

Terms of the deal were not disclosed, and the merger requires the approval of FDC's shareholders.

But industry observers speculated that FDC paid one-time revenue for the Atlanta-based health care IS company. Gerber Alley reported revenue of $78 million last year.

Analysts, meanwhile, said the merger made sense because it combined Gerber Alley's strength in large hospitals with FDC's target market of small to midsize institutions. They added that FDC will benefit from Gerber Alley's international operations.

"We didn't have an international arm, and this gives us entry into these markets," an FDC spokeswoman said.

If approved, the merger will also result in one of the largest health care systems providers in the industry, with more than 700 hospital clients and roughly 1,000 employees total.

Rumor mill

Peter Strombom, vice president of IS at Meriter Hospital in Madison, Wis., said he was not surprised Gerber Alley had agreed to be acquired. "There have been rumors out there for a good 10 months," he said, adding the company was not secretive about its need for cash.

Strombom said he was not concerned about continued support for his hospital's Gerber Alley systems, which it has used for three years.

The acquisition of Gerber Alley is the second significant purchase for the FDC unit.

In April 1989, as part of American Express Co.'s Information Services Corp. (ISC), it acquired McDonnell Douglas Health Systems Co. in St. Louis.

This April, American Express spun off ISC and renamed it FDC. American Express owns 54% of FDC, which had revenue of more than $1 billion last year.

Gerber Alley's product, The Precision Alternative, will become the company's turnkey solution for mid- to large-size hospitals.

FDC's Health Systems Group will continue to offer its current line of turnkey products as well as outsourcing services.

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DHL revamps with Big Blue

CONTINUED FROM PAGE 1

DHL's Unix installation was neither robust nor cost-effective enough to support the highly strategic applications the package handler is now launching against its competitors in the U.S. market, according to Michael Lanier, the unit's chief information officer.

The move is also seen as the best shot for DHL Worldwide Express' Western Hemisphere Division to catch up with its U.S. competitors in key strategic areas such as customer service and package tracking.

"The system was down 65.5% of the time when I got here," Lanier explained. Furthermore, a disparate mix of legacy systems lacked the integration needed to provide telemarketers and customer service representatives the data they needed instantaneously, Lanier said.

Now, with two applications that have been in production for several months, uptime clocks in at 99%, Lanier said. The telemarketing application has increased user productivity by 130%, primarily because telemarketers are spending most of their time dealing with customers rather than looking up key account information, he said. And next year, DHL plans to launch its first automated package-tracking application.

DHL, a privately owned, Europe-based company that only recently began focusing on the U.S. market, has long lagged behind U.S. market leaders Federal Express Corp. and United Parcel Service, Inc. in market share and key applications such as package tracking.

"Both Fedex and UPS are integrated operators — they operate their own pickup and delivery air fleet," said Jim Eckler, a partner at KPMG Peat Marwick's transport group. "DHL has some partially integrated delivery but not as much, which is all the more reason why it needs a state-of-the-art package tracking and handling system linked to a database" that can tell customers exactly where their packages are, Eckler said.

As for the expected bottom-line costs of this strategy, DHL paid an extra $5 million in capital costs in 1991 and expects to pay $10 million more this year, Lanier said (see box at left). Those figures cover the cost of designing the platform, beginning implementation and putting the first two applications into production, he added.

The company expects to pay about $15 million next year to complete the migration to the new system and launch several more key applications, such as package tracking and field systems, after which the yearly costs of the project should begin falling, Lanier said.

When Lanier was hired two years ago to re-engineer DHL Worldwide's information systems organization and systems, he quickly ascertained that the then-current Unix installation would never cut it.

"We took no umbrage with Unix — only with the timing" of migrating corporate operations to Unix six years ago, Lanier said. "Now the move makes sense, although some products are still immature, and the Unix industry still lacks adequate file backup and recovery."

Thus the decision to bring in IBM as co-developer, Lanier said.

"I don't think the word outsourcing does the relationship with IBM justice," Lanier said. "It really is a value-added partnership in which we work side by side."

Lanier said he made a conscious decision not to strike an outsourcing deal with IBM's Integrated Systems Solutions Corp. "We didn't want to turn the keys of the kingdom [over] to a company that doesn't know our business," he said. "IBM isn't running our computers." However, DHL and IBM are still discussing the possibility of IBM's taking over the monitoring and managing of the package handler's network.

IBM is DHL's weapon against the infamous hidden support costs of distributed networked systems, Lanier said.

To support the new platform in-house, he estimated that DHL would have paid IBM an additional $100,000 per support person per year "in order to provide multivendor database, operating system, network and application expertise." DHL would also have had to increase its support staff by 20% to 25% per year. "For every new system we put in place, we anticipated having to hire four to six new people."

Instead, each day, DHL has access to an average of three IBM branch managers on site and 15 IBMers in total for help with implementation, troubleshooting, answering questions, recommending enhancements and calling vendors together to figure out which is responsible for a system glitch.

Lanier estimated that providing support through IBM will cost roughly one-third of the estimated yearly capital costs of designing, developing and implementing the new distributed architecture.

The architecture is now firmly established at DHL — indeed, parent DHL Worldwide recently adopted an architecture that is "the mirror image of what we have here," Lanier said.

DHL's system

Servers: IBM RS/6000s; legacy systems from various manufacturers including NCR Corp., Stratus Computer, Inc., Pyramid Technology Corp., Prime Computer, Inc., HP, DEC.

Workstations: IBM PS/6000

Clients: Apple Computer, Inc. System 6.0, OS/2, Windows

Networking: IBM Token Ring/Novell, Inc. NetWare around TCP/IP, Open Systems Interconnect and IBM LU6.2 protocols.

Integration software: Peregrine, Inc.'s Pipes

Capital costs: $5 million in 1991, $8.0 million in 1992, $5 million predicted for 1993, with costs decreasing thereafter.

Seeking competitive advantage

DHL cannot afford to play catch-up with Fedex and UPS when it comes to fielding package tracking and handling systems.

Instead, DHL intends to implement its competing applications on a client/server platform at a lower cost and with higher availability than its competitors can provide on their primarily mainframe-based systems, CIO Michael Lanier said.

Indeed, both UPS and Fedex have recently begun implementing major enhancements to their systems. UPS is in the process of equipping its delivery trucks with laptops so drivers can report package whereabouts via cellular links throughout the day. Fedex recently launched a major revamp of its mainframe package-tracking system [CW, Nov. 23].

However, Fedex and UPS must pay a high price for their systems, which are both mainframe-based, Lanier maintained. This centralized architecture levies high costs in the dedicated lines that are used to pass package arrival data out to customer service centers, he added.

It also forces DHL's rivals to pay high costs in redundant mainframe power to avoid having their packages marooned during a system failure, Lanier said.

In contrast, DHL's package-tracking system, now awaiting 1993 budget approval, consists of multiple IBM RS/6000s on Token Ring local-area networks, with each LAN serving a customer region. Checkpoints at airports and other delivery points notify the centers only when a package is late, minimizing network traffic, Lanier said.

As insurance against failure, multiple servers on the same ring can share the same information, and an Enterprise System/9000 repository is regularly updated with package data in case an entire ring goes down, Lanier said.

A UPS spokeswoman said UPS avoids the risk of a system failure's downing its package-handling operations by maintaining a hot backup data center. She questioned how DHL will be able to match UPS' near-instantaneous-response time to customer queries on package whereabouts, particularly if the requested data resides on several servers. — *Elisabeth Horwitt*

DHL CIO Michael Lanier hopes that by 1994 his staff will number 255 — the head count in 1990. Last summer, IS numbers hit a high of 225. Typical support costs for a 5,000-user LAN internetwork total $6.4 million annually, compared with $2.3 million for a comparable SNA network, said a Forrester Research, Inc. report.

Picking Big Blue

IBM won the DHL contract against a bevy of Unix and communications-oriented vendors primarily because it was the only candidate willing to "go that extra yard," CIO Michael Lanier said. This translates into:

- **On-site support:** Typically, three IBM branch managers are on site at any given time, working alongside DHL technicians. When a problem develops, IBM acts as a liaison between DHL and multiple finger-pointing vendors.
- **Access to IBM's RS/6000 laboratory:** This includes early access to unreleased IBM products in the RS/6000 and AIX arena, including the NetView/6000 network management system.
- **Contract flexibility:** IBM offered initial technical services without pay and worked without a formal contract until October, when an interim contract was signed, Lanier said. The final contract is pending final approval for 1993.

IBM may recommend its own products, but the contract stipulates support for non-IBM products, Lanier said. "We have Hewlett-Packard Co. systems in Canada, Digital Equipment Corp. in New Mexico."

— *Elisabeth Horwitt*

Escrow counts

DHL CIO Michael Lanier was well aware of the perils of dealing with young vendors that tend to come and go like rockets in such volatile, new markets as distributed networked systems. DHL needed some of the capabilities promised by these vendors but could not chance losing support for a product if a firm went belly up. Lanier's solution to the problem: ask certain companies to either provide the source code to their products or put it in escrow to be made available to DHL upon the vendor's demise.

"There was a vendor of a telemarketing software package that our users really liked, but the vendor would not agree to do one or the other" of the above options, Lanier said. Regretfully, DHL declined to use that vendor.

If the package is unique enough, DHL will waive the requirement, Lanier said.

Sequoia users staying put

By Melinda-Carol Ballou
MARLBORO, MASS.

Despite persisting financial difficulties, Sequoia Systems, Inc. users remain loyal to the fault-tolerant computer maker — for now.

Earlier this month, the company announced a loss of $9.16 million on revenue of $9.9 million for its first fiscal quarter of 1992. It is desperately seeking sources of capital [CW, Nov. 23].

Sources said Hewlett-Packard Co. and Sequoia held talks last week in which the companies discussed: the purchase of an additional 10% of Sequoia stock by HP, which currently holds 8%; guarantees of ongoing support by HP for Sequoia products if the latter should fail; and a speeding-up of sales orders for Sequoia from HP. Such an infusion of cash and support guarantees may be essential for Sequoia's ongoing viability.

"Sequoia will bite the dust unless HP [or someone else] is willing to bail them out," said Steve Widen, a senior analyst at WorkGroup Technologies, Inc., a market research firm based in Hampton, N.H.

A Sequoia spokesman said the company is talking with all of its partners — which include Samsung Electronics Co. and Toshiba Corp. in addition to HP — to determine what they might be able to provide, whether it be "financial support, equity investments or joint funding of projects." He said any decisions must be made within a "few weeks."

Sequoia is facing lawsuits from shareholders as a result of having twice restated its fiscal results, and a third restatement is due out shortly. Sequoia said it counted revenue from contracts for which payment was never received.

Last week, Ultimate Corp., a Sequoia distributor, also filed suit against the company, stating that Sequoia violated contractual obligations.

Industry analysts said, however, that such lawsuits are not uncommon and alone would be unlikely to deter HP from propping up Sequoia.

Mum's the word

Officials at HP refused to comment on such negotiations and said they are continuing to work together with Sequoia on a "next generation" of fault-tolerant computers based on HP's Precision Architecture-RISC platform.

However, HP can now hedge its bets because Sequoia competitor Stratus Computer, Inc. has also committed to building fault-tolerant computers based on HP's PA-RISC.

The company's financial difficulties stem only in part from misstatements of revenue for the fiscal year ended June 27. During the past few quarters, Sequoia has not had the safety net of a large, cushioning backlog of sales orders, Widen said.

It will be increasingly difficult for Sequoia to make a convincing sales and marketing effort amid an ongoing reorganization, which has already pushed Chief Executive Officer Gabriel Fusco out the door as well as 19% of the firm's former 380-person work force, he added.

Customers who have made large investments are rooting for Sequoia to pull through but must also consider other options. KHP Services, Inc., a health maintenance organization and subsidiary of Pennsylvania Blue Shield based in Camp Hill, Pa., invested $5.5 million in Sequoia systems and has 50 people trained to use them, said MIS director Robert Sweigert.

"We want them to survive, but as MIS director, I have to be prepared to move to other platforms" in case they don't make it, Sweigert added.

Other users were more confident of Sequoia's ability to ride out the storm — with the help of HP.

"This situation hasn't affected our purchase plans at all," said DeMarquis Walls, vice president of systems and technologies at Damark International, Inc., a catalog mail order company based in Minneapolis that shifted from Stratus to Sequoia platforms a few years ago.

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(Without taking a political stand - users *will* change a system they perceive as failing to deliver sufficient value.)

News Shorts

IBM to build bus for clone maker

The IBM PC Co. said it will build the AnyBus local-bus motherboard under contract with CMS Enhancements, Inc., an Irvine, Calif.-based maker of computer accessories. The AnyBus is a highly upgradable bus that will let users upgrade from either Intel Corp. I486 or IBM 486SLC processors to a next-generation chip. The products are available now and will initially be featured in systems from Princeton, N.J.-based Lexar Systems.

Windows software sales surge

Desktop application software sales hit the $1.4 billion mark in the third quarter, marking an 11% increase from the third quarter last year, the Software Publishers Association reported last week. Sales of Microsoft Corp. MS-DOS-based applications were down to $644 million, although they still make up the largest chunk of desktop program sales. While DOS application sales have been slipping, Microsoft Windows applications are soaring. Windows applications represented $487 million in sales last quarter, a 91% increase over third-quarter 1991.

Banyan offers upgrade price break

Banyan Systems, Inc. in Westboro, Mass., has announced a new "More for Less" incentive program that will allow users to buy the 1993 release of its Vines local-area network operating system at 1992 prices. End users who purchase a currently shipping version of Vines (4.10, 4.11 or 5.0) for delivery before Dec. 31 will receive the next 1993 Vines revision at no extra cost.

Hayes settles patent suit

Hayes Microcomputer Products, Inc. and Packard-Bell Electronics, Inc. signed a truce last week on a legal fight over patent infringement. The dispute was the most recent litigious skirmish in a line of suits stemming back to 1985, when Hayes received a patent for its escape sequence with guard time device, and modem makers sued to invalidate Hayes' license. Hayes said it won or settled most of the earlier suits for a cumulative $10 million. According to Hayes, Packard-Bell agreed not to manufacture modems that infringe on its escape sequence patent. Hayes said that in the past, the licensing battles have not raised prices for modem buyers.

Shiva offers dial-in servers

Shiva Corp. last week began shipping servers, called LANRover/E, that let remote users dial into corporate Novell, Inc. NetWare and AppleTalk networks and use LAN resources. Additionally, LANRover/E for AppleTalk will be bundled with Magnet, a Macintosh file management program from No Hands Software. The company's four- and eight-port servers have a suggested retail price of $1,999 and $2,999, respectively.

SHORT TAKES **Apple Computer, Inc.** has announced it is shipping the Data Access Language (DAL) server for **IBM**'s Application System/400 family of midrange computers. The package starts at $4,250 but will be discounted by 25% for orders placed before March 31, 1993. ... **IBM** recently made 4% to 11% price reductions on Personal System/2 Server 85 and 95 lines. A top-shelf PS/2 95 now sells for $13,060.... **Novell, Inc.** said last week that it received a U.S. patent for the fault-tolerant computer system technology used in NetWare SFT III, which allows a second network server to transparently take over if the main server goes down.... **Toshiba America Information Systems, Inc.** established a TechEquity Trade Up Program to let businesses trade in used micros for Toshiba portables. Any purchaser of more than five Toshiba portables will receive cash back for trading in old systems.... **U.S. Robotics, Inc.** cut prices by $200 for its entire V.32 bis product line. Prices now range from $645 to $795.

UK investors to buy Atex

Publishing systems firm says sale will not impact support

By Kim S. Nash
BILLERICA, MASS

The English sure don't hold a grudge. While Harrod's, the king of London department stores, celebrates an American Christmas, a band of UK-based investors appears to have latched onto a similar theme. They announced plans last week to buy the Atex, Inc. publishing arm of Eastman Kodak Co. in a deal estimated at $10 million to $20 million.

Daniel Chapchal, a publishing executive known in Europe as a turnaround specialist, is poised to assume the role of chief executive officer at Atex when the deal is approved. That is expected to happen within 30 days.

Layoffs in the form of a 10% reduction of the 370-member Atex work force are "certainly possible," a spokesman said.

Vital stats

Founded in 1983.

Acquired by Kodak for $80 million in 1988.

Peaked in 1986 with 1,400 employees.

Current employment count is only 340 staff members.

Currently serves approximately 600 customers.

Miracle worker

Chapchal will replace Atex President and CEO Brian Lacey. Chapchal has made a career of turning around unprofitable companies, including printing firm Xenotron Holdings PLC, which he later sold to Siemens/Nell Group, and computer-aided design firm Applied Research of Cambridge Ltd.

Atex's 900 customers, including this newspaper, *The New York Times* and *Business Week*, should continue to receive service and support from the firm, according to an Atex spokeswoman. "Kodak took great pains to find a buyer committed to current customers," she said.

Kodak has also suffered financial pains since acquiring Atex in 1981, according to Steve Edwards, editor of the "Seybold Report on Publishing" in Media, Pa. Atex "has been a losing proposition almost every year since Kodak bought it," he explained.

Quite a deal

Edwards estimated that Chapchal's group is getting Atex for between $10 million and $20 million, "a fraction" of the $80 million Kodak originally paid for it. Neither Atex nor Chapchal would comment.

The deal gives Chapchal access to a large base of newspapers and magazines dependent on Atex equipment that he can theoretically tap for upgraded products, according to Edwards.

Leaner, nimbler publishing rivals such as System Integrators, Inc. in Sacramento, Calif., and Du Pont Co. have outpaced Kodak during the past few years, Edwards said.

"Even though they've been laying off people and decreasing overhead, [Kodak has] had a hard time adapting new technologies" to its strategy, Edwards added, citing the graphics and color printing features missing from Atex's current offerings.

Fifteen to 20 second-tier desktop publishing start-ups using Apple Computer, Inc. Macintoshes tied to large networks have also dented Atex's hold on the market, Edwards said.

Kodak, which has been looking to unload the reportedly unprofitable unit since early this year, said it will take a $140 million third-quarter hit for unspecified divestitures.

Cognos unveils AS/400 development tools, upgrades PowerHouse

Kim S. Nash
BURLINGTON, MASS

Cognos Corp. confirmed plans last week for a major upgrade to its PowerHouse fourth-generation language and lifted curtains on all-new tools for building and maintaining IBM Application System/400 software.

> InQuizitive frees systems designers to do the more complex work of application development.

The company, which shifted its focus earlier this year from minicomputer-only products to Unix client/server development, still makes a nice chunk of money from AS/400 sales. The planned offerings to feed this revenue pipeline include the following:

- PowerHouse InQuizitive, an end-user report writer, offloads report work from information systems and can export data to PC file formats such as ASCII or accept data from a Lotus Development Corp. 1-2-3 spreadsheet.
- PowerHouse Architect, an application maintenance tool previously available for other platforms, will also run on AS/400s. It generates test applications and prototypes and includes a toolbox of common AS/400 commands that can be used as menu options from the Architect toolbox.
- PowerHouse 4GL 5.67, an enhanced version that sports features such as rapid application development. The latest edition eats up as much as 60% less AS/400 processor power and time, according to a Cognos spokesman.

Likes what it sees

GE Capital Assets Management Corp. has used the products for the past several months. The company said it especially likes InQuizitive because it enables users to generate the bulk of reports once requested of IS. Systems designers are "free to do the more complex, creative work ... of application development," said George Pinsky, programmer/analyst.

Cognos, which claims a midrange installed base of 21,000 sites worldwide, is expected to rake in $167 million in sales for fiscal 1993, compared with $145 million for 1992, according to Alex. Brown & Sons, Inc. in New York. That figure includes proprietary and Unix-based tools, which were launched in May.

The company demonstrated various versions of PowerHouse, including one for Digital Equipment Corp.'s Alpha, at a user conference last month.

PowerHouse 4GL 5.67 for the AS/400 is priced between $8,000 and $161,300, depending on AS/400 size. The other two modules cost from $1,900 to $39,700.

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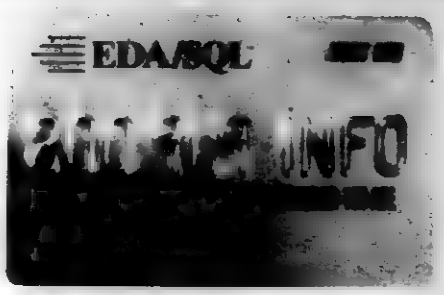

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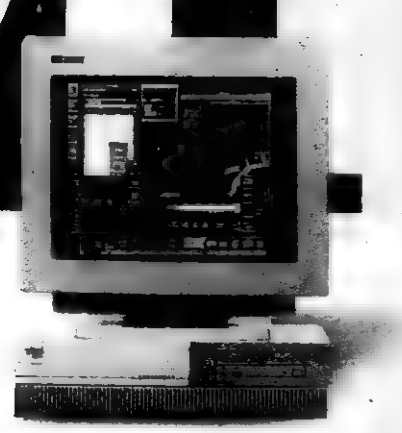

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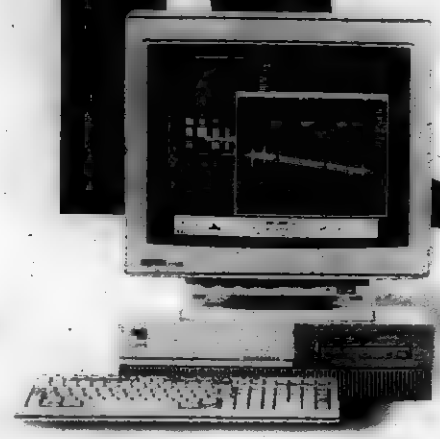

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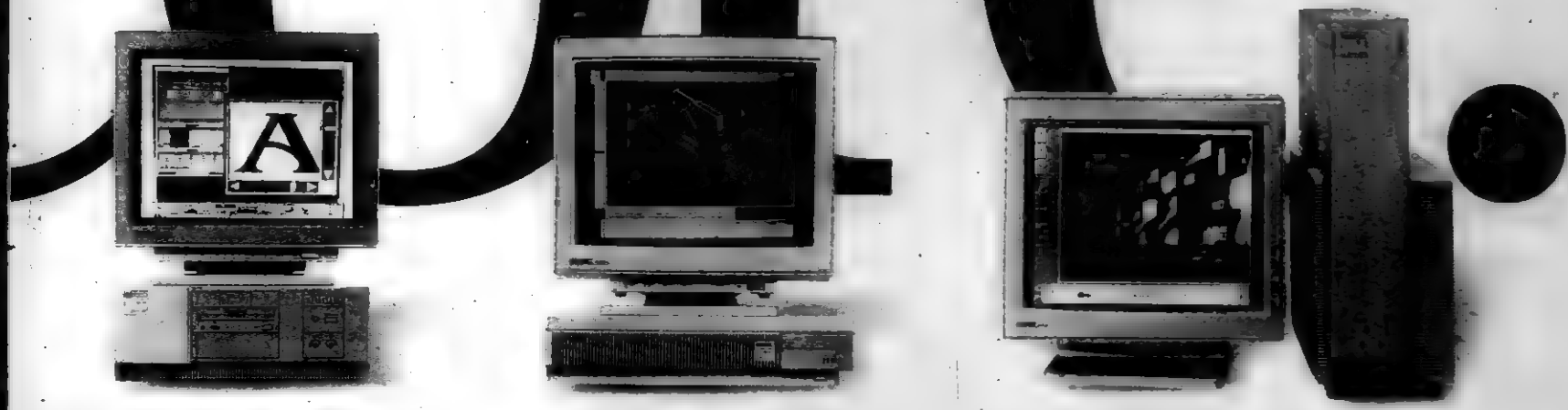

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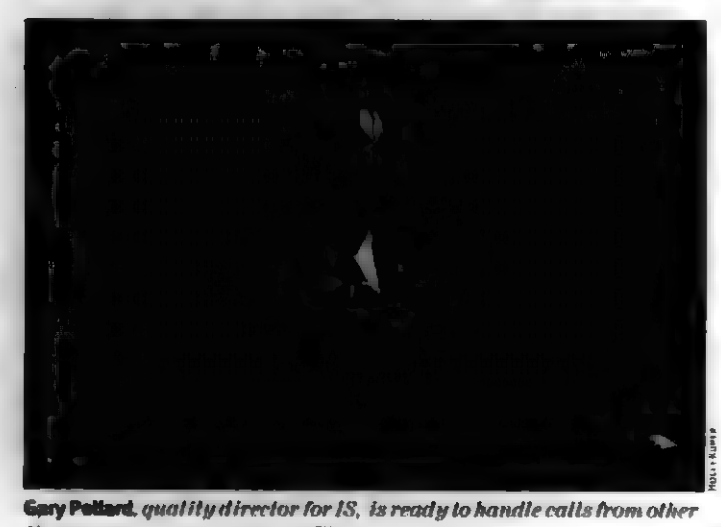
Benchmarking helps improve IS competitiveness

CONTINUED FROM PAGE 1

For example, TI has benchmarked such IS topics as data center costs, help desk operations and managing computer uptime. The goal is to adapt outsiders' best ideas to improve internal processes — or at least trigger some creative thinking.

The payoffs from benchmarking studies, which involve a mix of qualitative and quantitative analysis, range from small improvements in IS procedures to substantial bottom-line results. A comparative study of data center operations allowed Champion International Corp. to identify cost savings equivalent to 3% of its data center budget, and many companies reap savings of 20% or more, according to Tom Walsh, director of MIS



Gary Pollard, *quality director for IS, is ready to handle calls from other IS managers wanting to copy TI's successful user survey*

network services at Champion in Hamilton, Ohio.

After benchmarking, TI threw out its homegrown user survey and brought in a consultant to design a better survey, Pollard said. After a study of managing computer uptime, new procedures were instituted, and a "manager of computer availability" was hired, he added.

What makes it attractive?

Benchmarking is attractive because it fits neatly with the fashionable management trends of business process re-engineering and total quality management. Benchmarking data center costs, for example, can help determine whether outsourcing is necessary.

However, only a minority of IS departments are actively benchmarking. Out of 21 big companies surveyed in the Baltimore/Washington, D.C., area, for example, only four had external benchmarking activities, said William H. DeLone, professor of IS at American University in Washington, D.C.

"Most companies don't do it, but it's a simple, low-cost way to gain some insight into how well you're using [information technology]," said Tobey Choate, an IS consultant at Arthur D. Little, Inc. in Cambridge, Mass.

> Benchmarking could turn out to be nothing more than a consultant-enriching buzzword.

Even supporters of benchmarking are suggesting that it is not right for all firms. A major study by Ernst & Young and the American Quality Foundation in New York found that benchmarking is fine for industry leaders trying to fine-tune already good systems, but it may be a worthless distraction for "lower performance" firms that have more basic problems to fix.

Benchmarking could turn out to be nothing more than a consultant-enriching buzzword, but the fact is that some IS managers are forging ahead with ambitious projects.

Banking benchmarking

Judge W. Fowler, director of systems development at First Union Corp. in Charlotte, N.C., came up with the idea for an IS benchmarking study in the banking industry. Conducted by Towers Perrin, Inc., the study will measure the quality of IS service to internal customers at a number of banks.

Benchmarking also crosses industry lines. Just last month, 14 companies and a federal agency began comparing notes on electronic data interchange (EDI), such as how to sign up new trading partners and charge business units for centralized EDI services. Participants include Ford Motor Co., J. C. Penney Co., Polaroid Corp., United Parcel Service, Inc. and Weyerhaeuser Co.

Concern about sharing sensitive information directly with other companies prompted the users to bring in two consulting firms, The EDI Group Ltd. in Oak Park, Ill., and Price Waterhouse's EDI practice in Washington, D.C., to provide confidential analysis.

The most mature area of benchmarking is data center costs and operations. Data center studies compare personnel levels, systems' efficiency, equipment expenditures and chargeback costs.

Perhaps the most difficult IS area to benchmark is software development, which is "fraught with comparison errors," said Dennis B. Farley, president of the Development Center Institute, Inc. in Indianapolis.

The costs and productivity of software development vary greatly with the size of the business and other factors, so statistical comparisons should be combined with qualitative analysis of how the organization manages its development staff, tools and portfolio, Farley said.

Getting bogged down in arcane statistics, such as measuring "function points delivered," may be a mistake anyway because it fails the "so-what test" of business managers, Farley said. "They want to know whether the new system saved money or brought in revenue."

Though benchmarking often involves consultants and number-crunching, it can be simpler. At Carolina Freight Corp. in Cherryville, N.C., the IS staff is always on the lookout for IS techniques and software features it wants to copy.

"We steal shamelessly from anyone who has an idea that we perceive to be world-class," said John Rudasill, president of the computer services subsidiary of Carolina Freight. "We do it so much that sometimes we forget to call it benchmarking."

Zeroing in on benchmarking

For IS organizations eager to plunge into the benchmarking pool, the best advice is to focus, focus, focus.

Experts said companies will quickly sour on benchmarking if they try to study an area that is too broad, such as the whole IS function, or even something slightly narrower, such as computer uptime. "The way to get a very clean, efficient benchmark is to narrow the focus as sharply as you can," said Gary Pollard, quality director for the IS department at Texas Instruments.

For example, IS should determine the source of its problems with computer uptime and then find out how others have dealt with the specific problem, Pollard suggested.

Users and consultants said companies just getting started in benchmarking should take the following steps:

- Pick a few narrowly defined processes where you suspect there is room for improvement, especially those areas that could affect the bottom line.
- Study your own processes to make sure you ask the right questions.
- Look for "target" companies — both inside and outside your industry — that have a reputation for excellence in the areas you want to study. You can find target companies in the trade press and at user group meetings or talk with consultants and vendors.

Of course, not all target companies are willing to dish out information for benchmarking studies. If a competitor or foreign company balks, you may have to use the services of a business intelligence firm, such as Washington Researchers Ltd. in Washington, D.C., or Kirk Tyson International Ltd. in Oak Brook, Ill. — *Mitch Betts*

Get CIO A-OK

What kind of chief information officers try benchmarking? Experts said they tend to be either disciples of the quality movement, which preaches the gospel of continuous and measurable process improvements, or CIOs who want to be prepared when the question of outsourcing is raised by senior executives.

Benchmarking is also a great way for new CIOs to take stock of the operations they have inherited, according to consultant N. Dean Meyer, president of NDMA, Inc. in Ridgefield, Conn. With benchmarking, the incoming CIO can "stretch the management team's vision of what's possible and establish some clear, pragmatic action plans to pursue," he said.

IS benchmarking is limited by the fact that some CIOs believe their operations are so unique it is impossible to get apples-to-apples comparisons with other IS organizations, experts said. Also, CIOs who are entrenched and comfortable in their positions may see no need for benchmarking.

And while many CIOs will acknowledge that IS metrics are important, the actual task of benchmarking is "high on the procrastination list," said consultant Howard Rubin, president of Howard Rubin Associates, Inc. in Lexington, Mass.

For those who choose to indulge, leaders of the benchmarking movement have developed a code of conduct that requires those seeking information to be fully prepared for the interview with targeted questions. It also forbids talk about pricing issues that could lead to antitrust problems and, most of all, requires reciprocity so the sharing of information is a two-way street.

— *Mitch Betts*

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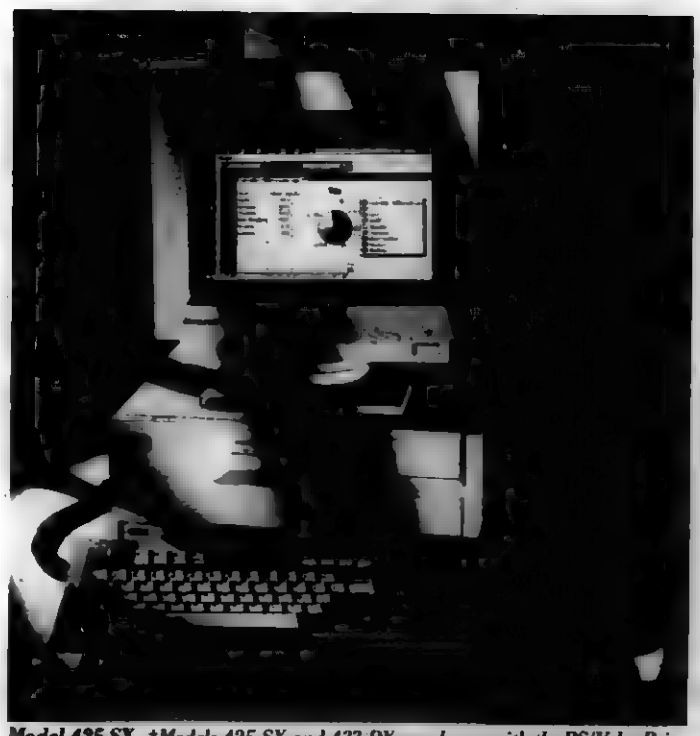

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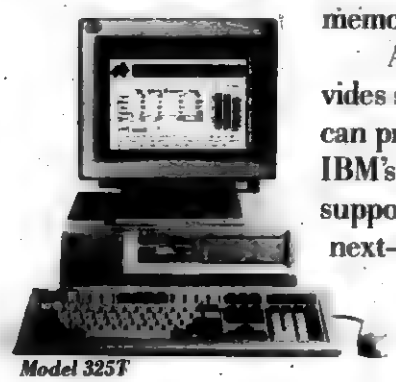

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Corollary unveils Pentium-based server

By Kim S. Nash
LAS VEGAS

With all the hoo-ha erupting at Comdex/Fall '92 over Microsoft Corp.'s expected early-1993 delivery of Windows NT, at least one firm had the foresight to look at what comes next. Specifically, Corollary, Inc. unveiled a three-chip multiprocessing server aimed at developers that want to test NT applications.

The MP Developer Station, due out in February, is a $15,000, fully symmetric system running three Intel Corp. 1486DX2, 66-MHz processors and SCO MPX, the multiprocessing version of The Santa Cruz Operation's Unix. A Pentium-based model is due out early next year, after Intel formally ships the advanced chip, according to George White, Corollary president.

Corollary, which supplies boards to Advanced Logic Research, Inc., Everex Systems, Inc. and Digital Equipment Corp., among others, already has one Pentium chip and is currently reworking existing C-bus II hardware to accommodate multiple Pentium processors.

Corollary will phase out MP Developer Station soon after Pentium and NT ship, according to White, because traditional systems vendors will be building their own boxes.

However, giving independent software vendors and corporate developers a way to test their NT creations now to ensure they run bug-free in a multiprocessing environment will boost the market, he said.

No independent software vendors have ordered the product yet, but at least one large user is interested: Sprint Corp. called Corollary the day of the announcement for more information, a spokesman for Corollary said.

RAID rampant at micro fair

By Kim S. Nash
LAS VEGAS

Multiprocessing servers based on Intel Corp.'s Pentium chip got a lot of attention at the recent Comdex/Fall '92, but introductions that took a storage slant on servers were also hot.

Several companies at the show introduced redundant arrays of inexpensive disks (RAID) subsystems, which enable server users to store and manage data dragged down from a mainframe or minicomputer host.

Raidtec Corp.'s FlexArray IX supports RAID Level 0 and 1 for Unix host systems, including IBM's RISC System/6000, Sun Microsystems, Inc.'s SPARCstation, Apple Computer, Inc.'s Macintosh and Quadra and Digital Equipment Corp.'s Ultrix boxes.

Priced between $4,950 and $28,500, FlexArray IX joins **Data General Corp.**'s Clariion in providing RAID support for a variety of Unix workstations and servers. Raidtec is located in Alpharetta, Ga.

AST Research, Inc. introduced a multichannel subsystem for its Premium SE and Manhattan SMP servers. The devices offer Level 0, 1 and 5 and a specialized AST implementation of RAID. A five-channel controller is priced at $3,995 and supports up to 16 hard drives. A three-channel board lists for $2,995 and handles up to eight drives. They are due out next month.

IBM announced Oasas 1 Version 2, which is a software-based disk array manager for use on 386-based Personal System/2s with OS/2 2.0. The product manages up to four arrays, providing RAID 0, 1 or 5 support. Due to ship next month, Oasas is priced at $800.

NCR Corp.'s ADP-92-06 is an array controller for managing up to 35 drives with a maximum of 20M bytes each.

Along with two new products, **NetFrame Systems, Inc.** in Milpitas, Calif., offered price cuts up to 40% on superserver storage offerings and increased warranties from one year to five years. New drives come in a 550M-byte, 3½-in. version for $3,795 and a 1G-byte, 3½-in. edition for $5,495. They are available immediately.

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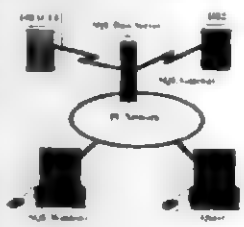

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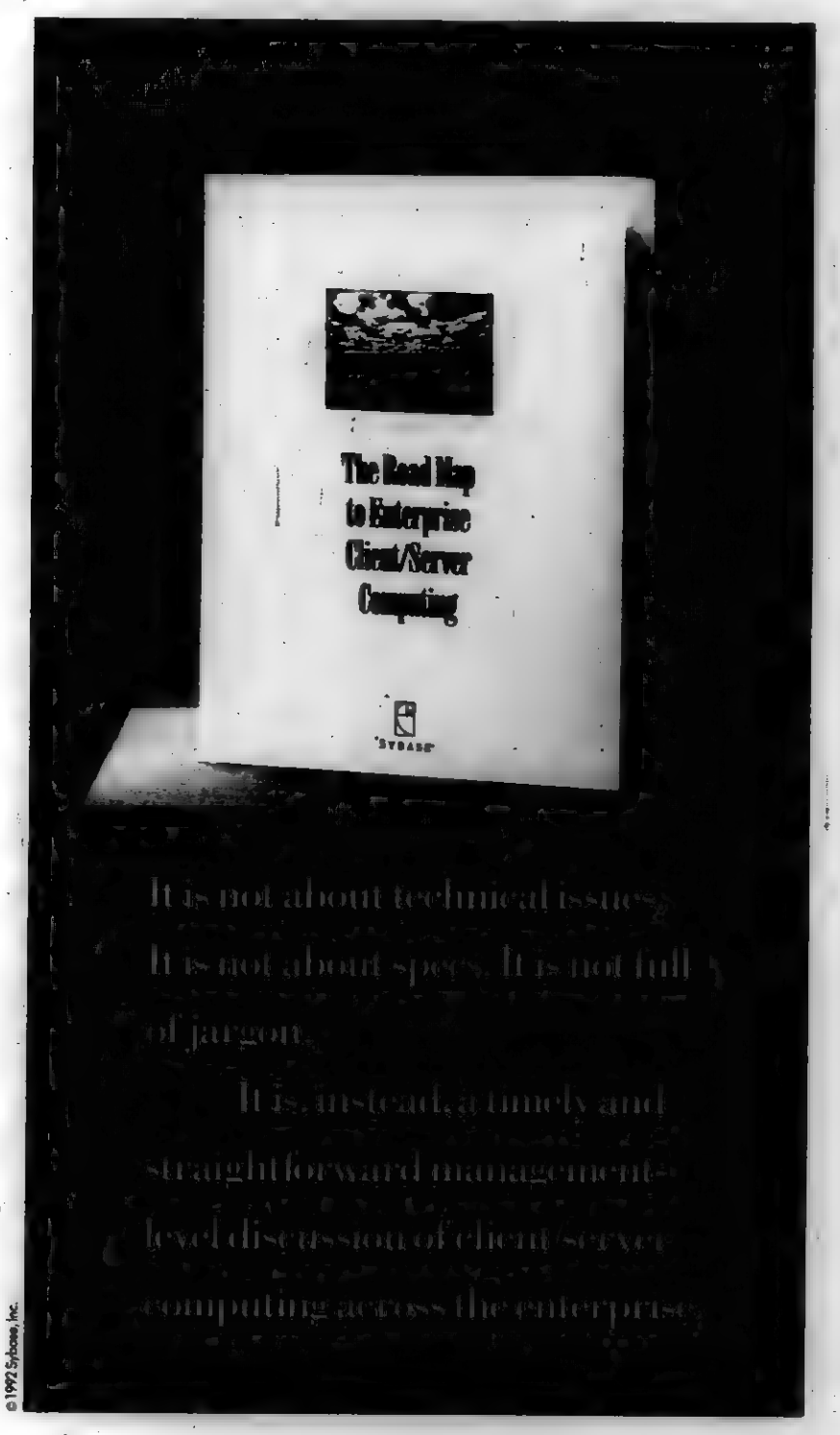

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Ease of Upgrade	4.6	4.4	4.0
Ease of Programming	4.4	4.3	3.9
Connectability	4.5	4.4	4.0
Training Time	4.4	4.1	3.8
Price Performance	4.5	4.5	3.6
Documentation	4.3	4.2	3.9
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TRON: Out of the limelight

Operating system of the future has made little progress in the present

By David Kellar

DESPITE THE LINGERING optimism of its proponents, Japan's revolutionary TRON technology appears stalled.

An effort to design the ultimate computer architecture for tomorrow's integrated electronic society, The Real-time Operating System Nucleus (TRON) project was launched with much fanfare in the mid-1980s.

At the time, some observers in the U.S. worried that the project might eclipse the diverse, uncoordinated computer operating systems that had been adopted by the rest of the world. Some even thought TRON would effectively block U.S. vendors from entering the Japanese market.

TRON standards

While not an overwhelming commercial success, the TRON project has led to Japanese innovations and several standards....

But competitive pressures and the momentum building behind international standards have so far prevented TRON from becoming an all-encompassing technology.

TRON has its strongest presence in Japan's factory automation and communications industries, according to Ken Sakamura, the Japanese professor who initiated the TRON project in 1984.

Sakamura claims TRON technology is found today in nearly 90% of Japan's computerized industrial machinery and communications equipment. "In time, we hope this success will spread to business and home sectors as well," he added.

However, there is little independent data to support or refute Sakamura's claims. Even the TRON Association, the not-for-profit central coordinator of the various TRON development projects, has not yet surveyed its members to determine TRON's market penetration. But interviews with Japanese companies involved in the project suggest that TRON is not nearly as widespread as Sakamura believes.

The story is similar in the Japanese communications industry, which has relied on TRON-based operating systems but seems to be moving away from this commitment in response to the growing need to comply with international communications standards.

"These claims [of commercial success] are absurd," said Steve Myers, senior analyst at Jardine Fleming Securities Ltd. in Tokyo. "There are lots of operating systems out there, and no large company has any incentive to make its products conform to any standard other than its own," he said, referring to the dominance of proprietary systems in Japan's industrial-automation arena.

The cordless electronic pen, expected to become the main input device for personal digital assistants and portable computers.

Still, TRON has served as a vehicle of technology transfer and communication among TRON Association members, including every major information tech- nology firm in Japan.

While several Japanese firms have dipped into the TRON market, none has dared plunge in. Recognizing the advantages of a brand new computer architecture designed from the ground up for real-time control, they find it difficult to turn their backs on Unix. Still, proprietary systems remain dominant for some applications because of market longevity and familiarity.

"TRON is like a glacier. It moves very slowly, but it is making definite forward progress," noted James Farrell, director of marketing communications at VLSI Technology, Inc. in Tempe, Ariz., and the official U.S. representative of the TRON Association.

The Dvorak-style keyboard, supplied as standard equipment with B-TRON computers and promoted by the TRON Association.

Support of multilingual processing, a TRON goal from the start.

While conceding TRON's weak market status, Farrell is optimistic about its future. "TRON is in the same situation now as the Macintosh was back in 1984," he said, implying that the TRON concept may be within a few years of acceptance. "There is great potential, especially in the area of B-TRON-based multimedia peripherals for existing PCs."

The key to global success, Farrell said, is for the TRON Association to build its membership. "There is a lot of interest in TRON in the U.S.," he said. He has received more than 1,000 inquiries in two years — though only one new member has actually signed up.

Kellar is an IDG News Service correspondent based in Tokyo.

I-TRON, you TRON?

TRON research is carried out on three types of real-time operating systems: B-TRON, for business and home applications; I-TRON, for industrial applications; and C-TRON, for communications systems. A fifth project, Macro TRON (M-TRON), is aimed at developing an overall operating system architecture for tying I-TRON, B-TRON and C-TRON together.

Business and home markets are the last bastions of hope for B-TRON.

I-TRON

Fanuc Ltd., the leading Japanese maker of robotic factory equipment, does not use TRON in its real-time control systems, company officials said.

Likewise, Fujitsu Ltd., NEC Corp. and Hitachi Ltd., which all produce microcontrollers for machine automation, concede that TRON-based operating systems account for only a small portion of the real-time operating systems they sell. The majority of embedded control systems sold in Japan remain proprietary.

At Hitachi, most real-time systems sold for embedded robotic applications are based on I-TRON, the TRON architecture optimized for industrial applications. But "TRON-compliant products represent a very small percentage of Hitachi's total line of computer control systems for industrial use," a company official said. "We use Unix or our own proprietary real-time operating system for most applications."

C-TRON

In Japan's communications industry, where the communications-specific C-TRON has become something of a standard, non-TRON products hold much of the market. NEC, for example, does not use C-TRON in any of its private branch exchange equipment, and Mitsubishi Electric uses C-TRON only for its high-end communications equipment because "it is too large and inefficient for systems with relatively low computing power," a company spokesman said.

Japan's largest telecommunications firm, NTT Corp., is now moving away from C-TRON as its main operating system to a newly developed specification called Interface for Real-time Operating Systems, which is compatible with international standards.

B-TRON

The last bastions of hope for the B-TRON specification are the business and home markets. "The big difference between B-TRON and other GUI-based operating systems is that B-TRON is designed to control things," said TRON project founder Ken Sakamura. "A Mac or DOS-based PC is just a computer. A B-TRON PC is not only a computer — it also works as a control panel, which makes it much more appropriate for use in computerized homes and office buildings."

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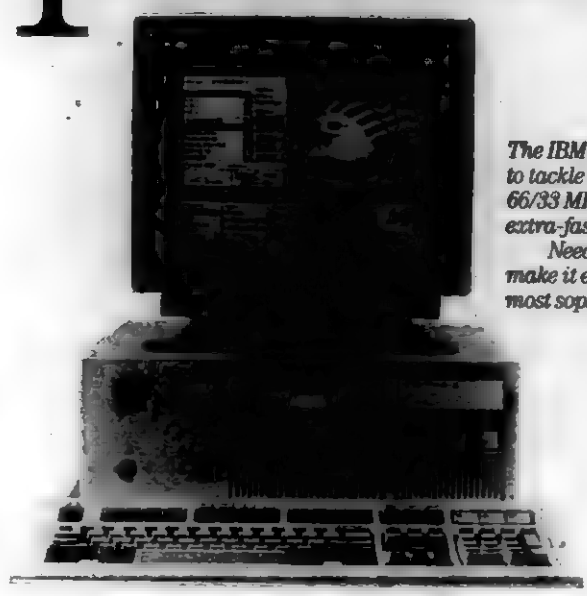

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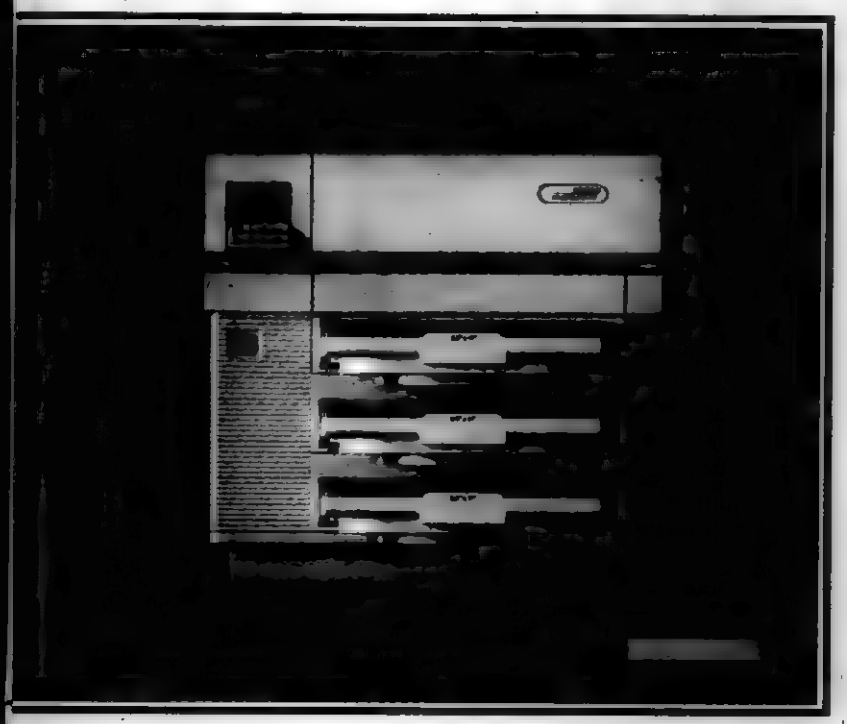

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BOTH MODELS: *Up to 800 x 400dpi (COMPAQ High-Resolution Mode) ♦ PostScript Level 2 and PCL 5 w/Intelligent Emulation Sensing ♦ One slot/port each for AppleTalk, Network Interface Cards, Internal FAX Modem, Serial and Parallel Port ♦ Available Options: Internal 60-MB Hard Drive, 1- and 2-MB Programmable Font Modules ♦ Consumables: One-piece cartridge with 12,000-page yield*

printers should meet all of your network needs. Ours provide a direct connect to Novell and AppleTalk environments.

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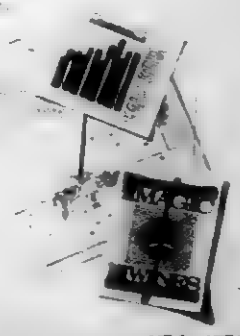
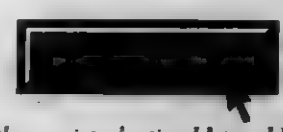


They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple TwinTrays hold up to 1,500 sheets. Impressed?



With our printers' optional Internal FAX Modem, you can send and receive presentation-quality documents, in sizes up to 11" by 17." Right from your desktop.

COMPAQ

Vicious cycle

We've said many times in this column that the only constant in the information systems world is constant change, and the pace of change, if anything, is accelerating.

Here's a good illustration of just how fast things are changing, courtesy of Ronald Chwang, president of PC maker Acer America Corp. I met with him at Comdex and asked him whether he sees any end to the ongoing PC price wars.

The answer, in one word, was no. Price declines may slow a bit with desktop machines but could actually accelerate for color laptops and portables. The onus is on vendors to squeeze every last drop of productivity from their manufacturing and distribution, essentially doing more with the same or fewer inputs. Sound familiar?

Anyway, Acer's Taiwan factory can pump out one PC every 15 seconds. Like other PC makers, Acer uses many industry-standard parts that it has purchased from numerous third parties.

Formerly, the finished goods would be trucked to the docks for a leisurely trans-Pacific trip to the U.S. But Acer found that, because of rapidly falling PC prices, the PCs could lose significant value from the time they are loaded to the time they are delivered to customer sites — a matter of several weeks. Remember when products had life cycles that measured years? Chwang does too, and fondly so. Now the manufacturers are counting weeks.

So like any other company trying to compete in a white-hot environment, Acer re-engineered. It now ships non-price-sensitive materials such as the PC chassis and power supplies by boat and flies the price-shifting motherboards and storage components to the U.S. Then assembly is done locally, with the accent being on customization.

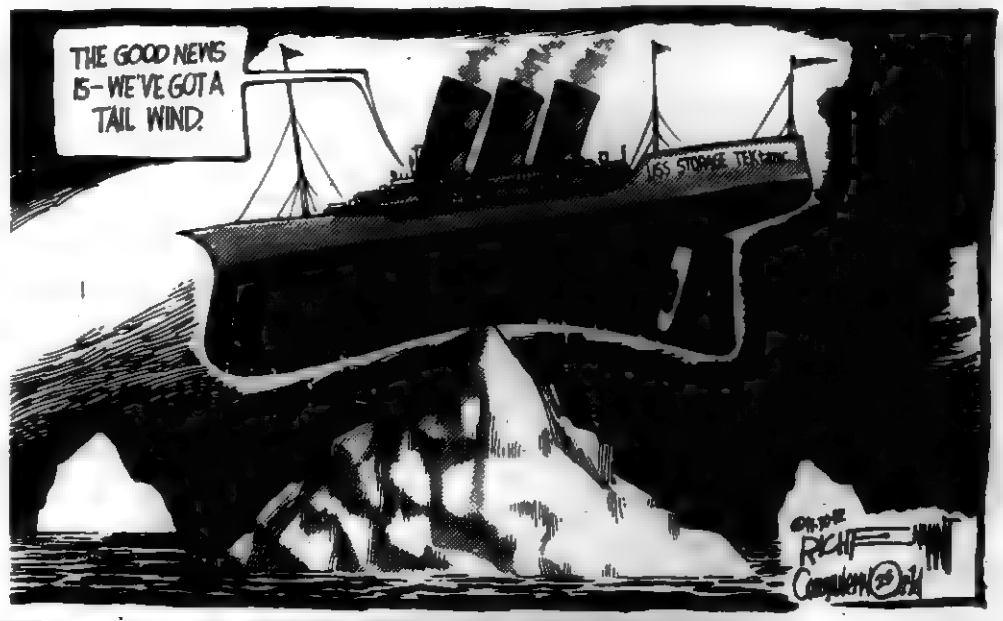
This re-engineering process has allowed Acer to do some remarkable things, such as announce 35 new models recently based on only *two chassis and two motherboards*. That's the level of customization buyers want, and that's what Acer and the other PC makers must deliver and still eke out some profit.

In Acer's manufacturing lines, nothing is permanent. Chwang knows that what is working today will be insufficient in 12 to 18 months. He also knows that his profit margins are tied to Acer's ability to gain the lowest prices for parts. That's done only through volume purchasing. And volume purchasing results only through volume sales of its PCs. It's an incredibly vicious cycle.

Meanwhile, you the customer will continue to see falling hardware prices. Chwang estimated that prices for basic materials for PC manufacturing are falling 15% to 20% per year. He also said the costs to manufacture color screens for laptops are due for some breakthroughs, which could put significant downward pressure on prices.

Bill Laberis

Bill Laberis, *Editor in chief*



ISDN not meant as a networking nirvana

Computerworld does the industry a disservice by making snide references to ISDN [Executive Briefing, CW, Nov. 9], where the Trip '92 event is introduced with, "While the industry now knows ISDN will never be networking nirvana ...."

ISDN was never intended to be "networking nirvana"; rather, it was developed to be a digital infrastructure. ISDN's value is that it is a public network architecture developed by international standards bodies to provide a digital information highway using existing copper wiring.

ISDN is a practical transition from analog copper communications to an all-fiber public network of the future.

Open your eyes and start talking to businesses that use ISDN today for applications such as access to multiple hosts with terminals or PCs, local-area network interconnection, long-distance access to file servers and other applications.

By describing how companies are using ISDN today and focusing on the real issues, you provide useful information to the industry and dispel all the ISDN myths.

Mike Gawdun
San Antonio

Don't discredit downsizing

I was dismayed by the lack of logic in some of Howard Glassman's comments in his otherwise excellent Viewpoint article about the downside of downsizing [CW, Nov. 2].

He has made the assumption, several times, that current practices are correct practices and must be continued.

In fact, a considerable part of the savings from downsizing may be achieved by carefully examining not just what you're doing and what platform you're doing it on, but why you're doing it.

He also notes, for instance, a need to recover source code for the past five years. What if the life cycle for code in the downsized environment (because of greater flexibility or changing business patterns) is three years? He notes that users must continue to get things on the same schedule. Why, unless they need to?

New systems that are simply downsized versions of old ones on new iron don't really deliver the goods nor do they show an adequate concern for user participation in the downsizing process, which is always a key to successful and creative implementation.

Amy D. Wohl
Bala Cynwyd, Pa.

Viruses are deadly

The answer to the title "Can a 'good' virus be a bad idea?" [CW, Oct. 5] is easy: A "good" virus is always a bad idea!

A virus, a program that spreads among computers covertly, changes the software on the computers it infects. In at least some cases, the changes are damaging.

Please don't make Frederick Cohen's mistake of confusing the idea of a "good" program with the idea of viruses as a "good" way of distributing software.

If Cohen's "good" programs don't spread covertly, then they aren't viruses. Remember: Calling a sheep's tail a leg doesn't make it a leg.

Robert V. Jacobson
New York

Plain and simple

At least one of the answers in your Help Line [CW, Nov. 9] is apparently gleaned from an ancient edition of the Microsoft Word user's guide.

The column lists seven steps of choosing, selecting and typing to remove the display of the last four files at the bottom of the File menu.

Page 65 of the User's Guide for Word 5.0 gives a far simpler, more intuitive procedure:

1. From the Tools menu, choose Preferences.
2. Select the View category and then clear the List Recently Opened Documents check box.
3. Click the close box to close the Preferences dialog box.

In advancing from Word Version 2.0 to 5.0, even this relatively minor improvement vividly demonstrates the industry's continuing strong application support for PC markets.

Mike Bonner
Stratham, N.H.

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Long-term planning is strictly for the birds

Ken Harris

The best laid plans of mice and men often giang aplookt. And when that happens, no one remembers that the five-year forecast was based on scientifically quantifiable formulas that precisely captured the relationship between robust results and the plan's magic dust.

On the other hand, when you give your customers what they want, when they want it, they don't even care if you exactly fitted Insert A into Slot B.

We're in the retail fast-food business. Speedy chicken is our thing. Isolated, monolithic, intergalactic plans are not. Our restaurant associates use terms like "quick service," "limited time only" and "the competitor down the block." In restaurants, two minutes is a long time to wait. We in IS need to think the same way.

We need to focus on results, not process.

At best, our long-term strategic plans should only aim for directional accuracy. They should not prohibit contrary tactical decisions. Our short-term plans should be developed with erasable ink, communicated via mantra and, most important, validated by results customers want.

Plans take valuable time to prepare and tend to lock people into channels of thought, action and investment. We instead follow two maxims: 1) "Since some pieces hit the floor, cook extra chicken," and 2) "Throw away expired product, regardless of the cook's pride in it."

IS lives in the same environment as the front

MICHAEL SIGGINS

line of our business: fast paced, customer-pleasing and certainly not chicken-hearted about taking risks. We've found service success requires short-term delivery, hands-on prototypes, small project teams and large doses of direct, immediate customer feedback. And, because most customers don't eat the wrapping, we simply eliminate the paperwork.

There is a dramatic cultural shift here. This is not a way of operating that can work in the context of a formal planning process, but it sprouts wings when seasoned with a heavy dose of communication — "surroundsound," as we call it. That's an organizational frenzy for constant, thorough, informal communication involving everyone, conveying a willingness to change and engendering respect, quality and empowerment.

In short, it's the essence of leadership.

And leadership is not just for quick-service restaurants. Today, every business and business function is being squeezed to reduce overhead, improve customer service and shorten the time to market for new products. In fact, the longer and more complex the development cycle and the larger the organization, the more that can be gained from leading this chicken across the road.

With customers demanding more, sooner, for less, it's essential to the survival of IS that we find a new paradigm.

Scrap the planning; fry the process. Let's create an environment where results happen because IS professionals are living, breathing and thinking like front-line employees. Let's swap the planning process for a focus on results, with customer satisfaction as the only metric.

Harris is vice president of worldwide information services at Kentucky Fried Chicken in Louisville, Ky.

Bloodless revolution won't work

COUNTER-INFORMATION *by* Michael Schrage

The "Information Revolution" is over. We lost.

For years, we all spoke, shared and believed the gospel that information management was the key to our corporate competitiveness. We honestly thought our abilities to process and package data empowered our organizations. Well, we were wrong, and we should have the guts and integrity to admit it.

Take a look at the numbers. Morgan Stanley's Stephen Roach, Harvard's Gary Loveman and a slew of other economists offer damning evidence that our huge technological investment in white-collar productivity has virtually no measurable return. The truth is that U.S. companies still spend billions of dollars every year on information technologies, with very little to show for it.

That's why words like "outsourcing" and "downsizing" now define budget allocations. That's why more and more companies now view information technology as administrative support, rather than strategic necessity.

So what happened? We fundamentally misunderstood both our technologies and organizations. The IBMs, the DECs, the Microsofts, the management gurus — and all of the companies that bought into their infoshticks — believed technology created value by making it easier for organizations to access, manipulate and transmit information. While that might be true to an extent, it reflects an essential ignorance of how organizations really create value.

Information doesn't create value — people do. Indeed, it is the relationships between people that generate value in the enterprise. By viewing the world solely through the lens of information, we guaranteed that we would have a warped perspective of our design challenges. Humans are "information processors." But if that's how we treat people, should we be surprised that the Information Revolution has yielded such puny productivity results?

That's why this column is called "counter-information." Being counter-information doesn't mean you're "pro-nonsense." It means you recognize that a better balance has to be struck between the information imperatives of an organization and the relationships that really make it run.

Instead of simply asking, "What's the critical information that people need, and how do we get it to them as swiftly and efficiently as possible?" network architects have to start asking, "What are the key relationships both inside and outside the firm, and how can we use the technology to augment them?"

Where do you think the value of a Sabre reservation system is? In the information it manages or in the customer communities it creates? The answer is, of course, "both."

But when Max Hopper writes the definitive piece on Sabre for the *Harvard Business Review* and doesn't use the word "relationship" once, something is wrong. When companies such as IBM and DEC argue, in the face of customer skepticism, that their techno offerings will boost "information productivity," something is wrong.

Certainly information matters. But quality relationships — relationships that generate innovation and ideas — should matter more. If you focus your design efforts on managing information, you will end up with networks that do a great job of managing information. That's it. Your design implicitly says your organization values information management over people management.

If, however, your network architectures are explicitly designed to encourage and support productive relationships between people (instead of between people and information), chances are your organization will tap talents and abilities you didn't know it had. That's the revolution that matters.

Schrage consults and writes about how technology reshapes the way people interact. He is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science and author of a book on collaborative technologies, *Shared Minds* (Random House, 1990).

Life is full of tough choices: A performance car vs. a practical car. A job that satisfies your pocketbook vs. one that satisfies your mind. A disk storage solution that offers speed vs. one that offers complete data availability. Well, the last choice just got easier to make. Because now there's the Symmetrix 5500 ICDA,™ from EMC.

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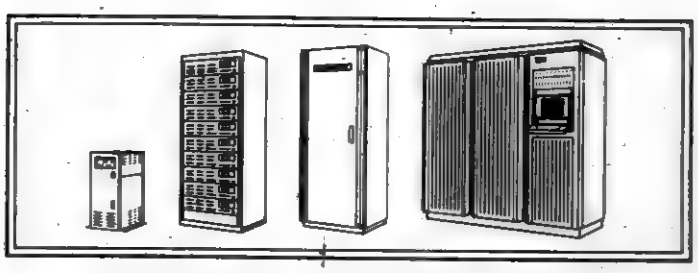
But the benefits of the Symmetrix 5500 don't end there. It also offers high

The disk storage syste for speed. The disk the right is known for Fortunately, they'r



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

that all add up to a maximum return on your storage investment.

So if you can't choose between a disk storage solution that offers speed and one that offers continuous operation,

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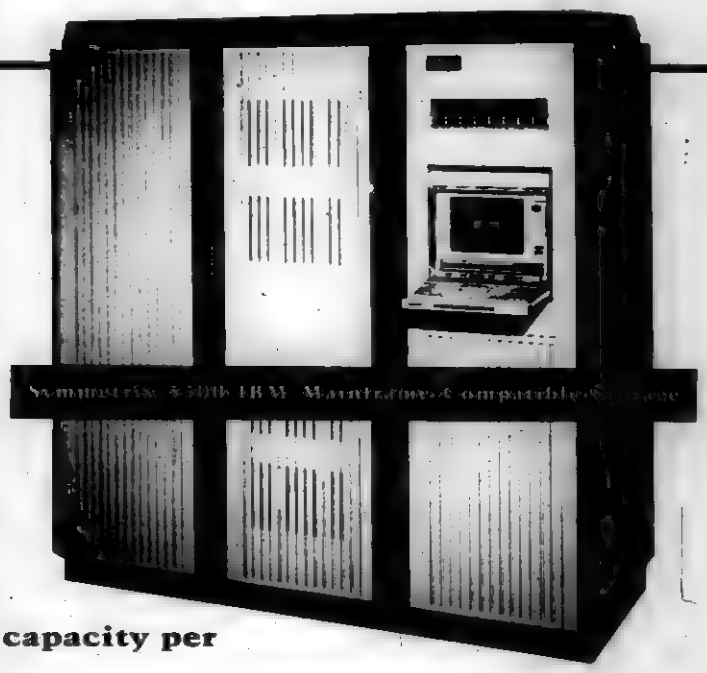

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Charles Babcock

Alpha's real appeal

DEC's new Alpha architecture resembles the Apple Lisa in more ways than one.

Like the Lisa, it is a strongly conceptualized system, with a number of advanced ideas incorporated into one package. And, also like the Lisa, Alpha sometimes seems as though it is a step or two ahead of its time.

Does the world really need a 64-bit architecture?

> PALcode has been lightly described as Alpha's "underwear."

Well, no, most of the world doesn't. The number of address spaces a 64-bit system can address is a very large number — one that only a Ross Perot statistician, used to the dimensions of the national debt, could enumerate. Meanwhile, only the largest sites and customers have outgrown the virtual memory limits of 32-bit systems — 4G bytes — and for the most part, they can find ways around those limits short of a leap to 64-bit.

Nevertheless, Alpha is intriguing on several points, not the least of which is its Privileged Architecture Library, better known as PALcode (see story page 67).

Terry Shannon, the DEC-watcher analyst in Ashland, Mass., once lightly described it as Alpha's "underwear," and the term isn't entirely inappropriate.

PALcode in a sense is neither hardware nor software but rather a hidden layer beneath the visible parts of the system that gives Alpha its ability to run more than one operating system.

Circuit booster

With any computer design, a set of decisions must be made as to what can be managed within the logic chip and what should be traded off as external functions.

In large systems, manufacturers put functions such as memory management, interrupts and context switching into microcode. Users sometimes roll their own by writing assembly language routines. In the world of the PC, BIOS library routines take over the chores. In Alpha, PALcode substitutes for microcode and BIOS.

Through PALcode, DEC freed Alpha's RISC chip circuitry of any speed-impinging tasks. When an Alpha system is booted, a hardware dispatch orders the correct PALcode to be loaded into main memory from a FlashPROM. Thus the functions external to the chip are discharged by instructions that are tightly coupled to the rest of the system, much like microcode. In this sense, PALcode merely duplicates microcode and represents no advance.

Flexibility breakthroughs

But what DEC has really accomplished in PALcode is a measure of flexibility that has eluded system designers in the past.

PALcode for different operating systems can be loaded into one FlashPROM — Alpha currently ships with both VMS and OSF/1 PALcode on board — and there's no barrier to adding another operating system, such as Windows NT, as it becomes available.

Perhaps more importantly, both the underlying Alpha circuitry and the operating system can change, but DEC guarantees that the interface between them will remain the same. Even the PALcode instructions underlying the interface can change to optimize performance, which gives DEC considerable flexibility in future chip design.

In this sense, PALcode is a kind of new "social contract" between hardware optimizers and the developers of operating systems and other external layers, who remain interested in rich functionality.

Each world is now free to pursue its own goals as rapidly as possible with the PALcode interface as the only thing fixed between them. Across that interface, each party can be sure of shaking the other's hand.

Babcock is *Computerworld*'s technical editor.

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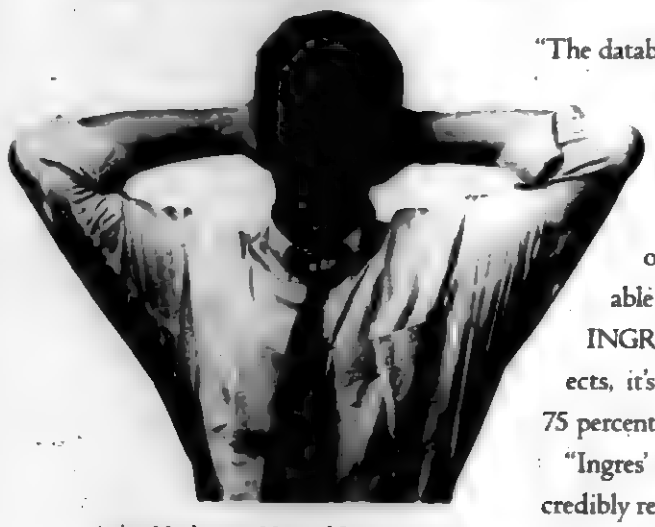

Anders Nicolausson, National Systems Manager, Construction Market Data, Inc., 250 employees in 15 U.S. offices.

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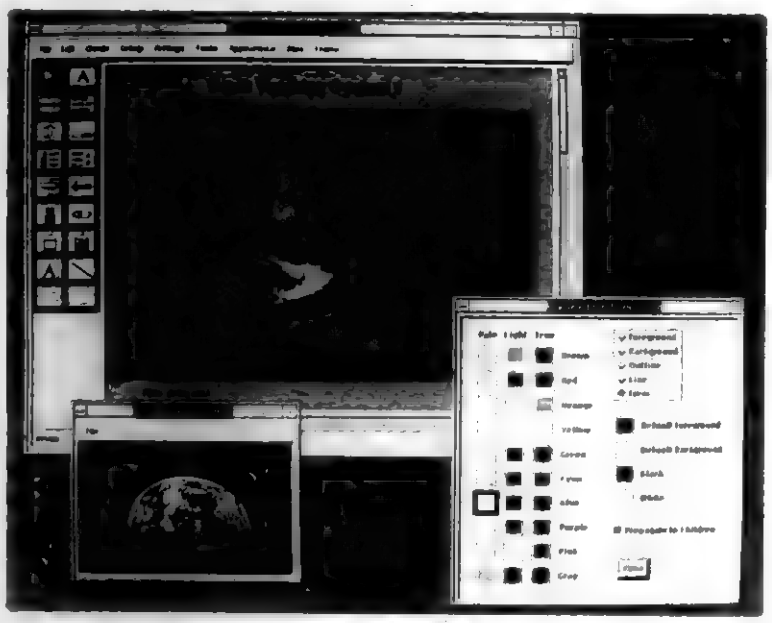

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Carrying the load

Airline loads up on Mac system

By James Daly
DALLAS

Ever wonder how an airplane gets and stays up in the wild blue yonder? In addition to some elementary rules of physics and rocket-like engines, it also depends on a tricky internal balancing act called load balancing.

The success of any flight is dependent on an adequate load plan, a critical guide that instructs the ground crew how to load freight around the plane's center of gravity so that the aircraft will fly efficiently and safely.

Load planning on a major airline is a complicated process that can take up to six hours and often involves numerous ground personnel, more than 100 load agents and sophisticated computer systems. Multiply that single flight by the more than 2,300 domestic and international flights flown by American Airlines every day and you are talking a serious logistical challenge.

Although it is still a complicated matter, load planning has gotten a little easier for American. At its System Operations Control (SOC) Cen-

Airline, *page 41*

ON SITE

American Airlines
Dallas

Challenge: To efficiently manage the aircraft load planning process.

Technology: Expert system running on Apple's Macintosh and developed using Neuron Data's Nexpert.

Results: Increased load planning capacity by 300 flights in six months without adding load planning staff.

IBM values ValuePoint

PC line means more orders, satisfied customers for Big Blue

By Michael Fitzgerald
WHITE PLAINS, N.Y.

■ While IBM PC Co.'s ValuePoint announcement pales in comparison to Compaq Computer Corp.'s record-shattering Prolinea debut, it has nonetheless managed to give IBM a needed boost in orders and in visibility with customers.

ValuePoint has clearly opened doors previously closed to IBM because of the company's historically high prices. One such site is Midas International Corp. in Chicago.

"We haven't used any IBM PCs for a long time, but we are looking seriously at ValuePoint," said Ashvin D. Dave, director of systems and operations at Midas.

ValuePoint has generated an uptick in orders. Recent research by WorkGroup Technologies, Inc. in Hampton, N.H., showed that IBM orders through dealers are up 17% since ValuePoint was announced.

"IBM has seen nearly a 20% increase in orders since ValuePoint was announced, and that's not bad at all," said John Dunkle, WorkGroup Technologies' president.

Yet while ValuePoint has halted a steady IBM decline, it has not given IBM the same jump in the sales cardiogram that Prolinea gave Compaq.

"Prolinea is probably one of the best-orchestrated launches that we've seen for a while, and they coupled it with such dramatic price drops that it would be hard to match that kind of single impact," said Dan Ness Jr., an analyst at Computer Intelligence in La Jolla, Calif.

Frenzied fall season

Ness said IBM has made such a dizzying flurry of announcements this fall that "I don't even know if people realize how much they've done. It's the difference between a thunderstorm and a long season of showers," he added.

But while the Prolinea/DeskPro I announcement had greater impact, "ValuePoint . . . has exacerbated the price wars, and I think it's going to have a corrosive effect on the market over time," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Computer Intelligence's user surveys show that ValuePoint has helped IBM halt a long-term decline in market share. Ness said he expects to see the company hold flat this period, the first such two-month blip in more than a year.

In part because of a burst in customer interest, resellers expressed little concern that ValuePoint has not had the same dramatic sales pop as the Compaq products did.

"I don't know how you can compare [the two]. Compaq was the first guy in, and no one expected Compaq to be that aggressive [on pricing], while IBM's was pretty well preannounced," said William Tauscher, chairman and chief executive officer of ComputerLand Corp. in Pleasanton, Calif.

Coming back

Still, Tauscher and other resellers said they have witnessed a strong boost in interest for IBM, thanks to ValuePoint.

"I've been amazed, actually — we had to move away from [IBM] because of their pricing, and now with the three-year warranty [on Personal System/2s] and the 24-hour Helpware line and ValuePoint, we definitely see a resurgence" of interest, said Edward Phelan, president of Connecting Point of Boulder in Boulder, Colo.

Low-cost lines appear to be in vogue, as Dell Computer Corp. and AST Research, Inc. have both experienced big volume increases driven by low-cost lines. Apple Computer, Inc., the first major PC vendor to take the plunge into low pricing, started things off with its Macintosh Classic line.

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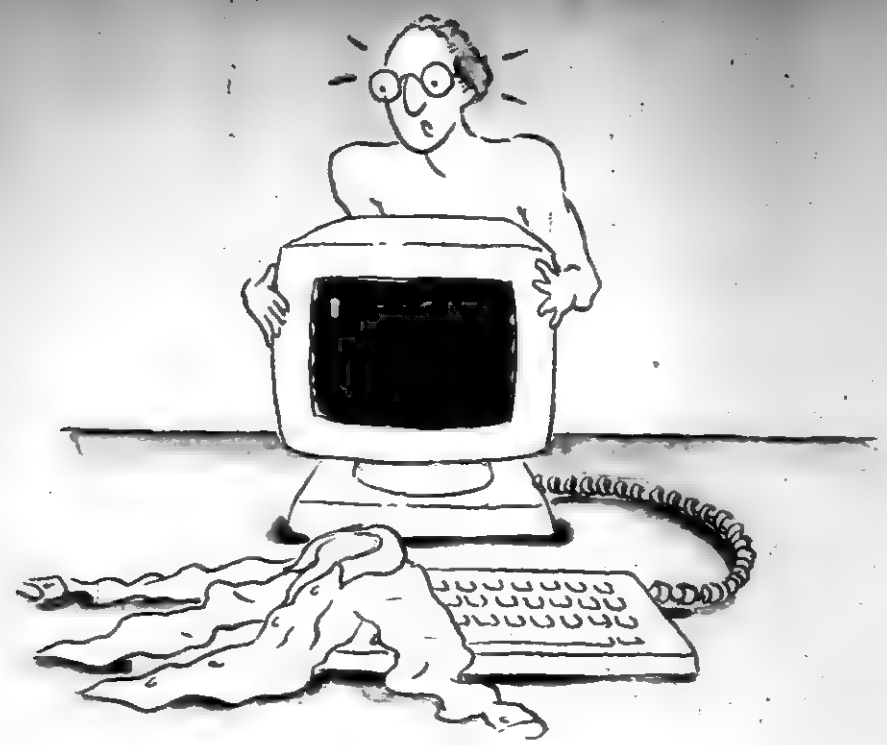

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Acrobat eases file transfer

By Christopher Lindquist

Transferring files between different computing platforms is not so tough, right? Convert all those documents to ASCII and they will work fine. Of course, seeing your document as plain text on a Macintosh after you spent hours making it picture-perfect on your PC is aggravating at best. And what about those graphics?

Adobe Systems, Inc. hopes it has the answer. As a side benefit, Adobe hopes to save some trees as well.

The technology, called Acrobat, previously code-named Carousel, allows for cross-platform transfers of documents, including text, graphics and font information. The documents could be viewed, not edited, using an Adobe Viewer on Unix, DOS, Microsoft Corp.'s Windows or Apple Computer, Inc. Macintosh systems. For example, a company newsletter could be distributed over a network and seen in the same form by engineers on Unix workstations, Macintosh users in the art department and accountants on PCs.

> What lies behind the technology is a new, transportable file format called the Portable Document Format.

Significant development

"I think it has a lot of significance," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "It will eventually be that critical factor that allows us to transfer files between computers over long distances." Bajarin noted that Adobe's ability to leverage the de facto PostScript page description language gives it an advantage over other document-oriented companies that may be contemplating a similar document interchange strategy. That, in turn, could translate into industry acceptance, both by software vendors and users. "Eventually, it will probably permeate through the entire industry," he added.

What lies behind the technology is a new, transportable file format called the Portable Document Format (PDF). PDF files are created by intercepting and "distilling" PostScript files before they are sent to a file or the printer. Because PostScript is used by thousands of applications on several platforms, creating the PDF files would require a transparent step in the document creation process. And once it is in PDF format, the file could be transferred to anyone with a viewer on any system.

The benefit is that documents that at one time would have needed to be printed, copied and distributed could now be stored and viewed electronically and printed only as needed, saving paper, money and trees. "We need to stop thinking of computers as paper producers," said John E. Warnock, chairman and chief executive officer at Adobe. Today, "all applications are dedicated to producing paper."

Warnock also noted that studies have shown that if paper use continues to climb at its current rate, it will only be a matter of a few decades before there are simply no trees. "If you follow the curve, you run out of trees," he said. "You have to change. There's no option."

The first stage of Acrobat's release, due sometime next year, will consist of a PDF Writer, an Acrobat Distiller for collecting document information and a Viewer. The first platforms to be supported will include DOS, Windows, Unix and the Macintosh, with OS/2 support coming shortly thereafter.

Later stages of Acrobat are expected to include text searching, character recognition and editing capabilities, as well as video, sound and document-management features.

Airline loads up on Mac system

CONTINUED FROM PAGE 39

ter near the Dallas/Fort Worth airport, American's Assistant Load Planner (AALP) has taken over a significant portion of the process. Perhaps more importantly, the 18-month-old Apple Computer, Inc. Macintosh-based setup has become another shining example of how knowledge-based systems are being effectively applied to mainstream business problems.

It has given the airline an important tool for expanding service and staying competitive, allowing it to increase its load planning capacity by 300 flights in only six months without increasing staff. The result is that "we've been able to off-load about 30% of the load planning task onto AALP," said Lynden Tennison, managing director of the knowledge systems group.

Today, AALP handles much of the scut work that forms the initial part of the load planning process. In that first step, a week's worth of historical data on past flights in a particular route is downloaded from a mainframe host in Tulsa, Okla. This information includes averages for the number of passengers as well as freight, baggage and mail weights and is compared with data for the upcoming flight.

Then, the knowledge base provides recommendations for the selection of the runways, as well as a forecast of the takeoff temperature. Aircraft flap settings and load distribution are also entered into the system. With this information, the knowledge base provides the optimal plan for the distribution of the baggage, freight and mail.

Before AALP, Tennison said, agents were spending a third of their time in this initial decision-making process, so the airline decided to build a tool to automate this process.

Tennison's staff developed the system using Neuron Data, Inc.'s Nexpert Object. The Macintosh was chosen because "its graphical interface is so well-suited to the kinds of tasks we have to do," Tennison said.

Until AALP's implementation, the 325 Macintoshes in the SOC were primarily used for terminal emulation to the mainframe host. Tennison said his staff also needed a development tool that could be easily integrated with SuperCard and C because those were the supporting languages in the graphical user interface and communications functions.

The AALP display also provides an agent with a graphical representation of the current load plan that offers a valuable mental picture of the baggage storage.

The scheduling knowledge base also contains a record of every flight and its departure time and triggers a 60-rule knowledge base into action four hours before each flight. For example, Flight 1236 might be scheduled to depart from Chicago's O'Hare Airport at 2:04 p.m. At 10:04 a.m., the knowledge base automatically accesses the mainframe host. AALP then determines the average mail, baggage and freight loads from past instances of Flight 1236 as well as passenger booking, current weather information and the type of aircraft assigned to the upcoming flight. The system then plans the distribution.

Up until flight time, load agents access and revise the plan with information such as updated fuel figures and changes in weather conditions. Within an hour of takeoff, the plan is sent to baggage handlers for loading. Finally, a radio closeout of the plan is dispatched to the cockpit just minutes after the aircraft is backed off the gate.

Flying high

Key goals for American's Assistant Load Planner project:
- Help to ensure safe, efficient operation of flights.
- Improve productivity of load planning staff.
- Add consistency to load planning function.
- Decrease costs through improved fuel burn rates.

Paul Gillin

Comdex cliches

"So, how was Comdex?"

If you're as tired as I am of that question, perhaps you'll sympathize with some of the other favorite frustrations of this frequent show goer.

In other words, I'm going to scream the next time:

I see a keynote session used by some vendor CEO to demo his products. Bill Gates and Philippe Kahn both did it this year, though Kahn had the good taste not to *say* they were his products. Come to think of it, I think I'm going to scream next time Gates or Kahn gives a keynote address. Anywhere.

I see a boothful of IBMers dressed in matching golf shirts. Has this become the blue pinstriped suit of the '90s?

I hear someone accuse Microsoft of being a proprietary standards company just because it doesn't favor the proprietary standards that everybody else who is against Microsoft favors.

I have to wait in a cab line.

Someone tells me how crowded his flight was.

Someone tells me how late his flight was.

Someone tells me how cheesy his hotel is.

Someone tells me how late he was up last night.

Some vendor tells me it's targeting the corporate market. My favorite corporate market-seeker this year was the guy with the Windows utility that makes screaming and crashing noises when you click on icons. Corporate America is holding its breath for this breakthrough.

I hear some consultant say IS departments should be more in tune with the business. People get paid to say that. Really.

I see someone use Elvis to sell PCs. (Conversely, I'd love to see someone use Monty Python to sell PCs.)

I hear someone say Windows NT is "solid." If it's so solid, why isn't it available?

I hear someone ask, "So, how's the show for you?"

A vendor says, "You mean you've never heard of us?" with the same righteous indignation as if I had just insulted his mother.

Some vendor says it'll be shipping its product by late December. Why is it that with all the work being done all over the industry, everything just barely squeaks out the door by late December?

I hear a vendor tell users what they want. Shouldn't it be the other way around?

I hear something described as a "paradigm shift." My paradigms have shifted so many times I need new glasses.

A vendor describes itself as "the best kept secret in the industry."

A cabbie asks, "So, you in computers?"

I hear a speaker say business is going to be more competitive in the '90s. If you don't think that, you're probably looking for a job right now.

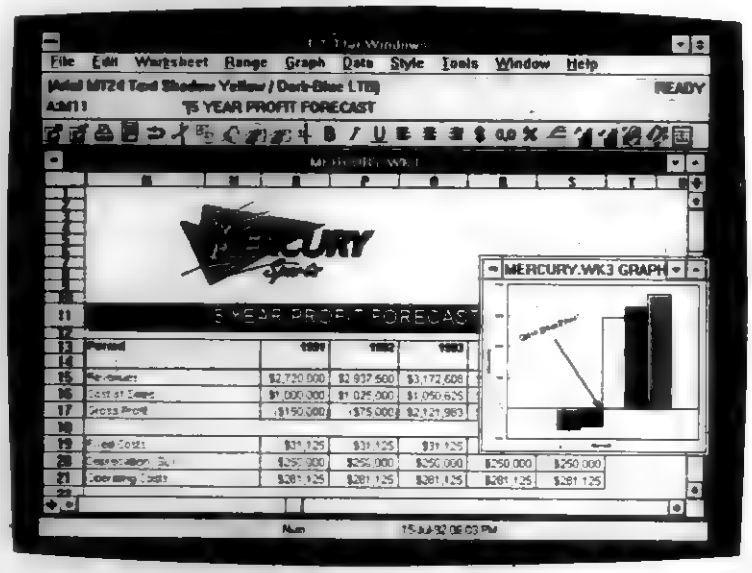
I hear a speaker say IS people live in the glasshouse or are mainframe bigots. C'mon, the early '80s are over.

I have to go to Comdex.

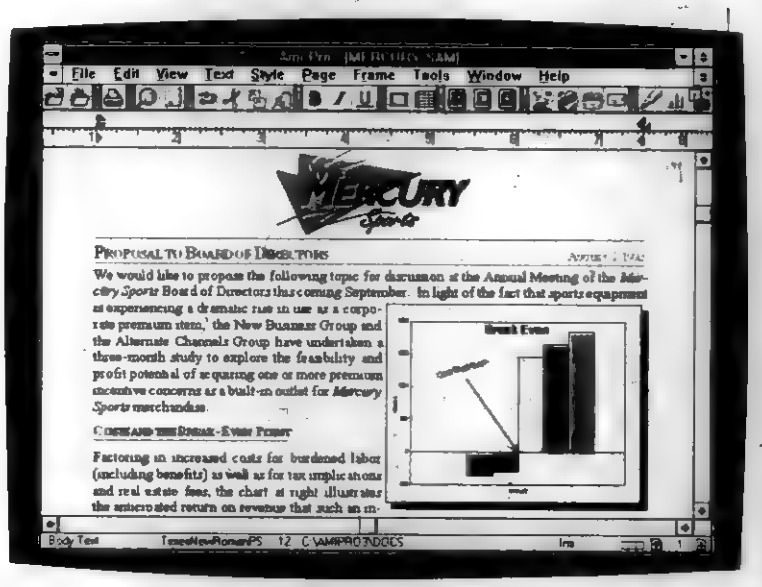
On the other hand, all things considered, I'd hate to miss it.

Gillin is *Computerworld*'s executive editor.

Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.

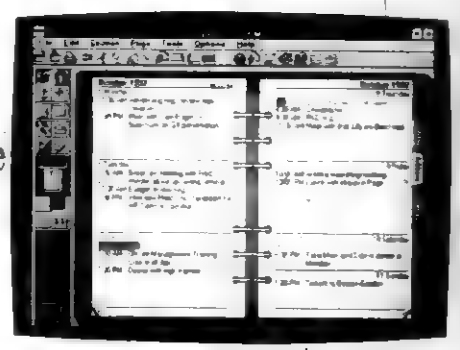


Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite and Microsoft Office include full-featured products. But SmartSuite has been recently updated to include 1-2-3 for Windows Release 1.1 with SmartPak and the newly released Ami Pro 3.0, as well as Freelance Graphics and cc:Mail.

All four of these award-winning products share a common interface as well as our innovative SmartIcons.™ So when you've learned one, you've learned them all.



For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products, for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint. You can even move

*Offer expires 12/31/92 or while supplies last. **Suggested retail value. ***In Canada, call **1-800-GO-LOTUS.** When you purchase 10 SmartSuite packages, you'll get a free cc:Mail for Windows Platform Pack (a $495 value).
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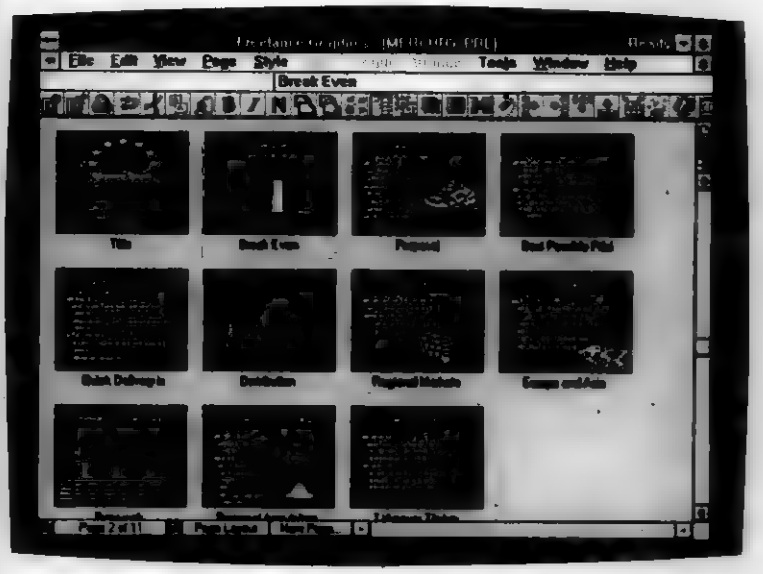
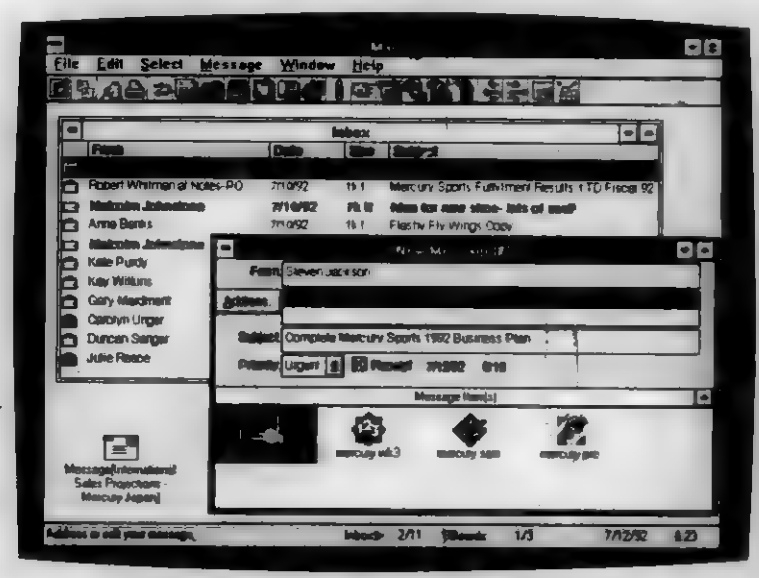
tus SmartSuite, s more like a cubicle.



Award-winning Freelance Graphics is the easiest, fastest way to create a stunning presentation.



cc:Mail, the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

quickly between SmartSuite applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

For one thing, you just can't beat the total value. In fact, for a limited time,* **when you buy SmartSuite, we'll give you Lotus Organizer (a $149 value**) absolutely free.** It includes an on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder that are all fully integrated. Plus if you're upgrading from any version of 1-2-3, Symphony, any Lotus word processor or graphics product, or cc:Mail, you'll save even more. So do the smart thing. Visit your Lotus Authorized Reseller or call **1-800-872-3387, ext. 7239*** for a free demo disk.

Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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Jesse Berst

Embed and conquer

In the last installment, I discussed the TrueType feature of Windows 3.1, its benefits for IS groups and the Font Assistant and Panose type matching in Microsoft's new Font Pack 2.

Now I'd like to alert you to an important but little-known TrueType feature called "embedded fonts." Embedding increases document portability by storing fonts inside a document. When you open that document on another computer, you can view and print the document exactly as it is supposed to look even if the new computer does not already have the correct fonts installed. If there is a problem, it is that embedding will work only if application vendors make use of it.

In theory, embedding can solve a problem that hampers many network administrators — namely, making sure every user has access to the same fonts so that documents posted on the network can be viewed, edited and printed by anyone. Font embedding means you do not have to purchase and install an identical set of fonts for every computer in the company. It also lets you enforce consistency.

> For embedding to work, it must be supported by the font vendors and by the applications.

Possible uses

Here are just three of the many possible uses for font embedding:

- Distribute documents that match the corporate identity program.
- Give a professionally designed computer slide presentation to the entire field sales force with confidence that it will display properly on any Windows computer.
- Send brochures to branch offices to be "customized" for local conditions without losing the look you want.

It's up to font vendors to decide what level of embedding to allow. The lowest level is no embedding.

The next highest level is "Preview and Print." Under this option, Windows 3.1 temporarily installs the fonts on the receiving machine. You can preview the document on the screen or print it out. You cannot, however, modify the document. Nor can you use the temporary fonts with any other application.

The next level up is "Editable," which allows you to modify and print the document. This option lets you start a document on one computer and finish it on another. You cannot, however, save the document under a new name or use the fonts in any other document. Closing the document deletes the temporary fonts.

Finally, the highest level is "Installable." When you move the document, Windows automatically installs the fonts on the new computer, where they can be used by other applications. The fonts that ship with Windows 3.1 and with the first Microsoft Font Pack are installable.

Does embedding sound like the solution to some of your document interchange problems? Not so fast. For embedding to work, it must be supported by the font vendors and by the applications.

Most of the hard work falls to the applications developers. They must modify their applications to use font embedding. Unfortunately, Microsoft didn't do a good job of explaining why, when and how to make these modifications. As a result, only a handful of applications can take advantage of font embedding right now.

Things should soon begin to change for the better. For one thing, Microsoft is releasing a Dynamic Link Library (DLL) that handles most of the basic chores (such as deleting the temporary font). Developers can simply link to this DLL so they don't have to write all of the functions themselves.

For another, Microsoft has made embedding more palatable to font vendors. It did not want to support an embedding scheme that would let people have unlimited use of its fonts without paying for them. Microsoft's new "Editable" format lets it provide value to users without giving its fonts away.

So here's my alert to IS professionals and developers: If you want to improve the portability of your documents, start looking for applications that support embedded fonts. And if you are developing custom solutions for documents, you'll want to modify those custom applications to support font embedding.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Newton to 'talk' with Hobbit

By David Kellar
TOKYO

Apple Computer, Inc. is working to ensure that the fax, modem and phone functions of its Newton personal digital assistant are compatible with wireless communicators based on AT&T Microelectronics' Hobbit chip set, said Apple Senior Vice President David Nagel at the recent Multimedia '92 show.

Though design and functionality will differentiate Newton from Hobbit-based units such as EO, Inc.'s recently announced Personal Communicator, it will be difficult to attract users unless Newton offers standard communications functions and data exchange compatibility, Nagel said.

This compatibility will be offered through the use of standard file formats and common transmission frequencies, said Frederick Bullock, market development manager at Apple Pacific. "We are currently talking with McCaw Cellular Communications, Northern Telecom and other wireless service providers to make sure we have access to frequencies that allow common data exchange."

> It will be difficult to attract users unless Newton offers standard communications functions.

Apple's Newton will incorporate both infrared and cellular signal transceivers to enable "wireless LAN and wireless WAN" communications functions, Bullock said. The infrared unit will allow a user to automatically update Newton's scheduler and phone directory with data from a PC, while the cellular module will enable wireless fax, modem and phone communications.

Apple's projected release date for the Newton is still "sometime next year" because of the unpredictable nature of software development. "The hardest part of this product is the software," Bullock said, "because we must be sure to provide just the right functionality, intelligence and ease of use, and we must customize functions for each local market."

Several companies are expected to release wireless communicators in 1993. Newton will be marketed by both Apple and development partner Sharp Corp., while EO's Personal Communicator, slated to reach the market in the second quarter, will be sold through AT&T Phone Center stores. NEC Corp. and Toshiba Corp. also announced their plan to develop Hobbit-based products for release next year.

Kellar is a Tokyo correspondent for the IDG News Service.

[redacted]

Systems

Number Nine Computer Corp. has released the #9GXE graphics board.

The product is the first graphics board to use the 86C928 graphics accelerator chip from S3 Corp. The #9GXE was designed as a graphics solution for graphical user interface and Microsoft Corp. Windows environments.

The range of features includes high-performance Video Graphics Array support and zero-wait state for optimal bus performance. A #9 HawkEye Feature Set comprised of HawkEye's Virtual Resolutions, the HawkEye Zoom, the HawkEye Exchange, the #9 Chameleon Cursor and the #9 Smart Mouse is provided to enhance Windows productivity.

Prices begin at $495.

➤*Number Nine Computer*
18 Hartwell Ave.
Lexington, Mass. 02173
(617) 674-0009

Peripherals

Epson America, Inc. has introduced the FX-870 and FX-1170, enhanced versions of the company's FX-850 and FX-1050 nine-pin printers.

According to the company, the new models operate up to 30% faster than their predecessors and offer additional paper-handling features. The difference between the FX-870 and the FX-1170 is found in the carriage width. The FX-870 is narrow, with 80 columns, and the FX-1170 is wide, with 136 columns. Within SuperDraft mode, both products print up to 380 characters per second; they print 68 characters per second in Near Letter Quality mode.

The FX-870 costs $499; the FX-1170 costs $699.

➤*Epson America*
20770 Madrona Ave.
Torrance, Calif. 90509
(310) 782-0770

Fujitsu Computer Products of America, Inc. has introduced the PrintPartner 10W and the PrintPartner 10 laser printers.

The PrintPartner 10W has an Advanced Micro Devices, Inc. 2900 15-MHz reduced instruction set computing processor and is optimized for Microsoft Corp.'s Windows 3.1 environment. Features include 35 TrueType outline fonts directly embedded in the printer and Microsoft's TrueImage page description language.

Both printers offer multiple types of connectivity as well as serial and parallel ports. For Macintosh connectivity, the 10W has an Apple Computer, Inc. AppleTalk port.

PrintPartner 10 costs $1,995, while the 10W costs $2,450.

➤*Fujitsu Computer Products of America*
2904 Orchard Pkwy.
San Jose, Calif. 95134
(408) 432-6333

Fax

TGI Technologies Ltd. has released Version 1.6 of SCI NET 2000, a multiline fax management system for Novell, Inc. networks.

SCI NET 2000 allows an unlimited number of users to send fax messages directly from their Microsoft Corp. Windows applications and from DOS applications. Notification of sent or received fax messages is instantly made via Novell's messaging service feature. The system also offers a new fax broadcast feature that enables a user to send a document to 5,000 destinations.

SCI NET 2000 costs $995.

➤*TGI Technologies*
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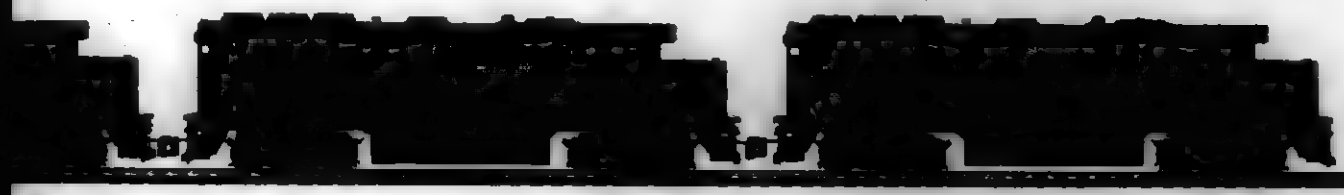
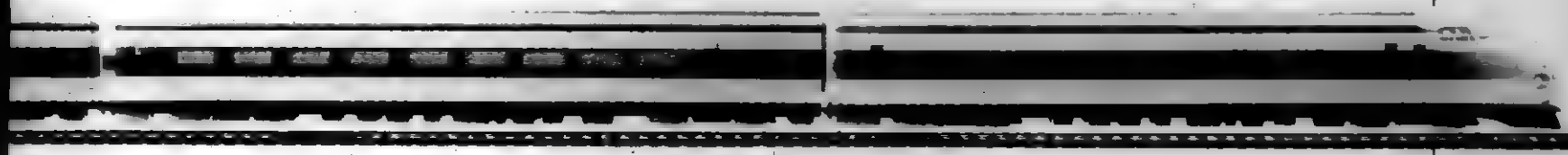
Why combine a number of SPARCstations,



when a network of HP workstations and X stations operates for less?



It just stands to reason. The more engines, the more cost. Not only in initial purchase price, but system administration, backups and OS updates. That's why more and more people are getting on board with an HP workstation/X station network. A powerful engine that carries plenty of passengers.

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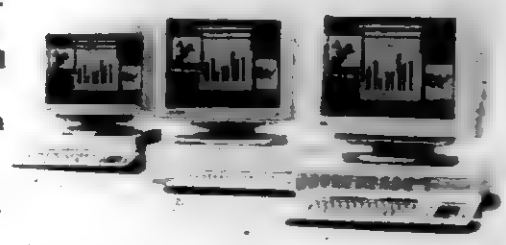

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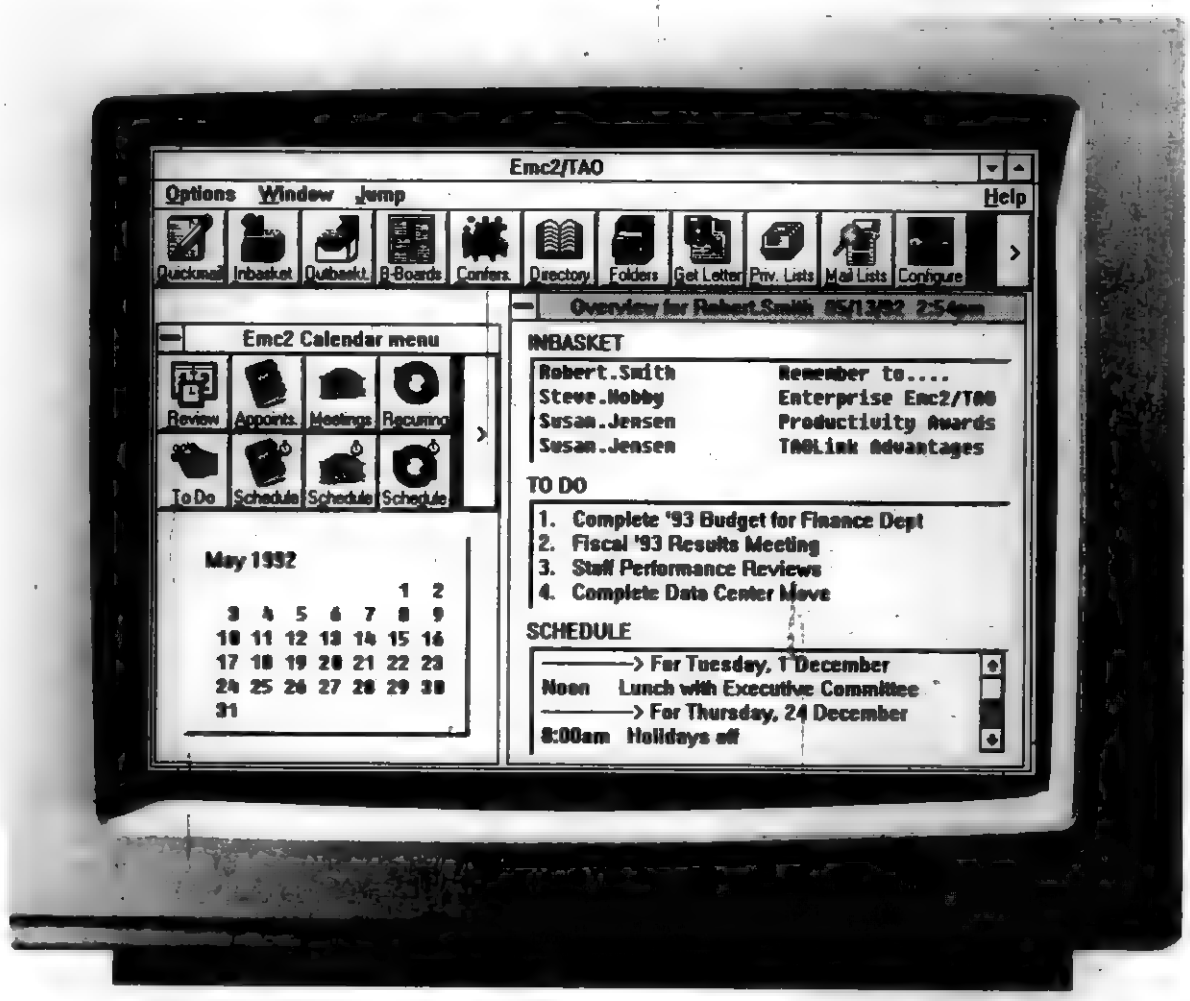

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CA begins work on E-mail software for local-area networks

By Rosemary Cafasso

Computer Associates International, Inc. said it is not interested in jumping on the workgroup computing bandwagon, but it does have workgroup-related projects under way.

A contradiction? Not so, said Marc Sokol, CA's director of product strategy.

"The workgroup term is overused," Sokol said. "These days, anything on a network is considered workgroup. We don't see workgroup as a [separate] strategy. We see it as a component of our other strategies," which include system management software, microcomputer software and application development.

David Marshak, an analyst at the Patricia Seybold Group in Boston, said the CA strategy makes more sense than charging into the market with a workgroup product line.

"It's a difficult game to break into now because you have to position against Notes," Marshak said.

"For a company like CA, the approach sounds correct," he added.

LAN version for E-mail

Nonetheless, CA is working on a local-area network version of its mainframe-based electronic-mail software.

CA-E-mail LAN should be shipping by mid-1993 and will be targeted at its installed base of mainframe E-mail users, Sokol said. As a result, CA-E-mail LAN will not be sold through the retail channel.

"We will not go head-to-head with CC:Mail" from Lotus Development Corp., Sokol said of the leading LAN E-mail package.

Resorts tee off with server-based reservation system

By Maryfran Johnson
MYRTLE BEACH, S.C.

Tangled tee times and cranky golfers rank among the top nightmares of the hoteliers and golf course owners along the Carolina coast's Grand Strand resort area.

This sun-soaked, 80-mile stretch of the North and South Carolina coastline plays host to an estimated 2.7 million rounds of golf each year, which pumps tourist revenue of roughly $350 million into the local economy.

What better place, then, for the world's largest computerized tee-time reservation system?

PAM PRESTON

Golfing *in North and South Carolina accounts for approximately $350 million a year in revenue*

24-hour service

"We've got 45 courses and 17 hotels hooked up to the system now," said George Hilliard, general manager of the Grand Strand Tee-Time Network, which is run by the Grand Strand Executive Golf Association. "The hotels can provide much quicker service to their guests and make tee-time reservations around the clock now."

The technology behind the Grand Strand network, which made its debut last spring, is an IBM RISC System/6000 Model 950 server running a customized reservation system designed by Aptech Computer Systems, Inc. in Pittsburgh.

The network was built to the specifications of the golf courses and hotels at a shared cost of "well over $1 million," Hilliard said.

Annual membership fees from the golf association help maintain the system, which relies on a single, on-site systems administrator and Wheeler Computer Services in Myrtle Beach for technical upkeep.

There is also room for growth on the Model 950, which could eventually accommodate 75 golf courses and 50 hotels.

Challenging setup

Setting up the telecommunications portion of the network was especially challenging because each hotel and golf course had to tap into the RS/6000 with its own IBM PC or clone machine, ASCII terminals and printers. In one case, a connection had to be established for an old IBM System/36 machine.

"This is a new arena for computer advances," said Paul Veltri, marketing manager for the Tee-Time Reservation program at Aptech. "It's pretty much been a pencil-and-paper operation in

Resorts, *page 49*

ON SITE

Grand Strand Executive Golf Association
Myrtle Beach, S.C.

Challenge: To manage tee times for rounds of golf at 45 courses.

Technology: IBM RS/6000 Model 950 running a customized reservation system designed by Aptech Computer Systems.

Benefits: Hotel guests can schedule an entire week of golf on a computer screen with a two-second response time instead of having hotels make 15 to 20 phone calls.

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Your entry should be a custom program currently in use (not a prototype), and not for resale.

It should also be either an entirely new application, a modification of an off-the-shelf application, or a Windows front-end for a host application. And of course, it should require Windows.

Entries will be accepted in the following eight industry categories: 1) Manufacturing, 2) Finance, 3) Insurance/Real Estate, 4) Transportation/Communications/ Utilities, 5) Services/ Professions, 6) Wholesale/ Retail/Distribution, 7) Government/Public Administration, and 8) Other.

Call for Entry.

Just call the WINDOWS WORLD Open Hotline toll-free at 1-800-829-4143, or 1-206-443-3329 to request your official WINDOWS WORLD Open entry kit.*

The deadline for entry is Midnight, February 15th, 1993.

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Microsoft announces plans for Windows NT on shop floor

By Ellis Booker
DETROIT

Mice, trackballs and windowing operating systems have been common enough on the desks of industrial engineers for years. The change is that increasingly powerful PC hardware and standard operating systems are poised to make significant inroads in this once specialized, high-end marketplace.

At the giant Autofact Exhibition and Conference here earlier this month, none other than Microsoft Corp. was pushing its Windows NT-based operating system as a manufacturing platform.

On hand with Microsoft were a number of independent software vendors demonstrating mechanical engineering and design products that use the 32-bit version of Windows. For example, Intergraph Corp. announced that Version 5 of its widely used MicroStation product would be released for NT in the second quarter.

Intergraph was one of more than a dozen developers announcing their commitment to provide Windows NT-based products in 1993.

From a manufacturing perspective, the new products will take advantage of several new capabilities in Windows NT, not the least of which is its built-in support for Transmission Control Protocol/Internet Protocol.

"What's happening is a lot of software has been custom-made for particular environments, and we're seeing it being replaced with modular, more user-friendly systems," said Aleda V. Roth, an associate professor at the Fuqua School of Business at Duke University in Durham, N.C.

> Intergraph announced its commitment to provide Windows NT-based products in 1993.

Roth said this trend is especially evident on the shop floor, where less technically proficient workers are being expected to do more. "Now, less technically skilled people can use computers [to full advantage]," she said.

Making a move

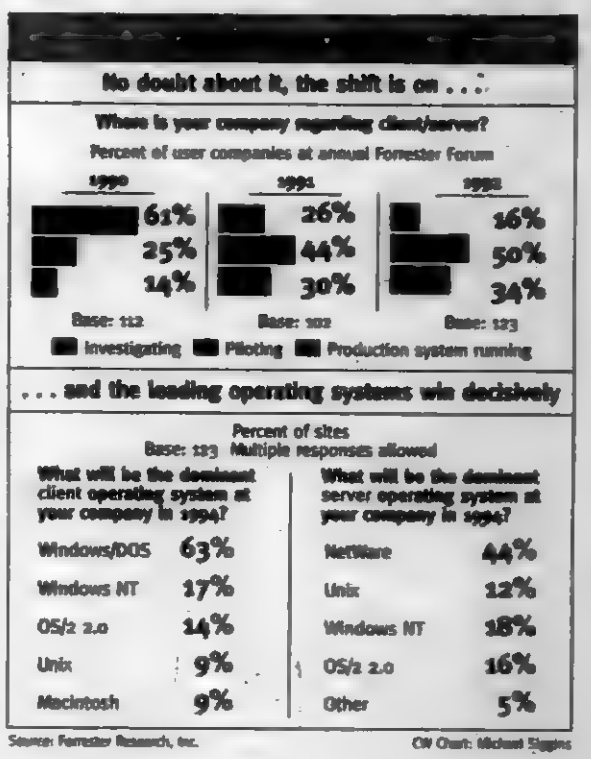
Another indication of this trend was a statement of direction by Autodesk, Inc. that it planned to leverage its position as the leading provider of desktop computer-aided design (CAD) software toward high-end products capable of [addressing] the entire design-to-manufacturing process."

Sausalito, Calif.-based Autodesk said it planned to realize this strategy by internal research and development and technology acquisitions and partnerships. Indeed, at Autofact, the firm announced an agreement with Integrated Industrial Information, Inc. in Raleigh, N.C., to develop and distribute large mainframe-compatible desktop CAD products.

Computervision Corp. demonstrated 18 design and manufacturing packages, including an NT version of its DesignView parametric engineering product, which Computervision said is now available.

Other Computervision products are expected to be made available in 1993.

Still, PCs are not up to some manufacturing tasks, which still demand the very top-of-the-line hardware and software. At Autofact, as in past years, it was left to companies such as Cray Research, Inc. and Sequent Computer Systems, Inc. to show the latest in photorealistic simulation and complex mechanical analysis tools.



Resorts tee off with server-based system

CONTINUED FROM PAGE 47

the past."

The project got its start in 1989, when complaints about the time-consuming, cumbersome manual reservation system were rising. Hotels trying to book tee times for large groups of golfer guests at local courses found themselves making 15 to 20 phone calls.

Fighting the frustration

Changes and cancellations were an additional frustration, requiring another round of phone calls.

"One of the primary reasons this system was even possible goes back to the cooperation that has made Myrtle Beach successful as a whole," said Matthew Brittain, president of the network's board of directors. "The willingness of competitors to agree to share the cost of a system that would make the golf reservation process much more efficient for everyone was what made it work."

Now, an entire week's golf scheduling can be handled automatically, and response time is guaranteed at two seconds. One computer screen can show all or selected tee times at seven courses for a single day, or seven days at one course — and various other combinations.

Secret schedule

The system's security was an important and sensitive point with the officials of Grand Strand courses, which guard their tee-time sheets from competitive eyes, and the hotels, which are loathe to share customer information. Yet the golf courses and hotels recognized the need to swap certain information.

The problem was solved through additional security measures built into the reservation system application and through some of the security protections already built into IBM's AIX operating system, Veltri said. In addition, a 2.3G-byte disk drive unit on the RS/6000 gives the 60-plus users on the system plenty of storage space.

Veltri noted how quickly the hotels found the system to be a marketing advantage, as they discovered how quickly they were able to book and confirm tee times for incoming guests.

The next step the hotels would like to take, Hilliard said, is to merge the tee-time system with their own reservation systems so guests can book their golf time when they call to reserve a room.

Syntax to resell LAN Workplace for DOS

Will add Novell product to TotalNet line of networking software

By Lynda Radosevich
FEDERAL WAY, WASH.

Syntax, Inc. has announced an agreement with Novell, Inc. to resell Novell's LAN Workplace for DOS as part of its TotalNet line of networking software. The company also announced four other additions to the TotalNet line.

Aimed at managers who are trying to network disparate client platforms, the TotalNet products conform to open system standards and can link DOS, OS/2, Unix and Apple Computer, Inc. Macintosh-based workstations to Unix servers.

LAN Workplace for DOS provides DOS and Microsoft Corp.'s Windows users with access to Unix and Novell NetWare-based resources such as file sharing and printing using Transmission Control Protocol/Internet Protocol (TCP/IP). Syntax is packaging the product with its TotalNet for DOS LAN software.

Eight-year-old Syntax offers software that links disparate PC, Unix and Macintosh client platforms to Unix and Novell NetWare servers. The company claims an installed base of 2,000 sites in 500 companies worldwide.

Future plans

In January, the 8-year-old company plans to ship NWserver, server software that enables computers on 30 different Unix platforms to provide file and print services to Novell NetWare clients on an Ethernet network. NetWare users will be able to use the NWserver directories and printers and use the storage space available on the Unix servers.

In December, Syntax is scheduled to release the following:

- **TotalAdmin**, software that lets a network administrator manage a group of Syntax servers from one DOS station using normal DOS commands.
- **TotalBackup**, a software program that allows a network administrator to back up any number of DOS clients from the Unix-based Syntax host.
- **TotalMac**, software that enables Unix computers to provide file and print services to Macintosh computers on an Ethernet network.

LAN Workplace for DOS/Windows starts at $295 per site license. A competitive upgrade price from any other TCP/IP product starts at $95 per site license.

NWserver starts at $1,595 for 10 users; TotalAdmin comes with server software starting at $595; TotalBackup starts at $995; TotalMac starts at $795.

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Now that's good news for anyone buying a Windows spreadsheet. First, we recently updated 1-2-3 for Windows so it now gives you more of the features you've been looking for in a Windows spreadsheet. Second, we lowered the price to just $495.* (Plus, for upgraders, and for a limited time only, we've included the SmartPics Clip-art Sampler absolutely free.)

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Of course, when you come right down to it, there are plenty of other reasons why 1-2-3 for Windows is the best spreadsheet choice you can make.

Better still, we're offering license packs for network users so you can set up your network configurations more cost-effectively. All of which makes Lotus 1-2-3 for Windows the best deal in a Windows spreadsheet.

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1-2-3 for Windows now includes more than 25 new features and usability enhancements, as well as a robust set of GUI development tools.

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commands whenever you choose. Excel, on the other hand, only supports 80% of 1-2-3 Release 2.01 commands. And has no support for releases beyond.

What's more, only 1-2-3 for Windows offers you a better compatibility bridge from DOS to Windows. And unlike Excel, 1-2-3 can read and execute *any* 1-2-3 for DOS file, style and macro.

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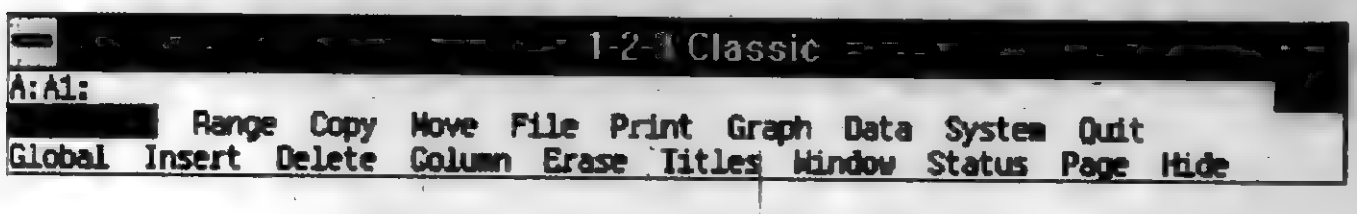

Corporate Computing (8/92) wrote that *"for the experienced 1-2-3 database user, 1-2-3 for Windows with DataLens is the front-end tool of choice."* Excel's data access capabilities rely on a third-party product with limited relational capabilities.

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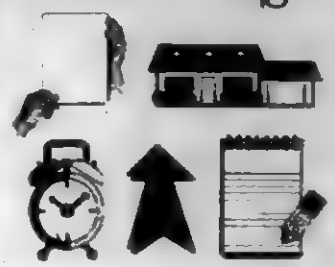

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LAN hardware

North Hills has introduced three local-area network products in conjunction with IBM.

The NH-CAU 5500 is a Token Ring concentrator designed for up to 80 locally attached devices on 4M and 16M bit/sec. Token Ring LANs.

The NH-CAU 5500 reports to IBM's NetView and Network Manager and supports connections over fiber-optic, shielded and unshielded twisted-pair and coaxial cabling.

Support for 20 shielded twisted-pair workstations or a maximum of 80 connections per Controlled Access Unit (CAU) is provided by the LAC-5501.

The product can be plugged directly into IBM's 8230 CAU or the NH-CAU 5500 and operates with 4M and 16M bit/sec. Token Ring LANs.

Users who want to migrate to Token Ring without pulling new wire can use the LAC-5504, which handles coaxial cabling.

Prices start at $1,650.

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Modems

PSI Integration, Inc. has started shipping the PowerModem III and the PowerModem IV internal fax modems.

The products were designed for Apple Computer, Inc.'s PowerBook 145, 160 and 180 computers. Sending and receiving faxes and data at rates of 9.6K bit/sec., the PowerModem III includes V.32, V.42, V.42 bis and Microcom Networking Protocol 2-10, according to the company.

The PowerModem III's actual data throughput can reach speeds of up to 38.4K bit/sec. with data compression.

The PowerModem IV sends and receives faxes and data at rates of 14.4K bit/sec. and includes V.17, V.32 and V.32 bis. Its actual data throughput can reach speeds of up to 57.6K bit/sec. with data compression.

PowerModem III costs $395, and PowerModem IV costs $495.

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Megahertz Corp. has unveiled two Personal Computer Memory Card International Association (PCMCIA) Notebook fax/modems with XJack for palmtop and PCMCIA 2.0-compliant computers.

XJack is a design developed by Megahertz that provides a fully internal but extendable RJ11 jack on the PCMCIA modem card, the company reported. Available in two credit-card-size versions, the fax/modems are the following: CC2144, a 14.4K bit/sec. data/fax product, and the CC224FM, a 2,400/9.6K bit/sec. data fax product.

V.42 advanced error correction and cellular capability are included with both models.

The CC2144 costs $699, and the CC224FM costs $429.

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David Coursey

E-mail invasion

Wireless E-mail draws attention, as the early users of RAM Mobile Data's Mobitex network have discovered.

Sitting in a Manhattan restaurant typing on a palmtop computer beside a somewhat larger radio transceiver generally catches a few eyes. Obviously, you are doing something important, but nobody around you can figure out just what it might be.

Eventually someone asks, and I shift into wireless missionary mode. Sometimes I pull out my SkyTel pager and show receive-only messaging before I get to the piece de resistance: full two-way wireless E-mail. "This allows my office to find me wherever I am and lets me respond immediately to their requests," I usually add with a flourish.

About half the time, a wave of recognition washes across the person's face. If not, I can usually guess what the response will be: "But I don't WANT my office to be able to find me!" It's usually said in the manner of a child facing a dose of some foul, red cough elixir.

Office avoidance

That's a logical first response to technology that seems to enhance the invasion of individual privacy and leaves a bad taste in your mouth. After all, who really wants to be required to check their E-mail, say, every hour, 15 hours a day, 365 days a year. It's really not so bad, but it's an acquired taste, so I prefer to turn the argument around: Wireless E-mail allows me a better way to hide from the office.

How many times, for example, have you stayed at your desk waiting for the phone to ring or a piece of E-mail to arrive? How many times have you hooked a portable to a phone line, just to check your mail? Didn't you have better things to do?

If the answer is yes, then wireless E-mail is an important tool for you, cutting the chains that bind businesspeople to desktops, LANs and telephone lines. It is a time compres-

Coursey, *page 58*

Analysis

Internet security risks

By Gary H. Anthes

■ Despite security and privacy risks, commercial use of the Internet is growing rapidly. However, cautious companies are getting only half a loaf as they try to protect themselves by blocking user access to many Internet resources.

The Internet is a global mosaic of interconnected, multiprotocol networks supporting collaboration in research and education. Data traffic is doubling every six months, and there are now an estimated 7 million Internet users.

> Data traffic is doubling every six months, and there are now an estimated 7 million Internet users.

The Internet's incredible reach and its wealth of software and information resources — many of them free — are proving irresistible to a growing number of commercial enterprises. Many more would no doubt rush to tap into the network if it were not for the threat of worms, viruses and other mischief.

"Our management put off connecting to the Internet for years because of security concerns," said an official at a government contractor firm who asked not to be named. Now, the firm routinely communicates with government researchers on the Internet via electronic mail, and it electronically sends documents that were once carried by couriers or the U.S. Postal Service, according to the official.

He said safety is provided by a service from ANS CO+RE Systems, Inc. in Elmsford, N.Y. The service, called InterLock, consists of software running on an IBM RISC System/6000 gateway that controls access to Internet from inside the company and access to the company from Internet. A user-maintained rules base limits traffic going in and out by person, function performed, host, network or time. It can block access to any of the Unix processes often exploited by hackers.

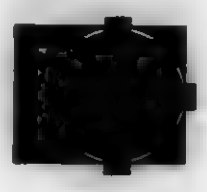
"Internet users fall into a couple of categories," said Stephen Kent, chief scientist at BBN Communications, Inc. in Cambridge, Mass. "Some new users have heard all the bad things that can happen and are therefore appropriately cautious. Others sign up because of the good publicity about connectivity and access to resources and, if they are naive about security, then they are highly vulnerable."

Kent, a privacy and security expert on the Internet Activities Board, said sophisticated Internet users such as IBM, Digital Equipment Corp., Xerox Corp. and AT&T sidestep the security problem by employing mail relays that allow only the movement of E-mail and by blocking file transfers and Telnet sessions that could enable an outsider to log onto an internal host. In so doing, they close the door to much of what the Internet can offer.

"For many users there's a conflict between what they want from a security standpoint and what they want from an information standpoint," Kent said. "We don't have wonderful technical alternatives."

At a glance

- **Number of attached hosts:** 1.2 million
- **Number of Internet Protocol networks:** 7,500
- **Number of users:** 7 million
- **Number of countries reached:** 117
- **Traffic volume:** 1006 bytes per day
- **Traffic volume increase:** 15% per month



Cautious use

Amoco Corp. has several thousand people worldwide using the Internet for research-oriented purposes, most of it involving E-mail and none of it mission-critical, said David Burns, Transmission Control Protocol/Internet Protocol project leader at Amoco. "We've been moving very carefully, and we're certainly concerned about security and privacy issues."

Burns said Amoco may allow mission-critical communications between Amoco and its suppliers when a new release of ANS' InterLock — which will offer encryption capabilities — comes out next month.

The availability of encryption opens up attractive data communications options for users, Kent said. "If you are a company that's geographically disbursed, you might like to have your branch offices connect to the Internet and form a virtual private network as an alternative to the long-distance carriers."

Commercial naivete

"Commercial users often don't know how to secure a Unix environment," said Dain Gary, operations manager at the Computer Emergency Response Team at Carnegie Mellon University, which deals with breaches of Internet security. "And that problem is compounded by their not really understanding that in the Internet, they're kind of free game."

Gary said new commercial Internet users often mistakenly assume that the network is like their internal environments — ordered and disciplined, with a known set of users, someone in charge and penalties for those who do not obey the rules.

He said another problem is that naive administrators often bring up new Unix systems "with a full complement of vulnerabilities," neglecting to turn off unneeded Unix functions that provide security holes, changing default passwords and the like.

—Gary H. Anthes

Chevron bets on APPI protocol for its global internetworking

By Elisabeth Horwitt
SAN FRANCISCO

Chevron Corp. has already decided to use Advanced Peer to Peer Internetworking (APPI) as the basis for integrating local-area network and IBM Systems Network Architecture (SNA) over a single corporatewide internetworking backbone, according to Nancy Vandell, senior communications analyst for network design and services at Chevron Information Technology. What makes this decision something of a leap of faith is the fact that the APPI Forum has only just begun to hammer out the specifications, which will route SNA transmissions over a backbone of Transmission Control Protocol/Internet Protocol (TCP/IP) routers.

Cisco Systems, Inc. proposed APPI this fall as a purportedly more open alternative to IBM's Advanced Peer-to-Peer Networking (APPN) protocol. IBM has been pushing APPN for some months now as a multivendor protocol that will coordinate connections and resource-sharing across a corporatewide network of IBM and non-IBM devices. Any device that supports IBM's LU6.2 or APPN end-node protocols — both publicly available specifications — can access resources on an APPN network.

However, a device needs to support the more sophisticated APPN Network Node protocol in order to be a fully participating member of such internetworks. IBM has promised to pub-

Chevron, *page 62*

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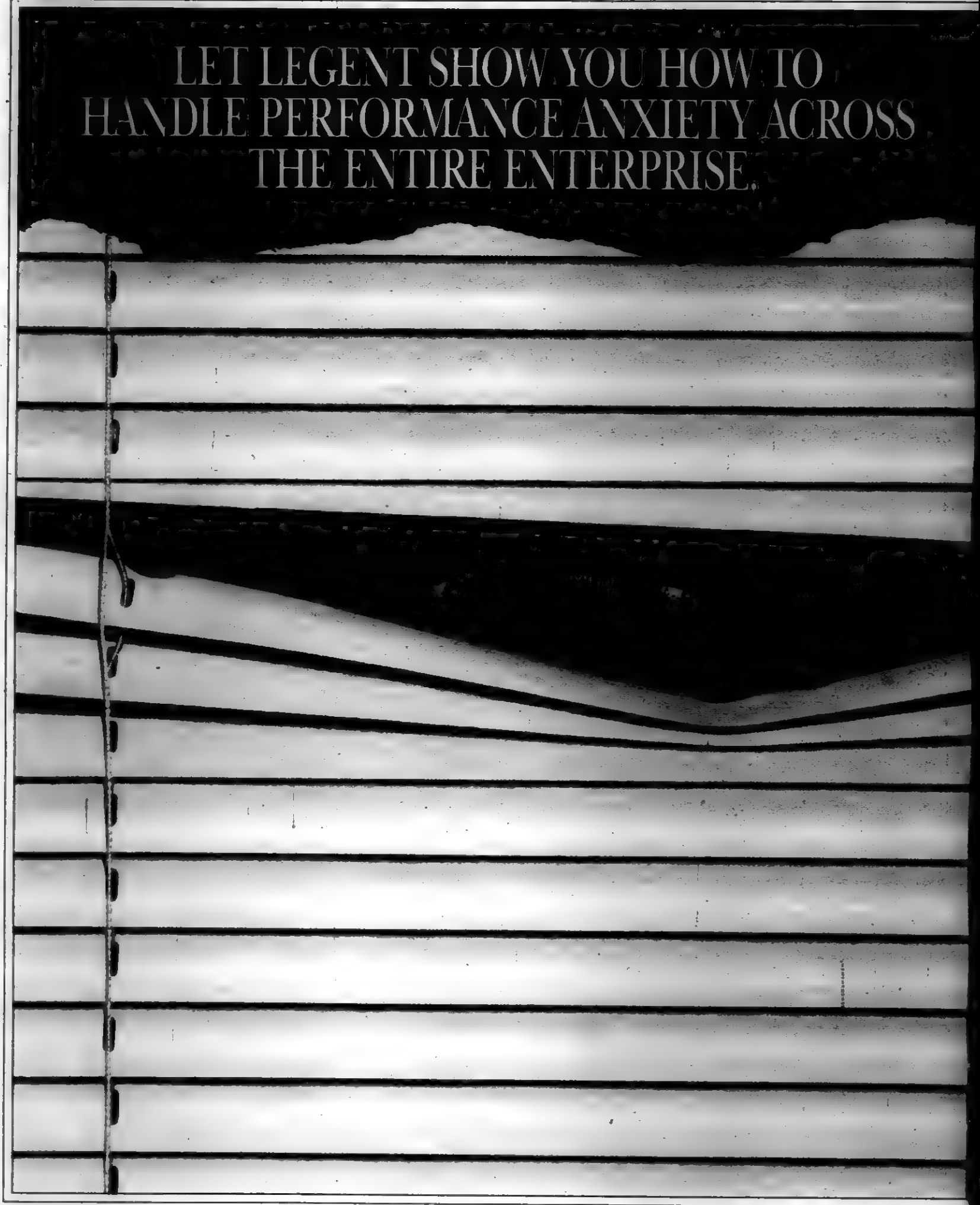

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LEGENT has licensed NaviGraph technology from Landmark Systems Corporation.

Sprint announces ISDN connectivity

By Lynda Radosevich

As part of the nationwide movement to bring Integrated Services Digital Network (ISDN) to the desktop, Sprint Corp. has announced immediate availability of its Local Packet Network (LPN)-to-ISDN connectivity product.

The LPN-ISDN interconnect will reduce costs by letting companies use ISDN services over phone lines provided by their local telephone companies to gain access to company mainframes connected to SprintNet. Before, companies that required ISDN service to tie into SprintNet had to lease a dedicated line from their local carrier.

The service will also allow users to access public services such as CompuServe and Dow Jones News/Retrieval directly, without using a modem.

ISDN provides 64K bit/sec. digital access to voice and data service over a single telephone line.

One initial application of the LPN-ISDN service will be credit-card validation, according to Peter Nalaszkiewicz, a SprintNet services product manager. The service will speed up processing without increasing costs, he said, because users make a digital rather that analog connection.

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Coursey

CONTINUED FROM PAGE 55

sion tool, like the cellular telephone, which allows otherwise wasted minutes to be put to productive use.

> Wireless E-mail cuts the chains that bind businesspeople to desktops, LANs and telephone lines.

This is what wireless messaging is all about, and I haven't even mentioned wireless calendaring and scheduling, wireless work-flow applications, wireless vertical or mission-critical applications or even wireless 3270 sessions. Add those together and you have a powerful reason to be investigating wireless right now.

Let me warn you up front: Wireless messaging is in its infancy, about ready to master a well-coordinated crawl. But before a real baby would be ready for first grade, several flavors of wireless should be widely available. Here's a quick primer:

• Available right now is RadioMail from RadioMail Corp. in Menlo Park, Calif. It runs over the RAM Mobitex network and uses an HP-95 palmtop and an Ericsson GE Mobidem radio modem. The system costs about $1,600 plus a monthly service charge. Every user is given an Internet address and can send and receive messages.

The current limitation is coverage. RAM Mobitex is up and running with limited coverage (airports, downtowns) in most major metropolitan areas. Wide coverage is available in New York, Boston, Washington, D.C., Baltimore, Chicago, Philadelphia, San Francisco and Los Angeles. In those cities, RAM Mobitex really shows its worth. More coverage will be added throughout 1993.

• The strongest near-term competitor to RAM Mobitex doesn't exist yet, but when it does, it will come from the cellular telephone carriers, which are looking at ways to build data support into their systems. There are trials under way. The cellular folks made a splash at Comdex, but commercial availability will have to wait for next year's model.

• Later, expect to see new personal communications services created to provide data support for portable computers. Both personal communications services and the cellular services are likely to be technically superior to RAM Mobitex over the long haul, more easily supporting large numbers of users and the tiny radio signals sustainable by the batteries of personal digital assistants, when they finally arrive on the scene.

People who care about mail and workgroups should investigate wireless messaging. If budgets allow, highly targeted demonstration applications make sense. Then, as the technology comes together, you'll be in a position to move — before your competition does.

Coursey is editor of "P.C. Letter," an industry newsletter based in San Mateo, Calif. Send him mail at coursey@radiomail.net, and he'll send you your first wireless message.

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The Newspaper of IS

Chevron bets on APPI protocol

CONTINUED FROM PAGE 55

lish APPN Network Node specifications early next year and to elicit vendor input on future APPN enhancements at regular forums.

However, some vendors, Cisco among them, claim APPN can never be a truly open protocol because IBM will continue to control APPN and its development.

Vandell is responsible for developing a tactical plan for consolidating Chevron's SNA and LAN transmissions on a single multiprotocol internet backbone. At a recent meeting of the APPI Forum, she outlined her reasons for choosing APPI.

One big reason is that Chevron already has a "multiprotocol internetwork" backbone that links various LAN sites worldwide via Cisco routers. The firm currently has about 50 routers, "with a potential for over 500," Vandell said. "We have a very diverse computing environment; if something exists, we have at least one of it."

> Chevron wants become a totally TCP/IP shop but must still support SNA.

Various Chevron installations have Token Ring, Ethernet and Fiber Distributed Data Interface networks running a combination of TCP/IP, Digital Equipment Corp.'s DECnet, Xerox Network Systems, SNA and Novell, Inc.'s IPX.

Chevron is now looking at ways to incorporate SNA on the internetwork. "A lot of sites where we have deployed our multiprotocol internetwork also support SNA," Vandell said. "And a lot of SNA sites are going toward distributed processing." In addition, many of Chevron's SNA sites also use TCP/IP, she added.

Chevron eventually wants to become "a totally TCP/IP shop" but still has the need to support SNA, Vandell said. "APPI sounds great" as a way for Chevron to go ahead with its plans to support peer-to-peer SNA, including IBM's APPN — but "in an open environment. APPN is proprietary" and would constitute yet another protocol that Chevron would have to implement on its backbone, Vandell said.

In contrast, APPI promises to allow users to route SNA over their existing TCP/IP routers, Vandell pointed out.

"Even if IBM eventually opens up APPN, it still needs to work with TCP/IP standards bodies to incorporate the best of both protocols," Vandell said. She added that she hopes the APPI Forum will do exactly that: "We want the forum to provide TCP/IP [multivendor] interoperability features on APPN and provide APPN features, like security, on TCP/IP." Chevron expects to integrate its SNA and multiprotocol internetworks' physical networks fully by 1995 using APPI, she said.

Vandell is also considering implementing frame relay and then the higher speed Asynchronous Transfer Mode technology, she said. Both handle any type of networking protocol. Open Systems Interconnect is also a possible long-term direction for the company, Vandell said.

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In Brief

Continental service

The European network services market will see revenue growth rates of 38% annually over the next five years, according to a recent report from **Datapro International.** LAN and internetworking markets will see a total growth of 259% in terms of units shipped between 1991 and 1995, the report said. However, that growth will be offset by a steady decline in price per unit, Datapro said.

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Gateways, bridges, routers

Walker Richer & Quinn, Inc. has introduced Version 2.0 of Reflection 8 terminal emulation software.

Reflection 8 was designed to bridge the Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM's Systems Network Architecture environments. The product provides 3270 communications capabilities to local-area network-based PCs that are linked to a Token Ring or Ethernet backbone, the company reported.

Reflection 8 uses the TN3270 protocol and needs a TCP/IP network to be on either a 3172-style controller attached to the mainframe or the IBM mainframe. Extended display and field attributes are supported as well as full keyboard mapping and structured fields.

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Micro-Integration Corp. has released the MI 5250 Remote Gateway. Support for up to 64 sessions per card and up to 256 sessions per local-area network are provided.

The gateway runs at rates of up to 64K bit/sec.

A new intelligent card that requires fewer PC resources than cards in previous versions enables users to increase their gateway speed regardless of what type of PC they are using, the company reported. Working with or without IBM PC Support/400, the MI 5250 Remote Gateway allows users to mix PC Support sessions and emulation on the same card.

The product costs $2,995.

➤*Micro-Integration*
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Network management

Concord Communications, Inc. has introduced Trak/Report, a utility for its Trakker internetwork monitor.

The utility integrates an Ingres Products Division relational database with graphing and reporting capabilities, the company reported. Two key capabilities are provided: Data from all network segments can be combined to form one coherent network view; and Trak/Report configures network nodes into logical groups, enabling users to see aspects of the network from various points of view. Link layer monitoring is provided for a number of protocol suites including Novell, Inc.'s NetWare, Apple Computer, Inc.'s AppleTalk, IBM's PC-NET and Xerox Corp.'s XNS.

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Customer premises equipment

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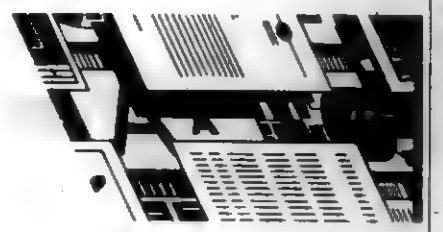

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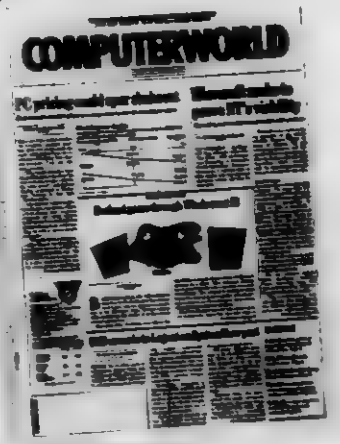

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DEC's Alpha offers OS choices

At a glance

How can multiple operating systems run on Alpha AXP? With PALcode, a set of subroutines specific to a particular Alpha operating system, according to DEC.

PALcode subroutines offer operating system primitives for context switching, interrupts, exceptions and memory management. Written in standard machine code, PALcode offers implementation-specific extensions to access low-level hardware.

By Melinda-Carol Ballou

■ When Digital Equipment Corp. demonstrated the company's Alpha AXP PCs running Microsoft Corp.'s Windows NT operating system earlier this month, the minicomputer maker opened the question of which operating system will ultimately be the primary one for the Alpha family of processors.

DEC demonstrated a range of applications, including Oracle Corp.'s relational database management system, Cincom Systems, Inc.'s Supra Server, Precison Visuals, Inc.'s PV-Wave visual data analysis software and Computervision, Inc.'s DesignView parametric engineering software, some of which have long roots in the DEC VMS and Unix families. It is part of DEC's effort to position Alpha as a host for the range of operating environments.

One of the highlights of DEC's Alpha AXP series is the ability of the architecture to encompass a range of operating systems through the use of Privileged Architecture Library (PALcode) subroutines. DEC is already shipping platforms running Open VMS and OSF/1 and will ship the PCs running Windows NT when Microsoft makes NT generally available next year.

The goal of this strategy is to allow DEC to run a variety of horses in the operating systems race — Unix and Open VMS, with Microsoft's installed base of millions of DOS and Windows users moving to Windows NT as a key potential prize for the company.

"The goal with NT is to put DEC back into the mainstream," said Bill Bluestein, analyst at Forrester Research, Inc., a market research firm in Cambridge, Mass.

One of the challenges for DEC in relying on NT as a vehicle to move into that mainstream is a dependence on Microsoft's release date for NT, which is behind schedule, he added. Another challenge is wooing non-DEC users to adopt Alpha AXP.

But DEC has been doing well in the PC market through PCdirect, and "the idea that these are the highest performing NT machines ... as servers for PC LANs rather than 486 machines ... may serve them well," Bluestein said. "Just the fact that DEC is riding the Microsoft wave gets the noise level up to the point where people will say, 'Maybe we should consider DEC.'"

And many of DEC's current customers are eagerly awaiting the release of the NT-based Alpha AXP platforms.

Stanley Rose at Bankers Trust Co. in New York, for instance, is looking to Alpha AXP initially as an

Alpha, *page 70*

Moving to client/server

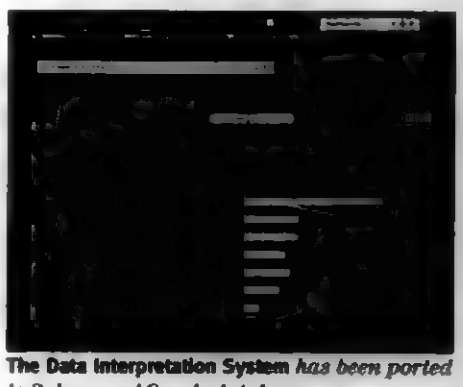
Metaphor opens its decision support

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Metaphor, Inc., an IBM subsidiary, is like a surfer trying to ride the next wave all the way to the beach.

The 10-year-old firm, which has been selling decision support software to some of the country's largest companies, is adapting it for client/server database systems. The move comes a year after IBM bought the firm and months after it was granted marketing autonomy and took on a new chief executive officer.

Longtime users said the changes are welcome, moving Metaphor's workgroup decision support products from an IBM-only architecture to open systems databases and off-the-shelf PC applications. "We see their expansion as opening the doorway to standard PC packages," said Robert Peterson, director of marketing information services at Coors Brewing Co. in Golden, Colo. "Metaphor's tool set is extremely good at doing 90%' of basic [data] analysis, but there are things it would make sense for them to include, like graphics packages."



The Data Interpretation System *has been ported to Sybase and Oracle databases*

Metaphor said earlier this month that it had ported its Data Interpretation System (DIS) software to Sybase, Inc. relational database management system servers. DIS had already been ported to Oracle Corp. databases. There is also new support for Red Brick Systems, Inc.'s Warehouse product, providing users of Metaphor's OS/2 platform with a view of data from IBM's Information Warehouse databases and a gateway to NCR Corp.'s Teradata database.

Prices for DIS start at $10,000 for a 10-user OS/2-based system. Metaphor software tools start at $2,200.

DIS is based on object-oriented "capsules" that contain both data and applications. Users click the capsule icons to rearrange them, varying their analyses of statistical and sales data. They can then send the modular programs to co-workers for further analysis. Before 1989, Metaphor ran only on proprietary hardware from former supplier Britton-Lee, Inc. Metaphor now runs DOS and OS/2 applications; it does not yet support Microsoft Corp. Windows desktop applications.

Nynex Corp. uses DIS to study sales data from an IBM DB2 RDBMS and to find market trends before competitors do, said John Tedesco, director of marketing information systems. One hundred users launch up to 120,000 DB2 decision support queries a month — up from 10,000 queries launched from an information center before Nynex purchased DIS in 1990.

Users create custom applications based on the building blocks of DIS "capsules" containing data and applications. "I've always thought of [the capsules] as Tinkertoys," said Tedesco, who manages Metaphor use at Nynex. "We can connect them any way we want."

Metaphor hopes to hang on to users like Tedesco. Metaphor has about 200 customers, many of them multibillion-dollar corporations such as Procter & Gamble Co. in Cincinnati. But its proprietary systems slowed sales to new customers. "They have been less visible the last couple of years," said Clare Gillan, an International Data Corp. software analyst, who noted that Metaphor once had $60 million in sales of bundled hardware systems. Now, software sales are just a fraction of that, with most of those being additional sales to existing Metaphor sites.

However, Chief Executive Officer Cathie Selleck, a longtime IBM executive, plans to boost sales by targeting vertical markets beyond Metaphor's consumer products stronghold. Given IBM's blessing to take a different marketing tack, Metaphor is rapidly paddling out to find more surf.

"It's wonderful to be on the right side of the wave," Selleck said. "We have the complete ability and charter to make arrangements with anyone we feel can help to move this business ahead."

Verity's DDA enables application access

By Melinda-Carol Ballou

Verity, Inc. last week announced Dynamic Data Access (DDA), a suite of packaged and documented software interfaces that will let systems integrators and value-added resellers develop Topic applications that access, search and retrieve information stored in other applications.

The first implementations of DDA will include Topic SQL Gateways to Lotus Development Corp.'s Notes and accessors to word processing files and foreign language interpreters, company officials said.

"We needed a driver' strategy to hook into other repositories," said Laura Cory, senior vice president of marketing at Verity.

Major vendors such as Hewlett-Packard and Lotus licensed the Topic technology, and DEC has been considering it.

She said that when the company released SQL Gateways to specific databases such as those from Sybase, Inc. and Oracle Corp. more than a year ago, it discovered that users needed access to a range of database and other applications. "We could have been stuck hard-coding nothing but database accessors," she said.

DDA enables Verity to focus on product development while giving developers and sophisticated end users a way to use Topic's text-retrieval and searching capabilities across applications.

Major vendors such as Hewlett-Packard Co. and Lotus have licensed the Topic technology, and Digital Equipment Corp. has been considering doing so.

DDA will be available with Topic Version 3.12, which is scheduled to ship next month. It is priced from $40,000 to $100,000.

IBM gives health provider shot in the arm

By Rosemary Cafasso
NORWOOD, MASS.

Neponset Valley Health System (NVHS) plans to upgrade to a higher-end IBM Application System/400 Model E80, which will give a needed boost to current processing capabilities as well as expand its use of patient-care applications.

A second project will bring T1 lines to NVHS to link its various satellite operations. NVHS is the parent organization of two community hospitals, clinics and several home-care services groups in Southeastern Massachusetts.

It is also a veteran IBM midrange user, having started with an IBM System/38 in the early 1980s. NVHS runs a combination of IBAX Healthcare Systems application software and in-house-designed systems. It now uses an AS/400 B70 and said it was not interested in looking at other platforms when it made a decision to upgrade.

"When you consider other hardware, think, what it would take to convert?" said Walter Kane, vice president of MIS. "It would probably take $3 million or $4 million" when the new hardware and software as well as training and support are factored in, he added.

Kane said NVHS approved the E80 purchase late last month. It should bring the response time of three to five seconds down to about one second, he said. It will also offer "much better throughput" on the current processing, which is about 90,000 transactions per hour, Kane said.

But beyond these improvements for the core applications that support accounting, human resources and headquarters, the E80 will give information systems more capacity so it can increase the hospital's use of clinical and patient-care systems, Kane added. "The strong emphasis now is on the clinical side," he said.

Some clinical applications are installed today but are in limited use. An order communications system from IBAX, for example, is helping to automate the process of requesting laboratory tests for patients. By putting the procedure on-line, the medical staff will no longer write orders on paper and dispatch them by messenger to the appropriate department.

Kane said the software is being used at three nursing stations at its Norwood Hospital facility. These stations are linked directly to Healthcare Laboratories, a for-profit NVHS division. The goal now is to expand that throughout the Norwood facility and then include the second hospital, Southwood Community, which will eventually have better access to the computer system because of the T1 lines.

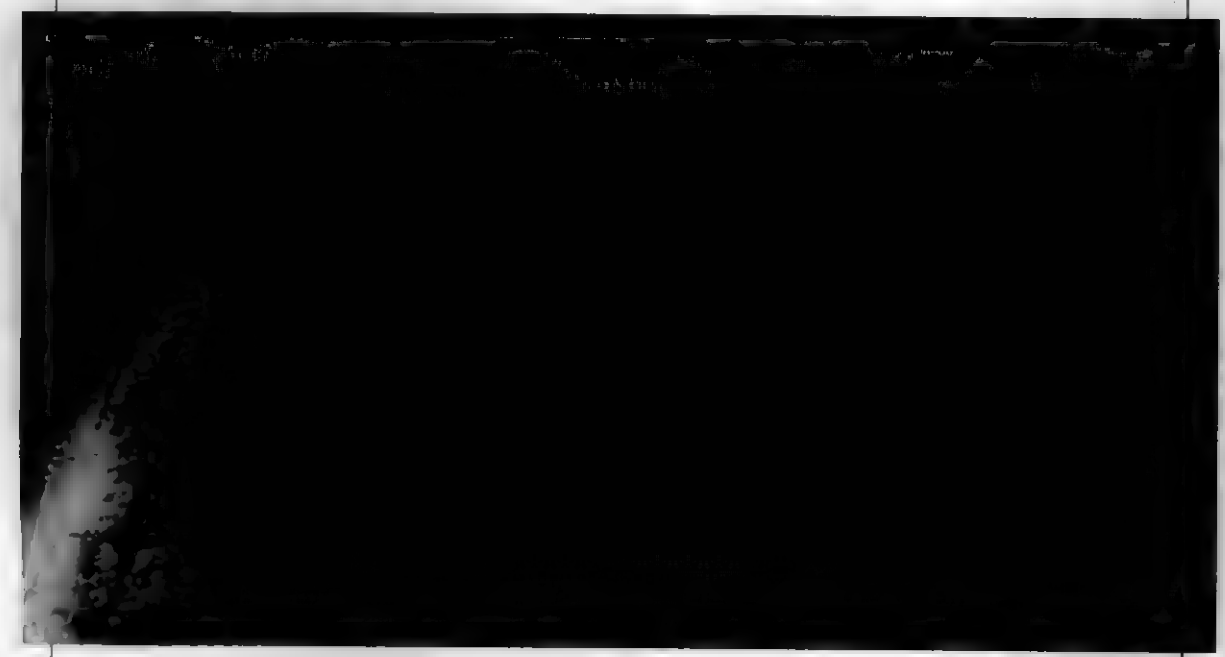
Another application Kane is hoping to expand is an employee profile system that is currently produced for companies in the NVHS region. The system compiles data on hospital visits of a firm's employees and then produces charts to indicate trends. Kane's staff has been producing these reports for two years on an occasional basis and is now aiming to produce reports "at a minimum of once a quarter."

ON SITE

Neponset Valley Health System
Norwood, Mass.

Challenge: Increase processing capacity to get better throughput and add more clinical applications to system.

Strategy: Replace AS/400 Model B70 with higher end E80, add T1 lines to connect healthcare group's satellite offices.



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TestBench adds case-based reason

By Kim S. Nash
PITTSBURGH

Carnegie Group, Inc. has upgraded TestBench, a system for building help desks and troubleshooting programs for field and customer service departments. Version 2.2 adds case-based reasoning to other problem-solving capabilities already included in the product, such as decision trees and user-defined rules of thumb.

TestBench is used by customer service and field support workers in various industries as a diagnostic tool that can be tailored to the needs of different kinds of problem solvers, such as sales representatives, inventory planners or computer help desks.

The addition of case-based reasoning lets users enter and keep files on common problems and solutions.

A development module, called TestBuilder, was designed to help users create knowledge bases for diagnosing and fixing problems encountered by field and customer service workers.

The latest edition also supports Dynamic Data Exchange and Dynamic Link Library functionality for Microsoft Corp.'s Windows. That means the product's TestView module can talk to other applications running under Windows to display pictures or link cross-referenced data, according to Carnegie Group.

Due to ship in January, TestBench Version 2.2 is priced at $4,000 for an upgrade.

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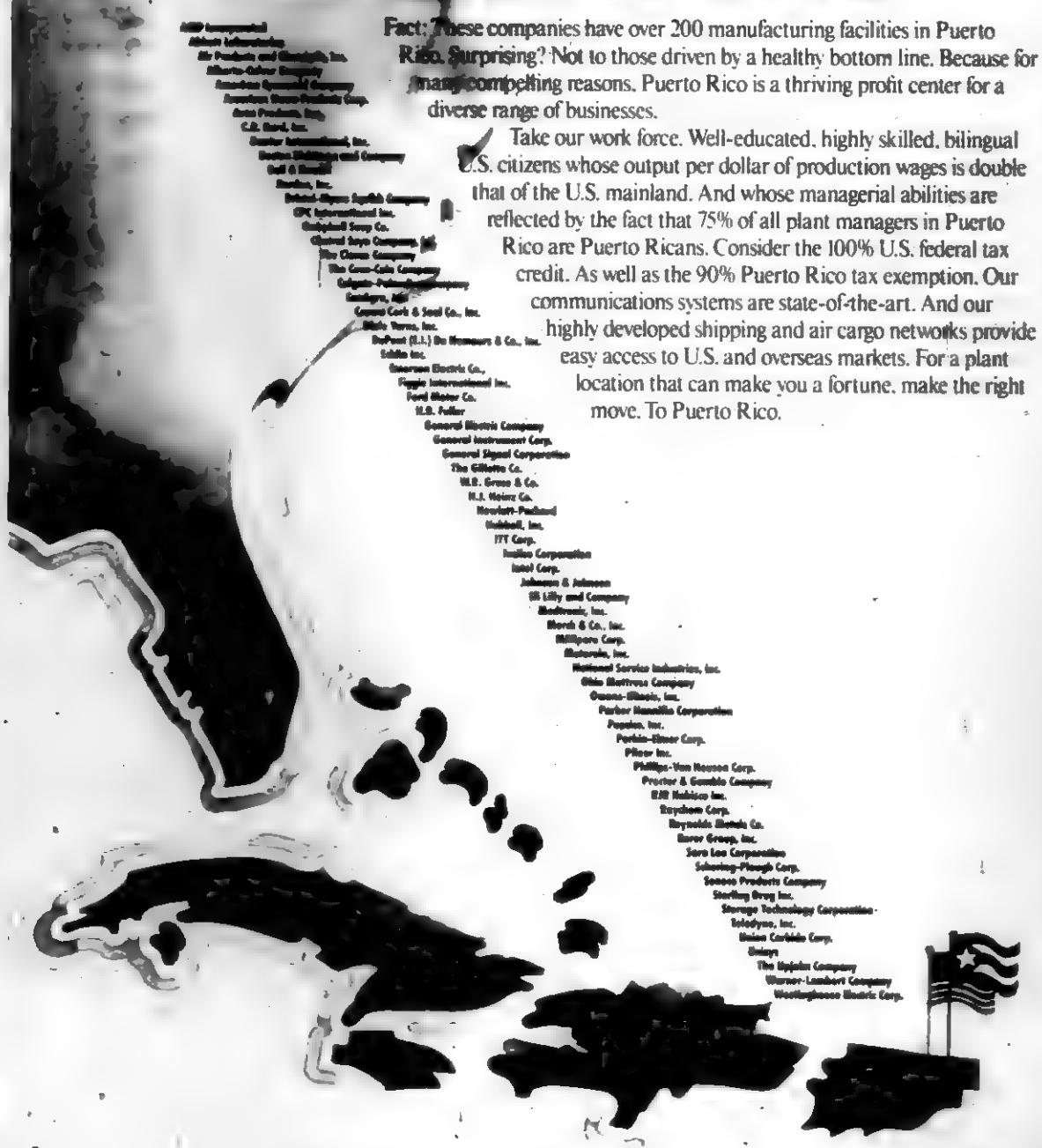

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DEC's Alpha offers OS choices

CONTINUED FROM PAGE 67

upgrade path for his current VAX systems on VMS and ultimately as a platform for NT.

"We think NT will be the hot operating system of the future, although I don't know what the operating systems wars will yield in five years or whether NT will completely replace VMS [by that time]," Rose said. "But the marketplace will vote."

Other DEC users said they are interested, but they are taking more of a wait-and-see attitude.

"I'm sure [NT] will be something that many VMS sites and Unix sites will be wanting, but it's not here today," said Marge Knox, president of the U.S. chapter of the Digital Equipment Computer Users Society (DECUS). "It's an interesting technology, and people are trying to get educated about it."

"There's a lot of waiting and seeing to be done, and people that I've been speaking with are still predominantly interested in VMS. But NT is riding like a bullet. It would not surprise me for NT to exceed VMS in terms of unit shipments [for Alpha] within 12 to 18 months after it ships," said Bill Mayhew, chairman of DECUS' business practices special interest group.

Mayhew added that the price of the Alpha PCs, which DEC has said will be under $10,000, will help persuade people who have not bought into DEC in the past to buy into the platform.

In Brief

Confused about whether to restructure or ditch your outsourcing contract, or whether to even outsource in the first place? Compass America, Inc. in Reston, Va., announced a service, ROI, that compares what users are getting — or will get — for their outsourcing dollar with the best cost of doing it internally.

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Flexibility	9.1	8.8	8.6	8.4	8.4	7.6
Interface Capabilities	8.9	8.9	8.4	8.1	8.7	7.4
Comprehensiveness	9.1	8.8	8.6	8.3	8.7	7.6
User Friendliness	8.9	7.7	8.3	8.1	7.5	7.0
OS Compatibility	9.6	8.4	8.9	9.0	8.8	7.5
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	7.4	8.2	6.8
Vendor Training	8.7	7.9	8.0	7.9	7.6	6.7
Problem Response Time	8.8	7.5	7.2	6.6	6.4	6.2
Quality of Vendor Support	9.0	7.8	7.5	7.4	6.9	7.2
Frequency of Releases	8.5	7.5	6.7	6.9	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.8	7.0	6.5
OVERALL SATISFACTION	9.3	8.7	8.5	8.3	8.0	7.6

Compiled from the latest Datapro reports on DBMS/Computer System Series Software available for each product listed (for Informix, see Informix/SQL). All results are those of actual users of the product as surveyed by Datapro.

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	PROGRESS SOFTWARE	BORLAND	INFORMIX	INGRES
PRODUCT FEATURES				
Ease of use	8.76	8.67	8.80	6.00
Memory requirement	7.25	6.30	6.14	5.11
Ease of programming	8.87	8.74	8.79	6.37
Ability to manipulate data	8.73	7.24	7.14	7.07
Sorting capabilities	8.58	7.24	7.21	7.56
Provision for software security	8.00	8.23	7.00	6.70
Report writing capabilities	7.84	8.54	6.58	6.50
Ease of use of interface	8.13	8.89	8.85	6.50
Software integration capabilities	8.99	8.92	7.20	8.15
Ease of data retrieval	8.88	7.26	7.65	7.04
Satisfaction with product profitability	7.88	8.61	8.79	5.18
Overall quality of product	8.87	8.97	7.35	6.71
PRODUCT FEATURES AVERAGE	8.32	8.82	8.06	6.41
SUPPORT FEATURES				
Provision for customer support	8.20	8.73	8.18	5.44
Charges for training time	8.91	5.79	5.56	4.71
Provision for technical support	7.57	8.14	8.00	5.15
Provision for marketing support	7.04	5.97	5.33	4.04
Documentation & product information	8.82	7.03	8.57	8.00
Frequency of updates & revisions	7.75	8.26	8.05	5.74
SUPPORT FEATURES AVERAGE	7.88	8.32	5.93	5.18
OVERALL AVERAGE	8.11	8.65	8.62	8.00

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For the second consecutive year, PROGRESS resoundingly swept all 18 categories of the VARBUSINESS Report Card. And for the fourth year in a row, PROGRESS came out on top in the Datapro surveys. Once again, users rated PROGRESS superior to all competitors on everything from strength of product to quality of service and support. Which is only logical, since PROGRESS is the one development system that gives you the flexibility to build and implement high performance applications independent of platforms and database systems. It even lets you deploy any application in both multi-user and client/server environments. But don't just take our word for it. Listen to a source far more convincing. Your peers. Call 1-800-4 PROGRESS for survey results or a test drive.

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CPWADV1130

Application Development

Wrapping code can save time

By Jean S. Bozman

Enthusiastic about object-oriented technology but have a long, long inventory of Cobol programs to re-engineer? No problem, some users said. There is a shortcut that can move you into an object-oriented, client/server environment faster than you think: wrapping.

Wrapping simply means covering traditional programs, Cobol code and old-fashioned database systems with a veneer of object-oriented code, such as C++ or Borland International, Inc.'s SmallTalk.

"To me, it's just a word," said Steve McClure, a senior consultant at International Data Corp. in Framingham, Mass. "The concept is that you define a very specific and well-thought-out interface that says how you interact with the old applications."

Wrapping may be only a transitional step, but it can save valuable time — and prevent application developers from having to reinvent every program wheel in the corporation. Some said the technique is akin to using an adapter to bridge the differences between American 110V electrical current and European 220V current. It is one way to bridge the gap between the client/server and mainframe architectures.

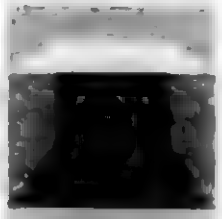
"With wrapping, you're defining a small piece of code that connects to the old data," explained Richard Soley, vice president and technical director of the Object Management Group in Framingham, Mass. "But when you've got the time and you want to get better performance and better features, you'll go back and rewrite the old application. For now, it's a step along the path, and it saves you time — absolutely."

Taking the lead

Some large user sites are leading the way, including Citicorp, Deere & Co. and The Boeing Co.

"We're considering placing wrappers around legacy systems," said Colin Crook, senior technology officer at Citicorp in New York. That way, he said, reduced instruction set computing machines could act as front ends for legacy database servers running on mainframes. "It's permitting us to look at the legacy applications from an object-oriented [point of] view."

Citicorp, the nation's largest bank, plans to mix new and old programming technologies in a 1990s re-engineering effort that will rewrite or discard about half of the bank's inventory of mainframe applications, he said. The aim is to let business units quickly prototype new applications — using object-oriented languages in many cases — and access data servers throughout the bank's network. "New objects running on client/server technology communicate with old legacy systems, which we treat as pseudo-objects," Crook said.



The big question

Even though users and analysts see benefits to wrapping old code, there can be snares for which you have to be on the alert.

"You have to be very confident that the code you wrap is good," said John Mowatt, a Unix analyst at International Data Corp. in Framingham, Mass. "If you throw a wrapper around something and a bug occurs, the question will be whether it's a bug in the original code or a bug in the wrapper. That's why many people won't truly encapsulate but will find ways to interface with the old code."

At Deere & Co., the emphasis is on tying together disparate systems on an enterprise network so a new crop of client systems can access scattered data sources. "We're trying to take existing legacy applications and provide a message-based front end on them," said one developer who did not wish to be identified. "We've had various versions of it running on our own software for more than a year."

Some analysts said the trend toward wrapping will accelerate as users realize it is a practical use of object-oriented technology that protects decades of investment in old systems.

"People are so excited about client/server technology," said Natasha Krol, a senior software analyst at Meta Group, Inc. in Westport, Conn. "But serious client/server systems will come about only when you start taking pieces of your legacy systems and migrating them to the desktop." Krol said users may choose to encapsulate many elements of the existing architecture, including SQL statements, data sets, programs and entire databases. "It's extremely conducive to encapsulating any legacy system and weaving it into a new infrastructure," she explained.

However, some analysts cautioned, there may be a downside to wrapping: It merely papers over a lot of old procedural code. "Object wrapping is sometimes like wrapping fish," said Adrian Bowles, vice president of New Science Associates, Inc. in Westport, Conn. "It continues to rot inside. So wrapping a system doesn't make it better. It's a lot like coating a pill to make it easier to swallow."

Commercial users, vendors accuse government of CASE standards bias

By Garry Ray

A major CASE standards effort became rancorous in recent weeks as vendors, government officials and commercial users leveled charges of favoritism and commercial bias at one another. At stake, both sides said, is the long-term viability of the U.S. computer-aided software engineering (CASE) industry.

More than a technical dispute, it involves "proposals to put substantial amounts of money" into software standards, said Gene Forte, executive editor of "CASE Outlook," a Seattle-based CASE newsletter. "It's about the competitive advantage of American software companies vs. Europeans," he added.

The dispute became public with a letter sent Nov. 18 by Edward White, a vice president at Atherton Technology in Sunnyvale, Calif. In the letter, addressed to a senior official at the National Institute of Standards and Technology (NIST) and sent by White to members of the press, White charged that NIST and the U.S. Department of Defense (DOD) are supporting a CASE standard that will "undermine American National Standards Institute efforts to establish a standard which will better serve the interests of the U.S."

Atherton is the developer of the CASE A Tool Integration Standard (ATIS), which has been implemented by The Boeing Co., GTE Government Systems, Verdix Corp. and other companies in a number of government contracts. ATIS competes in the CASE standards arena with the Portable Common Tools Environment (PCTE), a 10-year effort headed by the European Computer Manufacturers Association at a purported cost of more than $400 million, according to a senior Boeing official. In addition, PCTE is currently the foundation for a proposal under review by the International Standards Organization (ISO).

Because of its support in Europe, and in the ISO, "we want to use PCTE as baseline" for a U.S. CASE standard, said NIST senior computer scientist William Wong, the recipient of White's letter.

Not entirely impartial

But politics are also playing a part in the decision. Though Wong agreed "PCTE is not quite strong enough now," he said that by working on the standard, "we have the opportunity to influence" the ISO.

No matter. The DOD "is pulling the trigger too fast" by supporting PCTE, White later said. Because it supports dated technology, "PCTE is another AD/Cycle, another attempt to boil the ocean," he said.

A Boeing spokesman agreed: "We support the direction and thrust of Atherton and are strongly committed to ATIS and the functionality underneath it."

But beneath the immediate technical concerns is one point on which all parties seem to concur. Forte said, "If you let Europe define what the [CASE] standard is, then they will have a competitive advantage" in CASE and commercial software over the long term.

Greg Pope

Quality, not quantity

While the U.S. is the unequivocal leader in the global software market, it is no secret that our software is infested with bugs.

This anomaly is possible only in the absence of serious international competition. Like the automobile industry in the 1950s and '60s and the semiconductor industry in the 1970s and '80s, the U.S. software industry has used its pioneering innovations to sustain a prolonged period of unchallenged prolific growth.

This period is now over. As foreign software developers continue to produce more high-quality code, the U.S. software industry — including commercial users — must re-evaluate its entire software development methodology to retain its competitive edge. If quality does not become a priority, the U.S. software industry will suffer the fate of the automobile and semiconductor industries.

The issue of software quality transcends the domain of U.S. economic competitiveness and impacts everyone living in an industrialized society.

As heirs of the technology revolution, we unwittingly interface with several million lines of software code every day. Making a phone call, for

Pope, *page 74*

Pope

CONTINUED FROM PAGE 73

instance, depends on our more than 500,000 lines of reliable software code. Digital alarm clocks, stereo systems, traffic signals, aviation equipment, medical devices, televisions and car braking systems all rely on quality software programs.

The need for reliable, bug-free software is no longer an issue that belongs exclusively in the software testing laboratory. It is an issue that affects our economic position in the global marketplace as well as our everyday safety and well-being.

To err is human

The development of software applications and programs is a complex, arduous and tedious task sometimes requiring several hundred thousand lines of software code for a single application. Because software development is still largely a human endeavor, it will, by nature, generate errors. If these errors are not detected and corrected, they can cause the software to malfunction. Depending on the specific application, a software malfunction can be a minor nuisance or, in the case of systems that control hazardous materials, result in injury or death.

The demand for efficient and thorough software testing tools is magnified by computer-aided software engineering tools, software re-engineering, object-oriented programming and other automated software development tools and methodologies. These new tools and methodologies have enabled programmers to generate an unprecedented amount of code. The result is a backlog of software that cannot be adequately tested with today's debugging tools and manual testing methodologies. More than ever, there is a need for better and more automated testing methodologies.

There exists in the U.S. software industry a mythical six-stage software development "waterfall" process that is based on an adequate project schedule. This schedule is predicated on the belief that 1) the system design requirements will remain frozen during the entire development period; 2) the development resources will remain stable; and 3) the software will be tested for up to half the period using state-of-the-art debugging tools. At the completion of this development process, it is believed the software will be bug-free and ready for delivery.

The need for reliable, bug-free software is an issue that affects our economic position in the global marketplace.

But in the real world, software testing is generally regarded as the stepchild of the software development process, rarely receiving the attention it deserves. Based on the assumption that software can never be perfect, software management has come to accept the notion that incomplete or flawed software is acceptable.

This dangerous line of reasoning is often used by management to compress testing cycles to ensure timely delivery. The result is defective software and a continual devaluation of the software testing process.

The real-world software development process reinforces the all too common assumption that software testing is inconsequential, an impediment to the development and financial goals of the software organization.

Beta testing and early adopter programs are often used as a substitute for thorough system testing, creating the potential for defects to go undetected. While beta testing was originally conceived as a method for evaluating the customer's software preferences, it has now grown into a bug detection methodology.

The problem, however, is that a corporate beta tester rarely has the time to significantly evaluate the product. Then when bugs are detected, the user usually gets frustrated and discontinues evaluating the product without forwarding the relevant information to the test engineer.

Clearly, software quality is the new imperative. But achieving quality does not happen by accident. By making long-term strategic investments in quality programs such as automated test tools, U.S. software vendors can begin to build quality and user satisfaction into the very fiber of the development process.

Pope is the general manager of the Test Products Group at Tiburon Systems, Inc., a software company in Santa Clara, Calif.

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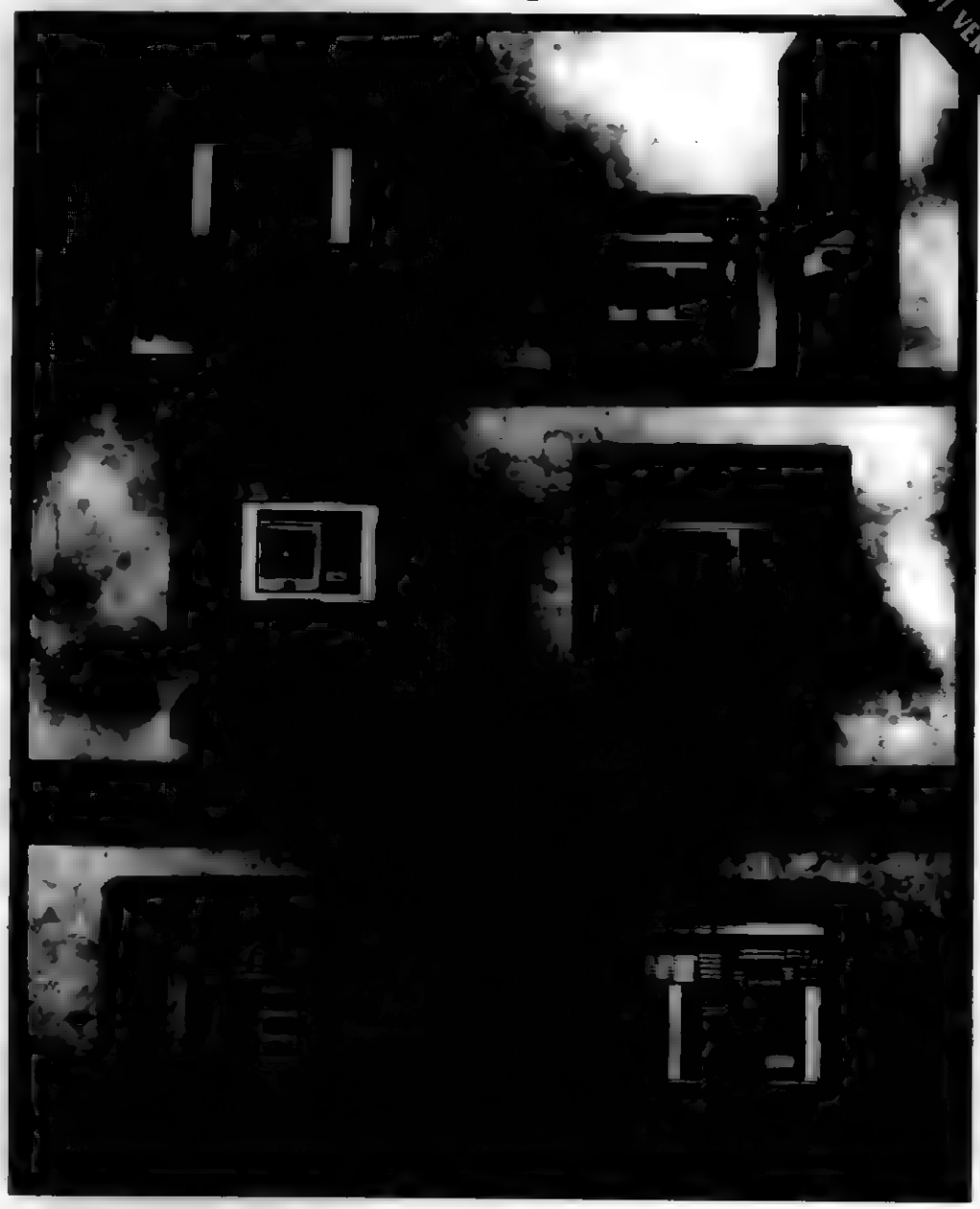

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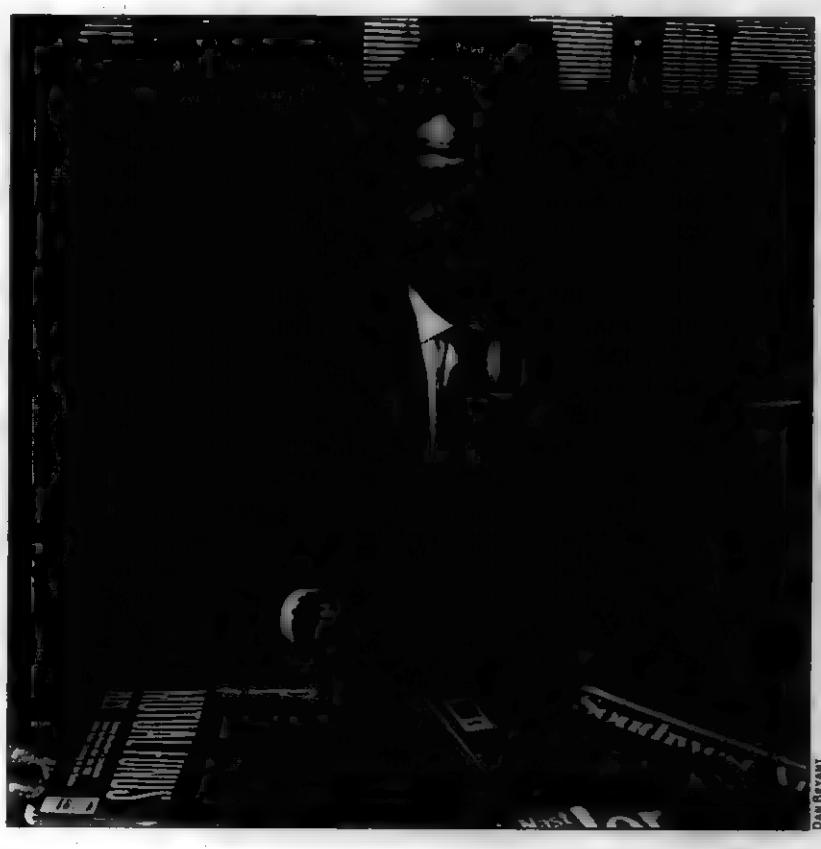
Seize the *customer* day

As chairman of the world's largest direct marketing servicer, Neodata's Tom Harbison misses no opportunity, including outsourcing, to satisfy his 130 million customers



DAN BRYANT

The chairman: Thomas O. Harbison, chairman and chief executive officer at Neodata.
The career: Neodata, chairman and CEO; Telecommunications Marketing, Inc., founder; U.S. Telephone, Inc., president and CEO; Probe One Computer Service, founder; Sorbus, Inc., founder and president; MAI Basic Corp., president; IBM, account representative, product specialist. University of Texas at Austin, bachelor's degree in business administration, 1965.
Greatest accomplishment: "Turning an early 1980s vision of creating a fully integrated supplier of direct marketing services into a reality."

Jom Harbison says he learned his most important lesson about customer service not in business school or from 27 years in marketing, but at a Houston hotel in 1977.

"I gave the desk clerk my credit card, and in about five minutes he came back," recalls the husky Texan, who was traveling with three small sons. "Instead of rejecting my credit card and being loud and boisterous, he was tactful enough to lean over and say: 'Mr. Harbison, your credit card is full.' That is a customer moment I have never forgotten."

Not only has Harbison remembered that day, but he's also made it the cornerstone at Neodata Corp., the $1.75 million Dallas-based firm that bills itself as the world's largest direct marketing services firm.

Formed in a 1990 merger, privately held Neodata acts as a customer service and fulfillment company for its 500 clients, which include *Reader's Digest*, General Foods, *Better Homes and Gardens*, the U.S. Postal Service and scores of other big names in banking, retail, insurance and dozens of other fields.

For a fee, Neodata will process subscriptions, catalog sales, television offers — you name it. But its real forte is database marketing, an emerging field that uses huge stores of data to help clients identify new opportunities.

And nowhere is this dual focus on customers and technology more evident than in a massive new relational database project under way since 1989. When completed, the so-called NCORE system (Neodata Customer Oriented Relational Environment) will handle millions of customer transactions.

No technophobe, Harbison, 49, a former IBMer and founder of Sorbus, Inc., the largest independent computer service provider, has outsourced most of Neodata's technology operations since 1990 to Electronic Data Systems Corp. — to the tune of about $30 million a year.

Joseph Maglitta, a *Computerworld* senior editor, management, spoke recently with Harbison.

■ Why no CIO?

People have asked me about it. People have pushed for it. I think the original thought was that if we're going to outsource to EDS, we needed that person to manage EDS. I said no.

Harbison, *page 78*

Inside Intelligence files: *Items of interest from publications, speeches, research projects.* *Page 79*

Seize the customer day

CONTINUED FROM PAGE 77

I wanted somebody to be counselor and to be in a position to understand exactly what's going on in Neodata.

[EDS representative] John Nastasi carries a business card today that says "VP of Information Technology, Neodata." Now, he works for EDS; he's paid by them. But when he goes to meetings, that's the card he hands out. And that's what he is for us. John's a member of our steering committee; I don't even think of him as EDS.

We have a president of an EDS unit who's been on one of our boards for two years, for the basic reason that EDS is such an integral part of our operation. We pay them a lot of money. But we would have paid a lot of money to ourselves.

■ Why EDS?

We did it for several reasons, but more importantly, we found it was a practical approach to planning. We said: "We need results now. We need volume in order to maintain current systems, to afford the latest technology for our clients."

We didn't outsource to EDS because of anything other than that I really thought it was the best thing. There were no hidden agendas. I know some people from EDS; that didn't hurt. I know they spend more money training their people.

■ Outsourcing rough spots

I can't say we've ever gotten screwed. We've had uncomfortable moments.... Look: I get mad at my wife — we've been married 25 years. Do [EDS and I] have differences? Yes. But I believe more than anything else in my life that intent is the cornerstone of any relationship. We've never had that problem.

Family relationships, marriages, business relationships generally fail not because I did wrong or because what we did was not successful but because you questioned my intent, my agendas. We're doing a lot to eliminate that.

■ The vision thing

What we have done is to be very careful to articulate where we are going, even though we're not sure of how we're going to get there.

If you walk into any office in Neodata, you'll see that stuff plastered in lobby hallways, bathrooms. The mission book that we produce, every manager has a personalized copy, with their name on the bottom of every page. By going public with those things, it's making it easier for our people to commit to each other and not question intent.

Every organization, whether it be the information technology group or the marketing or operations group, all know the direction of Neodata.

I went to Federal Express two years ago and we had dinner, the presidents of several companies. I sat with a young man from Atlanta who worked as the assistant manager of billing, probably 27 to 30 years old. He articulated the Federal Express mission and vision. And he wasn't the only one. You could tell that they just didn't prime the pump for the meeting. We're not there yet, but I hope that two years from now that we are there.

■ Seizing customer moments

Our mission in life is to enhance the customer moment — that is: For our clients, make each and every potential contact that our service organization has with their end customer the most precise, rewarding and enhancing experience.

Technology is making that more possible and reducing the "impersonal" nature that generally is associated with most direct marketing.

I don't care whether you are a direct marketer or with General Motors or a mass product distributor in some wholesale or retail line or target marketing. Understanding and building relationships with your customer is critical to the success of any information technology direction.

■ Aligning business and IS

We focus on planning because information technology is the most expensive thing in our corporation, second only to labor. Our 5,000 employees work worldwide basically in important transaction processing.

We have to clearly define the role of information technology in our organization based upon three or four competencies. We have developed a simple chart that is expressed to everybody in our organization. These core competencies are the envelope that those kinds of responsive systems will exist in.

When we were able to secure our single largest client, we were able to do that simply because we were able to articulate an information technology direction that they felt comfortable with. When we've made mistakes in the past, it is that we've had a separate information technology culture. The ownership of information technology has to come from the groups.

■ Creating business with technology

Take *Better Homes and Gardens*, a very successful publication. Through information derived from transaction processing and reading letters to the editor and so forth, they started a magazine called *Wood*.

Wood has been an extremely successful magazine. From that they started a magazine called *Wood Decor* because they understood from managing the information that's stored in our system that most of the letters to the editor were from women.

Neodata Chairman Tom Harbison: *"We have been very careful to articulate where we are going"*

Neodata facts

Provides services, including fulfillment and database marketing, to companies that use direct marketing.

Headquarters are in Dallas. Divisional headquarters in Omaha; Boulder, Colo.; Des Moines, Iowa; Limerick, Ireland, and five states.

Employs 5,000.

Annual revenue is approximately $175 million. Company is privately held; has filed for an IPO.

Last year, Neodata sent out 500 million pieces of mail and received 70 million responses. Company agents fielded 25 million telephone calls and made 13 million outgoing telephone calls.

■ Down on "high-level"

If I never hear the word "high-level" again, it will be just fine. One of the things I think we do as information technology people is we want to give everybody a high-level view. People in operations don't understand these high-level views. They need to know how they are going to impact their operation — today.

■ On being a technology pioneer

We were the last family in Wichita Falls, Texas, that had a color TV. When I was growing up, they were kind of greenish. My dad kept saying they were gonna perfect them. I wish I had more of my dad's mentality today because we have stepped out on some things that cost.

We put in predictive dialing equipment in our telemarketing service. We weren't very smart. We were the leader who paid 60% more than everybody who waited a year. We had projections that we were going to get a premium. We're not getting a premium.

I don't know what the answer is. Somehow vendors have got to protect the client when they make those kinds of investments.

■ Next steps

We are developing what has been written about as the virtual organization. It is not easy and it's scary and things change.

We are working point to point to where the next time I check into that hotel in Houston it will be: "Welcome to the Four Seasons. How was your flight from Dallas? I notice that this is your fourth trip to the Four Seasons this year.... We have your favorite bottle of [wine] in your room to celebrate your birthday."

Executive Track

Summit Information Systems, Inc. Vice President **Gerald A. Long** has been promoted to president. Summit, the information systems subsidiary of Akron, Ohio-based Roadway Express, was spun out from its less-than-truckload motor carrier parent in 1999.

A slew of promotions recently struck among the IS advisory complement at international accounting, tax and management consulting firm **Ernst & Young**'s West Region Management Consulting Practice. In the San Jose, Calif., office, 16-year IS veteran **Matthew K. Hudes**, who heads up the High Technology Information Systems practice, is now a partner. Before joining Ernst & Young in 1984, Hudes served as IS director at Fremont, Calif.-based Vitalink Communications Corp.

In Ernst & Young's Los Angeles office, 20-year IS veteran **Patrick Garrett**, who leads the Advanced Technology practice, has been named a principal of the firm. An expert in all aspects of data center management, Garrett formerly served as one of the office's senior managers.

Varian Associates, Inc., a diversified technology company serving a panoply of vertical markets, has named **John Ineson** director of corporate IS. Ineson joins Varian after 16 years at N.J.-based paper and chemical manufacturer Union Camp Corp.

Have you or a colleague in IS recently been promoted? *Computerworld* would like to share your news with the rest of the IS community. Please contact Associate Editor Carol Hildebrand at (800) 343-6474 to pass the news along.

Intelligence Files

IS for one-stop shopping

Here are three ways to make your information systems more customer-focused:

• Systems should support one-stop shopping with a cross-functional database. In a multidivision company, customers should be able to call one place and have one person take care of all their needs.

• When an information system is designed, get customer input from surveys, focus groups and face-to-face meetings. Too many IS projects focus on streamlining internal operations rather than on benefiting customers.

• Systems should support "One and Done." That means one call is all that is needed to close a transaction. Strive for an average of 1.1 to 1.2 contacts per transaction.

Source: Interview with Leslie Harps of The Customer Service Group, Silver Spring, Md., Oct. 16, 1992.

Mergers and outsourcing

Consolidation has become a way of life in many industries, so organizations need to consider how mergers will affect their outsourcing contracts.

This problem was underscored by the recent merger of two Pittsburgh-based banks, Integra Financial Corp. and Equimark Corp.

Each company had an outsourcing contract with a different vendor. Equimark decided to drop its outsourcing vendor and go with Integra's, but the termination required a $4.5 million payment to the losing vendor.

The lesson: Be sure to have an escape clause in the event a merger forces the cancellation of outsourcing services.

Source: "Outsourcing Contract Concerns," from "Bank Outsourcing Report," Oct. 15, 1992.

Librarians for CIO

Theoretically, corporate librarians are in a good position to become information czars in a corporation, but that is not happening. Instead, many business libraries are being decimated by budget cuts, and librarians are either too timid or unprepared to take leadership roles.

If the librarian becomes CIO, then the corporate library will become integrated with other information resources and survive. Otherwise, it may very well disappear.

Source: "Librarians in the 21st Century — Endangered Species or Future Chief Information Officer?" by Arlene Farber Sirkin, in "Specialist," the newsletter of the Special Libraries Association, October 1992.

Making the 'open' case

The consortium X/Open Co. has introduced a guide to help IS executives persuade management to take the plunge into open systems. The "Open Systems Business Case Guide" provides a methodology for identifying areas where open systems can support business objectives. The guide will be available by year's end for a nominal fee.

Source: X/Open Co., Menlo Park, Calif., Oct. 5 announcement.

Outsourcing complexity

The federal government has made dozens of regulatory changes in its student loan program this year, prompting more banks to consider outsourcing that portion of their business.

Fearful that a mistake in updating their systems will result in financial penalties, small banks are turning to outsourcers for student loan processing, according to John E. Dean, special counsel to the Consumer Bankers Association.

Source: "Outsourcing Gains in Student Loan Area," by Matt Barthel, *American Banker*, Sept. 29, 1992.

Compiled by national correspondent Mitch Betts.

Calendar

DEC. 13 - DEC. 19

The Fourth Annual Baltimore Computer Conference and Exposition. Baltimore, Dec. 15-17 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

JAN. 3 - JAN. 9

ShowBiz Expo East. New York, Jan. 7-9 — Contact: Live Time, Inc., Los Angeles, Calif. (213) 668-1811.

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

JAN. 17 - JAN. 23

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 UDMS User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E.J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

Nell Margolis

Saying when

From the invention of the wheel to the advent of the VCR, just about every technological turn in history has had one big advantage over the Desktop Revolution: to wit, a reasonably clear idea about what the stuff is good for and how much, when and how to use it.

Oh, sure, plenty of folks refused to *drive* the Model T or to ride in it — but how many failed to realize that driving and riding were the general idea? Lucky Henry F.

And lucky Tom Edison, whose ad folks never proposed this campaign: *The Light Bulb: so nutritious — and it tastes good, too!*

Today's IS leaders aren't going to be that lucky — at least, not immediately. Out there on the front lines of the Desktop Revolution, the hard stuff may be getting easier all the time. But the easy stuff, like knowing where the technology fits in and where it fouls up, remains deceptively tough.

That's why any IS leader who admits that it's hard, acknowledges that knowing how technology works doesn't necessarily mean knowing when it's appropriate, focuses on asking the right questions rather than obsessing over the right answers and inspires users to follow suit is likely to emerge as a hero in the age of re-engineering.

Too much technology ...

I had my first glimmer of how tough the going was about to get one day six years ago, when I watched a computer-savvy executive figure out how much money would revert to his budget if one of his straight-salary staffers went to a four-day workweek.

On the off chance that this fellow, who graduated *cum laude* from one of the nation's leading universities, had a problem figuring 80% of the staffer's $30,000 in his mind, he had within easy reach two pocket calculators, one adding machine and 10 fingers.

What he used was a spreadsheet package on a VAX minicomputer.

Five minutes and heaven knows how many dollars later, he looked up in triumph. "Do you know how much we could save?" he asked.

"Six thousand dollars a year?" I ventured.

"Wait a minute," he said. "How did you get that? You can't even see the screen from there."

True, but I could see my fingers.

Unfortunately, folks, this story is true.

... and too little ...

Just how much we all still have to figure out about when to use desktop technology and when to lose it was hammered home to me on two coasts last month: In California at the annual Society for Information Management conference, IS leaders didn't exploit desktop technology when they should have (were you at SIM? Remember all the awful slides?); and in Massachusetts, a prep school leader shouldn't have reached for the PC when she did.

Person after person took to the podium during the three days of one of the IS community's most prestigious gatherings to urge the recognition of the importance of driving technology through the user organization and to talk of the compelling ways in which the PC is changing the way we work.

Virtually everyone showed slides. Virtually every slide showed pies, bar graphs, or, worst of all, text.

Sadly, the slides were boring, confusing and hard to see.

It was pathetic: A host of seasoned technologists sat down at PCs packed with enough powerful presentation graphics software to give a Hollywood studio a run for its money. Instead, they came up with nothing that would have strained the capacity of the simple overhead transparencies folks used to draw on with magic markers, project onto screens and call "visual aids."

... too late

I arrived home from SIM just in time for an assembly at my daughter's school. The headmistress is no techie, but she's no slouch, either. Charged with introducing the evening's speaker, she did her notes on a PowerBook.

Unfortunately, her tongue got a tad ahead of the screen. That's how she came to deliver what amounted to an accidental comic monologue full of golden moments along the lines of: "After he returned from China, this versatile artist was committed (long pause) to a more introspective way of life."

Happily, this is a lady of some humor as well as dignity. After three or four awkward pauses, she stopped trying to conceal what was going on and started to camp it up. She left the stage to rousing applause.

Not as much applause, however, as the next speaker, who flawlessly delivered a riveting presentation without any notes or slides whatsoever. He grinned and said, "It was easy — I don't have a PowerBook."

Margolis is a *Computerworld* senior editor, management.

Only one thing can turn your global network from a burden to an asset.

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Syncordia has a better way to manage your global network. Outsource it with us.

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With us as your partner, managing complex global networks isn't so complex, because that's the business we were formed to pursue.

Most important, to us, partnership means pursuing opportunities, not just solving problems. We'll make it our business to know your business and help you use information technology to get an edge over the competition.

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Syncordia is the first company built from the ground up to provide global network outsourcing solutions.

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Syncordia outsourcing solutions range from planning and integration through procurement, installation and maintenance to the operation of your entire network.

In all cases, we guarantee the highest level of customer service through Network Control Centers armed with Concert™ network management software; Customer Support Centers, staffed with multilingual, multicultural managers; and Integrated Single Currency Billing.

The Syncordia Service Level Agreement spells out every detail of what you can expect from our partnership. It defines the shared risks and rewards.

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Outsourcing your global communications network takes time. And teamwork. All the more reason to begin right away. Because the sooner we become your partner, the sooner your network burden will become a business asset.

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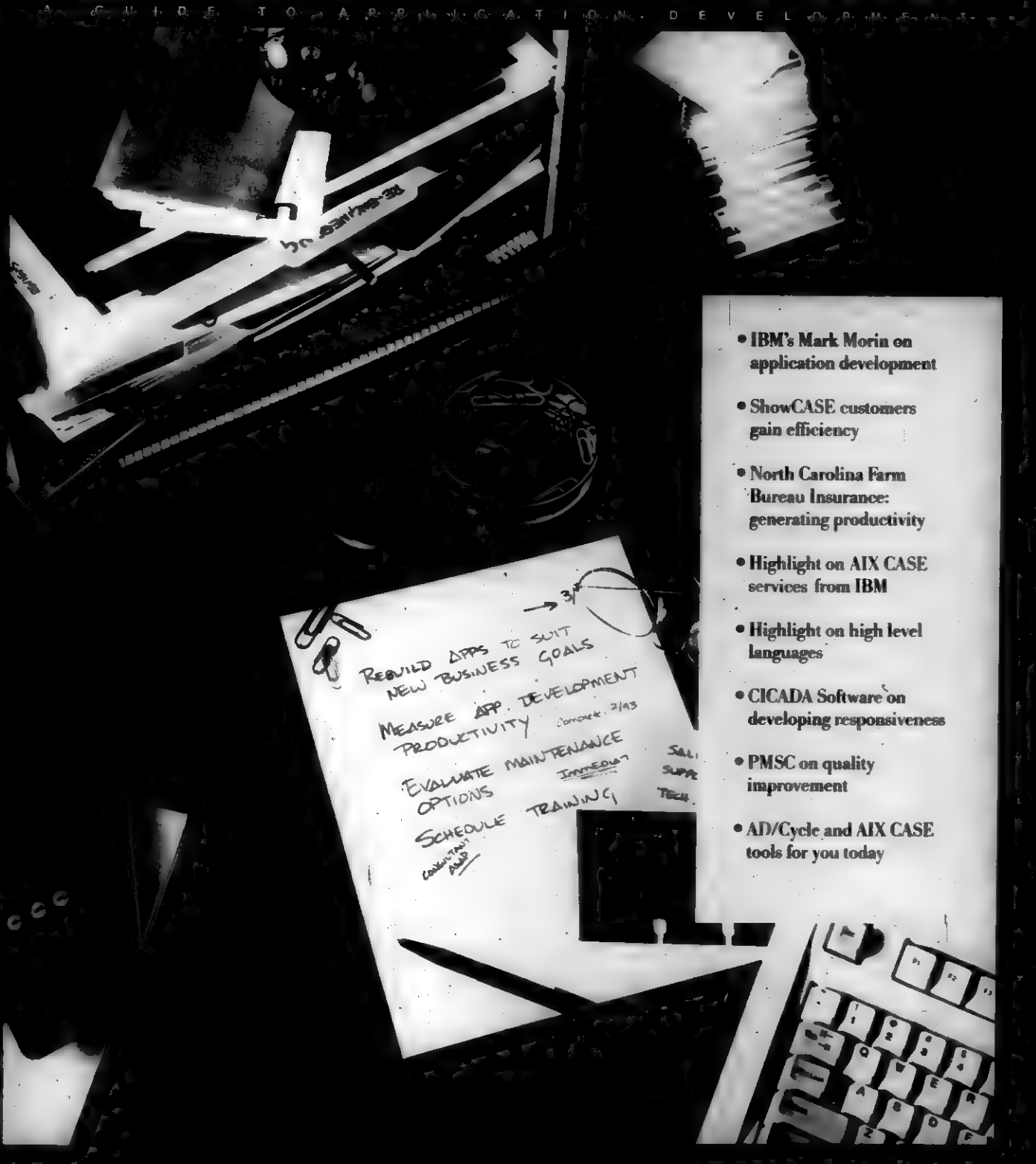
IBM

AD/*Today*

A GUIDE TO APPLICATION DEVELOPMENT



- IBM's Mark Morin on application development
- ShowCASE customers gain efficiency
- North Carolina Farm Bureau Insurance: generating productivity
- Highlight on AIX CASE services from IBM
- Highlight on high level languages
- CICADA Software on developing responsiveness
- PMSC on quality improvement
- AD/Cycle and AIX CASE tools for you today

"Software. Support. And more support."

"We can only be a success to the extent that we support each application development tool with consulting, education and technical services."

Q: From your perspective, what is the focus of IBM's information strategies and offerings today?

Mark Morin: Software. Support. And more support. IBM's reputation is that of a hardware supplier. Mostly big systems at that. But, beyond our hardware, mainframes to notebooks, most people don't know that we're the world's largest software supplier. And software is what's driving business today. It's what a company can *get out* of its hardware that makes the difference in profitability. Software applications are often the most important differentiating factor in a corporation's competitiveness. Through software applications, companies can provide faster response to their customers' needs. As a result, both top management and I/S have recognized that application development is strategically important.

So how are we helping our customers? By delivering a broad range of software development options and implementation services. That is what's critical to giving our customers a strategic competitive advantage. They have specific application development tasks and priorities. And we are providing them with quality tools and services they can integrate into their current environment and benefit from.

Q: In terms of application development, what do your customers need?

Mark: First let me mention that as a company, we face exactly the same issues our I/S customers face in application development. In fact, IBM is the world's largest application development shop. The question of efficient, high quality application development has been vitally important within our own business since the early 1970s. And from the start, IBM has had an enterprise-wide vision of data and application development.

Today our customers count on IBM to: Protect and leverage their current investment in technology, data and applications. Give them a broad range of methodology, process, tool and service options. Address development in an open environment across multiple platforms, including MVS.

Mark Morin,
Assistant General Manager,
Software Marketing,
IBM Corporation

AIX, OS/400 and OS/2. Maintain a framework of consistency, integration *and* choice. Enable them to easily adopt the latest technologies. And finally, provide them with a secure and evolving migration path.

Q: How are you accomplishing that?

Mark: Our job is to offer products and services that meet the specific requirements and priorities of each individual customer. We can only be a success to the extent that we support each application development tool with consulting, education, implementation plans and technical services. Tools and services go hand-in-hand. And both are required.

On the tool side, through AD/Cycle™ and AIX CASE, we provide the industry's broadest portfolio of cross-life cycle tools. Even IBM isn't large enough to provide all of these tools. As you probably know, a significant portion of the application development offering is provided by members of the International Alliance for AD/Cycle—a consortium of leading CASE vendors whose tools are fully AD/Cycle-compliant.

These companies include Bachman Information Systems, Digitalk, Easel Corporation, KnowledgeWare, Micro Focus Limited and Synon. I'm happy to say that we have recently added Sapiens International Corporation, and VIASOFT as members.

For AIX CASE, over 20 leading CASE vendors have agreed to integrate their products into the Software Development Environment Workbench. An additional 20 software vendors are targeting their products to CICS™ AIX on the RISC System/6000™ for users developing transaction processing applications. Also, there are hundreds of products that run on the RISC System/6000, including design tools, reverse engineering tools and compilers.

Now, on the services side, our investment plan this year is significantly greater in services and support for customers, and in particular, in application development.

You can expect to see service and support more tightly integrated with everything we offer in application development. It's the most logical step for us as a comprehensive software and services supplier.

Q: What about the tools themselves?

Mark: Our tools and systems are constantly evolving to meet our customer requirements. What does I/S need? Faster, more efficient maintenance. High quality development that meets the needs of end users and fulfills the business goals. Greater synergy across people, tasks, data and tools. Open systems. And a development environment that leverages their hardware investment, from mainframes to PCs.

We're also putting a large investment into workgroup development, to give our customers a development environment that can incorporate their current IBM application development tools. All of this comes directly out of customer requests.

In fact, this is an excellent example of IBM providing a comprehensive application development strategy that protects our customers' technology and data investment, offers a broad range of options and delivers the latest technologies along with a stable migration path.

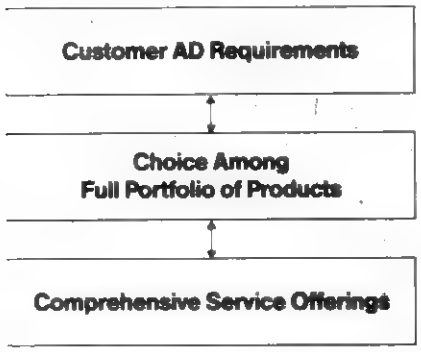
And you can bet we'll back it with every service necessary to make us both a success.

"...we provide the industry's broadest portfolio of cross-life cycle tools."

AIX CASE highlight: Services, support and training

Application development customers have a place to go for practically all of their questions on how to get to tomorrow faster: IBM service support.

IBM can ease the tasks of installation, start-up and education with a range of services and support for AIX Software Development Environment (SDE) WorkBench/6000, SDE Integrator/6000 and AIX Configuration Management Version Control/6000 (CMVC).



Here are some of the current AIX software development offerings you may purchase:

WorkBench project tool analysis and implementation.

IBM will work with your development staff to evaluate your development tools and recommend how they fit into your evolving development process. The support team can then install selected new tools on your system and set up the WorkBench task manager to invoke tool sets automatically on start-up.

CMVC requirements analysis and setup.

Working with your staff, IBM can evaluate your configuration management and version control requirements. You can use the IBM support team to configure and install CMVC on your system, train your developers in the use of CMVC and show them how it works in your development process.

Software Customization for RISC System/6000.

Simply put, Software Customization is an IBM service that installs fully configured system and application software on your new system while it is being assembled. When the system arrives at your site it is fully loaded, tested and ready to do productive work. All you add is network hardware, peripherals and your files.

Classroom education.

Classes on the SDE WorkBench, AIX CMVC and SDE Integrator can be custom-tailored to your requirements. These classes can be delivered to your staff at your location or at the IBM support center in Dallas, Texas. These classes include installation, administration, customization and support for both CMVC and WorkBench.

IBM can also provide a class on how to integrate other tools into the WorkBench environment using the IBM AIX SDE Integrator/6000 tool.

Installation support.

Whether your needs are a complete installation or telephone assistance, IBM is prepared to help you install WorkBench, the Integrator and CMVC. You simply determine how much work you are prepared to do and let us do the rest.

SystemXtra™ for IBM RISC System/6000.

This help desk support service provides your authorized technical support personnel unlimited access to an 800 number for your system services needs. That includes hardware and software usage assistance and problem reporting from 8 a.m. to 5 p.m. in your time zone, with emergency call-back service after hours. Through the IBMLink electronic facility, 24-hour access is available for database search and text-based question submission. At the other end of the 800 number is the IBM Technical Service Center with its full-time RISC System/6000 and AIX support specialists.

Services and support from IBM can help you with evaluations, installations, training and system changes. Teams are equipped for your needs and ready to begin today.

For more information contact your IBM marketing representative or call 1-800-547-1283.

AD/Cycle highlight: High level languages

Business environments large and small are becoming increasingly dependent upon information accessed through computer applications, often creating their own custom applications.

One issue these businesses face in planning their application development tool strategy is whether to implement stand-alone tools or select from among those tools designed for compatibility and integration.

Further, in designing an application development environment, the I/S department must decide how to protect the corporation's existing inventory of applications while expanding the department's ability to implement new technologies.

Support through a framework structure.

IBM's high level languages development environment is a single, cohesive framework of cooperative products that can bring new levels of programmer productivity and quality to application development.

Specifically, this framework of tools can help application developers reduce the time-consuming and expensive job of handcrafting code. It also gives developers the ability to reuse existing code in new applications, independent of the language of the application. And it can offer them a boost in productivity throughout the development, test and maintenance process, either on existing or new applications.

High level languages for high level productivity.

At present, four sets of products comprise the high level languages development environment. The first is a suite of language compilers: AD/Cycle C and AD/Cycle COBOL for the System/370™ environment, AD/Cycle RPG/400® and AD/Cycle COBOL/400® for the AS/400. These compilers offer improved functionality and ease of use over previous versions. Over time, other Systems Application Architecture languages will be announced and supported under the high level language development environment.

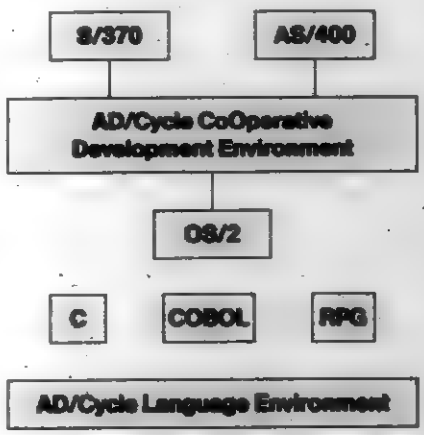
Next, the AD/Cycle Language Environment/370™ provides developers with one run-time environment for all applications, regardless of the application programming language. In a single product and through a single, shared interface, you get a common set of services, protocols and linkage connections.

AD/Cycle CoOperative Development Environment for the System/370 and AS/400 (AD/Cycle CODE/370 and AD/Cycle CODE/400) provide cooperative edit, compile and debug capabilities that support multi-language, multi-system environments. CODE/370 and CODE/400 can enable you to develop applications faster, remove errors sooner and leverage the power of workstations.

Finally, Micro Focus Limited offers the Micro Focus COBOL Workbench. The COBOL Workbench complements CODE/370 and enables developers to create and maintain COBOL applications on the workstation that run on workstation *and* mainframe platforms.

Putting practical advantages to work today.

As a composite set of tools, the high level language development environment can provide you with a clear, integrated path to application development. Further, because most of these tools can operate in a stand-alone mode and provide increased productivity and quality, you can begin to implement them today one step at a time.



The AD/Cycle Language Environment/370 provides one run-time environment for your applications. AD/Cycle CODE/370 and CODE/400 offer cooperative edit, compile and debug capabilities.

An interview with the data processing managers at North Carolina Farm Bureau Insurance

"We don't view CASE as an option. It's a critical need."

Dennis Nelson
Tom Morris
Walt Scheper

Q: You started looking at CASE tools to change your approach to data processing back in 1985. How did this come about?

Dennis Nelson, Data Processing Manager: Our portfolio of application systems had started to age, and the question was how they were going to be replaced. The decision was to design and develop the insurance systems in-house. Systems are dynamic, constantly requiring changes and enhancements. To have the work done correctly and on time meant doing it ourselves, and not relying on outside sources.

Furthermore, we support 650 agents in the field and 550 users in the office who need timely access to constantly changing data. And we differentiate ourselves largely by the information services we can provide our customers. The key is efficient application development.

So we have been working toward reducing our use of packaged software, creating our own development methodology, moving our development effort from the mainframe to the workstation, developing a relational database perspective, replacing duplicate, free-standing databases with a shared data environment and installing CASE tools that would take us to application generation directly from models.

We anticipated something like AD/Cycle, and we were delighted when it was announced.

Q: What are you doing with AD/Cycle tools currently?

Walt Scheper, Data Administration Manager: We have a relational commercial risk application from a third party developer. The data resides on an OS/2 LAN server and is not part of our DB2® mainframe policy system. To get this policy risk information out to our agents and adjusters in the field, we're implementing IBM's Distributed Database Connection Services/2 and moving the data to DB2. IBM has been supportive in this endeavor. They have provided proof-of-concept assistance along with training and Field Television Network broadcasts.

With these tools, we'll connect the application to our host-based policy risk database, using the host as a server.

That will provide risk information throughout the network, putting critical information at everyone's fingertips.

Also, we are in the initial phase of redeveloping our current policy processing system, which has more than one million lines of code. We have identified what the major business functions are and will be using CASE tools to model our information needs and develop the required processes.

Tom Morris, Systems and Programming Manager: Right. We've either got to have CASE tools that can generate code, or an extremely large staff. So to that end, we're using the BACHMAN CASE tool set for data and process modeling. We plan to use BACHMAN/Designer to generate our application code.

We've developed several application systems using IBM's Cross System Product. We plan to install IBM's Cross System Product/2 AD in 1993.

Walt: In effect, we're building a corporate data model that will help us consolidate databases residing in seven distinct departments for 650,000 clients, claimants, witnesses and other involved parties. We want to build a single-view database architecture that will serve as a hub for the rest of our architecture and applications.

Tom: We don't view CASE as an option. It's a critical need. Especially in terms of IBM's Cross System Product code generation. We want to develop all of our applications in-house and maintain them using a top-down approach, starting with business models. Using this approach, we'll be able to handle business changes in a more effective manner.

Q: How have these tools and processes affected your programming staff?

Tom: Once fully implemented, CASE code generators will reduce the amount of code programmers must write. That will eventually redefine the programmer's job, enriching the quality of the tasks they perform. The tools will take over many of the mechanical, mundane and repetitive tasks, allowing the developer to concentrate on the business needs.

Walt: That's key. We now understand the real business need for information at least ten-fold better than we did a few years ago. We used to just analyze and fix individual information problems. Now we understand the entire information flow, and our solutions are not little isolated applications anymore. They're corporate solutions, based on a much wider perspective. And it's had a positive effect corporate-wide.

"...we differentiate ourselves largely by the information services we can provide our customers. The key is efficient application development."

Keys to success with AD/Cycle

IBM would like to extend a special thank-you to all ShowCASE participants and the author, Bill Pope. Bill is a consultant specializing in information systems engineering planning and implementation.

In 1990, IBM established a partnership with 30 Fortune 500 companies that were adopting AD/Cycle. The partnership, called ShowCASE, gives IBM a chance to study application development teams making the transition from hand-crafting code to using the CASE approach of AD/Cycle.

This article summarizes research done by the author to understand the gains these companies experienced, specifically in increasing programmer productivity and application quality.

Several ShowCASE customers collected productivity data and evaluated the quality of applications delivered. On the next page you can see the customers' results for their first and third projects. At the time of this research, seventeen members of ShowCASE had successfully completed one or more projects. The increases in productivity and quality are impressive.

But perhaps the most interesting finding was the discovery that these same seventeen successful companies shared several common preparatory steps before implementing AD/Cycle. In particular, there are twelve steps that the companies agreed were important. These twelve steps seem to contribute enormously to a successful launch of AD/Cycle.

We thought you would be interested in a description of these keys to success in implementing AD/Cycle or AIX CASE projects:

Select an AD/Cycle area of focus.

Choose a pilot program based on your system engineering expertise, your relationship with the system's users, business and I/S management support, strategic needs and current AD/Cycle capabilities. These areas can include: enterprise modeling and I/S architecture planning, business process improvement, application generation, maintenance or reengineering. Information Warehouse™ development is also a suitable area of focus for an AD/Cycle pilot project.

Obtain the buy-in of management.

To help ensure your pilot project is a success, get the buy-in of the entire team, including the management of application development, data administration, database administration and the business unit that will use the application.

Bring I/S management and business management together.

Establish a forum to discuss and document all objectives and clear expectations for results. Success requires a goal-oriented approach by a team often made up of corporate managers, I/S management and staff, and users.

Develop an AD/Cycle implementation plan.

The plan should include all of the key activities listed here and assign management responsibilities, resources and schedules for each.

Appoint an implementation project manager.

Charge this person with the authority and responsibility to coordinate and direct representatives from all involved groups. Good communication skills and credibility are a must.

Acquire an engineering-oriented development methodology.

A methodology designed for CASE tools and processes is a requirement. It describes the types of planning, analysis and design models your team will use to develop an application. While those who developed their own methodology recommend allocating two years for the task, about 70% of the survey group purchased a finished, proven methodology.

Develop tool usage guidelines.

AD/Cycle offers many tool choices resulting in some overlap between tools. You can save a lot of time by having a select group of developers become familiar with the tool options and best procedures for your environment. They can then document specific tool usage procedures to be followed by the entire team.

Provide early training on the methodology and tools.

Early, formal training is a critical ingredient. Training, at different levels, should include I/S management or staff, developers and users. Each group will be affected in different ways by the shift to automated methods, and early preparation helps them get the most out of the change.

Build a support organization.

A good guideline is to dedicate one support person for each ten to fifteen developers to provide help with your method, tools and model management. Whether your CASE specialists are employees or consultants, systems engineering and CASE tool experience is a must.

Initiate cultural change programs to transition programmers and users alike.

Help people prepare for change—and even welcome it—with in-house education, benefit-oriented presentations, promotions and awards. While most I/S professionals are ready for change, some will still resist it. Transition programs can smooth the way with both I/S management and staff and users.

Utilize consultants if systems engineering skills are not available in-house.

You can make the most of your investment by taking advantage of IBM's consulting services such as situation assessment, long-term planning, transition management, AD/Cycle training, implementation and support.

Measure your progress.

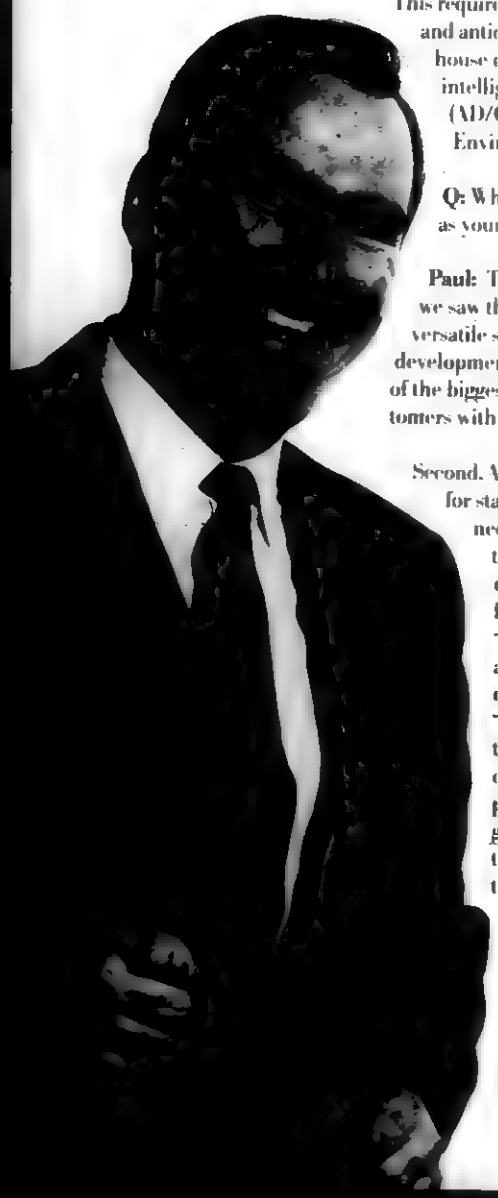
Start measuring your current productivity and quality levels as a baseline reference. Current-approach measurements often provide strong data to support your need to change to AD/Cycle. And if you have an experience similar to the ShowCASE participants, your third project results will show that vast improvements were yours to have.

The chart below shows the gains reported by those companies that kept measurements for both traditional and AD/Cycle projects.

ShowCASE Productivity and Quality Gains		
Application Under Development:	**1st Project**	**By 3rd Project**
• Improved Application Development Productivity:		
— CASE plus 4GL Application Generator	20-50%	100-200%
— CASE plus 3GL Manual Coding and Test Tools	21-25%	50-100%
• Reduced Application Delivery Time	0-27%	50-56%
Application In Operation:	**Overall**	
• Improved Application Quality	82-97%	
• Reduced "Maintenance" Staff Allocation	30-80%	
• Improved Application Enhancement Productivity	20-40%	

"...take a close look at a combination of the AS/400, PS/2s and AD/Cycle tools."

Paul Devitt is the Vice President of Management Consulting for CICADA Software Group in Toronto, Canada.



Q: Unlike most AD/Cycle customers, your company exists to sell the software it develops. Can you describe your business challenge as it relates to your development strategy?

Paul Devitt: We're a three-year-old company in the business of developing application and productivity software for specialized industries. Our success hinges on controls and productive development. Our customers are always looking for the most function possible, but typically within tight budget constraints.

CICADA sells support, and TCR (Total Customer Responsiveness) is important to us. This requires always listening to our customers and anticipating their future needs. Our in-house development is done using OS/2 intelligent workstations and CODE/400 (AD/Cycle CoOperative Development Environment/400).

Q: What led you to choose the AS/400® as your primary development platform?

Paul: There were several reasons. First, we saw the AS/400 as a scalable and versatile system offering a wide range of development tools for our client base. One of the biggest client bases out there is customers with AS/400s.

Second, AD/Cycle provides the opportunity for standardization and consistency we need for responsiveness throughout the life cycle of systems. On any day, I can expect the sales manager for one of our customers to say, "We want to break down sales in a number of new ways, immediately." And I can honestly say, "We can do it," without concern that we can't find original source code or get our programs compiled quickly. Our CICADA program generator and AD/Cycle tools provide a consistent application development strategy.

Third, we wanted in-house productivity. CODE/400 intelligent workstation development is another excellent productivity tool. Its workstation compile option has taken a considerable load off our mainframe and it's quick. CODE's design specification utility is great for designing screens and reports. We have been able to increase our productivity by as much as 25% using individual CODE/400 features in just six months.

Q: Why is AD/Cycle important to you?

Paul: We believe in standardization. And AD/Cycle provides a framework for developing and delivering services. We don't use all of the AD/Cycle tools, but you need to have some standardization among tools in the marketplace. Look at the disruption when a key individual leaves a development team. That just shouldn't be the case. We're rectifying the problem with the integration and consistency we get from AD/Cycle.

AD/Cycle ensures that something important is not lost between two technicians. And it ensures that what one technician creates can be used by the other one. That means gains in productivity. Specifically, reduced training on tools, increased synergy between programmers and their tasks, and fewer errors.

We find AD/Cycle gives us the flexibility to choose the tools we want *and* it gives us the standards and discipline to do consistent implementation.

Q: How else has IBM helped?

Paul: IBM has met our product expectations and matched them perfectly so far. They are constantly providing innovative tips and techniques for employing the AS/400 and AD/Cycle tools to improve our business.

Q: Do you have any suggestions for other customers looking to improve their development process?

Paul: Yes. First, look for a system that can grow with your business. Second, consider the use of intelligent workstations. Third, standardize and put common controls on your processes. Fourth, ask IBM for help. Lastly, look at a combination of the AS/400, PS/2s and AD/Cycle tools. We've found that this solution can significantly improve productivity. After all, that's what it's all about.

AD/Cycle: A framework of choice

Q: Your company started out as the data processing department for an insurance company, and now it would be difficult to find a major insurance company that doesn't buy software applications from you. What are your goals for application development?

Bill McNair, Manager of Data Administration and Standards, Policy Management Systems Corporation: Our primary business is developing applications that run on MVS, OS/400, OS/2 and PC/DOS. We have over 2500 developers in this organization. You can imagine the importance of AD/Cycle to me.

My goals are to improve developer productivity, boost product quality and decrease maintenance. I'm looking for a 20% reduction in our time-to-develop, with an even greater reduction in number of defects.

Q: What do you get from AD/Cycle?

Bill: In a general sense, openness, the flexibility to choose the tools and techniques we feel are the best of breed, and a framework designed for consistent implementation and use of these tools. All based on the methodologies *we* choose. We've enjoyed two years of continual expansion with AD/Cycle using planning, analysis, design and construction tools. With each of our product releases, we've expanded the use of new tools in our environment. And now the efficiency of our release schedule is closely associated with our AD/Cycle implementation schedule.

More specifically, the whole AD/Cycle environment improves the likelihood that the final implementation meets our customer needs, because it's based on their requirements. We can drive development from business models and associate development information across the life cycle. We've always done a good job of understanding customer requirements, but before AD/Cycle it was a manual procedure. AD/Cycle has insulated the developers from many of the complexities of development and allowed them to focus on fulfilling the business requirements. We have a clearer, automated connection from the requirement to the implementation. And we track the requirement all the way through development. The end product is much easier to maintain. Now maintenance means *adding capabilities* to accommodate changes in the requirement, instead of fixing bugs.

Plus, these days, I/S is being run more as a business. We need to help our customers show cost justifications. AD/Cycle helps us more accurately predict the cost side of the equation.

Q: What do you gain from IBM itself?

Bill: A strong company, mature products and the ability to grow. Plus, IBM's technical support. It's always excellent. It's one of their greatest strengths. And don't forget languages, databases, operating systems, and standards, such as CUA™ (Common User Access) and SAA.™

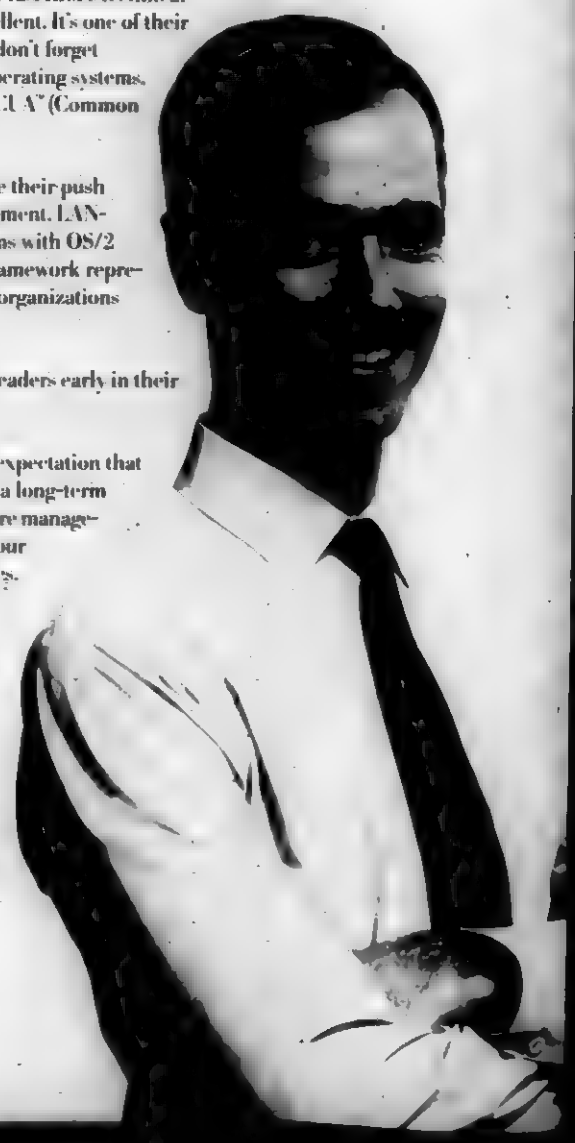
Most recently, I welcome their push into workgroup development. LAN-based development teams with OS/2 tools and a consistent framework represent what development organizations need the most.

Q: Any suggestions for readers early in their implementation?

Bill: Set management's expectation that the payoff is going to be a long-term proposition, but make sure management also hears about your short-term success stories. There will be many of increasing significance. Improved quality and productivity are our key measures, but don't ignore the positive reaction of the developers themselves. They enjoy working in this new environment, and they take pride in doing quality work.

"I'm looking for a 20% reduction in our time-to-develop."

Bill McNair



From the I/S professionals featured in this issue:

"...we track the requirement all the way through development. The end product is much easier to maintain. Now maintenance means adding capabilities to accommodate changes in the requirement, instead of fixing bugs."

Bill McNair
Policy Management Systems Corporation

"We believe in standardization. And AD/Cycle provides a framework for developing and delivering services."

Paul Devitt
CICAD Software Group

"...we differentiate ourselves largely by the information services we can provide our customers. The key is efficient application development."

Dennis Nelson,
North Carolina Farm Bureau Insurance

"Our job is to offer products and services that meet the specific requirements and priorities of each individual customer."

Mark Morin
IBM Corporation

Get the application development business partner video series

IBM can provide you with video tapes featuring the members of the International Alliance for AD/Cycle:

BACHMAN
DIGITALK
EASEL
KNOWLEDGEWARE
MICRO FOCUS
SAPIENS
SYNON
VIASOFT

The series also includes one IBM business partner, INFOSPAN.

These tapes will give you insight into the companies and their products. Several tapes in the series include demonstrations and customer applications. Please contact your IBM marketing representative for copies.

Application development products from IBM and International Alliance members:

Cross Life Cycle Tools:

- Application Development Project Support (ADPS)
- Personal Application System Project Management/2

Enterprise Modeling Tools:

- BACHMAN/Analyst
- BACHMAN/Shared Work Manager
- KnowledgeWare ADW/Planning Workstation
- SAPIENS Development VM
- SAPIENS Development VSE
- SAPIENS Development MVS
- SAPIENS Run Time VM
- SAPIENS Run Time VSE
- SAPIENS Run Time MVS

Analysis/Design Tools:

- BACHMAN/Analyst
- BACHMAN/Shared Work Manager
- BACHMAN/Database Administrator
- BACHMAN/Designer
- EASEL Workbench
- KnowledgeWare ADW/Analysis Workstation
- KnowledgeWare ADW/Design Workstation
- KnowledgeWare ADW/Documentation Workstation
- KnowledgeWare ADW/MVS
- KnowledgeWare ADW/Rapid Application Development Workstation
- KnowledgeWare ADW/Repository Enablement Facility

Languages:

- SAA AD/Cycle C/370
- SAA C/400
- SAA AD/Cycle COBOL/370
- SAA AD/Cycle COBOL/400
- SAA AD/Cycle CoOperative Development Environment/370 (CODE/370)
- SAA AD/Cycle CoOperative Development Environment/400 (CODE/400)
- VS FORTRAN
- SAA FORTRAN/400
- SAA AD/Cycle Language Environment/370
- Micro Focus COBOL
- Micro Focus COBOL Workbench
- Micro Focus Dialog System
- Micro Focus CICS Option for Micro Focus COBOL Workbench
- Micro Focus Host Compatibility Option for Database Manager
- Micro Focus IMS Option for Micro Focus COBOL Workbench
- Micro Focus CICS OS/2 Option for Micro Focus COBOL Workbench
- Micro Focus 370 Assembler
- OS PL/I
- AS/400 PL/I
- SAA AD/Cycle PL/I Package/2
- SAA RPG/370
- SAA AD/Cycle RPG/400
- VS COBOL II

Generators:

- Cross System Product/370 Application Development
- Cross System Product/370 Runtime Services
- Cross System Product/2 Application Development
- Cross System Product/2 Runtime Services
- EASEL/2 Production Compiler
- EASEL/Win Production Compiler
- EASEL/DOS Production Compiler
- EASEL/2 Runtime Services
- EASEL/Win Runtime Services
- EASEL/DOS Runtime Services
- KnowledgeWare ADW/CSP Enablement Facility
- Synon/AD Interface
- Synon/2E
- Synon/2G
- Synon/Client Server Generator (CSG)
- Synon/Client Server Driver (CSD)
- Synon/Entry
- Digitalk Smalltalk/V PM
- Digitalk Smalltalk/V for OS/2 2.0
- Digitalk Smalltalk/V DOS
- Digitalk Smalltalk/V for Windows

Knowledge Based Systems:

- AD/Cycle—The Integrated Reasoning Shell Development/2
- AD/Cycle—The Integrated Reasoning Shell Runtime/2
- AD/Cycle—The Integrated Reasoning Shell Builder/370
- AD/Cycle—The Integrated Reasoning Shell Runtime/370

Test/Maintenance/Redevelopment Tools:

- BACHMAN/DBA
- BACHMAN/DBA Enabler
- BACHMAN/DBA Catalog Extract VM
- BACHMAN/DBA Catalog Extract VSE
- BACHMAN/DBA Catalog Extract MVS
- BACHMAN/Analyst Capture for IBM's IMS
- BACHMAN/Analyst Capture COBOL
- COBOL and CICS/VS Command-Level Conversion Aid (CCCA)
- COBOL Structuring Facility (COBOL/SF)
- SAA AD/Cycle Dictionary Services/MVS
- SAA AD/Cycle FastRef/2
- Software Analysis Test Tool (SATT)
- VIASOFT VIA/Insight
- VIASOFT VIA/Renaissance
- VIASOFT VIA/SmartDoc
- VIASOFT VIA/Recap
- VIASOFT VIA/Redevelopment Series
- VIASOFT VIA/Existing System Workbench
- Workstation Interactive Test Tool (WITT)

Application Development Platforms:

- ISPF/PDF Software Configuration and Library Manager (SCLM)
- Repository Manager/MVS
- SAA AD/Cycle Workstation Platform/2 (WSP/2)

ADW Life Cycle Solutions:

- KnowledgeWare ADW/Planning Workstation
- KnowledgeWare ADW/Analysis Workstation
- KnowledgeWare ADW/Design Workstation
- KnowledgeWare ADW/RAD Workstation
- KnowledgeWare ADW/Documentation Workstation
- KnowledgeWare ADW/Cross System Product Enablement Facility
- KnowledgeWare ADW/Construction Workstation-MVS
- KnowledgeWare ADW/Construction Workstation-400
- KnowledgeWare ADW/Construction Workstation GUI
- KnowledgeWare ADW/Inspector
- KnowledgeWare ADW/Pinpoint
- KnowledgeWare ADW/Recoder
- KnowledgeWare ADW/Maintenance Workstation

AIX CASE Products:

- IBM AIX Software Development Environment (SDE) WorkBench/6000
- IBM AIX SDE Integrator/6000
- IBM AIX CMVC Client/6000
- IBM AIX CMVC Server/6000
- IBM AIX MVS Library Connector/6000
- IBM Library Connector for AIX/MVS
- IBM AIX XL Languages
- IBM AIX Base Application Development Toolkit

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Downsizing *without the fuss*

TIM CLARK

Not ready for client/server but need to cut data center costs? Consider 'rehosting.'

By Alan Radding

Six years ago, before downsizing, rightsizing and client/server computing became buzzwords, Pepperidge Farm, Inc. was fed up with its IBM 4381 mainframe. "We were spending more time supporting the IBM product than supporting Pepperidge Farm products," recalls David Wright, manager/information technology.

At the time, the Application System/400 minicomputer was just a rumor code-named Silverlake. But Wright liked what he was hearing about it: a big, host-like machine that required minimal support. "We figured we could bring in three of those instead of the 4381 and still save money," he explains.

IBM "told us it was a pipe dream," Wright continues, but it played along when the Norwalk, Conn.-based biscuit and baking company opted for the change.

Looking back, Wright realizes that what he was talking about then was a type of downsizing now referred to as "rehosting," a trend the minicomputer vendors — especially IBM and Hewlett-Packard Co. — have recently embraced and started to promote heavily, especially as high-end PCs and Unix boxes increasingly invade their turf.

Like old wine in a new bottle, rehosting repositions and repackages the familiar minicomputer for the 1990s.

The rehosting promise goes like this: By moving applications off the mainframe and onto a less expensive and more easily supported host, you can still save bundles of money without having to totally retrain your staff, hire new people or encounter the risks associated with a radically different environment such as Unix or PC local-area networks.

Not only do you save money (the main purpose of this type of downsizing) and get to dump those tired, worked-over mainframe applications for new and usually integrated minicomputer applications, but the new host also helps you make the eventual adjustment to PC LAN-based, client/server computing. The host minicomputer, the promise goes, can eventually be evolved into a big LAN file server.

A lot of the rehosting promise is real. Because they've moved up the price/performance curve faster than mainframes, minicomputers now of-

Downsizing, *page 82*

Radding is a free-lance writer based in Newton, Mass.

Cutting costs quickly

Cotter Canada, a Winnipeg-based retailer, was able to knock $2 million out of its $3.8 million annual data center budget by consolidating mainframe data centers and then rehosting from an IBM 4381 to an HP 3000. "We saved $250,000 the first year just on the difference between the cost of [IBM's] MVS and [HP's] MPE operating systems," says Norman Moore, MIS director. The company also enjoyed hardware savings, reduced application software costs and a reduction in operating staff required to support the minicomputer.

Not ready for client/server

Indian Head Industries, Inc., a manufacturer in Southfield, Mich., considered a PC LAN-based system when it left its IBM 4381 but opted instead for the AS/400. The problem with the PC LAN strategy, says Dennis Griffin, vice president of MIS, was that "we would just trade mainframe experts for a set of PC LAN experts." That wouldn't help him meet his objective, which was to save money. The AS/400 was the better choice because it didn't require any additional expertise, he says.

Inside

Price comparison: Mini vs. mainframe. Page 82

Lab report: Benchmark results. Page 82

Strengths and weaknesses of leading rehosters. Page 83

Residual values. Page 83

HP, IBM top satisfaction poll. Page 84

Straight talk from William Sines. Page 85

Minicomputers

Lab report: TPC-A benchmark ranks minicomputer speeds

THE TPC-A BENCHMARK IS TYPICALLY USED TO MEASURE PERFORMANCE OF ON-LINE TRANSACTION PROCESSOR APPLICATIONS SUCH AS UPDATE-INTENSIVE DATABASE ENVIRONMENTS. IT MEASURES HOW MANY TRANSACTIONS PER SECOND A SYSTEM CAN PERFORM WHEN DRIVEN FROM MULTIPLE TERMINALS AND, IN THIS CASE, WITHIN A LAN CONFIGURATION. WHILE THE TPC PUBLISHES THE BENCHMARK SPECIFICATIONS, THE IMPLEMENTATION IS LEFT UP TO THE INDIVIDUAL TEST SPONSORS, WHO MUST SUBMIT REPORTS TO TPC DETAILING THEIR COMPLIANCE WITH ALL TPC SPECIFICATIONS.

Featured vendors' best systems (by throughput)

System	Operating system	Database	*Total system cost	Throughput	Price/performance
Unisys 2200/622ES	OS1100SBR 4R2	DMS	$11,245,568	255.70	$43,980
Unisys 2200/462	OS1100SBR 4R2	TIP/FCSS	$6,410,096	228.50	$28,053
HP 3000 Series 977	MPE/IX V40.12	Allbase/SQL VFO.25	$1,337,303	150.60	$8,879
IBM AS/400 9406 E70	OS/400 V2R1	OS/400 int. rel. database	$987,792	54.90	$17,993
Digital VAXserver 4000-300	VMS V5.4	VAXDSM V6.0	$525,065	41.40	$12,683

Featured vendors' best systems (in price performance)

System	Operating system	Database	*Total system cost	Throughput	Price/performance
Digital VAXserver 4000-100	Open VMS V5.5-2	VAX Rdb/VMS V4.1	$416,255	51.95	$8,013
Digital MicroVAX 3100 Model 90	Open VMS V5.5-2	VAX Rdb/VMS V4.1	$278,016	34.00	$8,177
HP 3000 Series 957	MPE/IX V40.12	Allbase/SQL VFO.17	$703,433	84.93	$8,282
IBM AS/400 9404 E10	OS/400 V2R1	OS/400 int. rel. database	$98,697	9.92	$9,949
Unisys 2200/442	OS 1100 SBR 4R2	TIP/FCSS	$4,897,491	177.30	$27,623

*Includes five years of maintenance

Source: Transaction Processing Performance Council

Always a trade-off

Although Unisys Corp.'s 2200/622ES and 2200/462 throughput ratings proved to be the most efficient of this Lab Report's featured vendors, they also held heavy price/performance costs. On the flip side, Digital Equipment Corp., whose machines filled the top price/performance slot, scored very light throughput ratings.

Downsizing without the fuss

CONTINUED FROM PAGE 81

Great debate

Certain arguments leap to mind when the subject of rehosting comes up.

POINT: You risk being abandoned on a dead-end platform with no easy way off. Each of the leading minicomputer vendors has an active Unix product line.

COUNTERPOINT: Users consider this scenario remote. In a worst-case scenario, they point to the robust third-party market that would be more willing to fill a void until a migration path can be established.

fer sufficient performance and capacity for all but the largest mainframe applications at a significantly lower cost.

And the vendors have worked hard to get third parties developing the requisite applications, especially HP, which has had to play a fast game of catch-up to IBM and Digital Equipment Corp.

For those not quite ready for the big change to client/server but needing quick cost-cutting, it's a likely solution.

"We see [rehosting] happening all the time," says Bill Sines, vice president/midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass. "Instead of being dragged into client/server development — a high-risk undertaking," he continues, users "opt for a mainframe-like minicomputer.

"An IS shop should be able to reduce the cost of providing a set level of service by 15% to 20% a year," Sines says, "but large mainframes haven't kept pace with that kind of reduction."

POINT: Minis still cost more than their Unix counterparts. Although the vendors have reduced prices substantially in recent months, pound for pound the multiuser Unix machines deliver more bang for the buck.

COUNTERPOINT: You may pay more, but users say they get a more robust operating system and one-call support without finger-pointing. Under Unix, users would have to integrate a number of tools and services to create a comparable environment.

Not a cure-all

But rehosting isn't the answer to everybody's prayers. There is a downside to this strategy. First, there is more to rehosting than simply swapping the mainframe for a cheaper box.

You must be prepared to leave behind existing mainframe applications or undertake a difficult porting effort that may not be 100% successful, Sines notes.

If you opt for new applications, that will of course be disruptive as you train and otherwise prepare users for the new platform. The environment might be less robust than what you are used to; the wide variety of data center management tools in the mainframe environment are not readily available in the minicomputer world, for instance.

But the most obvious argument against rehosting is that while the world moves to open systems, environments such as the AS/400, HP 3000 and DEC VAX are proprietary. That doesn't seem to bother users, though, who cite the support for standards such as Posix and SQL and Transmission Control Protocol/Internet Protocol.

They note that the machines support PC LANs, albeit awkwardly in some cases, and have attracted a large, active market of third-party providers of products and services, which keep them honest. DEC users point out Open VMS, suggesting it is as open as many of the so-called "open" platforms.

Client/server is not for everyone right now. As more people look into moving applications off the mainframe, downsizing may increasingly simply mean "rehosting." •

When asked of their plans, 26% of 119 minicomputer purchasers say they won't change how they use the minicomputer. Roughly the same number say they will work the mini into a LAN or will phase out the mini in favor of a LAN.

Cost of ownership

THIS MODEL SHOWS WHAT YOU CAN SAVE BY MIGRATING FROM AN IBM 4381 TO AN AS/400. IT ASSUMES A TWO-YEAR TRANSITION PERIOD DURING WHICH THE ORGANIZATION ABSORBS COSTS ASSOCIATED WITH BOTH MACHINES, CAUSING TOTAL EXPENDITURES TO RISE DURING THAT PERIOD.

	Annual cost	Savings (thousands)
Year 1: Run 4381 (includes all costs)	$1.3 million	0
Year 2: Acquire and run A/S 400	$1.67 million	-370
Year 3: Run A/S 400	$1.375 million	-75
Year 4: Run A/S 400	$800,000	500

$500,000 annual savings from Year 4 on allows the company to reduce its IS expenses or invest in new systems

Source: ADM Consulting, Inc.

Minicomputers

'Rehosting' contenders

The Big Three — IBM, DEC and HP — set the pace in the market for rehosting

By Alan Radding

Leading the rehosting charge are the Big Three minicomputer makers: IBM, Hewlett-Packard Co. and Digital Equipment Corp. Second-tier minicomputers include Bull HN Information Systems, Inc., Unisys Corp. and Data General Corp., but these companies have been backing away from their minicomputers in favor of Unix-based servers. Here's how the leading vendors stack up:

Hewlett-Packard Co.

HP is serious about rehosting and has the Mainframe Alternative program to prove it. It now positions its HP 3000 machine as a "worry-free, business-critical solution" for people who want to move high-end applications off the mainframe but don't have the resources for Unix and can't do a lot of internal work on the application.

"For customers who don't want MVS but are nervous about Unix, HP is a good choice," says John Logan, vice president at the Aberdeen Group in Boston.

With its reduced instruction set computing (RISC) architecture — HP is the only one of the three top-tier vendors with RISC — the HP 3000 delivers 145 trans/sec. compared with about 55 trans/sec. for the Application/System 400, Logan reports. "For running [a processing-intensive application like] Oracle, it's a screamer," he notes.

HP offers symmetric multiprocessing, which makes for easy scalability. It also offers comparable multiuser Unix models as part of its Mainframe Alternative program, something the other vendors do not.

HP has been hard at work gathering "channel partners" to offer strong business and specialized vertical-industry applications. So far, it can list 3,000 to 4,000 applications, far short of the approximately 10,000 applications claimed by both IBM and DEC. Of course, HP claims these applications are the best the industry has to offer.

Despite the smaller pool of applications, new software was the key to choosing the HP platform for AIGM, Inc., an insurance company in Wilmington, Del. "We were following a two-pronged assault — reduce expenses and get more functionality," recalls Marty Hupka, vice president of systems.

The plan was to buy an off-the-shelf package and modify it in-house. "We eventually found a package we liked, and it was only available on HP," Hupka says. So the company purchased an HP 3000 Model 960 to support 300 users.

AIGM reduced information systems expenses by about 40%, Hupka says, and got the extra functionality it sought. The savings came primarily from lower cost hardware and less expensive development and testing, which can be done on a PC because the package is written in Micro Focus, Inc.'s Cobol. Software costs did not decline, "but we are getting a lot more functionality," he explains.

Key factors

Price and software availability are the biggest factors in minicomputer selection. In fact, many users are looking to replace cumbersome, old mainframe applications, so the availability of a good integrated package is often the most important determinant.

In the database area, HP offers TurboImage, a networked database management system, and Allbase/SQL, its relational DBMS. "Allbase is good but not very portable," Logan says. But neither is IBM's AS/400 database.

IBM

IBM's AS/400 is frequently the platform of choice for rehosting because users are often starting out with an IBM mainframe. "If people bought their mainframe from IBM, then they are very likely to continue with IBM by going to the AS/400," says Bill Sines, vice president/midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass.

On the other hand, IBM only recently began actively positioning the AS/400 as a mainframe alternative because it was reluctant to cannibalize its higher margin mainframe business, says Teresa Elms, president of Elms Information Services Group, a San Diego research firm that follows the IBM midrange.

One of the key features of the AS/400 is its relational-like database. The database is tightly integrated into the AS/400 operating system, making it easy for every AS/400 application to use the database. Users often feel they get the database for free because it comes as part of OS/400.

The database, however, is not the equivalent of one from Oracle Corp. or Sybase, Inc. "It's not really relational, and IBM hasn't upgraded it much," Elms explains. "It needs referential integrity and two-phase commit. It has SQL, but it is not ANSI-standard." She says she expects IBM to upgrade the database in the next 18 months, making it closer to ANSI standards.

Lack of scalability — the ability to grow within the AS/400 line — has been a complaint about the machine, particularly at the high end. The current high end is the E series, but IBM is expected to introduce an even larger F series in 1993.

Indian Head Industries, Inc., a manufacturer in Southfield, Mich., opted for the AS/400 because it was comfortable with IBM from its mainframe days. "We wanted good support facilities, and IBM is always good for that," says Dennis Griffin, vice president of MIS. The company liked what it saw from DEC, but when it came down to making the buy, IBM's familiar support carried the day.

Digital Equipment Corp.

DEC's program has been on hold while users wait for Alpha AXP systems, its high-performance, RISC-based series of machines unveiled this month. The Alpha-based minicomputers will give DEC the performance lead in this category. However, Logan says he doesn't expect the VAX Alpha to be a factor in the rehosting market until 1994, when it is shipping in large quantities.

When it comes to scalability, DEC offers the widest range, from the desktop MicroVAX to the VAX 9000 series.

In the database area, DEC supports its own relational DBMS, Rdb, and leading relational databases such as Oracle. Unlike the AS/400, DEC does not tightly integrate the database with the operating system.

Like IBM, DEC boasts more than 10,000 applications, but many of these are scientific and technical rather than commercial. The IBM AS/400 application set is overwhelmingly commercial.

Even without Alpha, however, a DEC minicomputer can beat an IBM mainframe for certain users. Keyport Life Insurance Co. in Boston opted for a VAX to replace its mainframe-based accounting systems after looking at both PC and IBM AS/400 alternatives.

"We looked at PC-based systems, but they couldn't support our operation," says Roger Japlit, director of financial analysis. The AS/400 would do the job, but it was much more expensive, he notes.

Keyport runs Dun & Bradstreet Corp. software and supports 25 users. Japlit says he hopes to upgrade the VAX in January to better accommodate anticipated growth. •

Future values

THE FOLLOWING ARE RETAIL RESIDUAL VALUE PROJECTIONS FOR FIVE LEADING MINICOMPUTERS

	List	1993	1994	1995	1996
IBM AS/400 9406-E30	$927,000	New*	$407,880	$222,480	$111,240
IBM AS/400 9406-E25	$71,070	New*	$26,296	$12,082	$3,554
DEC VAX 6000-520	$315,400	$100,928	$47,310	$18,924	Salvage
DEC MicroVAX 3100-20	$11,879	$2,495	$1,069	$356	Salvage
Hewlett-Packard 3000-960	$485,000	$101,850	$48,500	$19,400	Salvage

*The equipment is being marketed by the manufacturer and/or other distributors as new, at the manufacturer's list price or a discount of that price.

Source: IDC Financial Services Corp.

Minicomputers

Buyers' Scorecard: HP, IBM rank on top of minicomputer satisfaction poll

By Derek Slater

HEWLETT-PACKARD CO.'s venerable HP 3000 line is still spry, according to users who gave it the highest satisfaction rating among four minicomputers.

The HP 3000, introduced in 1972, squeaked out a narrow first-place margin over IBM's Application/System 400 in the Buyers' Scorecard user survey. The HP 3000's overall score was 84, with the AS/400 at 83. Digital Equipment Corp.'s VAX finished third with a score of 79. Data General Corp.'s Eclipse MV systems rounded out the survey at 76.

The HP 3000, which also topped the previous Buyers' Scorecard on minicomputers [CW, Sept. 24, 1990], earned the highest score in important areas such as overall performance and availability. HP 3000 systems are based on reduced instruction set computing processors and run the company's proprietary MPE/IX operating system. Low-end models support eight users; the high end of the line supports up to 2,300 simultaneous users.

The company markets HP 3000 systems primarily as complete turnkey solutions for specific applications, which can be a blessing or a curse. Some users said the difficulty of adding new applications to the system is a significant limitation. The forthcoming port of IBM's CICS transaction processing environment (due in the second half of 1993) may increase the HP 3000's flexibility.

The AS/400 is a relative newcomer to the minicomputer market; the first models were released in 1988. AS/400 users noted flexibility as a key attribute of the IBM systems. The OS/400 operating system includes an integrated relational database component, which makes programming tasks much easier, according to users. (Taking its cue from IBM, HP will integrate similar database functionality into MPE/IX starting next month.) However, respondents also said the AS/400, like other minicomputers, is difficult to integrate with other hardware technologies.

The most recent AS/400 model, the E95, was released in September. It features a four-way processing scheme. The majority of the respondents in the survey reported using D or E series models.

The DEC VAX systems scored well in ease of use. Respondents — many of them using models in the VAX 6000 line — indicated that the relative ease of linking and configuring multiple VAX units was a plus. However, VAX systems scored poorly in cost-related categories, in part because of the lack of support for standard equipment such as inexpensive small computer systems interface disk drives. VAX systems also earned low marks in efficient I/O performance.

Several users said they plan to move away from the VAX platform but mentioned eagerness to see new systems based on DEC's Alpha technology.

DG scored well on price and performance. However, many Eclipse users said the architecture is outdated, despite the company's continuing product upgrades. DG released the new high-end Eclipse MV/60000 in August, expanding the Eclipse performance range up to 120 million instructions per second, with support for up to 1,709 users.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with minicomputers in 15 categories.

All categories were factored into the final scores. The scores for each product in the six most important categories are listed in the tables below. (See the methodology on the following page for a complete description of the scoring process.)▪

Minicomputers

Total scores reflect user ratings for 13 measured areas, weighted by user-assigned importance. Response base: 119 total respondents (29 for Data General; 30 each for all other vendors).

TOTAL POSSIBLE SCORE 100 MEAN SCORE 81

PRODUCT	HIGHEST RATINGS	LOWEST RATINGS
Hewlett-Packard's HP 3000 SCORE 84	• Availability • Compatibility with installed hardware • Vendor service and support	• Availability of applications • Overall cost of ownership • Effective networking support
IBM's AS/400 SCORE 83	• Ability to provide future growth • Vendor service and support • Sufficient storage capacity	• Reasonable cost per cycle • Overall cost of ownership • Support for distributed computing
DEC's VAX SCORE 79	• Availability • Compatibility with installed hardware • Vendor service and support	• Reasonable cost per cycle • Overall cost of ownership • Support for distributed computing
Data General's MV Eclipse SCORE 76	• Sufficient storage capacity • Availability • Sufficient memory	• Availability of applications • Support for distributed processing • Ability to provide future growth

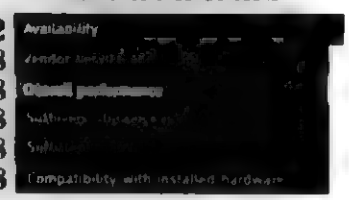
Ratings are based on a 1-to-10 scale, where 10 is best.

Responses are based on the most frequently stated answers. Quotes are selected from users' responses.

Reasons are based on the most frequently stated answers.

Hewlett-Packard's HP 3000

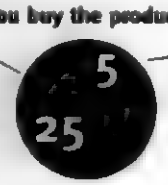
RESPONSE BASE: 30 USERS



LIKES: "We like the reliability and ease of use."

DISLIKES: "It's too specific in its capabilities — doesn't handle new functions well."

Would you buy the product again?

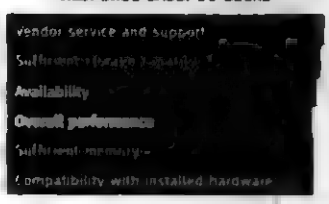


LIKELY — REASON: Well-made, good service

UNLIKELY — REASON: Doesn't meet growing requirements

IBM's AS/400

RESPONSE BASE: 30 USERS



LIKES: "The database processing aspect of the operating system makes programming much easier."

DISLIKES: "The cost of the machine and tiered pricing for the operating system."

Would you buy the product again?

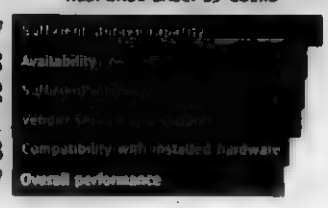
LIKELY — REASON: Good machine, good performance

UNLIKELY — REASON: Too expensive

1 – DON'T KNOW

Data General's MV Eclipse

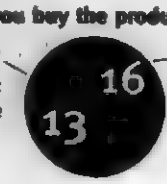
RESPONSE BASE: 29 USERS



LIKES: "It is reliable and gives us good performance for the price."

DISLIKES: "The proprietary operating system and lack of third-party software."

Would you buy the product again?



LIKELY — REASON: Good service

UNLIKELY — REASON: Outdated technology

Minicomputers

Halfway to client/server?

By Alan Radding

You may opt to downsize to a minicomputer instead of a PC local-area network, but it's likely you'll want PC connectivity — either now or down the road.

A PC can be used three basic ways in a minicomputer environment: as a dumb terminal; as a PC occasionally accessing the minicomputer for host data and file sharing; and as a participant in a client/server setup.

Terminal emulation

There is plenty of terminal emulation software available that lets the PC access a minicomputer as a dumb terminal. Functionality is limited, and users may gripe about having to exit their PC to enter terminal mode and learning two operating systems . . . but it works.

File and data sharing

All the vendors provide facilities that allow LAN users to store and access files residing on the minicomputer. The performance will be slower than a typical PC LAN server, and you may have to resolve a memory crunch on the PC when you load minicomputer connectivity modules on top of the PC LAN operating system modules.

Client/server

Here the question becomes one of applications, not connectivity. Trouble is, the business applications that are such a large part of the appeal of minicomputers were not designed for client/server computing. It is feasible (but not simple) to create new ones, where the minicomputer becomes a database access server.

Given the demand for some level of PC connectivity and a clear movement toward client/server computing, the minicomputer vendors are scrambling to boost PC connectivity capabilities.

IBM offers PC Support, which lets the PC connect with the Application System/400 without it having to operate as a dumb terminal, the traditional way PCs connect to minicomputers.

Teresa Elms, president of Elms Information Services Group, a San Diego research firm that follows the IBM midrange, gives IBM an "A" for good intentions, but she is disappointed in the end result. "PC Support is slow because it provides a lot of functions users don't really need. It is also expensive," she says.

Still, it works, and there aren't many alternatives if you want to connect PCs on a LAN to an AS/400. Novell, Inc. offers networking products that facilitate a connection between NetWare PC LANs and AS/400 minicomputers.

Digital Equipment Corp. provides PC connectivity through Pathworks, a network operating system that lets the VAX participate as a server to a PC LAN.

As a full-blown network operating system, Pathworks supports a broad range of desktop clients and servers running on many networks.

Pathworks, too, is criticized as being slow and expensive, although DEC has recently cut prices. Using a DEC product called NetWare Coexistence, you can get the Pathworks server to work together with Novell NetWare clients, but it consumes a lot of resources.

Hewlett-Packard Co. supports PC connectivity by running common PC network operating systems. The 3000 supports Novell's Portable NetWare and Microsoft Corp.'s LAN Manager. This gives HP the most mainstream approach when it comes to PC LAN connectivity.

Some users, however, find it is still easier to maintain separate LAN and minicomputer connections. AIGM, Inc., an insurance company in Wilmington, Del., for example, puts two connectors into each PC, one for the Token Ring LAN and another for an asynchronous connection to the HP 3000. The users access the HP directly for application processing.

"Eventually, we'll get asynchronous connectivity over the LAN," notes Marty Hupka, vice president of systems at AIGM.•

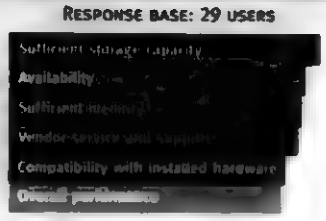
A place for minicomputers

HOW DO YOU SEE THE FUTURE OF THE MINICOMPUTER? Response base: 129	
Mission-critical applications host	18%
Eclipsed by other architectures	15%
File server for PC networks	11%
Transition to LAN architectures	7%
Other/Don't know	49%
WILL YOUR MINICOMPUTER EVER BE INCORPORATED INTO AN OPEN SYSTEMS STRATEGY?	
Yes	55%
No	34%
Don't know	11%

Source: CW Buyers'-Scorecard

Data General's MV Eclipse

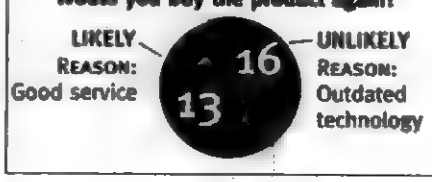
RESPONSE BASE: 29 USERS



LIKES: "It is reliable and gives us good performance for the price."

DISLIKES: "The proprietary operating system and lack of third-party software."

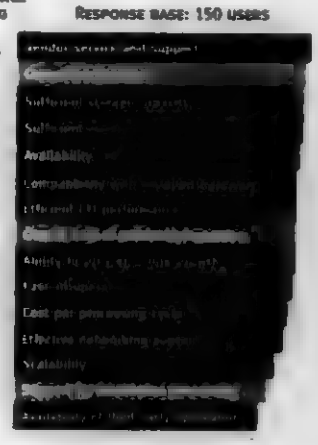
Would you buy the product again?



Ratings in order of importance

Users rated the following categories on a scale of 1 to 10, where 1 is least important and 10 is most important.

IMPORTANCE RATING — RESPONSE BASE: 150 USERS



Opinion

Cut to the chase!

By William Sines

Let's get past "Mainframes forever" and "PCs rule the world." It's time for some straight talk and level-headed thinking.

American business today is in a state of massive transition, with nearly everyone rethinking fundamental business assumptions. Chief information officers and information systems management are playing a direct role in this process or are strongly influenced by the outcome. In just a few short years, they have focused on business and placed "gee-whiz" technology in its proper context.

Of all the concerns weighing on IS executives today, the most immediate is controlling costs and managing the IS budget. Recent studies indicate that fully 80% of major corporations are interested in downsizing. The reason behind this reinvestment? Cost reduction.

It's too early to tell how successful this effort will be. There are indications that many organizations moving toward highly distributed PC solutions are experiencing significant difficulties. One out of three CIOs will probably not survive many of the latest downsizing efforts.

The truth is, one size does not fit all. While some companies will find that highly distributed LANs fit their skill set and business requirements, others — 20% of the downsizing movement — are taking a more low-risk approach and opting to rehost applications on minicomputers/servers.

This more prudent approach does not imply that CIOs should select yet another proprietary lock-in.

A strategic vendor-neutral standards domain must be established to guide future migrations and maintain an architecture flexible enough to meet future requirements.

Choosing between minis and PC LANs is not the issue.

It's time for vendors and integrators to cut the technical hype and address the serious issues facing IS professionals.

Sines directs research of rightsizing and the open systems movement at Technology Investment Strategies Corp. in Framingham, Mass.

BUYERS' SCORECARD METHODOLOGY

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their minicomputers in 15 specific categories. Users also rated the importance of each category.

User names were obtained from nonvendor sources. First Market Research, an independent data collection company in Austin, Texas, conducted the survey and tabulated the results. The response base was 29 users for DG's Eclipse MV and 30 users for each of the other products. Users rated their satisfaction with their installed products and were not asked to compare or rate one product against another in the survey.

To compute the overall score for each product, perform the following: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

Computerworld thanks the following firms for their assistance in preparing this Buyers' Scorecard: CW Database Division; International Data Corp.

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The case of the BLUNTED BUDGET

What's a CIO to do when he's got a lot less money to work with next year?

What follows is a case study of an IS department in turmoil because of a budget cut. While the case is fictitious, the issue it raises — making trade-offs in tight times — is very real. We asked a trio of experts to offer their advice on how to handle the situation.

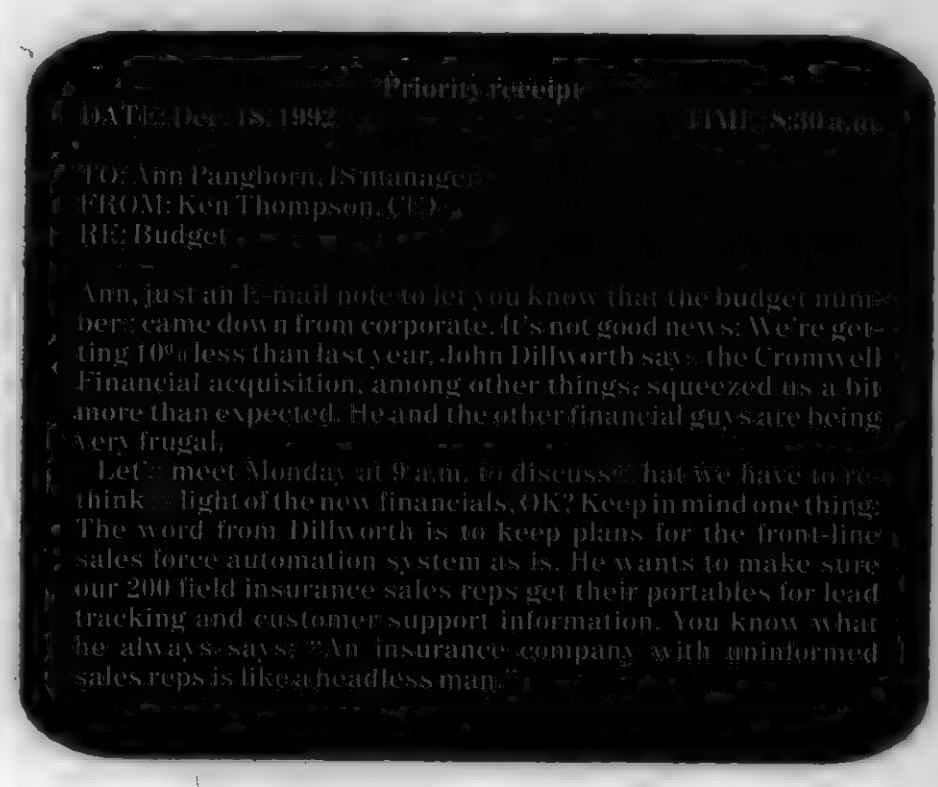
VIP advisers

Here is the list of industry notables who will give Ken and Ann their opinions, beginning on page 89:

John J. Alexander is senior vice president and chief information officer at Unum Life Insurance Co. in Portland, Maine. Prior to joining Unum in 1987, Alexander held positions as senior vice president of information systems at MCI Communications Corp. and as executive vice president and chief operating officer at the Midwest Stock Exchange. He is an organizer of the CIO Council of Maine.

DuWayne Peterson is head of DuWayne Peterson Associates, an IS consultancy in Pasadena, Calif. He is former CIO and executive management committee member at Merrill Lynch & Co. in New York and has held high-level IS positions at Security Pacific Corp., RCA Corp. and Citibank.

Stuart Stoodley is senior information technology/systems consultant at McKinsey & Co.'s Cambridge, Mass., office. He has spent 18 years in management consulting, focusing on information technology strategy, planning, design and development.



Priority receipt

DATE: Dec. 18, 1992 TIME: 8:30 a.m.

TO: Ann Pangborn, IS manager
FROM: Ken Thompson, CEO
RE: Budget

Ann, just an E-mail note to let you know that the budget numbers came down from corporate. It's not good news: We're getting 10% less than last year. John Dillworth says the Cromwell Financial acquisition, among other things, squeezed us a bit more than expected. He and the other financial guys are being very frugal.

Let's meet Monday at 9 a.m. to discuss what we have to rethink in light of the new financials, OK? Keep in mind one thing: The word from Dillworth is to keep plans for the front-line sales force automation system as is. He wants to make sure our 200 field insurance sales reps get their portables for lead tracking and customer support information. You know what he always says: "An insurance company with uninformed sales reps is like a headless man."

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"The Computerworld White Paper Program was a real winner for us. The OMG, Computerworld and IDC teamed up to publish 'Object Technology: A Key Software Technology for the '90s,' which is helping us educate the IS market on our mission.

"Object technology's place in the computing environment is well-established and growing rapidly. That's why the Computerworld White Paper Program is a key part of our strategy to reach information systems management, the buying power in today's market."

Christopher Stone
President
The Object
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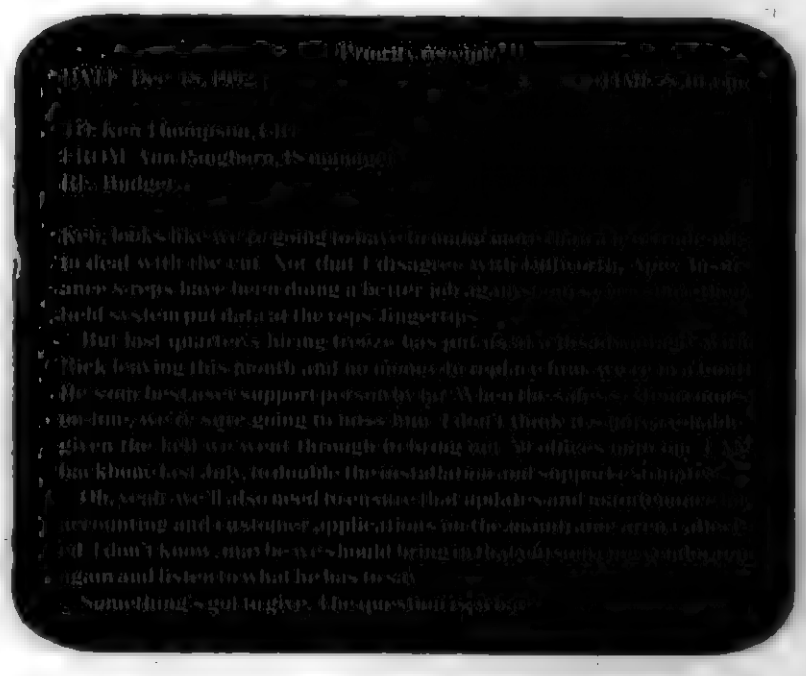

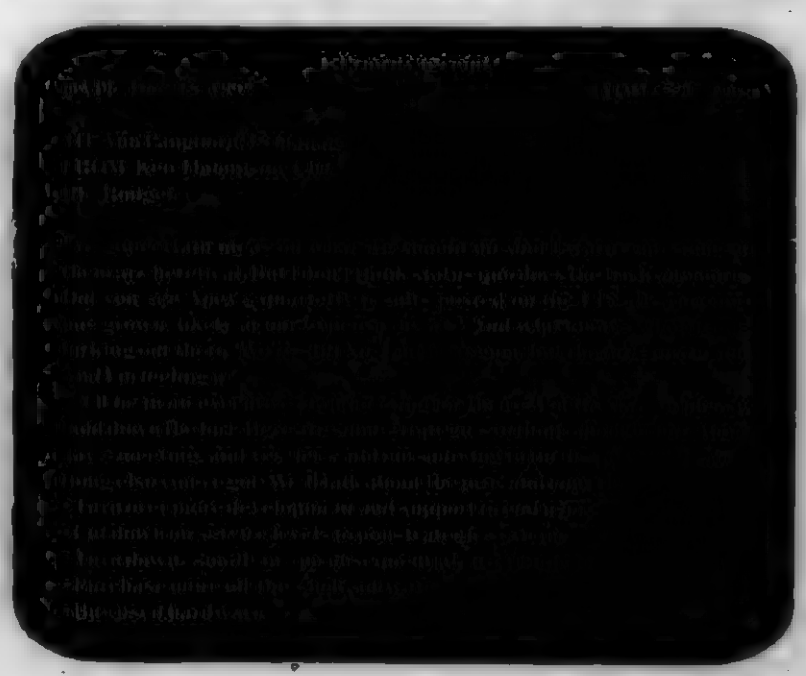

Try benchmarking, overseas coders

By John J. Alexander

Ken and Ann, I hope you find it comforting to know you are not alone. Most CIOs are in the same boat: Every business is looking for more results from the IS function at lower cost and with better quality.

At a strategic level, many firms are striving to become more focused on their customers, moving systems and services closer to the point of origination and, in doing so, raising the value and reducing the cost.

To achieve a true customer focus, think about "ruthlessly prioritizing" your planning process — working from the products and services the customer values (and is willing to pay for) back into the business, eliminating all less-important activities en route.

Ken, the alternatives you and Ann are considering are good but may not go far enough. For example, if you have some programming project work that is well-defined, why not get quotes from off-shore vendors in Ireland or India that have done good work for other U.S. companies? The programmers speak English, are educated and let's face it: They produce quality results at a low cost.

I used a firm in India for two programming projects here at Unum and found I saved 20% to 50% on the cost of software development.

Off-loading some of the routine programming work can help alleviate the stress and strain on your already burdened staff (which is about to become more burdened once Rick departs).

I must reemphasize, however, that programming projects you farm out should be well-defined. If you don't know where you are going, you don't ask the Cheshire cat which path you should take.

Another strategy you might consider is to benchmark your data center operations against that of world-class competition. There are several organizations out there, including Compass America, Inc., that have comprehensive databases containing information on IS sites. You can segment your data center into half a dozen pieces and benchmark each piece against that of sites in the Top 10% of the database.

In this way, you can see whether your data entry, production scheduling, tape library, computer operations or system software pieces are good, bad or indifferent in comparison to the Top 10 percentile of sites.

What Unum found was that we were 5% better overall than Compass' top sites. However, we tended to be really good in some areas and not so good in others. For instance, we didn't have automatic tape libraries in place and were overstaffed in the tape library area. Benchmarking ourselves against that group enabled us to justify an investment, change our strategy, downsize our staff and really improve that piece of the operation.

As for bringing users into the IS equation, I'm all for it. PC users have demonstrated an ability to employ technology and put it to good use when it's packaged well. For example, word processing, spreadsheet and electronic mail have deeply penetrated most enterprises. Why not consider turning over the data reporting functions to users?

Finally, you've got to make your business managers understand that buying "cheap" vs. quality never seems to pay off in the long run. Technology decisions cast long shadows; when some companies bring in new technology or build a system, they have to live with it anywhere from five to 15 years. The insurance business tends to be at the high end of that range.

There is a trade-off between making an investment up front that will pay off in the long term vs. buying cheap. If your business managers understand what resources cost, they can climb the learning curve.

You need to have in place a well-designed chargeback system that prices resource use within the organization so that business managers understand the relationship between work done and cost incurred.

I hope these thoughts help you achieve the results your business needs.

Ken's missing piece is better planning

By DuWayne Peterson

Ken, the situation happening at your company is occurring over and over again in organizations around the country. Companies are finding themselves under profit pressures that can't be relieved easily. Economic and competitive forces are keeping revenue down. For most companies, expense reductions are the only way to hold the company steady.

Your company has reacted to pressures like so many other organizations: quick, across-the-board reductions in the budget, hoping there will be little or no disruption to strategic IS projects and the company as a whole.

Unfortunately, however, the sense I get is of a company and systems organization that is reactive and isolated.

Ken, I don't think most of your recommendations will result in any meaningful changes. Ann's initial response indicates frustration. I can guess these approaches have been used before to no avail.

You and your IS group should not be in this position in the first place. How can you avoid this situation from happening again? An effective IS organization should have the following processes in place to deal with the profit pressure:

•First, you need a business planning process that states in clear terms what each business unit needs to do to achieve the profit objectives of the firm. It is incumbent on the IS chief to coordinate systems plans with these business plans and strategic projects. Ongoing support costs need to be factored into these profit objectives.

•Second, you need a financial system that tracks all revenue and expenditures to measure whether you've achieved your profit objectives. The system should include all costs for supporting the business, including system development projects and operating costs. This setup implies some form of chargeback system based on business transactions and project expenditures.

The financial system may demonstrate that turning over more development and support to end users will not necessarily result in increased profits in the business unit. Rather, it may show a movement of costs from one side to the other.

With these two processes in place, you can deal with the issues your company is facing now and in the future, as conditions change. You will be prepared if a major change of events — even another acquisition — occurs.

Ken, you've got to challenge each business unit to provide an action plan on how they will improve their performance. Would it be in the best interest of the company to exit certain tangential businesses? Should the company reduce support? Is it time to re-engineer the business process?

Any one of these business-motivated actions, aided by technology, can cut back on activities and, therefore, reduce costs. The financial system you've put in place will help evaluate the impact of recommended actions.

What's key is that you've got built-in business management participation and support.

Peterson, *page 92*

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Sources: Dataquest Ledgeway 7/92; COMPAQ News Release, 10/5/92.
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Continued from page 89

Of all your suggestions, I think the most substantive one is outsourcing. Outsourcing can be one of the most important ways to reduce costs. It can help deal with the limited business resources and skill levels that will be available in future years.

It's unfortunate, however, that you've brought up this recommendation in a crisis atmosphere. Again, this shows a lack of an orderly planning process.

You must first classify all of your IS functions as either "essential" or "nonessential." Only then will you be prepared to think about outsourcing nonessential functions as cost and skill pressures increase. Only when you've strategically evaluated your IS resources can you make an informed decision.

Ken, it is never too late to begin to put these processes in place. Meet with Ann, CFO Dillsworth and other key systems and business managers and start down this new road together.

First step: Fix management structure

By Stuart Scantlebury

Ken, I think you have a bigger problem than you may realize. The potential strategies for dealing with your budget cut would only provide symptomatic relief. They would not address the root causes of the crisis: The management structure is not conducive to managing IS for maximum business value.

Many IS organizations are in the same position as yours. IS reacts to user requests and corporate directives rather than acting as a partner with the business leaders of the company. Until you and top management change the way you view and manage IS, you will continue to have such problems year after year.

Your E-mail message to Ann about budget numbers coming down from corporate shows you were not a key participant in the budget decision process but rather a victim. And the round number for the cut — 10% — makes me think that you're talking about an across-the-board 10% cut. At the very least, it seems to indicate that not much thought was given to what makes business sense to spend on IS.

In addition, comparing the budget to last year's budget smacks of bureaucracy, not zero-based budgeting.

Certainly, CIOs in a proactively managed IS organization may need to cut their IS budgets, but they would do so based on a joint decision-making process carried out by the top management team. It is imperative that the CIO is a full member of this team. The group would conduct a review of every ongoing activity and potential investment opportunity throughout the company to determine which expenditures will yield maximum business value.

It seems to me that the sales force automation system is being saved not because the top management team decided it provides maximum business value compared with other potential projects but because of one man's opinion. The CFO should not be allowed to protect a pet project.

The executive staff needs to make major decisions on new systems investments as a group. Fortunately, Ken, you are considered a member of the executive staff; many of your colleagues at other companies are not. Use your influence in these meetings to push for investments that provide maximum value to the business as a whole.

Perhaps the front-line sales force automation system makes sense, but it should be part of an integrated business system of people, policies, procedures, technology and incentives, starting at the front line and extending through all functional areas involved with the core process of insurance policy sale and generation (underwriting, actuarial and policy production).

And one last thing. I think you're going to have to replace Ann. You need an IS manager who can focus on strategic issues, develop her own recommendations and communicate them effectively. The second paragraph of her E-mail message to you is completely off the subject. Her approach to management is summed up in, "I don't know, maybe we should bring in that outsourcing vendor rep and listen to what he has to say." The last thing you want to do is rely on a salesman for advice.•

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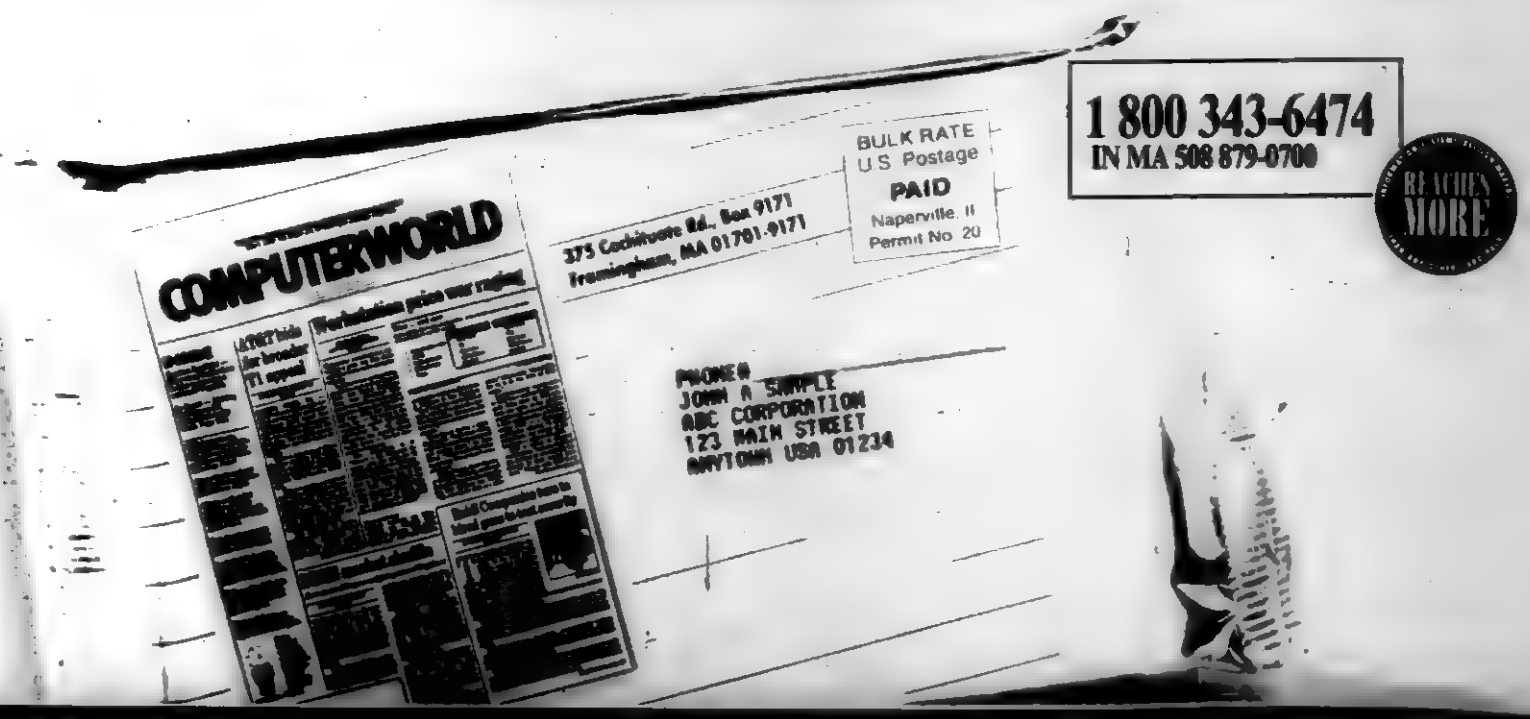


The rise of technical stars

By Sheryl Kay

Five years ago, Jim Jenkins supervised a group of 10 systems programmers at GTE Data Services, Inc. (GTEDS) in Temple Terrace, Fla. Because of a shortage in staff, however, he often found himself performing technical duties, and soon he realized he felt most comfortable in that capacity.

"Dealing with people as their manager was a struggle for me," Jenkins says. "I prefer to only worry about myself."

Fortunately, GTEDS offers information systems employees the option of building a career in either direction — a technical track or a management track. The pay is comparable in both tracks, so Jenkins was able to maintain his salary when he chose to leave management for a technician's position.

Today he is an advisory systems engineer at GTEDS, working as an internal consultant in capacity planning, performance and tuning.

According to Jack Schwartz, Source Edp's area managing director in New York, highly placed technical professionals like Jenkins typically prefer to manage their own projects or product development rather than manage people. They are very senior-level technicians who possess in-depth knowledge of one or more facets of automation, such as operating systems, databases or communications.

Historically, companies offered IS professionals only one mechanism for advancing their career: a move into management. This posed a problem both for those who entered the field because of their keen interest in technology and for those who disliked the administrative tasks required of a manager.

It takes a mix of skills to rise to the top of the technical career ladder:

- In-depth technical knowledge spanning many software system types.
- Understanding the business objective.
- Creativity and vision.
- Strong proficiency in problem-solving.
- Perseverance to see a job to completion.
- Ability to work both independently and in a group.

Increasingly, companies around the country are recognizing the value of such technical contributors. "They're the backbone of support for technology in an organization — the walking, talking manuals," says Ron Cybyske, senior vice president for information services at Banc One Services Corp. in Columbus, Ohio. "They take complex business issues and translate them into the language of the computer."

Corporate America catching on

Such senior-level technical tracks are becoming more common. Most of these positions are found at technology-driven companies such as software vendors or systems integrators. But these professionals are also scattered across corporate America. In fact, some predict that this population will begin to grow as applications programming becomes more the responsibility of end-user departments.

"With the lights-out data center and continued end-user computing will come an increased need in IS for highly trained technical support professionals," notes Ephraim McLean, professor and Smith Chair of IS at Georgia State University in Atlanta.

Projects that may be assigned to these technical professionals include systems programming, database administration, network administration, research and development, capacity planning and technical evaluations.

Historically, managers and high-level technical professionals have not been paid the same. It is only in the last five to 10 years that senior-level technical professionals' pay has come up to the level of their management counterparts. But while the salaries are on par, perks such as bonuses are not; traditional managers still bring home more in total compensation.

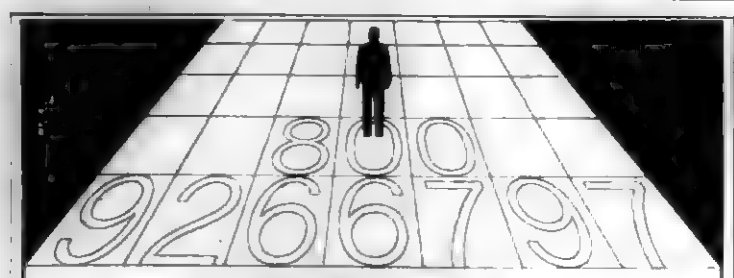
People who reach this level have to perform many of the same functions that managers do, although they don't manage people. They must have the same planning and prioritizing abilities that managers need, observes Derry Kabcenell, vice president of relational database management systems development at Oracle Corp.

The primary lures to a career as a technical contributor, Cybyske notes, are the instant gratification one receives in such a position when a technical issue is resolved and the ability to receive ongoing acknowledgment and status.

And there are other positive aspects of the technical contributor's job. Perhaps most importantly, technicians are not tied to one industry. "I can always sell skills no matter what happens to any company I'm with," notes Ken Breckenridge, corporate systems consultant to the CEO at Affiliated Computer Systems, Inc. in Dallas.

Hours may also be an issue. Individual contributors are often required to work long or odd hours to resolve technical issues. "I couldn't be in any other profession — except for maybe a doctor — and get a call from a woman, get up and leave the house, and my wife doesn't ask any questions," Breckenridge says.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies.



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Wishful thinking

Putting your feet in someone else's shoes

By Jill Vitiello

Imagine for a minute that an information systems genie appears in your cubicle and presents you with a 24-hour opportunity to trade places with anyone in the computer industry. Whose job would you want to take? What position would you want to try?

We're no genies, but we spoke to a number of IS professionals to find out how they would spend such a day if the opportunity arose. Surprisingly, a significant number say they wouldn't want to change at all. But roughly one-third of those surveyed reveal they would leave their traditional IS jobs to work as researchers at vendor companies. Another third crave power and would spend the day as an industry leader. Let's see why.

Tech meisters

Being on the cutting edge of technology appeals to Mark Scott, microcomputer specialist at Memorial Hospital in Chattanooga, Tenn. He says he would like to spend one day as a NetWare engineer at Novell, Inc. to get a jump on new products that will be introduced to users. Scott is studying to become a certified Novell engineer and sees NetWare as the hottest, most exciting IS technology right now.

On the other hand, "I'd like to be a researcher at IBM," says Doug Colbert, a programmer/analyst at Continuum, Inc. in Austin, Texas. "It would be great to find out what IBM is up to so you don't outdate yourself as soon as you put your code down."

Spending one day as a Bell Laboratories research technician would teach Ronald Garffie some interesting things about micro circuitry. A programmer at Agrex, Inc. in Overland Park, Kan., he says he feels this would give him insight into other areas of the computer field. He'd also like the opportunity to learn more about the ins and outs of his line of business, perhaps by exploring agricultural technologies.

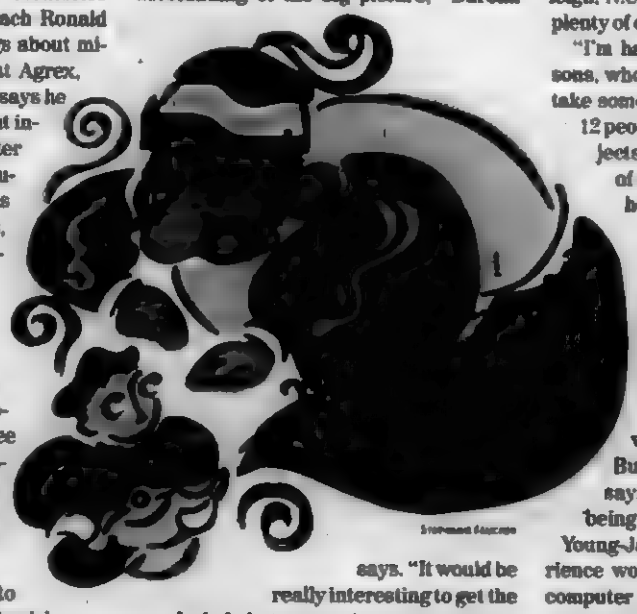
View from the top

"I'd like to see what Bill Gates goes through in a day," says Charles Bedekovich, data processing manager at Employee Benefit Claims, Inc. in Pittsburgh. Bedekovich considered being other industry leaders for a day but couldn't resist Gates' wealth.

"What keeps Gates going to the office every day?" Bedekovich muses. He surmises Gates' motivation isn't simply picking up a paycheck, sizable as it is, but rather the excitement of pushing the industry forward. Bedekovich says he believes he'd return from a day as Bill Gates with a new industry perspective, some management ideas and a glimpse of a brilliant mind.

Leaving industry and global views to others, Tom Durban, senior programmer/analyst at Delta Airlines in Stone Mountain, Ga., longs for the chance to get a corporate overview. How? He'd spend his 24 hours as vice president of communications and information services at his company. With roughly 1,700 IS employees reporting to that position, it would be no small feat.

"What an opportunity to get a better understanding of the big picture," Durban says. "It would be really interesting to get the feel of what goes on in corporate strategy, life and politics at that level."



Some high-level people are perfectly content with their jobs and say they would prefer to leave that big-picture view to their higher-ups. They have had plenty of exposure to their bosses' jobs and have seen that the top posts come complete with their own headaches.

"I like my job just fine," says Mark Briebart, IS manager of the cardiology department at Children's Hospital in Boston. "I wouldn't want anyone else's problems."

He heads a small group of IS professionals dedicated to working with the hospital's cardiologists, who Briebart says are computer-literate, savvy users.

Satisfied IS professionals such as Jack Parsons, director of systems and programming at Atlantic States Bankcard in Raleigh, N.C., say their present jobs provide plenty of challenges.

"I'm happy with what I do," says Parsons, who would also decline any offer to take someone else's place for a day. With 12 people reporting to him and new projects on tap, he says he never runs out of work — and that's just the way he likes it.

Joe Backes agrees. The network manager at The Bowlin Co. in Shreveport, La., says he gets a kick out of troubleshooting problems and wouldn't want to change jobs with anyone else, even for one day.

Roberta Young-Jackson wouldn't want to change, either. But if she was forced to trade, she says she would like to get a taste of being a systems analyst for a day. Young-Jackson says she thinks the experience would make her a more effective computer users' coordinator, which is her current job at the computer center in Randolph Macon College in Ashland, Va. But, she demurs, she enjoys the academic environment of the college and wouldn't want to leave it.

Vitiello is a free-lance writer based in East Brunswick, N.J.

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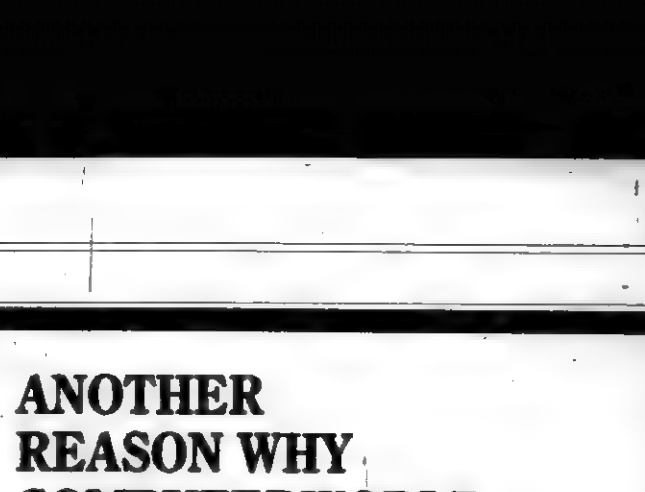

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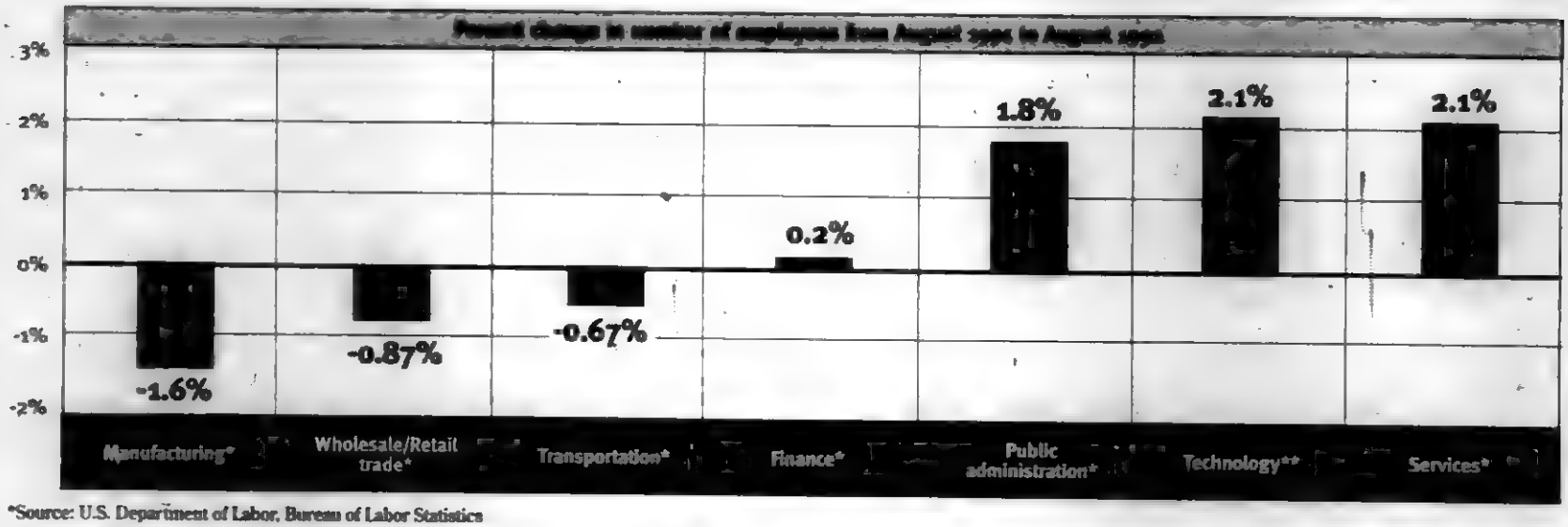

*Source: U.S. Department of Labor, Bureau of Labor Statistics

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-Stephen J. Kukoy
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"Looking ahead, we expect several factors to escalate our recruitment advertising needs - the growing demand by clients for greater selectivity, an increasingly specialized industry, a continually mobile marketplace, and NCA's expansion into the lucrative European marketplace. As this all happens, we intend to increase our advertising budget in *Computerworld* proportionately.

"*Computerworld* recruitment advertising has been equally successful for Abacus Consultants. Although we've experienced many such situations, one specific instance comes to mind. After local advertising proved unsuccessful for finding a particularly hard-to-find individual in the Denver area, the client gave us the go-ahead to advertise nationally. We ran one recruitment advertisement in *Computerworld* - and got an instant response from just the candidate we were looking for - right here in our local area. It just goes to show that *Computerworld* delivers far better candidates than any other source.

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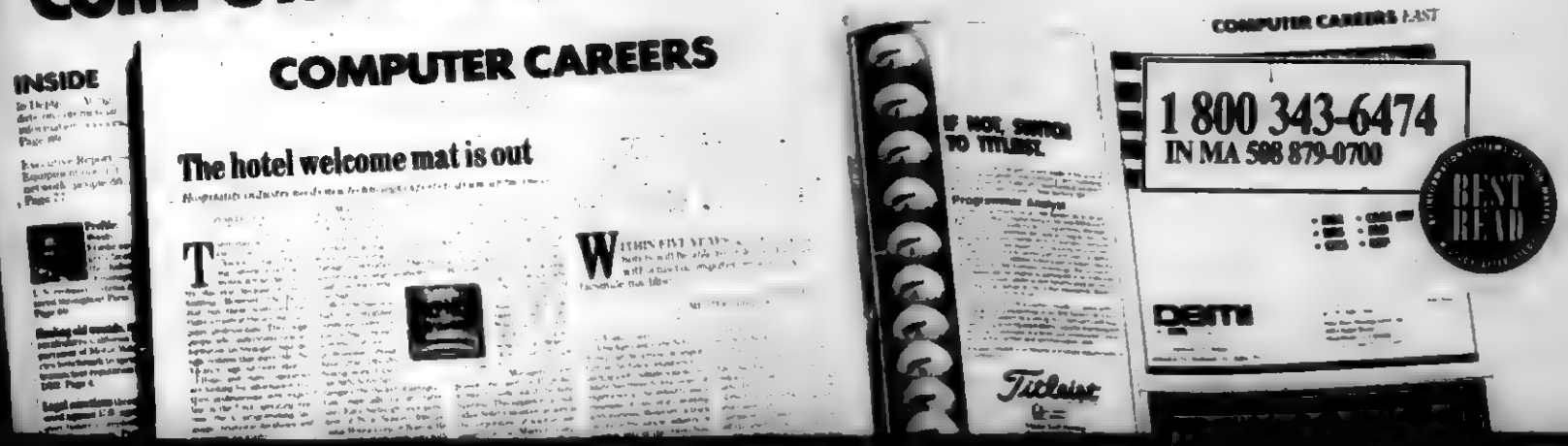

You can't be too cautious making a deal

Misleading product marketing verbiage, vendor stalling practices, "trust us" ploys — you name it and buyers have to deal with it. While these problems may not be encountered every day, buyers only have to fall prey to them once to damage a deal they have been working on. In this week's Shopper Alert column, buyers and consultants share a few of their experiences with dirty dealers. While companies that practice these tricks are in the minority, it is best to keep an eye out and avoid them altogether.

'We don't need to put that in writing'

■ Put up your guard when you hear this one. Some vendors encourage their sales staff to create personal relationships with clients for their own gain. Often, their aim is to deemphasize the importance of including certain vendor commitments — such as standing behind product performance and reliability — in the written agreement.

Once established, personal relationships can sway normally cautious executives into accepting a salesman's spoken assurances on a variety of technical and legal points.

In many cases, the vendor's rep never had the authority to make the commitment, and vendor management will not accept the burden of fulfilling the promise. The vendor may also change its original position to offset reduced earnings or to intimidate the user into upgrading his system.

The key rule in avoiding this is simple: "If it's not in the contract, it's not part of the deal." Also, buyers should never sign the vendor's standard form agreement, and buyers should always involve their attorney or other professional advisers early in the negotiations.

— Joe Auer, president of International Computer Negotiations, Inc. in Winter Park, Fla.

Come across any questionable selling practices? Call in your experiences to Jodie Naze at (800) 343-6474, X727 or fax them to (508) 875-8931.

Real video adapters?

■ Some vendors have been making an easy buck by selling PCs they claim come with coprocessed video adapters, when in reality they are only a clone Video Graphics Array board with the S3 chip on it. This chip is not coprocessed. It simply has Microsoft Corp. Windows drawing functions encoded in the hardware. Phony coprocessed video adapters are substantially less expensive and slower than a true programmable coprocessor. To be sure, ask the vendor to explain whether the board is accelerated or coprocessed.

Todd Henschell, PC consultant and freelance writer based in Burbank, Calif.

Truth in advertising?

■ Don't believe everything you read. When resellers — particularly resellers of cheaper systems — advertise hard disk capacities they usually don't tell you that the figure listed is the *unformatted* capacity of the disk. You generally lose 5% to 20% of the disk's capacity when you format it, and depending on the computer's BIOS, you may lose more if it's a partially supported drive type. To avoid any unpleasant surprises during installation and setup of the system, establish that the figures quoted by the vendor are "usable" megabytes.

— Todd Henschell

'We can't do that; it would set a precedent'

■ Vendors say this when they don't want to grant a requested concession for discounts, guaranteed uptime, extended warranties and the like. They argue that if the request is granted, they would be forced to make similar concessions for other buyers.

This is difficult to rebut because buyers can't know whether the vendor has granted the same or a similar request to another user. They also do not know whether the vendor would really have a "precedent" problem if it conceded. To counter this, have the vendor restate its "precedent policy," and demand a list of previous concessions.

If the vendor claims there is no list or prior concessions (an unlikely event), ask how it can talk about precedents and what it can or cannot do if it doesn't have a list.

One tactic to use early in the negotiations is to ask the vendor to include a "most-favored nation" provision in the agreement. This states that if a better price or broader concession has been granted before, the vendor is obligated to provide the same concession to the user.

One caveat to be aware of is the use of "side letters" to grant concessions. All well-drafted vendor agreements include a provision that states the contract itself is the only binding agreement among the parties, and no other documents will be binding unless formally incorporated into the contract.

— Joe Auer

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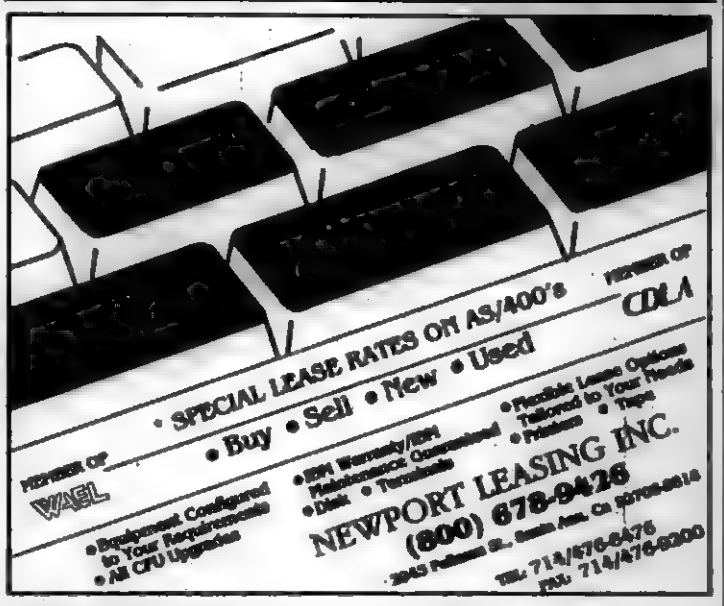

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On December 9, 1992 at 10:00 a.m. at the law offices of Lowenthal, Landau, Fischer & Bring, P.C., a public sale will be conducted by James E. Beckwith or any member of the law firm of Lowenthal, Landau, Fischer & Bring, P.C., on behalf of UNIQUEST INCORPORATED ("Secured Creditor") of the following assets of Concept Systems Inc., a Pennsylvania corporation, Concept Holding Corporation, a Delaware corporation and AIS Incorporated, a Utah corporation with their principal locations at The Wanamaker Building, 100 Penn Square East, Suite 800, Philadelphia, PA 19107 (collectively the "Debtor"): (a) accounts, including, without limitation, all rights to payment for services or inventory (however arising), leases, chattel paper, contract rights, instruments, life insurance policies and documents; (b) general intangibles (including, without limitation, inventions, designs, patents, patent applications, trademarks, trade names, copyrights, leasehold interests, tax refund claims, guaranty claims, and security interests or other security held by Debtor to secure accounts); (c) inventory including without limitation, returned and repossessed goods, raw materials and work-in-progress; (d) goods, equipment, vehicles, and fixtures, together with accessories thereto and replacements parts therefor, but excluding all property used exclusively for personal, household or family use; (e) all monies, accounts, deposits and property in the possession or under the control of Secured Creditor or its bailee; (f) all books and records, including, without limitation, customer lists, credit files, computer programs, printouts and other materials and records pertaining to any of the foregoing; (g) all documents of title evidencing or issued with respect to any of the foregoing, and (h) all proceeds and products of all of the foregoing, including, without limitation, proceeds of insurance policies insuring the foregoing.

All bidders at the sale will be requested before the bidding commences to disclose their names and addresses and agree to the terms of the sale hereinafter set forth and set forth in the rules and procedures of sale distributed at the time of the sale, if any.

The highest bidder shall be required to deposit with Secured Creditor, as secured creditor, a sum of money equal to 10% of the aforesaid bid, with the balance to be paid within five (5) days thereafter. Failure to make such deposit of the balance of the highest bid will result in forfeiture of the earnest money deposit and the property shall be sold to the next highest bidder or at another public sale.

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For further information on this matter, contact the following:

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MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg. Suite 508, Jackson, MS 39201 for the following:

RFP No. 2287, due Mon. 12/14/92 at 3:30 p.m. for a computerized voice processing system for dictation for the DEPARTMENT OF REHABILITATION SERVICES. No Charge.

RFP No. 2289 due Fri. 12/11/92 at 3:30 p.m. for 25 80386 based microcomputers and various peripherals for MS GULF COAST COMMUNITY COLLEGE. Charge $10.00.

RFP No. 2293, due Tues. 12/15/92 at 3:30 p.m. for a Tape Remittance Software package for use with the PIMS system for the MS DEPARTMENT OF HEALTH. No Charge.

RFP No. 2294 due Tues. 12/15/92 at 3:30 p.m. for maintenance services for an IBM 9375 minicomputer and IBM PS/2 microcomputers and various peripherals for the DEPARTMENT OF MENTAL HEALTH. Charge $10.00.

RFP No. 2295, due Tues. 12/29/92 at 3:30 p.m. for a UNIX-based optical imaging system for the UNIVERSITY OF MISSISSIPPI. No Charge.

RFP No. 2296, due Tues. 12/15/92 at 3:30 p.m. for a forty station local area network for JONES COUNTY JUNIOR COLLEGE. Charge $10.00.

RFP No. 2297 due Fri. 12/11/92 at 3:30 p.m. for 120 gigabytes of 3390-type DASD and the needed controller(s) to replace the existing DASD capacity and provide additional DASD storage for the MS STATE COMPUTER CENTER. Charge $10.00.

RFP No. 2298, due Fri. 12/11/92 at 3:30 p.m. for an additional IBM 3480-B22 tape drive with autoloaders, and an IDRC upgrade for two existing IBM 3480-A22 controllers for the MS STATE COMPUTER CENTER. Charge $10.00.

RFP No. 2299, due Fri. 12/11/92 at 3:30 p.m. for a new Front-End Processor (FEP) capable of running in native mode 6670's NCP Version 5.3 and supporting up to 50 56KB lines to replace an existing Amdahl 4705 FEP for the MS STATE COMPUTER CENTER. Charge $10.00.

RFP No. 2300, due Fri. 12/11/92 at 3:30 p.m. for 21 color 80386DX 25MHz microcomputers for the Technical Business Program for SOUTHWEST MS. COMMUNITY COLLEGE. Charge $10.00.

RFP No. 2301, due Fri. 12/11/92 at 3:30 p.m. for an upgrade to an existing Novell Local Area Network for the MS DEPARTMENT OF AGRICULTURE AND COMMERCE. Charge $10.00.

RFP No. 2302, due Fri. 12/11/92 at 3:30 p.m. for a local area network for the MS STATE VETERANS AFFAIRS BOARD. Charge $10.00.

RFP No. 2306, due Fri 12/11/92 at 3:30 p.m. for 50 MS-DOS based microcomputers and peripherals to ITAWAMBA COMMUNITY COLLEGE. Charge $10.00.

RFP No. 2307, due Fri. 12/11/92 at 3:30 p.m. for an upgrade to the existing Intergraph network for the MS DEPARTMENT OF TRANSPORTATION. No Charge.

RFP No. 2308, due Tues. 1/5/93 at 3:30 p.m. for an upgrade to an IBM RISC6000 System for JACKSON STATE UNIVERSITY. Charge $10.00.

RFP No. 2309, due Wed. 1/6/93 at 3:30 p.m. for the services of a consulting firm to provide professional services to conduct a feasibility study, help identify applications, and define and establish standards for the strategic implementation of imaging technology for the STATE OF MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY. No Charge.

RFP No. 2310, due Tues. 2/2/93 at 3:30 p.m. for a LAN-based, mainframe-based, or combination platform-based automated telephone management system for the CENTRAL DATA PROCESSING AUTHORITY (CDPA) BUREAU OF TELECOMMUNICATIONS. THERE WILL BE A MANDATORY BIDDER'S CONFERENCE ON TUESDAY, JANUARY 5, 1993 AT 10:00 A.M. AT CDPA. No Charge.

Detailed specifications for each RFP with a charge may be obtained by submitting a written request accompanied by the appropriate payment. No phone requests will be accepted. NOTE: Valid forms of payment are corporate checks on a Mississippi bank, certified check or POSTAL money order made out to Central Data Processing Authority. No cash or out-of-state checks. For RFPs with no charge call Kelli Brown @ 601-359-2804. If you would like to pick up RFPs at CDPA, you may do so between the hours of 1:00-3:00 p.m. daily. The CDPA reserves the right to reject any and all bids and proposals and to waive information.

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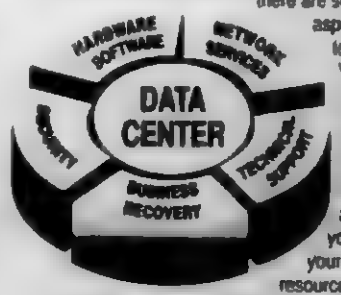

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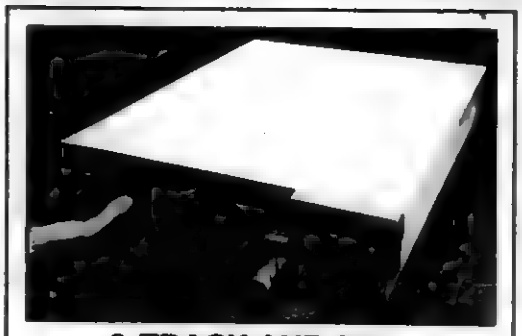

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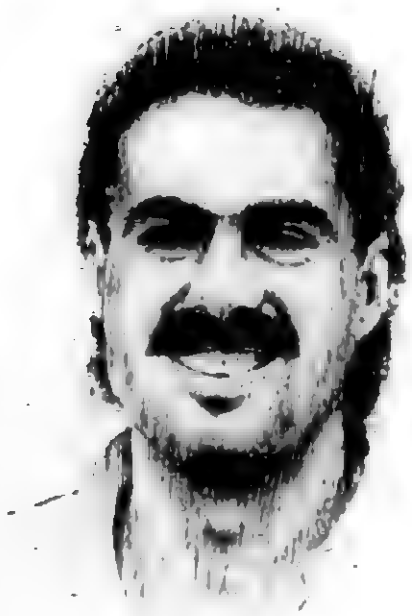

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Acer America 37
BMC Software 68
Borland 112
Bus-Tech, Inc. 18
Cincom 83
Cognos 86
Command Technology 39
Commonwealth of Puerto Rico 78
Compaq Computer Corp. 30-31
ComputerLand 29
CW Circulation 80-81
CW Classified 53, 62, 64, 66
CW Marketing 47, 86
CW White Paper 64, 66
Digital Equipment Corporation 90
Eastman Kodak 82
EMC Corp 34-35
Fischer International 48
Gupta Technologies 24
Hewlett Packard 10-13,4 5
Hitachi Data Systems 26-27
IBM 22-23, 32/33, 52, 53, 76, 90-91
Information Resources 15
Information Builders 17
Informix 9
Ingres 20
Innovation Data Processing 7
JMP Information Systems 78
Legent Corp. 56-57
Lotus Development Corp 42-43, 80-81, 84
Micro Focus 11
National Education Foundation 30
Neuron Data 74
Northern Telecom 13
Object Management Group 68
Oracle 3
Progress Software 72
Pyramid Development Corp. 46
Ross Systems 100
SAS Institute 75, 111
Software 2000 88
Software Engineering of America 8
Sun Microsystems 107
Sybase 25, 69
Syncordia 90
Windows World 48
Xerox 82

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Companies in this issue

Page number refers to page on which story begins

A

Aberdeen Group ... 8,83
Acer America Corp. ... 32
Adobe Systems, Inc. ... 41
Advanced Logic Research, Inc. ... 24
Advanced Micro Devices, Inc. ... 44
Affiliated Computer Systems, Inc. ... 94
Agrex, Inc. ... 95
Alex. Brown & Sons, Inc. ... 106
American Airlines ... 12
American Express Co. ... 12
American Quality Foundation ... 1
American University ... 1
Amoco Corp. ... 55
Apple Computer Inc. ... 8,14,16,24,39,44,64
Applied Research of Cambridge Ltd. ... 16
Aptech Computer Systems, Inc. ... 47
Archive Corp. ... 109
Arthur D. Little, Inc. ... 1
Association for Computing Machinery ... 6
AST Research, Inc. ... 6,24
Atex, Inc. ... 16
Atlerton Technology ... 73
Atlantic States Bankcard ... 95
AT&T ... 10,55
AT&T Microelectronics ... 44
AT&T Network Systems ... 4
Autodesk, Inc. ... 49

B

BancOne Services Corp. ... 94
BankAmerica Corp. ... 12
Bankers Trust Co. ... 67
Banyan Systems, Inc. ... 16
Baxter Healthcare Corp. ... 12
BBN Communications, Inc. ... 55
Bell Laboratories ... 95
Best Data Products, Inc. ... 53
Better Homes and Gardens ... 77
Boeing Co. ... 73
Boole & Babbage, Inc. ... 1
Borland International, Inc. ... 4
Bull HN Information Systems, Inc. ... 83
Business Software Alliance ... 6

C

Carnegie Group, Inc. ... 70
Carnegie Mellon University ... 55
Carolina Freight Corp. ... 1
Cellular Telephone Industry Association ... 6
Ceridian Corp. ... 10
Champion International Corp. ... 1
Chemical Bank ... 110
Chevron Corp. ... 55
Children's Hospital in Boston ... 95
Cincom Systems, Inc. ... 67
Cisco Systems, Inc. ... 7,55,110
Citibank NA ... 87
Citicorp ... 73
CMS Enhancements, Inc. ... 16
Communications Network Architects ... 1
Compaq Computer Corp. ... 6,39
Compass America, Inc. ... 49
Computer Associates International, Inc. ... 1
Computer Corporation of America ... 109
Computer Intelligence ... 39
Computer Intelligence/Infocorp ... 4
Computer Reserves, Inc. ... 109
ComputerLand Corp. ... 39
Computervision, Inc. ... 67
ConShare Corp. ... 1
Concord Communications, Inc. ... 64
Conner Peripherals, Inc. ... 109
Consumer Bankers Association ... 79
Continuum, Inc. ... 95
Coors Brewing Co. ... 67
Corollary, Inc. ... 24
Cray Research, Inc. ... 49
Creative Strategies Research International, Inc. ... 41
Crowax, Inc. ... 109
CSX Technologies ... 1
Cummins Cash and Information Services ... 6

D

Damark International, Inc. ... 15
Data General Corp. ... 83,84
Dean Witter Reynolds, Inc. ... 8
Deere & Co. ... 73
Dell Computer Corp. ... 6,110
Delta Airlines ... 95
Development Center Institute, Inc. ... 1
DHL Airways, Inc. ... 1,4,14
Digital Equipment Corp. ... 4,6,14,24,36, ... 55,67,81,83,84,85,110
Dr. Pepper Co./Seven-Up Cos. ... 1
Du Pont Co. ... 16
Dun & Bradstreet Corp. ... 83
DuWayne Peterson Associates ... 87

E

Eastern Management Group ... 10
Eastman Kodak Co. ... 16
Electronic Data Systems Corp. ... 6,77,109
Electronic Transaction Corp. ... 4
Elmo Information Services Group ... 83
EMC Corp. ... 108
Employee Benefit Claims, Inc. ... 95
EO, Inc. ... 44
Epson America, Inc. ... 44
Equimark Corp. ... 79
Equitable Resources, Inc. ... 1
Ernst & Young ... 1,78
European Computer Manufacturers Association ... 73
Everex Systems, Inc. ... 24

F

Fanuc Ltd. ... 28
Federal Express Corp. ... 1,14
First Data Corp. ... 12
First Union Corp. ... 1
Fiserv, Inc. ... 109
Ford Motor Co. ... 1
Forrester Research, Inc. ... 67
Frito-Lay, Inc. ... 12
Fujitsu Computer Products of America, Inc. ... 44
Fujitsu Ltd. ... 28
Fuqua School of Business ... 49

G

Gateway 2000 ... 110
GEC Siemens ... 6
General Foods ... 77
Georgia State University ... 94
Gerber Alley ... 12
Goal Systems International, Inc. ... 1,12,109
Grand Strand Executive Golf Association ... 47
GTE Data Services, Inc. ... 94
GTE Government Systems ... 73
GVC Corp. ... 16

H

Harvard Business School ... 12
Hayes Microcomputer Products, Inc. ... 16
Hewlett-Packard Co. ... 4,6,14,15,67,81,83,84
Hitachi Ltd. ... 28
Holiday Inn Worldwide ... 7
Howard Rubin Associates, Inc. ... 20
Hyatt Corp. ... 4

I

IBAX Healthcare Systems ... 68
IBM ... 1,4,6,7,12,14,24,44,47, ... 64,67,68,77,81,83,84,85,108,109
IBM PC Co. ... 16,39
Informix Software, Inc. ... 4
Integra Financial Corp. ... 79
Integrated Systems Solutions Corp. ... 109
Intel Corp. ... 8,16,24
Intergraph Corp. ... 49
International Data Corp. ... 4,7,8,10,36,67,73
International Standards Organization ... 73
Intersolv, Inc. ... 109

J

Jardine Fleming Securities Ltd. ... 29
J.C. Penney Co. ... 1

K

Kelly Services, Inc. ... 1
Keyport Life Insurance Co. ... 83
KHP Services, Inc. ... 15
Kidder, Peabody & Co. ... 6
Kirk Tyson International Ltd. ... 20
KPMG Peat Marwick ... 1

L

LaserData, Inc. ... 53
Legent Corp. ... 1,109
Lexar Systems ... 16
Liberty Diversified Industries ... 8
Lotus Development Corp. ... 67

M

MAI Basic Four ... 77
Maine Bureau of Taxation ... 8
McDonnell Douglas Health Systems Co. ... 12
MCI Communications Corp. ... 87
McKinsey & Co. ... 87
Megahertz Corp. ... 53
Memorial Hospital ... 95
Merrill Lynch & Co. ... 87
Meta Group, Inc. ... 1,73
Metaphor, Inc. ... 67
Micom Communications Corp. ... 6
Micro Focus, Inc. ... 83
Microcomputer Managers Association ... 8
Micro-Integration Corp. ... 64
Microsoft Corp. ... 4,8,16,24,44,67,85
Midas International Corp. ... 39
Midwest Stock Exchange ... 67

N

National Institute of Standards ... 73
Natural Gas Pipeline Co. ... 1
NCR Corp. ... 14,67
NDMA, Inc. ... 20
NEC Corp. ... 28
Neodata ... 77
Neponset Valley Health System ... 68
NetFrame Systems, Inc. ... 24
Neuron Data, Inc. ... 39
New Science Associates, Inc. ... 73
New York State Police ... 110
New York University Stern School of Management ... 12
Next, Inc. ... 110
North Hills ... 53
Novell, Inc. ... 1,14,16,44,49,53,55,64
Number Nine Computer Corp. ... 44
Nynex Corp. ... 67

O

Object Management Group ... 73
Occidental Petroleum Corp. ... 1
Oklahoma Department of Transportation ... 1
Oracle Corp. ... 4,67,94

P

Packard-Bell Electronics, Inc. ... 16
Peerlogic, Inc. ... 14
Pennsylvania Blue Shield ... 15
Pepperidge Farm, Inc. ... 81
Personal Computer Memory Card International Association ... 53
Plessey Telenet Ltd. ... 6
Polaroid Corp. ... 1
Praxis International, Inc. ... 109
Precision Visuals, Inc. ... 67
Price Waterhouse ... 1
Prime Computer ... 14
Procter & Gamble Co. ... 67
Proteon, Inc. ... 6,7
Pyramid Technology Corp. ... 14

R

Raidtec Corp. ... 24
Randolph Macon College ... 95
RCA Corp. ... 87
Reader's Digest Association, Inc. ... 77
Red Brick Systems, Inc. ... 67
Roadway Express ... 78

S

S3 Corp. ... 44
Samsung Electronics Co. ... 15
SAS Institute, Inc. ... 1
Security Pacific Corp. ... 87
Sequent Computer Systems, Inc. ... 4,49
Sequoia Systems, Inc. ... 15
Sharp Corp. ... 44
SHL Systemhouse, Inc. ... 109
Siemens/Nell Group ... 16
Software AG of Germany ... 8
Source EDP ... 94
Special Libraries Association ... 79
Sprint Corp. ... 6,10,24,58
Storage Technology Corp. ... 108
Stratus Computer, Inc. ... 14,15
Summit Information Systems, Inc. ... 78
Sun Microsystems, Inc. ... 4,24,110
Sybase, Inc. ... 1,4,67
Symplex Communications Corp. ... 64
Syntax, Inc. ... 49
System Integrator ... 16

T

Technology Investment Strategies Corp. ... 81,83
Texas Instruments, Inc. ... 1,10,20
TGI Technologies Ltd. ... 44
The Bowlin Co. ... 95
The Customer Service Group ... 79
The EDI Group Ltd. ... 1
The Genix Group ... 109
The Society for Information Management ... 78
The Yankee Group ... 12
Toshiba Corp. ... 15
Towers Perrin, Inc. ... 1
TRON Association ... 28

U

Ultimate Corp. ... 15
Union Camp Corp. ... 78
Unisys Corp. ... 83
United Parcel Service, Inc. ... 1,14
United Services Automobile Association ... 12
Universal Software ... 6
Unum Life Insurance Co. ... 87
U.S. Department of Defense ... 73
U.S. Department of Justice ... 109
U.S. Postal Service ... 77
U.S. Robotics, Inc. ... 6

V

Varian Associates, Inc. ... 78
Verdix ... 73
Verity, Inc. ... 67
Vitalink Communications Corp. ... 78
VLSI Technology, Inc. ... 28

W

Walker Richer & Quinn, Inc. ... 64
Washington Researchers Ltd. ... 20
Wellfleet Systems, Inc. ... 7
Weyerhaeuser Co. ... 1
Wheeler Computer Services ... 47
Wohl Associates ... 1
WorkGroup Technologies, Inc. ... 15,39

X

Xenotron Holdings PLC ... 16
Xerox Corp. ... 55,64
Xerox Network Systems ... 55
X/Open Co. ... 79

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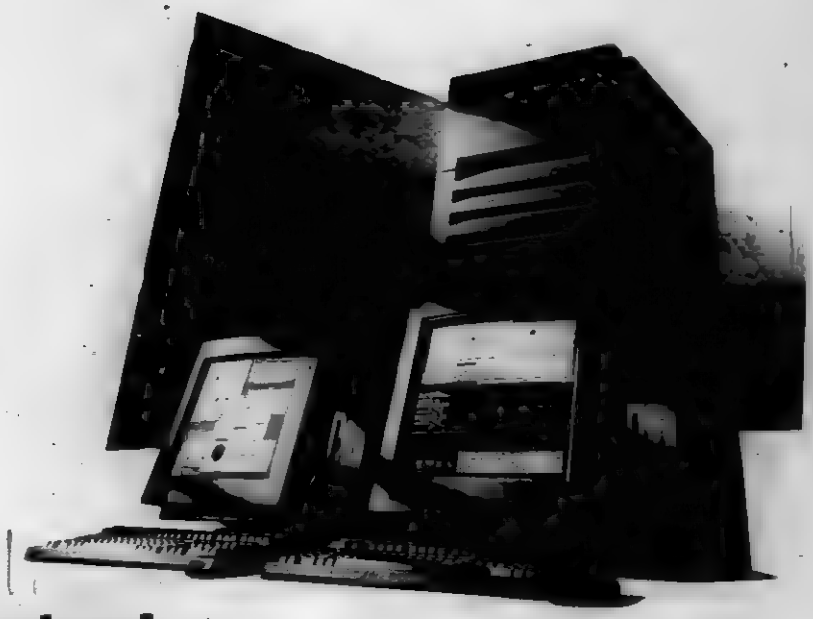

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Gainers

Percent

Data Switch Corp.	26.7	Spinnaker Software	-23.5
Systems Center Inc.	25.0	Phoenix Technologies	-21.7
Bachman Info. Systems	17.8	Printronix Inc.	-17.4
Ultimate Corp.	13.3	Micrografx Inc.	-17.1
Go Video	13.0	American Software Inc.	-14.6
Compuware Inc.	12.0	Zeos International Ltd.	-10.9
Filenet Corp.	10.7	Cray Computer	-10.9
System Software Assoc.	10.7	Computervision Corp.	-10.6

Dollar

System Software Assoc.	3.63	Microsoft Corp.	-4.50
3Com (L)	3.50	Cabletron Systems (H)	-2.38
Computer Sciences	3.13	Parametric Technology (H)	-2.00
Wellfleet Communications (H)	2.75	BMC Software Inc.	-1.75
Hewlett Packard Co.	2.63	Boole & Babbage	-1.75
3M Corp	2.50	Micrografx Inc.	-1.75
Intelligent Info. Systems	2.50	Oracle Corp.	-1.63
Filenet Corp.	2.38	American Software Inc.	-1.50

Rise and fall of storage stocks

The stock market fortunes of data storage competitors Storage Technology Corp. (STK) and EMC Corp. (EMC) have taken divergent paths during the past year. Storage Tek's stock opened 1992 at approximately 2½ times EMC's value. Early last week, however, EMC's share price was slightly higher than Storage Tek's.

Storage Tek's stock value has weathered several heavy drops, which have resulted mostly from repeated delays in the shipment of its much-ballyhooed Iceberg system. Storage Tek was approximately 51 in January. The stock gained some ground before beginning its descent, falling to its close last Monday of less than 21.

EMC, meanwhile, started January at just under 13. The stock climbed steadily, reaching 16 by July and closing on Monday at 28¼.

Some Wall Street watchers said the worst may be over for Storage Tek. Alex. Brown & Sons, Inc. analyst Joseph Payne said a revamped product line will make Storage Tek more competitive in the coming year. Alex. Brown currently rates Storage Tek a Buy. The stock carried a rating of Strong Buy until Alex. Brown downgraded it to Buy status on Nov. 9.

"That's a more realistic growth scenario, considering the uncertainty of the incredibly mushy European market," Payne said.

However, Salomon Brothers, Inc. analyst John Dean rated Storage Tek a Hold in a Nov. 18 report. Dean said the economic climate, coupled with increasing competition in the storage market, will make the company's new product rollouts problematic. Prior to the most recent Iceberg delay, Salomon Brothers had rated Storage Tek a Buy.

"EMC earned a Neutral rating as Alex. Brown recently initiated coverage of the Hopkinton, Mass.-based firm. Payne said he expects EMC's revenue to continue to grow but that the current stock value fairly represents EMC's performance. "EMC is certainly doing well; we're just looking for the correct valuation," Payne said.

EMC's successful redundant arrays of inexpensive disks (RAID) product lines — Harmonix for the IBM Application System/400 and Symmetrix for IBM-compatible mainframes — will face increased competition in 1993. Storage Tek plans to ship its Alpine RAID systems for the AS/400 this month, and IBM's new 9337 RAID system will also be a formidable foe.

As for Storage Tek's Iceberg, Payne said, "It will definitely be at the top of the market when it finally ships. It has the most ambitious objectives of anything out there."

— Derek Slater

[redacted]

Exch	52 Week			Nov 25 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up o 8 %
OTC	74.00	9.63	3 COM Corp.	22.38	-0.75	-3.2
NYS	70.63	56.25	American Info Techs Corp.	67.75	0.50	0.7
NYS	47.75	32.88	AT&T (H)	47.75	0.13	0.3
OTC	4.25	0.75	Artel Communication Corp.	0.97	-0.09	-8.8
OTC	22.00	10.25	Banyan Systems Inc.	21.00	0.50	2.4
NYS	49.75	40.25	Bell Atlantic Corp.	47.75	0.00	0.0
NYS	55.50	43.38	Bellsouth Corp.	49.25	-0.50	-1.0
NYS	6.75	3.63	Bolt, Beranek & Newman	5.13	0.13	2.5
NYS	74.13	40.88	Cabletron Systems (H)	72.63	-2.38	-3.2
OTC	31.00	17.75	Chipcom Corp.	27.50	0.25	0.9
OTC	74.75	24.13	Cisco Systems Inc. (H)	74.75	0.25	0.3
OTC	35.25	5.50	Compression Labs Inc.	14.00	0.00	0.0
OTC	3.38	0.88	Data Switch Corp.	2.38	0.50	26.7
NYS	23.63	13.75	Digital Comm. Assoc.	16.75	-0.38	-2.2
OTC	15.25	7.50	Digital Systems Int'l Inc.	12.00	0.25	2.1
OTC	19.25	3.63	DSC Communications	19.25	0.75	4.1
OTC	10.88	4.75	Fibronix Int'l Inc.	6.25	0.13	2.0
OTC	37.50	10.50	Filenet Corp.	23.25	2.25	10.7
OTC	3.38	1.13	Gandalf Technologies Inc.	1.75	0.00	0.0
OTC	2.25	0.69	Gateway Communications	1.31	-0.06	-4.5
NYS	5.50	2.38	General Datacomm Inds.	4.75	0.13	2.7
ASE	5.88	0.94	Go Video	3.25	0.38	13.0
NYS	35.75	28.88	GTE Corp.	34.13	-0.13	-0.4
NYS	70.88	50.00	ITT Corp.	70.88	0.25	0.4
OTC	38.38	26.50	MCI Communications Corp.	38.38	0.13	0.3
OTC	14.25	2.25	Microcom Inc.	4.25	-0.13	-2.9
NYS	18.25	9.50	Network Equipment Tech.	9.88	-0.13	-1.3
OTC	25.50	8.00	Network General	17.13	0.50	3.0
OTC	20.00	8.50	Network Systems Corp.	14.88	0.00	0.0
OTC	30.50	5.63	Newbridge Networks Corp. (H)	30.50	-0.13	-0.4
NYS	49.25	30.50	Northern Telecom Ltd.	41.50	-0.50	-1.2
OTC	33.50	22.50	Novell Inc.	31.63	0.38	1.2
NYS	88.38	69.13	Nynex Corp.	82.50	0.50	0.6
OTC	37.50	14.50	Octel Communications Corp.	23.00	1.13	5.1
OTC	9.88	3.38	Perrin Data Comm. Ntwks.	4.38	0.25	6.1
OTC	53.00	10.25	Picturetel Corp.	25.25	-0.25	-1.0
OTC	18.75	7.00	Proteon Inc.	10.00	0.75	8.1
NYS	36.75	13.88	Scientific Atlanta Inc. (H)	36.75	0.38	1.0
NYS	70.50	56.25	Southwestern Bell Corp.	70.38	1.25	1.8
NYS	26.38	20.75	Sprint Corp.	26.38	0.88	3.4
OTC	22.13	4.88	Standard Microsystems Corp	21.25	1.38	6.9
OTC	67.50	15.25	Synoptics Communications	64.50	-0.50	-0.8
NYS	40.00	32.88	U S West Inc.	37.25	0.00	0.0
OTC	68.00	24.00	Wellfleet Communications (H)	68.00	2.75	4.2
PCS AND WORKSTATIONS						Off o 8 %
OTC	10.50	3.50	Advanced Logic Research	4.50	-0.25	-5.3
OTC	70.00	41.50	Apple Computer Inc.	56.50	-1.25	-2.2
OTC	24.50	11.25	AST Research Inc.	20.00	1.75	9.6
NYS	19.25	6.75	Commodore Int'l.	7.25	-0.25	-3.3
NYS	43.13	22.13	Compaq Computer Corp.	40.88	-1.00	-2.4
OTC	39.25	15.00	Dell Computer Corp. (H)	36.25	1.00	2.8
OTC	7.75	0.88	Everex Systems Inc.	1.31	-0.06	-4.5
NYS	34.63	21.25	Harris Corp.	34.63	0.25	0.7
NYS	85.00	47.25	Hewlett Packard Co.	63.38	2.63	4.3
NYS	29.75	14.13	Silicon Graphics	25.88	-1.25	-4.6
OTC	36.13	20.75	Sun Microsystems Inc.	30.88	-1.38	-4.3
NYS	31.25	22.25	Tandy Corp.	29.13	1.63	5.9
NYS	11.13	5.00	Zenith Electronics	6.00	0.13	2.1
OTC	25.50	2.75	Zeos International Ltd.	3.38	-0.50	-12.9
LARGE SYSTEMS						Off o 8 %
ASE	20.63	7.75	Amdahl Corp.	8.00	0.00	0.0
NYS	16.38	4.75	Convex Computer	7.25	-0.25	-3.3
OTC	15.25	1.88	Cray Computer	4.63	-0.63	-11.9
NYS	49.50	19.00	Cray Research Inc.	23.50	2.00	9.3
NYS	18.13	7.13	Data General Corp.	11.00	-0.50	-4.3
NYS	65.50	31.63	Digital Equipment Corp. (L)	31.63	-0.50	-1.6
NYS	100.38	61.00	IBM (L)	65.50	3.50	5.6
OTC	13.25	5.50	Kendall Square Research	9.88	-0.38	-3.7
NYS	119.25	83.00	Matsushita Electronics	87.00	2.00	2.4
OTC	17.50	6.00	Pyramid Technology	10.25	-0.50	-4.7
OTC	17.88	9.88	Sequent Computer Sys.	14.50	0.25	1.8
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.0
NYS	56.25	29.50	Stratus Computer Inc.	33.00	-1.00	-2.9
NYS	15.13	9.50	Tandem Computers Inc.	14.00	0.13	0.9
NYS	11.75	3.63	Unisys Corp.	8.63	0.00	0.0
ASE	7.50	0.25	Wang Labs Inc. (n)	0.44	0.00	0.0
SOFTWARE						Off o 8 %
OTC	68.50	25.25	Adobe Systems Inc.	33.63	1.88	5.9
OTC	44.25	10.25	Aldus Corp.	15.50	-0.75	-4.6
OTC	19.75	7.00	American Software Inc.	8.75	-1.50	-14.6
OTC	20.00	9.75	Ase Computer Systems	17.25	0.50	3.0
OTC	56.50	23.25	Autodesk Inc.	48.50	-1.25	-2.5
OTC	37.75	3.75	Bachman Info. Systems	6.63	1.00	17.8
OTC	43.00	32.00	BGS Systems Inc.	43.00	1.00	2.4
OTC	79.00	37.25	BMC Software Inc.	63.13	-1.75	-2.7
OTC	25.50	13.00	Boole & Babbage	20.75	-1.75	-7.8
OTC	86.75	24.25	Bodland Int'l Inc.	24.25	0.25	1.0
OTC	10.50	3.63	CE Software	4.25	0.00	0.0
ASE	29.75	9.16	Cheyenne Software Inc.	26.75	-0.75	-2.7
OTC	13.13	5.63	Cognos Inc.	7.25	0.13	1.8
NYS	19.50	8.63	Computer Associates	18.25	0.50	2.8
NYS	12.38	4.75	Computervision Corp.	5.25	-0.63	-10.6
OTC	20.00	6.75	Comshare Inc.	12.88	1.38	12.0
OTC	47.88	6.00	Easel Corp.	11.75	0.25	2.2
OTC	25.00	11.50	Group I Software	12.50	-0.50	-3.8
OTC	6.63	3.50	Hogan Systems Inc.	6.00	0.38	6.7
OTC	36.25	18.50	Information Resources	30.75	0.50	1.7
OTC	33.50	5.88	Informix Corp. (H)	31.63	-0.88	-2.7
OTC	22.88	11.00	Intergraph Corp. (L)	12.88	1.13	9.6
OTC	15.00	7.00	Interleaf Inc.	13.25	0.00	0.0
OTC	20.25	10.25	Intersolv Inc.	14.50	0.75	5.5
OTC	21.38	9.50	Knowledgeware Inc.	15.00	0.13	0.8
OTC	50.50	28.75	Legent Corp.	49.88	0.13	0.3
OTC	38.75	14.75	Lotus Development	21.00	0.25	1.2
OTC	7.38	1.88	Meca Software	4.00	0.00	0.0
OTC	22.25	5.25	Mentor Graphics	8.00	-0.25	-3.0
OTC	38.25	27.25	Micro Focus	37.75	0.25	0.7
OTC	20.50	6.50	Micrografx Inc.	8.50	-1.75	-17.1
OTC	95.00	61.88	Microsoft Corp.	90.50	-4.50	-4.7
OTC	24.75	12.00	Oracle Corp.	20.63	-1.63	-7.3
OTC	56.25	20.13	Parametric Technology (H)	52.25	-2.00	-3.7
OTC	11.00	3.50	Phoenix Technologies	5.13	-1.38	-21.2
OTC	25.25	11.25	Platinum Technology	22.00	1.50	7.3
OTC	59.00	29.00	Progress Software Corp.	59.00	0.50	0.9
OTC	26.63	4.00	Quarterdeck Office Sys.	5.38	-0.38	-6.5
OTC	32.75	11.75	Rainbow Technologies Inc.	22.13	0.13	0.6
OTC	22.75	4.00	Rasterops	7.63	0.13	1.7
OTC	17.25	3.63	Ross Systems	7.38	-0.25	-3.3
OTC	18.50	8.50	Sapiens USA Inc.	18.50	0.88	5.0
OTC	26.25	6.75	Software Publishing Corp.	8.75	-1.00	-10.3
OTC	8.00	2.00	Software Toolworks Inc.	5.75	-0.13	-2.1
OTC	7.25	0.75	Spinnaker Software	1.63	-0.50	-23.5
OTC	16.50	3.25	State of the Art	6.50	-0.50	-7.1
NYS	25.25	13.75	Sterling Software Inc.	20.88	0.88	4.4
OTC	30.00	8.00	Struct. Dynamics Research	11.88	-0.38	-3.1
OTC	45.25	16.75	Sybase Inc.	43.25	1.00	2.4
OTC	51.00	5.88	Symantec Corp.	11.88	-0.63	-5.0
NYS	15.50	5.25	Systems Center Inc.	7.50	1.50	25.0
OTC	37.50	16.66	System Software Assoc.	37.50	3.63	10.7
OTC	13.25	2.50	Trimix Corp.	3.50	0.00	0.0
OTC	29.75	14.50	Walker Interactive Systems	21.38	-1.13	-5.0
OTC	5.38	1.38	Wordstar	2.06	0.00	0.0
SEMICONDUCTORS						Off o 8 %
NYS	21.50	7.38	Advanced Micro Devices	17.63	-0.50	-2.8
NYS	13.63	7.13	Analog Devices Inc.	13.63	1.13	9.0
OTC	15.00	6.75	Atmel Corp. (H)	15.00	-0.13	-0.8
OTC	14.13	3.25	Chips and Technologies	4.88	-0.13	-2.5
NYS	18.38	7.38	Cypress Semiconductor Corp	10.75	-0.88	-7.5
NYS	13.75	6.75	Dallas Semiconductor (H)	13.75	-0.50	-3.5
OTC	70.75	39.75	Intel Corp.	70.00	-0.25	-0.4
NYS	9.88	4.88	LSI Logic Corp.	9.00	0.13	1.4
NYS	22.38	12.13	Micron Technology	19.13	-0.75	-3.8
NYS	101.38	57.50	Motorola Inc.	99.75	-0.13	-0.1
NYS	14.13	5.25	National Semiconductor	12.75	-0.38	-2.9
OTC	27.00	8.25	Sierra Semiconductor	14.25	0.25	1.8
NYS	52.25	26.00	Texas Instruments	48.00	-1.50	-3.0
OTC	10.50	6.00	VLSI Technology	7.25	-0.13	-1.7
OTC	7.00	2.13	Weitek	5.25	0.25	5.0
ASE	8.00	2.00	Western Digital Corp.	7.50	0.13	1.7
OTC	31.00	14.50	Xilinx	21.00	0.63	3.1
OTC	33.50	15.25	Zilog Inc.	30.75	-0.75	-2.4
PERIPHERALS AND SUBSYSTEMS						Off o 8 %
OTC	11.25	3.63	Archive Corp. (H)	11.13	0.00	0.0
OTC	26.75	13.75	Banctec Inc.	25.75	-0.25	-1.0
OTC	23.50	9.25	Cambex Corp.	17.00	0.00	0.0
ASE	15.13	5.66	Cognitronics Corp.	15.13	0.00	0.0
NYS	23.88	12.50	Conner Peripherals	19.13	-0.75	-3.8
OTC	24.88	14.25	Data Race Inc.	21.88	0.13	0.6
ASE	19.66	4.75	Dataram Corp.	11.38	0.25	2.2
NYS	31.00	8.63	EMC Corp.	20.25	0.93	4.8
OTC	8.88	4.75	Emulex Corp. (H)	8.75	0.25	2.9
OTC	23.00	13.25	Evans & Sutherland	17.25	-0.25	-1.4
OTC	40.63	12.00	Exabyte	20.00	1.63	8.8
OTC	36.88	15.75	Intelligent Info. Systems	26.50	2.50	7.4
OTC	11.25	4.75	Iomega Corp.	7.75	-0.75	-8.8
OTC	34.75	10.25	IPL Systems Inc.	12.00	0.25	2.1
OTC	22.75	10.75	Kodak Inc.	22.75	0.75	3.4
OTC	17.88	4.38	Maxtor Corp. (H)	17.88	0.50	2.9
OTC	12.63	7.13	Micropolis Corp.	9.00	0.00	0.0
NYS	107.00	85.38	3M Corp	102.50	2.50	2.5
OTC	6.75	3.50	Printronix Inc.	4.75	-1.00	-17.4
NYS	18.00	6.88	QMS Inc.	8.75	-0.13	-1.4
NYS	18.00	8.88	Quantum Corp.	14.88	0.38	2.6
OTC	12.75	3.75	Radius Inc.	6.88	0.13	1.9
NYS	14.25	6.50	Recognition Equipment	12.75	0.13	1.0
OTC	13.88	5.63	Rexon Inc.	11.50	-1.25	-9.8
OTC	19.63	7.75	Seagate Technology (H)	18.88	-0.13	-0.7
NYS	78.00	20.38	Storage Technology (L)	20.38	-0.63	-3.0
NYS	22.88	16.50	Tektronix Inc.	20.25	-0.50	-2.4
NYS	82.25	60.75	Xerox Corp.	78.75	1.13	1.5
SERVICES						Up o 8 %
OTC	22.88	11.84	American Mgmt. Systems	22.88	1.13	5.2
NYS	5.38	3.00	Amacomp Inc.	3.75	-0.38	-9.1
OTC	22.00	12.50	Analysts Int'l	21.25	-0.75	-3.4
NYS	51.25	36.50	Auto Data Processing	51.25	0.75	1.5
NYS	17.25	7.06	Ceridian Corp.	15.00	-0.38	-2.4
NYS	23.22	12.50	Comdisco Inc.	15.63	0.00	0.0
OTC	13.50	6.75	Computer Horizons	8.00	-0.75	-8.6
NYS	84.88	57.00	Computer Sciences	78.00	3.13	4.2
NYS	10.13	7.00	Computer Task Group	8.63	0.50	6.2
OTC	40.50	15.00	CompUSA Inc.	35.25	-0.75	-2.1
OTC	19.25	6.00	Corporate Software	11.00	-1.00	-8.3
OTC	30.75	7.75	Egghead Discount Software	10.25	0.63	6.5
NYS	33.06	25.25	General Motors E (EDS)	32.25	1.75	5.7
OTC	30.38	6.25	Intelligent Electronics	8.75	-0.38	-4.1
OTC	14.88	6.63	Medisel	10.63	0.38	3.7
OTC	15.75	5.75	Microdyne Inc.	7.50	-0.38	-4.8
OTC	40.00	18.16	Paychex	38.75	0.50	1.3
NYS	78.50	55.00	Policy Management Sys.	77.75	1.63	2.1
NYS	50.63	29.75	Reynolds and Reynolds (H)	50.63	1.13	2.3
OTC	32.00	22.00	SEI Corp.	27.75	-0.25	-0.9
OTC	24.38	16.88	Shared Medical Systems	21.88	0.38	1.7
OTC	30.00	16.00	Sungard Data Systems	28.25	0.50	1.8
NYS	3.63	1.13	Ultimate Corp.	2.13	0.25	13.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

SHL losses narrow

SHL Systemhouse, Inc. posted a fourth-quarter net loss of $7.4 million (Canadian), compared with a $30.9 million loss in the same period last year. Sales in the period ended Aug. 31 rose 24% to $190.4, the Ottawa-based systems integrator said. For the year, SHL posted a $9.5 million loss on revenue of $738.6 million, a 21% jump from last year.

Intersolv profits up

Intersolv, Inc. recorded second-quarter net earnings of $1.5 million, a 25% increase from the same period last year. Sales rose 15% to $21.2 million in the quarter ended Oct. 31, the Rockville, Md., application tools vendor said.

Conner acquisition

Disk drive maker **Conner Peripherals, Inc.** has agreed to acquire tape systems maker **Archive Corp.** in a stock transaction valued at $176 million. Conner, based in San Jose, Calif., will buy outstanding Archive stock for $11.25 a share. The offer is contingent on Conner's purchase of at least 51% of Archive's common stock.

Praxis buyback

Employees at **Praxis International, Inc.** — the parent corporation of **Computer Corporation of America** and two other computer firms — purchased all of its outstanding common and preferred stock from **Crowax, Inc.** in Toronto. The Cambridge, Mass., company is now 100% owned by its employees.

Wetmore is COO

Legent Corp. has named David Wetmore, former chairman and chief executive officer at recently acquired **Goal Systems International, Inc.**, as chief operating officer. Wetmore assumes responsibility for marketing and customer services, the Vienna, Va., company said.

Outsourcers assess IBM tactics

Rivals walk a fine line between concern, dependence on Big Blue for products

By Mark Halper
WASHINGTON, D.C.

Outsourcing vendors are watching closely as the U.S. Department of Justice ramps up its antitrust investigation of IBM's outsourcing business.

For many outsourcers, the issue is a delicate one in which they must balance their concern over IBM's possibly unfair advantage with their reliance on the computer giant for products.

Users are concerned that an eventual Justice Department ruling could impact any outsourcing agreement they sign with IBM.

While few of IBM's rivals are willing to publicly state that they believe IBM is violating the 1956 Consent Decree, they acknowledge that the case deserves the attention that the Justice Department is giving it.

Separate service?

At issue is whether IBM's outsourcing practice constitutes service bureau work as defined in the decree [CW, Nov. 9]. The decree stipulated that IBM could participate in the service bureau business only through a separate subsidiary. The decree also barred IBM from offering the subsidiary special discounts.

Russell West, senior vice president of strategic planning for lessor and outsourcer Comdisco, Inc., said, "The question is, 'Is outsourcing a repricing of service bureau work?' You have to be an incredibly good lawyer to convince anyone that it's materially different."

Don Seiden, president of Computer Reserves, Inc., a Pine Brook, N.J., computer services placement firm, offered an answer. "Services are more sophisticated, but I don't think it's substantially changed in 30 years," he said. "We called it timesharing, we called it remote processing. Now we call it outsourcing."

The Justice Department recently escalated its investigation, largely at the urging of Dallas-based outsourcer Affiliated Computer Systems, Inc. (ACS). ACS has complained that IBM's formation of its Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary did not conform to the decree.

ACS has asked IBM to provide it with details on how much IBM charges ISSC for products. It has also requested that IBM reveal how much ISSC charges the parent for any processing it provides to them. ACS claims that the decree requires IBM to provide this information to competitors on request. IBM has responded to ACS that it offers the same terms to ISSC as to any other "service bureau."

Doug Tayle, director of marketing at The Genix Group, a Dearborn, Mich., outsourcer, said he hopes IBM reveals more financial information about ISSC. "I think IBM owes an obligation to shareholders and the industry at large to disclose financial details of its subsidiaries," he said.

IBM could be giving ISSC an unfair break if it is actually allowing ISSC to operate at a loss in the interest of winning or keeping hardware and software accounts, Tayle noted. "It's a very muddy issue," he said. "If IBM [ISSC] would show that its performance stands basic financial scrutiny, then fair is fair. If ISSC is not profitable, explain why it's not profitable — is it because IBM allows it to run at a loss to protect the rest of their business?"

IBM is expected to push ahead of Computer Sciences to take over as the second-largest outsourcing vendor by 1995

Company	Annual revenue (in millions)	Company	Annual revenue (in millions)
EDS	$1,200	EDS	$3,300
Computer Sciences	$400	IBM	$1,200
IBM	$350	Computer Sciences	$1,000
Fiserv	$225	Perot Systems	$500
Systematics	$225	Affiliated Computer Systems	$425
Others	$1,135	Others	$2,325
Total	$3,535	Total	$8,750

Source: Merrill Lynch & Co.

At a glance

1956: Consent Decree issued.

April 1992: gCS asks Genix to formally complain to the Justice Department.

May 1992: IBM forms wholly owned subsidiary ISSC to handle its outsourcing contracts.

Aug. 4, 1992: gCS sends letter to IBM requesting information on ISSC. IBM responds in September.

November 1992: Justice Department elevates probe.

On the sidelines

Sources said outsourcing leader Electronic Data Systems Corp. is closely monitoring the case. EDS competes fiercely with ISSC for outsourcing jobs and is one of IBM's largest customers. Kevin Kaspar, vice president of corporate marketing at Fiserv, Inc., a Milwaukee-based banking industry outsourcer, described Fiserv as "an interested observer" in the Justice Department's investigation.

"We're relying on the opinion of others," he said, referring to the Justice Department.

Fiserv, he said, has a good relationship with IBM and uses the Application System/400 as the platform for its comprehensive banking software offering. Some cast the matter in the light of an incipient IBM breakup, viewing any eventual ruling against IBM as one more chunk that IBM will spin off its cumbersome mass for a combination of business and legal reasons.

Big Blue's defense

An executive at IBM's Tarrytown, N.Y.-based ISSC outsourcing subsidiary last week said that ISSC's current communication with the Justice Department regarding the Consent Decree is no different from discussions the two parties have had during the decree's 36-year span.

But the executive, who asked not to be identified, did not dismiss the possibility that these discussions could lead either to modification of the decree by the department or to adjustments by IBM. The executive described questions regarding those possibilities as "speculation."

The decree is an agreement — not a law — between IBM and the Justice Department and is subject to change, the executive explained.

The executive declined to comment when asked if IBM considers the Justice Department's recent elevation of the case to the deputy assistant attorney general level to mean that the department will soon take action — either for or against IBM.

The executive repeated earlier assertions that IBM is in compliance with the Consent Decree, which bars IBM from participating in the service bureau business except through a separate subsidiary that does not get special pricing on IBM hardware and software.

Contrary to assertions by IBM detractors, the decree permits IBM's sales force to offer ISSC services and, while ISSC cannot use the IBM moniker in its own name, the decree does permit it to use the parent's name in other contexts, the executive said.

He said the service bureau of 1956 "is a far cry from today's outsourcing business," explaining that service bureau customers 36 years ago typically could not afford their own computers.

— Mark Halper

Trends PC LAN servers

Wireless technology — up and coming

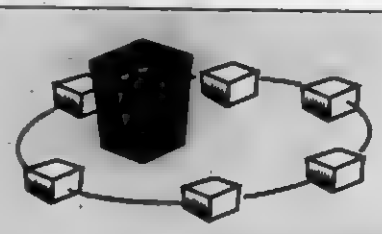
(Percent of U.S. revenue)

	Wired PC	Wireless PC
1991	95.8%	4.2%
1992	89.7%	10.3%
1993	79.0%	21.0%
1994	69.5%	30.5%

Superservers, a growing market

(Percent of U.S. shipments)

	PC	Superserver
1991	80.2%	19.8%
1992	78.5%	21.5%
1993	76.3%	23.7%
1994	72.3%	27.7%



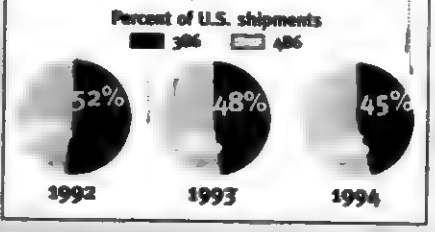
Anticipated compound annual growth rate of revenue from 1991 to 1998

386 — 6.0%

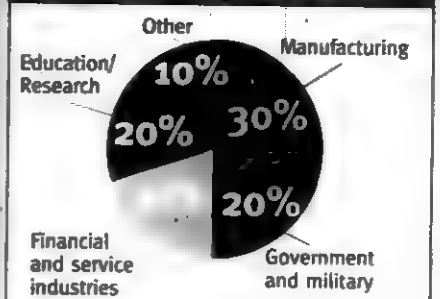
486 — 8.9%

386 vs. 486

486-based servers will pull ahead in 1993



Revenue by industry



All figures are rounded.
Source: Market Intelligence Research Corp., Mountain View, Calif.

The Fifth Wave

Inside Lines

A twist on urban renewal

As restructuring gets fully under way at DEC, sources said the company is setting up "enterprise zones" for products that would otherwise be put out to pasture or passed over to third parties for support and services. Product managers or others would have the opportunity to prepare a business plan and bring it in front of management, who would then evaluate and assign "property" in the form of desk or cubicle space and give the staffers some autonomy. "Products which might not be selling well for DEC could be profitable for a two- to four-person outfit," one source said.

Docket dynamics

Symantec and Borland were supposed to go to court early last week, but the date has been pushed back to Jan. 19. Symantec was given a chance to show the judge why it should not be held in contempt of court for allegedly violating a restraining order preventing the company from receiving "Borland proprietary" information. Borland claims that Symantec violated the order when a former Borland employee, now working at Symantec, attempted to retrieve a number of electronic documents after leaving Borland.

The big squeeze

Dell's interest in the retail channel appears to be waning, or perhaps it no longer feels love for CompUSA and its customers. One long-term Dell user buys Dell through CompUSA to save on shipping expenses and improve availability. (He says it takes up to six weeks to get product from Dell that CompUSA gets him in a week.) The user says Dell has spent the last six months squeezing him to again buy directly from Dell. Lately it has told him his 4% to 6% corporate discount will be reduced through CompUSA, though the retailer hasn't changed his pricing. Dell also warned the customer that his models will no longer be sold through CompUSA.

Snow jobs?

If you haven't heard from Steve Jobs' Next lately, it's because it has been quietly pushing back the arrival dates of a few projects. Reportedly, a version of the company's NextStep software for Intel microprocessors that was promised for this quarter won't ship now until the middle of next year, insiders say. And a public stock offering that Jobs once said could be coming shortly has also been pushed back, although it's reportedly still in the works.

Casting a big shadow

Gateway 2000 is expected to announce today that it will have sold $750 million worth of systems in the first three quarters of this year, putting it on target to sell $1 billion worth of systems this year. Nice results, if completely unsupportable — Gateway is private and reveals no figures on units shipped, profitability or long-term debt, though analysts say the company is strong.

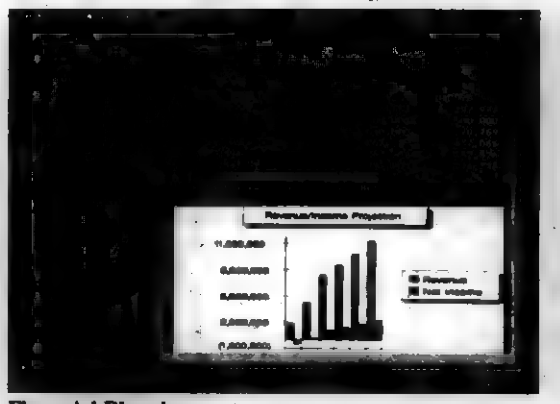
Helping an old friend

Cisco is actually moving faster than expected to extend its routers' Synchronous Data Link Control support to older IBM devices that use half duplex or the Non Return to Zero Inverted coding option. That capability will start general shipment on Dec. 15 on a "quasi-daughterboard," the company said last week.

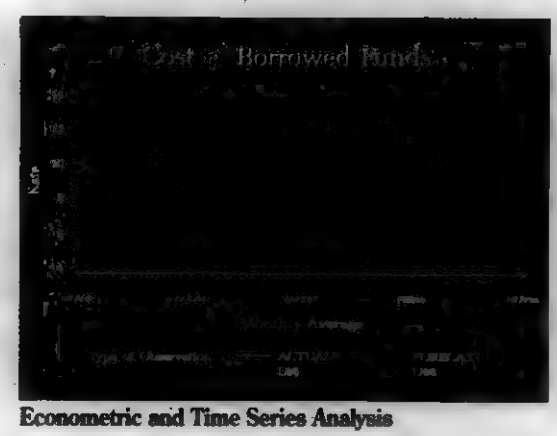
Point-and-click spying

There's a new wrinkle in the corporate espionage game, according to Don Delaney, a senior investigator with the New York State Police. An individual was recently spotted on New York City's Helmsley building pointing a receiving antenna at the nearby offices of Chemical Bank in what was purported to be an attempt to capture the screen image on Chemical's PCs.

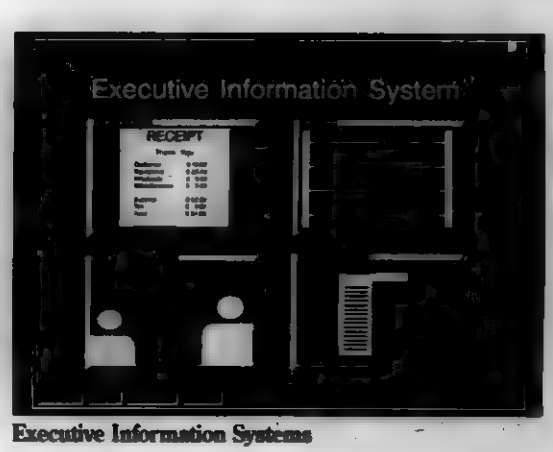
One PC reseller recently told Computerworld *that she loses 2% on every PC that moves out the door. The only reason she's still in business is to sell profit-making peripherals, the reseller said. "Let's hope that lasts," she added. Do you have any other tales of woe? Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537, 2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*



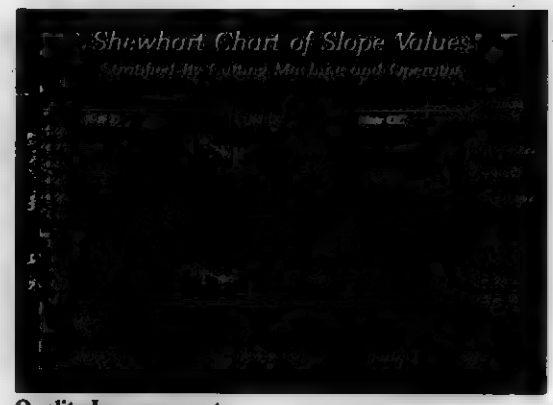
Financial Planning



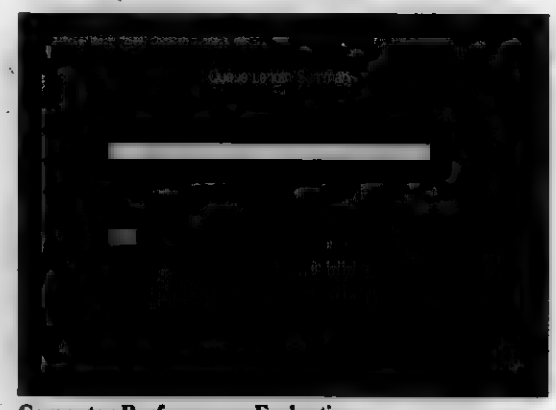
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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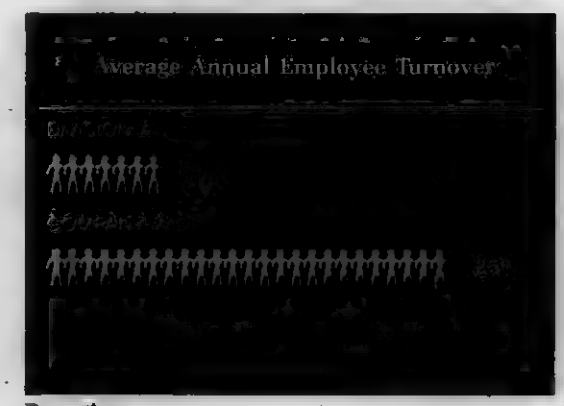


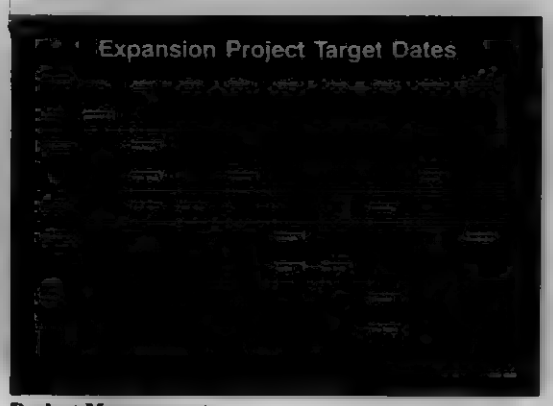
Reporting

Market Research

Business Graphs

Visualization

Data Analysis



Project Management

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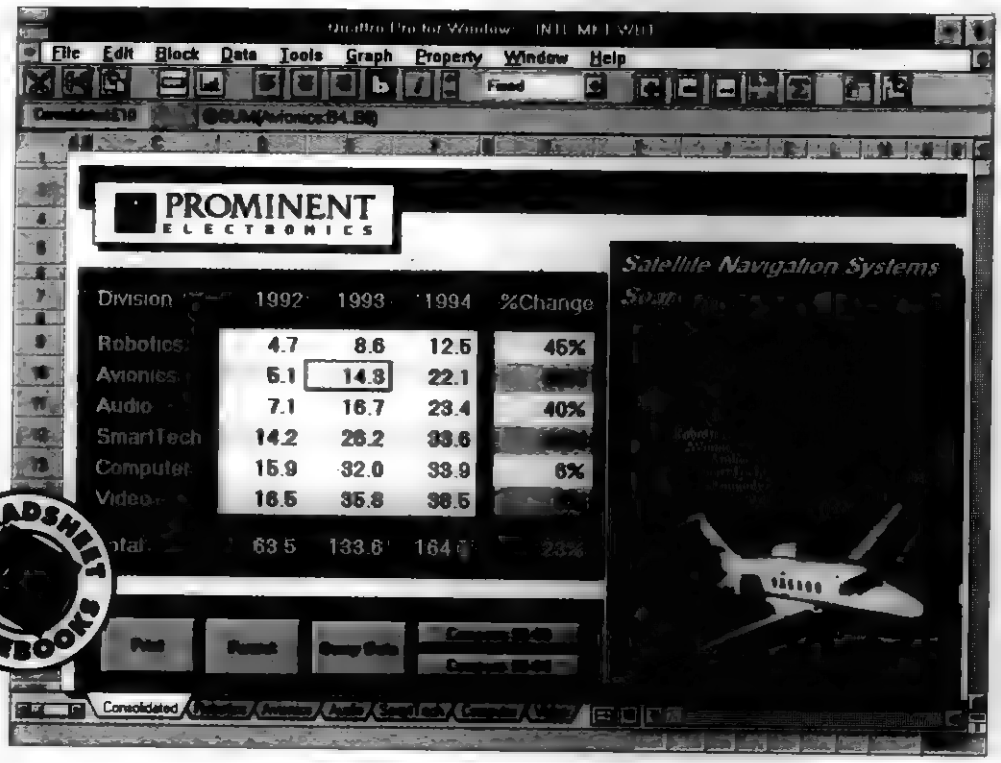

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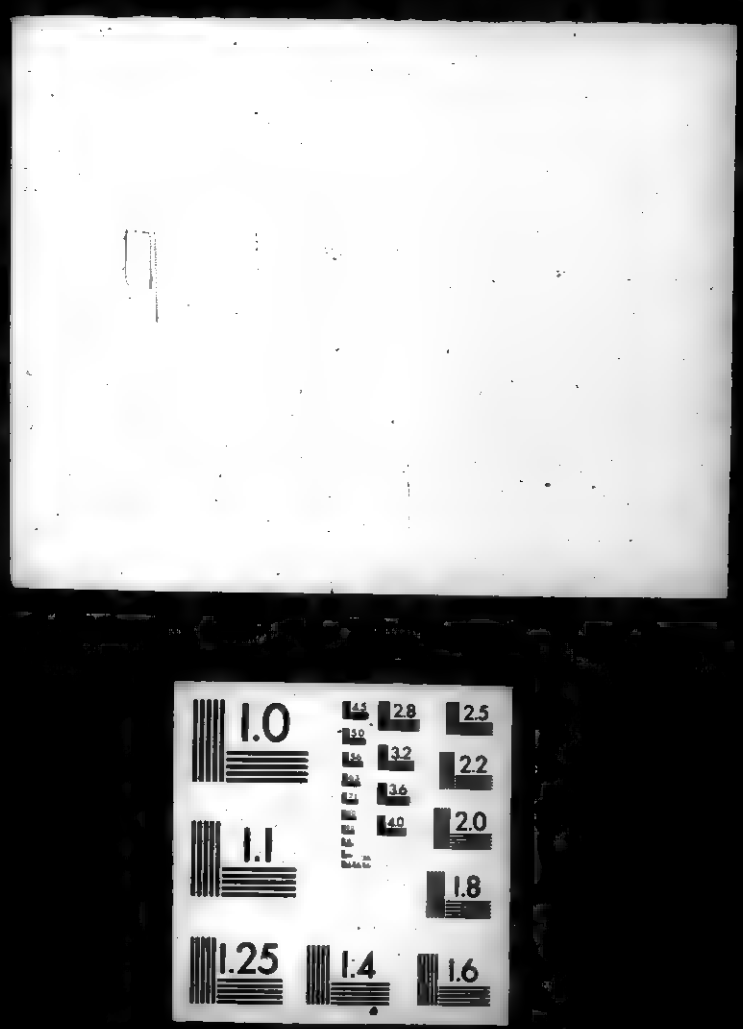
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COMPUTERWORLD

DEC faces wary users with revised game plan

By Melinda-Carol Ballou
LAS VEGAS

■ Digital Equipment Corp. and Digital Equipment Computer Users Society officials will help clarify ongoing changes in DEC marketing, product availability and personnel to users attending this week's DEC user group meeting. Meanwhile, the conference seminar program is being altered as DECUS officials attempt to substitute speakers and topics for departing DEC officials and products.

One constant amid the upheaval, however, will be a focus on making the transition to DEC's Alpha AXP platforms. According to DEC sources, nearly 1,000 platforms have been sold in the first month since the products began shipping. And with ship schedules of 400 applications by March and 500 more by the end of next year, the push to the new technology may be starting to take hold.

But users in the know are bracing for shifts by DEC that, while crucial to the company's survival, could take a toll on customer confidence.

Prior to the conference here, DEC officials announced the approval of a channels marketing plan, which will ultimately place the major re-

DEC, *page 16*

On DECUS
Facts about DECUS' U.S. chapter

Founded: 1961.

Membership: 52,000.

Charter: Forum for discussion of issues relevant to DEC users.

Organization: Board of directors, management committee, special interest groups, local user and working groups.

Select product areas: DECUSserve user network, source code library of discontinued DEC products and seminars unit.

Success breeds closer scrutiny

Dell hits the big time

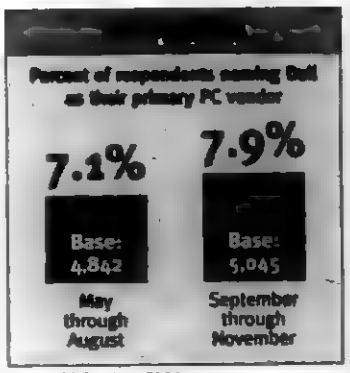
By Michael Fitzgerald
AUSTIN, TEXAS

Dell Computer Corp. has had to dodge so many bullets in its dash to the PC industry's upper echelon that it could start a second career as a commando. But while Dell has avoided serious injury so far, some analysts question whether the company has an arsenal potent enough to keep competing against larger, more powerful rivals.

By many accounts, Dell is now in a class with personal computing's Big Three — the IBM PC Co., Apple Computer, Inc. and Compaq Computer Corp. Many large organizations — including Amoco Corp., 3M Co. and the Federal Deposit Insurance Corp. — have put Dell on their approved purchase lists.

"We certainly see them as a first-tier vendor," said John Biglin, sys-

Dell, *page 14*



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Open systems advocates push for better answers

By Maryfran Johnson
WASHINGTON, D.C.

■ Senior executives from more than 100 corporations and government agencies gathered last week to strengthen the business case for open systems and to kick-start the stodgy standards process that many said bogs down their migration plans.

The management and control of distributed systems took center stage at the X/Open Co.'s Xtra '92 World Congress, where users singled out nearly 30 requirements for computing standards that their businesses will need sooner rather than later.

Among them were a common transaction processing environment, an open systems repository model, distributed security, system and network administration and several aspects of data management over distributed networks.

"Open systems is not improving nearly as fast as it needs to," said Mark Schmidt, vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark., which has more than 3,500 Unix systems serving its 2,000 retail outlet stores.

Schmidt criticized the open system standards process for its slow pace, lack of precision and politicized vendor squabbles. "The systems management area has multiple vendors now and is neither as open nor as standard as the open systems hype would have everyone believe," he said sharply. "That slows us down, and I believe X/Open can provide a great deal of leadership in this area."

Robert M. White *urges user participation*

At the meeting, X/Open released its first worldwide survey of suppliers' plans for open systems (see chart page 8), in which 65 system and software vendors indicated both product plans for and commitment to standards in areas such as on-line transaction processing.

While users were comforted by the strong vendor commitment (88%) to the Open Software Foundation's Distributed Computing Environment, several users expressed dismay at the paucity of product plans in areas such as distributed security and object management services.

"Users must help create a unified market for standard products," said Robert M. White, undersecretary for technology at the U.S. Department of Commerce.

He and other users urged the quicker development and market acceptance of standards through industry consortia and user alliances. "We need a mix of de facto, formal and market standards to meet the needs of open systems," White said.

The Unix operating system also needs to over-

Open systems, *page 8*

Pressured COS overhauls

Users frustrated by poor OSI, TCP/IP interoperability

By Elisabeth Horwitt
MCLEAN, VA.

The Corporation for Open Systems, a major focal point of global networking standards efforts, this week will start laying out short- and long-term objectives for a massive reorganization that aims to better serve users' interoperability and migration needs.

COS' reorganization, slated to go into effect in January, is based on a survey "in which members told us they wanted to tackle the same objectives but from more of a business, as opposed to technical, perspective," a COS spokeswoman said.

Indeed, the reorganization responds to a high level of frustration among members and affiliates, which include manufacturing, aerospace, energy, utility and government-sector users who remain committed to Open Systems Interconnect as an industry standard. A major focus of user ire is the escalating standards wars between Transmission Control Protocol/Internet Protocol and OSI.

"I think users are saying 'I'm mad as hell and I'm not going to take it anymore,'" said Jerry Johnson, standards analyst for the state of Texas' department of information resources in Austin. "We don't need any more standards holy wars where everybody loses."

"COS is creating a user/vendor environment to address issues

COS, *page 16*

Bridging the gap

OSI users want TCP/IP interoperability because of the following:

- Standards bodies are taking forever to finalize standards.
- Most products are based on the 1984 version of OSI.
- Products based on the 1988 version of OSI are expensive, buggy and do not always interoperate with older OSI products.

Executive Briefing

A comprehensive guide to the week's news

OPEN SYSTEMS

Open systems users are clamoring for speedier standards development in areas such as systems and network management, distributed security and data management. Building a stronger business case for open systems was a key theme of X/Open's Xtra '92 World Congress last week in Washington, D.C. *Page 1*

The Corporation for Open Systems is reorganizing to get closer to users' interoperability needs. *Page 1*

If you sit back and take what vendors and standards bodies dish out, you are probably going to get a lot that doesn't serve your purposes. But according to Elaine Bond, if users will rouse themselves, vendors will listen. *Page 32*

SECURITY/DISASTER RECOVERY

playing it SAFE

The Software Publishers Association gets 20 to 30 tips a day about the use of pirated software. Your company could be next. Guilty or not, it helps to know what to expect. *Page 108*

Growing use of client/server architecture, electronic mail, open systems and laptop computers, along with downsizing, have made LAN security tougher than ever. IS managers are responding with an innovative mix of technology, policy and recentralization. *Page 87*

Jingle bells: Your PC may pick up a Christmas virus this month. *Page 57*

The use of computers to carry out telephone fraud continues to grow as a threat to large organizations. *Page 71*

MANAGEMENT

IS chiefs can influence business decisions about outsourcing, corporate funding and re-engineering by cluing executives in to how technology affects business performance. That means IS managers need to know which value measurement technique to use in which business situation. *Page 95*

Noranda, an $8.5 billion natural resources firm based in Toronto, tells about how it uses friendly persuasion to gain buy-in from 1,000 IS professionals in 60 operating companies for a new set of corporate software standards. *Page 6*

If you're overwhelming your users with computerspeak, you could be making yourself obsolete. IS professionals need to look past technology and focus on the image they present to their companies and users by communicating more clearly. *Page 101*

DOWNSIZING

A shrink-to-fit software conversion program at Levi Strauss has enabled the jeans maker to start loading a stock management program on HP minicomputers, which will share duties with the IBM mainframe on which the software already resides. *Page 8*

IMAGING

A document imaging system will aid Resolution Trust this week as it holds the largest real estate auction of its kind. *Page 20*

Groupware

Microsoft's Windows for Workgroups receives praise from reviewers and early users for ease of use and installation, but some glitches are reported, and certain features aren't as robust as they could be. *Page 63*

PCs

Dell's giant new product rollout and recent sales surge have it gaining on Compaq and IBM, but some observers say the company is headed for a fall. *Page 1*

Users are finding several Apple products — including the PowerBook 180 and 145 portables, the newly introduced Performa 600 and the high-end Quadra 950 — in short supply. *Page 1*

Lotus ships its latest 1-2-3 for DOS and considers streamlining its DOS spreadsheets. *Page 1*

Compaq ups the service wars with a new three-year warranty, but few competitors expect to follow suit. *Page 14*

The price plunge in 486 PCs may slow as Intel bests AMD in court and delays AMD's push into the 486 market by at least six months. *Page 15*

The next big step for Ryder will come when it implements a nationwide network of PCs to automate its trucking dealerships. *Page 57*

Enterprise networks

The distinction between wireless and wired communications will blur in the mid-'90s and could cause heightened competition for traditional network services, said a recent Deloitte & Touche survey. *Page 73*

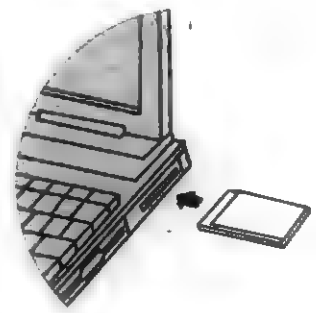
Network Peripherals, Inc. cuts prices on its FDDI adapter cards and introduces a four-port concentrator. *Page 12*

The Interop show just doesn't have the same feeling it had before the marketing folks bumped the working technical people into the shadows, according to *Computerworld*'s Elisabeth Horwitt. *Page 71*

Big-name vendors are lining up behind start-up Isocor's effort to bring X.400 traffic to international dial-up telephone networks. *Page 73*

Local-area networks

Compatibility labs such as the one run by LANDA at Comdex could make it easier for users to match LAN equipment and software. *Page 65*



PCMCIA cards offer users some interesting possibilities, especially for portables. *Page 28*

People costs — such as administration and support — represent the greatest part of the LAN bill. *Page 65*

Users of IBM's expired OfficeVision/LAN product are making the move to Lotus Notes and encountering few problems along the way. But there weren't that many OfficeVision/LAN users to begin with. *Page 4*

Outsourcing

Advantis, the IBM/Sears network outsourcing venture, wins a major contract, but the customer had already chosen IBM anyway. *Page 12*

The right price was a key reason IBM beat out Genix Corp. at the last minute on an outsourcing deal with BICC Cables Corp. *Page 78*

Don't expect the outsourcer lion to lie down with the user lamb anytime soon, says Executive Editor Paul Gillin. *Page 32*

Data management

Borland is lining up other vendors to support its proposal for IDAPI, a new API optimized to reach relational databases as well as flat-file PC databases. *Page 60*

DEC optimizes Rdb for Alpha and seeks to range from the restrictions of proprietary RDBMSs. *Page 77*

Dirty data is a big and growing problem, and IS managers don't seem willing to face up to what is needed to fix it, says Alastair McKeating, a data architect at Prudential Assurance in Ontario. Replacing equipment isn't the answer; that's like hoping a new set of clubs will improve your golf game. *Page 33*

Careers

Thanks to the tourism industry's heavy reliance on technology, some promising job possibilities can be found in theme parks, car rental companies, hotels and motels. *Page 103*

Midrange systems

DEC's users meeting in Las Vegas this week will have to cope with a host of changes. DEC will explain its new focus on third-party sales channels, personnel changes and its decision to discontinue some products. **1**

Hewlett-Packard is embarking on a two-pronged pricing plan for its minicomputer software, moving away from processor-based pricing. **77**

Application development

Pragmatic business concerns are driving interest in a horde of new workbenches supporting cross-platform and client/server application development. **83**

A bumper crop of PC development tools has sprouted for Microsoft's Windows NT and IBM's OS/2. **83**

SunPro introduces a suite of graphical code management tools that enable software developers to work more easily in large or graphically dispersed workgroups. **24**

Large systems

Amdahl denies there are severe technical problems with its new 5995M IBM-compatible mainframes, although the $1.7 billion firm acknowledged that flawed channel-interface boards caused outages at some 5995M sites this fall. **10**

The State of Michigan Department of Social Services looks for greater accuracy and efficiency and ease of use in a system that is being assembled for it by Unisys. **83**

Industry

The U.S. and its allies say they will relax curbs on the export of advanced computers to the former Soviet Union. **117**

Client/server

D&B Software plans to lay off 400 employees as it streamlines its ranks in preparation for a client/server and Unix push.

Departments

Advanced Technology 28
Application Development ... 83
Calendar 92
Company Index 114
Computer Careers 101
Computer Industry 117
Desktop Computing 57
Editorial/Viewpoint 32, 33
Enterprise Networking 71
Friday Stock Ticker 116
In Depth 95
Industry Currents 103
Inside Lines 118
Large Systems 77
Management 87
Marketplace 108
News Shorts 6, 16
Technology Analysis 63
Workgroup Computing 65
WYSIWYG 118

IDG

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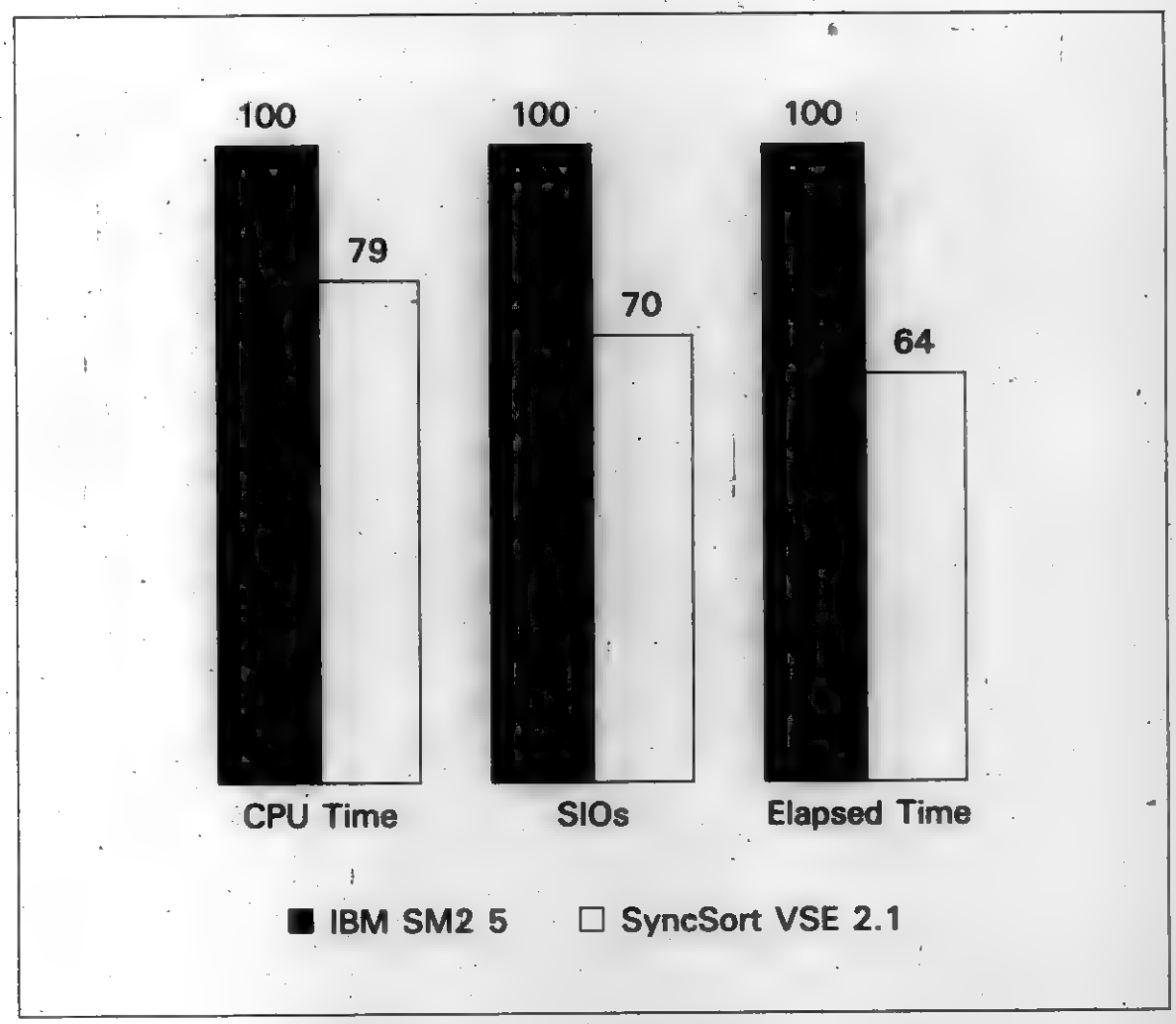

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OfficeVision users take Notes

By Rosemary Cafasso

■ Early users of the IBM/Lotus Development Corp. Notes exchange program have kissed OfficeVision/LAN 2 goodbye and are not looking back.

The customers report smooth migrations to the Lotus software from the now-defunct IBM office automation platform, in part because they had little more than OfficeVision mail files and directories to swap over.

IBM "kept us in the dark for much too long, so we weren't too pleased with that," said Gord Stang, project leader of office automation for the city of Edmonton in Alberta, Canada. "But they have since provided a pretty good service to us."

In June, IBM officially killed OfficeVision/LAN 2, which it once expected to be a key piece of its Systems Application Architecture office strategy. It then boosted an existing relationship with Lotus by positioning the company's Notes workgroup platform as the key local-area network software for its office strategy and offering OfficeVision/LAN customers a free trade-in program to Notes.

In June, IBM officially killed OfficeVision/LAN 2, which it once expected to be a key piece of its SAA office strategy.

The companies are now saying they expect up to 500 customer sites worldwide to make the swap by year's end. However, that includes dozens of very small OfficeVision installations, where the LAN software was installed but never really took off.

According to Lotus, of the approximately 200 U.S. customers they have picked up, two-thirds had fewer than 50 users and a few had only one or two licenses. Lotus also said that 80% are new customers.

"The interesting thing is with the limited success of OV/2, the real beneficiary in this is Lotus," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass.

The Notes converts said they are pleased with their switch and said IBM is making up for its mishandling of the OfficeVision/LAN saga. "They knew a year ago that OfficeVision/LAN was dead, but they didn't tell us until early this year," Stang added.

Blue Cross/Blue Shield of Florida in Jacksonville recently switched 100 users to a combination of Notes and CC:Mail.

"As an administrator, it's easier now," said Rein Hofstra, network administrator at Blue Cross. "And the functionality for users has really improved.

Hofstra said the exchange program delivered Notes at a fraction of what it would have cost if he had licensed it as a new Notes user. He was running OfficeVision for Microsoft Corp. DOS and Windows, with a per-seat cost of about $99. Each Notes license lists for about $495.

Stang said IBM threw in extra service and support to help convert his 75 users. While the original contract called for three weeks of service, "our rep said he'd do it until the end of the year, and he's lived up to it," he said.

Apple latest victim of PC shortage

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. is once again having trouble meeting demand for some of its hottest PCs.

Distributors said the models in shortest supply are the PowerBook 180 and 145 portables, the newly introduced Performa 600 and the high-end Quadra 950. Apple now faces a backlog that some sources said is growing by as much as $100 million each week and is expected to last through next month.

Particularly troubling is the dearth of the PowerBooks, which an Apple spokesman attributed to a constrained supply of its active-matrix screen. The popular line has generated more than $1 billion in revenue since its introduction in October 1991, but right now "the PowerBooks are virtually impossible to come by," said Edward Anderson, president of the 320-store Computerland Corp. chain.

"We're getting 10% to 20% of what we order. Our salespeople are hysterical," he added.

Apple is not alone in its inability to satisfy its customers' hunger for new machines — both IBM and Compaq Computer Corp. are also having trouble meeting demand [CW, Nov. 23] — but the current shortfall has generated a painful feeling of deja vu for the firm, which experienced similar scarcities when the original three PowerBooks were introduced last year.

Distributors fear the undersupply could slow a rising tide of enthusiasm for the Macintosh. Apple has thus far surpassed IBM in unit sales of PCs in the second and third quarter of this year and could finish 1992 in the top spot if the shortages do not prevent that.

"It's a real mistake to have products that are hot and unavailable," one distributor said. "I just hope we don't get customers moving to other manufacturers' products."

Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif., added: "Apple has used the ease-of-use argument to lure people from buying Windows, but if they do not have desktop systems to meet demand, the uncommitted could jump back to the Windows camp."

Joe Harris, director of information technology at NBC-TV, said the shortage of PowerBooks and Quadra 950s has been exacerbated by another product drought. "Even more difficult than getting the boxes is getting the upgrades to the memory, expecially for the PowerBook line," he said. "This is unforgivable."

Apple spokeswoman Pat Kinley said the company is doing everything it can to meet demand by going to a 'round-the-clock production cycle at the main PowerBook production facility in Fountain, Colo. The shortage is not expected to ease, however, until at least the first quarter early next year, she said.

Some analysts also said part of the problem can be attributed to "double booking" — retailers' ordering twice as many computers as needed to fill orders.

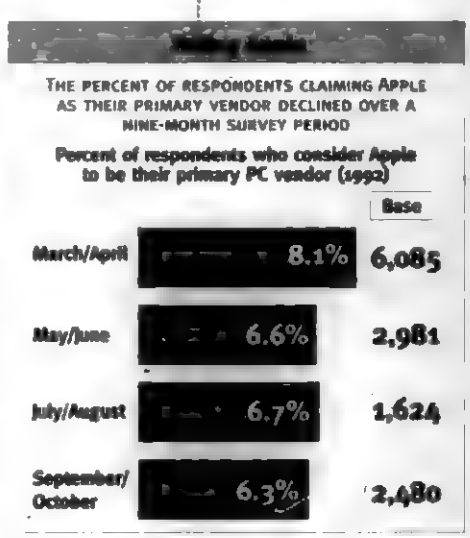
The swelling backlog has also reportedly prompted new punitive measures within Apple. According to some Apple employees, the company has begun cracking down on divisions and managers who continually underestimate what consumers will buy.

How's them Apples?

The shortage of the Performa 600 this Christmas shopping season could be painful for Apple. When it was introduced, Apple Vice President Keith Fax said it would target home users. Some analysts called the Performa 600 "the first easy-to-use multimedia computer." Suddenly, Apple has some very hot machines — but no one can get their hands on them.

THE PERCENT OF RESPONDENTS CLAIMING APPLE AS THEIR PRIMARY VENDOR DECLINED OVER A NINE-MONTH SURVEY PERIOD

Percent of respondents who consider Apple to be their primary PC vendor (1992)



Source: CW Database Division

Lotus to ship 1-2-3 upgrade

By Rosemary Cafasso
CAMBRIDGE, MASS.

With the shipment of 1-2-3 for DOS Release 3.4 scheduled for today, Lotus Development Corp. said it is once again considering a plan to consolidate its various DOS spreadsheets into a single product line.

"We are exploring doing a release that could be an upgrade path for both" the 2.X and 3.X series of DOS spreadsheets, said Jeffrey Beir, vice president of Lotus' spreadsheet division. "If we find we can't, we will continue on the two-product path."

A possible merger of DOS products is an ongoing issue for Lotus. A single product line would be easier and less costly to manage. Yet Lotus also continues to say that it will not leave either group in the lurch.

Lotus currently markets the 3.X series of DOS spreadsheets to power users who require such advanced features as three-dimensional modeling, while its 2.X releases are for the more typical spreadsheet users.

Beta-test users differed when it came to a single DOS spreadsheet.

With the release of 3.4, the similarities between the 3.X series and 2.X series will be even greater. Release 3.4 will pick up many of the ease-of-use features of 2.4, making the two products a "subset and supersubset," according to Beir. "With this release, we are in a better position to ask if we can deliver a single product," he added.

While beta-test customers gave 3.4 good reviews, they differed sharply when it came to the idea of a single DOS spreadsheet.

"I really need the three-dimensional worksheets, and [3.4] has given me some features that make it easier and quicker," said Dan Saint, an international finance specialist at Chrysler Corp.

Todd Munyon, a senior marketing engineer at Square D Co. in Smyrna, Tenn., said he wants Lotus to sell just one DOS spreadsheet "so it would be much easier to keep track of.

"You hear about 2.4 and 3.1 and you wonder which one is the most recent or which one has the features of the previous one," Munyon added. "Today, there's a bit of a question mark."

On the other hand, William Reichenstein, PC support consultant at American Savings Bank in Irvine, Calif., said he hopes Lotus sticks to its current game plan because his users require both products.

"About 25% of us use the 3 series and 75% are using 2," Reichenstein said. "It suits us to have both."

Reichenstein said the smaller group is made up of "heavy users" in the finance and accounting department. Meanwhile, the bank continues to use some IBM PC XT systems, which can't run the 3 series. In this case, the users have no choice but to use a 2 series spreadsheet.

At the very least, Lotus should come up with a new naming scheme to help users better understand the product differentiation, said Jeffrey Henning, a senior analyst at BIS Strategic Decisions in Norwell, Mass.

"The 3.X products should have a new name, especially now that they are cross-pollinating them," Henning said.

DATABASE PERFORMANCE

SYBASE
BEST: 183 TPS

ORACLE7
BEST: 645 TPS

Database	System	Cost/TPS	Transactions Per Second
ORACLE7	Pyramid MiServer ES	$ 10,765	645.1
ORACLE7	Sequent S2000/750	$ 11,066	618.3
ORACLE7	HP 9000/890	$ 11,606	578.0
ORACLE7	NCR 3550	$ 9,398	312.3
DMS	Unisys A16-61E		272.5
DMS	Unisys 2200/622ES		255.7
TIP/FCSS	Unisys 2200/462		228.5
Rdb	VAX 6400		206.8
ORACLE7	HP 9000/897	$ 10,737	184.5
SYBASE	Sequent S2000/250	$ 8,686	183.3
TIP/FCSS	Unisys 2200/442		177.3
Informix	HP 9000/870		173.2
SYBASE	Sequent S2000/700	$ 14,662	169.9
ORACLE7	IBM RISC 6000/980	$ 11,002	160.3
DMS	Unisys 2200/611ES		159.4
DMS	Unisys A16-41E		158.1
ORACLE7	IBM RISC 6000/580	$ 9,179	157.2
ORACLE7	NCR 3450	$ 8,045	152.4
Informix	NCR 3550		150.6
ALLBASE	HP 3000/992		145.0
DMS	Unisys 2200/462		133.1
Informix	Sequent S2000/700		129.1
Informix	Unisys U6000/65		129.0
Rdb	VAX 7610		123.8
Informix	IBM RISC 6000/580		120.9
Informix	HP 9000/870		111.1
ALLBASE	HP 3000/977		111.1
SYBASE	HP 9000/867	$ 8,323	110.5
SYBASE	HP 9000/877	$ 8,472	110.5
Informix	HP 9000/867		110.4
Informix	HP 9000/877		110.4
ORACLE7	Sun 690MP	$ 12,604	107.2
DMS	Unisys 2200/442		104.5
Rdb	VAX 4600		103.8
Rdb	VAX 4500		103.1
Rdb	VAX 6610		102.3
Informix	IBM RISC 6000/970		100.9
Informix	NCR 3450		100.3

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Fastest on UNIX
Fastest on HP
Fastest on IBM
Fastest on NCR
Fastest on PYRAMID
Fastest on SEQUENT
Fastest on SUN

These record setting benchmarks were not run by Oracle Corporation. They were run by IBM, Hewlett-Packard, Sequent, Pyramid, NCR and Sun. The benchmark results and full disclosure reports have been filed with the Transaction Processing Council, the independent standards body that defined the industry standard TPC-A database benchmark. If performance is important to you, call 1-800-633-1071 Ext. 8103.

ORACLE

ALL TPC-A BENCHMARKS OVER 100

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News Shorts

OLE 2.0 enters beta testing

Microsoft Corp. has announced that Object Linking and Embedding (OLE) Version 2.0 has entered beta testing. The new version supports in-place editing and user-interface integration, meaning that when an object is manipulated, it will remain in place on the document and only the menus will change. OLE 2.0 also supports drag and drop of objects between applications and provides a means of allowing applications to register their command set, creating a method for "integration languages" to control multiple, dissimilar applications at a low level. OLE 2.0 is due for release in the middle of next year.

Windows leads software sales surge

The **Software Publishers Association** said PC software sales for the third quarter grew 11.6% over the same quarter last year. The $1.43 billion worth of software, measured at retail sites, included $644 million for DOS applications, $487 million for Windows and $243 million for the Macintosh. DOS once again showed a year-to-year decline, this time of nearly 16%. Windows and Macintosh software saw respective growths of 90.6% and 17.4%.

PowerPC notebooks on tap

Austin, Texas-based **Tadpole Technology, Inc.** last week announced an agreement with **IBM** to develop notebook systems based on the PowerPC reduced instruction set computing (RISC) architecture. Tadpole, which last year introduced the SPARCbook notebook computer, plans to develop notebooks that IBM will market. The first product will use the PowerPC 601 chip, one of four high-performance RISC microprocessors being co-developed by IBM and **Motorola, Inc.**

Hackers plead guilty

Two computer hackers charged in July with illegally entering and tampering with some of the nation's largest computer networks pleaded guilty last week to federal conspiracy charges [CW, July 13]. John Lee, 21, of Brooklyn, N.Y., and Julio Fernandez, 19, of the Bronx, face up to five years in prison; they will be sentenced at a Feb. 5 hearing in U.S. District Court in Manhattan. They and three other men — part of a group called MOD (Masters of Deception) — were arrested in July on federal charges of tampering with large corporate computer networks, including those at **Martin Marietta Corp.** and **TRW, Inc.** In a written confession, Lee said he was able to monitor data transmissions and obtain passwords on Tymnet, a worldwide network used by banks and the federal government. Authorities said the telephone companies and corporations whose systems were corrupted claim they suffered $330,000 worth of damage. The other three defendants, charged with 11 counts of conspiracy and other computer-related crimes, face trial in April.

SHORT TAKES **Oracle Corp.** said last week that it has formed a new business development group to develop more partnerships and joint ventures to take advantage of new technologies. Its initial focus will be on telecommunications and publishing.... **Data General Corp.** signed up **Dickens Data Systems, Inc.** in Roswell, Ga., to sell DG's Clarion storage line. Dickens plans to offer a Unix-based redundant arrays of inexpensive disks system this month, with prices starting at $28,000 for a 2.5-gigabyte device.... **IBM** last week named Steven A. Mills as site manager of its Santa Teresa Laboratory in San Jose, Calif. Mills replaces Thomas Furey Jr., who was tapped to head IBM's relaunched client/server unit.

News shorts, *page 16*

Canadian firm uses leverage to enforce enterprisewide standards

Will pay half the cost if units install corporate-standard software

By Jean S. Bozman
TORONTO

Noranda, Inc. has a model for distributed computing in the 1990s — and it works.

The $8.5 billion Canadian natural resources company has not owned a mainframe since 1985. Its 60 operating companies handle their own data processing on midrange computers.

Now, as it moves to a client/server architecture, Noranda is using friendly persuasion to gain support from the firm's 1,000 information systems professionals for a single set of corporate software standards.

Last week, for example, Noranda said it had selected a single relational database engine, The ASK Group, Inc.'s Ingres 6.4, along with Ingres application development tools.

Reason to comply

Noranda is giving business units a big incentive to comply with standards: It will pay half the cost if the units agree to install corporate-standard software.

"There are always economies of scale because we get master license agreements with vendors," said Chief Information Officer Ray Connell.

The drive for standards allows the firm to share expertise in application development and to reduce overall costs because of reusable code and master software licenses, such as the use of Ingres at multiple sites (see story at right).

> Standards are one way the conglomerate hopes to keep IS costs down.

One reason Noranda's distributed scheme works, Connell said, is that just a fraction of all data flows from one operation to another — or to headquarters. However, financial results, including consolidated sales figures, are sent to Noranda headquarters and processed on Hewlett-Packard Co. computers that headquarters shares with IS departments at Noranda Minerals, Inc., a Toronto business unit.

Crystal ball

The future came early at Noranda, which started its move to distributed computing in the late 1970s with multiple minicomputers.

"I hate to tell you this," Connell said, "but I have no computers on the floor [of my department]."

The headquarters IS staff numbers only 35, he said, and includes many with business backgrounds.

Noranda's IS group began devising a comprehensive set of software standards in 1990 as the foundation of the company's move toward Unix, open systems and client/server computing.

CIO Ray Connell: *"There are always economies of scale"*

Various criteria

Task forces survey products in various categories and select one based on key criteria, such as usefulness and the availability of technical support around the world. However, some business units may elect to keep their own databases and development tools, including Oracle Corp. databases and older, flat-file databases.

Other standards include Transmission Control Protocol/Internet Protocol for networking, Unix operating systems, the Open Software Foundation's OSF/Motif and Microsoft Corp.'s Windows graphical user interfaces.

Standards are one way the conglomerate hopes to keep IS costs down and share technical skills on standard products across business units.

Common applications built on these standards can also be shared among companies, such as process manufacturing software for mining, pulp plants and natural gas companies.

As Noranda moves to open systems, it plans to install IBM RISC System/6000s and Unix computers from HP, Digital Equipment Corp. and Sun Microsystems, Inc. The Sun systems will be used mostly by Noranda's oil and gas exploration business units.

"We're looking for common systems to share business problems," Connell said. "If four or more Noranda companies are willing to go in on a venture, we create a functional interest group to study systems."

Good source of NEWS

Noranda uses a networking committee called NEWS (Noranda Enterprise Wide Systems) Group to gain enterprisewide corporate IS technology standards.

A kind of corporate glue for IS planning, NEWS holds quarterly teleconferences, an annual on-site meeting and monthly telephone calls. Meetings may include 30 to 40 people representing about one-third of the Noranda companies.

"There are good concepts spread throughout the companies," said NEWS Chairman Murray Dunnigan, manager of information services at James MacKeven, Ltée., a Noranda pulp and paper manufacturing unit in Masson, Quebec. "We get the best people together and identify the best operating practices in these companies. We've taken the technological best-of-breed so that we get the best application money can buy; but we also know how to use the thing."

So far, NEWS has identified eight core applications that can be reused by many business units; no single unit has adopted more than two of them, Dunnigan said.

"We don't maintain that we can model the whole Noranda enterprise, but we do have a model that can be applied to each operating unit," he said. The enterprise data model might be considered complete in five years, he said, adding, "that's when we get the ultimate payoff."

Noranda's IS budget runs about 2% to 3% of sales, Dunnigan said — a low percentage compared with companies that depend on mainframes. But IS budgets may fall even lower by 1997.

"I don't think we can identify financial gains from standards right now," Dunnigan said, "but four to five years from now, we will be able to do that. Until then, we are sharing the talents and skills that are not available in every Noranda company." — *John S. Bozman*

DISTRIBUTED QUERIES

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
CREATE PROCEDURE la_qty
/* for use on WESTCOAST server */

/* returns count for one part only */
@partno char(6),
@la_count int output
AS
SELECT @la_count =
(SELECT qty FROM la_parts
WHERE partno = @partno)

DECLARE @cnt int
DECLARE @counter int
DECLARE @la_count int
DECLARE @partno char(6)
SELECT @cnt = COUNT(partno) FROM ny_parts

/* ny_parts is the parts master; need count
for sequential comparison with la_parts
to simulate a distributed join */

SELECT @counter = 0

/* create temporary table for part numbers
and quantities from ny_parts */
CREATE TABLE #allparts1
   (partno char(6) NULL,
   ny_qty int null)

/* create temporary table for row numbers
for sequential call of la stored procedure */
CREATE TABLE #allparts2
   (seq int)

/* create temporary table for
sequential build from first two temp tables */
CREATE TABLE #allparts3
   (partno char(6) NULL,
   ny_qty int null,
   la_qty int null,
   seq int)

/* build sequence numbers for each ny row */
while @counter 1> @cnt
begin
   select @counter = @counter + 1
    insert into # all parts 2 (seq) values ( @ counter )
end

/* populate temp table with ny parts and quantities */
insert into #allparts1 (partno, ny_qty)
select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

ORACLE7

3 LINES OF INDUSTRY STANDARD SQL

```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
```

These two programs do exactly the same thing: retrieve data from multiple servers. Oracle does it with a single 3 line industry standard SQL query. Sybase requires 90 lines of complex code. If productivity is important to you, call 1-800-633-1071 Ext. 8185 for a free copy of "Client/Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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Levi's moves order system from host to HP minis

By Mark Halper
SAN FRANCISCO

Levi Strauss & Co. last week gave new meaning to the term "shrink to fit" as it completed a massive conversion program that will enable it to run a critical piece of IBM mainframe software on smaller Hewlett-Packard Co. minicomputers.

The jeans and apparel maker said it will continue to run its Model Stock Management (MSM) software on an IBM 3090 for U.S. operations but will start loading the program on HP 3000 minicomputers in its international division, where the company is HP-based and has been operating without the MSM software.

Levi Strauss tapped Norwood, Mass.-based systems integrator Innovative Information Systems, Inc. for the eight-month project in which Innovative converted 500,000 lines of Cobol code using IBM's DB2 into a program using HP's Allbase/SQL database running on HP's MPE/IX operating system.

The MSM software enables Levi Strauss sales representatives to submit retailers' orders electronically using laptop computers tied into the host, explained Paul Benchener, director of Levi Strauss Global Quick Response operations.

MSM helps Levi Strauss determine its customers' product needs by keeping detailed records about which products are moving, noting information such as color, size and style. The MSM software is part of Levi Strauss' LeviLink services, which support a delivery system intended to supply goods exactly when needed.

Benchener said he expects international retailers to use the system extensively because many do not have their own sophisticated inventory management programs. In contrast, he said about 75% of all electronic orders placed by Levi's U.S. customers are through each customer's own system, and the balance is placed through MSM.

Benchener estimated that close to half of Levi Strauss' approximately $3.3 billion in U.S. sales in the year ended Nov. 30 were placed electronically via one of the two methods. Levi Strauss expects to report corporate revenue of about $5.5 billion for the year.

Steven Levandowski, vice president of information resources at Levi Strauss International, said the company began running a pilot installation in Helsingborg, Sweden, earlier this year. It plans to add MSM to an HP 3000 in Toronto next month to service the 250-store Pantorama chain. It also plans to bring MSM on-line on HP machines in the Philippines, Mexico, Australia and Hong Kong next year. Levandowski said there is currently no time line for Europe.

He said Levi Strauss is in the process of developing a point-of-sale (POS) information system for the HP 3000. The HP system will include more functionality than the IBM-based POS information system Levi Strauss uses in the U.S., he said.

Allbase for all

Levi Strauss' sites in Europe, Asia and Canada will each have their own copy of the Allbase/SQL relational database running under HP's MPE/IX operating system.

The relational database will serve as a central repository for store inventory information at 25 sites worldwide. But the multiple Allbase databases will be able to exchange information over a network and make "shadow copies" of vital data on other HP machines.

The company's MSM system had been used only for inventories in U.S. stores prior to the eight-month conversion from IBM's DB2 to HP's Allbase, according to Steven Levandowski, vice president of information resources at Levi Strauss International.

"It was a function innovated in the U.S.," he said. "The [international] business units literally didn't have the application." Without the conversion, Levi Strauss would have had to install an IBM mainframe in Europe.

Client/server updates from the European HP relational database management systems to IBM's DB2 running on the mainframe at Levis Strauss' San Francisco headquarters are technically possible.

Both types of databases support the industry-standard SQL database query language, and HP's Allbase supports read/write access to DB2 databases. But frequent updates from Europe to the U.S. are not part of Levis Strauss' current plan, Levandowski said. "This application will run at the business unit level."

—Jean S. Bozman

Advocates push for better answers

CONTINUED FROM PAGE 1

come its patchy reputation in the commercial arena, other users said.

"Unix doesn't guarantee open systems, but it's almost impossible to go open without it," said Peter Bauer, information systems director at the Michigan-based Marshfield Clinic, which recently completed a $5.5 million conversion from a Unisys Corp. proprietary system to a Unix-based Amdahl Corp. mainframe.

"The arguments that Unix is not standard are tremendously exaggerated, but I think Unix would be better served if the proprietary vendors would stop trying to create their own Unixes," Bauer added.

Executives were advised to seek strategic partnerships with vendors.

Another bit of advice offered to the executives was to seek strategic partnerships with vendors — and insist they share some of the added personnel costs associated with moving from proprietary to open systems.

At the UK's Department of Social Security, for example, IBM and two European computer vendors agreed to deliver products that not only comply with X/Open standards but are tested to work in the department's computing environment, according to George McCorkell, technical infrastructure director.

In separate workgroups at the conference, users hammered out their requirements for standards in areas such as data management, desktop strategy and distributed applications support. The end product of their work will appear in March 1993 in X/Open's Open Systems Directive — a kind of blueprint for X/Open's future.

A sampling of 65 vendors' commitments to open systems products

- **Green Light: Standards stable and majority of suppliers committed to products.**
- Transaction processing monitors. High growth in 1993-94.
- Transparent file access and management services.
- Distributed transaction processing.
- **Yellow Light: Standards emerging and most suppliers promising products.**
- The Open Software Foundation's Distributed Computing Environment (DCE), including directory and naming services.
- Transaction processing over DCE. Growth expected in 1993-94.
- Application management functions. Development in 1994-95.
- Systems and network management. Significant growth 1993 onward.
- **Red Light: No clear standards, market direction unstable and majority of vendors uncommitted.**
- Distributed security and time services; object management services.
- Access to non-SQL databases. Low growth in 1993-94.
- Distributed backup and restore capability. Low growth in 1993-94.
- Management of multiple data types. Little growth expected.
- Global data dictionaries. Direction unclear until 1995.

Source: Dataquest Europe S.A., X/Open Co.

Corrections

An article on wrapping object-oriented code around Cobol code [CW, Nov. 30] inadvertently mentioned Borland International, Inc. as a vendor of the SmallTalk object-oriented programming (OOP) language. Borland sells a version of the C++ OOP language, not SmallTalk.

A box that accompanied a story on IBM's client/server strategy [CW, Nov. 30] should have stated that at least 500 people from the company's Endicott, N.Y., Enterprise Systems line of business — or at least 900 people overall from across the company — were involved in the effort.

Because of a software glitch at our production plant, the information graphics on pages 14, 16 and 109 were incorrect. See the corrected versions at right.

DHL's system

Servers: IBM RS/6000s; legacy systems from 11 manufacturers including NCR Corp., Stratus Computer, Inc., Pyramid Technology Corp., Prime Computer, Inc., HP, DEC.

Repository: IBM ES/9000

Clients: Apple Computer, Inc. System 7.0, OS/2, Windows

Networking: IBM Token Ring; Novell, Inc. NetWare; and TCP/IP, Open Systems Interconnect and IBM LU6.2 protocols.

Integration software: Peerlogic, Inc.'s Pipes

Capital costs: $5 million in 1991; $10 million in 1992; $15 million predicted for 1993, with costs decreasing thereafter.

Vital stats

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Peaked in 1986 with 2,400 employees.
Current employment count is only 370 staff members.
Currently serves approximately 900 customers.

At a glance

1956: Consent Decree issued.
April 1991: ACS asks Adapso to formally complain to the Justice Department.
May 1991: IBM forms wholly owned subsidiary ISSC to handle its outsourcing contracts.
Aug. 4, 1992: ACS sends letter to IBM requesting information on ISSC. IBM responds in September.
November 1992: Justice Department elevates probe.

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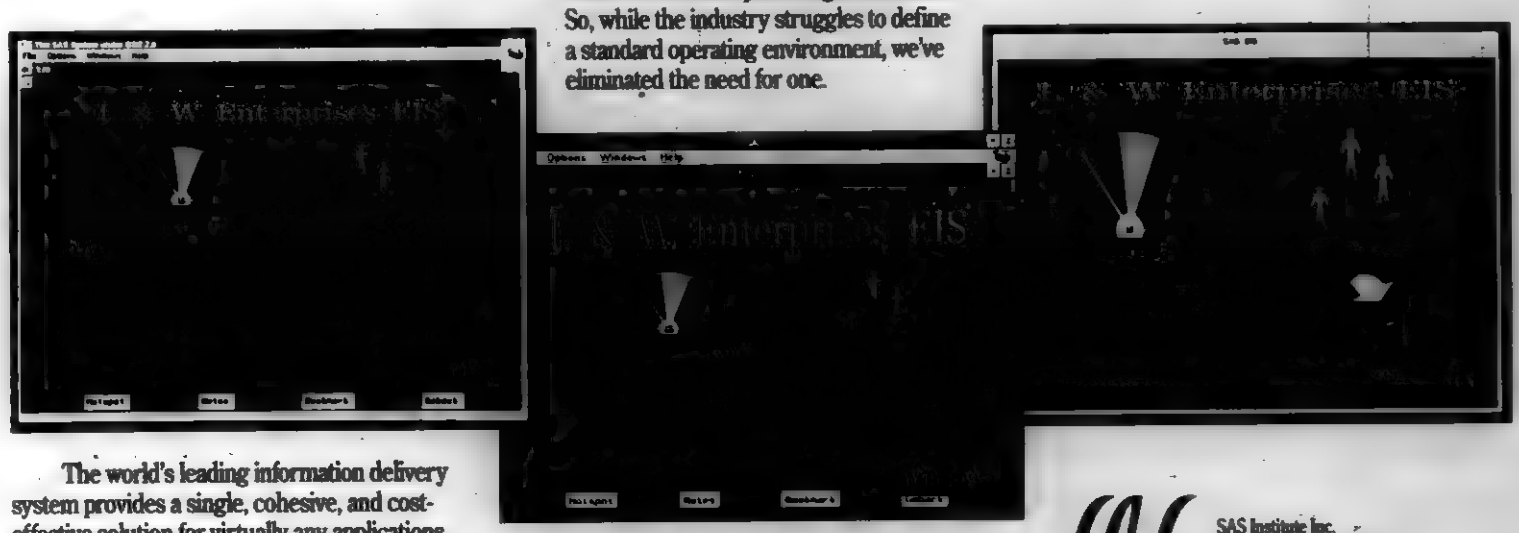

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Production woes hit Amdahl

By Jean S. Bozman
SUNNYVALE, CALIF.

Amdahl Corp. last week publicly acknowledged that a manufacturing flaw in some channel interface boards had led to outages for some users of 5995M mainframes.

The $1.7 billion mainframe maker, however, denied statements by several industry analysts that technical problems had slowed installations of its new 5995M IBM-compatible mainframes, saying, "speculation that the 5995Ms have severe technology problems is incorrect."

Amdahl said about 10 user sites were affected by problems with the new machines' Quadruple Dual Interface Handlers (QDIH) boards, which connect the mainframe CPU with its channels. That is roughly 20% of all 5995M machines shipped since late last year, analysts said.

Some 5995M users discovered the problem through outages; others were warned by the company, Amdahl spokesman Dick Whitcomb said. The boards had been treated with a new chemical process designed to avoid the use of chlorofluorocarbons (CFC), which damage the ozone layer, he said.

The water-cleaning process was also used on other types of 5995M boards, according to Mark Hess, vice president of Gartner Group, Inc.'s large computer strategies service. "In late August and September, they began to see some problems in other parts of the machines, [in] some memory boards and a board in the service [maintenance] processors," Hess said.

Those problems had not cropped up when the QDIH board problem was identified, he said.

Whitcomb said boards besides the QDIH boards might have been affected by the flawed cleansing process, but he would not identify them. He said diagnostic software in Amdahl mainframes would pick up any intermittent failures caused by faulty boards before a full outage occurred.

> Diagnostic software in Amdahl mainframes would pick up any failures caused by faulty boards.

Some sites, however, have not yet replaced the QDIH boards, Whitcomb said. "We have worked out this issue with our customers," he said. "We are a long way down the path of finishing this off."

A few 5995M sites received brand-new mainframes rather than a field-support repair for the faulty channel interface boards. "Amdahl is replacing entire systems in some instances," Whitcomb said, adding that those sites had been planning upgrades to larger machines.

Few users wanted to comment on the problem, which cropped up in September; some only learned of it in October and November.

"We were definitely notified," said Garland Crabtree, area manager for computer support at Southwestern Bell headquarters in Houston. To prevent future problems with its four-processor 5995M, the company switched out the affected boards during scheduled weekend downtime.

Hess said the board problems, while troublesome, did not indicate any fundamental failure in the 5995M product line. "I think there's a little bit of the 'Chicken Little, the sky is falling' reaction, but they're dealing with a manufacturing problem," he said.

Amdahl said all boards are now being cleaned by the older CFC process, which has been modified to comply with U.S. environmental regulations. The process was used only in Amdahl's Sunnyvale plant, which makes 5995Ms for North America. Its Dublin plant did not use the water process.

Demand for the 5995Ms is much lower than expected, dampening Amdahl's plans to recoup hundreds of millions of dollars invested in 5995M development with sales of CPUs list-priced at $20 million to $30 million.

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Advantis nets contract

Joint venture will build, manage network for Ford New Holland

By Elisabeth Horwitt
SCHAUMBURG, ILL.

■ Advantis, the joint IBM/Sears, Roebuck and Co. network outsourcing venture, marked its official launch last week by announcing a contract to build and manage Ford New Holland, Inc.'s corporate network backbone.

The contract with IBM's Network Systems Services (NSS) — now part of Advantis — is expected to save Ford New Holland $1.7 million this year and $2.5 million next year over what it would have paid former parent Ford Motor Co. for network services, according to David Hibshman, Ford New Holland's network manager.

Savings stem primarily from redesigning the network into a more efficient, fault-tolerant topology; from being able to mix voice and data on the same lines; and from being able to bargain with carriers through IBM, he added.

However, the deal is hardly a coup for Advantis, given that the farm and industrial equipment manufacturer originally awarded the contract to IBM's NSS business unit last spring.

IBM won the three-year contract, valued at approximately $10 million, primarily because it was able and willing to go the extra mile, offering technical services even before Ford New Holland had awarded the bid, Hibshman said.

Indeed, Ford New Holland, as a major IBM shop and user of Network Equipment Technologies, Inc.'s (NET) Integrated Digital Network Exchange (IDNX) switches, is almost too good a fit with IBM's and Sears' embedded expertise, according to Howard Anderson, managing director of The Yankee Group, a Boston-based research firm.

"The real goal of Advantis is to sign multiprotocol, not just SNA clients," he added. Advantis is working on several such contracts right now, a company spokesman said.

Announced this summer, Advantis combines IBM's and Sears' internal network operations and network services to create a network outsourcing firm that will offer everything from design and implementation to support and management of customers' data and voice networks, an Advantis spokesman said.

> IBM won the three-year contract because it was willing and able to go the extra mile.

The organization falls under the aegis of IBM's Integrated Systems Solutions Corp. unit and is said to comprise some 3,000 networking professionals.

Leader of the pack

IBM's NSS organization won a competitive bid last spring against the three long-distance carriers to provision and manage a T1 network for Ford New Holland's North America, Mexican and Canadian operations. The $3 billion-plus global manufacturer began planning to exit from Ford Motor's Tariff 12 network in June 1991, when Ford sold 80% of the firm to Fiat SpA, Hibshman said.

The combined networking installations and users of IBM and Sears give Advantis the power to extract major price and service concessions from carriers as the "No. 1 largest user" in the U.S., Hibshman said. By itself, IBM was No. 2 domestically, behind the U.S. government.

IBM's clout has already manifested itself in faster line provisioning. As Ford's carrier, AT&T took up to 45 days to get a new line in place; with IBM, it takes as little as 15 days, Hibshman said.

With almost 6,500 employees in the U.S., Ford New Holland initially considered a Tariff 12, or software-defined, network solution from one of the three leading U.S. carriers.

However, IBM's NSS got its foot in the door when it was brought in to help re-engineer Ford New Holland's Systems Network Architecture network in fall 1991, Hibshman said.

As a reseller of NET IDNX switches, IBM also had the facilities and technical team in place to roll out Ford New Holland's IDNX-based network within four months, while the carriers were talking 12 months, he added.

The U.S. part of the network is scheduled for completion by year's end; links between the U.S. and overseas sites are scheduled for deployment early next year. Ford New Holland will continue to manage its local-area networks in-house.

So far, the outsourcing arrangement has worked well: "I lost a T1 circuit to Chicago the other day and the network never flinched," Hibshman said.

Going global

One piece of Advantis' competitive strategy that is just beginning to fall into place is how the network outsourcing company can compete against global network outsourcers such as Infonet and BT's Syncordia Corp.

Source: Go Research, Inc.

When the joint IBM/Sears venture was announced last fall, company spokesmen were vague about whether Advantis would offer overseas networking outsourcing services that went beyond bringing in IBM Information Network's overseas units to provide value-added network connections.

In the past few months, however, Advantis' "geographical partners" in Europe and Asia-Pacific regions have grown "more interested in having the same view of network outsourcing as we have and are establishing businesses that [are] offering the same as Advantis in their geographic regions," an Advantis spokesman said.

Still unclear is how various IBM organizations, such as Integrated Systems Solutions Corp. and IBM Information Network, will be involved in these overseas offerings and how overseas and U.S.-based organizations will coordinate their services to provide multinational customers with an integrated, global network outsourcing solution, the spokesman indicated.

"We certainly intend to use a common architecture" for offering such services, including common network platforms, network management software and a common business approach, the Advantis spokesman said. Advantis has already taken part in team bids with overseas IBM businesses on "close to a dozen international solutions," he added.

— Elisabeth Horwitt

Responds to pressure from fast Ethernet

Network Peripherals cuts FDDI prices

By Lynda Radosevich
MILPITAS, CALIF.

Spurred by competition from inside and outside the Fiber Distributed Data Interface (FDDI) camp, Network Peripherals, Inc. said it will begin shipping today a low-cost concentrator and will reduce prices by up to 50% on its FDDI adapter cards.

The Network Peripherals four-port Departmental Concentrator lists for $3,995, and its FDDI adapter cards list for $1,995, down from between $3,000 and $4,000.

The price cuts follow Interphase Corp.'s announcement this fall of $1,595 and $1,995 FDDI adapter cards, which it said will ship in early 1993. The Network Peripherals maneuver drops the average cost per port of an FDDI fiber-port concentrator from around $1,500 to $1,000.

Cable ready

Data-grade unshielded pair (DGUTP) wiring already accounts for more than one third of LAN cable shipments and will continue at the expense of other media such as fiber

Projected U.S. cable connections (in thousands)

	Fiber	DGUTP
1992	120	2,017
1993	126	2,737
1994	126	3,681
1995	132	4,815
1996	146	6,038

Source: Forrester Research, Inc.

"FDDI vendors are feeling pressure from emerging 100M bit/sec. Ethernet technology and the fact that the FDDI market hasn't really taken off," said Chip Pettirossi, an analyst at International Data Corp. In addition to the competition, dropping chip prices are allowing vendors to produce lower priced FDDI cards, he said. But prices will have to drop even further to rival the roughly $200 per card cost of Ethernet and the expected $400 to $600 per card cost of fast Ethernet.

Network Peripherals, which said it owns roughly 15% of the total FDDI adapter card market, expects managers to use its FDDI technology to connect technical workstations and to bundle PC-based servers on an FDDI server network.

Despite the price cuts, some users said they were wary of FDDI because it is still too pricey and has an uncertain future. FDDI technology is being challenged by other high-speed local-area network technologies such as switched Ethernet and fast Ethernet and, in the future, Asynchronous Transfer Mode.

"The cost of adapter cards is one of the major considerations. The other is that the wiring infrastructure is not there," said Jim Watson, manager of the advanced data processing laboratory at Sparta, Inc. in Huntsville, Ala.

IDC estimates that the total number of FDDI PC and workstation adapter cards shipped in 1992 will be only 3,300 and 12,300, respectively. Ethernet card shipments will reach 5.7 million in 1992, the company said.

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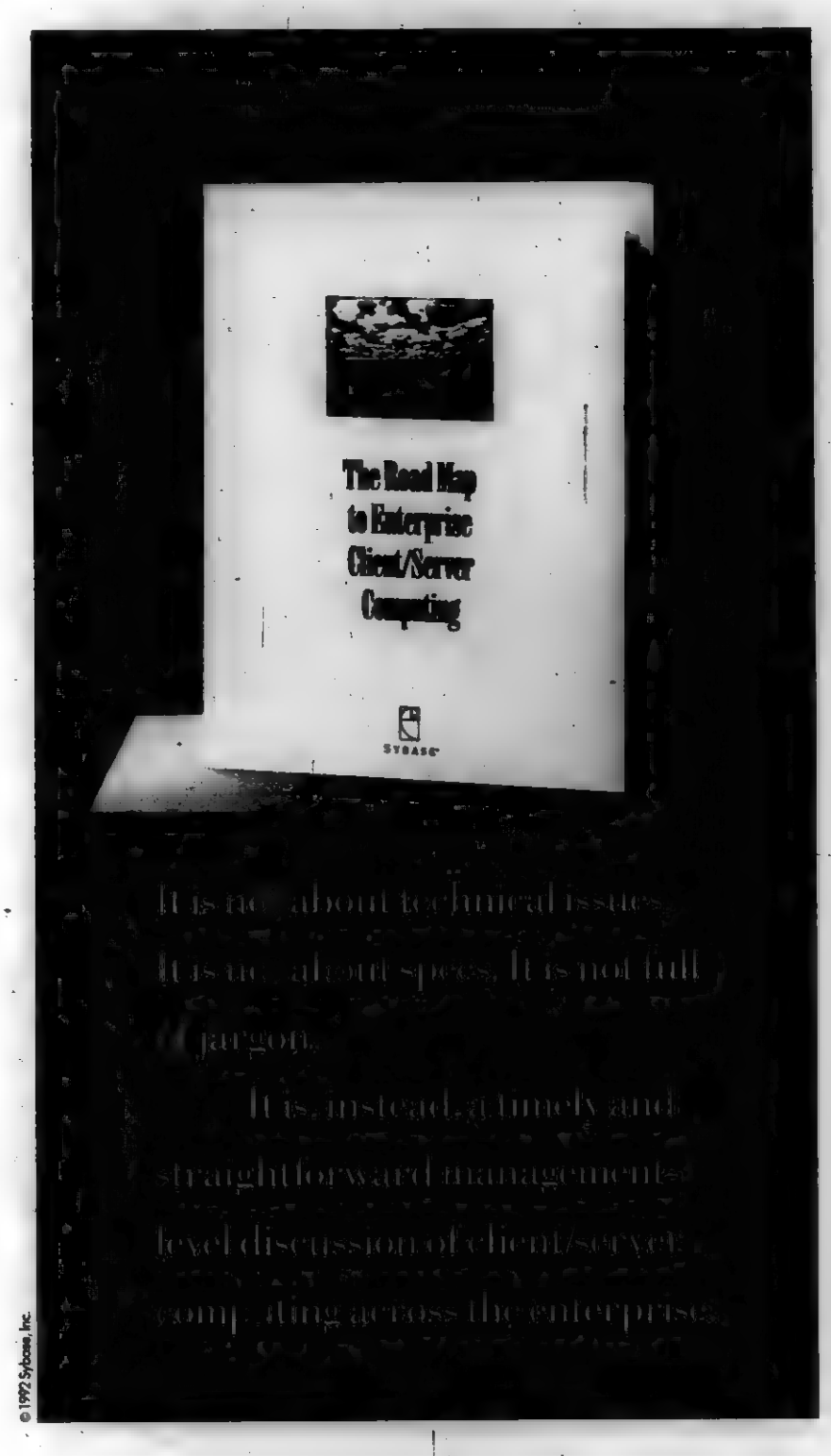

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Vendors use warranty lure

By Michael Fitzgerald

In a market where features have become commodities and price differentials have flattened, some vendors have turned to longer warranties and sweetened support to woo corporate customers.

The IBM PC Co. started this trend in mid-September by giving three-year warranties and offering seven-day-a-week, 24-hour telephone support, but only for its high-end Personal System/2s. A month later, Hyundai Business Group's Information Systems Division opened its toll-free telephone support to any user. Compaq Computer Corp. initially matched IBM's warranty and support for its servers, and last week it one-upped IBM by announcing a three-year warranty and round-the-clock support for its entire productline.

At least some users were unimpressed.

"The warranty is not a checkoff item in buying — we want to know how they're really going to perform at 3:00 on Friday afternoon when we have a problem," said Jerald S. Noble, director of telecommunications and PC support at the American Cancer Society in Austin, Texas.

The Cancer Society has operations in all 50 states, and Noble said the ability to provide on-site service has much more import than a parts warranty.

Compaq competitors also remain unconvinced that there is a need for such warranties.

"Nothing's free. All those things get bundled in the price of a machine," said Michael Dell, Dell Computer Corp.'s chairman. Dell said his company has so far found that very few of its customers want 24-hour service.

"We don't hear customers asking for just one thing, so we'll offer different programs to different customers, at a cost," Dell added.

"It's not going to raise the cost of our products; we've become more cost-efficient in repairs, enabling us to lower our costs," said Gus Kollias, vice president of customer service and training at Compaq North America.

Kollias acknowledged that on-site service is good for only one year, after which customers have to take the products to authorized service centers. Full, three-year, on-site service costs $77 per unit.

Other vendors agreed with Dell.

"We're not ready to make that decision, and we won't do it just to copycat Compaq," said Rick Krause, general manager of the systems and technology division at CompuAdd Computer Corp. in Austin, Texas. "If a three-year warranty is something customers demand and are willing to pay for, then we'll do it."

Analysts also downplayed what one called "the service wars."

"It's a marketing shift, the battle to see who can come up with the best technical support," said James Poyner, analyst at Rauscher Pierce Refsnes, Inc. in Dallas. "In reality, if a part doesn't go in the first 30 days, chances are very slim it will go in the next three years."

Breaking into the first tier, Dell under closer scrutiny

CONTINUED FROM PAGE 1

tems analyst/programmer at General Waterworks Management Service Co. in King of Prussia, Pa., which has standardized on Dell equipment.

"It's a matter of semantics, isn't it?" asked Michael Stonecipher, office systems manager at United Missouri Bank in Kansas City. "Dell made second-tier vendors legitimate, and the lines between second and first tier have begun to gray anyway."

While some Dell users stop short of calling Dell a first-tier company, they nevertheless have standardized on its PCs. Most said they were drawn to Dell because it offered a lower priced, quality alternative to IBM and Compaq, and it offered effective service. Most added they see no reason to switch back now.

"A number of my clients are going through RFPs [requests for proposals], and most of them absolutely consider Dell," said Matthew Cain, senior analyst at Westport, Conn.-based Meta Group, Inc., which advises large corporate users.

Tough to catch up

Despite perceptions and name recognition, though, Dell has a lot of growing to do to seriously challenge the likes of IBM. Computer Intelligence's database of 128,000 corporate sites shows that Dell has 2% of the installed base, with 3.9% saying they will buy in 1993. But IBM, while down 5%, is in 30.8% of companies' 1993 purchase plans.

But nothing — even rampant industry price cutting — has slowed Dell down. In fact, third-quarter revenue growth hit 149%, the third straight quarter it grew more than 100% from the year-earlier period.

Dell's third-quarter success seemed to dodge another bullet because it was achieved with a product line that was slated to be overhauled last summer. Dell waited until last week to release new models.

Dell executives said the decision to delay the product refresh was a matter of course. Company founder and Chairman Michael Dell told *Computerworld* he remembers it differently. "I was surprised when I heard the recommendation to wait," Dell said. But top staff convinced him that while the company needed new products, it would fall short of customer needs if it did not wait for certain components, such as S3 Corp.'s video accelerator chip.

The decision to wait underscores claims that Dell remains flexible even as it heads toward $2 billion in revenue.

Still, along with success comes scrutiny.

"People are asking when Dell's going to hit the wall, just like they did with Compaq," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

In the spotlight for its rapid growth and presence in the corporate buying realm, Dell has sometimes blinked from the glare.

For instance, the company attacked a Kidder, Peabody & Co. analyst who questioned the way it accounted for its currency trading [CW, Nov. 30], going so far as to publicize the analyst's relationship with an investment fund analyst in an attempt to discredit him.

Michael Dell *has made Dell a company that ranks alongside IBM, Apple and Compaq*

Analysts have also challenged Dell's business model. Dell's integrated model gives it control over everything from design to distribution, though Dell builds no notebooks save the 320SLi. Nor does it manufacture its Dimension family of products.

Michael Dell said this approach nets the company invaluable customer feedback, which its competition lacks.

"The integrated model is what will win in this marketplace, and we're the only ones who have it," said Thomas Martin, Dell's vice president of marketing.

John Varol, director of production/manufacturing engineering at Dell, said the firm will manufacture its next-generation high-end notebooks. This mollified some analysts, who said they feared Dell wants to reduce its manufacturing presence.

"It has a viable business model, but it's also sensitive — if Dell's gross margin continues falling [from 30% to 21% in 1992 alone], the model has problems without [continued rapid increases] in volume, and I think we're looking at peak growth right now," said James Poyner, analyst at Rauscher, Pierce and Refsnes, Inc. in Dallas. Poyner said Dell could lose money at some point in the next year before the price wars end.

Joel Kocher, newly promoted to Dell president, North America, defended Dell's gross margins, saying recently that Dell can operate effectively on 15% margins. The company's third-quarter operating expenses were 14.8% of sales, down from 28.8% the previous year.

Dispute heating up

Still, some customers said they worry that if shrinking margins do not hurt the company, a worsening tiff between Dell and reseller CompUSA will. As of September, Dell shifted CompUSA (and Staples Office Superstores) away from selling its entire product line to selling only its low-end Dimension line.

While Dell officials said this is a positive move for both companies and will affect only "a couple of handfuls" of customers, two contacted by *Computerworld* said they would leave Dell if they have to buy direct from it, and several others said they would like to buy Dell products from local resellers to gain a local point of service.

"When I need to reach out and slap somebody, it helps when they're local," Stonecipher said.

"We have for the most part stayed with Dell, but if we're buying a machine where there's no difference in price between Compaq and Dell, we may buy Compaq because we can buy it through a reseller and deal with them if there are problems, instead of going mail-order," added William Tignanelli, assistant vice president of information systems at the Federal Reserve Bank of Baltimore, which switched from Compaq to Dell early this year.

These questions are something of a surprise, given Dell's consistently high marks in service surveys from the likes of Dataquest, Inc. and J. D. Powers and Associates.

Still, even the worst naysayers stop short of predicting doom for Dell. Users and analysts agreed the company has marketed itself as one that provides quality machines at low prices. Several cited the new product lines, which make it the first major vendor to include local-bus video, as examples of Dell's attention to customer wants.

Overall, International Data Corp. (IDC) estimated Dell will sell 450,000 units in the U.S. this year, tripling last year's sales. IDC said Dell will ship 725,000 units worldwide this year, which is significant, though well shy of the 2.6 million units Apple is expected to ship.

Product makeover

Dell's new product lines, the L, M, ME and T families, overhaul its offerings and, in the case of the T, give it a midrange server to battle Compaq's Pro$ignia line.

The 486/L series: Five low-profile, AT-bus PCs with a base price of $1,200.

The 486/M series: Midrange AT-bus systems with a base price of $1,450.

The 486/ME: Extended Industry Standard Architecture PCs starting at $1,750.

The 486/T: Three AT-bus tower servers with a 33-MHz 486DX system starting at $1,950.

Base prices include a 25-MHz 486SX (except the T line), 4M bytes of random-access memory, an 80M-byte hard drive and one floppy. All systems use local-bus graphics and have embedded diagnostics.

AMD loses bid to copy Intel I486

By Michael Fitzgerald
SANTA CLARA, CALIF.

Intel Corp. scored a major victory in its battle against Advanced Micro Devices, Inc. (AMD), last week when a judge said AMD does not have the right to copy Intel's microcode. Analysts said the decision could stem the fall of 486 PC prices, for now.

AMD retains the rights to produce and sell its clones of the 386, pending a review of an arbitrator's ruling earlier this year, but it cannot sell its 486 clones. AMD had planned to release the clones as early as this month if the judge decided in its favor. AMD issued a statement saying it expects to have a clean-room version of the 486 on the market by the middle of 1993.

"This could stem lower prices on 486 systems," said Richard Zwetchkenbaum, analyst at International Data Corp. in Framingham, Mass. "It helps to solidify Intel as the dominant 486 supplier. There is still IBM and Cyrix/TI to contend with, but [the decision] somewhat postpones the need for Intel to drop 486 pricing next year."

IBM makes an Intel-sanctioned variant on the 386 and 486, and Cyrix Corp. designed its own versions of the chips, prompting an Intel suit. Texas Instruments, Inc. licensed the Cyrix design, and both companies have said they plan to aggressively introduce new products in 1993.

An Intel spokeswoman said Intel will continue to make quarterly price cuts on its various 486 models. She emphasized that Intel does not plan to attack AMD customers or end users.

Intel has asked a judge for $35 million in damages for AMD's copy of the 287 math coprocessor and for $600 million in damages for the 386, should it win its appeal of the arbitrator's ruling, which is not likely to be decided for some time.

CA sued by bank over upgrade fees

By Thomas Hoffman
LOS ANGELES

First Interstate Bancorp is suing Computer Associates International, Inc. for imposing upgrade, maintenance and new license fees that the bank claimed are not allowed under its license agreements.

CA filed a counterclaim last week, stating the bank "knowingly misused" certain software products and allowed its unlicensed affiliates "access to the licensed software products." First Interstate recently consolidated its data processing operations into two data centers, which are operated by First Interstate Bank of Oregon in Portland and by First Interstate Bank of Arizona in Tempe.

First Interstate claimed that its "perpetual" license agreements with CA prohibit the vendor from charging upgrade and maintenance fees against fixed-price licenses, according to court papers filed on Aug. 25 in U.S. District Court in Los Angeles. The bank claimed the terms and conditions of the licenses cannot be altered, regardless of CPU upgrades or site relocations.

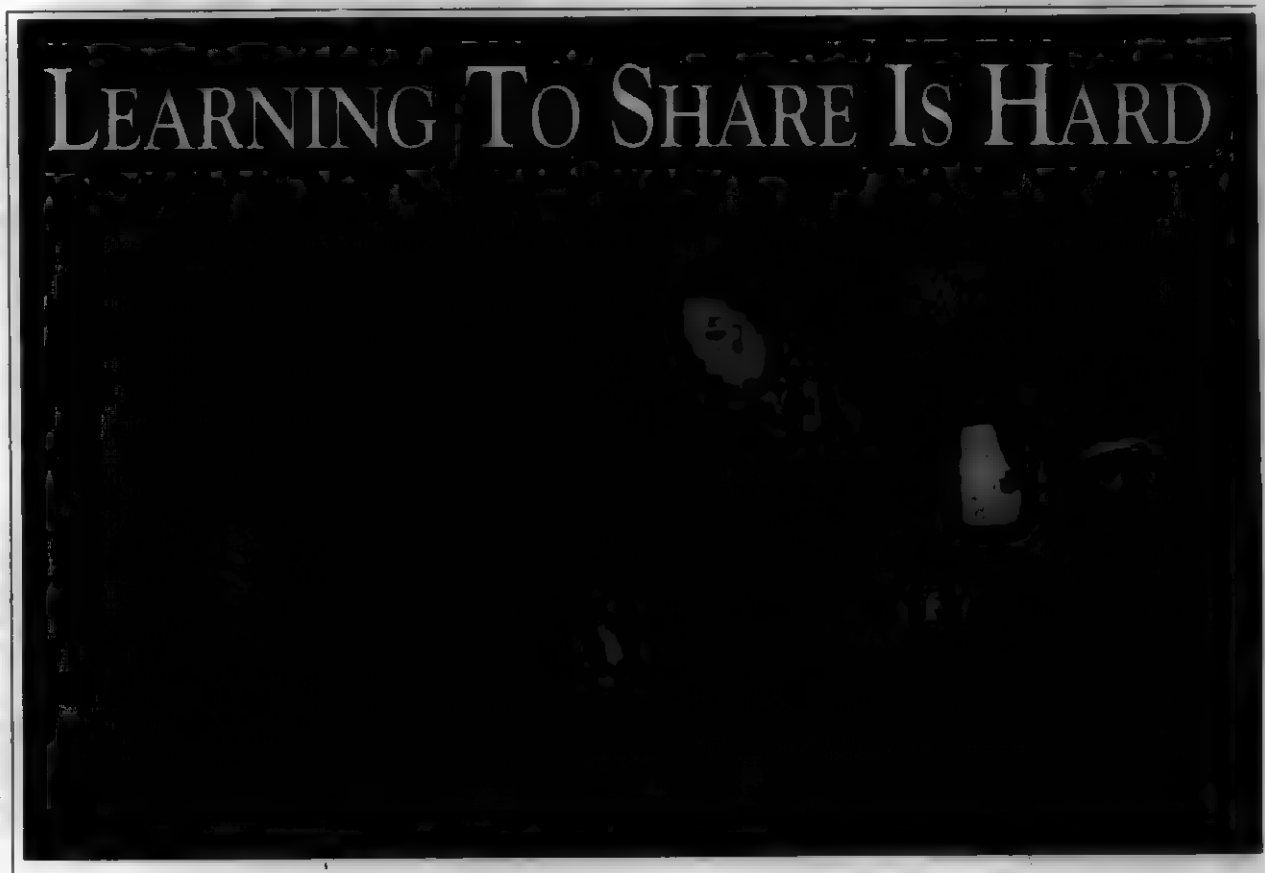
CA said it "actively opposes software piracy and violations of software licensing." The vendor said it plans to "vigorously pursue this case."

Other charges include breach of contract and unlawful withholding of maintenance.

The bank holding company, which has $51 billion in assets, has more than 60 software licenses with CA, including ACF/2, CA-1, CA-7 and CA-11 mainframe software programs. All are involved in the suit. CA's recent licensing alterations are not relevant in this case, a source close to the bank said.

First Interstate and its legal counsel, Steven A. Marenberg at Irell & Manella, a Los Angeles law firm, refused to comment on the suit.

The case is currently in the discovery stage. No trial date has been set.



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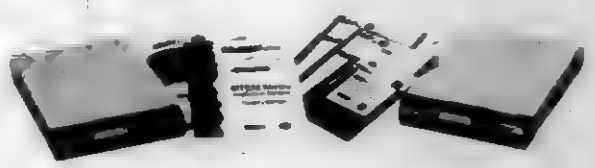

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News Shorts

Halon phaseout accelerates

Representatives of industrialized countries meeting in Copenhagen agreed to phase out the production of ozone-destroying halon gases by the end of next year, a year earlier than the current plan and six years earlier than stipulated in the 1987 Montreal Protocol treaty. The latest agreement to stop producing the popular fire-retardant chemical used in many computer rooms must now be ratified by each country.

GM ups EDS contract

Electronic Data Systems Corp. last week announced a five-year deal with **General Motors Corp.**'s North American Operations that calls for EDS to continue supplying data processing services. Terms were not disclosed. The agreement essentially consolidates accords EDS had in place with divisions that GM disbanded earlier this year. EDS said it agrees with GM that cuts in processing, which will be made redundant by the consolidation, should be sought. The accord also creates the possibility that EDS will start to provide non-data processing services to the ailing automaker.

Federal Reserve to rewire

The **Federal Reserve** last week started to link its 12 banks into an autonomous data network with connections to depository institutions and banks. The new network will help carry increased traffic from the banks to three new data processing centers and will use switching and rerouting to protect the data, a spokesman said.

Browning-Ferris outsources

SHL Systemhouse, Inc. said it signed a five-year contract with Houston-based **Browning-Ferris Industries, Inc.** under which SHL Systemhouse will take over application development and support. Terms were not disclosed. SHL Systemhouse said it is offering jobs to the 90 people in Browning-Ferris' IS department who have been handling the work SHL Systemhouse is taking over.

NSFNet goes to T3 speeds

The last circuits on the 4-year-old T1 National Science Foundation Network, which provided the Internet backbone, were switched off last week in favor of a new T3 backbone. Operating at 45M bit/sec., the new backbone can send a 20-volume encyclopedia across the network in less than 23 seconds, according to **Merit Network, Inc.**, a member of the consortium that worked on the project. More than a million host computers are connected to the Internet.

SHORT TAKES **IBM** shipped its 200,000th Application System/400 last week to **Heineken N.V.** in Amsterdam, which has 23 AS/400s.... **Sequoia Systems, Inc.** announced that it plans to engage an investment banker to resolve the company's liquidity problems. It is currently in default under its bank credit agreements and must obtain additional funding to continue operations .... Wendell Ying, an analyst at IBM's Toronto laboratory, took over chairmanship of **CASE Communique**, a 100-member alliance of users and vendors that is seeking application development standards.... **BT** added **Cisco Systems, Inc.** routers and **Fibronics International, Inc.**'s fiber-optic multiplexers last week to the growing list of devices that it will sell and support as part of its internetworking service.... **Cray Research, Inc.** installed a Y-MP C90 supercomputer at the **European Centre for Medium-Range Weather Forecasts** in Reading, England.... The **University of California** at Davis Medical School has found that women who make computer chips have 40% more miscarriages than those female employees who work elsewhere in the same factory.

DEC faces wary users with revised game plan

CONTINUED FROM PAGE 1

sponsibility for DEC sales on third-party channels, compared with the current emphasis on a direct DEC sales force.

For example, DEC has already begun discussions with mass merchandisers and large retailers such as Costco Wholesale Corp., according to a DEC channels marketing spokesman. These and several other channels will supplement the existing channels of systems integrators, technical OEMs, software developers, distributors, master resellers and value-added resellers to sell everything DEC offers, with the exception of mainframe systems. DEC's direct sales force will focus on more complicated, high-end projects, he said.

Industry analysts said making a transition like this one involves major shifts in distribution support and commission structures, which will be a significant challenge for DEC.

"It's going to be a major switch for DEC, and I don't know if the company can turn around like that," said Rich Finkelstein, president of Performance Computing, a market research firm in Chicago. He said that while DEC needs to do this to cut costs and compete effectively, customers are used to dealing directly with DEC and with specific people. "It's going to shake everybody up."

The DEC spokesman emphasized that most of these changes will occur gradually during the course of this fiscal year.

User Robert Ayr, a systems manager at PacifiCare Health Systems, a health maintenance organization in Cypress, Calif., said working with his own DEC salesman saved time. While some third parties with which he has worked have been stellar, others "really didn't know what they were doing and were just trying to drum up business."

Perhaps of more immediate concern to users are the products slated to be discontinued by DEC as part of its reorganization. These are expected to include products such as DECset computer-aided software engineering tools, graphics package DECpresent and word processor DECwrite, sources said.

A DEC spokesman said details have not yet been finalized, but DEC will communicate any available "good solid information" at DECUS.

Although the spokesman claimed that those affected will be "products which are not of maximum benefit to the greatest number of customers," some users were concerned.

"While it makes sense for DEC to cut back, a lot of customers at DECUS won't see it that way and will only see the effect it has on them," said Bill Mayhew, chairman of the DECUS business practices special interest group.

The products that are cut back will either be put into maintenance mode by DEC or discontinued altogether and farmed out to third parties or to entrepreneurial spin-off groups from within DEC that would then become independent subsidiaries or "enterprise zones."

"My own reaction is that it's about time that they get rid of the dead wood. On the other hand, I hope [my products are not] dead," said Jeffrey Jalbert, a member of DECUS' board of directors.

Layoffs of approximately 1,000 software group engineers and an additional 800 software engineers in the networking and hardware groups are expected to be finalized this week.

Layoffs of at least 8,000 DEC employees are expected to be announced by the end of this month, along with the structure for a reorganized DEC along the lines of eight business units and four horizontal service groups.

Sessions at DECUS that have been been cut entirely because of either a change in product strategy or personnel include a seminar on SESS, a software maintenance program.

COS overhauls under pressure from frustrated users

CONTINUED FROM PAGE 1

of concern, [such as] how to take advantage of the OSI functionality while maintaining interoperability with TCP/IP or proprietary systems during the transition," added Augie Nevolo, chief telecommunications engineer at Pacific Gas & Electric Co. (PG&E).

COS, which counts the MAP/TOP Users Group and the User Alliance for Open Systems among its affiliates, is being broken up into a series of executive interest groups, whose vendor and user members will work together on a variety of issues, the COS spokeswoman said. One group will set about educating the public on standards-based "deployment issues, products and services," she added.

Other groups will work to accelerate implementation of standards-based interoperability in specific product areas, including telecommunications (via Integrated Services Digital Network), electronic messaging, videoteleconferencing and routers.

The COS user/supplier forum will address TCP/IP-OSI interoperability and transition issues that are now harrying firms such as PG&E. The San Francisco-based utility has been aggressively implementing applications on TCP/IP while actively supporting its industry's efforts to standardize around OSI, Nevolo said. "So we have to find a way of coexisting and transitioning."

> A new COS interoperability test bed will provide services to users on various platforms.

Also of interest to would-be OSI migrators is a new COS interoperability test bed that will also "provide services to users on various platforms" in a production environment, a COS spokeswoman said. "So it will be a living interoperability lab."

COS will continue with its existing Mark program, which tests and certifies vendors' products as standards-compliant.

Also on the agenda at this week's COS meeting is a white paper produced by the Gosip Institute, outlining "how to glue the two architectures together so you can mix and match transport, service and application layers," said Dick Desjardins, director of the Silver Spring, Md., consulting company, which has no affiliation with the Government OSI Profile.

Another promising development slated for next year is the release of a draft Industry/Government Open Systems Specification, in which government, energy and manufacturing standards groups have come up with a consistent OSI standard based on the 1992 specification. Formerly, each organization had stabilized around a different OSI release.

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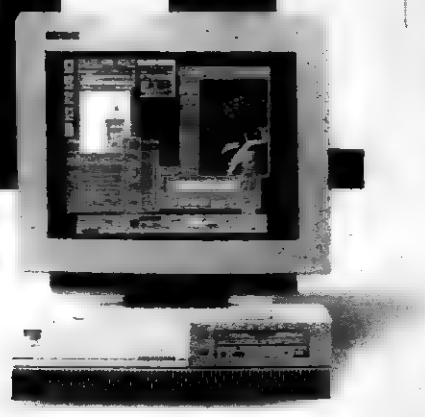

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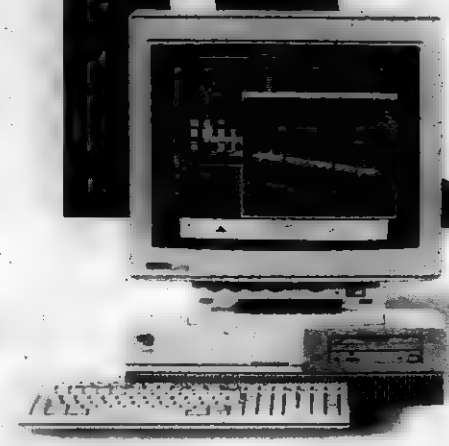

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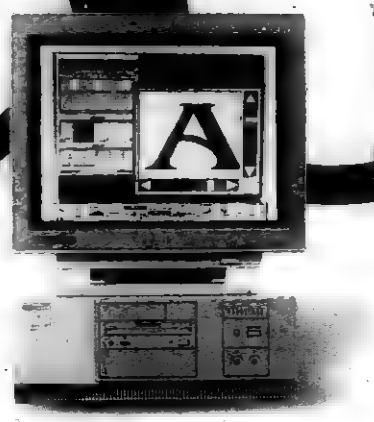

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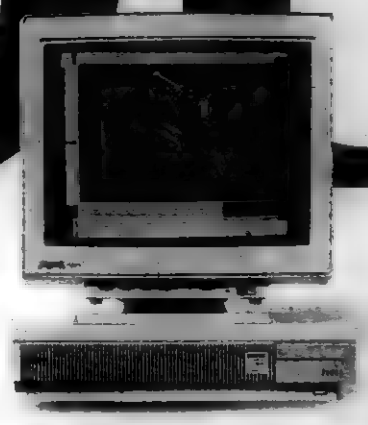

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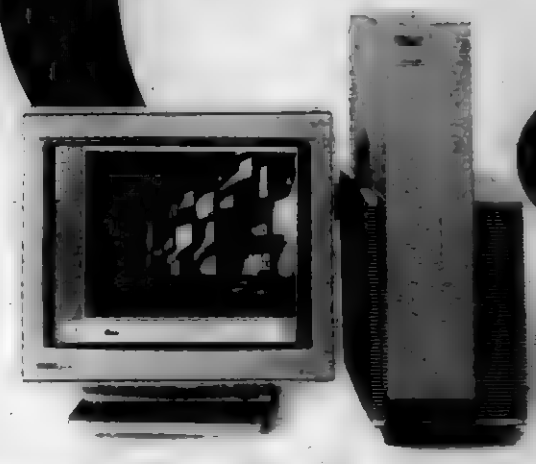

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HEWLETT PACKARD

Mega real estate auction counts on imaging

System will help bidders sort through thousands of documents related to $800M in failed S&L loans

By Ellis Booker
ATLANTA

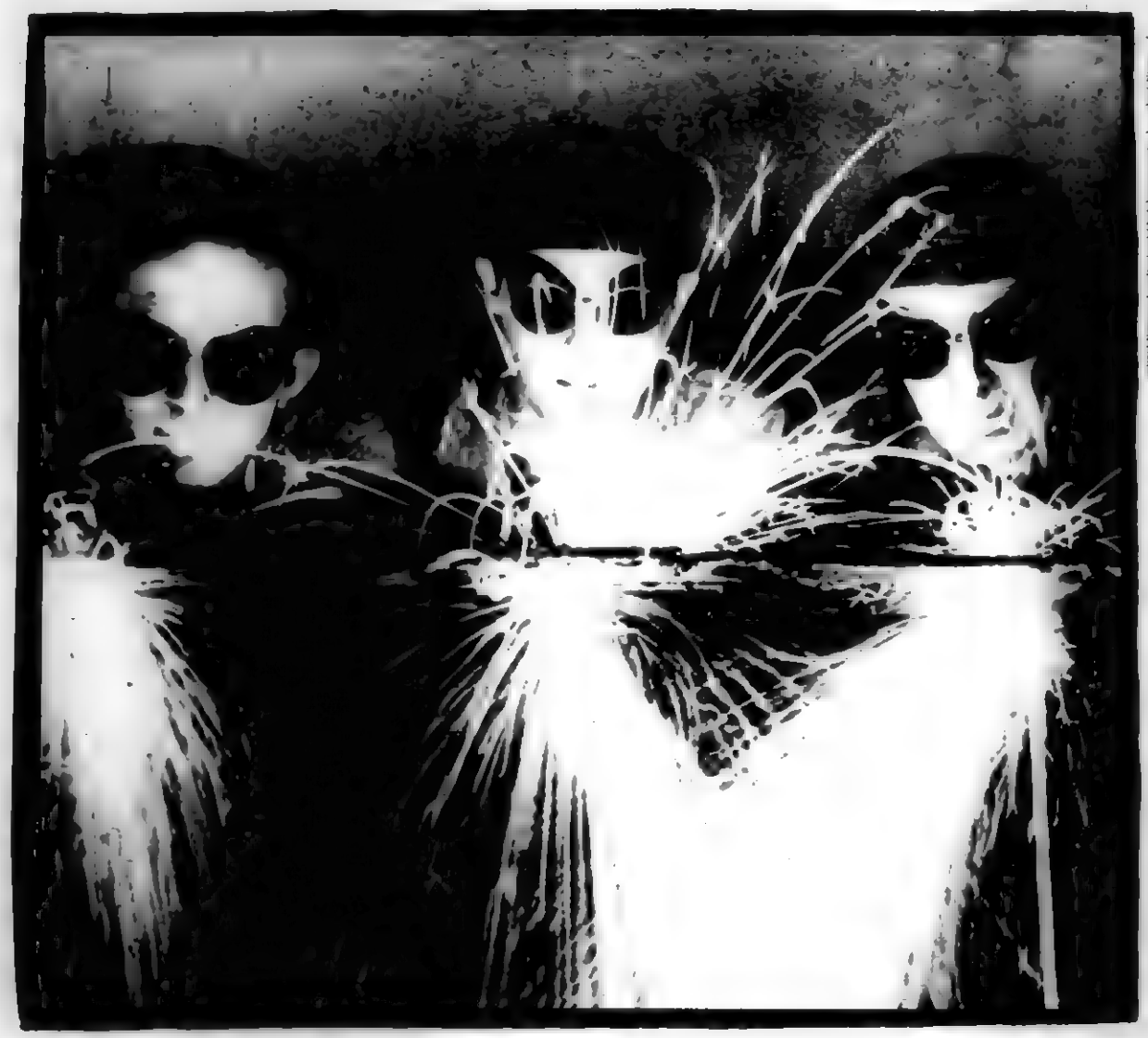
Resolution Trust Corp. plans to sell some $800 million worth of charged-off consumer, residential and commercial real estate loans this week, disposing of 45,853 assets from 136 failed savings and loan associations.

The Thursday mega-auction — the largest of its kind ever held — will also feature for the first time an electronic document imaging system that will help bidders sort through the thousands of documents in each of the 72 packages of assets up for sale.

"When you have 45,000 assets, you just can't use hard copy — it would be a strategic nightmare," said Maurice Gilbert, an asset marketing specialist at Resolution Trust and the financial instruments auction coordinator at the government agency's office in Atlanta.

About six months ago, Gilbert said, Resolution Trust saw the potential of using optical storage and scanning to permit this kind of large-scale auction.

The imaging system will let interested investors examine the portfolios and conduct their due diligence without monopolizing the individual files, Gilbert explained.



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Beat at their own game

The $700,000 PC-based system was developed by JBS & Associates, Inc., a real estate consulting and auction company based in Chicago. JBS won the bid to handle this week's Resolution Trust auction, winning out over auction houses, many of which proposed using microfilm/microfiche to handle the massive number of documents.

The JBS system uses Microsoft Corp.'s Windows environment as a front end to an image database from Optika Imaging Systems, Inc. in Simi Valley, Calif.

> The system will register prospective buyers and alert attendees to the status of successful bids and, at the end of the day, generate customized purchase agreements for closing.

To support the application, about 45 Compaq Computer Corp. 386/33 workstations, each with 20-in., high-resolution monitors, have been moved onto the 22nd floor of the Atlanta Merchandise Mart, where the auction is scheduled to take place.

The configuration also includes a Compaq SystemPro 486/33 file server connected to a 30G-byte disk array and a 50G-byte optical disc jukebox. The scanning of the documents was accomplished with two Eastman Kodak Co. and five Bell & Howell Co. scanners, which were able to input more than 46,000 pages per eight-hour shift.

Event automation

In addition to its imaging component, the JBS system will automate other events at the auction, speeding buyers through the high-stakes proceedings.

For example, the system will register prospective buyers, alert attendees to the status of successful bids and, at the end of the day, generate customized purchase agreements for closing.

If the auction system performs as expected, Resolution Trust could conceivably make a lot more use of document imaging in the future, Gilbert said. He noted that Resolution Trust does not yet use an imaging system to support its own back-office operations.

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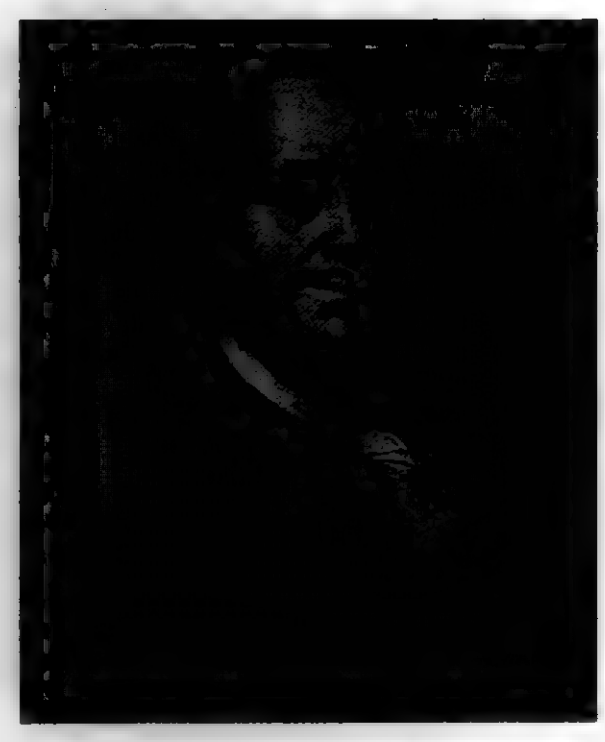
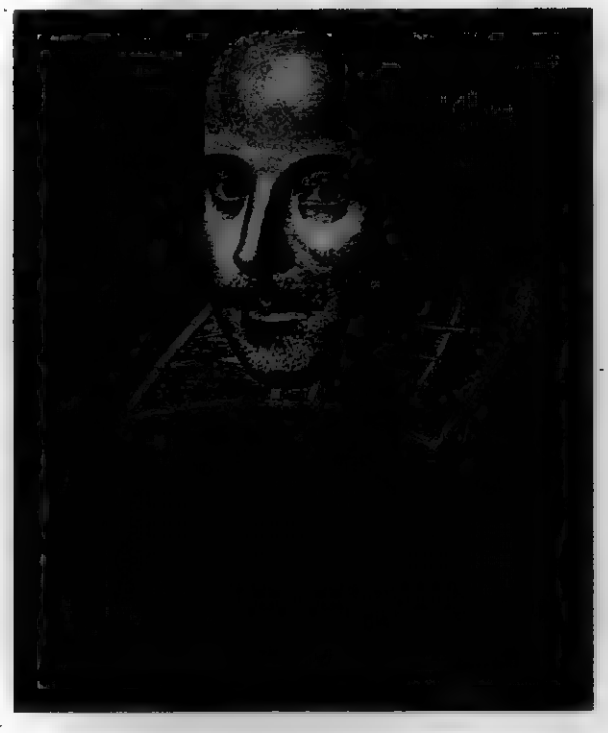


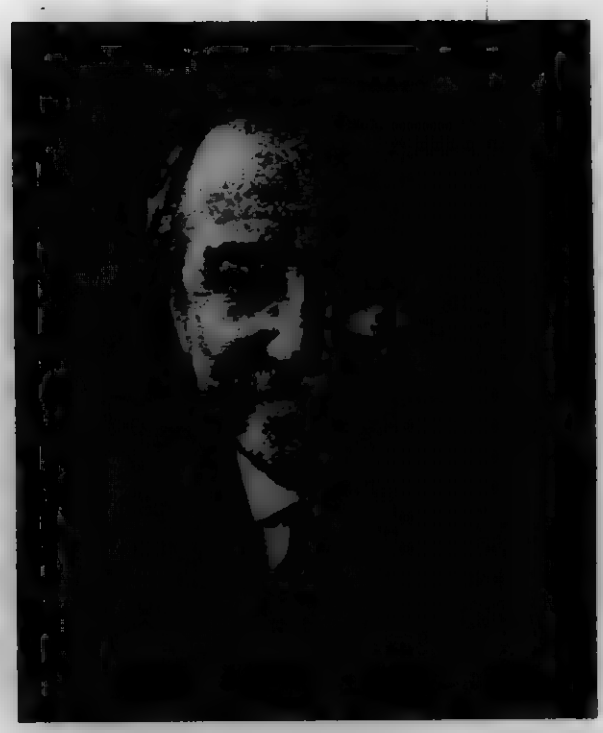
"Electrifying idea, my boy."
Benjamin Franklin



"Thou art a superb writer."
Shakespeare

© 1992 AT&T "Readers responded to the question in Network World's Enterprise Technology survey: "Please vote for the one vendor whose products or services you feel are most interoperable, or are best designed to work in an enterprise network environment."

"Music to my ears."
Wolfgang Amadeus Mozart



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Network World Reader

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AT&T
The right choice.

Sun eyes group coding

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

SunPro, a Sun Microsystems, Inc. subsidiary, last week introduced a suite of graphical code management tools that enable developers to work more easily in large or geographically dispersed workgroups.

The SPARCworks/TeamWare and ProWorks/TeamWare products, scheduled to be available next month on both Sun SPARCstation and Intel Corp. platforms, were designed to ease software version control, release integration and project-building steps. The new tools augment SunPro's family of SPARCworks and ProWorks development environments. Pricing starts at $995 for a single-user network license, with quantity discounts available for 10-, 25- and 100-license packages.

The code management tools are intended to "hit a part of the market that's been missed by us and others: easy-to-adopt parallel development tools for workgroups," said Jon Kannegaard, vice president and general manager at SunPro.

"In software development, collaborative work is the norm. This product fills the void between basic Unix source control utilities and expensive, complex configuration management systems," Kannegaard said.

The TeamWare tools reportedly let software developers distribute and coordinate their work in networked development environments. Teams can work on multiple releases at the same time, integrate change from many developers, reuse code and build project components in parallel.

TeamWare lineup

TeamWare includes four separate but integrated tools:

- **Code Manager** — for graphical project integration and release management.
- **VersionTool** — for inspecting and managing multiple versions of source files.
- **CheckPoint** — for capturing source file configurations for later retrieval.
- **ParallelMake** — for accelerating project builds.

One customer beta-test site is Kodak Digital Systems Center in Rochester, N.Y., which is using the TeamWare tools to develop software programs called raster image processors. Containing up to 200,000 lines of code each, the raster image processors handle the processing needed to produce high-quality printed images on advanced laser printers.

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"SPARCworks/TeamWare enables two or more engineers to work simultaneously on the same code, then merge it into a single source," said John DeHority, a senior software engineer at the Kodak center. "Given the heavy competition and pressure to market in this industry, that's a tremendous advantage."

The Kodak center is introducing the SunPro tools to additional development teams, with the aim of making the package a development standard for the 200-engineer staff, DeHority added.

Developers at Chicago-based Andersen Consulting are also using the TeamWare tools. They are building advanced applications for an engineering company client. More than 20 developers are working in parallel and reusing class libraries and objects, said Larry Podmolik, technical manager of the Andersen project.

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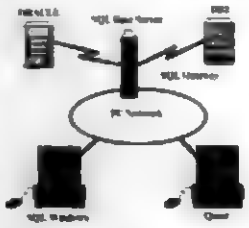

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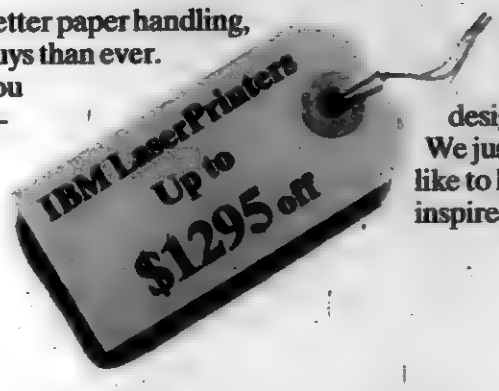

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E R S P A G E S A H E A D

Tech Talk

Bellcore honors

Bellcore honored two of its own last month, awarding Dennis Egan and Leonard Forys the research and development organization's annual Fellow Award. Egan, director of information sciences research, was recognized for his work on Bellcore's SuperBook electronic browsing system; Forys, director of communications technology and traffic analysis, was noted for his work on "traffic synchronization."

Massive problem

Can massively parallel processing (MPP), a supercomputer architecture showing promise for some kinds of scientific calculations, help commercial customers? Yes, said scientists at Thinking Machines Corp., which last month demonstrated the ability of an MPP to compute predictions for both a 100,000-point "chaos" physics problem and a currency exchange rate problem composed of 30,000 individual exchange prices.

New storage

A spin-off company to commercialize the use of holography for data storage was announced last month by The Microelectronics and Computer Technology Corp. (MCC), the R&D consortium in Austin, Texas. The new company, Tamarack Storage Devices, Inc., plans to have its first products ready by the end of 1993. In holographic storage, data is recorded on film or crystals in the form of a three-dimensional hologram; with a multiplexing scheme, multiple holograms can occupy the same physical space. For instance, 30 to 50 pages can be recorded in a single crystallite about 1mm in diameter and a few millimeters long.

Tiny probe

IBM researchers have developed a probe for inspecting the smallest surfaces of integrated semiconductors without damaging them. The technique is a variation of scanning force microscopy, which measures the attractive force between the probe tip and the nearby chip surface.

PCMCIA gains new respect

Standard-based cards could replace current bus interfaces

By Michael Fitzgerald

THE BIGGEST LITTLE ACRONYM in town these days is PCMCIA, which stands for Personal Computer Memory Card International Association.

PCMCIA cards got their start as flash cards, programmable solid-state integrated circuits that could be used as random-access memory or other types of storage. The standards group that gave the flash card its name formed in 1989, and three years later the software and hardware standard is effectively in place.

"This hasn't been much of a user issue to date because cards haven't been available," said Leslie Fiering, an analyst at the Gartner Group, Inc. in Stamford, Conn. "It's been real for about six months, though, and you'll start to see a lot of products next year."

PCMCIA predictions

Total PCMCIA card sales*	
1991	2.7 MILLION UNITS
1992	3.6 MILLION UNITS
1993	7.3 MILLION UNITS
1994	13.1 MILLION UNITS
1995	21.2 MILLION UNITS

* Figures represent all cards in the credit-card size form factor. One-third to one-half of all cards sold today are PCMCIA-compliant, but by 1995, they will account for almost all cards sold.

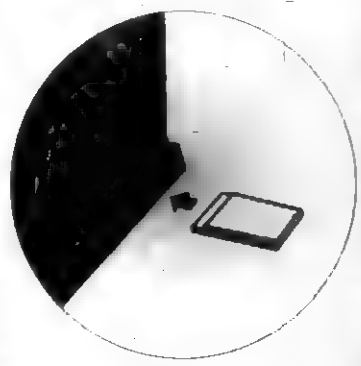
Source: AP Research — CW Chart: Janell Genovese

Because PCMCIA cards are small, use very little power and have no moving parts, they make ideal devices for the portable environment. PCMCIA cards include Type I, Type II and Type III, which measure 3.3mm, 5mm and 10.5mm in thickness, respectively. The Type I card has been used for memory, Type II for memory and I/O devices such as modems and Type III for larger I/O devices such as disk drives.

They offer users some interesting possibilities in terms of new products.

Some of the possible uses of PCMCIA technology are still being developed, but one that is likely to hit the market in 1993 combines software and hardware on the same card. For instance, a PCMCIA modem card could also include communications software bundled with it.

There is also the possibility that PCMCIA could replace the various



bus interfaces now in use, such as AT, Micro Channel Architecture and Extended Industry Standard Architecture. "We think this is a packaging and interface standard," said Robert M. Carberry, assistant general manager at IBM's Entry Systems Technology Division.

"PCMCIA is not a technology, it's a standard," agreed J. Michael O'Dell, vice president of systems development at Dell Computer Corp. O'Dell said PCMCIA has its primary place in portables right now but could work well in an expansion station format.

Carberry said IBM plans to produce a number of cards and is likely to build machines with both the PCMCIA and conventional buses in the future. He also said PCMCIA cards would fit in well with speech recognition in the future.

IBM is working on prototypes of its version of personal digital assistants that may use some speech recognition capabilities for simple commands such as opening files. Building these capabilities onto the tiny PCMCIA cards would give such handheld devices more storage space.

At Comdex/Fall '92, some 40 companies displayed products, and up to 100 cards were shown, according to Brendan McGuire, executive director of the PCMCIA.

The majority of these were flash memory cards, which hold up to 20M bytes of data, and communications products, primarily modems and fax/modems. Wireless modems and LAN adapters were also shown in the PCMCIA form factor, and some companies showed hard drives that fit directly into PCMCIA sockets.

Full deck: Most of the 100 or so PCMCIA cards demonstrated at Comdex/Fall '92 were of the flash memory variety. But showing the broader potential of this interface standard, other cards on display functioned as modems (wired and wireless), LAN adapters and hard drive interfaces.

While PCMCIA cards, including some popular application programs, have been available since 1990, the challenge has been to achieve interoperability. PCMCIA cards have to work like floppy disks and have not done this with any degree of consistency before.

Hardware vendors have generally not adopted PCMCIA drives in droves, either, because of interoperability concerns. Early adopters of PCMCIA technology include AST Research, Inc., which has two PCMCIA drives as well as a floppy in its Power Exec line of notebooks. NCR Corp.'s 3170 notebook and the Dell 320SLI have PCMCIA drives for input only.

Hardware support should increase, though, because the PCMCIA recently implemented new specifications for card services and socket services. These software initiatives will help establish important input standards and should improve card interoperability.

On the desktop, too

Even desktop computer makers see a use for the PCMCIA slots. IBM picked Comdex to show its next-generation PC, which had four PCMCIA slots — two in back and two in front. Also rumored to be working on PCMCIA-based desktop machines are Zenith Data Systems, Acer Corp. and NCR.

"I think the reason you're seeing such an explosion of products coming is that PCMCIA II is nailed down," Fiering said.

Still, as PCMCIA struggles to establish itself firmly as a standard, some efforts could give the industry pause.

Intel Corp. has announced an exchangeable card architecture (EXCA) effort, a variation on the PCMCIA standard. McGuire and Intel, which participates in PCMCIA, took pains to say that the EXCA effort does not compete with the PCMCIA standard but rather is an implementation of it that works for X86-based computers.

It remains to be seen, however, if non-EXCA cards will operate in the Intel environment, though, or how widespread EXCA will become.

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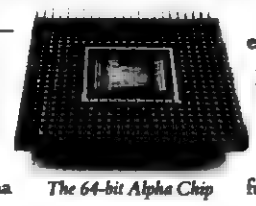

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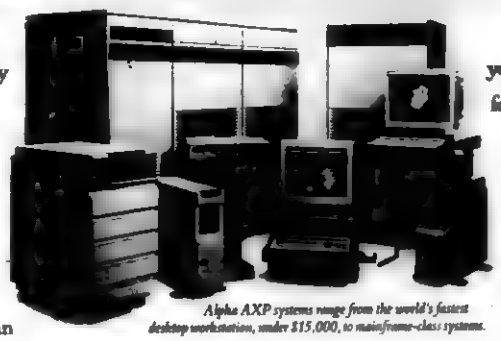

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Lion vs. lamb

It's taken a very short time for outsourcing to shift from being a chief information officer's nightmare to a politically correct management tool. But I get the feeling most CIOs are making the transition grudgingly.

Last week's well-attended Outsourcing Conference in Boston pointedly highlighted the mixed emotions most information systems people are still feeling about this subject. The room was packed with IS executives who heard a lot of talk about the importance of partnering with outsourcers and the value of selectively outsourcing nonstrategic IS functions. They were told that their new role will be to manage outside contractors who will increasingly become integral parts of their organizations.

Yet there was also much talk about lengthy contract negotiations, hidden charges and the need for lawyers to go over every drop of ink on the pact between outsourcer and client. Gartner Group's Rita Terdiman warned of the practice of some outsourcers to slide in hidden incremental charges that can swell contract payments. She told of one contractor who tried to sneak in a clause committing the user to negotiate those payments only after the deal was signed. Some partnership.

And while there was no shortage of speakers from the user community to tell of the benefits of strategic outsourcing partnerships, an unsettling number of them didn't come from the IS world. "It's always the CFO who gives those speeches," grumbled one IS vice president who's attended several conferences on this subject. Other IS executives I met at the conference voiced similar sentiments.

So goes this awkward new dance between IS executives who have historically seen EDS as being in league with the devil and outsourcers who are trying to warm to the notion of working cheek by jowl with the very IS executives they would like to replace. The good news is that the relationship is improving. "In the last year, the number of questions I've received [from CIOs] on outsourcing has doubled if not tripled," Terdiman said. Selective outsourcing should indeed be an arrow in the IS quiver, and when applied selectively, it can help get runaway budgets under control.

But the idea that the typical CIO and the average outsourcing vendors are going to be drinking buddies anytime soon is pretty farfetched. Remember that outsourcing is still a business relationship from which the vendor stands to gain as more and more of the client's internal functions are handed over. As long as there are vendors whispering in the CFO's ear about all the money that could be saved by simply getting rid of the IS department, there will continue to be plenty of CIO suspicion.

In short, this talk of partnering is still mostly talk. Don't expect the lion and the lamb to lie down together anytime soon.

Paul Gillin, *Executive editor*

GUI Scorecard not a fair comparison

As a graphical user interface (GUI) user, I read with interest your Buyers' Scorecard on the four leading GUI choices [CW, Nov. 2]. However, it is hard for me to see what you actually compared.

The Open Software Foundation's Motif is not a complete GUI — it is a style guide and a tool kit. A complete Motif GUI comprises a Motif Window Manager, a desktop/file manager (such as X.desktop) and some user productivity tools (editor, mailer, etc.).

OpenLook is similar to Motif but on a Sun (the only place you can get it). It comes as part of Open Windows, which includes a great deal more.

From the results of your study, it would appear that the Motif users were using a whole variety of systems. In addition, the price quoted for Motif — $1,000 — is the price for the source code license.

Most users get Motif free on their hardware, or pay a few hundred dollars for a complete Motif environment on their Sun.

Next time you publish a similar scorecard, please compare apples with apples or specify more clearly what is being evaluated.

Ray Anderson
Founder/CEO
IXI Ltd.
San Ramon, Calif.

Quote misses the information boat

"Gurus offer pearls for IS pilgrims" [CW, Oct. 26] had a quote from Peter Drucker that left me perplexed: "IS professionals think that information is [their] job, but [their] job is data. Information is the user's job — [IS professionals] can only provide the raw material."

Granted, the total utility of any information, at any one point in time, is only realized by the end user of that information. This does not, however, relieve the IS professional of his primary responsibility: to act as a steward of pertinent information, not raw data, for his organization and to thoroughly understand the mechanisms for enhancing the utility of that information.

Drucker is correct in questioning the productivity gains, or lack of them, that have been brought about by relatively large information technology expenditures. His assertion that the solution to this problem will come about when IS professionals shirk all of their information management and stewardship functions is not correct, however.

The delegation of these functions to the end-user community will only serve to further degrade the organization's information resource, resulting not in productivity gains but greater productivity losses.

Nicholas V. Cross
Arcata, Calif.

Out of control

To paraphrase a recent shampoo commercial, "Don't hate me because I'm an auditor." However, the message espoused by Harvey R. Shrednick in the Viewpoint article "Dismantle the pyramid and share power" [CW, Nov. 9] is enough to strike terror in the hearts of any information systems control professional.

Shrednick states, "I can't ask the managers, supervisors and directors in the organization to give up control unless I'm willing to do the same." Like a ship without a helmsperson, over-empowered organizations can end up running in circles.

Isn't the real management challenge to determine where the hierarchical "chain of command" is inappropriate and make changes, rather than attempt a 180-degree turn at high speed?

What may appear effective to a systems development team at a given point in time may be totally ineffective from the overall organization perspective.

I'd suggest that Shrednick consider adding another word to his new vocabulary — guidance. Successful managers have been delegating, authorizing, enabling and permitting since time began.

Sounds like the major challenge for us auditors is to try to keep the senior officers from letting go of the helm and going overboard!

John D. Tongren
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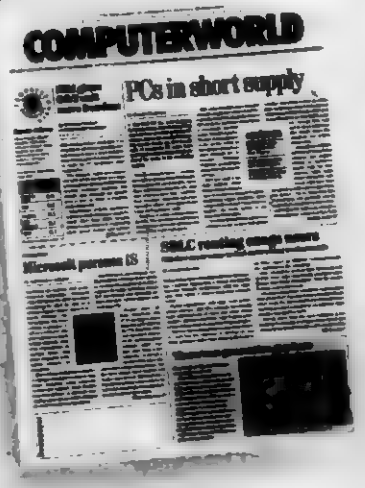

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- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 60. Sys. Integrators/ VARs/Consulting Mgt.

CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 80. Educator, Journalists, Librarians, Students
- 99. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/ communications systems? (Please check only one)

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Quality can stop dirty data

Alastair McKeating

I didn't know whether to laugh or cry when I read about the actions IS managers are taking to correct data pollution [CW, Sept. 28]. Sixty percent of IS managers have dirty data, and the most common response is to replace problem equipment. That's like me blaming my golf clubs because I can't break 90.

The second most common solution is sampling and analyzing data. It's better, but it still doesn't solve the problem. Then comes forming a task force. Same thing. Next, there's backing up the bad data so we can get back into the same mess in the event of a disaster. 'Nuff said. It isn't until you get down to fifth place that anyone even talks about addressing data quality.

From my view, there are three main causes of bad data: redundancy, poor definition and poorly defined creation and collection processes.

I have worked in companies where data from the same form was input 15 to 20 times. Keying errors are inevitable in that kind of situation, but what's even more insidious is that the same business event is often recognized several times from the perspective of several interested parties.

Different departments frequently use different names or numbers for the same part. One department may recognize a customer as a corporate entity, while another thinks of each office as a separate customer.

A corollary of redundancy is poor definition. The meaning of data is rarely obvious, yet most

data dictionaries are hard-pressed to provide more than one line of definition for each data element. Defining SALE DATE as "the date of a sale" is worse than useless because it gives the impression that the definition is understood and accepted.

To many people, especially programmers, this discussion is too esoteric. To them, a customer is merely a record identified by a six-digit number and as long as you use unique identifiers, the problem is solved. But randomly assigning a unique number to customers as they are added to the database does not prevent adding the same person several times.

What it finally comes down to is what we really mean by data quality. Is it enough simply to be consistent, or is there a higher test, such as reflecting reality?

In my experience, once a field has a value — "$33,500" or "Smith, Jane," it generally maintains that value, whether or not it tells the whole story or reflects changing facts.

What we need to ask is this: whether credit-card holders have received a raise since their application was approved or whether Jane changed her name when she married. To answer these questions, we need to examine the processes that we depend on to collect, enter and update data.

Keying errors will be the least of our problems if we continue to ask overburdened clerks to collect a multitude of demographic data while doing their regular jobs. Depending on employees and customers to fill out forms and update information isn't the answer either.

Salespeople are interested in making sales; filling out forms takes time. If we want to clean up our data, we have to be ready to assign the resources needed to define it and ensure its ongoing integrity.

McKeating is a data architect at The Prudential Assurance Co. in Kitchener, Ontario.

It's time to take vendors to task

LISTEN UP! *by* Elaine Bond

This is a call to action for all users. It's time for us to unite and speak up, to shoulder our fair share of the work load, to understand and define what we want from vendors, to reconcile our differences and to express our needs in a coherent, prioritized manner.

Why now? There are many reasons, but chief among them is the multiplication of both products and requirements.

Although multivendor computing architectures have been evolving for more than a decade, the last few years have brought a mind-boggling diversity of components and suppliers.

This is good news in that we are benefiting handsomely from the innovation, lower costs and functional richness that competition is compelling vendors to provide. It is also bad news, however, because with so many vendors, we seem to have lost the ability to influence what they deliver to us.

There is also no longer a single user point of view. The technology is no longer isolated in the data center, where it affects only a few IS professionals. It is widely deployed in our organizations. Now, technology touches many people directly. They have opinions and they have needs.

In the earlier, more serene world of massive mainframes and mighty minis, the IS professionals spoke for everyone, and vendors not only listened but also worked to resolve architectural and integration issues. Now the technology in our companies is widespread. Individual employees, business units, customers and suppliers all have an influence on what we deploy.

The architectures within our enterprises are moving toward an "any-to-any" infrastructure capability. This is cause for rejoicing because it means that within the foreseeable future, we will finally have a computing capability that permits the sharing of information or objects across and among organizations. But oh, what a challenge in integration and complexity!

One step at a time

This "any-to-any" evolution (some might say "revolution") is, lamentably, happening in an ad hoc manner: one user at a time, one application at a time, one location or region at a time. Not a very pretty or efficient approach, and unfortunately, a rather painful process. Factor in the rate of technology change, and it becomes downright ugly.

Is there a better way?

Theoretically, a robust, responsive, energetic standards process could help enormously. But there are many standards groups, and they (understandably) inch out effective results, which take even longer to be reflected in products. There is also a question as to when to standardize on what, if technology is changing rapidly.

But an even bigger issue is that standardizers tend to be technically skilled people and rarely represent business or senior levels of user management and their pragmatic concerns.

The reality is that users are getting what vendors see fit to provide, and that is no longer enough. But if we want to change that reality, we have to speak up.

If we can say what we want and say it in convincing volume, vendors will respond. Competition will assure that. I'll guarantee some vendor right now is avidly seeking such opportunities.

My company feels strongly enough about the validity and importance of defining user needs for vendors that it is allowing me, in my own "distinctive" style, to help organize an independent effort to achieve it. We founders call it Open Users Recommended Solutions, or OURS, and it is a don't-miss opportunity for both users and vendors to collaborate positively — and profitably.

Is anyone out there listening?

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank NA, where she previously served as senior vice president, corporate systems executive, for 11 years. Bond is a founder of the recently formed user advocacy group called Open Users Recommended Solutions.

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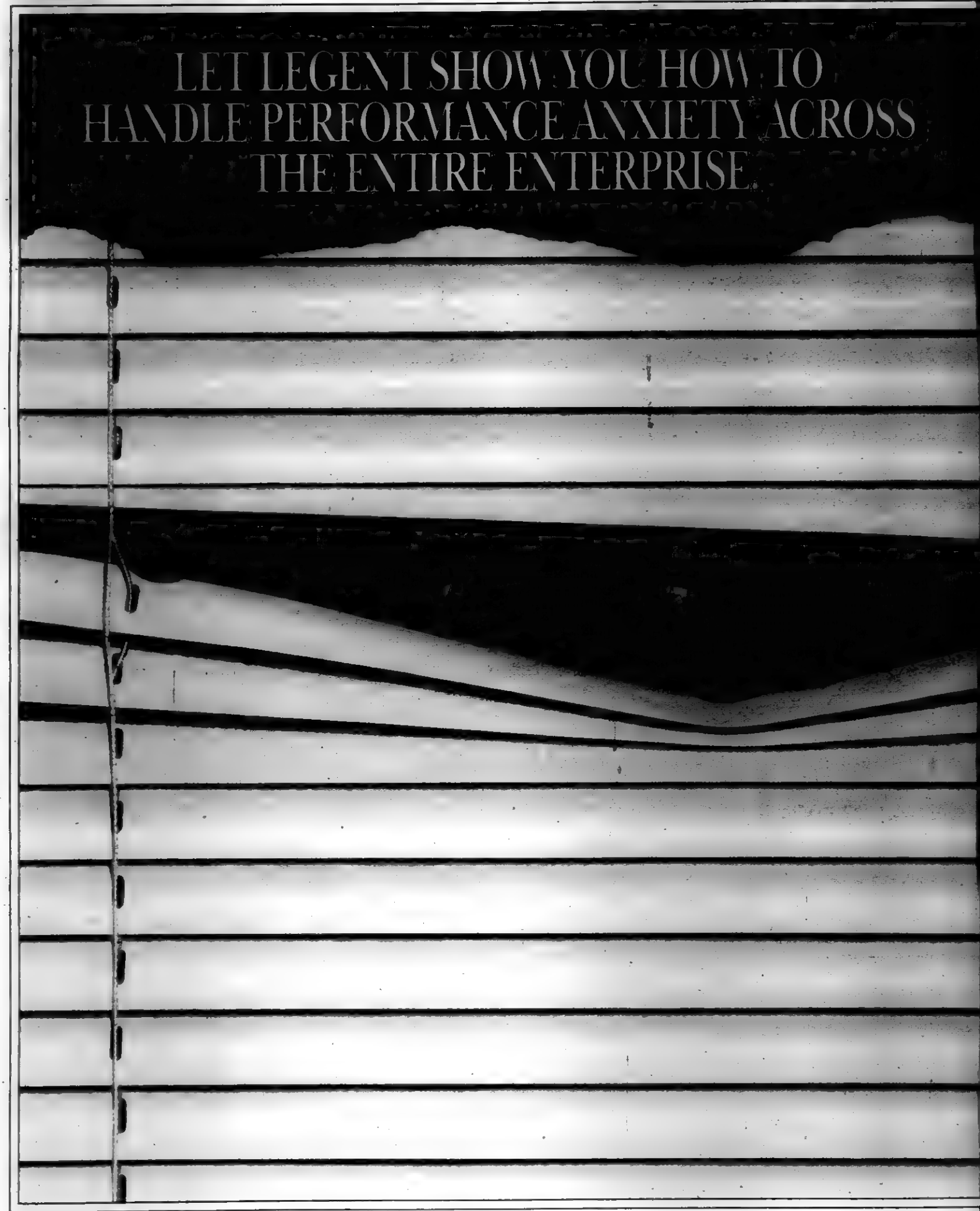

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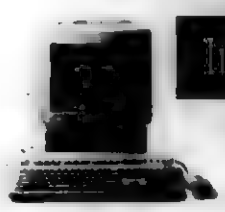

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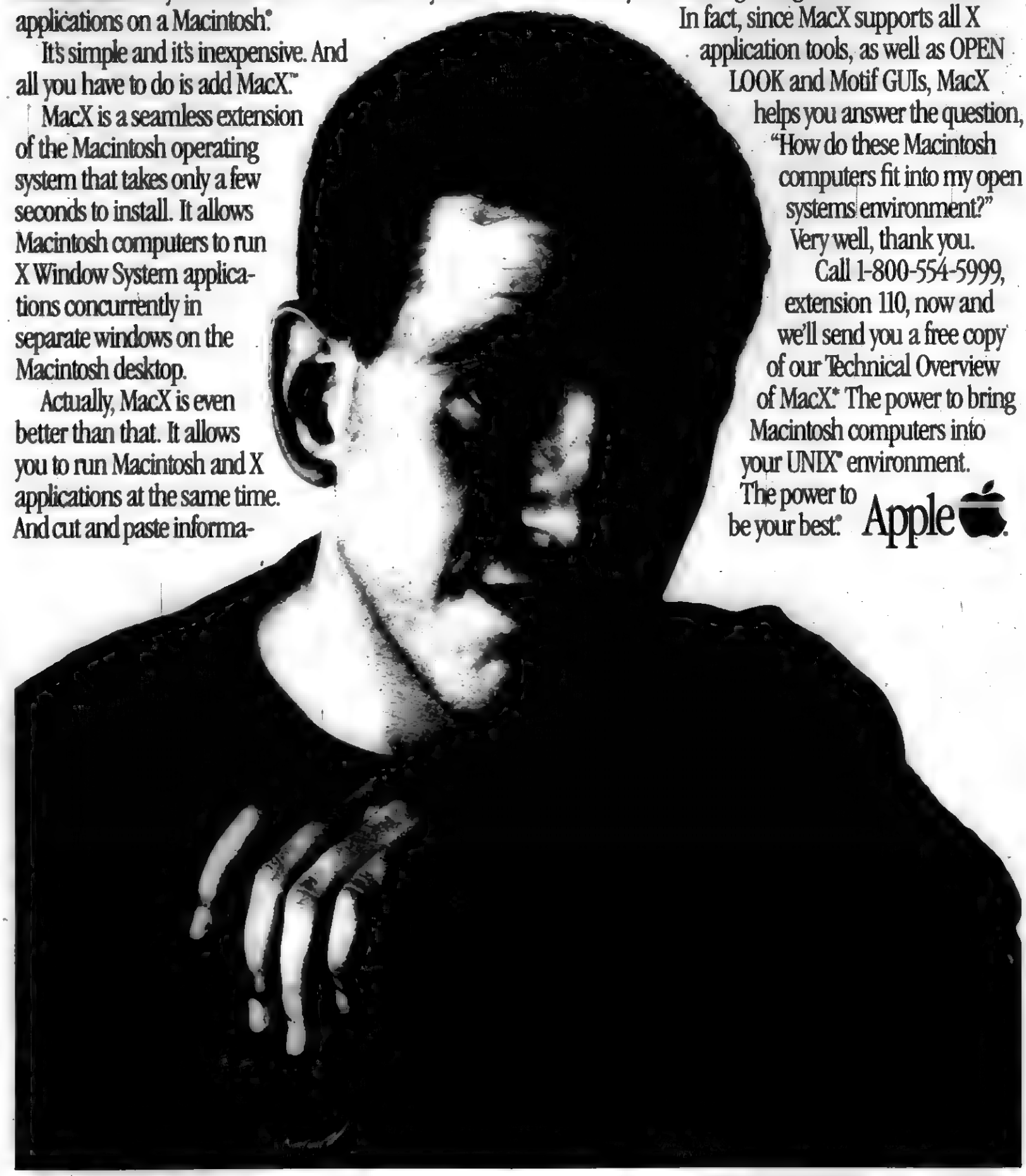

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[redacted]

Charles Babcock

Hard lessons

I carry with me a June 19, 1968, issue of *Computerworld*, all 16 pages of it, as a reminder of how changes sweep through the computer industry. The Page One headline reads, "First patent issued for software, full implications not yet known."

The first software patent, issued to Martin Goetz, vice president of Applied Data Research, marked the birth of the independent software industry.

The next two decades saw rapid growth, with software companies racking up 25% to 30% annual revenue increases. Quickly becoming giants were Cullinet Software, Management Science America, McCormack & Dodge, Software AG, Computer Associates International, Applied Data Research, Cincom Systems and Information Builders. With the exception of a young upstart named Oracle Corp., they were all mainframe software companies.

These firms, with their continuing investment in software development, were an industry resource. They extended the basic system software provided by IBM and added a rich catalog of applications.

The sudden demise of many of them in the second half of the 1980s contains lessons on the strengths and weaknesses of our industry.

By the mid-1980s, the presence of millions of PCs had begun to impact IS operations, so it is easy to conclude that these companies were destined to go the way of the mainframe — doomed to be downsized, replaced by newcomers or just out. Yet if this were true, then all the mainframe companies would have suffered the same fate, when in fact several survive and prosper.

Indeed, for those producing mainframe software, business is good and several newcomers are larger than the former giants. Examples are Legent, which is now a $350 million a year company, and BMC in Sugarland, Texas, a $400 million-plus company.

The survivors found strength in a diversified product line and moved toward multivendor capability at an early date. They extended their core products to the DEC VAX, Unix workstations and sometimes to MS-DOS PCs. By the mid-1980s, many of the independents were impressed by Oracle's rapid growth and the established clout of Cullinet software.

Software AG with Adabas, Cincom Systems with Supra, Applied Data Research with DatacomDB and Cullinet with the new, improved IDMS-R all made bids for the mainframe database market, as did Oracle. All this activity presupposed a quiescent IBM, which instead launched DB2. Presumption was punished by stalled or declining revenue.

What had looked like a sure thing had become a trap, and not everyone escaped. Applied Data Research was acquired first by Ameritech, then by CA, which also picked up a much weakened Cullinet.

One survivor, Software AG, had a database system with differentiating features and a fourth-generation language, Natural, which could run in several environments. It was also privately held, allowing it to withstand a slowdown in database revenue while reinvesting in Natural.

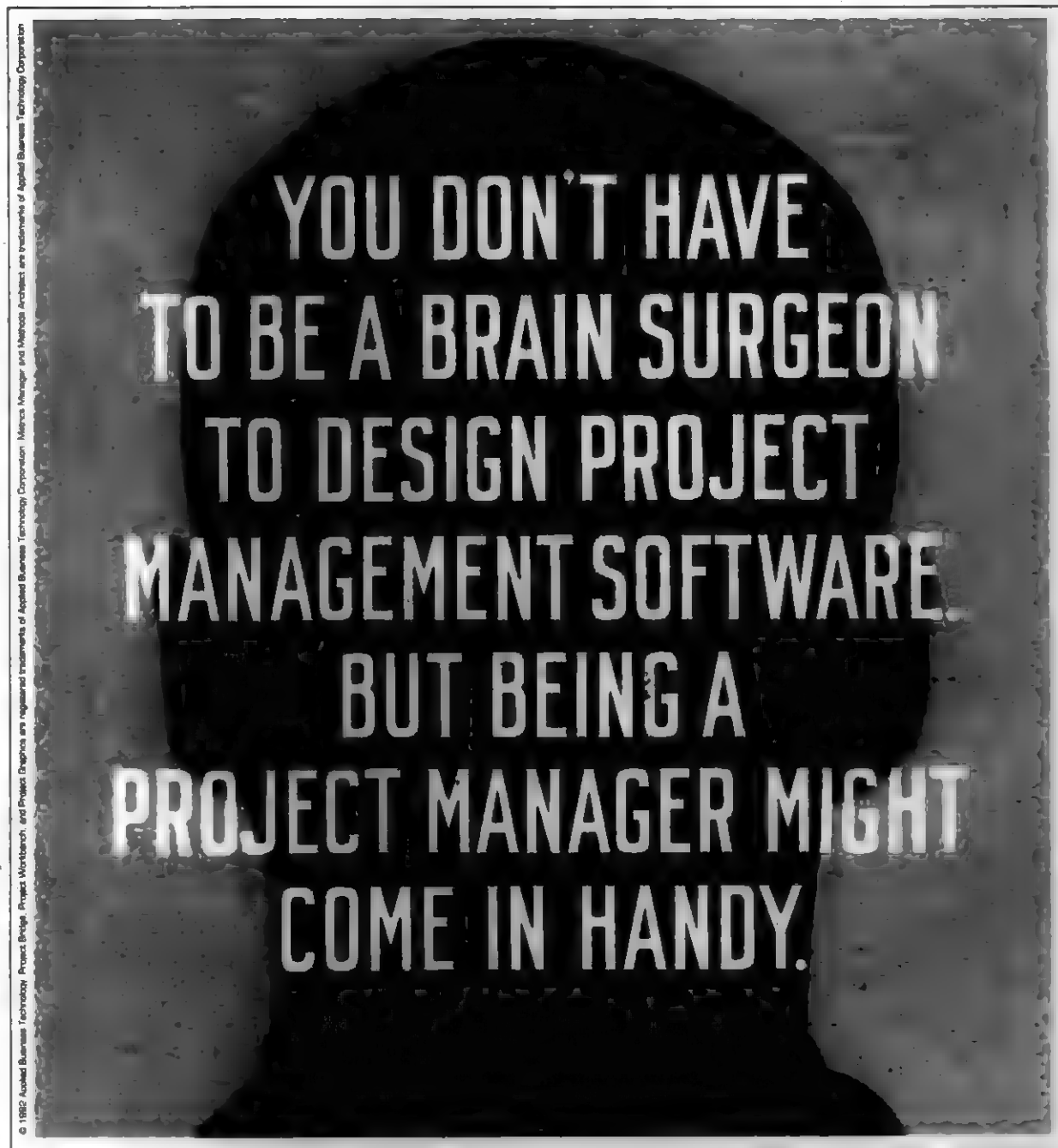
Another survivor, Cincom Systems, had a strong line of multivendor manufacturing software to fall back on, and it, too, remains privately held.

CA, a dabbler in the database market, benefited from the weakened condition of the mainframe firms by acquiring several.

All of these companies thrived when they developed software out of their core expertise, and the widely varying product lines reflected the interest and skill sets of young companies. As they matured, they relied less on their own instincts and more on what proved to be a common analysis of where future revenue would be found, to their own detriment.

The survivors found ways to extend what they could do well beyond the IBM mainframe, and in this way they served their customers best and gained a continued lease on life.

Babcock is *Computerworld*'s technical editor.



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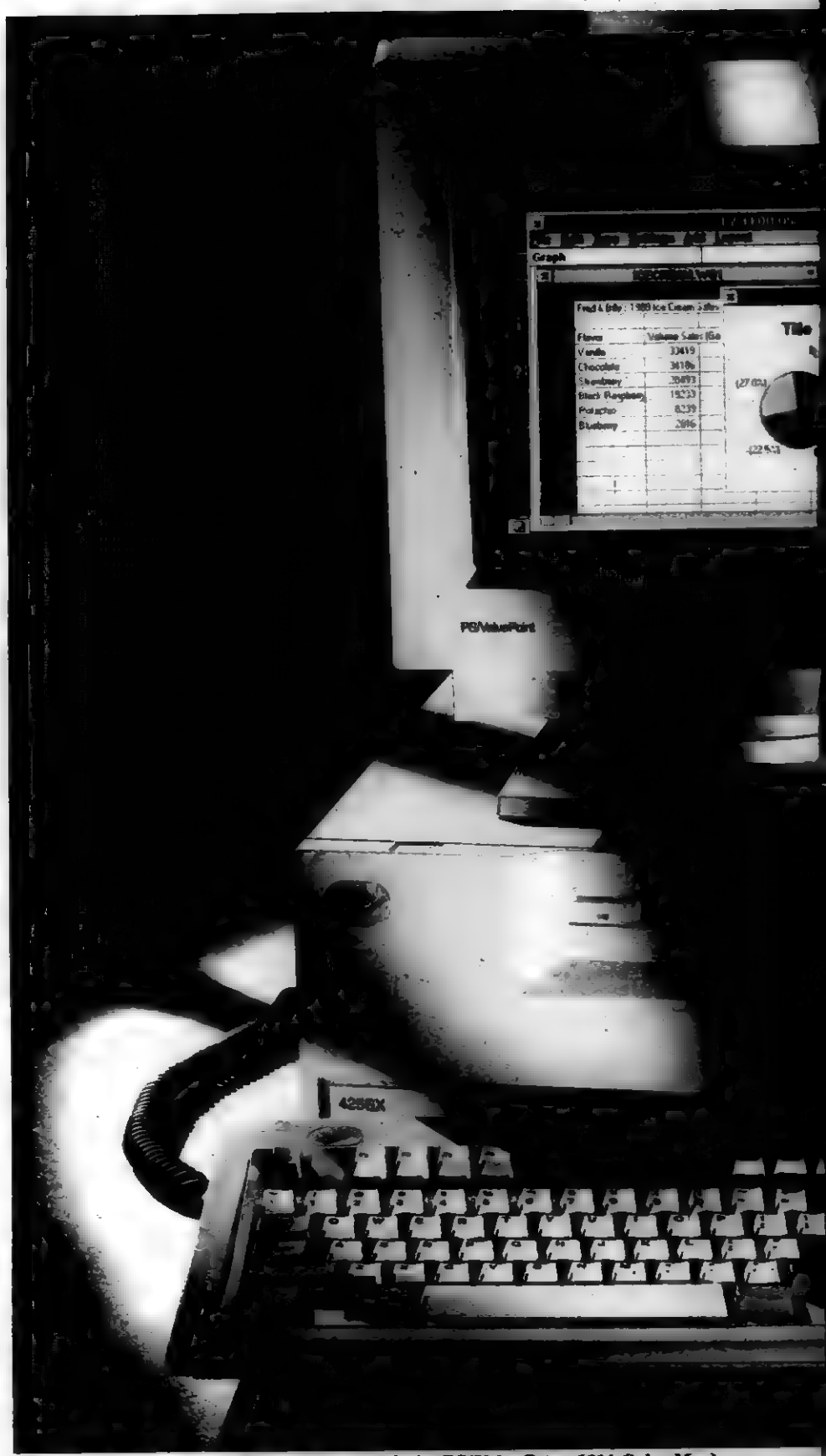

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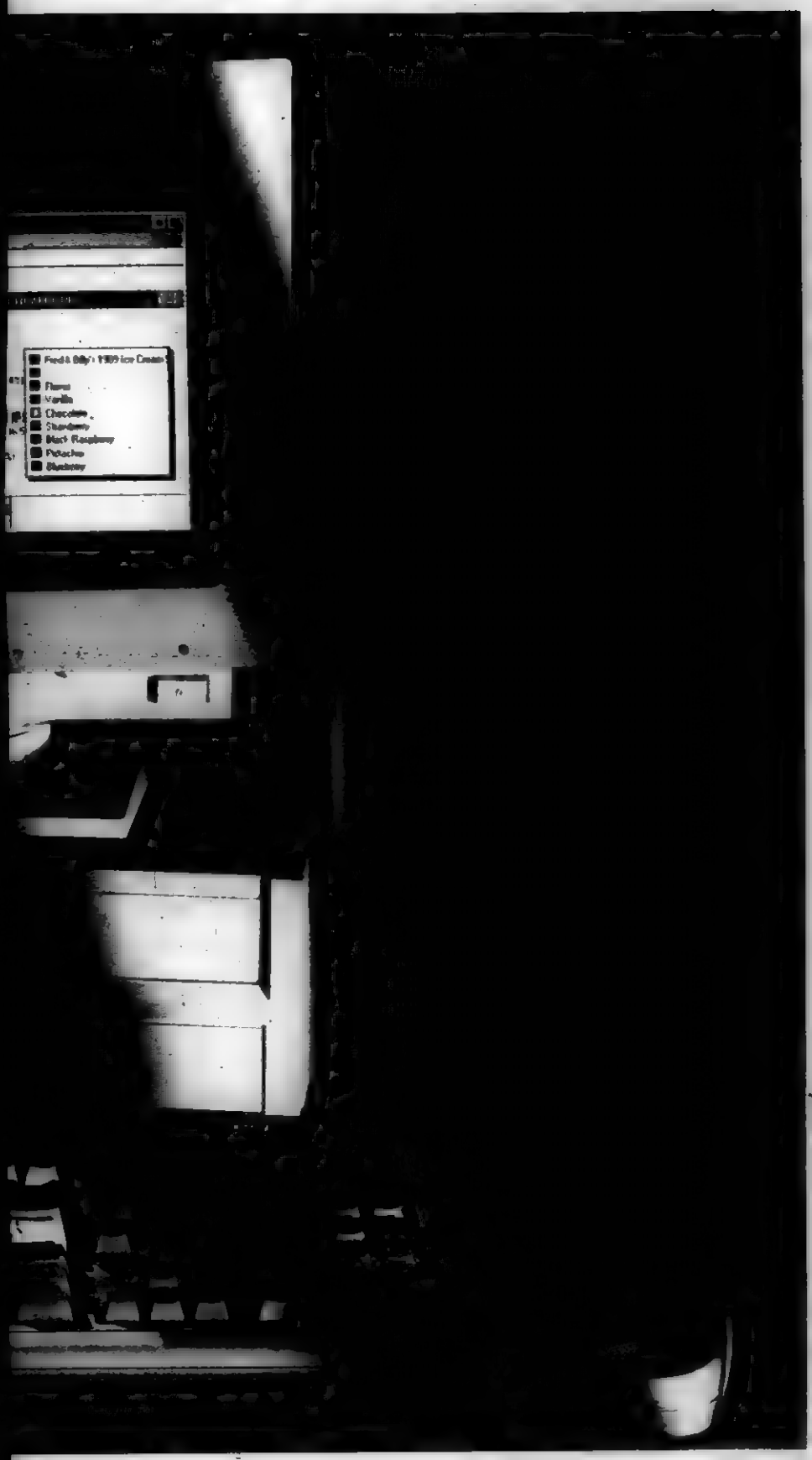

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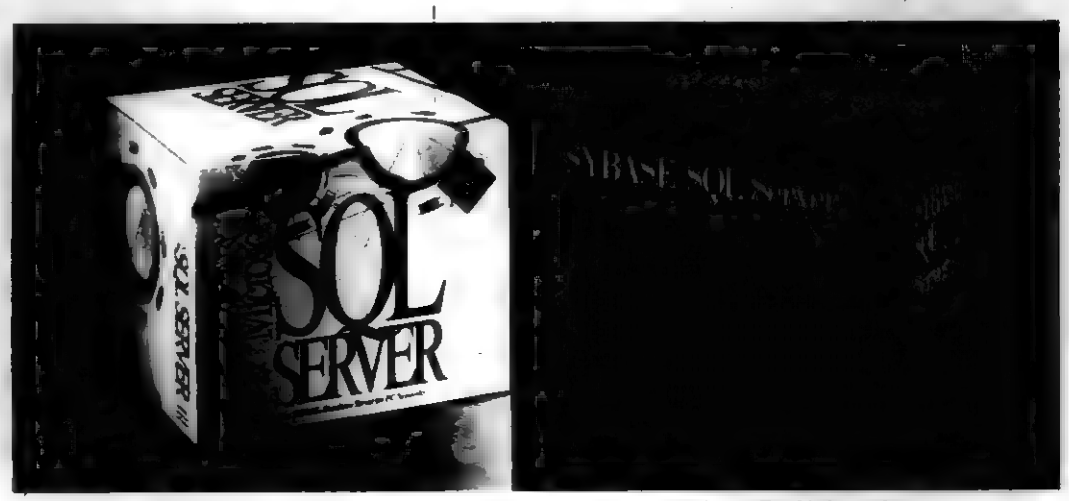

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White Paper

Sales Force Automation

These days, it takes more than a hat full of tricks to boost sales.

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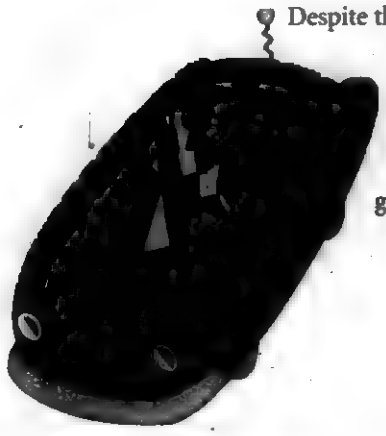
Introduction

It is somewhat surprising to find that sales departments, which directly account for the revenues that drive so many companies, are among the last to receive enabling information technologies. Perhaps it is because sales men and women are often able to tap their own internal resources in times of need.

No mater how talented these indivuduals may be, however, they can improve their performance through the use of Sales Force Automation (SFA). SFA, which includes automated sales support and the integration of sales data with other corporate information, is taking advantage of current computing trends, such as open systems, group collaboration and portable computing, to keep sales people better informed then ever.

Portable computing, in particular, is a bulwark of SFA. Although the bulk and weight of earlier models discouraged all but the most slavish devotees, newer versions — most notably notebook computers — conveniently lend themselves to the requirements of mobile sales forces.

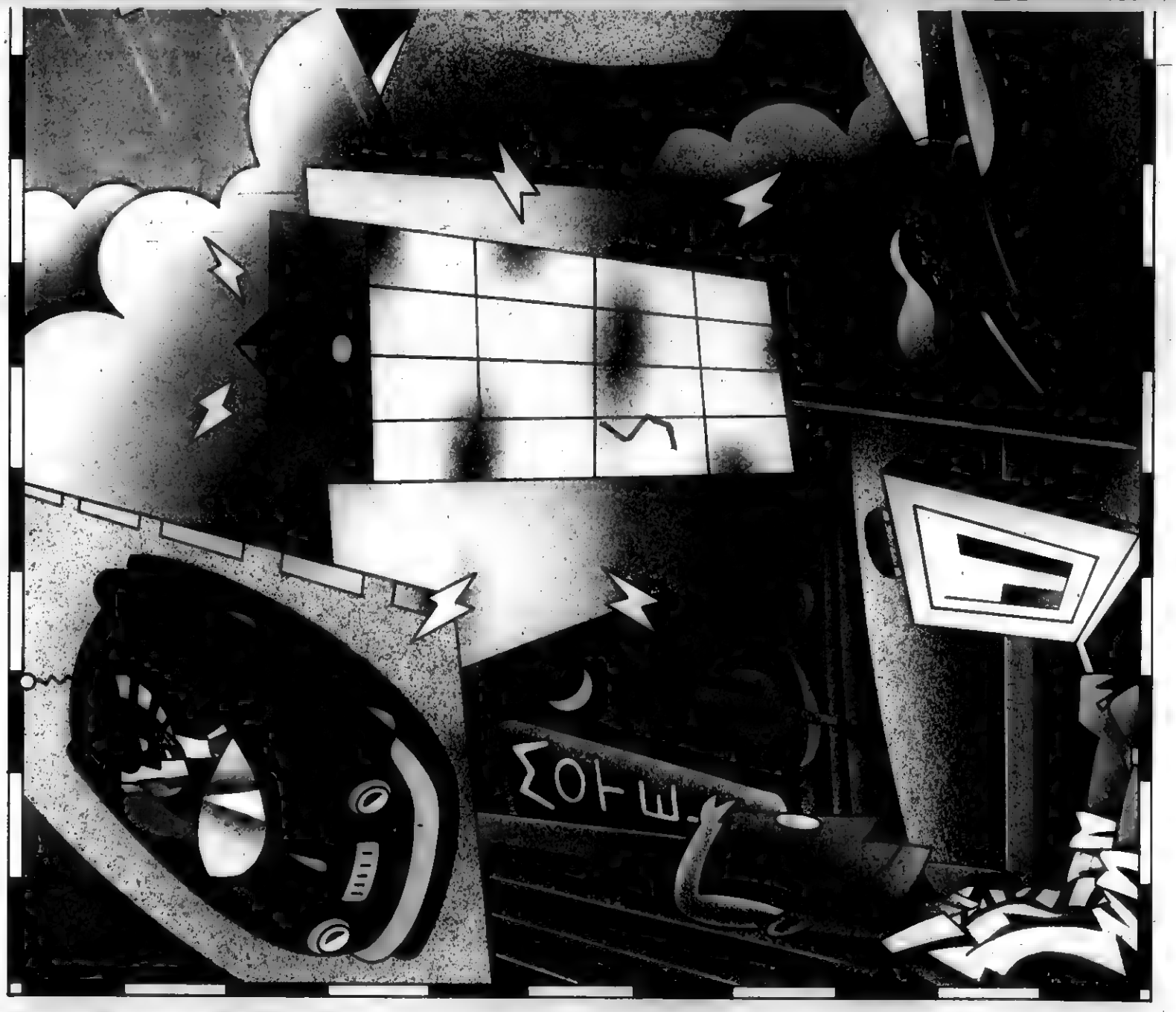
In fact, sales managers interviewed by IDC claim that the new generation of notebooks is enabling them to set unprecedented strategies for the widespread integration of automation.



Despite the gains, however, SFA is still struggling to overcome poor market awareness, general apathy and lack of technical sophistication. The first of these three problems is rapidly improving. Apathy is also giving way as organizations increasingly realize the competitive edge they can gain by empowering their sales forces with SFA.

This White Paper was written independently of the Computerworld *editorial department by Clare Gillan, manager of the Applications and Information Access Program with IDC.*

For more information on the White Paper Program, please call 508-879-0700.



White Paper

The convergence of economic issues and technological advancements is moving the sales function into the IS limelight. In the wake of this convergence, automated sales support and the integration of sales data with other corporate information — Sales Force Automation (SFA) — have become necessary tools for many companies.

Other tools — lightweight portable computers, intuitive graphical user interfaces, open access to heterogeneous data, and advances in communication technology — are all stimulating broad demand for SFA applications considered too complicated for previous technologies.

SALES FORCE AUTOMATION

Despite this demand, however, sales has been one of the least automated areas in business. That is finally changing as tough economic conditions force companies to reduce costs, optimize resources and improve quality and service. Now companies are turning their attention not

only to sales, but also to related functions such as customer service.

The benefits of a properly implemented sales system go well beyond increasing a sales person's productivity. Sales data is critical to the decision-making process at all organizational levels, from the executive making corporate decisions to the sales representative canvassing a territory.

To date, few companies have successfully implemented comprehensive SFA systems. IDC attributes this low activity to a lack of resources, awareness and know-how among many prospective users. Over the next two to three years that will change as radical advancements are made in technology aimed at improving sales productivity and the quality of customer relationships.

KEY FEATURES OF SFA

SFA encompasses technologies tailored to the sales function, in particular, providing field sales people the necessary automated tools to increase their productivity. Attributes of SFA include territory management, e.g., a customer database, electronic calendar/tickler files, integrated word processing with mail-merge capability, and reporting. More advanced systems may support sales forecasting, two-way communication between the field and group offices, links to external and corporate data, and a high level of reporting and analysis.

The most valuable SFA systems do more than increase the productivity of the individual sales person. The truly influencial SFA systems integrate with corporate information systems and facilitate the flow of information across sales and related functions such as marketing or customer service.

ENTERPRISE INTEGRATION

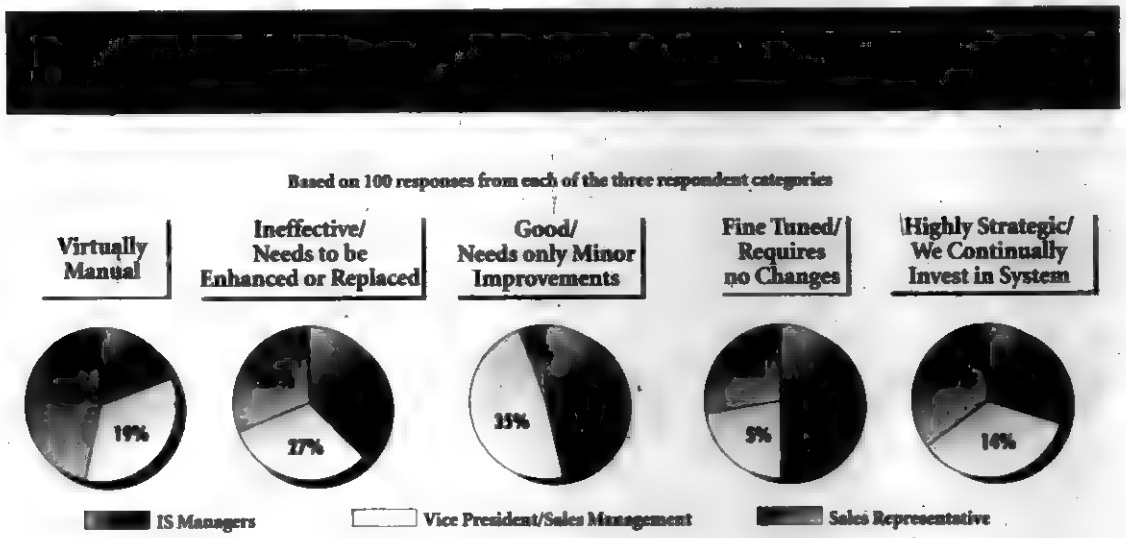
The currently emerging generation of business applications is best referred to as "enterprise integration." The dominant trend of this generation is the act of bringing information and people together. Applications facilitate communication among people and the integration of disparate information located in corporate, departmental and personal databases. Key technologies enabling this movement include:

- Open systems - Open systems promote the deployment of SQL-based applications, data access middleware for access to heterogeneous databases and hardware platforms, and Unix for platform portability.
- Group collaboration - Group collaboration is characterized by integrated office systems — in particular electronic mail — for communicating and coordinating with others; groupware applications like Lotus Notes, which allows people to share hard and soft information: and workflow applications that optimize processes involving multiple people.
- Distributed information - Critical characteristics of this category include client-server technologies, LANs, WANs and portable computers. Wireless communications, allowing access to remote computers without a modem, will also become important as its costs drop.

Sales organizations stand to benefit from these technologies, particularly in companies that embrace the concept of team selling. A recent IDC study indicates that 73% of IS managers at large organizations consider sales to be an integrated part of their corporate IT user community.

THE CURRENT STATUS OF SFA

There are three primary stumbling blocks to SFA: poor market awareness, apathy and a lack of sophisticated technology. Poor market awareness is a problem despite the fact that nearly 100 U.S. vendors provide SFA packages. Unfortunately, the majority of these vendors are small companies that lack marketing muscle. Since active market demand is often a function of marketing

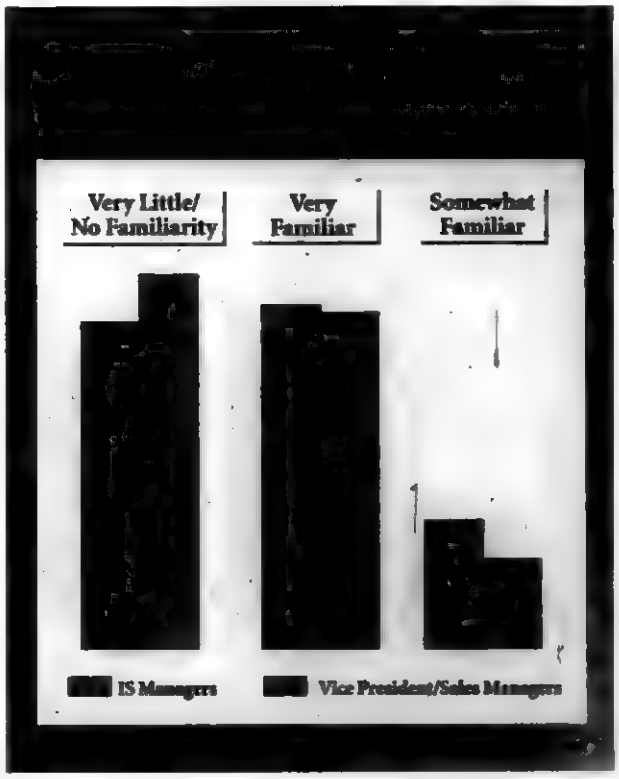


Source: International Data Corp.

dollars spent, corporate focus on SFA has been relatively low.

Lack of interest in this application came partly from the fact that the 1980s was a good decade for business in general. So long as the sales function met its quotas, increasing sales productivity was not a broad market issue. Other business issues, such as controlling inventory overhead and more quickly informing management on its previous month's performance, took precedence.

Perhaps the biggest deterrent to SFA was the lack of sophisticated technology. Only recently have the necessary tools successful SFA implementations require become available. These technologies include lightweight and affordable portable computers, such as Apple's Macintosh Powerbook, intuitive graphical user interfaces and flexible integrated applications. More companies are using them as they attempt to utilize every possible weapon in their competitive arsenals.



SFA ACTIVITY AMONG U.S. COMPANIES

IDC recently interviewed 100 large U.S. companies (5,000 or more employees) regarding their use of sales technology. The participants were senior IS people, vice presidents and senior managers of sales operations and sales people — the three groups generally involved in successful SFA projects.

More than half of the companies consider themselves to be somewhere between "efficient" and "bleeding edge" when asked how they apply IT toward increasing performance and competiveness. IDC estimates that less than 15% of sales-support systems are highly strategic, i.e., instrumental in helping the sales organization and the overall corporation meet or set objectives.

Seventy-five percent of the surveyed companies are in manufacturing; the balance are spread across other non-government, non-education industries. Sixty-six percent of the sales forces are centrally organized, while the others operate on a distributed structure. Fifty percent of the companies rely completely on direct sales people. Another 35% claims more than 40% of their staff focuses on direct sales. Twenty-seven percent have less than 10 sales people, while 38% have more than 10 but less than 50. Only 12 sites have more than 500.

Most large companies support their sales effort with some level of computerized technology. These sales support systems vary in sophistication. Some are composed of a single terminal located in the sales area. This terminal is used to send sales data to a corporate database or a PC in the sales manager's office. It may run a spreadsheet, calculate commission, adjust quotas or forecast sales activity. Although these systems are used in the sales area, their back-office focus and limited integration with a sales strategy strongly reduce their effectiveness.

Investment in SFA is picking up. Forty eight percent of the IS managers interviewed report that they are actively improving automation in the sales area; another 34% are in the planning stages. IDC attributes this increased SFA activity to a reversal of the three previously negative factors holding SFA in check: poor market awareness, apathy and the lack of sophisticated technology.

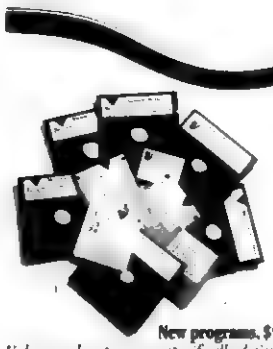
PORTABLE COMPUTING

Portable computing is one the strongest drivers of current SFA activity. Clearly, the bulk and weight of first-generation portables deterred their use in SFA. Even now, despite the advances made in portable computer technology, about 35% of sales organizations in large companies still do not have any portable computers. Of those that do, portables are only used by about one-third of the sales representatives and managers.

This is changing as the allure of portables grows while prices and sizes shrink. Consider Apple's Mac Portable: In August 1991, it sold at an average street price of $3,170 and included 2M bytes of RAM, a 40M byte hard drive and 16 MHz clock speed. The Mac portables have since been succeeded by Apple's Powerbook line of notebook computers. Today the top-of-the-line Powerbook 180 weighs just 6.8 pounds, comes with 4M bytes of RAM, up to a 120M byte hard drive, a 33 MHz processor, and sells for an average street price of $3,595.

Although the price gap between desktop computers and portable computers has not disappeared, it is shrinking to the point where it is no longer an automatic impediment for companies that are serious about automating field sales.

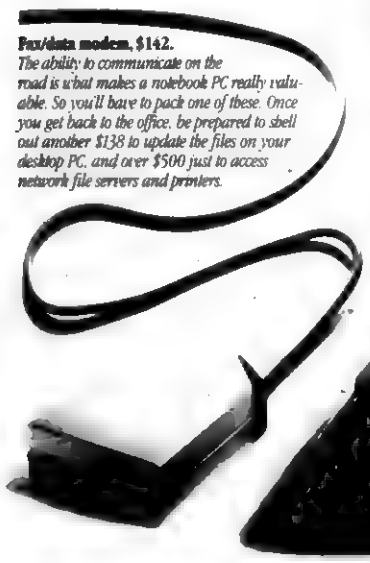
The hard way.



New programs, $506 each.
Unless you buy programs specifically designed for Windows 3.1, you'll have to use conventional character-based programs and their awkward commands.

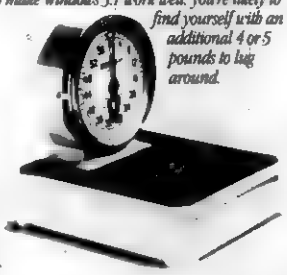
Extra memory, $210. *Most notebook computers in use today simply aren't fast enough to make Windows 3.1 practical. And many that are fast enough may require extra memory, which can add hundreds of dollars to their price tags.*

Clip-on trackball, $172. *If you're going to try to use Windows 3.1 on many portable computers, you may have to plug this in and clip it onto the side of your computer. (Be careful not to catch the cord in your airplane tray.)*



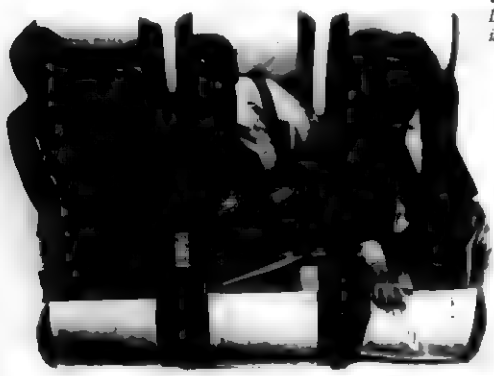
Fax/data modem, $142.
The ability to communicate on the road is what makes a notebook PC really valuable. So you'll have to pack one of these. Once you get back to the office, be prepared to shell out another $138 to update the files on your desktop PC, and over $500 just to access network file servers and printers.

Added weight. *Many notebook computers may claim to weigh less than 7 pounds, but by the time you add all the components you need to make Windows 3.1 work well, you're likely to find yourself with an additional 4 or 5 pounds to lug around.*



Your time, name your price. *Fiddling around with MS-DOS or Windows 3.1 on the road can cost you plenty of time. How much is yours worth?*

Ordinary notebook, $2,497. *The typical notebook computer of today was designed to run DOS only; not Windows 3.1. It doesn't have enough memory, speed or screen brightness, and its screen isn't fast enough for high-quality graphical computing.*



Comfort *is something most notebook computer ads never talk about. Because, truth is, they're not very comfortable to use. Which may explain why they don't win awards for being well designed. (PowerBook, of course, has won more design awards than all other notebook computers combined.)*

Instruction manual, 2 pounds. *There's nothing like forgetting a DOS command when you're 2,000 miles from home, so you may want to carry a manual with you. And since Windows 3.1 is based on DOS, you'll definitely want instructions handy.*

The couch seat factor. *If you want to run Windows 3.1 on most portable computers, you'll find that you need a front-mounted keyboard and a side-mounted trackball or mouse. What you won't find is enough room on an airplane tray to hold it all.*

If you're looking for a notebook computer that's easy to

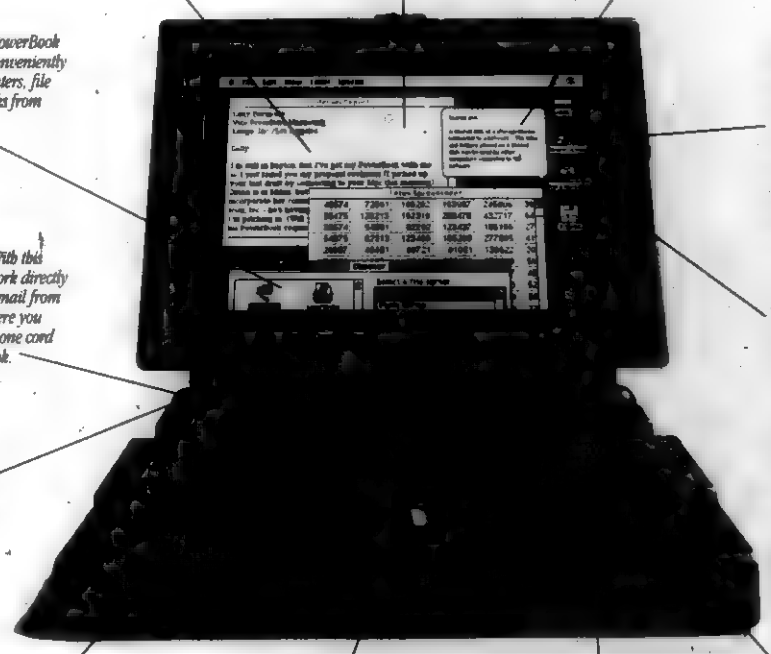
*"This price and all the prices noted here reflect average Manufacturer's Suggested Retail Prices. **Comparisons are based on a 1991 independent research study conducted by Ingram Laboratories that tested a variety of personal computers running applications available for both the Macintosh and Microsoft Windows 3.0 environments. Microsoft Windows is a trademark of Microsoft Corporation. 1-2-3 is a registered trademark of Lotus International Business Machines Corporation. WordPerfect is a registered trademark of WordPerfect Corporation. This ad was created using Macintosh computers.*

The easy way.

Consistent applications. *Every PowerBook runs thousands of Macintosh programs (including Lotus 1-2-3 and WordPerfect) that all work in the same consistent, intuitive way. You learn one, you know the basics of all of them.*

Blistering speed. *Because Apple® Macintosh® computers are optimized for graphical computing, PowerBook® can significantly outperform comparably priced notebook computers running Windows.™*

Built-in Balloon Help.™ *Point at what you want to know about, and your Macintosh will tell you what it's for. So you can leave your manual in a desk drawer at home.*



Built-in networking. *Plug your PowerBook into an AppleTalk® network, and conveniently access all network resources—printers, file servers, e-mail, even other networks from Novell, IBM and Digital.*

Built-in fax/data modem. *With this option, you can send your work directly to a fax machine or access e-mail from almost any telephone anywhere you happen to be. Just plug the phone cord into the back of the PowerBook.*

Built-in peripheral support. *Like every Macintosh, PowerBook lets you add up to six external hard drives, CD-ROM drives, scanners or other peripherals simply by plugging them in.*

Palm rests. *Working on the road isn't like working at your desk. So Apple designers provided a place to rest your hands, making it much easier and more comfortable to work in tight quarters—such as a middle seat on an airplane.*

Integrated trackball. *Everything about Macintosh computers is designed to make it easy for you to work. In the case of PowerBook, the pointing device is integrated into the computer. There's nothing to hook up or clip on. Open it up and you're ready to go. (It's comfortable whether you're left- or right-handed, too.)*

It's compatible. *Like every Macintosh, PowerBook is compatible with the personal computers you use at the office. It can read from and write to floppy disks from MS-DOS or OS/2 PCs, or even run DOS software using programs such as SoftPC.*

AppleTalk Remote Access. *This remarkable software is an option with every Macintosh PowerBook. It not only allows you to access all the files on a modem-equipped Macintosh at your office or at home, it also gives you complete access to your network—printers, files, file servers, e-mail—from anywhere there's a phone.*

Built-in file sharing. *On most notebook computers, sharing information with a desktop computer is virtually impossible. But every PowerBook has powerful file sharing built in. So you can easily connect your PowerBook to a desktop Mac® or another PowerBook and copy files from one computer to the other.*

Built-in sales. *The ease of Macintosh makes PowerBook the ideal tool for salespeople on the road. For information on how you can automate your sales force, call 800-635-9550, ext. 125. We'll send you our free brochure.* Macintosh in Sales.

use, there are basically only two ways you can go.

environments. ©1992 Apple Computer Inc. All rights reserved. Apple, the Apple logo, AppleTalk, Mac and Macintosh are registered trademarks of Apple Computer Inc. Balloon Help and PowerBook are trademarks of Apple Computer Inc. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. MS-DOS is a

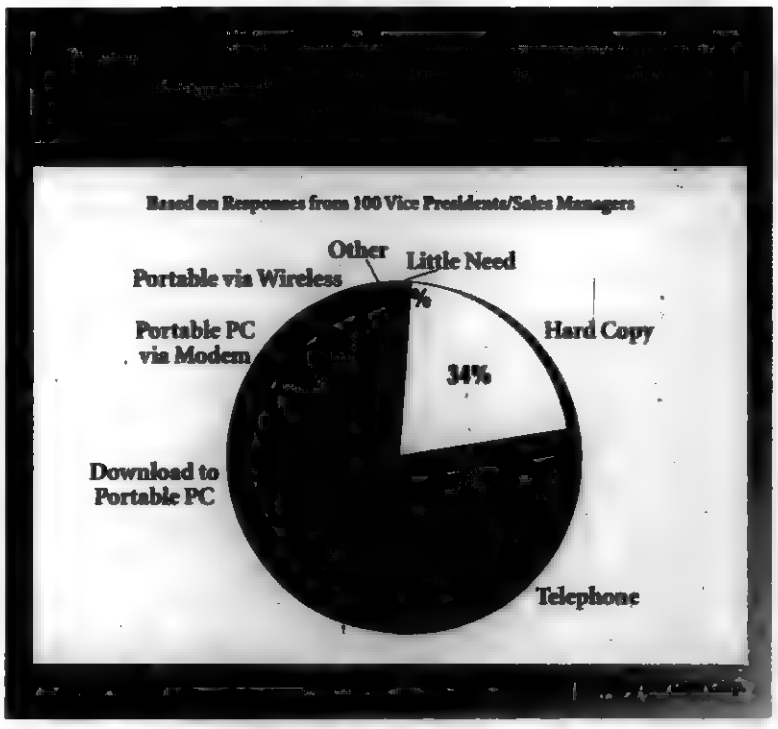
THE VIRTUAL OFFICE

Enthusiasm will spread as laggard companies come up against competitors armed with a "virtual office," which is essentially a portable computer equipped with all the information and function a sales representative needs inside or outside the office. For example, portables in the SFA environment hold all customer account information, order forms, pricing information, electronic sales presentations and electronic mail access. A modem allows the representative to download or interact with information from the home office. A modem and facsimile software enable the representative to use any available facsimile machine as a substitute for the printer. However, portable printers are available from a number of vendors.

This virtual office concept allows sales reps to function on a sales call as efficiently as if all their prospects had come to their office. Ultimately, such a properly planned and implemented system will generate more and higher quality sales calls. The virtual office implies corporate integration, but corporate integration requires a large investment of hard and soft (time and resources) dollars. There are less expensive, unintegrated approaches, but they may be insufficient when applied to a highly competitive situation.

IDC asked sales reps about their views of portable computers as a sales support tool. Forty-five percent indicate that portables only enhance sales performance if they are part of an automated and integrated sales automation effort. Integration becomes particularly important in a team selling environment. Notably, 40% agree that even using portables as personal tools supporting daily sales-related activities would contribute to increased performance.

Many companies choose to start at this personal level. However, it is important that they do not get caught in a dead-end strategy. As the system grows, back-end data servers and integration with other corporate information become more important. Portable computer users must adapt to such changes.



REMOTE ACCESS TO CORPORATE INFORMATION

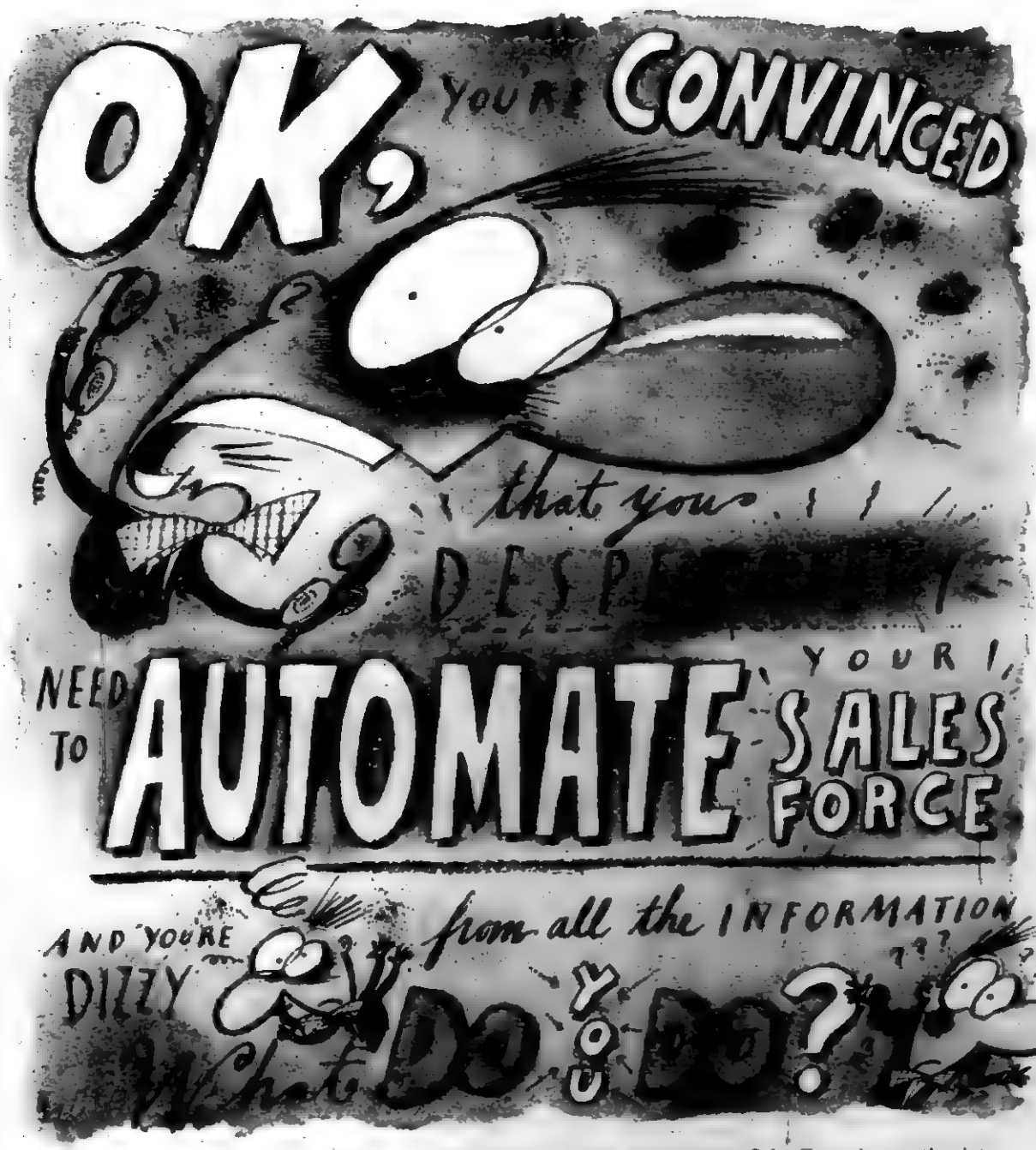
Not suprisingly, most reps still use the telephone to access sales-related information located back at the office. This practice will decrease dramatically over the next few years. Seventy percent of the sales managers report to IDC that their reps access this information by telephone today. The second most common data access method is downloading via on-line portable computer communication. Within three years, this method will be number one. With technology such as AppleTalk Remote Access, users can act as end nodes on the network no matter what their location, whether at home or via cellular connection. Printouts are now the third most popular information access method.

While SFA vendors frequently compete against internal development, they also run up against more general packaged business applications that offer sales-automation capabilities. Examples of non-sales-specific solutions include spreadsheets, word processors and Personal Information Managers (PIMs).

SFA vendors have begun to realize that the opportunity lies not in competing with generalized solutions, but in leveraging them. For instance, more mature SFA solutions initially included a proprietary word processor and a proprietary electronic mail capability, largely because de facto application standards had not yet emerged.

Since that time, many of these SFA packages have been altered, allowing users to integrate popular word processing and electronic mail products such as Microsoft Word, WordPerfect and Lotus's cc:Mail. Leveraging third-party technology allows SFA vendors to be more focused on the value-added features, such as optimizing profit margins and coordinating workflow in team selling environments.

SFA software vendors continue to evangelize the market. About 40% of IS and sales managers report that they are being consistently contacted by vendors about SFA solutions. Another 20% report that they have been contacted by a small number of vendors, but that these vendors called infrequently. Despite the various contacts between users and vendors, more than 40% of IS and sales



Let ComputerLand® handle it. No one has more resources to help you integrate Sales Force Automation into your company. From design to implementation to support. ❑ For starters, we have long-standing relationships with all the major vendors in the business. So we can help you choose and get hardware and software that meets your needs. Including the best-selling Apple® Macintosh® PowerBook.™ ❑ When it comes to networking, you'll find that our expertise is unmatched. ❑ So is our support. We'll cover you nationwide with training through the ComputerLand Learning Network. Full telephone tech support through our national Help Desk. And complete Systems Maintenance and repair. ❑ So stop spinning and start the ball rolling. Just call. 1-800-852-8043.

Everything about the PowerBook is designed to make it easy for you to use, anywhere. Networking and peripheral support are built in. So is an optional fax/data modem. There are palm rests for comfortable operation and a built-in dual button trackball—nothing to hook up or clip on. And, like all Macintosh computers, the PowerBook runs thousands of easy-to-learn programs.

The Apple Macintosh PowerBook 170.

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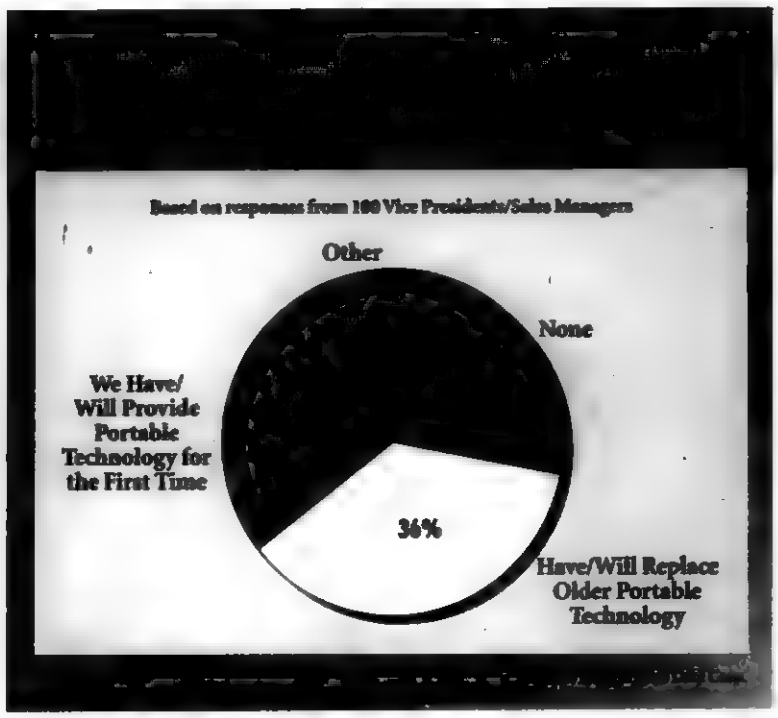


managers indicate they have little or no familiarity with the range of available SFA solutions.

APPLICATION WISH LIST

IDC asked each of three groups (IS, sales management, and sales representatives) to identify the three areas of sales they would most like to automate if their management gave them a blank check. IS says it would focus on sales analysis and remote access to corporate data. Sales management and sales reps agree that account management would be their number one investment.When asked what area they would automate last, all three groups indicate telemarketing. Customer presentations and external database access also rank low. The importance of customer presentations could increase now with the advent of multimedia capability on notebooks such as the Apple Powerbook.

INTEGRATION WITH OTHER INFORMATION

The newfound emphasis on team selling, particularly among companies selling into large accounts, is boosting SFA. Team compositions vary. For instance, the team might be composed of multiple sales people, or a sales executive and a technical engineer. It may also involve people from various parts of the company, i.e., customer service, marketing, engineering and sales. Whether or not team selling has been formalized in a given company, integrating the sales information system with other information systems not only benefits the overall organization, but also enables individual reps to simulate the shared-knowledge environment offered by team selling.

Today, more than 75% of SFA systems in large companies are integrated with order processing and general accounting systems. Seventy percent of these large-company SFA systems are integrated with customer service. IS, sales management and sales reps all agree that order processing, customer service and price/specification data are the three most important areas for SFA integration.

Frequently, companies do not consider what areas besides sales can benefit from sales data. For instance, executive information systems provide senior management easy access to critical business information from a variety of data sources. Sales information should be included in the mix. Although financial data is the most common source of information, sales and marketing data are also vitally important.

It is interesting to compare views on how IS management, sales management and sales reps view the automation level of their current sales system. IDC interviewed representatives from all three groups across 30 companies to find out. Ten percent of IS management feels their sales support system is manual compared with 23% of sales management and 30% of sales reps. By comparison, 17% of IS report that the sales support system is highly strategic, compared with 13% of sales management and 7% of sales reps. Most people, regardless of group, report that their system requires some level of improvement. Only a handful of people report full satisfaction.

INFLUENCERS AND DECISION MAKERS

Just who drives an SFA project? Vendors report that the initiators range from an individual sales person to IS vice presidents, noting that the sales manager is typically the most influential. IS management, sales management and field sales people agree that IS, marketing management and sales management are the most active SFA decision makers.

Senior corporate management generally observes SFA projects without intervening. The IDC-interviewed groups all agree that the actual users of the SFA system are more involved in the selection, design and implementation processes than the CEO. Despite this, CEOs generally sign off on these expensive projects.

In smaller companies, or even in smaller-scale implementations, the decision-making roles may change. For instance, in a smaller company, a sales manager or senior sales rep may be able to drive an SFA project from beginning to end. It should be noted that these projects are relatively simple, often using off-the-shelf single user software.

Storage Technology Tightens Up With SFA

The Company

Storage Technology is a $1.5 billion manufacturer and supplier of storage systems to computer manufacturers. The firm describes its selling style as "relationship selling." Sales cycles often take up to one year, requiring an average of 50 on-site sales calls. It has about 200 field sales people in North America and more than 85% of its sales volume is direct.

The Mission

"Apollo" was the name given to the Sales Force Automation (SFA) system developed by John Williams and Tom Campbell. Williams, vice president of North American field operations, conceived of the system and Campbell was made project manager in February 1991. He was given eight months to have the system up and running. This aggressive deadline was driven by Storage Technology's anticipated launch of a major new product line.

Hardware and Software Selection

Prior to this project, the sales force had limited exposure to computer automation. Campbell involved the regional sales support managers and one sales rep from each of six regions in evaluating alternatives. They agreed that portable computers — notebook computers in particular — were a necessary component.

Before committing to a specific notebook configuration, Campbell and his team investigated a variety of off-the-shelf SFA software solutions. They concluded that, considering the cost of packaged software and the specific functions they desired, it would be better to design and build their own single-user system. They also saw this as a way to increase their strategic advantage, because it would make their system more difficult to duplicate.

The company evaluated a number of notebook computers during a period preceding the introduction of Apple Computer's Powerbook notebook model. Under terms of non-disclosure, Apple representatives described Powerbook to Storage Technology's SFA project team. Based on that presentation, Campbell and his team selected the Powerbook. They were particularly attracted to the quick prototyping software facilities that would enable them to deliver a highly functional and easy-to-use application within four months.

The team selected Fourth Dimension, a Macintosh-compatible database application, as the software development platform for their custom application. Microsoft Office was chosen to provide integrated word processing, spreadsheet and presentation graphics. The storage systems company selected an external messaging service as an interim solution for remote communications and electronic mail.

Consulting Assistance

Storage Technology commissioned Andersen Consulting to develop the functional design specifications and data conversion plans, handle project management and training materials, and the actual training. The objective was to have each rep's portable equipped with all necessary information upon delivery. Metropolis Software Inc., an experienced Fourth Dimension developer, provided most of the technical leadership and programming for the custom application.

Production System Launch

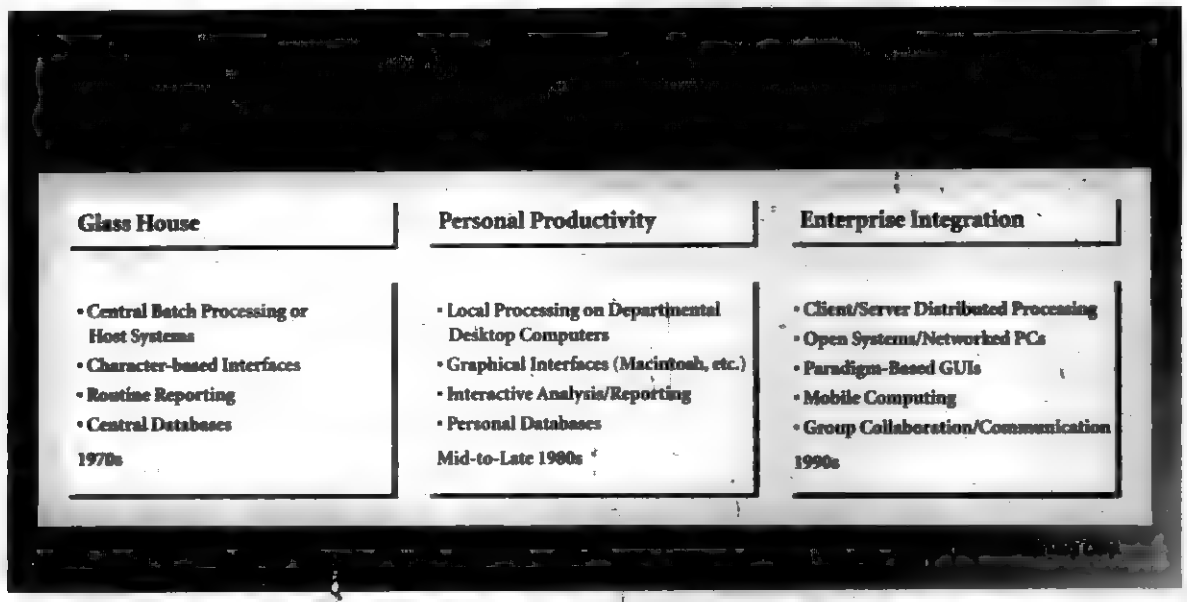
The system went live in November 1991. Each sales rep received two full days of training and a notebook equipped with a broad suite of applications. Applications included territory management, calendaring, account information, pricing configuration, communications and a proposal generator. All data could be stored locally or in corporate data bases. Product descriptions and competitive comparisons were also scanned and downloaded to the portables.

Campbell estimates that about 95% of the sales force currently uses Apollo. Some use it casually, others heavily. The casual users tend to be older sales reps who have established their accounts and territory, as well as a refined style of account management. The more aggressive users tend to be the less experienced reps who are toiling to develop their territory.

Estimated Return on Investment

Storage Technology has done some preliminary analysis of how the system has affected its business. The cost of implementing the system, including development, software, hardware and training was about $1.5 million. Spread over the 200-person sales force, the cost per rep is about $7,500. Campbell estimates the system will pay for itself within eighteen months.

He also points out that, prior to implementing the SFA system, the average number of sales calls per sale was 50. As a result of the system, that number has dropped to 40. He adds that as the system is increasingly used, the number of calls will drop even further.



CONCLUSIONS

The need for SFA varies by company. The answer may be as simple as hooking sales into a corporate electronic messaging system, or as complicated as building a highly strategic sales system that integrates various departments across multi-national companies.

When making the decision whether or not to invest in sales automation, be aware of the many available alternatives. If your company has decided, or is even thinking about moving down the SFA path, consider the following "dos" and "don'ts":

• Don't underestimate the importance of ease of use. The weakest link in the system can be the one between the user and the computer.

• Begin with an effective sales strategy. Throwing technology at a dysfunctional process will only set your company back. Also, consider the sales process as it involves other departmental functions.

• Meet with a broad range of SFA software vendors. Many have gone through great pain to overcome potential SFA pitfalls. Their references will provide you with the opportunity to compare notes on SFA strategies and expectations.

• Investigate new technologies. An effective SFA system does not necessarily require bleeding edge technology. However, as when making any IT investment, beware of dead-end technologies — such as those that may lock you into a single-user approach — as well as the obsolete (transportable computers). Select products that receive healthy and regular investments by the manufacturer or provider.

• Leave room to grow. In addition to considering current and future needs in the sales organization, consider how the use of the system may change. Take into account central IS issues even if rolling out independent systems, thus allowing potential integration down the road. Avoid the trap of outgrowing your first SFA investment.

• Don't alienate potential users or supporters. Despite the potential benefits of SFA, some may perceive it as a prying Big Brother. Interview users extensively not only to find out what will excite them but also to make them feel like contributors, not victims, of the process.

• Don't encourage abandoning unique selling styles in favor of generic system prescriptions. Customization should be considered at the sales organization and at the personal level. The system should complement rather than inhibit a rep's style of selling.

• Stay in touch. View the SFA implementation as an evolution, not a revolution. Let the users know you care. Check back with them after several months of usage.

• Invest in the system continually. Sales people will pay more attention to a system that receives regular attention than one that is established and forgotten. Sending out regular notices regarding system enhancements and training classes can be a passive, yet effective, way to encourage system usage. Furthermore, as the system is used, leave open the possibility of incorporating new needs or suggestions.

The SFA evolution is underway. Becoming SFA-aware is an inexpensive first step for companies that have not fully extended computer automation to the sales function. This simply requires understanding the potential benefits of SFA and how the various alternatives might apply to your sales organization. If nothing else, becoming SFA-aware will help to prevent competitors from taking your company by surprise.

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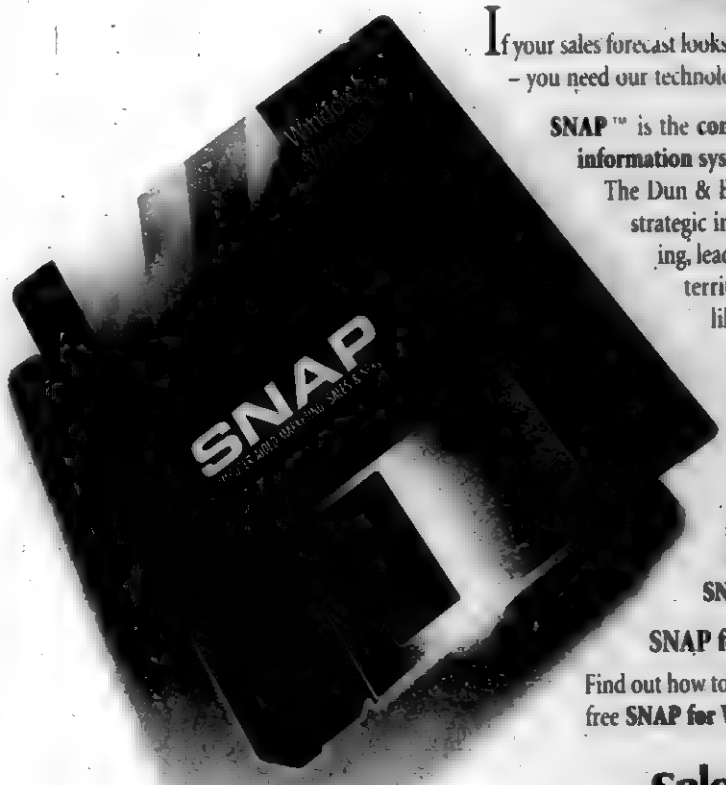

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Ryder trucks in automation

By Rosemary Cafasso

After a nearly five-year effort, Ryder System, Inc. now has its eye on the finish line for a project that places PCs in the offices of thousands of independent consumer truck dealers and links them to the Miami-based firm.

Dubbed Ryder First, the project, which cost more than $20 million, is considered critical to the company's "long-term business success," said Dennis Klinger, vice president of information systems and chief information officer.

Dennis Klinger: *Ryder is investing in a segment under pressure*

It is intended to boost Ryder's only consumer business, which has been under pressure from a sagging economy and fierce competition. Ryder currently holds the No. 2 slot under market leader U-Haul Co., said Douglas Rockel, a first vice president at Merrill Lynch & Co. in New York.

Last year, Ryder lost money in this segment, confirmed Gerald Riordan, senior vice president and general manager of the consumer truck rental business, although he declined to provide specifics.

While the consumer rental group is less than 25% of Ryder's overall business, it is nonetheless a core unit and will remain a significant part of Ryder's operations, Riordan said. The company's other businesses range from commercial truck leasing and rentals to jet engine repair. Together, the units brought in more than $5 billion in revenue to Ryder in fiscal year 1992.

"Ryder First is a high priority—an investment in a segment that's been under pressure," Klinger said. "It is one of those systems that is key to the business."

With Ryder First, order entry, sales, marketing and, perhaps most importantly, inventory management, are automated. By linking local-dealer systems with regional hosts and a mainframe at headquarters, Ryder gets more immediate data on where its 30,000 trucks are. Ryder can also change rental rates from headquarters or on a regional basis and have the changes automatically reflected at the dealerships.

Ryder First replaces a system that relied on pencil, paper, telephones and the U.S. mail, which often meant critical data on truck availability was conveyed to Ryder well after it would have been useful. At the same time, Ryder could not automatically notify dealers of rate changes.

The company plans to have all of Ryder's 4,500 independent dealers on-line by March 1993. About half of this group is now linked to the Ryder First system, which is based on IBM Personal System/2s with customized software and dial-up modems that reach the company's regional IBM Application System/400s. At corporate headquarters, IBM 3090s are fed regional data.

Ryder began installing the systems at dealer locations a year ago. Through most of 1992, it brought one district per month on-line. In September, it upped that to two districts per month.

Dealers currently using the system are showing revenue-per-unit gains as well as slight decreases in transfer expenses, Riordan said. He said the dealers are well on their way to boosting the revenue-per-unit numbers by up to 20% and cutting transfer expenses by as much as 15%, which are the goals of the Ryder First project.

Company officials seem to identify with Ryder First, not only because it is so critical to the firm's business goals but because this project has been under way for so long.

The plan for the system was conceived in the late 1980s. The company evaluated existing systems, including credit-card processing software, to see what could be tailored to Ryder's business because "we didn't want to reinvent the wheel," said Andy Anderson, director of operations and support for the consumer truck rental group.

In 1988, Ryder launched a prototype that involved about 500 dealers; it ran for a year. Klinger said the prototype taught Ryder plenty.

"We found that we needed to give more capabilities to the dealers to entice them to want to do this," Klinger said. "We also found that we needed to have tighter controls to keep the quality of the data."

Ryder then worked closely with the dealers to determine exactly what their needs were by involving them in prototyping sessions.

The end result is a Microsoft Corp. DOS 5.0-based system with graphical features, menus and prompts to help dealers complete an order. Microbilt, Inc. in Atlanta wrote the desktop software for Ryder and designed it to work with the firm's in-house-designed inventory management software running on the larger IBM equipment. The dealer's desktop software also includes sales suggestions so dealers can better market the Ryder product.

Klinger said a key factor to Ryder First was winning the dealers' approval. As independent businesses, the dealers are not on the Ryder payroll and could not be instructed to adopt the system. Instead, Ryder needed to prove that the system would improve business and not severely disrupt dealer operations.

"We gave them value to help us," Klinger said. "To the extent they are successful, we are successful."

ON SITE

Ryder System, Inc.
Miami, Fla.

Challenge: To boost efficiency of its consumer rental business — much of which was managed with paper, pencil and telephones in the field.

Technology: Extend use of existing base of IBM 3090s and AS/400s; add 4,500 IBM PS/2s and customized software to manage dealer operations and link them to headquarters.

Results: Dealers on-line show revenue-per-unit boosts and small decline in truck transfer expenses. Moving toward goal of revenue boosts of up to 20% and drop in transfer expenses of 15%.

Beware: Viruses take no holiday break

By James Daly

'Tis the season to be jolly, that is true, but if you are a virus writer, that might mean destroying data on the files of some unsuspecting PC user. So while the rest of the world is wishing for good will, do not let your guard down: In addition to the fall's usual rogues' gallery of malicious codes [CW, Aug. 31], December features several seasonal — albeit rare — virus variants.

These newcomers are, theoretically, nondestructive. But since virus writers are not particularly known for crackerjack code, any or all may cause a loss of data, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software.

As with all viruses, these dates of occurrence are made for general awareness and are not exclusive. Many a skilled programmer can change a few lines of a code and make the virus go off whenever they desire. We have said it before and we will say it again: Scan any new disk before it is used and back up, back up, back up.

You better watch out

Christmas week is the time for December-specific viruses, which include the Father Christmas virus, due to strike between Dec. 19 and Dec. 31; the 1253 virus on Dec. 24; and Poem on Dec. 21.

The Father Christmas virus, which activates from Dec. 19 to Dec. 31, is a nonresident infector of .COM files. When infected files are executed, a Christmas tree graphic is displayed on the monitor bearing the following message: "Merry Christmas & a Happy New Year for all my lovely friends from Father Christmas."

The user must then strike a key to allow the executed programs to finish running. Users with infected systems may also notice cross-linking of files and lost clusters that result in a loss of data.

Another December virus, 1253, is a generic infector of .COM files, including COMMAND.COM. It is set to activate on Dec. 24. Along with .COM files, it infects the boot sector of floppy disks and the partition table of hard disks.

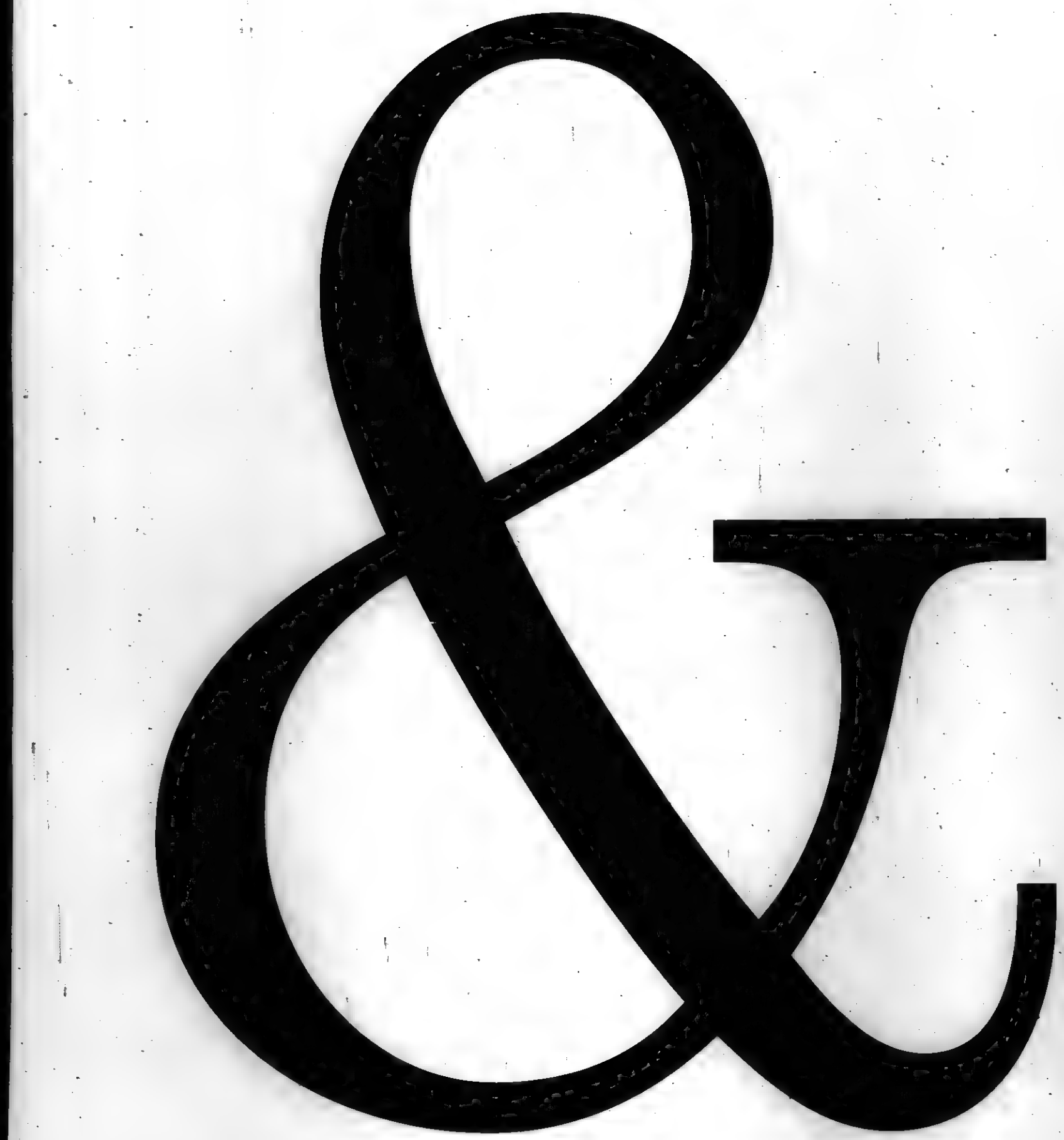
On activation, any disks accessed while 1253 is present in memory will have their boot sector infected. Newly formatted disks will also be infected immediately.

The 1253 virus can also have different effects, depending on its method of activation. If an infected program on a disk is executed on the virus activation date, the virus will overwrite the entire disk with a pattern of nine sectors of what appears to be a program fragment. If the system is booted from the infected hard drive or floppy on Dec. 24, there will be unexpected disk activity to inactive drives.

Once the 1253 virus has started to overwrite a disk, a user may stop the disk activity by turning off the system power. Eliminating the 1253 virus requires disinfection of the hard disk's partition table and the boot sector of any disks exposed to the infected systems, as well as the infected .COM programs. Otherwise, the virus will promptly reinfect the system upon reboot.

Dec. 21 is the activation date for Poem, a memory-resident infector of .COM programs, including COMMAND.COM. Poem resides in memory and keeps track of how many times interrupt 21 has been called. When interrupt 21 has been called 2,112 times, the virus will display a poem called "Void," and the user will be prompted to press escape to continue.

If an infected file is executed on Dec. 21, the virus will display the same "Void" poem. It will then overwrite the first 1,221 sectors of the system hard disk, drive C, with an unencrypted copy of the virus' code.



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Borland, Microsoft duel

By Jean S. Bozman
SCOTTS VALLEY, CALIF.

Borland International, Inc.'s rivalry with Microsoft Corp. has turned into a tug-of-war on database standards for the desktop. Both sell PC databases, and both are hawking different client/server application programming interface (API) standards.

Borland's proposed Integrated Database Application Programming Interface (IDAPI) [CW, Nov. 16] is intended to counter Microsoft's Open Database Connectivity (ODBC) API for client/server Windows applications.

Borland claims that Microsoft's ODBC, which more than 40 vendors support, is just for Microsoft Windows client machines and does not let users take full advantage of nonrelational PC databases such as Borland's dBase.

Microsoft counters by saying it will move ODBC beyond the Windows desktop in 1993, adding extensions for the Apple Computer, Inc. Macintosh and, eventually, Unix.

IDAPI handles client queries according to the type of target database required by the application. That way, the speed of querying data stored in flat-file databases using the Indexed Sequential Access Method can be preserved. Both APIs use SQL, the industry-standard database query language, to find records in relational databases.

Borland's IDAPI, a variation of Borland's former ODAPI standard to connect Borland databases, was announced with support from IBM, Novell, Inc. and WordPerfect Corp. At Comdex/Fall '92 last month in Las Vegas, more vendors signed up for IDAPI.

Political goal

But industry analysts said Borland's goal with IDAPI is as political as it is technical. Borland wants to keep rival Microsoft from writing the rule book, said Charles Phillips, a research vice president at SoundView Financial/Gartner Group, Inc. in Stamford, Conn.

Users and developers said the standards war is confusing — and they are worried that it will cost them extra money to support both APIs.

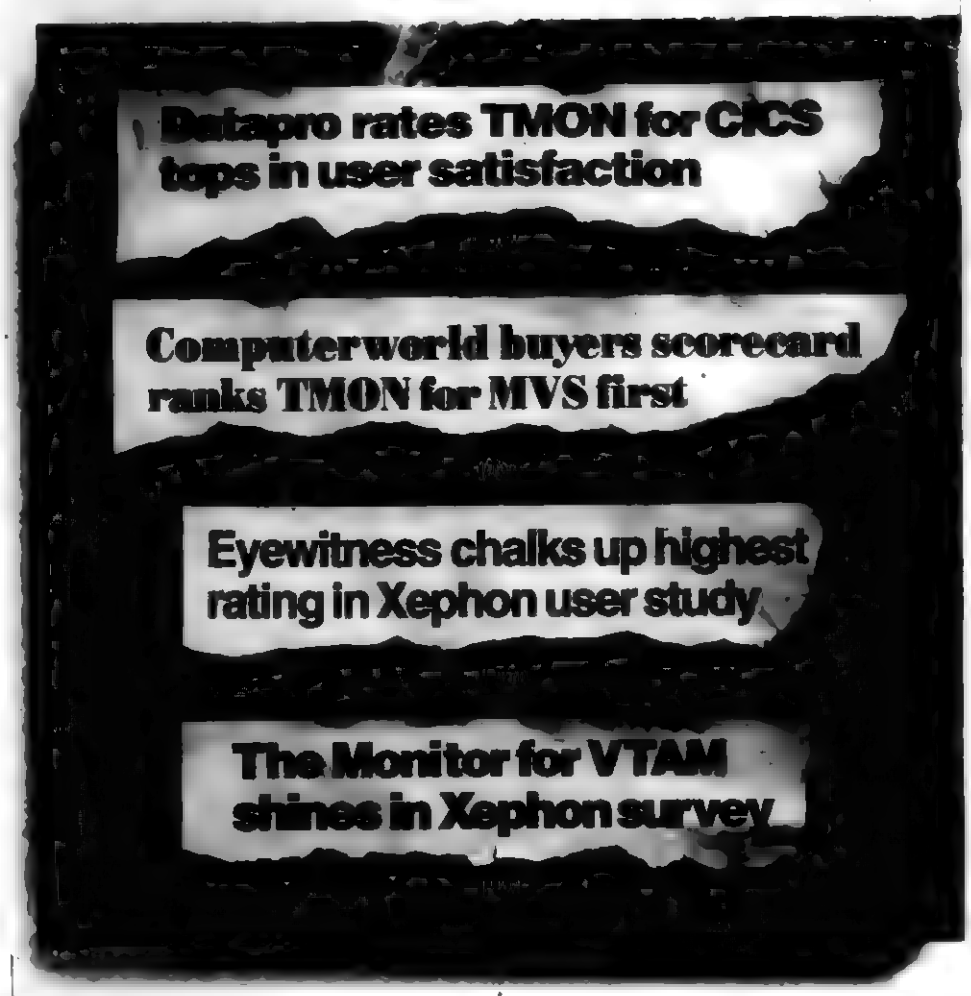
"It's getting to the point where you need a database to keep track of the acronyms," said Alan Zenreich, president of Zenreich Systems, a database consulting firm in Oradell, N.J. "ODBC and IDAPI make developers and users even more confused than they were before. And yet it seems that they are quite similar and fundamentally do the same thing."

For network browsing and ad hoc queries, both ODBC and IDAPI will get desktop clients the data they need at a much lower cost than database-specific client/server links, users said.

"It's the beginning of a plug-and-play software environment," said Michael Corey, president of the International Oracle Users Group.

Interoperability will be important to most end users.

"All the clients should all be able to talk to all the servers," said Michael Fitzmaurice, MIS director of the National Association of Broadcasters in Washington, D.C., who has both Borland's Paradox and Microsoft's SQL Server for OS/2. "It's to our advantage to have something resembling a standard. I'm really tired of living in a tower of data-babble."



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Stacker 3 offers more compression muscle

By Christopher Lindquist
CARLSBAD, CALIF.

Data compression to save disk space works. But several factors have hampered its widespread acceptance: Compression products were slow, hard to use or unreliable. Stac Electronics recently tried to eliminate all three hurdles with Version 3.0 of its Stacker data compression product.

The company has been in the compression business since 1988, and Stacker has been on the market since 1990. But the latest version of the product seeks to combine power with ease of use under both Microsoft Corp.'s Windows and DOS. According to users, it succeeds.

While important, ease of use and a pretty interface take a backseat to reliability when a product touches every piece of data on a system. Not to worry, users said.

"It's dead stable," said Charlie Russel, computer integrated manufacturing systems administrator at New United Motors Manufacturing, Inc., noting that when he has run into problems in the past, Stac's technical support was very good.

Stability may get the vote of information systems managers, but it takes more than that to attract users. Stac reportedly has addressed that area by making the product as transparent and simple as possible.

"It's much easier for the user to use," Russel said. He added that the product not only looks better, but it has higher performance as well. "There's a noticeable improvement in both speed and compression," he said.

"It has very, very good performance," agreed Greg Feeler, IS manager at Employer's Resource Corp. Feeler said he found the performance of the Version 3.0 software to be even better than that of Version 2.0, with a coprocessor card on some high-end machines.

Ease-of-use enhancements include an improved installation program that can be used under Windows or DOS, the ability to dynamically change the size of "stacked" drives or to "unstack" them altogether and a Windows-based "Stackometer" that provides information on compression ratio, available disk space and disk fragmentation levels.

Users can also protect stacked drives with passwords and use Stacker Anywhere to move data between machines that may not have Stacker installed.

Stacker Version 3.0 is available now for a list price of $149.

Peripherals

Inforite Corp. has introduced the Inforite MP Series of Writing Pads.

Both DOS and Microsoft Corp.'s Windows-based versions are available. Data or signatures can be captured by using a nonelectronic stylus or ballpoint pen and paper. The MP100 was tailored for general office use and the MP200 was designed for the point-of-sale environment, the company said. Each weighs approximately 16 ounces.

The MP100 and the MP200 each cost $295.

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Microsoft's Windows for Workgroups

Smooth to use, but it has its limits

Reviews	E-mail/ Applications	Utilities	Ease of use	Performance	Resource/hardware requirements	Software compatibility	File sharing	Security	Overall value
PC Week 10/12/92	Not powerful enough	NC	One-stop packaging	Strong	NC	A number of problems	NC	NC	Uses advanced technology
PC Magazine 12/8/92	Full strength	Useful	Shifting	Fast	Recommends 8M bytes RAM	Works with large number of extensions	NC	Less comprehensive	Superbly put together
Windows Magazine 12/92	Nice looking	NC	Eases networking considerably	Quite snappy	NC	No software compatibility problems	Shares directories simply	Relatively low	Well-designed
Users									
Kirby Thornton, Logistics Systems Engineering, Inc.	■	▙	▙	▙	■	▙	■	▙	Very useful product
Steven Stern, JMB Realty Co.	■	▙	▙	▙	▙	■	▙	▌	Excellent
Rick Smith, Synergy Computing	■	▙	■	▙	▌	▙	▙	▌	Pretty good deal
Analysts									
Krystyna Filiatrault, Dataquest, Inc.	▙	▙	▙	▌	▙	▌	▌	▌	Part of an evolving strategy
John Dawson, WorkGroup Technologies, Inc.	■	▙	■	■	▙	■	■	▙	Incredible
Earl Rich, Faulkner Information Services	■	▙	■	▙	▙	▙	▙	▙	Excellent E-mail facilities

Key: ■ Very good ▙ Good ▌ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC: No comment.

Reviewers found Microsoft Corp.'s Windows for Workgroups painless, easy and smooth to install and use, but they also said the package has limitations when it comes to large networks. Reviewers also reported glitches in Windows for Workgroups' compatibility with several Windows applications.

The offering gives networked users peer-to-peer file and peripheral sharing, Windows utilities including File Manager and Print Manager, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), a bundled mail package and a group scheduler program.

ELECTRONIC MAIL/APPLICATIONS

Microsoft Mail, a calendar and a group scheduling application called Schedule+ are bundled with Windows for Workgroups. Mail is an E-mail package that can also serve as an engine for building workgroup applications. Reviewers reported that this version is a bit diluted. However, OLE support is provided.

UTILITIES

Two utilities are included for monitoring local-area network activities and resources. WinMeter graphically displays how much processor use the server is snatching from applications, and NetWatcher exposes user names and directories connected to local PCs. *PC Week* said these utilities do not have the muscle needed to support networks with more than a few dozen users.

EASE OF USE

According to reviewers, one of Windows for Workgroups' greatest assets is its easy, completely automated installation.

RESOURCE/REQUIREMENTS

PC Magazine advised that a Windows for Workgroups server setup should consist minimally of a 386DX/33 with 8M bytes of random-access memory and at least a 200M-byte hard disk.

SOFTWARE COMPATIBILITY

Attempts to make a Network DDE link with Borland International, Inc.'s Quattro Pro for Windows resulted in repeated crashes in the Windows environment. Additional problems were cited with WordPerfect Corp.'s WordPerfect for Windows and Lotus Development Corp.'s Ami Pro 3.0 and 1-2-3 for Windows (see vendor response). Applying Windows for Workgroups on a Novell, Inc. NetWare network is complicated, reviewers said.

SECURITY

Reviewers claimed that Windows for Workgroups' security is less comprehensive than that of Windows NT. Passwords are assigned for either read/write/create access or just read-only access.

OVERALL VALUE

While Windows for Workgroups may not be appropriate for larger firms because of its inability to transmit across gateways, smaller offices should benefit from its features. Windows for Workgroups costs $300. A two-user Starter Kit lists for $850.

Summary by Lisa Davidson.

Vendor background data

MICROSOFT REPORTED RECORD REVENUE OF $818 MILLION FOR THE QUARTER ENDED SEPT. 30, A 41% INCREASE OVER THE $581 MILLION REPORTED LAST YEAR. "I ENVISION WINDOWS FOR WORKGROUPS EVENTUALLY SUPPLANTING ORDINARY WINDOWS APPLICATIONS IN THE NEXT TWO TO FOUR YEARS," SAID CHARLES TAYLOR, A NEEDHAM & CO. ANALYST.

Russell Siegelman, product manager for Windows for Workgroups

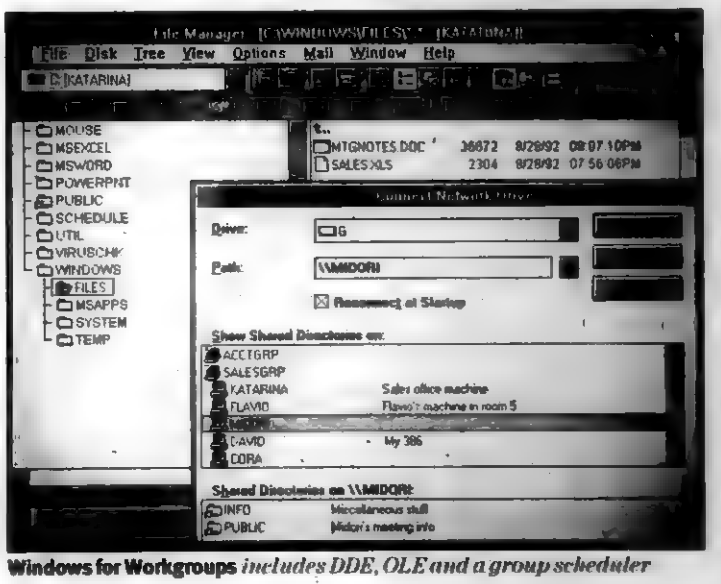
Software compatibility: Some problems and early versions of Windows for Workgroups contained problems when using Network DDE with certain applications. Some of these problems occur because applications do not properly support DDE or OLE. A few of these were because of problems in Windows for Workgroups. These problems are now fixed.

Running Windows for Workgroups in connection with Novell's NetBIOS requires some hand configuration because of conflicts between Microsoft's and Novell's NetBIOS implementations. The necessary steps are documented in the Windows for Workgroups Resource Kit.

Windows for Workgroups supports any Network Device Interface Specification-compatible protocol with NetBIOS as its primary protocol.

E-mail and applications: Windows for Workgroups ships with a complete mail solution, including Post Office, for a single workgroup. For additional management features, access to gateways, remote access, etc., Microsoft ships the Mail and Schedule+ Extensions. The Mail and Schedule capabilities are full and capable systems with no limitations as long as a single Post Office is used. For larger installations, multiple Post Office applications may be beneficial.

Security: Windows for Workgroups security provides for read-only and full-access permissions on shared printers, directories and Network DDE items. Windows NT does not offer advanced security features.



Windows for Workgroups *includes DDE, OLE and a group scheduler*

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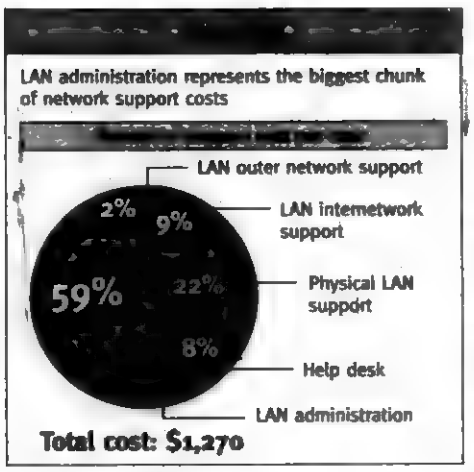
At triple the price of SNA, are large LANs worth it?

By Michele Dostert

Hidden administration costs can make supporting large local-area networks two to three times as expensive as supporting the same number of users on a traditional Systems Network Architecture (SNA) network, according to a report from Forrester Research, Inc., a research firm in Cambridge, Mass.



Source: Forrester Research, Inc.

The report, authored by analyst Janet Hyland, said that the typical yearly cost of user support on a 5,000-user internetworked LAN is $6.4 million, compared with $2.3 million on an SNA network. Of the "$1,270 per-user support cost for new corporate networks, routine tasks such as restarting hung printer queues, rebooting frozen users and rearranging disk space account for $750," the report said.

"Users are suffering from the costly legacy of departmental LANs. Novell, Inc.'s NetWare [which is installed in at least 60% of the current LAN market] contributes heavily to the administrative burden since it was originally conceived with all administration focused on a single server," Hyland said.

Novell's forthcoming Version 4.0 of NetWare, with new Global Directory services, will help make LANs more centrally manageable, according to the report.

Hyland also blamed LAN administration costs on information systems oversight. She said companies have a battalion of poorly trained local LAN administrators with ill-defined procedures for problem escalation. These local administrators often do not do their jobs cost-effectively.

Large LANs, *page 66*

LAN Lab shows the art of interconnection

By Michele Dostert

In the good old days — say, three years ago — setting up a local-area network meant connecting one basic technology: the Intel Corp.-based PC. Today, LAN managers are being asked to connect not just apples and oranges but grapes, pomegranates and the odd kumquat here and there.

One of the hottest attractions at the recent Comdex/Fall '92 networking pavilion was the LAN Lab, where users saw a whole fruit basket of different platforms and products connected on a single LAN and got valuable tips on how to do it themselves.

The LAN Lab was installed and managed by members of the Local Area Network Dealers Association (LANDA). The booth was staffed by the technicians who had done the setup — and who often found themselves giving impromptu seminars on LAN design and the art of the heterogeneous LAN to eager listeners.

Ryk Edelstein, an engineer at LANequip in Montreal and a LAN Lab engineer, said, "A lot of people came in with problems that we've handled a hundred times; they're basic to us, but they give the users fits. We helped them with everything from cabling problems to LAN/Unix connectivity to high-end LAN/mainframe integrations. We not only told them how to do it, we often showed them right there in the lab."

According to Scot Steele, a network consultant at Universal Networks in Elmhurst, Ill., and the LAN Lab's primary designer, many LAN Lab visitors were just starting to build LANs and were looking for design fundamentals.

"I told them to build it in three steps: First, get everyone running the desktop they will use — DOS, Windows, Macintoshes, whatever. Next, get everyone attached to the LAN. Thirdly, figure out the services you need to provide — applications, E-mail, modem service, fax service, mainframe connectivity, etc. — and put all those services on a central location so you don't end up with local peripherals all over the place that are not being used."

Steele said his three-step procedure, refined over hundreds of LAN installations, can save thousands of dollars and man-hours.

Although LAN Lab did a landmark business in free network consulting, its primary function was as a showcase heterogeneous LAN where users could see 22 vendors' products working together. The

Interconnections, *page 66*

$76 326 923 288

By the end of this week Computerworld readers will have spent over $76.3 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
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Source: IDG Research Services Fall 1991

In Brief

PeopleSoft/Sun deal

Applications vendor PeopleSoft recently announced support for Sun Microsystems, Inc.'s Solaris 2.1 platform. PeopleSoft, which sells client/server-based human resource and financial applications software, also said it has signed a joint marketing and development agreement with Sun. Walnut Creek, Calif.-based PeopleSoft plans to port its PS/HRMS human resource management package to Solaris 2.1 by the first quarter of 1993.

X use grows at Sun sites

A survey of 400 network computing sites recently conducted by The X Business Group in Fremont, Calif., revealed that use of the Open Software Foundation's (OSF) Motif graphical user interface has increased by more than 100% in the Sun customer base during the past year. This is despite the fact that Sun's own OpenLook interface is bundled with Sun operating system sales, according to The X Business Group.

Proactive support

Proactive Software, Inc. in Mountain View, Calif., recently announced that its Customer Information Resource system will support servers running the Informix Software, Inc. Informix-Online relational database management system. Proactive also added support for PC and workstation clients running X Window System and the OSF's Motif.

The art of interconnection

CONTINUED FROM PAGE 65

LAN Lab consisted of five segments, two running over Ethernet from Standard Microsystems Corp. and the other three running over Token Ring provided by Racal-Datacom, Inc. and IBM.

The LAN used Novell, Inc.'s NetWare running on servers from Net Frame, Inc. and Epson America, Inc. as its core operating system. Attached to the NetWare LAN and sharing files and printers with it were an IBM RISC System/6000 running AIX, two Next machines from Next, Inc. running the NextStep operating system and an Intel-based server running The Santa Cruz Operation's Unix. NetWare/Unix connectivity was provided by Novell's LAN Workplace for DOS and Quarterdeck Office Systems' Desqview/X products.

Users also saw backup software and hardware from seven vendors, new laptop-to-LAN connectivity products from Xircom, Inc. and a 386-based Ethernet LAN workstation from LANCO, Inc. that includes preloaded software drivers for 12 different networking environments.

"I'd say the biggest stars of the LAN Lab, the ones which generated the most excitement, were Intel's Storage Express backup system, the Next workstations running Desqview/X and the RS/6000 connectivity," Steele said.

The LAN Lab was such a success that another lab is being planned for the Comdex/Spring '93 show in Atlanta. "Comdex has asked us to do it, and we're already talking to a lot of vendors who want to add their products to the LAN Lab," said Vern Tepe, president of Universal Networks and LANDA's treasurer.

"I think demonstrating networks like LANDA's provides a real service in educating Comdex users," said Stan Schatt, a LAN analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. "Most of the real network experts go to Interop and Networld, where internetworking demonstrations are a dime a dozen. But Comdex attracts PC experts and people who are just starting to connect all their stuff together; for them, the LAN Lab functioned as a networking tutorial."

Large LANs

CONTINUED FROM PAGE 65

How can IS stop pouring money down the LAN support pit? Hyland recommended a two-pronged approach. First, the report said that large LANs should move to high-capacity superservers. It takes fewer people to support one server with 150 users than to support 10 servers with 15 users each.

Secondly, IS must tackle the people front. Hyland said, "The root of high costs is in the high number of individually run departments. Having fewer servers allows companies to cut back on LAN administrators."

Hyland recommended that the remaining administrators be combined with the best of the current help-desk personnel to form a new "network savvy" help desk.

Surprisingly, the report did not recommend outsourcing as a support-cost solution. Hyland said the lack of good remote tools and cross-server administration capabilities means that third parties cannot deliver support any cheaper than in-house staff. But Forrester expects that upcoming products will make outsourcing more cost-effective.

How can you produce while curbing

For Cadillac and EDS, the answer is teamwork. The 1993 Cadillacs arriving now in showrooms continue the same tradition of excellence as the award-winning 1992 models. The 1992 Cadillac Seville STS was the **first car ever to receive all three major automotive press awards** in the same year, including Motor Trend's coveted Car of the Year. Yet thanks, in part, to information technology from EDS, production cost efficiencies are improving.

EDS helped Cadillac improve production efficiency by combining more than 80 different systems into one comprehensive scheduling system. In another major project, EDS provided

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Modems

QuickComm, Inc. has introduced Spirit II modems.

According to the company, the modems operate at the newest speed standard of V.32 bis, which is equivalent to 14.4K bit/sec. A Group 3 fax modem as well as communication and fax software are included.

Operating at speeds of 1,200 bit/sec. to 14.4K bit/sec., the Spirit II asynchronous modem supports CCITT V.42 and Microcom Networking Protocol 2-5 error correcting protocols.

The Spirit II also supports V.22 and Bell 212A modulation data rates. The internal Spirit II occupies a one-half card PC expansion slot.

The external Spirit II costs $249, and the internal model costs $229.

➤*QuickComm*
Suite K
2290 Ringwood Ave.
San Jose, Calif. 95131
(408) 956-9145

Workgroup software applications

Mai Systems Corp. has introduced ManBase Release 7.0.

The Unix-based Enterprise Resource Planning system was designed for process manufacturers. It features a client/server architecture, fourth-generation language tool sets and a relational database.

According to the company, ManBase can function as a business planning and control system and includes sales-order management, full financials and inventory and production management.

The product was written to use Sybase from Sybase, Inc. and support platforms from Sun Microsystems, Inc., IBM's RISC System/6000, Hewlett-Packard Co.'s HP 9000 and The Santa Cruz Operation's Unix.

Prices range from $50,000 to $350,000.

➤*MAI Systems*
Suite 150
39555 Orchard Hill Place
Novi, Mich. 48375
(313) 347-9070

Workstations

Dataram Corp. has announced expansion memory products designed for Digital Equipment Corp.'s Alpha-based workstations.

Available in 32M-byte and 64M-byte capacities, the DR15 memory is fully compatible with the 64-bit Alpha architecture, the company reported. The memory comes as a set of eight 4M-byte or 8M-byte modules that plug into the carrier cards of the Alpha-based systems.

The DR15/32 costs $5,600, and the DR15/64 costs $10,000.

➤*Dataram*
Route 571
Princeton Heightstown Road
Cranberry, N.J. 08512
(609) 799-0071

Data General Corp. has introduced three workstations based on Intel Corp. 1486 microprocessors.

The workstations are IBM PC/AT-compatible and can be configured into applications such as desktop publishing, database management, networking, Microsoft Corp. Windows and graphics.

The Dasher II-486SX/25A is for any processor-intensive application that does not require a math processor.

Dasher II-486/33A and Dasher II-486DX2/50A each offer a built-in math coprocessor, and they are better suited for computer-aided design and manufacturing as well as other math-intensive applications.

All three provide 4M-byte system memory, which is expandable to 16M bytes; 8K-byte on-board cache memory, and a built-in Small Computer Systems Interface controller capable of supporting up to seven devices.

Base configurations for the three workstations include a 3½-in., 1.44M-byte diskette drive, Small Computer Systems Interface controllers, two serial ports, one parallel port and Ultra Video Graphics Array capabilities.

Prices begin at $2,095.

➤*Data General*
4400 Computer Drive
Westboro, Mass. 01580
(508) 366-8911

Unix

Waterloo Maple Software and Mathsoft, Inc. have jointly announced a new version of Maple V for the Unix platforms from Sun Microsystems, Inc. and Digital Equipment Corp.

According to the companies, Maple V is a comprehensive mathematical software package for performing numeric and symbolic calculations. Maple V Release 2.0 has enhanced two- and three-dimensional graphics, an improved user interface and typeset-quality output.

The product includes more than 700 new math functions, advanced graphics, an Open Software Foundation Motif-compliant interface, a new graphical user interface for Microsoft Corp. Windows and enhancements to the Maple programming language.

Maple V Release 2.0 costs $795.

➤*Waterloo Maple Software*
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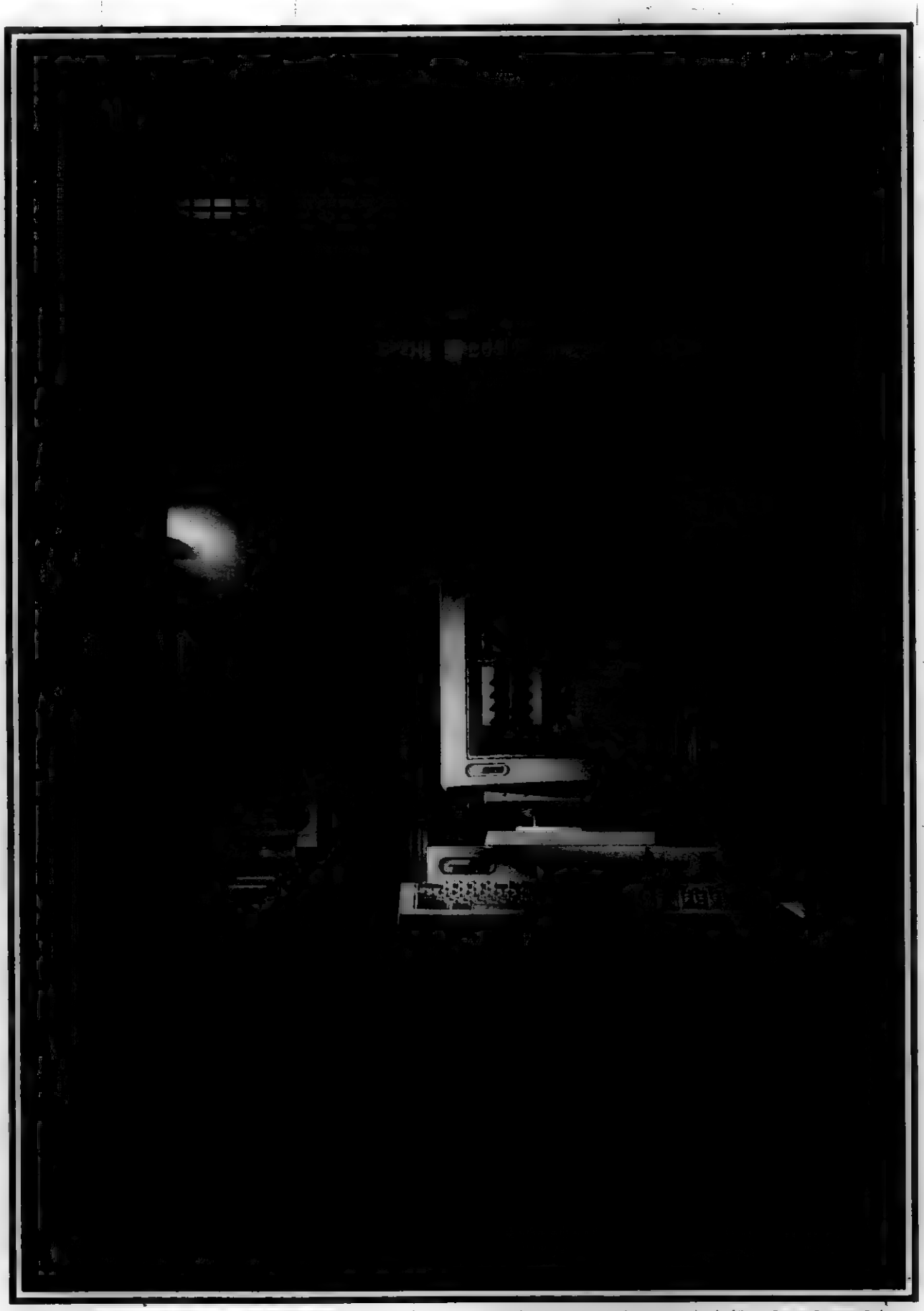

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–PC Week, June 22, 1992

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–PC Week, October 5, 1992

"Despite its low price, the ProSignia packs a variety of features."
–PC Week, October 5, 1992

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–PC Laptop, October 1992

"It is the best-looking color screen on any notebook, plain and simple."
–PC Computing, August 1992

"DeskPro/i...combines the traditional Compaq virtues of strong performance and technical innovation with aggressive pricing."
–PC Week, June 22, 1992

"Make no mistake about it: this is a strikingly energetic Compaq."
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–PC Magazine, August 1992

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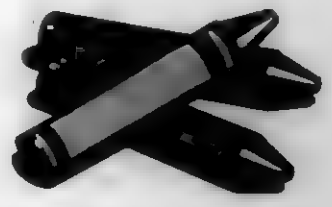

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Toll fraud biting into businesses

By James Daly

While most information systems security professionals spend their day protecting their data from destruction or theft, there is a subtler form of fraud that is quietly picking corporate America's pockets: the theft of telephone services.

In the past few years, toll fraud has grown so fast that U.S. businesses are expected to pay more than $4 billion in unauthorized calls this year, according to Telecommunications Advisors, Inc., a Portland, Ore.-based consultancy.

Here is another cruel twist: Now that many users own the equipment penetrated by the thieves, long-distance carriers assert that liability for such losses rests with the user or owner. In other words, if unauthorized calls are discovered on your phone bill — be they for $100 or $100,000 — you will be the one who ultimately pays. Not AT&T. Not Sprint. Not MCI.

It is not just teens looking for kicks who illegally access telephone services. A thriving call/sell operation attracts drug dealers, illegal aliens and organized crime figures, all of whom are lining up for free calls that are difficult to trace.

Skilled hackers loop in and out of private branch exchanges (PBX) to reoriginate the calls and prevent line tracing by law enforcement. Crimes are often committed over 800 service lines, so the companies also pay the criminal's operating expenses. Using someone else's PBX is a great way to avoid detection and save money.

As a result, law-enforcement officials say, toll fraud is is only going to get worse. "It's not a matter of if people will be hit, but when," said Don Delaney, a senior investigator at the New York State Police. Delaney said he has received 150 complaints of toll fraud in the past year, with losses ranging from $40,000 to $500,000. Once in, system crackers resell their means of entry to others, who fill the telephone lines with illicit traffic. It has become so prevalent that toll fraud insurance of up to $1 million is now provided by The Travelers Corp. insurance company.

Tips for curtailing telephone fraud

Make sure you are using all of the security features of your PBX.

Disable toll-calling ports.

Limit calling permissions.

Monitor the amount of time the direct inward switch ports on the PBX are available.

Consider some of the telecommunications monitoring packages on the market.

Contact your vendors if you suspect something bad ops.

The initial problem is that the PBX that handles most phone service is up against tough problems. Frequently, unscrupulous callers take advantage of Direct Inward Switched Access (DISA), which was designed as a less expensive alternative to issuing employees surcharge-laden calling cards. DISA allows employees to call an 800 number into their company's PBX and then access a dial tone to make outgoing calls.

Other areas of telecom security concern are the remote maintenance port (a digital port that permits vendors to access a customer's equipment for diagnostics), the Automated Attendant (an adjunct system that attaches to the PBX to direct calls to predetermined extensions) and voice mail, which is connected to the PBX but often sports few security features.

Warning signs to look for

Users said the key to fighting phone fraud is recognizing abnormal calling patterns quickly. Earlier this year, Sherry Roggeman, communications coordinator at the Empire Southwest Co., a heavy equipment dealer in Phoenix, noticed an unusual amount of telecom activity with Puerto Rico, a place where Empire Southwest does not normally do much business. To Roggeman's dismay, she discovered that someone had gained unauthorized access to the company's PBX through its 800 number and was charging long-distance calls to the company. By the time she clamped down and tightened access, Empire had been hit with $15,000 in unauthorized calls. "It's frightening," she said. "Telecom fraud is a big business, and it's scary to think that someone is spending all this time trying to crack my systems."

But there are solutions short of unplugging everything and shutting down all the PBX features. There are many products already on the market to ease some of the hacker-generated anxiety.

Atlanta-based Complementary Solutions, Inc., for instance, markets a product called Telemate FraudFighter that learns normal telecommunications activity levels and then monitors specific trunk groups, extensions, calling regions and DISA codes for deviant patterns. Similarly, Xiox Corp. in Burlingame, Calif., offers a family of fraud prevention products that use such artificial intelligence features as voice identification.

Toll fraud support services can also be gleaned from Sprint Corp., which offers Sprintguard. Some of its features include customer notification of abnormal calling patterns. AT&T offers a similar program, called Netprotect, to relieve customers of liability for international long-distance fraud.

Experts advise, however, that users should not rely on others to prevent fraud. "Right now users are doing very little to protect themselves," said John Haugh, chairman of Telecommunications Advisors. "AT&T handles about 115 million calls a day. AT&T can't look out for you."

Telecom users bullish on wireless

By Ellis Booker

Business users are exceedingly bullish on the prospects of wireless data networking, even if they do not see it replacing wireline communications, according to a recent worldwide survey of some 3,500 telecommunications directors and information systems executives.

The study, conducted by Deloitte & Touche Telecommunications & Electronic Services Industry Program, found that business users prefer wireless in most situations — provided features and prices are similar to those offered by wireline technology.

In addition, 40% of the respondents said the distinction between wireline and wireless communications will disappear by the middle of the decade. Also, 50% of those surveyed said they did not expect to pay a premium for wireless services by then. The remaining 50% expected to pay only a 10% premium over the cost of wireline services.

> Wireless will supplement, not replace, wireline services.

Interestingly, 96% said wireless will "supplement," not replace, wireline services.

One outcome is that providers of traditional wireline networks — especially local exchange carriers (LEC) — will come under competitive pressure from providers of wireless services. Non-LEC firms have been the major recipients of Federal Communications Commission licenses for Personal Communications Systems trials.

LECs will be able to offset some of these lost revenues through higher access fees charged to wireless providers. "However, they will not be able to recover all the lost revenue," said Joseph S. Kraemer, industry national director of telecommunications and electronic services at Deloitte & Touche.

Even so, Kraemer said, wireless technology may not become a ubiquitous networking option, and thus achieve its full potential, unless the currently fractured wireless industry can provide a common billing and interconnection scheme.

To achieve their full potential, Deloitte & Touche said, wireless services will have to be priced to be attractive to a mass market.

The company's survey results support this view: 72% said the price of a wireless service would be the most significant barrier to its growth.

Elisabeth Horwitt

The good ol' days

A few years back, Interop was sort of a neutral zone where a bunch of networking techies — vendors and users both — could get together and hammer out crucial issues such as how to ensure their various products really worked together using TCP/IP.

Not anymore.

At the Interop '92 show in October, vendors still claimed to be working together to promote standards-based interoperability. There were still demos to show that a standard such as FDDI or SNMP really worked across multivendor platforms. But the relaxed camaraderie that used to exist in birds-of-a-feather sessions at the old Interop shows was conspicuously lacking.

Vendors were trumpeting how their standards support is so much more genuine and user-oriented than their competitors'.

Meanwhile, various factions were trying to get users and other vendors to support their particular mix or brand of standards.

IBM and Cisco bickered about the best way to route SNA across internetworks.

Horwitt, *page 73*

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Vendors push X.400 for dial-up lines

By Lynda Radosevich

An international group of vendors led by start-up messaging developer Isocor has joined forces to push for multimedia communications based on the X.400 messaging standard over ordinary telephone lines. Currently, X.400 requires a leased-line X.25 connection.

The technology would make it possible for companies to run fax, voice and data traffic over voice lines using circuit-switched technology instead of having different networks for the various technologies, said David Knight, Isocor's vice president of marketing. It could also save companies fees associated with leasing lines.

The vendors hope to attract firms with remote users who could use X.400-compliant applications to dial into their local-area networks, as well as firms that regularly send fax and electronic messages abroad but do not have dedicated lines.

"Dial-up has typically been left on the table, but it's getting attention lately because of dedicated line costs," said Charlie Robbins, director of communications research at the Aberdeen Group in Boston.

Other experts pointed out that while the X.400-over-phone-lines solution is appealing, it has limits. For instance, X.400 is typically a high-end messaging protocol used in wide-area networks, and its related X.500 directory structure makes it more difficult to scale down to LANs, said Wayne Kernochan, director of commercial systems research at the Aberdeen Group.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said X.400 does not provide for synchronizing voice and video and that video quality over phone lines is poor.

"You can't give me 30 [video] frames per second over telephone lines. Nobody can," Dzubeck said.

Vendors working together to promote the standard — called Asynchronous Protocol Specification (APS) — include BT, AT&T, Digital Equipment Corp., Hewlett-Packard Co., Norwegian Telecom and France Telecom. The vendors hope to deliver a final draft of the APS to the Consultative Committee for International Telephony and Telegraphy by spring 1993.

Other news

In a related development, Isocor recently announced a $3,450 fax system that works within X.400 electronic-mail environments, including Isocor's Isoplex X.400 electronic messaging servers. The system, which is currently shipping, allows users to integrate fax and E-mail capabilities to automatically route incoming faxes to users across a large corporate network, according to the company. It includes a single-line board for the IBM PC bus from GammaLink in Sunnyvale, Calif.

In addition, Isocor made the following X.400-related joint announcements:

- With the MaXware division of Norwegian Telecom to allow remote users with MaXware client products to dial into Isoplex servers.
- With, Eicon Technology Corp. in San Francisco to offer the company's X.25 cards as an option with the Isoplex server.

Horwitt

CONTINUED FROM PAGE 71

Sprint, AT&T and MCI argued about whether supporting SMDS is important or a waste of time and money.

At the nearby Electronic Mail Association conference, Lotus' Jim Manzi magnanimously agreed to support the Microsoft Mail API — while taking potshots at his rival's E-mail-enabled products.

What has happened to Interop?

First off, it stopped being a venue primarily for TCP/IP geeks — vendor engineers and savvy users from the engineering, scientific and government sectors. Those folks knew what they wanted and had little tolerance for marketing hype. They still meet at Internet Engineering Task Force meetings and typically get a lot done in terms of improving TCP/IP and SNMP protocols.

Interop is now a commercial enterprise, just like Comnet or Networld, where the usual assortment of vendor representatives sell their wares to wary users from all sectors of industry and government.

Interop is now a commercial enterprise, where vendors sell their wares to wary users...

One contributing factor: Vendors have started using standards support as a competitive weapon rather than as a means of cooperating for users' good.

Even the Interop demos have become less of a sanctuary against vendor rivalry. Two years ago, Fibronics International circulated reports of competitors' products that performed below par in an FDDI demo. This broke an agreement signed by all participants in Interop demos not to disclose performance results.

Fibronics was banned from Interop demos the following year. But the damage was done.

Indeed, a network technician from a scientific firm complained over coffee that Interop just isn't the same anymore. "It used to be a lot more fun," he said.

A lot more useful, too.

Horwitt is a *Computerworld* senior editor, networking.

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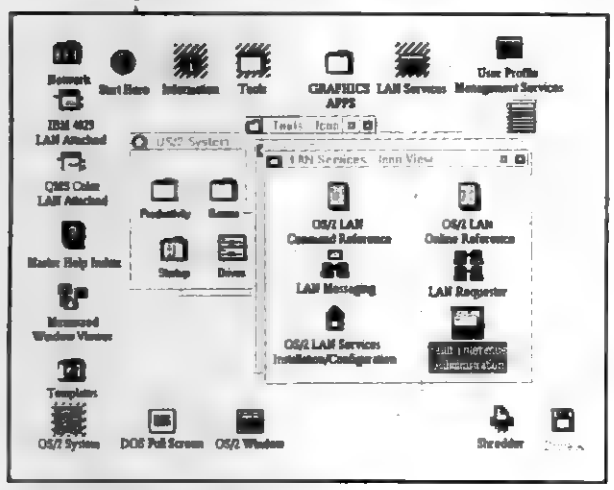

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DEC to focus on database market through Alpha

By Melinda-Carol Ballou

■ Digital Equipment Corp. will use the muscle of its new Alpha AXP systems to target the database market by optimizing Rdb for Alpha server platforms on Open VMS, Microsoft Corp.'s Windows NT and OSF/1. DEC will also support Microsoft's Open Database Connectivity (ODBC) and other standards.

Analysts said that while DEC's relationship with Microsoft may help the company, marketing Rdb outside of DEC's installed base will be a challenge. DEC must compete against the effective marketing organizations of relational database management system competitors such as Sybase, Inc. and Oracle Corp., which are already well-established in the client/server, open systems market.

DEC officials said they hope the high performance and large memory capacities offered by the Alpha platforms will ultimately make them attractive to users seeking to perform data "mining" — rapid processing of large amounts of data in parallel or prefetching pages, for instance.

"A good section of the DEC market is [made up of] high-end production systems, and the high-end Alpha boxes will put us in a different space," Steve Hagan, senior engineering manager for Rdb, said about the advantages of Alpha compared with VAXs. "The initial version on Alpha will be able to run 10G bytes in memory, for instance."

DEC has already prepared Rdb for running on Alpha machines by developing a dynamic optimizer that allows users to automatically make use of the increased amount of buffered storage available with Alpha.

Some users agreed that Alpha as a high-end server for Rdb is advantageous.

"With the memory capabilities of Alpha, you could store everything in memory in buffers so that you don't have to go out to disk all the time, reducing I/O [performance bottlenecks]," said Martin Keiser, a senior specialist at Du Pont Co. in Newark, Del.

Migration route

DEC officials described the process by which they migrated Rdb to Alpha — part of which involved the creation of an Rdb code generator that will put out VAX or Alpha code and the addressing of data alignment issues.

"Depending on which platform you're running on, you'll get code which is optimized for that platform. The disk structures will be identical, so there will be essentially no database conversion required to move [Rdb] from VAX to the Alpha [platforms]," Hagan said.

Mixed clustering is another key feature for making the transition that Rdb already supports. This means users will be able to run different versions of Rdb on VAXclusters or on clusters that mix VAX and Alpha platforms.

In the past, Rdb has been criti-

Alpha, *page 81*

HP shifts pricing gears

HP 3000, 9000 users will pay fees based more on usage

By Mark Halper
PALO ALTO, CALIF.

Not all software pricing is created equal, as Hewlett-Packard Co. will prove this week when it reveals a shift in fee structures for its MPE and Unix programs.

As HP told users in August, the company is moving away from processor-based pricing, under which users have been paying more for software as they add power to their hardware [CW, Aug. 31].

But the nature of that shift varies according to whether the user is running MPE/IX or HP/UX. MPE/IX is the proprietary operating system with Unix hooks for the HP 3000 minicomputer, and HP/UX is HP's Unix implementation for its HP 9000 minicomputer.

More users, more money

Under the new pricing scheme, which took effect last week, HP is moving HP 3000 users to a usage charge under which an information systems shop would pay more as it adds users. The shop would not pay more for simply adding or upgrading processors.

"This could be good," said Rodger Lindquist, manager of business systems development at Hercules, Calif.-based Bio Rad Laboratories, Inc.

Lindquist said Bio Rad runs three HP 3000s with "a lot of batch-intensive work with few users." About 80 users tie into separate manufacturing and distribution systems, each of which is built to support up to about 400 users. With HP's pricing paradigm shift, Bio Rad could pay less for software.

HP is also moving HP 9000 users off a tiered processor schedule but is not implementing a per-user fee. Rather, it is basing pricing on system expandability, according to HP software planning manager George Liddle. Although the new 9000 pricing permits processor upgrades without additional software charges, it is not as per-user-oriented as HP's new 3000 pricing.

HP is taking the separate approaches because of differences in markets for the HP 3000 and HP 9000, Liddle said.

Access discrepancies

Lindquist suggested that HP is not placing HP 9000 shops on a straight per-user basis because "a lot of people have access without making direct connections." Users can tie into the HP 9000 through local-area networks that are not as readily available to HP 3000 users, he said.

HP is implementing the HP 3000 software pricing scheme gradually, starting first with the operating system and selected system software last week. The per-user fees will kick in for other system software next month.

The new pricing will not apply to application software until the middle of next year, when HP is scheduled to build its Network License Server (NetLS) software into MPE/IX. NetLS manages system access and monitors usage. HP already builds it into HP/UX and has licensed it to other system vendors, including IBM and Silicon Graphics, Inc.

In a related announcement, HP said it plans to soon increase the number of HP/UX applications with NetLS calls. The company now offers a handful of those applications.

HP also said last week that it had simplified its support prices.

One step ahead

In Hewlett-Packard's installed base of multiuser computers, the HP 3000 still holds an edge over the HP 9000. As of the end of 1991, according to International Data Corp., there were 13,732 medium-scale HP 3000s in use, compared with 4,972 medium-scale HP 9000s. At the small-scale level, the HP 9000 is much closer to the HP 3000.

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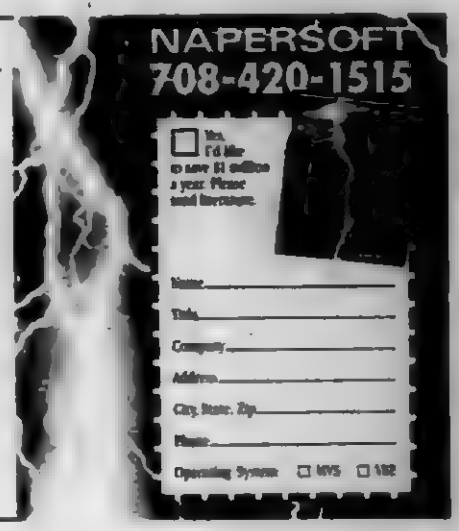

IBM wins outsourcing deal at 11th hour

By Mark Halper
WEST NYACK, N.Y.

Electrical and cable manufacturer BICC Cables Corp. was all set to sign off on a data center outsourcing deal last month with services vendor Genix Corp. when something happened on the way to the closing.

IBM swooped in with an eleventh-hour counter pitch that BICC found irresistible: an offer to essentially lease remote computer space that eliminated the need for its own information systems real estate.

"Genix had made a super offer, and we had drafted a letter to them," recalled Sal Tramaglini, BICC's MIS vice president.

But as the $1 billion company prepared to glide into its transition from an interim outsourcing contract with Litton Computer Services to Genix, "IBM made an offer we couldn't refuse," according to Tramaglini.

In short, IBM's price beat Genix, and IBM worked its magic by exercising computing wherewithal that translated into economies of scale that Genix and others could not match, Tramaglini said. He declined to state the contract's value.

The successful IBM bid — BICC had rejected an earlier IBM proposal — entailed combining BICC's data center operations with those of a BICC sister company in Toronto, Phillips Cables Ltd. An IBM Canadian affiliate, Information Systems Management Group — a Regina, Saskatchewan, outsourcer 51% owned by IBM Canada Ltd. — was already processing for Phillips. Both Phillips and BICC are owned by BICC Group PLC, a $6.5 billion London-based company. So IBM offered use of a single dedicated processor in Irving, Texas, to run both companies.

"They made it a sweetheart deal for us," Tramaglini explained.

Not through ISSC

IBM's winning offer did not come from the computer giant's Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary, although an ISSC solution had been on the negotiating table at one point.

In short, IBM's price beat Genix's.

Rather, IBM won the deal through its IBM Information Network (IIN) group, which provides network services and remote processing. IIN is scheduled to enter the ISSC feld in January through an IBM joint venture with Sears, Roebuck and Co.

Under the provisions of the 1956 Consent Decree, IBM essentially will be limited to providing the processing power while BICC keeps its computer operators. In effect, Tramaglini explained, BICC's outsourcing deal is no different from a leasing deal under which IBM would install equipment on site for BICC to operate. BICC will operate the remote processor from terminals at its own site.

"I get the benefit of not having to provide floor space for the processor," Tramaglini said. While IBM's detractors said IIN starts with an unfair hardware cost advantage, Tramaglini noted that rival outsourcers could achieve competitive costs in the used computer market.

Other outsourcers that BICC evaluated included Electronic Data Systems Corp., Litton Computer Services, Mellon Bank Corp. and May & Speh, Inc.

BICC had been buying services from Litton on a monthly basis. Litton had taken over from BICC's previous outsourcing provider, ISI, which went out of business.

BICC has about 17 million instructions per second of processor requirements.

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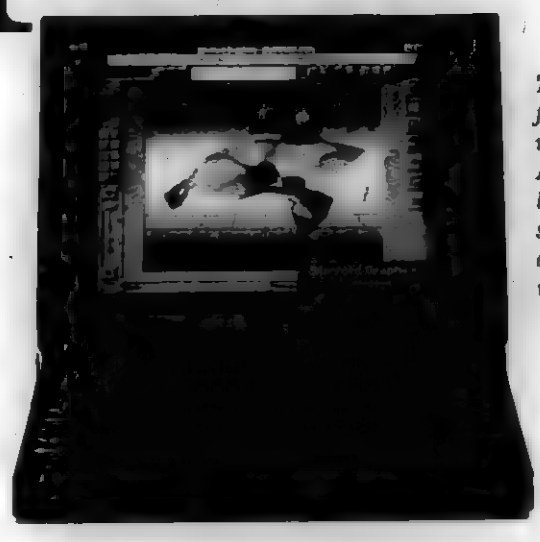

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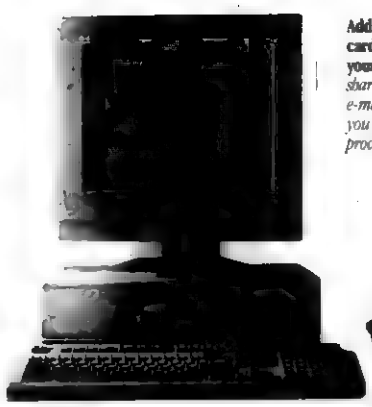
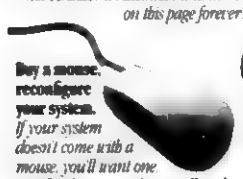


Add Windows, buy a new PC. *Most PCs in use today weren't designed for graphical computing. So if you want to run Windows, you may have to buy a new computer. Why not consider a Macintosh and avoid all the problems on this page forever?*

Add networking card, reconfigure your system. *To share files and send e-mail to other PCs, you may have to add a card. This means going through the long, tedious process of reconfiguring your system. On a Mac, you just plug in a cable.*

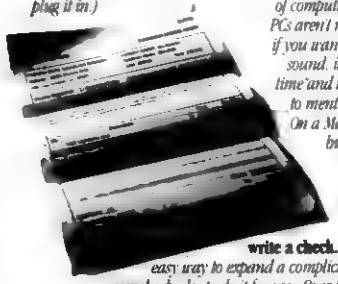
Upgrade your memory, reconfigure your system. *Add memory to a Mac, and it reconfigures itself accordingly. But add memory to a PC, and you'll almost always have to run a setup program to configure the new memory – or the computer won't know what to do with it.*

Add almost anything, reconfigure your system. *Expanding your PC's capabilities can be amazingly frustrating. But a Macintosh easily adjusts to whatever extra device you add to it.*



Buy a mouse, reconfigure your system. *If your system doesn't come with a mouse, you'll want one. But first be prepared to install and configure a special software driver. (No need with a Mac – you just plug it in.)*

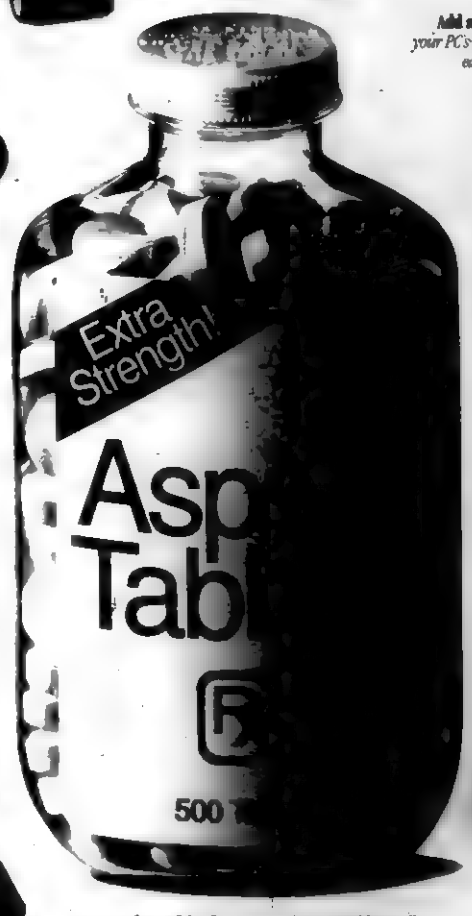
Play and record sounds, reconfigure your system. *Multimedia promises to be the future of computing. But most PCs aren't ready for it. So if you want to work with sound, it'll cost you time and trouble – not to mention money. On a Mac, sound is built in.*



Call for help, write a check. *There is one easy way to expand a complicated PC – hire somebody else to do it for you. Over time, of course, that can wind up costing you more than the PC.*

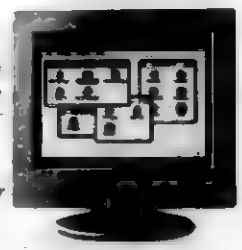
Add peripherals, reconfigure your system for each one. *Want to add a CD-ROM or hard disk drive? Then prepare to spend hours installing cards, flipping switches and editing files – for each one. With a Mac, you can add up to seven peripherals by simply plugging them in and clicking a button or two.*

Add printer, adjust DIP switches. *Hooking up a printer seems easy. Until you set your DIP switches, install your driver, locate your Windows diskettes, make an error and start all over again.*



Expand your PC, take two aspirin. *Inevitably, you'll want to expand your computer's capabilities by adding extra devices. The more instructions you slog through and switches you fiddle with, the more time it will take. And the more pain reliever you'll need.*

Change monitors, reconfigure your system. *Add a new monitor, and you'll have to reconfigure your entire system – or your monitor could look like this one. A Mac recognizes a new monitor and adjusts to it automatically.*



Whoops! *When you add something to an ordinary PC, you may have to "reconfigure" your system – a process of hardware and software adjustments, which can be complex, tedious, and take up hours of your time.*

Manual labor. *Software like Windows purports to make things easier. But the reality is, you'll still spend hours reading manuals just to make it all work – time you could spend doing more useful things with your computer.*

On a typical PC, even adding a simple hard disk can be extraordinarily complicated. You'll probably have to "reconfigure" your system – the time-consuming process of telling your computer what pieces you've added. You may have to edit complex CONFIG.SYS and SYSTEM.INI files, install special device drivers and fiddle with DIP switches. And, of course, building even a basic network is extremely difficult – what with installing

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cards and networking software. An Apple® Macintosh®, on the other hand, knows when you've added a hard drive. Installing a CD-ROM drive or scanner is a matter of plugging in a cable and clicking a couple of buttons. Even installing a network requires nothing more than plugging one Mac® into another. It's just one more example of how a Macintosh works in a simple, logical way. So you can, too.

If you know how to use a plug, you know how to expand a Macintosh.

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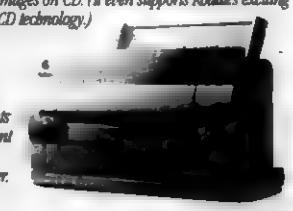

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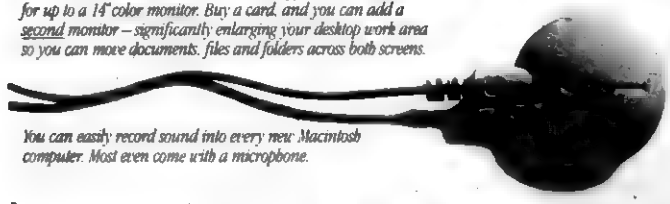

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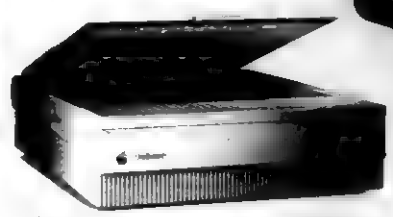

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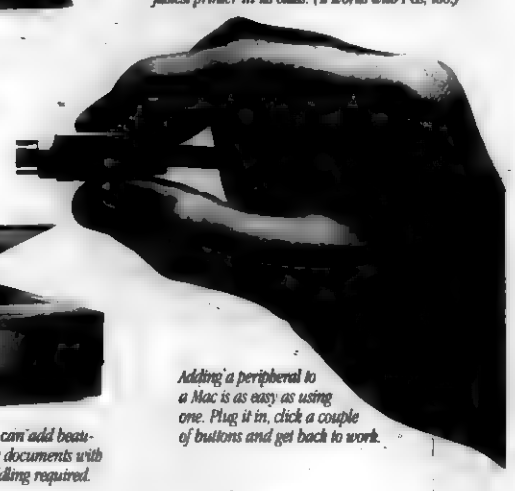

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DEC to focus on database market

CONTINUED FROM PAGE 77

cized as a proprietary database. But how successful can DEC be with Rdb outside of the company's traditional user base of VMS platforms? While Rdb has previously been available only on VMS, DEC will offer Rdb on OSF/1 by March and on Windows NT by the middle of 1993, DEC said.

These ports may initially be achieved by porting a Bliss compiler to the other operating systems, but the company is also re-engineering the Rdb database for C, which will make it more easily portable to additional operating systems. Hagan said such a port would be transparent to users and would not affect their applications.

Resources lacking

Although Rdb will no longer be limited to VMS and analysts praised the database engine, DEC currently has little or no marketing resources in place to sell it [CW, Nov. 23]. In addition, NT and OSF/1 are relatively untried, and users with large production applications are unlikely to go with them in the near future.

"Even on VMS it could presumably be used as a server for client/server applications, but few people consider it. [DEC] really is not positioned for the market that they are trying to enter from either a marketing or an application development point of view," said Rich Finkelstein, president of Performance Computing, a market research firm based in Chicago. He added that Microsoft is a strong partner for DEC and will help it focus market attention, but "DEC will have to put tremendous marketing effort behind [it] to compete against the marketing and sales capabilities of Oracle and Sybase."

DEC has also now incorporated support for Microsoft's ODBC client support into Rdb. ODBC is a database driver that lets Windows applications use SQL queries to access RDBMSs and is based on specifications from the SQL Access Group. It will let users of the Microsoft Access database access Rdb data.

Michigan eyes IS payback

By Thomas Hoffman
LANSING, MICH.

A systems overhaul being conducted by the state of Michigan's Department of Social Services (DSS) is expected to save the agency up to $40 million annually by eliminating scores of errors and fraud that plague the current network environment.

Last month, the state named Unisys Corp. as the primary contractor for developing a new client/server architecture that will support more than 6,000 caseworkers in 130 offices statewide. Norm Charles, the chief information officer at DSS, said the project's primary goal is to increase the accuracy and efficiency of the state's welfare caseworkers who determine public assistance eligibility for more than 750,000 Michigan citizens.

Norm Charles *says the new network will bring accuracy and efficiency*

Other vendors bidding on the six-year contract included IBM and Bull HN Information Systems, Inc., the incumbent vendor. The contract will cover equipment and services from more than 30 information systems vendors.

Charles said the process DSS uses to determine eligibility is very paper-intensive, and because the current network is not fully automated, caseworkers are forced to manually gather most information on public assistance applicants from credit bureaus, the Department of Motor Vehicles and other state-run agencies.

The new network, Charles said, will be designed to provide caseworkers with new automated features, such as electronic interfaces to banks and government agencies, as well as access to government databases. Charles said he expects the new network to help DSS caseworkers drastically reduce errors resulting from manual procedures and fraudulent applications.

"The new network will provide our caseworkers with more accurate determinations of eligibility and benefit levels," he said.

Under the current network, caseworkers using Unisys CTOS workstations are connected via T1 links to a three-processor Bull HN DPS 9000 mainframe computer at the central data facility in Lansing. However, Charles said, the network does not provide DSS caseworkers with the integrated level of support required to process budgeting, financial eligibility calculations and benefit payments because there are few automated operations.

The $60 million network is part of a $90 million project called the Michigan DSS Assist welfare eligibility automation program. Charles said the other $30 million is earmarked for additional staffing, facilities upgrades and administrative costs as part of the Assist program.

The new network will link more than 6,200 Intel Corp. 80386-based workstations to two Unisys 2200/644 mainframes in Lansing using 144 Unisys U6000 servers over a Hughes Network Systems, Inc. X.25 packet switch network with a T1 backbone. The U6000 servers are intended to offload application control functions from the mainframes and provide electronic mail, office automation and workstation control services for the client PCs.

Charles said the network will be designed to conform with the U.S. Government Open Systems Interconnect Profile network standard. DSS will use the Unisys OFIS E-mail system statewide.

Other uniform software packages to be used throughout DSS include Lotus Development Corp.'s AmiPro 3.0 word processing system and Microsoft Corp.'s Excel for Windows spreadsheet package. Unisys Ally and Mapper computer-aided software engineering/fourth-generation language tools will be used for application development and ad hoc reporting, respectively.

DSS plans to test the network in phases with several counties and offices during a 12-month period. Charles said he expects the network to be fully operational within three years.

DEC unveils ESP500 SCSI-2 family for OEM market

By Melinda-Carol Ballou

Digital Equipment Corp. recently announced the ESP500 family of SCSI-2 Solid State Disks (SSD) for the OEM market at a price of $13,500 for evaluation units, which DEC officials said is below the cost of comparable offerings.

The ESP500 SSDs offer a 5¼ in. form factor and can be mirrored, striped and bound in volumes like magnetic disks. Data is placed on them using Small Computer Systems Interface (SCSI)-2 commands. The Model ESP530 offers 267M bytes of capacity, while the model ESP510 offers 107M bytes and a Data Retention System that combines power sensing logic, batteries and a hard disk to back up data in the event of a power failure.

This marks DEC's first step in building an SSD OEM business, DEC officials said.

SSD devices use solid-state dynamic random-access memory to achieve a high rate of I/O requests per second with data access rates of as much as 100 times faster than magnetic disk, they added.

Evaluation units are available now, and volume shipments are scheduled to begin in the third quarter of 1993, according to DEC officials.

[redacted]

System software

BlueLine Software, Inc. has released Vital Signs for VTAM 2.0, the newest version of its network and VTAM performance monitor.

The product provides MVS, VM and VSE sites with the ability to monitor and report on both network and VTAM performance data via historical reports and real-time displays, the company reported.

New "Point and Shoot" capabilities enable users to view network statistics by navigating the network. Starting at a high-level network or sessions statistics display, users place the cursor on a line to view performance data down to the logical unit or terminal level. It also includes a centralized performance database. Additional features include a centralized performance database and Dynamic Definite Response time measurement.

Prices start at $8,680.

➤*BlueLine Software*
Suite 690
5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

Tone Software Corp. has announced Release 4.2 of OMC-Print, a print management tool.

Without respooling, the product provides spooled output routing to almost any VTAM print device. According to the company, any type of data residing in the JES spool can be printed on non-JES print devices.

OMC Print functions include an enhanced Command Display Facility that can be run as an ISPF application; an expanded job selection criteria that includes an external writer name; Streamlined Command Display Facility panels that combine several functions into fewer screens for output delivery; plus expanded device support, which includes IBM's Application System/400, System/36, System/38, PC and bar-code imprinting devices.

Prices start at $11,000.

➤*Tone Software*
1735 S. Brookhurst
Anaheim, Calif. 92804
(714) 991-9460

Software application packages

WorksRight Software, Inc. has announced Estimate Master and Work Diary, software systems designed for the IBM Application System/400.

According to the company, Estimate Master can classify expenses and produce the simplest or most complex estimates.

Because the product is a multiuser system, it can be used to simultaneously work on up to 999 estimates.

Estimate Master and Work Diary each cost $199.

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In Brief

Andersen to port Foundation to Sun

Andersen Consulting plans to port Foundation, its computer-aided software engineering (CASE) workbench, to run on **Sun Microsystems, Inc.** Unix workstations and servers, including Sun's new SPARCcenter 2000 high-end processor. Andersen announced a similar arrangement with **Hewlett-Packard Co.** two weeks ago.

Reverse-engineering tool ships for Wang

Lansa USA, Inc. started shipping a reverse-engineering tool designed to migrate **Wang Laboratories, Inc.** software to run on IBM's Application System/400.

No need to rewrite application software

Kendall Square Research Corp. is now shipping Micro Focus Cobol/2 with Animator and Micro Focus Toolbox on Kendall's KSR1 family of supercomputers. The tools let users port mainstream business applications to KSR1 machines without rewriting the code, according to a spokesman.

Easel to release tool

Easel Corp. announced Enfin/2 SQL Edition Version 2.0 for Windows, an object-oriented tool based on SmallTalk from **ParcPlace Systems, Inc.** It helps developers build Microsoft Corp. Windows- and IBM OS/2-based applications using point and click and other object-style techniques. The $3,995 product is due out next month.

Nynex ships CASE management tool

AGS Management Systems, a subsidiary of **Nynex Corp.** in King of Prussia, Pa., started shipping Windows and OS/2 versions of firstCASE, a process management system for use on application development projects.

Workbenches offer cross-platform support

By Garry Ray

As talk of client/server computing gets dangerously close to the overblown hype of artificial intelligence and computer-aided software engineering (CASE), a new generation of workbenches is arriving that could save the notion from a similar fate.

The workbenches, which span the range from high-end commercial tools to end-user programming aids, could significantly reduce the cost and complexity of application development for multiple platforms in client/server environments, according to users and analysts. However, analysts also said the new tools currently lack critical functions needed to coordinate large development projects.

"Once you take two developers and put them into team development, it's not very long before you need team support tools such as version control," said analyst Tony Picardi, director of software research at International Data Corp. in Framingham, Mass.

In addition, Picardi said, the workbenches need to provide or support utilities such as regression testing and performance analysis tools. "Then you're back to CASE again," he added.

Cross-platform programming benches

	Released	Client platforms	Server platforms	Languages	Tools	Database support	Price per seat
COMPONENT WORKSHOP Component Software Corp.	11/92	MACINTOSH	WINDOWS, UNIX	C++	INCREMENTAL COMPILER, EDITORS, BROWSERS, CLASS LIBRARIES, INSPECTOR	N/A	$2,495
GALAXY Visix Software, Inc.	1/93	UNIX	WINDOWS, OS/2, MACINTOSH	C, C++	GUI BUILDER, EDITORS, HELPWRITER, CLASS MANAGERS	ORACLE, SYBASE	$9,600
VISUALWORKS ParcPlace Systems, Inc.	10/92	WINDOWS, MACINTOSH, OPENLOOK, MOTIF	OS/2, NEXT	SMALL-TALK	GUI BUILDER, EDITORS	ORACLE, SYBASE, EDA/SQL	$2,995-$4,995
PARTS Digitalk, Inc.	10/92	OS/2 2.0	WINDOWS	SMALL-TALK	GUI BUILDER, EDITORS	BTRIEVE, OTHERS WITH OPTIONAL PARTS DATABASE INTERFACE	$1,995
SYNCHRO-WORKS Oberon Software	Q2 '93	N/A	MOTIF, SOLARIS	C++	EDITORS, BROWSERS, DATA MODELING	EMBEDDED OODBMS, ORACLE, SYBASE	DEVELOPER EDITION $7,250 VISUAL TOOLS $4,750 RUNTIME $1,500

CW Chart: Michael Siggins

Two categories

More recent entries to this new genre of tools fall into two basic categories: high-end workbenches for independent software vendors and corporate application developers writing complex applications and more accessible, visually oriented tools designed for quick development of in-house applications (see chart).

That division is also reflected in the programming languages supported by the two types of workbenches. High-end tools, such as Visix Software, Inc.'s Galaxy and Component Software Corp.'s Component Workshop, tend to demand C or C++ programming.

More accessible workbenches such as ParcPlace Systems, Inc.'s Visualworks and Digitalk, Inc.'s Parts workbench are based on SmallTalk. However, a developer's intention will dictate the most appropriate workbench. "Some people prefer to work closer to the iron with C, and others want to get their applications done faster with SmallTalk," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

But technology is not the only driving force behind the recent deluge of cross-platform workbenches. Consultants, systems integrators

Workbenches, *page 85*

Decision time: PC development tools for Windows NT, OS/2 arrive

By Kim S. Nash

With a bumper crop of PC development tools unveiled recently for IBM's OS/2 and Microsoft Corp.'s Windows NT, corporate and commercial software builders have their hands full choosing products for creating client/server applications.

The emerging generation of tools comes closer to fulfilling the promise of building truly client/server programs than previous offerings, said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. The initial wave focused on adding graphical user interfaces to host-based applications; the new tools do more to split the processing logic of an application so that part of it runs on a client and part on a server, she said.

> Many tools do not need to be tuned for a specific operating system to do the job.

Keep in mind, however, that many PC tools are less robust than their mainframe and midrange counterparts and often handle only one or two discrete development tasks. And, with few integrated computer-aided software engineering workbenches in this market, programmers must be careful to cover the critical bases of client/server development, users and analysts said.

In addition to the usual suspects, such as compilers and screen generators, tools that do project management and version control are important for keeping track of work

Tools, *page 85*

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[redacted]

Frank Dodge

A winning client/server formula

When I learned about the client/server movement a little more than two years ago, I couldn't believe what I heard. Desktop software applications more powerful and flexible than mainframe solutions? Heresy. Coming from 20 years in the mainframe world as I did, at McCormack & Dodge, I found it unbelievable that the mainframe could be replaced with a PC — a toy.

As my interest grew, I talked to many companies that were planning a move to client/server. Their biggest motivations were to save on high maintenance charges, take advantage of better software and escape from old, proprietary hardware/software platforms.

Analysts I spoke with concurred. A poll conducted by Forrester Research, a Cambridge, Mass.-based market research firm, found that 48 out of 50 companies are already downsizing because of the opportunity for dramatic new applications with functionality just not achievable on the monolithic mainframe.

I also talked to companies that have developed successful client/server applications. To my surprise, I found out how quickly and economically client/server applications could be developed. To prove my point, my company developed highly functional and sophisticated client/server financial applications in one year — written from scratch. And we used a fraction of the staff we would have needed for a mainframe application, without cutting corners.

Sound too good to be true? Believe it; it's the wave of the future. Client/server applications will rapidly replace old mainframe systems, with relatively standardized applications being first.

It won't be easy

I'm making it sound easy. It's not. The point is that you shouldn't be afraid of it. Client/server applications can be developed quickly and economically. There are, however, a few premises that must be in place to make this happen. First, you must develop the application from scratch, and second, you need top-notch, senior people for the job.

With that in mind, where do you start?

Is there one definition of client/server software? The term has caused so much confusion that its value to both end users and software vendors is decreasing.

What industry experts and customers are finding is that a "true" definition for client/server software is emerging as a standard. It includes four critical components:

- Software designed for an SQL relational database (such as Ingres, Sybase or Oracle).
- Software designed for advanced networking capabilities (such as Novell or Microsoft Windows NT).
- Software designed for a GUI (such as Windows or Motif).
- Software that splits the application functionality between the desktop machine and the server machine.

Each piece plays a significant role as it fits together in the architecture.

A typical, incorrect way of approaching client/server is an evolutionary approach by which the mainframe acts as the server connected to networked PCs. Many mainframe software vendors maintain that this protects current customer investment in their technology and reduces the learning curve. The fact is, you cannot salvage and repackage old code to fit the new client/server architecture — you must start from scratch to truly exploit its potential. Customers will save significant time and money by avoiding the evolutionary approach.

> **You cannot salvage and repackage old code to fit the new client/server architecture.**

The key is the software design. The combination of a relational database, a GUI, networking and code splitting are so different from old mainframe environments that applications need to be totally rethought. The technology used to be a barrier, an inhibitor — now it is an enabler. Limitation on applications is now dependent on the creativity and imagination of the designer.

The team

This kind of design approach requires senior development staff: senior systems architects, senior application architects, senior database designers and programmers. These people will be critical to successful product implementation in a timely fashion. Think in terms of half the time and a fraction of the cost.

The armies of people who worked on typical mainframe projects are not needed here. What works is just a handful of senior specialists working closely together, unencumbered by endless meetings, countless memos and old technology. Today they are surrounded by plenty of white boards and armed with modern, exciting technology tools. This is emerging as the new model of development.

If you start from scratch with a senior team of developers, you can develop world-class client/server applications quickly and economically. Three years ago this wasn't possible, but it is today. Don't be afraid — dive in!

Dodge is president and chief executive officer of The Dodge Group in Waltham, Mass.

Benches offer cross-platform support

CONTINUED FROM PAGE 83

and corporate developers also consider the tools to be critical components of corporate information systems strategy.

Because they allow applications to be developed once and then deployed on a number of platforms, "you preserve your investment in the core business logic supporting corporate applications," said Michael Beller, a principal at systems integration firm Technology Solutions Co. in Chicago. Beller declared that typical $5,000- to $10,000-per-developer costs for the workbenches are "peanuts, compared to the $1.5 million you'd otherwise spend supporting the next generation of an operating environment."

That points to another reason the workbenches are gaining notice: developers' desire to spread their potential risk across a variety of platforms. "Developers are not willing to bet on one operating system anymore," Hurwitz said.

With lingering memories of their 1980s commitment to OS/2, which caused many to "lose their shirts," Hurwitz said corporate and commercial developers "can no longer do one platform and be assured that they're doing the right platform."

Decision time: PC development tools

CONTINUED FROM PAGE 83

in progress. "That sometimes gets overlooked," said Doug Hamilton, president of Hamilton Laboratories, an independent software developer in Wayland, Mass. Hamilton Labs is beta-testing Windows NT and developing Hamilton C Shell for Microsoft's 32-bit operating system, which is due to ship first-quarter 1993.

Many tools do not need to be tuned for a specific operating system to get the job done. Tools such as souce code editors and file browsers used to build DOS applications will work similarly under Windows NT or OS/2, Hamilton said, which could stretch your development budget.

A caveat comes in the form of budgeting for Windows NT development. Its software will theoretically be able to run on several different hardware platforms, including PCs and servers. That means development teams working on different boxes may have to buy multiple copies of Windows NT tools for different systems.

The infantile market has yet to settle on fair pricing for such cases, Hamilton said. After Windows NT has been out a while, the situation will smooth itself, probably by summer 1993, he said.

Corporate developers might also want to plumb their vendors for specifics on availability of OS/2- or Windows NT-based products.

"They could be building them already, which would save you from establishing a relationship with a new, untried vendor," Hamilton explained.

The Free Software Foundation is a source for, well, free software. Bulletin board cruisers can pull down products such as Gnu, a Unix shell that has been ported to Windows NT.

So your corporate climate is changing from proprietary to open.

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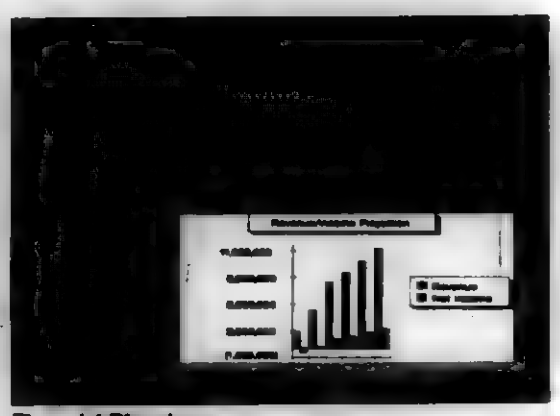

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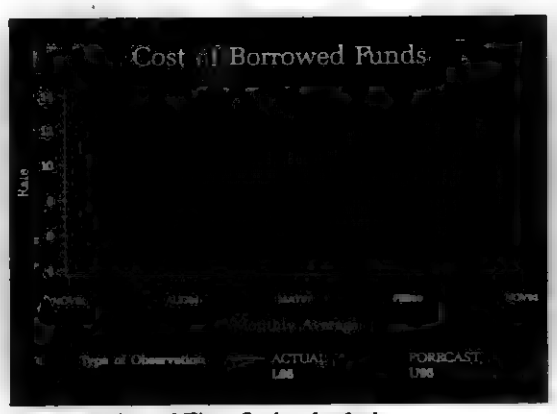

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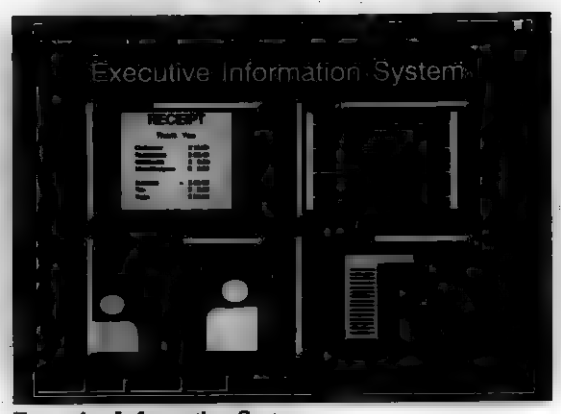

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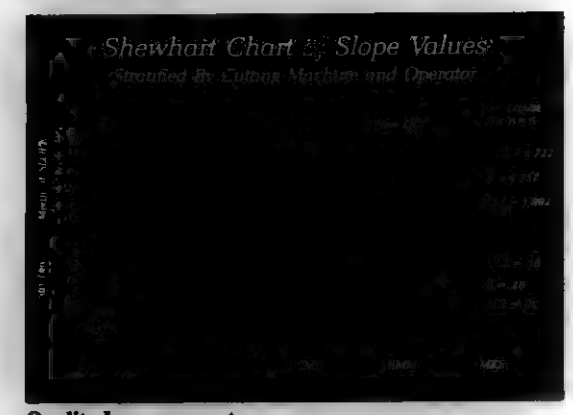

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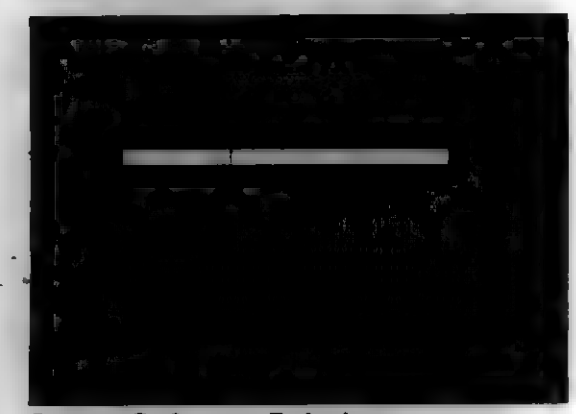

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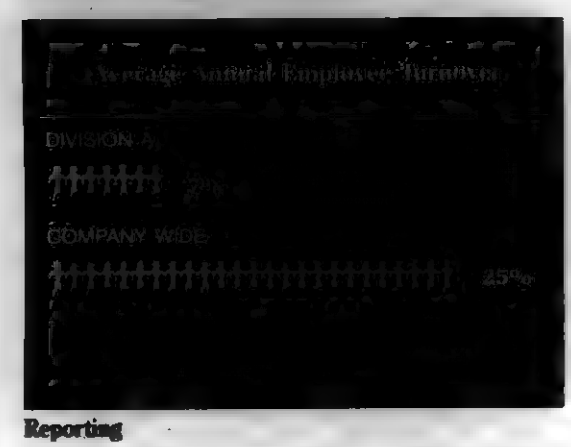

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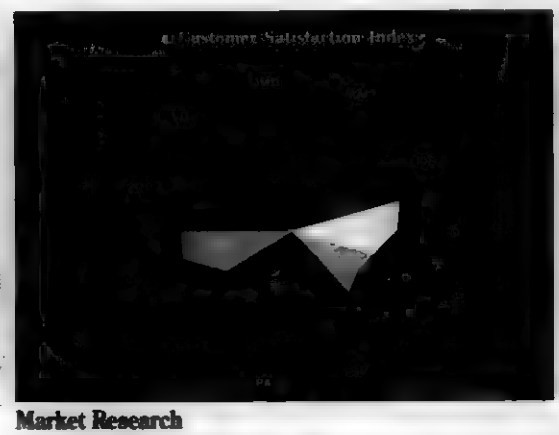

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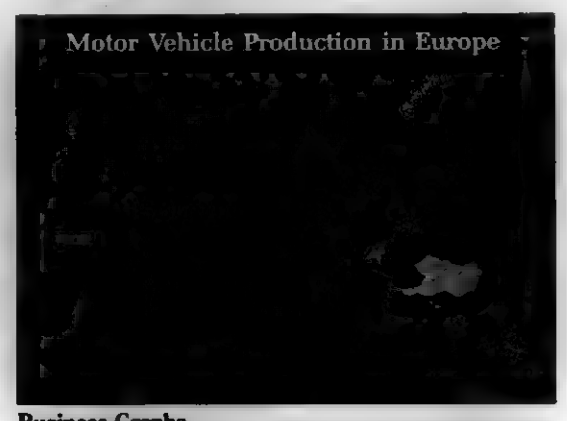
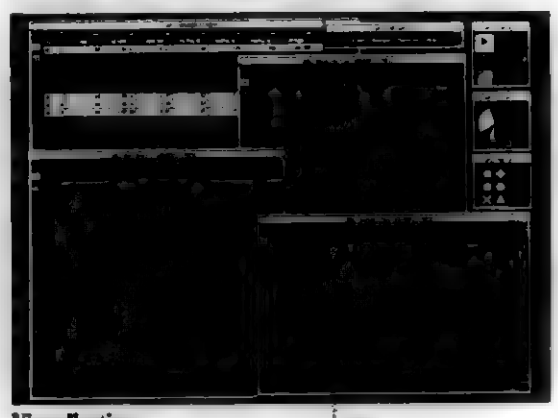
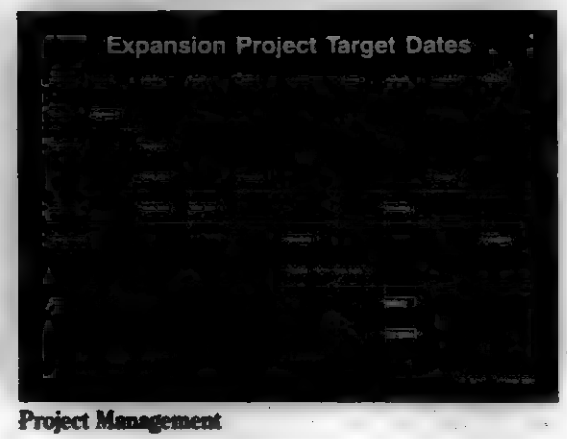


Business Graphs



Visualization

Data Analysis



Project Management

The ENEMY WITHIN

New technology is only half your LAN security problem. Users are the rest.

By Joseph Maglitta and John P. Mello Jr.

If new technology doesn't succeed in fraying your local-area networks and nerves, then wait: Your users probably will.

That's the word from experienced information systems managers, consultants and vendors of network security products, who say the widespread embrace of downsizing, client/server architecture, electronic mail and open systems is making LAN security, never great, an even bigger headache.

"No system is totally secure," says Jim Hansell, vice president of investment systems at the New York office of securities firm UBS Asset Management. "But LANs are less secure than mainframes; they need to plug those holes."

Add the explosion of laptop computer use, the appearance of new viruses aimed at networks, groupware and users who often don't know or care about security and licensing issues, and it's easy to see why legions of IS managers, systems managers and LAN administrators are nervous.

Novell, Inc.'s recent disclosure that any NetWare LAN user can give himself supervisor privileges only heightened anxiety.

Inside

Vendor update.

One manager's security secrets.

Pages 89, 92.

These pressures couldn't come at a worse time. Record numbers of U.S. corporations are moving critical applications from mainframes to distributed platforms built on PCs and interlinked LANs. According to International Data Corp. in Framingham, Mass., some 400,000 LANs and LAN operating systems were sold last year in this country alone.

More users means more problems, consultants say. Because so much important corporate business is now handled by networks, concern about LAN integrity is no longer confined to individual departments or groups. Keeping people and viruses out of strategic LANs has become a sticky issue.

"When you put more control at distributed sites, like you do with LANs, you increase your security risk," acknowledges Mark Dodge, telecommunications manager at United Parcel Service, Inc.'s ■ group in Mahwah, N.J. "But the cost savings of LANs are so great that it's worth the security risk."

Unauthorized network access was the second most serious concern of 1,153 IS professionals recently surveyed by Datapro Information Services Group, the Delran, N.J., researcher (viruses topped the list). Yet only 2.3% of respondents reported having a company policy on network or Unix security.

Government is hardly in better shape: One recent survey of 150 federal agencies, including defense, reported that although 90% have a security policy, nearly half have a security budget of $1,000 or less.

Signs of life

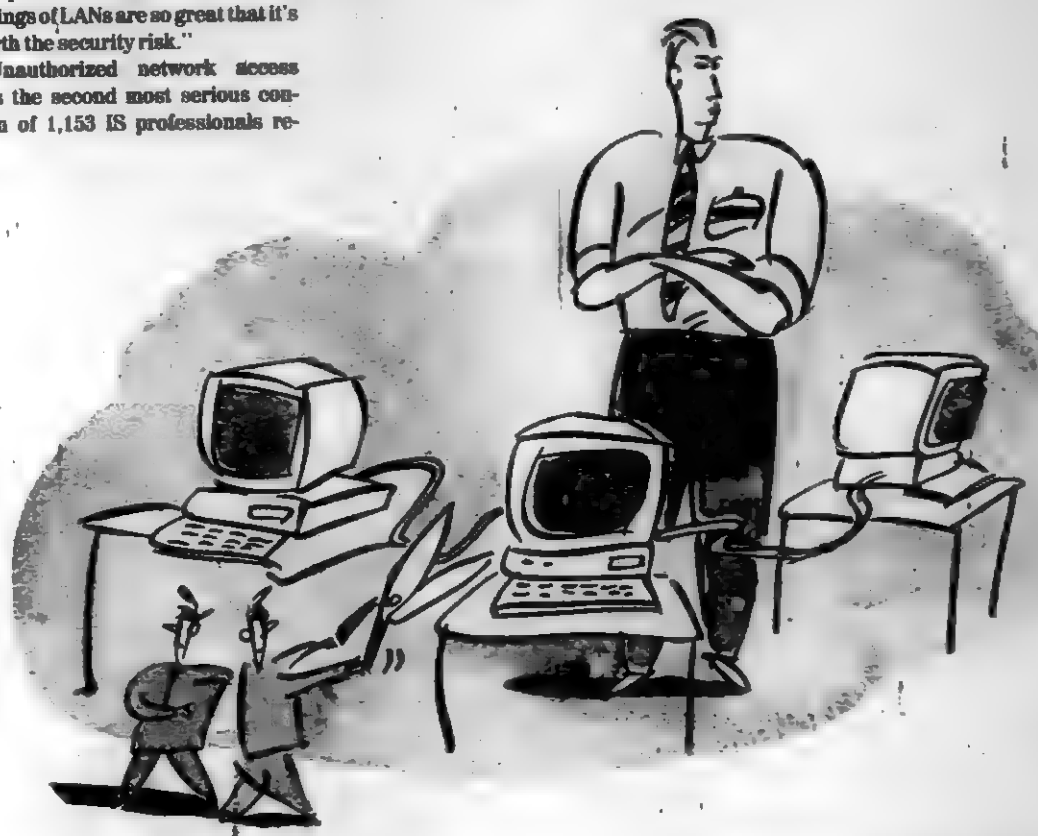
There are signs of stirring, however. Some 1,300 people attended the 19th Annual Computer Security Conference held in Chicago last month. Many sessions dealt with security in downsized, distributed, client/server environments, as did talk at the recent Comdex/Fall '92. Technical journals have also begun to address the problem.

In recent months, industry vendors, including Novell, Microsoft Corp. and IBM, have rushed to address concerns with LAN security. Some have beefed up security features in their products or introduced new offerings (see story page 89).

A specialty market in LAN security tools and virus-detection products is also flourishing.

Still, critics say there's lots of room for improvement.

Security, *page 89*



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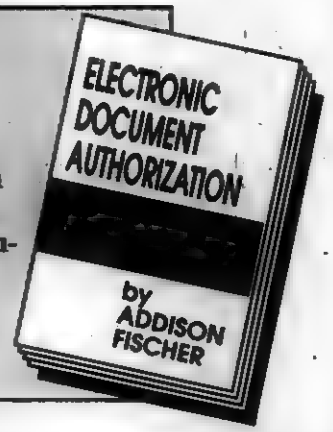

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LAN security problems

CONTINUED FROM PAGE 87

Security "is an area where network operating systems fall flat on their face," says Howard G. Conrad, chief technical officer at Trellis Network Services, a systems integrator. "How can you audit what's being used by whom and how long?"

Conrad is especially tough on nonmandatory security. A big problem, Conrad says, is that network operating systems don't make security mandatory. This, he continues, "allows the user to say, 'Yeah, I want it,' or 'No, I don't want it.' That's a big problem."

People problems

It's widely agreed that users, not new technology, pose the biggest threat to LAN security.

"The whole damned thing gets down to people discipline," says Harry Demaio, a senior manager and security specialist at Deloitte & Touche. Users, he says, must be taught sound security procedures — and must adhere to them.

John Worthen, president and chief executive office at Pyramid Development Corp. in Rocky Hill, Conn., adds: "The most malicious destruction — 80% of the security breaches — is from insiders. They're normally not stealing information; they're normally destroying it."

Little wonder that many security professionals say the first line of defense should be an educated — and contained — user community.

IS fights back

"Information protection is technology and psychology," observes Demaio, former director of corporate security programs at IBM. "You can't do the whole thing on the technological plane alone."

Indeed, scores of IS chiefs are struggling to tame LANs with a blend of products and practices aimed at plugging holes in operating systems, databases or applications. Some have set up security hot lines.

TRW Information Services in Anaheim, Calif., for example, recently began using new computer terminals with embedded passwords. Southwestern Bell also installed new devices and procedures, according to a company spokesman. Both companies have suffered from data hacks during the last year [CW, July 13].

Hundreds of corporations, including MCI Communications Corp., Unum Life Insurance Co. and Motorola, Inc., are aggressively tackling security issues.

Most efforts focus broadly on two areas: keeping outside intruders away from networks, and managing insiders.

At the University Hospital Consortium in Oak Brook, Ill., network administrator Jack Skalon says he relies on NetWare's built-in security features, plus a few commonsense policies, to keep security tight among his 115 or so users on 10 Novell servers.

Besides scanning the network "four or five times a week," Skalon says IS makes sure that all software is licensed and certified virus-free by an end-user liaison. Plus, the computer room is locked and off-limits to all but a few selected supervisors.

While Skalon acknowledges that security policies are "really hard to police," he says users are complying. "Once you find viruses," he notes, "people tend to pay more attention" to rules.

At UPS, network drives are also scanned for viruses each day. Dodge, who is lucky enough to have a network administrator who handled minicomputer security in a previous job, has devised another clever tactic: Tying an IS audit into an annual accounting audit at all UPS sites.

Dodge explains: "This means that as we measure cost, we also check to see that our established security procedures are being followed."

Getting tougher

To combat the virus problem, some companies are enacting strict policies, including firing employees who do not scan floppy disks for viruses.

Hypobank in New York has taken a different tack. "We've disabled access to the A drive for all computers throughout the bank," explains Joe Sanchez, an assistant treasurer who oversees IS at the German bank.

If a user tries to insert a disk into the off-limits PC drive, a product called Watchdog Director made by Fischer International Systems Corp. in Naples, Fla., flashes a warning message. An audit trail is also created by the product, so IS can see who's been trying to load disks.

Experts say regardless of the tactic chosen, the trick is to be effective while avoiding costly overkill. Not every site, for example, needs bulletproof security, Demaio notes. "A password and a personal identification number may be all you want for networks that aren't carrying the organization's family jewels," he says.

Enough but not too much is the approach favored by DHL Airways, Inc., a unit of shipper DHL International. LAN security "is obviously a topic of importance to us," says Michael Lanier, chief information officer. "But we're not essentially dealing with Pentagon secrets here — we're running a mail service."

Key financial data is stored on a secure mainframe, according to Lanier. But he says the unit is moving to distributed networked Unix systems (IBM RISC System/6000s), and plans are afoot to bring in a new accounting system next year, probably a networked Application System/400. "IBM has committed to creating [security] capabilities in the networked arena," he says, "and we get early access."

While valiant IS efforts mount, managerial, technical and legal obstacles loom.

On the technical side, seamless security for heterogeneous networks and mixed platforms is a ways off. And each day, more IS managers discover a harsh reality: Client/server simply isn't built for security.

Experts say current National Security Agency data encryption standards, while effective, are not recognized overseas. And investigations continue into a serious crack discovered in the Data Encryption Standard (DES) last year by two Israeli mathematicians. If they are correct, DES, developed by IBM in the early 1970s, could be in serious jeopardy.

Finally, at present no standards exist for wireless data flow, also a big potential problem.

As for people issues, executive apathy remains a big foe. The problem is so bad that IS managers and consultants say it often takes a serious data loss before top executives take notice.

At Hypobank, for example, Sanchez says he spent five working days to eradicate the "Joshi" virus, which wiped out 40 important disks after being introduced into the company from a home PC. "I said to [management], 'Now do you realize how important security is?' " he recalls. "Ever since that day, no matter what I ask for that has to do with computers, they would never say no."

But top bosses can't be blamed too harshly, Demaio cautions. IS and users, he says, must also shoulder blame for poorly articulating security needs to vendors.

Central control needed

Perhaps the biggest challenge is a familiar one: Lack of IS influence over departmental LANs.

"This isn't the way the culture has grown up," says an IS executive at a major Midwest manufacturing company. "But there's too much critical information on these servers and LANs to leave maintenance and control up to the users. No matter what you call them, these are little mainframes. IS has to centralize control."

One IS manager relates that of 120 or so attendees at a recent security seminar, only a handful raised their hands when asked if IS exercised any meaningful control over LANs at their respective companies.

But growing duties could spell trouble for network administrators, many of whom are already juggling dozens of responsibilities, notes an IS executive at a New York company.

Despite the obstacles, hope remains. Smart cards, digital signatures and call-back systems are catching on. Some regional phone companies are experimenting with Caller ID, but not on a national basis as yet.

Also, in January, the National Institute for Standards and Technology in Gaithersburg, Md., drafted new minimum security standards for multiuser operating systems and access control.

And earlier this year, the Bush administration relaxed controls on some software with encryption capabilities. Vendors say the move could eventually lead to better security features in mass-market packages.

As long as the lure of fantastic savings and flexibility outweighs the risks, LAN security innovation will continue.

Computerworld staff members Michele Dostert, Carol Hildebrand, Elisabeth Horwitt and Nell Margolis contributed to this report.

Magiitta is a *Computerworld* senior editor, management. Mello is a free-lance writer based in Woonsocket, R.I.

Resources

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Manager speaks out on secure LAN plans

An executive at a major Midwest manufacturing company, who requested anonymity, recently agreed to share his firm's tactics for protecting local-area networks with Nell Margolis, a Computerworld *senior editor, management. Some of his observations follow.*

"We're in the middle of major LAN security changes right now. Eight years ago, we let users create and control their own LANs. They could do basically whatever they wanted and had to justify what they did to their [respective] business unit heads.

"There was a lot of very important company data on those babies, and users didn't understand the need or have the means to protect it. As the pattern of a potential large-scale security breach began to emerge from the reports, the CEO came to a decision: He said, 'Let's get this thing fixed.'

"We began an enormous desktop security education program (35 training sessions of 1½ hours each) in headquarters alone. We're now doing this at all sites, not just in the U.S. but worldwide.

Like mainframe, like LAN

"IS is now using Novell LAN management software — and in a proactive way — to monitor and back up the LANs exactly the same way we do the mainframe. We've got about nine LANs in this building alone. We already had these folks in place and familiar with the Novell package. Why not use them?

"We brought [workstation servers] back inside physically — moved them right into the new data center here at headquarters. This is the safest place in the company, and that's where they ought to be.

"This is the direction things are moving in — I'm certain of it. In addition to that change, we had to redefine the network administrator's role. [Each administrator now shares authority and responsibility with central IS.] IS backs up every server, seven days a week.

"Was there resistance to IS' stepping into the LAN control picture? I can't tell you how much! Let me put it this way: I wear 'arrow' shirts.

"We did what we could to ease the transition. In our education stage, we told everything to folks at all different levels at the same time. This way, vice presidents on down heard the same words at the same time. That's extremely important.

Keeping at it

"You take away a LAN with 10 PCs on it, you're taking away a lot of control. And that's even if you don't take it away literally, physically, which in some cases we did. That was hard enough, but pulling away the program diskettes killed us. But we just kept on pounding away: It took almost a full year to [appropriate and lock up some 20,000 disks].

"And now we're beginning to deal with the security issues raised by a sales force that uses laptops. The salespeople need that device out there. But when they connect to the LAN, suddenly they're wired into major repositories of mission-critical information.

"That's a big shock to the company, but we've taken some security precautions. The salespeople themselves don't know how to sign on; they only know how to get to a program that gets to a program that does it for them. . . . We don't have to worry about a thief getting the data. We can't protect everything, but we protect the data that's on a C drive — that's gold.

"Are all users delighted with the new measures? No — but they're beginning to see the benefits of increased IS control over LANs. In the past year, we've had three major hard disk crashes. In all three, no data was lost because the people were adequately prepared. And in all cases, people admitted that before the security training, they hadn't been prepared."

Calendar

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

Redundant Arrays of Inexpensive Disks Advisory Board Meeting. Sunnyvale, Calif., Jan. 13 — Contact: Joe Molina, Technology Forums, Lino Lakes, Minn. (612) 704-2379.

JAN. 17 - JAN. 23

Retailing 1993 A Turning Point. New York, Jan. 17-20 — Contact: Retail Services Division, New York, N.Y. (212) 244-8780.

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 24 - JAN. 30

Marketing the IS Organization Internally. Atlanta, Jan. 26-27 — Contact: Oulette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London (011-071) 637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo, Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 UDMS User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

Compcon Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706.

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

Doing Business in the Pacific RIM International Conference. Sydney, Australia, Feb. 25-26 — Contact: Computer Law Association, Fairfax, Va. (703) 560-7747.

FEB. 28 - MARCH 6

CompTel '93. Washington, D.C., Feb. 28 - March 2 — Contact: Trade Associates, Inc., Rockville, Md. (301) 468-3210.

Share '93. San Francisco, Feb. 28-March 5 — Contact: Share headquarters, Chicago, Ill. (312) 822-0932.

Advanced Object-Oriented Analysis and Design: The State of the Art. San Diego, March 1-4 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Sensors Expo West '93. San Jose, Calif., March 2-4 — Contact: Expocon Management Associates, Inc., Trumbull, Conn. (203) 374-1411.

Executive Track

The board of directors of the **Federal National Mortgage Association**, better known as **Fannie Mae**, recently elected **William E. Kelvie** executive vice president and chief information officer. Kelvie, who served as a consultant at Nolan, Norton & Co. prior to joining Fannie Mae as senior vice president and CIO in 1990, is responsible for the full range of the Washington, D.C.-based federal mortgage association's information technology systems.

At **Keuka College** in Keuka Park, N.Y., **Harry Smith** has joined the administrative staff as director of computer services. Smith comes to the liberal arts college from Cincinnati-based Cars Information Systems Corp., where he served as director of public sector services. He has also served as director of computing services at Baltimore-based Loyola College.

Wilbur L. Smither is the new CIO and senior vice president of customer information services at **Mary Kay Cosmetics, Inc.** A two-decade veteran of the business, management and information systems worlds, Smither comes to the Dallas-based cosmetics firm from Blockbuster Entertainment Corp., where he served as vice president of IS.

Arlington, Va.-based USAir recently promoted **Joan W. Harper** to the position of senior vice president of IS. Succeeding Harper at his prior post — that of vice president and controller at USAir and its parent, USAir Group — is **Ann Greer-Rector.**

Before joining USAir in 1991, Harper held financial management positions at Trans World Corp. and TransWorld Airlines.

Have you or a colleague in IS recently been promoted? *Computerworld* would like to share your news with the rest of the IS community. Please contact Senior Editor Nell Margolis at (800) 343-6474 to pass the news along.

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Do you measure up?

There are various methods out there for gauging the return on your IS investment. Find out how to use these measures to guide business decisions such as outsourcing, re-engineering, etc.

By Walter M. Carlson and Barbara C. McNurlin

When your chief executive officer asks you to quantify information technology's return on investment, just describing changes in systems staff productivity and service levels isn't enough. CEOs want the return put in terms of business improvements.

Unfortunately, chief information officers can rarely give a full accounting of technology's effect on business performance. The problem isn't lack of measurement methodologies — there are a growing number of those. The problem is knowing which measure to use in which business situation.

You want to get to know your measurements — whether quantitative, qualitative, ratios, percentages or comparisons — and where it makes sense to use them. In this way, you can help guide some of the most gut-wrenching business decisions, such as outsourcing, corporate funding, business process re-engineering, quality management and entering new markets.

You've heard and read a lot about getting more involved in the business. Here is your chance to make an impact:

Guiding *outsourcing* decisions

Companies today are exploring outsourcing in hopes of saving lots of money on in-house information systems operational expenses and capital investments. To know whether and which IS functions to outsource, you need to know not only how efficient the IS organization is but also how effective — in other words, how swiftly and accurately your systems department understands business needs and acts on them.

If you base your outsourcing decision on IS efficiency alone, you have an incomplete picture and may even make a misguided outsourcing decision. Cost savings shouldn't be the sole driver; improving the business is a crucial goal.

Measures of IS efficiency include time to complete projects, percentage of service level agreements met, operational costs and programmer productivity (using function points so that comparisons can be made between projects).

Measuring IS effectiveness and how it relates to business performance is more complicated.

One approach comes from CogniTech Services Corp. in Easton, Conn. Through research and analysis of 47 companies, CogniTech has identified 79 factors that define an effective IS organization in areas such as organization (amount of business unit control of deliverables), culture (leadership style, decision procedures), planning (formal planning processes, interaction with business units) and architecture (standards employed, policy flexibility).

The idea is to zero in on those effectiveness factors that need improving, thereby improving

Measure up, *page 97*

Where are you headed with your applications development?

BACHMAN

Continued from page 95

business performance. CIOs can quantify their effectiveness and focus outsourcing discussions on business performance factors (Are we effective in this area? Can the outsourcer be more effective?) instead of merely on IS costs.

CognITech uncovered three performance measures — return on equity, earnings per share and revenue vs. expense — that are reliable indicators of IS effectiveness. The company found that companies with high return on equity and earnings per share tend to have systems departments that concentrate on being effective.

If your IS group falls into this category, you need to think twice about outsourcing. It might bring certain cost savings, but it might also damage the IS group's effectiveness and, by extension, harm the business.

CognITech also discovered that companies with centralized IS functions concentrate on minimizing costs. Effective IS organizations generally have a more decentralized structure, with part of the systems department reporting centrally and part reporting to functional units.

In making a decision to outsource, companies with an effective, decentralized organizational structure may want to farm out only a portion of their functions. They want to make sure their outsourcer retains the company's organizational structure so IS effectiveness does not suffer. Functional managers should retain control of system development of single-function applications and local-area network management so they can keep an eye on effectiveness and business performance improvements.

Guiding corporate *funding* decisions

One way CEOs are responding to downturns in business is to mandate across-the-board budget cuts. But it's unwise to cut back on IS and services wholesale; doing so could impair business performance. The plain truth is that some areas just can't be cut. CIOs should know where technology is and isn't paying off and allocate money where it is going to have the greatest business impact.

To help their companies decide on funding, IS chiefs need measures in five areas: information technology resources used, IS effectiveness, business efficiency, business effectiveness and quality.

Boston-based Nolan, Norton & Co.'s gray cell approach covers measurement in most of these areas. In this approach, operations first get ranked according to their impact on revenue and profits.

Second, the company measures and estimates the distribution of technology resources across these operations.

Third, it estimates improvements from using information technology in each operation. For example, a manufacturing company might give a high rank to investments in systems such as electronic data interchange because of their importance in achieving more flexible manufacturing.

The combination of these three measurements shows where a company is using resources to support strategic or nonstrategic operations. In this way, the company can channel funds to where they will have the greatest impact.

Generally, this analysis reveals that companies have made investments to improve the efficiency of specific business activities.

Unfortunately, today's cost-accounting systems do not provide figures to show how these activities or processes have improved. Such information would go a long way in helping companies decide where to spend and where to cut back.

There is hope, however, in the shape of an emerging accounting system, known as activity-based cost management. Activity-based cost measures the cost of every significant activity in a process; therefore, it attaches value to such overlooked, yet important, activities as delays and rework. It also allocates overhead costs to specific products and services rather than spreading them across the board as a percentage of direct labor.

Activity-based cost management forces companies to understand their business processes and gives them a way to quantify such intangible benefits as higher quality and faster speed to market. In so doing, it provides executives with deep knowledge of the most valuable company processes so that they can decide which ones should receive the highest level of support.

Guiding *re-engineering* decisions

Re-engineering means redesigning business processes to make dramatic, companywide improvements in such areas as cycle time, quality and price.

Companies are beginning to take advantage of the power of computers by rethinking their assumptions about how businesses should work.

Unfortunately, few companies know how to measure information technology's impact on personnel productivity, customers and business performance after re-engineering; therefore, they are probably missing opportunities to improve their business processes further.

Measures that have the most meaning for re-engineering center on business efficiency and business effectiveness. Also important are IS effectiveness measures because management needs to know whether the IS department can deliver its promised services.

Boston University professor John C. Henderson and Northeastern University associate professor Kathleen Curley have developed the value assessment framework, which measures the value of IS in the business process arena.

Henderson and Curley say they believe the sources of value using information technology occur at three organizational levels: individual, division and corporate. Furthermore, they see the impact of an information technology investment in three areas: changes in economic performance, impact on key functions and changes in organizational processes. Most companies today do not include process change measurements; therefore, they do not really know the measurable impact of their information technology investments on business processes.

By combining their two views — organizational level and impact areas — the professors get a broad assessment of technology investments. This broad view describes benefits that narrower measurement techniques miss.

Henderson and Curley used their measurements to evaluate a human resources information system brought in at a large chemical company in New York. They looked at how the system affected the jobs of human resources counselors, the human resources function as a whole and the corporation's ability to manage its people.

What they found was that the system enabled individual counselors to concentrate on important and complex questions because employees could access the system directly for simple queries.

In terms of the human resources function, the system eliminated one process completely — medical claims verification. The claims are so accurate they can be sent directly to the insurer.

At the corporate level, the system has allowed the firm to restructure "intelligently," retaining the needed skills rather than simply making across-the-board cuts.

The key to getting measurable value from re-engineering is not to stop at process and technology changes. Rather, redesigning processes and systems must go hand in hand with rethinking jobs.

Peter Sassone, a professor at Georgia Tech University, conducted five years of in-depth interviews with 1,719 people in companies re-engineering their offices. He measured people's work before automation and then how their tasks were distributed afterward. What he found in some cases was astounding. Companies cut back on their clerks to save money. But any savings and benefits were diminished because high-paid employees took on the clerical tasks, even in some cases setting aside their planning and managing duties to do so.

Sassone says that only by taking detailed before-and-after measurements of work composition and then redesigning work force composition can companies reap re-engineering benefits. For some of Sassone's interviewees, those benefits include a 15% increase in productivity.

Guiding *quality* decisions

Companies have been measuring quality control for close to 70 years, but those efforts have generally not involved IS.

The current quality movement changes that. CIOs need to be involved in the measurement aspects of quality because information systems will be the tools used to gather, synthesize and communicate those quality measurements across departments. Measurement is a central ingredient in quality decisions, from the shop floor to the boardroom.

Much of the needed quality and performance data — such as product defects, number of customer complaints and number of returned products — is already in machine-readable form. Installed systems are collecting it. But the measurements are spread across departmental databases, so they present only pieces of the picture of how the firm is doing on quality.

CIOs have a tremendous task in front of them: creating a companywide view of quality data. Accomplishing this task will reap rewards for the business.

A quality measurement program requires linking measures in four areas: quality, business effectiveness, business efficiency and IS effectiveness. These measures range across a wide spectrum: quality improvement, customer satisfaction, cost of quality controls and the ability of the IS department to provide quality-tracking systems.

Systems departments need to create databases that link these disparate pieces of existing operational measures so they can be used for quality purposes. Once such links are available, departmental and corporate management can receive timely data on how well quality efforts are working. Furthermore, management can see the impact of its operating decisions on business performance from the standpoint of both costs and customer service.

Bases to cover for effective technology measurement

To help with your measurement efforts, you might want to keep in mind the following framework. It consists of business and technology areas to consider when assessing the value of information technology. Unfortunately, no measurement plan exists today that has all of these elements in it; IS chiefs will find themselves combining techniques and measures from various sources to touch all bases:

- *Information technology resources used.* All measurement systems must begin with a statement of hardware, software, communications, data and people.
- *IS efficiency.* Typically, companies measure efficiency by cost and productivity, such as dollars, work-months per thousand lines of code and function points.
- *IS effectiveness.* Companies measure IS effectiveness in terms of responsiveness to new business requirements, breadth of system coverage of business processes and user satisfaction. Measurements in this category tend to come from user surveys.
- *Business efficiency.* Business efficiency is normally measured in terms of labor productivity and unit costs of products or services.
- *Business effectiveness.* Market share, customer satisfaction and time to market for new products and services are indicators of business effectiveness.
- *Quality management.* Errors in business processes and customer service, delays in problem correction and the level of IS commitment are measures of quality.

Guiding *market* decisions

Exploiting a new product or service by entering a new market is one of the most challenging decisions management can make. Today's fast-moving pace requires companies to be flexible so they can react to new opportunities and to competitors more quickly. Such flexibility increasingly hinges on the firm's IS infrastructure.

However, infrastructure investments are difficult, if not impossible, to cost-justify because they provide no intrinsic return on investment.

Their purpose is solely to enable new ways of operating. The new operating modes provide the value; the infrastructure does not. So how can companies analyze and justify their infrastructure investments? How should they approach measurement?

One way is to use the financial options theory, espoused by New York University assistant professor Ajit Kambil, Boston University's Henderson and Hossein Mohsenzadeh in London.

An option (using the stock market definition) is a contract that gives the owner the right to buy or sell a specified amount of assets at a specified price on or by a specific date. A "call" option allows buying; a "put" option allows selling.

Information technology infrastructure investments can be seen as providing similar types of options. They can give management either the ability to create new applications not possible if the infrastructure is not in place (a call option) or the ability to replace existing applications quickly when they no longer meet needs (a put option).

An investment in electronic mail, for example, can be equated to a call option because it gives the company a way to create distributed systems more easily (using the mail system as the communications link). The new, distributed applications could conceivably be at customer sites — a possibility perhaps not economically feasible without the mail system infrastructure.

On the other hand, an investment in standards-based equipment could be equated to a put option because it enables management to abandon software from one vendor without also having to abandon the hardware.

By drawing on the numerous formulas and models used in financial options pricing, companies can more carefully estimate the future value of infrastructure investments. Companies will know when to build applications (call option) and when to abandon them (put option).

Companies without such measurement techniques are more likely to miss these put and call opportunities.

In the next few years, IS organizations will finally have measures to uncover the value of information technology in terms of business performance, thereby contributing to major corporate decisions. •

Carlson is a retired IBM corporate marketing consultant based in Boulder Creek, Calif. McNurlin is an independent writer in Torrance, Calif. The authors have spent the past four years researching the area of IS value measurement, and their findings appear in the report "Uncovering the information technology payoffs" ("I/S Analyzer," United Communications Group, Rockville, Md.)

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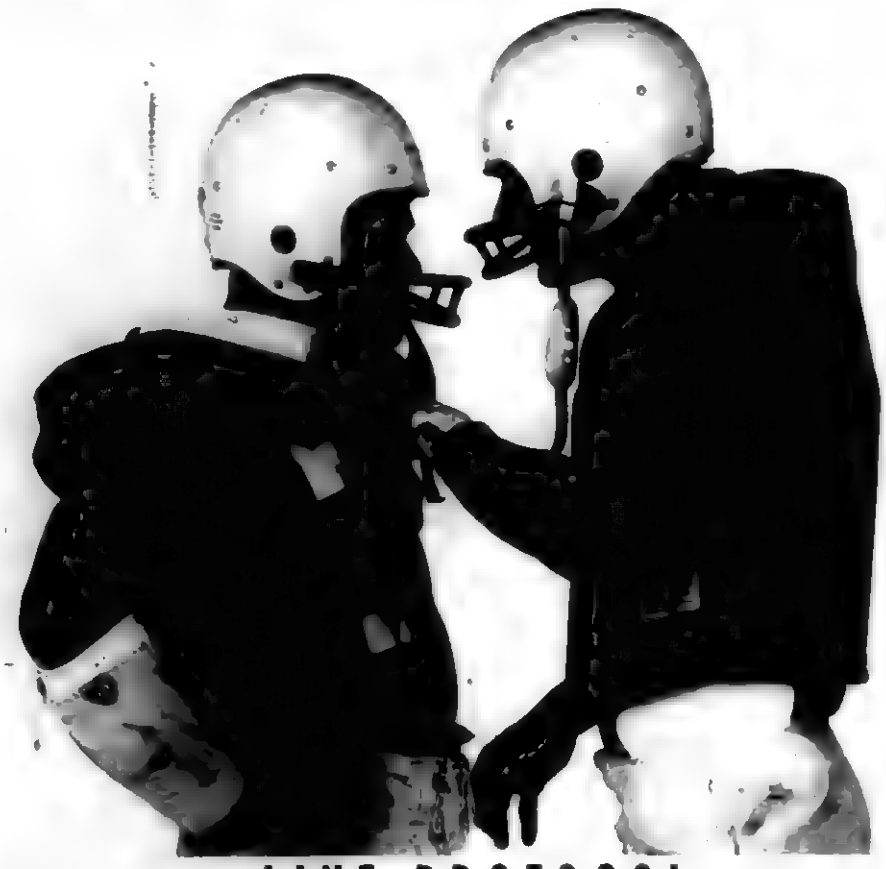

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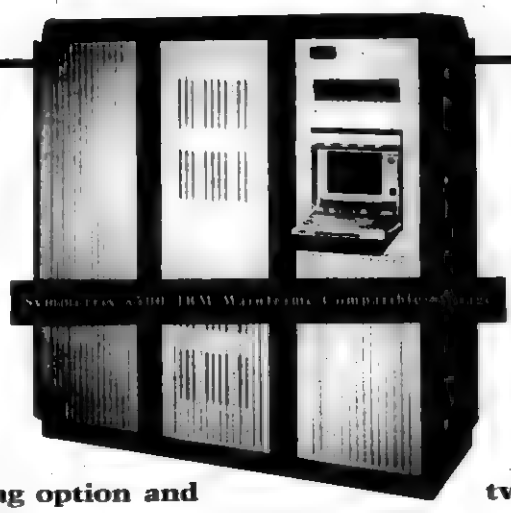

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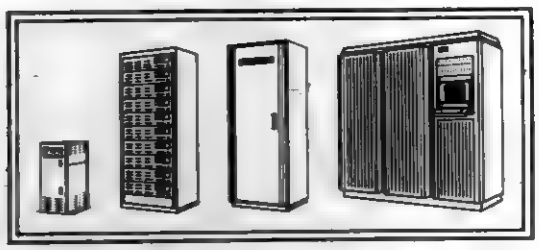

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Computer Careers

Your image could cost you your job

By Martin Morris

Are you scaring your users? You probably don't think of yourself this way, but for some users, information systems professionals are acronym-breathing monsters, threatening and unhelpful.

If you don't believe it, watch them the next time you answer a question or offer an opinion. They squint their eyes and start to focus on you. The muscles around their noses and mouths tighten up. They lean forward, not wanting to miss a word (even though they probably won't understand anything you say). After a few minutes, they put their pencils down and collapse mentally. They have just overdosed on computerese.

Later, as you describe this scene to your co-workers, they laugh and make uncomplimentary remarks about the user not understanding the system.

Wake up! You need to improve your image and clean up your act or you can expect to become obsolete.

Users' jobs were here long before mainframe, peripherals and magnetic tape became household words. Their jobs will *still* be here after local-area networks, image processing, fourth-generation languages and other products have come and gone.

We owe ourselves the chance to see beyond our technical limitations. We owe our users the same energy we expended learning that first programming language or operating system. Only now, we need to focus on learning what their business needs are all about. We've had blinders on for too long. It's time to take them off.

Grim alternative

We need to shift our thought processes from thinking our skills will always be in demand to thinking that our skills and the *image* we present to the company need to be upgraded daily. The alternative is becoming obsolete or being dismissed.

Image improvement outside your technical speciality isn't difficult. The best place to start is in your user community. For instance, ask a user to explain how a complex report, produced by a system you maintain, is used in the company operations. *Don't* tell him which job produced the report, how many files it took to compile the report or how many gyrations the computer operations department went through to align the special report forms. Leave that information back at your desk. Have the user explain the report's function in business terms. If you do, you'll make a friend for life.

I first learned of the value of approaching users in this way in the mid-'70s, when I was a programmer/analyst at a bank. I was frustrated with never seeing the results of my work. So I asked users to show me how my work affected their jobs. By running test calculations, I was able to see the effects I could have on the user. This opened a major channel of communication: It made the users feel better to know I understood the impact my work could have on theirs, and it helped me to gain a new appreciation for users' work.

> **Wake up! You need to improve your image or risk becoming obsolete.**

Another way you can show your willingness to improve your relationship with users is to ask them to set aside a few mornings to teach you about their departments and how they do their jobs. You'll be amazed at how the smallest effort will improve the relationship you have with the user community. Chances are you'll be able to spot areas where small procedural changes could result in significant time and money savings for the company.

In users' shoes

I had an educational experience in the early '80s as a first-line supervisor working with financial assistance programs administered by state governments. I went to a user site and had people take me through the same process through which they take applicants for assistance. They used a test system and together we created what-if scenarios.

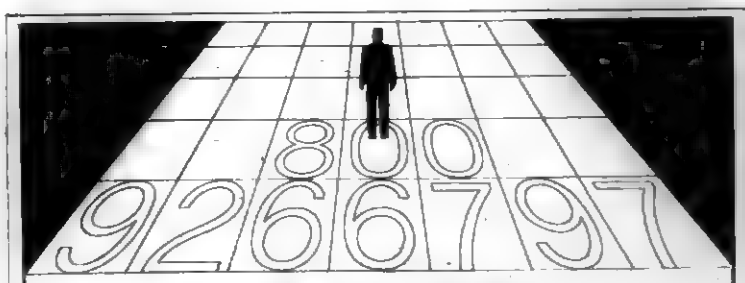
Once I knew the procedure from both sides, I found myself becoming an arbitrator — understanding the concerns of the JCL-type and the concerns of the end user who has to look across the desk at a person who needs financial assistance.

Even today, as a supervisor of IS professionals, I continue to see a tremendous payback when a programming technician spends quality time with users discussing their needs.

Today, I'm trying to use what I've learned to help my colleagues, and I try not to preach. Rather, I set up the scenario and let them come up with solutions. I use many analogies and try to bleed out the computerese. I try to equate situations at hand with things they deal with in everyday life.

The impression you make on users begins the first time you meet them and is reinforced each time you encounter them. Developing a positive image takes a lot longer than making a bad impression. Improving your image is as important as improving your technical skills.

Morris is an assistant vice president at AmSouth Bank in Birmingham, Ala.



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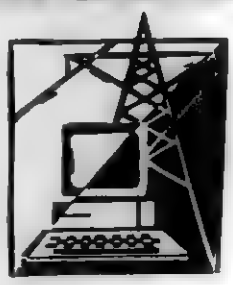

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Industry currents

Tourism driven by integrated technologies

By Emily Leinfuss

Resort destinations and theme parks hold the most promise for information systems jobs in the tourism industry, as jobs in this area heavily involve integrating different technologies.

In fact, technology is the thread that binds tourist attractions together. It is all-pervasive — video surveillance in parking lots, automatic ticket counting at the front gate and a world of animated visions and mechanized attractions.

This reliance on technology translates into some fruitful job opportunities in IS, although employment in other segments of the tourism industry, such as rental car agencies and motels, is not experiencing much growth.

Keeping guests happy

Competition for visitors is fierce at tourist attractions such as theme parks. With a recessionary economy, people take fewer vacations and are far more selective about where they visit. These attractions look to technology to make a difference.

"Technology in our environment has a direct impact on guest experience," says James Bell, director of IS at Colonial Williamsburg Foundation in Williamsburg, Va. Implementing touch-screen ticketing machines and improving ticketing systems can help lines move faster or disappear completely.

Bell says that his company is now hiring for these kinds of projects, but he is very selective. He looks for business-oriented people who can translate strategic objectives into systems running on either mid-range or client/server technologies.

"We push our staff toward consultant or analyst roles — people who use fourth-generation languages and tools such as CASE to create solutions at a higher level," Bell says.

Busch Entertainment Information Systems in St. Louis runs nine parks, including Sea World of Florida in Orlando, Fla., and Busch Gardens in Tampa, Fla. Each park is independent as far as revenue generation, but data collection and financial systems are handled collectively at corporate headquarters.

John Merritt, manager of computer engineering services at Busch's headquarters, says there are many jobs available at Busch and at theme parks in general. Busch conducted a survey with other theme parks and found the majority of systems — both hardware and software — are put together in-house.

"This creates jobs that range from IS programming to documentation writers to installers of equipment," Merritt says.

Like the other theme parks it surveyed, Busch does most of its own internal development work and needs systems programmers. The company also needs IS people at the local level — from data processing managers to network administrators, he says.

Future is Unix

Rental car agencies are still managing to hold their own as tourists continue to look for economical means of transportation. Unix is the technology of the future at car rental agencies and some motel chains as these companies move to a client/server, open systems strategy.

> A reliance on technology translates into fruitful IS job opportunities in tourism.

"The job demand is for people who have a background in Unix as well as DOS and LANs," says Scott Gross. As director of MIS at Welcome Corp., which owns Thrifty Car Rental in Alexandria, Va., he runs 17 area offices single-handedly.

Using technology to boost service is also a key concern at rental car agencies. Companies that are doing well, such as Alamo Rent-A-Car, Inc., offer opportunities in a number of areas including the mainframe environment for large transaction processing, the PC world and Unix.

Demand for Unix talent is on the rise, although right now, demand in the Cobol/CICS mainframe environment is still highest and will continue to be for a couple of years, says Thomas Loane, vice president of computer services at Alamo.

The job market is not as bright at motel chains: They were hit by the slowdown in the hospitality industry that started in the late 1980s. And because fewer tourists are choosing to travel to resort destinations, there just aren't enough people to fill all of the available rooms.

Downsizing or rightsizing has hit the motel industry, and jobs are starting to grow scarce, especially at economy chains. "There are not as many jobs as there used to be," says Sam Peace, vice president of IS at La Quinta Motor Inns, Inc. in San Antonio, Texas.

But Peace says talented people are always in demand, especially those with a background in creative problem-solving in programming.

IS professionals with property management experience are also in demand, says Robert Long, vice president of IS at Motel 6 in Dallas.

Long says that in general, the motel industry is moving toward local-area network-based technology, Unix, 4GLs, relational databases and computer-aided software engineering tools.

Specialty technologies — multimedia for marketing purposes and pen-based computers for check-in — are also becoming more prevalent. These technologies can translate into jobs for people with the right skills to address them.

Leinfuss is a free-lance writer based in Sarasota, Fla.

At a glance

Best opportunities: Tourist-based economies, such as Florida, California and Washington, D.C.

Salaries: $35,000 to $50,000 with three to five years' experience in jobs such as applications consultant, system programmer and programmer analyst.

Hot job titles: Consultant or network operating systems support analyst.

Required skills: Car rental agencies see a demand for communications specialists and C++ programmers with DOS and OS/2 experience. Motels are looking for a select few with skills in implementing specialized technologies such as multimedia and pen-based systems. Theme parks need problem solvers because so much of their job includes integrating different technologies.

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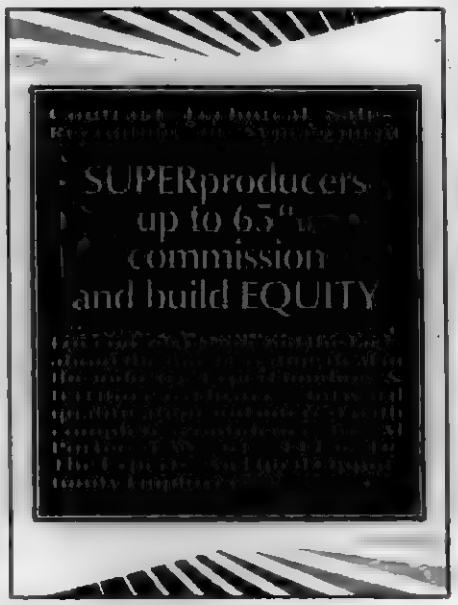

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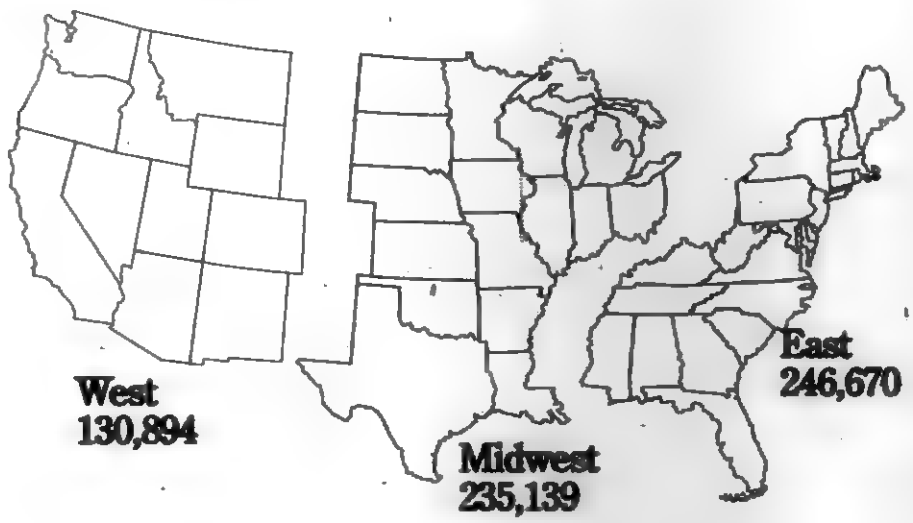

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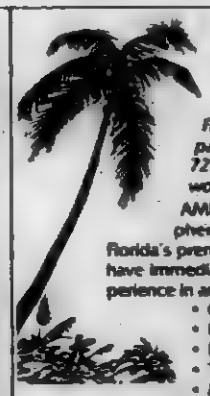

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When the SPA comes a-knockin'

playing it SAFE

By Joel Gilman

Every day, the Software Publishers Association (SPA) receives between 20 and 30 calls on its antipiracy hot line. Every day, it conducts two new audits, which are successful most of the time. Last year, it collected $3 million in fines.

While your company probably doesn't condone using pirated software, your employees could be using programs you don't know about. Either way, you will want to know what to expect when the SPA comes knocking on your door.

Most often, the Washington, D.C.-based organization gets a tip from a disgruntled former or current employee that a company is using unauthorized software.

Tip verification

Before acting on a tip, the SPA tries to verify it in a number of ways. It looks at the registration records the company has on file with the software publisher. If the tip indicates that the company has significantly more copies than the publisher has licensed to it, the SPA will investigate.

> Last year's SPA audits resulted in fines ranging from $500 to $498,000. The latter was from a company that had illegally copied 150 products published by 66 SPA members.

The investigation starts with a letter to the company, requesting its cooperation in conducting an audit.

When a company gets this letter, it can agree to the audit, which is entirely voluntary, or ignore it. However, the best thing to do is cooperate. It will cost less, the case will be resolved faster, and there won't be any adverse publicity.

"Ninety-five percent of the companies audited cooperate fully," says Ken Wasch, executive director of the SPA. Those that don't can expect the SPA to file a suit and show up with a federal marshal and a search warrant. "You'll end up in court. It will cost you more, take longer to resolve, and you risk bad press," Wasch says.

While waiting to be audited, don't be tempted to erase programs. The SPA uses Symantec/Peter Norton Computing Group's Norton Utilities and other tools to reconstruct deleted programs. "We are also acting on an inside tip, so we probably know more about where to look than you do," Wasch says.

The SPA looks only for software published by its members (of which there are more than 1,000), and it is interested only in end-user copying. For example, it won't conduct an audit of an OEM that sublicenses a member's product to end users.

If the SPA finds illegal software during the audit, you pay for it twice: It charges you a fine equal to the price of the product and then destroys the copy. If you wish to continue using the software, you must purchase a legitimate copy.

If you don't cooperate and illegal copies are found, the SPA pursues full legal remedies for copyright infringement, which can be far more costly than merely paying double. The U.S. Copyright Act provides for statutory damages of up to $100,000 for willfully copying software.

Gilman is a Seattle-based attorney who practices computer law.

Excuses that don't work

Ken Wasch, executive director of the SPA, has heard a lot of excuses from companies that have been turned in by tipsters. He highlights two of the most common ones:

We have a policy against copying software; we sent out a memo.

A circulated memo, used as evidence in court, will not forestall a finding that the company's conduct was willful.

Software copying is hard to manage; we just lost control.

This may be true, but Wasch argues that the SPA has a variety of educational tools and internal auditing guides to help managers prevent their organizations from getting a call from the SPA. For more information on these products, contact the SPA at (202) 452-1600.

How to call in a tip

What happens when you call the SPA antipiracy hot line? To find out, I called the hot line at (800) 388-7478, which is answered during normal business hours. The operator asks enough questions about your tip to determine how likely it is that a problem exists.

With only two hot line operators handling 20 to 30 calls per day, it is not uncommon to get a voice recording even during normal business hours.

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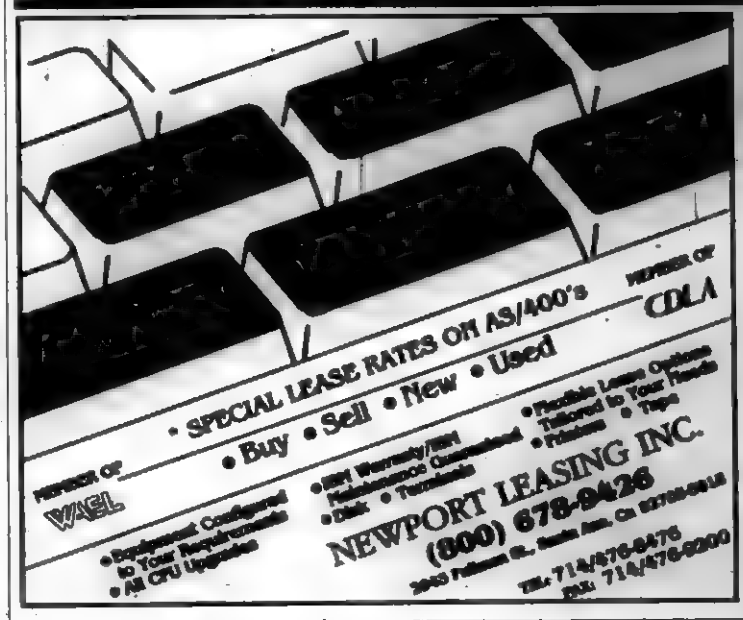

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	Closing Prices BoCoEx	AmCoEx
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PS/2 Model 30 286	$500	$450
[illegible]	[illegible]	[illegible]
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Compaq Portable II	$425	$300
Portable III	$500	$425
Portable 386	$950	$775
SLT-286	$800	$650
LTE-286	$800	$725
DeskPro 386s	$900	$825
DeskPro 386/33	$1,600	$1,575
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REQUEST FOR PROPOSAL NOTICE

The Department of Revenue, Migration Project, is seeking a firm to develop requirements and functional design for 1) a collection tracking and automated collection system, and 2) a business name and address and payroll tax return processing system. These systems must integrate to an accounting system being built for operation on an IBM AS/400.

Vendors may bid on either or both of the two systems to be developed.

Upon completion of the requirements and functional design, the department may construct part or all of the systems either by using its own resources, or by entering into a contract with the vendor that provided the requirements and functional design, or with another vendor.

Completion date of system requirements and functional design of the two systems is June 15, 1993. The construction completion date is January 1, 1994.

RFP's are available from Gary Friesen, Migration Project, Oregon Department of Revenue, 955 Center St. NE, Salem, OR 97310. Phone (503) 378-4000. Proposals must be received by December 24.

MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg., Suite 508, Jackson, MS 39201 for the following:

RFP No. 2311, due Tues. 1/5/93 at 3:30 p.m. for 100 327X-compatible CRTs, 50 laser printers, five 327X-compatible controllers, and 20 multiplexors for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER. No Charge.

RFP No. 2312, due Tues. 1/5/93 at 3:30 p.m. for the Medical Information Technology, Inc. (MEDITECH) Order Entry Interface package or its fully compatible equivalent to link a Data General-based MEDITECH system with the installed IBM mainframe for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER. No Charge.

RFP No. 2313, due Tues. 1/5/93 at 3:30 p.m. for an optical scanning machine to replace an existing HCS Sentry 7008 scanner for MISSISSIPPI STATE UNIVERSITY. No Charge.

Detailed specifications for each RFP with a charge may be obtained by submitting a written request accompanied by the appropriate payment. No phone requests will be accepted. NOTE: Valid forms of payment are corporate checks on a Mississippi bank, certified check or POSTAL money order made out to Central Data Processing Authority. We accept out-of-state checks. For RFPs with no charge call Kelli Brown @ 601-359-2600. If you would like to pick up RFPs at CDPA, you may do so between the hours of 1:00-3:00 p.m. only. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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An RFP has been written and will be sent to any interested vendor. Please include # of employees, last years revenue dollars, and at least one customer reference in your correspondence. Please send all correspondence to: CW-90889, Computerworld, Box 9171, Framingham MA 01701-9171

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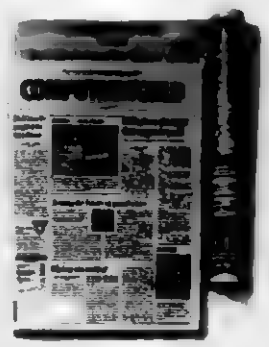

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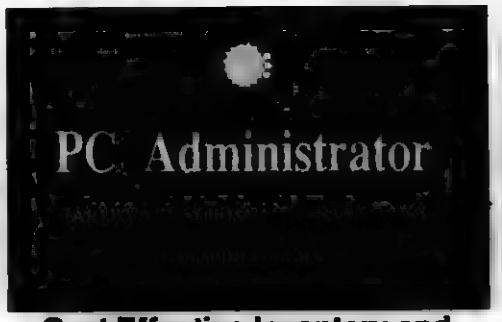

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Apple **26,40-42,80/81**
Applied Business Technology **37**
AT&T Business Communications Services **22-23**
AT&T Network Cable Systems **72-73**
Bachman **96**
BT Tymnet **78**
Candle Corporation **17**
Comdex **90**
Compaq Computer Corp. **64-65**
ComputerLand **51, 79**
CW Classified **24, 88, 92, 93**
CW Marketing **88**
CW White Papers **41/57**
Digital Equipment Corporation **30-31**
Dun & Bradstreet **21**
Eastman Kodak **56, 78**
EDS **66-67**
EMC Corp. **100**
Fischer International **86**
GE Information Systems **43**
Gupta Technologies **34**
Hewlett-Packard **10-11**
IBM **28-29, 64, 74-75, 90-91, 98**
Information Builders **82**
Informix **129**
Ingres **119**
Intergraph **62**
INP Information Systems **98**
Landmark Systems **89**
Legent Corp. **34-35**
Lexmark **26-27**
Lotus Development Corp. **61, 94**
Micro Focus **11**
Motorola Codex **94**
MultiTech Systems **15**
NaperSoft **77**
Northern Telecom **29**
Oracle **5, 7**
Platinum Technology **76**
Q-Star Technologies **25**
Sales Technologies **55**
SAS Institute **9, 86**
Software 2000 **39**
Sun Microsystems **115**
Sybase **12, 40**
Syncsort **3**
Unisys **58-59**
Windows World **89**
Workstation Group **85**
Xircom **28**

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Companies in this issue

Page number refers to page on which story begins

3Com Corp. 89
3M Corp. 1

A

Aberdeen Group 73
Acer Corp. 28
Advanced Micro Devices, Inc. 15,116
Advantis 12
Alamo Rent-A-Car, Inc. 103
Alex. Brown & Sons, Inc. 116
Alsys 117
Amdahl Corp. 1,10
American Cancer Society 14
American Electronics Association 117
American Savings Bank 4
Amoco Corp. 1
Andersen Consulting 24,83
Apple Computer, Inc. 1,4,60,73,83,89,118
Applied Data Research 37
AST Research, Inc. 28
AT&T 71,73

B

Banyan Systems, Inc. 89
Bell & Howell Co. 20
Bellcore 28
BICC Cables Corp. 78
Bio Rad Laboratories, Inc. 77
BIS Strategic Decisions 4
Blockbuster Entertainment Corp. 92
Blue Cross/Blue Shield 4
BlueLine Software, Inc. 81
BMC Software, Inc. 37
Borland International, Inc. 8,60
Boston University 95,98
Browning Ferris Industries, Inc. 16
BT 16
Bull HN Information Systems, Inc. 81
Busch Entertainment Information Systems 103
Busch Gardens 103

C

Cars Information Systems Corp. 92
CASE Communique 16
Chrysler Corp. 4
Cincom Systems, Inc. 37
Cisco Systems, Inc. 16,71
CogniTech Services Corp. 95,98
Colonial Williamsburg Foundation 103
Communications Network Architects, Inc. 73
Compaq Computer Corp. 4,14,20
Complementary Solutions, Inc. 71
Component Software Corp. 83
CompuAdd Computer Corp. 14
Compu USA 1
Computer Associates International, Inc. 37
Computer Intelligence 1
Computerland Corp. 4
Comshare, Inc. 117
Costco Wholesale Corp. 1
Cray Research, Inc. 16
Creative Strategies International, Inc. 4
Cullinet Software, Inc. 37
Cyrix Corp. 15

D

Data General Corp. 6,67
Dataram Corp. 67
Dell Computer Corp. 1,14,28,117,118
Deloitte & Touche 71,87
Demax Software 67
DHL International 87
Dickens Data Systems, Inc. 6
Digital Equipment Corp. 6,67,77,81
Digital Equipment Computer Users Society 1
Digitalk, Inc. 83
Dun & Bradstreet Software 117

E

Easel Corp. 83
Eastman Kodak Co. 20
Edify Corp. 117
E. I. Dupont de Nemours & Co. 77
Egghead Discount Software 118
Eiron Technology Corp. 73
Electronic Data Systems Corp. 16,78,118
Electronic Mail Association 71
Empire Southwest Co. 71
Employer Resource Corp. 62
Epson America, Inc. 65
European Centre for Medium-Range Weather Forecasts 16

F

Federal Communications Commission 71
Federal Deposit Insurance Corp. 1
Federal National Mortgage Association 92
Fibronics International, Inc. 16,71
Fifth Generation Systems, Inc. 57
Fischer International Systems Corp. 87
Ford New Holland, Inc. 12
Forrester Research, Inc. 4,65

G

Gartner Group, Inc. 10,28
Gateway 2000 Ltd. 118
General Motors Corp. 16,118
General Waterworks Management Service Co. 1
Genix Corp. 78
Georgia Tech 96

H

Hallmark Cards, Inc. 117
Heineken N.V. 16
Hewlett-Packard Co. 6,8,67,77,83,116
Highland Capital Partners 117
Hughes Network Systems, Inc. 81
Hurwitz Consulting Group 83
Hypobank 87

I

IBM 4,6,8,12,15,16,28,60,65,67,71,77,78,81,87,89
IBM PC Co. 1,14
Infonet Services Corp. 12
Inforite Corp. 62
Information Builders, Inc. 37
Informix Software, Inc. 66
Innovative Information Systems, Inc. 8
Integrated Systems Solutions Corp. 12,78
Intel Corp. 15,28,65,67,73,81,116
International Data Corp. 15,83,87,117
Interphase Corp. 12
Intersolv, Inc. 116
InterWest Partners 117
Iomega Corp. 117
Isocor 73

J

James Maclaren, Inc. 6
JBS & Associates, Inc. 20

K

Kendall Square Research Corp. 83
Keuka College 92
Keyfile Corp. 67
Kidder, Peabody & Co. 1

L

Lansa USA, Inc. 83
LaQuinta Motor Inns, Inc. 103
Legent Corp. 37
Levi Strauss & Co. 8
Litton Computer Services 78
Local-Area Network Dealers Association 65
Lotus Development Corp. 4,73,71,81
Loyola College 92

M

Marshfield Clinic 1
Mary Kay Cosmetics, Inc. 92
Mathsoft, Inc. 67
May & Speh, Inc. 78
MCI Communications Corp. 71
Mellon Bank Corp. 78
Merit Network, Inc. 16
Merrill Lynch & Co. 57
Meta Group, Inc. 1
Michigan Department of Social Services 81
Microbilt, Inc. 57
Microsoft Corp. 4,6,20,60,62,67,71,77,81,83,87,89,118
Motorola, Inc. 6

N

National Association of Broadcasters 60
NCR Corp. 28
Net Frame, Inc. 65
Network Equipment Technologies, Inc. 12
Network Peripherals, Inc. 12
New United Motors Manufacturing, Inc. 62
New York State Police 71
New York University 95
Next Computer, Inc. 65
Nippon Telegraph and Telephone Corp. 77
Nolan, Norton & Co. 92,95
Noranda, Inc. 6
Northeastern University 92,95,98
Norwegian Telecom 73
Novell, Inc. 6,60,65,87,89
Nynex Corp. 83

O

Open Software Foundation 6,66
Optika Imaging Systems, Inc. 20
Oracle Corp. 6,37,83,89,117

P

Pacific Gas & Electric 1
PacifiCare Health Systems 1
Pantorama Chain 8
ParcPlace Systems, Inc. 83
PeopleSoft, Inc. 66,117
Performance Computing 1
Personal Computer Memory Card International Association 28
Price Waterhouse 83
Proactive Software, Inc. 66
Prudential Securities, Inc. 116
Pyramid Development Corp. 87

Q

QuickComm, Inc. 67

R

Racal-Datacom, Inc. 65
Rauscher, Pierce and Refsnes, Inc. 1,14
Resolution Trust Corp. 20
Ryder System, Inc. 57

S

S3 Corp. 1
Sassone Associates, Inc. 98
Sears, Roebuck and Co. 12,78
Sequoia Systems, Inc. 16
SCI 118
SHL Systemhouse, Inc. 16
Silicon Graphics, Inc. 77
Smith Barney, Harris Upham & Co. 116
Software AG 37
Software Publishers Association 6
SoundView Financial/Gartner Group, Inc. 60
Southwestern Bell 10
Spartu, Inc. 12
Sprint Corp. 71
Square D Co. 4
Stac Electronics 62
Standard Microsystems Corp. 65
Sterling Software, Inc. 116
Sun Microsystems, Inc. 6,66,67,83
SunPro 24
Sutter Hill Ventures 117
Sybase, Inc. 83
Syncordia Corp. 12

T

Tadpole Technology, Inc. 8
Technology Solutions Co. 83
Technology Venture Investors 117
Telecommunications Advisors, Inc. 71
Telesoft 117
Tesseract 117
Texas Instruments, Inc. 15,117
The ASK Group, Inc. 6
The Chicago Corp. 116
The Quaker Oats Co. 12
The Travelers Corp. 71
The X Business Group 66
The Yankee Group 12
Thinking Machines Corp. 28
Thrifty Car Rental 103
Tiger Management Corp. 117
Tone Software Corp. 81
Trans World Corp. 92
Trellis Network Services 87

U

UBS Asset Management 87
U-Haul Co. 57
Unisys Corp. 1,81
United Missouri Bank 1
Universal Networks 65
US Air 92
U.S. Department of Commerce 1,117

V

Visix Software, Inc. 83

W

WalMart Stores, Inc. 1
Wang Laboratories, Inc. 83
Waterloo Maple Software 67
Welcome Corp. 103
WordPerfect Corp. 60
WorksRight Software, Inc. 81

X

Xiox Corp. 71
Xircom, Inc. 65
X/Open Co. 1

Z

Zenith Data Systems 28
Zenrelch Systems 60

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The old sacred cows are slowly dying.

We're in the same boat as you.

Show me another way then, you say. The good news is there *is* a new way. But better still, it's not a computer revolution.

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All with the help of a single machine.

This may come as a surprise, but Sun has really only one computer to offer you.

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We know. This was a handful of information. And we have much more to discuss when we meet. For instance, how leading global corporations are making their changeovers right now using Sun servers and workstations.

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Gainers

Percent

Microcom Inc.	44.1	Komag Inc. (H)	-19.8
Artel Communication Corp.	35.5	Ultimate Corp.	-17.6
Ross Systems	33.9	Bachman Info. Systems	-17.0
Intelligent Electronics	32.9	Spinnaker Software	-15.4
Phoenix Technologies	31.7	Everex Systems Inc.	-14.3
Kendall Square Research	31.6	Omega Corp.	-11.3
Group I Software	28.0	Platinum Technology	-10.8
Computer Horizons	21.9	Hogan Systems Inc.	-10.4

Dollar

Intel Corp. (H)	8.63	Komag Inc. (H)	-4.50
Synoptics Communications	5.75	Platinum Technology	-2.38
Bmc Software Inc.	5.13	System Software Assoc. (H)	-2.25
Matsushita Electronics	4.75	Filenet Corp.	-2.25
Micro Focus (H)	4.38	Bgs Systems Inc. (H)	-2.00
Data Race Inc. (H)	4.00	Sprint Corp. (H)	-1.63
Motorola Inc. (H)	3.75	Knowledgeware Inc.	-1.50
Group I Software	3.50	Chipcom Corp.	-1.50

Christmas stocking

With only 17 more shopping days left before Christmas, analysts pointed out several Wall Street offerings that may make good buys for the holiday season:

Advanced Micro Devices, Inc. (AMD)

Microchip maker AMD's share price took a hit at the end of last week as a federal judge's ruling set the company back in its efforts to enter the Intel Corp. 486 clone market (see story page 15). Nonetheless, analyst Mark Edelstone at Prudential Securities, Inc. rated AMD stock a Buy in the wake of the legal decision. Edelstone said he expects AMD to release a 486 processor with its own microcode by the second quarter of next year. The drop in stock price represents a buying opportunity rather than a cause for concern, Edelstone said.

New York Stock Exchange trading of AMD closed Thursday at 16¾.

Hewlett-Packard Co. (HWP)

Effective expense-control efforts and strong quarterly orders earned HP a Buy rating from analyst Shao Wang at Smith Barney, Harris Upham & Co., in spite of HP's disappointing fourth-quarter results. Wang said HP offers a superior product line, and demand for high-margin items, including testing and medical equipment, is on the rise.

HP closed Thursday at 63¾ on the New York Stock Exchange.

Sterling Software, Inc. (SSW)

Securities firm The Chicago Corp. said it anticipates steady long-term growth for Sterling Software. Analyst Robert Johnson set a target price of about 30 as Sterling Software continues to succeed in its electronic data interchange, systems software and federal systems groups.

The company has a large base of recurring revenue stemming from long-term government contracts and systems software maintenance fees, Johnson said.

The company's shares stood at 21¼ on the New York Stock Exchange Thursday.

Intersolv, Inc. (ISLI)

Alex. Brown & Sons, Inc. rated Intersolv a Buy in a Nov. 19 report. Analysts Christopher Mortenson and Laurence Fong said Intersolv's flagship Excelerator development tool has suffered disappointing sales, but Excelerator upgrades and the success of other products, such as the APS code generator, will spur strong growth in the near term.

Intersolv closed at 13½ on NASDAQ Thursday.

— Derek Slater

Exch	52 Week		Range	Dec 4 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up 3.1%
OTC	24.63	9.63	3 COM Corp	24.63	2.25	10.1
NYS	70.63	56.25	American Info Techs Corp.	67.63	-0.13	-0.2
NYS	47.88	36.63	AT&T (H)	47.38	-0.38	-0.8
OTC	4.25	0.75	Artel Communication Corp.	1.31	0.34	35.5
OTC	22.00	10.25	Banyan Systems Inc.	20.75	-0.25	-1.2
NYS	49.75	40.25	Bell Atlantic Corp.	47.75	0.00	0.0
NYS	55.50	43.38	Bellsouth Corp.	49.00	-0.25	-0.5
NYS	6.75	3.63	Bolt, Beranek & Newman	4.88	-0.25	-4.9
NYS	75.38	42.13	Cabletron Systems (H)	74.38	1.75	2.4
OTC	31.00	17.75	Chipcom Corp.	26.00	-1.50	-5.5
OTC	76.50	26.50	Cisco Systems Inc. (H)	73.75	-1.00	-1.3
OTC	35.25	5.50	Compression Labs Inc.	14.25	0.25	1.8
OTC	3.38	0.88	Data Switch Corp.	2.44	0.06	2.7
NYS	23.63	13.75	Digital Comm. Assoc.	17.00	0.25	1.5
OTC	15.25	7.50	Digital Systems Int'l Inc.	11.00	-1.00	-8.3
OTC	20.13	3.63	DSC Communications (H)	19.75	0.50	2.6
OTC	10.88	4.75	Fibronix Int'l Inc.	7.25	1.00	16.0
OTC	37.50	10.50	Filenet Corp.	21.00	-2.25	-9.7
OTC	3.38	1.50	Gandalf Technologies Inc.	1.88	0.13	7.1
OTC	2.25	0.69	Gateway Communications	1.56	0.25	19.0
NYS	5.50	2.50	General Datacomm Inds.	5.50	0.75	15.8
ASE	5.88	1.00	Go Video	3.00	-0.25	-7.7
NYS	35.75	28.88	GTE Corp.	33.50	-0.63	-1.8
NYS	71.75	50.00	ITT Corp. (H)	71.75	0.88	1.2
OTC	38.50	26.75	MCI Communications Corp. (H)	38.38	0.00	0.0
OTC	14.25	2.25	Microcom Inc.	6.13	1.88	44.1
NYS	18.25	9.50	Network Equipment Tech.	9.63	-0.25	-2.5
OTC	25.50	8.00	Network General	17.50	0.38	2.2
OTC	20.00	8.50	Network Systems Corp.	14.00	-0.88	-5.9
OTC	31.50	5.88	Newbridge Networks Corp. (H)	31.50	1.00	3.3
NYS	49.25	30.50	Northern Telecom Ltd.	47.25	0.75	1.6
OTC	33.50	22.50	Novell Inc.	31.38	-0.25	-0.8
NYS	88.38	69.13	Nynex Corp.	83.25	0.75	0.9
OTC	37.50	14.50	Octel Communications Corp.	22.50	-0.50	-2.2
OTC	9.88	3.38	Penril Data Comm. Ntwks.	4.25	-0.13	-2.9
OTC	53.00	10.25	Picturetel Corp.	25.00	-0.25	-1.0
OTC	18.75	7.00	Proteon Inc	10.63	0.63	6.3
NYS	38.00	14.13	Scientific Atlanta Inc. (H)	38.00	1.25	3.4
NYS	70.88	56.63	Southwestern Bell Corp. (H)	70.25	-0.13	-0.2
NYS	26.75	20.75	Sprint Corp. (H)	24.75	-1.63	-6.2
OTC	24.63	5.25	Standard Microsystems Corp(H)	24.63	3.38	15.9
OTC	70.25	15.25	Synoptics Communications	70.25	5.75	8.9
NYS	40.00	32.88	U S West Inc.	38.13	0.88	2.3
OTC	70.25	24.00	Wellfleet Communications (H)	70.25	2.25	3.3
PCS AND WORKSTATIONS						Up 4.9%
OTC	10.25	3.50	Advanced Logic Research	4.50	0.00	0.0
OTC	70.00	41.50	Apple Computer Inc.	57.50	1.00	1.8
OTC	24.50	11.25	AST Research Inc.	20.75	0.75	3.8
NYS	19.25	6.75	Commodore Int'l	8.75	1.50	20.7
NYS	43.13	22.25	Compaq Computer Corp.	42.50	1.63	4.0
OTC	39.25	15.00	Dell Computer Corp.	36.75	0.50	1.4
OTC	7.75	0.88	Everex Systems Inc.	1.13	-0.19	-14.3
NYS	35.38	21.25	Harris Corp. (H)	34.00	-0.63	-1.8
NYS	85.00	47.63	Hewlett Packard Co.	64.63	1.25	2.0
NYS	29.75	14.13	Silicon Graphics	27.50	1.63	6.3
OTC	36.13	20.75	Sun Microsystems Inc.	34.00	3.13	10.1
NYS	31.25	22.25	Tandy Corp.	30.88	1.75	6.0
NYS	11.13	5.00	Zenith Electronics	6.63	0.63	10.4
OTC	25.50	2.75	Zeos International Ltd.	4.00	0.63	18.5
LARGE SYSTEMS						Up 5.0%
ASE	20.63	6.63	Amdahl Corp. (L)	7.38	0.63	-7.8
NYS	16.38	4.75	Convex Computer	7.63	0.38	5.2
OTC	16.25	1.88	Cray Computer	4.75	0.13	2.7
NYS	49.50	19.00	Cray Research Inc.	23.88	0.38	1.6
NYS	18.13	7.13	Data General Corp	12.13	1.13	10.2
NYS	65.50	31.50	Digital Equipment Corp. (L)	33.38	1.75	5.5
NYS	100.38	60.88	IBM (L)	67.00	1.50	2.3
OTC	13.25	5.50	Kendall Square Research	13.00	3.13	31.6
NYS	119.25	83.00	Matsushita Electronics	91.75	4.75	5.5
OTC	17.50	6.00	Pyramid Technology	9.25	-3.00	-9.8
OTC	17.88	10.38	Sequent Computer Sys.	15.13	0.63	4.3
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.0
NYS	54.25	29.50	Stratus Computer Inc.	34.50	1.50	4.5
NYS	15.13	9.50	Tandem Computers Inc.	14.63	0.63	4.5
NYS	11.75	4.00	Unisys Corp.	10.25	1.63	18.8
ASE	7.50	0.06	Wang Labs Inc. (B) (L)	0.44	0.00	0.0
SOFTWARE						Up 4.1%
OTC	68.50	25.25	Adobe Systems Inc.	33.50	0.13	-0.4
OTC	44.25	10.25	Aldus Corp.	15.25	-0.25	-1.6
OTC	19.75	7.00	American Software Inc.	9.25	0.50	5.7
OTC	20.75	9.75	Ask Computer Systems	20.75	3.50	20.3
OTC	56.50	23.25	Autodesk Inc.	50.00	1.50	3.1
OTC	37.75	3.75	Bachman Info. Systems	5.50	-1.13	-17.0
OTC	43.00	32.00	BGS Systems Inc. (H)	41.00	-2.00	-4.7
OTC	79.00	37.25	BMC Software Inc.	68.25	5.13	8.1
OTC	25.50	13.00	Boole & Babbage	22.25	1.50	7.2
OTC	86.75	21.50	Borland Int'l Inc. (L)	24.75	0.50	2.1
OTC	10.50	3.63	CE Software	4.13	-0.13	-2.9
ASE	29.75	9.38	Cheyenne Software Inc.	27.25	0.50	1.9
OTC	13.13	5.63	Cognos Inc.	7.50	0.25	3.4
NYS	19.50	8.63	Computer Associates	19.00	0.75	4.1
NYS	12.38	4.75	Computervision Corp.	4.88	-0.38	-7.1
OTC	20.00	6.75	Comshare Inc.	14.00	1.13	8.7
OTC	47.88	6.00	Easel Corp.	12.75	1.00	8.5
OTC	25.00	11.50	Group I Software	16.00	3.50	28.0
OTC	6.63	3.50	Hogan Systems Inc.	5.38	-0.63	-10.4
OTC	36.25	18.50	Information Resources	33.50	2.75	8.9
OTC	33.50	5.88	Informix Corp.	31.88	0.25	0.8
OTC	22.38	11.00	Intergraph Corp	13.25	0.38	2.9
OTC	15.00	7.00	Interleaf Inc.	12.00	-1.25	-9.4
OTC	20.25	10.25	Intersolv Inc.	13.50	-1.00	-6.9
OTC	21.38	9.50	Knowledgeware Inc.	13.50	-1.50	-10.0
OTC	50.75	28.75	Legent Corp.	50.75	0.88	1.8
OTC	38.75	14.75	Lotus Development	22.50	1.50	7.1
OTC	7.38	1.88	Meca Software	6.00	0.00	0.0
OTC	22.25	5.25	Mentor Graphics	8.63	0.63	7.8
OTC	42.13	27.25	Micro Focus (H)	42.13	4.38	11.6
OTC	20.50	6.50	Micrografx Inc.	9.25	0.75	8.8
OTC	95.00	65.50	Microsoft Corp.	92.00	1.50	1.7
OTC	24.75	12.00	Oracle Corp.	22.88	2.25	10.9
OTC	56.25	23.38	Parametric Technology	52.00	-0.25	-0.5
OTC	11.00	3.50	Phoenix Technologies	6.75	1.63	31.7
OTC	25.25	11.25	Platinum Technology	19.63	-2.38	-10.8
OTC	60.00	29.00	Progress Software Corp. (H)	58.25	-0.75	-1.9
OTC	26.63	4.00	Quarterdeck Office Sys.	6.25	0.88	16.3
OTC	32.75	11.75	Rainbow Technologies Inc.	24.50	2.38	10.7
OTC	22.75	4.00	Rasterops	8.50	0.88	11.5
OTC	17.25	3.63	Ross Systems	9.88	2.50	33.9
OTC	18.88	8.50	Sapiens USA Inc. (H)	17.75	-0.75	-4.1
OTC	26.25	6.75	Software Publishing Corp.	9.50	0.75	8.6
OTC	8.00	2.00	Software Toolworks Inc.	5.75	0.00	0.0
OTC	7.25	0.75	Spinnaker Software	1.38	-0.25	-15.4
OTC	16.50	3.25	State of the Art	7.25	0.75	11.5
NYS	25.25	13.75	Sterling Software Inc.	21.50	0.63	3.0
OTC	30.00	8.00	Struct. Dynamics Research	12.38	0.50	4.2
OTC	45.25	16.75	Sybase Inc.	42.75	-0.50	-1.2
OTC	51.00	5.88	Symantec Corp.	33.88	2.00	10.8
NYS	15.50	5.25	Systems Center Inc.	7.13	-0.38	-5.0
OTC	37.50	16.66	System Software Assoc. (H)	35.25	-2.25	-6.0
OTC	13.25	2.50	Trinzic Corp.	3.75	0.25	7.1
OTC	23.75	14.50	Walker Interactive Systems	21.75	0.38	1.8
OTC	5.38	1.38	Wordstar	2.44	0.38	18.2
SEMICONDUCTORS						Up 1.4%
NYS	21.50	7.38	Advanced Micro Devices	16.75	-0.88	-5.0
NYS	14.63	2.50	Analog Devices Inc. (H)	14.63	1.00	7.3
OTC	16.25	6.75	Atmel Corp. (H)	15.88	0.88	5.8
OTC	14.13	3.25	Chips and Technologies	4.88	0.00	0.0
NYS	48.38	7.38	Cypress Semiconductor Corp	10.88	0.13	1.2
NYS	14.50	6.75	Dallas Semiconductor (H)	14.25	0.50	3.6
OTC	78.63	41.25	Intel Corp. (H)	78.63	8.63	12.3
NYS	10.38	4.88	LSI Logic Corp. (H)	10.38	1.38	15.3
NYS	22.38	12.13	Micron Technology	19.38	0.25	1.3
NYS	104.38	58.00	Motorola Inc. (H)	103.50	3.75	3.8
NYS	14.13	5.38	National Semiconductor	13.00	0.25	2.0
OTC	27.00	8.25	Sierra Semiconductor	15.00	0.75	5.3
NYS	52.25	26.00	Texas Instruments	49.25	1.25	2.6
OTC	10.50	6.00	VLSI Technology	7.13	-0.13	-1.7
OTC	7.00	2.13	Weitek	5.25	0.00	0.0
ASE	8.00	2.00	Western Digital Corp.	7.75	0.25	3.3
OTC	31.00	14.50	Xilinx	21.00	0.00	0.0
OTC	33.50	15.50	Zilog Inc.	31.75	1.00	3.3
PERIPHERALS AND SUBSYSTEMS						Up 1.1%
OTC	11.25	3.88	Archive Corp.	11.13	0.00	0.0
OTC	28.50	13.75	Bmctec Inc. (H)	28.50	2.75	10.7
OTC	23.50	9.25	Cambex Corp.	16.00	-1.00	-5.9
ASE	15.25	5.66	Cognitronics Corp. (H)	15.13	0.00	0.0
NYS	23.88	13.00	Conner Peripherals	20.88	1.75	9.2
OTC	26.75	14.25	Data Race Inc. (H)	25.88	4.00	18.3
ASE	19.66	4.75	Dataram Corp.	11.00	-0.38	-3.3
NYS	22.25	6.09	EMC Corp.	22.25	2.00	9.9
OTC	10.00	4.75	Emulex Corp. (H)	8.63	-0.13	-1.4
OTC	23.00	13.25	Evans & Sutherland	18.00	0.75	-4.3
OTC	40.63	12.00	Exabyte	19.75	-0.25	-1.3
OTC	38.00	15.75	Intelligent Info. Systems (H)	37.50	1.00	2.7
OTC	11.25	4.75	Komega Corp.	6.88	-0.88	-11.3
OTC	34.75	10.25	IPL Systems Inc.	13.25	1.25	-10.4
OTC	23.25	10.75	Komag Inc. (H)	18.25	-4.50	-19.8
OTC	19.38	4.38	Maxtor Corp. (H)	18.88	1.00	5.6
OTC	12.63	7.13	Micropolis Corp.	9.86	0.88	9.7
NYS	107.00	85.38	3M Corp	101.38	-1.13	-1.1
OTC	6.75	3.50	Printronix Inc.	5.00	0.25	5.3
NYS	35.50	6.88	QMS Inc.	10.63	1.88	21.4
OTC	18.00	9.00	Quantum Corp.	16.75	1.88	12.6
OTC	12.75	3.75	Radius Inc.	6.25	-0.63	-9.1
NYS	14.38	7.50	Recognition Equipment	14.38	1.63	12.7
OTC	13.88	5.63	Rexon Inc.	12.75	1.25	10.9
OTC	21.63	7.75	Seagate Technology (H)	21.63	2.75	14.6
NYS	78.00	20.00	Storage Technology (L)	23.00	2.63	12.9
NYS	22.88	10.50	Tektronix Inc.	19.88	-0.38	-1.9
NYS	82.25	60.88	Xerox Corp.	78.13	-0.13	-0.2
SERVICES						Up 4.0%
OTC	23.38	12.16	American Mgmt. Systems (H)	20.75	-0.13	0.5
NYS	5.38	3.00	Arascomp Inc.	4.13	0.38	10.0
OTC	22.75	12.50	Analysts Int'l (H)	22.75	1.50	7.1
NYS	52.88	37.00	Auto Data Processing (H)	52.50	1.25	2.4
NYS	17.25	7.06	Ceridian Corp.	15.88	0.88	5.8
NYS	23.22	13.50	Comdisco Inc.	15.13	-0.50	-3.2
OTC	13.50	6.75	Computer Horizons	9.75	1.75	21.9
NYS	84.88	57.00	Computer Sciences	76.75	-1.25	-1.6
NYS	10.13	7.00	Computer Task Group	8.88	0.25	2.9
OTC	40.50	15.00	CompUSA Inc.	34.25	-1.00	-2.8
OTC	19.25	6.00	Corporate Software	11.00	0.00	0.0
OTC	10.75	7.75	Egghead Discount Software	11.25	1.00	9.8
NYS	33.50	25.25	General Motors E (EDS) (H)	33.00	0.75	2.3
OTC	30.38	6.25	Intelligent Electronics	11.63	2.88	32.9
OTC	14.88	6.63	Merisel	10.25	-0.38	-3.5
OTC	15.75	5.75	Micrpage Inc.	9.88	1.38	18.3
OTC	40.00	18.38	Paychex	38.50	-0.25	-0.6
NYS	81.25	55.00	Policy Management Sys. (H)	79.25	1.50	1.9
NYS	51.13	31.88	Reynolds and Reynolds (H)	50.38	-0.25	-0.5
OTC	32.00	22.00	SEI Corp.	29.00	1.25	4.5
OTC	24.38	16.88	Shared Medical Systems	22.25	0.38	1.7
OTC	30.00	16.00	Sungard Data Systems	28.25	0.00	0.0
NYS	3.63	1.13	Ultimate Corp.	1.75	-0.38	-17.6

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Dell makes offering

Dell Computer Corp. plans to go ahead with a $148 million, 4 million share secondary stock offering despite the brouhaha following allegations that the Austin, Texas, PC vendor masked losses from foreign currency hedging [CW, Nov. 30].

Iomega pessimistic

Iomega Corp. last week said it expects fourth-quarter earnings to be substantially lower than 1991's comparable period. While revenue rose during the last two months, higher operating expenses and lower margins cut deeply into profits, the Roy, Utah, mass storage vendor noted.

Edify raises funds

Software start-up **Edify Corp.** in Santa Clara, Calif., has raised $8 million in its third round of financing. The developer of customer service software has now raised $16.8 million. New investors include **InterWest Partners** in Menlo Park, Calif., and **Tiger Management Corp.** in New York. They join investors **Sutter Hill Ventures, Technology Venture Investors** and **Highland Capital Partners.**

Alsys buys Telesoft

Ada software developer **Alsys** has agreed to buy technical computer-aided software engineering and services vendor **Telesoft** in a deal that will create a $40 million company. The combined company will be known as the Alsys Group and will be based in Burlington, Mass.

Yeutter lands at TI

Clayton Yuetter, a former U.S. trade representative, has joined the board of **Texas Instruments, Inc.** Yuetter's appointment raises the number of directors on TI's board to 15.

D&B Software to cut staff by 13%

By Melinda-Carol Ballou
ATLANTA

Dun & Bradstreet Software disclosed last week that its yearlong consolidation process will continue throughout next year, as the company plans to reduce its head count by 400 employees — or 13% of its work force — during 1993.

Earlier this year, the company closed down its Eagan, Minn., facility. The next round of cuts will encompass the closing of a Huntsville, Ala., facility by June 1993. A company spokesman said host-based human resources products produced in Huntsville will be moved to the company's Atlanta offices.

Of the 400 employees to be laid off, 250 will come from the company's U.S. offices. Hardest hit will be sales and administration groups, company officials said.

Some industry analysts and users said D&B Software's ongoing streamlining will strengthen the company as it pushes beyond its IBM mainframe and VAX/VMS roots into uncharted client/server waters.

In the works
Already available is Smartstream, a Windows-based product that can access information on a range of databases. By midyear the firm expects to release client/server versions of financial applications, with human resources, logistics and manufacturing to follow.

"We feel that they want to focus resources on the next generation of software and are cutting around the edges to do that," said Jennifer Scholz, a software analyst at International Data Corp., a market research firm based in Framingham, Mass.

The user base is divided over D&B Software's new direction, according to Les Palmer, former co-chairman of the D&B Software user group who is also property accounting manager at Hallmark Cards, Inc. in Kansas City, Mo. "While a lot of people were excited about it, others were concerned about how fast this technology is going to move forward and about continuing support for the existing line. I think D&B has done their best to reassure users about that."

Hallmark is undeterred by the company's ongoing reorganization. "I have only good things to say about doing business with D&B," Palmer said.

The company, however, rejected D&B Software's client/server software in favor of local-area network-based financial packages from Comshare, Inc. Hallmark will keep a D&B Software fixed-asset package.

Full client/server versions of those products are not expected to be fully rolled out for 12 to 18 months. Some pieces are available, including graphical user interface front ends to existing applications.

Scholz said the D&B Software installed base is likely to wait. The company, she said, faces little competition because "many other companies don't have the [client/server] solutions yet or are just getting them out."

While the company tries to cajole that stationary group, a diverse group of client/server competitors is gunning for the same action.

PeopleSoft, Inc., Tesseract and Oracle Corp., among others, have announced client/server applications that rival D&B Software's offerings.

Dun & Bradstreet Software is cutting its head count to keep expenses in line with lower revenue

	Revenue (software segment)		Approximate year-end head count
1990	$539	1990	3,600
1991	$549	1991	3,300
1992*	$527	1992*	2,900
	Revenue in millions	1993*	2,600

*Projected

CW Chart: Michael Siggins

Allies to relax curbs on exports to Eastern bloc

By Gary H. Anthes
WASHINGTON, D.C.

The sudden end of the Cold War may have done more to loosen controls on the export of U.S. computers than years of work by dozens of industry lobbyists.

In the recent inaugural meeting of the Cocom Cooperation Forum on Export Controls in Paris, the U.S. and 16 allies told the former Soviet republics that they would significantly ease restrictions on exports of advanced computers and telecommunications equipment in exchange for assurances that the goods would be used solely for peaceful purposes and would not be diverted to countries such as Iraq, Iran, North Korea and China, which might use them to build weapons of mass destruction.

The 17 members of Cocom (Coordinating Committee on Multilateral Export Controls) — a secretive organization that includes the U.S., Japan, Australia and all NATO members except Iceland — said the former Communist countries would be removed from the "Cocom proscribed list" as they are able to demonstrate they can meet Cocom safeguards.

The new forum is intended to move Cocom from an adversarial to a cooperative relationship with the former Soviet bloc nations. It consists of the Cocom members, all the former Communist countries of Eastern Europe, the newly independent states of the former Soviet Union and Mongolia.

"It's fantastic news for U.S. computer companies in that there's a huge opportunity," said Paul Freedenberg, a Washington, D.C., trade consultant and former undersecretary for export administration at the U.S. Department of Commerce. "There's almost unlimited thirst for ... big computers for reservation systems, banking systems and so forth." He also said engineering and software companies in the former Soviet Union are hungry for high-end workstations currently barred for export there.

Cautious enthusiasm

But Freedenberg cautioned U.S. firms not to count their sales until they are hatched, pointing out that many would-be customers lack the hard currency needed to pay for advanced equipment.

Another industry spokesman was unimpressed with the agreement. "It's a much bigger deal from a foreign policy standpoint than it is from the standpoint of how it impacts exporters," said an official at a major large-systems vendor. "The fact is, today, export licenses aren't getting denied for [the former Soviet Union] anyway."

Greg Garcia, manager of international trade at the American Electronics Association (AEA), said the AEA anticipates that the former Soviet republics will move first to a "favorable consideration" status in which export license requests are acted on quickly, then to one in which exports may be reported after the fact and finally to one in which the importing countries enjoy the same status as other major U.S. allies.

Garcia said the AEA had not yet developed market estimates for the region, but, he said, "no doubt it will be a huge market as they move from the 19th century to the 21st century."

Goals of the new Cocom Forum:
•Significantly widen access to advanced Western goods and technology.
•Protect against diversion of sensitive items for military use or unfriendly countries.
•Assist new states in developing export controls.

Wysiwyg

HIGH-TECH EXCUSES

FOR BREAKING YOUR ARM: "I was in a meeting with the software developers, and I gave them one too many bug reports. The software chief got mad and threw a PC at me. I made the mistake of holding up my arm to block it. The doctor told me that if I kept my arm down and let the PC hit my head, I would not have been injured and the PC would have been totaled."

James Landau,
support contractor
Pete Recigno
Federal Aviation Administration
Atlantic City Airport, N.J.

DID YOU KNOW?

A picosecond is shorter than a nanosecond (a trillionth vs. a billionth of a second, respectively).

TECH TRIVIA
1. WHAT COMPANY MADE THE W2 FORM A REALITY IN 1943?
2. EGA STANDS FOR ENHANCED GRAPHICS ADAPTER AND VGA STANDS FOR VIDEO GRAPHICS ARRAY. WHAT DOES XGA STAND FOR?
3. WHERE WAS THE C++ LANGUAGE FIRST DEVELOPED?

ANSWERS ➡ 1. IBM. 2. Extended Graphics Array. 3. Bell Laboratories

Source: *Digital at Work: Snapshots from the First Thirty-Five Years* (Digital Press)

A cost-effective productivity tool — NOT!

The first successful word processing program, dubbed the "Expensive Typewriter," enabled a $120,000 PDP-1 computer to do work almost as well as a $200 electric typewriter.

SUGGESTED NAME CHANGE IF THE ASK GROUP MERGED WITH ANSWER COMPUTER:

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

CW Chart: Stephanie Faucher

The Fifth Wave

"OH YEAH, AND TRY NOT TO ENTER THE WRONG PASSWORD."

Inside Lines

Building MacWindows

Microsoft will join in the fun at next month's MacWorld Expo in San Francisco with a different twist: a conference for Macintosh software developers interested in programming for the Windows platform. The software giant will hold the programming conference in San Jose, Calif., on Jan. 11 and 12, which will be just a few days after the MacWorld show draws tens of thousands of programmers to San Francisco. Microsoft officials claim they're not guilty of poaching — they're just interested in helping out in a little cross-platform development, that's all.

Sowing the seeds

Apple plans some exciting new introductions for its PowerBook line in the next few months. Look for a color model, which could be unveiled as early as next month's MacWorld, though it is more likely to have its debut at MacWorld in Japan in February. In October, the company revamped the hugely popular line with three upgraded machines.

No yoking!

Gateway 2000 may be looking to move beyond its direct response channel. Sources say the company is displaying its Handbook computer in a Chicago-area Egghead Discount Software store and has plans to display, but not sell, more products in Egghead stores if it likes the response it gets.

Back to earth

Dell's Dimension line seems to be giving the company some manufacturing and sales headaches. While the firm says its relationship with Dimension manufacturer SCI is solid after a shaky beginning in production, some say Dell may bring production in-house. Dell recently discontinued a program in which some customers were given the Dell P desktop family at the same price as Dimension when they requested Dimension machines. One analyst said this cost Dell a point in its gross operating margins. A Dell spokesman said the program was started informally when there was a two-month wait for Dimension computers; it has been discontinued because Dimension is down to a one-week backlog.

Hacker beware

The word in the computer underground is to brace yourself for Operation Sundevil II, a repeat of the dragnet that Secret Service agents launched two years ago against suspected electronic bandits. In recent weeks, law enforcement officials have once again turned up the heat on suspected system crackers and have even gone as far as breaking up a gathering of computer enthusiasts at a mall in suburban Washington, D.C. The first Operation Sundevil swept through 14 cities and shut down several on-line bulletin boards, while seizing 40 computers and 23,000 floppy disks.

Brother, can you spare a dime?

The Digital Equipment Computer Users Society (DECUS) is working under a deficit resulting primarily from lower attendance rates at this week's user conference and is cutting back annual expenditures by $650,000, according to DECUS sources. Services being cut back include a newsletter. Special interest groups may also be affected, the sources said. In addition, the DECUS board is considering charging membership fees.

Outsourcing companies ritualistically describe themselves as their clients' partners, and occasionally, that means they'll venture into providing nontraditional services. Case in point: Electronic Data Systems has won a commitment from its largest customer, General Motors, under which GM must notify EDS of any non-data-processing work for which it is seeking bids. EDS is already vying for the job of managing GM's pension fund and is eyeing a contract to publish technical publications and owner manuals. Got any news tips? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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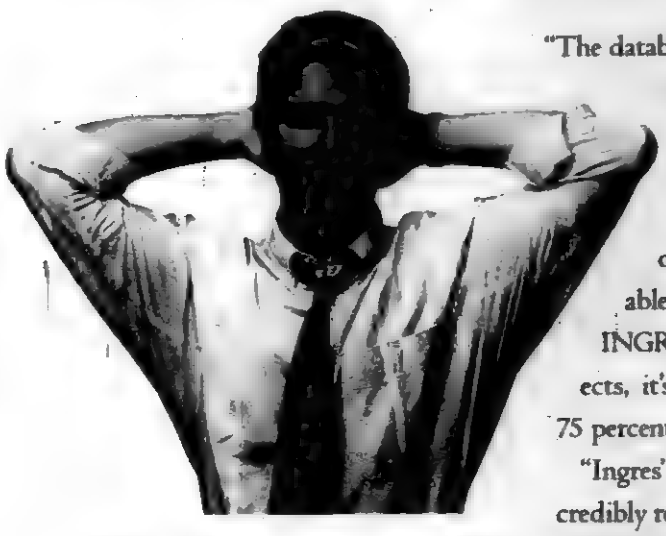
First, there's INGRES/Vision.™ It gives you a visual interface and 4GL code-generating technology that actually writes code for you. Next, there's INGRES/Windows4GL,™ which lets you create graphical client-server applications by simply pointing and clicking. That cuts development time by an average of 60%.



"The database we collect, massage, and manipulate to generate reports for clients *is* our business. The demand for new applications obviously is intense. I've been able to meet that demand with INGRES/Vision. On many projects, it's cut development time by 75 percent.

"Ingres' technical support is also incredibly responsive. No matter when I call, their support engineers always call back right away."

Anders Nicolausson, National Systems Manager, Construction Market Data, Inc., 250 employees in 15 U.S. offices.

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"By focusing on the underlying architecture of the database and how to achieve optimal connectivity to it, Ingres is able to maximize the power and performance of

Technological Innovation
1983 First client-server RDBMS
1985 First RDBMS-4GL integration
1986 First database gateway
1987 First transparent distributed RDBMS
1988 First UNIX DBMS to break 100 TPS
1989 First intelligent database, object support
1990 First RDBMS with automatic two-phase commit
1990 First RDBMS-graphical, OO 4GL integration
1991 First production-quality 4GL generator
1991 First SQL-based event alerters

open systems, and to provide the best possible framework for your move toward client-server computing. The result is a system architecture that mirrors the way your business works, and solves business problems."

If you'd like to know more about the effect Ingres can have on your productivity, call **1-800-4-INGRES**. Within Latin America, call **1-305-789-6685.**

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COMPUTERWORLD

Kahn sings the blues

Software price war forces Borland to lay off 350 workers

By Christopher Lindquist
SCOTTS VALLEY, CALIF.

After labeling 1992 "the worst year of my life," Borland International, Inc. founder Philippe Kahn last week laid off 15% of his work force in what he said is the first step in making the company more competitive in an increasingly price-vicious software market.

While the cuts helped to further deflate Borland's stock, the impact they will have on customers is unclear, although Borland said users will see improvements in support and service because of the new efficiencies in the organization.

The layoffs cap a year in which Borland has appeared to be on the verge of losing a look-and-feel suit filed by Lotus Development Corp., has accused a key former executive of bringing confidential documents to a competitor and has failed to get its Windows products out. The company now faces increased pressure from Microsoft Corp., which bested Borland by launching its own Windows database at Comdex/Fall '92.

Borland's Philippe Kahn *blames Microsoft and Lotus for the software price war*

In July, Kahn promised to ship Windows versions of the Paradox and dBase databases by summer's end [CW, July 6]. Both are now expected to ship early next year.

The 350-person layoff comes as a result of an ongoing software price war that will require software companies to change their thinking, Kahn claimed.

Kahn was quick to blame the "price war" on Microsoft and Lotus and, in particular, on their extremely low per-seat suite pricing. However, Borland's own pioneering pricing battles on the competitive upgrade front are often seen as the catalyst for the emergence of truly low-cost, major-brand software.

Whatever the cause, Kahn said he sees a future that contains much cheaper software — more along the lines of the $99 upgrade than the current $495 to $795 retail model. Kahn pointed to Microsoft's introductory offer of $99 for Access as an example.

Borland may be in "a death spiral," according to Jim Geisman, president of Marketshare, Inc. in

Borland, *page 16*

DB2 to get client hooks

By Jean S. Bozman
CHICAGO

■ IBM's top database strategist said last week the firm will provide two new building blocks next year for creating distributed databases: data management software that will prepare corporate DB2 data for client/server applications and a "browser" that will give users a road map to corporate databases.

Daniel Wardman, database strategy manager at IBM's Santa Teresa Laboratory near San Jose, Calif., said a copy manager to automatically create database "extracts" and the OS/2-based Business Information Locator would remove key technical barriers to implementing client/server applications in large corporations.

Both products are considered vital components of IBM's evolving Information Warehouse blueprint, Wardman said at the Database World conference.

Analysts said they believe IBM is making the moves in recognition of the shift away from mainframe-centered information systems strategies based on IBM 3270 terminal sessions for MVS applications toward distributed client/server systems that reside in corporate business units.

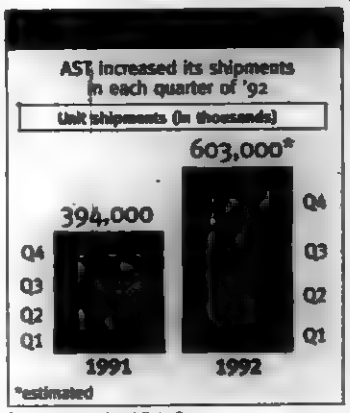
IBM, *page 10*

AST launches to sharpen image

By Michael Fitzgerald
IRVINE, CALIF.

■ AST Research, Inc. is planning an extended holiday party to toot its own horn and push new products. For starters, it will expand its PowerExec notebook line next Monday and will follow that up with a mid-January revamp of its Premium line of desktops and servers, according to sources.

The combination of talk and products appears to show a dramatic shift in AST's strategy, which was designed to help erase the question mark next to its name as the PC industry splits into "haves" and "have-nots."



Source: International Data Corp.

This surge of energy comes at a time when AST needs to take some dramatic steps to pump up its presence in the market, analysts said.

"They're posturing, and it's a good thing for them to do," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing," a newsletter based in Brookdale, Calif. "People want to buy from a winner, and they're posturing themselves as fast-growing and strong enough to be a winner."

Some users have always questioned the quality of AST's products, and some may be concerned about the stability of the firm's management following the departure of co-founder Tom Yuen in June.

AST, *page 14*

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Re-engineering rewards

In a year in which everyone seems to be re-engineering something, what does it take to be the nation's best user of technology to boost business? Look no further than Banc One Corp., the acquisitive Columbus, Ohio-based banking conglomerate that topped more than 60 tough competitors to win *Computerworld*'s first annual Excellence in Re-engineering award.

National correspondent Mitch Betts tells how Banc One boosted earnings 25% and revolutionized banking sales and service. See story page 93.

Winning combination

Banc One Corp., Columbus, Ohio

ANALYSTS SAY THERE IS A CLOSE LINK BETWEEN BANC ONE'S BUSINESS-DRIVEN TECHNOLOGY INVESTMENTS AND ITS ENVIABLE PROFIT GROWTH

- IS budget: $299 million
- IS budget as percentage of revenue: 7%
- Profit growth 1987-1991: 25%
- *Computerworld Premier 100* ranking: No. 3 in finance industry

Source: 1992 *Computerworld Premier 100* CW Chart: Janell Genovese

Executive Briefing

A comprehensive guide to the week's news

RE-ENGINEERING

Banc One wins *Computerworld*'s Excellence in Re-engineering award for several initiatives, including the Strategic Banking System, that revolutionize the way banking is done. *Page 93*

PC SOFTWARE

There are already thousands of Windows utilities, including some standout shareware products. Which ones are the most effective? Often those that add to or enhance the environment rather than replace parts of it. *Page 101*

Users outline some of their long-term needs for IBM/Apple joint venture Taligent. *Page 57*

OLE 2.0 defines a path for future Microsoft operating systems. *Page 57*

INDUSTRY

IBM is expected to announce further expense cuts during the next month. *Page 4*

The outcome of the FTC investigation against Microsoft may come more in the form of a whimper than a roar, if history is to be believed. *Page 129*

Borland's downward slide continues as CEO Philippe Kahn acknowledges a tough year, announces 15% layoffs and blames cuts on what he claims is an impending software pricing war. *Page 1*

CLIENT/SERVER

IBM's top database strategist told users at a Chicago database conference that the firm would provide two data management products to ensure that its Information Warehouse is widely used in client/server applications. *Page 1*

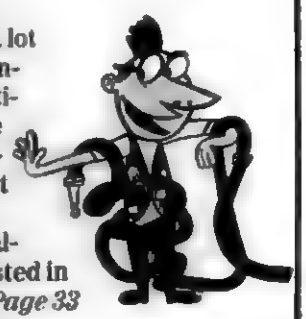
A move to client/server is likely to be costly and fraught with organizational and training challenges, according to a new study. *Page 89*

Users at a database show approach client/server gingerly, but vendors are far more bullish. *Page 10*

TELECOMMUNICATIONS

Hewlett-Packard and Ericsson take on the Herculean task of building integrated, cross-country network management systems for carriers, aimed at reducing cost and service implementation lead time in foreign countries. *Page 12*

SYSTEM DEVELOPMENT



The computer industry would be a lot healthier if vendors would concentrate more on usability and practicality and less on trying to create the ultimate in power and performance, consultant and author Art Gillis says. Users aren't getting what they need out of what they already have, so they aren't interested in buying more powerful versions. *Page 33*

The advent of object-oriented technologies foreshadows a day when the model in a simulation will cease to be merely a representation of a new system and will actually become the new system. *Page 28*

Security

Computer security expert says popular encryption schemes may not be safe. *Page 6*

Hacker charged in Air Force data theft. *Page 6*

PC hardware

AST plans to use new products and self-promotion in an effort to claim a place in the first tier. *Page 1*

"Restocking fees," "free service" and "complete money-back guarantee" are phrases used in mail-order ads that sound simple but can spell trouble even for the initiated. *Page 121*

Compaq goes direct — sort of. *Page 8*

Too busy for holiday shopping? Here are some last-minute gift ideas for the computer user. *Page 60*

Unix

Attendees at Sun User Group Conference & Exhibition last week worried about Solaris 2.1 migration issues and whether Sun has a strategy for dealing with Microsoft's Windows NT. *Page 7*

Big iron shops find a kinder, gentler way to transition to Unix with a Unix version of the ISPF mainframe text editor. *Page 80*

Large systems

D-Day for Alaska Airlines' cutover from an EDS reservation system to AMRIS' Sabre is approaching, and the company is sharpening its pencils because for a few hair-raising hours, it will have no computers available at all for processing customer requests. *Page 77*

DECUS attendees are excited about Alpha's potential, but some say corporate management is skittish about approving DEC purchase plans. *Page 14*

A spate of minicomputer product announcements from HP focus on software enhancements for its proprietary line while adding a dozen blazing boxes to its Unix hardware lineup. Amid the flurry, HP added relational capabilities to its Turbolmage database. *Page 12*

Application development

Users hate it when you show them prototype software and then tell them they have to wait months or years for the real thing. But that's how software developers work today. They should instead create software rapidly, delivering to users a basic working system that can grow and evolve to contain all the features users need. *Page 100*

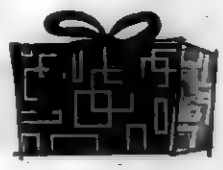
Encompass, a joint venture of AMR and CSX, recently completed the first version of its global shipment tracking system. Applications for the ambitious client/server system were built with tools from Uniface. *Page 89*

Legal issues

Data-over-cellular patent holder Spectrum Information Technologies cracks down on enforcing license fee payments amid rumors that wireless bigwig AT&T is considering acquiring the firm. *Page 4*

LANs

CW Editor .In Chief Bill Laberis talks about the trend of users' turning over their LANs to IS — and the price they'll have to pay for doing it now instead of earlier. *Page 32*



DASD durability

USERS RATED HITACHI DATA SYSTEMS TOPS IN RELIABILITY AMONG MAINFRAME STORAGE PRODUCTS.

SEE BUYERS' SCORECARD, PAGE 84

Product	Reliability rating
HDS' 7390	9.6
EMC's Symmetrix	9.3
Amdahl's 6390	8.8
IBM's 3390	8.5

MAXIMUM POSSIBLE SCORE: 10 RESPONSE BASE: 103 USERS

The Banc One team helped change the way the world thinks about banking processes. *Page 93*

Open systems

Users cite management and security as the primary generators of hidden costs in migrating to open systems in this month's User Voices poll. 65

Careers

Minorities can succeed in IS, says Ben Berry, a manager of computer services at Hughes Aircraft in Los Angeles. But getting ahead takes a carefully crafted strategy. Berry suggests that minority group members need to develop political savvy and remain flexible about the size and types of companies they'll work for. 113

Preparing for a promotion to a high-level position? Here is some advice that might smooth your transition. 115

DBMS

Big, mission-critical databases of names and addresses need sophisticated search software, users say. 77

Microsoft's Access is positioned to serve two types of users: those who want it as a database management system and those who want it as a tool to query enterprise databases. 66

Imaging

Exploring relatively uncharted waters, National City Bank of Cleveland will test a scalable, microprocessor-based imaging system in its item processing operation. 66

Enterprise networks

Standards bodies and users mull a proposal to end the network standards battle. 69

3Com adds a twist to the low-end router market with a new software architecture that eliminates administrative changes to remote devices. 14

Mass garment maker Byer California leverages the X Window System to meet time-to-market deadlines. 69

Departments

Advanced Technology 28
Application Development ... 89
Buyers' Scorecard 84
Calendar 99
Company Index 126
Computer Careers 113
Computer Industry 129
Desktop Computing 57
Editorial/Viewpoint 32, 33
Enterprise Networking 69
Friday Stock Ticker 128
Health Watch 130
In Depth 109
Large Systems 77
Management 93
Marketplace 121
News Shorts 6, 16
Product Spotlight 101
Workgroup Computing 67

REFERENTIAL INTEGRITY

SYBASE

200 LINES OF PROPRIETARY CODE

```
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
        declare @row int
        select @row = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
            key relationship */
        begin transaction
        if
            (select count(empno) from inserted where
                inserted.deptno is null)
            +
            (select count(deptno) from inserted
                where inserted.deptno in
                (select deptno from dept)
            < @row
        begin
            raiserror 22220 "emp row specifies non-existent department"
            rollback transaction
        end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
        else
        if
```

*Program code independently written and tested.

ORACLE7

12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

These two programs do exactly the same thing: direct the server to enforce business rules to ensure data integrity. Oracle does it in 12 lines of industry standard SQL. Sybase requires 200 lines of their vendor proprietary language, Transact-SQL™. If productivity is important to you call 1-800-633-1071 Ext. 8186 for a free copy of "Client/Server Database: Getting it Right" by programmer productivity expert Steve Schur.

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Wireless questions multiply

Standards, bandwidth issues concern users considering the technology

By Lynda Radosevich and Joanie M. Wexler
BOSTON

There was muted enthusiasm for emerging wireless technologies and services at the Wireless Datacomm '92 conference last week.

Would-be users said they were excited by the possibilities of wireless local- and wide-area networking but are concerned about several outstanding issues. These include a lack of cross-technology standards, bandwidth limitations and blurred distinctions among the relative merits of competing wireless telecommunications technologies: data over cellular and packet radio.

For example, Leo Moerkens, manager of service information systems at Phillips Medical Systems in Shelton, Conn., said his intent to link 900 field engineers to the company's IBM mainframes will depend on the maturity and ubiquity of wireless telecommunications.

His company, which sells X-ray, ultrasound and other equipment to hospitals, plans to equip the engineers with notebook computers so they can access dispatch information and customer files while they are on the road.

To make the system viable, he said he expects a one- to two-year payback in cost reduction due to improved efficiency.

The expectation seems reasonable. Robert Euler, vice president of marketing at Ardis Co., the provider of the Advanced Radio Data Information Services (Ardis) network which spans 400 U.S. metropolitan areas. He told conference attendees that nearly all Ardis customers have seen nine- to 18-month paybacks.

However, a major technical consideration for wireless service shoppers in the mass business market is the nonportable nature of users' mobile computing devices among the various wide-area services, said Andrew M. Seybold, publisher of the "Outlook on Professional Computing" newsletter, who chaired several show sessions.

Within the cellular market, users can change service suppliers without changing equipment. But emerging packet radio services running in different frequencies and using different protocols mean users cannot mix and match their equipment and applications among cellular and radio services. This limits dissatisfied users' ability to change providers.

Seybold and others have formed an association to address this issue (see box at left). Meanwhile, Seybold advised users to choose a wireless service before they invest in portable computing gear.

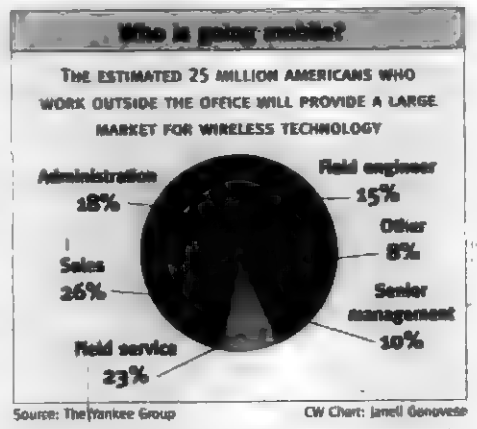
Applications guide choice

Analysts noted that users' applications play a role in the choice of a cellular or packet radio service. Roberta Wiggins, senior analyst at Boston-based consultancy The Yankee Group, said that packet radio is generally more appropriate for short, bursty messaging because of its error-correction and security features.

Users needing far-reaching service coverage today might choose cellular because of its ubiquity, she said, though "cellular is not as reliable for data."

Cost also plays a big role. United Parcel Service, Inc., for example, uses both the Ardis network and cellular provider GTE Mobilenet for two separate applications. An Ardis customer for an on-call pickup application, the shipping firm reportedly chose cellular for communicating delivery and pickup information to its 50,000 trucks simply because it was cheaper.

Wireless LAN technology presents its own challenges. For example, users may inadvertently become disconnected from the LAN if they step outside its transmission range. But the technology intrigues some users. A conference attendee who requested anonymity said he wants to install wireless LANs in his firm's warehouse stores, which currently use stand-alone workstations to design home improvement room layouts for customers.



The stores lack drop ceilings and inside walls to run network wiring in; wireless LANs could solve that problem and allow users to easily move workstations.

James Cavin, an education consultant at Telelead Corp. in Raleigh, N.C., said wireless LANs could simply be a cheaper solution to networking his company's 10 PCs because of traditionally high cabling labor costs.

IBM braces for more cutbacks

By Johanna Ambrosio
ARMONK, N.Y.

Within the next several weeks, IBM is expected to disclose details of another round of expense cuts, which may include more plant closings and reallocation of personnel, industry watchers said last week.

The company may also announce either the first layoffs in its history or another incentive program to get people out the door.

Other possible actions include cutting old or unprofitable product lines.

An IBM spokesman would neither confirm nor deny rumors of a special board meeting to be held this week to discuss these issues, nor would he comment on any pending announcements.

But IBM executives have said for some time that unless the company's financial situation improves, they would have to take further steps to trim expenses. Frank Metz, IBM chief financial officer, told a gathering of analysts in August, "We'll take the actions necessary to close the financial equation."

"It wouldn't be a big surprise to see layoffs," said Wendy Abramowitz, an analyst at Argus Research in New York, echoing a consensus of other industry observers.

"We all expect many more employees to leave, whether that's by using the 'L' word or through another incentive program," said Barry Bosak, an analyst at Smith Barney, Harris Upham & Co. in New York. "But no one really knows anything, and the uncertainty is killing us."

Already this year, some 40,000 IBM employees have left the company by means of an early-retirement program. By year's end, IBM expects to have 300,000 employees on its roster.

One reason further action may be necessary is because of the continuing economic softness. Although the economy in the U.S. is improving slightly in some sectors, market conditions in most European countries continue to be weak.

"The issue is Europe and Japan," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "If those countries don't improve, then no one in the technology business is safe no matter who you are — IBM, Digital or Sun."

In recent weeks, IBM has also been reeling from several major setbacks. Among them is trouble with its contract to supply an air traffic control system to the Federal Aviation Administration (FAA). The FAA reportedly has had some problems getting some of its IBM software to work, and IBM has yet to provide a fix.

Additionally, IBM's stock fell 4%, to $62.75, last week after Standard & Poor's put the company on its CreditWatch list, indicating it is considering lowering IBM's credit rating because of difficult near-term market conditions.

Cellular analog patent disputed

By Joanie M. Wexler
MANHASSET, N.Y.

A dispute over Spectrum Information Technologies, Inc.'s patent for technology that allows data to travel over analog cellular networks heated up last week when Spectrum said AT&T might consider acquiring Spectrum to get control of the patent.

An AT&T spokeswoman declined comment on whether the company was interested in buying Spectrum. She also declined comment on Spectrum's patent claims and said the dispute is between AT&T's suppliers of wireless modems and Spectrum.

Spectrum's hardware and software technology links cellular telephones with data modems. This allows nomadic corporate users with portable computers to send data over wireless networks instead of having to rely on cabled networks.

The Spectrum patent issue could inhibit the cellular efforts of vendors such as AT&T, IBM and Motorola, Inc., which are seeking opportunities in the burgeoning wireless market. The market is pegged at $150 million today by The Yankee Group and is expected to grow to $500 million by 1995.

Possible roadblock

Potential legal squabbling over the applicability of the patent to other vendors' devices could stall product and service development. As with any patent, enforcement of license fees would increase manufacturing costs to cellular vendors, which get passed to end users.

The patent, however, was already validated and reissued to Spectrum last month by the U.S. Patent Office despite opposition from modem maker Microcom, Inc. in Norwood, Mass., which uses the cellular technology in its modems. Shortly thereafter, Spectrum filed suit against Microcom for patent infringement.

The $100 million Spectrum has had some success in enforcing its patent; it recently received a letter of intent from Data Race, Inc., a maker of cellular modems, to license its technologies. Data Race, which is reportedly paying a seven-figure up-front licensing fee plus royalties, supplies modems to AT&T subsidiary NCR Corp.

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News Shorts

Univel starts shipments

Univel, the San Jose, Calif.-based joint venture between **Novell, Inc.** and **Unix System Laboratories, Inc.**, has begun shipping its new UnixWare family of network products. UnixWare, which Univel claims bridges the Unix and Novell NetWare operating environments, is available in Personal Edition, Application Server and Software Development Kit packages. According to Univel, more than 150 vendors are shipping or have announced products for the UnixWare environment.

Work-flow server for Notes

Lotus Development Corp. and **Action Technologies, Inc.** last week gave more details on how they will provide work-flow software to work with Lotus' Notes. At the same time, an Action Technologies executive said the companies will not release a product by year's end as originally planned. Lotus and Action Technologies have developed a work-flow server that will run as a companion product to Notes. While some pilot versions have worked with the current release of Notes, the companies are positioning the work-flow server to run with the yet-to-be-released Notes Version 3.0. Action Technologies also said it intends to offer a software developers kit so users and third-party developers can tailor their applications to run in a work-flow environment.

Clinton years, sans Young and Sikes

Federal Communications Commission Chairman Alfred C. Sikes said he will resign Jan. 19, the day before President-elect Bill Clinton is inaugurated. He did not say what he planned to do after that, and Clinton has not said who will replace him. Appointed by President George Bush in 1989, Sikes was generally liked by corporate telecommunications users for his efforts to increase competition and foster the deployment of new technology. Meanwhile, John Young, recently retired chief executive officer of **Hewlett-Packard Co.**, dashed the hopes of many when he said he was not in the running for secretary of commerce in the Clinton administration. He cited appearances of conflict of interest over his substantial business holdings.

Free-lancer wins copyright

A federal appeals court recently decided that a free-lance programmer will be allowed to hold the copyrights to software written under contract because the programmer was not a W-2 employee of the firm. The Second U.S. Circuit Court of Appeals in New York reversed a lower court decision against the programmer, Clifford Scott Aymes, of Robbinsville, N.J., who had written an inventory-tracking and cash-flow program for **Island Swimming Sales, Inc.** in the early 1980s. The court ruled Aymes was entitled to the copyrights because the firm did not give him health or Social Security benefits.

SHORT TAKES **Data General Corp.** snagged **Storage Technology Corp.** executive Larry Hemmerich for general manager of DG's new Clariion storage system unit, which is due to ship its first redundant arrays of inexpensive disks systems for Unix machines from **Sun Microsystems, Inc.** this month.... **SunConnect**, the Sun subsidiary that handles networking products, is moving its headquarters to Grenoble, France, and expanding its staff by 20%, the company said last week.... **Empress Software, Inc.** in Greenbelt, Md., released a DOS version of its Empress relational database management system, written for use with Unix systems.... **Novell** has begun shipping a new NetWare In-Place Upgrade Utility that will simplify upgrading local-area networks from NetWare 2.1 and 2.2 to 3.11 by allowing users to upgrade a server without first off-loading the data to a backup server.

News Shorts, *page 16*

Encrypted data at risk?

By Gary H. Anthes
GAITHERSBURG, MD.

A member of a government/industry advisory panel on computer security said last week that using existing technology, it takes only a few hours to unscramble data encoded by two popular encryption algorithms.

The assertion, which two major software vendors challenged, adds fuel to user concerns that privacy protection now available in software is inadequate. It also strengthens vendor arguments that federal export regulations are inhibiting the deployment of the best encryption methods.

Stephen Walker, a computer security expert and president of Trusted Information Systems, Inc. in Glenwood, Md., said that for about $50,000 it would be possible to harness the power of 100 microprocessors to derive 40-bit encryption keys — the maximum allowed in products for export — from an encrypted message in three hours or less. Walker based his analysis on the performance of an encryption chip offered by Cylink Corp. in Sunnyvale, Calif.

More ominous, Walker said an experimental chip in use at Digital Equipment Corp. could do the job in less than 18 minutes.

"I submit this is a pretty big issue," Walker told the quarterly meeting of the Computer System Security and Privacy Advisory Board. "As I began to explore this, I became very frightened."

The 40-bit limit was part of an agreement reached last July between the Software Publishers Association and the Bush administration (CW, July 7). National Security Adviser Brent Scowcroft agreed to allow the export of mass-market software using two encryption algorithms — called RC2 and RC4 — licensed by RSA Data Security, Inc. in Redwood City, Calif.

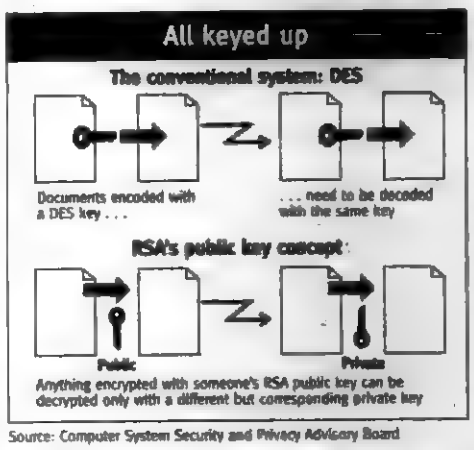
Domestic implementations of RC2 and RC4 typically use 64-bit keys. However, exportable versions would have to be limited to a less-secure, 40-bit key.

Scowcroft refused to ease restrictions on the export of products using the more secure 56-bit Data Encryption Standard (DES) algorithm, which is widely used in the banking industry. According to Walker, his hypothetical 100-processor machine would need 23 years to crack DES.

The 15-year-old DES algorithm is a government standard that the government is likely to soon reaffirm for an additional five years. But some members of the computer security board said last week that whatever is allowed for export will become the de facto standard in mass market software because vendors will not develop two versions of products. If the de facto standard becomes RC2 and RC4 with 40-bit keys, users will be exposed, several members said.

Officials at Novell, Inc. and Microsoft Corp. challenged Walker's analysis, saying it oversimplified the job of cracking encryption keys. They also pointed out that chips devoted to RC2 and RC4 encryption do not exist.

But Alan Eldridge, security architect at Iris Associates, Inc., which developed Notes for Lotus Development Corp., said, "It's not an issue of whether Walker is right or wrong. Users make similar calculations and reach similar results. We get frequent and loud complaints."



Source: Computer System Security and Privacy Advisory Board

Notorious hacker charged with stealing fed secrets

By James Daly
SAN FRANCISCO

An infamous electronic bandit who once used the computer network alias "Dark Dante" was charged with stealing a secret Air Force military document that listed the names and locations of structures to be attacked in the event of war.

Kevin Poulsen, a former Sun Microsystems, Inc. programmer who has been jailed for the last 20 months following an unsuccessful attempt to avoid earlier hacking charges, was named in a 14-count indictment returned last week by a grand jury.

In January 1990, the 27-year-old Poulsen, along with Mark K. Lottor and Robert E. Gilligan, was accused of conspiring to break into government and Pacific Bell Telephone Co. computers, stealing and trafficking in telephone access codes, obtaining unpublished phone numbers for the Soviet Consulate in San Francisco and wiretapping conversations of Pacific Bell officials who were investigating them.

Poulsen fled and remained at large until April 1991, when a tip in response to the television show *Unsolved Mysteries* led to his arrest.

The most recent indictment is likely to supersede the earlier charges, said Assistant U.S. Attorney Robert Crowe, who is prosecuting the case.

Lottor, whose case has been severed from Poulsen's, remains free on bail, and his trial will probably occur after Poulsen's. Gilligan pleaded guilty to the original charges and is now working with the government on the case, Crowe added.

Poulsen's latest indictment marks another chapter in his troubled legal history. He and another hacker were accused of illegally accessing computers at the University of California at Los Angeles in what was one of the first computer hacking cases prosecuted. His juvenile status shielded him from prosecution at the time.

He later went to work for Sun, which had a government contract to develop a computer system for the Air Force's Caber Dragon 88 exercises being conducted at Fort Bragg, N.C., according to an Air Force memo filed in court. It was then that Poulsen allegedly retrieved an Air Force Tasking Order that set forth commands for the exercises as well as the name of actual military targets, the government said in court papers.

An electronic copy of the document was later discovered during a search of Poulsen's apartment, Crowe said.

If convicted of the new charges, he could get a sentence of eight to 10 years in jail. Defense attorney Paul Meltzer has contended that the Air Force order was reclassified after the fact to raise the potential penalties against Poulsen. Crowe insisted this is not true. A federal judge is set to rule on the matter Feb. 1, and a trial will follow soon thereafter.

Sun users wary of Solaris migration

By Maryfran Johnson
SAN JOSE, CALIF.

Concerns about migrating to Sun Microsystems, Inc.'s just-released Solaris 2.1 operating system were uppermost in the minds of those at the Sun User Group Conference and Exhibition last week.

"Everyone here is looking forward to Solaris 2.1 with a little bit of dread and anticipation. It's a big transition," said Walter Herrich, a systems programmer at the University of California at Berkeley's Space Sciences Laboratory, which has 40 to 50 Sun machines on its network. "I don't know what problems we're going to see," he added, "but this is the direction Sun is going, so there isn't much choice."

Solaris, Sun's first implementation of Unix System V, Release 4, has been dogged by more than 1,000 bugs since its release last summer. With most of the initial bugs banished from 2.1 and symmetrical multiprocessing capability added, Sun is hoping commercial users will forge ahead with their migration plans now.

The conference, which drew about 1,800 users and exhibitors, focused on the impact of Solaris 2.0 and alternatives to it. "People come to this conference looking for answers," said Stan Hanks, president of the Sun User Group and principal scientist at Technology Transfer Associates, a consulting group based in Bellaire, Texas.

Letting its guard down

Several other issues explored at the conference seem to indicate an overall concern that Sun needs to pay more attention to both its technical customers and other industry players. Some discussion focused on issues such as Sun's reaction, or lack thereof, to the threat posed by Microsoft Corp.'s Windows NT operating system and a broad perception that Sun is not listening as well as it should to the user group.

Hanks noted that many of the same technical system administrators who once had only their Unix machines to worry about are now senior executives charged with caring for multivendor environments.

"The promise of open systems was that anything on your network would work with anyone else's equipment, but the reality is a support nightmare," Hanks said.

Sun's dismissive, indifferent attitude toward Windows NT was another concern.

"It's not just that NT will be an advanced operating system. It's all those applications Microsoft can bring to the table," said one systems administrator at the Department of Defense who asked not to be identified. "I can hear the footsteps of NT. Everybody can."

One defense Sun might mount against NT, he suggested, would be to improve and more tightly integrate its Deskset tools and applications for office environments.

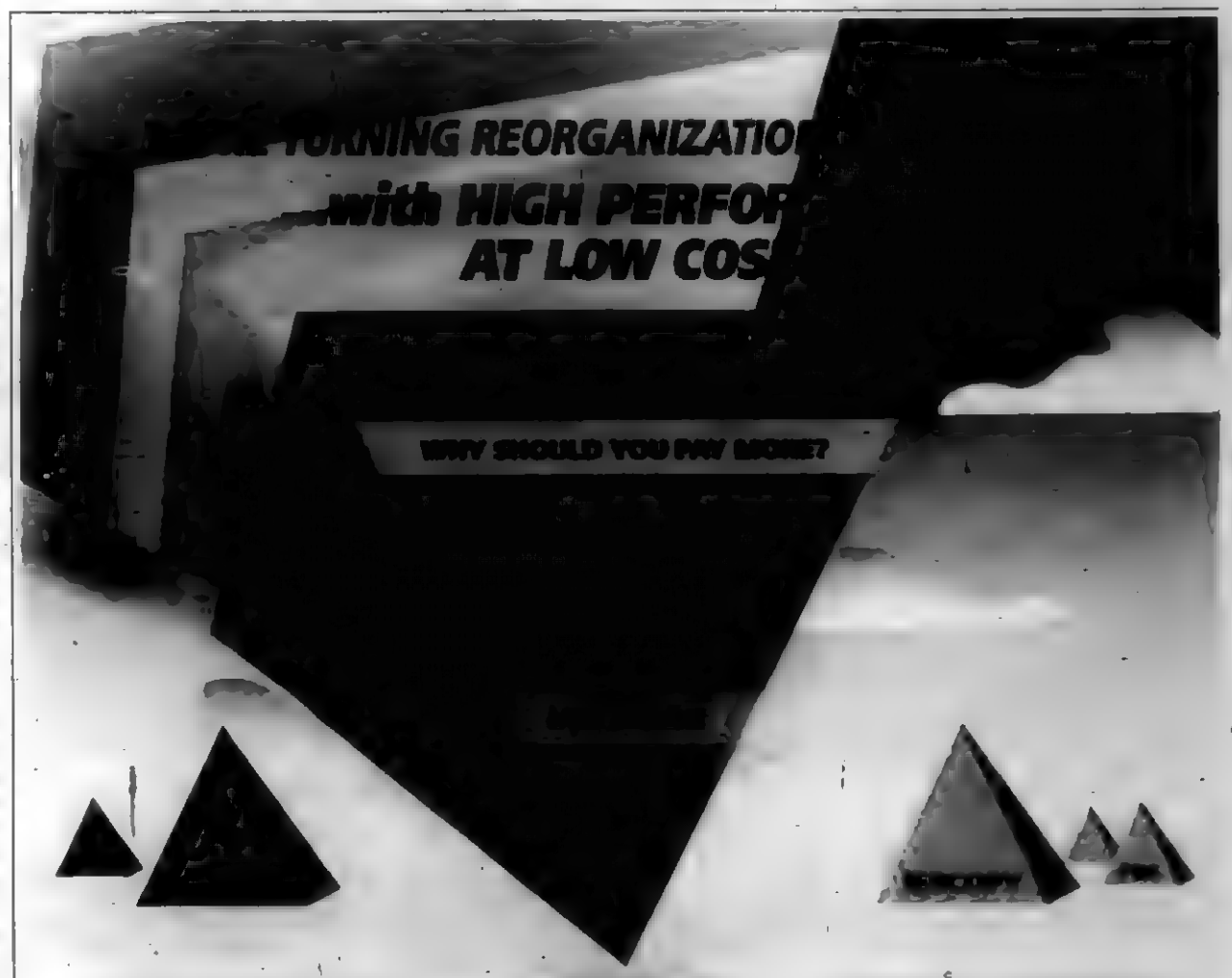
Sun, meanwhile, set up its own "listening booth" on the exhibit floor, where a steady stream of customers lined up to air complaints or offer suggestions. Still, the Mountain View, Calif.-based vendor has historically paid scant attention to the user group — even though its average member is responsible for spending up to $250,000 on Sun gear, Hanks estimated.

"Users really would prefer us to be an effective conduit of information for Sun, but frankly, we're not," the user group president said bluntly. "Sun specifically does not want user feedback."

The recent introduction of the $3,995 SPARCclassic color workstation also drew its share of attention at the conference.

Jesse Charfauros, a senior systems administrator at Brooktree Corp. in San Diego, said the PC-priced SPARCclassic will have a "big impact at small companies," particularly in health care and the legal profession. "The ability to get the distributed computing power of Unix at such a low cost per seat is very appealing," said Charfauros, whose company network includes roughly 100 Sun machines.

Unix system administrators are increasingly called on to integrate their networks with PC-LANs, one user at Chevron Oil Co. said. "I'm getting three calls a week now on this subject, while a year ago hardly anyone asked about it," said the systems administrator, who asked not to be identified.



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INNOVATION 20 YEARS

Compaq adopts direct (mail) effort

By Michael Fitzgerald
HOUSTON

After months of flirting with selling through direct mail, Compaq Computer Corp. last week said it would give five direct marketers the right to sell some of its products.

Compaq's ProLinea desktops and Contura notebooks as well as its LTE Lite 25C color notebook will be the first product lines to be resold by five mail-order houses. As Compaq catches up with demand for its other lines, they too will be handled by direct-mail resellers, said Ross Cooley, senior vice president of Compaq North America. Only certain high-end models of its server line will be exempt from what he acknowledged was not a true mail-order effort by Compaq.

Compaq opted to set up a direct-mail channel, rather than sell products directly to end users, to keep from infuriating long-time, loyal resellers. "This is not Compaq doing mail order; this is a group of organizations . . . who will represent us to customers who like to buy via mail order," he said.

Cooley said Compaq estimates that 700,000 units will sell via mail order this year.

Analysts called the move an extension of the broad strategic shift Compaq began after firing founder Joseph "Rod" Canion in November 1991.

"It's a logical toe-in-the-water approach to getting into direct mail," commented Kimball Brown, vice president of Infocorp in Santa Clara, Calif.

The five vendors who will resell Compaq products are Granite Computer Products, Inc. in Alameda, Calif.; Insight Distribution Network, Inc. in Tempe, Ariz.; PCs Compleat, Inc. in Marlboro, Mass.; PC Connection, Inc. in Marlow, N.H.; and USA/Flex in Bloomingdale, Ill. Granite is affiliated with MicroAge, Inc.; Insight with Computerland Corp. and USA/Flex with Comark, Inc. Cooley said 11 companies submitted proposals to Compaq.

Analysts said Compaq's heavy reliance on affiliates of the mainstays of its reseller business would help keep dealers from becoming disgruntled.

Competitors downplayed Compaq's move.

"We want to be where customers want to buy, too, but we don't see direct as a way for us to go," said Safi U. Qureshey, president and chief executive officer of AST Research, Inc. in Irvine, Calif.

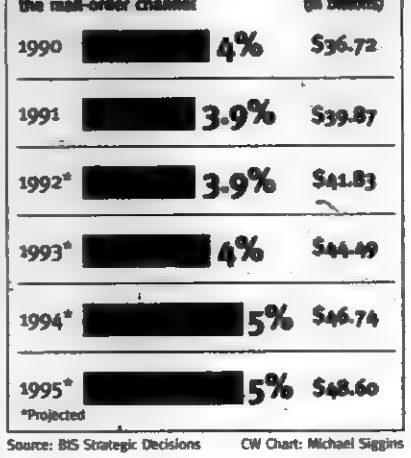
Qureshey said that while many vendors, including the IBM PC Co. and more recently Zenith Data Systems and NEC Technologies, Inc., have commenced efforts to go to mail order, "most companies will do a poor job of creating the business because they don't have the mentality for it."

Cooley responded that "Safi and [Hewlett-Packard Co.] are beating the dealer-only drum, and I'm the original Indian on that drum. But if your goal is to be No. 1, you have to have your products available in a variety of channels."

"From a strategic point of view, it's good for us because we've been known for software and peripherals," said Martha Danly, director of business development at PC Connection.

Special delivery

Compaq will try to claim a portion of the billion dollar mail-order channel



Source: BIS Strategic Decisions CW Chart: Michael Siggins

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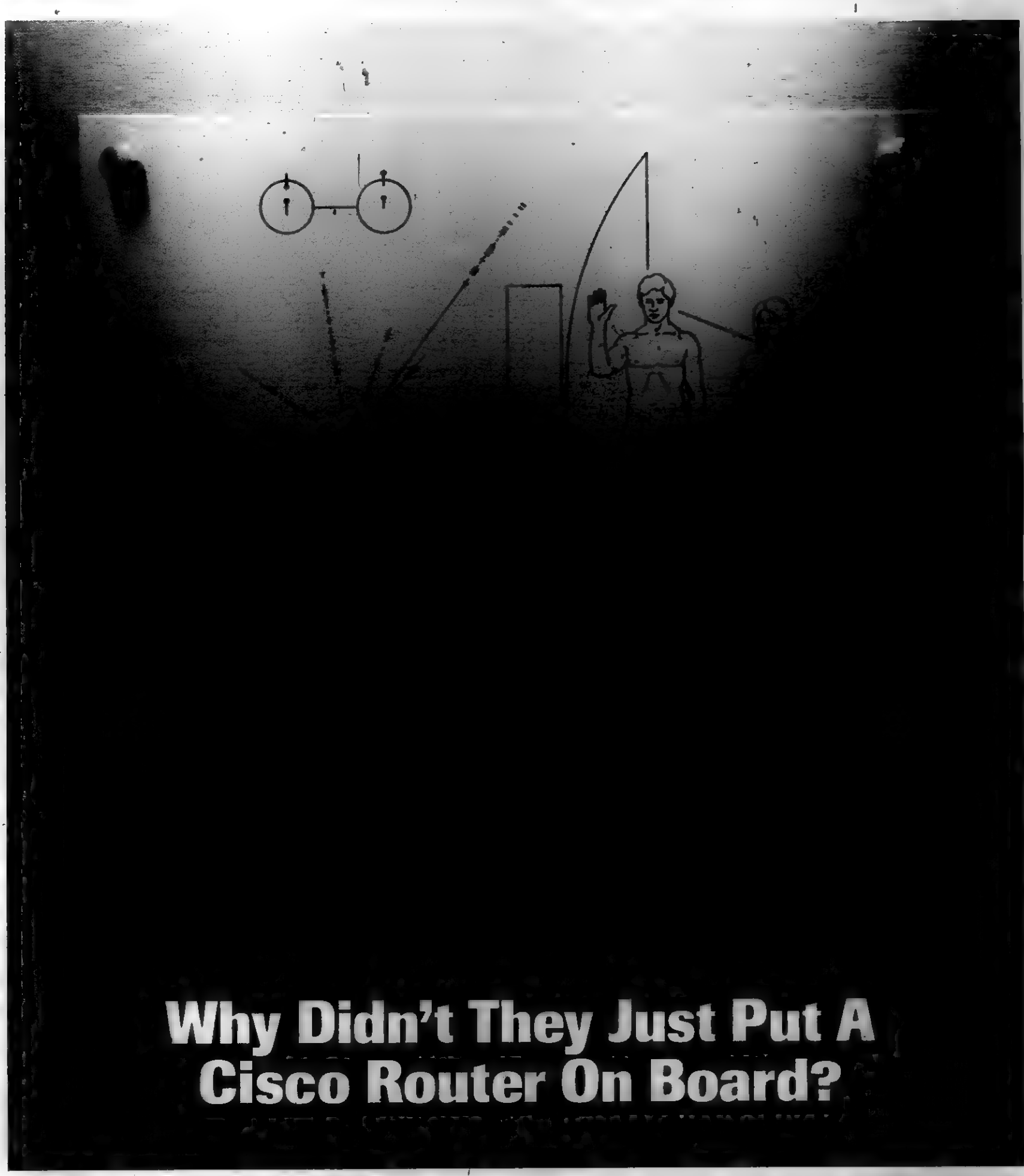

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IBM's DB2 to receive client hooks

CONTINUED FROM PAGE 1

Competitors Sybase, Inc. and Oracle Corp. are also scurrying to address the issue.

Wardman said IBM research indicates that many users are unable to find the DB2 and legacy data they need to access — even though their PCs can connect to the mainframes that hold the data. This is because IS managers at IBM sites have relied on a limited set of mainframe utilities to extract vital data from production IBM databases for use with client/server applications such as IBM's DXT product for DB2, he said.

For example, Joseph Iannello, manager of information resources at Amerada Hess Corp. in Woodbridge, N.J., said his firm uses an IBM utility to make "shadow copies" of DB2. However, the process, which is cumbersome, saves the entire database instead of just posting changes to an existing one.

Users also lack software tools that will enable administrators to describe corporate data in useful terms rather than listing it.

"We started out in our [Distributed Relational Database Architecture] thinking all we had to do was the hip-bone-connected-to-the-thigh-bone stuff," Wardman said. "But we didn't put the data in context for the user, and some people spent 80% of their time looking for data and only 20% analyzing it."

The Business Information Locator product would allow programmers to create customized database labels for local-area network-based client/server query applications. IBM will deliver a tool kit that will allow database managers to collect information on data categories contained in distributed databases — even those from other vendors' databases, such as Oracle 7.

Smart control needed

Some of the 1,500 users attending the conference agreed they need more utilities and tools for effective data management in organizations with large IBM mainframe data centers.

"It all comes down to who will manage the data repository," said Kingsley O'Kuesa, president of General Masters, Inc., a Bellwood, Ill., consulting firm. "There's a ton of information out there, but your business users may only require 50 to 60 [DB2] fields out of the thousands on the mainframe. You need an intelligent machine that can interpret all the requests coming in."

Some said IBM's Information Warehouse is at the top of their priority list, as they work to make end-user data access to centralized corporate databases real. "That's the only reason I came here," said Ed Geno, a systems manager at Southwestern Bell in St. Louis. "We're trying to get access to legacy systems and to provide the right information to the right people."

As pilot client/server projects go into production, database administrators are beginning to see the gaps in the Information Warehouse armor, analysts said.

"Once you go beyond the plumbing of client/server computing," said Aaron Zornes, a senior software analyst at Meta Group, Inc. in Westport, Conn., "you start to worry about server-to-server interactions and management of the data warehouse."

Users skeptical

While IBM has been working to provide an integrated data management tool set, several of IBM's business partners, including Information Builders, Inc. and Micro Decisionware, Inc., announced more data access software last week.

The move encouraged users but failed to convince analysts that IBM is putting the final touches on its Information Warehouse.

"Client/server technology looks good on paper, but when people try to implement it, they run into roadblocks," said Charles Phillips, a research vice president at SoundView Financial/Gartner Group, Inc. in Stamford, Conn. "I think users like the idea of enterprisewide connectivity but are not convinced that there have been enough [user] successes to buy into it."

Different strokes

Other vendors have taken alternative approaches to managing data accessed via client/server applications. Sybase, Inc. announced a new set of data management utilities for backup and recovery in its System 10 relational database system, scheduled to ship in 1993. Part of the package is a Replication Server, which will update multiple database servers, and the OmniSQL Gateway, which will allow applications to view many database servers as one virtual database. Oracle Corp.'s new Oracle 7 database management system, slated to ship in volume next year, supports two-phase commit, real-time updates on multiple servers and can take "snapshots" of an Oracle 7 system for delayed updates on other servers.

Software surplus

Software for IBM's Information Warehouse dominated third-party announcements made at last week's Database World conference. Among the highlights were the following:

- **Information Builders, Inc.** in New York said its Enterprise Data Access/SQL (EDA/SQL) client/server connectivity software would support IBM's CICS transaction-monitoring software for mainframes in 1993. Also announced was a Novell, Inc. NetWare Loadable Module version of EDA/SQL and support for Digital Equipment Corp.'s AccessWorks data servers.
- **XDB Systems, Inc.** in Laurel, Md., unveiled a Unix version of its XDB-Server, which reportedly will allow users to program IBM DB2 applications on Sun Microsystems, Inc. workstations.
- **Micro Decisionware, Inc.** in Boulder, Colo., announced a version of its DB2-compatible Database Gateway product for Microsoft Corp.'s Windows NT operating system. The firm also said IBM will begin selling its client/server software directly to IBM customers.
- **Progress Software Corp.** in Bedford, Mass., announced that its relational database and tools would support Univel's UnixWare client/server software for Novell networks. A software license ranges in price from $1,000 to $8,600, depending on its configuration.
- **Microsoft** said it has shipped hundreds of beta-test copies of a version of its SQL Server product adapted to the 32-bit Windows NT.
- **Intelli Corp, Inc.** in Mountain View, Calif., introduced a version of its Prokappa object-oriented development platform for IBM RISC System/6000s running AIX.

— Jean S. Bozman

Users step carefully to client/server

By Ellis Booker
CHICAGO

Excitement tinged with apprehension was how several attendees at Database World & Client/Server World here last week expressed their feelings about the distributed computing model.

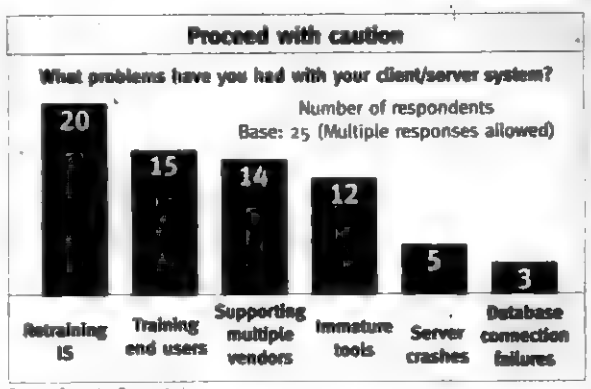
While a number of attendees said they had small pilot projects under way, nearly all said they planned to go quite slowly when it came to using client/server technology for mission-critical systems.

"We're a bit conservative," said Christopher Book, a team leader at Waste Management, Inc. in Oakbrook, Ill. Waste Management has deployed client/server configurations such as Lotus Development Corp.'s Notes, "but we're still developing a strategy for core business applications," Book said.

An ancillary obstacle, Book said, is that the firm has "long-term contracts and commitments" with a number of application developers for its legacy systems.

The city of Chicago has been installing local-area networks for its departments and is trying to link a mixed bag of Unix and proprietary servers, but it is still far from its goal of providing data access across the enterprise. "We're going through the client/server upheaval," admitted James Dunne, a technical support manager for the city and manager of a systems integration team formed last year.

Some information systems groups have trouble meeting user expectations about the alleged cost savings of client/server.

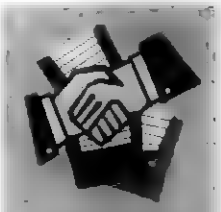


"It's hard to make it clear to users that this isn't necessarily cheaper than a mainframe," agreed Jill and Dave Harlow, a husband and wife team who are an analyst and a database administrator, respectively, in the IS department at Caterpillar, Inc. in Peoria, Ill.

For Rod Cressey, user services manager at the University of California at San Diego, the biggest problem is not getting information from hosts to desktops. "My biggest problem is making [users] understand what they're looking at on their desktops."

Vendors, not unexpectedly, were more bullish. "Within two years we'll turn off all our proprietary hardware and run exclusively on our own platform," said Nancy Colwell, director of commercial tools and technologies at Sun Microsystems Computer Corp. Sun uses a 4-year-old Amdahl Corp. mainframe running CA-IDMS for its worldwide manufacturing system.

But Bob Walsh, a database administrator at Bank of Boston, said, "I suspect the legacy stuff will pretty much stay where it is. The units have their business structured around the existing systems."



New horizons

The convergence of technologies at the desktop, in communications and in portable systems, promises new organizational opportunities, said Lotus Chief Technology Officer John Landry. "Coordination, not automation," will be the theme in the 1990s, he said, arguing that synchronized, server-based databases will be able to meet this challenge.

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GSA Contract Number GS00K90AGS5251-PS02.

HP bolsters 3000, 9000 lines

By Mark Halper
PALO ALTO, CALIF.

Hewlett-Packard Co. last week enriched its minicomputer line with a flurry of additions that included enhanced software bundles for its proprietary machines and a dozen Unix boxes that blazed through benchmark testing.

The juxtapositioning of the HP 9000 Unix hardware introductions in relation to the software orientation of the proprietary HP 3000 developments illustrated the bifurcation of HP's user base along the two product lines.

HP 3000 users are more interested than HP 9000 users in prepackaged solutions; HP 9000 users are focused on hardware performance advancements and are inclined to find or develop their own software, said Wim Roelandts, general manager of HP's Computer Systems organization.

Different perspective

Industry analysts said they did not see the differences from quite the same perspective. They noted that HP is under less pressure to advance 3000 hardware because HP's 9000 user base is essentially a captive audience, while 9000 users have other Unix hardware choices.

HP expects to sell more 9000s than 3000s in 1993, following a year in which unit sales of the two lines were about even, said Rich Sevcik, general manager of HP's Systems and Server Group.

With those market realities in mind, HP last week said it is offering several models in the 3000 line that are loaded with discounted networking and performance management software, among other features. The so-called Plus System Packages also include HP's new relational version of its TurboImage database, now called ImageSQL. With Allbase, it now has two relational databases (see story at right).

The bundled systems include an HP Vectra PC, and prices range from $143,000 for an HP 3000 Series 947RX Plus to $301,000 for an HP 3000 Series 987SX Plus. All include the MPE/IX operating system, a 100-user license, 64M bytes of memory, a 1G-byte hard drive and 2G bytes of digital audio tape backup. Some models have 12 expansion slots, and others have four.

On average, those prices are 20% less than what users would pay for the same configurations without the new discounts available with the Plus system packages, HP said. The company will also offer Allbase in the package for between $7,000 and $33,000.

Additionally, HP said it enhanced its EtherTwist router for the 3000 and that it added unlimited runtime support for various Posix standards to the 3000's MPE/IX operating system. Although HP's 3000 enhancements centered around software, the company did add four hardware models, all of which have four expansion slots and sit in a niche between HP's two-slot and 12-slot systems.

The new 937RX, 947RX, 957RX and 967RX range in price from $33,500 to $123,000 for base models, which include MPE/IX; the relational version of HP's Image database; a 100-user license; 64M bytes of memory; 1G byte of storage and 2G bytes of backup storage.

The new 3000 systems fall into the middle of the 3000 line and are not built on the latest version of HP's Precision Architecture-RISC chip, the 7100.

Meanwhile, three of the 12 new Unix systems are built on the 7100. HP last week boasted that these outperform IBM's top-of-the-line Application System/400 by 70%, running TPC-A benchmarks. The company also claimed that one of the models, the I50, ran the best ever price per tpsA —$5,913 (see chart).

HP also said the new systems include lower cost frame-relay access, an enhanced EtherTwist router and faster and larger Small Computer Systems Interface disks.

HP's new 9000 systems span the performance range.
A sampling:

F Class: For small businesses/branch offices				
F10	2	70.4*	$32,014	$33,250
G Class: For small businesses/workgroups in large companies				
G30	4	88.2	$87,250	$90,000
H Class: For medium-size businesses/depts. in large companies				
H50	8	139.5	$88,479	$96,000
I Class: For divisions in large companies				
I50	12	384.5 tpsA**	$2,044/$5,913	$103,000

*host-based configuration **performance metric of TPC-A

Source: Hewlett-Packard Co. CW Chart: Stephanie Faucher

All in the family

HP pumped up its 3000 product family with the following options:

- **HP OpenView Console,** a Windows-based systems and network management tool.
- **HP TurboStore/IX,** a data backup program with on-line capabilities.
- **HP AutoRestart/IX,** an automatic restart program.
- **HP ThinLAN 3000/IX,** an Ethernet card.
- **HP LaserRX/MPp** for gathering and analyzing performance information.
- **HP RX Forecast,** which signals the need for a software upgrade.
- **HP GlancePlus/IX,** which analyzes bottlenecks.

Turbo-charged sleeper

During what one industry analyst called the "sleeper" portion of last week's announcements, HP said it is adding SQL capabilities to its TurboImage database to convert the product into a relational database management system.

The move essentially gives HP two RDBMSs: Allbase and ImageSQL. But the relational modification will come at a cost to users.

Rich Sevcik, general manager of HP's Systems and Servers Group, said HP will increase the support charge for the new Image but does not plan to increase the price for the product. HP has not yet determined new support pricing, he said.

Image users have always applauded the database for its high-speed performance. HP product line manager John Goulden explained that Image will continue to outperform Allbase but will not be as thoroughly relational.

Although HP added SQL hooks, ImageSQL does not have two-phase commit or a distributed transaction processing monitor, he said. ImageSQL, like TurboImage, will be positioned for use by smaller shops, he said.

Users and analysts applauded HP's decision to make ImageSQL available as part of new packaged 3000 systems.

"This could be the sleeper product of the year," observed Eric Fisher, a principal at Fisher Systems Consulting in Groton, Mass. "I think there's going to be overwhelming interest in that option. There's been a huge [push by] users to make that part of the bundle."

Anthony Furnivall, president of SDL Software, Inc., a Buffalo, N.Y., developer of HP software, described ImageSQL as "the most significant" of the hardware and software product announcements made by HP last year. Image "now has complete access to SQL front ends," he pointed out. — *Mark Halper*

HP, Ericsson unite for global net management

By Joanie M. Wexler
STOCKHOLM

In an ambitious effort to solidify the management of disparate worldwide public telecommunications networks, Hewlett-Packard Co. and Ericsson, Inc. last week said they have formed a joint venture that will ship integrated network management products to telephone companies early next year.

The move — if it flies with most worldwide carriers — will likely first benefit users encountering snags in implementing network services across a European Community composed of incompatible systems, said Jim Carlson, HP's marketing manager of telecommunications for the Americas.

Carlson said he anticipates that Ericsson's Telecommunications Management and Operations Support (TMOS) system and HP's data expertise should lower phone service costs and improve service response to end users. This is because the venture aims to standardize billing, customer service systems and the monitoring, design and maintenance of switched networks.

A need exists for faster service implementation and consistency among intracountry network management information. Global advertising firm Young & Rubicam, Inc. in New York, which is planning a European network, is looking at a six-month wait for 64K bit/sec. data service among seven major European cities, said Howard Maynard, senior vice president and director of MIS. "That seems like a long time," he sighed.

Also, "if there's any way to get consistent network information from different geographical areas, that would be of value to us. But that would require a lot of consistency in how those telcos identify customers and standardization in coding," he said.

Herculean task

The seemingly gargantuan task makes Maynard skeptical about the vendors' plans to sell new network management systems to Postal Telephone and Telegraph authorities and other phone companies that have management systems in place.

"I wouldn't like to have a sales quota for selling telcos a new management system — though I hope I'm wrong," he said. The vendors did not name any telephone service providers that have committed to the Ericsson/HP platform.

Installed in 15 countries, TMOS will constitute the software framework and will run on all HP hardware platforms. The venture will also work with third parties to build integrated applications for their platforms.

The joint venture, called Ericsson Hewlett-Packard Telecommunications AB, will be 60% owned by Ericsson and 40% owned by HP. Products — including HP's entire hardware line — will be distributed through Ericsson's sales force.

Local-area network management was not included in the announcement, though Carlson said a separate project with Telecom Australia is under way to blend a plug-in telecom management platform with HP's LAN-oriented, Unix-based OpenView platform for integrating local- and wide-area network management.

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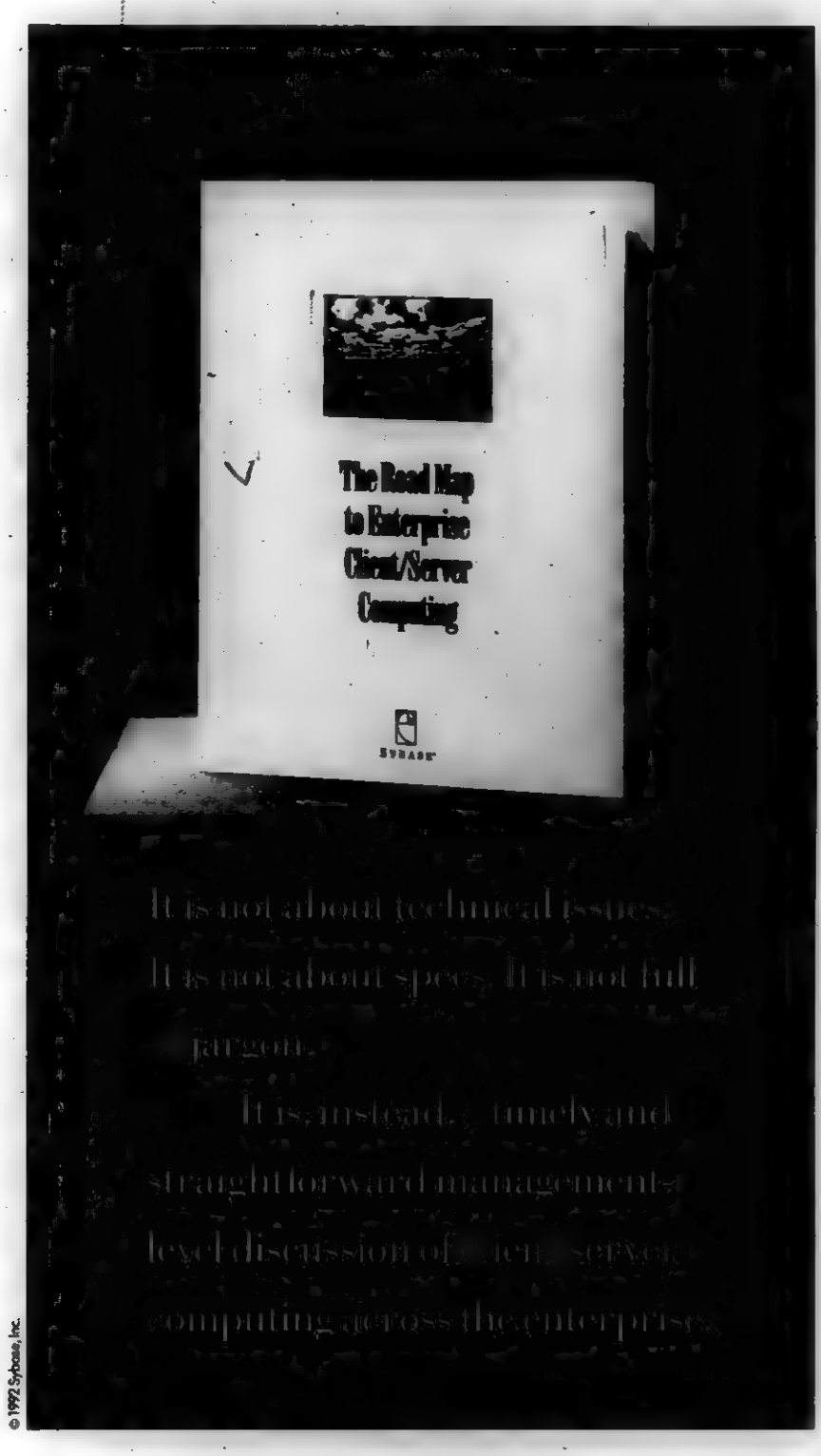

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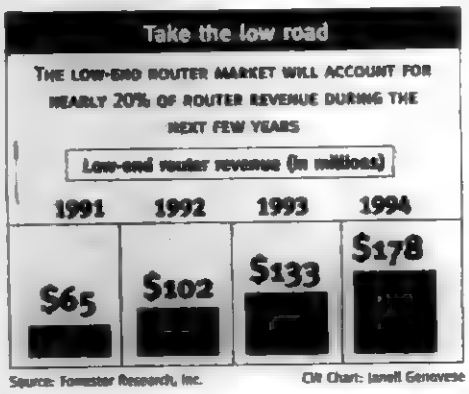
3Com eyes new route

By Joanie M. Wexler
SANTA CLARA, CALIF.

3Com Corp. last week attempted to one-up last summer's domino-like rollout of simplified routers designed for scattered, lightly staffed sites.

The vendor has developed a new architecture for feeder routers — those that sit on the periphery of sprawling corporate networks — to ease enterprise network management by off-loading much of their complexity to backbone routers.



Dubbed Boundary Routing System Architecture, the technology takes industry efforts to ease router network management a step further than flash erasable programmable read-only memory (EPROM) approaches from companies such as Proteon, Inc., Cisco Systems, Inc., Wellfleet Communications, Inc. and Hewlett-Packard Co. By transferring much of the feeder device software to a centralized high-end router, any changes made to the main router automatically translate networkwide.

The "flash-upgradable memory," or EPROM, approach from other vendors does do centralized downloading of router table changes and software upgrades networkwide. But network administrators must still configure the changes and download them to a number of sites, said Fred McClimans, a program director at Gartner Group, Inc., a consultancy in Stamford, Conn. In the 3Com scenario, central staff tweaks the main router, not worrying about those attached to it.

However, because the concept depends on nonmesh router configurations in which feeder routers are star-wired to a central router, the applicability of the architecture could be limited. Many users are likely to have some remote routers directly connected to each other.

For example, "We have remote routers talking directly to each other in a partial mesh configuration for redundancy," said Coyne Gibson, manager of information technology at Convex Computer Corp. Jeff Krause, director of internetworking technology at 3Com, said the flash EPROM approach is better suited to this scenario.

But John Merritt, a vice president at Southwest Network Services, Inc., an Austin, Texas, network systems integrator, said the product would fit in more than 50% of the sites his company has networked or bid on during the last few months. "All these customers would have use for this somewhere in their network," he said.

Gibson countered that maintaining a router network is "not a big thing." He noted that dynamic routing protocols mean that a change somewhere in the network is made networkwide.

The architecture will probably first appeal to 3Com shops because 3Com's high-end router will be first to get the necessary software upgrade. Users will be able to mix boundary routers with other vendors' backbone routers once the upgrade software becomes open.

DEC faces scrutiny from user management

By Melinda-Carol Ballou
LAS VEGAS

Although the mood at last week's Digital Equipment Computer Users Society (DECUS) meeting was decidedly upbeat, many information systems managers conceded that they face increasing skepticism from upper management when it comes to purchasing Digital Equipment Corp. products.

IS managers were excited about new DEC technologies such as Alpha AXP. But more than a dozen attendees said that as the Maynard, Mass., company keeps pruning products and staff, management is concerned about DEC business practices.

"Corporate management seems to prefer to purchase new PCs rather than continue to feed existing VAX machines with their high cost of software and maintenance," said DECUS member Douglas Wilson, who asked that his employer not be named.

So if loyal IS managers are to make a convincing case for DEC products, DEC must better market products to decision makers.

"I see other vendors who offer poorer products with sexy front ends that impress [our managers]. But those products don't have the same management and security features that you get with DEC," said one user at a pharmaceutical firm.

DEC's plan to restructure into horizontal and vertical business units could help the company get closer to corporate decision makers [CW, Nov. 2], observers said.

But Paul Rayner, a programmer/analyst at the Church of Latter Day Saints in Salt Lake City, said buying products from DEC remains difficult. Issues for Rayner and others include an inability to access data on relevant products. Others cited the inflexibility of software licensing.

Stanley Rose

The way we were

DEC's briefings on Alpha's ability to run Microsoft's Windows NT piqued user interest. "That's where the excitement is — it's like the VAX sessions used to be 10 years ago," said Stanley Rose, vice president of Bankers Trust Co. Attendance at a Microsoft preview of DOS 6.0 was 1,500.

"There are also truckloads of old hardware going to the dump . . . because DEC will transfer operating system licenses and support only if you have the original [owner and paperwork]," Wilson said.

The ability to license software across VAXclusters is a concern for Rockwell International Corp. user Brian Fairweather, who is excited nonetheless to use Alpha as a common platform for Unix and VMS systems.

But altering licensing options is not enough. When DEC changed its licensing practices earlier this year and cut some prices, it also eliminated discounts.

Stephen Tibor, assistant research scientist at New York University, said, "The problem is that DEC believes the Digital difference is worth 10% to 20% [more], and the company needs to rebuild its position [based] on quality and [lower] pricing."

While users have troubling business concerns, DEC is making a different kind of effort at this symposium to seek customer input, said Marge Knox, president of the U.S. DECUS chapter. These efforts included a last-minute decision by Jack Smith, senior vice president of operations, to attend the symposium; and a commitment from Chief Executive Officer Robert Palmer to attend in the spring.

AST launch

CONTINUED FROM PAGE 1

Despite the questions, AST is not only persevering — it is prospering. The company grew more than 30% in fiscal 1992 to $944 million in sales, and it looks on pace to hit at least $1.2 billion in 1993. AST has moved nimbly, coming from nowhere to be a Top 3 player in notebooks.

Customers contacted said AST has succeeded by meeting their needs. "They've listened to my input on products, and it's definitely a reason why I stay with them," said Terry Nugent, office automation specialist at Hitachi America Ltd. in Brisbane, Calif.

Abraham Chait, product manager of desktop computers and peripherals at Pacific Gas & Electric Co. in San Francisco, agreed. "We're standardized on AST and Compaq, and we get excellent service from them; both companies are very responsive to our technology needs."

Despite user praise, AST has had difficulty establishing itself as a first-tier vendor. Yuen's exodus and a more than 50% drop in profits year-to-year in the first quarter in the wake of the recent price wars have not helped matters, either.

Safi U. Qureshey, AST's cofounder, president and chief executive officer, termed both events "painful" and said price-cutting in 1993 would be geared more to normal drops in component costs and manufacturing efficiencies. He said that any time a founder leaves a firm, an unstable period follows.

At the same time, "business is good" for the cost-conscious company, which remains profitable and has reduced its long-term debt.

AST's inability to break into the first tier may be the result of perception problems. It has been way ahead in some trends and refused to follow others. For instance, AST was the first major vendor to plunge into a variety of consumer channels.

AST's refusal to enter business areas before it feels it and the market are ready has led to charges it is slow in responding to the market.

Qureshey acknowledged AST must "become more visible" in the market and "more aggressive in coming out with new products."

Safi Qureshey

The products

Next Monday: 386SX-based entry-level PowerExec. January: New PowerPremium desktops, servers that use the Video Electronics Standards Association's VL local bus, native 1,024 by 768 monitor support, external cache and Pentium upgradability. Late Q2: A 3.5-pound subnotebook code-named Aladdin. AST declined comment.

John O. Dunkle, president of market researcher WorkGroup Technologies, Inc. in Hampton, N.H., cited AST's coming product line (see box), which might have given it a stronger presence in the market's late-year volume surge. "It sounds like they've got the right game plan, but will the clock run out before they implement it? You almost want to kickstart them because if those products are indeed coming to market, it's too bad AST is missing the fourth-quarter volume ramp-up."

But Dell Computer Corp. released a similar product line only this month. AST redesigned its low-cost Bravo line earlier this year.

Qureshey defended AST's penchant for following the market rather than fads. "This is a marathon, not a sprint, and we are trying to be the Honda of the computer business. If we come up with cars our customers want to buy, we'll achieve our financial objectives," he said.

Global integration alliance formed

Inacom, ICG band together to serve multinational organizations

By Michele Dostert
OMAHA

Proving that it has taken the global economy doctrine to heart, Inacom Corp,, a nationwide reseller and systems integrator, has formed an alliance with Paris-based International Computer Group (ICG), one of the largest computer services companies in Europe.

According to the companies, this makes ICG the largest systems integration consortium in the world, with 353 locations in the U.S, the Asia Pacific region and 16 European countries.

The alliance will allow U.S.-based multinationals to coordinate the design, purchase, installation and support of their global information systems through one source — Inacom.

Inacom officials pointed out that the new alliance will allow ICG and Inacom to leverage not only their systems integration knowledge but also their expertise in distribution and marketing to much larger markets than either company could reach on its own.

ICG's European and Asian corporate customers can now look to Inacom's U.S. locations for service and support at their U.S.-based locations.

Welcome change

Inacom's multinational customers welcomed the new alliance. Patrick Carney, director of IS at ASEA, Brown Boveri's power engineering division headquarters in North Brunswick, N.J., said he plans to standardize and connect plants in the U.S, Sweden, Switzerland and Germany next year. He said Inacom "thoroughly understands" the way he does business.

> The alliance will allow U.S.-based multinationals to coordinate the design, purchase, installation and support of their global information systems through one source.

"This new alliance lets me hit the ground running. I don't have to waste three months looking for a European supplier and another three months educating him about our business," Carney said.

Jim Doucherty, general manager at ICG, said the new consortium's goal is to "take the hassle and risk out of border-to-border projects, whether it's the design and implementation of a global network or the installation of two PCs at an overseas sales office."

Analysts who study the computer industry channel said the deal makes a lot of sense.

"I think this was a great strategic move on Inacom's part. They've found a partner that can give them international reach, so they can step up to the table and bid against IBM, DEC, HP, Andersen [Consulting] and EDS on larger, multinational accounts," noted Stephen Clancy, associate director at Dataquest Worldwide Services Group in Framingham, Mass.

Inacom, one of the largest resellers in the U.S., has more than 1,000 sites nationwide, including value-added resellers and systems integrators. According to Rick Inatome, the chairman of Inacom's board, Inacom sales were more than $1 billion in the last year.

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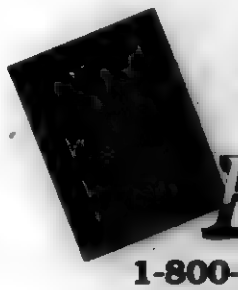

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(Without taking a political stand - users *will* change a system they perceive as failing to deliver sufficient value.)

News Shorts

Service bureau, IBM settle

First Financial Management Corp. (FFMC) in Atlanta and **IBM** have agreed to an out-of-court settlement regarding FFMC's Basis banking project. The bank service bureau had filed a $150 million suit against IBM on Oct. 5, alleging among other things that the project had fallen behind schedule because IBM had not supplied enough employees. Neither company would provide any details on the agreement, but a source close to the project said it calls for IBM to pay FFMC damages. An IBM spokeswoman confirmed that as of Jan. 1, IBM will no longer be involved in the project.

Novell reports gains

Novell, Inc. last week reported net revenue of $933 million for its 1992 fiscal year, up 46% from 1991 revenue, and a 53% gain in profits, to $249 million. The company reported 37% revenue growth in the U.S. — the highest since 1987. In a separate announcement, Novell officials flatly denied published reports that they were discussing a possible merger with **Apple Computer, Inc.**

Spice firm's CIO moves on

John Thompson is retiring as **McCormick & Co.**'s chief information officer at year's end. He will continue to work on special projects at the Sparks, Md., spice firm but will also head nearby Loyola College's Lattanze Center for Executive Research in Information Systems. Bob Miller will succeed Thompson at McCormick.

Mainframe turns server

IBM continues its mainframe-as-server push with last week's introductions of new releases of LANres. The new releases for the VM and MVS operating systems add support for Systems Network Architecture, Transmission Control Protocol/Internet Protocol and Novell's NetWare.

Good news, bad news

According to IS leaders at 95 firms that in the aggregate perform 80% of the research and development in North America, Europe and Japan, Japanese firms consistently show stronger alignment between technology and overall corporate strategy than do companies in the other two regions. But the IS executives — according to research by the **MIT Industrial Liaison Program** and Hightstown, N.J.-based **PA Consulting Group** — also indicated that Europe and the U.S. are doing something right on the R&D side. Rated as the top firms worldwide in R&D were **Du Pont Co., IBM, Merck & Co., Glaxo Holdings PLC** and **Sony Corp.**

SHORT TAKES **Giant Food, Inc.** in Landover, Md., will be the first supermarket to test LogicNet, a logistics information network intended to link consumer packaged goods manufacturers with retailers and to synchronize their systems and inventory schedules. ... **NCR Corp.** introduced new deposit-processing technologies for automatic teller machines (ATMs) designed to process electronic images of checks and bills at the ATM rather than in the bank's back office. ... **Computer Associates International, Inc.** announced the Dec. 15 delivery of CA-RET/Xbase, a Microsoft Corp. Windows-based report writer for CA-Clipper, Xbase databases and ASCII file users. ... **Cambex Corp.** in Waltham, Mass., will introduce tomorrow its Stor/9121 memory card for IBM's Enterprise System/9000 family of mainframes, claiming that its price of $860 per megabyte costs 31% less than IBM memory. ... **IBM** said an executive who helped launch the Application System/400, Stephen Schwartz, 58, will retire Dec. 31. ... **Unisys Corp.** has a newly created CIO post and an executive to man it: William G. Rowan, who most recently served as corporate controller.

PC chiefs take industry pulse

Kahn, Gates, Sculley address price wars, need for change

By Kim Nash and Christopher Lindquist
BURLINGAME, CALIF.

Vendors speaking at last week's Technologic Partners conference made it clear that while there are still wars to be fought, opportunities abound.

John Sculley: *Opportunities still exist*

■ THE FIRST WARNING came from Borland International, Inc., as Chairman and Chief Executive Officer Philippe Kahn stated that a new pricing model, with cheaper prices and thinner margins, was coming into play in the PC software industry. He claimed changes would have to occur if firms were to survive. The next day, change was exactly what happened as Borland announced layoffs (see page 1).

■ MICROSOFT CORP. Chairman Bill Gates offered his own recipe for survival. He predicted that future growth opportunities for software companies will lie in the creation of efficient development tools, scalable systems software and hardware innovation independent of software. Not surprisingly, Microsoft is focusing on these three areas.

Gates also suggested that PC software firms could make money by helping companies move their mainframe computing needs down to PCs, a market sector Gates said was sorely underrepresented.

■ APPLE COMPUTER, INC. Chairman John Sculley said the PC hardware price war appears to be slowing. With hardware vendors such as Apple hard-pressed to keep up with demand, he suggested there is little incentive to continue lowering prices.

Sculley stressed that hardware opportunities exist, noting that Apple had spent $1.2 billion during the past two years finding ways to tie mobile devices such as handheld computers and desktop machines to servers in a client/server architecture.

Workplace

Lee Reiswig, newly named president of IBM's Personal Software Products division, updated conference goers on the Workplace Family of products. It will run on a range of systems from handhelds to multiprocessors, an endeavor that pits it directly up against Microsoft's scalable approach to Windows products.

Reiswig also said OS/2 has the potential to allow software developers to finally take full advantage of available hardware and therefore differentiate themselves from other offerings. Such differentiation, he said, would help keep margins higher.

OS/2 should help hardware vendors as it "rapidly makes you want to have more speed, more memory and more DASD capacity," he said.

— Christopher Lindquist

Kahn sings the blues at Borland

CONTINUED FROM PAGE 1

Wayland, Mass. He described that scenario as one in which a company drops its price to sell products, which subsequently lowers the amount of development money. That reduction in development capital causes products to be late, which in turn causes users to jump ship.

"You may be seeing that play out at Borland," Geisman said. He noted, however, that it is still early and that when such a situation occurs at larger companies, it tends to affect individual products rather than an entire line.

While Kahn predicted that "Windows and DOS software prices will keep going down," some analysts and competitors said that the so-called "war" is probably more of a trend toward lower pricing. Users have been witnessing that trend for some time in the form of competitive upgrades, inexpensive software suites and and far-below-retail pricing in the reseller channel.

"I think many of us in the industry would say we've been in a price war," said Lotus Development Corp. spokesman Richard Eckel. "Clearly there has been lots of price maneuvering going on the past 18 to 24 months." He also noted that Borland is often blamed for kicking off the price-cutting rage with its competitive upgrade policy.

New model on horizon

Kahn responded by denying that Borland is the culprit, saying that there is a difference between upgrade pricing and cutting first-time buy prices. He insisted that "a new industry pricing model is emerging," adding that "this reorganization is designed to make Borland leaner, more competitive and profitable."

Death spiral or not, users will be watching closely for signs of change at Borland.

Bob Higby, a Paradox user and director of information systems at a large food manufacturer, said he hopes the layoff was just an "isolated fact."

"It may just mean that they are on their way to better health," he said.

Neal Hill, senior software analyst at Forrester Research, Inc. in Cambridge, Mass., said he does not expect users to see any significant changes in either products or support, at least for the short term. "If I were [Borland], the sacrosanct areas would be R&D, sales and support," he said.

He added that the "internal" areas of sales support and marketing might be hit the hardest, resulting in a downturn in service for resellers but not necessarily for users.

In a teleconference, Kahn said the layoffs will take place across all groups, with two-thirds of the cuts occurring in the U.S. Kahn also said the firm will be "consolidating" into functional areas by jettisoning its product structure in an attempt to streamline operations.

For example, instead of having separate research and development groups for all product groups, such as languages and applications, Borland will consolidate R&D in one group under Bob Warfield, vice president of R&D.

Wall Street was not kind to Borland after the announcement. Several firms, including Bear, Stearns & Co., Kidder Peabody & Co. and Alex. Brown & Sons, Inc., cut their earnings estimates and reduced their ratings for Borland.

Borland's stock price, already down after topping out at more than $80 earlier in the year, dropped 75 cents to $20.75 the day after the announcement.

By anyone's standards, 1992 was a bad year. Whether Borland has come through its trial by fire tempered or burned will be determined in 1993.

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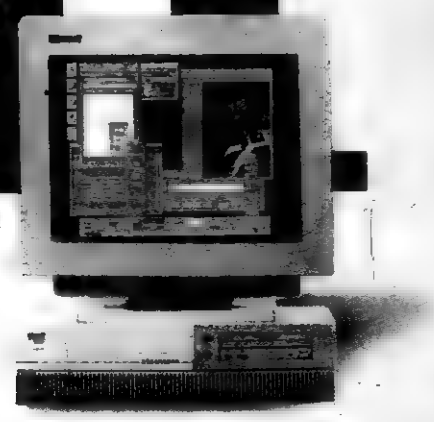

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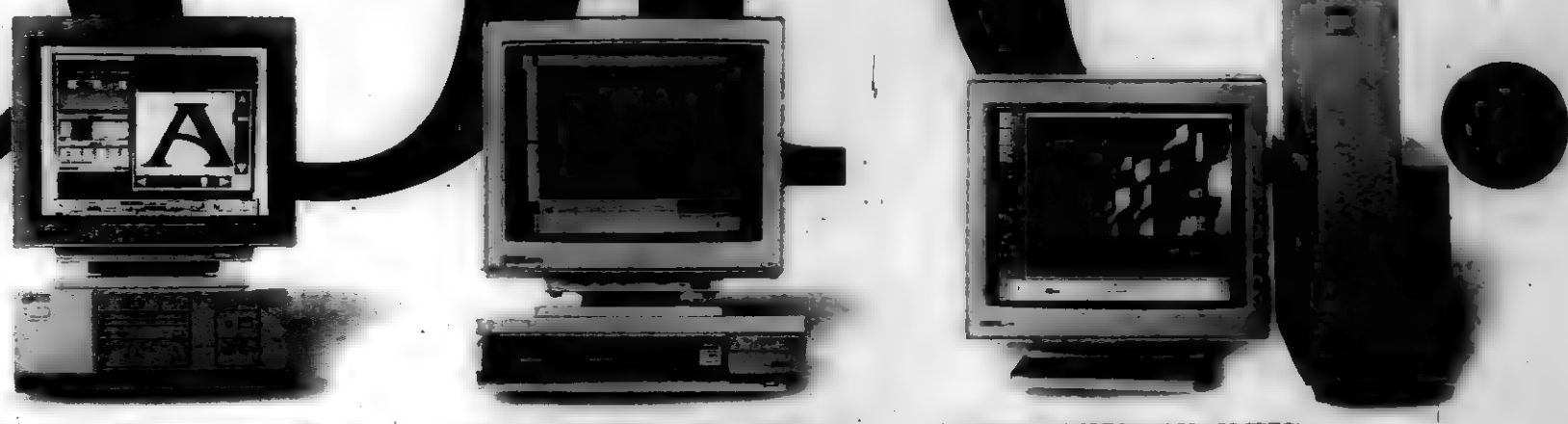

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Outsourcing lures media firm

By Nell Margolis
NEW YORK

A contrarian move into the outsourcing market could position broadcasting behemoth CBS and its insurance affiliate partner, Alicomp, Inc., as major players in the widely anticipated insurance outsourcing boomlet, analysts said last week.

Formerly the information systems department of Amalgamated Life Insurance Co., Alicomp became an independent outsourcing and disaster recovery provider in 1987. In partnership with Comdisco, Inc., it opened the first disaster recovery hot site in Manhattan, also in 1987.

The CBS/Alicomp tandem is targeting "incremental outsourcing" at insurance firms that are moving from mainframe-centric platforms to client/server and other distributed information technology architectures, said Alicomp President Arthur Kurek.

The partnership has already executed one deal: a one-year renewable contract to run all IS operations for Pan Am Corp. as it winds down its corporate activities under the terms of Chapter 11 bankruptcy proceedings. Four more deals are currently under negotiation, according to Kurek.

Outsourcing, however, has proved to be a nightmare for many corporate IS department spin-offs that have ventured into the market. In the past several months, promising entries from Kimberly-Clark Corp. and Sears, Roebuck and Co. have folded [CW, Aug. 10 and 24].

The reason, said Susan McGarry, an outsourcing analyst at Boston-based market research and consulting firm The Yankee Group, is deceptively simple: "The skills that enable you to provide high-quality IS services to an essentially captive intracompany market aren't the same ones you need to go neck-to-neck with the market leaders and a pack of seasoned niche players in a brutally competitive market like outsourcing."

Insurance industry experience

The real ace up CBS/Alicomp's sleeve, according to several analysts, is Alicomp's insurance industry pedigree. Kurek, a former Amalgamated chief financial officer and still an Amalgamated executive, brings two decades of insurance business experience to the mix.

Executive Vice President Lorraine Drake, who used to be Amalgamated's chief information officer, earned her stripes in insurance-specific IS. Insurance firms such as Stamford, Conn.-based Cologne Life Reinsurance and New York-based Health Insurance Plan of New York have joined Amalgamated on the Alicomp client roster.

"If they can leverage their insurance roots, they might be able to position themselves very nicely in the front ranks of the vendors that end up outsourcing the major insurance companies — when those companies begin to outsource," said J. P. Richard, an outsourcing analyst at Vienna, Va.-based market research firm Input.

Slow to the trigger

Competitively and financially stressed though many are, the nation's insurance giants have yet to embrace outsourcing. Nevertheless, industry watchers continue to predict that this wall of resistance will fall within the coming year, creating a lucrative outsourcing niche.

The CBS/Alicomp partnership initially will not have to worry about infrastructure. The marketing allies will use excess capacity at CBS' 105,000-sq-ft data center in Secaucus, N.J. CBS, which geared up for the go-go '80s needs of a sprawling conglomerate, no longer requires all of its huge data center's resources now that it has scaled back and tightly focused on its core broadcasting operations.

Alicomp has been quietly growing its New York area regional outsourcing and disaster recovery business during the last five years. Revenue for 1991 outstripped the prior year's by 20%, Drake said, and 1992 will mark an approximately 60% surge.

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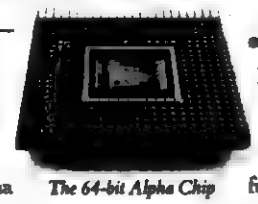

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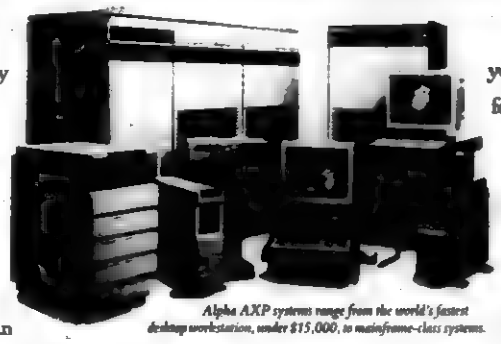

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NCR, AT&T usher in 'smart' ATM technology

By Thomas Hoffman
SAN ANTONIO

NCR Corp. and AT&T Smart Cards have developed a new technology that could make existing magnetic-strip automated teller machine (ATM) cards obsolete.

AT&T's new microprocessor-based smart cards contain several pages of personal, financial and medical information on cardholders that can be used for credit-card services, airline reservations and emergency medical services.

The technology, demonstrated here last week at the Retail Delivery Systems Conference, has been used extensively in Europe and is starting to show promise in the U.S.

According to Diane Wetherington, president of AT&T Smart Cards in Bridgewater, N.J., the AT&T subsidiary has entered into formal discussions with several U.S. banks, airlines and state agencies regarding the use of the smart cards for ATMs, electronic airline ticketing and electronic tollbooths on major highways.

Wetherington declined to name the organizations considering use of the technology, but she said the Italian Postal Bank is already using it to provide its senior citizens with social security debit and credit services.

In addition, Wetherington said, 30,000 cardholders in Milan, Italy, have been using the cards since 1990 for electronic toll collections on city highways.

The smart cards — developed at AT&T Bell Laboratories — are the same size as other bank ATM cards, but they contain microprocessors and memory chips that contain personalized information about cardholders.

> The chips contain a 'voice print' of cardholders that can be applied toward securing ATM transactions as well as reducing ATM and credit-card fraud.

For example, the chips contain a "voice print" of cardholders that can be applied toward securing ATM transactions and reducing ATM and credit-card fraud.

According to Wetherington, the cards were also designed to carry digitized pictures and fingerprints of the cardholder.

Cost considerations

However, the cost of integrating smart-card technologies with ATM equipment might outweigh potential profits for banks, according to James Moore, chief executive officer at Mentis Corp., an Eden, Md., financial services technology research group.

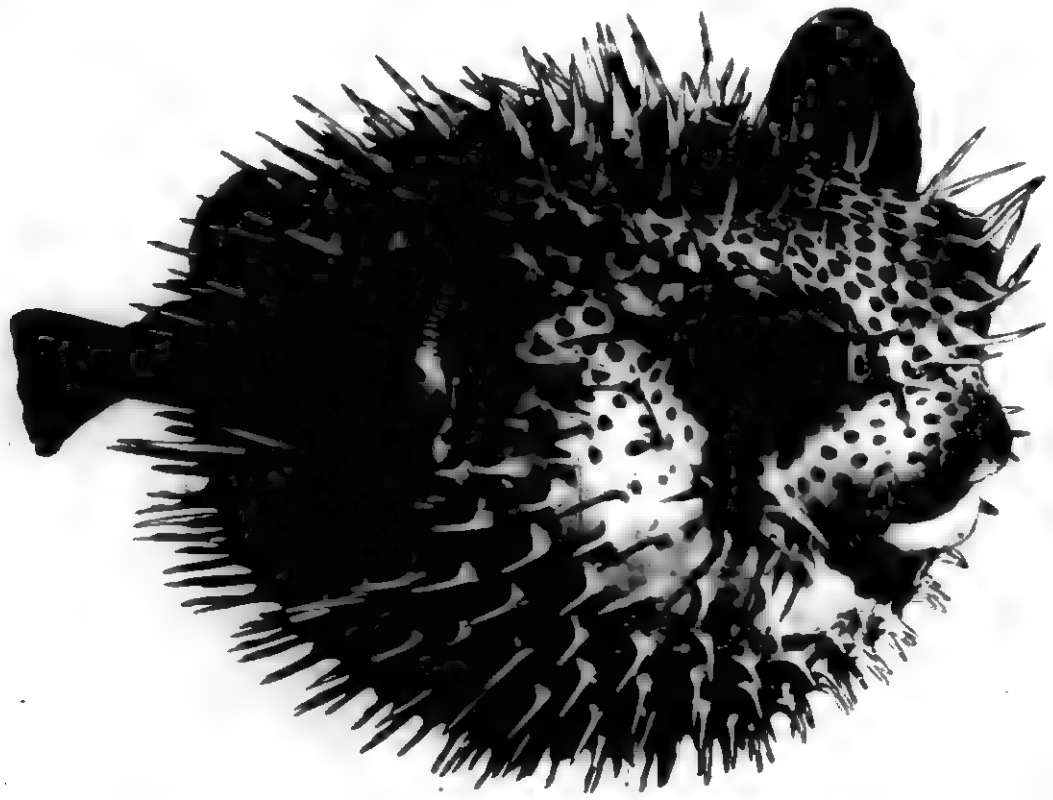
"Bankers would perceive the technology as more expensive than the [ATM] fraud they're trying to thwart. Most of our research shows that smart-card technologies are not something banks are willing to invest in," Moore said.

Wetherington disagreed. "We've had a number of discussions with banks, and the level of interest is high. I believe there would be a tremendous savings in fraud," she said.

Wetherington said banks would be able to add the smart cards while protecting their ATM investments by using upgrade kits that include smart-card readers. Meanwhile, AT&T and NCR are developing next-generation ATMs to support the use of smart cards.

According to Wetherington, AT&T has not yet determined the costs of the cards. She added that the AT&T unit is negotiating an electronic-toll collection contract at an undisclosed location in the U.S. Wetherington would not disclose the agency involved.

However, the New York State Thruway Association is reportedly considering bids for a statewide electronic-toll project on the state roadway, according to John Diebold, chairman of The Diebold Institute for Public Policies Studies, Inc., a nonprofit foundation in Bedford Hills, N.Y.



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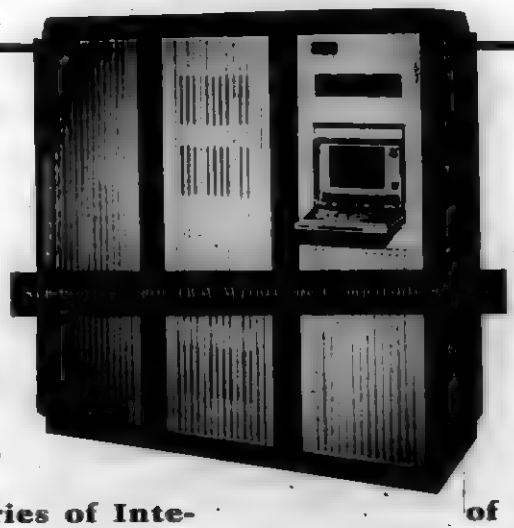

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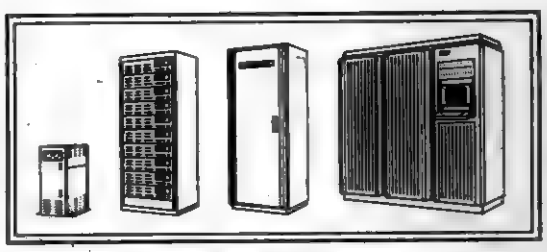

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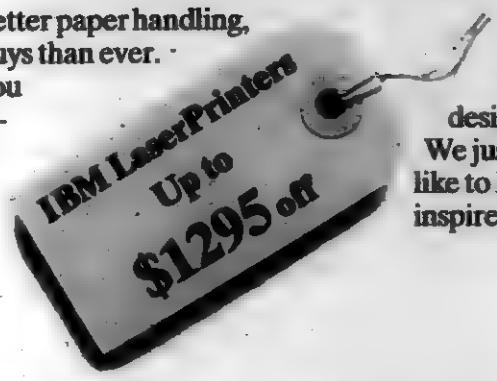

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ERS PAGES AHEAD

Tech Talk

Finger function is patented

A Digital Equipment Corp. researcher earlier this month patented a way to control a computer by pointing a finger — sans keyboard or mouse — at the screen. The system uses a vision system and a video camera to detect the position of the user's hand and orient a cursor on the computer monitor accordingly. The inventor was quoted recently as saying he developed his finger-pointing system because he become frustrated about continuously loosing his mouse beneath papers on his desk.

Designing atom-size widgets

Nanotechnology, the fledging science that envisions factories and devices constructed out of individual atoms, recently took a tiny step forward with a software program that designs and tests simulated molecular gears and bearings. The program, which was written by a research and development specialist at Xerox Corp. in Palo Alto, Calif., has already simulated the function of a few molecule-size components — such as a bearing made out of two rings of carbon atoms.

Vision breakthrough

Claiming a significant breakthrough in computer vision systems, the David Sarnoff Research Center earlier this month announced a patent and a commercial business for its real-time Smart Sensing system. The technology reportedly combines object recognition, motion tracking, image compression and fusion and optical character recognition. In addition, it places most of the advanced vision functions on a single chip. The Princeton, N.J.-based Sarnoff Center also announced the formation of Sensar, Inc. — its first spin-off company — to commercialize the technology.

More than just a model

Future object-oriented models could become actual systems

By Christopher Lindquist

GAMES THAT ALLOW YOU TO PLAY God and model life, such as Maxxis' SimCity, quickly illustrate how complex an environment can be to create and keep running.

However, for all their complexity, such games can be extremely useful for describing and simulating reality. And the advent of object-oriented technologies foreshadows a day when the model will cease to be merely a representation of a new system and will actually become the new system.

Would such a tool be beneficial to an information systems manager trying to re-engineer or reorganize systems within a company? Scientific and Engineering Software, Inc. (SES) hopes so.

The Austin, Texas-based company makes a product called SES/Workbench, a graphical tool that allows users to model systems — computer, manufacturing or human — and experiment with those models to discover optimum solutions for re-engineering problems.

Users graphically lay out a process on the screen using 24 icons with predefined behaviors. The details behind those behaviors, such as the amount of time customers spend in a line waiting for food or the amount of time a database query requires to be processed, can then be adjusted, both to model reality and to test possible improvements.

The flexibility of the system lies in the fact that "the processes described don't commit you to a given technology," said Reza Seddigh, senior applications engineer at SES. "Once you get the performance numbers, you can decide what your technology should be."

Key Van Behnia, a member of the technical staff at Pacific Bell, said his company is impressed enough with SES' system that it will try to use it in re-engineering and specification gathering projects next year.

Pacific Bell has used the SES/Workbench on several projects, including one that simulated systems distribution on a variety of platforms. "SES is extremely powerful in representing the problem to a very, very low level of detail," Behnia said.

Michael Siggins

SES/Workbench has been used to model environments ranging from the instruction set of a microprocessor to the queuing theory behind a fast-food restaurant's serving lines.

However, there lies the drawback. Simulation can only be as good as the input data, and "oversimulating," or trying to simulate too much, can bog users down in unnecessary details. It may also show them some important details they missed.

"We're still working at the same level of abstraction we did 35 years ago," contends Jim Browne, professor of computer science at the University of Texas at Austin and chief scientist at SES. Browne, who has developed several visual programming systems, describes the need for a paradigm shift in the way software is constructed and used. Brown also takes a dim view of trying to update Fortran and other older software languages. "We're designing additions to languages that are already obsolete, and I think we're wasting our effort."

As an example, Victor DeGragnano, regional sales manager at SES, described a scenario in which a user wants to back up a hard drive as quickly as possible, so he buys the fastest tape backup unit on the market. But his system is incapable of transferring data as quickly as the drive can take it, so the drive ends up stopping and starting — and running very slowly.

A properly designed model could have predicted such behavior and told the user to buy a slower tape backup unit or upgrade his system.

Is this a simple-minded example solvable with a little common sense? Maybe, but taken to the nth degree, such simple problems can soon become overwhelming.

To help keep the simulations from becoming overwhelming as well, SES/Workbench allows the user to animate the system. In essence, this allows the user to see information or a product as it flows through the environment and to visually note bottlenecks or problem areas. Graphs at individual nodes indicate whether a segment of a process is being over- or underused.

For example, a database server that receives requests faster than it can process them would be indicated by an ever-increasing graph — a sign that something is awry.

The product costs $37,000 for a single-user entry system, plus the cost of Unix hardware. The technical level of the user must be quite high, according to SES. Pacific Bell uses teams of programmers, modelers and "domain analysts" — specialists in a particular functional area — to develop the models with SES/Workbench.

Moreover, the system's output is still just a model. If you want to rebuild your systems to match the model, you have to do that on your own.

Yet this may not be the case in years to come.

As object-oriented code becomes widespread in the corporate world, the potential exists for an object-oriented model that, when modified, actually creates a new system. According to Natasha Krol, vice president and service director for advanced information management strategies at Meta Group, Inc. in Burlingame, Calif., "At this point, these tools are separate from the development. You have to model it, then you have to build it."

Any company working with an object-oriented strategy is implicitly working toward the ability to implement a model-as-system environment, Krol added.

When the link that allows this becomes available, the ability for systems to be put together and modified quickly should increase dramatically.

Then systems managers may get the chance, finally, to play God with their systems.

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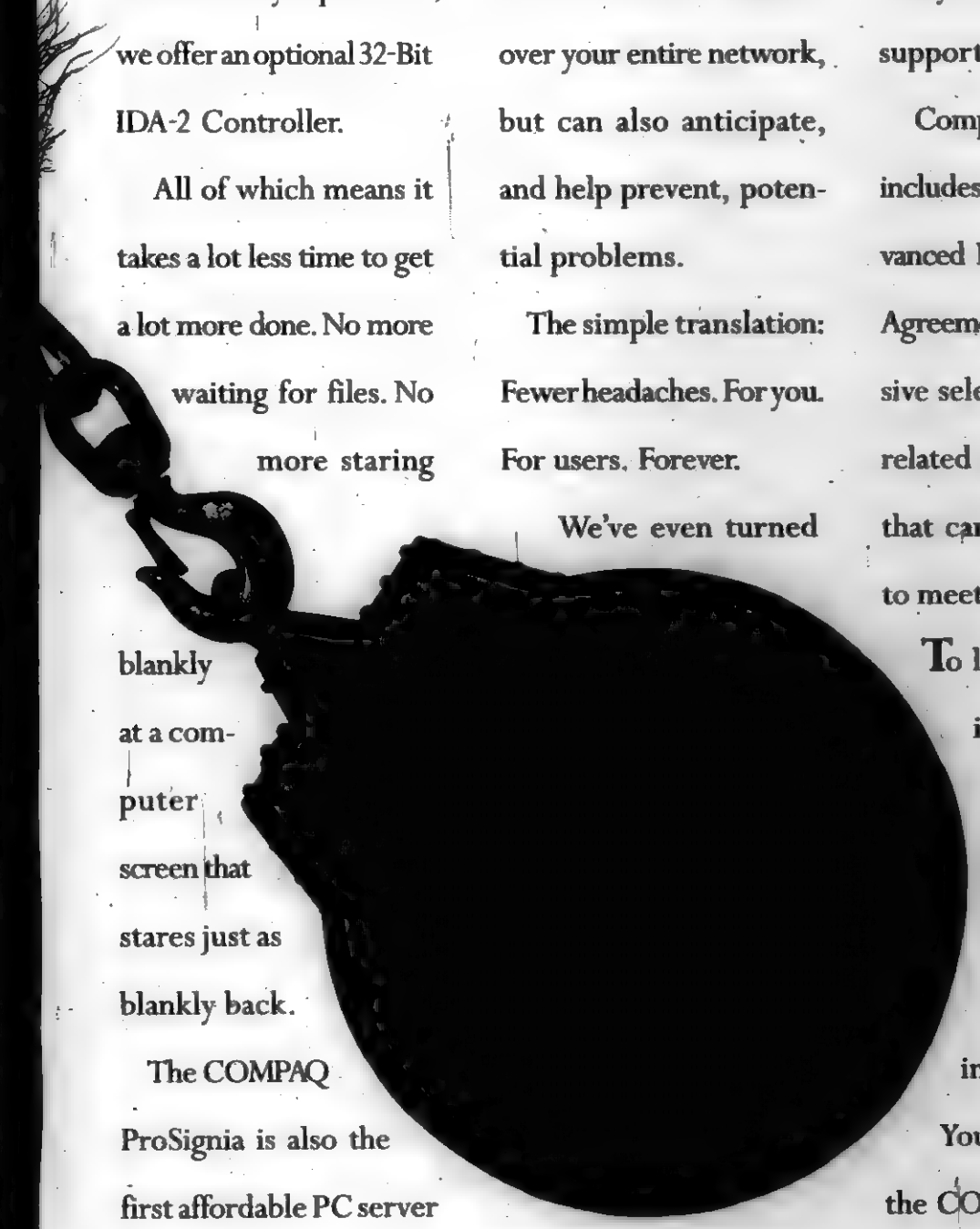

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Hot potato(e)

I am sure each of you can relate to this scene, which you have likely reenacted with your own kids if you have any.

You're young and sitting at the dinner table, heaping your plate to the ceiling. After a few mouthfuls, lo and behold, you're stuffed. Predictably, either your mom or dad says, "Your eyes are bigger than your stomach."

Thus it seems with a growing number of user departments when it comes to digesting the local-area networks they've been piling into their departments in recent years as part of their plan to empower the end user. "We'll do it ourselves," the department heads said, "and we'll buy them with our own money so we'll get what we want, not what IS tells us to buy."

But a funny thing happened on the way to independence. Those damned LANs just don't plug and play the way users thought they would. In fact, some users are finding they are as much or even more support-intensive than the big clunky systems of old.

Not only that, but LAN technology is evolving so quickly, who can keep up?

It is not surprising, therefore, to see stories appearing in network publications that testify to the information systems department's re-emerging influence on LAN purchase and implementation issues. For many user departments, this movement is going to be a rude awakening to the cold, hard light of dawn in the world of LAN support.

To begin with, it is very expensive. Users naively believed that the bulk of LAN expenditures ended with the purchase of a server, a LAN operating system, some wires and some software. Costs of training, upgrades, ongoing support and LAN interoperability were given lip service. Now the bills are coming due, and the users are in shock.

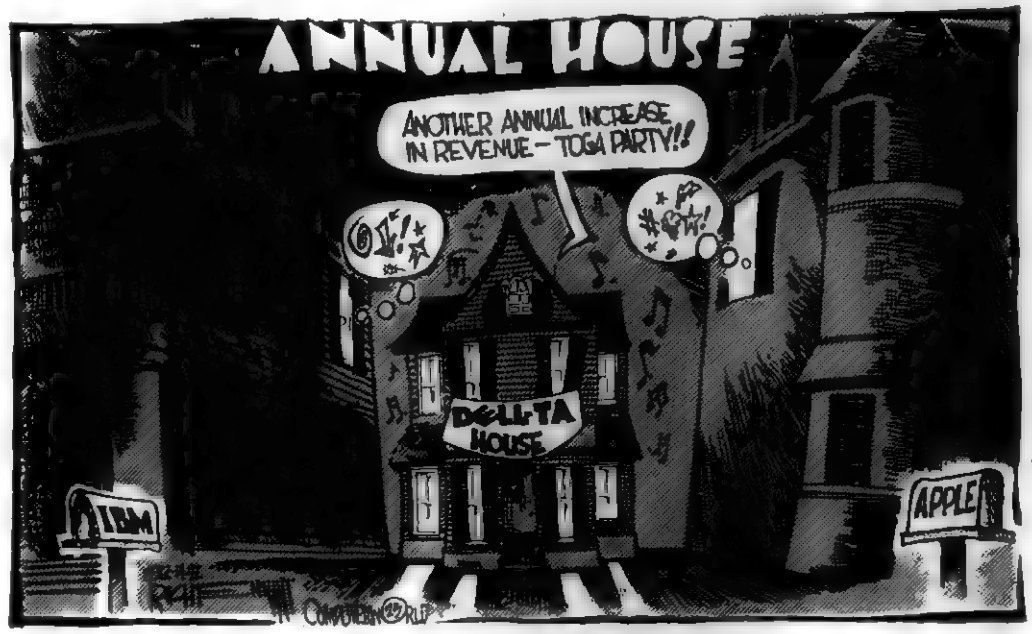
Also, the IS departments of yesterday had 25% or more staff than they do today. They cannot hide any support costs in elaborate staffing webs — all costs will be charged back. But at least there will be better orchestration of LAN deployment in those companies where IS is brought back into the picture.

This re-empowerment of IS — albeit perhaps reluctant re-empowerment, when you consider some of the messes IS will inherit — happens in all sorts of places. Even Microsoft, the power-to-the-user undisputed king of the desktop, rethought its strategy to have user departments provide PC support; responsibility was transferred back to the central IS staff. This was done for the same reason Microsoft uses some mainframes, among other things, to run the company: It is the best solution.

So yes, the reports are true. User departments are swallowing their pride (rather than choking on costs) and seeking help from IS to manage distributed computing strategies. Now we'll see what happens when the user departments start clamoring for multimedia and other expensive toys on the technology horizon.

Bill Laberis

Bill Laberis, *Editor in chief*



New design takes the stand

Those in favor...

Your efforts to downsize or right-size or whatever it's called,
Have not been without peril; you've emerged battered but not mauled.

The new format is great, the paper is slick,
The article overviews help me scan things real quick.

I can stay up to date on my profession, indeed.
You provide me with stories and info I need.

And for this consultant and mom, the new format saves time,
That feature alone is worth every dime.

So congrats to you all, the format works for me,
My renewal's in the mail, it's even early.

Gail von Huene
Triadigm International

Those not in favor . . .

I have two comments on the latest issue. First of all, is the new "upgraded paper stock" recycled and recyclable? If it is not recyclable, you are taking a giant step backward in today's environment.

Secondly, I always liked the "old" Executive Briefing inside the front cover until you changed it. The center and right columns are now hard to scan because you switched to a smaller type size, eliminated a lot of white space and included more details about each article. Make the Executive Briefing more "brief," and it will be much more useful.

Charles Berg
Mankato, Minn.

Upon receiving my Nov. 16 issue of *Computerworld*, the first thing that I noticed was not the new layout but the paper. Instead of the newsprint previously used, *Computerworld* is now printed on slick magazine-style paper, which you called a "higher quality paper stock."

Perhaps, but the slick paper cannot be easily recycled, and now, instead of being able to recycle my old issues of *Computerworld*, I'll have to throw them in the trash, which will take up more landfill space.

On a slightly different but related topic, I was glad to see that *Computerworld* is now using Unix-based client/server technology.

Michael A. Chance
St. Louis

I know that I am advancing in years, but *Computerworld*'s new format with its compression and smaller type is terrible! Are you sending magnifying glasses to your subscribers?

Frank Lesh
Princeton, N.J.

I don't care for your new type font, which is aesthetically attractive but harder to read than the former one.

I particularly don't care for your new paper. First, because it now reflects light more than the newsprint did, which makes it harder to read in brightly lit areas.

More importantly, this new paper can't be recycled like "plain old" newsprint could. This, I see, is a step backward.

Ted Koppel
Norcross, Ga.

Split decision

First, a comment on your new format, which I like. I prefer the smaller size, and I like the new typeface.

However, I hope that your new upgraded paper includes some recycled paper. It concerns me that a magazine of your size, printed every week, may not use any recycled paper.

As a consumer, I am increasingly concerned about recycling, and I make many of my purchasing choices based on this issue. If you aren't using recycled paper, I hope you are actively considering doing so.

Stella K. Crowe
Flint, Mich.

I like the new size, new columnists and management section. I dislike the new typeface, which is hard to read, and the new paper, which produces more glare from lights.

Michael J. Peters
Minneapolis

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Product mania needs a reality check

M. Arthur Gillis

For the past two or three years, we've been experiencing weaknesses in most sectors of the computer industry. Some experts blame the economy. That's only part of it. My answer is, "Enough already."

I'm not against progress or improvements in information technology, but some parts of the IS business have matured, and things work well enough to leave them alone. The problem is that even though vendors like to brag about solutions, the industry is still product-oriented. And what's worse, many corporate IS managers are just as product-oriented.

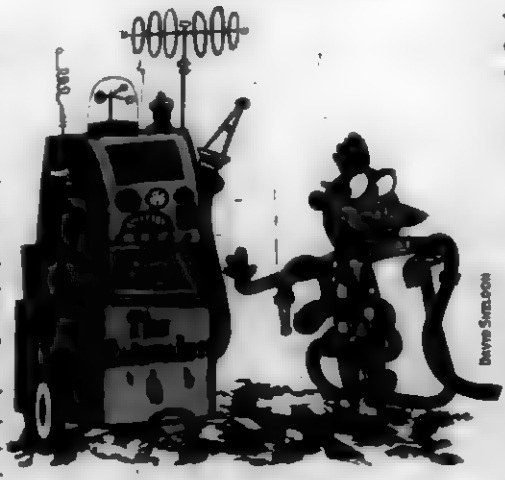
Smart users of computer technology will know how to balance legitimate need with supply in order to get the job done and not go overboard. Although technical excellence is a must in our business, I believe we need excellence in judgment and common sense. Before we get a chance to wear out technology, it seems that we are eager to replace it.

And here comes the shocker: Some functions just don't need to be automated.

I'm reminded of that when I go into a small retail store that was once quick to ring up my sale. Now the store has automated, and as a result, I get a chance to read the tabloids while the system records all kinds of information about the fact that I purchased some stationery.

When the main mission is delayed in order to favor the system or the owner of the system, I believe we have failed.

Technology companies are so desperate to keep up an uninterrupted pattern of growth that they seem to be forcing technology on functions that don't really need it.



Electronic mail is a great example. The first time E-mail approached me with its obnoxious three-beep signal to tell me someone was trying to interrupt my deep concentration, I decided I didn't need that kind of intrusion.

I want a gentler and kinder communications system. I'd rather suffer a paper cut from opening an envelope than be beeped.

Hindrance rather than help

I know we've got problems in this business because there are lawyers, engineers and consultants in my office building who frequently knock on my door in desperation. "Can you help me with my system?" they beg. They have a job to do, and their system is blocking them for a variety of reasons. Then I pick up the trade journals and almost everything I read involves new technologies and leading-edge products. It's like telling a user who can't produce an aged accounts receivable report that his computer uses the most advanced chip technology. Will that make him feel any better?

I sometimes believe the business of technology and the business of people are out of sync. It is as if we built a super automobile that can travel at speeds of 200 miles per hour on 60 miles per gallon, but we don't have the highways or the drivers to take advantage of such power. And even if we did, there are still some very nice people who will not want to drive that fast.

We've done a great job of producing superb technology. What we haven't done well is to place it at the right levels and make it work at all levels of user activity. Some of it is too complex for ordinary workers, and some of it is too threatening to executives. And some of it changes so fast that IS seems to be engaged more in upgrading technology than in processing applications.

Enough technology already. Let's get some work done.

Gillis has been a consultant to more than 200 financial institutions and has written 13 books and manuals on IS. This piece is adapted from his latest book, *Sorry, Our Computers are Down* (Vantage Press, 1992).

E-mail: The commercialization of time?

OPEN MIND *by* Esther Dyson

Last month, Gary Becker won the Nobel Prize in economics for explaining how people — consciously or not — base their their personal behavior on economic principles in spheres such as getting married, entering or leaving the work force, pursuing higher education or committing crimes. Like it or not, economics guides our lives.

People like to think there are some nobler parts of life that are secure from the rational calculations of economics. But that has never really been the case.

It's true that, until a few hundred years ago, most people didn't deal with money at all. They worked on farms for landlords who took care of them. They built their own houses, sewed their own clothes and maybe traded a few goods for other goods. Yet of course they were making economic decisions all the time: Eat the corn or plant it for next year. Raise the child or send him off to work in the city as an indentured servant. Get married or take the boat to America. And so on.

In our own century we've seen the commercialization of child care and many household chores. The next territory to be assaulted by commercialization will be communications, courtesy of E-mail.

E-mail is still outside the market, but not for long.

How we handle phone calls now is a precursor of how we'll handle E-mail, but E-mail will make the decision-making routines more explicit and automatic. We have informal schemes to handle phone calls — just as farmers had informal ways to value a lamb against a pair of shoes.

Some calls you return right away; some you respond to if the caller calls again. Some you refer to Fred in marketing; some you handle yourself. Explicitly or not, you're making decisions about the value of your time measured against other people's needs — and against what you may hope to get from them in return.

Fair enough. That's life in the corporate jungle. But E-mail will make all this more visible.

Suddenly, instead of making these decisions ad hoc, you'll have to make them beforehand — because the volume of decisions will go up. It's OK to trade a pair of shoes for a lamb once, but if you're trading shoes every day you need to establish a price. In the same way, E-mail will enable you to be deluged with requests, information and other messages and will force you to devise a "pricing" system to handle them.

That system won't be instructions to your secretary, but a set of filtering rules that sorts your mail and handles most of it automatically. At home, you may even set up pay-me schemes: Instead of receiving the magazine for free because of all the advertisements it contains, you'll have to pay for it because advertisers know that you can screen out their unwanted messages (shades of the television ad zapper and the rise of paid-for cable TV).

But you may also "volunteer" (sell) your time: Anyone who wants to send me ads can do so for $2 per screen. Or perhaps I'm buying a car. Anyone can send me car ads for free for a limited period only.

Yes, it may sound grungy. But it's a reflection of the power technology gives us to interact with a broader world; at some point, we'll have to classify those interactions explicitly in order to handle the volume of interactions technology makes possible.

Or you can just unplug your computer's modem and live outside the market. It's your choice.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets, respectively, in Eastern Europe.

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Charles Babcock

Seize the network

Ask any parent: Maturity isn't achieved without pain. Network managers know that — they are now facing the most painful stages of juvenile awkwardness as LANs move toward maturity.

Often created by end users for their own purposes — and without reference to requirements beyond their own departments — LANs often are uncommunicative things, difficult to connect to the corporate network and expensive to manage.

This situation has been a trial for those in IS who bear responsibility for computing infrastructure, so it is good news that Novell is trying to get the PC and NetWare to outgrow their adolescence and join the extended computing family. Don't start celebrating just yet, though. It isn't necessarily going to be an easy passage.

The vehicle Novell intends to use to accomplish this transformation is NetWare Version 4.0, which it will officially announce in early 1993. This won't be an operating system for amateurs. Unlike earlier versions of NetWare, which were often installed by guerrilla end users in defiance of IS, Version 4.0 will require professional evaluation of applications to see if they have been written by Novell's rules. If they have, they can be recompiled to run under 4.0. If not, you're in for a much longer, harder haul.

And the fact is that many NetWare applications weren't written by the rules. Many took advantage of NetWare's ability to run in unprotected memory and make direct calls to hardware address space. Although this practice yielded performance advantages, it will no longer be allowed in Version 4.0. So dirty hooks will have to be cleaned out, and those portions of the application will have to be rewritten and recompiled for Version 4.0, a Novell spokesman said.

So how extensive a problem is that? Enough of one that it will slow the conversions to Version 4.0. It is common knowledge that application developers at Novell often used dirty hooks, so it is likely they are widespread in the customer base.

Nevertheless, if NetWare LAN administrators can get past this hurdle, there is much in Version 4.0 to make for better LANs — grown-up features such as directory services and security.

Version 4.0 will depart from NetWare's server-centric, bindery-constrained existence. Until now, the NetWare LAN was focused on a server, which meant a user had to log on separately to every server containing data he needed. If you didn't know where the data was located, you were out of luck because the NetWare bindery was a flat file of system resources and users. To get beyond it, you had to be able to name and log on to a different server.

Version 4.0's Directory Services, on the other hand, will function much like a distributed database management system. Users can be added to NetWare locally, and a designated central point or points will be informed and will keep track globally.

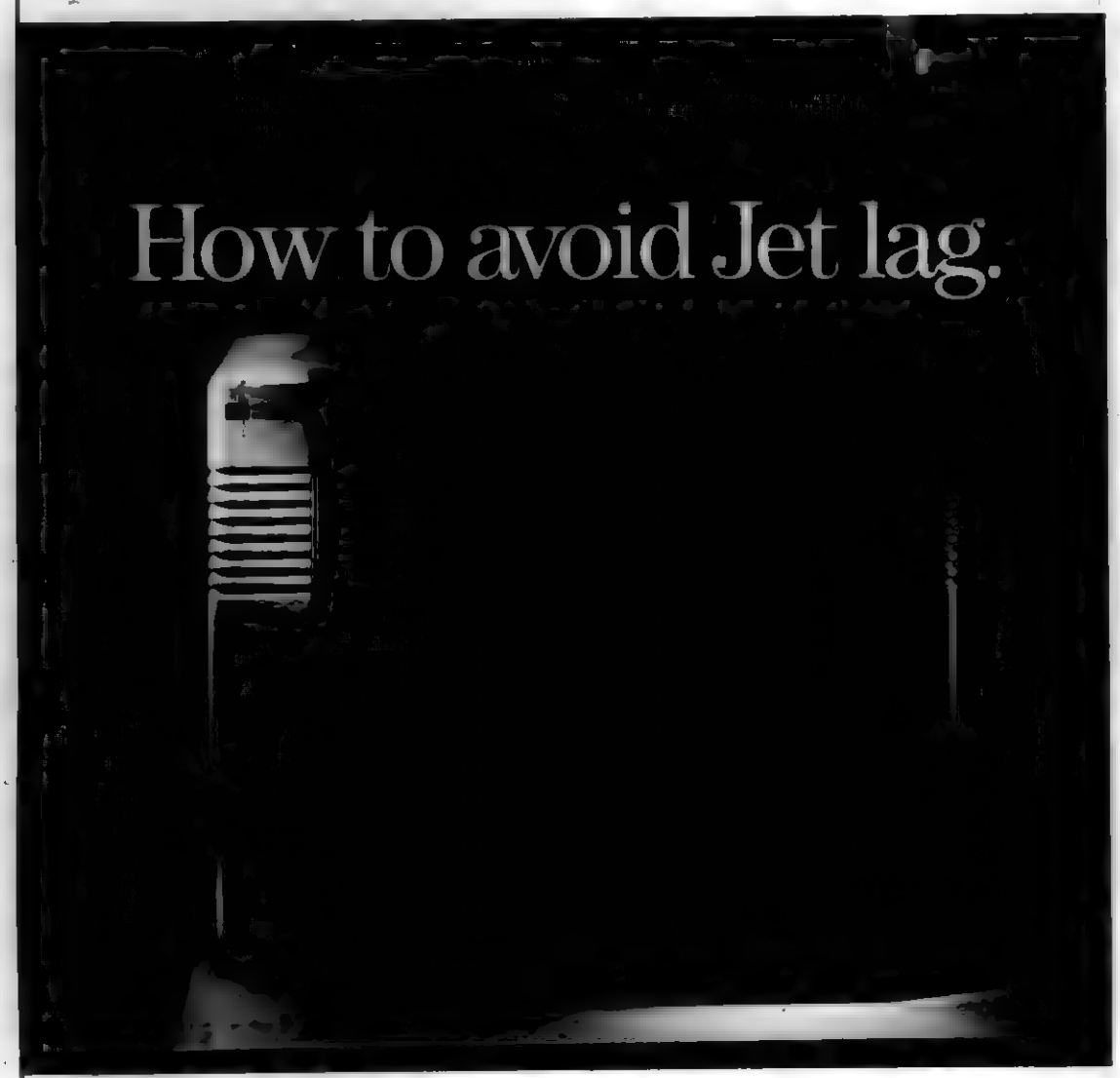
By the time of the 4.0 announcement, Novell expects to have graphical administration utilities to help set up the network. These will be followed by NetWare Management Services to allow management of the network in a graphical environment.

Equally important, the number of users allowed per NetWare network will reportedly rise from 256 to 500 or 1,000, and messaging will be internationalized in that recipients will receive messages in their native languages.

Such breaks from LAN constraints are critical to stemming rising network administration and management costs, as networks spread across workgroups and departments and connect to the WAN.

What was good a few years ago for the impromptu workgroup of PC users isn't good enough now. Novell has no choice but to go down this path to 4.0, and network administrators will have little choice but to seize the day and create larger, better integrated LANs, despite the difficulties.

Babcock is *Computerworld*'s technical editor.



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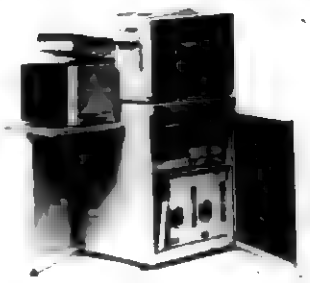

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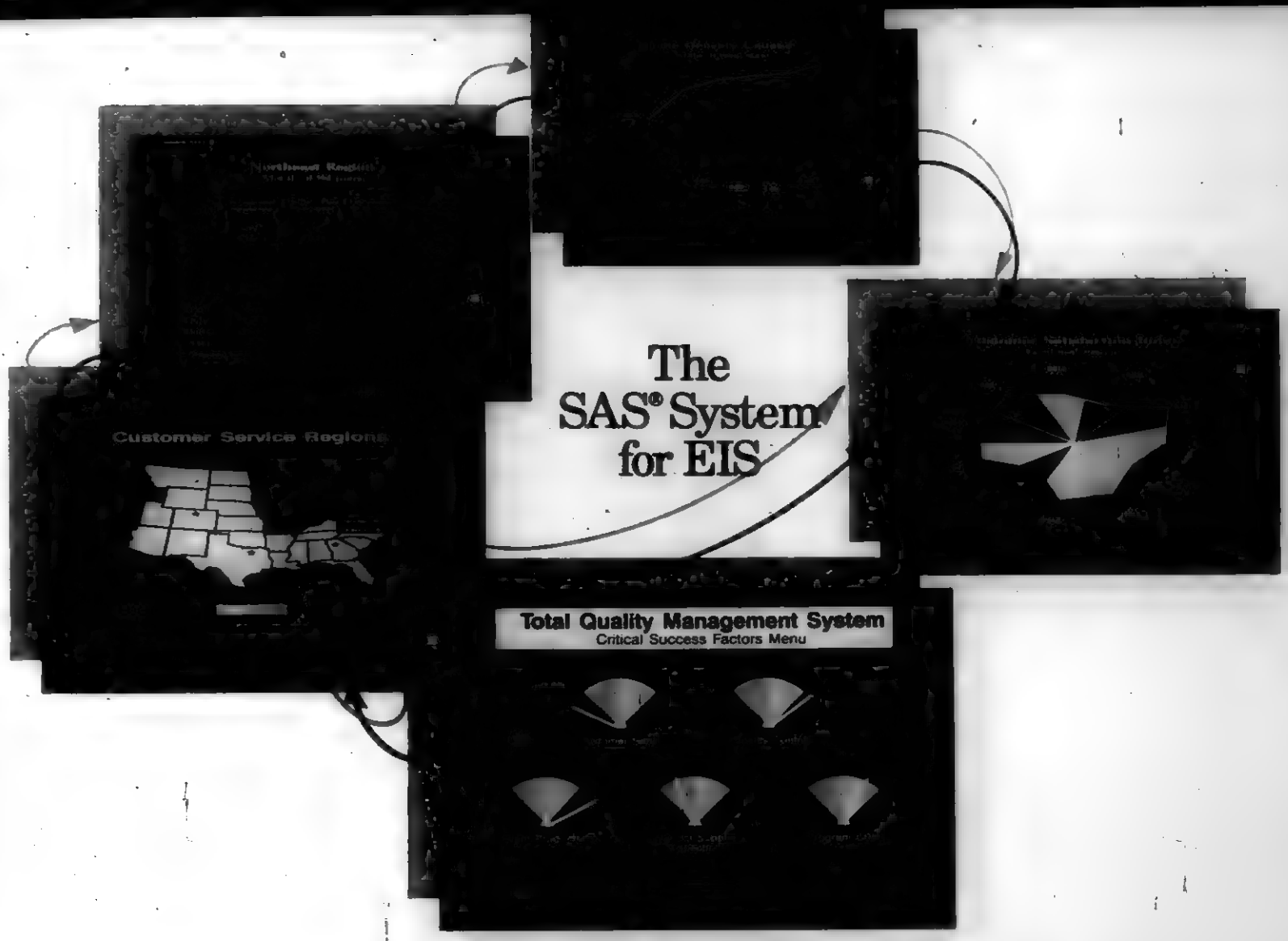

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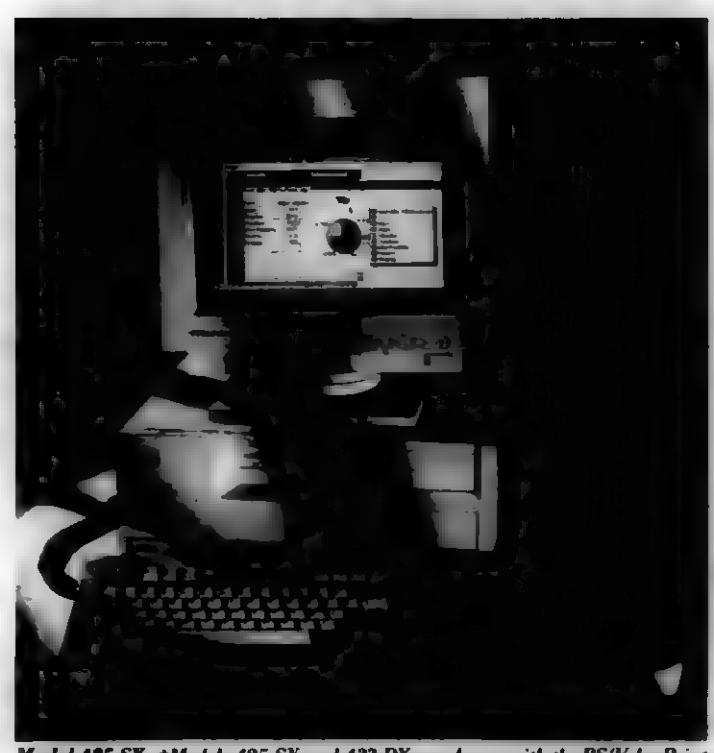

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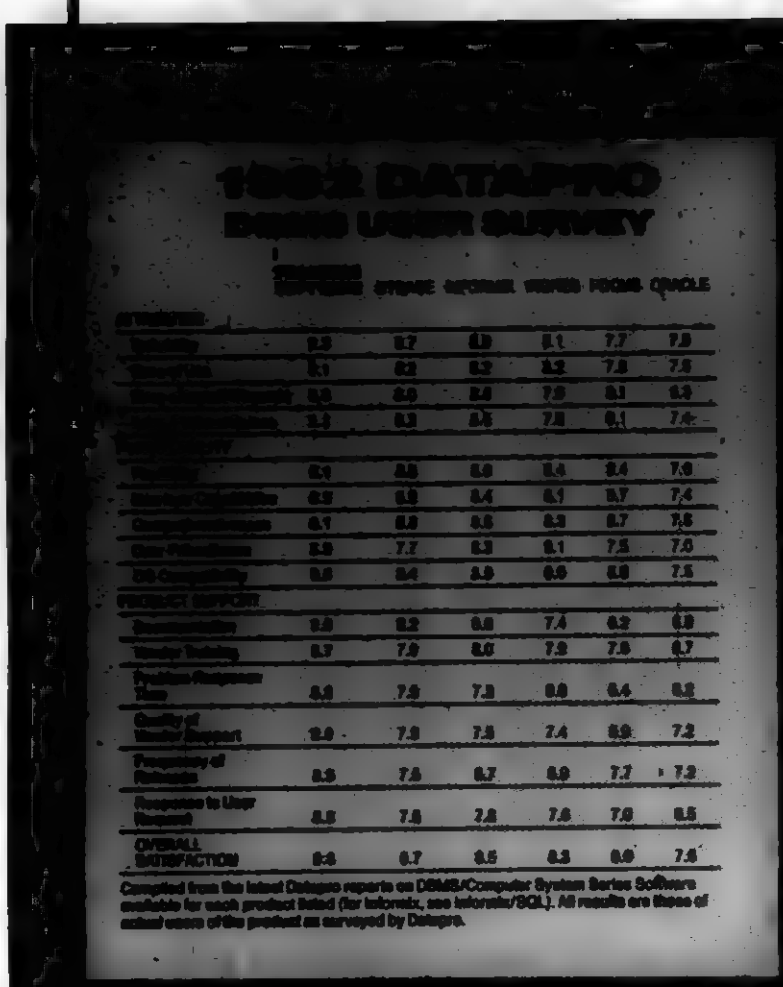

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Overall Satisfaction	8.0	8.0	8.4	8.1	8.7	7.4
Competitiveness	8.1	8.0	8.5	8.3	8.7	7.6
Ease of Purchase	8.0	7.7	8.3	8.1	7.5	7.6
DB Compatibility	8.0	8.4	8.0	8.0	8.0	7.5
PRODUCT SUPPORT						
Documentation	8.0	8.2	8.0	7.4	8.2	8.0
Vendor Training	8.7	7.9	8.0	7.9	7.8	8.7
Problem Response Time	8.0	7.9	7.3	8.0	8.4	8.0
Quality of Vendor Support	8.0	7.9	7.5	7.4	8.0	7.2
Frequency of Releases	8.0	7.6	8.7	8.0	7.7	7.2
Responsive to User Request	8.0	7.8	7.8	7.6	7.9	8.5
OVERALL SATISFACTION	8.0	8.7	8.5	8.3	8.0	7.6

Compiled from the latest Datapro reports on DBMS/Computer System Series Software available for each product listed (for Informix, see Informix/SQL). All results are those of actual users of the product as surveyed by Datapro.

1992 VARBUSINESS
DBMS REPORT CARD

	PROGRESS SOFTWARE	SOFTLAND	SPORTAK	INGRES
PRODUCT FEATURES				
Ease of use	8.70	8.67	8.80	8.00
Mastery requirement	7.96	8.00	8.14	8.11
Ease of programming	8.07	8.14	8.79	8.37
Ability to manipulate data	8.79	7.34	7.14	7.67
Sorting capabilities	8.50	7.34	7.21	7.36
Provision for software security	8.00	8.33	7.50	8.10
Report writing capabilities	7.96	8.14	8.50	8.00
Ease of use of interface	8.13	8.00	8.00	8.00
Software integration capabilities	8.00	8.02	7.29	8.15
Ease of data retrieval	8.00	7.96	7.86	7.84
Satisfaction with product productivity	7.89	8.01	8.79	8.18
Overall quality of product	8.07	8.07	7.36	8.71
PRODUCT FEATURES AVERAGE	8.32	8.02	8.06	8.41
SUPPORT FEATURES				
Provision for customer support	8.36	8.75	8.18	5.44
Charges for training time	8.91	8.78	8.50	4.71
Provision for technical support	7.57	8.14	8.00	5.18
Provision for marketing support	7.04	8.07	8.33	4.04
Documentation & product information	8.62	7.86	8.57	8.00
Frequency of updates & revisions	7.75	8.26	8.06	5.74
SUPPORT FEATURES AVERAGE	7.88	8.32	8.33	5.18
OVERALL AVERAGE	8.11	8.05	8.02	8.00

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For the second consecutive year, PROGRESS resoundingly swept all 18 categories of the VARBUSINESS Report Card. And for the fourth year in a row, PROGRESS came out on top in the Datapro surveys. Once again, users rated PROGRESS superior to all competitors on everything from strength of product to quality of service and support. Which is only logical, since PROGRESS is the one development system that gives you the flexibility to build and implement high performance applications independent of platforms and database systems. It even lets you deploy any application in both multi-user and client/server environments. But don't just take our word for it. Listen to a source far more convincing. Your peers. Call 1-800-4 PROGRESS for survey results or a test drive.

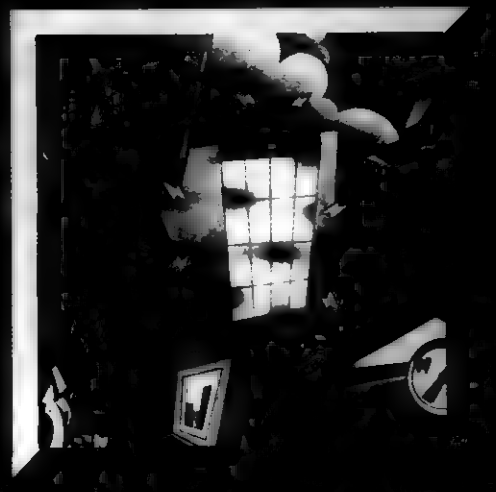
PROGRESS
SOFTWARE

THE APPLICATION DEVELOPER'S CHOICE.

PROGRESS applications are fully portable across the broadest spectrum of hardware platforms, operating systems, network protocols and user interfaces. So many, in fact, that we had to list them here in small type: AIX,™ CTOS, HP/UX,™ NOVELL NLM, OSF/1,® OS/2,® OS/400™ UNIX® ULTRIX,™ VMS,™ XENIX® MICROSOFT® WINDOWS™ XWINDOWS™ DECnet,™ LAN MANAGER™ NETBIOS,™ NOVELL® SPX/IPX TCP/IP and SNA APPC LU 6.2. Also, PROGRESS lets you process information in other databases, including AS/400, C-ISAM,™ CT-ISAM,™ ORACLE, Rdb, and RMS.

CPWADV1214

White Paper



Sales Force Automation

These days, it takes more than a hat full of tricks to boost sales.

A customized sales force automation system for the way you sell today. And tomorrow.

Selling just isn't what it used to be.

More than ever, today's sales professional must do more in less time. It's a real balancing act. And nobody understands this better than GE Information Services.

The proof is our Sales Marketing Communication System (SMCS). It's a complete customized package of easy-to-use productivity tools such as territory management, lead tracking, order entry, forecasting, call reporting, electronic mail and much more. Our hands-on support team will help you implement and use the tools that are right for you. And because SMCS integrates with most existing systems, there's no worry about loss of investment.

Sound good so far? Then consider GE's worldwide network that lets you conduct business just about anywhere in the world. Not to mention over 25 reputable years of business information experience. All of which, in the years to come, will put you heads above the competition. To find out more about SMCS, call 1-800-433-3683.

GE Information Services

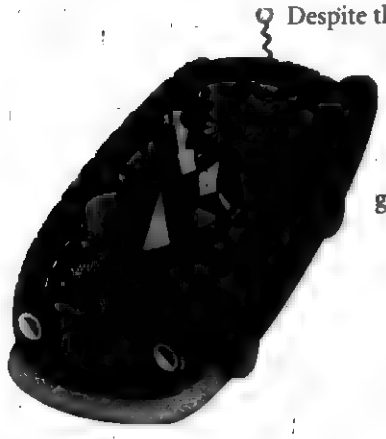
Introduction

It is somewhat surprising to find that sales departments, which directly account for the revenues that drive so many companies, are among the last to receive enabling information technologies. Perhaps it is because sales men and women are often able to tap their own internal resources in times of need.

No mater how talented these indivuduals may be, however, they can improve their performance through the use of Sales Force Automation (SFA). SFA, which includes automated sales support and the integration of sales data with other corporate information, is taking advantage of current computing trends, such as open systems, group collaboration and portable computing, to keep sales people better informed then ever.

Portable computing, in particular, is a bulwark of SFA. Although the bulk and weight of earlier models discouraged all but the most slavish devotees, newer versions — most notably notebook computers — conveniently lend themselves to the requirements of mobile sales forces.

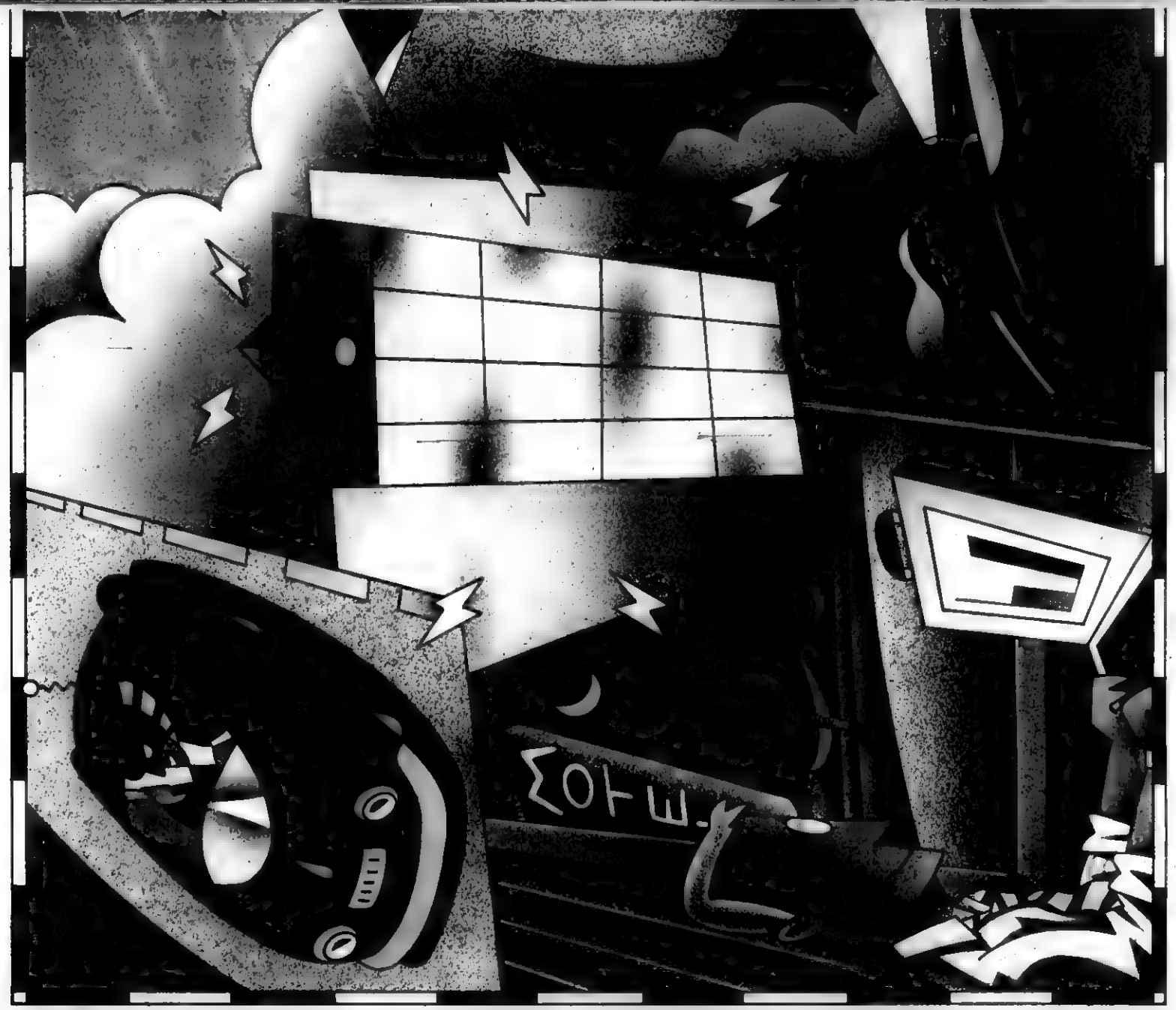
In fact, sales managers interviewed by IDC claim that the new generation of notebooks is enabling them to set unprecedented strategies for the widespread integration of automation.

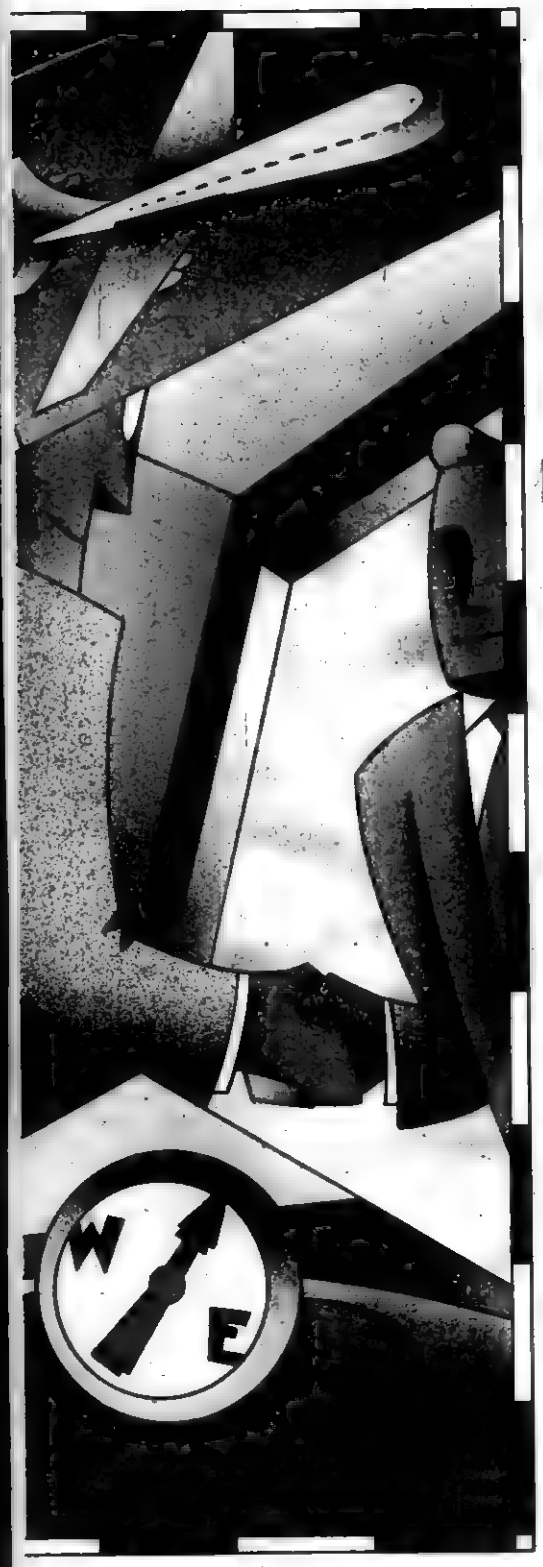


Despite the gains, however, SFA is still struggling to overcome poor market awareness, general apathy and lack of technical sophistication. The first of these three problems is rapidly improving. Apathy is also giving way as organizations increasingly realize the competitive edge they can gain by empowering their sales forces with SFA.

This White Paper was written independently of the Computerworld *editorial department by Clare Gillan, manager of the Applications and Information Access Program with IDC.*

For more information on the White Paper Program, please call 508-879-0700.





The convergence of economic issues and technological advancements is moving the sales function into the IS limelight. In the wake of this convergence, automated sales support and the integration of sales data with other corporate information — Sales Force Automation (SFA) — have become necessary tools for many companies.

Other tools — lightweight portable computers, intuitive graphical user interfaces, open access to heterogeneous data, and advances in communication technology — are all stimulating broad demand for SFA applications considered too complicated for previous technologies.

Despite this demand, however, sales has been one of the least automated areas in business. That is finally changing as tough economic conditions force companies to reduce costs, optimize resources and improve quality and service. Now companies are turning their attention not

only to sales, but also to related functions such as customer service.

The benefits of a properly implemented sales system go well beyond increasing a sales person's productivity. Sales data is critical to the decision-making process at all organizational levels, from the executive making corporate decisions to the sales representative canvassing a territory.

To date, few companies have successfully implemented comprehensive SFA systems. IDC attributes this low activity to a lack of resources, awareness and know-how among many prospective users. Over the next two to three years that will change as radical advancements are made in technology aimed at improving sales productivity and the quality of customer relationships.

KEY FEATURES OF SFA

SFA encompasses technologies tailored to the sales function, in particular, providing field sales people the necessary automated tools to increase their productivity. Attributes of SFA include territory management, e.g., a customer database, electronic calendar/tickler files, integrated word processing with mail-merge capability, and reporting. More advanced systems may support sales forecasting, two-way communication between the field and group offices, links to external and corporate data, and a high level of reporting and analysis.

The most valuable SFA systems do more than increase the productivity of the individual sales person. The truly influencial SFA systems integrate with corporate information systems and facilitate the flow of information across sales and related functions such as marketing or customer service.

ENTERPRISE INTEGRATION

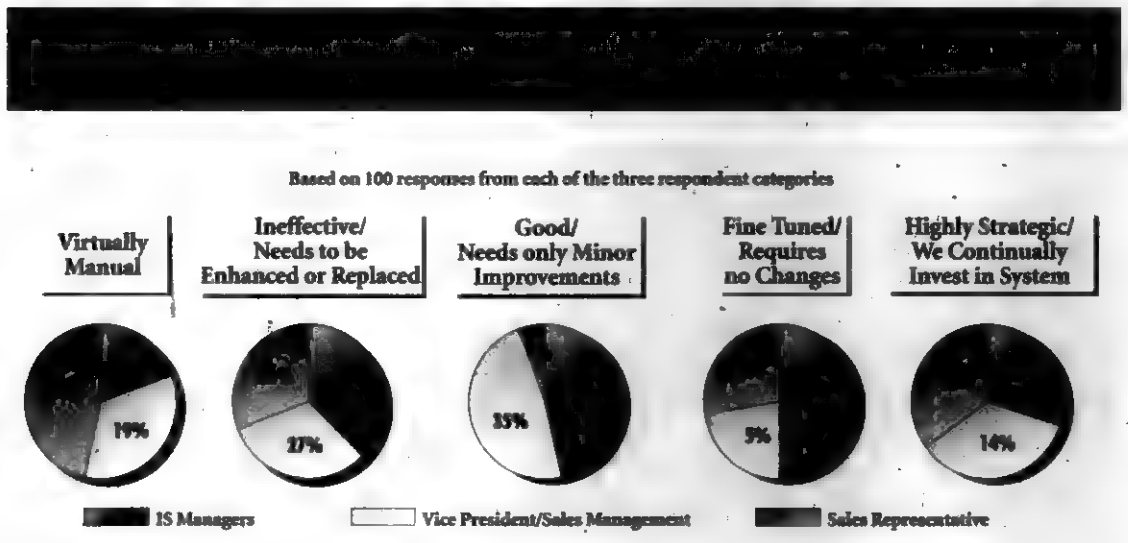
The currently emerging generation of business applications is best referred to as "enterprise integration." The dominant trend of this generation is the act of bringing information and people together. Applications facilitate communication among people and the integration of disparate information located in corporate, departmental and personal databases. Key technologies enabling this movement include:

- Open systems - Open systems promote the deployment of SQL-based applications, data access middleware for access to heterogeneous databases and hardware platforms, and Unix for platform portability.
- Group collaboration - Group collaboration is characterized by integrated office systems — in particular electronic mail — for communicating and coordinating with others; groupware applications like Lotus Notes, which allows people to share hard and soft information: and workflow applications that optimize processes involving multiple people.
- Distributed information - Critical characteristics of this category include client-server technologies, LANs, WANs and portable computers. Wireless communications, allowing access to remote computers without a modem, will also become important as its costs drop.

Sales organizations stand to benefit from these technologies, particularly in companies that embrace the concept of team selling. A recent IDC study indicates that 73% of IS managers at large organizations consider sales to be an integrated part of their corporate IT user community.

THE CURRENT STATUS OF SFA

There are three primary stumbling blocks to SFA: poor market awareness, apathy and a lack of sophisticated technology. Poor market awareness is a problem despite the fact that nearly 100 U.S. vendors provide SFA packages. Unfortunately, the majority of these vendors are small companies that lack marketing muscle. Since active market demand is often a function of marketing

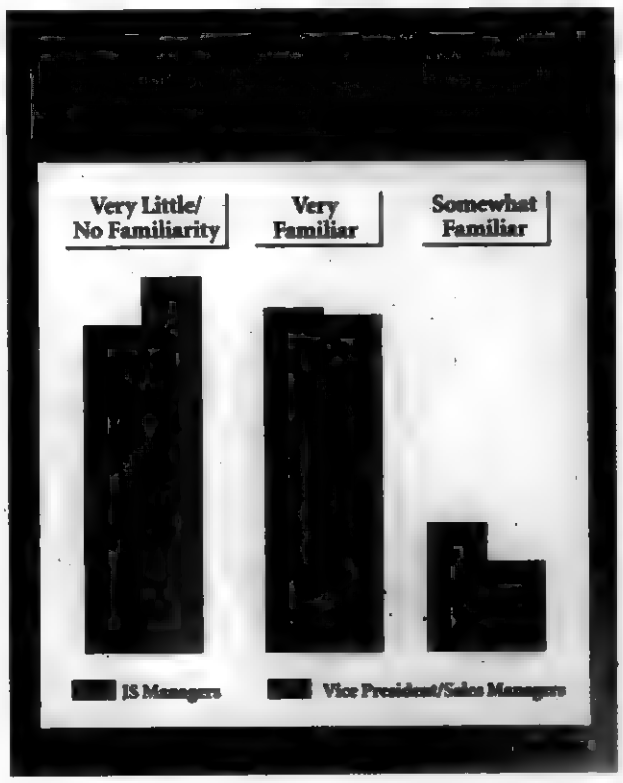


Source: International Data Corp.

dollars spent, corporate focus on SFA has been relatively low.

Lack of interest in this application came partly from the fact that the 1980s was a good decade for business in general. So long as the sales function met its quotas, increasing sales productivity was not a broad market issue. Other business issues, such as controlling inventory overhead and more quickly informing management on its previous month's performance, took precedence.

Perhaps the biggest deterrent to SFA was the lack of sophisticated technology. Only recently have the necessary tools successful SFA implementations require become available. These technologies include lightweight and affordable portable computers, such as Apple's Macintosh Powerbook, intuitive graphical user interfaces and flexible integrated applications. More companies are using them as they attempt to utilize every possible weapon in their competitive arsenals.



SFA ACTIVITY AMONG U.S. COMPANIES

IDC recently interviewed 100 large U.S. companies (5,000 or more employees) regarding their use of sales technology. The participants were senior IS people, vice presidents and senior managers of sales operations and sales people — the three groups generally involved in successful SFA projects.

More than half of the companies consider themselves to be somewhere between "efficient" and "bleeding edge" when asked how they apply IT toward increasing performance and competiveness. IDC estimates that less than 15% of sales-support systems are highly strategic, i.e., instrumental in helping the sales organization and the overall corporation meet or set objectives.

Seventy-five percent of the surveyed companies are in manufacturing; the balance are spread across other non-government, non-education industries. Sixty-six percent of the sales forces are centrally organized, while the others operate on a distributed structure. Fifty percent of the companies rely completely on direct sales people. Another 35% claims more than 40% of their staff focuses on direct sales. Twenty-seven percent have less than 10 sales people, while 38% have more than 10 but less than 50. Only 12 sites have more than 500.

Most large companies support their sales effort with some level of computerized technology. These sales support systems vary in sophistication. Some are composed of a single terminal located in the sales area. This terminal is used to send sales data to a corporate database or a PC in the sales manager's office. It may run a spreadsheet, calculate commission, adjust quotas or forecast sales activity. Although these systems are used in the sales area, their back-office focus and limited integration with a sales strategy strongly reduce their effectiveness.

Investment in SFA is picking up. Forty eight percent of the IS managers interviewed report that they are actively improving automation in the sales area; another 34% are in the planning stages. IDC attributes this increased SFA activity to a reversal of the three previously negative factors holding SFA in check: poor market awareness, apathy and the lack of sophisticated technology.

PORTABLE COMPUTING

Portable computing is one the strongest drivers of current SFA activity. Clearly, the bulk and weight of first-generation portables deterred their use in SFA. Even now, despite the advances made in portable computer technology, about 35% of sales organizations in large companies still do not have any portable computers. Of those that do, portables are only used by about one-third of the sales representatives and managers.

This is changing as the allure of portables grows while prices and sizes shrink. Consider Apple's Mac Portable: In August 1991, it sold at an average street price of $3,170 and included 2M bytes of RAM, a 40M byte hard drive and 16 MHz clock speed. The Mac portables have since been succeeded by Apple's Powerbook line of notebook computers. Today the top-of-the-line Powerbook 180 weighs just 6.8 pounds, comes with 4M bytes of RAM, up to a 120M byte hard drive, a 33 MHz processor, and sells for an average street price of $3,595.

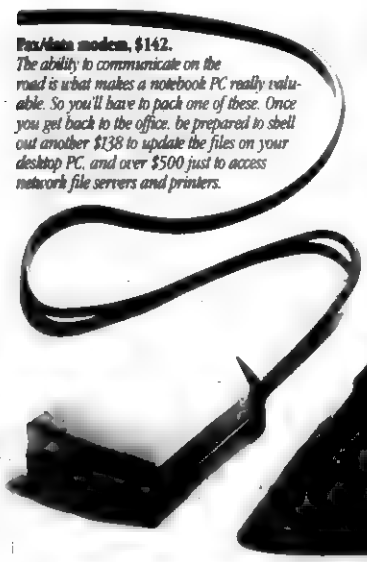
Although the price gap between desktop computers and portable computers has not disappeared, it is shrinking to the point where it is no longer an automatic impediment for companies that are serious about automating field sales.

The hard way.

New programs, $506 each.
Unless you buy programs specifically designed for Windows 3.1, you'll have to use conventional character-based programs and their awkward commands.

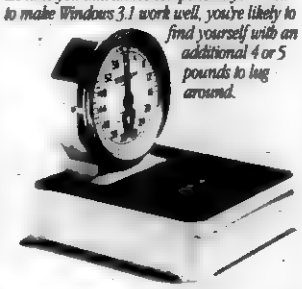
Extra memory, $210. *Most notebook computers in use today simply aren't fast enough to make Windows 3.1 practical. And many that are fast enough may require extra memory, which can add hundreds of dollars to their price tags.*

Clip-on trackball, $172. *If you're going to try to use Windows 3.1 on many portable computers, you may have to plug this in and clip it onto the side of your computer. (Be careful not to catch the cord in your airplane tray.)*

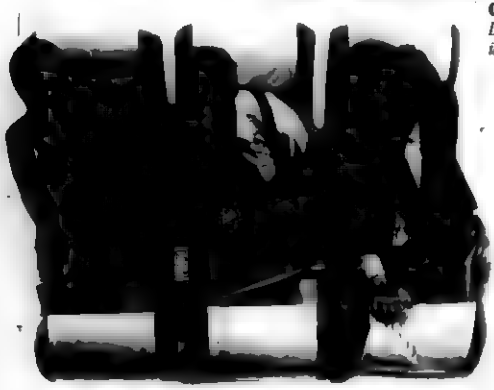


Fax/data modem, $142.
The ability to communicate on the road is what makes a notebook PC really valuable. So you'll have to pack one of these. Once you get back to the office, be prepared to shell out another $138 to update the files on your desktop PC, and over $500 just to access network file servers and printers.

Added weight. *Many notebook computers may claim to weigh less than 7 pounds, but by the time you add all the components you need to make Windows 3.1 work well, you're likely to find yourself with an additional 4 or 5 pounds to lug around.*



Your time, name your price. *Fiddling around with MS-DOS or Windows 3.1 on the road can cost you plenty of time. How much is yours worth?*



Ordinary notebook, $2,497. *The typical notebook computer of today was designed to run DOS only; not Windows 3.1. It doesn't have enough memory, speed or screen brightness, and its screen isn't fast enough for high-quality graphical computing.*

Comfort *is something most notebook computer ads never talk about. Because, truth is, they're not very comfortable to use. Which may explain why they don't win awards for being well designed. (PowerBook, of course, has won more design awards than all other notebook computers combined.)*

Instruction manual, 2 pounds. *There's nothing like forgetting a DOS command when you're 2,000 miles from home, so you may want to carry a manual with you. And since Windows 3.1 is based on DOS, you'll definitely want instructions handy.*

The coach seat factor. *If you want to run Windows 3.1 on most portable computers, you'll find that you need a front-mounted keyboard and a side-mounted trackball or mouse. What you won't find is enough room on an airplane tray to hold it all.*

If you're looking for a notebook computer that's easy to

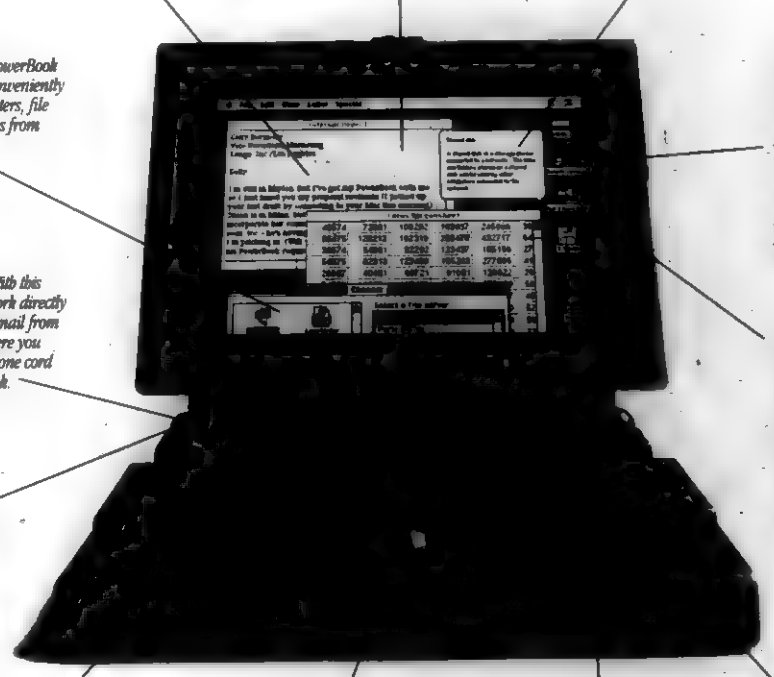
*"The price and all the prices noted here reflect average Manufacturer's Suggested Retail Prices. **Comparisons are based on a 1991 independent research study conducted by Ingram Laboratories that tested a variety of personal computers running applications available for both the Macintosh and Microsoft Windows 3.0 registered trademark and Windows is a trademark of Microsoft Corporation. 1-2-3 is a registered trademark of International Business Machines Corporation. SoftPC is a registered trademark of Insignia Solutions Inc. WordPerfect is a registered trademark of WordPerfect Corporation. This ad was created using Macintosh computers.*

The easy way.

Consistent applications. *Every PowerBook runs thousands of Macintosh programs (including Lotus 1-2-3 and WordPerfect) that all work in the same consistent, intuitive way. You learn one, you know the basics of all of them.*

Blistering speed. *Because Apple® Macintosh® computers are optimized for graphical computing, PowerBook® can significantly outperform comparably priced notebook computers running Windows.™*

Built-in Balloon Help.™ *Point at what you want to know about, and your Macintosh will tell you what it's for. So you can leave your manual in a desk drawer at home.*



Built-in networking. *Plug your PowerBook into an AppleTalk® network, and conveniently access all network resources—printers, file servers, e-mail, even other networks from Novell, IBM and Digital.*

Built-in fax/data modem. *With this option, you can send your work directly to a fax machine or access e-mail from almost any telephone anywhere you happen to be. Just plug the phone cord into the back of the PowerBook.*

Built-in peripheral support. *Like every Macintosh, PowerBook lets you add up to six external hard drives, CD-ROM drives, scanners or other peripherals simply by plugging them in.*

AppleTalk Remote Access. *This remarkable software is an option with every Macintosh PowerBook. It not only allows you to access all the files on a modem-equipped Macintosh at your office or at home, it also gives you complete access to your network—printers, files, file servers, e-mail—from anywhere there's a phone.*

Built-in file sharing. *On most notebook computers, sharing information with a desktop computer is virtually impossible. But every PowerBook has powerful file sharing built in. So you can easily connect your PowerBook to a desktop Mac® or another PowerBook and copy files from one computer to the other.*

Built-in sales. *The ease of Macintosh makes PowerBook the ideal tool for salespeople on the road. For information on how you can automate your sales force, call 800-635-9550, ext. 125. We'll send you our free brochure.* Macintosh in Sales.

Palm rests. *Working on the road isn't like working at your desk. So Apple designers provided a place to rest your hands, making it much easier and more comfortable to work in tight quarters—such as a middle seat on an airplane.*

Integrated trackball. *Everything about Macintosh computers is designed to make it easy for you to work. In the case of PowerBook, the pointing device is integrated into the computer. There's nothing to hook up or clip on. Open it up and you're ready to go. (It's comfortable whether you're left- or right-handed, too.)*

It's compatible. *Like every Macintosh, PowerBook is compatible with the personal computers you use at the office. It can read from and write to floppy disks from MS-DOS or OS/2 PCs, or even run DOS software using programs such as SoftPC.*

use, there are basically only two ways you can go.

environment. ©1992 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleTalk, Mac and Macintosh are registered trademarks of Apple Computer, Inc. Balloon Help and PowerBook are trademarks of Apple Computer, Inc. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. MS-DOS is a

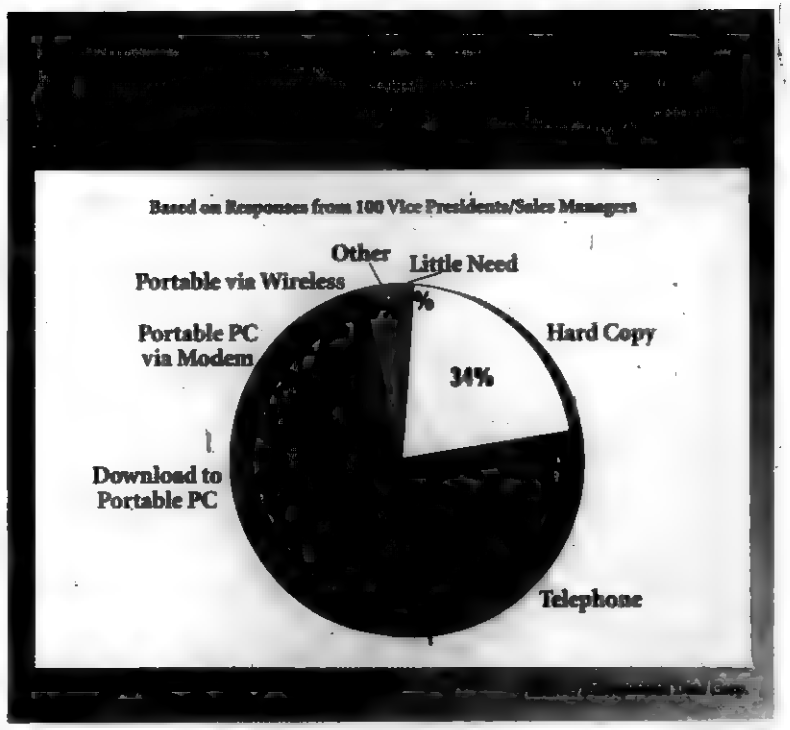
THE VIRTUAL OFFICE

Enthusiasm will spread as laggard companies come up against competitors armed with a "virtual office," which is essentially a portable computer equipped with all the information and function a sales representative needs inside or outside the office. For example, portables in the SFA environment hold all customer account information, order forms, pricing information, electronic sales presentations and electronic mail access. A modem allows the representative to download or interact with information from the home office. A modem and facsimile software enable the representative to use any available facsimile machine as a substitute for the printer. However, portable printers are available from a number of vendors.

This virtual office concept allows sales reps to function on a sales call as efficiently as if all their prospects had come to their office. Ultimately, such a properly planned and implemented system will generate more and higher quality sales calls. The virtual office implies corporate integration, but corporate integration requires a large investment of hard and soft (time and resources) dollars. There are less expensive, unintegrated approaches, but they may be insufficient when applied to a highly competitive situation.

IDC asked sales reps about their views of portable computers as a sales support tool. Forty-five percent indicate that portables only enhance sales performance if they are part of an automated and integrated sales automation effort. Integration becomes particularly important in a team selling environment. Notably, 40% agree that even using portables as personal tools supporting daily sales-related activities would contribute to increased performance.

Many companies choose to start at this personal level. However, it is important that they do not get caught in a dead-end strategy. As the system grows, back-end data servers and integration with other corporate information become more important. Portable computer users must adapt to such changes.



REMOTE ACCESS TO CORPORATE INFORMATION

Not suprisingly, most reps still use the telephone to access sales-related information located back at the office. This practice will decrease dramatically over the next few years. Seventy percent of the sales managers report to IDC that their reps access this information by telephone today. The second most common data access method is downloading via on-line portable computer communication. Within three years, this method will be number one. With technology such as AppleTalk Remote Access, users can act as end nodes on the network no matter what their location, whether at home or via cellular connection. Printouts are now the third most popular information access method.

While SFA vendors frequently compete against internal development, they also run up against more general packaged business applications that offer sales-automation capabilities. Examples of non-sales-specific solutions include spreadsheets, word processors and Personal Information Managers (PIMs).

SFA vendors have begun to realize that the opportunity lies not in competing with generalized solutions, but in leveraging them. For instance, more mature SFA solutions initially included a proprietary word processor and a proprietary electronic mail capability, largely because de facto application standards had not yet emerged.

Since that time, many of these SFA packages have been altered, allowing users to integrate popular word processing and electronic mail products such as Microsoft Word, WordPerfect and Lotus's ccMail. Leveraging third-party technology allows SFA vendors to be more focused on the value-added features, such as optimizing profit margins and coordinating workflow in team selling environments.

SFA software vendors continue to evangelize the market. About 40% of IS and sales managers report that they are being consistently contacted by vendors about SFA solutions. Another 20% report that they have been contacted by a small number of vendors, but that these vendors called infrequently. Despite the various contacts between users and vendors, more than 40% of IS and sales

Let ComputerLand® handle it. No one has more resources to help you integrate Sales Force Automation into your company. From design to implementation to support. ❑ For starters, we have long-standing relationships with all the major vendors in the business. So we can help you choose and get hardware and software that meets your needs. Including the best-selling Apple® Macintosh® PowerBook.™ ❑ When it comes to networking, you'll find that our expertise is unmatched. ❑ So is our support. We'll cover you nationwide with training through the ComputerLand Learning Network. Full telephone tech support through our national Help Desk. And complete Systems Maintenance and repair. ❑ So stop spinning and start the ball rolling. Just call. 1-800-852-8043.

Everything about the PowerBook is designed to make it easy for you to use, anywhere. Networking and peripheral support are built in. So is an optional fax/data modem. There are palm rests for comfortable operation and a built-in dual button trackball—nothing to hook up or clip on. And, like all Macintosh computers, the PowerBook runs thousands of easy-to-learn programs.

The Apple Macintosh PowerBook 170.

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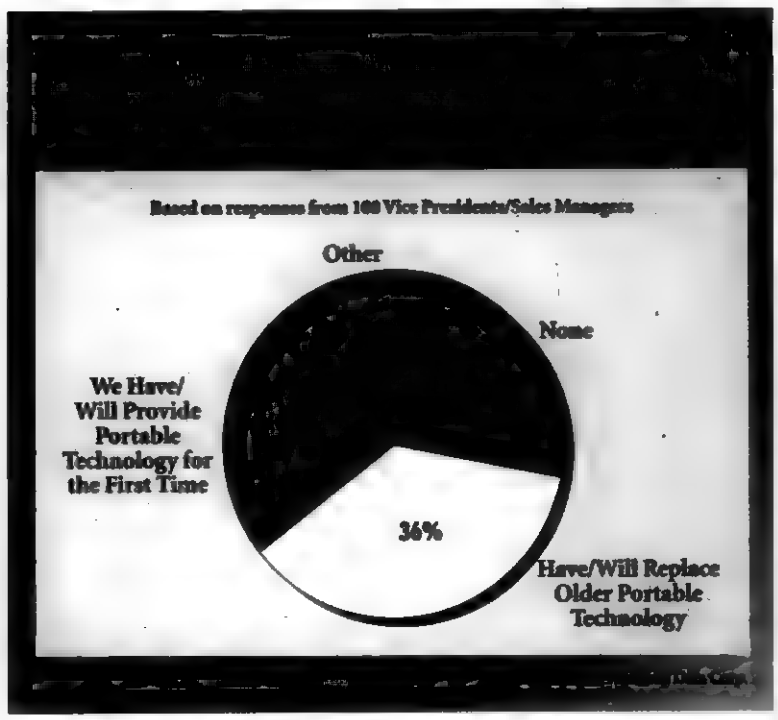


managers indicate they have little or no familiarity with the range of available SFA solutions.

APPLICATION WISH LIST

IDC asked each of three groups (IS, sales management, and sales representatives) to identify the three areas of sales they would most like to automate if their management gave them a blank check. IS says it would focus on sales analysis and remote access to corporate data. Sales management and sales reps agree that account management would be their number one investment.When asked what area they would automate last, all three groups indicate telemarketing. Customer presentations and external database access also rank low. The importance of customer presentations could increase now with the advent of multimedia capability on notebooks such as the Apple Powerbook.

INTEGRATION WITH OTHER INFORMATION

The newfound emphasis on team selling, particularly among companies selling into large accounts, is boosting SFA. Team compositions vary. For instance, the team might be composed of multiple sales people, or a sales executive and a technical engineer. It may also involve people from various parts of the company, i.e., customer service, marketing, engineering and sales. Whether or not team selling has been formalized in a given company, integrating the sales information system with other information systems not only benefits the overall organization, but also enables individual reps to simulate the shared-knowledge environment offered by team selling.

Today, more than 75% of SFA systems in large companies are integrated with order processing and general accounting systems. Seventy percent of these large-company SFA systems are integrated with customer service. IS, sales management and sales reps all agree that order processing, customer service and price/specification data are the three most important areas for SFA integration.

Frequently, companies do not consider what areas besides sales can benefit from sales data. For instance, executive information systems provide senior management easy access to critical business information from a variety of data sources. Sales information should be included in the mix. Although financial data is the most common source of information, sales and marketing data are also vitally important.

It is interesting to compare views on how IS management, sales management and sales reps view the automation level of their current sales system. IDC interviewed representatives from all three groups across 30 companies to find out. Ten percent of IS management feels their sales support system is manual compared with 23% of sales management and 30% of sales reps. By comparison, 17% of IS report that the sales support system is highly strategic, compared with 13% of sales management and 7% of sales reps. Most people, regardless of group, report that their system requires some level of improvement. Only a handful of people report full satisfaction.

INFLUENCERS AND DECISION MAKERS

Just who drives an SFA project? Vendors report that the initiators range from an individual sales person to IS vice presidents, noting that the sales manager is typically the most influential. IS management, sales management and field sales people agree that IS, marketing management and sales management are the most active SFA decision makers.

Senior corporate management generally observes SFA projects without intervening. The IDC-interviewed groups all agree that the actual users of the SFA system are more involved in the selection, design and implementation processes than the CEO. Despite this, CEOs generally sign off on these expensive projects.

In smaller companies, or even in smaller-scale implementations, the decision-making roles may change. For instance, in a smaller company, a sales manager or senior sales rep may be able to drive an SFA project from beginning to end. It should be noted that these projects are relatively simple, often using off-the-shelf single user software.

Storage Technology Tightens Up With SFA

The Company

Storage Technology is a $1.5 billion manufacturer and supplier of storage systems to computer manufacturers. The firm describes its selling style as "relationship selling." Sales cycles often take up to one year, requiring an average of 50 on-site sales calls. It has about 200 field sales people in North America and more than 85% of its sales volume is direct.

The Mission

"Apollo" was the name given to the Sales Force Automation (SFA) system developed by John Williams and Tom Campbell. Williams, vice president of North American field operations, conceived of the system and Campbell was made project manager in February 1991. He was given eight months to have the system up and running. This aggressive deadline was driven by Storage Technology's anticipated launch of a major new product line.

Hardware and Software Selection

Prior to this project, the sales force had limited exposure to computer automation. Campbell involved the regional sales support managers and one sales rep from each of six regions in evaluating alternatives. They agreed that portable computers — notebook computers in particular — were a necessary component.

Before committing to a specific notebook configuration, Campbell and his team investigated a variety of off-the-shelf SFA software solutions. They concluded that, considering the cost of packaged software and the specific functions they desired, it would be better to design and build their own single-user system. They also saw this as a way to increase their strategic advantage, because it would make their system more difficult to duplicate.

The company evaluated a number of notebook computers during a period preceding the introduction of Apple Computer's Powerbook notebook model. Under terms of non-disclosure, Apple representatives described Powerbook to Storage Technology's SFA project team. Based on that presentation, Campbell and his team selected the Powerbook. They were particularly attracted to the quick prototyping software facilities that would enable them to deliver a highly functional and easy-to-use application within four months.

The team selected Fourth Dimension, a Macintosh-compatible database application, as the software development platform for their custom application. Microsoft Office was chosen to provide integrated word processing, spreadsheet and presentation graphics. The storage systems company selected an external messaging service as an interim solution for remote communications and electronic mail.

Consulting Assistance

Storage Technology commissioned Andersen Consulting to develop the functional design specifications and data conversion plans, handle project management and training materials, and the actual training. The objective was to have each rep's portable equipped with all necessary information upon delivery. Metropolis Software Inc., an experienced Fourth Dimension developer, provided most of the technical leadership and programming for the custom application.

Production System Launch

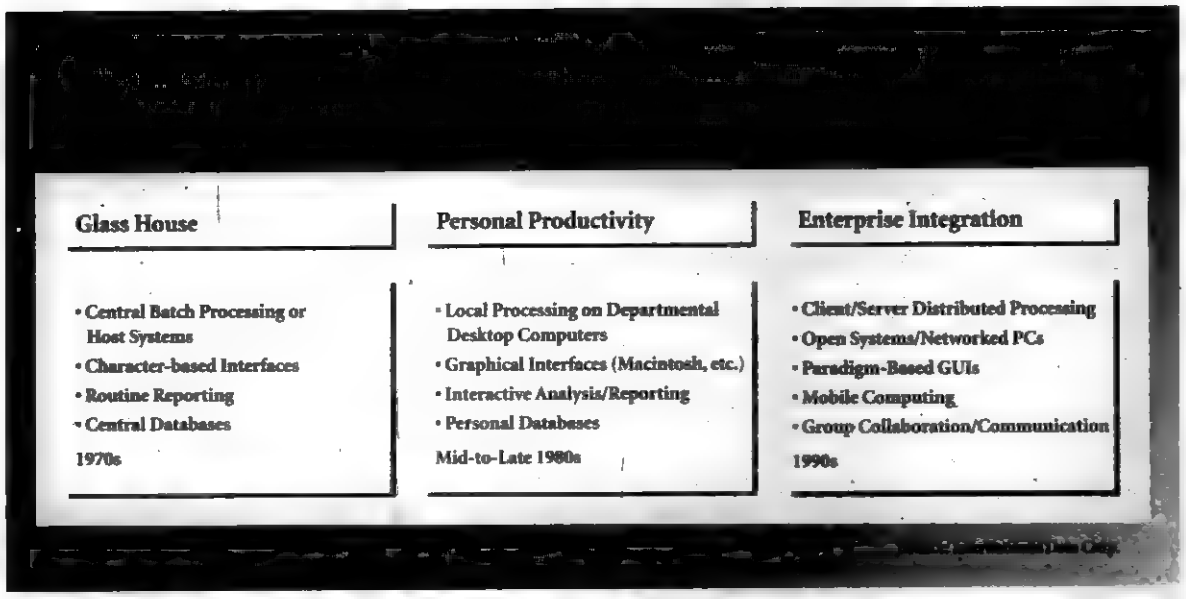
The system went live in November 1991. Each sales rep received two full days of training and a notebook equipped with a broad suite of applications. Applications included territory management, calendaring, account information, pricing configuration, communications and a proposal generator. All data could be stored locally or in corporate data bases. Product descriptions and competitive comparisons were also scanned and downloaded to the portables.

Campbell estimates that about 95% of the sales force currently uses Apollo. Some use it casually, others heavily. The casual users tend to be older sales reps who have established their accounts and territory, as well as a refined style of account management. The more aggressive users tend to be the less experienced reps who are toiling to develop their territory.

Estimated Return on Investment

Storage Technology has done some preliminary analysis of how the system has affected its business. The cost of implementing the system, including development, software, hardware and training was about $1.5 million. Spread over the 200-person sales force, the cost per rep is about $7,500. Campbell estimates the system will pay for itself within eighteen months.

He also points out that, prior to implementing the SFA system, the average number of sales calls per sale was 50. As a result of the system, that number has dropped to 40. He adds that as the system is increasingly used, the number of calls will drop even further.



CONCLUSIONS

The need for SFA varies by company. The answer may be as simple as hooking sales into a corporate electronic messaging system, or, as complicated as building a highly strategic sales system that integrates various departments across multi-national companies.

When making the decision whether or not to invest in sales automation, be aware of the many available alternatives. If your company has decided, or is even thinking about moving down the SFA path, consider the following "dos" and "don'ts":

• Don't underestimate the importance of ease of use. The weakest link in the system can be the one between the user and the computer.

• Begin with an effective sales strategy. Throwing technology at a dysfunctional process will only set your company back. Also, consider the sales process as it involves other departmental functions.

• Meet with a broad range of SFA software vendors. Many have gone through great pain to overcome potential SFA pitfalls. Their references will provide you with the opportunity to compare notes on SFA strategies and expectations.

• Investigate new technologies. An effective SFA system does not necessarily require bleeding edge technology. However, as when making any IT investment, beware of dead-end technologies — such as those that may lock you into a single-user approach — as well as the obsolete (transportable computers). Select products that receive healthy and regular investments by the manufacturer or provider.

• Leave room to grow. In addition to considering current and future needs in the sales organization, consider how the use of the system may change. Take into account central IS issues even if rolling out independent systems, thus allowing potential integration down the road. Avoid the trap of outgrowing your first SFA investment.

• Don't alienate potential users or supporters. Despite the potential benefits of SFA, some may perceive it as a prying Big Brother. Interview users extensively not only to find out what will excite them but also to make them feel like contributors, not victims, of the process.

• Don't encourage abandoning unique selling styles in favor of generic system prescriptions. Customization should be considered at the sales organization and at the personal level. The system should complement rather than inhibit a rep's style of selling.

• Stay in touch. View the SFA implementation as an evolution, not a revolution. Let the users know you care. Check back with them after several months of usage.

• Invest in the system continually. Sales people will pay more attention to a system that receives regular attention than one that is established and forgotten. Sending out regular notices regarding system enhancements and training classes can be a passive, yet effective, way to encourage system usage. Furthermore, as the system is used, leave open the possibility of incorporating new needs or suggestions.

The SFA evolution is underway. Becoming SFA-aware is an inexpensive first step for companies that have not fully extended computer automation to the sales function. This simply requires understanding the potential benefits of SFA and how the various alternatives might apply to your sales organization. If nothing else, becoming SFA-aware will help to prevent competitors from taking your company by surprise.

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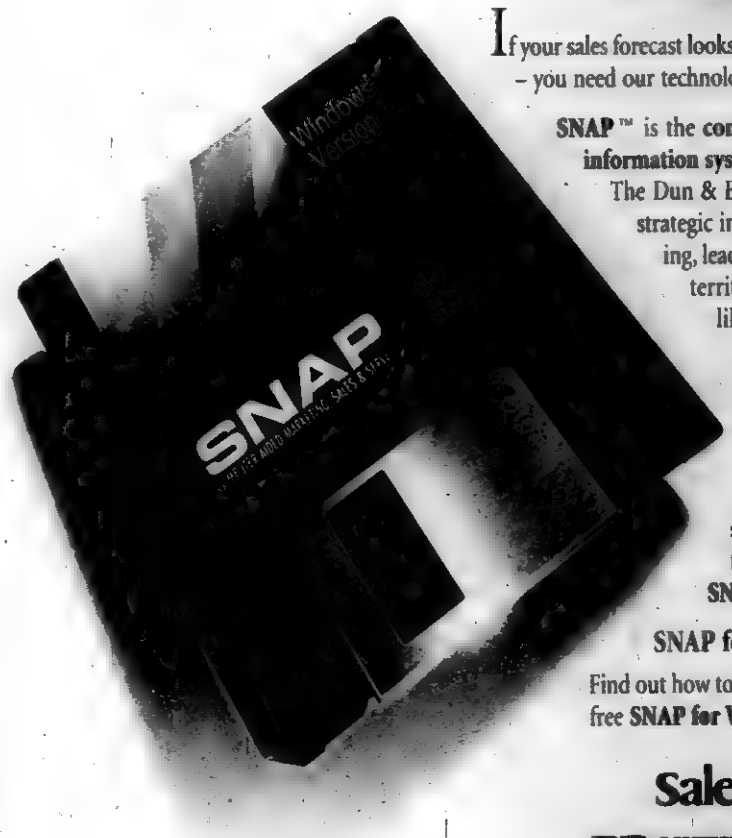

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PC MAGAZINE EDITORS' CHOICE

The Kodak Diconix 7[illegible] the mobile [illegible] that delivers affordable laser-[illegible]00 dpi text and graphics, in less desk space than a [illegible] paper.

The Kodak Diconix 701 printer delivers [illegible] quality that makes your communications, and you, look good. Yet it needs only 7.4 x 11.7" of desk space, even with the ingenious 30-page built-in paper feeder. It's a compact ink-jet printer, in the award-[illegible]inning Diconix tradition, quiet, easy-to-use, sleekly [illegible]ome. And it prints up to three pages per minute. [illegible]s than 6 lbs., including the optional [illegible]is is the definitive mobile printer. Use it [illegible]e, at home, or anywhere in betw[illegible]ever you work, don't wait: call for the n[illegible]aler near you in the U.S. and Cana[illegible]244-0006, Ext. 413.

LASER QUALITY. COMPACT DESIGN. [illegible]

OLE 2.0 awaits applications, tools

By Christopher Lindquist

■ The newest version of Microsoft Corp.'s Object Linking and Embedding (OLE) spells out the direction for future operating systems from the Redmond, Wash., software vendor.

It may be a while before corporations see any significant benefit, however. OLE is not easy to implement, and the use of many of its features will be dependent on software vendors producing applications and development tools for OLE 2.0, which recently went into beta testing. Microsoft said it hopes that such third-party products appear shortly after OLE 2.0's expected mid-1993 production ship date.

OLE is defined by Microsoft as a set of services that allow users to create compound documents consisting of information from multiple applications. For example, using OLE, a "sound object" could be embedded in a word processing document for voice annotation.

There is a hurdle, however. OLE 2.0 applications are not simple to develop, Microsoft acknowledged. "[Implementing] OLE 2.0 is a lot of work," said Cameron Myhrvold, director of developer relations at Microsoft's Systems Software Division. "We fear a little bit that people will look at OLE 2.0 and say, 'Gosh, this is hard.'"

As a result, he said, corporations that do not want to dedicate large amounts of time to hard-core Windows programming probably do not foresee themselves taking full advantage of OLE 2.0 until higher level integration tools ship. Such tools will be able to take advantage of OLE 2.0's ability to have applications register a command set that can be used by other applications, making very tight integration of dissimilar applications possible without having to rewrite the programs themselves. The first OLE 2.0 integration tools should be available when — or shortly after — OLE 2.0 ships in midyear 1993.

On the surface, OLE 2.0 offers such features as in-place activation of objects rather than requiring a separate window to be opened, and drag and drop of objects among applications and into other objects. But OLE 2.0 also makes some changes to the roots of OLE that may prove even more important. Indeed, OLE 2.0 starts to define the object-oriented model that will form a major part of Microsoft's far-future object-oriented operating system, code-named Cairo.

"Elements of OLE 2.0 become part of the native system in Cairo," said Dave Seres, product manager for the OLE and Interoperability Group at Microsoft.

Such an object-oriented approach will be important to Microsoft in the future, said Walt Johnson, senior research analyst at New Science Associates, Inc. in Belmont, Calif. The biggest advantage to such an object-oriented structure is flexibility, which he said Microsoft will need if it is to reach its goal of having Windows on everything from telephones to supercomputers. Microsoft's stated strategy for Windows is to have scalable Windows systems ranging from modular Windows on consumer products to Windows NT and Cairo on multiprocessor superservers for mission-critical applications.

Here's what's new

Among the new features in OLE 2.0 are the following:

- Objects that can be edited in place with only an application's menus appearing, rather than opening a separate window.
- Objects that can be nested inside one another.
- Dragging and dropping of objects among applications is supported.
- Storage-independent links that will allow objects within documents to update each other regardless of whether the object is stored in the computer's file system.
- Object links that are updated automatically whenever source or linked objects are copied to new locations.
- Objects that can contain version and conversion information, allowing programmers to work with objects created with different versions of the same program or allowing them to convert objects from one application format to another.

Workgroups seen as wave of the future

By James Daly

Mom always said it was nice to share. But in the 1990s sharing may be a business necessity.

That is the conclusion of a white paper recently released by Taligent, Inc., which surveyed hundreds of information systems professionals in a quest to determine what factors will drive the IS initiatives of the next decade.

The report revealed a strong orientation toward cross-functional workgroups, especially in geographically dispersed companies. As re-engineering gains momentum and global work-load balancing becomes imperative, the leaner and flatter organization will depend heavily on workgroup collaboration and seamless information exchange, said Joe Gillach, manager of market development, who helped conduct the study.

Taligent said it chose to share the information so the industry can slow its internecine sniping and focus on creating a more user-oriented, collaborative vision of the future. Taligent, a joint venture between IBM and Apple Computer, Inc., said its research found there is a need for object-oriented technology, which is Taligent's core interest.

During the study, nearly 300 people, from senior executives to entry-level employees, were interviewed from Bechtel Corp., The Boeing Co., Bristol-Myers Squibb Co., Brooklyn Union Gas Co., Citibank NA, Clorox Co., Esprit de Corp, Marriott Corp., MCI Communications Corp., Procter & Gamble Co., The Travelers Corp. and Union Pacific Railroad. Gillach said these companies were targeted because of their track records as innovators.

Basic needs

The interviewees were initially asked what propels their desire for increased collaboration. Leading the pack were the two central tenets that drive the business world: Reduce costs and increase growth.

Another catalyst for change is the fact that in a tight economy, customers can no longer be taken for granted. The result is a new emphasis on customer service.

Businesses are also increasingly taking a worldview. With domestic markets becoming saturated, many are already making operations and systems investments to support globalization, Gillach noted.

How are they going to achieve these goals? By empowering the end user. Winning strategies include the increased use of graphical user interfaces, data access tools, visual development environments and groupware products. End users will then climb the self-sufficiency curve, from addressing day-to-day reporting requests to tailoring applications, the study reported.

Some collaborative techniques deemed critical to success include agent- and knowledge-based systems, which will help users better navigate the growing volumes of enterprise data, Gillach said.

Techniques such as imaging and graphics were also underlined as key parts of data sharing. Boeing, for instance, relied heavily on such techniques in the creation of its 777 aircraft, which employed design teams in the U.S., Japan and Europe that continually shared visuals, Gillach said.

Unfortunately, cultural roadblocks often stand in the way of the collaborative process. Some interviewees identified a generation gap among senior managers, who may not view technology as a competitive weapon, and younger professionals, who grew up with the technology and are committed to it.

OS/2 PC network meets medical center's needs

By Rosemary Cafasso
TULSA, OKLA.

ON SITE

Hillcrest Medical Center
Tulsa, Okla.

Challenge: To clone a set of mainframe-based applications for a PC-LAN platform.

Technology: IBM OS/2; Novell, Inc. local-area network; 3Net Systems, Inc. application development tools.

Goal: To save $20 million in five years by removing mainframe upkeep costs.

A year ago, Hillcrest Medical Center looked at its information systems effort and the 20-year-old applications it was maintaining and knew there had to be a better way.

Today, the 500-bed community hospital is in the thick of a downsizing project that will move the bulk of its patient management and administration applications from outdated IBM 4300 mainframes to a network of IBM OS/2-based PCs. Hillcrest expects to go live with the first module, which manages patient registration and admitting, in March 1993.

But the hospital got on the downsizing bandwagon in a roundabout way. It had initially been shopping for a laboratory management replacement system when it came across a tiny software development and services company in Rancho Cordova, Calif., called 3Net Systems, Inc.

3Net demonstrated the lab system for Hillcrest, and in subsequent conversations "the idea began to germinate that we had something

Medical center, *page 60*

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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Your global network integration partner

Don't forget to put software on your list

By Christopher Lindquist
and Derek Slater

It is Thursday, Dec. 24. Someone is pushing that little button in the back of your mind that makes you think you forgot to do something. What could it be?

Not to panic. Here are a few suggestions for Christmas gifts that have floated across our desks recently and should be available at your local computer store.

The Ancient Art of War in the Skies
Micro Prose Software, Inc.
(800) 879-7529
Price: $59.95

Whether you prefer masterminding the strategic World War I defenses of France or jockeying a Sopwith Camel to blast the Red Baron out of the sky, The Ancient Art of War in the Skies is just the ticket. The Ancient Art puts you in the commander's chair in a variety of World War I battle scenarios; you can jump in and out of dogfights and bombing runs as you guide the strategies of the Allied or Central Powers forces.

It is easy to start playing right out of the box, without much reference to the manual (though the documentation, a primer on World War I history and battle tactics, is an interesting read anyway).

Unfortunately, in the heat of the battle the graphics-oriented game may outrun your hardware; on a 386 clone, the graphics occasionally got hung up and the cursor seemed to develop a will of its own.

The Mouse Arena
Formlnco
(800) 663-6764
Price: $29.95

Mouse pads, in general, have some problems. The surfaces sometimes do not grip the mouse ball firmly enough; they get dirty quickly; and we have had a couple begin to come apart after only a couple months of use. Perhaps you know someone in this same situation. Then maybe it is time to get The Mouse Arena.

OK, so the name is a little hokey. The product is not. The Mouse Arena consists of a circular pad with a "Tyron" work surface that provides enough friction for smooth mouse movement but does not build up dirt or "mouse fuzz" easily.

In addition, the Arena has an adjustable leather palm support and a cord holder that keeps the mouse cord out of the way. Seven rubber feet keep the Arena from migrating off your desk.

Star Trek: The Screen Saver
Berkeley Systems, Inc.
(510) 540-5535
Price: $59.95

Star Trek just keeps on wheezing along, and now comes Berkeley Systems, the After Dark screen saver company, to breathe some more life into it.

Star Trek: The Screen Saver provides more than a dozen Star Trek (the original, not The Next Generation) themes for preventing screen burn-in on your monitor. True, monitors do not have the burn-in problems that they used to, but these screen savers are simply fun to watch.

Whether the screen is filling up with tribbles or Mr. Spock is roaming around exterminating aliens, Star Trek fans are sure to be pleased with the authenticity of the product.

Out of this World
Interplay Productions
(714) 545-9001
Price: $59.95

Every once in a while a product comes on the market that redefines what is an acceptable level of quality. Out of this World has done that for us in the action/adventure game category. You play Lester Knight Chaykin, a scientist sent to another dimension via an experiment that goes awry (via the ever popular lightning-strikes-just-at-the-critical-moment scenario).

The graphics quality is outstanding, despite the apparent use of only 16 colors to help speed the game. The graphics, sound and storytelling combine with mind-bending puzzles to create one of the more exciting games we have ever played. There are times when you truly feel you are watching, and taking part in, a movie. It is well worth the price of admission.

Links386
Access Software
(800) 800-4880
Price: $69.95

If golf is your game, Links386 is the way to go if you have the hardware for it. Links386, as the name implies, requires a 386 or better processor and at least a couple of megabytes of memory, though the more the better. You will also need at least 13M bytes of free disk space. The benefit behind this hardware hunger is that the digitized 256-color graphics and sound are spectacular on the right machine.

Medical center picks OS/2 PCs

CONTINUED FROM PAGE 57

here at Hillcrest that could be migrated to the PC LAN environment," said John Cooper, administrative director in charge of information services.

Hillcrest and 3Net eventually struck a deal: 3Net would assist the hospital in downsizing its core applications for the OS/2 platform. In addition, it would train Hillcrest's small programming staff — longtime mainframe Cobol developers — to use Compose-It, 3Net's application development tool. Compose-It, a prototyping and applications generator tool, completed about 70% to 85% of the code. 3Net also agreed to write the remaining code in C++ to complete the software.

In return, 3Net will remarket the software applications to other hospitals when completed.

Everybody wins

"It could be a win-win for both Hillcrest and 3Net," Cooper said. "They will have a product to market, and we get downsized."

Cooper did not provide financial details on the deal. However, he said he expects Hillcrest to save up to $10 million in the downsizing project over the next five years from lost mainframe maintenance and upkeep costs.

The project was officially under way in March. Cooper was hesitant to say when he expects the conversion to be finished.

"What we have on the mainframe is a result of 20 years of history," Cooper said. "Exactly when all this will be migrated, we can't say for sure."

Sandra Brewer, a programmer analyst, said that while the new application development tool has taken some getting used to, it has been a smooth transition. "We had a two-week training period, and after that, we were fairly comfortable with the product. We were slow at it at first, but we were able to do the work," she said.

Brewer said the prototyping feature is new territory, but it has delivered a big boost to her programming efforts. "It's helpful because you can develop a screen rapidly and see how it will work," Brewer added.

"With the mainframe, you'd spend a lot more time before you could get the screen designed."

HELP LINE

WordPerfect for DOS

Part of a collection of user tips provided by vendors and drawn from questions asked of their customer support groups. This week's tips deal with WordPerfect Corp.'s 5.1 for DOS.

Q. How do you set up labels in WordPerfect 5.1, and what do you do when you receive error messages that say the label margins are increased or the labels will not fit?

A. In the May 31, 1991 interim release of WordPerfect, a new LABELS.WPM macro was included with the program. This macro was enhanced to include more label sizes and makes adding and deleting label definitions easier. The macro also displays a list of label sizes and stock numbers. To run the macro, press Alt-F10 and type labels.

In addition to the LABELS.WPM macro, the Format: Page menu (Shift-F8, P) has been enhanced to include a labels Paper Size/Type if one has been selected.

Q. Why does WordPerfect present the message, "Are other copies of WordPerfect currently running?"

A. WordPerfect creates temporary files each time the program is started, which are deleted each time the program is properly exited.

However, if a power failure, computer lockup or improper exit occurs, e.g., turning off the computer before pressing Exit (F7), the temporary files will still exist the next time the customer starts WordPerfect.

The message asks if other copies of WordPerfect are currently running so that if other copies are running (such as on a network) and the customer answers "Yes" to the message, the existing temporary files will not be deleted and a directory can be specified where the new temporary files can be created.

If the customer answers "No" to the message, then customers are given the option to Rename or Delete existing backup files that were created by the Timed Backup option — Setup (Shift-F1), Environment (3), Backup Options (1), Timed Document Backup (1).

Q. What can you do when horizontal text does not fit on one complete screen and you must scroll from left to right to read the screen?

A. This problem is most often caused when a small or proportional font is selected.

One temporary workaround this problem is to choose a Courier 10 pitch font for text editing and then change the font for the final formatting. (This solution would not work for a customer who is using tabular columns and plans on selecting another final font.)

Q. Why is it that when you try to select a landscape font, no landscape fonts appear on the list of base fonts?

A. A landscape Paper Size/Type code must be selected before you will see landscape fonts on the list of base fonts.

Software application packages

Great Valley Products, Inc. has introduced ImageFX.

The product joins traditional elements of image processing and editing with high-end special effects to achieve professional results on any Commodore Business Machines, Inc. Amiga computer.

The software has 24-bit image manipulation features for image creation, editing and retouching. ImageFX also has morphing capabilities for cinematic quality output and includes image processing tools for color correction and manipulation.

New modules may be added to support scanners, printers, frame grabbers and display devices.

An external "hook" program provides virtually unlimited expansion possibilities, the company reported.

ImageFX costs $369.

➤ *Great Valley Products*
600 Clark Ave.
King of Prussia, Pa. 19406
(215) 337-8770

Computer Associates International, Inc. has announced Version 2.0 of ACCPAC Simply Accounting for Windows.

According to the company, the product takes advantage of Microsoft Corp.'s Windows Data Exchange, enabling users to transfer data to other Windows programs. Instead of going through multiple journals, Version 2.0 has the ability to permit cash purchases or cash sales to be entered as single transactions. Key enhancements include flexible transaction handling and enhanced forms handling.

The product costs $199.

➤ *Computer Associates International*
1 Computer Associates Plaza
Islandia, N.Y. 11788
(516) 342-5224

Macintosh products

Timeslips Corp. has introduced LapTrack, a software program designed for the Apple Computer, Inc. Macintosh.

LapTrack is an application that automates time and expense tracking for productivity analysis reporting and client management purposes, the company reported. Users can track time and expenses and budgeted figures vs. actual figures.

Billable or nonbillable time spent can be tracked when the product is used on a portable, and with networked Macintoshes, time and expense records can be gathered from employees into a central multiuser database. LapTrack also has the ability to create analysis reports of time and expense data.

LapTrack costs $79.95.

➤ *Timeslips*
239 Western Ave.
Essex, Mass. 01929
(508) 768-6100

Blueridge Technologies has announced Optix 4.0, an Apple Computer, Inc. Macintosh-based software package for archival and retrieval of document images and all nonimage files.

The product's features include a flexible indexing database to archive and retrieve images, fast compression and decompression and image annotations. Support for high-speed printers, scanners and optical disc drives is also provided.

Version 4.0 enhancements include savable queries, processing queues, the ability to cut and paste thumbnails in documents and enhanced support for text files. New features to support optional optical character recognition and text search have been added.

A single-user copy of Optix 4.0 costs $695.

➤ *Blueridge Technologies*
Route 522
Flint Hill Square
Flint Hill, Va. 22627
(703) 675-3015

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UDS brings more to the table in the V.32 *bis* modem game

Modems that comply with the CCITT V.32 *bis* recommendation (and there are lots of them) share some common characteristics: 14.4 kbps basic rate, with compressible automatic fallback speeds; V.42 *bis* and MNP® level 5 data compression; sync or async full-duplex operation over two- or four-wire circuits and Hayes "AT" auto-dialing.

As these similarities drive value-conscious modem buyers to look beyond the common features, the search for added performance advantages brings them to the UDS V.3229.

In addition to the "standards," UDS offers a suite of features—automatic dial back-up, remote configuration capability, call security etc.—that is simply not available in competitive models.

If you're a modem buyer who understands that there's more to value than just price, UDS will happily rig the V.32 *bis* game in your favor.

For detailed specifications and a winning price/performance quote, contact UDS at

800/451-2369

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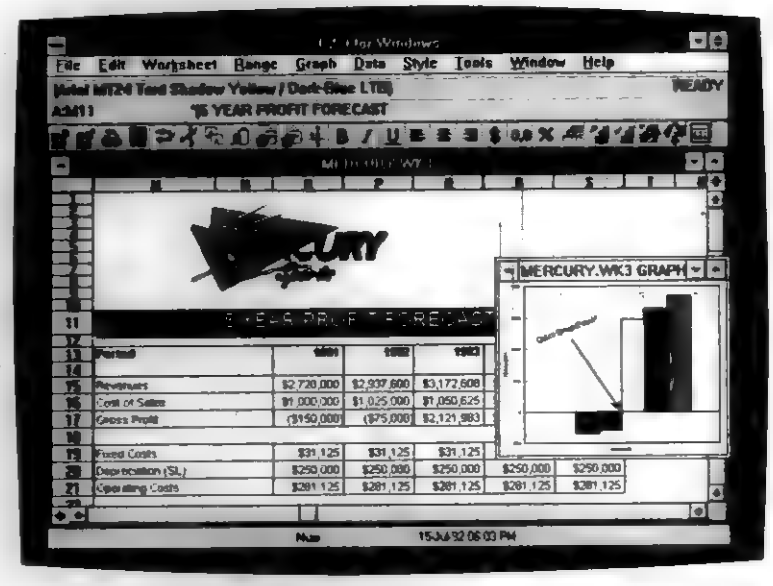
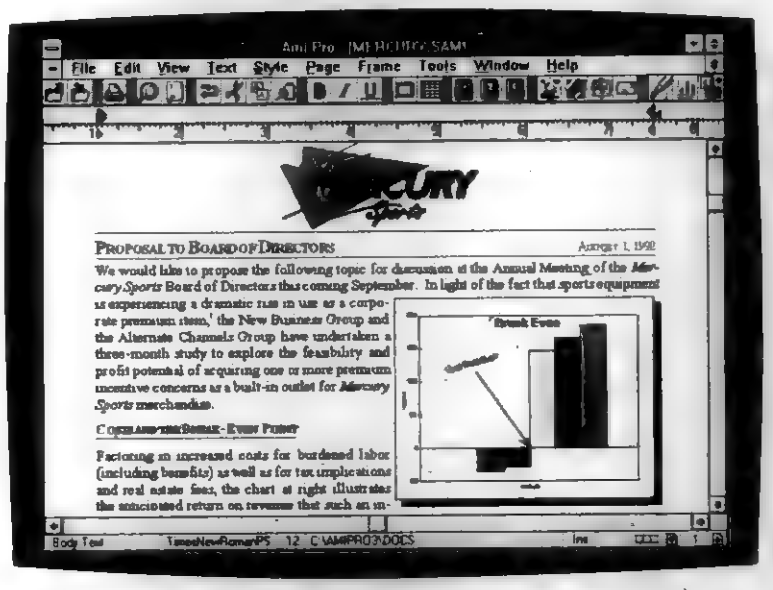
Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.

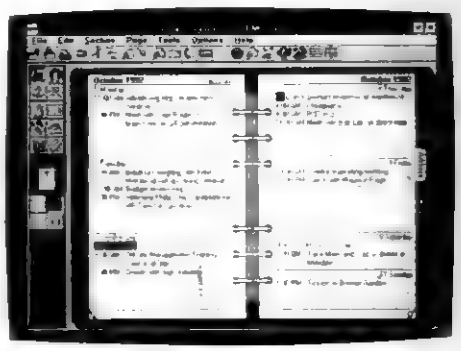


Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows™ desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite™ and Microsoft Office include full-featured products. But SmartSuite has been recently updated to include 1-2-3 for Windows Release 1.1 with SmartPak™ and the newly released Ami Pro 3.0, as well as Freelance Graphics and cc:Mail.

All four of these award-winning products share a common interface as well as our innovative SmartIcons.™ So when you've learned one, you've learned them all.

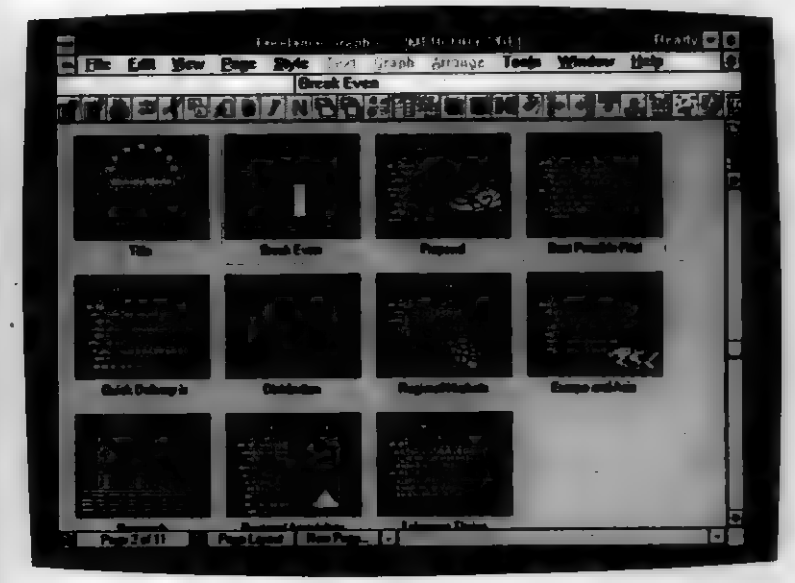


For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

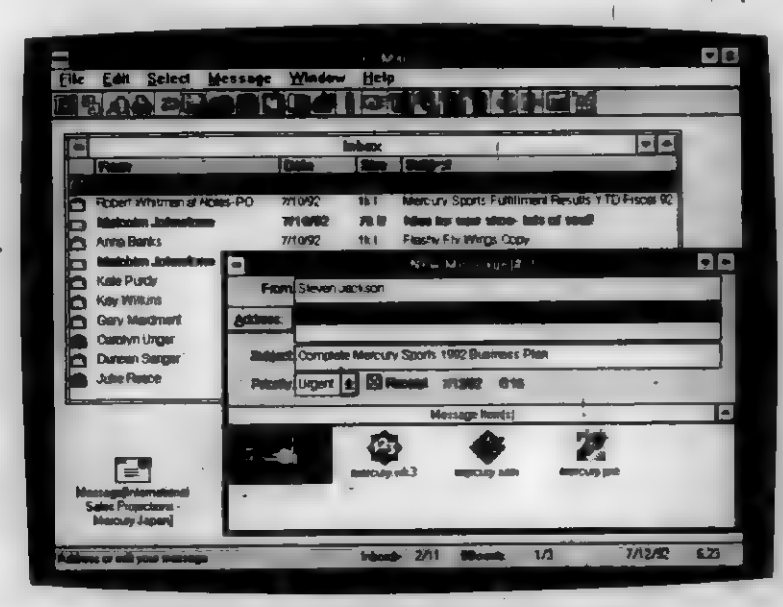
What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products, for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint. You can even move

*Offer expires 12/31/92 or while supplies last. **Suggested retail value. ***In Canada, call **1-800-GO-LOTUS**. When you purchase 10 SmartSuite packages, you'll get a free cc:Mail for Windows Platform Pack (a $495 value).
SmartMasters and Working Together are trademarks of Lotus Development Corporation. cc:Mail is a trademark of cc:Mail, Incorporated, a wholly

tus SmartSuite, s more like a cubicle.



Award-winning Freelance Graphics is the easiest, fastest way to create a stunning presentation.



cc:Mail the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

quickly between SmartSuite applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

For one thing, you just can't beat the total value. In fact, for a limited time,* **when you buy SmartSuite, we'll give you Lotus Organizer (a $149 value**) absolutely free.** It includes an on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder that are all fully integrated. Plus if you're upgrading from any version of 1-2-3, Symphony, any Lotus word processor or graphics product, or cc:Mail, you'll save even more. So do the smart thing. Visit your Lotus Authorized Reseller or call **1-800-872-3387, ext. 7240***** for a free demo disk.

Lotus **SmartSuite for Windows**

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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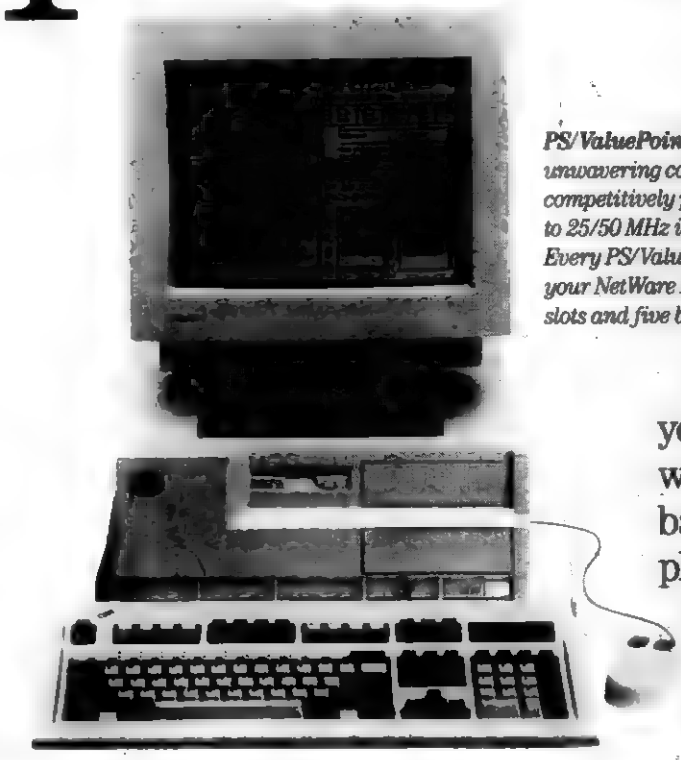

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User Voices

At what price open systems?

Computerworld: During your company's migration to open systems, what have you found to be the hidden or unexpected costs associated with the move? How have you dealt with them?

■ **Mark Schmidt,** *vice president of information technology and communications at Wal-Mart Stores, Inc. in Bentonville, Ark.*
What is difficult today is the complexity of managing the large, distributed environment. That's an area where the standards have not yet come together for things like security and software version control.

Distributed security has yet to really coalesce into a standard the whole world agrees on. For example, Posix has a standards group working on that, while the Open Software Foundation's Distributed Computing Environment is espousing MIT's Kerberos security scheme. And DCE is clearly a de facto standard.

But there are so many compelling reasons to be using open systems today, we are not hesitating. It has meant a lot for us in terms of our ability to deliver distributed services very cost-effectively. When we need software control and version management, we write it ourselves or we hire somebody to build it. You can afford to spend $250,000 doing that if you're saving $10 million to $20 million.

As standard products come to market, we'll probably phase them in over time. A good example is what we're doing with SNA. We had a remote SNA network that we lived with for many years. Well, this year we put in a TCP/IP backbone, so we support both protocols over our network.

Essentially, all the new development is TCP/IP. But that doesn't mean we're going to throw out SNA. If you give us five or six years, however, there probably won't be very many SNA applications left.

One of the things we've been sure to do is set up to standard interfaces. We've defined those and encapsulated their associated functions so that when we finally decide to actually pull [SNA] out, all we will have to do is change those places where we've encapsulated the interfaces.

■ **Mark Foster,** *MIS director at Au Bon Pain, Inc. in Boston*
I'd say the costs are largely in the time you spend integrating products that don't work together seamlessly.

When it comes time to tie everything together, you need this series of [appropriate software] drivers and patchwork software. And sometimes the hardware gets out ahead of specific applications, which aren't thinking about all the little drivers you need to tie it all together.

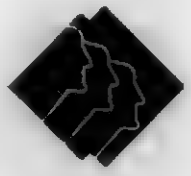
For example, we were kind of excited about [Microsoft Corp.'s] Windows for Workgroups, but the drivers aren't there for Unix-oriented NFS and TCP/IP protocols.

Hidden costs can depend on [the printer compatibility of] your application packages. For instance, we're looking now at purchasing a printer for our network, and it has to be able to handle pretty massive printing.

We're looking at Compaq vs. Hewlett-Packard. Now, Compaq has just won all these awards and has a beautiful machine. They're really on the leading edge and have chosen PostScript as their default graphics format. But we've been putting everything in PCL, and HP does PCL. Also, Compaq doesn't have the drivers for Lotus applications.

■ **Alan Dickman,** *technical staff member at Bell Communications Research, Inc. in Piscataway, N.J.*
With large corporations such as Bellcore, a big cost is participating in the standards-setting process to really suit your needs. There are considerable up-front costs for the big users who want to provide input and have their influence felt. On the back end, you have some assurance it really is solving the problem for you, although the investment is somewhat speculative.

As for unexpected costs, well, administrative costs and training and support have always been expensive. And it's going to get worse as you build more and more distributed applications. But it is for that reason we're making the up-front investments in supporting standards from X/Open, the Open Software Foundation, the Network Management Forum, the Object Management Group and others.



In the "User Voices" column, which will appear at regular intervals in our technical sections, Computerworld shares user opinions solicited at random on a computer-related issue. This week, users spoke out on the hurdles they have faced in migrating to open systems.

■ **John Van Weers,** *information systems manager at PTT Telecom in Groningen, the Netherlands*
System management is really the uncertain factor in moving to open systems. There are also concerns about having full-scale security and remote or distributed management. Those are the real needs.

The interoperability and price/performance really set people up for open systems and are benefits that are realized. What do we do? We write a lot of our own software. And yes, it's expensive.

We are making our own plans for DCE, but the initial costs are very high. DCE is part of the solution but certainly not a complete one. And the accompanying Distributed Management Environment is quite far away.

Responses compiled by senior editor Marytran Johnson. Comments have been edited slightly for clarity.

$77,884,615,605

By the end of this week Computerworld readers will have spent over $77.8 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

*Source: IDG Research Services, Fall 1992

Microsoft's Access: Tale of two audiences

By Jean S. Bozman

Microsoft Corp.'s Access desktop database product, barely out of its shrink-wrapped package, is seen by users and analysts as a product for two audiences: end users who want to create PC local-area network databases and those who want to use it to query corporate database servers.

The distinction is important, analysts said, because Access' on-line Help prompts end users as they create databases, queries and report forms for use on a desktop or a PC LAN. But users need to summon information systems staffers for security clearance before tapping into corporate databases — and they may need help connecting to remote database servers.

Access can be used as a personal database, a shared database on a workgroup LAN for several users or a front end to relational database servers, such as Microsoft's SQL Server for OS/2, Oracle Corp.'s Oracle 7, Sybase, Inc.'s SQL Server and IBM's DB2.

Access' power to query relational databases is real, but users who do not know about the structure of database tables could unwittingly slow a shared database or introduce data errors. "You shouldn't give end users access to live database tables; you should give them data views," cautioned Chris Le Tocq, a senior research analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. Microsoft product managers said some companies may elect to create database extracts so users do not alter critical on-line data.

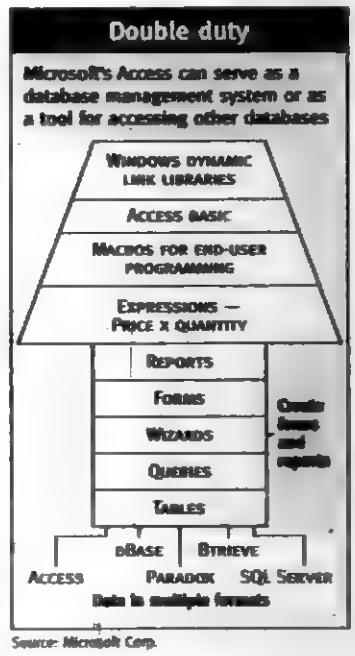
To prevent operational problems when Access is used with corporate databases, some IS managers envision a new kind of teamwork between users and corporate developers. "We will do the application for them," said John Hoffman, a systems designer at NBC's Broadcast Operations group in New York, which runs beta tests of Microsoft products. "As developers who have studied the internals of Access, we can program a script for them, and it becomes another end-user function."

In this teamwork scenario, users design their own screens but work with programmers to create queries against corporate databases. "Perhaps we need to review [the Access application] and make sure it's bulletproof," said Michael Fitzmaurice, MIS director at the National Association of Broadcasters in Washington, D.C., which has a Microsoft SQL Server for OS/2 and a Sybase NetWare Loadable Module (NLM) server in its all-PC shop. "Even seasoned developers make mistakes."

Powerful end-user tools such as Access, Borland International, Inc.'s Paradox and Gupta Corp.'s SQLWindows raise questions about the impact of client/server technology. All are capable of reaching across a network and picking data out of a data center's relational databases. "Regardless of which data access tool you're using, there is going to be some IS manager at the other end who is really ticked off that you want to touch his data," said Donald DePalma, a software analyst at Forrester Research, Inc. in Cambridge, Mass.

Another question is how to use Access in LAN workgroups. Access can read database files from Borland's Paradox and dBase, as well as from Novell, Inc.'s Btrieve database. But to do so, all PC systems hosting those databases must be left up and running even if end users are away from their desks. That could pose security problems, industry analysts said, particularly if log-in passwords are shared.

Microsoft said it is aware that many corporations have concerns about the security of corporate databases. "We have a security subsystem with lots and lots of control," responded Ross Hunter, a Microsoft program manager who ran Access "usability" tests with more than 500 people. But worried IS managers should also realize that Access will help address application backlogs, he said. "Corporate developers no longer have to deal with the fine points of designing reports," he said. "They can throw an application over the wall and allow end users to make their own reports."



Source: Microsoft Corp.

Performance of the Access database and application development environment may be slow if the PC hardware hosting it does not have adequate memory, Hunter cautioned. That is because underpowered machines have to write too many files to disk. He said 4M bytes of main memory is probably too little — 6M or 8M bytes would be better.

Updated releases are likely to follow in 1993, Microsoft said, including more "wizards" to automatically create database reports. Current users will get the upgrades for a small fee.

Access uses an Indexed Sequential Access Method to store data, said Ross Hunter, a Microsoft program manager. But it has relational database features and uses the SQL query language associated with relational databases. Individual Access databases can run up to 1,024M bytes in size.

Microsoft's Access has "wizards" to automatically generate database reports, "macros" to build database queries and "use cards" to prompt users who are building databases for the first time. Programmers can use a variant of Microsoft's Visual Basic or C for fine-tuning.

Bank to test scalable NCR imaging for check processing

By Ellis Booker
CLEVELAND

Like a handful of financial institutions around the country, National City Corp. (NCC) will use an image-enabled proof-of-deposit system in hopes of streamlining its check-processing operations.

What will make the $29 billion bank holding company's experience special will be the use of a scalable, microprocessor-based system. Other high-volume check-imaging systems — notably those from Unisys Corp. and IBM — are mainframe-based.

Last month, NCC announced the trial of NCR Corp.'s Scalable Image Item Processing System (SIIPS) as part of a strategic partnership.

"Our business case has been driven on how we can dramatically reduce our cost structure," explained Jon L. Gorney, senior vice president of information services and operations at NCC.

After installation in the first of NCC's four regional check proofing centers in January, the SIIPS system will automatically scan and read checks and other documents, using specialized high-speed document feeders and character-amount recognition technologies from NCR. The imaging software and associated applications run on NCR's System 3000 family of Unix computers.

Impressive feature

According to Gorney, the scalability of the NCR architecture was the product's most significant element, promising the ability to "size the system based on the volume and type of work we get." This feature also means NCC can start small and not "bet the bank" in a large capital investment that does not pan out.

POD appeal

The following three U.S. banks currently use image proof-of-deposit (POD) in full production. All are Unisys Corp. sites:

- Comerica Bank in Detroit.
- Huntington National Bank in Columbus, Ohio.
- Signet Bank in Richmond, Va.

From a technology standpoint, Gorney said, NCR's character recognition subsystem was key. "Without this, we would not be able to justify [the investment]," said Gorney, who hopes to cut his labor costs in half once the system goes into production.

"Check image capture [in banking] is by no means pervasive," said Ned Miltko, senior vice president at Littlewood, Shain & Co. in Exton, Pa.

Unisys' InfoImage Image Item Processing System was announced in late 1989 and began being deployed at a handful of customer locations late last year. IBM's offering, which comes as an enhancement to its existing item processing system for banks, was made generally available this month.

Nevertheless, Miltko said, announcements by NCR and others of microcomputer-based solutions have put pressure on Unisys and IBM to offer competitive products. Indeed, about 1½ months ago Unisys released an image statement solution for small institutions that uses a PC server.

An IBM banking customer who recently installed IBM's image statements product and is installing IBM's back-office image processing system agreed the NCR architecture had potential for the long term.

"But bottom line, we think we will save more money immediately with IBM because they've gone through the learning curve," said the user, who asked not to be identified. Two years from now, he added, NCR may have an "industrial-strength product" suitable for large institutions.

The user also predicted that in five to 10 years, all vendors will move to distributed bank imaging systems. Such distributed systems will permit the scanning of checks and other documents at the branch offices where they are received. This arrangement is not feasible today, he said, because high-bandwidth networks that carry the image traffic are prohibitively expensive.

NCR and NCC, which announced plans for the SIIPS deployment early last month, made a point of describing it as a test, noting that it would be part of the "NCR Image Technology Validation Program."

E-mail

NCR Corp. has released StarPro Enterprise Messaging, an enterprisewide electronic-mail messaging system.

The Unix-based system supports the X.400 international standard for messaging systems and X.500 for integrated directory services.

StarPro is available in a set of three products: MessageCentral400, the central component, provides the messaging backbone, an Internet gateway (RFC822) and mail boxes; Open Systems Interconnect (OSI)/Transmission Control Protocol (TCP) Connect provides the ability for MessageCentral400 and other OSI applications to exchange messages over a TCP/IP network; and OpenConnect400, which provides the gateway to LAN e-mail packages such as Microsoft Corp.'s Mail, CC:Mail and MHS-based systems.

Prices start $895.

➤*NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Modems

OmniTel, Inc. has announced the Business Card 2496C and the Business Card 2496C+ fax modems.

The2496C and the 2496C+ resemble a credit card in size and shape, and they fit into any PC with a Personal Computer Memory Card International Association Type II slot. Users can send and receive faxes at 9.6K bit/sec. The modems are compatible with the CCITT V.22 bis standard.

The 2496C for MS-DOS costs $349, and it costs $375 for Microsoft Corp.'s Windows. The 2496C+ costs $399 for DOS and $425 for Windows.

➤*OmniTel*
47281 Bayside Pkwy.
Fremont, Calif. 94538
(510) 490-2202

Unix

Pacific Software Group has introduced Version 1.0 of TaskMaster for Unix.

TaskMaster is a visual file manager and personal productivity tool. It has a point-and-shoot interface for controlling system functions and utilities and managing files. Users can build menus and run applications, create backups, find and browse files and directories and control print jobs. The ability to read and send mail and delete and undelete files is also provided.

Personal and group reminders can be scheduled that notify users even when they are not in TaskMaster, the company said.

A 10-user license costs $295. An unlimited user license costs $595.

➤*Pacific Software Group*
4703 Filly Lane
Riverside, Calif. 92509
(909) 681-2623

Demax Software has announced SecureMax 3.0 for the Unix environment.

SecureMax 3.0 is a distributed application that supports centralized security administration of an enterprisewide Unix security environment.

This release has a new console designed for Hewlett-Packard Co.'s HP/UX operating system, which offers users enhanced flexibility in executing security policies across the network.

Prices for Unix clients range from $6,000 to $20,000, while agent prices range from $125 to $1,500.

➤*Demax Software*
Suite 500
900 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Workstations

RDI Computer Corp. has announced the BriteLite LX portable workstation.

Based on Sun Microsystems Computer Corp.'s 50-MHz SPARCengine LX, the BriteLite LX offers an improved memory architecture that enables it to be configured with 16M to 96M bytes of memory, the company reported. BriteLite LX also has a high-capacity hard drive that possesses 450M bytes of internal disk storage. It has a Colorplus Active Matrix LCD display with a palette of 256,000 colors.

The BriteLite LX costs $15,995.

➤*RDI Computer*
6696 Mesa Ridge Road
Building A
San Diego, Calif. 92121
(619) 558-0985

XEROX

To add value to their database, they need to add color to their data.

This major insurance company needed to ensure its position in an increasingly competitive marketplace. That meant making customer service a priority. And that's a priority Chuck Schweitzer and a team from Xerox could help them achieve—with the Xerox 4850 HighLight Color Laser Printer.

As the first production-class duplex laser printer to offer highlight color, the 4850 lets them create documents that communicate more effectively. For instance, they can highlight variable data in Provider Directories so customers can find information they need quickly and easily.

It's a service their customers especially appreciate. And the company appreciates how the 4850 is the most cost-effective way to add color to variable data without incurring the prohibitive costs of offset printing. Not to mention the savings they enjoy by eliminating preprinted stock, reducing warehousing costs, and improving turnaround time.

If putting together results like this would stand out in your business, call 1-800-TEAM-XRX, ext. 6098.

Xerox
The Document Company

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These Routers Won't Let Your Network Down

No Single Point of Failure. Ensure that your network stays up, even if a single component fails, with extensive hardware and software redundancy, as well as fault isolation and recovery capabilities.

Unsurpassed Connectivity and Interoperability. Create one seamless internetwork with support for every major LAN and WAN medium and protocol, including SNA.

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On-line Operational Servicing (Hot Swap). Easily replace any hardware module without taking the router out of service.

On-line Dynamic Reconfiguration. Quickly change any configuration parameter without taking the router off-line or rebooting.

SNMP Node Management. Configure, monitor and control the router from a remote PC or workstation with our windows-based Site Manager. It's as easy as "point and click."

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Investment Protection. Satisfy your growing network needs by adding software and hardware modules to our scalable systems, rather than buying new routers. Our commitment to standards ensures interoperability with other products, now and in the future.

Your company's success depends on how well your enterprise internetwork supports mission-critical applications. You need to keep your internetwork running all day, every day, no matter how much traffic it handles. Regardless of the number and type of protocols it has to support. Regardless of how often you must make configuration changes. And regardless of unexpected malfunctions. That's why your internetwork needs the most technologically advanced routers ever developed -- Wellfleet's Backbone Link and Concentrator Nodes. For more information and a free copy of Wellfleet's Router Evaluator, phone us at **1-800-448-3400, Ext. 509W.** After all, you can't afford to choose a router that lets your network, or your company, down.

When Your Networks Are Complex, Your Choice Is Simple.™

X helps Byer keep pace

By Joanie M. Wexler
SAN FRANCISCO

Clothing maker Byer California is leveraging the graphics-oriented X Window System as its desktop of choice. Its main goal: to keep pace with a whirlwind garment industry that is continually slashing manufacturing turnaround times and producing burgeoning numbers of garments.

The stepped-up nature of Byer's business, which includes a 500% increase over the past five years in the number of garment styles and items made, means the company can no longer create a physical clothing sample for each of the company's eight U.S. show floors where buyers from retail stores select merchandise, explained Michael Higgins, technical support manager at Byer.

So, Byer is using X, a bit-mapped graphics-oriented protocol, to electronically send sharp-quality photographs of a garment "within hours or a day so we can sell directly from the picture," Higgins said. The images travel over a BT North America frame-relay wide-area network.

Byer, a mass producer of moderately priced, American-made clothing, is deploying X terminals from market leader Network Computing Devices, Inc. in Mountain View, Calif., at a pace of about 20 desktops per quarter for the foreseeable future, Higgins said.

To aid in-house operations, Higgins has set up a configuration that merges information from SQL databases with pictures of garments on users' X terminal screens. Oracle Corp. databases on Sequent Computer Systems, Inc. minicomputers house information on garment inventory, colors, fabric types, model numbers and other information. This data pops up on the X screen alongside a scanned-in picture of the item that can include handwritten comments (see diagram).

A 300-byte magnetic optical jukebox stores all the pictures and communicates to the X terminal through a Network File System (NFS) server and database server, which are both Sequent hosts running Unix System V.4. The NFS protocol makes the jukebox appear as a local file system on the database host.

Software called SView from Northern Development Group coordinates which image will be displayed and on which terminal.

The scheme allows salespeople and others "to readily identify a garment," Higgins explained. "Numbers [from a database] don't mean that much."

For example, garment makers view pictures to see if they have included enough buttons, zippers and bows on the item. Merchandising staff take a look when dealing with buyers so they can "talk intelligently about a bigger product set."

In addition, the shipping department can call up the picture and check it against a picking ticket to ensure the correct item is being shipped.

Next up for X deployment at Byer is the accounting department, where accountants will scan in all the backup for invoices and other documents. The use of X will allow workers "to see handwritten notes on a document, such as 'we didn't agree to pay air freight,'" Higgins explained.

Byer, *page 72*

ON SITE

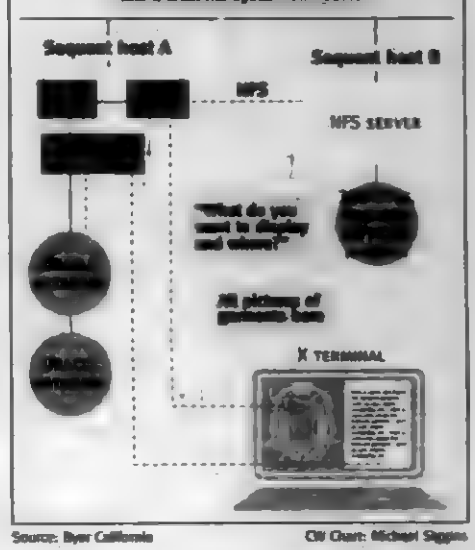
Byer California
San Francisco

Business challenge: To keep pace with quicker turnaround times for larger volumes of garment types and maintain service.

Technology: X terminals, Sequent clusters.

Results: Instead of creating samples for eight U.S. show floors, Byer can sell garments using electronically distributed photos.

Worth a thousand words in Byer



Source: Byer California — CW Chart: Michael Siggins

Tektronix updates display

X terminal interoperability, speed boosted

By Lynda Radosevich
WILSONVILLE, ORE.

■ Tektronix, Inc. last week introduced X Window System terminal hardware and software said to boost interoperability and performance and add support for PEX (Phigs Extension to X) three-dimensional graphics technology.

The company's Version 6.0 software lets system administrators integrate the diskless graphical terminals into Sun Microsystems, Inc., Digital Equipment Corp. and IBM host environments and other platforms. It includes a Sun Optimization Kit aimed at Sun's workstation customers. A separate DEC optimization kit is available as well, according to the company.

X terminal hardware now includes flash memory that lets users store fonts and connectors for ThinNet, ThickNet and twisted-pair Ethernet. List prices for Tektronix's TekXpress line start at $995 for monochrome and $1,995 for color.

Although he has not tried the new Tektronix terminals, Stephen Byers, a senior computer-integrated manufacturing engineer at Cummins Engine Co. in Columbus, Ind., said the Sun Optimization Kit should improve system administration by letting him boot up new terminals more easily.

X terminals are typically used for scientific and engineering applications but are moving into commercial applications such as document imaging in financial services, according to Dataquest, Inc. analyst Jack Roberts.

Benefits cited

Users benefit from the ability to simultaneously run sessions from different hosts in windows. System administrators benefit from central administration and less expense than comparable workstations or PCs.

While providing the graphical capabilities of workstations or high-end PCs, "X terminals don't become obsolete as fast as workstations or PCs because so much functionality is in the software," Roberts said.

Other X terminal vendors include Network Computing Devices, Inc., Hewlett-Packard Co., DEC, IBM, Visual Technologies, Inc., NCR Corp., Human Design Systems, Inc. and Wyse Technology, Inc.

For Cummins, X technology is the answer to the challenges of internetworking with various hosts. The 73-year-old company, which manufactures diesel engines for trucks, plans to replace "thousands" of PCs, Apple Computer, Inc. Macintosh computers, VT terminals and 3270 terminals with diskless X terminals during the next 10 years.

The diskless X terminals allow users to display applications running on the firm's IBM mainframes and Unix-based workstations and other networked host devices.

As part of the transition, the company last January installed 150 X terminals from Tektronix and 50 Unix-based DECstation 5000 workstations on an Ethernet network in a new manufacturing plant in Walesboro, Ind. The X terminals connect users to the workstations, giving them access to graphical office and plant floor applications without supplying expensive workstations to each desktop.

Looking for interoperability

End to standards battle sought

By Elisabeth Horwitt
SILVER SPRING, MD.

Standards-conscious user and vendor groups are starting to take a hard look at a white paper put out by The Gosip Institute that is intended as a basis for discussion about how to bring Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI) into an integrated, interoperable networking standard.

"We tried to describe the most likely path for the two sides to come together," said Dick desJardins, director of the independent institute and principal author of the paper. He added that he wrote the paper "as a polemic for moderates" on both sides of the standards issue to come together "as one community."

Such a rapprochement will come none too soon, given that the TCP/IP-OSI schism is making it increasingly difficult for users in the same industry, company or community to share information and computer resources.

The problem is particularly acute on Internet, the national science, research and government network, because the government mandates migration to OSI, while military and private-sector users are determined to continue using TCP/IP, said Jerry Johnson, a standards analyst for the state of Texas.

The paper was released by the institute this summer and is

Standards, *page 72*

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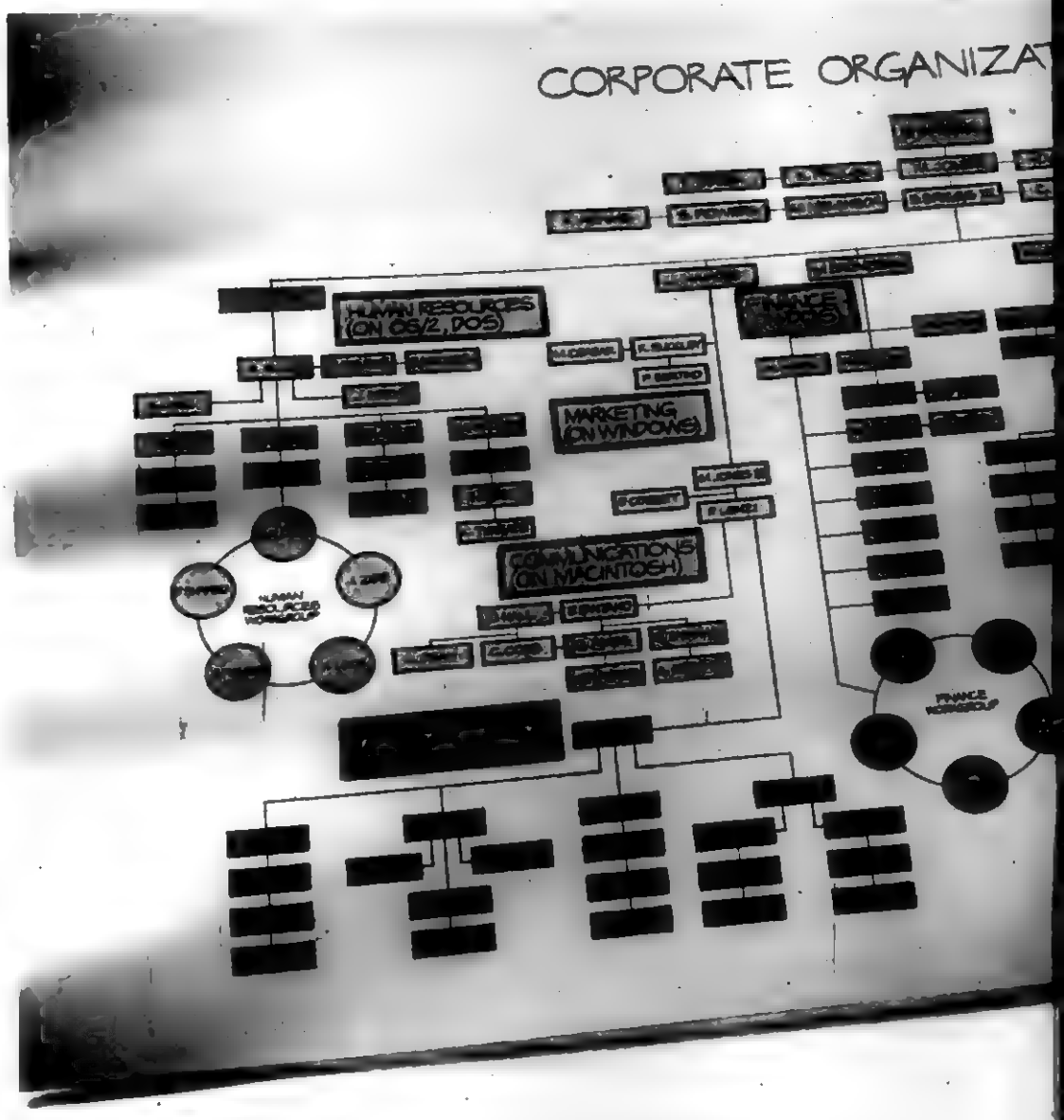

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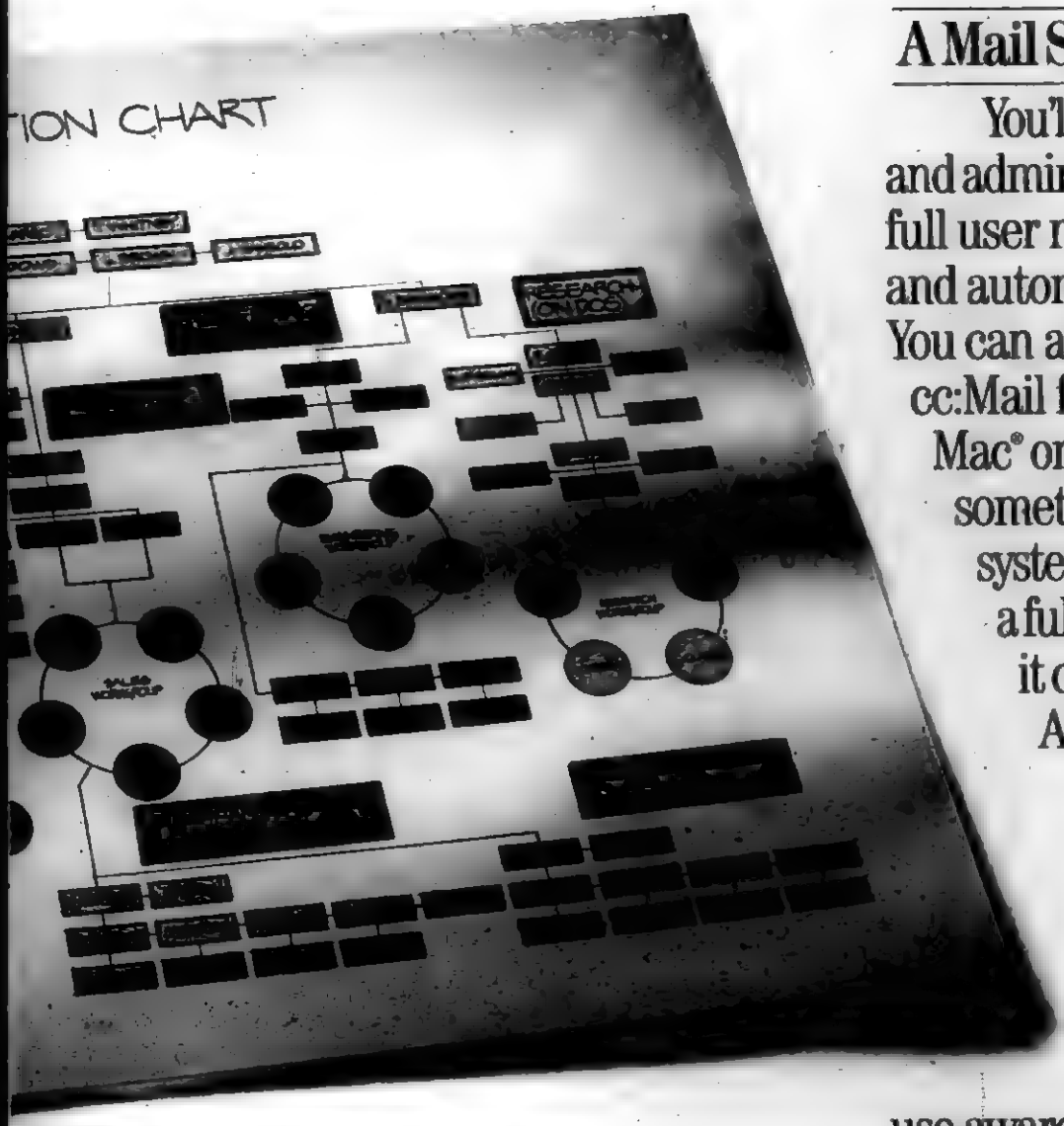

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In Brief

GIS being built

The University of Michigan's Center for Information Technology (CITI) and the Open Software Foundation (OSF) have agreed that CITI will develop an application that demonstrates the capabilities of the OSF's Distributed Computing Environment. The geographic information system application will be based on the university's Geographic Name Service, a database available over Internet that contains facts about geographic areas in the U.S. The new application will include a Motif-based client that will access a variety of databases and provide world map information.

NetWare tool ships

Novell, Inc. is shipping Version 3.0 of NetWare 3270 LAN Workstation for DOS, its IBM 3270 emulation package for DOS workstations. The package, which works with Novell's NetWare for Systems Application Architecture software, is said to provide encryption of DOS-to-host connections and dynamic reconnection to a backup host or server if the primary connection is lost. It is priced at $1,495.

Frame-relay priorities

StrataCom and Cisco Systems, Inc. have announced an enhancement that is said to enable users to assign priorities to different types of frame-relay traffic: for example, give IBM Systems Network Architecture traffic a higher priority than local-area network protocols such as Novell's IPX. The feature is scheduled for availability early in 1993 for Cisco routers and StrataCom IPX switches.

Retix picked

Societe Internationale de Telecommunications Aeronautiques (SITA), the international network service provider for the airline and travel industry, has selected Retix to provide a full suite of Open Systems Interconnect products for SITA's global messaging network, Retix said.

X helps Byer

CONTINUED FROM PAGE 69

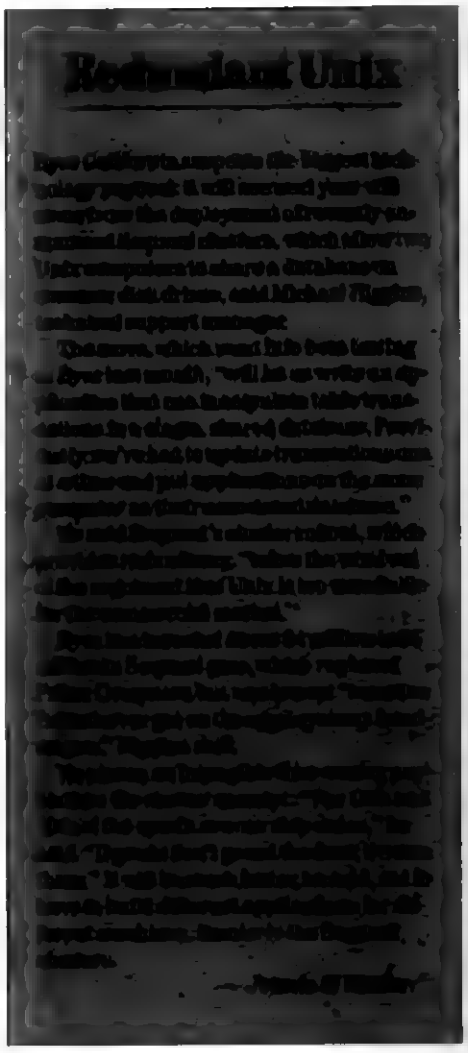
Without X in this scenario, "you can't link the Oracle database with the picture," he said. A customer's history and scanned documents appear simultaneously when queried.

X terminals are the premier desktop at Byer, largely because Higgins has "successfully kept PCs out of the company. We ship garments — not maintain DOS versions and get into operating system wars."

However, a few Apple Computer, Inc. Macintoshes at Byer can participate in the X network via the MacX protocol included in the Macintosh's System 7.0. The Macintoshes are used mainly for spreadsheets and word processing.

Higgins has resisted local-area network operating systems as well. "We can do with Unix anything we could do with a [network operating system]," he said. "And as soon as you deploy a [network operating system], you've restricted your platform choice." For example, he said, if Novell, Inc. NetWare users want to run a product that is not a NetWare Loadable Module, "it's a bummer."

Higgins said he will not deploy a network operating system "until they drag me from here kicking and screaming" because he does not consider them "open."



Software AG ups protocols

By Gary H. Anthes

RESTON, VA.

Software AG of North America, Inc. has announced support for additional communications protocols for its Entire Net-Work software for connecting heterogeneous computing environments.

Entire Net-Work is a "middleware" product that provides transparent communication between otherwise incompatible environments such as LU6.2 linked with Transmission Control Protocol/Internet Protocol (TCP/IP).

New protocols supported include TCP/IP for Unix, VMS and mainframes and support for Novell, Inc. SPX, NetBIOS and Systems Network Architecture (SNA) LU6.2 on OS/2. By the end of the year, Software AG said, the product will also support SNA LU6.2 for Unix, TCP/IP and Novell SPX for Windows, TCP/IP and DECNet for OS/2 and SNA LU6.2 and Wang network for Wang VS.

Entire Net-Work is a transport layer that supports multiple protocols and platforms with a common application programming interface (API). In distributed applications, it transparently intercepts API calls, translates them into the required format and then returns data back to the application regardless of where the program logic and the database are in the network.

Entire Net-Work is priced from $450 to $59,900 per node, with discounts and site licensing available.

End to standards battle sought

CONTINUED FROM PAGE 69

now making the rounds of standards bodies such as the Corporation for Open Systems International and the Open Systems Environment Workshop sponsored by the National Institute of Standards and Technology.

Interest is high among the broad range of users in industries such as power and utility, manufacturing and aerospace, as well as government sectors, which have officially adopted OSI as their future standard but are still using TCP/IP extensively on their networks.

> Interest is high among a broad range of users in the utility, manufacturing and aerospace industries.

"I've been telling state agencies for several months that neither TCP/IP nor OSI is the ideal solution," Johnson said. "Each has its own warts; TCP/IP needs some fixes in [functional] areas; OSI needs to be delivered faster and cheaper."

"I think the Gosip Institute effort is very useful because it puts on the table a concrete proposal that would converge the two worlds in several respects," said Augie Nevolo, chief telecommunications engineer at Pacific Gas & Electric Co. and chairman of the User Alliance for Open Systems.

The paper's centerpiece is the "Internet 2000 Framework," which describes how "anything over anything" interoperability could be achieved for multiprotocol networks. The architecture describes a series of common "interface definitions" that would optimally allow users to mix and match application services, network services and transport protocols.

For example, an application would be able to send a file via the FTP or FTAM file-transfer service, running over the TCP or TP4 transport protocol and the IP or CLNP network service.

Share and share alike

One of the paper's key recommendations is for standards bodies such as the Internet Engineering Task Force (IETF) and the Industry/Government Open Systems Specification (IGOSS) group to share the best features of each standard wherever feasible.

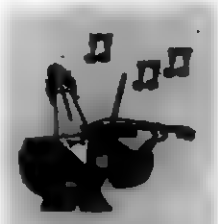
For example, the institute urged that the IETF adopt OSI's Connectionless Network Protocol as a means of remedying some serious limitations in TCP/IP's routing and addressing protocols. IETF has been debating this question for some months now.

The institute further recommended that OSI standards bodies adopt the IETF's more efficient methods of identifying, designing and finalizing new protocols — a suggestion that generated great user enthusiasm.

"In the ISO world, everything is done by consensus over a long period of time, while the IETF and Internet community work from a principle of developing code and proposals, putting them on Internet, getting participation from a variety of folks and quickly moving forward," Nevolo said.

The paper has gone through two iterations so far, desJardins said. A third version, due this month, will "have a lot more comments behind it," garnered from "a much larger group" of vendors and users that have read it in the past couple of months, he added.

"We've got good comments on how the communities can come together," desJardins said. In particular, the upcoming release will focus on the Internet community's current activities to formulate the next generation of TCP/IP, he added.



Vendors tuned in

The Gosip Institute's strategy is similar to the Network Blueprint that IBM has proposed for multivendor networking. In addition, Digital Equipment Corp. is pretty much in tune with the Gosip Institute's framework, having already introduced interoperability and integration of TCP/IP and OSI in its DECnet Phase V release, according to DEC. DEC also supports the Institute's goal of merging the two standards.

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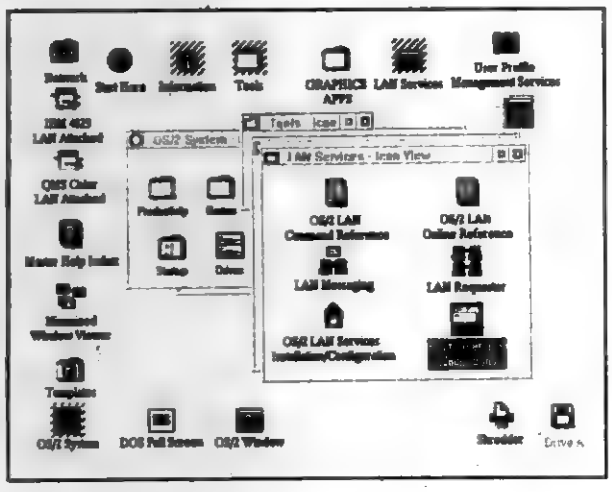

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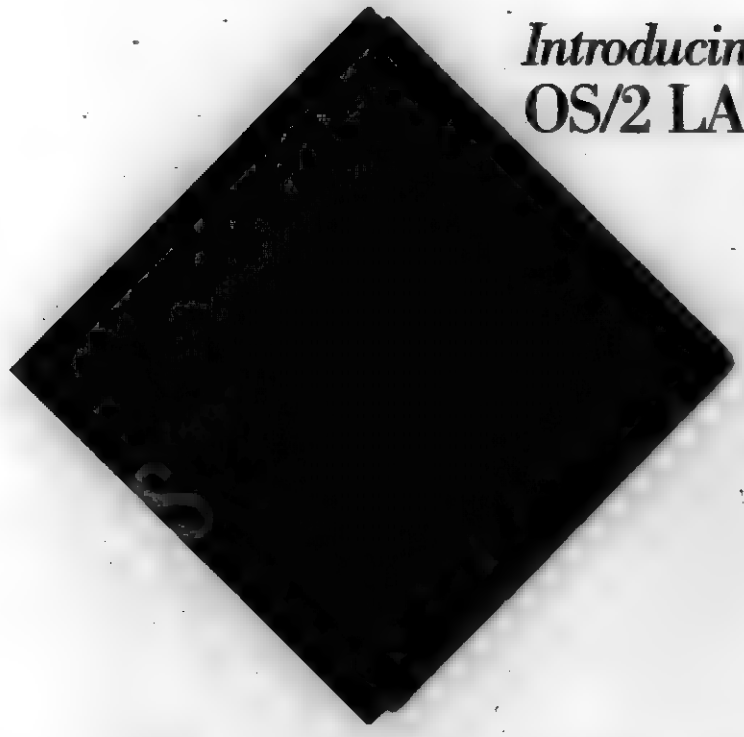

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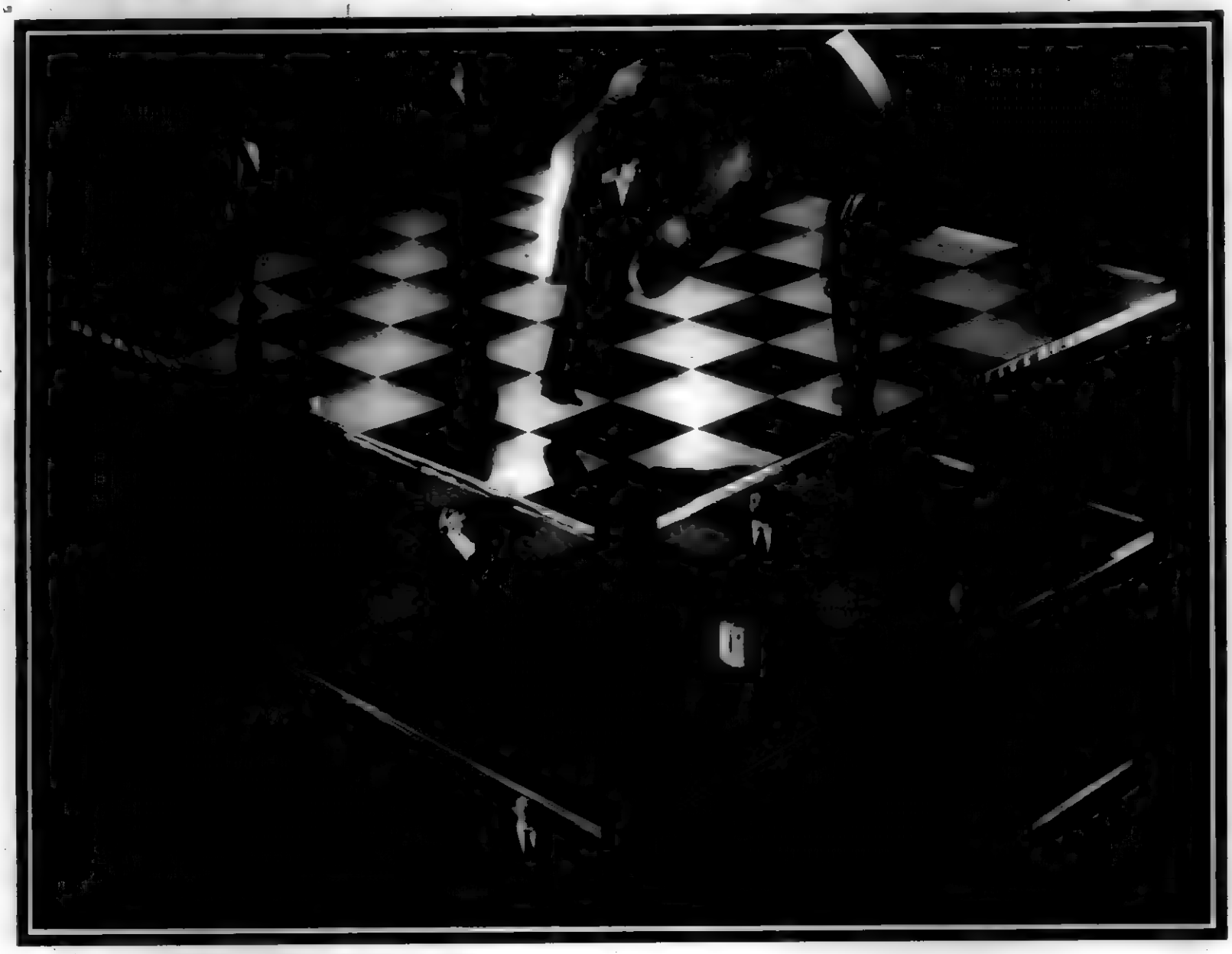

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Outsourcing cutover to Sabre system nears for Alaska Airlines

By Mark Halper
SEATTLE

■ They say changing outsourcers is hard to do, but the information systems folks at Alaska Airlines are confident their forthcoming switch will go smoothly, provided they have enough sharp pencils on April 17.

That is the day Alaska Air plans to cut over its computerized reservation system (CRS) from Electronic Data Systems Corp.'s Shares system — formerly Continental Airline's System One — to AMR Information Services, Inc.'s (AMRIS) Sabre system.

And although the airline expects to have completed a massive software conversion of more than 100 of its own programs by that eventful day, it must wait until the last second to start reloading its constantly changing customer data from EDS' system to AMRIS'.

The "flash cut" data transfer, as Alaska Air calls it, will take from two to eight hours, during which time neither system will be in operation, said Ed White, Alaska Air's assistant vice president of customer service.

So, for those trying few hours — which Alaska Air is scheduling for the lobster shift in the Pacific time zone, when its customer requests are lightest — the airline will rely on a rather archaic technology. "We'll be taking requests on paper," White said.

Alaska Air has not yet determined how it will shuttle data from an EDS data center in Charlotte, N.C., to an AMRIS center in Tulsa, Okla.

"Whether we do it electronically or physically is still up in the air," White noted.

An electronic transmission would accomplish the job faster than would flying tapes from one city to the other. But, White observed, "because of the size of our records, it may not be prudent to do it electronically." The airline keeps more than one million records, he explained.

And, he added, the more rudimentary approach of flying tapes served Alaska Air well once before, after the company acquired Horizon Airlines and had to transfer data from Horizon's system to Alaska Air's.

Heavy load

The cutover day will perhaps be the most ceremonious for the airline, but like a crew preparing for a rocket launch, it has much work to do before lift-off.

Both Alaska Air and AMRIS, for instance, will

Alaska Air, *page 80*

It's all in the name

Fedex, others count on name software

By Gary H. Anthes

When it absolutely, positively has to get there overnight — but it doesn't — Federal Express Corp. faces a daunting systems challenge: how to search through 56 billion bytes of information to find the airbill for John Smith at XYZ Corp. while Smith waits on the telephone.

Federal Express adds 2 million airbills to its files every working day. The generation of the indexes for those airbills and their subsequent use to retrieve information from the gargantuan database is made possible by software from Search Software America, Inc. (SSA) in Old Greenwich, Conn.

SSA's clients — which include AT&T, Visa International, Inc., Government Employees Insurance Co., Kemper Financial Services, Inc., Andersen Consulting and 100 others — are organizations whose operations depend on databases of names and addresses. For these firms, a slow or failed name match can mean a lost sale or an angry customer.

By generating multiple keys for a name, SSA's software can find Robert Jones if you enter Bob Jones, John Smith if you enter Smith John and XYZ Corp. if you enter XYZ, Inc. Furthermore, it adapts and optimizes its algorithms to the user's unique data.

Fedex runs its airbill data through SSA-Name3 to generate multiple 5-byte search keys for each airbill — for sender's name, sender's company, recipient's name and recipient's company. Those numbers become indexes in IBM IMS FastPath files. When doing a query, SSA-Name3 returns to the application keys or ranges of keys representing "search strategies" that tell the application where to look in the database.

If the first attempt does not retrieve the correct entry, the user can successively widen the search window, getting additional lists of possible matches until the desired record is found.

"We had a homegrown program, but we wanted a more robust

Fedex, *page 80*

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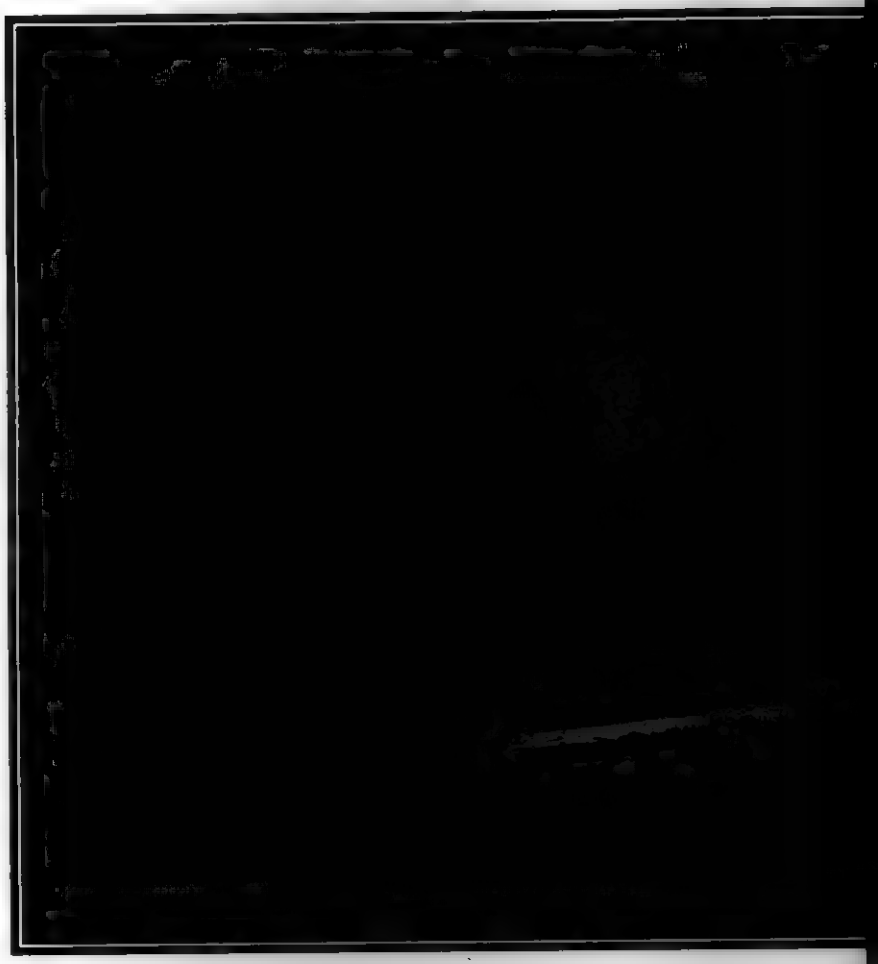

Pick up a paper and you'll no doubt read about another PC company on the brink of collapse. Does it matter? Not much. Unless you're stuck with a computer that's out of commission from a company that's out of business.

In the 80's, it seemed every time you turned around a new computer company opened up. For a while it looked like all you needed was a soldering iron, a toll-free phone number and a P.O. Box to get started.

Those days are over. The market has matured. Customers are demanding more. And clone companies are faced with an ugly reality: the less you know about making computers, the less likely you're going to be successful at it.

Writers in the press and financial analysts on Wall Street are even compiling lists as to which are about to go under. While all of these involve an amount of speculation on the part of their authors, you may be surprised to learn that many of the larger clone companies appear on the majority of them.

It is not a question of whether it will happen. It is only a question of when.

All of which means that choosing the right computer company has

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become every bit as important as choosing the right computer. It is no longer enough to compare price, product specs, service and support and then come to your decision.

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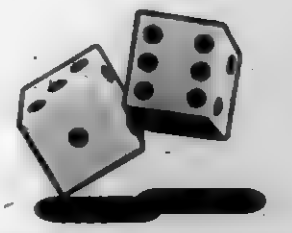

With their current credit and cash flow problems, buying computers from financially vulnerable clone companies has become something of a gamble.

Though this one's on display in our Houston offices, some of the first COMPAQ PCs are still being used. Obviously, our PCs are designed to be around a long time. So is the company.

COMPAQ

Mainframe transition

Unix text editor eases move

By Johanna Ambrosio

Some mainframe shops have discovered a kinder, gentler way to migrate to Unix: give end users a Unix version of their existing mainframe text editor.

The Workstation Group, a vendor in Rosemont, Ill., sells a Unix version of IBM's Interactive System Productivity Facility (ISPF) called uni-SPF. Some 75 customers are using the package, according to Susan Young, vice president of marketing.

The ISPF editor runs on IBM mainframes under the VM and MVS operating systems.

Everybody knows it

L. L. Bean, Inc. in Freeport, Maine, has uni-SPF on a Sun Microsystems, Inc. Model 490, said Jeffrey Newman, an operations support specialist.

"We use it to hide the Unix edit facility for the mainframe programmers," he said. The text editor that comes standard with most Unix systems, vi, "is not user-friendly. Everybody already knows ISPF," Newman added.

Introduced in January 1992, uni-SPF includes full-screen editing, cut-and-paste commands, a split-screen ability, a file browse feature and other utilities. It runs on Sun Microsystems, Inc. Sun 3, Sun 4 and Sun SPARCstations, Domain Series 3000 and 4000 machines and other computers from Hewlett-Packard Co. It also runs under IBM's AIX and Amdahl Corp.'s UTS as well as on other platforms. Prices start at $399.

Warm and fuzzy

Spencer Lauer, senior engineer at Sikorsky Aircraft in Stratford, Conn., said, "ISPF is the editor a lot of our engineers are used to. It's a simple matter of economics to move people off the mainframe and onto Unix workstations, but the standard Unix editors are very confusing to people."

Approximately 20 Sikorsky aircraft design engineers are now using uni-SPF.

Ray Evans, lead programmer/analyst at Union Oil of California (Unocal) in Brea, Calif., said uni-SPF includes "most of the features" found in ISPF but that some special features, such as text flow, are not yet part of the product.

"There are some differences," Evans said, "but the way it looks and feels works pretty much like the mainframe version. It's a real time-saver in getting people up and running on Unix."

Some 20 Unocal engineers are using uni-SPF on an IBM RISC System/6000.

Some 95% of all IBM or plug-compatible mainframe shops have ISPF, a mainframe text editor that runs under VM or MVS, according to Computer Intelligence in La Jolla, Calif.

Unisys extends its 2200 mainframe series

By Thomas Hoffman

BLUEBELL, PA.

Unisys Corp. recently extended the high end of its 2200/900 series mainframe computers by adding six- and eight-processor models.

Introduced in September 1991, the original high-end 2200/900 machine was a four-processor model.

The new eight-processor model expands the Unisys Extended Transaction Capacity system to 32 processors. Extended Transaction Capacity permits the coupling of up to four multiprocessor hosts.

No changes were made to the OS/1100 operating system software.

The six-processor model is priced starting at $19 million. The eight-processor machine is listed starting at $25 million. Both systems will be available in the second quarter of 1993.

At Fedex, it's all in the name

CONTINUED FROM PAGE 77

searching mechanism," said Dave Lorrig, database adviser at Fedex.

He said Fedex has used the self-optimizing algorithms in SSA-Name3 to fine-tune searches for international addresses. Fedex has also instructed the software to ignore common but useless words such as "mailroom" in addresses and to weigh the left-hand portion of company names most heavily but give the greatest weight to the right-hand portion when a person's name is being sought.

According to Geoffrey Holloway, SSA president, commonly used name-search algorithms — many based on principles laid out in 1916 — are flawed. "An exact match is what everyone thinks they want, but if you have two records on file and one is an exact match and one is very similar, which one do you want?" A single keying error may leave the correct entry unfound, he said.

"If you're in a business where not matching the record doesn't matter too much, OK. But if you are about to release a prisoner, it's not too good if you don't find the outstanding warrant," Holloway added.

The National Insurance Crime Bureau in Palos Hills, Ill., used to go at its database with a self-developed algorithm but now accesses the 22-million-record DB2 database with SSA-Name3. "Now, not only are we getting more exact matches, we are getting variations that are similar," said Al Krasich, a senior programmer.

Richard Hon, director of data processing at the Georgia Department of Revenue, said the state tax agency once relied on homegrown search algorithms. "They were not very good, and we were constantly struggling with all the exceptions," he said.

SSA-Name3, installed two years ago, has improved performance and search quality by "orders of magnitude."

In addition to helping process, for example, a check with an address but no taxpayer identification number and no legible name, the software has enabled the state to do things that were simply not possible before. For example, it can link the records for a person's business income tax, the sales tax from his business and the withholding tax for his employees, all of which are kept in separate systems that were difficult to cross-reference because of name and address variations.

"Now we can say, 'You are one and the same, and we are not going to give you an individual income tax refund because you still owe sales tax,'" Hon said. "In the old system, we'd have been sending out a refund check at the same time an agent was out there padlocking his business."

SSA-Name3 for a midsize IBM mainframe sells for $48,000. SSA-Extensions, a set of tools that, among other things, "scores" records to make humanlike judgments about the probabilities of correct matches, sells for $18,000.

In Brief

HP ups staff

Hewlett-Packard Co. continues to beef up its support and service operations. The firm last week disclosed that it has added about 150 staffers to its professional services group since August and that it plans to add another 150. The company has also begun offering its salesmen commissions and quotas on service sales. All this follows a reorganization last August in which the firm elevated the Worldwide Customer Support group to directly report to the chief executive office.

Net connections

Network Systems Corp. and Storage Technology Corp. said last week they had agreed to jointly develop connections between distributed networks and mainframe storage systems, such as Storage Tek's tape libraries. The products, to be jointly marketed, will allow different computers to share data. The firms said the alliance would generate $50 million in revenue in the next three years.

Alaska Air outsourcing cutover nears

CONTINUED FROM PAGE 77

be busy converting and modifying their own software so that their programs can talk together.

Furthermore, the company is retrofitting its reservations and cargos with 1,800 new terminals designed for Sabre. The terminals will replace the asynchronous terminals in place for the EDS system. The company will also have to send some 3,000 users for at least a week of training on the new system.

In case all is not ready by April 17, EDS has agreed to stay on for an extra couple of weeks, until April 30.

"It's a little fudge factor, in case we need the cushion," White explained.

Alaska Air's Ed White *has been reviewing CRSs for nine years*

Watching options

The decision to change reservation systems comes after years of constant review of performance and functionality.

Alaska has been using Shares and its predecessor systems — System One and Mutual Computing Services — since 1973, through a series of long-term and short-term contracts, White said. EDS recently took over System One from Continental.

As a matter of sound business practice, Alaska Air has habitually evaluated other CRSs for comparative functionality and cost-effectiveness.

"We've been in the process of reviewing alternatives for the last nine years," White said. "It's been a lifetime project for me. It's not an easy subject to get familiar with. It's not quite as simple as comparing a 1-2-3 spreadsheet with an Excel spreadsheet."

White said the company has been satisfied with the EDS relationship but that three features AMRIS recently added to Sabre convinced Alaska Air it was time to part ways with the system the airline had been using in one form or another for almost two decades:

- Sabre can now automatically handle double posting of flights, a technique common at Alaska Air in which the airline uses two flight numbers for the same flight.
- Sabre requires fewer keystrokes than Shares, cutting down on time and thereby saving money.
- Sabre includes more on-line documentation than Shares.

Alaska Air made its decision to jump to AMRIS in October [CW, Oct. 26].

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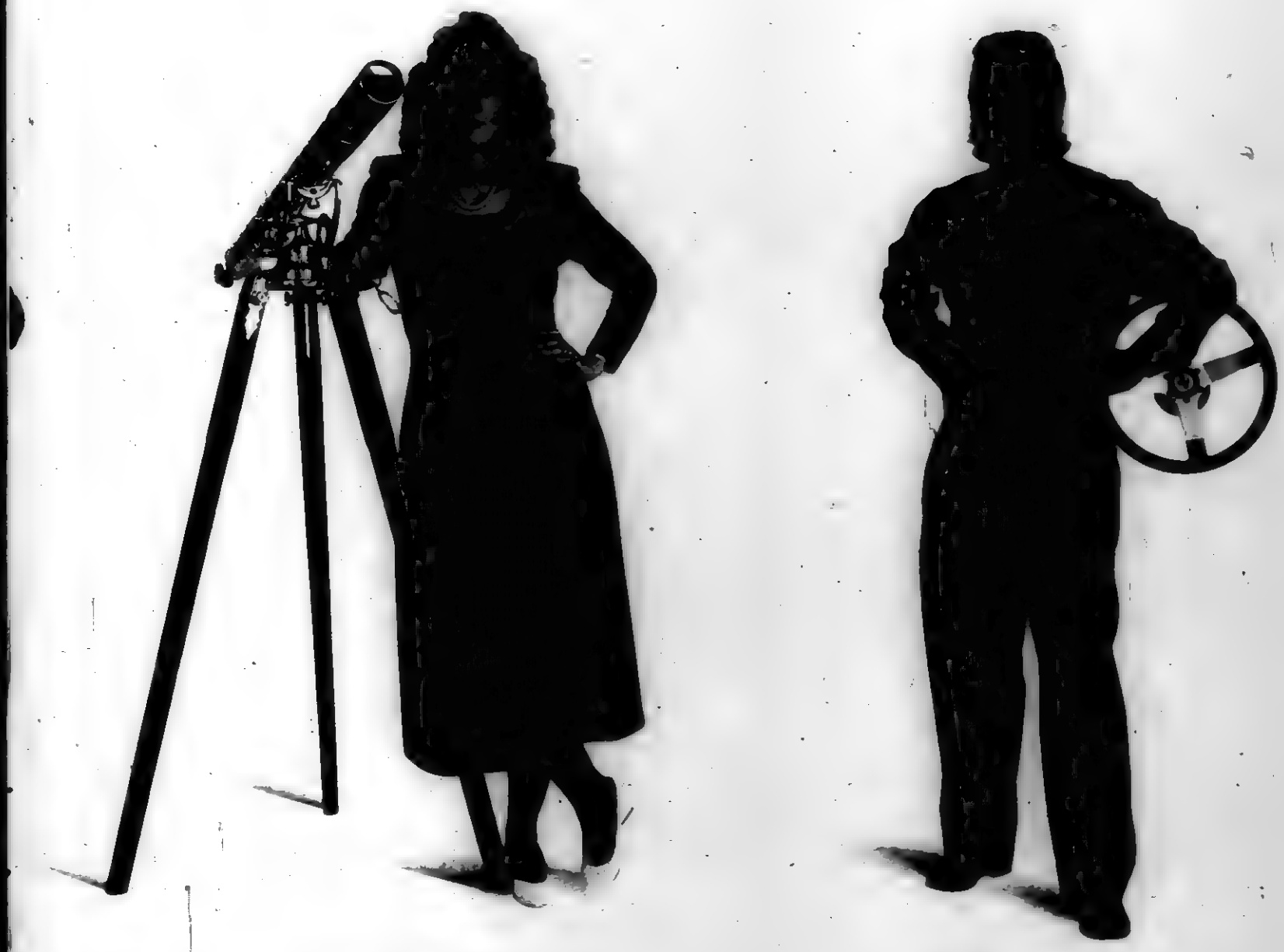

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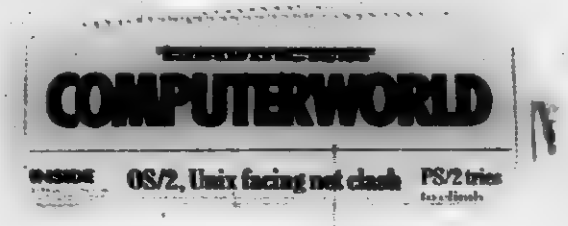


The Newspaper of IS

Mainframe storage devices

Buyers' Scorecard: HDS and EMC head mainframe storage list

By Derek Slater

The conventional and the unconventional finished in a dead heat in the Buyers' Scorecard on mainframe storage devices.

Hitachi Data Systems Corp.'s standard 7390 direct-access storage device (DASD) and EMC Corp.'s Symmetrix disk array technology ran neck and neck, finishing in a tie for first place in overall user satisfaction, with 91 points apiece. Amdahl Corp.'s 6390 and IBM's 3390 followed, with 83 points each.

The HDS, Amdahl and IBM products offer roughly comparable characteristics, at least on paper, according to analysts.

"They tend to be similar; otherwise they wouldn't be competitive," said Robert Katzive, an analyst at Disk/Trend, Inc.

However, HDS users gave their product distinguished ratings in a number of areas, including reliability and cost of acquisition and maintenance. In verbatim responses, users lauded HDS equipment for its IBM compatibility, but they also said HDS sometimes lags behind its DASD competitors in offering advanced features.

EMC's Symmetrix products are based on small form-factor disk drives integrated with a large memory cache. Most of the EMC respondents reported using models in the Symmetrix 4800 line, which was introduced in January 1992. Symmetrix scored well in reliability and compatibility. It also earned the highest marks in floor space requirements and ease of expansion.

EMC recently announced a new Symmetrix product, the 5500, which offers greater capacity of up to 240G bytes. The 5500 also emulates IBM's 3390 and provides native support for IBM's Escon channels, which was mentioned on the wish lists of Symmetrix 4800 users.

Amdahl's users pointed to their product's reliability and price as key selling points. The 6390 also offers more configuration options than its competitors. But it received low marks in several areas, including efficiency of environmental controls and ease of operation.

Pricing issues were the Achilles' heel of IBM's 3390. Users rated it well below its competitors in both cost per megabyte of storage and cost of acquisition and maintenance. However, with the exception of a few problems with 3390 Model 2 units, users said the 3390 is a reliable system.

Users indicated that higher capacity is the most desired improvement for current DASD systems. Improved caching was also frequently cited: 86% of the respondents said they rely on caching features to maximize system performance. Better manageability, flexibility and performance were other features DASD users said they would like to see.

Some DASD users noted they are keeping a watchful eye on forthcoming redundant arrays of inexpensive disks (RAID) technology.

Of the IBM, HDS and Amdahl respondents, 42% said they plan to consider replacing DASD systems with RAID products such as Storage Technology Corp.'s long-awaited Iceberg. Storage Tek's product is expected to offer a high level of redundancy, coupled with a low cost per megabyte of storage.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their mainframe DASD products in 13 categories.

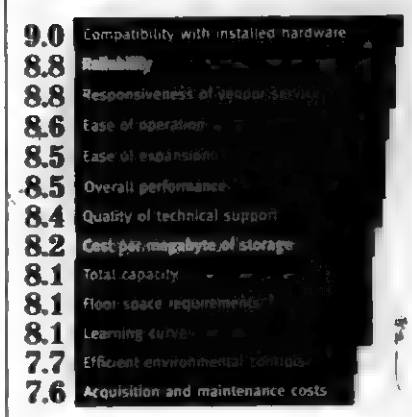
Users also rated the importance of each category. All categories were factored into the final scores. (See the methodology on the following page for a complete description of the scoring process.) •

Big Blue lead

IBM holds a whopping 85% share of installed DASD systems, according to Computer Intelligence. HDS accounts for a 6% market share, followed by Amdahl with 4% and Storage Tek with 3%. The remaining 2% share is held by various other companies. Computer Intelligence estimated the total U.S. installed DASD capacity to be in excess of 1.2 petabytes, or 1.2 million gigabytes.

Amdahl's 6390

RESPONSE BASE: 26 USERS



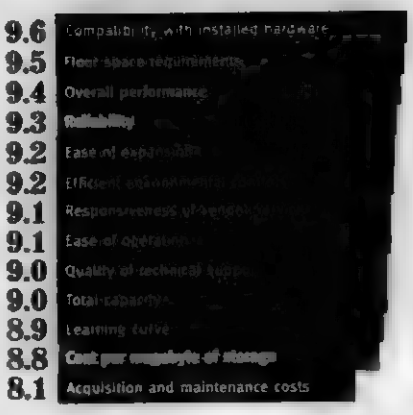
LIKES: "It's very reliable and cost-effective."

DISLIKES: "It lags behind others in technical features at the controller level."

Would you buy the product again?

EMC's Symmetrix

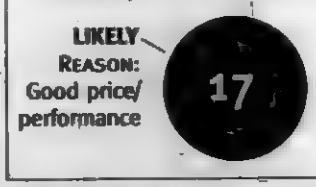
RESPONSE BASE: 17 USERS



LIKES: "We like its speed and minimal floor space requirements."

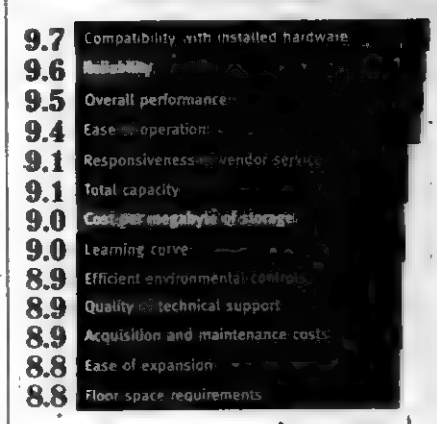
DISLIKES: "It doesn't work well with some software."

Would you buy the product again?



HDS' 7390

RESPONSE BASE: 30 USERS



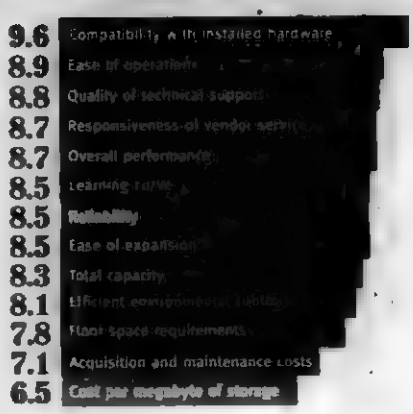
LIKES: "It's very reliable and has a good price/performance ratio."

DISLIKES: "They need to keep up with IBM's upgrades."

Would you buy the product again?

IBM's 3390

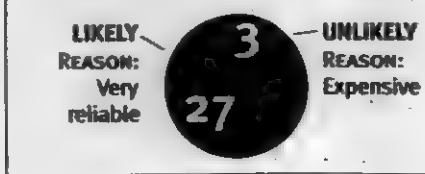
RESPONSE BASE: 30 USERS



LIKES: "The 3390 is reliable, and they've increased the speed."

DISLIKES: "They use more power in cooling down, and the cost is a little high."

Would you buy the product again?



Mainframe storage devices

Mainframe storage products

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users each for IBM's 3390 and HDS' 7390; 26 users for Amdahl's 6390; and 17 users for EMC's Symmetrix.

MEAN SCORE **87** TOTAL POSSIBLE SCORE **100**

Product	1991 score	1992 score
Hitachi Data Systems' 7390	86	91
EMC's Symmetrix	NR*	91
Amdahl's 6390	88*	83
IBM's 3390	80	83

* EMC's Symmetrix and Amdahl's 6390 were not rated in 1991. Amdahl's older 6380 product received a rating of 88 in last year's survey.

DASD advances continue

DASDs are nothing new, but DASD vendors are putting energy into staying on top of the market. Amdahl Corp., IBM and Hitachi Data Systems Corp. all announced new storage modules and products in 1992 to increase the flexibility and capacity of their DASD offerings.

Amdahl jumped out in front in January of last year with the release of new, higher-capacity drives for its 6390 systems. Users can fill each 6390 unit with up to 16 drives in either 1.9G- or newer 2.8G-byte capacities. IBM's Model 1, Model 2 and Model 3 3390s were released in 1992 as well through IBM's AdStar unit. The 3390 models use 5¼-in. drives.

In 1993, DASD products will face increasingly stiff competition from disk arrays. Redundant arrays of inexpensive disks (RAID) systems comprise a controller and several small form-factor disk drives; the controller distributes or "stripes" data across the drives. Since the system can write data to several drives concurrently, RAID can offer performance advantages over single-drive systems in some environments.

Several RAID levels also involve storing parity information that helps reconstruct missing data in the event of a crash. EMC's Symmetrix high-end 5500 announcement at the end of 1992 added new levels of redundancy and native Escon connectivity to the Symmetrix line. In 1993, the company plans to add Escon support for its older 4800 models and expand their capacity to 90G bytes.

Storage Technology Corp.'s Iceberg will offer enhanced RAID Level 5 capabilities, with data striping, parity and compression. Iceberg's 32 channels will enable it to handle storage duties for four host systems simultaneously. The final ship date for Iceberg remains uncertain. Analysts said they expect the system to enter field-testing sometime around April 1993.

Ratings in order of importance

Users said reliability is the key requirement for mainframe storage systems, followed in importance by compatibility and responsiveness of vendor service

IMPORTANCE RATING	
9.5	Reliability
9.3	Compatibility with installed hardware
9.2	Responsiveness of vendor service
9.1	Overall performance
8.5	Quality of technical support
8.4	Acquisition and maintenance costs
8.4	Total capacity
8.4	Cost per megabyte of storage
8.4	Ease of operation
8.2	Ease of expansion
8.0	Efficient environmental requirements
7.9	Floor space requirements
7.9	Learning curve

Selected specs

DASD products offer similar capacities, while pricing varies widely depending on configuration

Product	Capacity	Data transfer rate	Average seek time	Sample pricing
HDS 7390	90G bytes per string	4.2M bit/sec.	8.5-12.5 msec	$155,450 for 11.3G-byte 7390-3 A model
EMC Symmetrix 4800	6oG bytes	4.5M bit/sec.	NA*	Starts at $310,000 for 10G-byte model
Amdahl 6390	90G bytes per string	4.5M bit/sec.	11.5 msec	$128,700 for a low-end 7.6G-byte unit
IBM 3390	90G bytes per string	4.2M bit/sec.	17-22 msec	Starts at $201,800 for 3390-3 A model

*NA: Not applicable. A single Symmetrix 4800 unit contains multiple drive types and up to 3G bytes of cache.

Vital statistics

Profile of users who rated these products
RESPONSE BASE: 103

What is your position?	
CIO/VP/IS director	19
IS manager	19
Operations manager	16
Systems analyst	10
Other	39

How long have you been using this product?	
More than two years	50
One to two years	30
Less than one year	23

What is your responsibility for mainframe storage devices? (multiple responses permitted)	
Evaluate or recommend vendors	80
Set standards for your organization	74
Determine need	59
Approve or authorize purchase	48

BUYERS' SCORECARD METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent data collection company in Austin, Texas, conducted the survey and tabulated the results.

The response base was 30 users each for IBM's 3390 and Hitachi Data Systems Corp.'s HDS 7390, 27 users for Amdahl Corp.'s 6390 and 16 users for EMC Corp.'s Symmetrix.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Buyers' Scorecard.

To compute the overall score for each product, perform the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

Round off numbers where necessary.

Computerworld thanks the following for their assistance in preparing this Buyers' Scorecard: Robert Katzive, Disk/Trend, Inc.; CW Database Division; and Bob Abraham, Freeman Associates.

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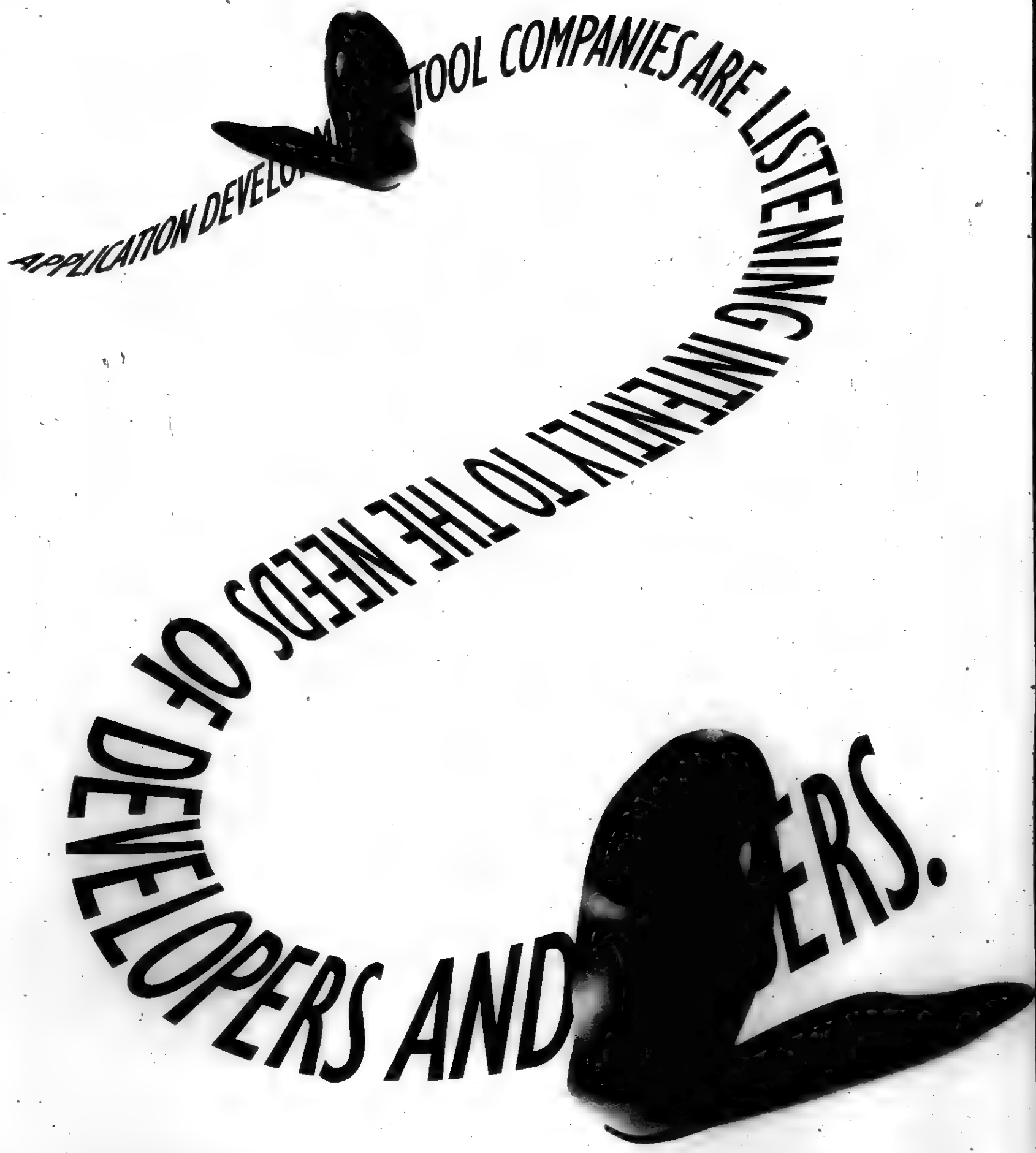
IBM



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Encompass keeps on globally trackin'

By Garry Ray

In 1989, AMR Corp. and CSX Corp., two powerhouses in the global transportation industry, teamed up with an ambitious goal. The companies, with combined revenue of more than $16 billion, decided to apply their formidable resources to the problem of global shipping logistics and planning.

AMR, the parent company of American Airlines, had already tackled such problems with its Sabre flight reservations system. Sabre has been so successful that its fiscal 1991 net profits exceeded $135 million, significantly more than the airline it supports. CSX, with 1991 revenue of $8 billion, is one of the world's largest land, ocean and rail shippers.

The partners launched their joint Global Logistics Venture secretly about three years ago. Known since its April unveiling as Encompass, the Cary, N.C.-based partnership has devised a client/server software system, also called Encompass, that has one overriding goal, according to Jim Schwab, director of product management.

Calling the concept "in-transit inventory management," Schwab said Encompass will provide manufacturers with "the status of their inventory-in-motion from the time they put it on a purchase order until the time it arrives at its destination." Currently, "when goods leave the dock, they go into a transit black hole," he noted.

To solve that problem, Encompass faced the challenge of linking manufacturers, shippers and third parties such as freight forwarders in a global tracking system. That drove the move to a client/server architecture with the ability to rapidly port the applications and system software to a variety of platforms.

Even though all transportation parties need to communicate, "shippers wanted to control their own data on-site," said David Cunningham, vice president of sales and marketing. "We provide [application] software, which he can control. We also wanted to provide security and control of data."

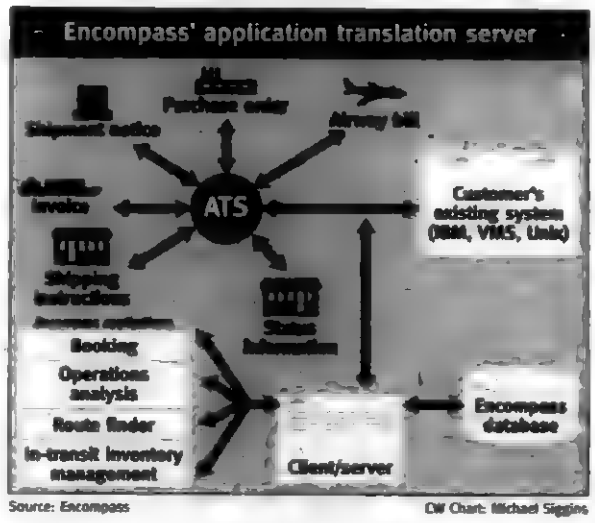
To tackle the issue of applications portability, Encompass wrote its five major application modules using products from Uniface Corp. in Alameda, Calif., according to Rick Pott, senior vice president of development and operations.

The Encompass development effort, which began little more than a year ago, required about 70 staff programmers and another 20 based at various third-party software providers. Nearly one-quarter of the staff programmers were dedicated to applications programming using Uniface, with the remainder working on communications, database and systems software.

Programmer/analyst Ric Peller said the early selection of Uniface tools had reduced Encompass' overall development time by about one-third. "If we chose ANSI C and an interface [building] tool, it would have tripled the programming time," he said. "It was important to the company to get to market as soon as possible."

An early evaluation of Uniface included the Smalltalk language, but "we just needed something to compare Uniface with. That's what people knew about," Peller said.

Although development continues in the Cary, N.C., facility on a Digital Equipment Corp. VAX 6510 cluster, Encompass was designed to accommodate client and server platforms. The first server implementation, which Pott said is being tested by Procter & Gamble Co. and DEC, uses Sybase, Inc.'s Sybase running on DEC's VMS operating system.



Source: Encompass

CW Chart: Michael Siggins

Training biggest obstacle in client/server move, survey says

By Gary H. Anthes

■ Companies spend $1.7 million, on average, for their first high-end client/server application, according to a survey of Fortune 1,000 firms by Forrester Research, Inc., a market research firm in Cambridge, Mass.

Those companies find that mastering client/server technology is not as hard as the training issues, with three-quarters of information systems professionals in large companies lacking the basic skills needed to move to client/server. According to Forrester, the companies spent $800,000, on average, to retrain their people, with onetime out-of-pocket costs per person likely to run $12,000 to $15,000 and yearly education costs between $1,500 and $2,500 per head.

"The main obstacle isn't technology," an IS manager at a petroleum refining company said. "Training, personnel and politics are a far larger challenge. As a result, we spent $4 million on training."

Forrester defines a "high-end" client/server system as one that directly impacts the financial state of a company, has 100 or more users and spans multiple sites.

Forrester said that because client/server technology is immature, the cost of developing applications will remain high for some time. "Costs will begin to fall in 1994 as a lot of holes get filled in," said John C. McCarthy, director of computer strategy research at Forrester. "In the age of diminishing budgets, this will be a bitter pill to swallow."

Companies surveyed by Forrester seemed to agree. An official at a scientific equipment company said, "LAN bigots say that the client/server world is cheap. Wrong. The initial price tag is quite a shock, but spread across five years, it doesn't look so bad."

McCarthy warned that companies attempting to do everything they are doing today plus move to client/server can expect to see their IS expenditures swell from 2% or 3% of sales to as much as 5%.

The report said companies preparing for client/server must structure their IS staffs into three components:

•Line MIS — groups of business-savvy developers and support people deployed in each business unit.

People problems

Training and support dominate the list of problems cited by managers with client/server systems

Number of respondents in large firms with major client/server projects (Base: 25; multiple responses allowed)

Retraining IS	20
Training end users	15
Supporting multiple vendors	14
Immature tools	12
Server crashes	5
Database connection failures	3

Source: Forrester Research, Inc.

•Central MIS — audits Line MIS to enforce corporate standards for quality, security and interoperability.

•Outsourcing providers — increasingly will get the legacy systems and non-mission-critical systems.

"Companies scrambling to find room in the budget for client/server are going to outsourcing just to free up resources," McCarthy said. "But they are also doing it to show their IS organizations they are serious about this new technology. They are saying, 'You better learn it or get out.'"

McCarthy added that users will bear a new responsibility for justifying their systems. "Because a lot of stuff is being moved out to the business departments, users will have to prove bottom-line benefit from client/server rather than just praying to the gods at the glass house."

And users had better be prepared for some service-quality sacrifices. "Mainframe uptime and reliability are definitely something you forego," said an official at an industrial equipment company. The official's IBM RISC System/6000 server "has been down twice a week vs. twice a year with the mainframe. Also, AIX has backup and security problems that IBM must make bulletproof."

Canadian Airlines International Found A Strong CASE For Managing Change.

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Richard Nelson
Director of Operations
Canadian Technology Services
Canadian Airlines International Ltd.

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1-800-336-5236.

TEXAS INSTRUMENTS

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[redacted]

Application development tools

Slate Corp. has started shipping Version 1.0 of PenApps Application Builder for Microsoft Corp.'s Windows for Pen Computing.

The product is a visual development tool that creates forms-based and data-intensive applications for pen-based computer platforms. A screen/forms designer, a built-in database and the Slate PenBasic programming language are included in the integrated package. According to the company, the product is the only visual development tool that lets users automatically build unique pen-centric features, such as ink as a data type, markup mode, deferred translation and sketch fields, into every application. PenApps is also available for Go Corp.'s PenPoint operating system.

PenApps costs $995.

➤*Slate*
15035 N. 73rd St.
Scottsdale, Ariz. 85260
(602) 443-7322

Eden Systems Corp. has released Version 2.3 of ES RE/Vision, a Cobol measurement and re-engineering tool.

Version 2.3 has been integrated with Cobol/II conversion capabilities and comprises the company's Q/Auditor and Q/Artisan tools. Q/Auditor has the ability to determine a variety of critical OS Cobol constructs that are not supported by Cobol/II, such as ON statements and Report Writer language items. Q/Artisan can automate much of the Cobol/II conversion. Replacing Examine statements with Inspect statements and removing invalid File-Control clauses such as File-Limit and Processing Mode are among the new rules designed to convert OS Cobol constructs not supported by Cobol/II.

Prices start at $9,995.

➤*Eden Systems*
Suite 201
14950 Greyhound Court
Carmel, Ind. 46032
(317) 848-9600

Languages

Manguistics, Inc. has announced Version 5.0 of APL Plus II, an APL system.

APL is a programming language that lets users process arrays of numeric or character data for scientific and business applications. Version 5.0 enables users to build applications in Microsoft Corp.'s Windows and DOS environments. Key features include an APL Graphical User Interface tool kit of object-oriented utilities, the APL Plus II Debugger, Windows interface enhancements with Dynamic Data Exchange and new primitive functions designed to increase compatibility between APL Plus II and IBM's APL2.

The product costs $1,700.

➤*Manguistics*
2115 E. Jefferson St.
Rockville, Md. 20852
(301) 984-5000

Compilers

Microware Systems Corp. has introduced the Ultra C ANSI-compatible compiler.

According to the company, the product is the only C compiler from a real-time operating system vendor and the only compiler that addresses time-critical response in real-time applications. Algorithms can be optimized for real-time operations, and the product has the ability to transport C programs among existing and future Motorola, Inc. and Intel Corp. processors. Ultra C's compilation is divided into four major processes: a front-end language processor, a target processor back end, the assembly and linking function and the optimization and linking function.

The product costs $1,250.

➤*Microware Systems*
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Des Moines, Iowa 50325
(515) 224-1929

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FILES with faces

Applaud Squad: *Team members Mitch Zoellner, director of implementation and support; Ianne McCrea, vice president of the strategic banking system; Kris Littell, senior product consultant; and Bob Barrett, president of Banc Once Ser vices Corp.*

A revolutionary new approach that personalizes customer records and products helps Banc One Corp. win *Computerworld*'s first annual "Excellence in Re-engineering" award.

By Mitch Betts

THERE'S A DIRTY LITTLE SECRET in the banking industry: Most banks have no way of knowing if a business tycoon such as Donald Trump is overextended on credit. That's because they lack the integrated information systems that could draw a complete picture of the tycoon's multiple accounts.

In fact, consultants say most banks know little at all about their customers; records are scattered among the separate computer systems that handle different kinds of banking transactions, such as car loans and savings accounts.

Banc One Corp. — a Columbus, Ohio-based banking conglomerate known for its big appetite for acquisitions and technology — is changing all that. The nation's 12th largest bank is replacing 17 fragmented systems with an integrated system that company officials say will give bankers a complete profile of their customers.

In business terms, that means more cross-selling, highly targeted marketing campaigns and the speedy rollout of new services tailored to individual customers.

It is a massive undertaking that exploits the power of distributed processing to revolutionize the way banking is done. This is why *Computerworld* has named Banc One winner of the first annual "Excellence in Re-Engineering" award. Our editors were impressed by several aspects of Banc One's business transformation:

- The Strategic Banking System, a huge software development project begun in 1986, handles transaction processing and acts as the central repository for all customer data. The mainframe-based system, with 10 million lines of code, reportedly cost more than $100 million. It has been installed in 23 branches so far and will be deployed to hundreds more starting next year.
- The Branch Automation System is an innovative, networked PC system used at the local level for customer service and as a front-end interface to the Strategic Banking System. So far, portions of the system have been implemented at 180 branches.
- The new systems are already showing benefits. The accuracy of basic customer data is up 25% to 50%, thanks to edit checks and the end of data redundancy, while the instances of cross-selling multiple financial products to a customer are up 15% to 20%.
- In a classic case of business process re-engineering, a subsidiary, Banc One Mortgage Corp. in Indianapolis, is moving from an assembly-line approach to a "work cell" approach to speed up mortgage processing (see story page 95). Banc One is coming off its most profitable year ever — net earnings were up 25% in 1991 — and analysts say the bank's technology strategy is an important part of that success. In the financial services industry, Banc One ranked No. 1 in a survey of its peers and consultants in the *Computerworld Premier 100* [CW, Sept. 14].

To appreciate Banc One's achievement, one must recognize that its strategy for the Strategic Banking System reversed decades of

Banc One, *page 94*

About the award

Computerworld's first annual Excellence in Re-engineering award recognizes an organization's outstanding use of information technology to improve business processes or dramatically transform the way it does business. This year's winner was selected by a panel of *Computerworld* editors from more than 60 companies.

Files with faces: Banc One re-engineers

CONTINUED FROM PAGE 93

At a glance

Banc One Corp., Columbus, Ohio.

Assets: $48 billion.

Has expanded beyond its Midwestern roots through acquisitions.

Owns 62 banks with 1,008 offices.

Ranked No.1 among peers and consultants in 1992 *Computerworld Premier 100.*

IS spending as a percentage of revenue: 7.1%. Industry average: 4.4%.

Banc One is known for its efficiency in absorbing the many banks it acquires. Its SWAT team of 150 conversion experts descends on new acquisitions and converts them to standard Banc One hardware and software overnight.

COMPUTERWORLD'S In

Winning Team

David M. Van Loar, past president of Banc One Services Corp. and now head of Banc One's regional bank affiliates group.

Linda Antrim, project manager in the early years of the Strategic Banking System project; now vice president of marketing and administrative services at Banc One Services.

Mitchell Zoellner, director of implementation and support for the new systems.

J. Terry Lowder, vice president of advanced technology at Banc One Services. Chief architect of the company's technology infrastructure.

banking tradition, which focused on using computers to complete transactions.

"We want a system that gives us everything there is to know about that customer and incidentally does handle the transaction," says Donald L. McWhorter, president of Banc One and the visionary behind the system. "We decided we're in the information business, not the transaction business."

CEO John B. McCoy maintains that Banc One is in three mainline businesses: banking, acquisitions and technology.

Lots of big banks are scrambling to patch their disparate systems together to support "relationship banking." But what separates Banc One from the pack is that its Strategic Banking System is a "more elegant and comprehensive form of integration," says James Moore, president of Mentis Corp., a Salisbury, Md.-based research firm that specializes in banking technology.

The Strategic Banking System can deliver a complete customer profile, on-line, down to the branch bank's customer service representatives. Furthermore, it can produce a profile of the customer's whole household or of all customers who work for a particular employer, Moore says.

The big difference is simply that the power was "designed in from the beginning," explains Robert Barrett, president of IS subsidiary Banc One Services Corp., which has a $293 million budget and 1,650 employees. He credits McWhorter not only with having the original vision but also with "having the courage to stay with it, even in the face of some adversity along the way."

Six years ago, when it appeared that nothing on the commercial horizon could do the job, Banc One teamed up with about 200 programmers from Electronic Data Systems Corp. to undertake the daunting task of building the next-generation software. (Interestingly, the relationship was based on a loose contract in which EDS paid roughly 80% of costs in return for the privilege of being able to sell the resulting software to other banks.)

Bankers steer

EDS officials started out by grilling approximately 300 Banc One employees — bankers and other employees from all parts of the company — in roundtable meetings aimed at finding out what data they wanted for the banking system of the future. All told, EDS assigned 200 people to the mammoth project.

Linda Antrim, a Banc One marketing professional who managed the project in its first few years, says she was impressed by the hard-working Banc One volunteers who took time out of their regular jobs to attend the meetings for this data modeling exercise. She also praises Banc One's management for allowing its bankers to work on a high-risk project without fear of adverse consequences.

"Back in 1986, this was a brand-new and very challenging vision," Antrim recalls. "A whole bevy of similar projects [attempted by other companies] had failed, so we knew it was territory that had been covered before and not successfully."

President Donald L. McWhorter: The visionary who launched development of a revolutionary, customer-focused banking system. "We decided we're in the information business, not the transaction business," he says.

Banc One officials say their project succeeded where others failed because it had a clear mission defined by bankers, not technologists, and it had a project champion with real clout — McWhorter. However, like any re-engineering project, the Banc One effort had its share of pain.

The overhaul, bigger and more complex than anyone had imagined, ran about two years behind schedule. It faced the usual technical challenges of implementing client/server systems, including network management and reliability.

The first release of the customer information system was finished in 1989 and installed by Norwest Corp., a Minneapolis-based bank that also participated in the project. The second release is now in use at Banc One's branch banks in Marion and Mansfield, Ohio.

In essence, the Strategic Banking System is the key to Banc One's business goal of providing customized products and services. That's why officials are positively giddy over the system's ability to do such things as automatically send bank statements to someone's Florida condo address during the winter months only.

Next year, Banc One will be able to create financial products such as deposit accounts and loans — on the fly — for particular customers or regions just by changing the product's parameters on a PC, says Kristen Littell, a senior marketing officer.

Ordinarily, parameters such as interest rates and maturity dates are hard-coded in the banking software, so it takes a programmer to make changes. But Banc One is excited about the prospect of having bankers adjust the pricing of standard products to meet competitive pressures, as well as the ability to respond quickly when legislators or regulators change the rules of the game.

Personal pitches

The Strategic Banking System can hold a whopping 12,000 pieces of information on each customer, including data extracted from the mortgage and securities subsidiaries and demographic data bought from outside sources.

Armed with that electronic dossier, Banc One is well-positioned to develop highly targeted marketing campaigns, Littell says. For example, it can compile a mailing list of customers with $5,000 balances in their checking accounts and who might be interested in a high-balance savings account at a higher rate, she explains.

Honorable mentions are no slouches

Computerworld's editors were also especially impressed by these re-engineering efforts:

■ **Eastman Kodak Co., Rochester, N.Y.** IS chief Candy Obourn's title says it all: As vice president of IS and business processes, Obourn has set out to move the company's core businesses to client/server computing and to re-engineer business processes along the way. Kodak recently began full-scale implementation of a software system that integrates order processing with manufacturing, financial distribution and operations [*CW Premier 100*, Sept. 14].

■ **Cigna Corp., Philadelphia.** This $66 billion insurance company's re-engineering effort was instigated by the top IS executive, J. Raymond Caron. Caron got a broad mandate to eliminate wasteful practices — whether or not they had anything to do with technology — and to turn a bloated bureaucracy into a responsive, data-driven business. The results are lower costs, fewer management layers and dramatically changing jobs [CW, June 22].

Even the IS department has been re-engineered and trimmed. By replacing 85% of its systems and reorganizing along team lines, Cigna has realized annual savings of $1.5 million and speedy delivery of information to line staff. For his re-engineering work, Caron recently won the Society for Information Management's Partners in Leadership Award.

■ **Bell Atlantic Corp., Philadelphia.** Bell Atlantic's Systems 2000 project is an ambitious, $2 billion project to completely rebuild some 400 applications supporting 120 business functions [CW, May 18].

Joseph T. Ambrozy, vice president of IS, has opted for more radical changes that will produce bigger benefits. For example, the company is replacing a 1970s-era hodgepodge of service-order systems with a network of Unix workstations for 6,000 customer service representatives — including an expert system to help them match available services and options with customer profiles [CW, Oct. 7, 1991].

■ **Levi Strauss & Co., San Francisco.** Consumers can't buy apparel that isn't on the racks, so Levi Strauss emphasizes paring product-delivery times to keep enough merchandise available to meet consumer demand — without piling up excess inventory.

This is accomplished via the LeviLink electronic data interchange system, which connects the company to its suppliers and trading partners [*CW Premier 100*, Sept. 14].

The progressive company is also undertaking a massive business re-engineering project to integrate U.S. operations with those abroad, and it recently developed its first client/server system for tracking shipments around the world.

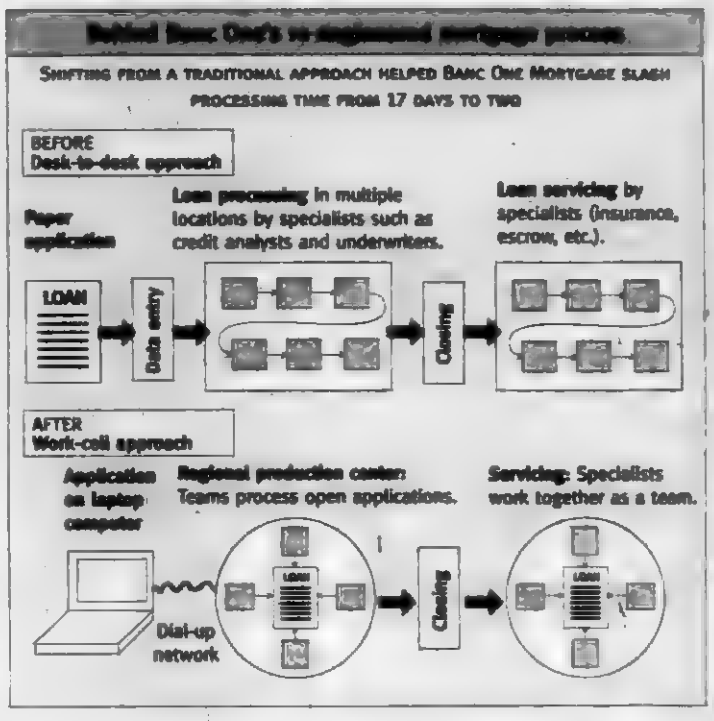
Banc One Mortgage melts paper blizzard

Subsidiary replaces desk-to-desk processing with team approach

Banc One Mortgage is re-engineering both the front end and the back end of its business because "we've got to control the paperwork blizzard," says J. Albert Smith, president of the Banc One subsidiary.

Otherwise, he fears being snowed under as the fast-growing company moves from handling 33,000 loans in the past to 300,000 loans next year.

So Smith has scrapped the traditional desk-to-desk approach to processing mortgages in favor of a speedier "work cell" or team approach that gets the job done weeks faster than before. He is also adding a dose of technology to boost productivity and reduce paperwork.



Using laptops in the field has produced some side benefits, too. Loan originators can now call up prices and check on the status of the loan for a customer. In addition, "the laptop [software] forces the originator to do it right the first time, so that you get all of the information you need up front," Smith says.

On the front end, the sales force now uses laptops to transmit the loan application to regional production centers, where groups of loan analysts with various skills work as a team to approve the mortgage.

On the back end, after closing, another team of specialists sets up the loan for servicing. A process that used to involve eight departments and take 17 days now takes just two days, Smith says.

"We're eliminating the paper chase. Before, if you needed to get your hands on that loan, you didn't know where it was because it could be in eight or nine different departments," Smith said.

The next step is implementing a $10 million imaging system with work-flow software, which Smith says he expects will boost productivity at least 30%. That system will be completed in June 1993. *—Mitch Betts*

J. Albert Smith, president of Banc One Mortgage: His division's smart technology use helped re-engineer how mortgages are approved and serviced and boosted the number of loans written tenfold to more than 300,000 a year.

Opportunities for cross-selling abound with an integrated database. "The more you know about the customer, the more you can target them for a specific type of product pertinent to their financial picture or lifestyle," says Mitchell Zoellner, director of implementation, and support for the system.

Obviously, customers who frequently overdraw their checking accounts are good prospects for an overdraft protection service.

"In nonintegrated systems, the information [about overdrawn accounts] would be kept on a separate system, and the banker may not be aware of that fact," Littell says.

Likewise, when customers apply for a car loan but their financial profile is ideal for an equity line of credit at a better rate, Banc One can steer them in that direction.

"It's critical that it's a win/win situation," Zoellner says, "good for them and more profitable for us."

More time for customers

For bank employees on the front lines, the beauty of the new back-office and branch automation systems is that they make the job less clerical and more sophisticated, says Jewell Beatty, vice president of personnel at the Marion bank. Instead of handling a lot of paperwork and typing information on forms, new-account representatives can spend more "quality time" with customers in hopes of closing a sale, she says.

Robert Barrett, president of Banc One Services Corp.: Power to combine scattered customer records was "designed in from the beginning." Barrett says he credits McWhorter for "having the courage to stay with it."

EDS is marketing the Strategic Banking System to other banks, but Banc One officials are not concerned about losing their competitive advantage. "No bank will ever know the software as well as we do. More importantly, the real competitive advantage is not the software," Antrim says, "but the way that bankers exploit that tool."

No one doubts Banc One will exploit its gold mine of customer data to boost profits and market share. "The real bang for the buck is yet to come," Barrett says — which means Banc One's competitors are in for a long, tough battle in the years ahead.

Consultants' corner

■ **Laura Jean Stuart, president of Stuart Research in Cambridge, Mass.:**
"At Banc One, the corporate culture is that the technologists think like bankers. And the bankers on the front lines know they have the technology support to find creative ways to serve their customers and look for new business opportunities.

"That's how Banc One Services Corp. contributes to bank profits — by helping to create happy customers and new business."

■ **James Moore, president of Mentis Corp. in Salisbury, Md.:**
"Banc One is innovative in branch automation... and has one of the best customer information systems.

"The senior management views technology as a competitive tool and they invest in it, not for technology's sake, but to get business results."

■ **M. Arthur Gillis, president of Computer Based Solutions, Inc. in New Orleans:**
"There is a connection between good bank earnings and good technology. Good technology gives them the capability to know their customers well.

"Out of the 55 biggest U.S. banks, there are 15 that excel in their use of technology, and Banc One is one of them. They are good, very good. Can't you guys [in the press] find someone new to write about?"

—Mitch Betts

Looking to start a re-engineering project?

For those of you thinking of beginning a re-engineering project, going to a conference is often a very good way to gather vendor information as well as glean war stories from information systems managers who have already trod the path.

One such upcoming show is the Downsizing Expo, slated to be held in Chicago Feb. 16 to 18, 1993. The show includes, among other forums, a complete miniconference on business re-engineering.

Scheduled speakers include Roger Burlton, an analyst at SRI Strategic Information Resources, Inc., who will keynote the event by talking on the challenges and megatrends of transforming business and IS processes.

Bruno Kierczak, the director general of the information services bureau at Public Works Canada, will talk about his re-engineering experiences.

In addition, a number of consultants will speak on topics ranging from cost justification of software redevelopment to effectively knocking down corporate culture barriers.

All these two

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organizations have things in common.

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Jackson National Life grew 750 percent in just six years with the help of systems developed by EDS that streamlined administration and made the company much more responsive to customers.

Chicago improved traffic flow and is collecting $420 million in unpaid parking tickets with the help of hand-held computers and up-to-date imaging technology. EDS helped develop and implement the systems.

The **Armed Forces Financial Network** provided service personnel access to their finances from virtually any U.S. military base through a global EDS ATM network.

Smith's Food & Drug Centers expect to double productivity thanks to EDS systems which support all aspects of the retailer's operations.

Prince Manufacturing now makes product design changes in days instead of weeks thanks to the EDS Unigraphics® CAD/CAM system.

The **Indiana Department of Transportation** saved millions of dollars and increased the productivity of engineers 60 percent. EDS's client/server-based Graphic Data System was the key.

Results like these have helped EDS become the world leader in helping organizations apply information technology effectively. To find out how we could help you, write Peter V. Abene, EDS, 7171 Forest Lane, M59, Dallas, TX 75230. Or call (214) 490-2000, extension 159.

Results and EDS

Intelligence Files

60-second briefing: Buying technology

Growth of new channels

"The days of having large-account representatives opening up new sales are gone. Very few companies can afford on-site sales.

"IS people are going to have to be more comfortable with intermediaries, such as integrators and consultants.

"Because of the advent of client/server, you will see a dramatic distribution shift as companies find different channels of distribution that work from a profit standpoint. These include direct mail, catalogs, telemarketing, software resellers."

Impact on service

"There is no reason to have a hardware maintenance contract. But client/server systems are not as robust as mainframe applications, so software maintenance is still necessary."

Fewer vendor choices

"There is a significant decline in outside companies buying into the computer industry, as well as less diversification within the industry. With these short product cycles, they have to stick to something they understand."

A mini-interview with Paul Deninger, managing director at Broadview Associates. The Fort Lee, N.J.-based investment banking company has specialized in information technology acquisitions and mergers since 1973.

Global outsourcing

Farming out information processing to contractors in foreign countries has become a small but rapidly growing portion of the outsourcing market.

India, Singapore, the Philippines and Ireland are among the countries with low-wage, well-trained, English-speaking labor pools that can provide data entry, programming and transaction processing at low costs.

However, the remote locations make project management and quality control more difficult. In addition, the notion of exporting jobs could raise big political problems in the U.S.

Source: "Global Outsourcing of Information Processing Services," a paper by Uday M. Apte and Richard O. Mason at Southern Methodist University, presented Nov. 4, 1992.

Fed-up decision-making

"Most companies send people to all the outsourcing conferences, and read all the magazine articles, and hire pricey consultants — but they still make their outsourcing decisions like this:

"One day something happens — one crisis too many or one dollar too far over budget for the umpty-umpth time in a row — and the CEO says, 'OK, I've had it: Get IS out of here. Let somebody else do it.'

"And once they make the decision to outsource because the boss is fed up with worrying about IS, most of them put aside all the impressive philosophy they've learned from the seminars and the articles and the consultants and go with the bidder that gives them the best price."

Source: Information systems director attending a monthly luncheon meeting of the Boston area chapter of the Society for Information Management, Nov. 13, 1992.

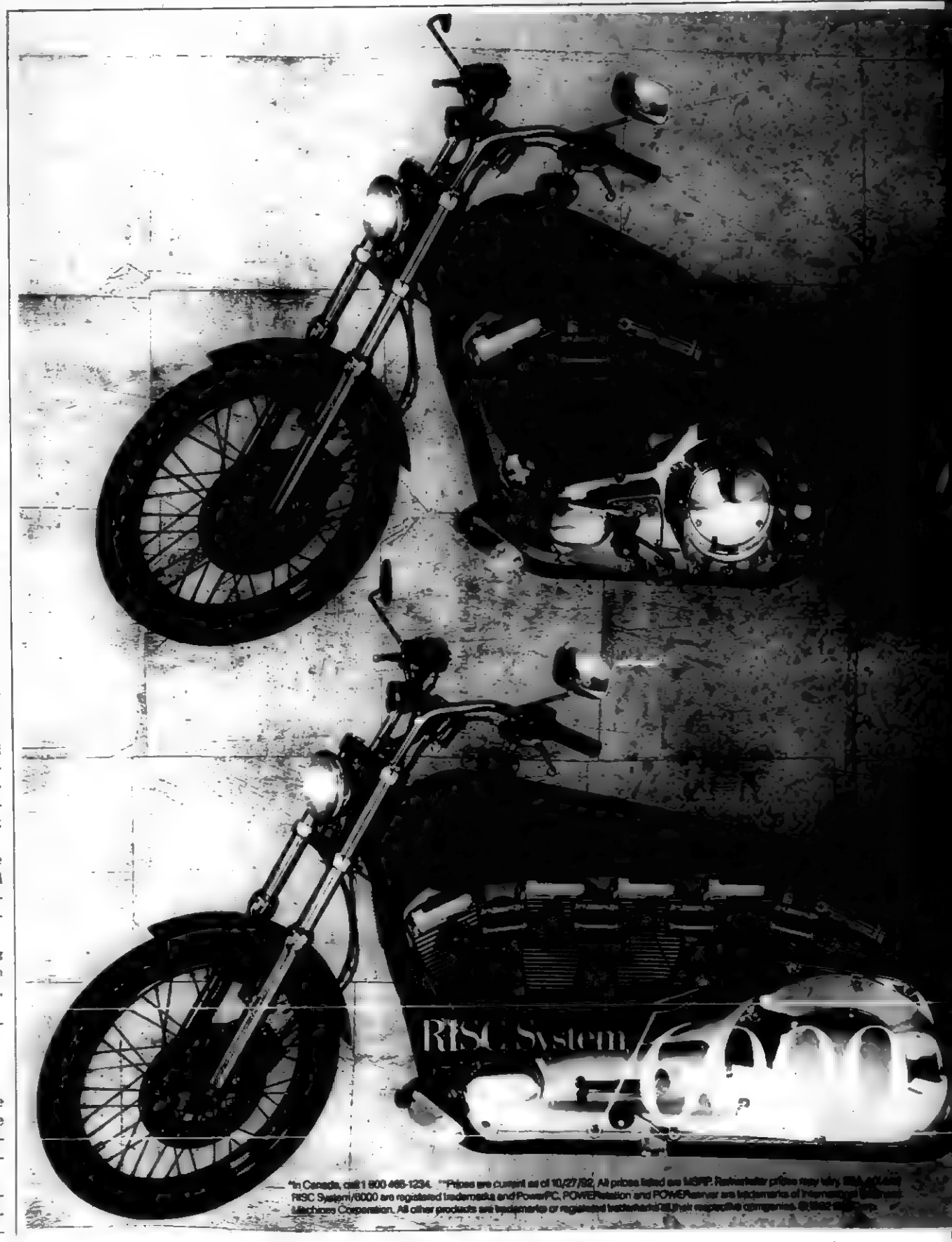
Why the CFO says 'no'

The majority of proposed document-imaging projects were turned down by chief financial officers because the proposals failed to generate an adequate return on investment. Are CFOs just myopic, bean-counting Luddites?

No, the problem is that the proposals were not revolutionary enough. The rejected imaging proposals would simply have streamlined existing processes, producing a small financial return. If the applications had redesigned those processes to achieve not only cost reduction but also revenue enhancement, they would have received the CFO's approval.

Source: "CFOs turning thumbs down on ill-conceived imaging," by Thornton May, *Imaging World*, October 1992.

Compiled by Computerworld *national correspondent Mitch Betts, senior editor, management Nell Margolis and associate editor, management Carol Hildebrand.*



Calendar

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

Redundant Arrays of Inexpensive Disks Advisory Board Meeting. Sunnyvale, Calif., Jan. 13 — Contact: Joe Molina, Technology Forums, Lino Lakes, Minn. (612) 704-2379.

JAN. 17 - JAN. 23

Retailing 1993: A Turning Point. New York, Jan. 17-20 — Contact: Retail Services Division, New York, N.Y. (212) 244-8780.

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 24 - JAN. 30

Marketing the IS Organization Internally. Atlanta, Jan. 26-27 — Contact: Oulette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England (011-071) 637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems Users Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

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Product Spotlight: Windows utilities

SOMETHING *for* everyone

Page 102

Page 106

MANAGERS

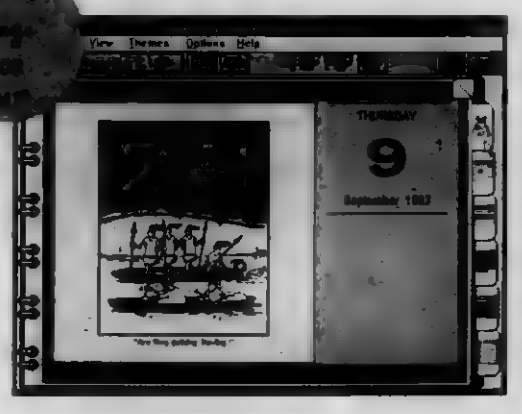
- Configuration
- User setups
- Software maintenance
- Network monitoring

Page 108

DEVELOPERS

- Simplifying development
- Diagnosing problems
- Optimizing applications

Page 103



I like Windows, but I don't like icons — and I'll tell you why. And no, I'm not trying to have it both ways when I say that.

By Todd Henschell

Most folks over the age of 12 started computing with a system that booted up to some flavor of DOS. Many of us don't want to work with software that looks like it should come in a cartridge and be played on a television with a joystick.

For the icon-phobic

The good news is, you don't have to dig through teensy pictures of cute file folders to get your work done with Microsoft Corp.'s Windows. You can ignore most of what Microsoft includes in the package. But you'll need a suite of good utilities.

There's a problem with many Windows utilities: They forget that the point of even having this monster on your hard disk is that the software is supposed to be easy to use. A program that asks me to remember that a disk with an arrow pointing to the left means "open file," and a disk with an arrow pointing to the right means "save file" has missed the point.

This is even more critical in utilities. If you have a disk with an error you want to fix, the difference between FORMAT DISK and CHECK

Utilities, *page 103*

ALSO . . .

- [illegible]
- [illegible]
- [illegible]

Henschell is a PC consultant and free-lance writer (and icon-phobe) in Burbank, Calif.

Windows utilities

Why so many utilities?

By David Rorabaugh

THERE ARE SO MANY Windows utilities on the market that you might start to wonder whether there are deficiencies in this environment that require utilities.

Some of the bumper crop of Windows utilities do fulfill features that Microsoft Corp. should have included in Windows. However, Microsoft also chose to leave some features to third parties to ensure the health of the aftermarket utilities business.

The fact is, no operating environment can suit every user, manager or developer. Windows encourages these differences because the system can support a great number of utilities. In DOS, you can only load so many terminate-and-stay-resident (TSR) programs and device drivers before running out of memory or encountering conflicts between programs.

That — combined with the fact that the operating system is more complex than DOS — has resulted in a greater demand for utilities.

There are also many users who have switched to Windows from DOS and want to replace their old DOS utility programs. Unfortunately, it's generally believed that the overall quality of Windows utilities lags behind the quality of utilities in the DOS world.

It's not an entirely fair assessment, however; the two markets are at different stages of maturity. As Windows ages, the quality of applications and utilities will improve, while the time between major revisions lengthens.

Windows also presents a new level of opportunity for utilities. In DOS, utilities demand control of your system or remain resident in memory so you can pop them up over your application.

Many can run at once

In Windows, things are very different. Multitasking turns every program into a TSR, giving the user all of the benefits with none of the associated problems. Virtual memory makes it practical to run many programs at once, while Dynamic Data Exchange allows the programs to talk to one another. Dynamic Link Libraries allow programs to be extended with different functions.

I believe the best and most effective utilities are those that add to or enhance the environment rather than replace parts of it. For instance, programs that add options and functions to Program Manager or FileManager (see box at right) rather than simply replace one or the other are far more elegant than reinventing the wheel.

Why is this important? In Windows, many programs presume you are using Program Manager and not something else as your shell. If you are using another shell, various applications may not install properly. This is usually at the stage where the errant program tries to create a new Program Manager group and receives an error message instead of an acknowledgment.

There are many categories of utilities, and shareware utilities should also be considered. Shareware, designed to let users try a program for a few weeks before paying, often includes the brightest utility gems, though the commercial packages dominate the market. •

Rorabaugh is network systems manager at LTS Corp., a consulting firm in Rosslyn, Va. He can be reached on CompuServe at 76376,3423.

What's a utility, anyway?

Utilities have generally been defined as system- or service-related programs, while applications are business or scientific programs. These definitions are dated in our new world, where the critical mass of computing power drifts toward the desktop. Let's try this:

A UTILITY is a small or narrowly focused program.
AN APPLICATION is large or broadly focused.

Of course, there are variations within any set of categories, and this is confounded in a multitasking environment such as Windows. So let's add two other categories:

MEGA-UTILITIES are collections of utilities that approach the size and breadth of applications.
MEGA-APPLICATIONS are collections of applications that are integrated to function as a unified whole.

Into this semantic muddle we have to throw another word:

"APPLET" is Microsoft's category for the utility programs and small applications included with Windows.

Windows components

Following are the default programs of Windows. In Version 3.1, Microsoft built the first two to be extensible so that more functions and features could be added through utilities built by third-party developers. However, some utilities are actually replacements for — not extensions of — the program.

Program Manager is the default shell of Windows and graphically presents programs in logical groups. It is the "shell" from which other programs are started.

File Manager provides a file and directory tree-based display of the contents of local or network drives. Along with Program Manager, it provides the foundation on which Windows (by default) is built.

Task Manager is a sort of "agent" that pops up on demand to tell you what programs are running and lets you arrange them, switch between them or shut them down.

Self-reliance is the goal

There are hundreds of utilities that provide users with amusing or entertaining accessories, but these won't necessarily make them more self-reliant. Here are some major categories of Windows utilities that will make your end users less dependent on you.

MEGA-UTILITIES

These utility suites are perfect for users who need an immediate jump-start and don't have the time to build their personal tool kits. They're also useful for people who function best when immersed in a comfortable, integrated environment.

Norton Desktop (Symantec Corp.)
Norton Desktop for Windows (NDW) insulates users from Windows File Manager and Program Manager. Because it replaces both of these programs with a unified desktop application, there will be a learning period; these are not just minor enhancements.

Beyond all the file and program management tasks, NDW also adds a program launcher, a file viewer, a file finder, a desktop editor, a complete macro language, several calculators, a scheduler, a screen saver, several disk utilities, antivirus protection and an icon editor.

Amish Utilities (Amish Software, Inc.)
This is a smaller collection of individual utilities and therefore doesn't require as deep a commitment as NDW in changing the way users work. It includes a program launcher, a desktop/screen expander, an ASCII/Hex file viewer, a Post-It style memo pad, an enhanced clock and a memory monitor.

FONT GADGETS

Because Windows 3.1 provides TrueType support without any additional software, many users are now being exposed to the world of typography for the first time.

Many users will want to convert their fonts from their DOS applications, and many Windows 3.0 users may want to convert their ATM PostScript fonts into TrueType for use with Windows 3.1. Others may want to add corporate logos, add special characters or make small caps or foreign characters easier to use.

Font Monger (Ares Software Corp.)
If your users understand type, this product is probably a good place to start. Font Monger allows you to convert fonts between different types of formats, reassign key mapping and add custom characters.

AllType (Atech Software)
This is a good choice for users who don't understand fonts but need to use them with multiple applications. AllType doesn't offer significant font editing tools, but it does offer a wealth of conversion and installation features.

Printers Apprentice (Lose Your Mind Development)
Printers Apprentice is a wonderful utility for examining fonts, printing samples and spec sheets and generally getting to know your catalog of type. It's good for exploring and documenting your catalog of typefaces and learning a bit about what's lurking in there.

GRAPHICS

Windows supports a plethora of graphic file formats, and users often need to convert these among different programs. Often, a simple task may require special utilities. The Paintbrush program is good for basic pix-

Windows utilities

For the icon-phobic

CONTINUED FROM PAGE 101

DISK is crucial. Click the wrong picture and your data is history. You would *never* select FORMAT DISK if it were spelled out, but what does a green disk mean? Does it mean GO or FORMAT? Beats me.

In my Windows software travels (I've been a daily user since Version 2.11, and I live there 24 hours a day now), I've bumped into a few gems. There's also a lot of garbage that passes for software. Let me tell you about both categories.

For most companies, Program Manager, the default Windows shell, is "it." It's free, ships with Windows, and it sort of works. Too bad, too, because it's a lemon. Windows boots up, and lo and behold, the user who once pressed F2 to load an application is presented with this collection of colorful doodles. The user has to find the application's icon, which may be hidden behind other icons, scrolled off the program group's screen, etc. (And yes, I know about hot keys in Program Manager, but that's not my only objection to it.)

More like DOS

Command Post from Wilson WindowWare, Inc. fixes this problem. It makes Windows more like DOS, in that you get to read what you're doing. It's text-based and plain, but under the hood it's the most powerful add-on you can find for Windows.

Command Post lets you create an essentially unlimited number of menu items. You can have a program on your menu, written in the language of your choice, that will launch with a single click. You want WordPerfect? Click WordPerfect on your menu. No pictures, no hunting and no generic or identical icons.

One of my most-used utilities is Central Point Backup from Central Point Software, Inc. I evaluate a lot of software, some of which ends up mangling my Windows configuration. I get the pleasing chore of backing up and restoring a lot of data, and this product has never let me down.

The interface is elegant and simple and requires two mouse clicks (or a few keystrokes) to get it going. If you have enough horsepower, it'll run in the background and write to your tape backup while you work. It's a perfect example of how to do a Windows file management or system utility.

Only disk utility

Becker Tools 3.0 from Abacus Software is another useful tool. This collection of utilities can fix most minor floppy disk errors and format or copy floppies in the background and is generally a good thing to have around.

It's a bit quirky, but the product does what you tell it to. Currently, it's the only real disk utility for Windows I've come across.

Xtree for Windows from Xtree Corp. was touted as being the ticket for Windows file management. I know Xtree for DOS like the back of my hand, and I eagerly awaited Xtree for Windows. Guess what? None of the keystrokes mirrored the DOS version, and for no good reason. I bought it and returned it the same day. That was probably one of the saddest days in my computing life.

As for Symantec Corp.'s Norton Desktop, I'm sure I'll stir up a hornet's nest when I say that this multimegabyte heap of swirling icons isn't worth the hard drive real estate it hogs. It's fine if you want to do things such as drag a file to a picture of a printer — but most folks can figure out File Print just fine.

When you're using the Windows default shell, it can cause install programs to fail. If you have the undelete tracking installed, you can end up wth megabytes of hidden files if the program crashes, and it makes the already sluggish loading Windows crawl off a fast hard disk.

What's missing?

If you've already moved to Windows, you'll notice right away there are some utilities that have no Windows counterparts. There is no Norton Utilities for Windows (although Central Point is working on PC Tools for Windows). There are no disk optimization tools, either. We also need a file manager such as Xtree (DOS version) that's not a drag-and-drop circus.

Many of us use Windows because we like the true representation of printed output — but we don't want to keep grabbing for our mouse. Utilities that migrate from DOS to Windows should keep the keystrokes they use now but add the slick features of Windows applications, such as file viewers, great printed output and so on.

Windows or something like it will eventually come to your system — whether you're eager to have it or not. Because this is where we're headed, why not insist on software that does what we want it to do once we get there? ▪

Directory

Vendors mentioned in this article include the following:

Abacus Software
Grand Rapids, Mich.
(616) 698-0330

Amaze, Inc.
Kirkland, Wash.
(206) 828-7007

Central Point Software, Inc.
Beaverton, Ore.
(503) 690-8090

Playroom Software
Charlotte, N.C.
(704) 536-3093

Wilson WindowWare, Inc.
Seattle
(800) 762-8383

Silly software

Just because I don't like icons doesn't mean I don't want to enjoy myself when I use Windows. Garry Larson's Far Side Calendar 2.0 from Amaze is worth the hard disk space it occupies. Not only does it throw flying pterodactyls across your screen at unpredictable times, but it's actually a first-rate contact management and appointment book.

Also, Makeover from Playroom Software provides something Windows lacks: good looks. It's a shareware product that allows you to fully control every aspect of Windows' appearance. This includes changing the radio buttons if you'd like them to read UP and DN instead of having little triangles that point. — *Todd Honeycutt*

el editing, but it is severely limited when it comes to manipulating the image as a whole.

While there are several commercial programs to do this, the two that stand out most visibly are shareware products. The price of these two products combined is about 10% to 15% of what each of their commercial competitors costs.

Paint Shop Pro (JASC, Inc.)

Paint Shop Pro includes an impressive list of supported graphics file formats. It offers many options beyond format conversion.

WinGif (SuperSet Software)

WinGIF allows the user to load and save graphics files in several formats — with several flavors for each file format. The editing commands allow resizing, scaling, clipping, dithering and cropping of images.

EXTENSIONS There are many programs that extend (rather than replace) File Manager or Program Manager.

Task Manager is a Windows component that many users never see. Rather than replace File or Program Manager, some opt to replace Task Manager, turning a simple task switcher into a versatile and complex management tool. This reflects an innovative approach.

Plug-in (Pinnet Crafters, Inc.)

Plug-In adds several time-saving features to Program Manager, as well as visual enhancements. For instance, while Program Manager uses the same icon for each program group, Plug-In lets you use different custom icons for each group.

XTree (XTree Co.)

The granddaddy of the DOS world has migrated to Windows. Although it leaves several key features of the DOS version behind, the new Windows utility is worth a look, especially for the faithful.

File Commander (Wilson WindowWare, Inc.)

File Commander is best when used with the embedded Windows Interface Language, which is essentially WinBatch, another Wilson WindowWare product. File Commander gives you a configurable and versatile set of extensions; it's more of a File Manager extension tool kit than an extension because the interface, menus and options can all be completely redefined using the Windows Interface Language.

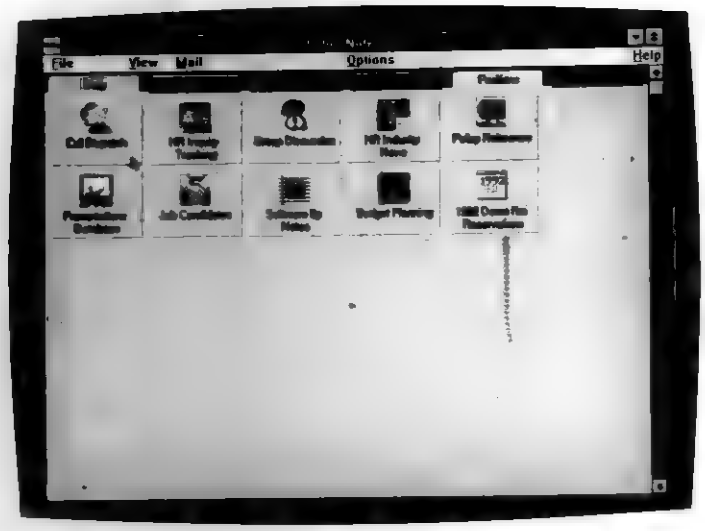
Metz Task Manager (Metz Software)

Metz Task Manager is by far the most elegant utility covered in this article. It provides immediate access to your Program Manager groups, quick launch and run options and a number of simple tools for managing the appearance of your desktop appearance.

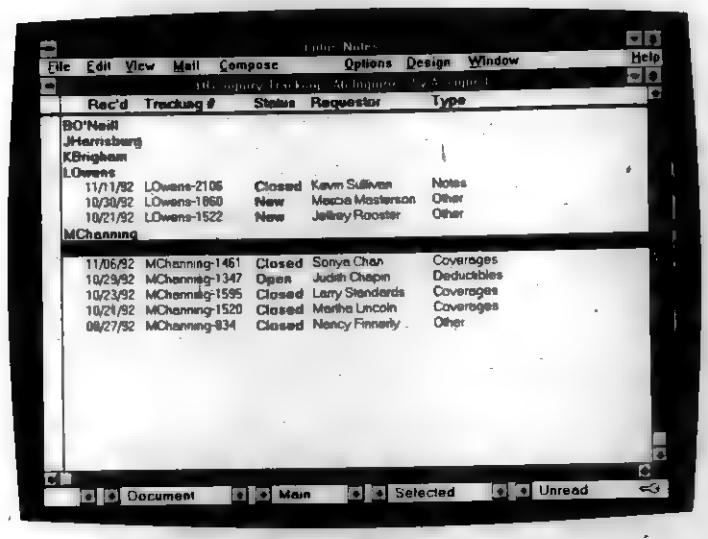
By pulling so many features into one location without sacrificing existing skills, Metz Task Manager accelerates switching between applications. Some users may use this as a very quick task switcher, and some may prefer it to Program Manager.

— *David Rombaugh*

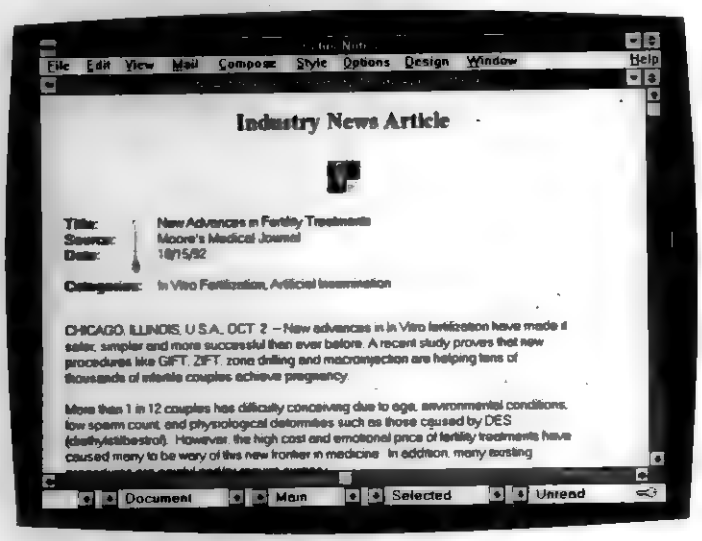
For a full list of Windows utilities, try "The Windows Shopper's Guide," a directory of products and services. For more information, contact: Whitefox Communications, Inc., P.O. Box 7125, Beaverton, Ore., 97007 or call (800) 669-5612.



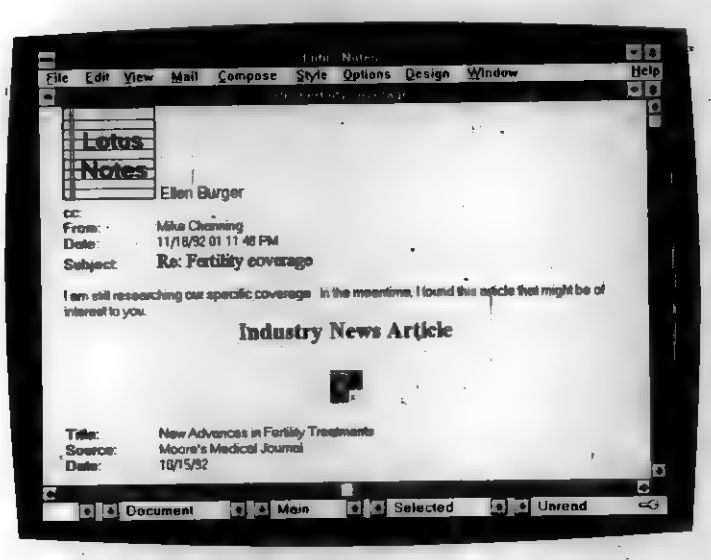
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, he generally uses them all. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the CALL DISPATCH database icon.



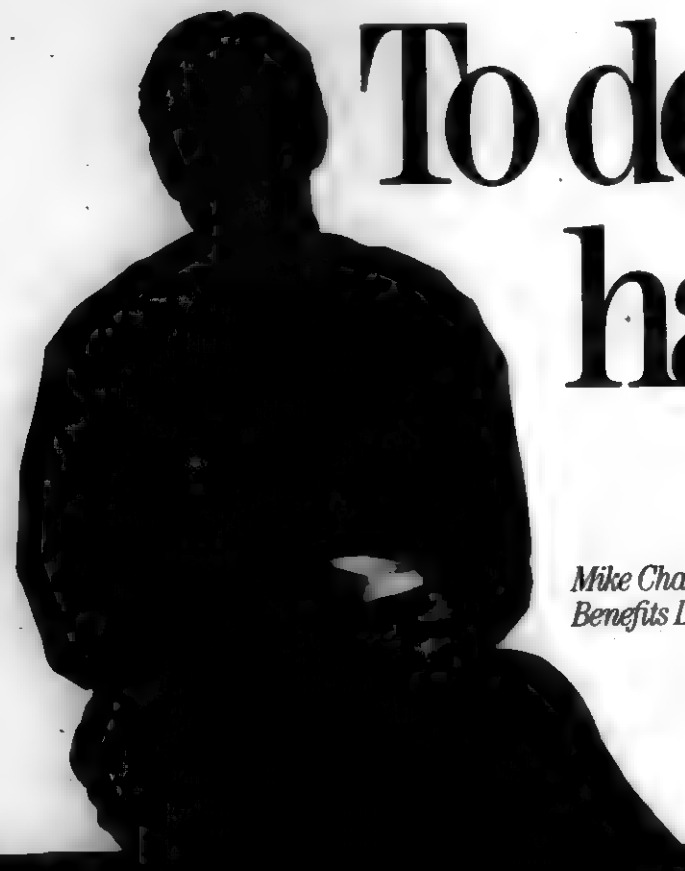
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note, attaches the article and sends it directly to Ellen. That done, he gets himself a cup of coffee.



To demonstrate th had to make an

Mike Channing
Benefits Liaison

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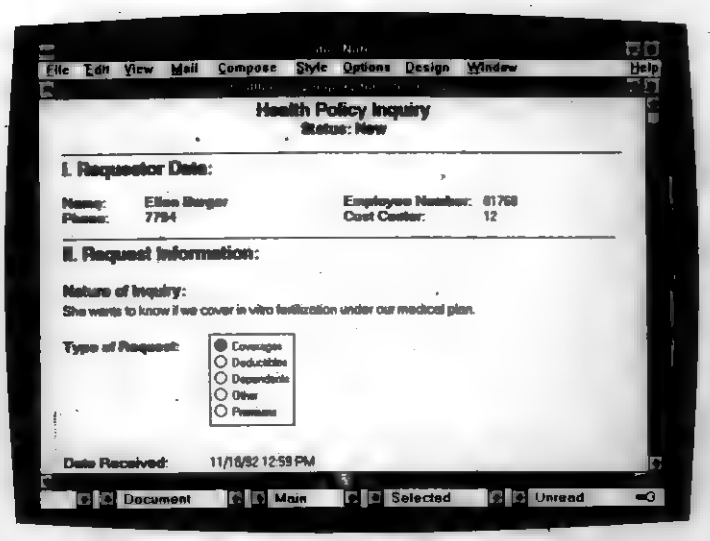
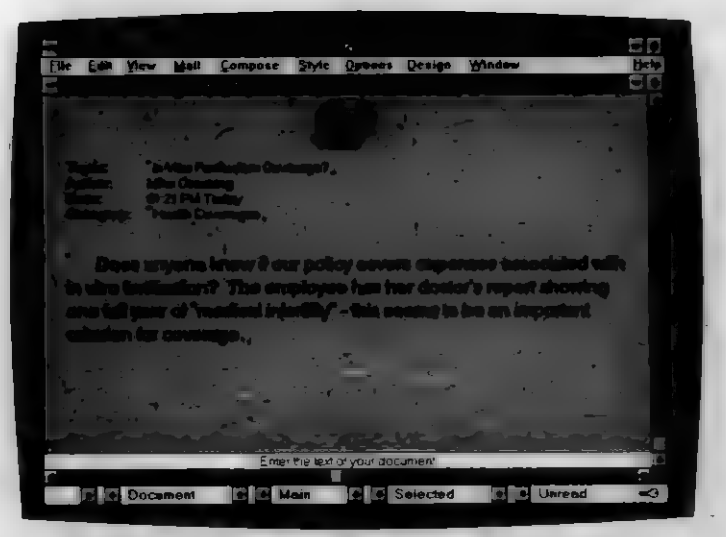
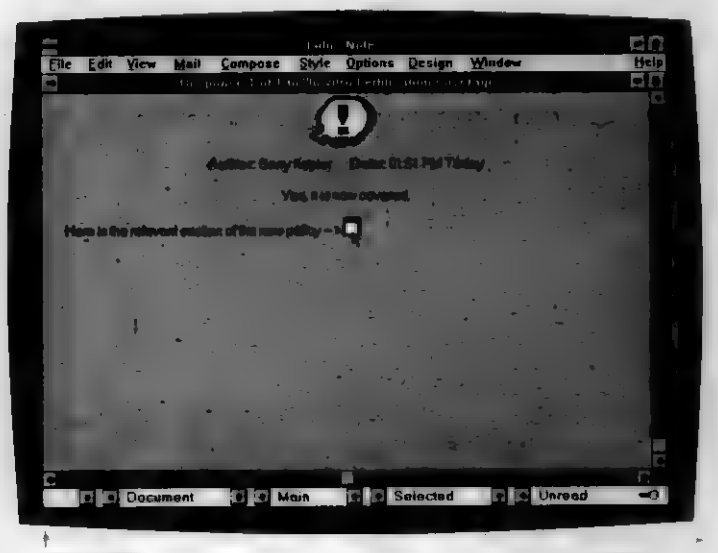


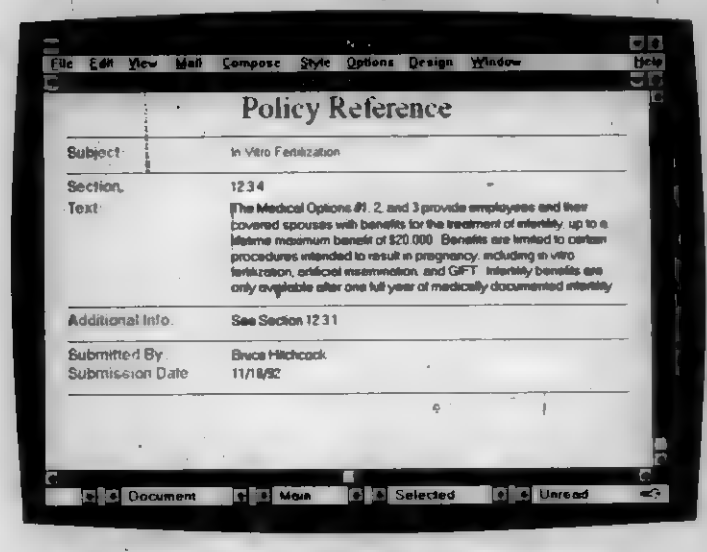
3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.



7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DIRECT DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

Watch how Notes organizes information so it's easy for Mike to get the answers he needs. How effortlessly he taps his workgroup's knowledge. How quickly he accesses conventional references. Now you can see why people who have Notes build their work around it. And why the companies that have installed Notes have seen as much as a 400% return on their investment.*

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Windows utilities

Simplify, diagnose, optimize

These functions are critical to Windows application developers

By Jeff McGroary

TOOLS FOR DEVELOPERS

Amid all the software development activity surrounding Windows has emerged a growing need for developers' utilities. Three types are most important to the Windows application developer: utilities for simplifying the development process, diagnostic utilities and system and application optimization utilities.

Windows developers can generally be divided into two groups: those that use the Microsoft Corp. Windows Software Development Kit (SDK) and the C/C++ 7.0 compiler; and those that use Borland International, Inc.'s C++ and Application Frameworks environment.

Accordingly, we've chosen to focus on the utilities included in those tool kits.

Simplifying development

To assist in the development of the user interface, the Microsoft SDK provides three utilities:

- **The Dialog Editor**, which is used to construct and lay out dialog boxes.
- **The Image Editor**, which allows the developer to create and modify cursors, icons and bitmaps.
- **The Hotspot Editor**, which helps create Hypergraphics. These are used in the Help system to provide links to related topics or to display more information on a given topic.

Borland provides the equivalent functionality in a single utility: the Resource Workshop, which allows the developer to compile a project's resource file, a separate utility in the Microsoft SDK.

Borland's Resource Workshop is also sold as a separate product and can be used in place of the Windows development utilities.

Making diagnoses

Given the complexity of the Windows multitasking, event-driven environment, developers absolutely need utilities that allow them to get some glimpse of "what's going on in there."

Microsoft provides several glimpses. CodeView is one. It allows developers to trace through problem code to track down the source of an error.

Another is Dr. Watson, which often clues you in to which section of code caused the problem. This utility deserves some of the credit for greatly reducing the frequency of unrecoverable application errors under Windows 3.1.

Two other useful diagnostic utilities provided by Microsoft are Spy and DDESpy, which allow developers to "spy on" events their applications are receiving.

Borland provides similar diagnostic utilities, although they are used somewhat differently.

The Borland equivalent of Microsoft's CodeView is Turbo Debugger. While Microsoft provides Dr. Watson to diagnose a sick Windows application, the Borland folks have a doctor of their own: Dr. Frank.

When Borland developers need to spy on on their Windows applications, they make use of the Borland event monitoring utility WinSight.

Shareware

The best sources for shareware are the commercial information services. Local bulletin boards have a lot to offer, but none offer the sheer volume and instant accessibility of the CompuServe information service. The following forums are a good source for Windows shareware and demonstration utilities:

MSL: Microsoft's language forum. Will locate Microsoft Systems Journal articles and files.

BCPPWIN: Borland's C++/Windows forum.

WINDEV: Microsoft's Windows Developers' Forum.

System and application optimization utilities

The final step in the development process is application optimization, which is especially important in the Windows operating environment. A poorly designed, inefficient Windows application can adversely affect the performance of the entire Windows workstation.

Both Microsoft and Borland provide an application profiling utility. Microsoft's is called Profiler, while Borland's goes by the similar title of Turbo Profiler. These utilities gather runtime information regarding the performance of an application and identify frequently accessed code segments.

The Windows utilities provided by the Microsoft and Borland Windows development packages are certainly the most frequently used Windows utilities, but they're by no means the only utilities available to developers.

There are literally hundreds of Windows utilities available from a variety of sources. They range from MicroQuill, Inc.'s widely used, very sophisticated (and expensive) Segmentor application optimization utility to freeware found on CompuServe and other computer bulletin boards. •

McGroary is a consultant at The Aristos Co., a Windows and OS/2 consulting firm in West Hartford, Conn.

Developer tools

Here is just a very brief sampling of vendors of new and widely used Windows utilities for developers:

Abacus Software
Grand Rapids, Mich.
(616) 698-0330

Borland International, Inc.
Scotts Valley, Calif.
(408) 439-1421

MicroQuill, Inc.
Seattle
(800) 441-7822

Microsoft Corp.
Redmond, Wash.
(206) 882-8080

PC-Kwik Corp.
Beaverton, Ore.
(800) 274-5945

SuperSonic Group, Inc.
San Diego

Make your life easier

By David Rorabaugh

TOOLS FOR MANAGERS

Several utilities packages have special relevance for information systems managers and administrators. These provide control over configuration, help in setting up and maintaining user software or help in configuring and monitoring the network.

These utility packages can not only make your life easier but also shield your users from some potential complexities.

WinLogin

WinLogin from Microsoft Corp. helps managers deal with users who move from one system to another but still want to have the same individual settings on whatever machine they use. While WinLogin takes a bit of work to set up and maintain — and many managers are likely to expect more from it than it delivers — it is worth a look. Its scope is narrow, but you may find it a remarkable value.

Winstall

Aleph Systems' Winstall 2.0E is a complete, configurable system for enabling end users to install (and remove) their own Windows applications with a simple click of the mouse. For the manager who needs to make frequent changes to multiple user configurations, Winstall can be a lifesaver.

Net Tools

Automated Design Systems has been in the Windows networking market longer than any competitor. This longevity shows in the quality of its product, Net Tools.

Net Tools is a mega-utility for network managers and users. It contains several modules, including a network-aware scripting language, security features, menus, application monitoring and exemplary print management. Many network managers treat it as a grab bag, with most using a different combination of the various types of modules.

Automated Design Systems' product is priced for a full network installation, which may be high for small networks.

NetWare Tools

As part of its DOS/Windows Client Kit, Novell, Inc. has made available a group of utilities named NetWare Tools. These Windows "applets" help monitor users and disk space, send and receive messages and work with some printing tasks.

While the provided utilities won't replace the features of SYSCON or PCONSOLE, they do provide the manager with a quick window on the network and are very much worth installing. •

Manager tools

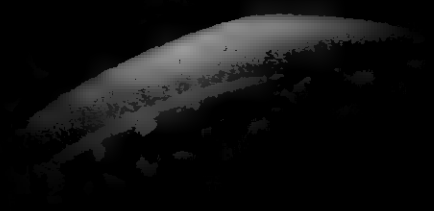
Vendors cited in this article include the following:

Aleph Systems
Takoma Park, Md.
(301) 270-4458

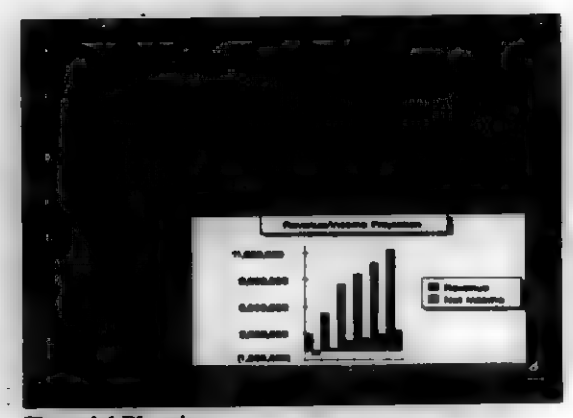
Automated Design Systems, Inc.
Atlanta, Ga.
(404) 394-2552

Novell, Inc.
Provo, Utah
(801) 429-7898

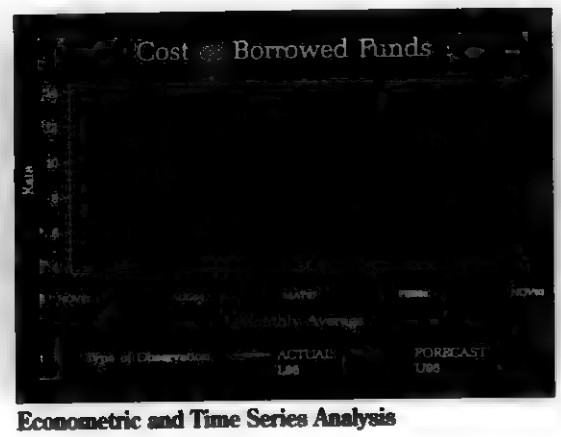
Where are you headed with your applications development?



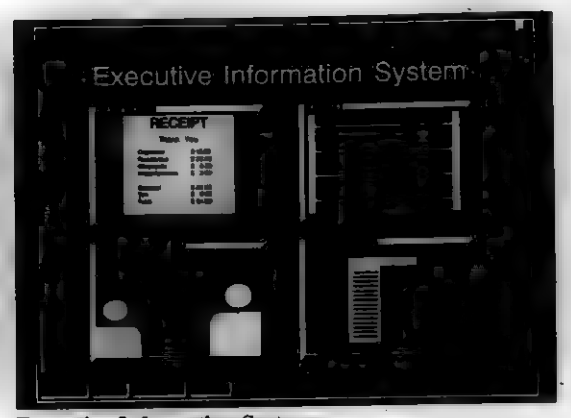
BACHMAN



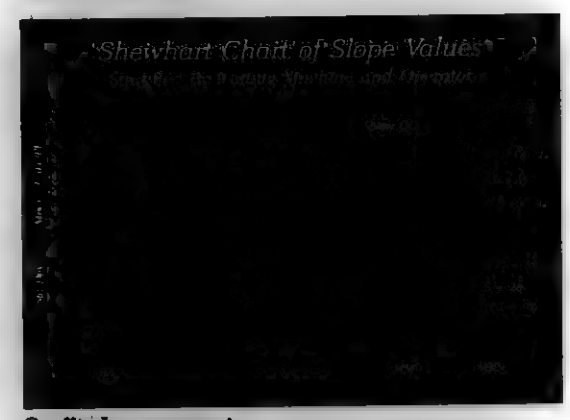
Financial Planning



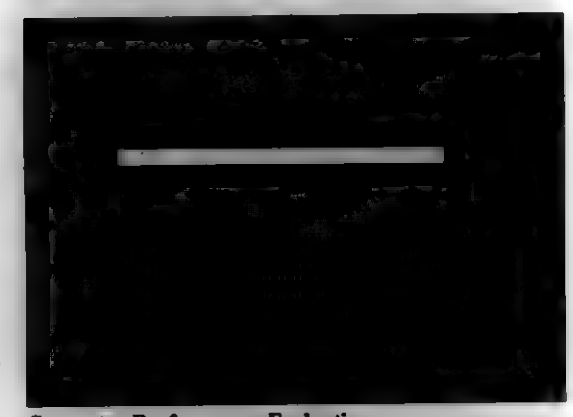
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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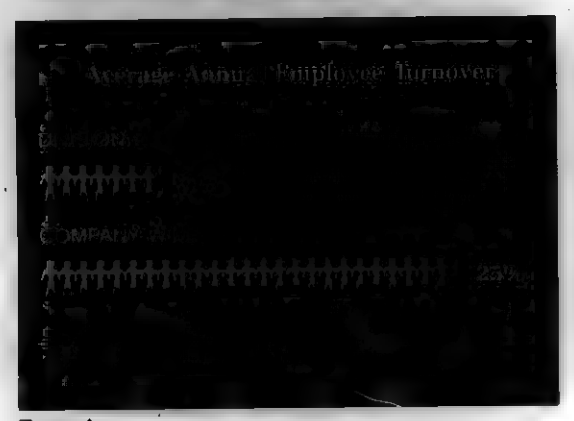
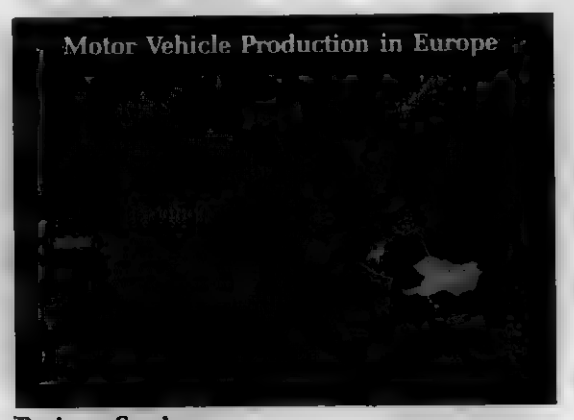


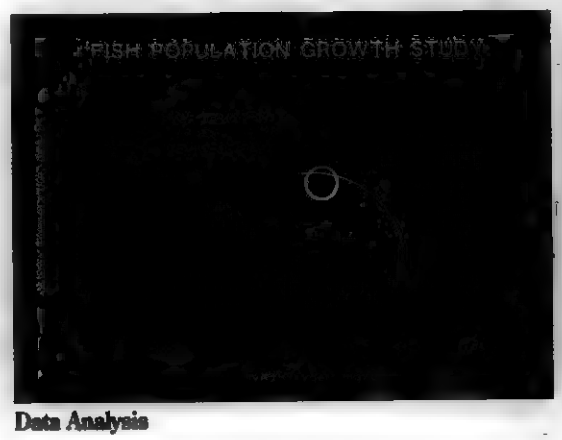
Reporting

Market Research

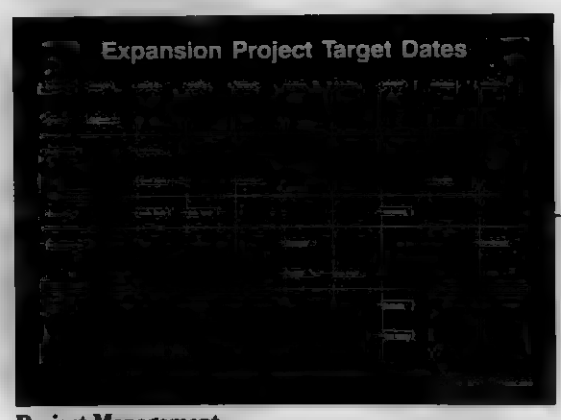


Business Graphs

Visualization



Data Analysis



Project Management

Quick & dirty

The long process of creating detailed software can be a waste of time. A better idea is to deliver a basic working system quickly and grow it to meet user desires. Such rapid evolutionary development improves software quality and flexibility, reduces cycle time and promotes innovation.

By Lowell Jay Arthur

Rapid evolutionary development describes the rapid prototyping and ongoing evolutionary processes needed to create and grow software quickly. With such processes in place, you can begin to measure and improve software quality and productivity.

In some beliefs, everything began in Genesis. God created the world in six days and rested on the seventh. Everything else occurred through evolution. Genesis is an excellent model for rapid evolutionary development because we want to create a deliverable, functioning prototype in as little time as possible, take a deep breath and begin the endless additions, changes and deletions required to keep the system in balance and evolving to meet the needs of the business.

Notice that in Genesis, God didn't create a prototype, show it to users and then tell them they would have to wait 15 million years for the real thing. God created the basic working model that contained pairs of opposites — heaven and earth, ground and water, light and dark, man and woman — which provided balance. God obviously has a very binary mind. In Genesis, the earth was created quickly. Its current state came about through evolution.

Rapid evolutionary development relies on speed, simplicity and a shared vision to create a desired product. It emphasizes reuse of data, program components and parts. In rapid evolutionary development, prototypers create a basic working system that does not contain all the variety the customer ultimately desires but that does work and provides the essential, initial elements of the system.

Once the information systems staff installs a basic working system and turns it over to the customer, a series of step-wise improvements — evolutions — turns the system into the customer's desired paradise. Sounds like a utopian fantasy, doesn't it?

Quick & dirty, *page 110*

From *Improving Software Quality: An Insider's Guide to TQM* by Lowell Jay Arthur. Copyright 1992, John Wiley & Sons, Inc. Reprinted by permission of the publisher John Wiley & Sons, Inc. (New York).

Continued from page 109

And it's much more likely to occur this way than through most "construction" or manufacturing methodologies, which rarely evolve to meet the changing needs of the business or technology. Can you imagine what would have happened if God had tried to specify the requirement for this earthship and then built it from scratch, with all the bells and whistles? It could have taken 150 million years just to get started. Instead, God chose to rapid-prototype the initial version in six days and grow it from there.

Unlike the traditional development life cycle, speed is required more than direction in rapid prototyping. Once you're rolling, you can change course at will. If you're not moving, you have no feedback to guide your first steps.

The waiting game

Imagine walking into a car dealer's showroom and seeing that perfect red sports car you've always wanted. The salesperson takes you for a test drive and it feels like a dream. It corners like it's on rails, and the acceleration is second to none. You know that in this car, you'll feel unstoppable, on top of the world. This car is everything you've ever wanted.

You say, "I'll take one," and the salesperson says, "I'm sorry, this is only a prototype, but I can have one ready for you in 24 to 36 months." How would you feel? Disappointed? Angry? Would you take your business elsewhere?

This is the common mistake most prototyping projects make. They believe the customer will stand still, waiting while the IS staff redevelops the "production" version of the system based on the prototype's demonstrated requirements. However, if you can show it to users, they'll want it. You had better be ready to deliver or there will be hell to pay in terms of customer relations and lost credibility.

If you are going to create a prototype, it must be a deliverable one that can then be evolved to meet customers' desires and expectations.

One way to look at rapid evolutionary development is to use a logical view of what happens. First, you create the initial working system. Then, until the system is replaced by a younger one, you continue to expand and grow the system from infancy to maturity. Amazing things can happen using this approach.

At Du Pont Co., the use of an iterative development approach, coupled with heavy user involvement and computer-aided software engineering (CASE) tools, has produced more than 400 new programs with no failures and helped reduce maintenance by 70% to 90%.

Trans World Airlines completely rewrote its IMS-based frequent-flier program in a relational database system. The project took 15 months using a data-driven methodology and integrated CASE tools. Users can now add new functions to the application in four to eight hours. In isolated cases, users reported fivefold productivity gains in new product development.

Taking it slow

Despite the success stories, few IS organizations have undertaken the job of transforming the development and maintenance process to an evolutionary one.

History has shown us that large, cumbersome methodologies will fit only a certain size of project, not all projects. A flexible, evolutionary prototyping methodology lays out the fundamentals of software creation and evolution. It can significantly improve productivity and quality. The methodology works like the expansion unit in a PC: The application creation or evolution team can choose the specific methods (expansion cards) to customize the prototyping methodology to match its application.

Using a flexible, evolutionary methodology, we can then integrate software tools with the methods to create an integrated technology platform to automate the software processes. The technology platform will then support all of the activities of software creation and evolution.

The creation process for rapid evolutionary development is simple:

PLAN the project.
Choose the project that requires fast delivery and is not well-understood. This means there must be rapid growth and evolution of the requirements and the whole product during its development. Iteration and evolution will occur whether planned or not. Planned evolution before the product escapes is better than unplanned evolution after a failure in the field.

Gather and define customer and market requirements. It is useful to begin framing the user's expectations of the creation process. Focus on his needs, not his wants or wishes.

There will be many rounds of mutual negotiation, participation and feedback to create an embryonic system that can be used effectively. This repeated assessment of the customer's and market's requirements will ensure rapid convergence on the best possible solution.

Quick & dirty, *page 112*

Benefit rundown

Rapid evolutionary development has some dramatic benefits:

Rapid evolutionary development enables IS departments to create software quickly and effectively at low cost. In fact, the cost of a microcomputer-based system can be as low as $10,000 to $50,000 for a three- to 12-month effort.

The process chops cycle time from concept to delivered product by a factor of four or more. Because you create only 20% of the product that provides 80% of the value, the system comes into the world with incredible capabilities.

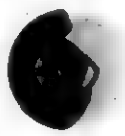
Raising a bouncing baby system

Rapid evolutionary development can be described in terms of human courtship and family development:

Courtship

First you have to choose the right mate. Initially, there's a lot of courting as the software developer and user romance each other. Eventually, they decide to "get into bed" together. A prenuptial agreement is often a great idea.

Pregnancy



Prototyping is much like pregnancy — creation of an embryonic system that can survive in the real world. First, the user conceives an idea. Together, the software developers and the customer work together to develop the initial version of the system. This pregnancy is accompanied by tremendous enthusiasm and growth.

Notice that expectant fathers never ask, "How long will this take? Couldn't you deliver the baby in four months instead of nine?" Everyone knows it takes nine months, no matter how many people you put on the task. It's best to let the prototyping process take its natural course and deliver the baby when it's ready.

During this period, parents must prepare a loving environment to receive the new child. Everyone has to be trained in care, feeding and so on.

Birth

Finally, the system is formed sufficiently to live in the world. The initial version (a small one) is "delivered" and installed for use. Like most newborns, it will wake IS parents up in the middle of the night with all kinds of problems. Brand new systems need a lot of initial care. Parents don't ask "When is this child going to be able to take care of itself?" because they know it will take time to reach maturity.

Childhood

At this point, the system is fairly well-mannered. It continues to grow organically and naturally — no new hands, feet or organs are added. It learns at a reasonable rate. Customers and IS both enjoy this period of working together to help the system develop.

Customer terrorists

Quality improvement has one main focus: customer satisfaction. Keep in mind that a dissatisfied user is a terrorist. A dissatisfied user will tell an average of 16 other people about his problems. A satisfied user will tell eight. Rapid evolutionary development can help improve software quality and productivity and, hence, customer satisfaction.

Adolescence

The system will continue to grow, gain weight and learn. At this stage, changes in markets or organizations can cause problems. The software may develop some wild hormonal urges that will test the mettle of the developer and customer. The software may need braces for its teeth or strong guidance to set its path.

At this point, the system may get the urge to spin off some children of its own. Just say "No!"

Adulthood

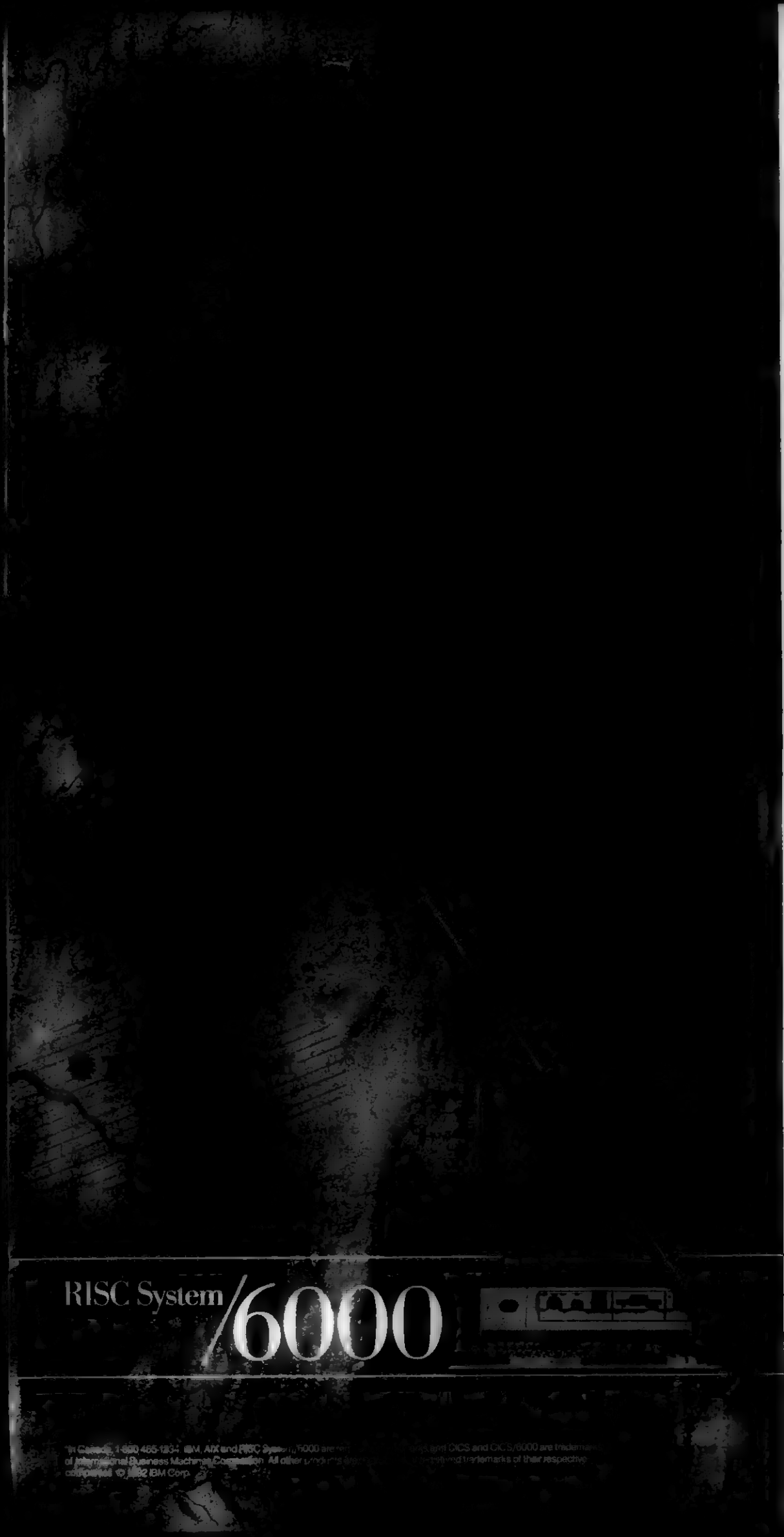
Maturity develops. We can no more create a mature system that we can create a mature person. As the system matures, however, it will provide increasingly more benefit to the customer and require less support and attention from the developer.

At some point in their lives, systems may put on some extra weight and need to reduce some flab — both data and processes. Some systems will opt for plastic surgery and various creams and balms to postpone the aging process. This is OK. No one likes ugly, old systems; we appreciate elegant, mature ones. Through good nutrition and balanced effort, the system can stay younger longer.

Old age

Through proper exercise and diet, software can thrive. It can live a long and healthy life and retire, or it can develop all kinds of health problems and require expensive medical care.

All of this depends on how it was treated during its lifetime. Rapid evolutionary development demands that we examine the overall ecology of any change in the system during its life.•



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Continued from page 110

Begin the analysis of the customer's process. As we gather requirements, we need to begin sorting and chunking the customer's requests into needs, wants and wishes. We need to begin anticipating the evolutionary path of the system as it grows. Process management can help IS guide the technical evolution. Will the system be a plant, rooted in one place, or a more mobile system that can move quickly to attack various markets?

CREATE the prototype.
The prototype plays a key role in the success of the software mission. A demonstrable behavioral model provides so much feedback that you can't help but come up with better products.

Static, two-dimensional representations (design documents) of dynamic software systems that are supposed to move and grow and process information cannot help but be incomplete.

CHECK closeness of fit.
Evaluate the prototype using customer feedback. Given a working, demonstrable system, customers can tell you how far or how close you are to their goal. They can give you better feedback about how to make their system better.

ACT to improve.
You always want to improve the prototype. Using customer and prototype feedback, identify the next steps required to ecologically grow the system to the next step in its evolution.

Beneficial gains
Compared with standard development processes, rapid evolutionary development offers several benefits:

• **Effective communication.** Rapid evolutionary development opens up communication because the embryonic systems demonstrate, rather than represent, what is happening.

Designs are maps of the world. Prototypes are the territory. Prototyping simplifies demonstration, evaluation and modification of the growing system.

• **Reduced risk.** Rapid evolutionary development reduces risk by eliminating uncertainty. The initial system is often created with fewer people in less time. Cycle time to proof of concept is reduced.

• **Desired functionality delivered.** It increases the ability to deliver desired functionality. Customers continuously refine their needs by using the prototype and offering feedback. This reduces the need for maintenance and enhancement when the system gets in customers' hands.

Customers usually don't know exactly what they want. They learn along with IS as the system develops. Changes in direction are accomplished easily.

• **Built-in learning process.** Because we know that we are operating on incomplete knowledge whenever we start a development process, rapid evolutionary development encourages us to learn as we go, backtracking and changing things until we get them right. It encourages change rather than stifling it. Frozen requirements cannot reflect the dynamics of the organization or market.

• **Innovation.** Rapid evolutionary development encourages discovery and serendipity in the development of desired functionality. If we learn as we go, there is a much greater chance of discovering opportunities along the way that will shape the course of the system and possibly the course of the company.

• **Reduced cycle time.** The process chops cycle time from concept to delivered product by a factor of four or more. Because we are creating only 20% of the product that provides 80% of the value, the infant system comes into the world with incredible capabilities.

Rapid evolutionary development enables IS to create software quickly and effectively at low cost. In fact, the cost of a microcomputer-based system can be as low as $10,000 to $50,000 for a three- to 12-month effort. Rapid evolutionary development also permits early availability of a working system to begin exploiting the opportunities in the market.

• **Fewer defects.** It reduces defects through continuous testing and evaluation of system components during the initial prototyping and ongoing evolutionary phases. User manuals and training can be developed using the working prototype to ensure accuracy.

• **Flexible growth.** It encourages the creation of evolutionary systems that are easy to grow and evolve because every step of development is an evolutionary step.

• **User commitment.** It continuously involves users in the solution, which encourages ownership and commitment. It also encourages product acceptance. The marriage of IS and users creates a healthy environment for the system's development.

User needs are always changing, and software, by nature, is always late and falls short of the user's expectations. Evolutionary prototyping, however, minimizes delay and shortfall when compared with conventional, incremental or throwaway prototype development approaches.

Unlike a car that rolls off an assembly line or a house ready for occupancy, software systems continue to expand and change over time. Once you've gone through rapid evolutionary development and delivered the system into everyday use, its freewheeling accelerated growth slows. The software grows in a more carefully orchestrated and focused process of software evolution (maintenance).

Software evolution structures the customer's change requests and problem reports into scheduled system releases that maximize productivity through grouping changes by interim product — data, program or documentation — and through the ability to schedule and rigorously test each of these as it is changed.

Growing and growing
The evolutionary maintenance methodology establishes a way to grow a system from infancy into adulthood through incremental, evolutionary enhancement steps and genetic or surgical repairs.

Where maintenance once consumed 80% of the IS budget, evolution will consume less than 50%. The remainder of the budget can be used to deliver new systems and functions via the rapid evolutionary development process.

The software creation process can be used throughout the system's life to create major enhancement and extensions of the system's knowledge and abilities. Using rapid evolutionary development and software evolution, prototypers can continuously improve and enhance the system as the environment changes around it. ▪

Arthur has more than 20 years' experience in the creation and evolution of software. He is the author of *Programmer Productivity, Software Evolution: The Software Maintenance Challenge* and *Rapid Evolutionary Development*.

The right formula

The critical success factors for succeeding at rapid evolutionary development are:
- **A committed and informed executive sponsor.**
- **An operating sponsor — a champion.**
- **Appropriate IS staff.**
- **Appropriate technology.**
- **Management of data.**
- **A clear link to business objectives.**
- **Management of organizational resistance.**
- **Management of system evolution and spread.**

For example, Hitachi Data Systems Corp. management found it needed a disciplined and standardized approach to development, an effective way to visualize and control the production process, a consistent way to specify requirements, an integrated set of tools, portable computer languages and reuse of components. Rapid evolutionary development encompasses all of these things.

Paperwork prevention

Large, cumbersome software development methodologies generate masses of paper and require an extensive paper-support system that impedes productivity.

What upsets software professionals more than anything is to have some new laborious paperwork process foisted on them in the guise of a great new methodology. Rapid evolutionary development, however, tends to minimize paperwork because the system grows organically.

Rigorously documenting a changing structure and functionality is unnecessary. There are so few people involved in the project that communication of changes can be handled informally. Only the bare essentials of documentation are required.

The prototyping team should create its own standards for depth of documentation and then follow them.

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Key to minority success: Follow a strategy

By Ben Berry

You'd think that with the overwhelming proliferation of systems across industries and the need for professionals to support them that doors would open to minorities. Yet few of us have made it through the ranks of information systems.

I found one of those open doors. And behind it, I found other open doors. I didn't make it to the top because companies had requirements to meet — I made it with a strategy and the perseverance to make it work.

Few minorities

I nearly always seemed to find myself alone as the only African-American IS professional on the job while progressing up the ranks.

But I've established a network with IS professionals by joining enterprisewide strategic teams whose goals are to set IS standards and the baseline for policy decision. I also take advantage of opportunities to give professional presentations. I see these as opportunities to share my agenda and be recognized by cross-departmental or intercompany organizations.

If minorities have not entered IS in great numbers, then perhaps the reasons are twofold. First, there is not enough mentoring and role modeling. If few minority mentors and role models exist in this business, then it's no wonder only a few of us ever make it to the ranks of programmers, systems analysts and managers.

It is also important to develop political savvy. It helps to know and understand your boss' boss. Establishing either formal or informal one-on-one meetings with these individuals can help you understand how the office really runs and gain a better appreciation of the short- and long-term organizational goals. This investment of time will build your political capital, which you can cash in at appropriate points during your career. For instance, by knowing the players in the game, you'll hear about job openings before they're posted.

Even though many people are not comfortable with establishing political allies and forging links with senior-level management, you can overcome this by recognizing politics as just one more component in the cost of production. It's not just the best technology or process that wins at the end of the day. If you can't sell it or position it because of a political deficit, then you may become a loser among winners.

In addition to politics, several other strategies have helped boost my career.

I learned very early that IS has two career paths. Both paths start from a programming root, but as we move on, the path may branch: one toward an ever-increasing technical window, the other opening into management.

With each move, my strategy was to be flexible and mobile in terms of the type and size of company and its location. I was able to beat my competition in scope and depth of experience and secure the position, increasing my responsibilities and compensation package.

Secrets to success

- Decide between technical or management path early.
- Find a minority mentor.
- Develop political savvy.
- Be flexible about type and size of company for which you are willing to work.
- Continue education.
- Prepare and publish IS documents.
- Give speeches and presentations.

In my experience, I've found that for minorities, advantages and disadvantages exist in both large and small companies. In large companies, equal opportunity programs seem to provide more entry-level positions for minorities who are new to the field, so it might be a better place to start your career. However, large companies could also be to your disadvantage because a larger competition base exists.

A drawback to smaller firms is that they tend to maintain their company culture. This means that if minorities are not already on staff, firms might subconsciously avoid hiring minorities. If you do find a job in a small company, however, you'll find that they promote staff faster and provide a greater variety of work assignments. This is driven by the need for a few good people to do a lot more work. The downside is that you are typically overworked and, on average, not paid as much as colleagues in larger firms.

Role model

In either case, it's helpful to find a role model once you are at a company. If there aren't many minority role models in your organization, you might want to try some other tactics. My successes were gained through public job announcements in computing magazines, newspapers and an employer-paid job service.

Because minorities have traditionally been underrepresented in both educational-level and business-area analysis, it has become a catch-22 for why fewer minorities are promoted to higher levels of IS.

One way to overcome this lag might be to continue your education. Going back to school and taking computer courses (my undergraduate degree was in the sciences) made me more competitive in applying for IS positions. I was also able to widen my experience base by preparing and publishing IS documents and giving presentations. Additionally, I increased my IS value by joining critical success-factor teams to broaden my exposure to technology issues in order to supplement my current work-load assignments.

IS opportunities exist for minorities. But like any IS professionals in this economy, we need to think smart and follow a strategy to stay on top of career advancement opportunities.

Berry has worked in IS for 18 years. He is currently employed at Hughes Aircraft Co. in Los Angeles as a computer services manager.

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HP Logistics Programmer Analysts — We seek individuals with at least 10 years experience programming for automated supply or maintenance accounting systems and USAF supply/maintenance operations and automated systems. Hands-on experience with HP MPE/XL, HP MPE/V, QUERY, IMAGE, VIEW, POWERHOUSE, CASE Tools, 4GLs, Oracle, COBOL, JCL, PROTOS, ADAGER, QEDIT, and/or SUPERTOOL is a must. Thorough knowledge of supply/maintenance policies and procedures (especially related to FMS programs) is desired.

Data Processing Systems Analysts — These positions require a Bachelor's degree or equivalent with 10+ years practical maintenance experience to include five years with an automated logistics system. Your background should demonstrate strong analytical and problem-solving abilities, excellent organizational and communications skills, and familiarity with USAF procedures related to maintenance of automated logistics. USAF flight line or industrial aerospace manufacturing experience is strongly preferred.

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Career advice for the '90s

For security, target future technology

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Chick Bisberg, president of Two-Party Systems, Inc., an information technology recruiting firm in Livingston, N.J.

Q: I'm a mainframe Cobol/Assembler programmer with four years of experience. My first year I worked with CICS, and the balance of my experience is with IBM's Check Processing Control System. I'm afraid that I'm becoming too specialized. How can I ensure my future competitiveness?
A: Look into what other application areas at your bank (preferably supporting profitable product or service groups) presently use the Cobol, Basic Assembler Language or CICS strengths you have already developed. Find out which of those applications might be ripe for migration to newer systems technologies.

Keep up with job postings from those areas and try to move internally. If that's not feasible, look to other companies that would hire you for the skills you possess now and might train you for new things down the road.

Q: I'm a systems analyst and have been in the computer business for 12 years. I have experience with the System/34, System/36, Application System/400, RPG and Cobol. I would like to get a job in Saudi Arabia. How should I go about finding one?
A: Scour the media for ads listing opportunities in Saudi Arabia, contact the Saudi Embassy and inquire about potential opportunities with U.S. or Saudi companies that might relocate there. Contact recruiting firms specializing in international and overseas positions.

Identify U.S. firms that would likely do business in Saudi Arabia (such as firms that supply oil field equipment or expertise) and be sure to get in touch with their human resources departments.

Q: I'm an MIS manager at a small manufacturing company. Our central computer system is old technology. Fortunately, I have been able to introduce PC hardware and software so my technical skills are very current. I'd like to get into business systems analysis as my own business or with a consulting organization. Any tips on how?
A: Make certain that your resume fully outlines the front end of your skill set: the user interface, analytical, design, spec writing, training and acceptance testing functions. These, teamed with your project/people management abilities, form the real day-to-day job content of most business systems analyst roles.

Your hands-on technical skills and knowledge should also be discussed in the context of your overall functional objective: to provide solutions to business problems.

Q: I'm a network administrator with a bachelor's degree in computer science and a master's degree in information systems. What is the most effective way to outline this information on my resume?
A: Include both of your degrees, as well as a full listing of hardware and software experience. List this information at the beginning of your resume.

This produces a very scannable document and will provide a base for more detailed discussion of your network skills, knowledge and accomplishments in the experience section of the resume.

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How to prepare for a high-level position

■ It's a matter of taking on more responsibility than what's required before the post becomes open. Most people who work for me are qualified for the next position before it opens.

John Robinson, director of data processing County of Walla Walla, Walla Walla, Wash.

TIPS from the TIMES

■ A lot of people don't concern themselves with preparing for a particular position until it becomes open, but that's typically too late. Be proactive. If a position exists in the company that you'd like, even if it's currently filled, that's the ideal time to get to know the skills and understand the job. By being proactive, rather than waiting, your manager will see that you've demonstrated your ability to be a good candidate.

Michael W. Onufer, director of data processing Radio & Records, Inc., Los Angeles, Calif.

■ Let your supervisor know periodically or at review time that you're interested in advancing within the department or company. If it's a job that has a broader scope, you should be asking for assignments that will prepare you for those additional responsibilities.

Alan K. Mis, director of information systems American Steamship Co., Buffalo, N.Y.

■ Call the manager of the department that you're interested in and make him aware of your interest. If you want to follow a specialized career path, you might want to take some courses. You could ask a manager what you will need to qualify for a position down the road.

Robert M. Goldberg, vice president, IS group Old Stone Bank, Warwick, R.I.

Compiled by Kelly Sewell, assistant editor, features.

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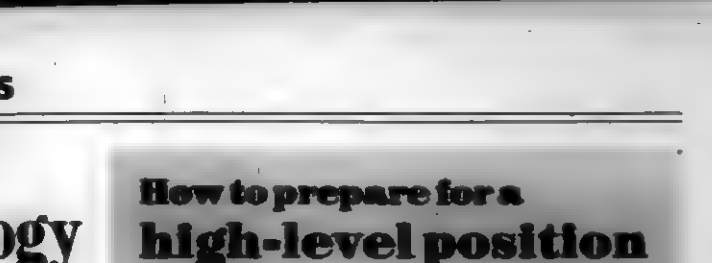
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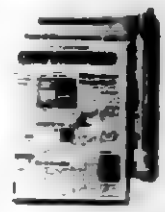

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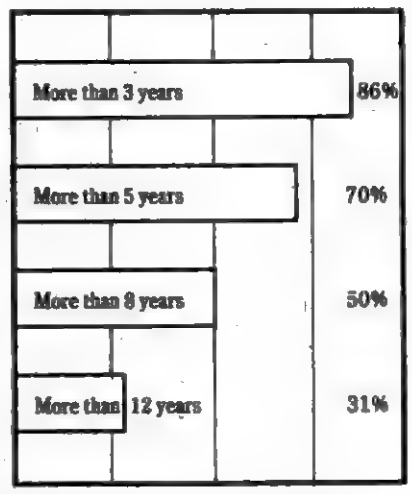

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Avoid mail-order pitfalls: Read all the fine print

By Alice Bredin

Many computer mail-order ads promise everything short of doing your work for you. But what do all of the words in these ads mean? And how many of these promises are genuine? Phrases such as "free service," "complete money-back guarantee" and "cash discount" sound simple, but they aren't always as straightforward as they appear. Following are some of the trickier terms that might lead you astray:

■ **FREIGHT ON BOARD (FOB), FREIGHT ON DELIVERY (FOD):** If the ad says FOB, shipping costs are paid by the seller. If it says FOD, the buyer pays. This cost varies depending on the system price and how it is delivered.

■ **RESTOCKING FEE:** A common buyer complaint is about the fee tacked on by the vendor when equipment is returned. "Restocking fees are legal and can run as high as 30% of the system price," says Stephanie Brown, director of consumer affairs and special projects at the Electronic Industries Association in Washington, D.C.

These fees can apply even when an ad touts a money-back guarantee — which can translate to money-back minus a restocking fee.

■ **RETURN AUTHORIZATION:** It is pretty common for a buyer to need return authorization or approval from the vendor to return the system. Buyers have to explain the reason for the return and get an authorization number that tells the vendor what to do with the machine when it arrives.

Before the sale, seasoned buyers suggest checking into who pays for shipping costs and what the replacement policies are in case a machine is delivered dead on arrival.

■ **CASH DISCOUNT:** This is a typical way for a company to charge fees for credit-card use. While most major credit-card companies don't allow this, some vendors still offer it. Beware, an advertisement for a 3% cash discount can really mean that credit-card users will face a 3% surcharge. Incentives to pay cash may also indicate that the company is in financial trouble.

■ **ON-SITE SERVICE:** In some cases, ads may boast of on-site service, but the catch is it is not offered to everyone, or at every location. It may also be for a very limited period of time. Ads with "on-site service" in bold letters often have fine print at the bottom stating that a service contract must be purchased, Brown says. Her advice: Before buying, call and check with the vendor to see what the service encompasses.

■ **FULL MANUFACTURER WARRANTY:** This term can indicate that the company or dealer that sells the system does not offer support. In this case, you will have to contact the manufacturer and make sure support is easily obtainable.

■ **WE RESERVE THE RIGHT TO SUBSTITUTE AN EQUIVALENT ITEM:** When a component is not in stock, vendors will replace it with another brand. "This substitution clause is standard," says Maxwell Sroge, owner of Maxwell Sroge Co., a mail-order catalog consultancy in Chicago.

However, the word to watch is "equivalent," which can be subject to broad interpretation. In some instances, a better part will be substituted. For this to work, the ad should read "equivalent item or better."

Also, be sure the return policy allows you to return the system if you are unhappy with the substitution, Sroge says.

Bredin is a free-lance writer based in New York.

Sins of omission

Free delivery — Not. Free delivery is only occasionally offered for mail-order items. Unfortunately, buyers may learn about shipping and handling charges after it's too late, says Maxwell Sroge, a mail-order catalog consultant in Chicago. Savvy buyers suggest making a few calls to the vendor before putting in the purchase order.

Freebies. Most vendors don't usually advertise that they have promotional items — usually software — to give away. The best bet is to ask if anything additional comes with the system or if anything can be tossed in for free.

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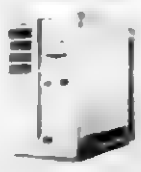

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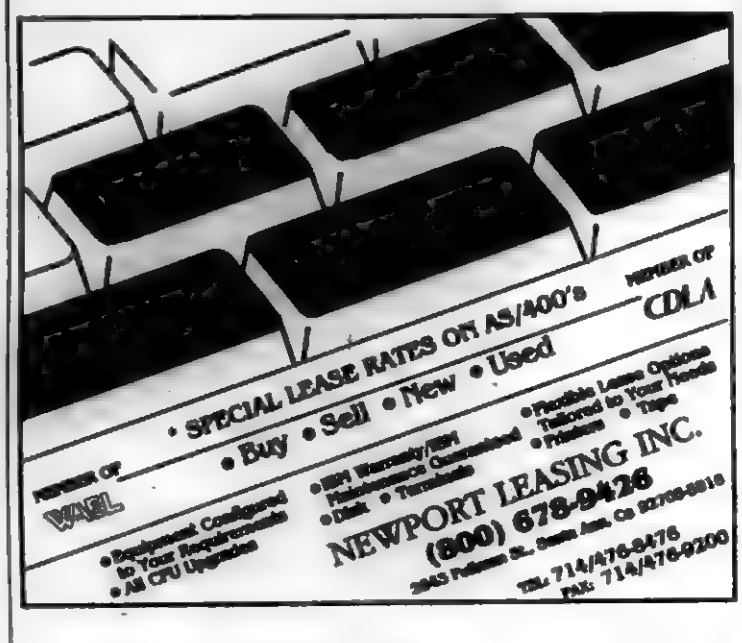

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Detailed specifications for each RFP with a charge may be obtained by submitting a written request accompanied by the appropriate payment. No phone requests will be accepted. NOTE: Valid forms of payment are corporate checks on a Mississippi bank, certified check or POSTAL money order made out to Central Data Processing Authority. No cash or out-of-state checks. For RFPs with no charge call Kelli Brown @ 601-359-2604. If you would like to pick up RFPs at CDPA, you may do so between the hours of 1:00-3:00 p.m. only. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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REQUEST FOR INFORMATION (RFI) FOR DEMONSTRATION PROJECTS:
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The New York City Department of Transportation requests information from vendors who are interested in conducting a demonstration project, at no cost to the City, using automted devices for issuing parking violation tickets.

Last date for response is January 29, 1993, 2:00 p.m. The demonstration project will be conducted as soon thereafter as feasible. The RFI is issued to obtain information only and constitutes neither a request for bids nor a commitment by DOT to implement an automated parking ticketing system.

Requests for RFI package should be directed to: RFI Coordinator, NYC Department of Transportation, 51 Chambers Street, Room 420, New York, NY 10007. Fax no. (212) 788-8159. For further information contact Dr. Hadvah Shuchman (212) 788-8168.

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NOTICE OF SOLICITATION
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REQUEST FOR PROPOSAL
No. 92-05481-P-JB

The Federal Deposit Insurance Corporation ("FDIC") issued a Request for Proposal for a Legal Division Information Management System on December 2, 1992. The FDIC and its Legal Division are soliciting for the acquisition, customization, integration and installation of an existing and commercially available software product, package or packages and/or service or services to create the system. The FDIC Legal Division has locations in Washington, D.C., 17 regional and 35 field offices with a projected legal staff of 2569 employees.

Those who wish to receive a copy of the Request for Proposal, submit an offer, or receive amendments and other information must contact Jim Brennan, Contract Specialist in FDIC's Procurement and Contracts Section, at (202) 898-8675.

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The Port Authority of New York and New Jersey invites contractors interested in supplying system administration services for the Port Authority's turn-key systems to request a copy of a Request for Pre-Qualification. Responding contractors who qualify will be invited to respond to a Request for Proposals early in 1993. Services required are for the support of various turn-key systems involving a variety of hardware, software and communications facilities including, minis, LANs, UNIX workstations and servers and micros at various Authority NY/NJ sites. Responses are due January 15, 1993.

Questions should be directed to: **Mr. Humberto Cruz, Port Authority of New York and New Jersey, One World Trade Center, 82 South, New York, NY 10048** or by FAX, to his attention, at (212) 435-3954.

Vendors who were previously qualified based on response to our advertisement for these services, on July 22, 1992, need not re-qualify.

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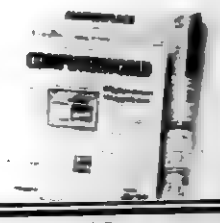

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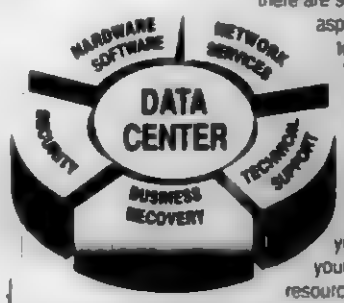

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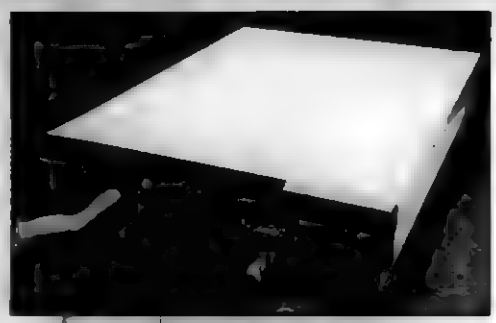

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Companies in this issue

Page number refers to page on which story begins

3Com Corp. 14
3Net Systems 57

A

Abacus 101
Action Technologies, Inc. 8
Adobe Systems, Inc. 61
Advanced Micro Devices, Inc. 61
Alaska Airlines 77
Aleph Systems 106
Alex. Brown & Sons, Inc. 1
Allcomp, Inc. 20
Amalgamated Life Insurance Co. 20
Amdahl Corp. 84
Amerada Hess Corp. 1
American Airlines 89
AMR Corp. 89
AMR Information Services, Inc. 77
Andersen Consulting 15,77
Apexx Technology, Inc. 67
Apple Computer, Inc. 16,57,61,69
Ardis Co. 4
Ascom Timeplex, Inc. 72
AST Research, Inc. 1,8
AT&T 4,24,28,77
AT&T Network Systems International 72
Automated Design Systems 106

B

Banc One Corp. 1,93
Banc One Mortgage Co. 93
Bank of Boston Corp. 10
Bear, Sterns & Co. 1
Bechtel Corp. 57
Bell Atlantic Corp. 94
Blueridge Technologies 61
Borland International, Inc. 1,16,106, 128,129
Bristol-Myers Squibb Co. 57
Brobeck Phleger & Harrison 129
Brooklyn Union Gas Co. 57
Brooktree Corp. 7
BT 72
BT North America, Inc. 69
Byer California 69

C

Cambex Corp. 16
Caterpillar, Inc. 10
CBS 20
Central Point Software, Inc. 101
Chevron Oil Co. 7
Cigna Corp. 94
Cisco Systems, Inc. 14,72
Citibank NA 57
Clorox Co. 57
Cologne Life Reinsurance 20
Comdisco, Inc. 20,72
Commodore Business Machines, Inc. 61
Communications Network Architects 4
Compaq Computer Corp. 8
Computer Associates International, Inc. 16,61
Computer Based Solutions, Inc. 95
Computer Intelligence/Infocorp 8,66
ComputerLand Corp. 8
Continental Airlines 77
Convex Computer Corp. 14
CSX Corp. 89
Cummins Engine Co. 69
Cylink Corp. 6

D

Data General Corp. 6
Data Race, Inc. 4
Dataquest, Inc. 69
Decision Data, Inc. 129
Dell Computer Corp. 1
Demax Software 67
Digital Equipment Corp. 6,10,14,15,72, 89,129,130
Digital Equipment Computer Users Society 14
Disk/Trend, Inc. 85
Donaldson, Lufkin & Jenrette Securities Corp. 128
Du Pont Co. 16,109

E

Eastman Kodak Co. 94
Eden Systems Corp. 92
Electronic Data Systems Corp. 15,77,93
EMC Corp. 84
Empress Software, Inc. 6
Ericsson 12
Espirit de Corp. 57

F

Federal Express Corp. 77
First Financial Management Corp. 16
First Market Research Corp. 85
Forrester Research, Inc. 1,66,89
Freeman Associates 85

G

Gartner Group, Inc. 14
General Masters, Inc. 1
Georgia Department of Revenue 77
Giant Food, Inc. 16
Glaxo Holdings PLC 16
Global Logistics 89
Go Corp. 92
Government Employees Insurance Co. 77
Granite Computer Products, Inc. 8
Great Valley Products, Inc. 61
GTE Corp. 4
Gupta Corp. 66

H

Harris Corp. 72
Health Insurance Plan of New York 20
Hewlett-Packard Co. 6,8,12,14,15, 67,69,72,80,130
Hillcrest Medical Center 57
Hitachi America Ltd. 1
Hitachi Data Systems Corp. 84,109
Home Depot, Inc. 4
Human Design Systems, Inc. 69

I

IBM 1,4,10,15,16,57,61,66, 67,72,80,89,92,130
IBM PC Co. 8
Inacom Corp. 15
Information Builders, Inc. 1,10
Ingres Products Division 6
Input 20
Insight Distribution Network, Inc. 8
Integris 72
Intel Corp. 92
IntelliCorp, Inc. 10
Iris Associates, Inc. 6
Island Swimming Sales, Inc. 6
Italian Postal Bank 24

K

Kemper Financial Services, Inc. 77
KI Research 72
Kidder, Peabody & Co. 1,128
Kimberly-Clark Corp. 20
KnowledgeWare, Inc. 130

L

Lee Data 129
Levi Strauss & Co. 94
Lexmark International, Inc. 61
Littlewood, Shain & Co. 66
L. L. Bean, Inc. 80
Lotus Development Corp. 1,6,10,128

M

Manguistics, Inc. 92
Marketshare, Inc. 1
Marriott Corp. 57
McCormick & Co. 16
MCI Communications Corp. 57
Mentis Corp. 24,93
Merck & Co. 16
Meta Group, Inc. 1
Micro Decisionware, Inc. 1,10
Micro Technology, Inc. 129
MicroAge, Inc. 8
Microcom, Inc. 4
MicroQuill 106
Microsoft Corp. 1,6,7,10,16,57,61,66, 67,72,92,101,102,106,128,129,130
Microwave Systems Corp. 92
MIT Industrial Liaison Program 16
Motorola, Inc. 4,92

N

National Association of Broadcasters 66
National City Corp. 66
National Institute for Standards and Technologies 69
National Insurance Crime Bureau 77
NBC Broadcast Operations 66
NCR Corp. 4,16,24,28,67,69
NEC Technologies, Inc. 8
Network Computing Devices, Inc. 69
Network Systems Corp. 80
New Science Associates, Inc. 57
New York State Thruway Association 24
New York University 14
Northern Development Group 69
Northern Telecom, Inc. 72
Norwest Corp. 93
Novell, Inc. 6,10,16,66,69,72,106,130

O

Omnitel, Inc. 67
Open Software Foundation 72
Oracle Corp. 1,6,10,66,89

P

PA Consulting Group 16
Pacific Bell Telephone Co. 6
Pacific Gas & Electric Co. 1,69
Pacific Software Group 67
Pan Am Corp. 20
PC Connection, Inc. 8
PCs Compleat, Inc. 8
Personal Computer Memory Card International Association 67
Phillips Medical Systems 4
Phoenix Technologies, Inc. 72
Playroom Software 106
Prime Computer, Inc. 72
Procter & Gamble Co. 57,89
Progress Software Corp. 10
Proteon, Inc. 14

R

RDI Computer Corp. 67
Retix 72
Rockwell International Corp. 14
RSA Data Security, Inc. 6

S

Scientific and Engineering Software, Inc. 28
Search Software America, Inc. 77
Sears, Roebuck and Co. 20
Sequent Computer Systems, Inc. 69
Shanghai PTT 72
Sigma Network Systems, Inc. 129
Sikorsky Aircraft 80
Societe Internationale de Telecommunications Aeronautiques 72
Society for Information Management 98
Software AG of North America, Inc. 72
Software Publishers Association 6,128
Sony Corp. 16
SoundView Financial/Gartner Group, Inc. 1
Southern Methodist University 98
Southwest Network Services, Inc. 14
Southwestern Bell 1
Spectrum Information Technologies, Inc. 4
Standard Microsystems Corp. 129
Storage Technology Corp. 6,80,84
StrataCom, Inc. 72
Stuart Research 95
Sun Microsystems Computer Corp. 10,67
Sun Microsystems, Inc. 6,7,10,69
Sun User Group 7
Sybase, Inc. 1,10,66,89
Symantec Corp. 101,102
Synernetics, Inc. 72
Syntrex Technologies, Inc. 72

T

Taligent, Inc. 57
Technology Transfer Associates 7
Tektronix, Inc. 69
Telelead Corp. 4
Telematics International, Inc. 72
Telfa S.A. 72
The Boeing Co. 57
The Diebold Institute 24
The Gosip Institute 69
The Workstation Group 80
The Yankee Group 4,20
Timeslips Corp. 61
Trans World Airlines 109
Travelers Corp. 57
Trusted Information Systems, Inc. 6

U

Uniface Corp. 69
Union Oil of California 80
Union Pacific Railroad 57
Unisys Corp. 16,66,72,80,130
United Parcel Service, Inc. 4
Univel 6,10
University of California at Berkeley 7
Unix System Laboratories, Inc. 6
U.S. Patent Office 4

V

Verdix Corp. 72
Visa International, Inc. 77
Visual Technologies, Inc. 69
VPL Research 6

W

Waste Management, Inc. 10
Wellfleet Communications, Inc. 14
Wilson WindowWare, Inc. 101
WordPerfect Corp. 6
WordTech Systems, Inc. 129
WorkGroup Technologies, Inc. 1
Wyse Technology, Inc. 69

X

XDB Systems, Inc. 10
XTree Co. 101

Y

Young & Rubicam, Inc. 12

Z

Zenith Data Systems 8
Z-Nix Co. 129

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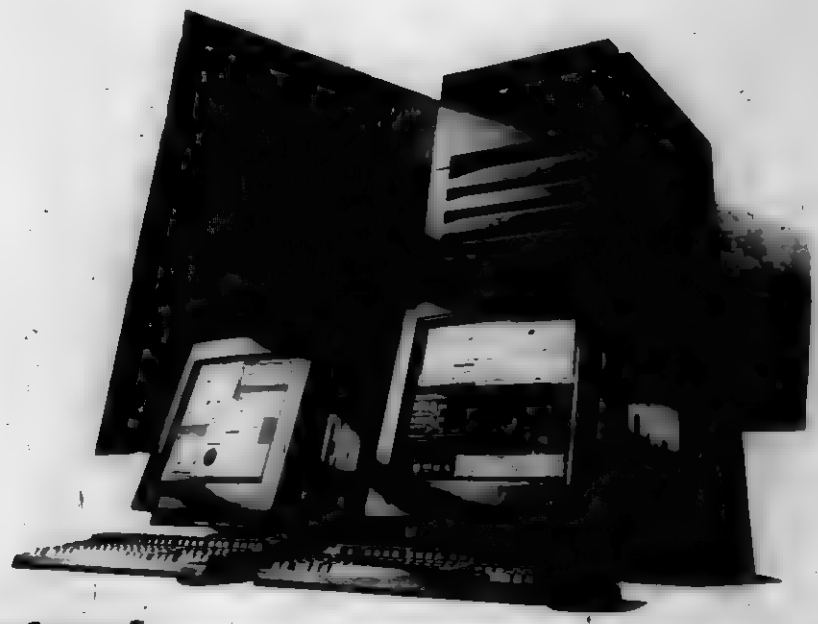

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Gainers Losers

Percent

Meca Software	48.6	Ross Systems	-16.5
Spinnaker Software	27.3	National Semiconductor	-16.4
Sequent Computer Sys.	19.0	Borland Int'l Inc.	-16.2
QMS Inc.	15.3	Rainbow Technologies Inc.	-14.3
Intelligent Info. Systems	14.7	Network Systems Corp.	-13.4
Abtel Communication Corp.	14.2	Sierra Semiconductor	-13.3
Corporate Software	11.4	Zeos International Ltd.	-12.5
Dell Computer Corp.	10.9	Egghead Discount Software	-10.2

Dollar

Intelligent Info. Systems	5.50	Microsoft Corp.	-5.75
Dell Computer Corp.	4.88	IBM	-4.88
Sequent Computer Sys.	2.88	Borland Int'l Inc.	-4.00
Wellfleet Communications	2.50	Parametric Technology	-4.00
Computer Services	2.50	Autodesk Inc.	-3.75
Watkins-Johnson	2.50	BMC Software Inc.	-3.50
Zilog	2.25	Rainbow Technologies Inc.	-3.50
Stratus Computer Inc.	2.25	Novell Inc.	-3.38

Software firms ride trends

Recent action in the stock exchange has reflected market trends affecting big desktop software vendors. Software sales favor Microsoft Corp. (MSFT) and Lotus Development Corp. (LOTS) while, for the moment, Borland International, Inc. (BORL) seems to be swimming against the tide.

For example, sales of Windows-based word processors and presentation graphics packages are booming, according to figures released by the Software Publishers Association (SPA) in Washington, D.C. The SPA pegged third-quarter Windows word processor revenue at $37.6 million, up 215% from the same period in 1991. Windows presentation graphics sales, a smaller category with roughly $8 million in third-quarter sales, jumped a healthy 368%.

Microsoft, which closed Thursday at 89, is well-positioned in both of these high-growth areas, with Word for Windows gaining market share in recent months and a new version of PowerPoint selling well.

Lotus' Ami Pro owns a relatively small share of the word processing market, but Version 3.0 is rapidly gaining momentum, according to a report by analyst Terence Quinn at Kidder, Peabody & Co. Freelance Graphics for Windows is also gaining ground against presentation graphics leader Harvard Graphics. Lotus stood at 20½ on Thursday.

Borland has no products to contend with Microsoft and Lotus in the graphics and word processing markets, and revenue growth in Borland's areas of strength is less robust. The SPA figures show a 3.4% decline in overall sales in the DOS database category from the third quarter of 1991, where Borland's dBase and Paradox lines are struggling to maintain share against Microsoft's FoxPro. Meanwhile, Microsoft has released Access, while Borland struggles to bring Windows database products to market. Borland stock has fallen dramatically in recent months, and it closed Thursday at a 52-week low of 20¾.

—Derek Slater

Desktop dilemma

Wall Street analysts disagree on what's in the cards for the big desktop software vendors

Vendor	Donaldson, Lufkin & Jenrette	Kidder, Peabody & Co.	Needham & Co.
Borland International, Inc.	Neutral	Underperform	NR
Lotus Development Corp.	Neutral	Buy	Hold
Microsoft Corp.	Attractive	Hold	Buy

NR: Not rated

Each	52 Week High	52 Week Low		Dec.31 Close	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						
OTC	24.00	9.63	3 COM Corp.	23.63	-1.00	-4.1
NYS	70.63	56.75	American Info Techs Corp.	69.00	1.38	2.0
NYS	48.75	36.63	AT&T	48.75	1.38	2.9
OTC	4.25	0.75	Abtel Communication Corp.	1.50	0.19	14.2
OTC	22.00	10.25	Banyan Systems Inc.	19.75	-1.00	-4.8
NYS	49.75	40.25	Bell Atlantic Corp.	49.63	1.88	3.9
NYS	55.50	43.38	Bellsouth Corp	50.00	1.00	2.0
NYS	6.75	3.63	Bolt, Beranek & Newman	4.63	-0.25	-5.1
NYS	75.38	42.13	Cabletron Systems	72.00	-2.38	-3.2
OTC	31.00	17.75	Chipcom Corp	26.50	0.50	1.9
OTC	76.50	26.50	Cisco Systems Inc.	71.00	-2.75	-3.7
OTC	35.25	5.50	Compression Labs Inc.	13.38	-0.88	-6.1
OTC	3.38	0.88	Data Switch Corp.	2.56	0.13	5.1
NYS	23.63	13.75	Digital Comm. Assoc.	16.88	-0.13	-0.7
OTC	15.25	7.50	Digital Systems Int'l Inc.	10.50	-0.50	-4.5
OTC	20.13	3.63	DSC Communications	19.00	-0.75	-3.8
OTC	10.88	4.75	Fibronix Int'l Inc.	6.88	-0.38	-5.2
OTC	37.50	10.50	Filenet Corp.	21.38	0.38	1.8
OTC	3.38	1.50	Gandalf Technologies Inc.	1.75	-0.13	-6.7
OTC	2.25	0.69	Gateway Communications	1.38	-0.19	-12.0
NYS	6.00	2.50	General Datacomm Inds. (H)	6.00	0.50	9.1
ASE	5.88	1.00	Go Video	2.88	-0.13	-4.2
NYS	35.75	28.88	GTE Corp	33.88	0.38	1.1
NYS	72.00	50.00	ITT Corp. (H)	69.75	-2.00	-2.8
OTC	38.50	26.75	MCI Communications Corp	38.00	-0.38	-1.0
OTC	14.25	2.25	Microcom Inc.	5.88	-0.25	-4.1
NYS	18.25	9.50	Network Equipment Tech.	9.50	-0.13	-1.3
OTC	25.50	8.00	Network General*	17.75	0.25	1.4
OTC	20.00	8.50	Network Systems Corp.	12.13	-1.88	-13.4
OTC	33.75	5.88	Newbridge Networks Corp. (H)	33.75	2.25	7.1
NYS	49.25	30.50	Northern Telecom Ltd.	41.38	-0.88	-2.1
OTC	33.50	22.50	Novell Inc.	28.00	-3.38	-10.8
NYS	88.38	69.13	Nynex Corp.	84.25	1.00	1.2
OTC	37.50	14.50	Octel Communications Corp.	22.50	0.00	0.0
OTC	53.00	10.25	Picturetel Corp	22.75	-2.25	-9.0
OTC	18.75	7.00	Proteon Inc.	9.63	-1.00	-9.4
NYS	38.25	14.13	Scientific Atlanta Inc. (H)	36.88	-1.13	-3.0
NYS	71.00	56.63	Southwestern Bell Corp.	71.00	0.75	1.1
NYS	26.75	20.75	Sprint Corp.	25.25	0.50	2.0
OTC	25.38	5.25	Standard Microsystems Corp (H)	24.50	-0.13	-0.5
OTC	70.25	15.25	Synoptics Communications (H)	69.50	-0.75	-1.1
OTC	24.25	12.25	US Robotics	20.25	0.25	1.3
NYS	40.00	32.88	U S West Inc	38.00	-0.13	-0.3
OTC	72.75	24.00	Wellfleet Communications	72.75	2.50	3.6
PCS AND WORKSTATIONS						
OTC	10.25	3.50	Advanced Logic Research	4.38	-0.13	-2.8
OTC	70.00	41.50	Apple Computer Inc.	58.25	0.75	1.3
OTC	24.50	11.25	AST Research Inc.	19.50	-1.25	-6.0
NYS	19.25	6.75	Commodore Int'l	7.75	1.00	-11.4
NYS	43.25	22.25	Compaq Computer Corp.	43.25	0.75	1.8
OTC	40.75	15.00	Dell Computer Corp.	40.75	4.00	10.9
OTC	7.75	0.50	Everex Systems Inc.	0.50	0.00	0.0
NYS	35.38	21.25	Harris Corp.	33.00	-1.00	-2.9
NYS	85.00	47.63	Hewlett Packard Co.	65.38	0.75	1.2
NYS	29.75	14.13	Silicon Graphics	26.25	-1.25	-4.5
OTC	36.13	20.75	Sun Microsystems Inc.	32.63	-1.38	-4.0
NYS	31.25	22.25	Tandy Corp	29.75	-1.13	-3.6
NYS	11.13	5.00	Zenith Electronics	6.25	-0.38	-5.7
OTC	25.50	2.75	Zeos International Ltd.	3.50	-0.50	-12.5
LARGE SYSTEMS						
ASE	20.63	6.63	Amdahl Corp.	7.38	0.00	0.0
NYS	16.38	4.75	Convex Computer	7.63	0.00	0.0
OTC	14.25	1.88	Cray Computer	4.63	-0.13	-2.6
NYS	49.50	19.00	Cray Research Inc.	23.00	-0.88	-3.7
NYS	18.13	7.13	Data General Corp.	11.38	-0.75	-6.2
NYS	65.50	31.50	Digital Equipment Corp.	33.25	-0.13	-0.4
NYS	100.38	60.88	IBM	62.13	-4.88	-7.3
OTC	13.25	5.50	Kendall Square Research	13.00	0.00	0.0
NYS	119.25	83.00	Matsushita Electronics	94.25	2.50	2.7
OTC	17.50	6.00	Pyramid Technology	8.50	-0.75	-8.1
OTC	18.00	10.38	Sequent Computer Sys.	18.00	2.88	19.0
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.0
NYS	54.25	29.50	Stratus Computer Inc.	36.75	2.25	6.5
NYS	15.13	9.50	Tandem Computers Inc.	15.00	0.38	2.6
NYS	11.75	4.00	Unisys Corp.	9.75	-0.50	-4.9
ASE	7.50	0.06	Wang Labs Inc. (a)	0.44	0.00	0.0
SOFTWARE						
OTC	68.50	25.25	Adobe Systems Inc.	31.38	-2.13	-6.3
OTC	44.25	10.25	Aldus Corp.	13.75	-1.50	-9.8
OTC	19.75	7.00	American Software Inc.	9.13	-0.13	-1.4
OTC	22.38	9.75	Ask Computer Systems (H)	22.38	1.63	7.8
OTC	56.50	23.25	Autodesk Inc.	46.25	-3.75	-7.5
OTC	37.75	3.75	Bachman Info. Systems	6.00	0.50	9.1
OTC	43.00	32.00	BGS Systems Inc.	39.00	-2.00	-4.9
OTC	79.00	37.25	BMC Software Inc.	64.75	-3.50	-5.1
OTC	25.50	13.00	Boole & Babbage	22.00	-0.25	-1.1
OTC	86.75	20.75	Borland Int'l Inc.	20.75	-4.00	-16.2
OTC	10.50	3.63	CE Software	4.19	0.06	1.5
ASE	29.75	9.38	Cheyenne Software Inc.	28.88	1.63	6.0
OTC	13.13	5.63	Cognos Inc.	7.50	0.00	0.0
NYS	19.50	8.63	Computer Associates	18.13	-0.88	-4.6
NYS	12.38	4.63	Computervision Corp.	4.63	-0.25	-5.1
OTC	20.00	6.75	Comshare Inc.	13.75	-0.25	-1.8
OTC	47.88	6.00	Easel Corp.	12.25	-0.50	-3.9
OTC	25.00	11.50	Group I Software	16.00	0.00	0.0
OTC	6.63	3.50	Hogan Systems Inc.	5.63	0.25	4.7
OTC	36.25	18.50	Information Resources	32.00	-1.50	-4.5
OTC	33.50	5.88	Informix Corp.	31.75	-0.13	-0.4
OTC	22.38	11.00	Intergraph Corp.	13.00	-0.25	-1.9
OTC	15.00	7.00	Interleaf Inc.	11.13	-0.88	-7.3
OTC	20.25	10.25	Intersolv Inc	12.50	-1.00	-7.4
OTC	21.38	9.50	Knowledgeware Inc.	14.38	0.88	6.5
OTC	51.00	28.75	Legent Corp. (H)	48.00	-2.75	-5.4
OTC	38.75	14.75	Lotus Development	20.75	-1.75	-7.8
OTC	7.38	1.88	Meca Software	5.63	1.63	40.6
OTC	22.25	5.25	Mentor Graphics	8.50	-0.13	-1.4
OTC	42.13	27.25	Micro Focus (H)	41.00	-1.13	-2.7
OTC	20.50	6.50	Micrografx Inc.	8.75	-0.50	-5.4
OTC	95.00	65.50	Microsoft Corp.	86.25	-5.75	-6.3
OTC	24.75	12.00	Oracle Corp.	21.88	-1.00	-4.4
OTC	56.25	23.38	Parametric Technology	48.00	-4.00	-7.7
OTC	11.00	3.50	Phoenix Technologies	6.63	-0.13	-1.9
OTC	25.25	11.25	Platinum Technology	18.25	-1.38	-7.0
OTC	60.00	29.00	Progress Software Corp.	59.75	1.50	2.6
OTC	26.63	4.00	Quarterdeck Office Sys.	6.25	0.00	0.0
OTC	32.75	11.75	Rainbow Technologies Inc.	21.00	-3.50	-14.3
OTC	22.75	4.00	Rasterops	7.50	-1.00	-11.8
OTC	17.25	3.63	Ross Systems	8.25	-1.63	-16.5
OTC	18.88	8.50	Sapiens USA Inc.	17.38	-0.38	-2.1
OTC	26.25	6.75	Software Publishing Corp.	8.88	-0.63	-6.6
OTC	8.00	2.00	Software Toolworks Inc.	5.50	-0.25	-4.3
OTC	7.25	0.25	Spinnaker Software	1.75	0.38	27.3
OTC	16.50	3.25	State of the Art	7.75	0.50	6.9
NYS	25.25	13.75	Sterling Software Inc.	20.63	-0.88	-4.1
OTC	30.00	8.00	Struct. Dynamics Research	11.88	-0.50	-4.0
OTC	45.25	19.00	Sybase Inc.	43.63	0.88	2.0
OTC	51.00	5.88	Symantec Corp.	14.13	0.25	1.8
NYS	15.50	5.25	Systems Center Inc.	7.00	-0.13	-1.8
OTC	38.00	16.66	System Software Assoc. (H)	34.38	-0.88	-2.5
OTC	13.25	2.50	Tenzic Corp.	3.50	-0.25	-6.7
OTC	23.75	14.50	Walker Interactive Systems	22.13	0.38	1.7
OTC	5.38	1.38	Wordstar	2.44	0.00	0.0
SEMICONDUCTORS						
NYS	21.50	7.38	Advanced Micro Devices	16.63	0.13	0.7
NYS	14.88	7.50	Analog Devices Inc. (H)	14.88	0.25	1.7
OTC	16.25	6.75	Atmel Corp.	15.50	-0.38	-2.4
OTC	14.13	3.25	Chips and Technologies	4.88	0.00	0.0
NYS	18.38	7.38	Cypress Semiconductor Corp	10.38	-0.50	-4.6
NYS*	14.50	6.75	Dallas Semiconductor	13.50	-0.75	-5.3
OTC	79.00	41.25	Intel Corp. (H)	79.00	0.38	0.5
NYS	10.75	4.88	LSI Logic Corp. (H)	10.75	0.38	3.6
NYS	22.38	12.13	Micron Technology	17.63	-1.75	-9.0
NYS	104.38	58.00	Motorola Inc.	102.50	-1.00	-1.0
NYS	14.13	5.38	National Semiconductor	10.88	-2.13	-16.3
OTC	27.00	8.25	Sierra Semiconductor	13.00	-2.00	-13.3
NYS	52.25	26.00	Texas Instruments	47.25	-2.00	-4.1
OTC	10.50	6.00	VLSI Technology	7.63	0.50	7.0
OTC	7.00	2.13	Weitek	4.88	-0.38	-7.1
ASE	8.00	2.00	Western Digital Corp.	7.63	-0.13	-1.6
OTC	31.00	14.50	Xilinx	23.25	2.25	10.7
OTC	33.50	15.50	Zilog Inc.	32.75	1.00	3.1
PERIPHERALS AND SUBSYSTEMS						
OTC	11.25	3.88	Archive Corp.	11.13	0.00	0.0
OTC	29.50	13.75	Bairdtec Inc. (H)	27.63	-0.88	-3.1
OTC	23.50	9.25	Cambex Corp.	14.13	-1.88	-11.7
ASE	15.25	5.66	Cognitronics Corp.	14.38	-0.75	-5.0
NYS	23.88	13.00	Conner Peripherals	20.13	-0.75	-3.6
OTC	27.50	14.25	Data Race Inc. (H)	25.50	-0.38	-1.4
ASE	19.66	4.75	Databarn Corp.	11.25	0.25	2.3
NYS	22.38	6.09	EMC Corp. (H)	21.00	-1.25	-5.6
OTC	10.00	4.75	Emulex Corp.	9.00	0.38	4.3
OTC	23.00	13.25	Evans & Sutherland	18.25	0.25	1.4
OTC	40.63	12.00	Exabyte	17.38	-2.38	-12.0
OTC	43.00	15.75	Intelligent Info. Systems	43.00	5.50	14.7
OTC	11.25	4.75	Iomega Corp.	6.75	-0.13	-1.8
OTC	34.75	10.25	IPL Systems Inc.	11.75	-1.50	-11.3
OTC	23.25	10.75	Komag Inc.	18.25	0.00	0.0
OTC	19.63	4.38	Maxtor Corp. (H)	17.50	-1.38	-7.3
OTC	12.63	7.13	Micropolis Corp.	9.13	-0.75	-7.6
NYS	107.00	85.38	3M Corp	103.38	2.00	2.0
OTC	6.75	3.50	Printronix Inc.	5.00	0.00	0.0
NYS	15.50	6.88	QMS Inc.	12.25	1.63	15.3
OTC	18.00	9.00	Quantum Corp.	16.38	-0.38	-2.2
OTC	12.75	3.75	Radius Inc.	5.75	-0.50	-8.0
NYS	14.25	7.50	Recognition Equipment	13.75	-0.63	-4.3
OTC	13.88	5.63	Rexon Inc.	11.75	-1.00	-7.8
OTC	21.75	7.75	Seagate Technology (H)	20.63	-1.00	-4.6
NYS	78.00	20.00	Storage Technology	23.00	0.00	0.0
NYS	22.88	16.50	Tektronix Inc.	18.38	-1.50	-7.5
NYS	82.25	60.88	Xerox Corp.	77.50	-0.63	-0.8
SERVICES						
OTC	23.38	12.16	American Mgmt. Systems	22.63	-0.13	-0.5
NYS	5.38	3.00	Amacomp Inc.	4.25	0.13	3.0
OTC	23.00	12.50	Analysts Int'l (H)	23.00	0.25	1.1
NYS	52.88	37.00	Auto Data Processing	52.50	0.00	0.0
NYS	37.25	7.06	Ceridian Corp.	14.75	-1.13	-7.1
NYS	23.22	12.50	Comdisco Inc.	15.50	0.38	2.5
OTC	13.50	6.75	Computer Horizons	9.38	-0.38	-3.8
NYS	84.88	$7.00	Computer Sciences	79.25	2.50	3.3
NYS	10.13	7.00	Computer Task Group	8.75	-0.13	-1.4
OTC	40.50	15.00	CompUSA Inc.	31.75	-2.50	-7.3
OTC	19.25	6.00	Corporate Software	12.25	1.25	11.4
OTC	30.75	7.75	Egghead Discount Software	9.88	-1.38	-12.2
NYS	33.75	25.25	General Motors E (EDS) (H)	32.25	-0.75	-2.3
OTC	30.38	6.25	Intelligent Electronics	11.13	-0.50	-4.3
OTC	14.88	6.63	Merisel	10.00	-0.25	-2.4
OTC	15.75	5.75	Microage Inc.	9.25	0.38	4.2
OTC	40.00	18.34	Paychex	36.75	-1.75	-4.5
NYS	81.38	55.00	Policy Management Sys. (H)	79.38	0.13	0.2
NYS	25.56	15.94	Reynolds and Reynolds	25.00	-0.19	-0.7
OTC	32.00	22.00	SEI Corp.	30.00	1.00	3.4
OTC	24.38	16.88	Shared Medical Systems	21.75	-0.50	-2.2
OTC	38.25	16.00	Sungard Data Systems	30.25	2.00	7.1
NYS	3.63	1.13	Ultimate Corp.	1.88	0.13	7.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
Note: Reynolds and Reynolds completed a 2-for-1 stock split. Copyright Nordby International, Inc. Louisville, CO
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In Brief

Suits settled

Digital Equipment Corp. said last week that it has settled long-simmering storage-patent suits with **Micro Technology, Inc.** in Anaheim, Calif. As a result, both companies agreed to dismiss all pending litigation and to cross-license some of each other's storage technologies. The license covers DEC's patented disk and controller technology and certain Micro Technology fault-tolerant redundant arrays of inexpensive disks, networking and storage devices.

Borland acquisition

Borland International, Inc. last week acquired dBase-compatible technology from **WordTech Systems, Inc.** in Orinda, Calif. Borland picks up the Argo line of database management software, including code for all versions of WordTech's dBXL database management system and Quicksilver compiler, as well as technology under development.

SMC diversifies

PC local-area network enhancement vendor **Standard Microsystems Corp.** (SMC) in Hauppauge, N.Y., said last week that it has agreed to acquire **Sigma Network Systems, Inc.**, a Reading, Mass.-based provider of internetworking products. SMC said it expects to issue 350,000 shares of common stock to facilitate the transaction. SMC's stock was trading at 25⅞ last Wednesday, which gave the deal a value of roughly $9 million.

Lee Data expands

Lee Data in Minneapolis is acquiring selected assets of Horsham, Pa.-based **Decision Data, Inc.**'s Application System/400 and System 3/X-compatible peripherals line. The purchase price is estimated at $19 million, plus other considerations to be paid at closing.

FTC's bark worse than its bite

Investigation of Microsoft likely to result in reprimand, not restructuring

By Christopher Lindquist
BELLEVUE, WASH.

ANALYSIS

When it was revealed in early 1991 that Microsoft Corp. was under investigation by the Federal Trade Commission (FTC), some observers predicted that the desktop software giant would eventually be split into separate operating systems and applications companies. Historically, however, such an investigation has been more likely to result in a stern warning — for example, on DOS licensing — than a painful restructuring.

There are several reasons for the FTC's passiveness. First, experts said it is unlikely that the FTC would do anything that might prove harmful to one of the U.S.' best competitors in the global market. "They don't want to be blamed for hurting American competitiveness," said Tom Villeneuve, a partner at the technology group at the law firm of Brobeck Phleger & Harrison in San Francisco.

Second, the FTC has rarely been forceful in its dealings with most companies, either in or outside the technology sector. The most famous government investigations of technology companies — IBM's mainframe business in the 1960s and AT&T in the early '80s — were handled by the Department of Justice, not the FTC. And there is no reason to believe that trend will change.

"[In lots of [the FTC's] investigations, nothing much really happens, or it is settled quietly," Villeneuve said.

No escape for high tech

Which is not to say that the FTC has not been keeping an eye on the high-technology industry. Given the FTC's record, some members of the computer industry are not taking any chances. Novell, Inc. Chairman Raymond Noorda, who has crossed swords with Microsoft on both a systems and a network software level, is reportedly soliciting financial and other support to back an antitrust action against Microsoft should the FTC fail to act. And a small print shop filed its own antitrust suit two weeks ago, seeking $8 billion (see story at right).

There are reasons to believe that the FTC will do something, however minor. The case is garnering more public attention than previous FTC forays into the technology arena, and action of some sort would serve notice to other technology firms that the FTC, and not just the Justice Department, should be taken seriously.

"There seems to be some inner tensions between the FTC and the Justice Department over who owns high technology," said Dan Kaufman, a partner at the technology group at Brobeck, Phleger & Harrison. So there is "some incentive for the FTC to do something."

A second consideration is that a new administration is about to enter Washington, and whether the FTC will release any decision before that happens is uncertain. On Dec. 15 Washington closes down, said Frank Dzubeck, president of Communications Network Architects, Inc. And with a new administration moving in shortly, "if you're any kind of manager, you probably avoid any kind of decision at this point," he added.

And that decision, said Art Amolsch, editor of "FTC: WATCH," will probably deal with Microsoft's DOS licensing practices. "I think it's quite clear that the FTC staff thinks that there's a problem with the DOS licensing," he said. Microsoft's DOS licensing structure is seen by some competitors as a barrier to competing operating systems' being bundled with hardware.

One thing observers seem to agree on is that Microsoft will remain one company.

"The FTC is not going to try and break up Microsoft," Amolsch said. "There are not good antitrust reasons to do that."

The FTC will not release any information until an actual decision is made, and that decision could be simply to send the investigation team back for more information. Exactly when that will happen is up for speculation, too.

A shooting star

MICROSOFT'S GROWTH DURING THE PAST THREE YEARS CLEARLY OUTPACES THE LEADING U.S. SOFTWARE VENDORS

Packaged software revenue (in millions)

	Microsoft	Leading U.S. software vendors
'90	$1.29	$12.35
'91	$1.97	$14.86
'92	$2.83	$17.12
Compound annual growth rate	48.5%	17.7%

Source: International Data Corp.

Watching time

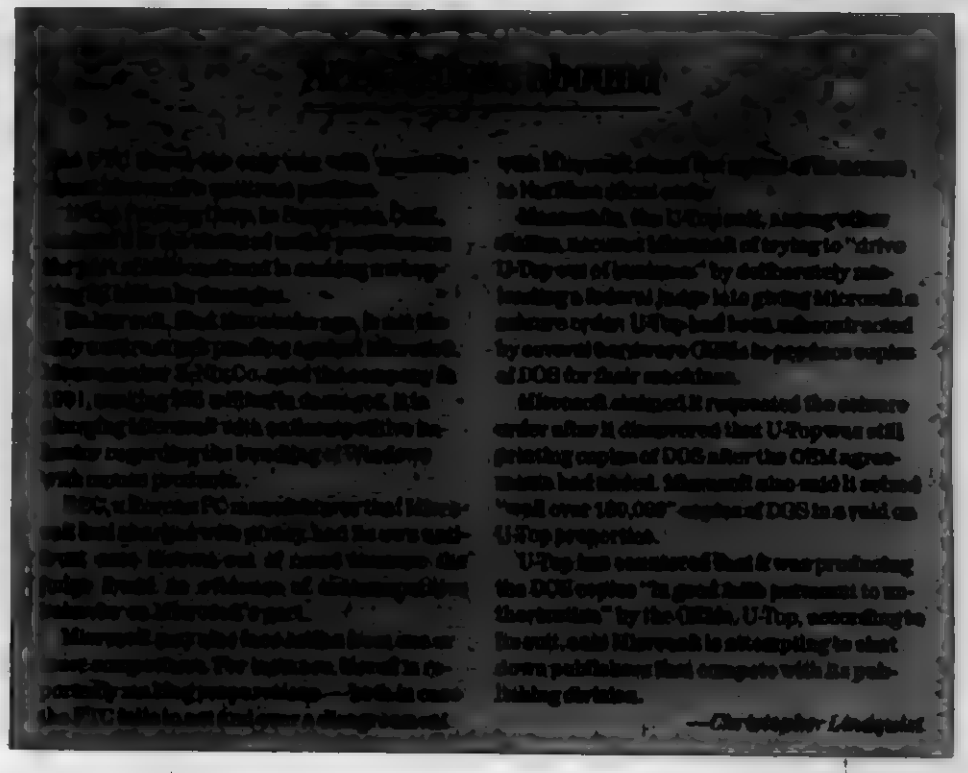
November 1989: FTC investigates a joint statement by IBM and Microsoft concerning the future of OS/2 and Windows.

December 1989: Microsoft says the FTC probe has been expanded to investigate allegations of monopolistic behavior.

March 1990: The Open Software Foundation admits that the FTC has contacted it concerning pricing practices.

June 1990: Chairman Bill Gates memo notes FTC probe may affect Microsoft's future.

November 1990: Rumors of a Novell antitrust suit against Microsoft and completion of FTC investigation surface.



—Christopher Lindquist

Industry HEALTH WATCH

WELL
SO-SO
POOR

	1992 Q1-Q3			1991 Q1-Q3		
	Revenue	Net income	Profit margin	Revenue	Net income	Profit margin
Apple	$5,223.9	$364.4	7.0%	$4,633.3	$159.3	3.4%
AST	$794.2	$43.0	5.4%	$588.2	$53.5	9.1%
Dell	$1,393.6	$70.3	5.0%	$604.2	$35.5	5.9%
Compaq	$2,667.1	$123.7	4.6%	$2,398.0	$64.3	2.7%
Tandy	$3,321.1	$95.3	2.9%	$3,050.7	$97.7	3.2%

Source: International Data Corp.

1989	1990	1991	1992*	1993*	1994*
$38.3	$43.2	$46.5	$51.1	$57.1	$62.9

System	1990	1991	1992*	1993*
Intel 286	$1,738	$1,420	$1,160	$970
386SX, 20 MHz	$2,531	$2,077	$1,648	$1,036
386SX, 25 MHz	—	—	$1,323	$850
386DX, 25 MHz	$4,891	$3,336	$2,387	$1,570
486SX, 20 MHz	—	—	$2,483	$1,380
486SX, 25 MHz	—	—	$3,444	$1,700

Source: International Data Corp.

The Fifth Wave

InsideLines

Dog bites man, begs for treat

It's no secret that IBM's AD/Cycle is on the wane. But confirmation of the obvious came last week on a surprising front. At the announcement of its Application Development Workbench Version 2.7, AD/Cycle alliance partner KnowledgeWare bit the hand that feeds it when President Don Addington said the CASE technology "has not been as successful as we or IBM thought it would be. It is disjointed and not a true blend of technology." KnowledgeWare CEO Fran Tarkenton did nothing to lessen the bite when he outlined long-standing disagreements with KnowledgeWare's largest customer. Still, both execs concurred that "our commitment to AD/Cycle and IBM is there."

The road to success

Many industry analysts said they believe it's just a matter of time before HP replaces DEC as the nation's No. 2 computer company. HP Vice President Wim Roelandts last week outlined what it will take before HP pulls off such a move. His formula? "A little bit of luck and a little continued poor performance of Digital." But Roelandts cautioned, "We're not immune to economic uncertainties." Meanwhile, Roelandts could not resist the opportunity to take a shot at No. 1. Noting that IBM formed its client/server division 18 months after HP organized such a group, he observed, "It shows they're getting on the fast track. Normally, they're five years behind us."

Easy for you to say now . . .

DEC co-founder and retired president Ken Olsen, speaking at a fund-raising dinner for The Cotting School in Lexington, Mass., last week, promised not to criticize the current regime at the company he founded 35 years ago. Moments later, he said DEC's "big curse" remains its fat layer of management that is neither productive nor responsible for balancing its budgets rather than the hordes of worker bees the company is laying off. Olsen left DEC last summer after refusing to make cuts demanded by the company's board. Renowned for doling out employee benefits, Olsen then broadly criticized big computer companies for massive layoffs because "they see the phenomenon of downsizing as the way to go." His advice to DEC and other large companies: Maintain morale, maintain resources and keep customers happy, even if you're not earning a profit on them at the moment.

Bridging the gaps

Unisys this week will introduce a set of software products designed to provide connectivity between its CTOS-based LAN workstations and Microsoft's LAN Manager, IBM's LAN Server and Novell NetWare environments. LANce (LAN connectivity enhancer) PC and LANce LM will enable customers to share information between back-office PC LANs and front-office CTOS LANs, according to Steve Ballenger, a product marketing manager at the Unisys Distributed Systems division. LANce LM will provide full implementations of the NetBIEU and NetBIOS application programming interfaces for peer-to-peer connectivity between CTOS and DOS environments.

Conference calling

At DECUS last week, DEC Vice President Don Gaubatz said the company will release a new video card along with a new version of DECspin videoconferencing software in May. The card will include capture and compression as well as audio on one channel card, targeting a DEC 3000 AXP Model 500 with six turbochannel slots as the multimedia "vehicle of choice," he said.

Last week, a Lotus public relations representative accidentally left the phone off the hook while she briefed a disinterested Lotus manager for an interview with a Computerworld *reporter. During the unintentional conference call, she described* Computerworld *readers as "fat old IS guys," adding that nonetheless, "We need them." Those of you who buy hundreds or thousands of copies of Lotus applications might want to invite your Lotus rep to your next workout session. Besides, it's not how old you are; it's what you know and what you have in your wallet that counts. By the way, the average* Computerworld *reader is 42 years old. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

Informix Database Technology Helps Corn Products Keep Cash Flowing.

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Corn Products chose the CDI/Informix UNIX solution.

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COMPUTERWORLD

Is the method consistent?

User pricing ties HP in knots

By Mark Halper
PALO ALTO, CALIF.

Following its recent decision to shift to a user-based software pricing formula, Hewlett-Packard Co. now faces a Gordian knot of issues that will probably prevent it from fully implementing the new scheme before summer, at the earliest.

User-based pricing is potentially less costly for information systems shops. It eliminates the double jeopardy represented by processor-based pricing, in which a shop pays twice for upgrading its CPUs: once for hardware and a second time for software. It is well-suited for operations that need powerful CPUs tied to few user seats.

> "It's a complex dance in that there are many steps."
>
> *Wayne Holt, Software Research Northwest*

But before HP begins full implementation — which will differ across HP 3000 and 9000 lines (see story page 16) — it must work hand in glove with a legion of software partners such as Oracle Corp., Sybase, Inc., Computer Sciences Corp. and The ASK Group, Inc., among others, to establish uniformity in the way they set price categories. If HP fails, it risks causing payment headaches for users befuddled by countless price and licensing mechanisms.

Users and developers applauded HP's leadership among computer vendors in embarking on its pricing shift (CW, Dec. 7) and expressed hope that the company's preeminence in the open systems world will pressure other vendors to make similar moves.

While many software companies have already begun such a shift, leading hardware vendors that promulgate open and proprietary operating system software have not.

But no one — HP included — expects changes overnight.

Like a government trying to meet the demands of an eclectic constituency, HP is trying to balance the needs of customers with the needs of third-party software developers. HP must also account for the vicissitudes of market dynamics across its varied minicomputer and workstation lines and across different classes of software.

"It's a complex dance in that there are many steps," said Wayne

HP, *page 16*

IBM struggles on

Revamp has helped, but strategy questions still abound

By Johanna Ambrosio

■ A year after launching a massive restructuring effort designed to break its business into smaller, more discrete pieces, IBM is receiving kudos from large customers who are impressed with a nimbler, more price-competitive Big Blue.

Even so, the struggling behemoth has a long way to go in what is deemed a critical year. And last week's disclosure of personnel and manufacturing cuts are seen as salve on the wound.

For example, some small to medium-size firms said they have noticed few positive differences in their dealings with the new IBM.

Some have even complained about IBM's much-vaunted service and support, citing a constantly changing cast of sales representatives (see story page 12). Customers of all sizes pointed out that IBM still has to cut prices even more to get on par with other suppliers.

Making a move

The big question, according to observers, is whether IBM can move ahead quickly enough to take advantage of key growth areas, such as software and services, and refocus its energies away from the mainframe market while retaining an overall cohesiveness among the company's many units. Or a case of

Struggling, *page 12*

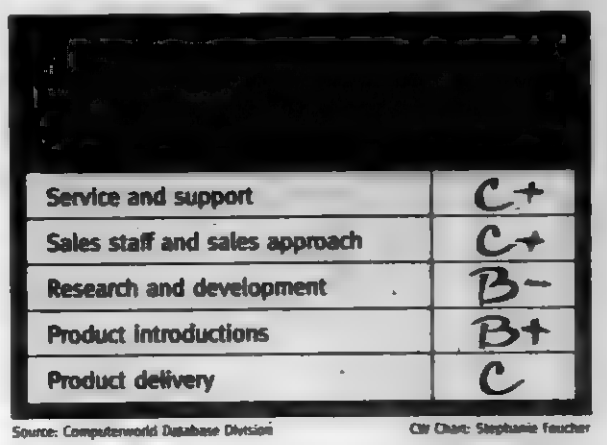
Buckling down
Analysts expect IBM to do the following:
- Continue to build and market its consulting businesses.
- Turn up the pressure on customers to convert to the newest releases of software.
- Jettison unprofitable product lines.
- Reorganize businesses that have been untouched, especially Programming Systems.
- Move up the introduction of its "open mainframe" from 1995 to 1994.

By Kim S. Nash and Maryfran Johnson

■ As competition for the same set of commercial customers steadily mounts between IBM's money-making Application System/400 midrange family and the Unix-based RISC System/6000 line, technology advances are poised to reshape this pair of business units into even fiercer sibling rivals.

The Rochester, N.Y.-based AS/400 and Austin, Texas-based RS/6000 groups "are fighting with increased vigor," said Marc Schulman, president of Technology Strategies Group, Inc. in Stamford, Conn. "The intensity of competition between the two has increased since the decentralization of IBM."

Strategy, *page 13*



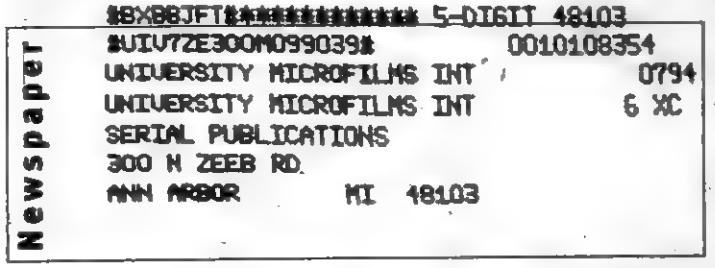
Source: Computerworld Database Division — CW Chart: Stephanie Faucher

Hard times spur ingenuity

By Kim S. Nash

Desperate to save a buck after eight consecutive quarterly losses, Hartmarx Retail Group has turned to its information systems department for help.

The sale of one of the Norcross, Ga.-based clothier's divisions three months ago brought in more than a quick financial transfusion: The new owner of the unit is also paying Hartmarx to do its data processing. Retailing Hartmarx's IS expertise will bring in an estimated $1.6 million to $1.8 million per year, according to Lonnie Johnson, vice president of IS.

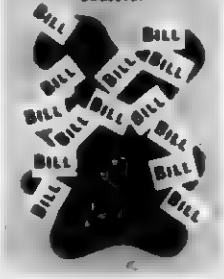


Doing more with less

In greener years, Hartmarx probably would not have stumbled on this money-maker of an idea. But Chapter 11 bankruptcy protection — or the prospect of filing for it — can lead IS groups to find innovative approaches to cut computing costs and reshape the IS function.

"The common way to deal with financial distress is layoffs or budget freezing," said Dennis Bowman, a management consultant at McKinsey & Co.'s Stamford, Conn., office. "But the better way to manage is to improve IS efficiency."

Red ink spreads
As of 1992's third quarter, corporate bankruptcies had climbed 14% over last year, with nearly half of those business failures hitting the retail and service sectors.



Troubled companies interviewed by *Computerworld* cited several tactics, including the following:

- Renegotiating cheaper or more flexible software and hardware contracts with vendors.
- Temporary outsourcing.
- Weeding out unnecessary equipment from data centers.
- Laying off employees from the bottom up.

Empowering IS during this period can be so beneficial that some analysts insisted that Chapter 11 is precisely the wrong time to make cuts in this area. Finely honed technol-

Hard times, *page 14*

MAJOR RESTRUCTURINGS

Large customers see a nimbler, more price-competitive IBM since its restructuring into separate lines of business a year ago. But the financially beleaguered company still has work to do: It must cut costs and prices even further, recapture lost market share and refocus the company away from the slow-growth mainframe business. *Page 1*

IBM's AS/400 and RS/6000 units are beginning to fight for the same customers as the RS/6000 catches up with commercial customer demands and the AS/400 adopts more 'RISC-like' features. *Page 1*

Industry watchers worry about weaknesses in two key IBM subsidiaries — Integrated Systems Solutions Corp. and the IBM PC Co. — while users offer advice to IBM Chairman John Akers. *Pages 12, 13*

DEC seeks to target broader markets with new organization and more focused product offerings. *Page 8*

DOWNSIZING AND LAYOFFS

The state of Maryland consolidates data centers for a $5 million savings the first year and projected savings of $29 million during the next five years. *Page 8*

The EPA outsources the pain of major IS cuts to its new contractor, Martin Marietta. *Page 6*

American Airlines' cost-cutting grazes the Sabre Computer Services division, which loses 89 IS workers. *Page 2*

DISASTER RELIEF

Learn a few IS cost-saving tricks from the experts — companies in or near the Chapter 11 firing line. *Page 1*

Television networks shipped everything from portable satellites to solar showers in order to broadcast reports on Operation Restore Hope from Somalia. *Page 15*

Several Wall Street area businesses were forced to transfer staff and computer operations from flooded offices to backup emergency sites following the brutal northeaster that pounded the financial district last week. *Page 20*

Technical Sections

Application Development	47
Desktop Computing	27
Enterprise Networking	41
Large Systems	45
Workgroup Computing	37

■ In Viewpoint this week: Is client/server the computing savior of the '90s? Or is it just hot air? Columnist John Gantz shares his ideas. Page 25

Departments

Advanced Technology	21
Calendar	54
Company Index	73
Computer Careers	59
Computer Industry	73
Editorial/Viewpoint	24, 25
Friday Stock Ticker	72
In Depth	55
Management	51
Marketplace	66

AMR cuts costs, jobs

Sabre Computer Services division loses 2% of work force

By Nell Margolis
DALLAS

A corporatewide cost-cutting mandate on parent AMR Corp.'s part last week cost American Airlines' Sabre Computer Services division 89 jobs, roughly 2% of its work force.

So far, three other AMR information systems divisions — Sabre Travel Information Network, American Airlines Decision Technologies and AMR Information Services, Inc. (AMRIS) — remain unscathed by the trickle-down effect of the approximately 576-person work force cut announced earlier this month.

The three units are likely to remain in the safety zone, said AMR spokeswoman Teresa Hanson, because they are clear profit-makers for the beleaguered airline company.

Sabre Computer Services — which is "the computer services and development group for the entire airline" — is more vulnerable to swings in the fortunes of the overall airline industry than are AMR's other IS-related operations, Hanson explained. Ironically, that is because it moved early and effectively to tightly align its initiatives with the goals of the various business units it serves, some of which are now being scaled down.

Such an alignment is currently being urged by industry observers as a key hallmark of the IS organization that will survive, much less thrive, in the next several years. Integrating IS into business unit customers, however, means that the fortunes of individual IS professionals are tied to those of the customer units.

"No specific IS projects" have been tabled, Hanson said of the Sabre cuts, which encompass 17 layoffs and 72 voluntary severances.

Hanson denied that the Sabre cuts contradicted earlier reports that the AMR ax would likely bypass IS. "Yes, we were saying that the bulk of IS would be safe," she said, "and that is true today. Three IS organizations are untouched."

Rob Decker, an analyst at Duff & Phelps, Inc., was similarly sanguine. "American has always been considered a leader in IS, and that hasn't changed," he said. "But the benefits conferred by the systems are dwarfed by the pressures and problems of the airline industry right now."

The work-force cuts currently augur no changes in the management structure of the computer services division, according to Hanson.

Meanwhile AMRIS, its employee roll intact, is battling to hold on to one of its outsourcing clients.

Carrollton, Texas-based Compass Computer Services, formed by former Confirm partners Hilton Hotels Corp. and Budget Rent-A-Car Corp. to operate those firms' shared NORTH reservation system and Hilton's EAST property management system, inked a "global systems support services" contract with AMRIS in late 1988.

Recently, however, Compass put the contract out to bid.

"AMRIS is still a viable contender," said AMR spokeswoman Karen Wacaser last week.

AMR Corp.

Senior vice president, IS technology: Max D. Hopper

U.S. IS budget: $1.1 billion

Approximate number of IS staff members: before cut — 6,096; after cut — 6,007

Processor value: $79 million

Number of PCs and terminals: 117,889

Late Breaking News

EDS to ink pact with Bethlehem Steel

Electronic Data Systems Corp. this week is expected to sign a 10-year, $500 million outsourcing agreement with Bethlehem Steel Corp., sources close to the Dallas information services company said late last week.

The $4.3 billion firm, which is smarting from heavy losses, is like the rest of the steel industry struggling to cut costs to remain competitive with foreign producers. The company spent $82.6 million on information systems this year and employs 469 people in its IS department, according to data collected by *Computerworld*.

"Aha! So they won!" said J. P. Richard, an outsourcing analyst at Vienna, Va.-based market research group Input. Industry insiders, he noted, have been eagerly awaiting the outcome of what was seen to be a heated contention between EDS and outsourcing archrival Integrated Systems Solutions Corp. for the lucrative Bethlehem Steel deal, "one of the biggest outsourcing deals to be signed by anyone in quite some time."

It is also believed to be the first of what is expected to be a number of deals signed in the steel industry in the coming months, he added.

The fact that two major vendors so vigorously duked it out over the troubled manufacturing company, said Richard, "can only be good for the user. Whichever firm finally won that deal had to put together a heck of an offer to beat the other's bid. EDS is very strong in the manufacturing area. They're probably better positioned to handle this contract than anyone in the [outsourcing] business," Richard said.

The deal could extend beyond Bethlehem's $5.4 million IBM complex and might involve an upfront payment to the struggling steel maker, one Wall Street source said, citing the magnitude of the contract.

EDS declined comment and Bethlehem Steel was unavailable at press time.

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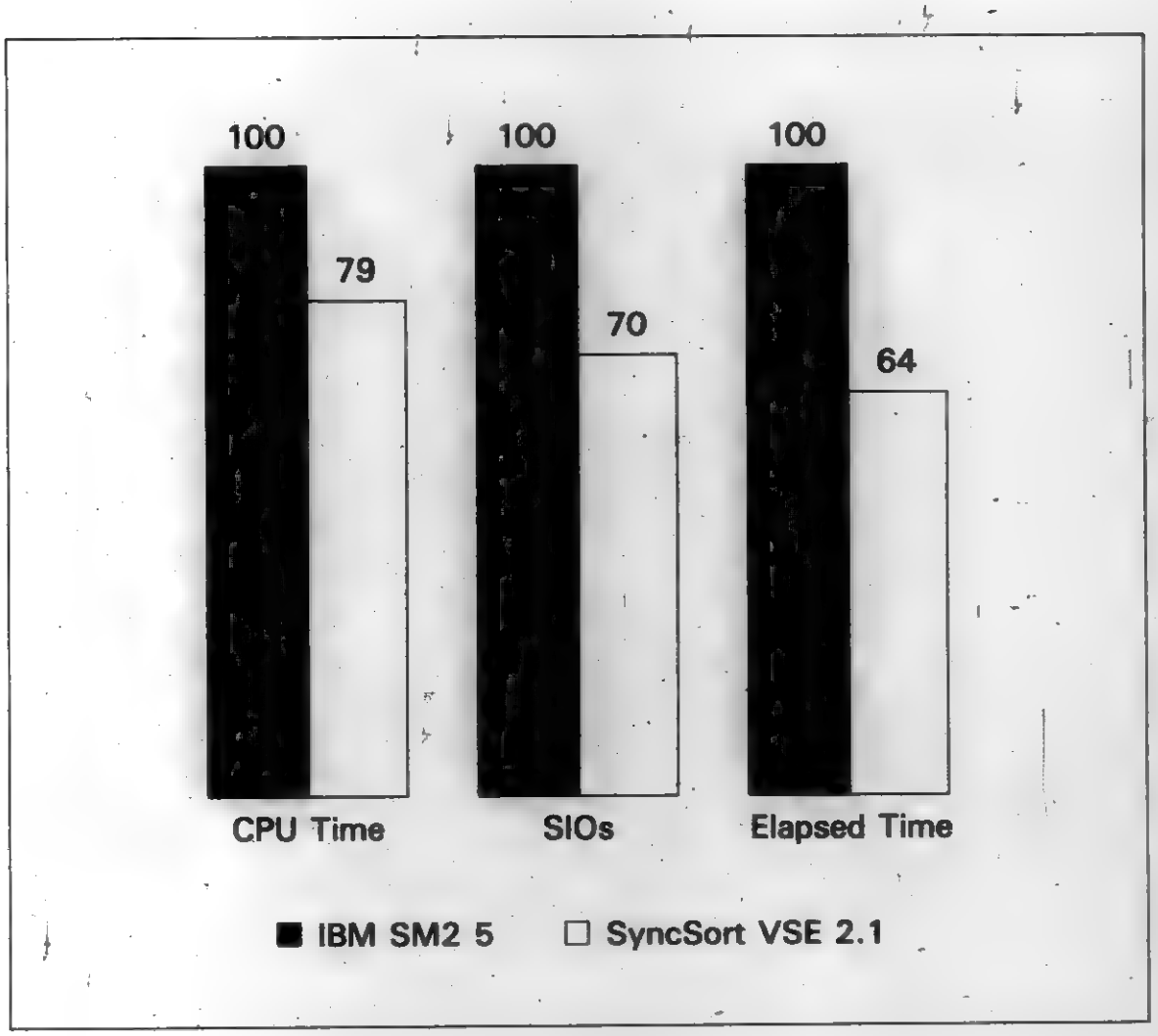

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Oracle 7 slow out of the gate

But users are patient, preferring to wait for unhurried, bug-free version

By Jean S. Bozman
REDWOOD CITY, CALIF.

■ Oracle Corp. missed a commitment to ship its overdue Oracle 7 database in volume this fall, managing to deliver production copies to only about 20 selected customer sites as of today.

As thousands of Oracle user sites await shipment, the company now says they can expect volume deliveries of Unix and Digital Equipment Corp. VAX/VMS versions by February.

Meanwhile, early reports from the sites just beginning to use Oracle 7 indicate that some are not using many of the software's new distributed database features for client/server computing. Instead, they are using the release as a performance upgrade from the 4-year-old Oracle Version 6.0.

These sites have so far noted few bugs, but most said they are stress-testing their new software for a few weeks before putting it into production. Many of the same sites have been participating in Oracle's Alliance beta-test program, which began in August 1991.

When Oracle 7 was announced in June 1992, shipments were promised for October. Oracle shipped the VAX/VMS version to a few customers on Oct. 31 and last week claimed it would deliver Unix versions to select sites with Hewlett-Packard Co., IBM, Sun Microsystems, Inc., Pyramid Technology Corp. and Sequent Computer Systems, Inc. machines by Dec. 21.

"It's a type of controlled release, I guess you could say," said Tim Negris, senior director for server product marketing. "We're offering production support for Oracle 7 applications to customers who sign up for that service. We'll work with any customer who requests it."

Waiting game

"We've watched the semantics flip back and forth for months now," said Terence Quinn, an analyst at Kidder, Peabody & Co. in New York. "It's much later than the users expected, but the sales force has been saying that the production version wouldn't be available until early 1993."

Tardy production deliveries are not a major problem, according to analysts. "Users would rather see them ship it three or four months late and bug-free than trying to push it out the door in the fall time frame they promised," said John Morrell, a Unix analyst at International Data Corp. in Framingham, Mass.

But some early Oracle 7 customers pressed Oracle for production-level software, supported by Oracle's customer hot line, partly because of their own contractual commitments to end users. "The people who have [production Oracle 7] are asking to get it early," said Jim Bosco, project manager at ITT Hartford Life Cos.' $1 billion Employee Benefits Division in Hartford, Conn.

"We went into production this week," said Dennis Erskine, president of Intelligent Networks, Inc., a Chantilly, Va., Oracle value-added reseller that is shipping a 400-node distributed database network based on Oracle 7 and DEC VAXs to a large customer next month.

Intelligent Networks, which will build and operate the distributed database network for People Karch International, a Chantilly, Va., fitness chain and day-care center operator, said it is still stress-testing many of Oracle 7's key features, such as two-phase commit for real-time updates, snapshots, referential integrity and the SQL*Net 2.0 communications package.

Some early sites said they viewed Oracle 7 as an upgrade and did not try to exercise all of its new features. J. J. Kenny Co., a New York firm that rates municipal bonds and provides information services to brokers, is in the midst of a downsizing move from an IBM 3090 Model 150E mainframe. It plans to have 1,200 users for its 20G-byte Oracle 7 database by the end of 1993.

"We have gotten clearance from Oracle for production support for an early release, 7.0.11," said Ira Kirschner, director of technical services at J. J. Kenny. "By the end of this week, we expect to have upgraded our whole [computer] environment to 7.0.11."

Oracular view

In early December, some users found minor bugs in Oracle 7.0.10, which were fixed in 7.0.11, the release now approved for production at some sites.

The reported bugs, which occurred during the loading of database tables, did not cause a system crash, but Oracle recommended waiting for 7.0.11.

The general availability production release of Oracle 7 in early 1993 will be called 7.0.12, an Oracle spokeswoman said.

Vendors talk AppleTalk interoperability issues

By Joanie M. Wexler

Evidence that the Macintosh has become a serious member of corporate internetworks surfaced last week with the birth of an AppleTalk user/vendor interoperability forum.

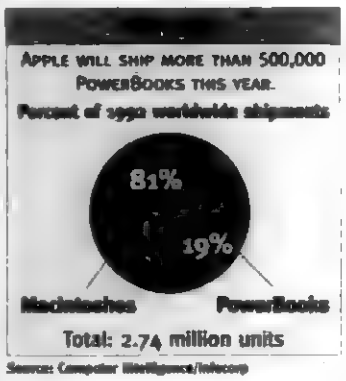
Blessed by Macintosh-maker Apple Computer, Inc., several key communications vendors, including router bigwigs Cisco Systems, Inc., Wellfleet Communications, Inc. and 3Com Corp., said they have united to standardize cross-equipment AppleTalk internetworking schemes and make the protocol more efficient across wide-area links.

Users running large AppleTalk internetworks applauded the arrival of the AppleTalk Networking Forum (ANF), which also includes Apple, Novell, Inc. and others. They cited the following problems with blending AppleTalk networks into their backbones, which the ANF will address:

•The "chatty" nature of the AppleTalk protocol, which decreases bandwidth efficiency on relatively slow wide-area links and hampers the scalability of growing Apple networks.

•Inconsistent vendor implementation of "zone filters," which are known to hide network services from unauthorized users.

•The lack of close integration between Transmission Control Protocol/Internet Protocol (TCP/IP), a widely used backbone protocol, and the Macintosh.



•The absence of a network numbering design to allow AppleTalk networks in different companies — once meant to be isolated from each other and thus incorporating duplicate numbering schemes — to communicate.

IP encapsulation

For example, Brian Donovan, network manager at Hambrecht & Quist, Inc. in San Francisco, said he plans to participate in the ANF to promote the encapsulation of AppleTalk in IP packets. He runs several hundred AppleTalk nodes coast to coast.

"Having one protocol to concern myself with in the backbone makes the network easier to control and manage," said Donovan, who explained that AppleTalk has been the firm's only protocol outside its Ethernet backbone for four years.

Donovan said he would like to see the forum's work go beyond encapsulation to render "TCP/IP native to the Mac. I'd like to eliminate AppleTalk directly and just run TCP/IP over everything," he said.

A network specialist at a large transportation company who is very familiar with the ANF's plans explained that the majority of the work will address limitations with AppleTalk's proprietary Router Table Management Protocol (RTMP), which is entrenched in AppleTalk code and contributes to the protocol's overhead.

RTMP, unlike "open" protocols such as Open Shortest Path First, "broadcasts table updates every 10 seconds whether you need it or not. So you can appreciate what happens to network performance over a relatively low-speed [wide-area] connection," he said.

The user, who asked not to be identified, runs a global, 1,500-Macintosh AppleTalk network.

He said a new Macintosh routing protocol from the ANF "will belch out router table updates only if there is a change."

Wireless links bow for Macs, PowerBooks

By Joanie M. Wexler
OVERLAND PARK, KAN.

Digital Ocean, Inc. said last week that in March, it will ship the first wireless local-area network connection for Apple Computer, Inc.'s portable PowerBooks and desktop Macintoshes. The move will allow roaming PowerBook users to access their LAN from anywhere in their office building.

Digital Ocean's radio-based Grouper product should also open the door for administrators of desktop Macintosh networks to the flexibility of wireless options that operators of PC-based LANs have had for the past two years.

Grouper appeals to users such as Alice Dixon, electronic publishing specialist at Western Auto Supply Co. in Kansas City, Mo. Dixon is a PowerBook user and supports 50 desktop Macintoshes.

Dixon is responsible for automating the company's advertising and marketing department. "I take my PowerBook with me everywhere and would like constant access to the network," she said.

On-the-fly LAN

Doug Bachtel, director of marketing at Digital Ocean, said he envisions users creating a portable network on the fly at meetings. For example, several marketing staff members could congregate in a conference room and cooperatively edit a press release. Or a financial staff member could fold up his PowerBook, walk it down the hall for a second opinion on a spreadsheet and make changes in real time, he said.

Grouper's pricing is slated to fall "under $500," with specifics to come, Bachtel said. Dixon said she would have a tough time justifying a cost "over $500, but at $99, no problem."

Grouper is both a transmitter and receiver, and it requires no separate antenna. However, Bachtel said that sometime in 1993, Digital Ocean intends to introduce a separate hub product that would allow Grouper to bridge to wired LANs and access the corporate internetwork.

TWO-PHASE COMMIT COMPARISON

SYBASE

50 LINES OF COMPLEX CODE

```
dbsqlexec ( dbproc_ server 2 );
/*
    two-phase()
    {

    /* open up two servers and a commit service */

       dbproc_server1 = dbopen(login, databasename1);
       dbproc_server2 = dbopen(login, databasename2);
       dbproc_commit = open_commit(login, NULL);

    /*
    ** prepare data for each command buffer and select a database to
    ** use, then start distributed transaction on commit service
    */

       commid = start_xact(dbproc_commit, application, "my_xact", 2);

    /*
    ** build transaction name and begin transactions on different
    ** servers
    */

       build_xact_string("","" commid, xact_string);
       dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s",
       xact_string);
       dbsqlexec(dbproc_server1);
       dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s",
       xact_string);
       dbsqlexec(dbproc_server2);

    /* perform various updates and then.... */

    /* if there is a failure on one abort all of them */

       if (return_code == FAIL)
       {
          abort_xact(dbproc_commit, commid);
          dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
          return_code = dbsqlexec(dbproc_server1);
          dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
          return_code = dbsqlexec(dbproc_server2);
          if (return_code != FAIL)
          {
             remove_xact(dbproc_commit, commid, 1);
          }

       dbexit();
       exit(ERREXIT);
       }

    /* otherwise prepare to commit */
    dbcmd ( dbproc_server 1, "PREPARE TRANSACTION");
    dbsqlexec (dbproc_ server 1);
    dbcmd (dbproc_ server 1);
    dbcmd ( dbproc_server 2, "PREPARE TRANSACTION");
}
/*
m
D
D
c
{
```

SYBASE code example from A Guide To SYBASE and SQL Server by D. McGoveran with C.J. Date.

ORACLE7™

7 LINES OF INDUSTRY STANDARD SQL

```
UPDATE SAVINGS
SET S_BALANCE = S_BALANCE - 250.00
WHERE S_DEPOSITOR = 'JONES';

UPDATE CHECKING
SET C_BALANCE = C_BALANCE + 250.00
WHERE C_DEPOSITOR = 'JONES';

COMMIT WORK
```

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News Shorts

Everex on the brink?

Everex Systems, Inc., the troubled Fremont, Calif., PC manufacturer, last week restated its expected loss for 1992 and drew closer to becoming the PC industry's first major casualty. While results remain unofficial, the company said it now expects to lose between $80 million and $100 million for fiscal 1992 on sales of $503 million, and it will post "a substantial loss" in the first quarter of fiscal 1993, ended Oct. 31. Everex said it expects its auditor to question the company's ability to survive when it releases its audit. In addition, Everex said Harold Clark, president, and David Zacarias, chief financial officer, have resigned.

AST unveils low-end notebooks

AST Research, Inc. rounded out its notebook product line with a new group of low-end notebooks. The Intel Corp. 80386SL-based PowerExec EL family starts at a suggested list price of $1,745. It is a stripped-down version of the PowerExec notebook family AST launched in late September. The new PowerExec ELs have many of the same features of the PowerExec but have only one Personal Computer Memory Card International Association slot instead of two and come standard with nickel cadmium batteries instead of nickel metal hydride batteries. The base model comes with 2M bytes of random-access memory and a 60M-byte hard drive.

Microsoft extends WOSA API

Microsoft Corp. has announced the latest in its series of Windows Open Services Architecture (WOSA) application programming interfaces (API). The Windows System Network Architecture API can be used by application developers to take advantage of Windows features while remaining compatible with other Systems Network Architecture APIs. Microsoft claimed the API will help developers write software that will better integrate Windows workstations with IBM mainframes and minicomputers.

Banyan, Novell cooperate on support

Banyan Systems, Inc. and **Novell, Inc.** have signed a joint support agreement under which Banyan will join Novell's Technical Support Alliance and Novell will join Banyan's Strategic Support Alliance. The agreement between the two companies, which compete fiercely in the local-area network operating system market, was sparked by Banyan's upcoming Enterprise Network Services for NetWare product, which will offer directory, management and security services on Novell NetWare LANs.

SHORT TAKES Global network services provider **BT** said it will slash the pricing of its domestic frame-relay services by nearly 50%, depending on configuration. . . . **Borland International, Inc.** announced last week that it had acquired dBase-compatible technology from **WordTech Systems, Inc.** WordTech's eight-person development team will join Borland's database group. . . . U.S. marshals in 10 locations in New Jersey and California seized more than $9 million in counterfeit MS-DOS software, reportedly the largest such seizure in history. . . . **Dell Computer Corp.** last week said it would start a Professional Services Capabilities unit to strengthen its ties to the system integrator and value-added reseller community. . . . **WordPerfect Corp., Deltina Corp.** and **WordStar, Inc.** have committed to message-enabling their applications, through support of **Microsoft**'s Messaging Application Programming Interface. . . . **Alliant Computer Systems Corp.** announced that Chief Executive Officer/President Craig Mundie resigned to accept a position at Microsoft as general manager, advanced consumer technologies.

News shorts, *page 16*

EPA hangs tough

IS escapes federal cuts by passing on layoffs to outsourcer

By Elisabeth Horwitt
RALEIGH, N.C.

Like a seawall in a hurricane, the Environmental Protection Agency's (EPA) 22-year-old outsourcing strategy has once again proved itself to be a staunch bulwark — this time against a particularly nasty round of federal budget reductions.

The cuts, now under way, will leave the agency's small staff of information systems and telecommunications managers virtually untouched. However, EPA contractor Martin Marietta Technical Services, Inc. will be forced to eliminate 100 people from the 400-plus staff it was building to serve the agency, said Don Fulford, director of the agency's national IS division here.

Indeed, Martin Marietta won the five-year, $300 million EPA outsourcing contract away from Unisys Corp. in October just in time to bear the brunt of the cuts, Fulford said.

In the beginning

The EPA began outsourcing its data center in 1974, precisely to gain flexibility in hiring and firing and to avoid the constraints of federal regulations, Fulford said.

Because this round of cuts is being administered to contractors and not in-house personnel, 100 IS positions can be eliminated in about 45 days instead of six months, he added.

"We could do it pretty clean and easy," simply by letting Martin Marietta know that "we are not going to do the following functions," Fulford said.

Hard-hit areas include the mainframe hot line, local-area network help desk functions and the telecommunications group, which lost almost half of its 130 contracted employees.

"It's a godsend to us" that telecom lost people only on the contractors' side, while the 11-person internal staff remained untouched, said David Bittenbender, manager of telecommunications at the EPA.

While outsourcing operations is not, in itself, a less expensive way to process data, speeding up the personnel reduction translates into significant cost savings, Fulford said: "Flexibility is money."

Outsourcing flexibility has served the EPA well in the past. For example, the company was able to eliminate 28 operating positions through automated operations — a move that would have been flat out impossible if the agency had had to go through "due government process," Fulford said.

In addition, the EPA has been able to hire the "critical expertise that is needed [because] a contractor is not constrained by government salary caps," he added.

Ballpark figure

The EPA's current arrangement with Martin Marietta is quite flexible. The $300 million contract is only a ballpark ceiling for what the agency can spend during the next five years, with a guaranteed minimum "that is pretty low," Bittenbender said.

Next year, the EPA will pay Martin Marietta a lot less than the $25 million originally earmarked for annual operations costs, he added.

Furthermore, Martin Marietta's fee each trimester depends on how well it has met predesignated service levels in areas such as network performance, Bittenbender said. "If they don't meet those levels, they lose a big part of their work fee."

The EPA's internal staff of about 50 IS managers and 11 telecommunications managers works with contractors to update the "management work plan" that determines what new technologies, upgrades and systems are needed to meet the EPA's changing computing and networking requirements, Bittenbender said.

He added that his people spend most of their time tracking network policies and standards and planning for future needs. They spend about 40% of their time monitoring contractor activities.

The telecommunications staff stays abreast of the latest changes in networking technologies, standards and policy by attending various conferences and subscribing to various research reports, Bittenbender said.

A plan to link the agency's LANs via frame relay has been put on hold because of the budget cuts, he added.

Table full

In addition to the flexibility, Martin Marietta brings several choice items to the EPA's table, including broad computing and networking experience, Bittenbender said.

For example, the EPA is likely to gain use of software developed internally by Martin Marietta that allows a variety of network devices to feed statistics to IBM's NetView, he added.

Landing the EPA contract was a real "trial by fire" for Martin Marietta, Bittenbender said. Unisys protested the award as soon as it was made in October, which precluded Martin Marietta from hiring anyone until a federal judge resolved the protest in early November.

Martin Marietta had made contingency offers promising potential staff members work if and when the award came through, Bittenbender said.

"Then they had to rescind many of those offers because we sent word that we didn't have as much money as we thought," he said.

EPA outsourcing

Martin Marietta is managing/operating the following:

- **Central EPA data center; IBM ES/9000 Models 900 and 860.**
- **Cray Research, Inc. supercomputer center in Bay City, Mich.**
- **Small data center in Cincinnati that serves as disaster recovery, another Model 9000 (entry-level model).**
- **About 2,700 PCs (IBM compatibles); 200 LANs (Novell, Inc. NetWare-based).**
- **Nationwide network connecting EPA facilities, state capitals. Combines dedicated lines, 56K to 1.5M bit/sec., plus one 45M bit/sec. link on the way; growing Integrated Services Digital Network installation for voice; X.25 for data.**
- **Network management: hodgepodge of IBM's NetView and LAN Manager, Digital Equipment Corp.'s DECmcc, proprietary systems.**

Doug Wagar/Zaner

EPA's David Bittenbender: *'It's a godsend' that his 11-member internal staff remains untouched*

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DEC plans integration unit

New business groups, product cuts key to profitability

By Melinda-Carol Ballou
MAYNARD, MASS.

In an effort to help offset shrinking hardware revenue, Digital Equipment Corp. is expected to announce this week that it will increase its emphasis on systems integration services offered across new business units, according to sources close to the company.

As a part of the shift in focus — and in an effort to cut costs behind the scenes — the company is quietly finalizing retirement plans for as many as 250 products, according to internal and third-party sources.

Several third-party sources said DEC is talking with them about the potential sale of 20 to 250 products. DEC officials said they will offer ongoing support or smooth migration for customers who require it, but they would not comment on which products will be affected.

Chief Executive Officer Robert Palmer acknowledged earlier this year that hardware will increasingly become a commodity market and that to yield profits, the company must focus its efforts on systems integration, consulting and "product areas where the company can differentiate itself."

Alpha hurts VAX sales

One challenge DEC faces is that its Alpha platform offers nearly three times the performance for the same price as comparable VAXs. Hence, faced with lower margins on hardware and fewer hardware sales, DEC hopes to overcome this negative through an increased emphasis on systems integration and consulting.

Palmer is likely to detail DEC's new business organization this week, along with the names of those in charge of the various groups. Systems integration will be a "critical area that will cross all of the business units," said a DEC spokesman, who refused to comment on the details.

Four horizontal organizations servicing the business units will include systems integration and professional services, engineering, manufacturing and sales/channels, sources said.

The new management structure will include [product- and industry-specific] business units responsible for their own profits and losses.

"The new structure will not just mandate but will reposition systems integration and consulting services as lead components in the solutions," marketed by the business units, according to one DEC source.

DEC will be less publicly forthcoming, however, about the fate of products that are going to be essentially retired from its portfolio but will tell users directly, a spokesman said.

Remaining DEC software products will include those that enable users to glue disparate systems and applications together on the one hand, such as Network Application Support (NAS) or Teamlinks, and production applications such as ACMS or Rdb on the other, DEC sources said.

And DEC is already beginning to break the news to users.

One Swiss user was told by DEC account managers that a transition to Microsoft Corp.'s suite of office products from DEC's DECwrite and DECpresent products would be required, according to Lynn Berg, a director at Gartner Group, Inc., a market research firm based in Stamford, Conn.

Stephen Tihor, assistant research scientist at New York University, said as long as DEC offers good transition paths, customers are likely to retain their commitment to DEC. "But if these sorts of burdens happen too frequently, DEC will lose business."

New lineup

DEC's new organization will include the following: product-specific business units (PCs, storage, components and multivendor services) and industry-specific business units (process and health care industries, discrete manufacturing and defense, financial and professional services and communications and consumer industries).

Maryland agency saves big by melding data centers

By Johanna Ambrosio
ANNAPOLIS, MD.

■ The comptroller's office in the state of Maryland is putting the finishing touches on a consolidated data center that is expected to save $29 million during the next five years.

In addition to saving money by eliminating duplicate software licenses and host machines as well as 68 jobs, the consolidation allowed the state to shutter its Baltimore data center in May and move all operations to a single site here.

A new IBM Enterprise System/9000 Model 740 replaced both the 3090-600E residing in Baltimore and the 3084Q that used to reside in Annapolis.

Besides handling the processing for the comptroller's office, the Annapolis data center now supports the departments of human resources, employment, health, social services and other agencies. The departments of transportation, public safety and corrections have their own data centers, which are all connected to one another and to the Annapolis center.

The consolidation, begun in October 1991, was undertaken in response to the governor's request that all state agencies trim their budgets.

"It just became obvious, mostly because of the larger mainframes becoming available, that one processor could handle the work load," said John Salmon, deputy director at the data processing division of the comptroller's office. "This would not have been possible several years ago."

Speed of implementation was a crucial factor, said chief deputy controller J. Basil Wisner. "We had told the governor that we could reduce our budget by $5 million during the next fiscal year, which began July 1, and he took us at our word and reduced our budget accordingly. So we had to have everything completed or we would have run into financial problems," Wisner said.

Deadline pressure

Instead of putting the equipment out to bid — the normal procedure for a state agency — the tight deadline led the office to amend an existing IBM contract to take the new machine into account.

Another time-saver, Salmon said, was that the Annapolis data center had been built two years earlier to meet the state's needs 10 years out. It had a ready-made space for the ES/9000's larger footprint and higher power requirements.

The state is finishing up by installing some automated operations software from IBM, Candle Corp. and Landmark Systems. That project should be finished in January, Salmon said.

Plans are already in the works for the next upgrade, slated for January 1994, to a Model 820. The exact timing of that depends on a project being piloted by the human resources department that will deliver more information for case workers to determine the eligibility of people who apply for public assistance.

Windows link to pagers aids LAN troubleshooters

By Joanie M. Wexler
TROY, MICH.

A communications link between Microsoft Corp.'s Windows 3.X operating environment and mobile users' pocket pagers is slated to ship this week, bringing benefits such as split-second network troubleshooting and the ability to "beep-enable" any Windows application.

Beta testers of Fourth Wave Technologies, Inc.'s $149 WinBeep wireless messaging system — a communications package that runs under Windows — said the software eliminates the time-consuming phone tag and in-person visits that now occur when employees respond to a page.

For example, Bankers Trust Co. in New York has been testing WinBeep for about a month, and computer analyst Evan Hochstein estimated the firm has saved about 200 minutes a day in network troubleshooting.

The savings come from dispatching instructions directly from a PC to one or more alphanumeric pagers carried by wandering technicians or other mobile personnel, who can view messages and take immediate action.

Reach out and beep someone

An estimated 12 million to 13 million pagers are in use in the U.S. today.

Analysts estimate the percentage of those having alphanumeric displays to be from 6% to 20%.

An estimated 50% of pagers now being manufactured are equipped with the alphanumeric capability.

"The bottom line is that our support is now immediate," explained Hochstein, who said troubleshooters are now en route to a user site 30 to 50 seconds after notification. "We trade money all over the world all day long. If a guy's machine freezes, we lose money. The less he's down, the more we make."

Right to the source

Beta-test site LAN Solutions, a systems integrator in Ferndale, Mich., hopes to someday deploy the technology throughout its customer base so clients can message the firm directly.

"Our customers will be able to leave us a brief description of the problem and tell us whether they're in deep doo-doo or the fix can wait," said Jerry Svetcos, an engineer at the company.

Fourth Wave President Tim Hudson said a developer's kit is available that "allows you to beep-enable any application." For example, he said, a maker of local-area network monitoring equipment is working on allowing a tape backup system to automatically send an alert to someone's pager if a backup aborts.

Also, a fax board vendor is working on permitting traveling fax recipients to download their faxed messages via a pager.

Hochstein said he has spoken to developers about automating WinBeep so that, for example, "if an error pops up on a file server, it is automatically broadcast. Currently, a person sees the error, then places a call to page the troubleshooter, who must call back. This would save us a lot of time and money."

The WinBeep application is currently a one-way communications link, but it is slated to connect with the interactive Ardis and RAM Mobile Data wireless packet networks and the Embarc cellular data network in the first quarter of next year, according to Hudson.

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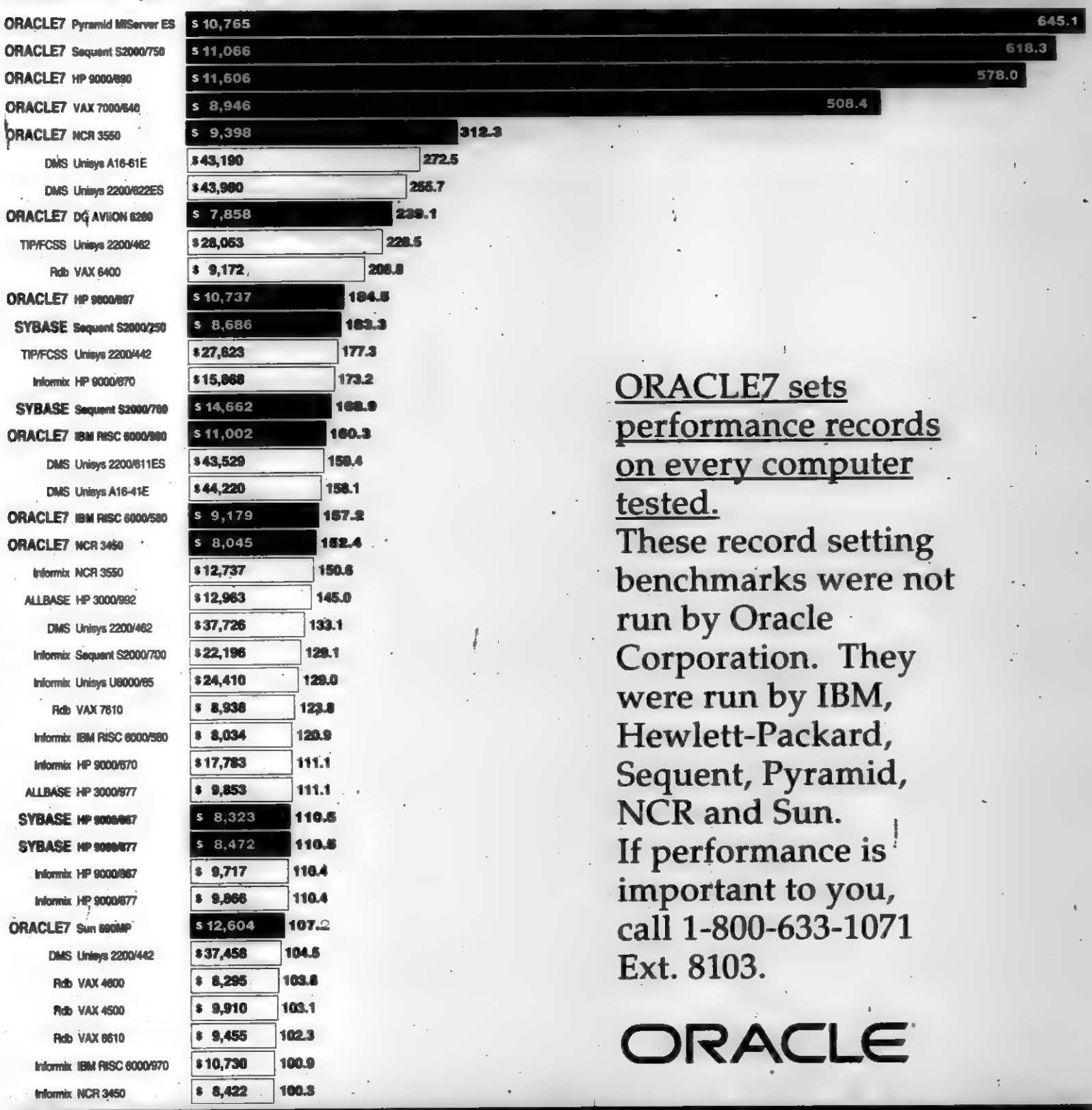

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Microsoft DOS licensing faces UK scrutiny

By Mike Magee
LONDON

Following complaints from several British hardware manufacturers, the UK government has moved to investigate Microsoft Corp.'s DOS licensing practices.

Member of Parliament Nigel Griffiths, the Labour Party's spokesman on consumer affairs, confirmed last week that he will pass a dossier on Microsoft's UK activities to the Office of Fair Trading (OFT) government department. OFT is the UK equivalent of the U.S. Federal Trade Commission, which is winding down its own investigation of Microsoft [CW, Dec. 14].

Griffiths, who has received complaints from vendors, had previously tabled two written questions in the House of Commons asking the government to investigate Microsoft's supply and charging practices.

Microsoft formerly sold MS-DOS to its UK customers through two channels — a high-end licensing scheme for large OEMs and in units of 20, 50 or 100 to smaller IBM PC clone makers. Late last month, more than 400 UK companies received letters inviting them to join the Microsoft Easy Distribution plan.

The Microsoft plan commits vendors to paying royalties for every Intel Corp.-based 80286, 80386, 1486 or Pentium PC they ship, whether they are DOS machines or not.

If they decide not to sign up, they face paying more for DOS because Microsoft will change its UK pricing from pounds sterling to U.S. dollars.

Griffiths likened the arrangement to a scenario in which a company that is paying a 5-cent-per-bottle royalty on every Coke sold in the UK is suddenly asked to pay 5 cents on every other bottle it sells, even if it contains milk or fruit juice.

"This is the back end of a bad monopoly," said Mark Travers, production manager at Edinburgh-based Datalink Computer Systems. "It's like Microsoft wants a percentage of every PC in the world, whether or not you're using the company's software on it."

Magee is a free-lance writer based in London.

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Paramount to open multimedia unit

By Jean S. Bozman
PALO ALTO, CALIF.

Paramount came here, not to Hollywood, for its latest production: a brand-new business unit designed to soak up Silicon Valley's multimedia technology and mold it into new types of entertainment and educational materials.

Paramount Communications, Inc. plans to acquire and license various technologies, including multimedia, digital compression algorithms and interactive video. But the $4 billion firm will also fund some new ventures with several million dollars in seed money and may decide to sell technology to users in the future.

"Our primary role will be to evangelize, to educate and to implement technology in all of our existing businesses," said Keith Schaefer, president of the new Paramount Technology Group.

Final frontier

Schaefer said the first applications would most likely come in electronic publishing at Paramount's Simon & Schuster, Inc. publishing division in New York and in interactive video software based on Paramount movies and television shows.

Instead of waiting for *Star Trek* shows and movies, which are Paramount properties, PC users will be able to fire phaser weapons in interactive video games based on scenes from those shows.

"We're going to bring all the content from the motion pictures group, from the television group and from sports figures on the [New York] Knicks and New York Rangers into multimedia," Schaefer said.

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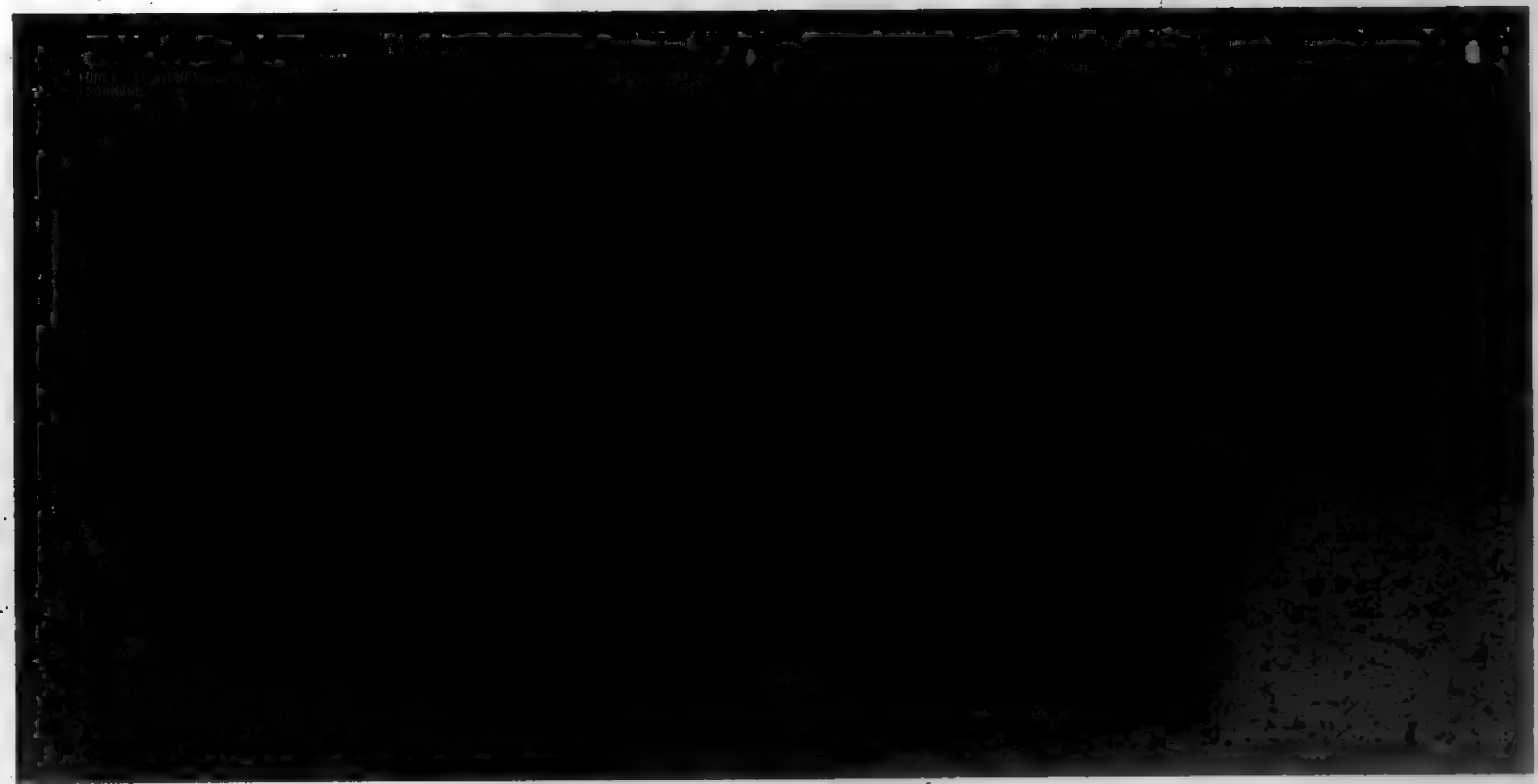

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Big Blue struggling on

CONTINUED FROM PAGE 1

too little, too late?

IBM executives have been talking since at least 1987 about the need to depend less on hardware revenue, but this has proved to be an elusive goal.

For the year ended Dec. 31, 1991, IBM derived 36% of its revenue from software and services, vs. 30% the year before.

Large systems — computers, storage devices and software — account for half of IBM's revenue and two-thirds of its profits.

Ominously, mainframe growth is expected to be in the low single digits for the foreseeable future. This is forcing IBM into riskier, lower margin businesses, including PCs, in which IBM has had mixed success.

Feel the heat

In short, IBM is in hot water, and company officials appear to be feeling the heat. Although they declined to comment for this report, evidence comes in the form of last week's decision to cut 25,000 jobs and cut manufacturing capacity — moves that will cost the struggling company $6 billion.

If early-retirement packages fail to entice, the company said it would resort to its first layoffs in approximately 50 years.

IBM also took steps last week to bolster the autonomy of three previously spun-off units — the IBM PC Co., the Adstar storage unit and the Pennant Systems printer division (see stories below and on 13). Some of these units, including the IBM PC Co., will undoubtedly get their own sales forces sometime down the line, some industry watchers speculated.

Bankers Trust's Anish Mathai: *IBM more competitive now than a year ago*

Poor response

Analysts are largely unimpressed. What IBM should have announced, they said, are immediate layoffs of at least 50,000 people, a reduction of its sacrosanct dividend and plans to cut the umbilical cords of even more of its business units, leaving them to succeed or fail on their own.

"Another year has been wasted in repositioning the company for the future," said analyst Bob Djurdjevic, president of Annex Research in Phoenix. "IBM has to organize around the customer and come out with solutions targeted at specific market niches — [such as] a mainframe for the aerospace industry."

Other analysts suggested IBM is cutting too much out of key areas.

"You can save yourself all the way to bankruptcy," said Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "If you continue to chase the expense line and invest less in generating demand, there's less differentiation later, so customers don't buy as much."

In the meantime, IBM has certainly made up some ground with many of its largest customers. Besides an increased willingness to negotiate on price, customers said they have also noticed that IBM sales representatives are listening more to what they need instead of simply telling them what they have to sell.

"IBM is substantially more flexible to work with," said Anish Mathai, vice president of technology strategy planning at Bankers Trust Co. in New York. "They are absolutely more competitive than they were a year ago on all fronts, from marketing to pricing."

Bill Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y., agreed that IBM is trying. "When we go out for a bid, they will move heaven and earth to respond in a timely and competitive format."

He added that IBM won two major systems integration projects at Pep-

Time out

1986: IBM starts 87 early-retirement programs.

6/91: IBM forms ISSC.

12/91: IBM reports first annual loss of $2.83 billion; creates 13 business units. Carl Conti, VP and GM, enterprise systems, takes early retirement.

2/92: George Conrades, senior VP, and C. Michael Armstrong, world trade head, take early retirement.

3/92: Akers takes 40% pay cut; senior execs' pay cut 20%.

4/92: Bill Grabe, VP and GM, marketing services, takes early retirement.

11/92: Terry Lautenbach, senior VP, takes early retirement.

12/92: Stephen Schwartz, VP and GM, application business systems, takes early retirement. IBM to reduce head count by 25,000 beyond the 40,000 jobs cut in '92.

'Dear John' letters

Here is some advice that IBM customers — some anonymously through a Computerworld *survey — wanted to pass along to IBM Chairman John Akers.*

"IBM should reinstate their service level closer to what it used to be. They charged a 20% premium for their service, but I didn't mind because I got great service. Now, all the good service techs are gone. This is the main reason why I went elsewhere lately and spent $3.2 million." — *Mainframe/midrange/micro customer of 15 years or more.*

"If there's an order-of-magnitude more powerful processor, rather than extend the old life cycle, bring the new one to market more quickly." — *Doug Underhill, vice president, CSX Technology, Jacksonville, Fla.*

"Go back to IBM's approach of the early 1970s: a team of sales, engineering and systems analysts assigned to an installation until the job was complete." — *Midrange/micro customer of six to nine years.*

"Get the hell out of the mainframe business and into services." — *Bill Dean, director of technology management services, Pepsico, Purchase, N.Y.*

"Stop losing experienced, valuable people and replacing them with unschooled, inexperienced people. And go to smaller companies within the corporation." — *Midrange customer of 15 years or more.*

"Do a better job on your PC LAN software. Make more powerful products, or we'll have to go to Novell like the rest of the world." — *Mainframe/micro/networking customer of 15-plus years.*

"Don't think you set the standard anymore. You're now part of what's set, and you have to uphold that." — *Irwin Bernstein, vice president of planning and administration, Maidenform, Inc., Bayonne, N.J.*

"Buy Apple." — *Midrange/micro customer of 10 to 14 years.*

"Buy Microsoft. Understand midrange computer systems users and how they use their AS/400s. We're not a 9 to 5 organization, and we require 24-hour nonstop backup." — *Midrange/micro/networking customer of three to five years.*

IBM PC Co.: Case of bad timing

By Michael Fitzgerald
SOMERS, N.Y.

■ Three months after its birth, IBM watchers say the IBM PC Co. is a good idea that came a bit too late.

While it is clearly moving toward wiping the tarnish off the IBM label in the PC market, critics harped on IBM's timing. They said IBM waited too long to unveil the IBM PC Co. and its so-far-successful ValuePoint line and missed a huge opportunity to generate sales on the low end.

Robert Corrigan, IBM PC Co. president, seemed to concede as much at Comdex/Fall '92 when he told reporters that IBM's PC side had taken "such a beating in the third quarter" it could take most of next year before it contributes profits to IBM corporate. Corrigan and other officials declined to be interviewed for this article.

But before it can hope to boost profits, IBM PC Co. must first regain the confidence of users by establishing a consistent track record.

IBM PC Co. was born with the intent of reinvigorating IBM's PC business. Lurking in the background was the unavoidable need to convince corporate customers that it was capable of being a long-term player. The game plan seemed obvious: Produce good products at competitive prices and innovate when it suits customer needs. IBM had lacked these qualities in the past.

Revamped service and support, competitive products and the aggressively priced technology leadership evident in the ThinkPad 700C are some of the reasons IBM is racking up sales under the newly autonomous division, analysts said.

"I have to say I'm really impressed with the PC side of things. They seem to realize that just rolling out products with those three letters doesn't bring any magic," said Richard Kolbe, MIS director at Harley-Davidson Co. in Milwaukee.

However, many users contacted said they remain skeptical of real change at IBM. "They fail to realize that particularly [on the] desktops, they're not the only game in town anymore," said Bill Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y.

Observers said IBM has turned the corner here, and customers seemed to agree, as preliminary data from researchers shows that IBM has at least stopped losing market share. Data from Computer Intelligence in La Jolla, Calif., and the *Computerworld* Database Division shows that IBM's PC share decline has finally leveled off, while a recent study from WorkGroup Technologies, Inc. showed a 20% increase in IBM's recent hardware sales. Still, IBM is not experiencing any significant rebound in share and may have succeeded only in making users consider it again.

Even the Personal Systems Programming group, which remains tethered to IBM corporate, has made efforts to change. It has found undeniable success in the market, though the 2 million copies of OS/2 it sold this year pale next to sales of Microsoft Corp.'s Windows 3.1.

sico that did not include any IBM equipment. "They competed on the basis of price, and won."

Maidenform, Inc., in Bayonne, N.J., did not have any IBM disk drives for about 10 years, but it recently bought some, said Irwin Bernstein, vice president of planning and administration. "They'll reduce the price and throw in free service," he said. "They have ways of sweetening a deal they didn't have before."

Not all customers agree they have seen that much of a difference. "We haven't seen an IBM salesman in over a year," complained Larry Stouffer, vice president of the computer services group at First Bancorp of Ohio. "Maybe they don't even know we exist anymore."

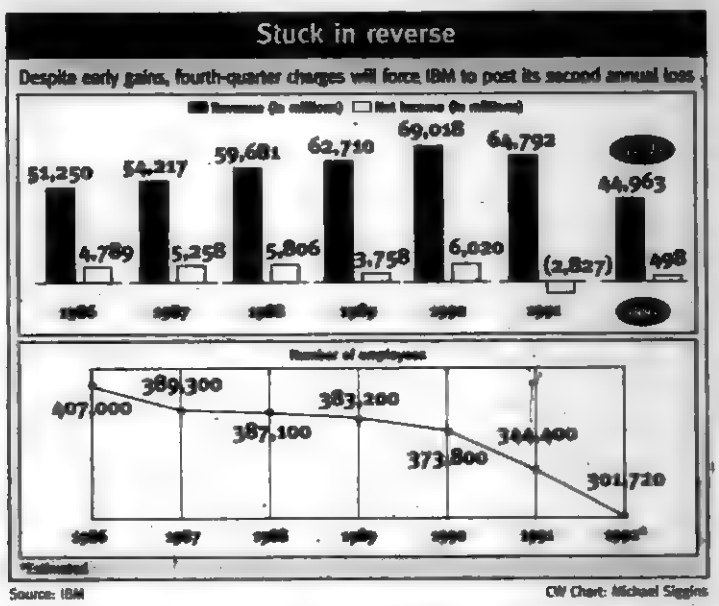
Tom Loane, vice president at Alamo Rent-a-Car, Inc. in Fort Lauderdale, Fla., said that even though "not much has been accomplished yet," IBM at least has not seriously messed up its customer relationships like AT&T did when it divested back in 1984. "It took AT&T two years to get its act together, with a six-month backlog on everything. That hasn't happened here."

Nor has IBM done all it can to get its prices to the lowest levels possible. "They are still out of line when they go head to head with other vendors," said Tom Braswell, vice president at Genuine Parts Co. in Atlanta. "If we have to pay a premium, we expect value-added services."

Most observers agree that 1993 will be key for IBM as it seeks to capitalize on many of the changes wrought during the last few years (see time line page 12). Still, it could take it another year or even two to realize the fruits of what must rank as one of the most wrenching changes in its entire corporate history.

Some industry watchers, however, are still upbeat about IBM's chances in the 1990s. "As the fittest [of the lines of business] survive, you will see a more nimble and accomplished IBM," said Sam Albert, an analyst in Scarsdale, N.Y. "The Darwinian selection process will continue."

Mid-Atlantic correspondent Thomas Hoffman contributed to this report.



IBM's cost cuts include: •Reduce worldwide workforce by 25,000. •Reduce manufacturing capacity in semiconductors, storage devices and semiconductors. •Cut capital spending and research and development by $2 billion each. •Give the storage, printer and PC businesses more autonomy.

ISSC no role model

Though IBM's Integrated Systems Solutions Corp. (ISSC) has been touted by some observers as a model in Big Blue's ongoing decentralization, it may not be a paragon example, outsourcing watchers said.

The unit, whose revenue is made public, may never have been intended to be a profit center but rather a mechanism for cementing account control and channeling business to other IBM units, observers contend.

Although IBM's competitors in the outsourcing business complain that ISSC wins deals because of its special business relationship with IBM's operations, outsourcing industry watchers gave the subsidiary a mediocre report card.

"They started out with a bang, but it has slowed down," observed Joan Paul Richard, vice president of market research firm Input in Vienna, Va.

Part of the reason for this may have to do with some customers' reluctance to trust IBM in a pure consulting capacity. "A hardware vendor as a consultant does not have my best interest at heart," said James Glump, senior vice president of information services at Actmedia, Inc. in Norwalk, Conn. "It's still IBM; it's still one company."

Gartner Group, Inc. analyst Rita Terdiman pointed out that the absence of a dedicated sales force has created confusion among potential ISSC clients.

"I had a client complain that they received three different bids from IBM," Terdiman said. "They got disgusted and threw IBM out totally."

Ironically, IBM's competitors complain that ISSC's use of IBM's sales force is an antitrust breach that gives the company an unfair business edge. IBM formed its outsourcing subsidiary in May 1991, in part to quicken its response time.

ISSC's largest wins include what was to have been a nearly $300 million deal with Zale Corp. in Irving, Texas, and a $400 million contract with Continental Bank Corp.

For ISSC to prosper, some observers said the unit should get additional autonomy. Bob McMullen, chief financial officer of The Bisys Group, Inc., an outsourcer in Little Falls, N.J., suggested that IBM sell all or part of the company in a public offering, a move that IBM is considering, according to published reports.

"The perception is better among potential services customers if it's a services company, not a hardware company," McMullen said. "It would look stronger if it was a company unto itself."

The bottom line for many analysts is that IBM may not want to use ISSC as the model for other parts of the company. "The outsourcing business itself is a different model from making hardware," observed Leonard Bergstrom, vice president of Real Decisions, Inc., a Darien, Conn., firm specializing in measuring information systems and outsourcing performance. Product companies have vastly different infrastructures and cost elements than do service companies, he said. —*Mark Halper*

IBM strategy questions abound

CONTINUED FROM PAGE 1

It will certainly heat up early next year when the AS/400 is expected to add a reduced instruction set computing (RISC)-based I/O processor and broaden its "openness" appeal with support for Posix interfaces and the Open Software Foundation's Distributed Computing Environment (DCE).

Meanwhile, the RS/6000 team is building up its number of robust commercial applications and adding mainframe-class software such as CICS to the AIX Unix operating system.

Many large AS/400 sites are happy with their systems despite the "openness" dogma they hear from Unix makers, including RS/6000 evangelists. "We haven't found anything [AS/400] cannot connect with," said Ron Sieman, vice president of information technology at Royal Caribbean Cruises Ltd. in Miami.

Promises to keep

IBM has promised to enhance the RS/6000 and AS/400 product lines at both the low and high ends, and by 1996 both platforms may run on the same chip. Application Business Systems (ABS), the business unit in charge of the AS/400, and the Entry Systems line of business, which controls the RS/6000, already share many development costs — including expenses to build the PowerPC chip. PowerPC engineering falls to IBM's joint venture with Apple Computer, Inc. and Motorola, Inc.

Largely untouched in last year's reorganization, the AS/400 and RS/6000 units were rebels before the revamp and remain so now.

For example, ABS ran against IBM's internal "mainframe first" mind set earlier this year in the redundant arrays of inexpensive disks (RAID) arena. ABS beat the IBM mainframe group to the RAID punch by courting Adstar, IBM's storage company.

The kind of entrepreneurial spirit that IBM is trying to clone in its other lines of business has kept an AS/400 shipping every 12 minutes and catapulted the 2-year-old RS/6000 workstations and servers into the No. 3 market position for worldwide Unix system shipments.

> **IBM has promised to enhance the RS/6000 and AS/400 product lines at both the low and high ends.**

Profitwise, the AS/400 clearly leads with its $15.5 billion in revenue projected for 1993. The RS/6000 has only eased into profitability this year, with $2 billion in revenue.

Despite such successes, problems loom: The duo increasingly pursues the same customer sets, especially mainframe downsizers; and both target many of the same resellers and third-party developers.

And the AS/400, with its poor PC connectivity and high-priced tiered software, may already be losing its grip on the commercial market in Western Europe.

At the same time, the RS/6000 is still "very immature" in software, system management facilities, scalability and other commercial attributes, said Myron Kerstetter, an analyst at Gartner Group, Inc. in Stamford, Conn.

Indeed, users such as Samsonite Corp., which recently weighed a choice between the two rivals for a database application, rejected the faster performance of the RS/6000 in favor of the easier management of an AS/400.

If IBM envisions more technology sharing between the RS/6000 and AS/400, it would be wise to meld them carefully to avoid creating a skittish installed base on both sides, analysts and users cautioned.

Wholesale swaps of one platform for the other seem highly unlikely. "If you believe in one, you're not likely to believe in the other," said Charles Greene, MIS director at Pace Foods, Inc. in San Antonio, which is looking to upgrade its AS/400 Model D30.

High-tech leaders ask Clinton for quick action

By James Daly
LITTLE ROCK, ARK.

■ Leaders of the nation's embattled high-tech industry gave President-elect Bill Clinton a piece of their mind at last week's summit by writing an urgent prescription for curing the country's economic ills and increasing its competitiveness.

Clinton proved himself friendly to the computer industry during the campaign when he outlined a national technology policy. Now many executives want him to move rapidly on his plan without getting bogged down in the typical quicksand of government.

"I applaud the fact-finding that you're doing, but . . . get on with making decisions as fast and quickly as you can," urged Autodesk, Inc. President Carol Bartz.

Some consider Clinton's high-tech initiatives a critical catalyst for fueling the country's economic engine. "Fifty percent of this country's economic growth since World War II has come from the technology-based industry, yet we have not had a consistent and well-understood technology policy," said Sandra Kurtzig, president of The ASK Group, Inc. in Mountain View, Calif., who attended the two-day summit.

Clinton's high-tech policy includes establishing a civilian advanced technology agency modeled on the Defense Advanced Research Projects Agency that focuses on emerging industries such as robotics, high-speed computing and environmental technology; building a national fiber-optic data network by the year 2015; research and development tax credits; a 50% cut in the capital gains tax on long-term investments in new business; and educational initiatives that include a continuing education program and apprenticeship programs.

Call to order

In a format that resembled a session of the U.N. Security Council, Clinton and Vice President-elect Al Gore called together 300-plus business executives and academics for a session designed to provide their administration with a running start on how best to address the global economic challenge.

Suggestions from the high-tech leaders included the following:

- Ease credit policies and bank regulations so cash can flow quickly and easily to emerging companies.
- Control the flood of lawsuits facing American business, particularly the knee-jerk complaints often filed after reports of a down fiscal quarter.
- Toughen penalties on software piracy.
- Increase the access to capital for businesses owned by women and minorities. Offer regional directors the ability to authorize the dispersal of federal loans, rather than waiting for a sign-off from Washington.

Apple Computer, Inc. Chief Executive Officer John Sculley trumpeted the need for a revamped public education system designed to give students the skills required for success in a highly automated society. "We are still trapped in a public education system that is preparing our youth for jobs that no longer exist," Sculley said.

The U.S., Sculley said, is at a major economic "turning point," similar to its late 19th-century transformation from an agricultural-based economy into an industrial one. He said the country needs a major transition from the highly centralized assembly-line production of the Henry Ford era to decentralized firms such as those in Silicon Valley.

The marathon economic summit also converted some Clinton skeptics. Kurtzig said she was impressed with Clinton's and Gore's command of technology issues. "Their intellectual grasp of the issues and breadth of knowledge was very impressive," she said.

Others tried to temper the meeting's general upbeat mood with a splash of cold reality. Cray Research, Inc. Chairman John Rollwagen said the goodwill generated at the summit could easily evaporate once difficult economic policy decisions are made.

Sun merges Sitka, SunSelect units

Move could boost network profile

By Elisabeth Horwitt
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. last week said it is merging its Sitka Corp. and SunSelect divisions into a single PC networking unit charged with taking on the likes of Microsoft Corp. and Novell, Inc.

Sitka, historically an Apple Computer, Inc. Macintosh connectivity company that expanded into PC networking, will lose its name and be folded into SunSelect "to strengthen Sun's position in the open networking market," said Carl Ledbetter, SunSelect's general manager.

Sun officials said the new unit will provide users with one-stop shopping for Sitka and SunSelect products.

Sitka is "a well-kept secret" that, with Sun's name behind it, could well compete with the PC networking giants, said Karen Scherberger, acting director at Westport, Conn., consulting company New Science Associates, Inc. The Sun division's main strength is a "cross-platform networking strategy" that is more open than the Novell or Microsoft offerings, she added.

Sun officials emphasized the benefits of providing users with one-stop shopping that would encompass both Sitka's multivendor "peer-to-peer" networking products and SunSelect's client/server, PC-to-Unix offerings. A single sales and marketing organization will work with value-added resellers to "implement the most appropriate solution," Ledbetter said.

What is missing from the equation, however, is any technological synergy between the two Sun networking arms, Scherberger said.

Sun has "no intent to merge technologies" across Sitka and SunSelect product lines, Ledbetter said. "We think they serve two customer sets."

The transition is scheduled to take effect Dec. 28, Sun said. Deborah Triant, Sitka's president and chief executive officer, will move to another part of Sun, as yet undecided on, she said. The company will be based in Chelmsford, Mass.

In the loop

When a company is under a financial thundercloud, IS has to respond to the turmoil of all other departments. IS executives must be in the loop during business reshuffling talks so they are prepared to act quickly when changes come down, said McKinsey & Co.'s Dennis Bowman. Also, a host of IS functions are affected when a firm reorganizes, whether the changes involve shutting a business unit or streamlining the way a product is handled. IS can help, "but only if they are kept up on what's in the hopper," he said.

Hard times spur ingenuity

CONTINUED FROM PAGE 1

ogy is what gives companies an edge. Hacking away at the IS department can remove the leg up that could potentially pull the company back to profitability, says Gil Mintz, an analyst at Broadview Associates in New York.

Carter Hawley Hale Stores, Inc. would agree, at least partially. Just before filing for Chapter 11, the Los Angeles-based retailer invested heavily in an integrated computer-aided software engineering workbench so that in-house staff could build programs to handle the deluge of data demands a Chapter 11 filing brings on.

The IS director at another company, which requested anonymity, said it saved between $100,000 and $200,000 by creating Chapter 11-related applications itself, rather than hiring an outside service to help process the information requested by bankruptcy court.

"You have to cut selectively, with an eye toward improving productivity," Bowman explained.

Creative cutting

Cuts do not have to wound, and options should be carefully considered. For example, cost-cutting by renegotiating vendor contracts for price breaks was a hidden benefit of Chapter 11 for some firms. America West Airlines saved between 25% and 50% in operating costs by renegotiating contracts with hardware and software vendors [CW, Oct. 5].

A large East Coast food company saved "several hundred thousand dollars" by talking lessors into more attractive rates, according to the IS director there.

At Hartmarx, along with typical money-saving measures such as layoffs, the company found other surprise glints of silver amid the gloom. For example, an inventory of assets revealed that the company had warehoused several terminals, network controllers and point-of-sale systems, which it quickly sold to hardware brokers.

Then Hartmarx decided it had too much hardware and began consolidating and downsizing two IBM 3084 mainframe data centers into two Application System/400s. The move will cut the operating budget from $13 million this year to half that for 1993, Johnson estimated.

Keeping track

R. H. Macy & Co., which filed for Chapter 11 a year ago, last month unveiled new accounting and merchandise management systems designed to let the struggling retailer closely track inventory disbursement and hone in on which products are selling where.

Macy's management is counting on the new inventory system to jack up cash flow to $800 million by 1998.

Although Chapter 11 is fraught with pressure, it also constitutes a grace period of sorts. It gave some companies, such as Revco D.S., Inc., the time to implement a $50 million IS overhaul. Victimized by a leveraged buyout gone bad, the Twinsburg, Ohio, drug store chain filed for Chapter 11 in July 1988. It then emerged last June "totally reworked," according to Rich Weber, former director of systems planning and development.

Three functional IS units became two team-oriented groups focused on application development. Executives on both the business and IS sides of the house examined every nook and cranny in the company to determine where they were losing out to competitors and how technology could win back consumer favor.

Perhaps the most positive by-product of this gloomy time was improved communication between the front and back offices.

"We knew what we were doing was fighting for the survival of the company," said Weber, who has since been laid off.

Operation Restore Hope

Media counts on technology in Somalia

By Rosemary Cafasso

Operations executives at the major television networks are accustomed to supporting staff members who are in the field under harsh conditions. But the current operation in famine-ravaged Somalia has stretched their skills to new levels.

"We have never had to work in a situation where there was absolutely nothing," said Michael Duffy, vice president of operations at ABC.

Network executives said they do not remember managing such a large-scale operation from a location that has virtually no infrastructure and lacks the most basic necessities of food and water. As a result, the networks were required essentially to build high-tech news operations from scratch to gather and disseminate their dispatches from compounds near Mogadishu and its airport.

While the Persian Gulf war coverage was more complex and demanding, staff members could at least sleep in hotels, and many had access to telephones, electricity and running water. And as long as they played by the rules, reporters could remain relatively safe.

By contrast, the early network teams that arrived in Somalia before the U.S. military had to pay locals to serve as their armed security guards.

To do their jobs in Somalia, ABC, CBS, CNN and NBC simply brought everything with them. Everything. Their gear included portable satellite dishes, laptops, portable telephones, generators and gasoline, food, drinking water and even portable bags of water that can be torn open for showers.

Suitcase satellites

At the heart of the networks' operations are the portable satellite dishes. These devices, which CNN estimated cost around "a quarter of a million dollars," are collapsible units that can fit into oversize suitcases and be lugged around in the back of a four-wheel-drive vehicle. The setup process takes about two hours, and the different types of dishes measure from 5 feet to 11 feet or 12 feet in diameter.

CNN and ABC are broadcasting video from these devices, while CBS is using a similar but larger dish along with a conversion device that allows voice and data to be transported as well.

Don DeCesare, vice president of operations at CBS, would not divulge the source of this proprietary technology because he claimed it gives his network the edge over its competition. For example, the device allows CBS reporters to submit their stories directly to headquarters in New York.

The other networks, including CNN and ABC, said their reporters were using laptops to write broadcast scripts and were then either faxing them or dictating them over the telephone to their home offices.

Dick Tauber, director of satellites and circuits at CNN, said he is familiar with the CBS gear. "I wish we had that equipment," he said.

The networks are also relying on portable telephones, which fit into a suitcase-size package and come with their own tiny satellite dish. The device, called an Inmarsat, was originally designed for use aboard ships.

While the Inmarsat phones come in handy, they are a killer expense, costing nearly $10 per minute to use. "And we use them like crazy," Duffy said.

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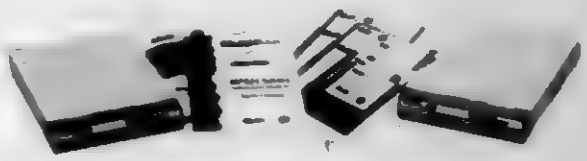

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News Shorts

Two get Baltimore computing award

Judging for the first annual Baltimore Information Technology Award resulted in a tie, so the award was presented to two winners at last week's Baltimore Computer Conference. Michael Griffen, deputy director of data processing at the Maryland Department of the Environment, won for his work on a Superfund information system that has allowed the state to recover nearly $1 million from polluters. Ronald J. Sanders, manager of marketing/administrative systems at Crown Central Petroleum Corp., was recognized for installing a store management system that automates what was a labor- and paper-intensive reporting process at more than 400 stores.

House panel rips USPS on privacy

A congressional report blasted the U.S. Postal Service for sharing its change-of-address database with direct mail companies that use it to send junk mail to "new movers." The House Committee on Government Operations said the practice disregards the privacy interests of people who want to keep their address confidential. Patrons should be able to check an "opt-out" box on the change-of-address cards to block the disclosure of their new address to third parties, the report said. Postal Service officials said that sharing the database helps mailers reduce the amount of misdirected mail, and they opposed the "opt-out" recommendation.

Informix chairman resigns

Informix Software, Inc. Chairman Roger Sippl resigned his post last week, citing an interest in new business ventures. The firm said Sippl, 37, who co-founded Informix in 1980, relinquished his role as chief executive officer in 1989. Phil White, who became CEO in 1989 and president in 1990, was elected chairman by the Informix board of directors last week. Sippl also had a role in founding the SQL Access Group, an industry standards group, in 1989.

SNA rivalry intensifies

Proteon, Inc. announced what it claims is a better way to ensure that IBM Systems Network Architecture traffic does not get bumped off an internetwork by local-area network traffic. In contrast to Cisco Systems, Inc. and Wellfleet Communications, Inc., which are fitting their routers with the ability to prioritize SNA traffic, Proteon's Internetworking Traffic Management software's "bandwidth reservation" allocates specific bandwidths to up to 10 applications, so that no one type of transmission can hog the whole link, Proteon said. Another key feature of the software, which will ship in the first quarter of 1993, is NetBIOS filtering, which directs NetBIOS traffic to specific target addresses instead of clogging up the internetwork by trying to locate the device they want to access, Proteon said.

SHORT TAKES Storage Technology Corp. warned Wall Street last week that it expects its fourth-quarter financial results to fall below analysts' expectations. The $1.5 billion firm cited slow sales of its flagship line of automated tape libraries, as well as restructuring costs, as factors. . . . A recent national survey found that 33.6% of companies plan to increase the size of their information systems staffs in the first half of 1993, a 2.2% decrease from projections for the first half of 1992. The poll, conducted by the CompuSearch recruitment firm, showed that 13.1% of the companies surveyed plan to reduce their IS staffs. . . . AT&T announced plans to invest $222 million for a 30% stake in a $740 million trans-Atlantic fiber-optic network designed to transmit voice, data and video between the U.S., France and the U.K. The network, called the TAT-12/TAT-13, will be able to transmit up to 320,000 simultaneous phone calls.

User pricing ties HP in knots

CONTINUED FROM PAGE 1

Holt, director of research and development at Software Research Northwest, Inc., a Vashon Island, Wash., vendor of higher education administrative software.

"User-based pricing is not a trivial subject," observed Rich Sevcik, general manager of HP's systems and server group, an approximately $3 billion minicomputer operation. His software partners agreed with that assessment.

> Software companies tend to prefer different models depending on whether they sell applications, tools, system software or databases.

"There is more in this subject than you'll ever want to know," said Peter West, vice president of marketing at The ASK Group. "There are lots of technical and business issues we have to work through."

One of the most fundamental challenges HP faces is coordinating its pricing model with that of its software partners. For instance, to avoid confusing users and to minimize potential revenue havoc for itself and its partners, HP must strive to establish number-of-user categories that are consistent with those its partners use.

"If the application is a 20-user license and the operating system is a 10-user license, the user could end up buying an application license he can't use," West said.

Agreement key

Getting all partners to agree to consistent user categories is a potentially huge task, considering that even a small tweak to a software company's pricing scheme could radically alter the vendor's revenue stream.

Complicating matters, Sevcik noted, is that software companies tend to prefer different models depending on whether they sell applications, tools, system software or databases.

Even within HP, different product groups throughout the minicomputer and workstation operations may have preferences that do not match those of other HP product groups, said Jim Geisman, president of Marketshare, Inc., a Wayland, Mass., consulting firm.

"There's been some difficulty getting internal groups to buy into user-based pricing," Geisman said. "They're wondering if they're going to take a revenue hit."

Another element around which HP hopes to establish uniformity is software monitoring. HP has chosen to use its own Network License Software, or NetLS, to monitor software use. If its partners were to choose other monitoring programs, users would have to cope with inconsistent measurements across different programs.

"If we chose a different program from the one HP is using, then the customer has to use two license managers. That's not too clever," West said.

As the hard work sets in, the parties must not lose sight of the intention of user-based pricing, Sevcik and others noted. "It gives potential to customers to buy a license from HP that gives them the ability to run fewer users than the theoretical limit of the machine," West said.

Hard choices

The plethora of other issues that HP and its partners must iron out before swinging full gear into user-based pricing includes the following:

- **How to count users:** Some vendors want to stick with a strict model that identifies the users by name. A more flexible approach would specify a number of users whose identities are transferrable.
- **Resolving network issues:** Software vendors must decide whether a company could use a license in one location and then send the program over a network to a different location.
- **Peak use:** Vendors disagree over how to charge a shop that loads up on users for short spans only. Some vendors would assign a user license based on the number of users during peak periods. Others prefer an "overtime" fee.
- **Open systems portability:** As open systems evolves and programs become portable across vendors' platforms, should a user pay for each system on which he runs a program?
- **Taxes:** Some European governments want to tax software purchased out of the country but used in the country. —*Mark Halper*

Split decision

Diversity, like charity, starts at home, and so does the effort to deal with it.

Such is the case at HP, which had to deal with a monumental internal issue before addressing the outside world in its efforts to derive a user-based software pricing formula.

Specifically, the company sells its HP 3000 line of minicomputers, with its relatively proprietary MPE/IX operating system, amid a different set of market dynamics than that of its Unix line, the HP 9000, running the HP/UX operating system.

The differences have translated into a more profound user orientation in HP's 3000 software pricing than for its 9000 software pricing [CW, Dec. 7].

HP is moving 3000 software to a pure user-based formula, while it is shifting gears only halfway on the 9000 side — users will pay based on the expandability of their systems.

"They're moving to a fairly different pricing model for the two lines," pointed out Sean Bandarkar, director of marketing at the HP products division of Oracle Corp.

One reason for the varied approach is that HP has not yet built its license management software, NetLS, into MPE/IX, while NetLS is a part of HP/UX. NetLS measures number of users and CPU power.

HP's timetable for implementing its changes is modest. It has already shifted MPE/IX and selected MPE/IX system software, but it will not offer it for MPE application software until at least the middle of next year, when it plans to have added NetLS to MPE/IX. It will configure NetLS so that HP 3000 users can choose whether to measure by users or CPU power. —*Mark Halper*

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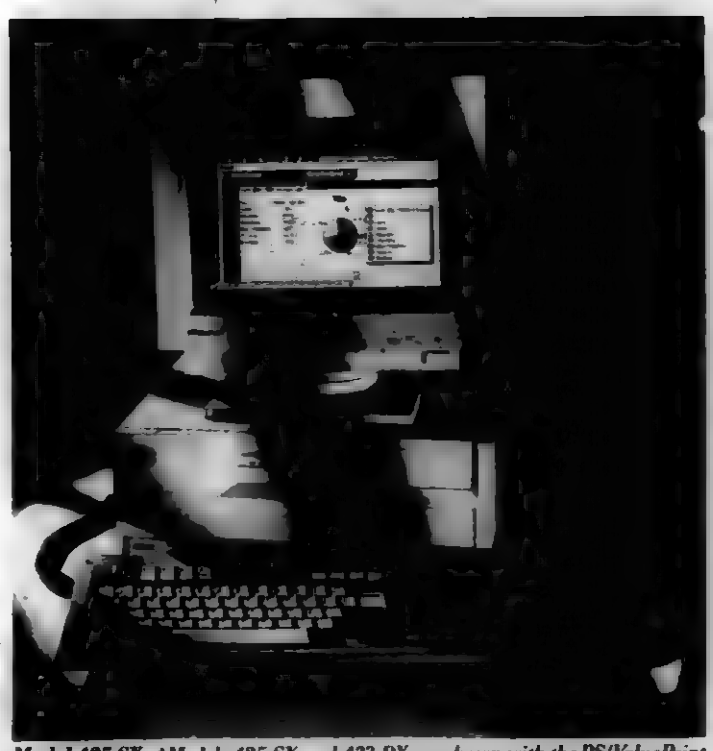

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Companies wade through Wall Street

In storm's aftermath, Manhattan firms move operations to avert disaster

By Thomas Hoffman
NEW YORK

Disaster aversion was the catchphrase last week for several Wall Street firms that were forced to transfer staff and computer operations from flooded buildings in downtown Manhattan, following one of the most severe storms to hit the Northeast in recent memory.

But according to disaster-recovery experts, the economic impact from data processing disruptions was minimal compared with other recent disasters. Many companies switched to private generators, which helped minimize disruptions.

Companies such as Chemical Banking Corp. and County NatWest Securities were forced to transfer hundreds of staff members and several key computer operations from their respective offices at 55 Water St. and 100 Wall St.

Evacuation was necessary for many waterfront businesses as the rising tides of New York Harbor swept into basement vaults, knocking out electrical transformers and telecommunications equipment.

Six New York-based companies declared nine separate disasters with Comdisco, Inc., according to Michael J. Tobin, Comdisco's vice president of marketing.

Nine disaster alerts were also reported to Comdisco, but Tobin said none were upgraded to full-blown disaster declarations. The companies that declared disasters, Tobin said, transferred staff and operations to three Comdisco recovery centers in lower Manhattan and Carlstadt and North Bergen, N.J.

The financial impact of the storm was not expected to rival past disasters, such as the August 1990 Wall Street blackout, said Jeff Marinstein, president of Contingency Planning Research, Inc. (CPRI), a Jericho, N.Y.-based disaster-recovery management consulting firm.

At that time, 25 companies declared disasters with Comdisco. CPRI estimated that New York businesses suffered in excess of $1 billion in losses resulting from the 1990 disaster.

Securing the securities

Among the companies struck in the recent storm was County NatWest, a securities trading subsidiary of National Westminster Bank, which declared disaster on Dec. 12. It transferred 75 traders from its equity and treasury trading operations from 100 Wall St. to a disaster-recovery facility operated by Exchange Resources, Inc. (ERI).

The transfer was exceptionally smooth, considering County NatWest had not yet finalized a disaster-recovery contract with ERI when the storm arrived.

"What made it difficult was going from a cold start to creating a trading-room environment within 24 hours," noted Ken Israel, ERI's president.

ERI provided County NatWest's traders with IBM 3270 links to the company's mainframe operations and connections to market data services from Quotron Systems, Inc., Reuters Information Services, Inc. and Telerate, Inc.

Also, ERI replicated County NatWest's Microsoft Corp. MS-DOS applications running on Novell, Inc. local-area networks over Ethernet. Traders moved to the Staten Island facility began conducting trades by 6:45 a.m. Monday.

The primary data center for the Commodities Exchange, Inc. at 80 West St. was flooded on Dec. 11, which forced the exchange to transfer operations to its backup data facility at 15 Maiden Lane. Because the firm's data centers mirror each other's operations, the exchange experienced no problems, a spokesman said.

Just in time...

The winter storm that ravaged the Northeast last week couldn't have come at a more inopportune time for Chemical Banking. When the storm reached its peak the afternoon of Dec. 12, the bank had just completed the first phase of a planned conversion of its wholesale demand deposit account system. Rather than withdraw from the project, Chemical decided it would be more prudent to continue the conversion over the weekend — which it successfully completed.

Riding out the storm

Here's how a number of Wall Street firms kept their computers humming, despite storm-induced flooding in lower Manhattan:

- **The Depository Trust Co.** (DTC), located at 55 Water St., ran its computer systems on emergency generators. However, DTC was not forced to evacuate the building or transfer its operations to an alternate hot site because the generators continued to power the firm's data center on the 21st floor, said Chris Lord, DTC's systems software director.
- At **Drexel Burnham Lambert, Inc.**, an uninterruptible power supply prevented power surges from disrupting transactions conducted over its PC LAN systems, said Howard Ertel, Drexel's senior vice president of systems. Ertel said Drexel houses its mainframes at an alternate data center site.
- **Fahnestock & Co.**, a government bond agency, was also helped out by backup systems. According to Charles E. Padgett, senior vice president and general counsel at Fahnestock, the landlord at its 110 Wall St. building shut down building power as a precautionary measure at 10:30 a.m. on Friday. After emergency generators kicked in, the company moved its traders to other offices, including its primary data center on 54th St. Telecommunications was also rerouted to other offices.
- **Salomon Brothers, Inc.** moved roughly 500 people from 2 New York Plaza to offices in the World Trade Center, according to Fred Pinto, a Salomon vice president.

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Tech Talk

Multimedia medicine

Multimedia systems can help head-trauma patients regain some of their faculties, according to a paper being written by David Cox, director of the neuropsychology department at the Florida Hospital Medical Center in Orlando. Some rehabilitation therapists who have experimented with tailored multimedia systems for patients speculate that the rich interactive environment — incorporating sound, images and video — may help the brain develop new pathways, rerouting information around damaged neurons. Government statistics indicate that 90,000 of the people who suffer head injuries each year have some lifelong loss of brain function.

Digital camera

Victor Hasselblad AB, an honored name among photography buffs for decades, is stepping into the digital age. The Sweden-based camera maker announced earlier this month that it would attach a digital system to the back of one of its motorized cameras. The Hasselblad DB 4000, which will use technology from Leaf Systems, Inc. in Southboro, Mass., will be capable of producing images with more than 16,000 shades per color — actually offering greater dynamic range than film. But casual snapshot-takers beware: List price for the digital camera will be $35,000.

European tech

The European Commission's core research effort into advanced computing, known as the third European Strategic Programme for Research into Information Technology, or ESPRIT III, recently added funding for five new projects to be carried out during the next three years. They include the following:

- IDEA (Intelligent Database Environment for Advanced Application).
- EDS 2 (European Declarative Systems, Evaluation for Exploitation), a computer language project.
- Epoch, a parallel computing project.

MPP: Not there yet

Traditional supercomputers still best the new kid on the block

By Ellis Booker

THEORETICAL performance aside, massively parallel processing (MPP) systems are still outpaced by traditional vector supercomputers, according to a recent study by the Los Alamos National Laboratory.

While vector machines put billions of calculations in a line (or vector) and process them sequentially, MPP systems divide a computing problem among hundreds or thousands of simple processors running in parallel.

In tests, Los Alamos researchers found that a Cray YMP/8 from Cray Research, Inc. outperformed a Thinking Machine Corp. Connection Machine-2 (CM-2). The CM-2 uses 2,048 parallel processors. The three test codes were optimized for each platform before being run.

Balance sought

The team concluded that the current generation of MPP systems has not yet achieved the correct balance between processor speed and communications (processor-to-memory and processor-to-processor) speed.

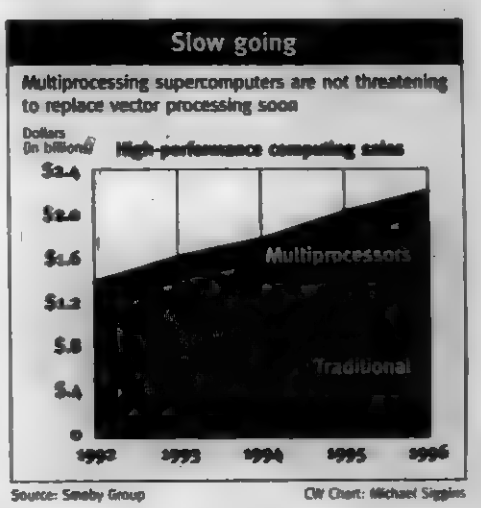
Nevertheless, the three-year study, presented at Supercomputing '92 in Minneapolis last month, emphasized that MPP architectures will be vital to the future of high-performance computing.

Gary Smaby, president of high-performance market research firm Smaby Group, Inc. in Minneapolis, concurred: "MPP is here to stay and will be, in some variation, part of high-performance computing going forward."

At the same time, Smaby said, users of high-performance systems are, for now, in something of a "never-never land," with the promise of MPP delayed by the fact that this architecture is not as mature as vector systems.

MPP lacks "all the the robust infrastructure a company like Cray has spent 20 years perfecting," he said.

Makers of conventional vector supercomputers have seen the MPP writing on the wall. Also at Supercomputing '92, vector processing pioneer Cray announced that its first MPP system, the T3D, would be available in 1993.



Silicon frontier is glowing

By Lori Valigra

Luminescent silicon may change the computer industry the way Elvis Presley revolutionized music.

Not coincidentally, the face of the "king of rock 'n' roll" has already been etched onto the new type of silicon and induced to glow intensely.

"And we did it without a velvet background," said Michael J. Sailor, assistant professor of chemistry at the University of California at San Diego.

Backers of the new technology said they expect it to be used in tomorrow's superfast optoelectronic computers, optoelectronic storage units and flat-panel displays.

Previously thought to be devoid of optical properties, silicon was found to be luminescent about two years ago. Several researchers discovered that highly porous silicon glows brightly when stimulated by electricity or light. (Porous silicon looks like a forest of widely separated "silicon" trees, so it conducts electricity well.)

The discovery took the microchip industry by surprise, spawning new research by physicists and chemists such as Sailor. Until then, scientists who had wanted to marry optics and electronics had been exploring new materials such as gallium arsenide phosphide.

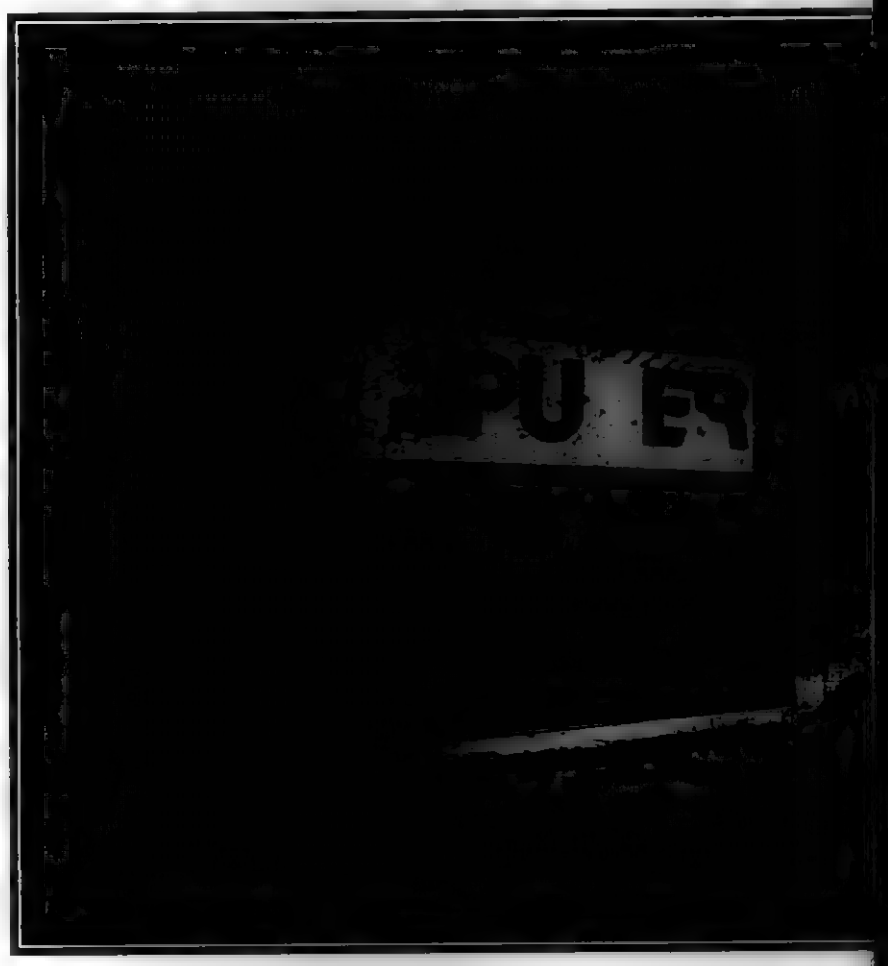
Future optical silicon would radically change the internal workings of microprocessors, replacing electrons flowing down a wire with light signals traveling down a fiber-optic cable. The design could boost the speed of a computer at least 10 times and would permit denser packaging on chips, Sailor said.

"You can multiplex optical signals without interference, so you can put a lot more signals down a fiber-optic cable," Sailor explained at the recent "New Horizons in Science" briefing in San Diego held by the Council for the Advancement of Science Writing.

"Getting porous silicon to [work] with light is not a near-term project," Sailor said. The first step, he said, is finding out just why silicon glows. As in most areas of science, the reason is now under debate.

Valigra is an IDG News Service correspondent.

Our Computers To Outlast Most Co



Pick up a paper and you'll no doubt read about another PC company on the brink of collapse. Does it matter? Not much. Unless you're stuck with a computer that's out of commission from a company that's out of business.

In the 80's, it seemed every time you turned around a new computer company opened up. For a while it looked like all you needed was a soldering iron, a toll-free phone number and a P.O. Box to get started.

Those days are over. The market has matured. Customers are demanding more. And clone companies are faced with an ugly reality: the less you know about making computers, the less likely you're going to be successful at it.

Writers in the press and financial analysts on Wall Street are even compiling lists as to which are about to go under. While all of these involve an amount of speculation on the part of their authors, you may be surprised to learn that many of the larger clone companies appear on the majority of them.

It is not a question of whether it will happen. It is only a question of when.

All of which means that choosing the right computer company has

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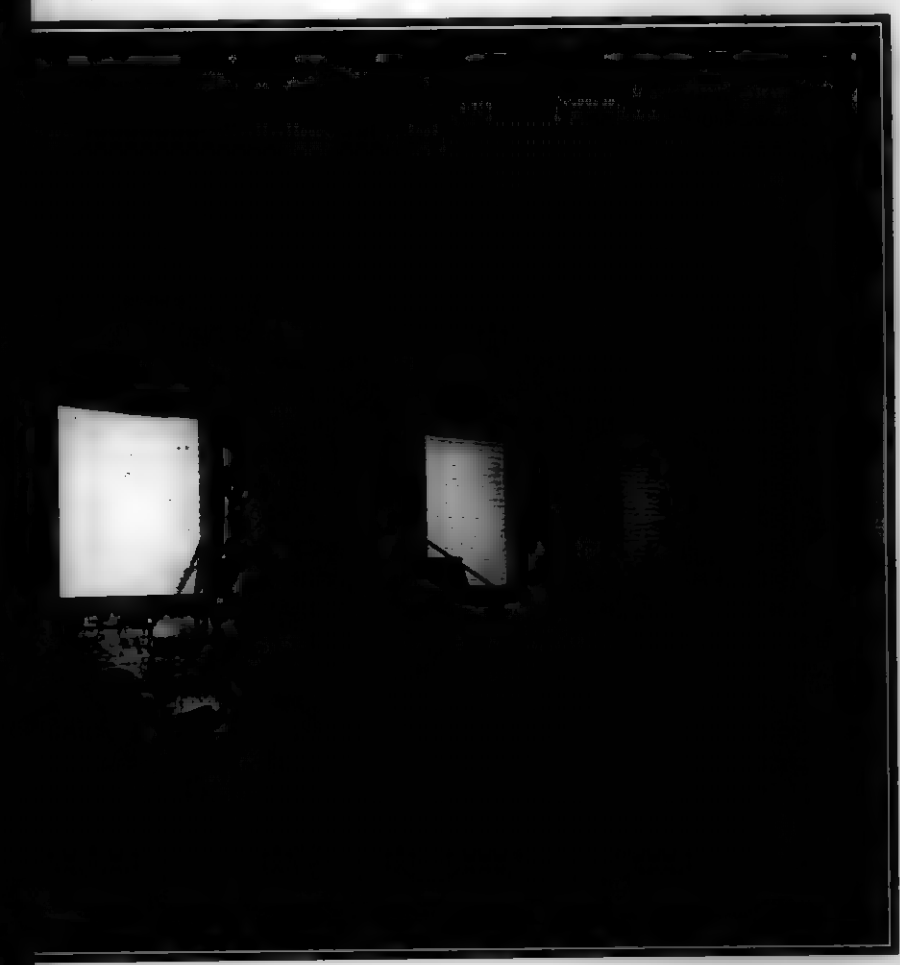

become every bit as important as choosing the right computer. It is no longer enough to compare price, product specs, service and support and then come to your decision.

After all, a company can promise all of the service and support in the world and it won't much matter if their toll-free line has been disconnected.

Which is why, as one leading trade publication puts it, "Planning ahead for more COMPAQ systems has rarely looked more prudent."*

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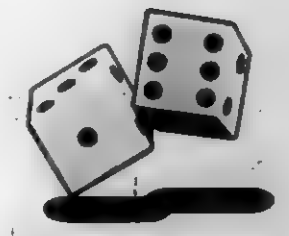
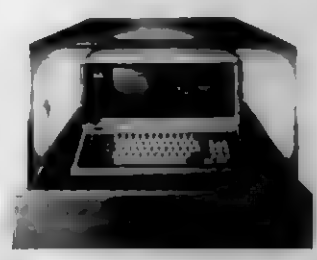


With their current credit and cash flow problems, buying computers from financially vulnerable clone companies has become something of a gamble.



Though this one's on display in our Houston offices, some of the first COMPAQ PCs are still being used. Obviously, our PCs are designed to be around a long time. So is the company.

COMPAQ

How bad is it?

The irony of it all. Last Monday in Little Rock, a dean of liberal economic thought, Robert Solow, told Bill Clinton and the economic summit members that the nation's most serious problem is its failure to invest in new plants and equipment.

Simultaneously, about 1,000 miles away, IBM's board of directors was prepping a series of stunning announcements, one of which would padlock some of the plants in which the company had sunk nearly $25 billion in the 1980s during a blistering capital investment program.

At a time in the '80s when so many companies were salting away profits into antitakeover war chests, IBM was doing exactly what the economists said it should do. It was building the most modern manufacturing and research and development facilities in the world. It was investing billions in pure research. It was preparing the desktop operating environment of the 1990s with partner Microsoft.

What the heck happened? More importantly, where is the current situation heading at IBM? The company is, after all, the single most important factor in the installed base of a majority of U.S. and worldwide corporations.

There are so many analogies that fit IBM's predicament. The best I can think of is that of the U.S. military in 1941, which built the heart of its Pacific defense around huge, powerful battleships. Then came air power. Then came Dec. 7, 1941. With lightening speed, the new and nimble vanquished the old and slow.

Like the U.S. Navy in late 1941, IBM is trying desperately to regroup. Reports are surfacing of some of the greatest deals on large systems in IBM's history. They're selling low-cost PCs. Its workstations are under tremendous price pressure. So for users, it's a case of the shark ethic: Eat the wounded.

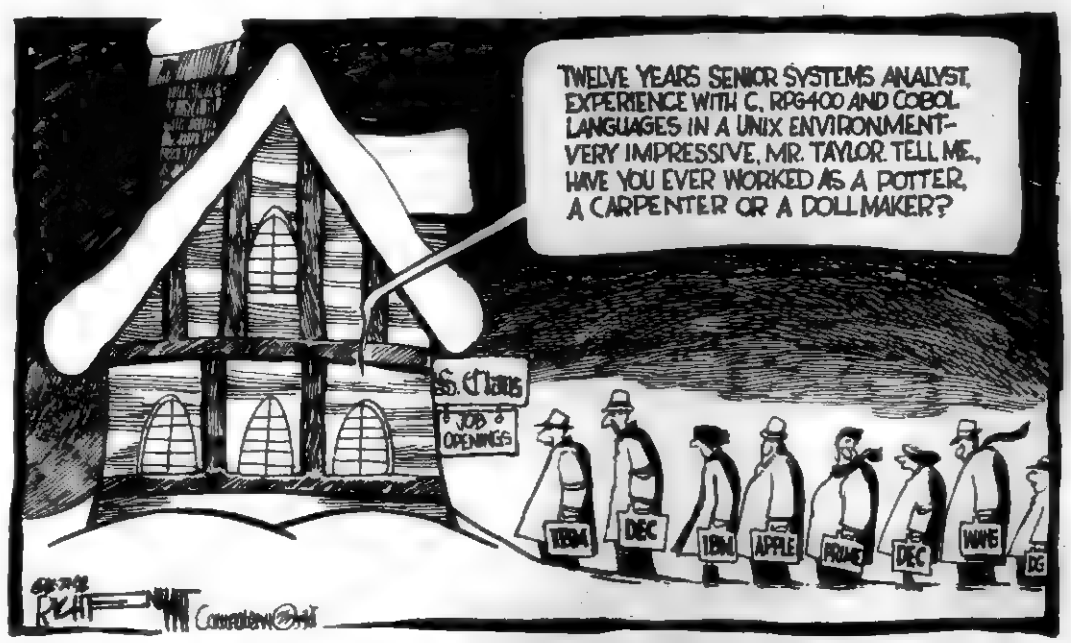
But most importantly, what happened last week was the first real breaching in IBM's veil of invulnerability. The unthinkable has happened. IBM is failing.

Not font-tolerant

We crowed quite a bit recently about our new publishing system and new publication design. Lately we've been eating some crow — the result of some serious typographical problems that have turned parts of our text into what looks like alphabet soup. The problem is not in the stars, but at our printer, where some shoddy proofing failed to catch the results of a type default. Rest assured our printer has been duly apprised of the situation and has all but guaranteed us no repeat of these embarrassing and troublesome errors. In early January, we will also have improved the readability of our typeface, which we have recustomized for easier reading.

Bill Laberis

Bill Laberis, *Editor in chief*



Be innovative

Regarding Joshua Hammond's "Hard and fast truths about quality" [CW, Oct. 26]: I agree that the question "Is quality improvement right for every company?" needed to be asked. "Traditional" quality improvement tools should not be embraced on a wholesale basis but must be adapted to the performance evolution of a company.

My research shows that many successful companies, however, have achieved "high performer" status without ascribing to the generic quality-improvement management practices reviewed in the article. These companies have pursued breakthrough innovation as the focus of their quality efforts — to create product technologies with enduring market power, to identify new market opportunities and to create market technologies that truly "delight" customers. They recognize that innovation, not execution, is most likely to result in long-term value.

Innovation requires unrelenting attention to developing quality decision-making capabilities. These are the capabilities that focus the business on doing the "right things," as opposed to merely "doing things right."

Steven D. Bassill
Chicago

Unfair criticism

Computerworld greatly surprised me when it published Nicholas Andrelli's anti-intellectual and bigoted letter [CW, Nov. 9]. The only remarkable thing about his letter is the peculiar combination of an uninformed attack on a programming language and a xenophobic broadside against recent immigrants.

I have had the privilege to work with and supervise programmers and analysts who were not born in this country. I found that their educational background, work ethic and desire to succeed were equal or superior to those of the average "American" programmer.

The only instances where I encountered difficulties in communication were those in which the original statement of the problem to be solved lacked focus and cohesion.

Frank Phillips
Ellicott City, Md.

DEC responds to Product Spotlight

Regarding your Product Spotlight and lab report on minicomputers [CW, Nov.30]: The DEC system listed is not the best performance system we offer. The article should have listed the VAX 6000 Model 640 as the best throughput system. The VAX 6000 Model 640, using VAX ACMS V3.2/VAX Rdb/OpenVMS V4.1, runs at 208.80 TPS-A, according to the Oct. 23, 1992 Transaction Processing Council report.

The article also makes several statements that DEC Alpha AXP systems are not currently shipping in volume. This is simply not true — Alpha AXP systems are now shipping in volume to customers. Additionally, the article notes that DEC's efforts to capture mainframe downsizing business are "on hold while users wait for Alpha AXP systems."

There are active sales and marketing programs aimed at the downsizing market in DEC today that focus on both VAX platforms as well as Alpha AXP platforms.

Judith Abrahamowitch
OpenVMS/AVS public relations consultant
Boxboro, Mass.

Staff reduced? Cut back on work load

In "Trying times indeed for IS staffs" [CW, Nov. 16], you note Southwestern Bell Public Service Co. reduced staff from 30 to 16 people with no change in work load.

How can I go into one of my groups and say we are reducing your staff by half, but there is no change in the project or delivery dates? If the personnel in that group are working 40 to 50 hours per week, and because software development hours do not scale linearly, what does one expect of the developers?

In reality, it is necessary to scale back projects and expectations along with personnel. I do not have the luxury of hand-waving and saying everything appears to be simple, and why can't I have all my candy tomorrow. And here, we certainly do not allow the people above us that luxury either.

Richard L. Coleman
Englewood Cliffs, N.J.

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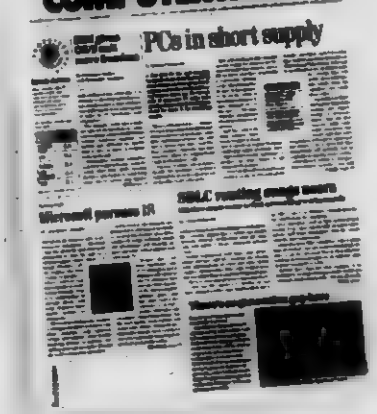

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The 'Ize' have it

Michael Cohn

Recent employment forecasts are grim. Shops are downsizing. Firms are running lights-out operations. Budgets are shrinking. Jobs are drying up. Even seasoned systems programmers are wondering who'll be next.

We could give up. We could blame the economy. We could agonize and criticize, rationalize and then go write our resumes.

Or we can do something about this. We can save ourselves. We can organize and energize and create all the IS jobs we'll ever need. Even with a minimized IS industry, we can maximize IS employment. All we have to do is be creative and try a couple of things. Consider the following:

•**SPECIALIZE:** If it worked for doctors, it will work for us. They have arm specialists and hand specialists, finger specialists and cuticle specialists — and they all drive German sedans.

So how about IS specialists? "Sure, we'll fix your abend; talk to our Cobol specialist, who'll refer you to our Procedure Division specialist, who'll let you see the guy who only handles nested-ifs." This would keep all kinds of IS folks on the payroll. Just knowing OCCURS DEPENDING ON could bring in six figures a year.

•**UNIONIZE:** Other industries have unions. Let's join together and keep our jobs.

Of course, it might not be that easy. When you get a bunch of us together, we don't agree on anything. We won't buy the same hardware. We won't work the same hours. We won't wear the same clothes, except for maybe the white socks.

•**TERRORIZE:** Destroy a disk pack. Create a crisis. There's nothing like some healthy panic to keep our numbers growing. An operator once told me, "If you're fighting fires, hire more firemen." Of course, he used to be a CIO.

JANELL GENOVESE

•**DECENTRALIZE:** We once had megacorporations, information empires and a happily employed IS bureaucracy. Now, divisions want autonomy. Departments want computers. Users want LANs, servers and software.

So let them have departmental systems. They'll take years to integrate. In the meantime, departmental systems will grow into disparate systems, which will grow into duplicate systems, which will mean more jobs for everybody.

In the old days, a computer did the work of 10 people. Now, 10 people want 10 computers. I don't know if that's progress, but it keeps us off unemployment.

•**UPSIZE:** Remember water-chilled CPUs? Used ones are a dime a dozen. Dumb terminals? They're practically giving them away.

Don't let your CFO buy into this client/server stuff. Don't let your CEO fall for the tiny, open systems. They need 90 MIPS mainframes and lots of 'em. They're cheap. They'll create jobs. They'll use up unwanted floor space.

RISC is here today, gone tomorrow, but big boxes will be around forever — because no one will take them off your hands.

•**FRATERNIZE:** This is dramatic, but it's time to get to know the users. Hang around their offices. Reboot their PCs. Buy them a drink or two.

As unfair as it may seem, users occasionally survive, while IS employees get the ax. And some accountant, planner or other misguided user is probably doing the chopping.

So make friends with users. Convince them that IS will save the company. Get them to believe it, or get them fired. Either way, the odds are better for us.

Cohn works for a very large computer company in Atlanta.

Is client/server a lot of hot air?

FIRE WATCH *by* John Gantz

Now that IBM has formed a whole division in support of client/server, I have to wonder if maybe this whole concept of client/server — the new computing paradigm to which we are migrating — is a hoax.

Mind you, I've been crisscrossing the country for the last several years pumping up the concept, along with related topics such as open systems and downsizing. In fact, at Comdex/Fall '92, I served on a panel addressing the subject. The room was full of well-informed people. We all talked as if client/server were real and as if it were going to save us money.

But I wonder.

In the 1970s, we had many of the same hopes for the concept of distributed data processing. It would put computer power close to the source of the transaction, we said. It would liberate the end user. It would relieve mainframe cycles. It would do this, it would do that, blah blah blah.

But distributed data processing fell of its own weight, brought down by the hidden costs of implementing it. The processing nodes (we call them servers now) weren't always reliable and required skilled administrators. The processing terminals (we call them desktop computers now) always seemed to need more memory and bigger printers. The users always seemed to need more training and support than expected, and developing distributed applications always seemed to be more difficult than envisioned (and it still is).

Here are two examples of the smoke and mirrors that may be making client/server seem more real than it is:

1. Motorola has always made a big noise about its migration from mainframes to multiuser Unix machines and, by most measures, is a guiding light in downsizing. But when I queried the executive in charge of the downsizing efforts at the division that makes cellular phones, I discovered that while the division had cut mainframe data processing costs to zero, the computers hadn't gone away. They were still being used by headquarters; and presumably other departments now picked up the cellular division's chargeback.

I have a feeling that a lot of the cost savings of client/server are like that — more shifts than real savings.

2. At my Comdex panel on distributing data, it was pretty much agreed that the only sane way to distribute databases was through a replication process. Two-phase commit, any-to-any multidatabase transactions are no more with us today than they were in the 1970s. If distributed data processing had a technological Achilles' heel, it was distributing the data. A lot of what is called client/server today is really time-sharing.

Client/server works on a small scale. But rolling it across an entire enterprise is different. The challenges include localization of enterprise applications, network software licensing, network management, software interoperability, planning, training and administration.

For that matter, I can't recall too many major client/server applications that didn't require the services of a consultant to implement. Andersen Consulting, in discussing its widely publicized Northwest Airline ticket auditing application, admits that very few IS shops or consulting firms could have pulled it off.

I like client/server. It's helping me make a living. But then, I liked distributed data processing, too. It was fun to study. Unfortunately, it just wasn't fun to implement.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Charles Babcock

In defense of 64-bit

You may think 64-bit computing is the last thing you need, but most IS professionals will soon find they must start considering the pros and cons. Buried in 64-bit characteristics are advantages in database mapping, rapid data movement and lower programming costs that will prove difficult to ignore in the long run.

The issue won't be a pressing need for increased address word size and address space. The demand for address space had to grow by a factor of 256 before a 16-bit application was forced to move up to a 32-bit system.

That factor was not so large that applications couldn't overtake it within a few years of the appearance of 16-bit systems. But the demand for address space has to grow 64,000-fold over early 32-bit system uses before it runs up against the 4G-byte limit.

And if you have outgrown 32-bit and already moved to Mips Technologies' R4000 or DEC's Alpha, your need for address space will have to grow by a factor of 4 billion before you exhaust its potential.

When asked for examples of applications that have run out of 32-bit address space, the first ones that Mips and DEC spokesmen came up with were the applications they use to simulate their next-generation computers. So it is fair to say that one of the first beneficiaries of 64-bit computer systems will be the computer makers.

Although doubling the address word does not automatically double performance, being able to read instructions and data in 64-bit gulps can and will improve performance. And in applications where large data types are moved around frequently, the 64-bit address word does actually double performance for these movements, according to Kevin Fielding, DEC's product marketing manager for the Alpha line. These include biological and meteorological simulations, high-resolution color imaging and graphics and financial applications relying on large numbers.

On the other hand, 64-bit systems can make more effective use of both internal memory and disk. Because of the almost infinite number of address spaces, an entire database can be mapped to a 64-bit system rather than segmented through a set of indexes and pointers. This in turn makes programming large database applications simpler and cheaper.

And true enterprisewide, client/server systems may run up against the limits of 32-bit systems sooner than expected. It will not do us much good to map the corporate database to a 64-bit server on the network and then not be able to freely make use of the data from 32-bit servers or user desktops.

In short, 64-bit has a viable claim as the system of the future, but the future is not today. Whether it arrives tomorrow or five years from now will depend on the needs of the organization.

Far from introducing a great deal more complexity, 64-bit will be the initiator of a new level of simplicity as far as database and networking programmers are concerned. Also, 64-bit will take fuller advantage of cheaper memory, allowing a new style of application design.

Neither of these characteristics will appear immediately. Remember, the early 64-bit systems are going to be running 32-bit operating systems and applications.

Babcock is *Computerworld*'s technical editor.

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Jesse Berst

Windows apps get smarter

A new trend in Windows software has become important enough to merit the attention of IS professionals: Windows developers are beginning to build smarter software.

A new drawing application called Visio typifies this new approach. Normally, I wouldn't discuss a low-end drawing package in this column because drawing programs are typically aimed at the graphic arts department, not at the ordinary business users served by IS.

Visio is different. Created by Seattle-based ShapeWare, Visio is a drawing tool for the non-artist. It can make that claim because it is one of the first examples of new-generation smart software.

Smart software understands certain rules and makes choices for the user based on conditions. Because some of the expertise is built into the software, the user doesn't have to bring as many skills to the table.

In the case of Visio, the expertise is embedded in smart tools and templates. To draw a straight line, for instance, you move the mouse straight. To draw a curve, you swing the mouse in an arc. Using gesture recognition, Visio knows what you want without your telling it in advance.

Template power

The real power of Visio lies in its templates. They contain predesigned shapes with behavior coded in. For instance, if you choose the template for an organization chart, you get predesigned boxes and lines. Those boxes already know where and how to place text. If you draw lines between the boxes, the smart connectors know enough to stay connected if you move the boxes around later.

Likewise, the space-planning template has smart shapes for walls, doors, windows and furniture. These shapes know how big they're supposed to be (to stay in scale) and how they're supposed to align with one another.

And now we come to the important part — the part that makes smart software so intriguing. Because of Visio's built-in intelligence, you don't have to know anything about drawing to use it.

Ordinary drawing programs have a wide range of powerful tools, but you have to understand drawing before you can put them to good use. Some of that drawing expertise is built into Visio. That makes it accessible to people who have ideas to express but normally would never consider sketching them out.

At first glance, you might think that an ordinary user wouldn't have much need for a drawing

Windows apps, *page 30*

Display standards elusive

By Michael Fitzgerald

Scientists have figured out plenty of new ways to manipulate the light that breaks through your laptop screen, and the result is ever-improving displays. Active-matrix screens offer the best display, but these screens are still costly and difficult to produce.

Most manufacturers have opted to use only color, active-matrix screens, but a couple of recent endorsements have raised interest in active-matrix monochrome screens as well. Apple Computer, Inc. uses the technology in its PowerBook line, and recently, Compaq Computer Corp. announced a notebook with an active-matrix monochrome screen.

Other vendors said they are studying whether they want to enter this market. The trade-offs come from high power consumption and cost; the difference in cost between active-matrix monochrome and color is negligible right now.

Passive vs. active

Key differences between passive-matrix and active-matrix screens

Passive matrix	Active matrix
Rows and columns of electrodes are charged by transistors located on the periphery of the panel.	Each pixel has its own drive transistor attached to the glass.
No way to turn on one pixel without affecting others.	Each pixel is turned on individually, eliminating crosstalk and providing seven times better contrast.
Price advantage: $1,000-$1,200 lower than comparable color portable using active matrix.	Response time is one-tenth that of STN.

Slow to follow suit

Despite Apple's PowerBook success and Compaq's claims that initial demand for its product far exceeds expectations, other vendors, such as IBM and AST Research, Inc., are shying away from active-matrix monochrome.

"There would be real benefit if you could get the resolution to XGA level, but that probably won't happen until maybe 1994. Until then, you can get color for almost the same price," said Jim Bartlett, worldwide product line executive for mobile computing at the IBM PC Co.

"It has benefits as a technology, but we think the market will go to passive-matrix color at the same price [as active-matrix monochrome]," said Marcy Puhnaty, notebook marketing manager at AST.

Randal Giusto, senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H., said he thinks vendors will shift to active-matrix monochrome only if it does not cost more than passive matrix, which it now does.

Most portable computers today have passive-matrix screens, which use fewer transistors spread out over a wider area of the display than active matrix. Each pixel on either type of screen gets a jolt of electric current from the transistor.

In a passive-matrix screen, the jolts come further apart, so screen refresh takes longer. In an active-matrix screen, where each pixel has a dedicated transistor, the flow of light and electric current is steady, resulting in an inherently crisper and sharper display.

The difference to users is simple: Active-matrix technology offers faster response and better screen display. Active-matrix screens make it easier to see the screen from side angles and also improve what users see on the screen. But they also are more expensive than passive matrix, by as much as $1,500 per screen.

"If you take a standard monochrome or passive-matrix col-

Display standards, *page 30*

Find ways around town with software

By Michael Fitzgerald

HAVERFORD, PA.

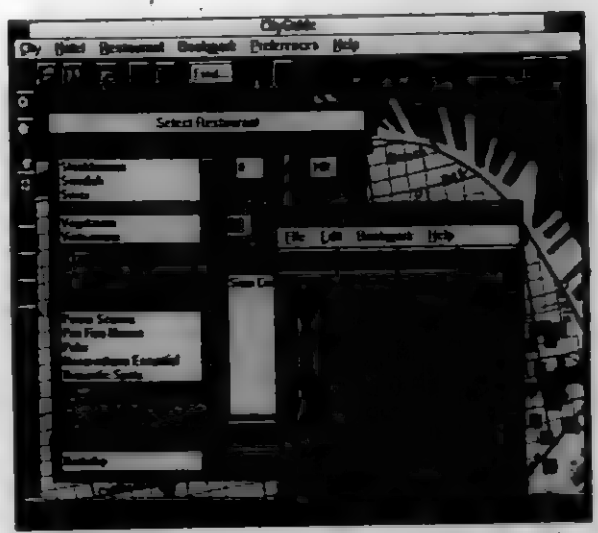
■ A new personal mapping software package promises to help people find their way around unfamiliar cities.

Axxis Software, Inc., a start-up chaired by J. Paul Grayson at Micrografx, Inc., recently began shipping the first modules of the Zagat-Axxis CityGuide, which was designed to give business travelers directions and dining and entertainment information for a variety of cities.

The CityGuide features the full text and ratings of Zagat's annual restaurant and hotel surveys. The software can be used to create personal maps of how to get around a city; it features a full display of the city's streets, with restaurants, hotels, landmarks and attractions all marked on the map. The maps are based on data from Etak, Inc.

Currently, New York, Chicago and Los Angeles CityGuides are available, with some 30 more U.S. cities planned. International versions will be done as well. Each guide costs $99; all three can be purchased together for $249.

CityGuide requires Microsoft Corp.'s Windows 3.0 environment or better, at least 2M bytes of random-access memory (4M bytes are recommended) and between 5M bytes and 9M bytes of hard disk space for each city. Axxis plans to produce a



CityGuide *features Zagat's restaurant and hotel survey information for travelers in unfamiliar surroundings*

version for the Apple Computer, Inc. Macintosh in 1993, as well as scaled-down versions for handheld machines. A version is also available on CD-ROM.

As they say, it's all in the genes. Introducing the ThinkPad™ from IBM. The slickest, sleekest little number that ever crunched one. A mere seven-and-a-half pounds of brains and beauty that just begs you to take it anywhere. And once you own one, that's exactly what you'll do.

The top-of-the-line ThinkPad 700C sports a

All this in only 11.7"

Introducing

ThinkPad

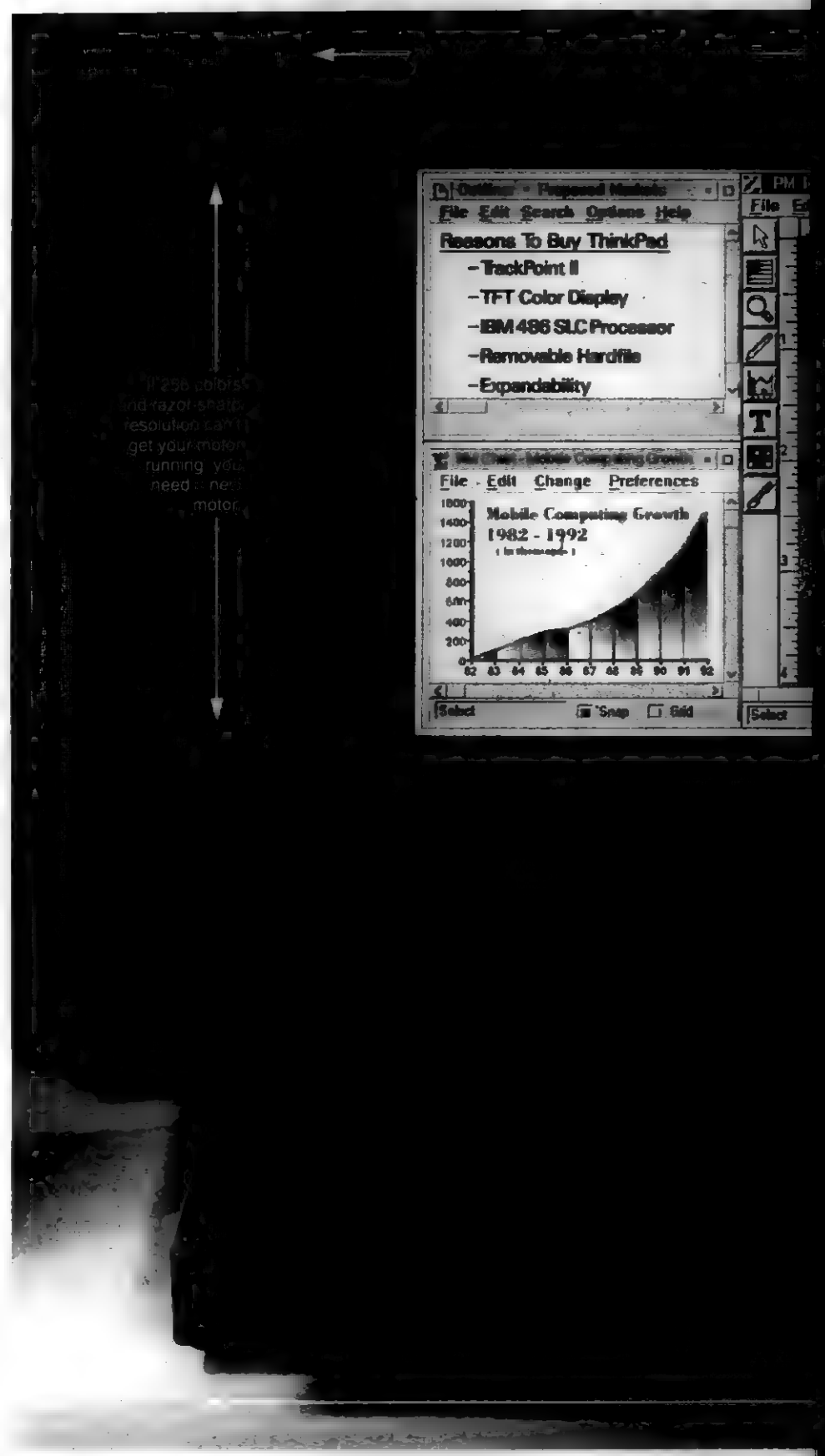
screaming 486 SLC™ 25 MHz upgradable processor. But it's built for comfort too. There's a surprisingly roomy interior, with a full-size, ergonomically designed keyboard. And a screen that literally bends over backwards (180 degrees, to be precise).

Strategically placed on the keyboard is a little red spot called the TrackPoint II.™ It does what a mouse would do with a few million more years of evolution. Nothing dangles; it's part of the soul of the machine. You can operate it with one fingertip. And it allows you to think on any terrain, even one without any flat surfaces.

The ThinkPad's screen is a thing of almost aching beauty. Its 640 × 480 VGA resolution is sharper than that of many desktop computers. It displays 256 colors. And it's the biggest screen on any notebook. All of which makes ThinkPad very easy on the eyes.

The ThinkPad comes standard with things some other notebooks don't even offer as options. Like 4MB of memory you can upgrade to 16MB. 120MB of hard disk space. Pre-installed DOS 5.0 and

*Depending on usage and configuration. **MSRP. Dealer prices may vary. †Warranty information available from the Personal Systems HelpCenter or an IBM authorized dealer. 700T warranty is available in USA and Canada only. ††In Canada, call 1 800 465-7999. IBM is a registered trademark and ThinkPad, HelpWare, HelpCenter, SLC and TrackPoint II are trademarks of International Business Machines Corporation. PRODIGY is a registered trademark of Prodigy Services Company. © 1992 IBM Corp.



Its mother was
Its father wa

PRODIGY.* You can soup it up with a turbo-charged 486SLC2 50/25 MHz processor—just one of the upgrade products IBM offers. And the hard disk is removable, which makes it easy to upgrade and share your ThinkPad, not to mention the great security and virtually unlimited storage.

ThinkPad blows the doors off its competition in an even more surprising arena. Price. Any ThinkPad in the line will give you more for your money—and for your psyche—than any other notebook you can buy.

ThinkPad	Model 700C	Model 700
Processor	486 SLC/25 MHz	486 SLC/25 MHz
Display	10.4" Active Matrix 256-Color Screen	9.5" Monochrome Display 64 Grayscale Screen
Battery Life*	2–4 Hours	3.8–7.5 Hours
Weight	7.6 Lbs. with Battery	6.5 Lbs. with Battery
Warranty	3 Years (International)	3 Years (International)
Price**	$4,350	$2,750

If you have questions along the way, your ThinkPad Models 700C and 700 are supported by HelpWare,™ an invaluable service package that includes a three-year international warranty.†

For more information or an IBM authorized dealer near you, call our Personal Systems HelpCenter™ 24 hours a day, 7 days a week at 1 800 772-2227!††

Then just park one in your lap and see what happens.

IBM

a mainframe. s a Maserati.

Windows applications getting smarter

CONTINUED FROM PAGE 27

tool. In reality, most people encounter dozens of situations where a picture would be worth a thousand words:

- A quick space plan for the new office.
- A flow chart to document the order-entry process for new employees.
- A simple illustration of market segments for the sales force.
- A circuit diagram for an engineering idea.
- A map to show a customer how to get to the office.

I don't want to oversell Visio. There's room for improvement and for more intelligence. But it does serve as a great example of an important new trend. More mainstream Windows programs are adding smart features. IS should begin to consider the intelligence of a program when making purchase decisions. And IS should look for ways to build intelligence into custom solutions.

> Ordinary drawing programs have a wide range of powerful tools, but you have to understand drawing before you can put them to good use. Some of that drawing expertise is built into Visio. That makes it accessible to people who have ideas to express but normally would never consider sketching them out.

Here are five ways Windows programmers are making software smarter:

- **Smart tools:** These tools anticipate the most common behaviors and build them in. You can override these intelligent defaults, but 90% of the time they give you what you want.
- **Object orientation:** The elements of the program are self-contained objects that "know" their own behavior.
- **Wizards:** A Wizard steps a user through a difficult function. Basically, it asks the user questions and then performs actions based on the answers.
- **Agents:** Agents are macros that can respond to a trigger event — start at a certain time, for instance, or take action if the value of a field drops below a certain point and so on. Because they know what events to watch for, agents can act on their own (in a limited sense).
- **Expert applications:** These programs include a knowledge base users can apply to the task at hand.

Smart software is in its infancy. Even so, it's clearly the direction we are headed in. In evaluating the next generation of Windows software, one of the first things you should do is check its IQ.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology mangers.

PC prices down

'Tis the season to cut prices — at least for four major PC vendors. Here is a roundup of recent changes:

Toshiba America Information Systems, Inc., Irvine, Calif.

Satellite line:

T1800: down 17%, to $1,300
1850: down 14%, to $1,650
1850C: down 10%, to $1,850

Multimedia line:

T6400DX: down 6%, to $4,599
6400DXC: down 8%, to $6,899

New products:

T6400DX: 25/50-MHz DX2 processor, $4,899
6400DXC: 25/50-MHz DX2 processor, $7,499

Zenith Data Systems, Buffalo Grove, Ill.

ZDS 600NL series:

620NL Model 60: down 3.5%, to $1,399
625NL Model 85: down 11.1%, to $1,599
625NL Model 85B: down 10.5%, to $1,699
625NL Model 120: down 10%, to $1,799

Z-Sport series:

Z-Sport 325S Model 60: down 21.2%, to $1,499
Z-Sport 325S Model 85: down 20%, to $1,599
Z-Sport 420S Model 85: down 21.6%, to $1,999
Z-Sport 425S Model 120: down 17.9%, to $2,299

Z-Note series:

Z-Note 320LB Model 60: down 13.5%, to $1,599
Z-Note 320L Model 60: down 12.2%, to $1,799
Z-Note 325L Model 85: down 16.7%, to $1,999
Z-Note 325L Model 120: down 15.4%, to $2,199
Z-Note 325LC Model 120: down 12.5%, to $3,499

NEC Technologies, Inc., Boxboro, Mass.

UltraLite SL/20, 80M-byte hard drive: down 15%, to $1,699
UltraLite SL/20, 120M-byte hard drive: down 16.7%, to $1,999
UltraLite SL/20P, 80M-byte hard drive: down 16%, to $2,099
UltraLite SL/20P, 120M-byte hard drive: down 14.3%, to $2,799
UltraLite SL/25C, 80M-byte hard drive: down 18.9%, to $2,999
UltraLite SL/25C, 120M-byte hard drive: down 17.5%, to $3,299

NEC also cut prices 6.6% to 12.7% on its cellular phone-equipped UltraLites with built-in 14.4 bit/sec. data/fax modems. Prices now range from $3,499 to $5,499.

Advanced Logic Research, Inc., Irvine, Calif.

Advanced Logic Research dropped prices 21% to 56% on all its 486 upgrade modules. Depending on the machine and the upgrade, customers can upgrade for anywhere from $199 to $2,495.

Display standards elusive

CONTINUED FROM PAGE 27

or screen, the cursor will 'submarine' on you, while with active matrix you don't lose it that way," said Andrew M. Seybold, editor in chief of the "Outlook on Professional Computing," a Brookdale, Calif., newsletter.

All wet

Submarining describes what happens when, for example, a user moves the mouse and loses track of the cursor until he stops moving the mouse or when the cursor in a word processing program disappears while editing. Submarining occurs because passive-matrix technology needs more time for each refresh of the screen than an active-matrix screen. The "computer is actually waiting for the screen to catch up with it," Seybold said.

Passive-matrix screens are improving greatly with each generation. The color versions of these screens in particular have shown gains, with the most recent batch of screens being much brighter and no longer suffering from the "striping" effect that made their predecessors look like poorly white-washed houses.

The battle between active and passive matrix should continue for some time and may not produce a clear marketplace winner. However, a joint venture between Motorola, Inc. and In-Focus, Inc., a Beaverton, Ore.-based flat-screen maker, may threaten active matrix. The two companies said they will produce passive-matrix screens that couple the economic pluses and power savings of passive matrix with the speed and brightness of active matrix.

Software application packages

SoftLogic Solutions, Inc. has introduced WinSense, The Windows Optimizer, which the company said was designed to unravel the mysteries of Microsoft Corp.'s Windows, making it easier for users.

A user profile feature evaluates work style and hardware resources. For optimal system performance this feature determines and recommends appropriate settings to Windows options. A fail-safe options control system to access and edit every aspect of Windows functioning is included, as is an on-line international database that explains more than 300 Windows options and more than 100 computer and software terms. WinSense runs on PCs with Windows 3.1 or higher.

The introductory price is $49.95.

➤*SoftLogic Solutions*
1 Perimeter Road
Manchester, N.H. 03103
(603) 627-9900

Softool Corp. has introduced CCC/Manager for Microsoft Corp.'s Windows NT, a configuration management product that manages the software life cycle from development through maintenance.

Features and benefits include an interface that is fully compliant with IBM's Common User Access; for Component Management, the product allows users to retrieve, manipulate and store multiple versions of any kind of file; for Application Management, virtual windows can be created and updated.

CCC/Manager for Windows NT costs $695.

➤*Softool*
340 S. Kellogg Ave.
Goleta, Calif. 93117
(805) 683-5777

Macintosh products

Storage Dimensions is shipping the MacinStor SpeedArray, a redundant arrays of inexpensive disks Level 0 disk array.

The product, which was designed for Apple Computer, Inc. Macintosh Quadra, can be used for disk-intensive applications including imaging, multimedia, color prepress and digital video. The firm's Macintosh I/O Co-processing Architecture technology is used. MacinStor SpeedArray is available in eight preconfigured models, ranging in single-enclosure capacities from 1G byte to more than 8G bytes that integrate from two to four MacinStor 2Fast hard disk drives. Configurations can reach up to seven drives or 14G bytes via expansion modules.

Prices start at $6,299.

➤*Storage Dimensions*
1656 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 954-0710

Utilities

Blackhawk Data Corp. has announced Version 1.2 of its ColrTrax Screen Print Utility.

Presentation-quality color images can be created by using ColrTrax with popular software packages, the firm said. Charts and graphs are generated by spreadsheets or presentation packages, color images with paint and illustration software. Using databases, ColrTrax provides printouts that mix images, photographs and text. ColrTrax runs on any DOS-based PC with IBM's Color Graphics Adapter, Enhanced Graphics Adapter, Video Graphics Array (VGA) and Super VGA video.

ColrTrax Unlimited costs $199. ColrTrax Single-User edition costs $99.

➤*Blackhawk Data*
Suite 411
7234 W. North Ave.
Elmwood Park, Ill 60635
(708) 453-9590

Product Evaluation

New Product In-Site

IBM PS/2 Server 295:
Users praise performance but hit tech support, interoperability snags

Computerworld's New Product In-Site is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

IBM PS/2 Server 295

■ IBM's Personal System/2 Server 295, an enhanced version of Parallan Computer, Inc.'s Server 290, is the company's offering to superserver customers. A wide array of fault-tolerant features and administration functions had evaluators claiming the Server 295 is a better system for downsizing than lesser priced, competing products.

■ Along with IBM's June acquisition of the marketing rights to the Parallan Server 290 came a number of transitional problems. While evaluators were happy with IBM's storage enhancements to the Server 295, they still desired more complete support for Novell, Inc.'s NetWare and alternate operating systems as well as better technical support.

For our evaluation of IBM's PS/2 Server 295, we surveyed four users. The result? Administrators and evaluators of the system found it pricier than other high-end servers, but it delivered on their expectations for fast, fault-tolerant, high-capacity processing. And though they were generally satisfied, they want and expect additional improvements during the next six months.

Like the Parallan 290, the Server 295 includes a modified version of OS/2 1.3 supporting up to 128M bytes of Error Correcting Code memory; a dual- or uniprocessor architecture with Intel Corp.'s 1486 33- or 50-MHz processors; and dual, 32-bit Micro Channel Architecture (MCA) buses with a total of 12 MCA slots. In all, the system was designed to support a fault-tolerant computing environment.

Because the Server 295 was released recently, *Computerworld* asked two users of earlier 290 systems to participate in this survey to provide long-term evaluative balance.

Server 290 and 295 users were all supporting environments of 50 to 200 users and had Token Ring or Ethernet topologies or both. They also expected to support a variety of network nodes.

All evaluators were running some type of SQL database application, along with a variety of off-the-shelf OS/2 programs.

This evaluation was developed with the assistance of Howard Rubin Associates, Inc. and Technology Investment Strategies Corp.

Installation descriptions for users who evaluated IBM PS/2 Server 295

SITE PROFILES

	Government agency	System integrator	Financial consulting	Financial services
Network type	Token Ring	Banyan, Novell, Unix, AppleTalk	Novell	Microsoft LAN Manager
Number of nodes	70	140	120	55
Applications	SQL Server, WordPerfect, SAS, Notes	SQL Database, Notes	SQL Server	SQL Server
Overall cost	$215,000	No comment	$60,000	$120,000

Network support

Although evaluators agreed that the Server 295 provided better than average networking support, they were waiting for additional enhancements to be made to the system early next year.

System integrator: "We have a strong desire for [NetWare] to be supported in native mode, and that's really the biggest short-term problem for us."

Consulting firm: "I had no problem with throwing in an internal bridge and running Token Ring and Ethernet on the system. Once I brought it up, everything was fully functional."

Networking hardware

Users found that a variety of additional networking hardware was available for and functional with the Server 295 MCA bus. They rated the system at about average.

Government agency: "I had to run Ethernet, 4M bit Token Ring and 16M bit Token Ring simultaneously. It was able to do all three."

Processor speed

Evaluators raved about the performance of the system, noting that processor speed and overall architecture provided stunning performance with a range of applications and usage loads.

Government agency: "It gave us the ability to take our [statistical] data from an IBM 3090 and move it to the Server 295 without a serious detrimental loss in performance."

Financial services: "The asymmetric multiprocessing counts for something, but not as much as I thought."

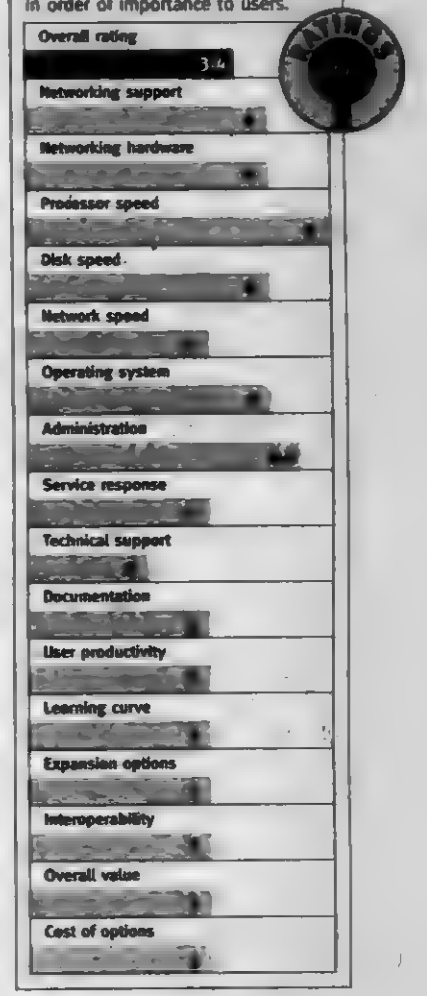
Disk speed

Evaluators were impressed with the disk performance of Server 295's redundant arrays of inexpensive disks (RAID)-5 storage subsystem. As with all RAID systems, the trade-

Server 295, *page 32*

IBM PS/2 Server 295

Ratings are based on user expectations on a 1 to 5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



Product Evaluation

Several 295 users say the system is expensive. IBM responds that it outclasses competing superservers.

CONTINUED FROM PAGE 31

off is between the overhead processing of RAID software — which reduces disk performance — and the protection it affords. For most downsizing operations, the trade-off will always favor fault tolerance.

New Product IN-SITE

Government agency: "The RAID-5 configuration carries a reasonably significant overhead."

System integrator: "Compared to numerous RAID subsystems we've tested here, this was the most impressive."

Network speed

Depending on network topology, evaluators rated the Server 295 as about average.

Government agency: "There's absolutely no bottleneck at all on the server side with everybody just beating on it like crazy."

Consulting firm: "We couldn't say it's any better than other servers we're using. We're running 4M bit Token Ring, but the bandwidth utilization is low."

Operating system

The Server 295 runs a modified version of OS/2 1.3, customized to support 128M bytes of random-access memory. Networking support comes through IBM's LAN Server and Microsoft Corp.'s LAN Manager.

Government agency: "I'd like to do more system updating in on-line, real-time mode rather than taking the server down and doing it in off-line mode."

System integrator: "On-line updating is a primary thing we'd like to see."

Consulting firm: "I'd prefer NetWare."

Administration

The Server 295's Maximum Availability and Support System/2 won raves from evaluators.

Consulting firm: "It was the only server system I've seen that supplied anything I like it."

Service response

Evaluators agreed that service and support are taking the brunt of the transition in the deal between IBM and Parallan. The financial services evaluator bought an early Parallan model and had reliability problems.

Financial services: "We suspected we had a lemon for a long time. In the first six months we had several dozen crashes."

IBM PS/2 Server 295 features

- Processors: One or two Intel i486DXs.
- Clock: 33-MHz/128K-byte cache or 50-MHz/256K-byte cache.
- Architecture: Dual 32-bit Micro Channel Architecture (MCA) bus.
- RAM: Up to 128M bytes.
- Hard disk: 400M-byte or 1G-byte SCSI drives with up to 28G bytes of total system storage.
- Channels: Two or four SCSI disk channels with 32-bit RISC processors.
- Expansion: 12 MCA expansion slots.
- Display: VGA.
- Operating system: OS/2 1.3 and OS/2 LAN Server 1.3 and 2.0; Novell's NetWare Requester for OS/2; Microsoft's LAN Manager.

FACTS FACTS

Documentation

Users of the Parallan Server 290 received the full complement of technical and user documentation and were favorably impressed. IBM Server 295 customers were provided only with user documentation, while the system integrator received both sets of manuals. Documentation was rated as average.

Government agency: "If you've been around IBM long enough, you recognize that they have a propensity for what they call 'user documentation' and 'technical documentation.'"

Consulting firm: "There was a lot they made reference to [in the documentation] that I couldn't find in my OS/2 manuals, like operating system issues and a lot on fine-tuning the server."

Productivity

Evaluators found the Server 295 slightly easier to install, configure and administer than expected. They also said throughput had increased user productivity.

Government agency: "Our end users have significantly improved their productivity since we moved off of [other servers]."

Consulting firm: "It was easier to get up and has run more smoothly than the [Compaq] SystemPro."

Learning curve

Despite the massive efforts needed to consolidate multiple servers, users and applications on the superserver, evaluators agreed the 295 made the job easier than expected.

Government agency: "There were no major surprises. There were a few hiccups, but overall it went relatively well."

System integrator: "From the initial training to getting it up and running for the test environment, it far exceeded our expectations."

Expansion options

Adding memory and MCA boards did not seem to faze the evaluators, but the difficulty of adding storage to the RAID-5 array seemed intimidating. They rated expansion better than average.

Government agency: "When it comes to disk expansion in the RAID-5 environment, it looks like that's going to be real ugly."

System integrator: "You've got to design ahead."

Consulting firm: "It's a snap. The reference disk either sees the add-ons or it doesn't."

Interoperability

Evaluators gave the system average marks for interoperability with other servers and network operating systems.

Consulting firm: "I've been considering using the OS/2 Requester and scrapping LAN Manager altogether."

Financial services: "We tried to get LAN Manager to talk to NetWare, but we could not tie these puppies together."

Overall value

Despite higher than average costs, evaluators gave the system a high value rating for its fault tolerance and its ability to safely implement mainframe downsizing.

Government agency: "I think we've very much gotten our money back in terms of productivity — continued productivity — compared to the [previous] environment of five separate servers."

Financial services: "Extraordinarily expensive."

COMPUTERWORLD PRODUCT EVALUATION COUNCIL

- Alamo Rent-A-Car, Inc.
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- America West Airlines
- American Greetings Corp.
- American Industries, Inc.
- American President Cos.
- AT&T
- Avon Products, Inc.
- Barnett Banks, Inc.
- C. R. Bard, Inc.
- Bell Atlantic Corp.
- Bergen Brunswig Corp.
- Borg Warner Corp.
- Bradley University
- Carolina Freight Carriers Corp.
- Carolina Power & Light Co.
- The Chase Manhattan Bank NA
- Cigna Corp.
- Clark Equipment Co.
- Colonial Williamsburg
- Commonwealth Edison Co.
- Consolidated Freightways, Inc.
- Corestates Financial Corp.
- Dresser Industries, Inc.
- Dr Pepper Co./ The Seven-Up Co.
- Federal Express Corp.
- First National Bank of Chicago
- FMC Corp.
- Federal Reserve Bank
- Freeport McMoRan, Inc.
- Fuller Co.
- Grumman Corp.
- Guilford Mills, Inc.
- Hasco Corp.
- International Paper Co.
- Kmart Corp.
- Lever Brothers Co.
- Long Island Lighting Co.
- Miles, Inc.
- Massachusetts Mutual Life Insurance Co.
- MCI Communications Corp.
- Mellon Bank Corp.
- Metropolitan Life Insurance Co.
- New Mexico State University
- Northeast Utilities
- People's Bank
- PMC Financial Corp.
- Preston Corp.
- Primerica Corp.
- Prodata, Inc.
- Public Service Electric & Gas Co.
- Ryder System, Inc.
- SCM Office Supplies Group
- Sprint Corp.
- Tribune Broadcasting
- Unum Life Insurance Co.
- Wilan Industries
- Worldcorp

IBM responds

We asked IBM the following questions based on this evaluation:

Q: Novell NetWare installations currently must run the Server 295 NetWare Requester to support users. Does IBM intend to provide native support for NetWare installations?

A: IBM plans to start the rollout of the 295's native support early in 1993. When the development work is completed, NetWare users can expect the full range of fault-tolerant, high-availability and management features available now to users of OS/2 and the Server 295.

Q: Does IBM intend to make any performance improvements in its Orthogonal Disk Array Subsystem?

A: The Server 295 performs better than other platforms with RAID-5 because of its efficient caching and high-performance disk subsystems.

Q: Will IBM add on-line updating of system software to the Server 295?

A: All the major network operating systems are moving toward remote management, and the Server 295 will take advantage of developments in this area.

Q: What server support will be added when IBM begins to deliver OS/2 2.0 with the Server 295?

A: OS/2 will support up to 512M bytes of RAM for applications demanding quick response. It is also a prerequisite for LAN Server 3.0, which supports larger numbers of users.

Q: The Model 295 seems substantially more expensive than other superservers. Why is this?

A: There is no other server like the 295. Its key features — multibus, multiprocessing, fault tolerance, ECC memory, sophisticated system management, recovery software and so on — are available on platforms priced well above the 295.

Backup. For people who don't.

Everyone who uses a PC ought to back up regularly. But most people don't back up at all.

In fact, if the people you work with are like those working in most places we know, about the only way their data is going to get backed up is if it happens without them.

Guess what?

Now it can.

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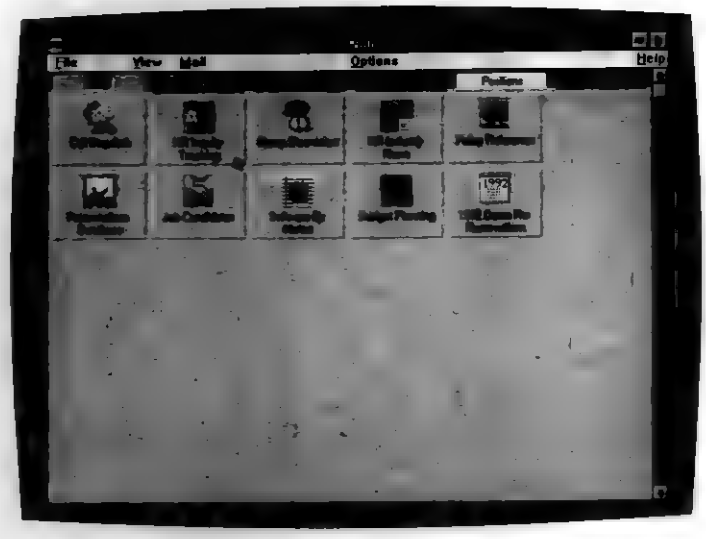
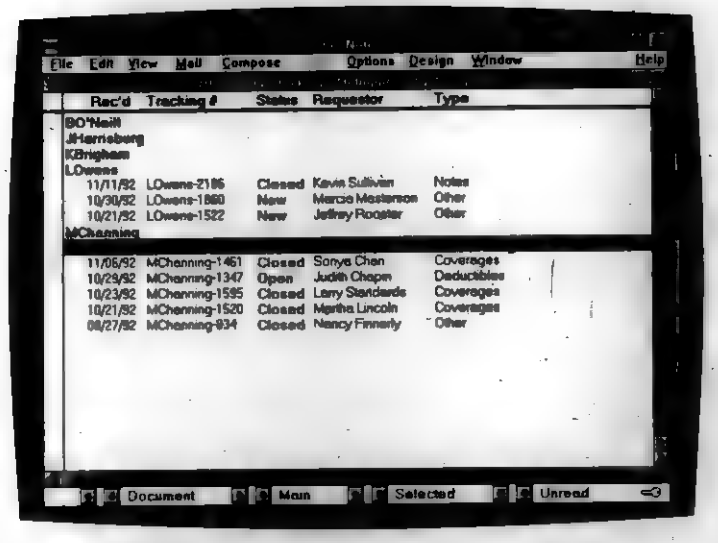
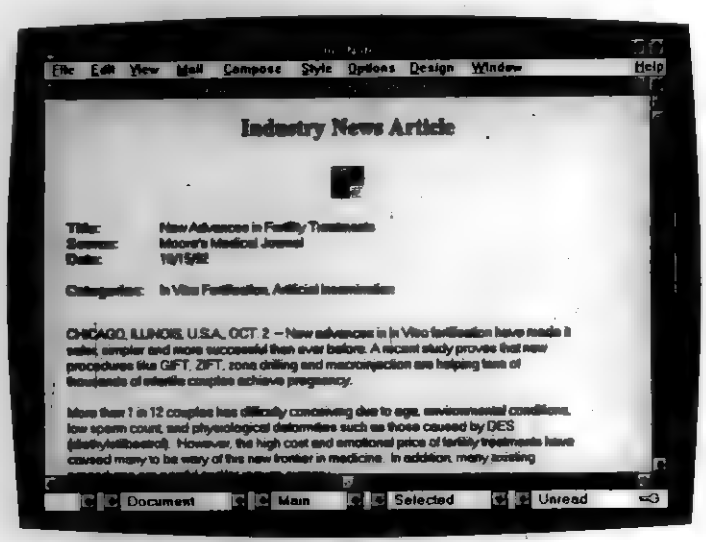


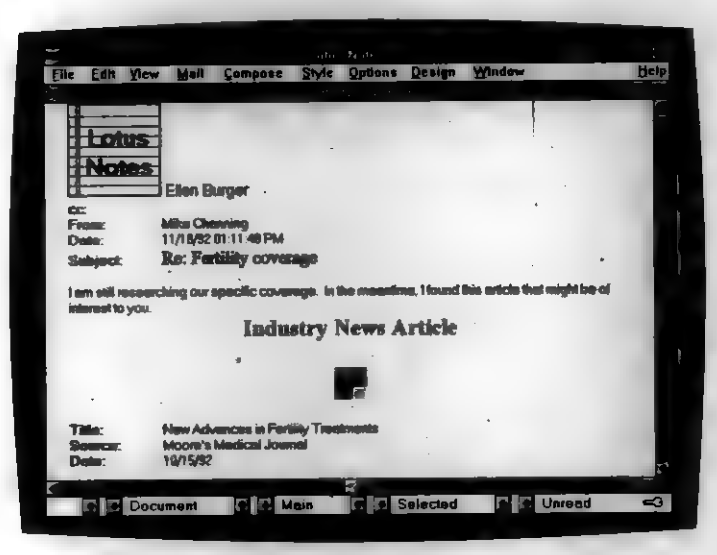
1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, these are the ones he uses most frequently. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the HR INQUIRY TRACKING icon.



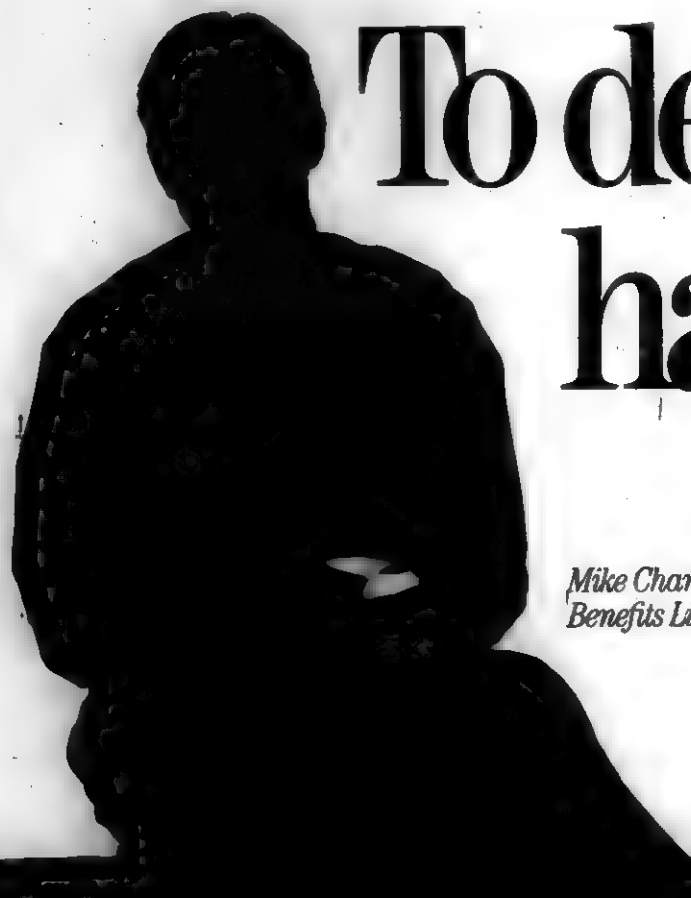
2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



6. Mike quickly composes a note and forwards this document directly to Ellen. That done, he gets himself a cup of coffee.



To demonstrate th had to make an

Mike Channing
Benefits Liaison

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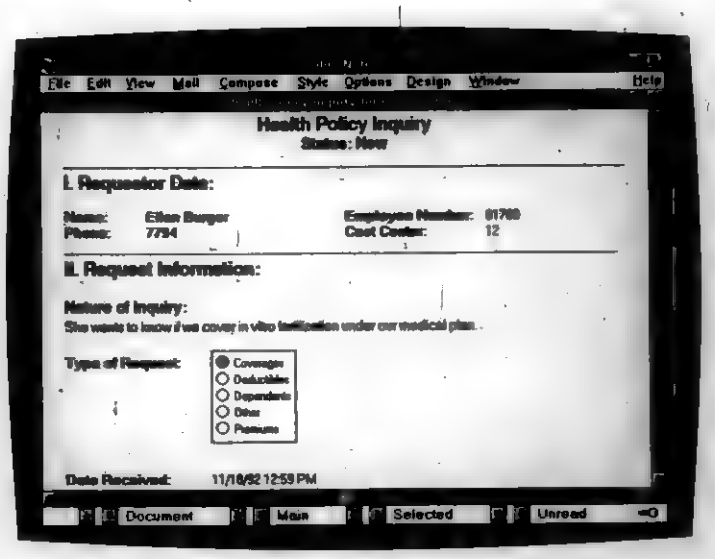
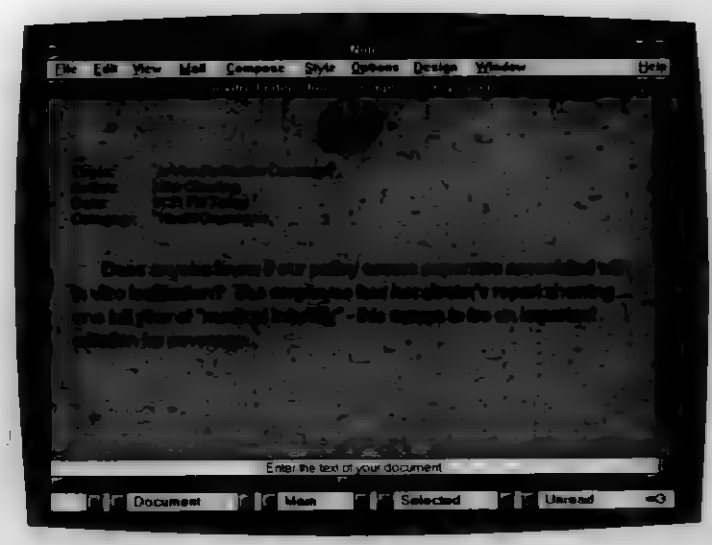
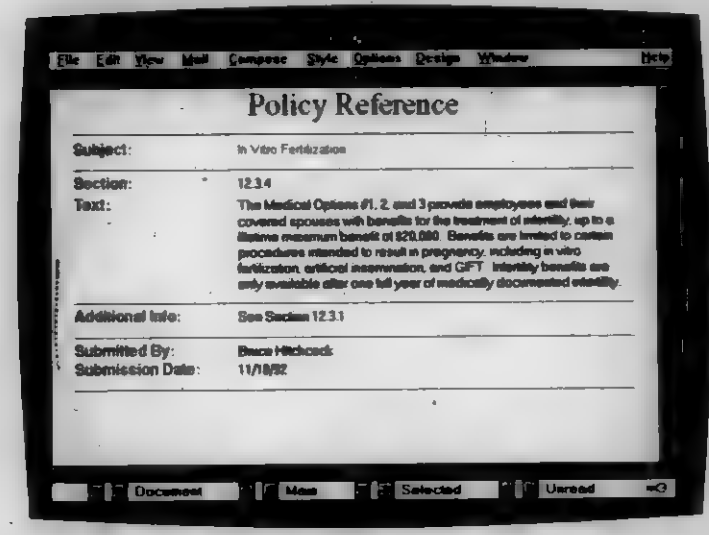


3. Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.



4. He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.

7. When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.



8. Mike clicks the DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

Watch how Notes organizes information so it's easy for Mike to get the answers he needs. How effortlessly he taps his workgroup's knowledge. How quickly he accesses conventional references. Now you can see why people who have Notes build their work around it. And why the companies that have installed Notes have seen as much as a 400% return on their investment.*

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Lotus Notes

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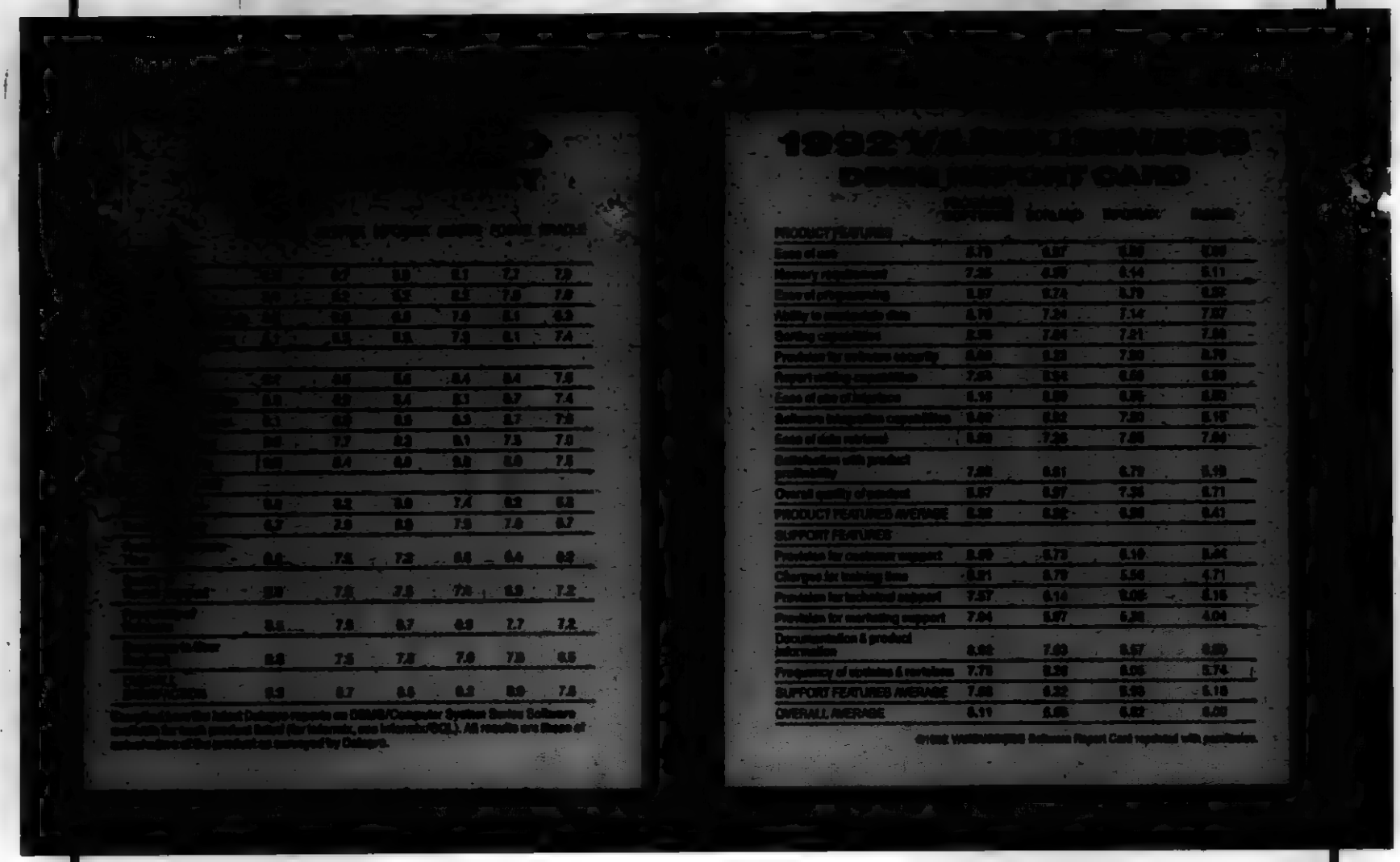
IF LOGIC ALONE DOESN'T CONVINCE YOU TO USE PROGRESS, THEN HOW ABOUT A LITTLE PEER PRESSURE?



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CPWADV1221

Selective data copying

Lotus to improve Notes' replication

By Rosemary Cafasso

Replication, a key technology behind Lotus Development Corp.'s workgroup platform, will get a performance boost with the shipment of Notes Version 3, now scheduled for early next year.

Lotus is working to bolster Notes' replication technology to make it more efficient and help users selectively copy data from Notes databases. Notes relies on replication and its synchronization function to allow users to share documents. These functions create multiple copies of databases and periodically update them to ensure they contain the same information.

"Version 2 did a lot for replication, and Version 3 will do a lot more," said David Marshak, a senior analyst at the Patricia Seybold Computing Group in Boston. "A lot of user feedback has pushed it far from where it was in Version 1."

Added bonus

Unlike the current Notes offering, Version 3 will allow users to select a slice of a database to replicate. This will be a bonus for the more mobile customers who are currently replicating databases from servers and downloading the entire file to their laptops.

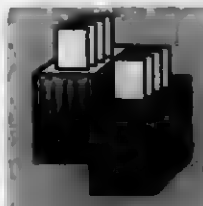
With Version 2, "you'd get a replica that was a whole database, say 10M bytes or 15M bytes," said Steven Beckhardt, a consulting engineer and founder of Iris Associates, Inc., the developer of Notes. "You can get that on a notebook, but that's a big chunk of data."

With Version 3, "you can design your replica with a formula," Beckhardt added.

Unlike others

Replication is perhaps the key function that distinguishes Notes from other workgroup and database software. Back in the mid-1980s when Iris was putting together the original Notes, it proceeded with the replication concept, which was well-known in academic circles and considered a departure from more traditional database approaches.

Replication does not rely on the complex mechanisms such as two-phase commit, locking and concurrency control that are used in other databases to prevent the corruption of data. These processes prevent two simultaneous updates to the same piece of data.



Keeping data in sync

- Replication and synchronization work well in Notes because its databases are used mostly for information sharing rather than transaction processing.
- To prevent occasional data conflicts, Notes users can use the software's security mechanisms to control access to documents.
- If a conflict occurs, Notes saves the updates and flags the conflict for resolution.

Instead, Notes is based on the assumption that many of the information-sharing applications created on this platform do not require that complex a set of controls.

For example, discussion databases are common in Notes, and each entry is considered an additional document to the original discussion topic as opposed to a modification or edit to the original document.

Although conflict is rare, it can happen. But it is uncommon enough that Iris determined the replication technique was suitable.

With replication, a customer determines a time for synchronizing data, which could be once a day or perhaps every three hours. At that time, each server on the Notes network will contact the other servers and essentially

Replication, *page 40*

LAN control falling to IS

By Michele Doxtert

As local-area networks become larger, more complex and more mission-critical, the responsibility for managing them is landing squarely on the shoulders of corporate information systems groups. IS managers are finding that supporting LANs requires them and their staff to develop new technology, people and organizational skills.

Analysts cite two reasons for the trend: data and applications on corporate LANs are becoming more valuable, and departments are beginning to realize the "hidden costs," in both personnel time and downtime, of supporting their own LANs.

"The server side of client/server computing has to be centrally managed to ensure that things like backup, security, resource administration and systems management are properly done," said Bob Gill, a LAN industry analyst at Gartner Group, Inc. in Stamford, Conn. "If IS people let mission-critical data sit on LANs that they don't control, they are asking for big trouble."

Control is key

Michael Blackman is an assistant vice president at Maryland National Bank in Baltimore, which is in the midst of a project to recentralize control of its distributed LANs. The LANs support more than 1,000 users. "We're taking over the LAN management so that our businesspeople can spend more time thinking about business and less time thinking about their network," he said.

LAN users may be glad to give up LAN support aggravation, but they hate to give up the control

LAN management, *page 40*

The number of LAN segments in corporate America will grow by 150% by 1995, while network managers' budgets will increase by only 50% and staff will grow by just 10%, according to a study by Infonetics Research in San Jose, Calif.

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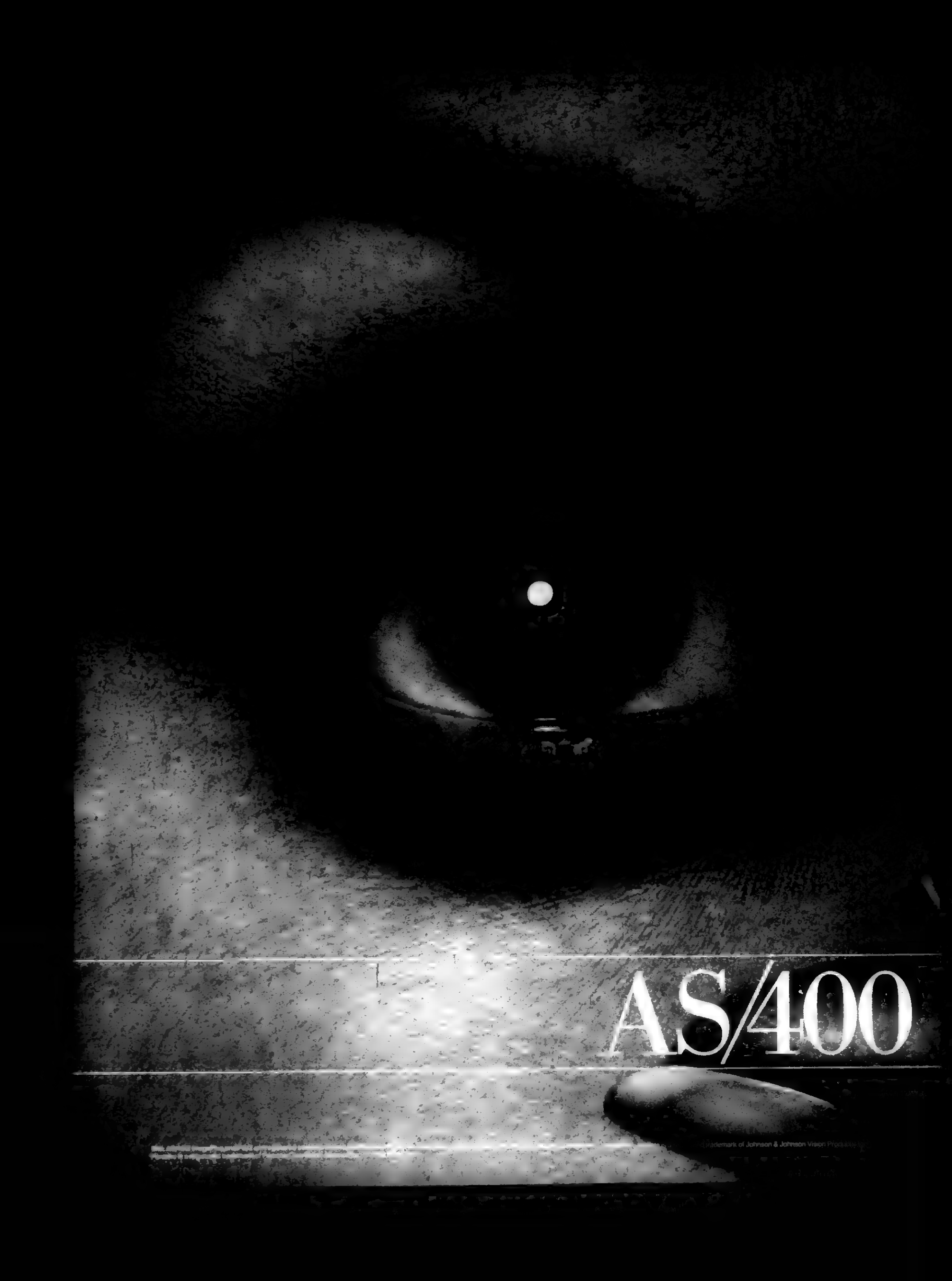
By the end of this week Computerworld readers will have spent over $79.4 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services Fall 1991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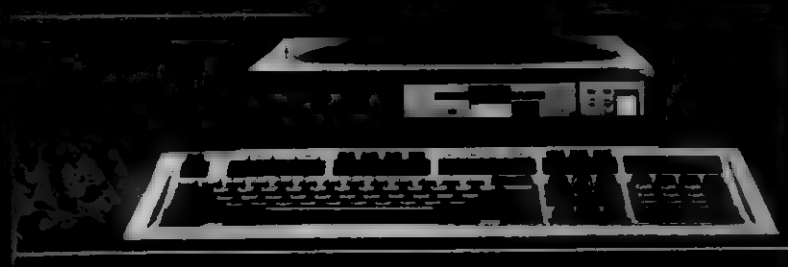

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4381 replacement

Credit union downsizes to PS/2 net

By Linda P. Musthaler

While many companies today are downsizing their computer applications, few can say they have replaced their IBM system 4381 mainframe with a PC server and DOS-based applications.

The Pacific IBM Employees Federal Credit Union (PAC IBM) can make that claim. In the past year, PAC IBM has downsized all of its core business applications from the mainframe to a wide-area network that is totally microcomputer-based, including the file and data servers. At the center of it all is an IBM Personal System/2 Model 95 that acts as the host data server for relational databases.

Based in San Jose, Calif., this independent credit union has 48,000 members with more than 150,000 accounts ranging from savings and checking to mortgage loans and major credit-card accounts. The company also provides automated teller machines (ATM), audio response services and limited commercial account services to its members.

Driven by the need for application flexibility, PAC IBM began considering a downsizing effort several years ago. The company was feeling boxed in by its old information systems. The mainframe software, which was a mix of RPG and Cobol, had been purchased in 1972 and was due for an update. The ATM applications included software the vendor could not support anymore.

Programmers spent more time maintaining old systems than developing new applications that could help the business grow. The applications also suffered from severe limitations and frequent downtime. President and Chief Executive Officer Daryl Tanner noted, "We needed a new approach."

Setting goals

The credit union outlined its goals for the new information system: quality services, expandability, development controls, financial controls, timely improvements, sustainable growth and creation of a "can-do" culture. PAC IBM shopped around for systems and suppliers that could help meet those goals, eventually choosing a client/server architecture offered by database company Prologic Computer Corp. and development house Telos Financial Services.

IBM Professional Services was brought in to manage the project and install the equipment. While the credit union was free to choose non-IBM gear, it chose IBM hardware for its reliability, capacity and performance and also to showcase PAC IBM's sponsor's latest client/server technology, according to Tanner.

Perhaps the most unique aspect of the project is the network and applications that were implemented. The network, which spans eight branch locations plus the home office, consists totally of PS/2s. While the network operates on Novell, Inc. NetWare, the workstations and the central data server run the core applications under DOS.

A Telos fourth-generation language called Probe was used to develop the Credit Union Business Environment (CUBE). The CUBE system provides a central information file, teller automation, new account setup, loan origination, deposit and loan accounting and an executive information system (EIS).

Dian Kiwiet, vice president of MIS, said the EIS has been one of the system's best features. "The first thing each morning, executives are able to access information regarding the performance of the credit union as of the close of business the previous day," Kiwiet said.

The CUBE applications run in a truly distributed environment. Each credit union branch has its own local-area network with a server.

The tellers' workstations preprocess and verify business transactions, such as deposits and withdrawals. All actual account transactions are performed by the central data server at the home office via a commercial high-speed communication line. With an average of 35,000 transactions per day, the system has a response time of under three seconds per transaction.

The system was brought on-line in less than a year. The company cites the following three lessons learned through this experience:

- Contract the network cabling to an experienced firm.
- Conduct rigorous "stress testing" of all applications prior to conversion.
- Contract for all required resources up front.

PAC IBM has invested about $1.6 million in its downsizing effort, including $471,000 for software, $907,000 for equipment and $223,000 for the network. The cost to lease the mainframe was about $1.3 million per year.

Tanner said the credit union is saving about a quarter-million dollars annually because of the change.

While pleased with the savings of the system, Tanner said he is more delighted with the flexibility it brings. "The tellers appear more knowledgeable and experienced to the customers because they can answer questions so quickly," Tanner said.

ON SITE

PAC IBM
San Jose, Calif.

Challenge: To implement distributed processing that would empower end users with customer account information and increase flexibility for managing products and services.

Technology: Prologic's Probe postrelational database management system and application development environment on a Novell network of about 160 PS/2 workstations and a central PS/2 "host" data server.

Results: Greater operational flexibility and annual savings of about $250,000.

Musthaler is an industry analyst at Currid & Co., a Houston-based consulting firm specializing in technology assessment and application.

LAN control falling to IS

CONTINUED FROM PAGE 37

over their computing destiny. IS departments taking over the management of distributed LANs are learning to talk with, instead of down to, their customers.

"Our position has changed to be more of a technical facilitator, a service provider, rather than 'keepers of mysteries,'" said Mike Wenger, director of MIS planning and operations at Rayovac Corp. in Madison, Wis.

Treading delicately around user egos is a must when seeking to enforce LAN standards. Many IS departments are inheriting a mishmash of different topologies, hardware, LAN operating systems and applications, installed by department managers with no IS guidelines to follow.

Fancy footwork

As a practical matter, users must be migrated to common hardware, operating system and applications standards, but IS managers said it takes delicate footwork to move a department from one word processing system to another without bruising user feelings.

At Rayovac, if users feel they cannot meet a business need with the technology currently on the IS standards list, a committee of users and IS is formed to investigate and add new technology, if needed, to the list.

IS management teams must also be careful that the data integrity, security and backup procedures they implement on department LANs do not decrease LAN performance to the point that users long for the chaotic good old days.

"If suddenly for some reason you can't access the printer or your database, users will be right back in the horrors of time-shared computing, which is precisely what they bought PCs to avoid," said Dana Peck, a development manager at Pacific Power and Light in Portland, Ore. He said there can be particular problems when IS manages LANs remotely.

Traditional mainframe IS distinctions between communications, systems and the applications specialists do not apply in the LAN environment.

What looks at first glance like an application error could actually be caused by the client BIOS, the client network card, the client operating system, the LAN operating system or any of 20 different things, said Larry Quinlan, manager of LAN services at Deloitte & Touche's data center in Nashville.

Stan Schatt, a LAN analyst at Computer Intelligence/Infocorp in Santa Clara, Calif., added, "LANs are changing IS personnel as much as MIS is changing LANs; it's teaching them how to talk to their users and how to talk to each other. That's the key to good, centralized LAN support."

Lotus boosts Notes' replication

CONTINUED FROM PAGE 37

compare databases to determine if modifications have been made. Servers keep track of modifications through time stamps, which each database and documents within databases receive when created and modified. The databases will then be synchronized so changes are reflected on each replica.

Users, analysts and Lotus itself pointed out that because of this approach, Notes was not designed for very high-volume transaction processing.

"We say you should not view Notes as a replacement for transaction processing if you think about transaction processing in the traditional sense," said John Landry, Lotus' senior vice president and chief technology officer.

The bad news is that if two users update data simultaneously in a Notes environment, a conflict will be created. The good news is Notes will automatically flag the data and retain the two simultaneous changes. The user must then resolve which change is the appropriate one.

Their way

Notes customers said they are impressed with replication technology but are also aware of data conflicts that replication can cause. Some have devised procedures to minimize potential data conflict problems.

Peoplesoft, Inc. created separate guidelines for Notes and for relational databases.

"We have a document that says, 'If it meets this portfolio, then it goes into Notes,'" said Rick Bergquist, vice president of technology. "If not, it doesn't go into Notes."

Bergquist said Notes does not handle cross-editing well "with tables like a relational database. But for sharing information, Notes is really strong."

Cellular technology may rival fiber-optic networks

By Joanie M. Wexler
WASHINGTON, D.C.

A high-speed cellular technology is emerging that could ultimately usurp fiber-optic cabling for carrying heavy-duty telecommunications applications. Its success, however, hinges on a few regulatory "ifs."

The Federal Communications Commission (FCC) this month approved the use of "CellularVision," a technology patented by CellularVision in Freehold, N.J., for running high-bandwidth applications over the nation's airwaves. Traffic traveling in CellularVision's 27.5- to 29.5-GHz FM radio band could include videoconferencing, high-definition television, medical imaging, multimedia and high-speed data, according to CellularVision inventor Bernard Bossard.

Bossard said uncompressed information could travel at about 1G bit/sec. and that the technology requires a transceiver and modem at each communicating site.

How the FCC will allocate the CellularVision spectrum remains a question — and one that will likely determine the usefulness of the technology to the business user. Benefits will depend on "how the FCC decides to divvy up licenses geographically, how many licenses are granted and how much spectrum each licensee gets," said Brian Moir, a partner at Fisher, Wayland, Cooper and Leader, a Washington, D.C., law firm that provides counsel to the International Communications Association user group.

Nationwide licensing

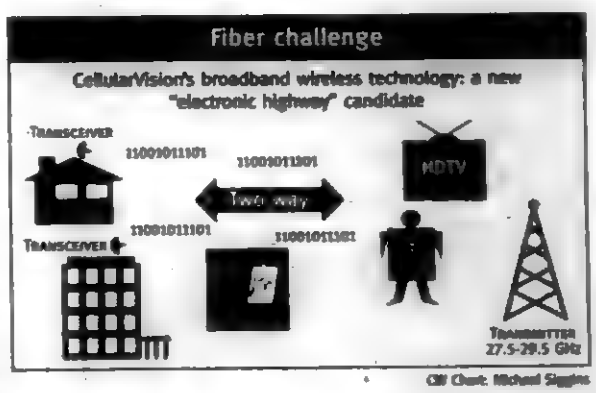
For example, if the FCC issued a single nationwide license, it would result in a seamless network for users, who would not have to contract with several carriers for interconnecting wireless segments. This could solve some of the problems faced by today's analog cellular telephone networks, where rates remain high because the spectrum is licensed in local chunks "and the interconnect charges between service areas are a fortune," Moir explained.

But the downside of a single license "is that the resources required to build a system like that [nationwide] are significantly higher," he said.

These issues parallel those with emerging personal communications networks (PCN), which will someday issue nomadic users a single, mobile phone number. One PCN proposal to the FCC from MCI Communications Corp. is to allocate spectrum to a small number of consortia nationwide in order to deliver both the seamlessness and the resources required to fund the network infrastructure [CW, Nov. 16].

Depending on how the specifics play out, CellularVision could fill a gap in the growing mobile computer market: Today's relatively slow (19.2K bit/sec.) wireless wide-area networks are frustrating users who are accustomed to local-area network speeds. Also, users such as John Faccibene, vice president of telecommunications at Garban Ltd., a New York brokerage firm, said he sees CellularVision's capabilities as providing the bandwidth and flexibility for creating virtual offices or trading floors, particularly in a disaster recovery situation.

"During the floods here in New York City, a lot of companies lost their trading rooms," he said. "Imagine if they had ability to move to another location via wireless."



CW Chart: Michael Siggins

A high-speed wireless network could preclude the expensive and time-consuming task of laying fiber to all doorsteps to make services ubiquitous, added Andrew M. Seybold, publisher of the "Outlook on Computing" newsletter. He said that in an urban area, "cable is probably cheaper because I can run a cable down a major street and pull drops off of it. Each drop would be less expensive than having a separate transmitter and receiver at each user location."

However, he said, "the cable companies cannot make their systems two-way [interactive] without a tremendous upgrade."

Bossard said several Bell telephone companies have expressed interest in CellularVision. An Ameritech Co. spokesman confirmed that his company has "had some conversations with CellularVision, but it is too early to assess how it might fit into the overall scheme of wireless communications."

"Beehive" cellsites

Each CellularVision cell spans 6 to 8 miles in diameter. When transmitting among cells, CellularVision reuses the same frequency so the full 2 GHz is continually available.

This differs from today's analog cellular phone network, through which communications change frequencies from cell to cell. This reduces the amount of bandwidth available.

CellularVision rivals fiber-optic capabilities, transporting traffic at 1G bit/sec. speeds.

Buddy's resume

Postal Buddy can:
- Lower its keyboard and screen for people in wheelchairs.
- Accommodate address changes weeks in advance.
- Print business cards.
- Produce customized letterheads in minutes.
- Dispense stamps.
- Provide a "Thinking of Moving" service that gives information about cities selected by users.
- Accept payments in cash, automated teller machine card, credit card or a special Postal Buddy Money card.
- Print an itemized receipt.

U.S. Post Office puts address changes on-line

By Gary H. Anthes

If you tend to think of the U.S. Postal Service as just a mite stodgy technologywise, check out the Postal Buddy — an interactive, multimedia kiosk coming to a supermarket or shopping center near you.

The first of some 10,000 Postal Buddies has been installed in the Washington, D.C., and San Diego metropolitan areas. The devices are intended primarily to process change-of-address notifications, which cost the Postal Service $1.3 billion annually and the public an uncounted sum of aggravation.

The user-friendly talking devices can also print custom business cards, stationery, mailing labels and a few other items while you wait.

Postal Buddy is the product of an unusual private/public partnership between Postal Buddy Corp. in San Diego and the Postal Service. Systems integration and software development were done by Electronic Data Systems Corp.

The Postal Service predicted that half of all address changes will eventually be processed by Postal Buddies, saving between $300 million and $500 million in data-entry labor during the 8½-year contract, according to a Postal Service spokesman. In addition, the Postal Service will collect a "small royalty" from the sale of products such as mailing labels, he said.

10,000 Postal Buddies *will be installed across the country*

Postal Buddy's brain is an Intel Corp. 1486 microprocessor running OS/2, which is integrated on the motherboard with an Intel i750 Digital Video Interactive chip for audio, video and high-resolution graphics. Software drivers control 27 internal peripherals including dual 213M-byte disk drives, a CD-ROM drive, a 9.6K bit/sec. modem, a 16-in. color monitor, a thermal receipt printer, a credit-card reader, a postage stamp dispenser and a laser printer.

Postal Buddy's application software was written by EDS in Digitalk, Inc.'s Smalltalk object-oriented programming language, and low-level device drivers were written in C. Object-oriented programming was chosen for the application because it will facilitate the rapid development of new Postal Buddy products and services, said Timothy May, account manager at EDS.

Using voice and video prompts, Postal Buddy guides users to enter change-of-address information via keyboard and touch-screen sensors. Old and new addresses are validated locally by scanning a CD-ROM database of 120 million addresses for the new "ZIP + 4" codes. The user may

Post Office, *page 42*

Net vendors up services, consulting ante

By Lynda Radosevich

Users thinking about linking their local-area networks have a new source of expertise: Like the systems manufacturers and independent consultants before them, networking vendors are jumping into the consulting and services game.

The vendors offer services ranging from limited design and installation to full-blown consulting and multivendor maintenance contracts. What they say they have to offer that the big consultants and systems vendors do not is expertise specific to the networking technology they sell.

Analysts warn that users should be on guard but say vendor services and consulting do have a place.

"The big problem is credibility," said Charlie Robbins, director of communications research at Aberdeen Group in Boston. "Suppliers are looking to develop closer relations with end users, but objectivity is difficult because this is a distribution vehicle."

A matter of bias

Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., agreed that vendors have more internetworking experience than an unbiased source such as Electronic Data Systems Corp. or Andersen Consulting. While most large companies handle their own internetworking, she said, companies jumping into new networking technology or servicing remote sites may find vendor services attractive.

Recent service announcements by networking vendors include the following:

- Cabletron Systems, Inc. announced in November that customers of Silicon Graphics, Inc., a Mountain View, Calif.-based manufacturer of graphics workstations, can receive Cabletron customer support services at variable costs — including network design and management of non-Cabletron products. Customers can use Silicon Graphics as their single point of contact to access Cabletron and other vendors.
- In November, 3Com Corp. added six network integration companies to its design, installation and multivendor support programs. The companies, which resell networking equipment from 3Com and other vendors, will be able to dispatch 3Com service engineers as part of their overall service programs. The advantage to customers is a single contact for problems and guaranteed interoperability between various network components, said Southwest Network Service, a network management company in Austin, Texas, that joined the 3Com program.
- Ungermann-Bass, Inc. announced new integration services that will help customers design, install and support multivendor networks.

These companies are looking to grow their businesses in what Hyland said she sees as a large but already competitive market. "I don't see service vendors doing handstands about the money they are making in the service market," she said. In addition to competing with independent consultants and systems vendors, the networking providers must compete with companies' own staffs for network service and support dollars.

Early customers have had mixed success.

Jim Pointer, a telecommunications analyst at The Quaker Oats Co., found that while he had plenty of expertise with the technology at the Chicago administrative offices, Cabletron's design and installation services were helpful in expanding Ethernet networks at remote distribution sites throughout the country.

After closely working with Cabletron engineers to define standards, Pointer said he was comfortable enough to let them start setting up distribution centers on their own.

Money in the bank

The cost of service is largely worked into hardware costs, Pointer said, and the company may have saved money because "we just don't have the bodies at the remote sites and would have had to hire someone anyway."

Dave Northrup, director of information systems at the University of Alabama Health Services Foundation, discovered that one vendor's consulting service (which he asked not to identify) wanted to install an expensive network in the foundation's new five-story clinic building.

After turning to independent consultancy Andersen Consulting to design and install the 400-node network (which connects to the affiliated hospital system), Northrup said he defrayed $200,000 of Andersen's $300,000 fee in savings over the network the vendor had planned to install.

The vendor "was pushing their own stuff. I felt better getting an independent consultant," Northrup said.

Post Office

CONTINUED FROM PAGE 41

also select names from among 200 periodicals and catalogs for automatic notification of address changes by the Postal Service.

Each night the address changes and other information are retrieved via phone by a communication server at Postal Buddy headquarters in San Diego. After additional validation and posting of financial information to Postal Buddy's books, the address changes are sent electronically to the Postal Service's computerized mail-forwarding system at the National Address Information Center in Memphis. From there, address change data is sent electronically or by paper to the businesses selected by the user.

Every year 42 million Americans change addresses, generating 2.3 billion pieces of mail and costing the Postal Service $1.5 billion.

Postal Buddy's 27 peripherals contain varying degrees of intelligence, May said. When one of them senses it is having a problem — a paper jam, for example — it immediately sends an alert to San Diego. There, technicians can route it to an EDS service center in Dayton, Ohio, which may generate a trouble ticket to dispatch a local repair person.

The public can use the devices free of charge for address changes — saving on postage that would have been used for the traditional notification post cards — and can expect to see changes posted faster and with fewer errors, a company spokesman said.

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[redacted]

WAN hardware

Patton Electronics Co. has introduced the Patton Model 2020, a miniature, passive interface converter that lets a synchronous RS-232 host or terminal communicate with a Digital Service Unit/Channel Service Unit incorporating a V.35 interface.

Batteries or AC power are not required, and Model 2020 supports data rates of up to 200K bit/sec. The product is protocol-independent and can communicate either in full or half duplex. Two different modes are available: Data Terminal Equipment (DTE) to Data Communication Equipment (DCE) and DCE to DTE.

Each version of Model 2020 costs $295.

➤*Patton Electronics*
7958 Cessna Ave.
Gaithersburg, Md. 20879
(301) 975-1000

Proteon, Inc. has introduced the GNX (Gateway Network Exchange) 400 gateway and the DNX 300I (Departmental Network Exchange) Bridging Router.

The GNX 400 has the capability to transport IBM's Systems Network Architecture (SNA)/Synchronous Data Link Control data over a local- and wide-area network internetwork to a LAN-attached host. The DNX 300I can send SNA and non-SNA traffic across a multiprotocol backbone to an assortment of hosts.

GNX prices start at $11,000, and the DNX 300I starts at $5,495.

➤*Proteon*
9 Technology Drive
Westboro, Mass. 01581
(508) 898-2800

Links

Photonics Corp. has introduced Collaborative PC, a wireless networking product designed for transmitting data from portables to desktop computers.

The Collaborative PC allows a desktop computer to serve as a link to the wired network and as a docking station for portable computers. The product comprises an internal half-card for an XT/AT bus or Extended Industry Standard Architecture bus plus an external tethered transceiver. Data is transmitted at 1M bit/sec.

Collaborative PC costs $250.

➤*Photonics*
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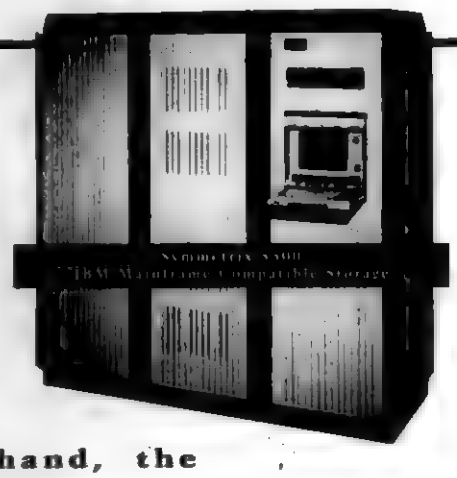
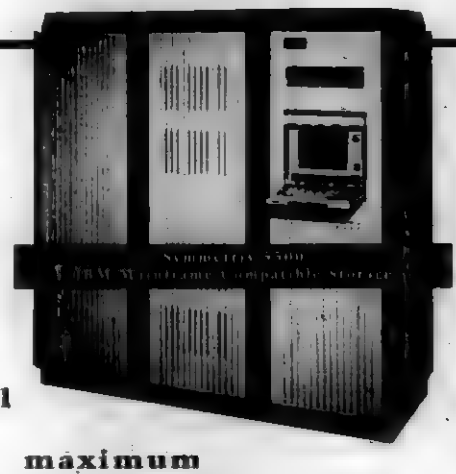
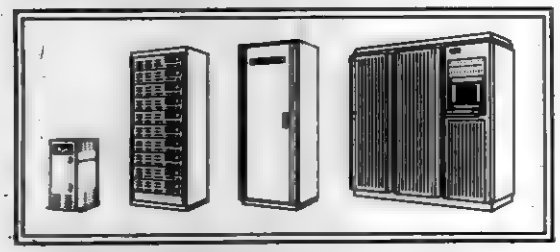
Because, right now, there's the Symmetrix 5500 ICDA,™ from EMC.

The disk storage system on the left is known for speed. The disk storage system on the right is known for continuous operation. Fortunately, they're one and the same.





On one hand, the Symmetrix 5500 is fast. It's based on EMC's Integrated Cached Disk Arrays (ICDA™), which means it can access information on an IBM or compatible mainframe computer almost as fast as you can say "Where's my data?"



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

On the other hand, the Symmetrix 5500 offers continuous operation. Which means you'll have access to your data 24 hours a day, seven days a week, with no costly downtime.

But the benefits of the Symmetrix 5500 don't end there. It also offers high capacity per square foot, low power and cooling requirements and a two year warranty that all add up to a maximum return on your storage investment.

So if you can't choose between a disk storage solution that offers speed and one that offers continuous operation, don't. Get the Symmetrix 5500. To learn more, please call 1-800-424-EMC2, extension LM65C.

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NYCE switches to 'insourcing'

By Thomas Hoffman
SECAUCUS, N.J.

The NYCE network, the largest electronic funds transfer (EFT) network in the Northeast, stands to reduce its transaction processing costs by 20% annually by "insourcing" its data processing operations. NYCE recently flipped the switch on its first data center after completing a seven-year outsourcing relationship with Deluxe Data Systems, Inc. in Glendale, Wis.

NYCE's move to insource when many other companies are outsourcing was driven by several considerations, according to Steven A. Rathgaber, vice president of operations and systems at NYCE. The EFT market is maturing and becoming more predictable, and it would be less expensive for NYCE to do its own transaction processing than to farm those services out to Deluxe Data Systems, he said.

"We realized that the cost per transaction would be 10% to 20% lower than what Deluxe was charging us," he said.

With more than 76 million transactions processed in September, NYCE is the second-largest aggregate switching company in the U.S., according to "Bank Network News," a Chicago-based banking technology publication. In the switching market — where EFT networks process automated teller machine (ATM) transactions among member banks — NYCE is ranked third, with 16.8 million switch transactions in September.

NYCE's 15% transaction processing growth during the past two years — combined with plans to deploy future electronic services such as point-of-sale debit transactions for retailers — helped NYCE decide to create its own data center, Rathgaber said. Real estate conditions were also favorable.

JOYCE RAVID

NYCE's Steven Rathgaber *says insourcing will reduce the exchange's transaction costs by 10% to 20%*

ON SITE

NYCE
Secaucus, N.J.

Challenge: To transfer transaction processing operations from a third party to a data center.

Technology: Cyclone fault-tolerant systems and Connex 5.4 switching software, a communications management system.

The network took over a data center once occupied by Columbia Pictures Industries, Inc., which had consolidated its operations in Los Angeles. Because Columbia was anxious to transfer its lease, NYCE was able to include uninterruptible power supply systems and diesel generators with the data center.

Tandem chosen

Deluxe Data Systems had processed NYCE transactions under a Tandem Computers, Inc. VLX fault-tolerant computing environment. Rathgaber said NYCE evaluated fault-tolerant hardware from Tandem, IBM and Stratus Computer, Inc. but opted for a Tandem Cyclone because "we felt that Tandem offered the best price and had the lead among other vendors in added utilities." Plus it would be easier to migrate from one Tandem environment to another, he said.

NYCE installed the software in June and added the eight-CPU Tandem Cyclone in July. It also replaced analog telecommunications with a Racal-Datacom, Inc. communications management system. NYCE's network infrastructure includes X.25, IBM's Systems Network Architecture and bisynchronous connections between the Tandem system and mainframes at member banks.

NYCE cut over to the new data center on Nov. 10. The biggest migration challenge was transferring a project plan containing more than 2,000 individual tasks once handled by Deluxe to NYCE, Rathgaber said. To help smooth the migration, Rathgaber lured Vern Counter, who had previously directed NYCE's operations at Deluxe, to man-

insourcing, *page 46*

Middleware speeds client connection

By Jean S. Bozman

■ In the client/server universe, you can get there from here, but you need a gateway and a protocol translator to do it. As the trend toward client/server computing accelerates, more vendors are announcing middleware to connect desktops to host databases. Users said they believe the new client/server middleware will speed application development, which is often slowed by the complexity of connecting each type of client to each type of server.

At the same time, the arrival of advanced database packages for PC clients, including Microsoft Corp.'s Access and Borland International, Inc.'s forthcoming Paradox for Windows, is boosting demand for middleware to simplify client/server links. Two new application programming interfaces (API), Microsoft's Open Database Connectivity for relational databases and Borland's IDAPI for relational and nonrelational databases, will allow client queries to address more than one database server.

Until recently, users had little choice but to install point-to-point gateways between specific combinations of clients and servers. But prepackaged gateways are already widely used, and many users are writing custom software to do the job. "We're finding that gateway technology is definitely going into production," said Peter Kastner, a senior analyst at the Aberdeen Group in Boston. "That means that users are getting their sleeves rolled up to do client/server applications."

Because middleware is scarce, some users have already taken matters into their own hands. At Texaco, Inc.'s Houston headquarters, a team of database programmers has designed a "virtu-

Middleware, *page 46*

BIM Spotlight

Wouldn't it be nice to have a couple more terminals on your desk?

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DEC, IBI ease legacy data access

By Melinda-Carol Ballou

■ Digital Equipment Corp. and Information Builders, Inc. (IBI) have announced a partnership that will provide DEC Accessworks servers with gateways to 50 additional databases through support of IBI's Enterprise Data Access/SQL (EDA/SQL).

"DEC had to do this," said Lynn Berg, a director at Gartner Group, Inc., a market research firm based in Stamford, Conn. "IBI has become the de facto standard for the way people plan to access legacy databases."

"It wasn't that you couldn't get to all that data before — there were plenty of ways, but none of them were much fun and this makes it easier," said Michael Goulde, an analyst at the Patricia Seybold Group, a Boston-based market research firm.

IBI's EDA/SQL is a family of products that provide SQL-based access to relational and nonrelational data across multivendor platforms via EDA/SQL Server, API/SQL, EDA/Link, EDA/Extender Products and EDA/Gateways (see story below).

DEC's Accessworks is a prepackaged group of servers that connect desktops to five databases and file systems: IBM's DB2, IMS and VSAM; Oracle Corp.'s Oracle; DEC's Rdb; and applications such as Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3.

Accessworks supports clients running Microsoft's Windows, IBM's OS/2, Apple Computer, Inc.'s Macintosh, DEC's OpenVMS and Unix.

"The nice thing about Accessworks is its flexibility — [users will be able to] either use the warehousing facilities available with Rdb or with EDA/SQL," Berg said. "Or they could use [Accessworks] as a straight pass-through facility from one application to another, so that the server becomes essentially a highly intelligent gateway."

Data

Accessworks and EDA/SQL also support DEC's Open Database Connectivity (ODBC) driver for Rdb, which will allow users to bring data to Rdb from Windows environments when it ships next year.

A Deferred Query Utility, also announced for DECquery applications running on an Accessworks server, allows users to schedule data requests to run at specific, preset times.

Beta-test site users spoke well of the new technology. Rod Cressey, user services manager at the University of California at San Diego, uses client/server computing to stave off costly upgrades to IBM mainframes. Cressey, who tried an early version of DECquery, plans to use the new IBI/Accessworks product with DEC's Deferred Query Utility. "We are very cash-tight right now," Cressey said, citing budgetary pressures created by the recession. "I ask users to run their queries at night so that I won't have to buy more hardware very soon."

Accessworks support for EDA/SQL is expected to ship during the first quarter of 1993, and DEC is also building Rdb extensions to EDA that are likely to be available in that same time frame, according to internal DEC sources. Pricing for the products will be announced at that time.

Middleware

CONTINUED FROM PAGE 45

al data server" that connects Sybase, Inc. end users with four target databases: IBM's DB2, Sybase, NCR Corp.'s Sharebase and Computer Corp. of America's Model 204. "The application is free to go to any database it wants," said Tom Peters, manager of data management at Texaco's exploration production technology department. The virtual data server took two years to design and build, Peters said.

Some sites use front-end database tools to generate database-specific queries. Relational databases can theoretically be accessed through industry-standard SQL queries; the problem is that each database vendor supports its own brand of SQL extensions, analysts said. "SQL is like Victorian children: It should not be seen or heard," Kagtner said. "We're moving into a new generation of smart front-end tools that know how to spit out the relevant SQL."

But there are other ways to gain client/server connectivity. Many Oracle Corp. sites use Oracle's SQL Net 1.0 to make the protocol translations between client applications and target database servers. "There are lots of ways of moving data from one point to another," said David Kreines, a senior project manager at the Educational Testing Service in Princeton, N.J. "All of the Oracle tools and applications talk to SQL Net, but you have to know which client is going to which server to make the connection." That is because both PCs and servers must run protocol translators for specific combinations.

The new wave of client/server middleware is expected to speed application development, even though it may prevent some database-specific features from being used by client/server queries.

For example, a new version of Oracle's SQL Net 2.0, due to ship in 1993, will contain a piece of middleware called the Multi Protocol Interchange to automatically translate protocols between clients and servers.

Burgeoning market

A number of data-access packages were announced at the recent Database World and Client/Server World shows in Chicago, including the following:

■ Information Builders, Inc. broadened its EDA/SQL server software with versions for Novell, Inc. NetWare networks, IBM mainframe CICS transaction monitors and DEC Accessworks routers. IBI's EDA/Link handles data translations between clients and servers, while an EDA/SQL interface links client applications to server databases.

IBI's Novell-compatible software will support NetWare Loadable Module clients and Novell's IPX/SPX networking protocols. The Novell modules will become available in the first quarter of 1993, said John Senor, vice president of IBI's Enterprise Data Access division.

IBI is building the NetWare Router for EDA, which can send EDA/SQL queries to Novell's NetWare SQL and Novell's Btrieve databases. IBI is also writing the EDA Gateway for NetWare. As a result, the EDA Gateway will now support 80 NetWare applications and tools.

The new IBI products will also support Novell's NetWare for SAA, which connects with EDA/SQL servers for IBM's MVS, VM and OS/2. "This is real nice for users because this removes some of the logical isolation of the NetWare LANs and lets them plug into the enterprise," said Herb Edelstein, a partner at Euclid Associates in Potomac, Md. "Users could do this for themselves, but it would require an enormous amount of effort and money."

■ Micro Decisionware, Inc. said its Database Gateway product will support Microsoft's Windows NT operating system. By April 1993, the firm will also have gateways between OS/2 clients and IBM's relational database servers for DB2, SQL/DS and OS/400 under IBM's Distributed Relational Database Architecture technology.

■ Sterling Software, Inc.'s Dylakor Division said it will begin shipping its client/server Journey product in February. Journey connects PC spreadsheets with mainframe databases, such as IBM's DB2 relational database and IBM's IMS hierarchical database.

A companion product, the Answer/Server, will extract DB2 and IMS mainframe data for access by PC users.

—Jean S. Bozman

[redacted]

5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

System software

BlueLine Software, Inc. has released Vital Signs for VTAM 2.0, a new version of its network and VTAM performance monitor.

The product provides MVS, VM and VSE sites with the ability to monitor and report on both network and VTAM performance data via historical reports and real-time displays, the company reported. New "point-and-shoot" capabilities enable users to view network statistics by navigating the network. Starting at a high-level network or sessions statistics display, users place the cursor on a line to view performance data down to the logical unit or terminal level.

Prices start at $8,680.

➤ *BlueLine Software*
Suite 690

Tone Software Corp. has announced Release 4.2 of OMC-Print, a print management tool.

The product provides spooled output routing to almost any VTAM print device. According to the company, any type of data residing in the JES spool can be printed on non-JES print devices. OMC Print functions include an enhanced Command Display Facility that can be run as an ISPF application; expanded job selection criteria; and expanded device support, which includes IBM's Application System/400, System/36, System 38, PC and bar-code imprinting devices.

Prices start at $11,000.

➤ *Tone Software*
1735 S. Brookhurst
Anaheim, Calif. 92804
(714) 991-9460

NYCE insources

CONTINUED FROM PAGE 45

age NYCE's data center.

Rathgaber and Counter have built a staff of 50 programmers, client service representatives and telecommunications and operations support members.

With the data center migration completed, NYCE is busy working on other information systems projects. It is implementing a local-area network-based system designed to help its client service representatives log and track customer problems.

That project, which uses Novell, Inc. NetWare, is scheduled for completion in January.

NYCE also plans to link LANs in its four major offices in Buffalo and Albany, N.Y., and Hackensack and Secaucus, N.J., during the first quarter of 1993.

In Brief

CASE price cuts

Andersen Consulting halved the price of a starter program for Foundation for Cooperative Processing, a computer-aided software engineering (CASE) workbench designed to build client/server software. Starter Kit Plus, which goes for $49,500, includes eight weeks of training and support, and CASE tools and sample design objects.

KnowledgeWare GUI

KnowledgeWare, Inc. introduced Flashpoint, a graphical user interface (GUI) builder it purchased from **Language Technology, Inc.** about a year ago. Flashpoint, which is available immediately, was adjusted to work with KnowledgeWare's other application development tools. The GUI builder is priced at $50,000 until Dec. 28.

Multiplatform tester

Horizon Strategies, Inc. in Needham, Mass., announced Message Express/Tour, a developer's workbench for testing multiplatform programs. It was developed using the firm's Message Express middleware. While Message Express/Tour runs on IBM OS/2 systems, programs tested on the workbench can be implemented across all platforms supported by Message Express, the company said. Priced at $2,399, the product is available now.

Data conversion

Bachman Information Systems, Inc. plans to resell data migration tools from **Evolutionary Technologies, Inc.**, an Austin, Texas-based spinoff of **Microelectronics and Computer Technology Corp.** With a base price of $200,000, Extract Tool Suite includes Master Set, a suite of four tools that define source and target databases, and Data Conversion Tool, which then graphically maps data from the old to the new database, automatically converting the data, the firm said.

Software reuse not a panacea

Some firms pursue it as a development goal; others question its viability

By Garry Ray

■ Software reuse, this year's holy grail of application development, is attracting as much interest as ever. But developers and analysts said that its promise is being hindered by a web of issues such as training, costs, technical difficulties and psychological resistance.

"People need a reality check [on software reuse]," said Clive Lee, president of North Andover, Mass., training firm Semaphore. "They've read the hype, and they know it's not a panacea. Reuse requires an upfront investment."

Lee, whose company specializes in object-oriented programming techniques, agreed with many analysts, consultants and users who have seen both the promise and the dark side of the reuse equation.

Almost unanimously, they said reuse is an attractive and compelling goal for any development shop. In theory, software reuse is said to have the long-term effect of cutting development costs and speeding the rate at which applications can be designed, coded and delivered.

In the optimistic scenario, developers will write base application classes for inclusion in an organizational software library. Later, these classes will be recalled, extended or modified and added to new applications. "We can't afford to develop huge systems from scratch anymore," said Ed Evers, program manager at the Virginia Center of Excellence for Software Reuse and Technology Transfer (VCOE) in Herndon, Va.

VCOE recently released its Reuse Adoption Guidebook to the Defense Advanced Research Projects Agency, which funded the study.

Unfulfilled promises

But to those with a more skeptical outlook, the golden castle of reuse is nothing new. With each new development methodology, "there was always the promise of reuse," said Adrian Bowles, vice president and director of advanced software development at Westport, Conn., consulting firm New Science Associates, Inc. "Even proponents of structured design said you could reuse structured modules" of application code.

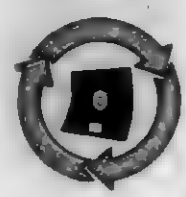
Nor will C++ programming — which is generally linked to object-oriented programming and software reuse — solve the problem. Lee said, "The syntax of C++ alone is not going to get people to their goal." Bowles said some C++ shops "are having the same problems that people are having with other languages." In and of itself, "C++ is of no real benefit" in writing reusable code, Bowles added.

Impediments to reuse

Technical: Languages must enforce use of interfaces to reusable components. Applications must be designed for reuse from the start.

Business: Costs of training are high. The first project will not produce reusable code. Business logic and business rules are not generally reusable.

Cultural: Programmers must be rewarded for creating reusable modules. Management must think for the long term. Code must be considered a tangible asset.



Although reuse success stories have been rampant in the past year, some firms are perplexed about where reuse might be applied. A development manager at a Northeast insurance firm said reuse "sounds like a great idea, but we haven't been able to find a set of common things that everybody wants to do" with software components.

Others have made reuse a company mantra. At Microsoft Corp. in Redmond, Wash., "we don't have to convince management that software is in fact an asset," said Bob Atkinson, a software development engineer and architect of the company's Object Linking and Embedding technology.

"Developing from scratch would be a significant obstacle to doing the things we want to do," he added.

However, Atkinson said he is pessimistic about the cultural impediments to software reuse. Noting that developers must be taught that others will use their code, he said that "some very serious social structures have to be developed" to "reward you for doing something for someone else."

Bowles agreed. "It's simple psychology," he said. "You get more of what you reward, so you have to reward people for finding things and reusing them and also for putting things in" reuse libraries.

DOD picks SoftBench for STARS project

By Kim S. Nash

PALO ALTO, CALIF.

The double whammy of recession and peacetime economy has shot holes through the defense industry, but one of the highest profile software development projects sponsored by the Department of Defense (DOD) continues — and keeps buying technology. Software Technology for Adaptable, Reliable Systems (STARS) recently adopted Hewlett-Packard Co.'s SoftBench framework as a software development guide.

STARS is a 4-year-old program funded by the U.S. Defense Advanced Research Projects Agency to help the government cut application development costs and speed up the process — goals that most civilian organizations say they are going after, too.

But what makes STARS different from other projects is its emphasis on "megaprogramming." This approach to software engineering puts reusability at a premium, but it is not necessarily focused on object-oriented techniques. More important is creating an environment that lets tools from various vendors work together and contribute data models, code and other parts of an application to a shared repository, according to Hans Polzer, program manager for STARS at Paramax Systems Corp.

"SoftBench gives us that freedom," Polzer said. Paramax is a subsidiary of Unisys Corp. and is leading the technology selection process for this project. Terms of the agreement were not disclosed.

SoftBench, which 100 systems and software makers support, lays out standards for application development products so they can work together, even if they were not built to do so. The framework does much of the translating and provides a common user interface. Tying tools together this way — rather than tightly integrating them with one another — gives users a bigger palette of options, Polzer explained.

HP's SoftBench is a market leader among several frameworks, including Sun Microsystems, Inc.'s ToolTalk and Atherton Technologies' BackPlane. HP recently signed up a reseller to handle overflow from direct sales. The framework is now available from Basis, Inc., an Emeryville, Calif.-based system integrator.

The $500,000 deal calls for Basis to sell HP's SoftBench 3.0 and the C++ version on Sun workstations and other Unix boxes as HP rolls out those versions. Basis is the first of several as-yet-unannounced third parties that will sell SoftBench and related products, an HP spokesman confirmed.

The Department of Defense is the largest software customer in the world, with spending for development and maintenance projected at $60 billion by 1993.

Software AG broadens OS/2 line

Tools geared for developing complex, high-volume host OLTP applications on workstations

By Gary H. Anthes
RESTON, VA.

Software AG of North America, Inc. last week unveiled its core application development tools for OS/2.

The products are Adabas Server, the company's database management system; Entire Net-Work, a "middleware" product that facilitates development of applications distributed across heterogeneous environments; and Natural for OS/2, an enhanced release of the company's fourth-generation application development environment for OS/2.

The products are especially geared for developing complex, high-volume on-line transaction-processing applications for distributed databases, and they have the same functionality as their corresponding mainframe products, the company said.

Adabas Server is the first high-performance database management system to exploit OS/2 2.0's 32-bit capabilities, Software AG said.

> Software AG's OS/2-based development tools have the same functionality as corresponding mainframe products.

It will support multiple data models including relational, entity-relationship and non-first formal, according to the company.

Adabas Server is written in C and is essentially the same software as was introduced earlier for Unix.

Entire Net-Work provides transparent communication between otherwise incompatible environments. It is a transport layer that supports multiple protocols and platforms with a common application programming interface (API).

In distributed applications, Entire Net-Work transparently intercepts API calls, translates them into the required format and then returns data back to the application regardless of where the program logic and the database are in the network.

Entire Net-Work for OS/2 supports Novell, Inc. SPX, NetBIOS and Systems Network Architecture (SNA) LU6.2. Support for Transmission Control Protocol/Internet Protocol and DECNet is in beta testing, Software AG said.

The new release of Natural for OS/2 supports a standard SQL implementation for data manipulation. Prices begin at $1,250 for a single-user development license and $300 for a single-user runtime license.

Adabas Server prices begin at $500 for a single-user license. Entire Net-Work for OS/2 is priced by node and begins at $300.

Separately last week, Software AG reported that Adabas — on a Unix-based Hewlett-Packard Co. HP 9000 Series 800 Model 150 uniprocessor system — had run at 303 transactions per second on the TPC-A benchmark, or 64% better than the comparable result reported by Oracle Corp.

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Application development

XOX Corp. has released Shapes, a geometric computing subsystem.

Shapes tools extend the C and LISP programming environments, offering a complete geometric computing capability. An assortment of data types as well as more than 175 operators specific to geometric computing are provided.

Within the space of any dimension, the product naturally models curves, mixed-dimensional and solid objects. Shapes has a dimensional independent cellular architecture and supports topology of mixed dimensional objects in manifold and non-manifold configurations.

Shapes' introductory price is $2,995.

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Lucid, Inc. has introduced Version 1.0 of XLT, a set of productivity tools.

The tools were designed for the Lucid Common LISP programming environment. An X Window System-based interface to data inspectors is provided, as are a stepper, a debugger and program and data analyzers. Other tools are also provided, including an interface to an editor called GNU Emacs.

According to the company, the system filters the information that it is presented faster than comparable products, simplifying a user's tasks.

The product is shipping with the Sun Microsystems, Inc. SPARC platform and compatible hardware, IBM's RISC System/6000, Digital Equipment Corp.'s DECsystem and the HP Series 700 from Hewlett-Packard Co.

XLT Version 1.0 costs $1,800.

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ProtoView Development Corp. has joined with Borland International, Inc. to ship ProtoGen Pascal, an interface design and code generation tool for Borland Pascal with Objects 7.0.

Based on ProtoView's current ProtoGen computer-aided software engineering tool, the product enables Pascal DOS users to create Microsoft Corp. Windows applications by visually creating the user interface.

The Pascal Windows code is automatically written, and users can add their application-specific code to the framework that is generated, the company reported.

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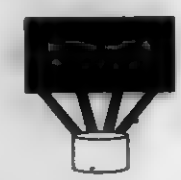

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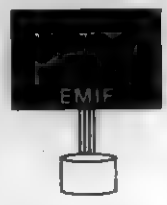

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PUBLISH *(wisely)* *or* PERISH

By 1995, 90% of all office information will be in digital form, predictions say Whether you departmentalize or centralize, finding the right electronic document strategy can help save you time and money

By Robert M. Knight

Mention desktop publishing to the average information systems manager and you'll probably hear something like: "That's nickle-and-dime stuff. User departments handle it."

True, much computer-based publishing takes places in far-flung corners of corporations, away from the gaze of IS. And, yes, individual desktop-published pages can be cheaply and easily produced on desktop platforms and laser printers for only pennies a page.

But industry analysts say that for the average corporation, those nickels and dimes can add up to millions of dollars of virtually invisible spending a year.

The explosive surge in digital information, imaging systems and groupware and the rapid growth of network-based printing are only expected to worsen the situation during the next five years.

The bottom line, according to some experts, is that unless IS becomes more involved in corporate publishing, many organizations will find themselves facing expensive integration problems during the next few years.

Keith Davidson, director of Xplor International in Palos Verdes Estates, Calif., worries that many corporations are haphazardly adopting desktop or personal publishing functions, just as they did with PCs a decade earlier.

"We keep saying, 'It isn't going to happen again,' but it happens," says Davidson, whose 1,400-member association promotes effective use of electronic document systems.

No longer simple

Since the early 1980s, the typical corporate publishing environment has grown from a centralized operation to a relatively simple, departmental PC-based operation. In many organizations, an interlocking web of imaging systems, forms processing, multimedia, text management, hypertext and work-flow software is beginning to spread across the entire corporation (see chart page 53). Many such systems are based on networked or open platforms, further increasing the complexity.

Few would argue with the fact that desktop publishing has allowed more people to produce more better looking documents than ever before without the aid of typesetters, graphic designers, photo engravers and commercial printers.

Yet with so many new computer- and communications-based technologies being used to gather, hold and produce information, experts warn it's naive at best — and dangerous at worst — to believe that document management and publishing is not an IS function.

"If your corporation moves information, your corporation is a publisher," writes Russell Lipton in *The Multimedia Toolkit* (Random House, Inc.), a new book that includes software development as a publishing activity. Lipton notes that many companies are struggling to construct new architectures that will permit interactive, on-line handling of information.

"Recognizing that, broadly, your business is the business of publishing is the first step toward making over your business in the '90s," Lipton concludes. "Conducting your publishing activities in the dark is foolish."

Yet experts say several major obstacles prevent corporate publishing from being a burning issue for IS — or even an issue at all, for that matter.

"Some people don't know they even have a publishing problem," says James Popkin, program director of office IS at Gartner Group, Inc. in Stamford, Conn.

Too bad. Popkin says, because networked copy is rapidly replacing paper as an end product. More importantly, by 1995

Publish (wisely) or perish, *page 52*

INSIDE

IS MANAGERS ON CORPORATE PUBLISHING PLANS. **Page 52.**

HOW ALLEN-BRADLEY, FUJISAWA AND AT&T DIVISIONS HANDLE ELECTRONIC PUBLISHING. **Pages 52, 53.**

A GRAPHIC LOOK AT THE COMPLEX WORLD OF INTELLIGENT DOCUMENT MANAGEMENT AND PRINTING. **Page 53.**

ROUNDUP OF GROUP PUBLISHING PRODUCTS. **Page 53.**

RESOURCES. **Page 53.**

MICHAEL ABRAMSON

Fujisawa USA's Dale Carlson: *'It wasn't a crisis. But we had inefficient systems'*

Publish (wisely) or perish

CONTINUED FROM PAGE 51

the amount of office information in digital form will double, from 25% to 50%, he says, thanks to the growth of local-area networks and more powerful desktop machines.

"[Companies] have trouble today managing 25%," he says. "If that doubles without the benefit of powerful documentation tools, [they] won't be able to handle it."

How much spent?

An even more basic problem, according to Ronald Mallett, chief executive officer of Graystone Cos., a Waterbury, Conn., supplier of digitization services, is that few companies have any idea how much desktop and electronic publishing costs their organizations.

"I'll wager a full week's consulting fee that no CEO of any company over 1,000 employees can tell you within 50% accuracy just how much his company spends on publishing activities," Mallett says. "Nor can they tell you how many people are involved, since middle managers tend to hide them under misleading job descriptions."

Mallett says he once worked for a corporate lab director who hid an entire speech-writing and publicity department in his customer engineering and support group.

Another problem stems from the nature of corporate publishing, consultants say, and the surprising importance some business units attach to it. "Department heads develop a fanatical attachment to their publications," Mallett says, "since these often represent the only hard proof of the department's productivity and corporate worth. Companies often overproduce, duplicate, replicate and even contradict themselves in a digital paperwork blizzard."

Companies that think about publishing at all tend to focus more on small, product-oriented issues, says Mark Walter, senior editor of the "Seybold Report on Publishing Systems," a newsletter published in Media, Pa.

> One electronic publishing standard you'll be hearing about is Standard General Markup Language, which gives documents an open architecture.

"I don't talk with a lot of people who say, 'I'm trying to get a handle on my publishing,' " Walter says. "I find myself talking with people who are looking at the tools they use and the next tools they are going to use. They want to save time. They want to save money. They ask, 'How can we improve our system?' "

To remedy these problems, some organizations and consultancies have tried to promote the idea of developing a corporate publishing strategy to set up guidelines for integrated publishing activities.

It's difficult, however, to formulate general guidelines and principles that apply equally well to different organizations. A centralized approach and strict corporate publishing strategy that is ideal for one company, for example, could very well be disastrous for another, even in the same field.

Predictably, organizations have tended to gravitate toward a wide range of strategies that make sense for their specific business climate and needs. Some require heavy IS control and scrutiny; others leave the task entirely to user departments.

Some companies, such as Allen-Bradley Co., are centralizing all publication functions in IS (see story page 53).

Critics note that too much centralized control can stifle the creativity that goes into producing a departmental document. Xplor's Davidson, for one, discourages thinking of centralization as the only choice.

"The secret is to balance the cost control and the structure that you get from a centralized structure with the flexibility and responsiveness that you get from a localized operation," he says.

It's also necessary to weigh issues of accessibility to databases or document storage devices against security issues.

Some corporations are outsourcing all publishing activities. Short of that, Gartner's Popkin has a couple of other alternatives.

"You can put together your own request for information to vendors outlining what the problem is and the applications you're looking for," Popkin says. "You'll get a variety of approaches that way. Or you can call one of the Big Six consulting firms or a technical consulting firm that specializes in document management or publishing."

Davidson recommends adopting a corporate document policy. "This policy needs to address, to establish some consistency of output so the corporate image and reputation is protected. It needs in some way to get some compatibility among the company's various systems or platforms or at least describe the conditions in which people may vary from them."

Knight is a free-lance writer based in Chicago.

User voices

Jeff Newman, assistant vice president, Barclays Bank PLC, New York
"Our policy on desktop publishing packages is the same as it would be for any other horizontal application, such as a spreadsheet — it's a free-for-all. Users can use any application they choose, but there's not a lot of desktop publishing packages going on. We mostly use [Microsoft] Word for our desktop needs, and it does a good job. For most needs, to learn a desktop publishing package, you have to be crazy."

Scott Stein, director, store automation, Dairy Mart Convenience Stores, Inc., Enfield, Conn.
"In retail, the focus is on bringing products in that have an impact on operations. It takes a little longer for a corporate desktop strategy to become real. We've kind of avoided it a little by using facilities within WordPerfect — it's [a] very generic desktop, so we haven't really made a jump."

Deb Leone, supervisor, technical communications, Waukesha Engine Division, Dresser Industries, Inc., Waukesha, Wis.
"We are a kind of stand-alone entity here, as far as desktop publishing. We do have an in-house print group, which has [Aldus Corp.'s] PageMaker, and if departments need something, they have the print group make it up for them. But there's no such animal as a corporate desktop [publishing] strategy."

Fujisawa: Re-engineer, then streamline

Few industries consider corporate publishing more crucial than does the pharmaceutical industry, where documents require more production than pills do.

In fact, producing documents takes up an estimated 70% of work time at Fujisawa USA.

The Deerfield, Ill., subsidiary of a Japanese conglomerate dispenses generic prescription drugs through its Lyphomed Division. Its FPC Division manufactures brand-name prescription, or "ethical," drugs.

> "We needed to streamline, replace redundant systems [and] automate manual systems." — Dale Carlson, Fujisawa USA

To keep up with the blizzard volume, the unit decided to focus product and paper from both divisions in the office of Dale Carlson, corporate quality assurance manager, and not with information systems.

The right approach

Fujisawa's approach stems from looking first at the business challenge — re-engineering — and then automating appropriate documentation processes.

Carlson and his staff track 1,000 to 2,000 pages of documentation for the Federal Drug Administration (FDA) each time Lyphomed makes a bid for an ethical drug to become generic.

Over a period that typically lasts at least seven years, FPC amasses about 100,000 pages to document each drug it wants the FDA to approve. And the paperwork doesn't stop there.

"After the product is approved, the documentation still has to be maintained," Carlson explains. The FDA can examine and investigate documents at any time to make sure the product is manufactured according to guidelines set up in the original application.

As a result, Carlson's staff must maintain its fat files on each approved product, and each year it must submit a report to the FDA that discusses any changes in manufacturing, procedures, raw material or clinical testing.

By late 1991, it became obvious that products and paper were bursting beyond Fujisawa's PCs and local-area networks, Carlson recalls. IBM Application System/400 computers support the LANs, which operate in corporate facilities in Deerfield and Melrose Park, Ill., and in manufacturing plants in Grand Island, N.Y., Canovanes, Puerto Rico, and Illinois.

"It wasn't a crisis," Carlson explains. "But we had inefficient systems. To support continued growth, we needed to streamline, replace redundant systems, automate manual systems and generally just get a better handle on all of our documentation needs."

Calling in the reserves

Company officials decided to get outside help and called in A. T. Kearney, Inc., a Chicago-based consulting firm. Last January, teams began a structured process to assess how people handled documentation. They interviewed employees at virtually every level of every functional unit to get a first-hand look about needs and concerns. From that needs assessment, Fujisawa and Kearney concluded the company needed an integrated documentation system that would be accessible to all, from development to manufacturing.

By next spring, Fujisawa expects to have re-engineered and streamlined its entire business process and cleaned up the manual systems — all before there is any attempt to automate the document process. Carlson sees input from IS, documentation and manufacturing as key to the process.

In the meantime, Dale Carlson and his staff are anxious to know what configuration of which software and hardware components will result from the yearlong look they have taken at their document management.

But they can wait, says Carlson, adding it makes sense to wait until components are in place first. He says he's not sorry that the company is taking the time to consult a wide range of employees and gain top management commitment. In typical Japanese business style, the company is prepared to go through the needed steps without rushing.

"It's important to answer short term questions as well as providing long-term benefits," Carlson says.

— Robert M. Knight

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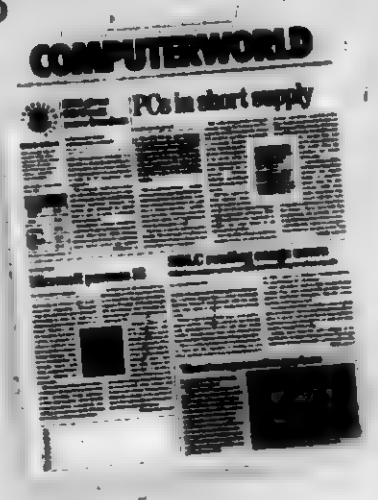

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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 69. Sys. Integrators/ VARs/Consulting Mgt.

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- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 89. Educator, Journalists, Librarians, Students
- 99. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/ communications systems? (Please check only one)

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- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Distr./Retailer
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- 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 69. Sys. Integrators/ VARs/Consulting Mgt.

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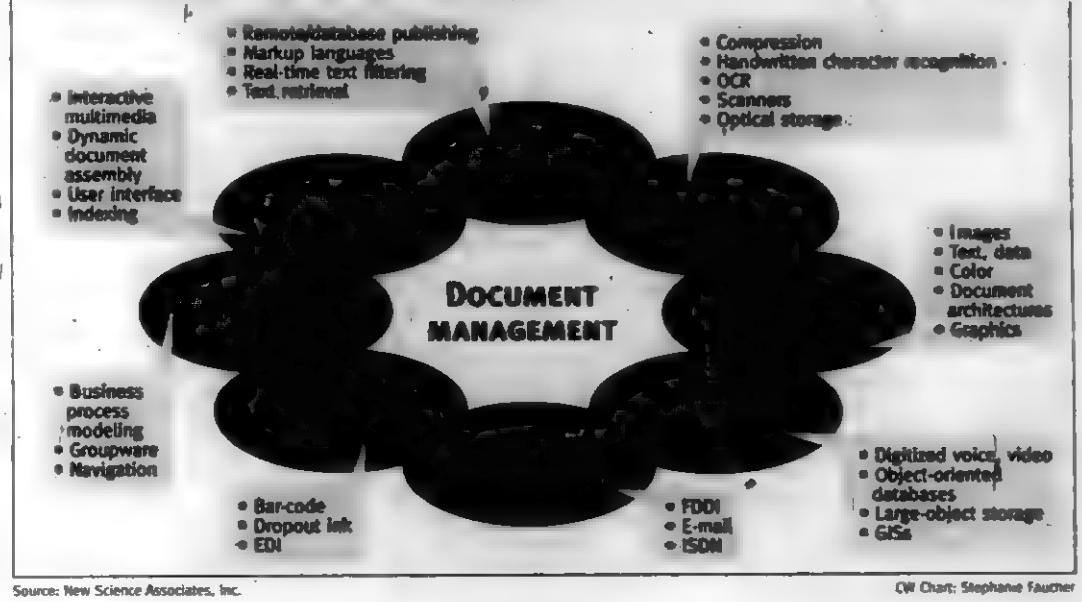
Resources

As technologies continue to evolve and overlap, it's tougher than ever to keep up. Following are some resources that can help you track the big picture as well as individual parts.

- Association for Information And Image Management. (301) 587-8202.
- "Document Management Technology," monthly newsletter. (602) 585-4254.
- "Seybold Report on Desktop Publishing" and "Seybold Report on Publishing Systems," monthly newsletters. (215) 565-2480.
- Xplor International, 1,400 members. (310) 373-3633.
- *Publish*, monthly magazine. (415) 243-0600.

New technologies and the need for corporatewide use of on-line data has created a hugely complex and multifaceted document management challenge for IS managers in the 1990s



Source: New Science Associates, Inc.

CW Chart: Stephanie Faucher

AT&T: People key to smooth operations

Technology secondary to discipline

For AT&T's Proposal Center in Greensboro, N.C., the biggest corporate publishing challenege isn't technical. It's educating internal clients to avoid missed deadlines and last-minute changes, according to Jean Omisore, network manager at AT&T Federal Systems Advanced Technologies.

The company aims so much of its work at the U.S. government that it has an entire unit dedicated to responding to federal requests for proposals.

"We have to work under really tight deadlines, and the publishing end of the proposal is the very last stage of the process," Omisore explains. "Since it seems like everybody else has missed deadlines, that means that change control — version control — is critical."

Special software helps

To help manage the process for the publication of an estimated 40,000 pages per year, the Proposal Center acquired Configuration Management Systems (CMS) workstation software from WorkGroup Technologies, Inc. in Waltham, Mass.

The CMS database captures all information about a file or proposal. It then stores information about all files so "we don't have to reinvent the wheel every time," Omisore says. "There isn't much that is reusable because each proposal is unique, but sometimes we can produce boilerplate formats."

> "Since it seems like everybody else has missed deadlines, that means that change control version control is critical."
> — Jean Omisore, network manager

The biggest problem, she says, is that customers are used to revising during the entire proposal cycle, which lasts from three weeks to three months. And not just for text. "Some proposals may have 300 to 400 drawings — full-page illustrations — and we get 10 revisions per graphic on average," Omisore says. "The CMS system allows us to collect information on how many revisions were asked for so if the customer asks, 'Why was this so expensive?' you can say, 'It's because you asked for 10 revisions on every page.'"

The education process is taking effect, she says. "When you present the customer with facts and can tell them, 'This expense is at your end, not our end,' it makes a difference. It's made a big impact on several of our proposal writers." — *Robert M. Knight*

Allen-Bradley pushes unity in publishing

Centralized approach to publishing helps company to present unified appearance

At Allen-Bradley Co.'s Automation Group, Tim Daunch and his department have the first and last word on corporate publishing.

"We handle all things that happen regarding publications," explains Daunch, information integration systems manager at the Highland Heights, Ohio, division. Milwaukee-based Allen-Bradley makes various line hardware and software products.

That means the 50-person department is in charge of all overseas literature, CD-ROM and downloading information to internal and commercial printers as far away as Europe. The department can drop-ship product information — programming manuals, user manuals, installation manuals, marketing literature — to any location in Europe from a high-speed printer in Kildare, Ireland, within 24 hours.

The staff revises and updates product documents and compiles and catalogs them quarterly on Apple Computer, Inc. Macintosh computers, sending the updates to subscription customers on CD-ROM.

The index of available documents alone covers 90 pages — each displaying about 20 line items. They represent an estimated 70,000 pages of product information.

For the records

Using RDM, a code management archival tool from Waltham, Mass.-based Interleaf, Inc., Daunch and his staff developed a "job jacket" format for every Automation Group product.

Each jacket, an electronic file that takes the place of piles of paper, includes not only manuals but also product changes, review copies, correspondence, engineering specifications, graphics — anything that anyone mapping a paper trail would want.

RDM indexes and cross-references each item, "which otherwise might be in a cardboard box somewhere," Daunch says.

For anyone wanting to initiate an electronic document management system, Daunch offers one recommendation: "Standards, standards, standards.

"We found that our partners in Milwaukee had developed their own templates," Daunch says. "They achieved the same look but in different ways. We had totally different instructions on how to lay out margins or graphics or headers or type fonts. What we called a 'header' they called a 'head' and others called a 'starter.'

"Larger companies tend to have different writing groups for different product lines or divisions, and they all have their own way of doing things," he concludes. "If a company wants to present a unified appearance, all the information should be presented as if they came from a unified group of documents." — *Robert M. Knight*

Product update

Group publishing products continue to be a hot market.

Agfa Compugraphic's CAPS Division announced an object-oriented shared document management system for **Sun Microsystems, Inc.'s** SPARCstations.

Among other new workgroup publishing systems are Page Director 1.5 ($1,495) from **Managing Editor Software**; ODMS ($1,500) from **Odesta Corp.**; The CopyFlow Family ($625 to $1,840) from **North Atlantic Publishing Systems**; and QuarkCopyDesk and QuarkDispatch ($1,790 for both) from **Quark Corp.**

XSoft, a Palo Alto, Calif.-based division of **Xerox Corp.**, introduced a suite of document management and publishing software, aimed at workstation and Unix-based publishing operations.

Separately, **Xerox Imaging Systems, Inc.** in Peabody, Mass., announced a client/server version of its Unix-based ScanWorx Intelligent Character Recognition Software for workstations. The product ($1,995) converts hard-copy documents to industry-standard formats, such as **Interleaf, Inc.** and **WordPerfect Corp.**

Digital Equipment Corp. announced a 32-page-per-minute network laser printer and software. DEC said the PrintServer 32 is ideally suited for complex print jobs that include graphics and multifont text. List price is $23,900.

Outsourcers: Get close but not too close

By Paul Gillin
BOSTON

Outsourcing has entered a new era characterized by cooperation and strategic partnering between users and vendors. But information systems executives are being cautioned not to get too chummy with their new allies.

Speakers and attendees at Digital Consulting, Inc.'s Outsourcing Conference recently agreed that interest in outsourcing is surging as corporations look to strategically farm out pieces of their operations, an approach called selective outsourcing.

"In the last year, the number of questions I've received on outsourcing has doubled if not tripled," said Rita Terdiman, a program director at Gartner Group, Inc. in Stamford, Conn. Chief information officers are now worrying less about losing their jobs to outsourcers and more about managing those relationships as a contractor overseeing a subcontractor.

However, there were plenty of caveats from speakers and attendees, who advised users to manage their outsourcing partners carefully and write extremely detailed contracts before opening their data center doors to outsiders.

"Good legal counsel will save you a lot of aggravation," said Robert Rough, chief financial officer at Harvest Foods, Inc. in Little Rock, Ark.

Us or them?

Outsourcing should be viewed as a strategic tool for IS to employ as the job of managing expanding corporate networks becomes too big for one department to handle, said Dale Kutnick, president of Meta Group, Inc. in Westport, Conn.

"If you have a lot of drudge work, outsourcing is an alternative," he said, citing as one example the manpower-intensive job of maintaining legacy mainframes. "Do you need MVS experts in-house or should you contract that out to IBM?" he asked. "After all, it's their software."

Kutnick attributed new interest in selective outsourcing to the "shattering of the data center" as networks, databases and application development move out of the glasshouse and into the user community.

He said future IS groups will increasingly find themselves competing with and managing contractors who handle everything from local-area network maintenance to application programming. "While the user may make the outsourcing decision, the IS group must manage the outsourcer," he said.

Users said they agree that outsourcing works best when it is a partnership but also emphasized that good fences make good neighbors.

Harvest Foods outsourced its entire 26-person IS operation to IBM's Integrated Systems Solutions Corp. six months ago and has reaped big benefits, including faster response to system problems and quicker deployment of new systems. Contract negotiations took three months, including a lot of haggling over details. "You have to decide who's going to pay for the staples," Rough said. "It's that detailed."

Other users agreed that despite a newfound spirit of cooperation, outsourcers have to be carefully managed and contracts painfully hammered out.

"We've had about 10 issues come up in the last year that required additional memos of understanding" with the outsourcing vendor, said Peter Wyman, senior vice president of support and services at California Federal Bank in Los Angeles. Cal Fed outsourced its data center to Systematics Corp. last year.

Wyman advised users to ensure that the outsourcer deal directly with the IS department. "Vendors may try end runs to your board or executive management. You want to make sure there are penalties for that kind of thing," he said. At Cal Fed one person is responsible for monitoring Systematics' compliance with the outsourcing contract. "It's helpful to have someone there who s[illegible] by making sure the relationship is good," he s[illegible].

Users also had their doubts about selective outsourcing, which they said can lead to finger-pointing and confusion as managers try to coordinate the activity of multiple outsourcing vendors.

Speaking for a panel of three outsourcing users at the conference, Rough said, "None of us would go [with selective outsourcing]. We want to make one phone call, not be the referee over who's at fault."

Cost-saving illusions

While most outsourcing deals are still done to save money, experts warn that the cost benefits can be illusory.

The fixed-price contract "is not real," said Rita Terdiman, a program director at Gartner Group. "There are indexed prices, pass-through services like telecommunications costs and even state taxes and incremental charges above the baseline."

Such add-on charges can dramatically increase the price of a contract but are rarely given much heed in negotiations, she said. "Outsourcing vendors would like to rush you through contract negotiations."

In contrast, internal IS departments can often compete successfully against outsourcers, particularly in large companies. Cost benefits are illusory because the outsourcer has to make a 15% profit on the contract.

As a result, "the average outsourcer has to charge you 30% over the cost of their service," says Dale Kutnick, president of Meta Group. Terdiman estimated vendor overhead to be roughly 40% and urged users to put together a competitive bid. — *Paul Gillin*

Executive Track

Mark T. Hogan, 41, formerly executive director of North American operations planning and corporate information management at **General Motors Corp.**, has been appointed president and managing director of **General Motors do Brasil, SA**. He succeeds **G. Richard Wagoner Jr.**, 39, who has been named executive vice president and chief financial officer at GM.

Herbert Moeller, formerly vice president of corporate information technology at **Gillette Corp.**, has been promoted to vice president of finance at the Boston-based company's North Atlantic division. Newly installed at Moeller's former post is **Patrick Zilvitis**.

Georgia-Pacific Corp. has named 25-year information systems veteran **Carl Wilson** to head its IS operations as vice president of information resources. Wilson joined the Atlanta-based firm from **Grand Metropolitan PLC, Pillsbury Co.** where he has served since 1984, most recently as senior vice president of IS.

Nicholas D'Agostino III, 30, is the new vice president of management information systems, design and construction at **D'Agostino Supermarkets, Inc.** in New Rochelle, N.Y. D'Agostino fomerly served as the firm's corporate director of systems.

Bethpage, N.Y.-based **Grumman Corp.** has a new senior vice president of strategic and technology planning: **Jacob Bussolini**, 56. Bussolini formerly served the aerospace and information services firm as vice president of strategic planning.

In Stuart, Fla., **Robert L. Kay** is newly in office as director of information systems at the **Martin County Board of Commissioners**. Kay, who pioneered a similar position for the city of San Antonio in 1981, replaces **Victor Ferreros**, who is now IS director at the **Palm Beach County Board of Commissioners** in Palm Beach, Fla.

Calendar

JAN. 10 - JAN. 16

Software User Documentation: Designing for Usability. Orlando, Fla., Jan. 11-12 — Contact: Digital Equipment Corp., Marlboro, Mass. (508) 467-6910.

Electric West '93. San Diego, Jan. 12-14 — Contact: The Fairfield Factor, Inc., Brookfield, Conn. (203) 775-0422.

Redundant Arrays of Inexpensive Disks Advisory Board Meeting. Sunnyvale, Calif., Jan. 13 — Contact: Joe Molina, Technology Forums, Lino Lakes, Minn. (612) 704-2379.

JAN. 17 - JAN. 23

Retailing 1993: A Turning Point. New York, Jan. 17-20 — Contact: Retail Services Division, New York, N.Y. (212) 244-8780.

The Canadian Software Re-engineering and Maintenance Conference. Toronto, Jan. 19-21 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Outsourcing Conference '93. Dallas, Jan. 22-23 — Contact: Frost & Sullivan International, New York, N.Y. (212) 233-1080.

JAN. 24 - JAN. 30

Marketing the IS Organization Internally. Atlanta, Jan. 26-27 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

JAN. 31 - FEB. 6

Downsizing Corporate Information Systems Conference. London, Feb. 1-2 — Contact: Amanda Stuart, IBC Technical Services Ltd., London, England 011-071-637-4383.

Object World. Boston, Feb. 1-4 — Contact: Lynn Fullerton, World Expo Corp., Framingham, Mass. (508) 879-6700.

Image World West. San Jose, Calif., Feb. 1-5 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Comnet. Washington, D.C., Feb. 2-4 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

For technology-dependent U.S. companies, operating in the former country of East Germany is

BUSINESS AS (un)USUAL

STEVE RUSSARAVE

By Liselotte H. Davis

"During the formative months after the Wall came down," says one Chrysler Automotive Services GmbH employee working in the former East Germany, "trying to reach the home office [in the U.S.] for decisions was difficult." To say the least: Chrysler had no direct dialing for international calls, instead having to register calls with an operator and wait for them to go through, which could take up to eight hours.

Furthermore, poor line quality rendered faxes all but useless. "You used portable phones and operated the office out of the back of a car," the Chrysler staff member says.

At General Motors Corp.'s Adam Opel AG auto factory in Eisenach, Germany, electrical outages have repeatedly shut down computer-controlled chassis assembly line robots, disrupting production.

Stories like these have come in from U.S. companies doing business in the former German Democratic Republic (GDR), which was reunified with the west on Oct. 3, 1990. They have experienced overburdened phone lines, telecommunications network difficulties, disrupted power and other infrastructure and utility problems that have wreaked havoc on voice and data processing. Such problems are the legacy of East Germany's 40 years of Communist rule and a basic infrastructure built in the 1930s.

So why do U.S. corporations such as Chrysler Corp., GM, The Coca-Cola Co., R. J. Reynolds Tobacco Co. and Otis Elevator, Inc. continue to set up branches in the former GDR, and why do their information systems managers cope with the headaches?

Because the advantages of accessing Germany's market of 16 million consumers (not to mention the European Community's megamarket of 377 million consumers) may outweigh the difficulties. The German government, whose objective is to rebuild eastern Germany, is offering substantial investment allowances and incentives to attract and assist investors.

At least 35 U.S. firms have decided to put in stakes in eastern Germany, investing approximately $1.7 billion to purchase existing sites or to set up joint ventures in the country, according to September 1992 figures published by Treuhandanstalt, an organization in charge of privatizing all formerly state-owned enterprises. Dozens more have set up business without Treuhandanstalt's involvement.

Some U.S. companies are already seeing a return on their investment. Sales at Otis Elevator's East German operations increased by 15% in 1991. Sales at R. J. Reynolds Tobacco

Former East Germany, *page 56*

Davis recently returned from a year in Germany as a Fulbright Fellow. She is currently a technology management consultant in Baltimore.

Going overboard

East German firms have had their own share of system headaches after reunification. A number of large East German firms, thrilled to finally gain legal access to embargoed Western technology, made inappropriate hardware and software purchases, buying large mainframes and expensive modularized financial application systems. These purchases were inappropriate because they were based on the size of the company at the time the embargo laws changed. Most companies have since downsized and restructured and now have more computer capacity than they need or can afford.

Continued from page 55

GmbH jumped by 19% that same year. Coca-Cola GmbH expects to reach sales of $1 billion in eastern Germany by 1993. GM's Adam Opel has sold more than 130,000 cars there to date.

Because of the unique business climate in the former GDR, however, many of these companies have had to come up with workarounds to ensure smooth operations. But things are slowly getting better: the country is updating its telecom network and infrastructure, companies are going for downsized systems in a big way, and there is a lot of talent in the IS ranks.

Here's what an IS manager in the former GDR must deal with:

The no-dependable-service situation

Imagine what it would mean for a company in the U.S. not to be able to get a phone connection for three months. Imagine having to adjust fax machines to transmit at 50% of normal speed or risk garbled and unreadable data.

Welcome to the former East Germany, with a backlog in 1989 of 1.2 million applications for phone service and where three-month phone setup time is currently the norm.

The former GDR's telecom infrastructure harkens back to World War II, after which the Communists severed phone connections to the West. In fact, in 1989, almost 70% of the existing network was based on switch mechanical technology developed in the 1920s. Network capacity was poor; the switch was tied up not only for setting up the call but also for the duration of the call. Furthermore, the copper lines — 60-plus years old — were corroding.

Sufficient, dependable telecom service is still unavailable everywhere in eastern Germany, even though an initiative is under way to revamp the telecom network by 1995. Called Telekom 2000 and approved in May 1989, the idea is to replace copper cable with fiber-optic, expand network capacity and make available Integrated Services Digital Network capabilities (see story page 58).

Because of the current limited number of lines, U.S. companies have had to work around the overburdened system, including using delivery services, to move their information. Nascent cellular networks and satellite systems in eastern Germany promise other ways of bypassing the outdated phone network.

R. J. Reynolds Tobacco GmbH and Coca-Cola GmbH, for instance, used couriers to carry documents and disks from east to west instead of faxing, transmitting or even using the phone to exchange information. In fact, through July 1991, Coca-Cola GmbH spent approximately $50,000 on couriers to send disks and financial information to its central processing site in Essen or one of its other 15 branch offices in Germany. At the time, it had a total of only 12 ingoing and outgoing lines from Berlin (it now has 60) to deal with its 5,000 to 7,000 customers.

Adam Opel AG "employees drove hours over the [former] border to reach a [western German] telephone" because of limited international lines in the east, according to a spokesman for GM's German subsidiary.

To deal with the limited number of lines between eastern and western Germany, Adam Opel used its own operators to route calls from Eisenach in the east through Zurich to Russelsheim in the west.

Mode of choice

Portable phones have become the workaround of choice for many companies, so much so that most list their portables' phone numbers in the telephone directory.

At Otis Elevator GmbH, for instance, it was not unusual, in the months after reunification, for employees to make as many as 50 unsuccessful attempts to reach a potential customer or business partner. Assuming that customers were having as much trouble reaching it, Otis provided portable phones to employees to supplement the office telephone network.

In this way, it could reach its maintenance workers on the road, it could ensure the availability of its 24-hour service line, and it could enable communications among employees in the same building.

Because of the large number of firms using portable phones, the current analog-based network, C-NETZ (which was "imported" from western Germany) has nearly reached its capacity of 600,000 users. In fact, users are starting to experience some of the same problems that drove them to portable phones in the first place: during peak hours (weekdays from 8 a.m. to 6 p.m.), C-NETZ users have to wait to make a call.

To alleviate the situation, Telekom, the German Post Office's telecommunications division, which oversees C-NETZ as well as the regular phone system, is expanding the network to 800,000 participants by the end of 1993.

However, for U.S. companies looking for easier access, better line quality and an international reach, the advent of digital cellular systems in the former GDR holds more promise.

Two new digital, wideband networks — D1-NETZ and D2 Privat — will likely provide more reliable connections, increased capacity and better transmission quality than C-NETZ. The equipment is also less expensive — although still very high by U.S. standards. Prices for *each* mobile phone, including setup, range from $1,415 to $2,625 for cellular vs. $2,500 to $4,375 for analog. The new networks also adhere to the Global System of Mobile Communication standards, which enable portable phone use throughout Europe.

Most of the current C-NETZ customers say they intend to upgrade to the digital networks as soon as the systems provide complete area coverage. Currently, D1-NETZ provides roughly 60% area coverage for 80% of the people. By the end of 1993, it will have 92% area coverage for 97% of the people.

New portable telephones allowing for data transmission are expected to be available in 1993, further expanding services to include file transfer and fax transmission.

Costly but consistent

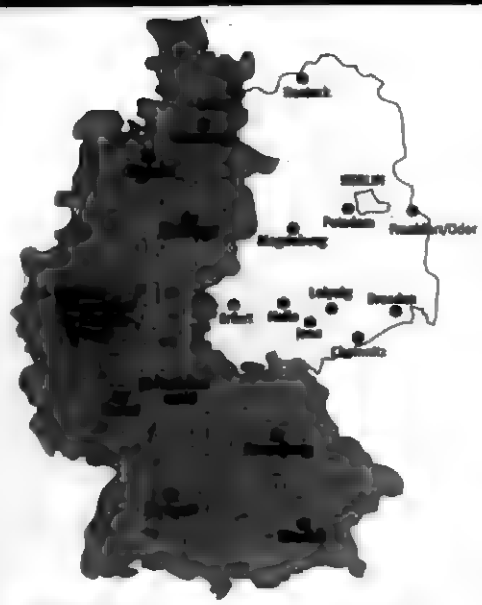
Certain U.S. firms, such as Coca-Cola GmbH and Citibank AG, have opted for satellite systems to ensure consistency in data and voice transmission quality and service, though this tends to be an expensive alternative to the regular phone network. Coca-Cola GmbH spent about $125,000 to install its satellite system to transmit financial information to its main office in Essen.

Aside from the cost of installing transmission equipment, usage charges are high. The charges for the Telekom's VSAT David satellite network depend on transmission capacity and the number of client stations. For example, the monthly charge for a client that has 50 stations in Europe is approximately $47,500 for 9.6K bit/sec. speed and $85,000 for 64K bit/sec. speed. Telekom's point-to-point satellite connection, FVSAT, costs approximately $8,440 per month for 64K bit/sec. and $13,125 for 128K bit/sec.

Citibank AG estimates that the need to use satellites within the former East Germany increased its

Former East Germany, *page 58*

The new Germany



The former German Democratic Republic
The former German Federal Republic

User profile

German users have a positive attitude toward learning new technology, with about 50% of them experienced in using computers, according to Mr. Roesser, an IS manager at Coca-Cola GmbH.

It could be (and was) worse

Before unification, environments were a hodgepodge

If you think IS departments have it hard today in the former GDR, think again. During the Communist era, systems environments were a mishmash of systems that German companies had to figure out how to integrate.

Before reunification, East Germany operated under a centrally planned economy. The typical East German firm (Kombinat or industrial group) was heavily focused on production and research and development. Because obtaining raw materials could be difficult, companies developed substitutions without regard to cost or time. Bringing products to market could take up to 10 or 15 years.

During this time, the primary hardware manufacturer was Robotron, a large Kombinat comprised of at least 20 different companies. System components were manufactured in different East bloc countries. The result was a hodgepodge of equipment from different countries such as Hungary, Yugoslavia or the former Soviet Union. The products were typically unreliable. In fact, after installation, units were left open so that staff members could easily access faulty components.

Before reunification, the systems environment consisted of a mix of architectures from the 1960s, '70s and '80s: VM knockoffs running on IBM 370-type machines with a few Intel Corp. 8086 PC knockoffs in the background. For instance, in 1985 Robotron produced an IBM 370 equivalent that became popular because it had the IBM documentation.

Robotron also created a minicomputer in 1989 that it patterned after the Digital Equipment Corp. VAX 11/780. While considered "modern" by East German standards, the VAX clone was based on a U.S. machine DEC stopped making in 1982.

From another Kombinat came the P 8000 minicomputer, which ran Unix, according to Bernd Michael Paschke, data processing manager at the Institut fuer Krankenhaushygiene at the Charite — Humboldt Universitaet.

Western computers were scarce because East Germany was under a technology embargo as a Communist country. Even though Robotron produced 10,000 machines a year, many were traded or sold to other Communist countries.

Companies had no logical systems procurement plan; they took what they could get. Because of this haphazard planning and mix of foreign systems, technical people became very adept at jury-rigging computer connections.

Despite the embargo, however, some East German firms and government agencies got Western technology illegally. Favorite targets included DEC VAX or IBM machines. Units almost always came without the accompanying user manual. Beautifully bound copies of scarce documentation still exist in the former GDR. •

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Continued from page 56

telecommunications costs by as much as 500%.

But for most firms, this is the cost of doing business in what could turn out to be a lucrative market.

The systems story

Because of telecom infrastructure problems and the high cost of space and building renovations, most U.S. firms in the former GDR tend to set up small branch offices that do little or no central processing. The typical systems function is data entry, with central processing handled by a major division in West Germany or another part of Europe. The central processing site would typically send information on to the U.S.

In many instances, companies have in place redundant manual procedures in case something goes wrong. Because their primary function is to access and transmit data, the eastern German sites are the essence of downsized operations — 386-based PCs running Microsoft Corp.'s Windows and combined into PC networks, typically from Novell, Inc.

Oftentimes, the microcomputer networks are coupled with midrange computers such as IBM's Application System/400. For instance, Adam Opel AG has a minicomputer to convert data that its dealers transmit via PC networks (some bigger dealers use minicomputers). Adam Opel's minicomputer then uploads the information to the company's mainframe in Russelheim in the west.

The emphasis for U.S. companies in the former GDR is low cost and ease of use so they can move quickly and cheaply into the emerging market; PCs are easier to bring on-line than bigger machines. To reduce expenditures and training time further, many U.S. companies bring over their in-house applications software. This also ensures worldwide standardization.

These lean, mean and modern operations, however, are a recent phenomenon. U.S. companies that took over existing firms, for instance, found few computer systems in place. Where systems did exist, they were outdated, incompatible or not cost-efficient (see story page 56).

Restrictions on technology imports to the former Communist country kept state-of-the-art systems from making their way east until reunification in October 1990.

For instance, Otis GmbH, which inked 13 partnerships with existing elevator maintenance firms in the East, found almost no computers in use at its sites. Even the typewriters dated from before World War II. Otis has since brought over equipment from West Germany, including PCs, copiers and typewriters.

Before restrictions were lifted, Coca-Cola GmbH's East German facilities were outfitted with IBM System/36-type machines. By 1991, changes were happening quickly. The company put an AS/400 into its main office in what had formerly been East Germany. During a six-month period in 1992, the IS staff converted 15 branch offices to either AS/400s or intelligent controllers. The voice and data communications system was a mix of satellites, portable phones and fiber-optic cable. Laying the cable had to be arranged through a private contractor.

Today, GM, which is one of the largest investors in the former GDR, has several hundred PCs, tied into a local-area network, at its Adam Opel GmbH factory in Eisenach.

More talkative

In 1989, the number of telephones in East Germany was 11 per 100 people; in the U.S., that ratio was 51 to 100. The German ratio is likely to get better. During 1991, Telekom installed in eastern Germany 555,252 telephone connections, including 152,903 for business customers. It set up 11,824 public telephones and 6,326 new data connections. More than 600,000 telephone connections will be installed in 1992, and 800,000 are planned for 1993.

The lowdown on staff

IS staff members in German divisions of U.S. companies are almost exclusively German-speaking. According to U.S. companies, systems people are knowledgeable and highly motivated, but they do require a lot of training.

IS staffers also tend to be integration specialists; more often than not they've had to tie together a hodgepodge of equipment from countries such as Hungary, Yugoslavia or the former Soviet Union. According to IBM, which has sites in the country, East German workers know the nuts and bolts of hardware and software better than their western German counterparts.

Where the Germans are lacking is on the "soft side" of systems knowledge — project management and system development methodologies, especially requirements definition and analysis, according to Coca-Cola GmbH managers. U.S. companies must provide guidance in strategic planning and management.

For some workers, English courses may be necessary so that they can work on in-house software developed in the U.S. and written with English commands. U.S. companies in the former GDR say they do a lot of on-the-job training. A common practice is to bring in experienced employees to help with the initial setup and conduct intensive in-house courses to familiarize employees with technology and procedures. Otis Elevator GmbH, for instance, has a two-person help desk staff in West Germany to answer inquiries and go on-site in the east if needed.

All this training is expensive. However, the investment is partially offset by the current wage differential. East German workers earn approximately 60% to 70% of what their western German counterparts earn.

Setting up a business in East Germany is certainly not a breeze. It requires time, patience, a sense of humor, innovative solutions to the challenges encountered and the willingness to invest for the long term.

U.S. companies must be patient while the Germans rebuild the necessary infrastructure and while the German work force familiarizes itself with new technology and concepts. As the Germans say, "Es geht, man muss es nur wollen." Loosely translated: "Where there's a will, there's a way." •

Don't say we didn't warn you

If your company is planning to expand its business into the former East Germany, here are some technology tips to keep in mind:

- If your company takes over an existing site, prepare for a lot of facilities management activities. Approach the situation as if dealing with new construction.

You will probably have to arrange for the installation of an entire telecommunication network. Coca-Cola GmbH, which took over a site in Berlin, not only needed to expand its regular telephone network but also hired a private contractor to install a high-speed transmission line using fiber-optic cable to connect two Application System/400 facilities in Berlin.

- Expect to innovate, especially if your site is outside a large city. The primary challenge will be how to work around the current outdated telecommunications infrastructure.
- When hiring IS staff, be prepared to spend time retraining employees in new technology. For example, Coca-Cola GmbH used a "snowballing concept" during its System/36-to-AS/400 conversions.

Experienced employees who are familiar with the technology did the initial conversions, with new employees participating at increasing levels as they became more familiar with the technology.

- Expect to provide strategic planning and management activities because staff has little experience in these areas.
- Take project time estimates and double them, especially for installation activities. Everything, from material delivery to telephone service connections, will take longer than you expect.
- Keep in mind and include in systems planning the fact that in one to two years, eastern Germany will have an extremely modern telecom network and services.

From bleeding to leading edge

While the telecom infrastructure in the former East Germany is outdated today, in the next few years it will become one of the most modern in the world, if all goes as planned.

During the next five years, Telekom is planning to invest $37.5 billion in the Telekom 2000 project. According to Wolf Reiner Menzel, Telekom's department manager responsible for customer interfacing, the project should be complete in 1995 — two years earlier than planned.

Currently, Telekom is installing fiber-optic digital technology, not just at nodes but to the home. By the end of 1993, more than 200,000 private homes will be connected to the new technology. The network will enable use of Telekom's Integrated Services

Two of Telekom's public phone booths in Berline, 11,824 of which the organization set up in 1991. Berline Cathedral and the TV tower at Alexanderplatz are in the background.

Digital Network system, which allows voice, text, video and data to be transmitted over one connection.

For its part, the D2 Privat cellular network will eventually become part of a network linking Europe, Asia and South America. When further enhanced, D2 Privat will serve as a personal communications network and become the basis for a new concept in telecommunications: the universal wireless phone. The resulting telephone service will be one of the most modern in the world.

Computer Careers

Make yourself too valuable to lay off

By Alice Bredin

THE RUMOR AT your medium-size bank is that layoffs are imminent, and you're on pins and needles wondering who will be let go. You're thinking, "Did I work hard enough? Am I as technically savvy as I should be? Should I have gotten that certification?"

Is there anything an information systems employee can do to become indispensable — or at least less likely to be laid off?

Employment experts and managers say "yes." IS employees who aggressively pursue projects at work, continually educate themselves and remain open to new technologies are the most likely to be spared when layoffs occur, they say.

One key to ensuring job security is to ask yourself what you can do to become a more valuable employee. In the IS field, this often means obtaining additional technical education, but it can also mean taking the initiative to get along better with co-workers or pursuing extra projects.

Managers say they tend to keep employees who exhibit a desire to continually improve themselves. "A lot of people do only what they need to [do to] get by, and that results in turnover," says Mary Boyko, an IS manager at Amco Corp., a Chicago-based manufacturer of wire shelving, storage materials and housewares.

On the boss' terms

But sometimes, employees who try to improve themselves make the mistake of doing it on their terms instead of their bosses' terms. "They'll say, 'I want to be trained in Unix,' but the company may not need you to learn Unix; in that case, it won't make you more valuable," says Steve McMahan, managing director at Source EDP in Boston, a placement firm specializing in software and data processing.

Many employee placement experts also say managers appreciate employees who want to give something back to the company. Once you have learned new technical skills, for example, it is important to share your information because that indicates you are a team player.

But don't play for the company at your expense.

Now that companies are going out of business and technologies are becoming obsolete, advisers say you must make sure you don't become obsolete along with them.

"Let's say you work at DEC and you are a VMS person. That is someone who should have been saying to themselves, 'Can I get into a Unix project internally?' " McMahan says. "Make sure your boss knows your goals as well by telling him or her you are concerned about being exclusively VMS and asking how you can diversify."

Resisting new technologies can also be grounds for layoffs, and Boyko says she witnesses this problem a lot.

"People aren't openly accepting CASE," she says. "People have a lot of excuses for not using it, like 'I can do it faster without it.' " This type of attitude leads to a great deal of turnover because Boyko is looking for employees who want to grow, she says.

Boyko encourages staff members to approach her and ask for information on how to learn more. But she says when she makes efforts to educate people with gestures such as cutting out magazine and newspaper articles, those articles often end up in the circular file.

"A lot of people just do what's necessary," she says. "It's like making a strawberry sundae and not putting the cherry on top because you don't want to make the effort to get on the step ladder and get the cherry out of the cupboard."

Bredin is a free-lance writer based in New York.

No job is guaranteed

If you think your manager's seat is secure, guess again. As more and more companies hire third parties or consultants, managers can become dispensable. An outsider can easily tell a company that he can do a better job than the IS department. If a manager wants to keep his job, he needs to explain why his department's activities make sense.

The first step for managers is to be active and involved in the downsizing process. If a consultant is brought in to lead downsizing efforts, the manager should express his interest in being involved in the decision-making.

"People are going to come in and tell a company that they can do something much more cheaply," says Jim Paul, a Pittsburgh-based consultant and president of Northtec consulting group. "A manager needs to be familiar with new technology and say, 'We are using that technology in this situation, but it would not work for all of our functions.' "

Paul recommends starting pilot projects with new technology and knowing where existing technology will still work. "If a person loses a job, it can be because an outsider comes in and says the company should be moving to a new technology. If a manager doesn't refute this, the manager looks bad."

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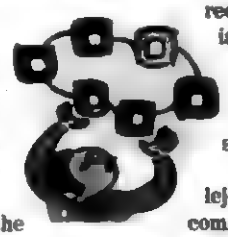
Job close-up

Network planners/architects: Directing a company's future

By Leslie Goff

Network planners/architects are not yet a standard part of the information systems ranks, but their numbers are growing. Manufacturing, which increasingly involves the integration of factory-floor, design and business applications, is expected to be a boom area for these positions.



Long stranded outside management ranks, programmers and systems analysts — with an allegiance to using new technologies to distribute data and applications throughout the organization — now have a position custom-tailored for their skills.

Network planners/architects report to the chief information officer or sometimes the vice president just below the CIO. Their titles vary — manager of strategic communications, manager of data and network planning and operations, manager of architecture and planning — but they basically hold a mid- to high-level IS management post and are responsible for strategic network planning and design.

Financial services is also expected to spawn many opportunities, as are other industries with a very high need for cross-department information sharing. Anywhere there's a "need to pass information to different types of operations throughout the company, that's where the challenge is," says Bruce Boyle, manager of architecture and planning at the Commercial Flight Systems division of Honeywell, Inc. in Phoenix.

Because network planners/architects oversee a company's effort to distribute information, the position requires high-level familiarity with telecommunications, systems design and analysis and PC programming and support.

For example, Cesar Vallejos, manager of strategic communications at Sea-Land Service, Inc., an international shipping firm in Elizabeth, N.J., oversees the planning, design and operation of a network of 168 offices in 114 ports in some 70 countries. He is spearheading a conversion from mainframe-based transaction processing to a client/server architecture.

Double trouble

Boyle says he would look for two basic qualities in a network planner: "a really strong technical understanding of communications and PCs and a good grounding in traditional IS practices. You don't often find the two together."

Moreover, because the position is responsible for establishing a long-term, strategic plan for the corporate network and the services to be delivered on the network, you must be able to keep up with the latest technology developments. This can prove difficult as you acquire more overall management responsibility, Vallejos says.

But, being on the leading edge is what draws people to the job.

David Kellenberger, supervisor of network planning and design at the Public Service Co. of Colorado, an electric and gas utility in Denver, manages a staff of five that is responsible for transmitting critical data, voice and video and imaging information to field and office workers over the fiber-optic corporate telecommunications network.

Boyle is setting his company's technology direction for the next five years and coordinating applications development and user support for consistency with corporate goals.

"This is a highly visible position," says Stan Perkins, manager of data and network planning and operations at United Telephone-Northwest in Hood River, Ore. "It's very important to the direction of the company in delivering data services internally."

"Coordinating the resources to move us into a more efficient company through the traditional MIS environment" is what Perkins says he finds appealing. "It's having the flexibility of being able to look at all the different parts of IS to create a solution, an answer to a problem."

Network planners/architects

SALARY: $45,000 to $65,000+, depending on location and experience.

EXPERIENCE: Five to 10 years of systems analysis, design and implementation with an emphasis on telecommunications; technical support; PC support and programming; and a good foundation in traditional IS practices.

EDUCATION: A degree in electrical engineering or information technology with an emphasis on communications; MBA recommended. Or, experience level equivalent to a degree program.

SKILLS: Ability to stay at the forefront of technology, envision the future direction of your company, analyze and solve complex problems and work closely with business to establish information technology needs.

Different degrees

A particular academic degree is not required, but Kellenberger and Vallejos, who are engineers, recommend a degree in electrical engineering followed by a series of networking-related positions such as technician, programmer and systems analyst.

"The methodology used in training an engineer is often required in studying, planning or analyzing networks," Vallejos says.

An MBA can also complement a technical background, Kellenberger says.

The right experience, however, is key to landing a network planner/architect position because most companies are recruiting from within and are not combing the university landscape for candidates.

In fact, Robin Wells, network coordinator at the National Grange Mutual Insurance Co. in Keene, N.H., parlayed his research and development and factory-floor experience at McDonnell-Douglas, Honeywell and Motorola, Inc. into his current position — his first in IS.

"It helped me that I came out of R&D. I was used to dealing with new technology," Wells says.

The position also offers room for growth. A network planner/architect could move into a divisional vice president post or a CIO position, as well as enter the telecommunications field through a start-up business or by joining an established company.

Goff is a New York-based free-lance writer.

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Because of our long-term recruitment success, we continue to place 100% of our national media advertising in one publication. Computerworld.

-Stephen J. Kukoy
President
National Computer Associates

Stephen J. Kukoy is not only President of National Computer Associates, but also President of Abacus Consultants, Inc. in Denver. Having been in the recruitment business for nearly 15 years, he knows the critical role advertising plays in finding the best qualified professionals. He also knows where his recruitment advertising dollars are best spent.

Founded in 1971, National Computer Associates (NCA) is an exclusive group of private firms dedicated to importing and exporting computer personnel on a national basis. With an active membership of 30 firms throughout the United States, Great Britain, Canada, and Australia, NCA is virtually a network of "branch offices" working together to place the best qualified IS professionals in the right jobs. Today, NCA's aggressive growth and strategic market positioning make recruitment advertising more important than ever.

"Since *Computerworld* is the most respected professional newspaper for computer professionals, we believe it's our most direct means for reaching our entire target audience - programmers, systems, analysts, and IS directors ... operations, technical support, telecommunications, and PC professionals ... even vice presidents and presidents. And with its national reach, *Computerworld* is the perfect place to tell these IS professionals about how NCA, with its pooled resources and industry expertise, offers them a wider variety of jobs in more companies in just about every location.

"Because of our long-term recruitment success, we continue to place 100% of our national media advertising in one publication. *Computerworld.* Time after time, *Computerworld* produces top-calibre candidates - qualified professionals who are truly interested in keeping their careers abreast of the industry's rapid changes and trends.

"Looking ahead, we expect several factors to escalate our recruitment advertising needs - the growing demand by clients for greater selectivity, an increasingly specialized industry, a continually mobile marketplace, and NCA's expansion into the lucrative European marketplace. As this all happens, we intend to increase our advertising budget in *Computerworld* proportionately.

"*Computerworld* recruitment advertising has been equally successful for Abacus Consultants. Although we've experienced many such situations, one specific instance comes to mind. After local advertising proved unsuccessful for finding a particularly hard-to-find individual in the Denver area, the client gave us the go-ahead to advertise nationally. We ran one recruitment advertisement in *Computerworld* - and got an instant response from just the candidate we were looking for - right here in our local area. It just goes to show that *Computerworld* delivers far better candidates than any other source.

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Stephen J. Kukoy. For all the facts on how *Computerworld* can put you in touch with qualified computer professionals, call John Corrigan, Vice-President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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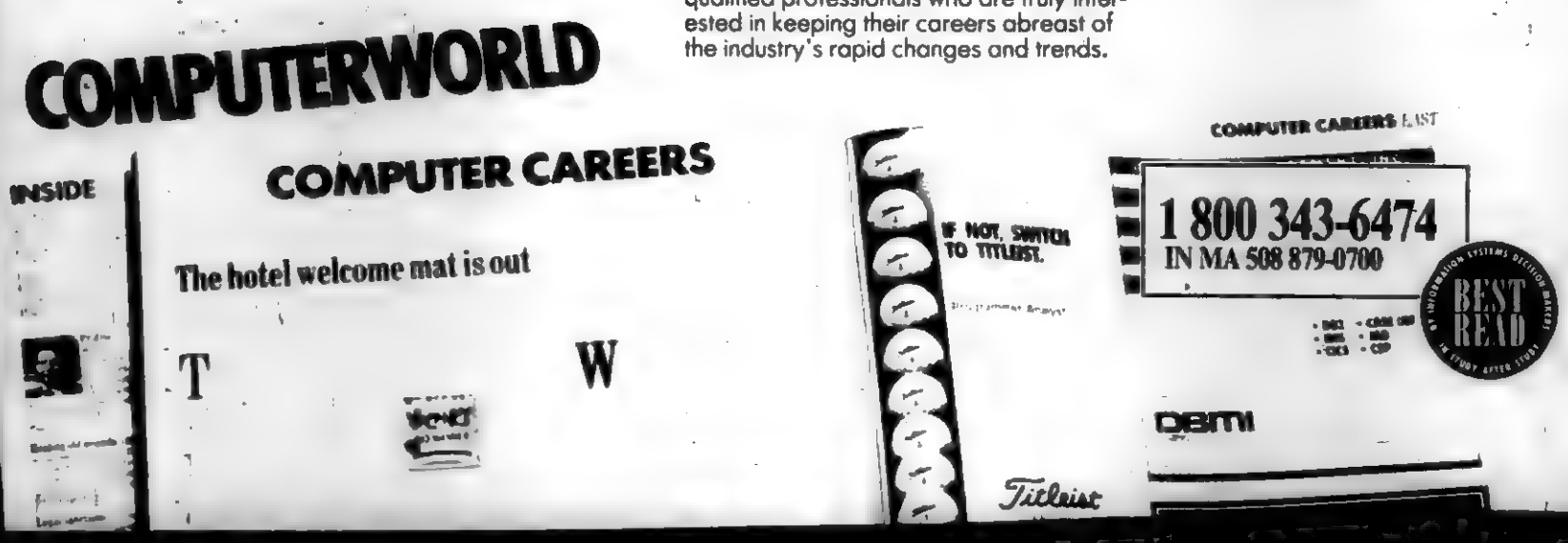

Midwest

Computer Specialist: Software programming modification and documentation for accounting package to meet industry needs and requirements. Must understand COBOL programming language, VMS operating system, and accounting. Assist in setup and transmission of data through EDI communications. Work with system manager in hardware maintenance and backup procedures. Maintenance and updating of Micro/Vax/VMS operating system. Train and support in-house program users. Minimum requirement: B.S. in computer science, two year's experience in COBOL and system administration of MicroVax 3500. Knowledge in network communication and accounting is a definite plus. 40 Hrs./Wk., $31,000/Yr. Must have proof of legal authority to work in the United States. Send your resumes to Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, Nebraska, 68509. Refer to Job Order NE 0072144. This advertisement is paid for by the employer.

Proposal manager for computer design and manufacturing company. Duties include responsibility for preparing proposals for sales of specialized computers, after-sale contract (both commercial and governmental, national and international). Work closely with and coordinate input from all relevant departments. Prepare precontract information, and bids and proposals. Analyze incoming contracts and interface with customers. Work with technical advisors and product marketing to assist order entry. Develop systems and procures to enhance proposals and sales order management. Requires three years of study in mechanical engineering, computer science or computer engineering, and also requires five years experience in the job offered or in technical sales support to include preparation of proposals. Salary is $48,000.00 per year. Hours are from 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, Michigan 48202. Ref. #73992. Employer paid ad.

Data Processing Manager

Supervises data processing activities. Performs book-up, cabling and ensures the system/users remains functional; system analysis, design, development and maintenance of software, including writing, testing, documenting, implementing and maintaining applications and systems programs. Ability to write in COBOL, prefer knowledge of RPGII; must have hands-on experience and training in operating and managing an AS/400 and LAN system. Requires degree and three years relevant experience, preferably in an insurance environment. Position located in Austin, Texas. Minimum starting salary $4079 per month with excellent benefits. Send resume to DP Manager, Texas Municipal League Intergovernmental Risk Pool, 211 E. 7th St., Suite 300, Austin, Texas 78701.

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SOFTWARE ENGINEER(II) (EL PASO, TX) - Development of gas industry software systems for plant thermal reduction calculation, liquid allocation, scheduling, public issue and revenue accounting data exchange, using COBOL and PACE database under VS operating system. Reqd.: 2 yrs. exp. in job offered. 40 hrs./wk., M-F, 9-5, $39,000/yr. Apply at the Texas Employment Commission, El Paso, Texas, J.O. #9867843 or send resume to the Texas Employment Commission, TEC Bldg., 101 East 15th St., Austin, TX 78778, J.O. # 9867843. Ad paid by an equal employment opportunity employer.

Systems Analyst. Administrate UNIX Operating System, technical support for clients, system level C language programming. Feasibility studies for proposed voice and fax response applications, develop and maintain these applications. Install and configure Datalogic hardware and software. Create voice response applications using AT&T Script Builder. Bachelor of Mathematics/Computer Science plus 6 months of experience in job. $30,000.00 per/year, 40 hours/week. *Must have proof of legal authority to work in the United States. Send your resume to Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, Nebraska 68509. Refer to Job Order NE 0072143. This advertisement is paid for by the employer.*

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SYSTEMS ENGINEER wanted. Duties: Analyzing the requirement for systems interface among hardware (h/w) & software (s/w) components of an auto diagnostic system &/or diagnostic functions within that sys; determining the optimum s/w interfacing strategy to expedite elec data processing for that system; designing computer h/w & s/w &/or modifying existing h/w & s/w to implement the determined interfacing strategy utilizing knowledge of elec systems & data processing principles & equip.; developing necessary sys components incl., but not limited to, GUI window appl. in C, h/w interface, data acquisition of analog & digital signals, transformation of raw values to engg. values, data comm., database mgmt, art. intelligence & Expert Systems. Need Master's in Computer Sc., Bachelor's in Computer Engg. or Elec Engg w/computer engg. option or concentrating in computer engg. and 6 mos exp in the job offered or as an Analyst/Programmer. Must have 1 grad crs in each of the following: adv. computer arch.; operating systems; computer networks; logic design methodologies; art. intelligence, & large database mgmt. The related exp must include system development for auto appls. Must have 1 undr crs in which each of the following were studied: computer graphics & GUI design, development w/window appl in C, elec circuit design and computer interface. Pay is $36,988. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #74182. Employer Paid Ad

Programmer Analyst: Designs, develops, programs, analyzes, tests, and debugs relational databases used by financial publisher to analyze comparative performances of various mutual funds. Programs and analyzes systems to insure that database is in conformance with entire computer systems design and is properly integrated. Uses Foxpro programming language along with SQL and appropriate power tools. Installs MAC Networks and performs troubleshooting of networks. Uses C and C++ in performance of duties. Requires Master's degree in Computer Science. Also requires one year and six months experience in the job to be performed or one year and six months experience as a Programmer II experience in related occupation, entire experience must include programming of databases used by financial publisher for analysis of various mutual funds using Foxpro, SQL, C++, and Fourth Generation language. Education to include completion of one course in each of the following: Concurrent Programming, Systems Programming, and, Database Organization. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $36,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Joan Sykstus, Ref #V-L 6369-S, No Calls. 2 copies of your resume required. An Employer Paid Ad.

Scientific Computer Programmer: 40 hrs/wk; 9 a.m.-5 p.m., $1670/month. Installation, maintenance and user support of various MVS/PC software packages, including SAS, SUDAAN, SAS-SCRIPT, BMDP, Fortran. Teach short courses to academic community including job control languages, supercomputing, SAS and INTERNET. Must have a B.S. in Computer Science and 1 yr. experience in job offered or as programmer analyst. Must have taken a course in Fortran, Assembly language, COBOL, UNIX, Local Networks, and Database System. Must have at least 3 mos. experience with CASE tools. Must have proof of legal authority to work permanently in the United States. Send resume to: Illinois Department of Employment Security, 401 S. State St., #3 South, Chicago, IL 60605. Attn: Gordon Dolber. Reference # V-IL 5863-G. 2 copies of your resume required. An Employer Paid Ad. NO CALLS.

COMPUTER CENTER DIRECTOR

Cameron County, Texas

Reports to Cameron County Commissioners Court. Responsible for managing county's computer center supervising programmers and analysts, developing new information systems, and providing user support for varied County functions and operations. Requires BS Degree in Computer Science, MIS, CIS or related field (Masters Degree preferred), five years supervisory experience, and three years experience in data programming and data systems. Salary based on qualifications. Send resume to Personnel Office, Cameron County Courthouse - Rm 420, 964 E. Harrison St., Brownsville, TX 78520 or call (210) 544-0827 for more information. Closing date 12-30-92.

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CPU

Looking for qualified computer professionals?

Look no further. More than 629,000 computer professionals read *Computerworld* every week. And you can reach all of them -- or just the ones in your region -- with a regional or national recruitment advertisement in *Computerworld's Computer Careers* section.

For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700); or call your local sales office listed below:

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NEW YORK: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662, Valerie Galbo, 201-587-0090

WASHINGTON, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031, Katie Kress, 703-573-4115

CHICAGO: 10400 West Higgins Road, Suite 300, Rose mont, IL 60018, Patricia Powers, 708-827-4433

LOS ANGELES: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, Barbara Murphy, 714-250-0164

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COMPUTERWORLD
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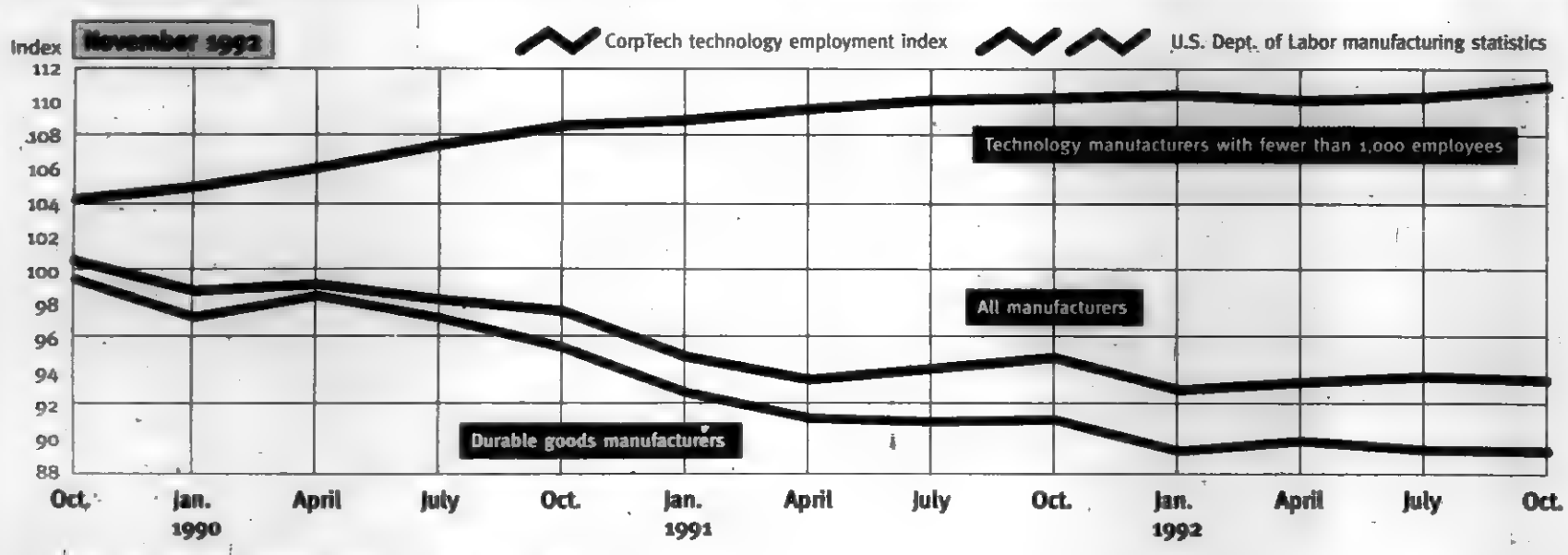
Computerworld/CorpTech Career Index

Technology manufacturers saw a slight uptick in their employee count during third-quarter 1992



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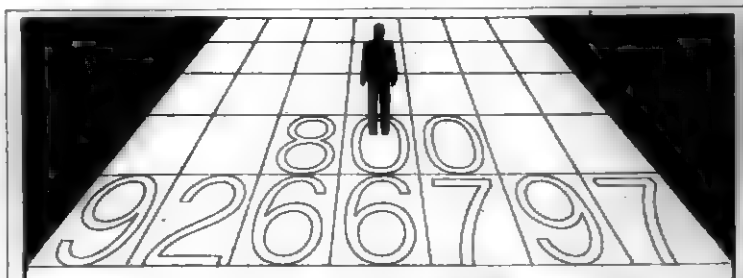

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National Computer Associates

SENIOR SOFTWARE ENGINEER - 40 hrs./wk., 8am-5pm, $46,500.00 per yr. To analyze, design and develop manufacturing, engineering and industrial computer application systems. Oversee conversion of "CLIPS" application from IMS to DB2: analyze requirements, design and develop conversion code in IMS/DC/DB2. Carry out integration, testing, performance tuning and change control coordination. Require Master's Degree in Computer, Electrical, Mechanical or Industrial Management Engineering, 3 years experience in job offered or 3 years experience as Programmer Analyst/Consultant. Must have experience with systems migration and with IBM 3090, SQL, DB2, IMS DB/DC, BTS, VSAM, COBOL and STRADIS methodology. "Employer paid ad". Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 90892.

Software Engineer - To do analysis, design and development of the Forms Administration application which is used for dynamic screen creation, using low-level X-window calls and XView to implement drag and drop functionality. To do design, development and maintenance of the Printer Management application using Sqlplus code to access the database over Sqlnet. Requires a Master's degree in Computer Science with experience in X-windows, XView, Motif applications on Sun, Tektronix workstations, Sequent and VAX/VMS minicomputers. Applicant must also have 2 years' experience in the job offered. 40 hours per week, (work schedule: 8:15 a.m. to 5:15 p.m.) Salary is $48,000 per year. Job is located in Jacksonville, Florida. Must have legal proof of legal authority to work in the United States. Send resumes to: Job Service Florida, 1307 N. Monroe Street, Tallahassee, Florida 32303. JO #0733292. E.O.E.

Software Engineer, 40 hrs./wk.; 8 am-5 pm; $40,000/yr. Job requires: Master's degree in Electrical Engineering or Computer Engineering and 9 months experience as a Research Engineer (on-campus employment acceptable). Job also reqs.: 1) Exp. must include 9 mos. exp. using UNIX, OS/2, & MS-DOS operating systems; 2) Exp. must include 9 mos. exp. using MATLAB, ACSL, or Matrix X, with C & FORTRAN interfacing; 3) Exp. must include 9 mos. exp. using control & embedded systems for automotive applications; & 4) 2 professional publications in control systems for automotive applications. Special reqs. 1), 2), & 3) may be met concurrently during the same 9-mo. period. Job duties: Evaluate engineering related contract announcements by government and/or industry. Perform feasibility study/analysis. Prepare proposals & contracts. Prepare technology capability demonstrations & project prototypes. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref. #87992. Employer Paid Ad.

HOGAN

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Top reasons to buy used: 1. Price. 2. Certain models have been discontinued. 3. Shortages of new systems from the manufacturer. This is common after a leading vendor makes a major price cut and can't keep up with demand.

Did you know? Approximately 20% of Fortune 1,000 firms purchase large CPUs in the used market, estimates Computer Economics.

Same system, lower price

By Alice LaPlante

When Debbie Colomb was searching for a system to replace her Digital Equipment Corp. MV 7800XP, her first move was to contact DEC for technical advice and a price quote. But she soon ruled out buying a new machine.

"I got a very strong impression that the vendor was just pushing new equipment in order to make quarterly quotas," says Colomb, senior vice president of information systems at VHA Long Term Care, a Memphis-based service bureau for nursing homes.

After calling a number of used-equipment vendors for price quotes, Colomb says she decided this was the route for her. "If you can get virtually the same equipment for just a quarter of the price, why would you buy new?"

VHA ended up buying a used MV 9600/2000 for $22,000 from BL Associates, Inc., a Boston-based used-equipment vendor. The same system, purchased new from DEC, would have cost more than $100,000. "It didn't seem like much of a decision," she says.

Many IS managers have discovered that price has helped the used market make enormous credibility gains.

"The used computer business has changed dramatically in the last 10 years," says Chuck Grimm, MIS manager at Amana Refrigeration Corp. in Amana, Iowa, who has purchased a large number of used systems. Vendors are more reputable and knowledgeable, he says.

Grimm purchased a used IBM 4381 mainframe for $70,000 (about one-fifth of the new price) to off-load processing from an overtaxed IBM mainframe. "This is a low-cost, interim solution so we can prolong the life of our 3090," he says. "Reliability? It really isn't an issue anymore," he adds. "Once a CPU is installed, your software loaded, and the system maintenance certified by the vendor, it's not likely to fail."

Another priority is service. "Can this dealer deliver the box when they say they can?" asks Michael Erbschlow, vice president of Computer Economics, a consulting firm in Carlsbad, Calif. "That's a real issue when you're putting in a major CPU."

IS chiefs say it pays to do your homework. When Robin Church, IS director at Formation, Inc., a peripherals subsystems manufacturer in Moorestown, N.J., was searching for a used computer vendor, his key concerns were the kinds of peripherals and options available and what system components had incompatibility problems. He eventually purchased an IBM 9375 for $8,000. "There is really no companion to buying used in terms of cost and effectiveness."

Prices are for Nov. 23, 1992, of some of the most active PC models on the used computer market that are still available new.

Machine	New street price	Used price
Clone 286 (1/40)	[illegible]	$275
Clone 386/25 (1/40)	[illegible]	$675
Compaq LTE/386	[illegible]	$1,575
Mac Classic (4/40)	[illegible]	$775
Mac PowerBook (1/40)	[illegible]	$1,425
Mac IICI (5/80)	[illegible]	$1,875
Toshiba T2200SX	[illegible]	$1,650
Laserjet III	[illegible]	$1,125

(Note: Megabytes of RAM/hard drive size are in parentheses.)

Source: American Computer Exchange Corp.

LaPlante is a free-lance writer based in Palo Alto, Calif.

PCs, too

A strong used market is starting to emerge for PC computer products as well. Bob Zieg, president of National Computer Exchange, Inc., a New York-based used PC broker, estimates that the used PC market is growing at approximately 20% annually.

Ryan Granard is operations manager at Computer Education International (CEI), a Glendale, Calif., consulting firm that provides computer training for local corporations.

For cost reasons, Granard typically buys used equipment for classroom use. "I have enough knowledge and experience that I feel comfortable buying used equipment," he says.

Although he has purchased used PCs from a variety of sources over the years, he used Atlanta-based American Computer Exchange Corp. to purchase more than 30 Compaq Computer Corp. portables this past year. The main reason was price: He purchased Compaq Portable III 286-based systems for only $500 each. —*Alice LaPlante*

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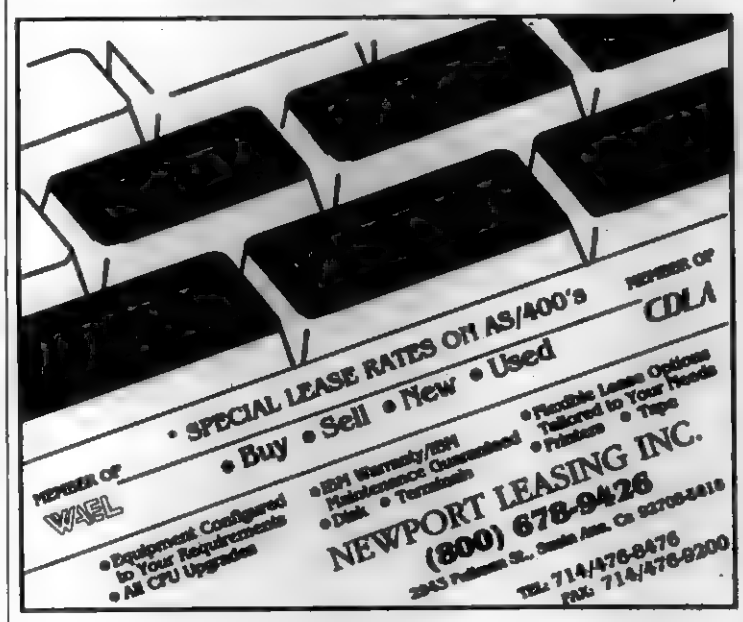

Buy/Sell/Lease

Index of used computer prices

Week ending December 11, 1992

	Closing Prices BoCoEx	AmCoEx
IBM AT 339	$400	$350
PS/2 Model 30 286	$500	$425
PS/2 Model L40SX	$800	$1075
PS/2 Model 55SX	$1,050	$825
PS/2 Model 60	$600	$475
PS/2 Model P70	$1,650	$1,425
PS/2 Model 80	$1,200	$1,075
PS/2 Model 90	$3,100	$2,900
Compaq Portable II	$425	$275
Portable III	$500	$400
Portable 386	$950	$725
SLT-286	$800	$675
LTE-286	$800	$700
DeskPro 386s	$850	$825
DeskPro 386/33	$1,600	$1,500
Apple Macintosh Classic	$750	$625
SE	$675	$650
HX	$2,300	$1,950
HCI	$2,600	$2,225
HFX	$3,550	$3,200

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The New York City FINANCIAL INFORMATION SERVICES AGENCY has issued two Requests for Proposal for the acquisition of ADABAS/COMPLETE Performance Monitoring Tools (Pre-proposal conference to be held on January 8, 1993 and Proposals due on February 8, 1993) and for the acquisition of DB2 Compression Utility Software (Pre-proposal conference to be held on January 15, 1993 and Proposals due on February 16, 1993). Requests for Proposal may be obtained by calling Mr. Raju Kshatriya at (212) 206-3157 for ADABAS/COMPLETE Performance monitoring tools and Ms. Adele Croce at (212) 206-3255 for DB2 Compression utility software. Minority and Women Owned Business Enterprises are encouraged to submit proposals. Further details regarding the specifications may be found within the RFPs.

The State of Maryland is soliciting proposals to acquire services of "computer programming/integrating" contractor(s), with Medicaid experience, to select, transfer, enhance, and install a HCFA certified Medicaid System.

The Original and eight copies of each proposal must arrive by Feb. 26, 1993, 2:00 pm, at the issuing office: Dept of Health and Mental Hygiene, Medical Care Operations Admin., Joseph E. Davis, Director, Room SS-18, 201 West Preston St., Balto., MD 21201.

A copy of the RFP may be obtained from the office of the Project Director, John J. O'Brien, at (410) 225-6967. The document will be forwarded upon request and without charge to interested parties.

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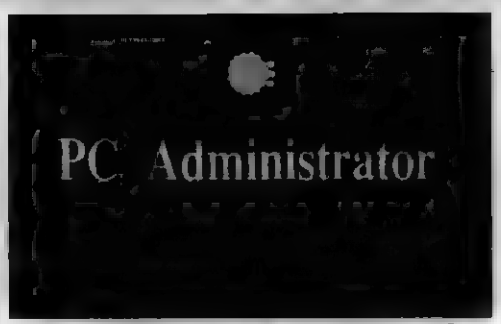

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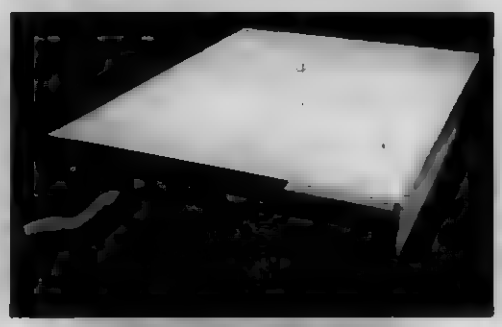

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Companies in this issue

Page number refers to page on which story begins

3Com Corp. 4,42

A

ABC Systems 15
Aberdeen Group 42,45
Actmedia, Inc. 13
Adam Opel AG 55
Adstar 1
Advanced Logic Research, Inc. 30
Affiliated Computer Services, Inc. 2
AgFa Compugraphic 53
Alamo Rent-A-Car, Inc. 1
Allen-Bradley Co. 53
Alliant Computer Systems Corp. 6
Amana Refrigeration Corp. 66
Amco Corp. 59
America West 1
American Airlines 2
American Computer Exchange Corp. 66
Ameritech Co. 41
Andersen Consulting 42,47
Annex Research 1
Apple Computer, Inc. 1,4,14,27,30,46,74
Association for Information and Image Management 53
AST Research, Inc. 6,27
A.T. Kearney, Inc. 52
Atherton Technology 47
AT&T 16,53
Autodesk, Inc. 14
Axxis Software, Inc. 27

B

Bachman Information Systems, Inc. 47
Bank Network News 45
Bankers Trust Co. 1,8
Banyan Systems, Inc. 6
Barclays Bank PLC 52
Basis, Inc. 47
Basis Information Technologies, Inc. 74
Bis Cap International 53
Blackhawk Data Corp. 30
BlueLine Software, Inc. 46
Borland International, Inc. 6,45,49
BT 6
Budget Rent-A-Car Corp. 2

C

Cabletron Systems, Inc. 42
California Federal Bank [redacted]
Candle Corp. 8
Carter, Hawley, Hale 1
Caseworks, Inc. 73
CBS 15
CellularVision 41
Chemical Banking Corp. 20
Chrysler Corp. 55
Cincinnati Bell Information Systems, Inc. 40
Cisco Systems, Inc. 4,16
Citibank AG 55
CNN 15
Coca-Cola Co. 55
Cognos, Inc. 47
Columbia Pictures Industries, Inc. 45
Comdisco, Inc. 20
Commodities Exchange, Inc. 20
Compaq Computer Corp. 27
Compass Computer Services 2
CompuSearch 16
Computer Economics 66
Computer Sciences Corp. 1
Computer Technology Corp. 47
ComputerLand Corp. 8
Compuware Corp. 73
Contingency Planning Research, Inc. 20
Country NatWest Securities 20
Cray Research, Inc. 14,21
Crown Central Petroleum Corp. 16
Currid & Co. 40

D

D'Agostino Supermarkets, Inc. 54
Dairy Mart Convenience Stores, Inc. 52
Defense Advanced Research Projects Agency 47
Dell Computer Corp. 6
Deloitte & Touche 37
Delrina Corp. 6
Deluxe Data Systems, Inc. 45
Depository Trust Co. 20
Digital Consulting, Inc. 54
Digital Equipment Corp. 4,8,46,47,49,53,56,72
Digital Ocean, Inc. 4
Digitalk, Inc. 41
Drexel Burnham Lambert, Inc. 20
Duff & Phelps, Inc. 2

E

Educational Testing Service 45
Electronic Data Systems Corp. 41,42
Environmental Protection Agency 6
Etak, Inc. 27
European Commission 21
Everex Systems, Inc. 6
Evolutionary Technologies, Inc. 47
Exchange Resources, Inc. 20

F

Federal Communications Commission 41
Federal Drug Administration 52
First Bancorp. 1
Fiserv, Inc. 74
Fisher, Wayland, Cooper and Leader 41
Florida Medical Center 21
Formation, Inc. 66
Forrester Research, Inc. 42
Fourth Wave Technologies, Inc. 8
Fujisawa USA 52

G

Garban Ltd. 41
Gartner Group, Inc. 1,8,13,37,46,51,54
General Motors Corp. 54,55
Genuine Parts Co. 1
Georgia-Pacific Corp. 54
Gillette Corp. 54
Granite Computer Products, Inc. 8
Graystone Cos. 51
Grumman Corp. 54

H

Hambrecht & Quist, Inc. 4
Harley-Davidson Co. 10
Hartmarx Retail Group 1
Harvest Foods, Inc. [redacted]
Hewlett-Packard Co. 1,4,16,47,49,74
Hilton Hotels Corp. 2
Honeywell, Inc. 61
Horizon Strategies, Inc. 47

I

IBM 4,8,16,24,27,30,42,45,46,47,49,54,55,56,73
IBM PC Co. [redacted]
InaCom Corp. 72
Information Builders, Inc. 46,47
Informix Software, Inc. 16
Input 13
Insight Distribution, Inc. 8
Integral Midrange 49
Integrated Systems Solutions Corp. 13
Intel Corp. 41,56,73
Intelligent Networks, Inc. 4
Interleaf, Inc. 53
International Communications Association 41
International Data Corp. 4
Iris Associates, Inc. 37
ITT Hartford Life Co. 4

J

J. J. Kenny Co. 4

K

Kidder, Peabody & Co. 4
KnowledgeWare, Inc. 47

L

LAN Solutions 8
Landmark Systems 8
Language Technology, Inc. 47
Leaf Systems, Inc. 21
Lexmark 74
Los Alamos National Laboratory 21
Lotus Development Corp. 37,46
Lucid, Inc. 49

M

Maidenform, Inc. 1
Marketshare, Inc. 1
Martin County Board of Commissioners 54
Martin Marietta Technical Services, Inc. 6
Maryland Department of the Environment 16
Maryland National Bank 37
McDonnell-Douglas 61
MCI Communications Corp. 41
McKinsey & Co. 1
Meta Group, Inc. 54
M&I Data Corp. 74
Micro Decisionware, Inc. 46
MicroAge, Inc. 8
Micrografx, Inc. 27
Microsoft Corp. 6,8,10,14,20,30,45,46,47,49,55,74
Montgomery Securities 72
Motorola, Inc. 1,61

N

National Association of Desktop Publishers 53
National Computer Exchange 66
National Grange Mutual Insurance Co. 61
National Westminster Bank 20
NBC 15
NCR Corp. 45
NEC Technologies, Inc. 30
Needham & Co. 72
New Science Associates 14,47,
New York Cash Exchange 45
New York University 8
North Atlantic Publishing Systems 53
Northtec Consulting Group 59
Novell, Inc. 4,6,20,45,46,47,55,

O

Odesta Corp. 53
Oracle Corp. 1,4,16,45,46,47,
Otis Elevator, Inc. 55

P

Pace Foods, Inc. 1
Pacific Power and Light 37
Palm Beach County Board of Commissioners 54
Paramax Systems Corp. 47
Paramount Communications, Inc. 10
Paramount Technology Group 10
Patricia Seybold's Office Computing Group 37,46
Patton Electronics Co. 42
People Karch International 4
PeopleSoft, Inc. 40,72
Pepsico, Inc. 1,10
Photonics Corp. 42
Postal Buddy Corp. 41
Prologic Computer Corp. 40
Proteon, Inc. 16,42
ProtoView Development Corp. 49
Public Service Co. 61

Q

Quaker Oats Co. 42
Quark Corp. 53
Quotron Systems, Inc. 20

R

Racal Datacom, Inc. 45
Radius, Inc. 73
Rayovac Corp. 37
Real Decisions, Inc. 13
Reuters Information Services, Inc. 20
Revco D.S., Inc. 1
R.H. Macy & Co. 1
R.J. Reynolds Tobacco 55
Robotron 56

S

Salomon Brothers, Inc. 20
Samsonite Corp. 1
Sea-Land Service, Inc. 61
Semaphore 47
SHL Systemhouse, Inc. 72
Silicon Graphics, Inc. 42
Simon & Schuster Publishing 10
Smaby Group, Inc. 21
Soft Logic Solutions, Inc. 30
Softool Corp. 30
Software AG of North America, Inc. 47
Software Research Northwest, Inc. 1
Software Spectrum, Inc. 72
Source EDP 59
Southwest Network Service 42
Sterling Software, Inc. 46
Storage Dimensions 30
Storage Technology Corp. 16
StrataCom, Inc. 72
Stratus Computer, Inc. 45
Sun Microsystems, Inc. 4,14,47,49,
Sybase, Inc. 45,1

T

Tandem Computers, Inc. 45
Telebit Corp. 72
Telekom 58
Telerate, Inc. 20
Telos Financial Services 40
Texaco, Inc. 45
Texas Instruments, Inc. 47,74
The ASK Group, Inc. 1,14
The Bisys Group, Inc. 13
Thinking Machine Corp. 21
Tone Software Corp. 46
Toshiba America Information Systems, Inc. 30
Treuhandanstalt 55

U

U.N. Security Council 14
Ungermann-Bass, Inc. 42
Unisys Corp. 6,47,74
United Telephone-Northwest 61
University of Alabama Health Services Foundation 42
University of California at San Diego 46
U.S. Defense Advanced Research Projects Agency 47
U.S. Postal Service 16

V

Victor Hasselblad AB 21
Virginia Center of Excellence for Software Reuse and Technology Transfer 47

W

Wang Laboratories, Inc. 73
Waukesha Engine Division Dresser Industries, Inc. 32
Wellfleet Communications, Inc. 4,16
WordPerfect Corp. 6
WordStar, Inc. 6
WorkGroup Technologies, Inc. 27,53

X

Xerox Imaging Systems, Inc. 53
XOX Corp. 30
Xplor International 51,153
XSoft 53

Z

Zale Corp. 13
Zenith Data Systems 30

Computerworld's Friday Stock Ticker

Gainers

Percent

Gandalf Technologies Inc.	64.3
Software Toolworks Inc.	27.3
Newbridge Networks Corp. (H)	18.9
Kendall Square Research (H)	17.3
Pyramid Technology	16.2
Intelligent Electronics	15.7
Brooktrout Technology	13.2
3 Com Corp. (H)	11.6
Quarterdeck Office Sys.	38.0
Spectrum Software	33.9
Artel Communication Corp.	25.0
Evans & Sutherland	25.0
IBM (L)	18.1
Stratacom Inc.	16.1
McAfee Associates	15.4
Wang Labs Inc. (a)	14.4

Dollar

Synoptics Communications (H)	7.75
Cabletron Systems	6.75
Intel Corp. (H)	6.50
Newbridge Networks Corp. (H)	6.38
Dell Computer Corp. (H)	6.25
Microsoft Corp.	3.63
American Info Techs Corp. (H)	2.88
Northern Telecom Ltd.	2.75
IBM (L)	11.25
Progress Software Corp.	3.25
Storage Technology	3.00
Wellfleet Communications	3.00
System Software Assoc.	2.75
McAfee Associates	2.75
MRS	2.50
Software Spectrum Inc.	2.50

[redacted]

Several new faces appear on the expanded *Computerworld* Friday Stock Ticker this week. Among them are the following:

InaCom Corp. (INAC)

PC reseller InaCom said it will report close to $1 billion in revenue in fiscal 1992, making it the fourth-largest reseller chain. InaCom works through systems integrators and other service providers as well as through its ValCom and Inacomp Computer Centers.

SHL Systemhouse, Inc. (SHKIF)

Ottawa-based SHL Systemhouse raked in $738.6 million in fiscal 1992 revenue, ranking it as the 11th-largest systems integrator. SHL Systemhouse expects continued growth because of its increasing backlog. Partly because of onetime charges, the most recent quarter resulted in a net loss of $7.4 million on revenue of $190.4 million.

Software Spectrum, Inc. (SSPE)

Software Spectrum resells software and maintains a library of applications that users can evaluate prior to purchase. The firm, in Garland, Texas, reported $189 million in revenue for the last fiscal year (ended in March 1992). Revenue for the most recent quarter was $49.9 million, with profits of $1.2 million; both are up from the year-ago quarter.

Telebit Corp. (TBIT)

Once focused on producing high-speed modems, Telebit has expanded into higher margin internetworking products. According to Wall Street firm Needham & Co., Telebit now derives approximately 17% of its revenue from internetworking goods such as its NetBlazer router, which uses standard telephone lines for data communications. Annual sales are approximately $50 million.

PeopleSoft, Inc. (PSFT)

PeopleSoft went public in November, with the initial share price of 17 jumping quickly to more than 30. The company develops a line of human resources management applications for client/server architectures. Revenue has grown quickly since PeopleSoft was founded in 1987, reaching almost $21 million for the nine-month period ended Sept. 30.

StrataCom, Inc. (STRM)

StrataCom's initial public offering was in September. According to a report by Montgomery Securities, the multiplexer vendor benefits from strategic relationships with Digital Equipment Corp. (DEC) and Sprint International that will facilitate broad penetration of the corporate wide-area networking market. — *Derek Slater*

Exch	52 Week High	52 Week Low		Dec 18 Close	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up 1.8%
OTC	26.38	9.63	3 COM Corp. (H)	26.38	2.75	11.6
NYS	71.88	56.25	American Info Techs Corp. (H)	71.88	2.88	4.2
NYS	49.63	36.63	AT&T (H)	49.63	0.88	1.8
OTC	4.25	0.75	Artel Communication Corp.	1.13	-0.38	-25.0
OTC	22.75	10.25	Banyan Systems Inc. (H)	19.75	0.00	0.0
NYS	51.63	40.25	Bell Atlantic Corp. (H)	51.63	2.00	4.0
NYS	55.50	43.38	BellSouth Corp.	52.13	2.13	4.3
NYS	6.75	3.63	Bolt, Beranek & Newman	4.38	-0.25	-5.4
OTC	17.25	10.00	Brooktrout Technology	15.00	1.75	13.2
NYS	78.75	42.13	Cabletron Systems	78.75	6.75	9.4
OTC	31.00	17.75	Chipcom Corp.	25.50	-1.00	-3.8
OTC	76.50	27.38	Cisco Systems Inc.	73.25	2.25	3.2
OTC	35.25	5.50	Compression Labs Inc.	12.25	-1.13	-8.4
OTC	3.38	0.88	Data Switch Corp.	2.50	-0.06	-2.5
NYS	23.63	13.75	Digital Comm. Assoc.	17.38	0.50	3.0
OTC	15.25	7.50	Digital Systems Int'l Inc.	11.00	0.50	4.8
OTC	20.88	3.63	DSC Communications (H)	20.00	1.00	5.3
OTC	10.88	4.75	Fibronix Int'l Inc.	6.50	-0.38	-5.5
OTC	37.50	10.50	Filenet Corp.	21.25	-0.13	-0.6
OTC	3.38	1.50	Gandalf Technologies Inc.	2.88	1.13	64.3
OTC	2.25	0.69	Gateway Communications	1.25	-0.13	-9.1
NYS	6.38	2.63	General Datacomm Inds. (H)	5.75	-0.25	-4.2
ASE	5.88	1.00	Go Video	2.50	-0.38	-13.0
NYS	35.75	28.88	GTE Corp.	34.25	0.38	1.1
NYS	72.00	51.13	ITT Corp.	70.00	0.25	0.4
OTC	39.13	27.50	MCI Communications Corp. (H)	39.13	1.13	3.0
OTC	14.25	2.25	Microcom Inc.	5.50	-0.38	-6.4
OTC	18.25	12.00	Netrix Corp.	17.00	-0.38	-2.2
OTC	16.75	9.63	Network Computing Devices	14.25	0.50	3.6
NYS	18.25	8.88	Network Equipment Tech. (L)	9.38	-0.13	-1.3
OTC	25.50	8.00	Network General	18.75	1.00	5.6
OTC	20.00	8.50	Network Systems Corp.	13.25	1.13	9.3
OTC	40.13	6.88	Newbridge Networks Corp. (H)	40.13	6.38	18.9
NYS	49.25	30.50	Northern Telecom Ltd.	44.13	2.75	6.6
OTC	33.50	22.50	Novell Inc.	28.75	0.75	2.7
NYS	88.38	69.13	Nynex Corp.	84.50	0.25	0.3
OTC	37.50	14.50	Octel Communications Corp.	20.75	-1.75	-7.8
OTC	9.88	3.38	Pemir Data Comm Networks	4.50	0.38	9.1
OTC	53.00	10.25	Picturetel Corp.	25.00	2.25	9.9
OTC	18.75	7.00	Proteon Inc.	9.25	-0.38	-3.9
NYS	39.00	14.50	Scientific Atlanta Inc. (H)	37.25	0.38	1.0
NYS	73.25	56.63	Southwestern Bell Corp. (H)	73.25	2.25	3.2
NYS	26.75	20.75	Sprint Corp.	25.50	0.25	1.0
OTC	26.25	5.88	Standard Microsystems Corp(H)	24.88	0.38	1.5
OTC	15.75	6.88	Stratacom Inc.	11.75	-2.25	-16.1
OTC	77.25	18.75	Synoptics Communications (H)	77.25	7.75	11.2
OTC	7.13	4.38	Telebit Corp.	6.00	-0.13	-2.0
OTC	24.25	12.25	US Robotics	20.13	-0.13	-0.6
NYS	40.00	32.88	US West Inc.	38.88	0.88	2.3
OTC	76.25	24.00	Wellfleet Communications	69.75	-3.00	-4.1
OTC	22.00	7.00	Xircom	8.50	-0.75	-8.1
PCS AND WORKSTATIONS						Up 1.3%
OTC	10.25	3.50	Advanced Logic Research	3.75	-0.63	-14.3
OTC	70.00	41.50	Apple Computer Inc.	58.50	0.25	0.4
OTC	24.50	11.25	AST Research Inc.	21.00	1.50	7.7
NYS	19.25	6.75	Commodore Int'l	7.63	-0.13	-1.6
NYS	45.63	22.25	Compaq Computer Corp. (H)	45.63	2.38	5.5
OTC	44.50	15.00	Dell Computer Corp. (H)	44.50	3.75	9.2
OTC	7.75	0.38	Everex Systems Inc. (L)	0.38	-0.13	-25.0
NYS	35.50	22.13	Harris Corp. (H)	33.75	0.75	2.3
NYS	85.00	47.63	Hewlett Packard Co.	69.88	0.50	0.8
NYS	29.75	14.13	Silicon Graphics	27.38	1.13	4.3
OTC	36.13	22.50	Sun Microsystems Inc.	33.25	0.63	1.9
NYS	31.75	22.25	Tandy Corp. (H)	30.75	1.00	3.4
NYS	11.13	5.00	Zenith Electronics	6.25	0.00	0.0
OTC	25.50	2.75	Zeos International Ltd.	3.75	0.25	7.1
LARGE SYSTEMS						Up 0.2%
ASE	20.63	6.63	Amdahl Corp.	6.88	-0.50	-6.8
NYS	16.38	4.75	Convex Computer	7.63	0.00	0.0
OTC	11.25	1.88	Cray Computer	4.50	-0.13	-2.7
NYS	49.50	19.00	Cray Research Inc.	22.88	-0.13	-0.5
NYS	18.13	7.13	Data General Corp.	11.88	0.50	4.4
NYS	65.50	31.50	Digital Equipment Corp.	31.88	-1.38	-4.1
NYS	100.38	50.88	IBM (L)	50.88	-11.25	-18.1
OTC	15.25	5.50	Kendall Square Research (H)	15.25	2.25	17.3
NYS	119.25	83.00	Matsushita Electronics	96.50	2.25	2.4
OTC	17.50	6.00	Pyramid Technology	9.88	1.38	16.2
OTC	19.25	11.13	Sequent Computer Sys. (H)	18.63	0.63	3.5
OTC	18.38	2.75	Sequoia Systems Inc.	3.50	0.00	0.0
NYS	54.25	23.50	Stratus Computer Inc.	35.38	-1.38	-3.7
NYS	15.88	9.75	Tandem Computers Inc. (H)	14.88	-0.13	-0.8
NYS	11.75	4.00	Unisys Corp.	10.38	0.63	6.4
ASE	7.50	0.06	Wang Labs Inc. (a)	0.38	-0.06	-14.4
SOFTWARE						Off 0.2%
OTC	68.50	25.25	Adobe Systems Inc.	30.50	-0.88	-2.8
OTC	44.25	10.25	Aldus Corp.	13.50	-0.25	-1.8
OTC	19.75	7.00	American Software Inc.	8.88	-0.25	-2.7
OTC	22.75	9.75	Ask Computer Systems (H)	22.75	0.38	1.7
OTC	56.50	23.25	Autodesk Inc.	47.25	1.00	2.2
OTC	37.75	3.75	Bachman Info. Systems	5.63	-0.38	-6.3
OTC	43.00	32.75	BGS Systems Inc.	41.25	2.25	5.8
OTC	79.00	37.25	BMC Software Inc.	67.13	2.38	3.7
OTC	25.50	13.25	Boole & Babbage	21.50	-0.50	-2.3
OTC	86.75	19.75	Borland Int'l Inc. (L)	22.00	1.25	6.0
OTC	10.50	3.63	CE Software	4.06	-0.13	-3.0
ASE	31.13	9.38	Cheyenne Software Inc. (H)	31.13	2.25	7.8
OTC	17.50	8.25	ChipSoft	15.00	-1.25	-7.7
OTC	13.13	5.63	Cognos Inc.	7.25	-0.25	-3.3
NYS	19.75	9.25	Computer Associates	19.75	1.63	9.0
NYS	12.38	4.75	Computervision Corp	4.88	0.25	5.4
OTC	20.00	6.75	Comshare Inc.	13.25	-0.50	-3.6
OTC	47.88	6.00	Easel Corp.	10.75	-1.50	-12.2
OTC	26.50	11.75	Frame Technology	13.88	0.38	2.8
OTC	25.00	11.50	Group1 Software	15.50	-0.50	-3.1
OTC	6.63	3.50	Hogan Systems Inc.	6.25	0.63	11.1
OTC	23.50	13.75	IMRS	21.00	-2.50	-10.6
OTC	36.25	18.50	Information Resources	30.88	-1.13	-3.5
OTC	34.25	6.31	Informix Corp. (H)	31.00	-0.75	-2.4
OTC	22.38	11.00	Intergraph Corp.	14.00	1.00	7.7
OTC	15.00	7.38	Interleaf Inc.	12.00	0.88	7.9
OTC	20.25	10.25	Intersolv Inc.	12.50	0.00	0.0
OTC	21.38	9.50	Knowledgeware Inc.	15.50	1.13	7.8
OTC	52.75	28.75	Legent Corp. (H)	48.25	0.25	0.5
OTC	38.75	14.75	Lotus Development	21.00	0.25	1.2
OTC	23.25	15.13	McAfee Associates	15.13	-2.75	-15.4
OTC	7.38	1.88	Meca Software	5.88	0.25	4.4
OTC	22.25	5.25	Mentor Graphics	8.38	-0.13	-1.5
OTC	42.75	27.25	Micro Focus (H)	42.25	1.25	3.0
OTC	20.50	6.50	Micrografx Inc.	8.50	-0.25	-2.9
OTC	95.00	65.50	Microsoft Corp.	89.88	3.63	4.2
OTC	24.75	12.00	Oracle Corp.	20.50	-1.38	-6.3
OTC	56.25	23.38	Parametric Technology	50.75	2.75	5.7
OTC	32.00	22.50	Peoplesoft	28.63	-1.38	-4.6
OTC	11.00	3.50	Phoenix Technologies	5.88	-0.75	-11.3
OTC	25.25	11.25	Platinum Technology	20.25	2.00	11.0
OTC	61.50	29.00	Progress Software Corp.	56.50	-3.25	-5.4
OTC	26.63	3.88	Quarterdeck Office Sys.	3.88	-2.38	-38.0
OTC	32.75	11.75	Rainbow Technologies Inc.	20.00	-1.00	-4.8
OTC	22.75	4.00	Rasterops	8.00	0.50	6.7
OTC	17.25	3.63	Ross Systems	9.00	0.75	9.1
OTC	18.88	8.50	Sapiens USA Inc.	18.50	1.13	6.5
OTC	26.25	6.75	Software Publishing Corp.	8.38	-0.50	-5.6
OTC	8.00	2.00	Software Toolworks Inc.	7.00	1.50	27.3
OTC	7.25	0.75	Spinnaker Software	1.16	-0.59	-33.9
OTC	16.50	3.25	State of the Art	8.00	0.25	3.2
NYS	25.25	13.75	Sterling Software Inc.	20.00	-0.63	-3.0
OTC	30.00	8.00	Struct. Dynamics Research	11.63	-0.25	-2.1
OTC	47.00	19.25	Sybase Inc. (H)	42.75	-0.88	-2.0
OTC	51.00	5.88	Symantec Corp.	12.88	-1.25	-8.8
NYS	15.50	5.25	Systems Center Inc.	7.25	0.25	3.6
OTC	38.00	17.50	System Software Assoc.	31.63	-2.75	-8.0
OTC	13.25	2.50	Tomcat Corp.	3.00	-0.50	-14.3
OTC	23.75	14.50	Walker Interactive Systems	21.00	-1.13	-5.1
OTC	5.38	1.38	Wordstar	2.44	0.00	0.0
SEMICONDUCTORS						Up 1.4%
NYS	21.50	7.38	Advanced Micro Devices	18.38	1.50	8.9
NYS	15.13	7.75	Analog Devices Inc. (H)	15.00	0.13	0.8
OTC	17.00	7.63	Atmel Corp. (H)	15.50	0.00	0.0
OTC	14.13	3.25	Chips and Technologies	4.63	-0.25	-5.1
NYS	18.38	7.38	Cypress Semiconductor Corp	9.38	-1.00	-9.6
NYS	14.50	7.00	Dallas Semiconductor	13.75	0.25	1.9
OTC	85.50	42.25	Intel Corp. (H)	85.50	6.50	8.2
NYS	11.13	4.88	LSI Logic Corp. (H)	10.50	-0.25	-2.3
NYS	22.38	12.88	Micron Technology	18.75	1.19	6.4
NYS	105.50	58.13	Motorola Inc. (H)	104.75	2.25	2.2
NYS	14.13	5.88	National Semiconductor	11.13	0.25	2.3
OTC	27.00	8.25	Sierra Semiconductor	12.25	-0.75	-5.8
OTC	35.50	22.25	SynOpsys	34.25	1.00	3.0
NYS	52.25	26.00	Texas Instruments	46.75	-0.50	-1.1
OTC	10.50	6.00	VLSI Technology	7.75	0.13	1.6
OTC	7.00	2.13	Weitek	5.00	0.13	2.6
ASE	8.00	2.13	Western Digital Corp.	7.38	-0.25	-3.3
OTC	31.00	14.50	Xilinx	23.50	0.25	1.1
OTC	33.50	17.50	Zilog Inc.	31.75	-1.00	-3.1
PERIPHERALS AND SUBSYSTEMS						Up 2.2%
OTC	11.25	3.88	Archive Corp.	11.13	0.00	0.0
OTC	29.50	15.50	Banctec Inc.	27.38	-0.25	-0.9
OTC	23.50	9.25	Cambex Corp.	14.13	0.00	0.0
ASE	15.38	5.75	Cognitronics Corp. (H)	14.63	0.25	1.7
NYS	23.88	13.50	Conner Peripherals	20.25	0.13	0.6
OTC	22.75	10.75	Creative Technologies Inc.	20.25	-0.75	-3.6
OTC	27.50	14.25	Data Race Inc.	24.50	-1.00	-3.9
ASE	19.66	4.75	Dataram Corp.	10.38	-0.88	-7.8
NYS	22.63	6.09	EMC Corp.	22.63	1.63	7.7
OTC	10.00	4.75	Emulex Corp.	8.38	-0.63	-6.9
OTC	23.00	13.25	Evans & Sutherland	16.75	-1.50	-8.2
OTC	40.63	12.00	Exabyte	17.38	0.00	0.0
OTC	44.00	16.25	Intelligent Info. Systems (H)	41.25	-1.75	-4.1
OTC	11.25	4.75	Iomega Corp.	6.88	0.13	1.9
OTC	34.75	10.75	IPL Systems Inc.	21.25	-0.50	-4.3
OTC	23.25	10.75	Komag Inc.	17.50	-0.75	-4.1
OTC	19.63	4.76	Maxtor Corp.	15.25	-2.25	-12.9
OTC	12.63	7.13	Micropolis Corp.	8.63	-0.50	-5.5
NYS	107.00	85.50	3M Corp.	101.75	-1.63	-1.6
OTC	6.75	3.75	Printronix Inc.	5.25	0.25	5.0
NYS	15.50	6.88	QMS Inc.	12.75	0.50	4.1
OTC	18.00	9.25	Quantum Corp.	16.13	-0.25	-1.5
OTC	12.75	3.75	Radius Inc.	5.00	-0.75	-13.0
NYS	14.75	7.50	Recognition Equipment (H)	14.13	0.38	2.7
OTC	13.88	5.63	Reron Inc.	12.00	0.25	2.1
OTC	27.38	8.25	Seagate Technology (H)	19.00	-1.63	-7.9
NYS	78.00	20.00	Storage Technology	20.00	-3.00	-13.0
NYS	22.88	16.50	Tektronix Inc.	20.13	1.75	9.5
NYS	82.25	63.63	Xerox Corp.	78.25	0.75	1.0
SERVICES						Off 0.2%
OTC	23.50	12.16	American Mgmt. Systems (H)	22.88	0.25	1.1
NYS	5.38	3.00	Amacomp Inc.	4.25	0.00	0.0
OTC	24.50	13.50	Analysts Int'l (H)	24.50	1.50	6.5
NYS	54.50	38.75	Auto Data Processing (H)	54.50	2.00	3.8
NYS	17.25	7.16	Ceridian Corp.	14.88	0.13	0.8
NYS	23.22	12.50	Comdisco Inc.	15.00	-0.50	-3.2
OTC	13.50	6.75	Computer Horizons	9.63	0.25	2.7
NYS	84.88	57.00	Computer Sciences	77.50	-1.75	-2.2
NYS	10.13	7.00	Computer Task Group	8.25	-0.50	-5.7
NYS	40.50	15.00	CompUSA Inc.	31.38	-0.38	-1.2
OTC	19.25	6.00	Corporate Software	11.25	-1.00	-8.2
OTC	30.75	7.75	Egghead Discount Software	10.13	0.25	2.5
NYS	33.75	25.25	General Motors E (EDS)	32.88	0.63	1.9
OTC	14.75	9.00	Ingram Corp.	13.75	-1.00	-6.8
OTC	30.38	6.25	Intelligent Electronics	12.88	1.75	15.7
OTC	14.88	8.63	Merisel	10.00	0.00	0.0
OTC	15.75	5.25	Microage Inc.	8.00	1.25	13.5
OTC	40.00	19.66	Paychex	34.50	-2.25	-6.1
NYS	82.25	58.63	Policy Management Sys.	78.63	-0.75	-0.9
NYS	25.56	16.56	Reynolds and Reynolds	24.75	-0.75	-3.0
OTC	32.00	22.00	SEI Corp.	29.75	-0.25	-0.8
OTC	26.38	16.88	Shared Medical Systems	22.38	0.63	2.9
OTC	14.38	5.75	SHL Systemhouse (L)	6.00	-0.63	-9.4
OTC	29.25	13.50	Software Spectrum Inc.	22.50	-2.50	-10.0
OTC	31.00	17.50	Sungard Data Systems (H)	29.50	-0.75	-2.5
NYS	3.63	1.13	Ultimate Corp.	1.88	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Intel rides the 486

Intel Corp. last week said high demand for its 1486 microprocessor would propel fourth-quarter results well above analysts' expectations. Fourth-quarter revenue is expected to be up about 25% from the $1.43 billion posted in the third quarter of this year, the Santa Clara, Calif., firm said.

IBM buys into CASE

IBM plans to buy an unspecified minority stake in Caseworks, Inc., an Atlanta developer of tools for building graphical user interfaces (GUI). Caseworks will not be an AD/Cycle partner, but its GUI tool for OS/2 will be incorporated into the development framework.

Wang asks for time

Wang Laboratories, Inc. has asked the U.S. Bankruptcy Court for 90 more days to file a Chapter 11 reorganization plan. The Lowell, Mass., firm, which filed for protection in August, was due to submit a plan last week but said it needs an extension to "reconcile creditors' claims [and] negotiate . . . acceptance of the plan," among other tasks.

Radius pessimistic

PC and Apple Computer, Inc. Macintosh enhancement vendor Radius, Inc. said sales for the quarter ending Dec. 31 would be lower than expected. As a result, the San Jose, Calif., company expects to report an operating loss for the quarter. The loss, however, is expected to be partially offset by a onetime tax benefit resulting from the adoption of Financial Accounting Statement No. 109.

IPO floated

Mainframe software and services vendor Compuware Corp. hopes to raise $180 million through an initial public offering, in which 8.2 million shares are being offered at $22 a share.

Kahn retrenches, reflects

Admits mistakes; reorganizes to respond to fierce database competition

By Christopher Lindquist
SCOTTSVALLEY, CALIF.

The ongoing reorganization at Borland International, Inc. — a company that was described as the "Microsoft of the '90s" by a Wall Street pundit only a few months ago — indicates just how difficult it has become to compete in the increasingly Microsoft Corp.-dominated market.

For example, Borland currently faces its stiffest competition from Microsoft in the database arena.

The release of Microsoft's Access database at a $99 price point has redefined pricing for database products and could stretch Borland's margins even thinner. Ironically, Borland has long been known as the pacesetter in inexpensive and innovative pricing.

Another competitor in the Windows database market, Software Publishing Corp. (SPC), said it will not even try to compete on that basis.

"Microsoft is trying to burn Borland's house down," said Fred Gibbons, SPC's chief executive officer. "There's a price war going on between those two gorillas, and they're going to keep swinging until one of them falls down."

Gibbons' own product, Superbase 2.0, is not aimed at that end of the market, he said. As a result, SPC is able to compete in areas that Microsoft does not address, he said.

Borland, meanwhile, following a tough year filled with missteps [CW, Dec. 14], reorganized two weeks ago and divided the company along functional vs. product areas. In the past, Borland's product units, such as languages and applications, worked somewhat autonomously on research and development, sales and marketing. Under the new structure, those areas have been consolidated.

The result, said President and Chief Executive Officer Philippe Kahn, is a company that performs the same tasks more efficiently and provides a common interface to both customers and himself. "I used to have to go and talk to four different marketing people when I wanted to implement a global marketing idea," he said. "This feels much better."

He noted that one big mistake was not implementing the structure a year ago.

The road back to profit

Though struggling in the third quarter, Borland's first half of '93 has outperformed the like period last year

Dollar figures are rounded (in millions)

	Revenue	Income	Employees
1990	$113.3	$11.80	2,200
1991	$226.8	$26.80	2,700
1992	$482.5	$(120.30)**	2,100
1993*	[illegible]	[illegible]	[illegible]

*Figures for Q1-Q2 only
**Includes write downs from Ashton-Tate acquisition

Source: Borland CW Chart: Michael Siggins

Kahn said the reorganization should also feel better for customers, who will now be able to deal with a common sales force familiar with the entire Borland product line, from Quattro Pro to Interbase. "I think customers will see a better company," he said.

> "Microsoft is trying to burn Borland's house down."
>
> *Fred Gibbons*
> *CEO*
> *Software Publishing*

Kahn declined to pinpoint which areas in Borland were affected by the layoff of some 350 employees, though he noted there was considerable managerial overlap among product groups. For example, instead of having separate research and development managers for each product, Borland's vice president of R&D, Bob Warfield, will now coordinate all efforts.

Rebound possible

Analysts seemed hopeful that the changes at Borland will indeed be enough to turn the company around. Andrew Topper, president of Foresite Systems, compared the company to other firms, such as KnowledgeWare, Inc., that stepped back, restructured and came out competitive. "I would expect that to happen with Borland," he said.

Such a resurgence will not come without a price, however. Wall Street is expecting an operating loss from Borland this quarter. What remains to be seen is how big the loss will be. Revenue is expected to be in the $110 million to $120 million range. The hit to that revenue as a result of the layoffs and other costs could result in a write-off as high as $35 million. Neither Wall Street nor Borland is predicting how high the company's quarterly loss will be.

Ironically, one reason for optimism is also at the root of some of Borland's recent troubles: object-oriented technology.

Kahn has admitted that rebuilding the company's products on an object-oriented base has taken about eight months longer than expected. As a result, Wall Street became impatient with slipped ship dates for vital Windows products, such as Paradox for Windows and dBase for Windows, and Borland's stock dipped to a quarter of its highest value.

However, that same object-oriented base should help Borland update products more quickly, efficiently and with fewer bugs in the future. Analysts point to Borland's speedy upgrades to ObjectVision as an example of what may be expected with other products. Kahn noted that an upgrade to Quattro Pro for Windows is due by September 1993 — roughly one year after the product debuted.

That technology base could help keep Borland afloat where other afflicted companies, such as Ashton-Tate Corp., have sunk. "Borland has historically had good technology," said Terence Quinn, senior technology analyst at Kidder, Peabody & Co. in New York. But, at this point, Borland's success, at least in the stock market, rides on one thing: getting good products out the door. Borland must "deliver on time," he said. And, he added, it must learn not to make promises it cannot keep.

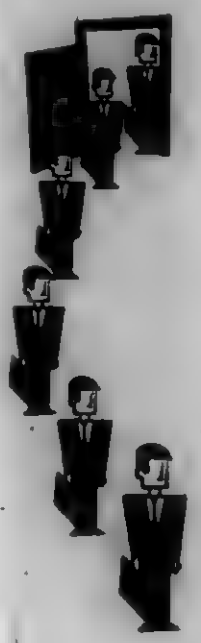
Kahn noted, however, that he will not let Wall Street or the press push him into releasing products that are not ready. "My biggest fear is to, at any point, be tempted to not stay the course," he said. "The only way to compete with Microsoft is to release the best products."

Poor precedents

While some analysts are calling for Borland to bring in outside executives to help run the company, history doesn't bode too well for such situations.

Apple Computer, Inc. lost its visionary when founder Steve Jobs was ousted from the company after he brought in John Sculley as president.

Microsoft has experienced its own problems finding — and keeping — company presidents. Jon Shirley, who joined Microsoft from Texas Instruments, Inc. in the mid-1980s, exited in 1989. His successor, Michael Hallman, who left a high-paying job as the president of Boeing Computer Services Co., departed last year after an 18-month stint.



Wysiwyg

TAKE A HINT, VENDORS

PCMCIA stands for Personal Computer Memory Card International Association. But Andy Seybold, publisher of the "Outlook on Computing" newsletter has offered a new definition for the word: People Cannot Memorize Computer Industry Acronyms.

"In God we trust, everything else we walk through"

Slogan from the Center for Project Management in San Ramon, Calif.

WINDOWS WEIRDNESS

By Jeff McGroary

Weird, off-the-wall, undocumented features appear in a lot of software, including Windows.

EAT Those of us who date back to the early days of Windows development — circa 1986 — remember the oddly named BurgerMaster segment that was an integral part of the Windows 1.X and 2.X memory management system. Why BurgerMaster? Well, it seems that the Windows development team wanted to recognize the Redmond, Wash., establishment that was its late-night restaurant of choice during development crunch time.

MASTER

BurgerMaster disappeared with Windows 3.X.

(Watch this space for future glimpses into the undocumented world of Windows.)

Find any interesting, undocumented features in your applications? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

FROM OUR READER FILES

ALL WET

In 1966, we were shipping software to the Marshall Islands from New Jersey. We shipped punch cards, and they stood out on runways in California and Hawaii and got drenched. They expanded and couldn't be read. So we had to establish software curing rooms; we put the cards in air-conditioning for four days to dry them out. We could not send magnetic tapes because at the time we could not keep them aligned. Eventually, we went to satellite transmission, not because we needed the speed but because that was the only way to avoid the physical problems of wet cards or tape misalignment.

The Fifth Wave

Inside Lines

Memory lapse

The word across CompuServe is that one of the more serious bugs in Microsoft's Access can occur when it is used with Stac Electronics' Stacker Version 3.0 disk compression package. Several Stacker 3.0 users have reported problems when using Access. Symptoms include "out of memory" errors and reports by Access of corrupted databases. According to both companies, the situation is under investigation, and it is unclear what is causing the problems.

PowerPrint

Apple will follow up on the outstanding success of its PowerBook portable (one-year totals of 400,000 units sold and $1 billion in revenue) with the release of a similarly sized portable printer. Sources familiar with Apple's plans said to keep your eyes out for a four-pound serial Quikdraw model sometime around midyear, with a slightly heavier color model to follow.

Hooray for user groups

A flurry of clamorous protests from Apple user groups regarding the System 7.1 upgrade kit has finally paid off. Although Apple has barred user groups from distributing System 7.1, Apple Senior Vice President Roger Heinen has sent out a letter saying members can get the System 7.1 upgrade kit for a reduced price of $27.95 by simply calling the upgrade line at (800) 769-2775 and identifying their group. The price represents a 20% discount off the kit's typical $34.95 price.

High fives

Unisys' financial recovery appears to be making steady progress. At a meeting last week with securities analysts in Boston, James A. Unruh, Unisys chairman and CEO, said the company expects to report its fifth consecutive profitable quarter for fourth-quarter 1992. In addition, Unruh said the company has exceeded its profit, cash flow and revenue goals for 1992, although he said fourth-quarter revenue will be down from last year's levels, which were abnormally high.

Rounding the Basis

First Financial Management Corp. (FFMC), which recently agreed to an out-of-court settlement with IBM regarding FFMC's Basis banking project [CW, Dec. 14,], has reportedly put its Basis Information Technologies, Inc. outsourcing unit on the block. Basis, which provides data processing and other computer services for 600 financial firms, is reportedly being considered by third-party data processing companies, including Fiserv, Inc. and M&I Data Corp., both based in Milwaukee.

Can you spell price war?

Don't look now, but with Intel planning record run rates of the 1486 for 1993, and IBM, AMD, Texas Instruments and Cyrix all in or certain to enter the 486 market in 1993, Kimball Brown, an analyst at Computer Intelligence/Infocorp, muses that there could be as many as 40 million 486-class chips produced for the year. He notes that the market has never absorbed that many PCs and sees a mini price war on the chip side, which could have an impact on box tags.

Ever wish your printer could talk — just so you could cuss it out? Wait until next year when Lexmark and TI are expected to release a new breed of printers based on the Network Printing Alliance protocol. The standard provides a high-speed bidirectional link between printer and PC or host. It also allows a printer to take care of all those nasty complex tasks that have bugged users for years — such as making sure your application matches the printer's definition language and letting you know when it runs out of paper — so you don't have to trek over in person to find out why your job didn't print. One question is how fast the rest of the industry will jump on the standard. HP is holding out with its own bidirectional link, according to sources. The standard is slated for general availability at Networld on Jan. 11. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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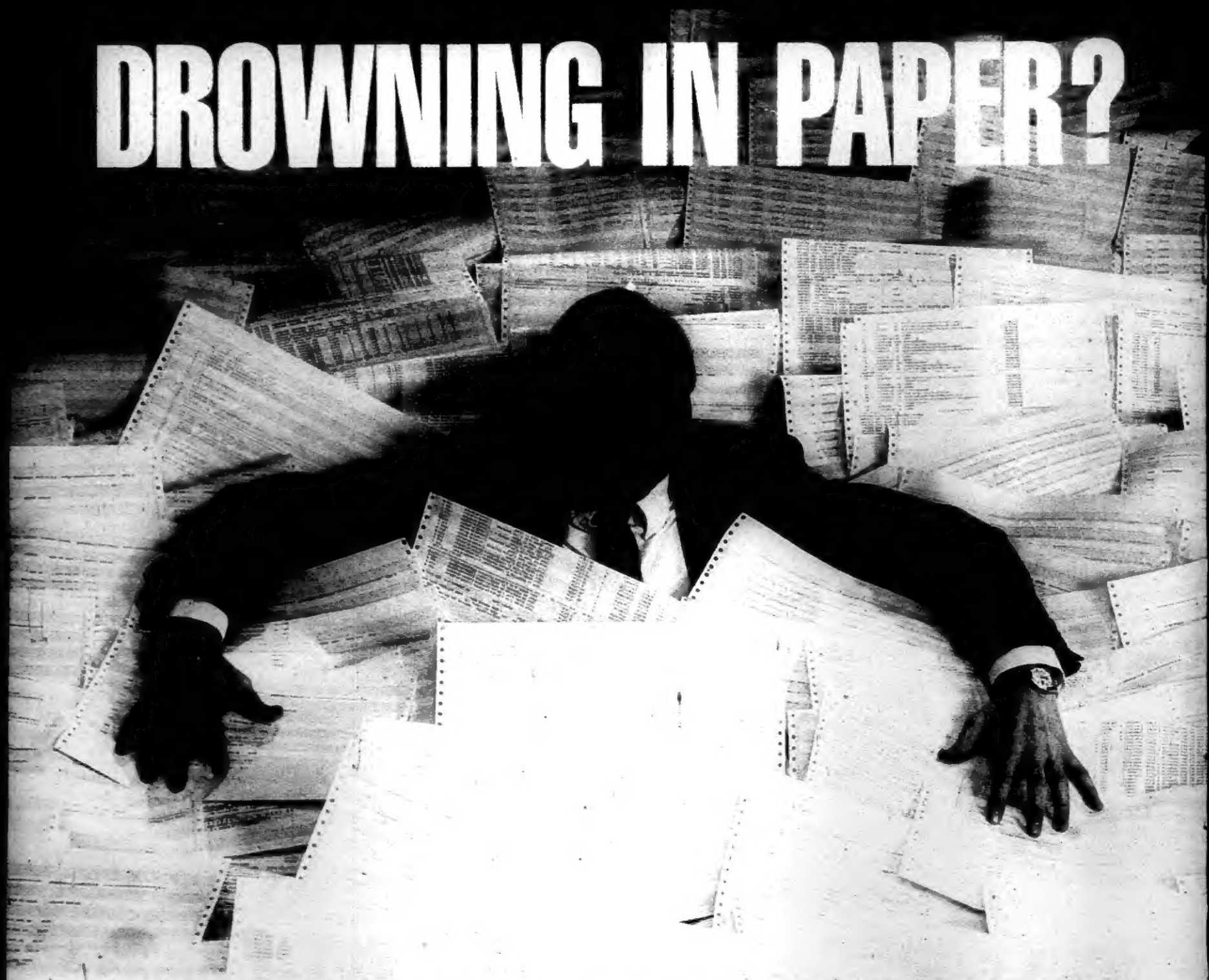
DROWNING IN PAPER?



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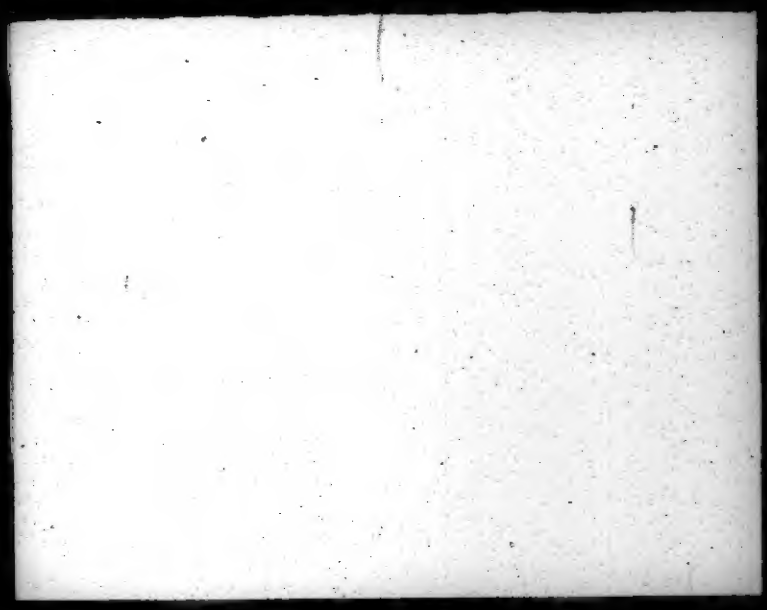

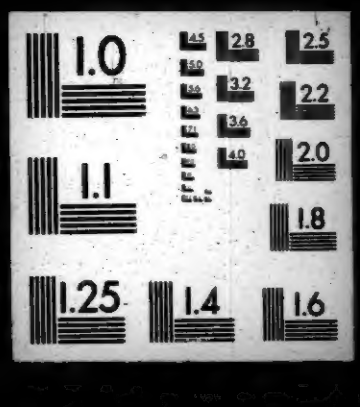
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